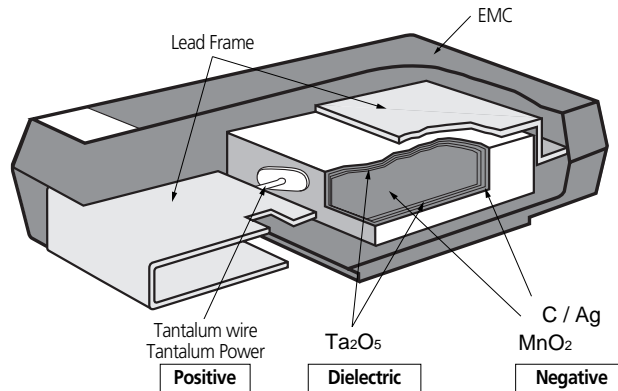
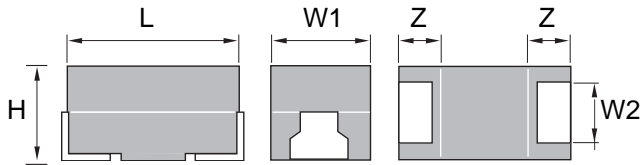


## TC Series - Standard Tantalum Capacitors

### Feature

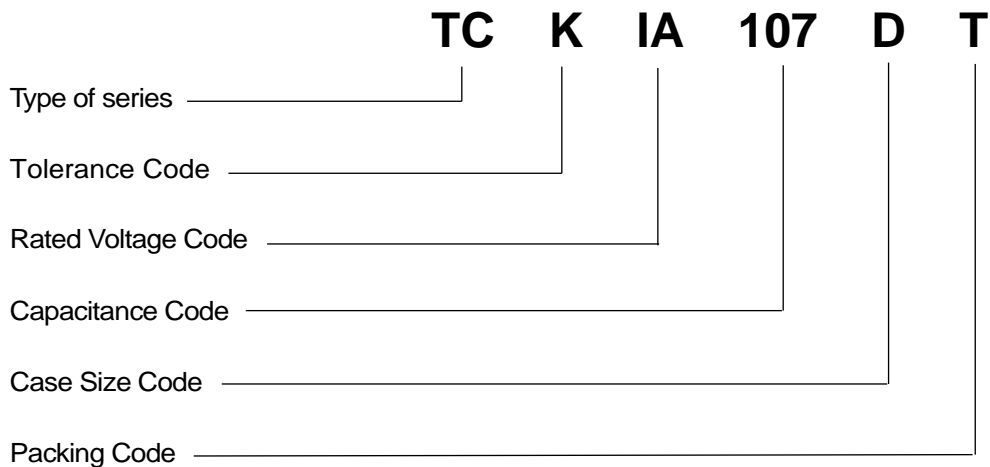


### Configuration and Dimension



Case Code	EIA Code	L	W1	W2	H	Z
P	2012	2.0 +/-0.2	1.25 +/-0.2	0.9 +/-0.1	1.1 +/-0.1	0.45 +/-0.1
A	3216	3.2 +/-0.2	1.60 +/-0.2	1.2 +/-0.1	1.6 +/-0.2	0.8 +/-0.3
B	3528	3.5 +/-0.2	2.80 +/-0.2	2.2 +/-0.1	1.9 +/-0.2	0.8 +/-0.3
C	6032	6.0 +/-0.3	3.20 +/-0.3	2.2 +/-0.1	2.5 +/-0.3	1.3 +/-0.3
D	7343	7.3 +/-0.3	4.30 +/-0.3	2.4 +/-0.1	2.8 +/-0.3	1.3 +/-0.3

### Part Numbering Code





## Feature

TC Series; The TC Series is designed for hybrid and low profile printed circuit boards where inductance is to be minimized, or where space is at a premium. These units have the further advantage of being compatible with automatic assembly equipment minus the problems associated with flexible terminal lead wires. Our chip tantalums meet all EIA sizes and are environment friendly, Pb-free.

