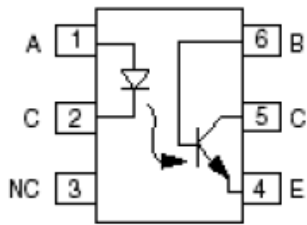


Feature:

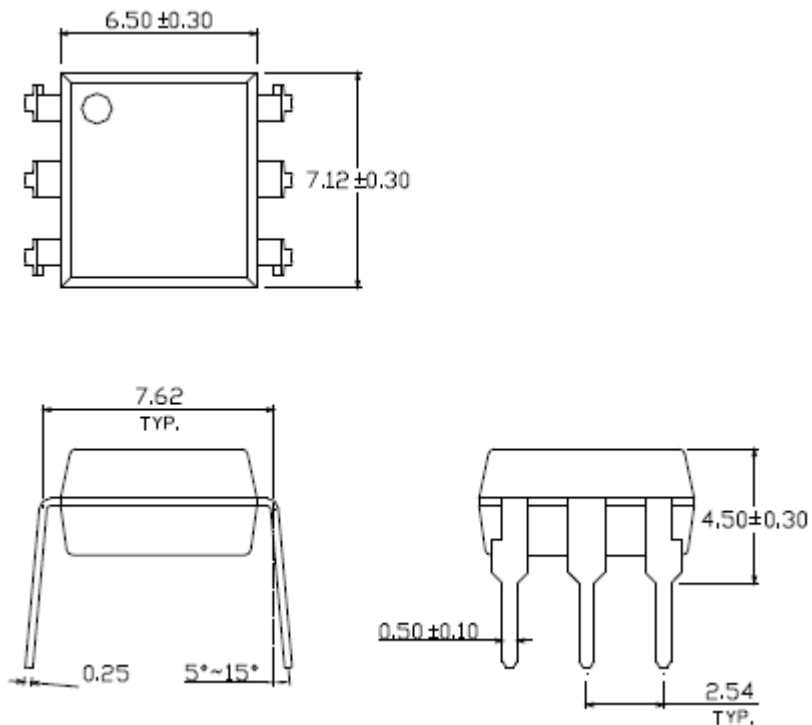
- High Isolation voltage between input and output (Viso = 5000V rms)
- Creepage distance > 7.6mm
- Operating temperature up to +100°C
- Compact dual-in-line package
- Packed in tube or Tape and reel
- Conventional black housing package

Schematic:

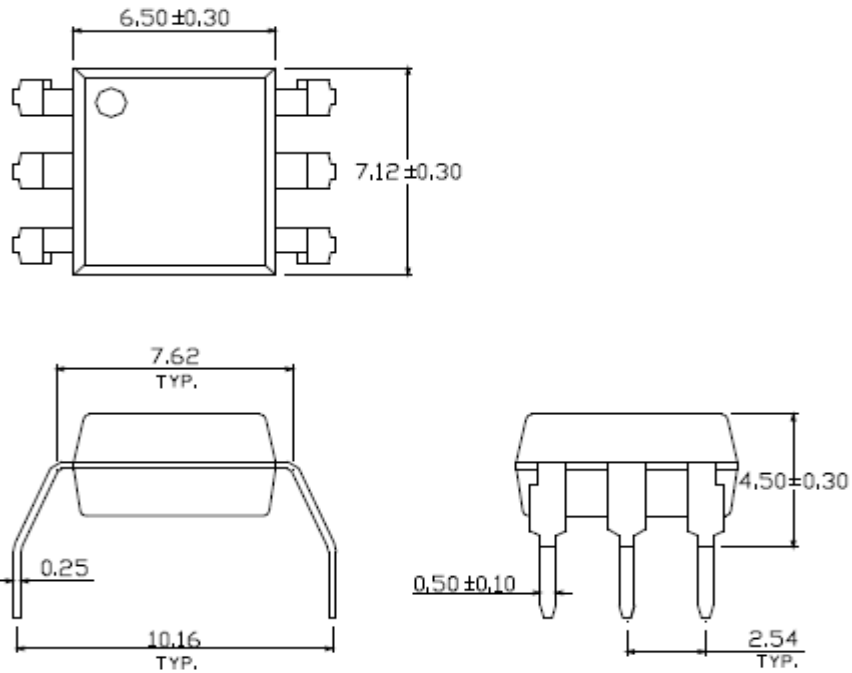
1. Anode
2. Cathode
3. No Connection
4. Emitter
5. Collector
6. Base

