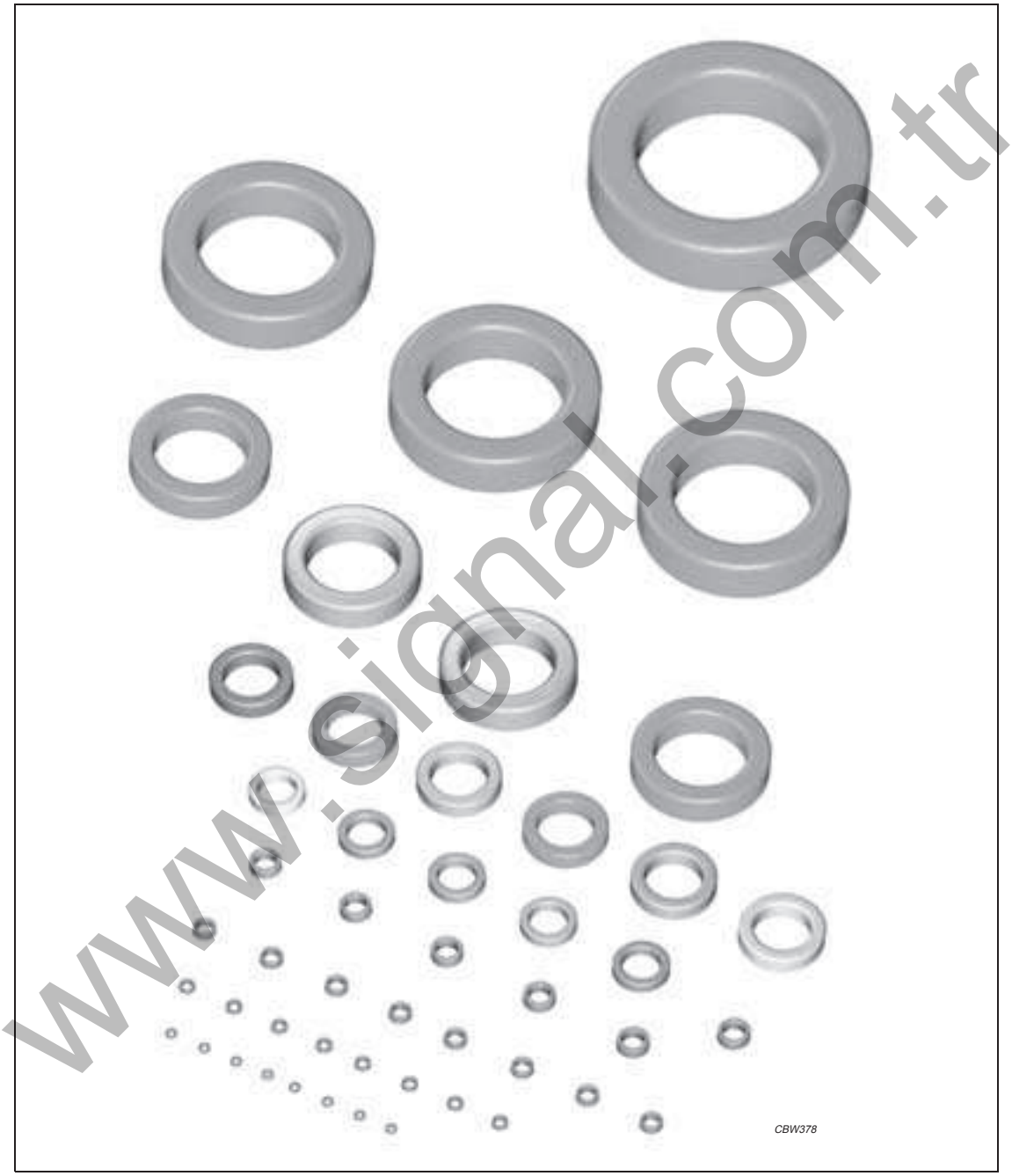


## PRODUCT OVERVIEW AND TYPE NUMBER STRUCTURE

**Product overview Ferrite ring cores (toroids)**

| CORE TYPE | $V_e$ ($mm^3$) | $A_e$ ($mm^2$) | MASS (g) |
|---|---|---|---|
| TC2.5/1.3/0.8 | 2.7 | 0.49 | 0.012 |
| TC2.5/1.3/1.3 | 4.29 | 0.76 | 0.022 |
| TC2.5/1.3/2.5 | 8.57 | 1.55 | 0.044 |
| TC2.5/1.5/0.8 | 2.21 | 0.37 | 0.012 |
| TC2.5/1.5/1 | 2.94 | 0.49 | 0.015 |
| TC3.1/1.3/1.3 | 6.35 | 1.06 | 0.033 |
| TC3.1/1.8/2 | 9.10 | 1.26 | 0.05 |
| TC3.4/1.8/1.3 | 7.3 | 0.96 | 0.035 |
| TC3.4/1.8/2 | 11.6 | 1.54 | 0.06 |
| TC3.4/1.8/2.1 | 11.5 | 1.52 | 0.06 |
| TC3.4/1.8/2.3 | 14.0 | 1.83 | 0.068 |
| TC3.5/1.6/1.3 | 8.3 | 1.15 | 0.043 |
| TC3.5/1.8/1.3 | 7.87 | 1.03 | 0.04 |
| TC3.5/1.8/1.8 | 11.0 | 1.44 | 0.06 |
| TC3.5/1.8/2 | 12.4 | 1.62 | 0.05 |
| TC3.9/1.8/1.8 | 14.8 | 1.83 | 0.09 |
| TC3.9/1.8/2.5 | 21.1 | 2.6 | 0.12 |
| TC3.9/2.2/1.3 | 9.2 | 1.0 | 0.045 |
| TC4/1.8/0.8 | 6.43 | 0.79 | 0.035 |
| TC4/2/2 | 16.7 | 1.92 | 0.095 |
| TC4/2.2/1.1 | 8.8 | 0.96 | 0.04 |
| TC4/2.2/1.3 | 9.8 | 1.07 | 0.05 |
| TC4/2.2/1.6 | 12.9 | 1.40 | 0.06 |
| TC4/2.2/1.8 | 14.4 | 1.56 | 0.07 |
| TC4/2.2/2 | 16.1 | 1.75 | 0.08 |
| TC4.8/2.3/1.3 | 15.5 | 1.52 | 0.09 |
| TC5.8/3.1/0.8 | 13.2 | 1.01 | 0.07 |
| TC5.8/3.1/1.5 | 26.1 | 2.00 | 0.13 |
| TC5.8/3.1/3.2 | 55.8 | 4.28 | 0.31 |
| TC5.9/3.1/3.1 | 53.8 | 4.12 | 0.14 |
| TC6/4/2 | 30.2 | 1.97 | 0.15 |
| TC6/4/3 | 45.2 | 2.96 | 0.23 |
| TC6.3/3.8/2.5 | 46.5 | 3.06 | 0.23 |
| TC7.6/3.2/4.8 | 148 | 9.92 | 0.70 |
| TC7.6/3.2/5.2 | 160 | 10.6 | 0.75 |
| TC8.2/3.7/4 | 144 | 8.50 | 0.70 |
| TC9/6/3 | 102 | 4.44 | 0.50 |
| TN9/6/3 | 102 | 4.44 | 0.50 |
| TX9/6/3 | 102 | 4.44 | 0.50 |

| CORE TYPE | $V_e$ ($mm^3$) | $A_e$ ($mm^2$) | MASS (g) |
|---|---|---|---|
| TC9.5/4.8/3.2 | 148 | 7.16 | 0.70 |
| TN10/6/4 | 188 | 7.8 | 0.95 |
| TX10/6/4 | 188 | 7.8 | 0.95 |
| TX13/7.1/4.8 | 361 | 12.3 | 1.8 |
| TN13/7.5/5 | 368 | 12.2 | 1.8 |
| TX13/7.5/5 | 368 | 12.2 | 1.8 |
| TX13/7.9/6.4 | 442 | 14.1 | 2.2 |
| TN14/9/5 | 430 | 12.3 | 2.1 |
| TX14/9/5 | 430 | 12.3 | 2.1 |
| TN14/9/9 | 774 | 22.1 | 3.8 |
| TX14/9/9 | 774 | 22.1 | 3.8 |
| TX16/9.1/4.7 | 548 | 14.7 | 2.7 |
| TN16/9.6/6.3 | 760 | 19.7 | 3.8 |
| TX16/9.6/6.3 | 760 | 19.7 | 3.8 |
| TN19/11/10 | 1795 | 40.8 | 9.2 |
| TN19/11/15 | 2692 | 61.2 | 13.8 |
| TN20/10/7 | 1465 | 33.6 | 7.7 |
| TX20/10/7 | 1465 | 33.6 | 7.7 |
| TX22/14/6.4 | 1340 | 24.8 | 6.5 |
| TX22/14/13 | 2750 | 50.9 | 14 |
| TN23/14/7 | 1722 | 30.9 | 8.4 |
| TN25/15/10 | 2944 | 48.9 | 15 |
| TX25/15/10 | 2944 | 48.9 | 15 |
| TN26/15/10 | 3360 | 55.9 | 17 |
| TX26/15/10 | 3360 | 55.9 | 17 |
| TN26/15/20 | 6720 | 112 | 34 |
| TN29/11/6 | 2680 | 50.8 | 14 |
| TN29/19/7.5 | 2700 | 36.9 | 13.5 |
| TX29/19/7.5 | 2700 | 36.9 | 13.5 |
| TX29/19/7.6 | 2600 | 35.5 | 13 |
| TN29/19/15 | 5410 | 73.9 | 28 |
| TX29/19/15 | 5410 | 73.9 | 28 |
| TN32/19/13 | 5820 | 76.5 | 29 |
| TX32/19/13 | 5820 | 76.5 | 29 |
| TX36/23/10 | 5820 | 64.9 | 28 |
| TX36/23/15 | 8740 | 97.5 | 40 |
| TX39/20/13 | 9513 | 112 | 45 |
| TX40/24/16 | 12100 | 125 | 62 |
| TX40/24/20 | 15100 | 157 | 77 |

| CORE TYPE | $V_e$ ($mm^3$) | $A_e$ ($mm^2$) | MASS (g) |
|---|---|---|---|
| TX42/26/13 | 9860 | 95.8 | 53 |
| TX42/26/18 | 13810 | 134 | 55 |
| TX50/30/19 | 22378 | 186 | 100 |
| TX51/32/19 | 21500 | 172 | 100 |
| TX55/32/18 | 26580 | 202 | 100 |
| TX58/41/18 | 23200 | 152 | 110 |
| TX63/38/25 | 46500 | 306 | 220 |
| TX74/39/13 | 34300 | 208 | 170 |
| TX80/40/15 | 50200 | 288 | 240 |
| TX87/54/14 | 46400 | 217 | 220 |
| T87/56/13 | 42133 | 194 | 200 |
| TX102/66/15 | 68200 | 267 | 325 |
| T107/65/18 | 96000 | 370 | 456 |
| TX107/65/18 | 96000 | 370 | 456 |
| T107/65/25 | 133000 | 514 | 680 |
| T140/106/25 | 161100 | 422 | 800 |
| TX140/106/25 | 161100 | 422 | 800 |
| TX152/104/19 | 176600 | 450 | 878 |

• In accordance with IEC 62317, part 12.

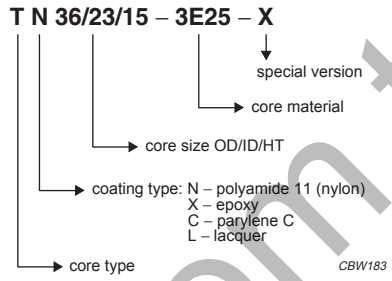



Fig.1 Type number structure for toroids.

## RING CORES (TOROIDS)

### Effective core parameters

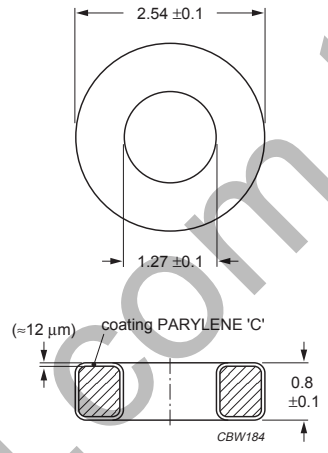
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| Σ(l/A) | core factor (C1) | 11.3 | $mm^{-1}$ |
| $V_e$ | effective volume | 2.7 | $mm^3$ |
| $l_e$ | effective length | 5.53 | mm |
| $A_e$ | effective area | 0.49 | $mm^2$ |
| m | mass of core | ≈0.012 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC2.5/1.3/0.8 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 | 94 +25/−20% | ≈850 | TC2.5/1.3/0.8-4A11 |

## RING CORES (TOROIDS)

### Effective core parameters

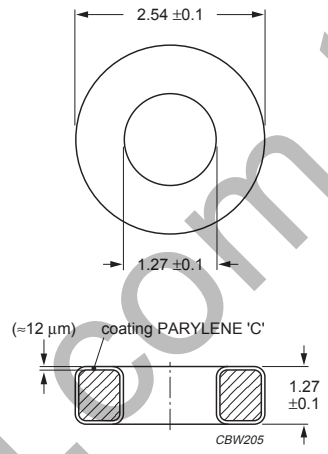
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 7.14 | $mm^{-1}$ |
| $V_e$ | effective volume | 4.29 | $mm^3$ |
| $l_e$ | effective length | 5.53 | mm |
| $A_e$ | effective area | 0.76 | $mm^2$ |
| m | mass of core | ≈ 0.022 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC2.5/1.3/1.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 des | 150 ± 25% | ≈ 850 | TC2.5/1.3/1.3-4A11 |
| 3S4 des | 300 ± 25% | ≈ 1700 | TC2.5/1.3/1.3-3S4 |
| 3E25 des | 970 ± 30% | ≈ 5500 | TC2.5/1.3/1.3-3E25 |
| 3E6 des | 1835 ± 30% | ≈ 10000 | TC2.5/1.3/1.3-3E6(1) |

**Note**

1. Maximum tolerances on mechanical dimensions are ± 0.13 mm.

## RING CORES (TOROIDS)

### Effective core parameters

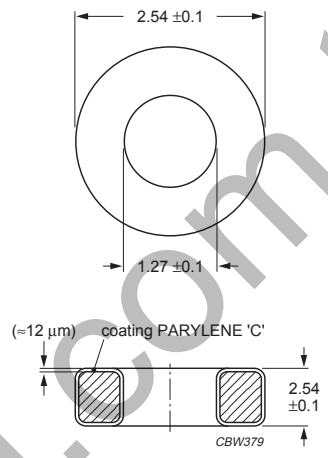
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 3.57 | $mm^{-1}$ |
| $V_e$ | effective volume | 8.57 | $mm^3$ |
| $l_e$ | effective length | 5.53 | mm |
| $A_e$ | effective area | 1.55 | $mm^2$ |
| m | mass of core | ≈0.044 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC2.5/1.3/2.5 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 des | 1400 ±25% | ≈4000 | TC2.5/1.3/2.5-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

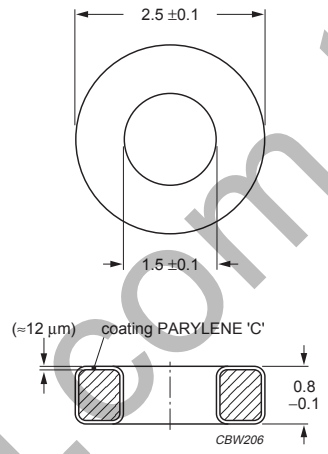
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 16.4 | $mm^{-1}$ |
| $V_e$ | effective volume | 2.21 | $mm^3$ |
| $l_e$ | effective length | 6.02 | mm |
| $A_e$ | effective area | 0.37 | $mm^2$ |
| m | mass of core | ≈ 0.012 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC2.5/1.5/0.8 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E6 des | 765 ± 30% | ≈ 10000 | TC2.5/1.5/0.8-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

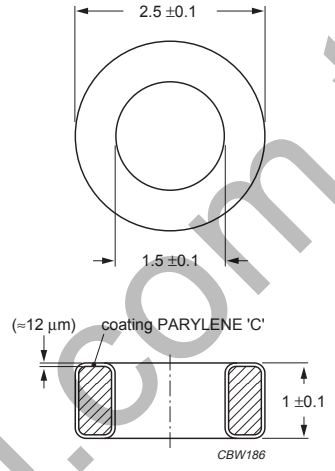
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 12.3 | $mm^{-1}$ |
| $V_e$ | effective volume | 2.94 | $mm^3$ |
| $l_e$ | effective length | 6.02 | mm |
| $A_e$ | effective area | 0.489 | $mm^2$ |
| m | mass of core | ≈0.015 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC2.5/1.5/1 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 des | 410 ± 25% | ≈ 4000 | TC2.5/1.5/1-3E28 |
| 3E27 des | 513 ± 20% | ≈ 5500 | TC2.5/1.5/1-3E27 |
| 3E5 des | 920 ± 30% | ≈ 9000 | TC2.5/1.5/1-3E5 |
| 3E6 des | 1020 ± 30% | ≈ 10 000 | TC2.5/1.5/1-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

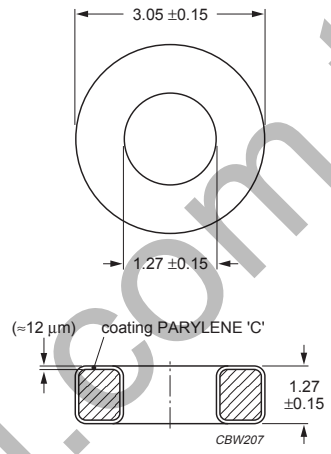
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| Σ(l/A) | core factor (C1) | 5.65 | $mm^{-1}$ |
| $V_e$ | effective volume | 6.35 | $mm^3$ |
| $l_e$ | effective length | 5.99 | mm |
| $A_e$ | effective area | 1.06 | $mm^2$ |
| m | mass of core | ≈ 0.033 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.1/1.3/1.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 des | 190 ± 20% | ≈ 850 | TC3.1/1.3/1.3-4A11 |
| 3E25 des | 1225 ± 25% | ≈ 5500 | TC3.1/1.3/1.3-3E25 |
| 3E6 des | 2225 ± 30% | ≈ 10000 | TC3.1/1.3/1.3-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

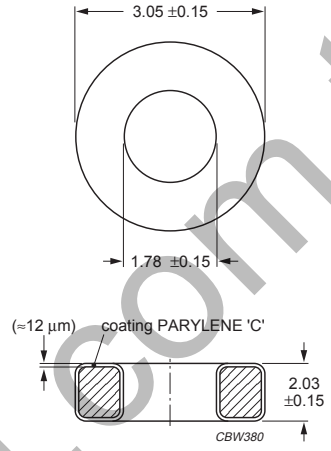
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 5.75 | $mm^{-1}$ |
| $V_e$ | effective volume | 9.10 | $mm^3$ |
| $l_e$ | effective length | 7.23 | mm |
| $A_e$ | effective area | 1.26 | $mm^2$ |
| m | mass of core | ≈ 0.05 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.1/1.8/2 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 des | 1100 ± 25% | ≈ 5000 | TC3.1/1.8/2-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

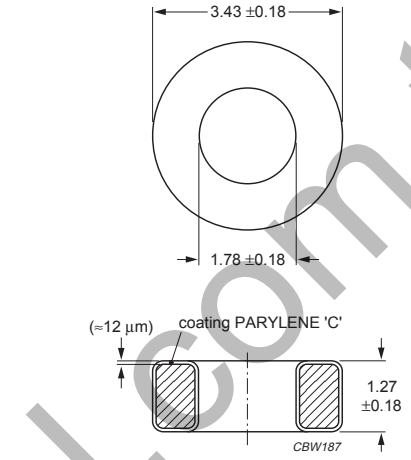
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 7.93 | $mm^{-1}$ |
| $V_e$ | effective volume | 7.3 | $mm^3$ |
| $l_e$ | effective length | 7.62 | mm |
| $A_e$ | effective area | 0.96 | $mm^2$ |
| m | mass of core | ≈ 0.035 | g |

### Coating

The cores are coated with parylene C; flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation




Dimensions in mm.