## Specifications

Capacitance	Range	0.47 $\mu$ F to 680 $\mu$ F						
	Tolerance	$\pm 20\%$ (M), $\pm 10\%$ (K)						
Dissipation Factor (Tan $\delta$ )		Refer to Specification						
Leakage Current		Refer to Specification						
Rated Voltage(VR)	T $\leq$ 85 $^{\circ}$ C	2.5	6.3	10.0	16.0	20.0	25.0	35.0
Category Voltage(V)	85 $^{\circ}$ C < T $\leq$ 125 $^{\circ}$ C	1.6	4.0	6.3	10.0	13.0	16.0	22.0
Surge Voltage(V)	T $\leq$ 85 $^{\circ}$ C	3.1	8.0	13.0	20.0	25.0	32.0	44.0
	85 $^{\circ}$ C < T $\leq$ 125 $^{\circ}$ C	2	5.0	8.0	13.0	16.0	20.0	28.0
Operating Temperature		-55 $^{\circ}$ C to 125 $^{\circ}$ C						

## Standard Value and Case Size

R.V.		2.5V (OE)	4V (OG)	6.3V (OJ)	10V (IA)	16V (IC)	20V (ID)	25V (IE)	35V (IV)
Cap. ( $\mu$ F)									
0.15	154								
0.22	224								A
0.33	334								A
0.47	474								A
0.68	684							A	A
1	105					A	A	A	A, B
1.5	155					A	A	A	A, B
2.2	225				A	A, B	A, B	A, B	B, C
3.3	335			A	A, B	A, B	A, B	A, B, C	B, C, D
4.7	475		A	A	A	A, B, C	A, B, C	B, C	C, D
6.8	685		A	A	A, B	A, B	B, C	B, C	C, D
10	106		A	A, B	A, B, C	A, B, C, D	B, C, D	B, C, D	C, D
15	156		A, B	A, B	A, B	B, C	C, D	C, D	C, D
22	226		A, B	A, B	A, B, C	B, C, D	B, C, D	C, D	D
33	336		A, B	A, B, C	A, B, C	B, C, D	C, D	D	D
47	476		A, B, C	A, B, C	A, B, C, D	C, D	D		
68	686		B, C	B, C, D	C, D	C, D	D		
100	107		A, B, C, D	B, C, D	C, D	D	D		
150	157		C, D	C, D	D				
220	227	B	B, C, D	C, D	D				
330	337		D	D					
470	477		D	D					
680	687								

## Ratings & Part Number Reference

Part Number	Case Size	Capacitance (uF)	DC Leakage (uA)@+25C Max.	DF (%)@+25C 120Hz Max.	ESR (Ohm)@+25C 100KHz Max.
2.5 volt Rating@+85C(1.6 volt Rating@+125C)					
TC*OE221BT	B	220	5.5	18	1.2
4 volt Rating@+85C(2.5 volt Rating@+125C)					
TC*OG475AT	A	4.7	0.5	8	8
TC*OG685AT	A	6.8	0.5	8	6
TC*OG106AT	A	10	0.5	8	6
TC*OG156AT	A	15	0.6	8	4
TC*OG156BT	B	15	0.6	8	3.5
TC*OG226AT	A	22	0.9	8	4
TC*OG226BT	B	22	0.9	8	3.5
TC*OG336AT	A	33	1.3	8	4
TC*OG336BT	B	33	1.3	8	3.5
TC*OG476AT	A	47	1.9	8	2
TC*OG476BT	B	47	1.9	8	3.5
TC*OG476CT	C	47	1.9	8	1.8
TC*OG686BT	B	68	2.7	8	1.8
TC*OG686CT	C	68	2.7	8	1.6
TC*OG107AT	A	100	4	30	2
TC*OG107BT	B	100	4	8	0.8
TC*OG107CT	C	100	4	8	1.6
TC*OG107DT	D	100	4	8	0.8
TC*OG157CT	C	150	6	8	1.2
TC*OG157DT	D	150	6	8	0.8
TC*OG227BT	B	220	8.8	18	0.5
TC*OG227CT	C	220	8.8	8	0.6
TC*OG227DT	D	220	8.8	8	0.9
TC*OG337DT	D	330	13.2	8	0.7
TC*OG477DT	D	470	18.8	10	0.6

\* Insert K for +/-10% tolerance and M for +/-20%.

Capacitance and DF are measured at 120Hz, 0.5V RMS with maximum DC bias of 2.0 volts.

DCL is measured at a rated voltage after 5 minutes.