Certification & Compliance:

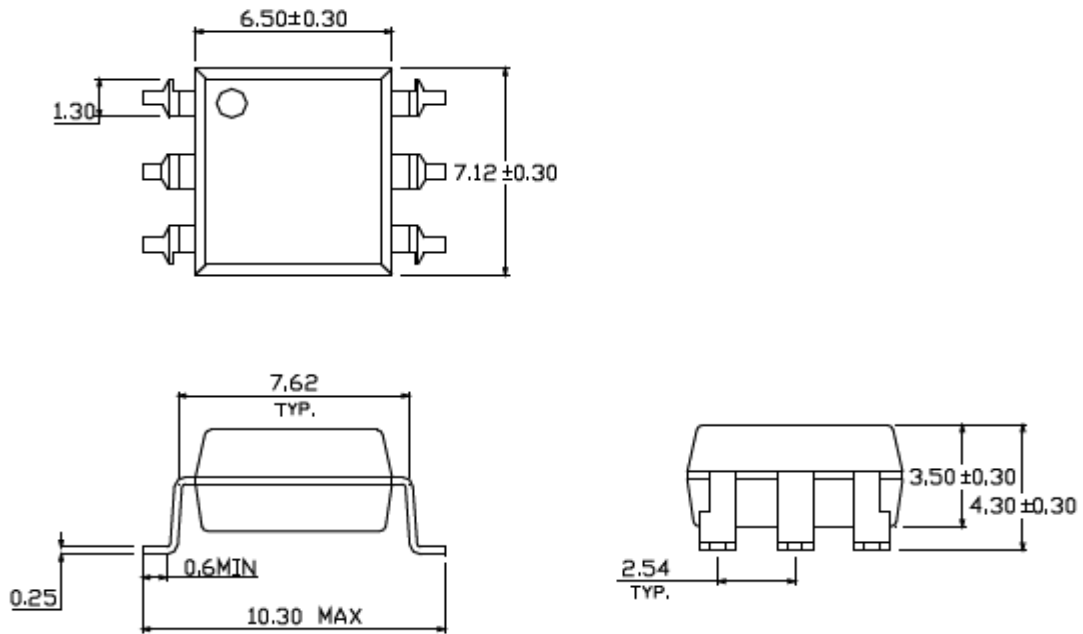
- Pb free and RoHS Compliant
- UL recognized (File # E338132)
- VDE recognized (File # 40030457)

**Dimension: (Dot location indicates pin 1)****6-Pin Dip (standard):**

Wide lead bend (Option W):



SMD lead bend (Option S):



All Dimensions are in mm
Tolerance = +/- 0.1mm

Absolute Maximum Rating

Symbol	Parameter	Rating	Units
T _{STG}	Storage Temperature	-55 to +150	°C
T _{OPR}	Operating Temperature	-55 to +100	°C
T _{SOL}	Lead Solder Temperature (≤10s)	260 for 10 sec	°C
V _{iso}	Isolation Voltage (AC for 1 minute, R.H. = 40~60%R.H.)	5000	V rms
P _{TOT}	Total Power Dissipation	200	mW
EMITTER			
I _F	Continuous Forward Current	60	mA
I _{FM}	Peak Forward Current	1	A
V _R	Reverse Voltage	6	V
P _D	Power Dissipation	100	mW
	Power Dissipation Derated above 25°C	1.41	mW/°C
DETECTOR			
V _{CEO}	Collector–Emitter Voltage	80	V
V _{CBO}	Collector-Base Voltage	80	V
V _{ECO}	Emitter-Collector Voltage	7	V
P _C	Collector Power Dissipation	150	mW
	Collector Power Dissipation Derated above 25 °C	1.76	mW/°C

Electrical Characteristic ($T_A=25^\circ\text{C}$)