Fig.1 TC3.4/1.8/1.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3D3 sup | 110 ± 20% | ≈ 750 | TC3.4/1.8/1.3-3D3 |
| 3B7 sup | 375 ± 20% | ≈ 2300 | TC3.4/1.8/1.3-3B7 |
| 3E27 | 660 ± 20% | ≈ 4200 | TC3.4/1.8/1.3-3E27 |
| 3E6 des | 1580 ± 30% | ≈ 10000 | TC3.4/1.8/1.3-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

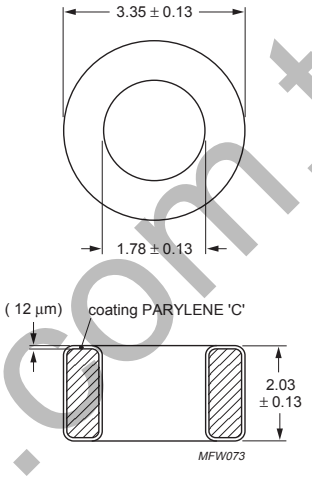
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 4.9 | $mm^{-1}$ |
| $V_e$ | effective volume | 11.6 | $mm^3$ |
| $l_e$ | effective length | 7.54 | mm |
| $A_e$ | effective area | 1.54 | $mm^2$ |
| m | mass of core | ≈ 0.059 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.4/1.8/2 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E25 des | 1420 ± 25% | ≈ 5500 | TC3.4/1.8/2-3E25 |
| 3E7 des | 3080 ± 30% | ≈ 12000 | TC3.4/1.8/2-3E7 |

## RING CORES (TOROIDS)

### Effective core parameters

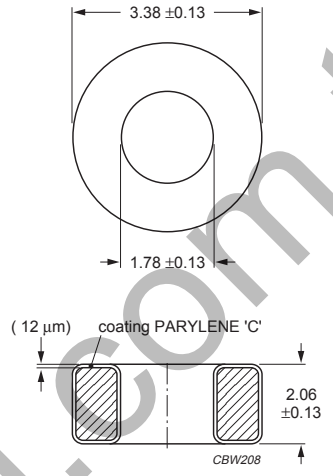
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 4.97 | $mm^{-1}$ |
| $V_e$ | effective volume | 11.5 | $mm^3$ |
| $l_e$ | effective length | 7.54 | mm |
| $A_e$ | effective area | 1.52 | $mm^2$ |
| m | mass of core | ≈ 0.06 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.4/1.8/2.1 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E25 des | 1420 ± 25% | ≈ 5600 | TC3.4/1.8/2.1-3E25 |
| 3E28 des | 1045 ± 25% | ≈ 4000 | TC3.4/1.8/2.1-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

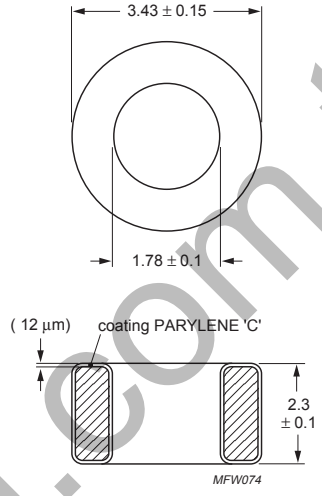
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 4.16 | $mm^{-1}$ |
| $V_e$ | effective volume | 14.0 | $mm^3$ |
| $l_e$ | effective length | 7.63 | mm |
| $A_e$ | effective area | 1.83 | $mm^2$ |
| m | mass of core | ≈ 0.068 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.4/1.8/2.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 des | 1207 ± 25% | ≈ 4000 | TC3.4/1.8/2.3-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

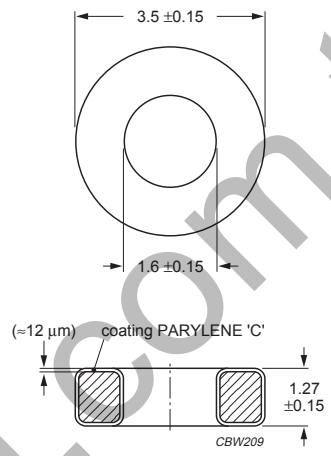
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 6.32 | $mm^{-1}$ |
| $V_e$ | effective volume | 8.3 | $mm^3$ |
| $l_e$ | effective length | 7.25 | mm |
| $A_e$ | effective area | 1.15 | $mm^2$ |
| m | mass of core | ≈ 0.043 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.5/1.6/1.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C11 | 862 ± 20% | ≈ 4300 | TC3.5/1.6/1.3-3C11 |

## RING CORES (TOROIDS)

### Effective core parameters

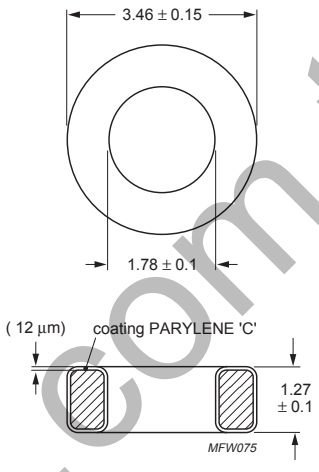
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 7.44 | $mm^{-1}$ |
| $V_e$ | effective volume | 7.87 | $mm^3$ |
| $l_e$ | effective length | 7.65 | mm |
| $A_e$ | effective area | 1.03 | $mm^2$ |
| m | mass of core | ≈ 0.04 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.5/1.8/1.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E27 des | 930 ± 25% | ≈ 5500 | TC3.5/1.8/1.3-3E27 |

## RING CORES (TOROIDS)

### Effective core parameters

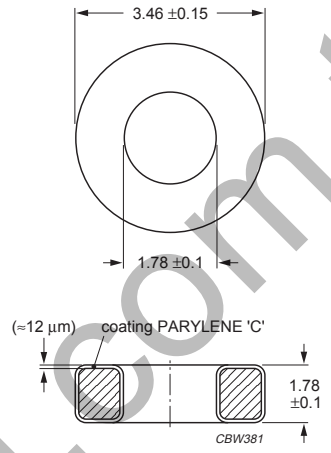
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 5.31 | $mm^{-1}$ |
| $V_e$ | effective volume | 11.0 | $mm^3$ |
| $l_e$ | effective length | 7.65 | mm |
| $A_e$ | effective area | 1.44 | $mm^2$ |
| m | mass of core | ≈ 0.06 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.5/1.8/1.8 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 des | 950 ± 25% | ≈ 4000 | TC3.5/1.8/1.8-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

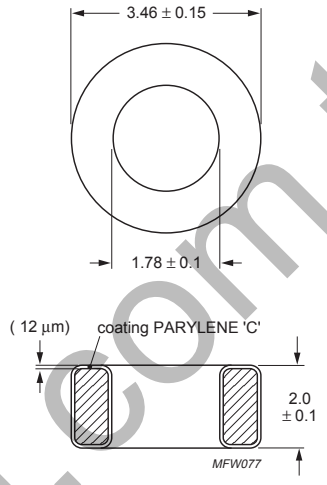
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 4.73 | $mm^{-1}$ |
| $V_e$ | effective volume | 12.4 | $mm^3$ |
| $l_e$ | effective length | 7.6 | mm |
| $A_e$ | effective area | 1.62 | $mm^2$ |
| m | mass of core | ≈ 0.05 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.5/1.8/2 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 des | 1060 ± 25% | ≈ 4000 | TC3.5/1.8/2-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

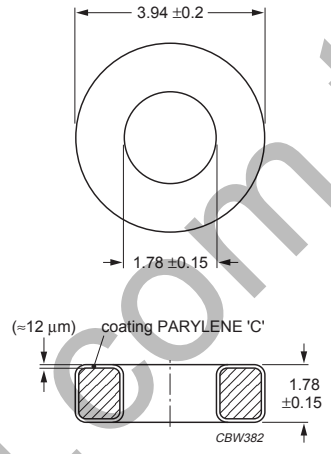
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 4.44 | $mm^{-1}$ |
| $V_e$ | effective volume | 14.8 | $mm^3$ |
| $l_e$ | effective length | 8.1 | mm |
| $A_e$ | effective area | 1.83 | $mm^2$ |
| m | mass of core | ≈ 0.086 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.9/1.8/1.8 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 des | 1400 ± 30% | ≈ 5000 | TC3.9/1.8/1.8-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

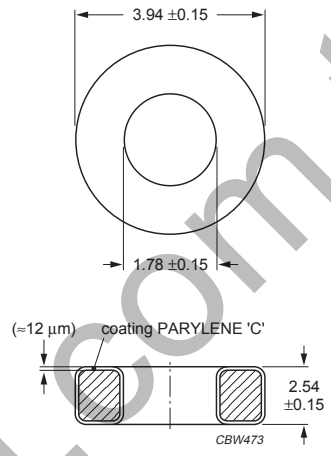
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 3.11 | $mm^{-1}$ |
| $V_e$ | effective volume | 21.1 | $mm^3$ |
| $l_e$ | effective length | 8.1 | mm |
| $A_e$ | effective area | 2.6 | $mm^2$ |
| m | mass of core | ≈ 0.12 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.9/1.8/2.5 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 | 2020 ± 30% | ≈ 4000 | TC3.9/1.8/2.5-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

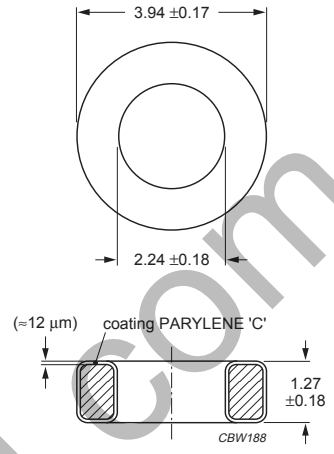
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 9.20 | $mm^{-1}$ |
| $V_e$ | effective volume | 9.20 | $mm^3$ |
| $l_e$ | effective length | 9.20 | mm |
| $A_e$ | effective area | 1.00 | $mm^2$ |
| m | mass of core | ≈ 0.045 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC3.9/2.2/1.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3D3 sup | 97 ± 20% | ≈ 750 | TC3.9/2.2/1.3-3D3 |
| 3B7 sup | 325 ± 20% | ≈ 2300 | TC3.9/2.2/1.3-3B7 |
| 3E27 | 575 ± 20% | ≈ 4100 | TC3.9/2.2/1.3-3E27 |

## RING CORES (TOROIDS)

### Effective core parameters

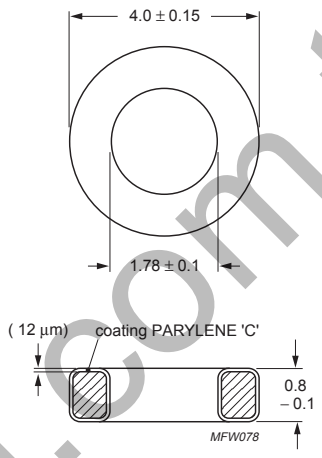
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 10.3 | $mm^{-1}$ |
| $V_e$ | effective volume | 6.43 | $mm^3$ |
| $l_e$ | effective length | 8.16 | mm |
| $A_e$ | effective area | 0.79 | $mm^2$ |
| m | mass of core | ≈ 0.035 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC4/1.8/0.8 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 des | 486 ± 25% | ≈ 4000 | TC4/1.8/0.8-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

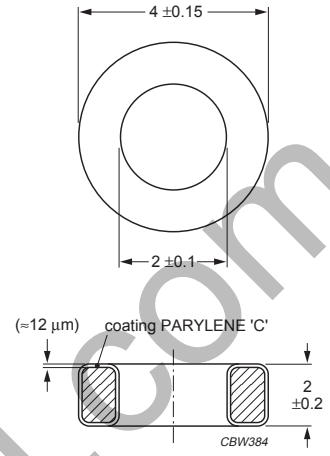
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 4.54 | $mm^{-1}$ |
| $V_e$ | effective volume | 16.7 | $mm^3$ |
| $l_e$ | effective length | 8.71 | mm |
| $A_e$ | effective area | 1.92 | $mm^2$ |
| m | mass of core | ≈ 0.095 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC4/2/2 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C11 | 1190 ± 25% | ≈ 4300 | TC4/2/2-3C11 |
| 3E28 des | 1110 ± 25% | ≈ 4000 | TC4/2/2-3E28 |
| 3E27 des | 1623 ± 20% | ≈ 5500 | TC4/2/2-3E27 |

## RING CORES (TOROIDS)

### Effective core parameters

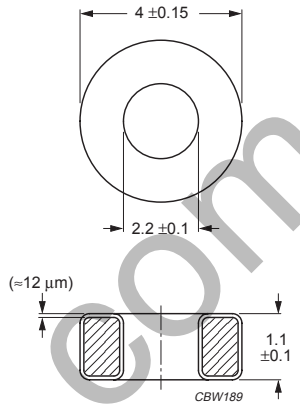
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 9.55 | $mm^{-1}$ |
| $V_e$ | effective volume | 8.82 | $mm^3$ |
| $l_e$ | effective length | 9.18 | mm |
| $A_e$ | effective area | 0.961 | $mm^2$ |
| m | mass of core | ≈ 0.04 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC4/2.2/1.1 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 16 ± 25% | ≈ 125 | TC4/2.2/1.1-4C65 |
| 4A11 | 92 ± 25% | ≈ 700(1) | TC4/2.2/1.1-4A11 |
| 3F3 | 260 ± 25% | ≈ 2000 | TC4/2.2/1.1-3F3 |
| 3E25 | 725 ± 30% | ≈ 5500 | TC4/2.2/1.1-3E25 |
| 3E5 | 1120 ± 30% | ≈ 8500 | TC4/2.2/1.1-3E5 |
| 3E6 des | 1315 ± 30% | ≈ 10 000 | TC4/2.2/1.1-3E6 |

1. Old permeability specification maintained.

## RING CORES (TOROIDS)

### Effective core parameters

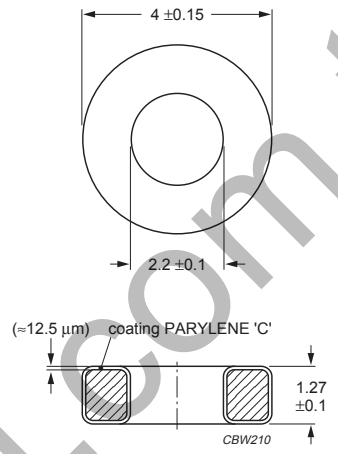
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 8.28 | $mm^{-1}$ |
| $V_e$ | effective volume | 10.2 | $mm^3$ |
| $l_e$ | effective length | 9.18 | mm |
| $A_e$ | effective area | 1.11 | $mm^2$ |
| m | mass of core | ≈ 0.05 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC4/2.2/1.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 | 122 ± 20% | ≈ 800 | TC4/2.2/1.3-4A11 |
| 3E25 | 720 ± 25% | ≈ 5500 | TC4/2.2/1.3-3E25 |