Calchip reserves the right to substitute a higher voltage rated part

Additional values may be available, please contact your sales representative for more information.

## Ratings & Part Number Reference

Part Number	Case Size	Capacitance (uF)	DC Leakage (uA)@+25C Max.	DF (%)@+25C 120Hz Max.	ESR (Ohm)@+25C 100KHz Max.
6.3 volt Rating@+85C(4 volt Rating@+125C)					
TC*OJ335AT	A	3.3	0.5	8	8
TC*OJ475AT	A	4.7	0.5	8	6
TC*OJ685AT	A	6.8	0.5	8	6
TC*OJ106AT	A	10	0.6	8	4
TC*OJ106BT	B	10	0.6	8	3.5
TC*OJ156AT	A	15	0.9	8	4
TC*OJ156BT	B	15	0.9	8	3.5
TC*OJ226AT	A	22	1.4	8	2
TC*OJ226BT	B	22	1.4	8	3.5
TC*OJ336AT	A	33	2	6	2
TC*OJ336BT	B	33	2	8	3
TC*OJ336CT	C	33	2	8	1.8
TC*OJ476AT	A	47	3	12	2
TC*OJ476BT	B	47	3	8	1.3
TC*OJ476CT	C	47	3	8	1.6
TC*OJ686BT	B	68	4.3	8	3.5
TC*OJ686CT	C	68	4.3	8	1.2
TC*OJ686DT	D	68	4.3	8	0.8
TC*OJ107BT	B	100	6.3	10	0.8
TC*OJ107CT	C	100	6.3	8	0.8
TC*OJ107DT	D	100	6.3	8	0.8
TC*OJ157CT	C	150	9.5	8	1.3
TC*OJ157DT	D	150	9.5	8	0.9
TC*OJ227CT	C	220	13.9	8	0.6
TC*OJ227DT	D	220	13.9	8	0.7
TC*OJ337DT	D	330	20.8	8	0.5
TC*OJ477DT	D	470	29.6	10	0.3

\* Insert K for +/-10% tolerance and M for +/-20%.

Capacitance and DF are measured at 120Hz, 0.5V RMS with maximum DC bias of 2.0 volts.

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## Ratings & Part Number Reference

Part Number	Case Size	Capacitance (uF)	DC Leakage (uA)@+25C Max.	DF (%)@+25C 120Hz Max.	ESR (Ohm)@+25C 100KHz Max.
10 volt Rating@+85C(6.3 volt Rating@+125C)					
TC*IA225AT	A	2.2	0.5	8	8
TC*IA335AT	A	3.3	0.5	8	6
TC*IA335BT	B	3.3	0.5	8	3.5
TC*IA475AT	A	4.7	0.5	8	6
TC*IA685AT	A	6.8	0.7	8	6
TC*IA685BT	B	6.8	0.7	8	3.5
TC*IA106AT	A	10	1	8	2
TC*IA106BT	B	10	1	8	3.5
TC*IA106BT	C	10	1	8	1.8
TC*IA156AT	A	15	1.5	8	4
TC*IA156BT	B	15	1.5	8	3.5
TC*IA226AT	A	22	2.2	8	2
TC*IA226BT	B	22	2.2	8	3
TC*IA226CT	C	22	2.2	8	1.8
TC*IA336AT	A	33	3.3	12	2
TC*IA336BT	B	33	3.3	8	1.8
TC*IA336CT	C	33	3.3	8	1.6
TC*IA476AT	A	47	9.4	20	3
TC*IA476BT	B	47	4.7	8	1.6
TC*IA476CT	C	47	4.7	8	1.2
TC*IA476DT	D	47	4.7	8	0.8
TC*IA686CT	C	68	6.8	8	0.9
TC*IA686DT	D	68	6.8	8	0.8
TC*IA107CT	C	100	10	8	1.2
TC*IA107DT	D	100	10	8	0.7
TC*IA157DT	D	150	15	8	0.8
TC*IA227DT	D	220	22	8	0.4

\* Insert K for +/-10% tolerance and M for +/-20%.

Capacitance and DF are measured at 120Hz, 0.5V RMS with maximum DC bias of 2.0 volts.

DCL is measured at a rated voltage after 5 minutes.

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Additional values may be available, please contact your sales representative for more information.