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
Emitter				Min	Typ	Max	
V_F	Forward Voltage	TIL111	$I_f = 16\text{mA}$	-	1.22	1.4	V
		TIL117	$T_A=0-70^\circ\text{C},$ $I_f=16\text{mA}$	-	-	1.4	
			$T_A= -55^\circ\text{C},$ $I_f=16\text{mA}$	-	1.32	-	
			$T_A=110^\circ\text{C},$ $I_f=16\text{mA}$	-	1.1	-	
MCT2 MCT2E	$I_f = 20\text{mA}$	-	1.23	1.5			
I_R	Reverse Current	TIL111 TIL117 MCT2 MCT2E	$V_R = 6\text{V}$	-	-	10	μA
Detector				Min	Typ	Max	
I_{CEO}	Collector-Emitter Dark Current	TIL117	$V_{CE} = 30\text{V},$ $I_F = 0\text{ mA}, T_A=70^\circ\text{C}$	-	0.2	50	nA
		TIL111 MCT2 MCT2E	$V_{CE} = 10\text{V}$ $I_F = 0\text{ mA}$	-	1	50	nA
I_{CBO}	Collector-Base Dark Current	TIL111 TIL117 MCT2 MCT2E	$V_{CB} = 10\text{V}$	-	-	20	nA
BV_{CBO}	Collector-Base Breakdown Voltage		$I_C = 0.01\text{mA}$	80	-	-	V
BV_{CEO}	Collector-Emitter Breakdown Voltage		$I_C = 1\text{mA}$	80	-	-	V
BV_{ECO}	Emitter-Collector Breakdown Voltage		$I_E = 0.1\text{mA}$	7	-	-	V
BV_{EBO}	Emitter-Base Breakdown Voltage		$I_E = 0.1\text{mA}$	7	-	-	V

DC Transfer Characteristic

Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
$I_{C(ON)}$	Collector current (Phototransistor Operation)	TIL111	$I_F = 16mA,$ $V_{CE} = 0.4V$	2	-	-	mA
	Collector current (Photodiode Operation)		$I_F = 16mA,$ $V_{CB} = 0.4V$	7	-	-	μA
CTR	Current Transfer Ratio	TIL117	$V_{CE} = 10V,$ $I_F = 10mA$	50	-	-	%
		MCT2 MCT2E	$V_{CE} = 10V, I_F =$ $10mA$	20	-	-	
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	TIL117	$I_C = 0.5mA, I_F =$ $10mA$	0.4	-	-	V
		TIL111 MCT2 MCT2E	$I_C = 2mA, I_F =$ $16mA$	0.4	-	-	