## RING CORES (TOROIDS)

### Effective core parameters

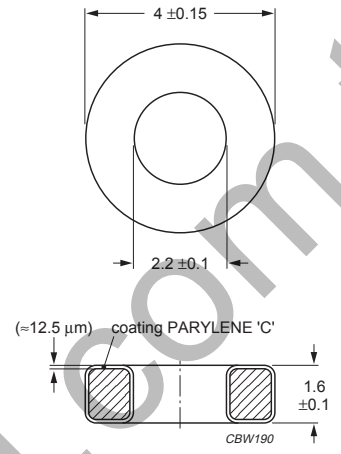
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 6.56 | $mm^{-1}$ |
| $V_e$ | effective volume | 12.9 | $mm^3$ |
| $l_e$ | effective length | 9.18 | mm |
| $A_e$ | effective area | 1.4 | $mm^2$ |
| m | mass of core | ≈ 0.06 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC4/2.2/1.6 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 24 ± 25% | ≈ 125 | TC4/2.2/1.6-4C65 |
| 4A11 | 134 ± 25% | ≈ 700(1) | TC4/2.2/1.6-4A11 |
| 3S4 des | 325 ± 25% | ≈ 1700 | TC4/2.2/1.6-3S4 |
| 3F3 | 380 ± 25% | ≈ 2000 | TC4/2.2/1.6-3F3 |
| 3E25 | 1050 ± 30% | ≈ 5500 | TC4/2.2/1.6-3E25 |
| 3E5 | 1630 ± 30% | ≈ 8500 | TC4/2.2/1.6-3E5 |
| 3E6 des | 1915 ± 30% | ≈ 10000 | TC4/2.2/1.6-3E6 |

1. Old permeability specification maintained.

## RING CORES (TOROIDS)

### Effective core parameters

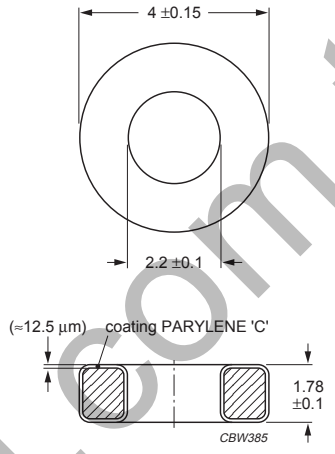
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 5.89 | $mm^{-1}$ |
| $V_e$ | effective volume | 14.4 | $mm^3$ |
| $l_e$ | effective length | 9.18 | mm |
| $A_e$ | effective area | 1.56 | $mm^2$ |
| m | mass of core | ≈ 0.07 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC4/2.2/1.8 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E6 des | 2130 ± 30% | ≈ 10000 | TC4/2.2/1.8-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

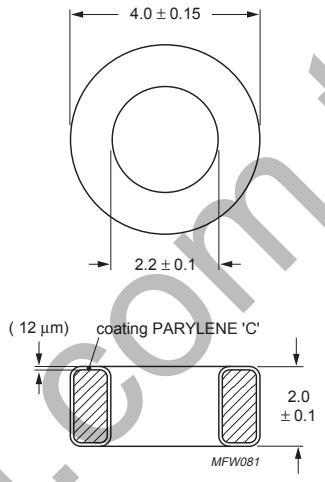
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 5.26 | $mm^{-1}$ |
| $V_e$ | effective volume | 16.1 | $mm^3$ |
| $l_e$ | effective length | 9.18 | mm |
| $A_e$ | effective area | 1.75 | $mm^2$ |
| m | mass of core | ≈ 0.08 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC4/2.2/2 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E25 des | 1315 ± 30% | ≈ 5500 | TC4/2.2/2-3E25 |
| 3E8 des | 3590 ± 30% | ≈ 15000 | TC4/2.2/2-3E8 |

## RING CORES (TOROIDS)

### Effective core parameters

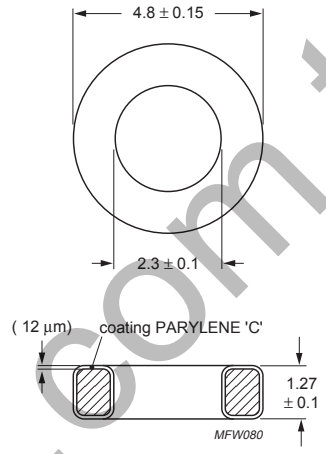
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 6.73 | $mm^{-1}$ |
| $V_e$ | effective volume | 15.5 | $mm^3$ |
| $l_e$ | effective length | 10.2 | mm |
| $A_e$ | effective area | 1.52 | $mm^2$ |
| m | mass of core | ≈ 0.09 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC4.8/2.3/1.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E27 des | 1030 ± 25% | ≈ 5500 | TC4.8/2.3/1.3-3E27 |
| 3B7 sup | 430 ± 20% | ≈ 2300 | TC4.8/2.3/1.3-3B7 |

## RING CORES (TOROIDS)

### Effective core parameters

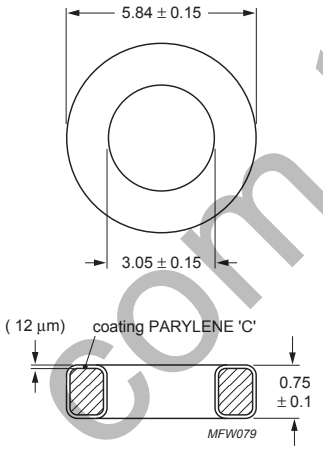
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 12.9 | $mm^{-1}$ |
| $V_e$ | effective volume | 13.2 | $mm^3$ |
| $l_e$ | effective length | 13.0 | mm |
| $A_e$ | effective area | 1.01 | $mm^2$ |
| m | mass of core | ≈ 0.07 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC5.8/3.1/0.8 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 des | 390 ± 25% | ≈ 4000 | TC5.8/3.1/0.8-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

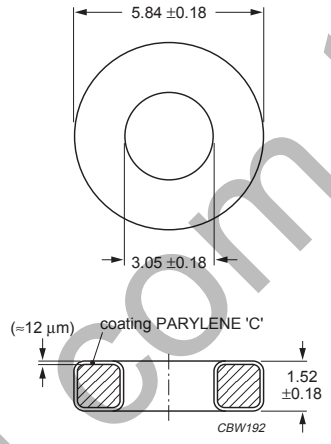
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 6.52 | $mm^{-1}$ |
| $V_e$ | effective volume | 26.1 | $mm^3$ |
| $l_e$ | effective length | 13.0 | mm |
| $A_e$ | effective area | 2.00 | $mm^2$ |
| m | mass of core | ≈ 0.13 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC5.8/3.1/1.5 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 25 ± 25% | ≈ 125 | TC5.8/3.1/1.5-4C65 |
| 4B1 des | 50 ± 25% | ≈ 250 | TC5.8/3.1/1.5-4B1 |
| 3B7 sup | 450 ± 20% | ≈ 2300 | TC5.8/3.1/1.5-3B7(1) |
| 3E27 | 890 ± 20% | ≈ 4600 | TC5.8/3.1/1.5-3E27 |
| 3E6 | 1960 ± 30% | ≈ 9925 | TC5.8/3.1/1.5-3E6 |
| 3E8 des | 2940 ± 30% | ≈ 15000 | TC5.8/3.1/1.5-3E8 |

**Note**

1. OD = 6 ± 0.18

## RING CORES (TOROIDS)

### Effective core parameters

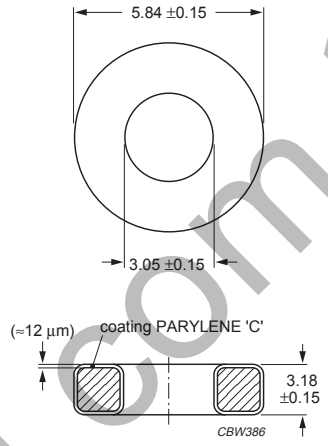
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 3.04 | $mm^{-1}$ |
| $V_e$ | effective volume | 55.8 | $mm^3$ |
| $l_e$ | effective length | 13.0 | mm |
| $A_e$ | effective area | 4.28 | $mm^2$ |
| m | mass of core | ≈ 0.31 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

Dc isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC5.8/3.1/3.2 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3D3 des | 310 ± 20% | ≈ 750 | TC5.8/3.1/3.2-3D3 |
| 3B7 sup | 940 ± 25% | ≈ 2300 | TC5.8/3.1/3.2-3B7(1) |
| 3E28 des | 1650 ± 25% | ≈ 4000 | TC5.8/3.1/3.2-3E28 |
| 3E6 des | 4130 ± 30% | ≈ 10000 | TC5.8/3.1/3.2-3E6 |

**Note**

1. Dimensions with coating.

## RING CORES (TOROIDS)

### Effective core parameters

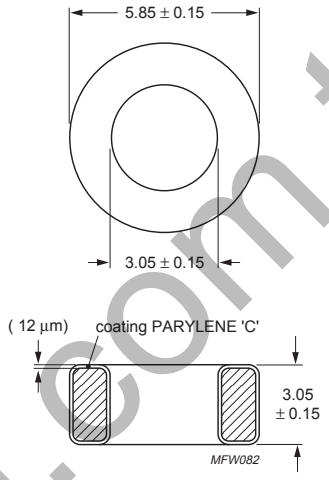
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 3.16 | $mm^{-1}$ |
| $V_e$ | effective volume | 53.8 | $mm^3$ |
| $l_e$ | effective length | 13.0 | mm |
| $A_e$ | effective area | 4.12 | $mm^2$ |
| m | mass of core | ≈ 0.14 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC5.9/3.1/3.1 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E6 des | 3960 ± 30% | ≈ 10000 | TC5.9/3.1/3.1-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

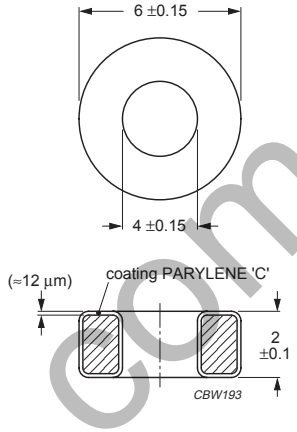
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 7.75 | $mm^{-1}$ |
| $V_e$ | effective volume | 30.2 | $mm^3$ |
| $l_e$ | effective length | 15.3 | mm |
| $A_e$ | effective area | 1.97 | $mm^2$ |
| m | mass of core | ≈ 0.15 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC6/4/2 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 20 ± 25% | ≈ 125 | TC6/4/2-4C65 |
| 4A11 | 114 ± 25% | ≈ 700(1) | TC6/4/2-4A11 |
| 3S4 des | 275 ± 25% | ≈ 1700 | TC6/4/2-3S4 |
| 3F3 | 325 ± 25% | ≈ 2000 | TC6/4/2-3F3 |
| 3E25 | 890 ± 30% | ≈ 5500 | TC6/4/2-3E25 |
| 3E5 | 1380 ± 30% | ≈ 8500 | TC6/4/2-3E5 |
| 3E6 des | 1620 ± 30% | ≈ 10000 | TC6/4/2-3E6 |

1. Old permeability specification maintained.

## RING CORES (TOROIDS)

### Effective core parameters

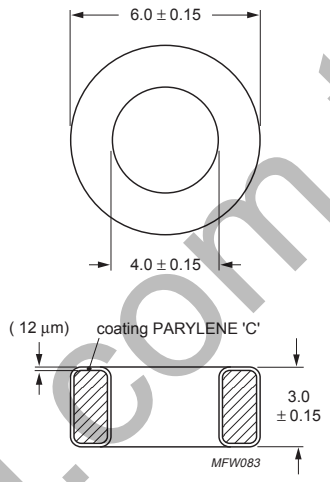
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 5.17 | $mm^{-1}$ |
| $V_e$ | effective volume | 45.2 | $mm^3$ |
| $l_e$ | effective length | 15.3 | mm |
| $A_e$ | effective area | 2.96 | $mm^2$ |
| m | mass of core | ≈ 0.23 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC6/4/3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E6 des | 2430 ± 30% | ≈ 10000 | TC6/4/3-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

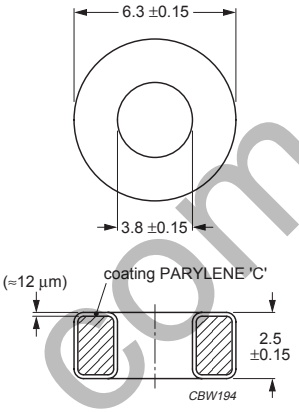
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 4.97 | $mm^{-1}$ |
| $V_e$ | effective volume | 46.5 | $mm^3$ |
| $l_e$ | effective length | 15.2 | mm |
| $A_e$ | effective area | 3.06 | $mm^2$ |
| m | mass of core | ≈ 0.23 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC6.3/3.8/2.5 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 | 177 ± 25% | ≈ 700(1) | TC6.3/3.8/2.5-4A11 |
| 3F3 | 500 ± 25% | ≈ 2000 | TC6.3/3.8/2.5-3F3 |
| 3E25 | 1390 ± 30% | ≈ 5500 | TC6.3/3.8/2.5-3E25 |
| 3E5 | 2150 ± 30% | ≈ 8500 | TC6.3/3.8/2.5-3E5 |
| 3E6 des | 2530 ± 30% | ≈ 10000 | TC6.3/3.8/2.5-3E6 |
| 3E7 des | 3600 + 30/− 40% | ≈ 12000 | TC6.3/3.8/2.5-3E7 |

1. Old permeability specification maintained.

## RING CORES (TOROIDS)

### Effective core parameters

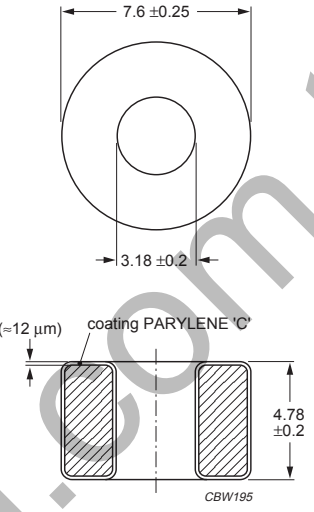
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.51 | $mm^{-1}$ |
| $V_e$ | effective volume | 148 | $mm^3$ |
| $l_e$ | effective length | 15.0 | mm |
| $A_e$ | effective area | 9.92 | $mm^2$ |
| m | mass of core | ≈ 0.7 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC7.6/3.2/4.8 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 | 1915 ±25% | ≈ 2300 | TC7.6/3.2/4.8-3C90 |
| 3E28 des | 3800 ±30% | ≈ 4000 | TC7.6/3.2/4.8-3E28 |
| 3E6 des | 8360 ±30% | ≈ 10000 | TC7.6/3.2/4.8-3E6 |
| 3E8 des | 12500 ±30% | ≈ 15000 | TC7.6/3.2/4.8-3E8 |

## RING CORES (TOROIDS)

### Effective core parameters

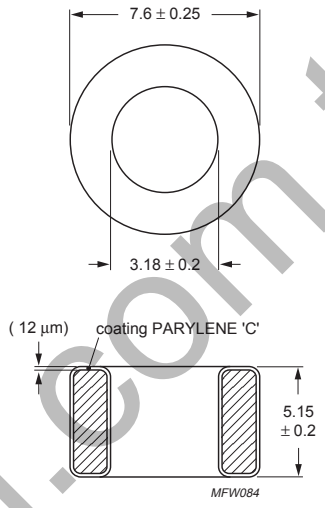
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.41 | $mm^{-1}$ |
| $V_e$ | effective volume | 160 | $mm^3$ |
| $l_e$ | effective length | 15.0 | mm |
| $A_e$ | effective area | 10.6 | $mm^2$ |
| m | mass of core | ≈ 0.75 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC7.6/3.2/5.2 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E28 des | 3580 ± 25% | ≈ 4000 | TC7.6/3.2/5.2-3E28 |

## RING CORES (TOROIDS)

### Effective core parameters

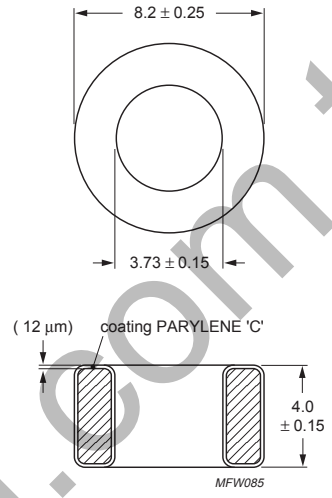
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.99 | $mm^{-1}$ |
| $V_e$ | effective volume | 144 | $mm^3$ |
| $l_e$ | effective length | 16.9 | mm |
| $A_e$ | effective area | 8.5 | $mm^2$ |
| m | mass of core | ≈ 0.7 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TC8.2/3.7/4 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 des | 440 ± 25% | ≈ 700(1) | TC8.2/3.7/4-4A11 |
| 3E7 des | 7560 ± 30% | ≈ 12000 | TC8.2/3.7/4-3E7 |

1. Old permeability specification maintained.

## RING CORES (TOROIDS)

### Effective core parameters

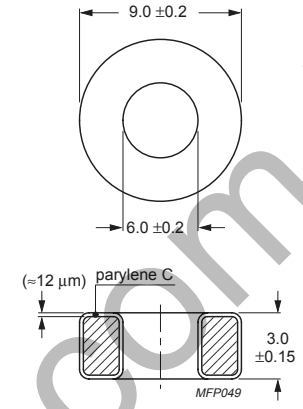
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 5.17 | $mm^{-1}$ |
| $V_e$ | effective volume | 102 | $mm^3$ |
| $l_e$ | effective length | 22.9 | mm |
| $A_e$ | effective area | 4.44 | $mm^2$ |
| m | mass of core | ≈ 0.5 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TC9/6/3 ring core.