## Ratings & Part Number Reference

Part Number	Case Size	Capacitance (uF)	DC Leakage (uA)@+25C Max.	DF (%)@+25C 120Hz Max.	ESR (Ohm)@+25C 100KHz Max.
16 volt Rating@+85C(10 volt Rating@+125C)					
TC*IC105AT	A	1	0.5	6	10
TC*IC155AT	A	1.5	0.5	8	8
TC*IC225AT	A	2.2	0.5	8	6
TC*IC225BT	B	2.2	0.5	8	4.5
TC*IC335AT	A	3.3	0.5	8	6
TC*IC335BT	B	3.3	0.5	8	3.5
TC*IC475AT	A	4.7	0.7	8	4
TC*IC475BT	B	4.7	0.7	8	3.5
TC*IC475CT	C	4.7	0.7	8	2.5
TC*IC685AT	A	6.8	1	8	3.5
TC*IC685BT	B	6.8	1	8	3.5
TC*IC106AT	A	10	1.6	8	3
TC*IC106BT	B	10	1.6	8	3.5
TC*IC106CT	C	10	1.6	8	1.8
TC*IC106DT	D	10	1.6	8	1
TC*IC156BT	B	15	2.4	8	3
TC*IC156CT	C	15	2.4	8	1.8
TC*IC226BT	B	22	3.5	8	2.3
TC*IC226CT	C	22	3.5	8	1.6
TC*IC226DT	D	22	3.5	8	0.8
TC*IC336BT	B	33	5.3	8	1.4
TC*IC336CT	C	33	5.3	8	1.5
TC*IC336DT	D	33	5.3	8	0.8
TC*IC476CT	C	47	7.5	8	1.4
TC*IC476DT	D	47	7.5	8	0.8
TC*IC686CT	C	68	10.9	8	1.4
TC*IC686DT	D	68	10.9	8	0.8
TC*IC107DT	D	100	16	8	0.7

\* Insert K for +/-10% tolerance and M for +/-20%.

Capacitance and DF are measured at 120Hz, 0.5V RMS with maximum DC bias of 2.0 volts.

DCL is measured at a rated voltage after 5 minutes.

Calchip reserves the right to substitute a higher voltage rated part

Additional values may be available, please contact your sales representative for more information.

## Ratings & Part Number Reference

Part Number	Case Size	Capacitance (uF)	DC Leakage (uA)@+25C Max.	DF (%)@+25C 120Hz Max.	ESR (Ohm)@+25C 100KHz Max.
20 volt Rating@+85C(13 volt Rating@+125C)					
TC*ID105AT	A	1	0.5	6	10
TC*ID155AT	A	1.5	0.5	8	8
TC*ID225AT	A	2.2	0.5	8	7
TC*ID225BT	B	2.2	0.5	8	4.5
TC*ID335AT	A	3.3	0.7	8	4
TC*ID335BT	B	3.3	0.7	8	3.5
TC*ID475AT	A	4.7	1	8	3.5
TC*ID475BT	B	4.7	1	8	3.5
TC*ID475CT	C	4.7	1	8	2.5
TC*ID685BT	B	6.8	1.4	8	3.5
TC*ID685CT	C	6.8	1.4	8	1.9
TC*ID106BT	B	10	2	8	3
TC*ID106CT	C	10	2	8	1.8
TC*ID106DT	D	10	2	8	1
TC*ID156CT	C	15	3	8	1.7
TC*ID156DT	D	15	3	8	0.8
TC*ID226BT	B	22	4.4	6	1.8
TC*ID226CT	C	22	4.4	8	1.6
TC*ID226DT	D	22	4.4	8	0.8
TC*ID336CT	C	33	6.6	8	1.2
TC*ID336DT	D	33	6.6	8	0.8
TC*ID476DT	D	47	9.4	8	0.7
TC*ID686DT	D	68	13.6	8	0.7
TC*ID107DT	D	100	20	8	0.9

\* Insert K for +/-10% tolerance and M for +/-20%.

Capacitance and DF are measured at 120Hz, 0.5V RMS with maximum DC bias of 2.0 volts.

DCL is measured at a rated voltage after 5 minutes.

Calchip reserves the right to substitute a higher voltage rated part

Additional values may be available, please contact your sales representative for more information.