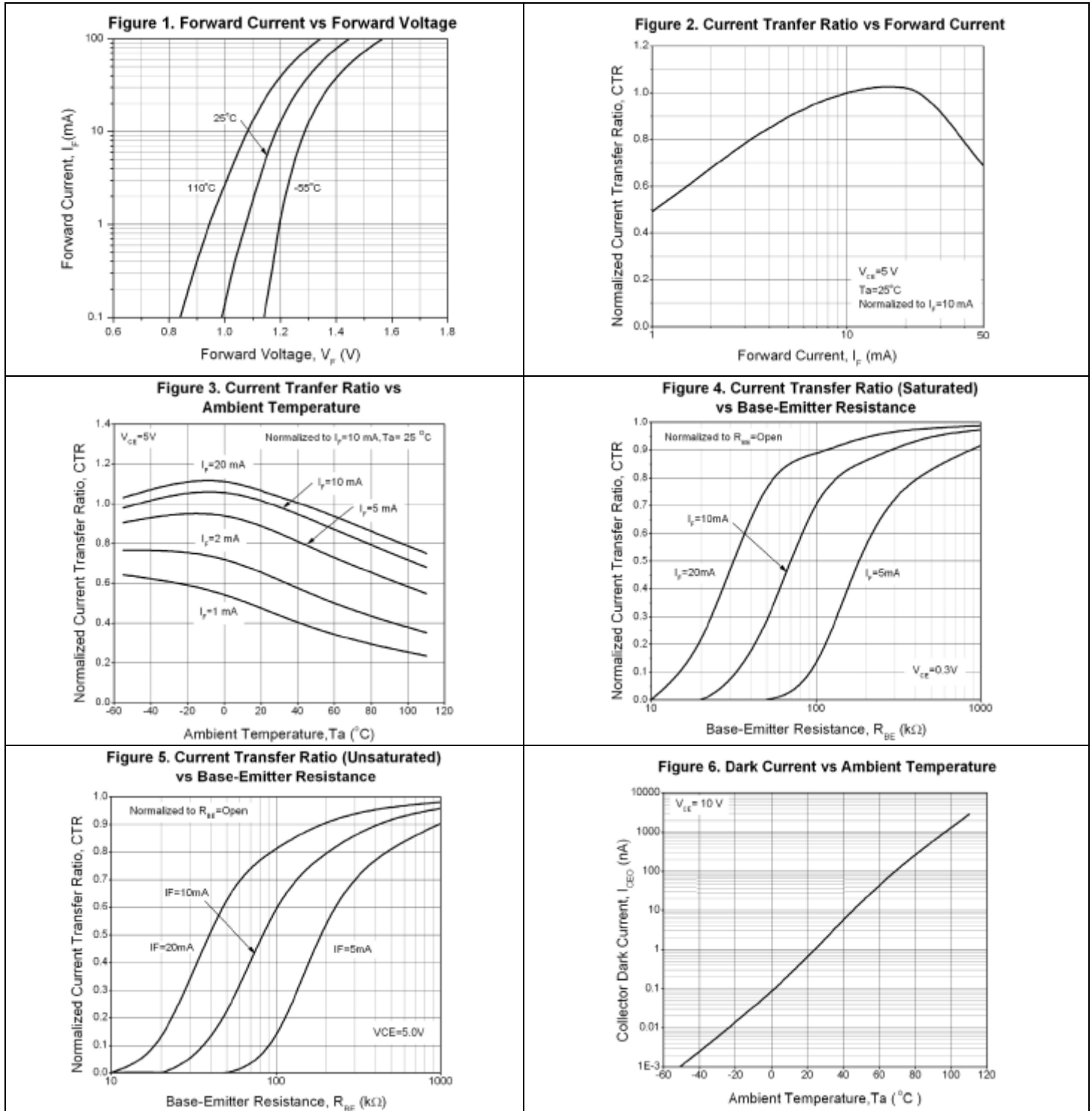
AC Characteristic

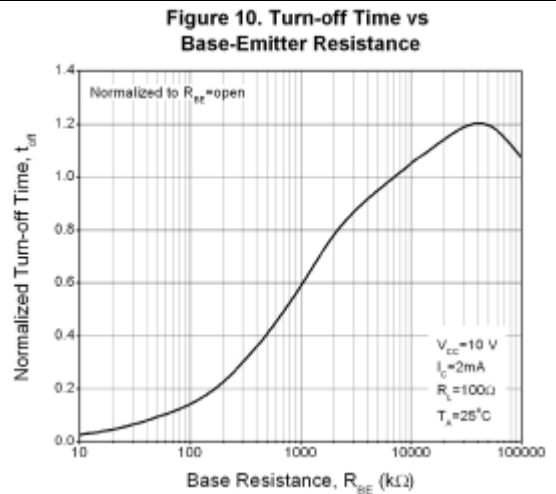
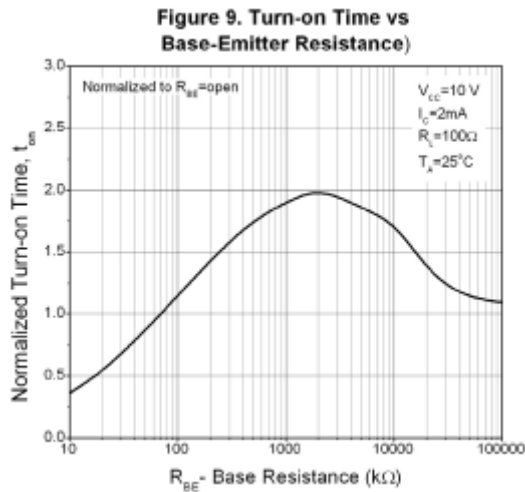
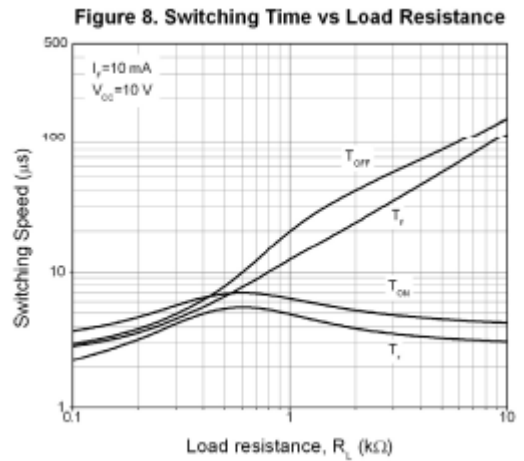
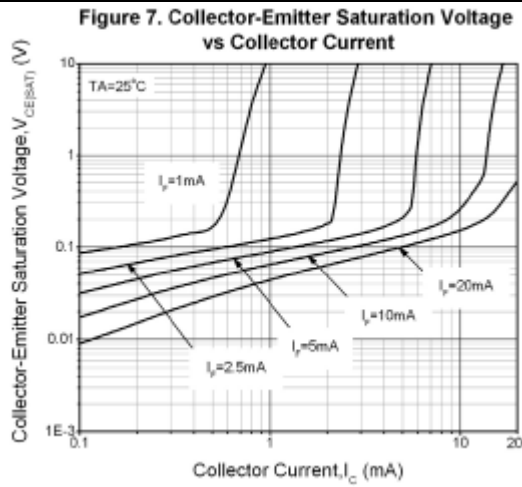
Symbol	Characteristic	Device	Test Condition	Range			Unit	
				Min	Typ	Max		
t_{on}	Turn-on Time	TIL117	$V_{CC} = 10V$ $I_C = 2mA,$ $R_L = 100 \Omega$	-	10	12	μs	
t_{off}	Turn-off Time			-	9	12		
t_r	Rise Time			TIL111	-	6		10
t_f	Fall Time			TIL117	-	8		10
t_{on}	Turn-on Time	MCT2 MCT2E	$V_{CC} = 10V$ $I_F = 10mA,$ $R_L = 100 \Omega$	-	3	10		
t_{off}	Turn-off Time			-	3	10		
t_r	Rise Time			-	3	10		
t_f	Fall Time			-	3	10		