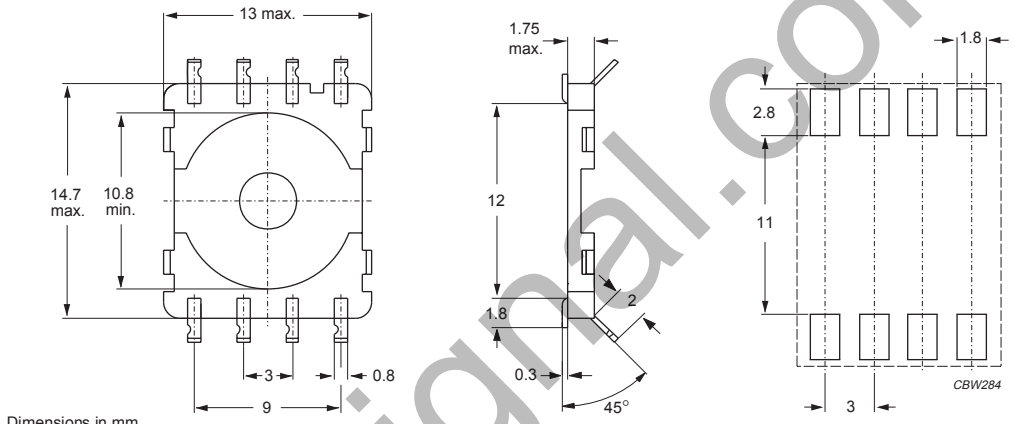
### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 2070 ± 30% | ≈ 8500 | TC9/6/3-3E5 |
| 3E6 des | 2435 ± 30% | ≈ 10000 | TC9/6/3-3E6 |

**Tag plate**

**General data**

| PARAMETER | SPECIFICATION |
|---|---|
| Tag plate material | liquid crystal polymer (LCP), glass reinforced, flame retardant in accordance with *"UL 94V-0"*; UL file number E54705 |
| Solder pad material | copper-tin alloy (CuSn), tin (Sn) plated |
| Maximum operating temperature | 155 °C, *"IEC 60085",* class F |
| Resistance to soldering heat | *"IEC 60068-2-20"*, Part 2, Test Tb, method 1B: 350 °C, 3.5 s |
| Solderability | *"IEC 60068-2-20"*, Part 2, Test Ta, method 1: 235 °C, 2 s |




Dimensions in mm.

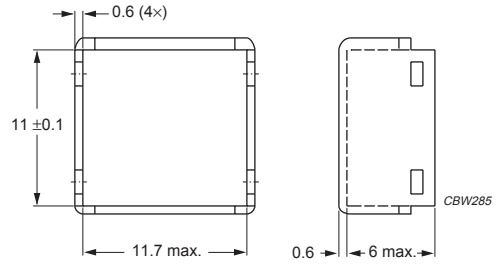
Fig.2 TC9/6/3 tag plate (SMD); 8-solder pads.

**Type number information for TC9/6/3 tag plate (SMD) with 8 solder pads**

| NUMBER OF SOLDER PADS | TYPE NUMBER |
|---|---|
| 8 | TGPS-9-8P-Z |

**Cover data**

| PARAMETER | SPECIFICATION |
|---|---|
| Cover material | polyamide (PA4.6) glass reinforced, flame retardant in accordance with *"UL 94V-0"* |
| Maximium operating temperature | 130 °C, *"IEC 60085"* class B |
| Type number | COV-9 |




Dimensions in mm.

Fig.3 TC9/6/3 cover.

## RING CORES (TOROIDS)

### Effective core parameters

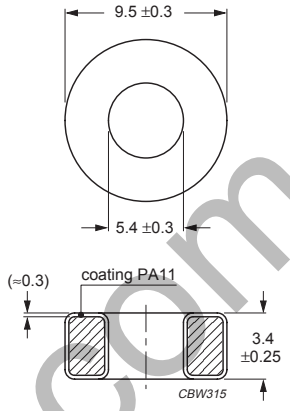
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 5.17 | $mm^{-1}$ |
| $V_e$ | effective volume | 102 | $mm^3$ |
| $l_e$ | effective length | 22.9 | mm |
| $A_e$ | effective area | 4.44 | $mm^2$ |
| m | mass of core | ≈ 0.5 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN9/6/3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 30 ± 25% | ≈ 125 | TN9/6/3-4C65 |
| 4A11 | 170 ± 25% | ≈ 700(1) | TN9/6/3-4A11 |
| 3R1(2) | – | ≈ 800 | TN9/6/3-3R1 |
| 3F3 | 440 ± 25% | ≈ 1800 | TN9/6/3-3F3 |
| 3C90 | 560 ± 25% | ≈ 2300 | TN9/6/3-3C90 |
| 3E25 | 1340 ± 30% | ≈ 5500 | TN9/6/3-3E25 |

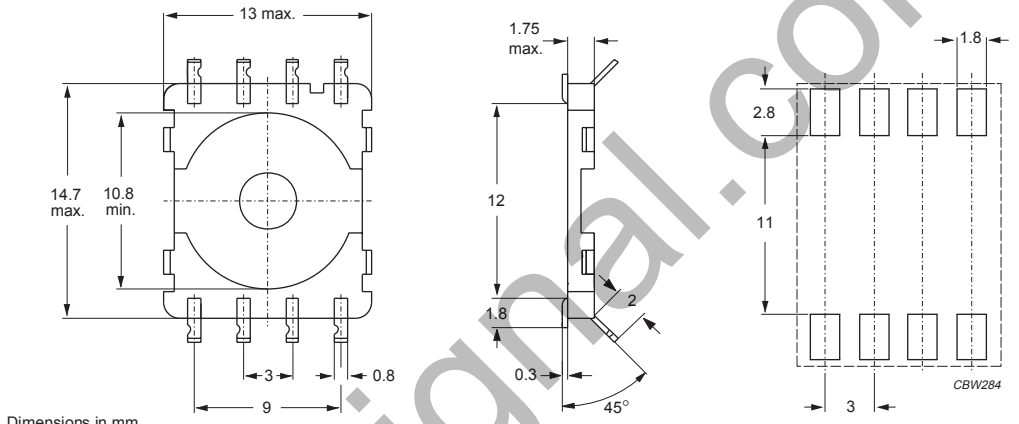
1. Old permeability specification maintained.
2. Due to the rectangular BH-loop of 3R1, inductance values strongly depend on the magnetic state of the ring core and measuring conditions. Therefore no $A_L$ value is specified. For the application in magnetic amplifiers $A_L$ is not a critical parameter.

| WARNING |
|---|
| Do not use 3R1 cores close to their mechanical resonant frequency. For more information refer to *"3R1"* material specification in this data handbook. |

**Tag plate**

**General data**

| PARAMETER | SPECIFICATION |
|---|---|
| Tag plate material | liquid crystal polymer (LCP), glass reinforced, flame retardant in accordance with *"UL 94V-0"*; UL file number E54705 |
| Solder pad material | copper-tin alloy (CuSn), tin (Sn) plated |
| Maximum operating temperature | 155 °C, *"IEC 60085",* class F |
| Resistance to soldering heat | *"IEC 60068-2-20"*, Part 2, Test Tb, method 1B: 350 °C, 3.5 s |
| Solderability | *"IEC 60068-2-20"*, Part 2, Test Ta, method 1: 235 °C, 2 s |




Dimensions in mm.

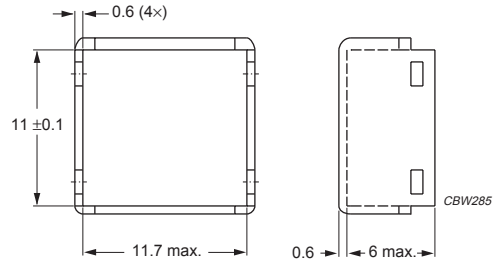
Fig.2 TN9/6/3 tag plate (SMD); 8-solder pads.

**Type number information for TN9/6/3 tag plate (SMD) with 8 solder pads**

| NUMBER OF SOLDER PADS | TYPE NUMBER |
|---|---|
| 8 | TGPS-9-8P-Z |

**Cover data**

| PARAMETER | SPECIFICATION |
|---|---|
| Cover material | polyamide (PA4.6) glass reinforced, flame retardant in accordance with *"UL 94V-0"* |
| Maximium operating temperature | 130 °C, *"IEC 60085"* class B |
| Type number | COV-9 |




Dimensions in mm.

Fig.3 TN9/6/3 cover.

## RING CORES (TOROIDS)

### Effective core parameters

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 5.17 | $mm^{-1}$ |
| $V_e$ | effective volume | 102 | $mm^3$ |
| $l_e$ | effective length | 22.9 | mm |
| $A_e$ | effective area | 4.44 | $mm^2$ |
| m | mass of core | ≈ 0.5 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.

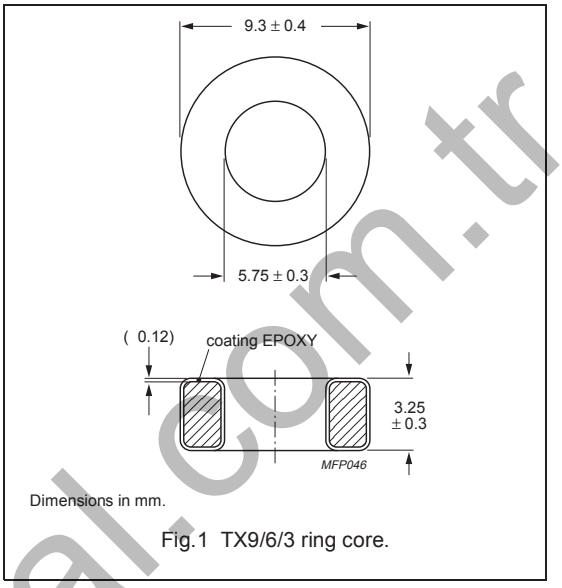



Fig.1 TX9/6/3 ring core.

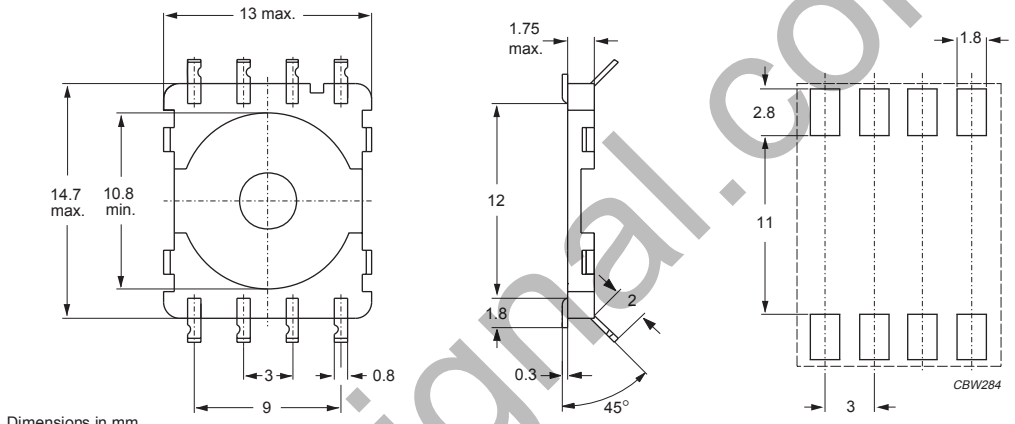
### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E25 | 1340 ± 30% | ≈ 5500 | TX9/6/3-3E25 |
| 3E5 | 2070 ± 30% | ≈ 8500 | TX9/6/3-3E5 |

**Tag plate**

**General data**

| PARAMETER | SPECIFICATION |
|---|---|
| Tag plate material | liquid crystal polymer (LCP), glass reinforced, flame retardant in accordance with *"UL 94V-0"*; UL file number E54705 |
| Solder pad material | copper-tin alloy (CuSn), tin (Sn) plated |
| Maximum operating temperature | 155 °C, *"IEC 60085",* class F |
| Resistance to soldering heat | *"IEC 60068-2-20"*, Part 2, Test Tb, method 1B: 350 °C, 3.5 s |
| Solderability | *"IEC 60068-2-20"*, Part 2, Test Ta, method 1: 235 °C, 2 s |




Dimensions in mm.

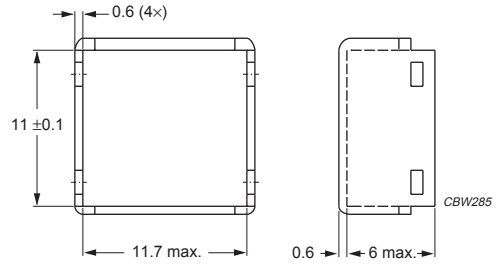
Fig.2 TX9/6/3 tag plate (SMD); 8-solder pads.

**Type number information for TX9/6/3 tag plate (SMD) with 8 solder pads**

| NUMBER OF SOLDER PADS | TYPE NUMBER |
|---|---|
| 8 | TGPS-9-8P-Z |

**Cover data**

| PARAMETER | SPECIFICATION |
|---|---|
| Cover material | polyamide (PA4.6) glass reinforced, flame retardant in accordance with *"UL 94V-0"* |
| Maximium operating temperature | 130 °C, *"IEC 60085"* class B |
| Type number | COV-9 |




Dimensions in mm.

Fig.3 TX9/6/3 cover.

## RING CORES (TOROIDS)

### Effective core parameters

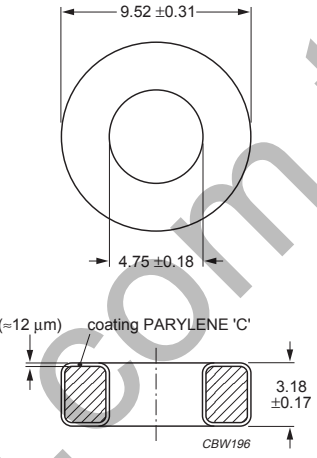
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 2.98 | $mm^{-1}$ |
| $V_e$ | effective volume | 144 | $mm^3$ |
| $l_e$ | effective length | 20.7 | mm |
| $A_e$ | effective area | 6.95 | $mm^2$ |
| m | mass of core | ≈ 0.7 | g |

### Coating

The cores are coated with parylene C, flame retardant in accordance with *"UL 94V-2"*; UL file number E 194397.
The coating is transparent.
Maximum operating temperature is 90 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TC9.5/4.8/3.2 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3D3 sup | 330 ± 20% | ≈ 750 | TC9.5/4.8/3.2-3D3 |
| 3F3 | 890 ± 25% | ≈ 2000 | TC9.5/4.8/3.2-3F3(1) |
| 3B7 sup | 1000 ± 20% | ≈ 2300 | TC9.5/4.8/3.2-3B7 |
| 3C81 | 1200 ± 20% | ≈ 2700 | TC9.5/4.8/3.2-3C81 |
| 3E27 | 2135 ± 20% | ≈ 4900 | TC9.5/4.8/3.2-3E27 |
| 3E6 des | 4390 ± 30% | ≈ 10100 | TC9.5/4.8/3.2-3E6(1) |
| 3E7 des | 5323 ± 30% | ≈ 12000 | TC9.5/4.8/3.2-3E7(1) |
| 3E8 des | 6590 ± 30% | ≈ 15000 | TC9.5/4.8/3.2-3E8(1) |

**Note**

1. Dimensions with coating.

## RING CORES (TOROIDS)

### Effective core parameters

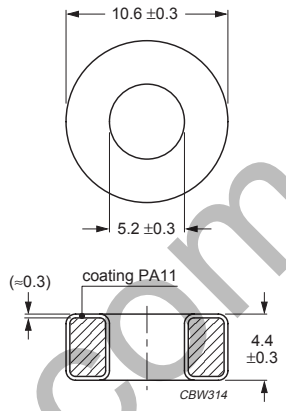
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 3.07 | $mm^{-1}$ |
| $V_e$ | effective volume | 188 | $mm^3$ |
| $l_e$ | effective length | 24.1 | mm |
| $A_e$ | effective area | 7.8 | $mm^2$ |
| m | mass of core | ≈ 0.95 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M). The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN10/6/4 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 52 ± 25% | ≈ 125 | TN10/6/4-4C65 |
| 4A11 | 286 ± 25% | ≈ 700(1) | TN10/6/4-4A11 |
| 3D3 | 306 ± 25% | ≈ 750 | TN10/6/4-3D3 |
| 3R1(2) | - | ≈ 800 | TN10/6/4-3R1 |
| 3F3 | 740 ± 25% | ≈ 1800 | TN10/6/4-3F3 |
| 3C90 | 940 ± 25% | ≈ 2300 | TN10/6/4-3C90 |
| 3C11 | 1750 ± 25% | ≈ 4300 | TN10/6/4-3C11 |
| 3E25 | 2250 ± 30% | ≈ 5500 | TN10/6/4-3E25 |

1. Old permeability specification maintained.
2. Due to the rectangular BH-loop of 3R1, inductance values strongly depend on the magnetic state of the ring core and measuring conditions. Therefore no $A_L$ value is specified. For the application in magnetic amplifiers $A_L$ is not a critical parameter.

| WARNING |
|---|
| Do not use 3R1 cores close to their mechanical resonant frequency. For more information refer to *"3R1"* material specification in this data handbook. |

**Properties of cores under power conditions**

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | $\hat{f}$ = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | $\hat{f}$ = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | $\hat{f}$ = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.021 | ≤ 0.021 | – |
| 3F3 | ≥320 | – | ≤ 0.03 | ≤ 0.04 |

## RING CORES (TOROIDS)

### Effective core parameters

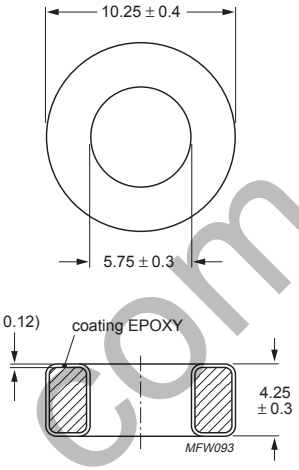
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 3.07 | $mm^{-1}$ |
| $V_e$ | effective volume | 188 | $mm^3$ |
| $l_e$ | effective length | 24.1 | mm |
| $A_e$ | effective area | 7.8 | $mm^2$ |
| m | mass of core | ≈ 0.95 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 1000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX10/6/4 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 3470 ± 30% | ≈ 8500 | TX10/6/4-3E5 |
| 3E6 des | 4085 ± 30% | ≈ 10000 | TX10/6/4-3E6 |

# Ferrite toroids TX13/7.1/4.8

## RING CORES (TOROIDS)

### Effective core parameters

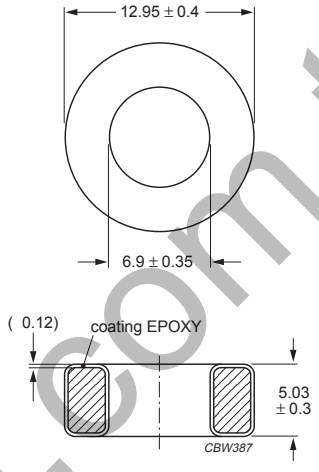
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 2.40 | $mm^{-1}$ |
| $V_e$ | effective volume | 361 | $mm^3$ |
| $l_e$ | effective length | 29.5 | mm |
| $A_e$ | effective area | 12.3 | $mm^2$ |
| m | mass of core | ≈ 1.8 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX13/7.1/4.8 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3D3 sup | 415 ± 20% | ≈ 750 | TX13/7.1/4.8-3D3 |
| 3F3 | 990 ± 20% | ≈ 1800 | TX13/7.1/4.8-3F3 |
| 3C90 | 1260 ± 20% | ≈ 2300 | TX13/7.1/4.8-3C90 |
| 3C81 | 1475 ± 20% | ≈ 2700 | TX13/7.1/4.8-3C81 |
| 3E27 | 2750 ± 20% | ≈ 5000 | TX13/7.1/4.8-3E27 |
| 3E6 des | 5400 ± 30% | ≈ 10400 | TX13/7.1/4.8-3E6 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C81 | ≥320 | ≤ 0.08 | – | – |
| 3C90 | ≥320 | ≤ 0.036 | ≤ 0.036 | – |
| 3F3 | ≥320 | – | ≤ 0.04 | ≤ 0.07 |

# Ferrite toroids TN13/7.5/5

## RING CORES (TOROIDS)

### Effective core parameters

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 2.46 | $mm^{-1}$ |
| $V_e$ | effective volume | 368 | $mm^3$ |
| $l_e$ | effective length | 30.1 | mm |
| $A_e$ | effective area | 12.2 | $mm^2$ |
| m | mass of core | ≈ 1.8 | g |

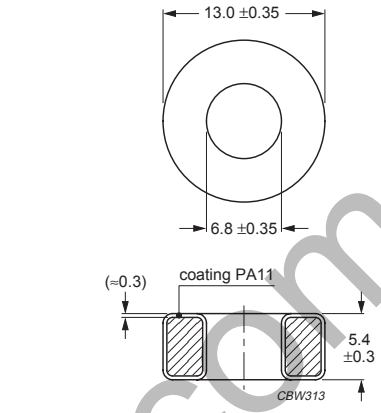



Fig.1 TN13/7.5/5 ring core.