## Ratings & Part Number Reference

Part Number	Case Size	Capacitance (uF)	DC Leakage (uA)@+25C Max.	DF (% )@+25C 120Hz Max.	ESR (Ohm)@+25C 100KHz Max.
25 volt Rating@+85C(16 volt Rating@+125C)					
TC*IE684AT	A	0.68	0.5	6	10
TC*IE105AT	A	1	0.5	6	8
TC*IE155AT	A	1.5	0.5	8	8
TC*IE225AT	A	2.2	0.6	8	6
TC*IE225BT	B	2.2	0.6	8	4.5
TC*IE335AT	A	3.3	0.8	6	3.7
TC*IE335BT	B	3.3	0.8	8	3.5
TC*IE335CT	C	3.3	0.8	8	2.2
TC*IE475BT	B	4.7	1.2	8	3
TC*IE475CT	C	4.7	1.2	8	2.5
TC*IE685BT	B	6.8	1.7	8	2.8
TC*IE685CT	C	6.8	1.7	8	1.9
TC*IE106BT	B	10	2.5	8	1.8
TC*IE106CT	C	10	2.5	8	1.5
TC*IE106DT	D	10	2.5	8	1
TC*IE156CT	C	15	3.7	8	1.5
TC*IE156DT	D	15	3.7	8	1
TC*IE226CT	C	22	5.5	8	1.2
TC*IE226DT	D	22	5.5	8	0.8
TC*IE336DT	D	33	8.2	8	0.7

\* Insert K for +/-10% tolerance and M for +/-20%.

Capacitance and DF are measured at 120Hz, 0.5V RMS with maximum DC bias of 2.0 volts.

DCL is measured at a rated voltage after 5 minutes.

Calchip reserves the right to substitute a higher voltage rated part

Additional values may be available, please contact your sales representative for more information.



## Ratings & Part Number Reference

Part Number	Case Size	Capacitance (uF)	DC Leakage (uA)@+25C Max.	DF (%)@+25C 120Hz Max.	ESR (Ohm)@+25C 100KHz Max.
35 volt Rating@+85C(22 volt Rating@+125C)					
TC*IV224AT	A	0.22	0.5	6	15
TC*IV334AT	A	0.33	0.5	6	14
TC*IV474AT	A	0.47	0.5	6	12
TC*IV684AT	A	0.68	0.5	6	10
TC*IV105AT	A	1	0.5	6	7.5
TC*IV105BT	B	1	0.5	6	4.5
TC*IV155AT	A	1.5	0.5	8	7.5
TC*IV155BT	B	1.5	0.5	8	5
TC*IV225BT	B	2.2	0.7	8	4.2
TC*IV225CT	C	2.2	0.73	8	2.5
TC*IV335BT	B	3.3	1.2	8	3.5
TC*IV335CT	C	3.3	1.2	8	2.2
TC*IV335DT	D	3.3	1.2	8	1
TC*IV475CT	C	4.7	1.6	8	2.5
TC*IV475DT	D	4.7	1.6	8	1.5
TC*IV685CT	C	6.8	2.3	8	2
TC*IV685DT	D	6.8	2.3	8	1.2
TC*IV106CT	C	10	3.5	8	1.6
TC*IV106DT	D	10	3.5	8	1
TC*IV156CT	C	15	5.3	8	1.4
TC*IV156DT	D	15	5.2	8	0.8
TC*IV226DT	D	22	7.7	8	0.9
TC*IV336DT	D	33	11.5	6	0.9

\* Insert K for +/-10% tolerance and M for +/-20%.

Capacitance and DF are measured at 120Hz, 0.5V RMS with maximum DC bias of 2.0 volts.

DCL is measured at a rated voltage after 5 minutes.

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Additional values may be available, please contact your sales representative for more information.



## Feature

- Reduced to about 1/3 the cubic volume.
- New low profile case size.  
(0805 size tantalum chip capacitors)
- Compatible with automatic pick and place equipment.
- Meets or exceeds EIA standard 535BAAC.