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M). The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 64 ± 25% | ≈ 125 | TN13/7.5/5-4C65 |
| 4A11 | 358 ± 25% | ≈ 700(1) | TN13/7.5/5-4A11 |
| 3F4 | 460 ± 25% | ≈ 900 | TN13/7.5/5-3F4 |
| 4A15 | 610 ± 25% | ≈ 1200 | TN13/7.5/5-4A15 |
| 3F3 | 900 ± 25% | ≈ 1800 | TN13/7.5/5-3F3 |
| 3C90 | 1170 ± 25% | ≈ 2300 | TN13/7.5/5-3C90 |
| 3C11 | 2200 ± 25% | ≈ 4300 | TN13/7.5/5-3C11 |
| 3E25 | 2810 ± 30% | ≈ 5500 | TN13/7.5/5-3E25 |
| 3R1(2) | – | – | TN13/7.5/5-3R1 |

1. Old permeability specification maintained.
2. Due to the rectangular BH-loop of 3R1, inductance values strongly depend on the magnetic state of the ring core and measuring conditions. Therefore no $A_L$ value is specified. For the application in magnetic amplifiers $A_L$ is not a critical parameter.

| WARNING |
|---|
| Do not use 3R1 cores close to their mechanical resonant frequency. For more information refer to *"3R1"* material specification in this data handbook. |

**Properties of cores under power conditions**

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; B̂ = 200 mT; T = 100 °C | f = 100 kHz; B̂ = 100 mT; T = 100 °C | f = 400 kHz; B̂ = 50 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.041 | ≤ 0.041 | – |
| 3F3 | ≥320 | – | ≤ 0.04 | ≤ 0.07 |

## RING CORES (TOROIDS)

### Effective core parameters

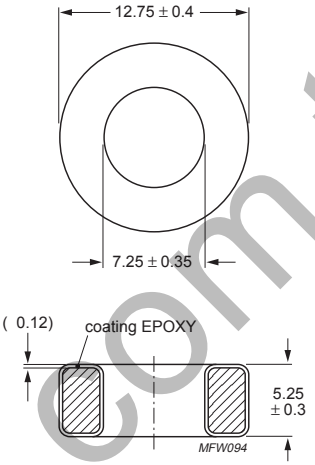
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 2.46 | $mm^{-1}$ |
| $V_e$ | effective volume | 368 | $mm^3$ |
| $l_e$ | effective length | 30.1 | mm |
| $A_e$ | effective area | 12.2 | $mm^2$ |
| m | mass of core | ≈ 1.8 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX13/7.5/5 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 4340 ± 30% | ≈ 8500 | TX13/7.5/5-3E5 |
| 3E6 des | 5095 ± 30% | ≈ 10000 | TX13/7.5/5-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

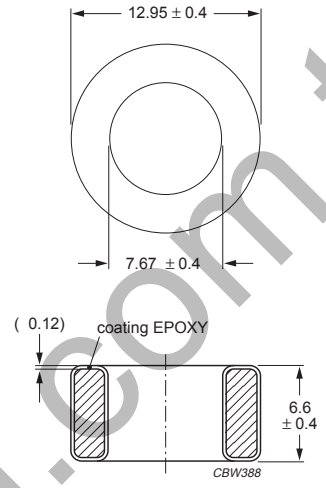
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 2.21 | $mm^{-1}$ |
| $V_e$ | effective volume | 442 | $mm^3$ |
| $l_e$ | effective length | 31.2 | mm |
| $A_e$ | effective area | 14.1 | $mm^2$ |
| m | mass of core | ≈ 2.2 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX13/7.9/6.4 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 75 ± 25% | ≈ 125 | TX13/7.9/6.4-4C65 |
| 3F3 | 1100 ± 20% | ≈ 1800 | TX13/7.9/6.4-3F3 |
| 3C90 | 1380 ± 20% | ≈ 2300 | TX13/7.9/6.4-3C90 |
| 3C81 | 1620 ± 20% | ≈ 2700 | TX13/7.9/6.4-3C81 |
| 3E27 | 3000 ± 20% | ≈ 5000 | TX13/7.9/6.4-3E27 |
| 3E25 des | 3000 ± 20% | ≈ 5000 | TX13/7.9/6.4-3E25 |
| 3E6 | 5900 ± 30% | ≈ 10600 | TX13/7.9/6.4-3E6 |

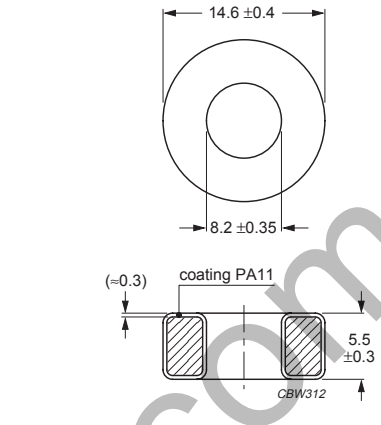
### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C81 | ≥320 | ≤ 0.10 | – | – |
| 3C90 | ≥320 | ≤ 0.044 | ≤ 0.044 | – |
| 3F3 | ≥320 | – | ≤ 0.05 | ≤ 0.09 |

## RING CORES (TOROIDS)

### Effective core parameters

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 2.84 | $mm^{-1}$ |
| $V_e$ | effective volume | 430 | $mm^3$ |
| $l_e$ | effective length | 35 | mm |
| $A_e$ | effective area | 12.3 | $mm^2$ |
| m | mass of core | ≈ 2.1 | g |




Dimensions in mm.

Fig.1 TN14/9/5 ring core.

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M). The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 55 ± 25% | ≈ 125 | TN14/9/5-4C65 |
| 4A11 | 310 ± 25% | ≈ 700(1) | TN14/9/5-4A11 |
| 3R1(2) | – | ≈ 800 | TN14/9/5-3R1 |
| 3F3 | 790 ± 25% | ≈ 1800 | TN14/9/5-3F3 |
| 3C90 | 1015 ± 25% | ≈ 2300 | TN14/9/5-3C90 |
| 3C11 | 1900 ± 25% | ≈ 4300 | TN14/9/5-3C11 |
| 3E25 | 2430 ± 30% | ≈ 5500 | TN14/9/5-3E25 |

1. Old permeability specification maintained.
2. Due to the rectangular BH-loop of 3R1, inductance values strongly depend on the magnetic state of the ring core and measuring conditions. Therefore no $A_L$ value is specified. For the application in magnetic amplifiers $A_L$ is not a critical parameter.

| WARNING |
|---|
| Do not use 3R1 cores close to their mechanical resonant frequency. For more information refer to *"3R1"* material specification in this data handbook. |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C90 | ≥320 | ≤0.048 | ≤0.048 | |
| 3F3 | ≥320 | | ≤0.05 | ≤0.08 |

# Ferrite toroids TX14/9/5

## RING CORES (TOROIDS)

### Effective core parameters

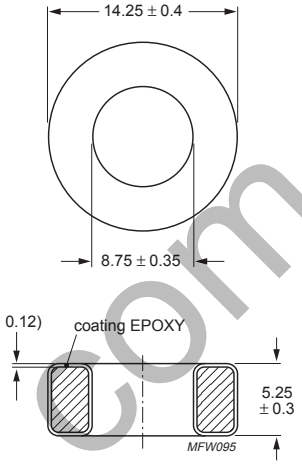
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 2.84 | $mm^{-1}$ |
| $V_e$ | effective volume | 430 | $mm^3$ |
| $l_e$ | effective length | 35 | mm |
| $A_e$ | effective area | 12.3 | $mm^2$ |
| m | mass of core | ≈ 2.1 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX14/9/5 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 3760 ± 30% | ≈ 8500 | TX14/9/5-3E5 |
| 3E6 des | 4415 ± 30% | ≈ 10000 | TX14/9/5-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

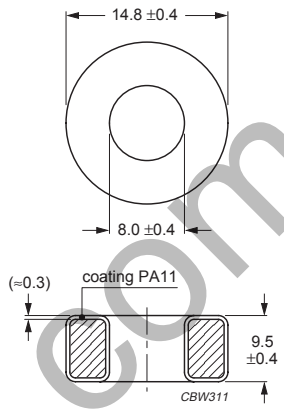
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.58 | $mm^{-1}$ |
| $V_e$ | effective volume | 774 | $mm^3$ |
| $l_e$ | effective length | 35 | mm |
| $A_e$ | effective area | 22.1 | $mm^2$ |
| m | mass of core | ≈ 3.8 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN14/9/9 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 | 557 ± 25% | ≈ 700[1] | TN14/9/9-4A11 |
| 3F3 | 1430 ± 25% | ≈ 1800 | TN14/9/9-3F3 |
| 3C90 | 1825 ± 25% | ≈ 2300 | TN14/9/9-3C90 |
| 3C11 | 3400 ± 25% | ≈ 4300 | TN14/9/9-3C11 |
| 3E25 | 4370 ± 30% | ≈ 5500 | TN14/9/9-3E25 |

1. Old permeability specification maintained.

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °D | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.087 | ≤ 0.087 | – |
| 3F3 | ≥320 | – | ≤ 0.09 | ≤ 0.15 |

# Ferrite toroids TX14/9/9

## RING CORES (TOROIDS)

### Effective core parameters

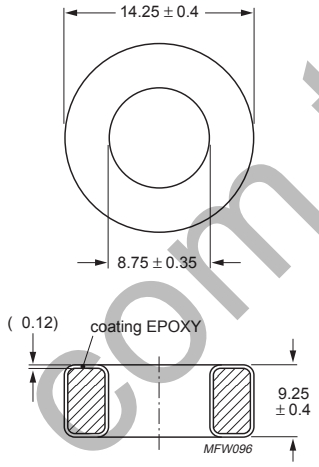
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.58 | $mm^{-1}$ |
| $V_e$ | effective volume | 774 | $mm^3$ |
| $l_e$ | effective length | 35 | mm |
| $A_e$ | effective area | 22.1 | $mm^2$ |
| m | mass of core | ≈ 3.8 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX14/9/9 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 6760 ± 30% | ≈ 8500 | TX14/9/9-3E5 |
| 3E6 des | 7955 ± 30% | ≈ 10000 | TX14/9/9-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

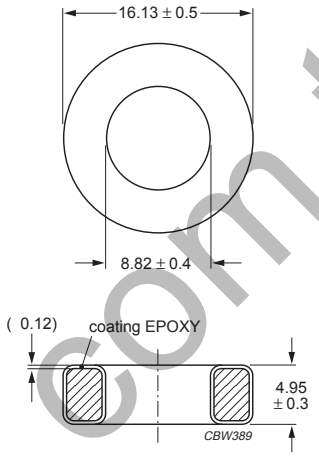
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 2.53 | $mm^{-1}$ |
| $V_e$ | effective volume | 548 | $mm^3$ |
| $l_e$ | effective length | 37.2 | mm |
| $A_e$ | effective area | 14.7 | $mm^2$ |
| m | mass of core | ≈ 2.7 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX16/9.1/4.7 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 | 1215 ± 20% | ≈ 2300 | TX16/9.1/4.7-3C90 |
| 3C81 | 1400 ± 20% | ≈ 2700 | TX16/9.1/4.7-3C81 |
| 3E27 | 2600 ± 20% | ≈ 5000 | TX16/9.1/4.7-3E27 |
| 3E6 des | 5200 ± 30% | ≈ 10500 | TX16/9.1/4.7-3E6 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C |
| 3C81 | ≥320 | ≤ 0.11 | – |
| 3C90 | ≥320 | ≤ 0.055 | ≤ 0.055 |

## RING CORES (TOROIDS)

### Effective core parameters

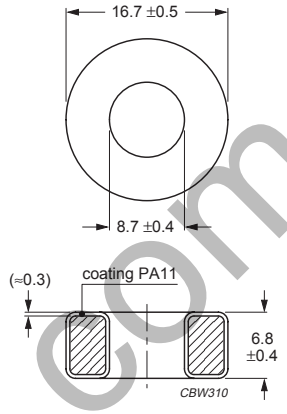
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.95 | $mm^{-1}$ |
| $V_e$ | effective volume | 760 | $mm^3$ |
| $l_e$ | effective length | 38.5 | mm |
| $A_e$ | effective area | 19.7 | $mm^2$ |
| m | mass of core | ≈ 3.8 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN16/9.6/6.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 | 450 ± 25% | ≈ 700(1) | TN16/9.6/6.3-4A11 |
| 3F3 | 1160 ± 25% | ≈ 1800 | TN16/9.6/6.3-3F3 |
| 3C90 | 1480 ± 25% | ≈ 2300 | TN16/9.6/6.3-3C90 |
| 3C11 | 2700 ± 25% | ≈ 4300 | TN16/9.6/6.3-3C11 |
| 3E25 | 3540 ± 30% | ≈ 5500 | TN16/9.6/6.3-3E25 |

1. Old permeability specification maintained.

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.085 | ≤ 0.085 | – |
| 3F3 | ≥320 | – | ≤ 0.09 | ≤ 0.15 |

## RING CORES (TOROIDS)

### Effective core parameters

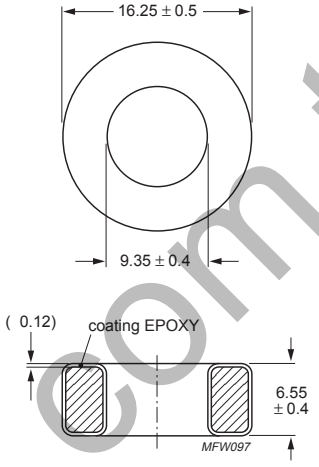
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.95 | $mm^{-1}$ |
| $V_e$ | effective volume | 760 | $mm^3$ |
| $l_e$ | effective length | 38.5 | mm |
| $A_e$ | effective area | 19.7 | $mm^2$ |
| m | mass of core | ≈ 3.8 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX16/9.6/6.3 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 5470 ± 30% | ≈ 8500 | TX16/9.6/6.3-3E5 |
| 3E6 des | 6430 ± 30% | ≈ 10000 | TX16/9.6/6.3-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

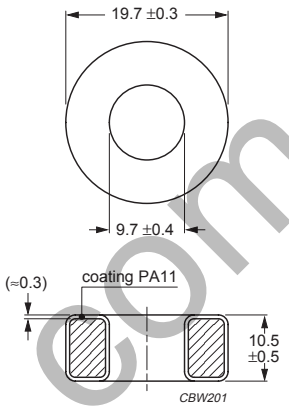
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.08 | $mm^{-1}$ |
| $V_e$ | effective volume | 1795 | $mm^3$ |
| $l_e$ | effective length | 44.0 | mm |
| $A_e$ | effective area | 40.8 | $mm^2$ |
| m | mass of core | ≈ 9.2 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN19/11/10 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 des | 2680 ± 25% | ≈ 2300 | TN19/11/10-3C90 |
| 3C11 | 5000 ± 25% | ≈ 4300 | TN19/11/10-3C11 |
| 3E25 | 6420 ± 25% | ≈ 5500 | TN19/11/10-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.20 | ≤ 0.20 |

## RING CORES (TOROIDS)

### Effective core parameters

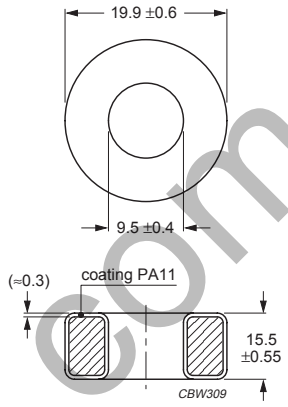
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.718 | $mm^{-1}$ |
| $V_e$ | effective volume | 2692 | $mm^3$ |
| $l_e$ | effective length | 44.0 | mm |
| $A_e$ | effective area | 61.2 | $mm^2$ |
| m | mass of core | ≈ 13.8 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 1500 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN19/11/15 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 des | 4020 ± 25% | ≈ 2300 | TN19/11/15-3C90 |
| 3C11 | 7500 ± 25% | ≈ 4300 | TN19/11/15-3C11 |
| 3E25 | 9630 ± 25% | ≈ 5500 | TN19/11/15-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.30 | ≤ 0.30 |

## RING CORES (TOROIDS)

### Effective core parameters

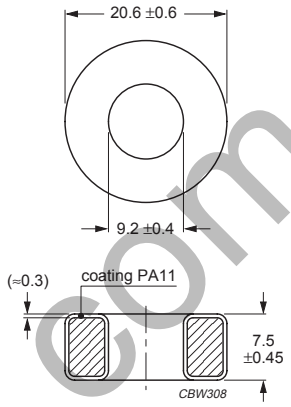
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.30 | $mm^{-1}$ |
| $V_e$ | effective volume | 1465 | $mm^3$ |
| $l_e$ | effective length | 43.6 | mm |
| $A_e$ | effective area | 33.6 | $mm^2$ |
| m | mass of core | ≈ 7.7 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN20/10/7 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 121 ± 25% | ≈ 125 | TN20/10/7-4C65 |
| 3C90 | 2230 ± 25% | ≈ 2300 | TN20/10/7-3C90 |
| 3C11 | 4150 ± 25% | ≈ 4300 | TN20/10/7-3C11 |
| 3E25 | 5340 ± 25% | ≈ 5500 | TN20/10/7-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.15 | ≤ 0.16 |

## RING CORES (TOROIDS)

### Effective core parameters

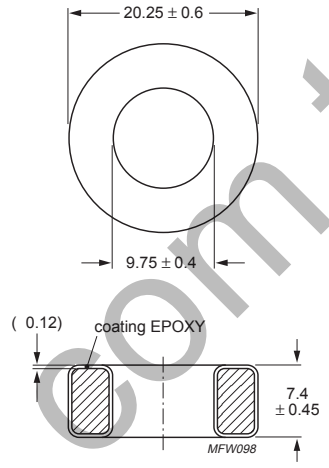
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.30 | $mm^{-1}$ |
| $V_e$ | effective volume | 1465 | $mm^3$ |
| $l_e$ | effective length | 43.6 | mm |
| $A_e$ | effective area | 33.6 | $mm^2$ |
| m | mass of core | ≈ 7.7 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX20/10/7 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 8250 ± 30% | ≈ 8500 | TX20/10/7-3E5 |
| 3E6 des | 9685 ± 30% | ≈ 10000 | TX20/10/7-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

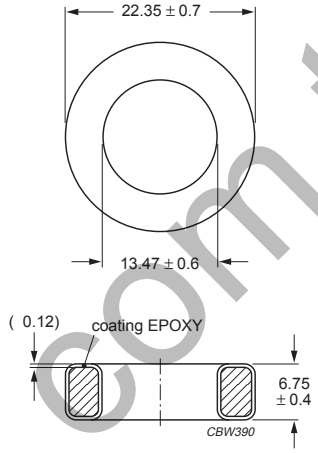
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 2.20 | $mm^{-1}$ |
| $V_e$ | effective volume | 1340 | $mm^3$ |
| $l_e$ | effective length | 54.2 | mm |
| $A_e$ | effective area | 24.8 | $mm^2$ |
| m | mass of core | ≈ 6.5 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX22/14/6.4 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 75 ± 25% | ≈ 125 | TX22/14/6.4-4C65 |
| 3D3 | 454 ± 20% | ≈ 750 | TX22/14/6.4-3D3 |
| 3C90 | 1400 ± 20% | ≈ 2300 | TX22/14/6.4-3C90 |
| 3C81 | 1650 ± 20% | ≈ 2700 | TX22/14/6.4-3C81 |
| 3E27 des | 3055 ± 20% | ≈ 5300 | TX22/14/6.4-3E27 |
| 3E6 | 6000 ± 30% | ≈ 10500 | TX22/14/6.4-3E6 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C |
| 3C81 | ≥320 | ≤ 0.21 | – |
| 3C90 | ≥320 | ≤ 0.13 | ≤ 0.13 |

## RING CORES (TOROIDS)

### Effective core parameters

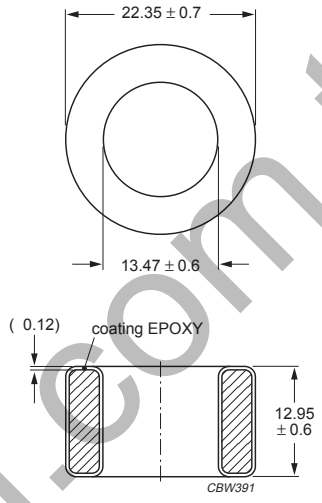
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.07 | $mm^{-1}$ |
| $V_e$ | effective volume | 2750 | $mm^3$ |
| $l_e$ | effective length | 54.2 | mm |
| $A_e$ | effective area | 50.9 | $mm^2$ |
| m | mass of core | ≈ 14 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX22/14/13 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3F3 | 2200 ± 20% | ≈ 1800 | TX22/14/13-3F3 |
| 3C90 | 2795 ± 20% | ≈ 2300 | TX22/14/13-3C90 |
| 3E27 des | 6110 ± 20% | ≈ 5000 | TX22/14/13-3E27 |
| 3E6 | 12080 ± 30% | ≈ 10300 | TX22/14/13-3E6 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3F3 | ≥320 | ≤ 0.30 | ≤ 0.52 |

# Ferrite toroids TN23/14/7

## RING CORES (TOROIDS)

### Effective core parameters

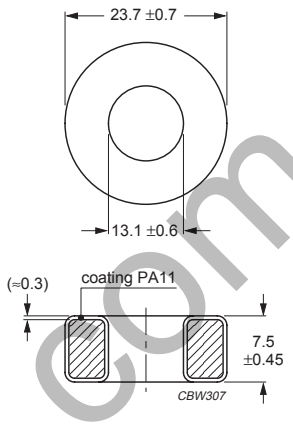
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.81 | $mm^{-1}$ |
| $V_e$ | effective volume | 1722 | $mm^3$ |
| $l_e$ | effective length | 55.8 | mm |
| $A_e$ | effective area | 30.9 | $mm^2$ |
| m | mass of core | ≈ 8.4 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN23/14/7 ring core.

Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 87 ± 25% | ≈ 125 | TN23/14/7-4C65 |
| 4A11 | 486 ± 25% | ≈ 700(1) | TN23/14/7-4A11 |
| 3R1(2) | – | ≈ 800 | TN23/14/7-3R1 |
| 3F3 | 1250 ± 25% | ≈ 1800 | TN23/14/7-3F3 |
| 3C90 | 1600 ± 25% | ≈ 2300 | TN23/14/7-3C90 |
| 3C11 des | 3000 ± 25% | ≈ 4300 | TN23/14/7-3C11 |
| 3E25 | 3820 ± 25% | ≈ 5500 | TN23/14/7-3E25 |

1. Old permeability specification maintained.
2. Due to the rectangular BH-loop of 3R1, inductance values strongly depend on the magnetic state of the ring core and measuring conditions. Therefore no $A_L$ value is specified. For the application in magnetic amplifiers $A_L$ is not a critical parameter.

| WARNING |
|---|
| Do not use 3R1 cores close to their mechanical resonant frequency. For more information refer to *"3R1"* material specification in this data handbook. |

**Properties of cores under power conditions**

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.19 | ≤ 0.19 | |
| 3F3 | ≥320 | | ≤ 0.19 | ≤ 0.33 |

## RING CORES (TOROIDS)

### Effective core parameters

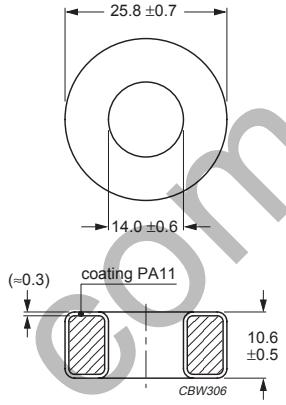
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.23 | $mm^{-1}$ |
| $V_e$ | effective volume | 2944 | $mm^3$ |
| $l_e$ | effective length | 60.2 | mm |
| $A_e$ | effective area | 48.9 | $mm^2$ |
| m | mass of core | ≈ 15 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN25/15/10 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3F3 | 1840 ± 25% | ≈ 1800 | TN25/15/10-3F3 |
| 3C90 | 2350 ± 25% | ≈ 2300 | TN25/15/10-3C90 |
| 3C11 | 4400 ± 25% | ≈ 4300 | TN25/15/10-3C11 |
| 3E25 | 5620 ± 25% | ≈ 5500 | TN25/15/10-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.33 | ≤ 0.33 | – |
| 3F3 | ≥320 | – | ≤ 0.32 | ≤ 0.56 |

## RING CORES (TOROIDS)

### Effective core parameters

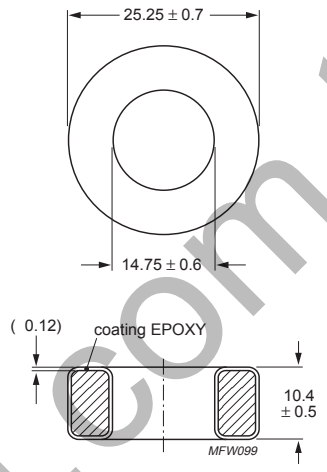
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.23 | $mm^{-1}$ |
| $V_e$ | effective volume | 2944 | $mm^3$ |
| $l_e$ | effective length | 60.2 | mm |
| $A_e$ | effective area | 48.9 | $mm^2$ |
| m | mass of core | ≈ 15 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX25/15/10 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 8680 ± 30% | ≈ 8500 | TX25/15/10-3E5 |
| 3E6 des | 10200 ± 30% | ≈ 10000 | TX25/15/10-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

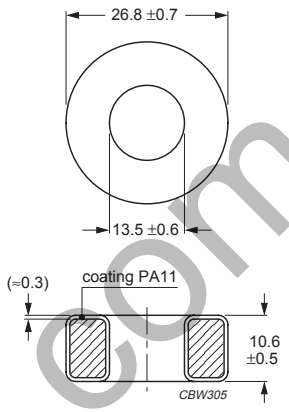
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.08 | $mm^{-1}$ |
| $V_e$ | effective volume | 3360 | $mm^3$ |
| $l_e$ | effective length | 60.1 | mm |
| $A_e$ | effective area | 55.9 | $mm^2$ |
| m | mass of core | ≈ 17 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN26/15/10 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 | 817 ± 25% | ≈ 700(1) | TN26/15/10-4A11 |
| 3C90 | 2645 ± 25% | ≈ 2300 | TN26/15/10-3C90 |
| 3C11 | 5000 ± 25% | ≈ 4300 | TN26/15/10-3C11 |
| 3E25 | 6420 ± 25% | ≈ 5500 | TN26/15/10-3E25 |

1. Old permeability specification maintained.

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.38 | ≤ 0.38 |

## RING CORES (TOROIDS)

### Effective core parameters

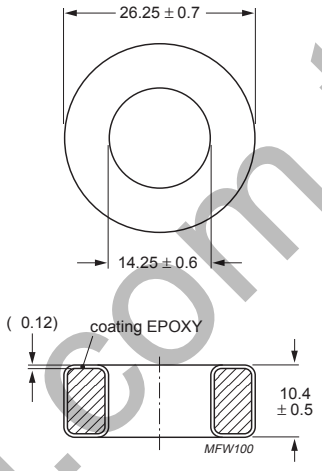
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.08 | $mm^{-1}$ |
| $V_e$ | effective volume | 3360 | $mm^3$ |
| $l_e$ | effective length | 60.1 | mm |
| $A_e$ | effective area | 55.9 | $mm^2$ |
| m | mass of core | ≈ 17 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX26/15/10 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 10000 ± 30% | ≈ 8500 | TX26/15/10-3E5 |

## RING CORES (TOROIDS)

### Effective core parameters

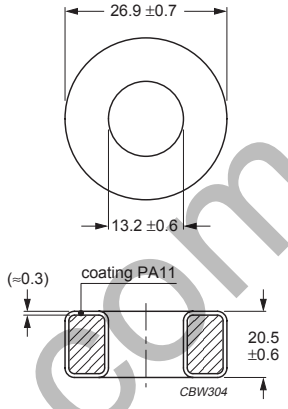
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.538 | $mm^{-1}$ |
| $V_e$ | effective volume | 6720 | $mm^3$ |
| $l_e$ | effective length | 60.1 | mm |
| $A_e$ | effective area | 112 | $mm^2$ |
| m | mass of set | ≈ 34 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN26/15/20 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 des | 5400 ± 25% | ≈ 2300 | TN26/15/20-3C90 |
| 3C11 | 10000 ± 25% | ≈ 4300 | TN26/15/20-3C11 |
| 3E25 | 12800 ± 25% | ≈ 5500 | TN26/15/20-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.75 | ≤ 0.75 |

## RING CORES (TOROIDS)

### Effective core parameters

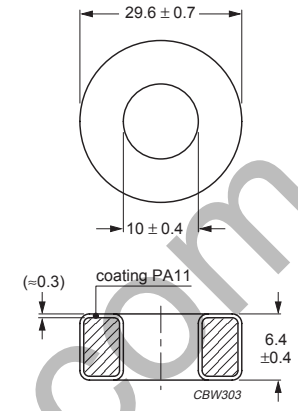
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.04 | $mm^{-1}$ |
| $V_e$ | effective volume | 2680 | $mm^3$ |
| $l_e$ | effective length | 52.9 | mm |
| $A_e$ | effective area | 50.8 | $mm^2$ |
| m | mass of core | ≈ 14 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN29/11/6 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 | 2780 ± 20% | ≈ 2300 | TN29/11/6-3C90 |
| 3C11 | 5100 ± 25% | ≈ 4300 | TN29/11/6-3C11 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | **H = 250 A/m; f = 25 kHz; T = 100 °C** | **f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C** | **f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C** |
| 3C90 | ≥320 | ≤ 0.3 | ≤ 0.3 |

## RING CORES (TOROIDS)

### Effective core parameters

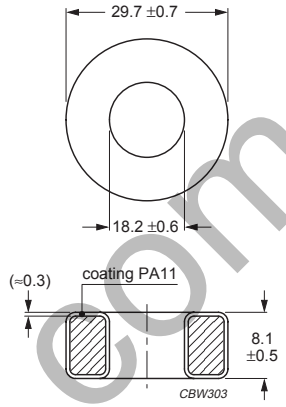
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.98 | $mm^{-1}$ |
| $V_e$ | effective volume | 2700 | $mm^3$ |
| $l_e$ | effective length | 73.2 | mm |
| $A_e$ | effective area | 36.9 | $mm^2$ |
| m | mass of core | ≈ 13.5 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN29/19/7.5 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 | 1460 ± 25% | ≈ 2300 | TN29/19/7.5-3C90 |
| 3C11 | 2700 ± 25% | ≈ 4300 | TN29/19/7.5-3C11 |
| 3E25 | 3550 ± 25% | ≈ 5500 | TN29/19/7.5-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤0.30 | ≤0.30 |

# Ferrite toroids TX29/19/7.5

## RING CORES (TOROIDS)

### Effective core parameters

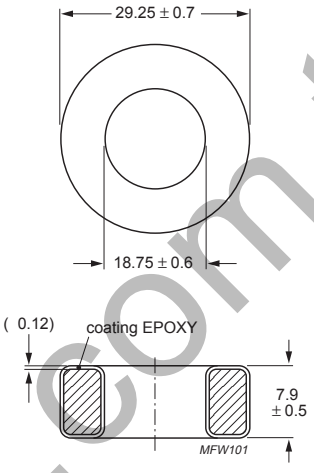
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.98 | $mm^{-1}$ |
| $V_e$ | effective volume | 2700 | $mm^3$ |
| $l_e$ | effective length | 73.2 | mm |
| $A_e$ | effective area | 36.9 | $mm^2$ |
| m | mass of core | ≈ 13.5 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX29/19/7.5 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E6 des | 6340 ± 30% | ≈ 10000 | TX29/19/7.5-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

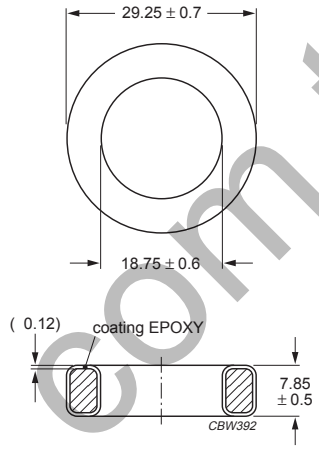
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 2.06 | $mm^{-1}$ |
| $V_e$ | effective volume | 2600 | $mm^3$ |
| $l_e$ | effective length | 73.2 | mm |
| $A_e$ | effective area | 35.5 | $mm^2$ |
| m | mass of core | ≈ 13 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX29/19/7.6 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C81 | 1740 ± 20% | ≈ 2800 | TX29/19/7.6-3C81 |
| 3E27 | 3225 ± 20% | ≈ 5300 | TX29/19/7.6-3E27 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at |
|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; B = 200 mT; T = 100 °C |
| 3C81 | ≥320 | ≤ 0.53 |