## Specifications

Capacitance	Range	0.22 $\mu$ F to 22 $\mu$ F						
	Tolerance	$\pm 20\%$ (M), $\pm 10\%$ (K)						
Dissipation Factor (Tan $\delta$ )		Refer to Specification						
Leakage Current		between 0.01CV and 0.5 $\mu$ A, whichever is larger						
Rated Voltage(VR)	T $\leq 85^{\circ}$ C	4.0	6.3	10.0	16.0	20.0	25.0	35.0
Category Voltage (V)	85 $^{\circ}$ C < T $\leq 125^{\circ}$ C	2.5	4.0	6.3	10.0	13.0	16.0	22.0
Surge Voltage (V)	T $\leq 85^{\circ}$ C	5.2	8.0	13.0	20.0	25.0	32.0	44.0
	85 $^{\circ}$ C < T $\leq 125^{\circ}$ C	3.2	5.0	8.0	13.0	16.0	20.0	28.0
Operating Temperature		-55 $^{\circ}$ C to 125 $^{\circ}$ C						

## Standard Value and Case Size

Cap.( $\mu$ F)	R . V	4V(0G)	6.3V(0J)	10V(1A)	16V(1C)	20V(1D)
0.22	224	P	P	P	P	
0.33	334					
0.47	474	P	P	P	P	P
0.68	684	P	P	P	P	P
1.0	105	P	P	P	P	
1.5	155					
2.2	225	P	P	P	P	
3.3	335	P	P	P		
4.7	475	P	P	P		
6.8	685	P	P			
10	106	P	P	P		
15	156					
22	226	P	P			
33	336		P			
47	476					
100	107					

## Ratings & Part Number Reference

Part Number	Case Size	Capacitance (uF)	DC Leakage (uA)@+25C Max.	DF (% )@+25C 120Hz Max.	ESR (Ohm)@+25C 100KHz Max.
4 volt Rating@+85C(2.5 volt Rating@+125C)					
TC*OG224PT	P	0.22	0.5	0.5	25
TC*OG474PT	P	0.47	0.5	0.5	25
TC*OG684PT	P	0.68	0.5	0.5	20
TC*OG105PT	P	1	0.5	0.5	20
TC*OG225PT	P	2.2	0.5	0.5	15
TC*OG335PT	P	3.3	0.5	0.5	8
TC*OG475PT	P	4.7	0.5	0.5	9
TC*OG685PT	P	6.8	0.5	0.5	8
TC*OG106PT	P	10	0.5	0.5	6
TC*OG226PT	P	22	0.9	0.9	3
6.3 volt Rating@+85C(4 volt Rating@+125C)					
TC*OJ224PT	P	0.22	0.5	4	25
TC*OJ474PT	P	0.47	0.5	4	25
TC*OJ684PT	P	0.68	0.5	4	20
TC*OJ105PT	P	1	0.5	6	20
TC*OJ225PT	P	2.2	0.5	6	15
TC*OJ335PT	P	3.3	0.5	6	8
TC*OJ475PT	P	4.7	0.5	8	9
TC*OJ685PT	P	6.8	0.5	6	8
TC*OJ106PT	P	10	0.6	8	5
TC*OJ226PT	P	22	1.4	8	4
TC*OJ336PT	P	33	2.1	18	2
10 volt Rating@+85C(6.3 volt Rating@+125C)					
TC*IA224PT	P	0.22	0.5	4	25
TC*IA474PT	P	0.47	0.5	4	25
TC*IA684PT	P	0.68	0.5	4	20
TC*IA105PT	P	1	0.5	6	20
TC*IA225PT	P	2.2	0.5	6	15
TC*IA335PT	P	3.3	0.5	6	8
TC*IA475PT	P	4.7	0.5	8	4
TC*IA106PT	P	10	1	8	6
16 volt Rating@+85C(10 volt Rating@+125C)					
TC*IC224PT	P	0.22	0.5	6	25
TC*IC474PT	P	0.47	0.5	6	25
TC*IC684PT	P	0.68	0.5	6	20
TC*IC105PT	P	1	0.5	6	20
TC*IC225PT	P	2.2	0.5	6	6.5
20 volt Rating@+85C(13 volt Rating@+125C)					
TC*ID474PT	P	0.47	0.5	4	25
TC*ID684PT	P	0.68	0.5	4	20

\* Insert K for +/-10% tolerance and M for +/-20%.

Capacitance and DF are measured at 120Hz, 0.5V RMS with maximum DC bias of 2.0 volts.

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