## RING CORES (TOROIDS)

### Effective core parameters

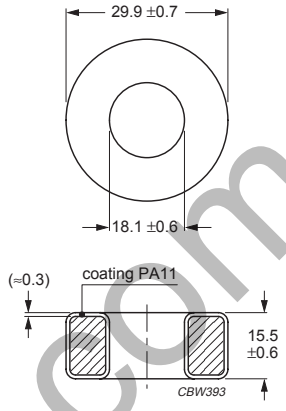
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.98 | $mm^{-1}$ |
| $V_e$ | effective volume | 5410 | $mm^3$ |
| $l_e$ | effective length | 73.2 | mm |
| $A_e$ | effective area | 73.9 | $mm^2$ |
| m | mass of core | ≈ 28 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN29/19/15 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 | 2960 ± 20% | ≈ 2300 | TN29/19/15-3C90 |
| 3E25 | 7000 ± 25% | ≈ 5500 | TN29/19/15-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.61 | ≤ 0.61 |

## RING CORES (TOROIDS)

### Effective core parameters

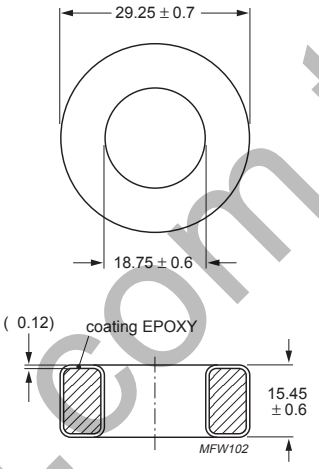
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.98 | $mm^{-1}$ |
| $V_e$ | effective volume | 5410 | $mm^3$ |
| $l_e$ | effective length | 73.2 | mm |
| $A_e$ | effective area | 73.9 | $mm^2$ |
| m | mass of core | ≈ 28 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX29/19/15 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 10780 ± 30% | ≈ 8500 | TX29/19/15-3E5 |
| 3E6 des | 12850 ± 30% | ≈ 10000 | TX29/19/15-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

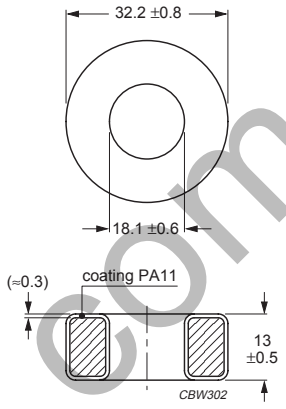
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.99 | $mm^{-1}$ |
| $V_e$ | effective volume | 5820 | $mm^3$ |
| $l_e$ | effective length | 76 | mm |
| $A_e$ | effective area | 76.5 | $mm^2$ |
| m | mass of core | ≈29 | g |

### Coating

The cores are coated with polyamide 11 (PA11), flame retardant in accordance with *"UL 94V-2"*; UL file number E 45228 (M).
The colour is white.
Maximum operating temperature is 160 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TN32/19/13 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 | 885 ± 25% | ≈ 700[1] | TN32/19/13-4A11 |
| 3F3 | 2270 ± 25% | ≈ 1800 | TN32/19/13-3F3 |
| 3C90 | 2910 ± 25% | ≈ 2300 | TN32/19/13-3C90 |
| 3C11 | 5450 ± 25% | ≈ 4300 | TN32/19/13-3C11 |
| 3E25 | 6950 ± 25% | ≈ 5500 | TN32/19/13-3E25 |

1. Old permeability specification maintained.

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 0.65 | ≤ 0.65 | – |
| 3F3 | ≥320 | – | ≤ 0.64 | ≤ 1.1 |

## RING CORES (TOROIDS)

### Effective core parameters

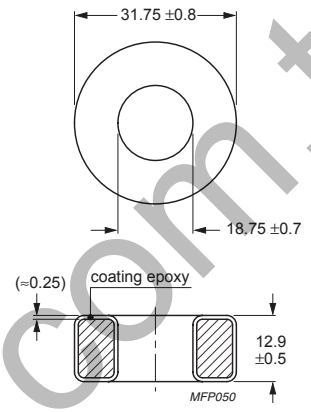
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.99 | $mm^{-1}$ |
| $V_e$ | effective volume | 5820 | $mm^3$ |
| $l_e$ | effective length | 76 | mm |
| $A_e$ | effective area | 76.5 | $mm^2$ |
| m | mass of core | ≈29 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX32/19/13 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 10700 ± 30% | ≈ 8500 | TX32/19/13-3E5 |

## RING CORES (TOROIDS)

### Effective core parameters

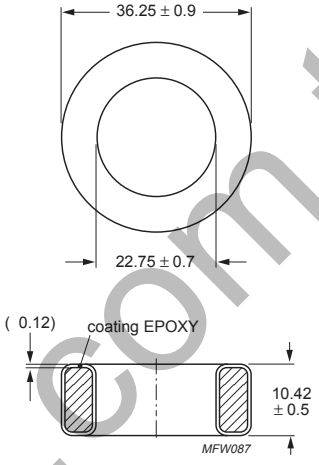
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.38 | $mm^{-1}$ |
| $V_e$ | effective volume | 5820 | $mm^3$ |
| $l_e$ | effective length | 89.7 | mm |
| $A_e$ | effective area | 64.9 | $mm^2$ |
| m | mass of core | ≈ 27 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX36/23/10 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 112 ± 25% | ≈ 125 | TX36/23/10-4C65 |
| 3C90 des | 2060 ± 25% | ≈ 2300 | TX36/23/10-3C90 |
| 3C81 | 2455 ± 20% | ≈ 2700 | TX36/23/10-3C81 |
| 3C11 | 3900 ± 25% | ≈ 4300 | TX36/23/10-3C11 |
| 3E27 | 4545 ± 20% | ≈ 5000 | TX36/23/10-3E27 |
| 3E6 des | 9090 ± 30% | ≈ 10000 | TX36/23/10-3E6 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | **H = 250 A/m; f = 25 kHz; T = 100 °C** | **f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C** | **f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C** |
| 3C90 | ≥320 | ≤ 0.64 | ≤ 0.64 |
| 3C81 | ≥320 | ≤ 1.1 | – |

## RING CORES (TOROIDS)

### Effective core parameters

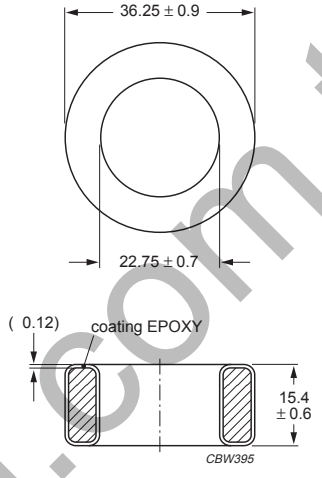
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.919 | $mm^{-1}$ |
| $V_e$ | effective volume | 8740 | $mm^3$ |
| $l_e$ | effective length | 89.7 | mm |
| $A_e$ | effective area | 97.5 | $mm^2$ |
| m | mass of core | ≈ 40 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX36/23/15 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 | 170 ± 25% | ≈ 125 | TX36/23/15-4C65 |
| 4A11 | 940 ± 25% | ≈ 700(1) | TX36/23/15-4A11 |
| 3R1(2) | – | ≈ 800 | TX36/23/15-3R1 |
| 3S4 des | 2285 ± 25% | ≈ 1700 | TX36/23/15-3S4 |
| 3F3 | 2420 ± 25% | ≈ 1800 | TX36/23/15-3F3 |
| 3C90 | 3090 ± 20% | ≈ 2300 | TX36/23/15-3C90 |
| 3C81 | 3670 ± 20% | ≈ 2700 | TX36/23/15-3C81 |
| 3C11 | 5800 ± 25% | ≈ 4300 | TX36/23/15-3C11 |
| 3E25 | 7390 ± 25% | ≈ 5500 | TX36/23/15-3E25 |
| 3E27 des | 6800 ± 20% | ≈ 5000 | TX36/23/15-3E27 |
| 3E5 | 11400 ± 30% | ≈ 8500 | TX36/23/15-3E5 |
| 3E6 | 13600 ± 30% | ≈ 10400 | TX36/23/15-3E6 |

1. Old permeability specification maintained.
2. Due to the rectangular BH-loop of 3R1, inductance values strongly depend on the magnetic state of the ring core and measuring conditions. Therefore no $A_L$ value is specified. For the application in magnetic amplifiers $A_L$ is not a critical parameter.

| WARNING |
|---|
| Do not use 3R1 cores close to their mechanical resonant frequency. For more information refer to *"3R1"* material specification in this data handbook. |

**Properties of cores under power conditions**

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | $\hat{f}$ = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | $\hat{f}$ = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | $\hat{f}$ = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C81 | ≥320 | ≤ 1.7 | – | – |
| 3C90 | ≥320 | ≤ 0.96 | ≤ 0.96 | – |
| 3F3 | ≥320 | – | ≤0.95 | ≤1.7 |

## RING CORES (TOROIDS)

### Effective core parameters

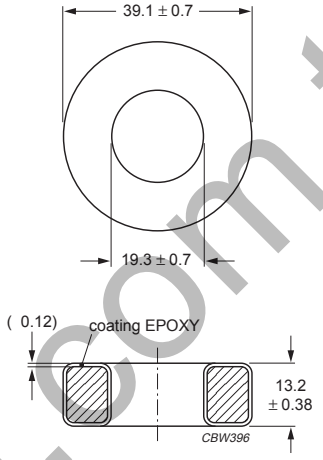
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.76 | $mm^{-1}$ |
| $V_e$ | effective volume | 9513 | $mm^3$ |
| $l_e$ | effective length | 84.9 | mm |
| $A_e$ | effective area | 112 | $mm^2$ |
| m | mass of core | ≈ 45 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX39/20/13 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3F3 | 3150 ± 20% | ≈ 1800 | TX39/20/13-3F3 |
| 3C90 | 3800 ± 20% | ≈ 2300 | TX39/20/13-3C90 |
| 3C81 | 4700 ± 20% | ≈ 2700 | TX39/20/13-3C81 |
| 3E27 | 8720 ± 20% | ≈ 5000 | TX39/20/13-3E27 |
| 3E6 des | 16700 ± 30% | ≈ 9600 | TX39/20/13-3E6 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | $\hat{f}$ = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | $\hat{f}$ = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | $\hat{f}$ = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C81 | ≥320 | ≤1.9 | – | – |
| 3C90 | ≥320 | ≤1.1 | ≤1.1 | – |
| 3F3 | ≥320 | – | ≤1.1 | ≤1.8 |

## RING CORES (TOROIDS)

### Effective core parameters

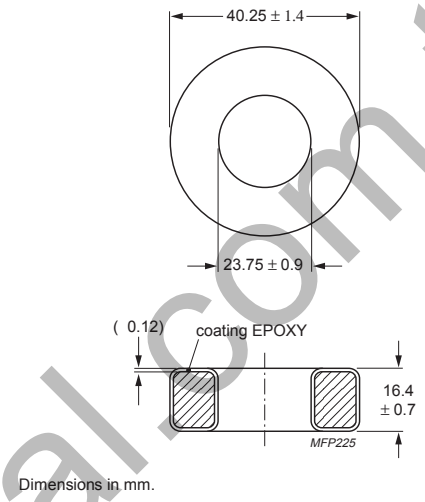
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.769 | $mm^{-1}$ |
| $V_e$ | effective volume | 12100 | $mm^3$ |
| $l_e$ | effective length | 96.3 | mm |
| $A_e$ | effective area | 125 | $mm^2$ |
| m | mass of core | ≈ 62 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX40/24/16 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3F3 | 3000 ± 25 % | ≈ 1835 | TX40/24/16-3F3 |
| 3C90 | 3500 ± 25 % | ≈ 2140 | TX40/24/16-3C90 |
| 3C11 | 6800 ± 25 % | ≈ 4160 | TX40/24/16-3C11 |
| 3E26 | 10800 ± 25 % | ≈ 6610 | TX40/24/16-3E26 |
| 3E27 | 9363 ± 25 % | ≈ 5730 | TX40/24/16-3E27 |
| 3E5 | 12900 ± 30 % | ≈ 7890 | TX40/24/16-3E5 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | $\hat{B}$ = 200 mT; f = 25 kHz; T = 100 °C | $\hat{B}$ = 100 mT; f = 100 kHz; T = 100 °C | $\hat{B}$ = 50 mT; f = 400 kHz; T = 100 °C |
| 3C90 | ≥ 320 | ≤1.4 | ≤1.4 | – |
| 3F3 | ≥ 320 | – | ≤1.4 | ≤ 2.3 |

## RING CORES (TOROIDS)

### Effective core parameters

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.615 | $mm^{-1}$ |
| $V_e$ | effective volume | 15100 | $mm^3$ |
| $l_e$ | effective length | 96.3 | mm |
| $A_e$ | effective area | 157 | $mm^2$ |
| m | mass of core | ≈ 77 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.

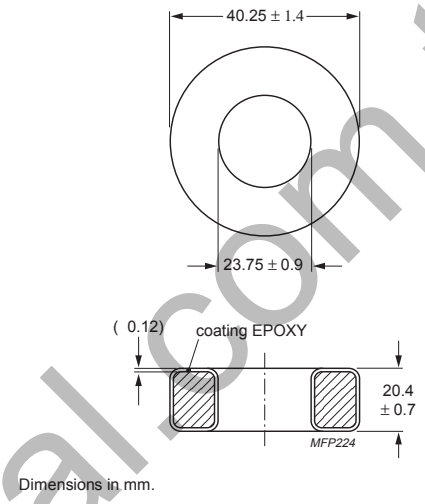



Fig.1 TX40/24/20 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E27 | 11600 ± 25 % | ≈ 5680 | TX40/24/20-3E27 |
| 3E5 | 16300 ± 30 % | ≈ 7980 | TX40/24/20-3E5 |

## RING CORES (TOROIDS)

### Effective core parameters

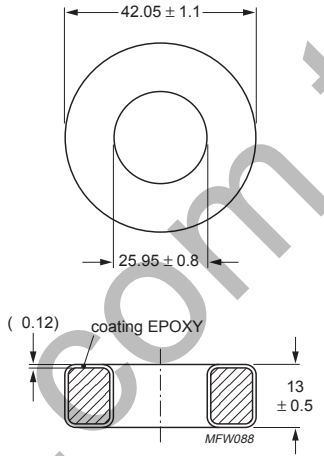
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.076 | $mm^{-1}$ |
| $V_e$ | effective volume | 9860 | $mm^3$ |
| $l_e$ | effective length | 103 | mm |
| $A_e$ | effective area | 95.8 | $mm^2$ |
| m | mass of core | ≈ 53 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX42/26/13 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 | 2690 ± 25% | ≈ 2300 | TX42/26/13-3C90 |
| 3C11 | 5000 ± 25% | ≈ 4300 | TX42/26/13-3C11 |
| 3E25 | 6425 ± 25% | ≈ 5500 | TX42/26/13-3E25 |
| 3E27 | 6425 ± 25% | ≈ 5500 | TX42/26/13-3E27 |
| 4A11 | 820 ± 25% | ≈ 700(1) | TX42/26/13-4A11 |

1. Old permeability specification maintained.

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; B = 200 mT; T = 100 °C | f = 100 kHz; B = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 1.1 | ≤ 1.1 |

## RING CORES (TOROIDS)

### Effective core parameters

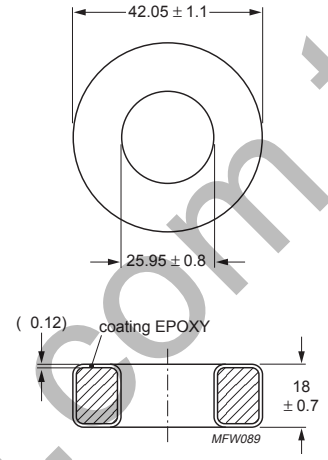
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.769 | $mm^{-1}$ |
| $V_e$ | effective volume | 13810 | $mm^3$ |
| $l_e$ | effective length | 103 | mm |
| $A_e$ | effective area | 134 | $mm^2$ |
| m | mass of core | ≈ 55 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX42/26/18 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E5 | 12900 ± 30% | ≈ 8500 | TX42/26/18-3E5 |

# Ferrite toroids TX50/30/19

## RING CORES (TOROIDS)

### Effective core parameters

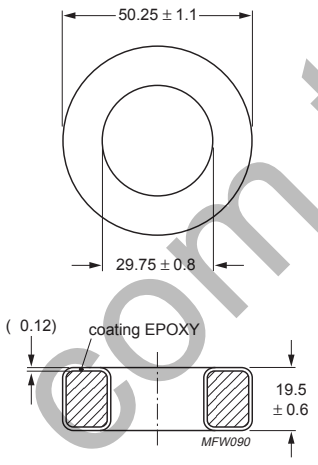
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.65 | $mm^{-1}$ |
| $V_e$ | effective volume | 22378 | $mm^3$ |
| $l_e$ | effective length | 120.4 | mm |
| $A_e$ | effective area | 186 | $mm^2$ |
| m | mass of core | ≈ 100 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 228348.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX50/30/19 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E6 des | 19400 ± 30% | ≈ 10000 | TX50/30/19-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

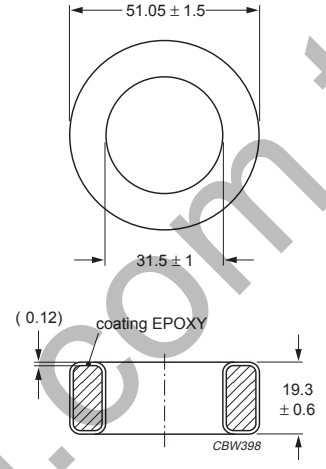
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.73 | $mm^{-1}$ |
| $V_e$ | effective volume | 21500 | $mm^3$ |
| $l_e$ | effective length | 125 | mm |
| $A_e$ | effective area | 172 | $mm^2$ |
| m | mass of core | ≈ 100 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 235873.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX51/32/19 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3F3 des | 3200 ± 20% | ≈ 1800 | TX51/32/19-3F3 |
| 3C90 | 3980 ± 20% | ≈ 2300 | TX51/32/19-3C90 |
| 3C81 | 4800 ± 20% | ≈ 2700 | TX51/32/19-3C81 |
| 3E25 | 8890 ± 20% | ≈ 5000 | TX51/32/19-3E25 |
| 3E27 des | 8890 ± 20% | ≈ 5000 | TX51/32/19-3E27 |
| 3E6 | 17300 ± 30% | ≈ 10000 | TX51/32/19-3E6 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C81 | ≥320 | ≤ 4.4 | – | – |
| 3C90 | ≥320 | ≤ 2.4 | ≤ 2.4 | – |
| 3F3 | ≥320 | – | ≤ 2.4 | ≤ 4.1 |

## RING CORES (TOROIDS)

### Effective core parameters

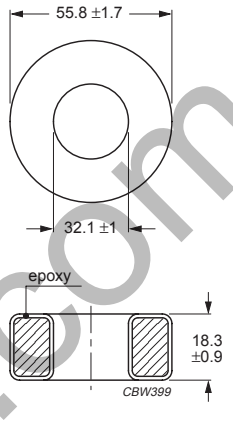
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.651 | $mm^{-1}$ |
| $V_e$ | effective volume | 26580 | $mm^3$ |
| $l_e$ | effective length | 132 | mm |
| $A_e$ | effective area | 202 | $mm^2$ |
| m | mass of core | ≈ 134 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 235873.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX55/32/18 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4A11 | 1350 ± 25% | ≈ 700(1) | TX55/32/18-4A11 |
| 3C11 | 8300 ± 25% | ≈ 4300 | TX55/32/18-3C11 |
| 3E25 | 10620 ± 25% | ≈ 5500 | TX55/32/18-3E25 |
| 3E27 | 10620 ± 25% | ≈ 5500 | TX55/32/18-3E27 |

1. Old permeability specification maintained.

## RING CORES (TOROIDS)

### Effective core parameters

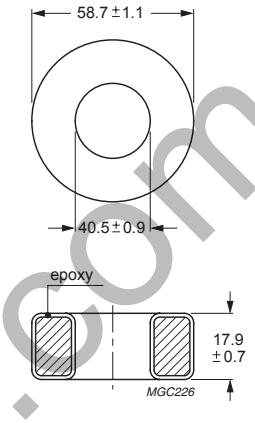
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.0 | $mm^{-1}$ |
| $V_e$ | effective volume | 23200 | $mm^3$ |
| $l_e$ | effective length | 152 | mm |
| $A_e$ | effective area | 152 | $mm^2$ |
| m | mass of core | ≈ 110 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 235873.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX58/41/18 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 des | 2890 ± 25% | ≈ 2300 | TX58/41/18-3C90 |
| 3C11 | 5400 ± 25% | ≈ 4300 | TX58/41/18-3C11 |
| 3E25 | 6900 ± 25% | ≈ 5500 | TX58/41/18-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 2.6 | ≤ 2.6 |

## RING CORES (TOROIDS)

### Effective core parameters

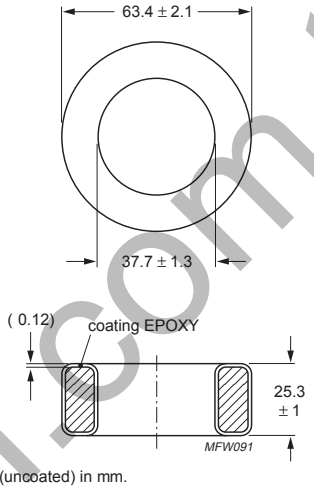
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.497 | $mm^{-1}$ |
| $V_e$ | effective volume | 46500 | $mm^3$ |
| $l_e$ | effective length | 152 | mm |
| $A_e$ | effective area | 306 | $mm^2$ |
| m | mass of core | ≈ 220 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 235873.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions (uncoated) in mm.

Fig.1 TX63/38/25 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3F3 | 4550 ± 25 % | ≈ 1800 | TX63/38/25-3F3 |
| 3E25 | 13900 ± 25 % | ≈ 5500 | TX63/38/25-3E25 |
| 3E6 des | 25280 ± 30 % | ≈ 10000 | TX63/38/25-3E6 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3F3 | ≥320 | ≤ 5.1 | ≤ 8.8 |

## RING CORES (TOROIDS)

### Effective core parameters

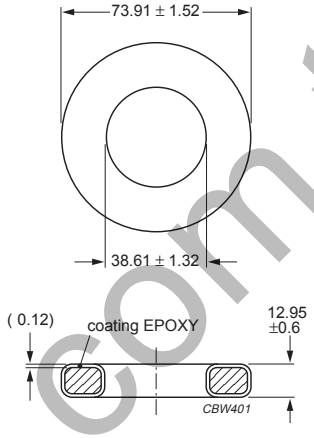
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.80 | $mm^{-1}$ |
| $V_e$ | effective volume | 34300 | $mm^3$ |
| $l_e$ | effective length | 165 | mm |
| $A_e$ | effective area | 208 | $mm^2$ |
| m | mass of core | ≈ 170 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 235873.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX74/39/13 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3F3 | 2900 ± 20% | ≈ 1800 | TX74/39/13-3F3 |
| 3C90 des | 3620 ± 20% | ≈ 2300 | TX74/39/13-3C90 |
| 3C81 | 4350 ± 20% | ≈ 2700 | TX74/39/13-3C81 |
| 3E25 | 8060 ± 20% | ≈ 5000 | TX74/39/13-3E25 |
| 3E6 des | 15776 ± 30% | ≈ 10000 | TX74/39/13-3E6 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | | |
|---|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | $\hat{f}$ = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C | $\hat{f}$ = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C | $\hat{f}$ = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C |
| 3C81 | ≥320 | ≤ 7.0 | – | – |
| 3C90 | ≥320 | ≤ 4.0 | ≤ 4.0 | – |
| 3F3 | ≥320 | – | ≤ 3.8 | ≤ 8.1 |

## RING CORES (TOROIDS)

### Effective core parameters

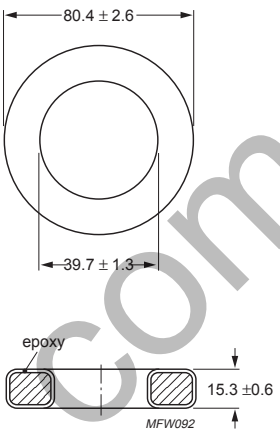
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.604 | $mm^{-1}$ |
| $V_e$ | effective volume | 50200 | $mm^3$ |
| $l_e$ | effective length | 174 | mm |
| $A_e$ | effective area | 288 | $mm^2$ |
| m | mass of core | ≈ 240 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 235873.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX80/40/15 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 | 4780 ± 25% | ≈ 2300 | TX80/40/15-3C90 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | $\hat{B}$ = 200 mT; f = 25 kHz; T = 100 °C | $\hat{B}$ = 100 mT; f = 100 kHz; T = 100 °C |
| 3C90 | ≥320 | ≤ 6.0 | ≤ 6.0 |

## RING CORES (TOROIDS)

### Effective core parameters

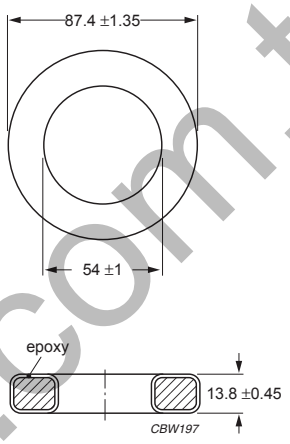
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.987 | $mm^{-1}$ |
| $V_e$ | effective volume | 46400 | $mm^3$ |
| $l_e$ | effective length | 214 | mm |
| $A_e$ | effective area | 217 | $mm^2$ |
| m | mass of core | ≈ 220 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 235873.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX87/54/14 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 des | 2930 ± 25% | ≈ 2300 | TX87/54/14-3C90 |
| 3C11 des | 5470 ± 25% | ≈ 4300 | TX87/54/14-3C11 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; B = 200 mT; T = 100 °C | f = 100 kHz; B = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 5.5 | ≤ 5.5 |

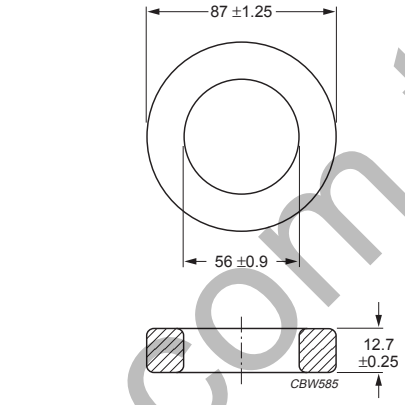
## RING CORES (TOROIDS)

### Effective core parameters

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 1.123 | $mm^{-1}$ |
| $V_e$ | effective volume | 42133 | $mm^3$ |
| $l_e$ | effective length | 217.5 | mm |
| $A_e$ | effective area | 194 | $mm^2$ |
| m | mass of core | ≈ 200 | g |

### Coating

Coated cores are available on request.




Dimensions in mm.

Fig.1 T87/56/13 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3E6 des | 11190 ± 30% | ≈ 10000 | T87/56/13-3E6 |

## RING CORES (TOROIDS)

### Effective core parameters

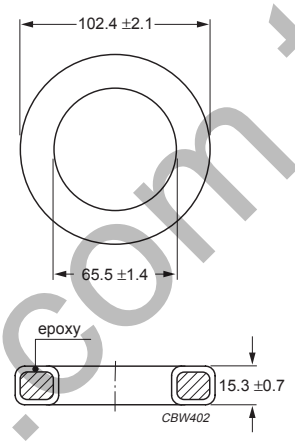
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.956 | $mm^{-1}$ |
| $V_e$ | effective volume | 68200 | $mm^3$ |
| $l_e$ | effective length | 255 | mm |
| $A_e$ | effective area | 267 | $mm^2$ |
| m | mass of core | ≈ 325 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 235873.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX102/66/15 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 4C65 des | 165 ± 25% | ≈ 125 | TX102/66/15-4C65 |
| 3C11 des | 5300 ± 25% | ≈ 4300 | TX102/66/15-3C11 |
| 3E25 des | 7900 ± 25% | ≈ 5500 | TX102/66/15-3E25 |

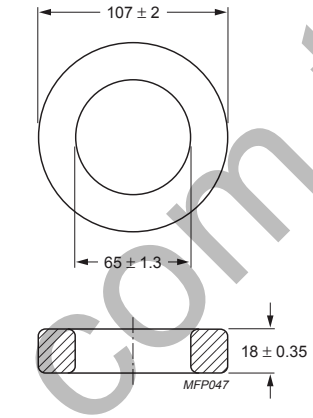
**RING CORES (TOROIDS)**

**Effective core parameters**

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.700 | $mm^{-1}$ |
| $V_e$ | effective volume | 96000 | $mm^3$ |
| $l_e$ | effective length | 259 | mm |
| $A_e$ | effective area | 370 | $mm^2$ |
| m | mass of core | ≈ 456 | g |

**Coating**

Coated cores are available on request.




Dimensions in mm.

Fig.1 T107/65/18 ring core.

**Ring core data**

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3F4 des | 1354 ± 25% | ≈ 750 | T107/65/18-3F4 |

## RING CORES (TOROIDS)

### Effective core parameters

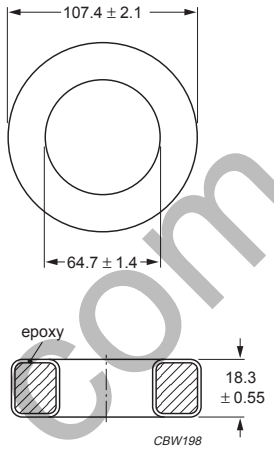
| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.700 | $mm^{-1}$ |
| $V_e$ | effective volume | 96000 | $mm^3$ |
| $l_e$ | effective length | 259 | mm |
| $A_e$ | effective area | 370 | $mm^2$ |
| m | mass of core | ≈ 456 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 235873.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.




Dimensions in mm.

Fig.1 TX107/65/18 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3F3 | 3230 ± 25% | ≈ 1800 | TX107/65/18-3F3 |
| 3E25 | 9900 ± 25% | ≈ 5500 | TX107/65/18-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | $\hat{B}$ = 100 mT; f = 100 kHz; T = 100 °C | $\hat{B}$ = 50 mT; f = 400 kHz; T = 100 °C |
| 3F3 | ≥320 | ≤ 10.6 | ≤ 18.2 |

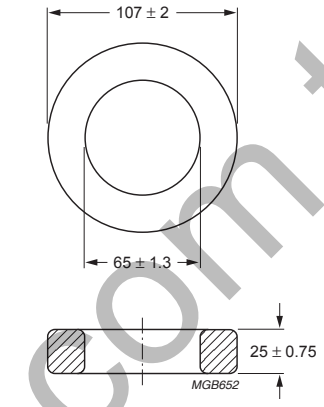
## RING CORES (TOROIDS)

### Effective core parameters

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.504 | $mm^{-1}$ |
| $V_e$ | effective volume | 133000 | $mm^3$ |
| $l_e$ | effective length | 259 | mm |
| $A_e$ | effective area | 514 | $mm^2$ |
| m | mass of core | ≈ 680 | g |

### Coating

Coated cores are available on request.




Dimensions in mm.

Fig.1 T107/65/25 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3F4 des | 1870 ± 25% | ≈ 750 | T107/65/25-3F4 |
| 3F3 des | 4485 ± 25% | ≈ 1800 | T107/65/25-3F3 |

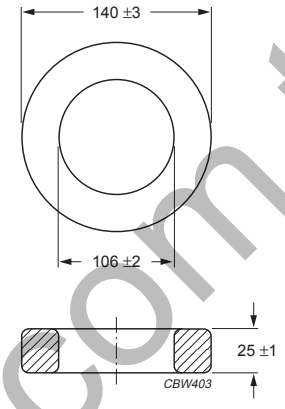
## RING CORES (TOROIDS)

### Effective core parameters

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.903 | $mm^{-1}$ |
| $V_e$ | effective volume | 161100 | $mm^3$ |
| $l_e$ | effective length | 382 | mm |
| $A_e$ | effective area | 422 | $mm^2$ |
| m | mass of core | ≈ 800 | g |

### Coating

Coated cores are available on request.




Dimensions in mm.

Fig.1 T140/106/25 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 | 3200 ± 20% | ≈ 2300 | T140/106/25-3C90 |
| 3E25 | 7700 ± 30% | ≈ 5500 | T140/106/25-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; B = 200 mT; T = 100 °C | f = 100 kHz; B = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 22.7 | ≤ 22.7 |

## RING CORES (TOROIDS)

### Effective core parameters

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.903 | $mm^{-1}$ |
| $V_e$ | effective volume | 161100 | $mm^3$ |
| $l_e$ | effective length | 382 | mm |
| $A_e$ | effective area | 422 | $mm^2$ |
| m | mass of core | ≈ 800 | g |

### Coating

The cores are coated with epoxy, flame retardant in accordance with *"UL 94V-0"*; UL file number E 235873.
The colour is white.
Maximum operating temperature is 200 °C.

### Isolation voltage

DC isolation voltage: 2000 V.
Contacts are applied on the edge of the ring core, which is also the critical point for the winding operation.

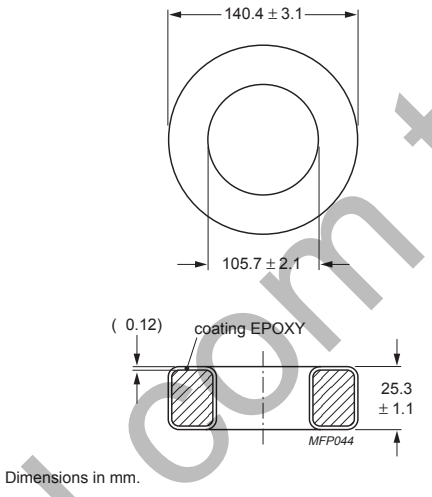



Fig.1 TX140/106/25 ring core.

### Ring core data

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C90 | 3200 ± 20% | ≈ 2300 | TX140/106/25-3C90 |
| 3E25 | 7700 ± 30% | ≈ 5500 | TX140/106/25-3E25 |

### Properties of cores under power conditions

| GRADE | B (mT) at | CORE LOSS (W) at | |
|---|---|---|---|
| | H = 250 A/m; f = 25 kHz; T = 100 °C | f = 25 kHz; B = 200 mT; T = 100 °C | f = 100 kHz; B = 100 mT; T = 100 °C |
| 3C90 | ≥320 | ≤ 22.7 | ≤ 22.7 |

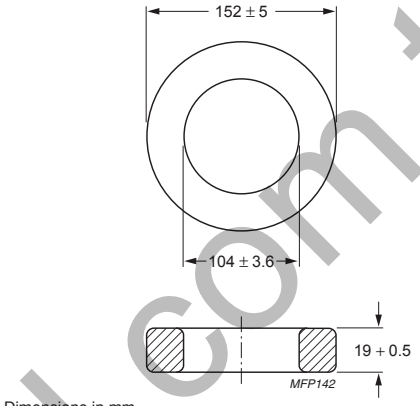
**RING CORES (TOROIDS)**

**Effective core parameters**

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.873 | $mm^{-1}$ |
| $V_e$ | effective volume | 176600 | $mm^3$ |
| $l_e$ | effective length | 393 | mm |
| $A_e$ | effective area | 450 | $mm^2$ |
| m | mass of core | ≈ 878 | g |

**Coating**

Coated cores are available on request.




Dimensions in mm.

Fig.1 T152/104/19 ring core.

**Ring core data**

| GRADE | $A_L$ (nH) | $\mu_i$ | TYPE NUMBER |
|---|---|---|---|
| 3C11 | 6000 ± 25 % | ≈ 4300 | T152/104/19-3C11 |
| 3E27 | 8500 ± 25 % | ≈ 6000 | T152/104/19-3E27 |