Isolation Characteristic

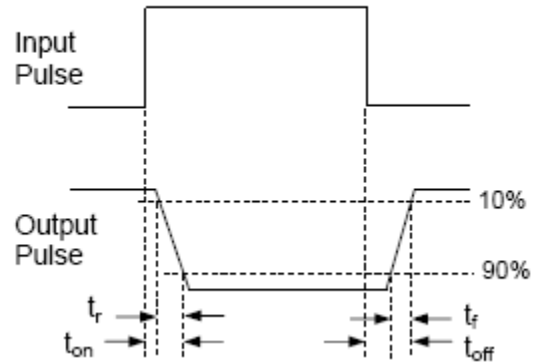
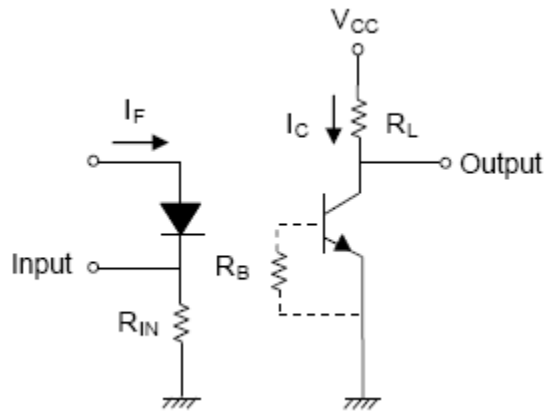
Symbol	Characteristic	Device	Test Condition	Range			Unit
				Min	Typ	Max	
V_{iso}	Isolation Voltage	TIL111 TIL117	AC for 1 minute, R.H. = 40~60%R.H.	5000			V rms
R_{IO}	Isolation Resistance	MCT2 MCT2E	$V_{IO} = 500Vdc$	10^{11}	-	-	Ω
C_{IO}	Input-output capacitance		$V_{IO} = 0, f = 1MHz$	-	-	2	pF

Characteristic Curves:

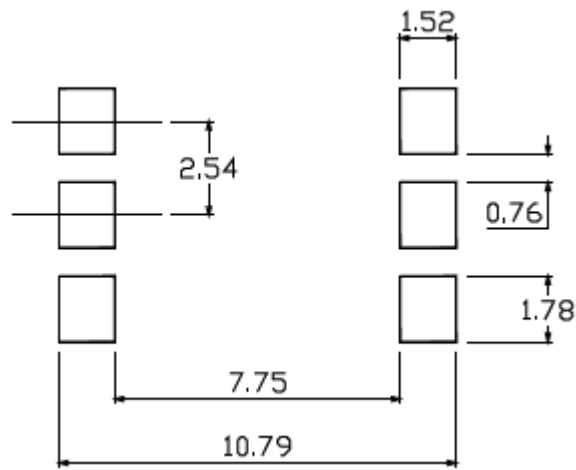
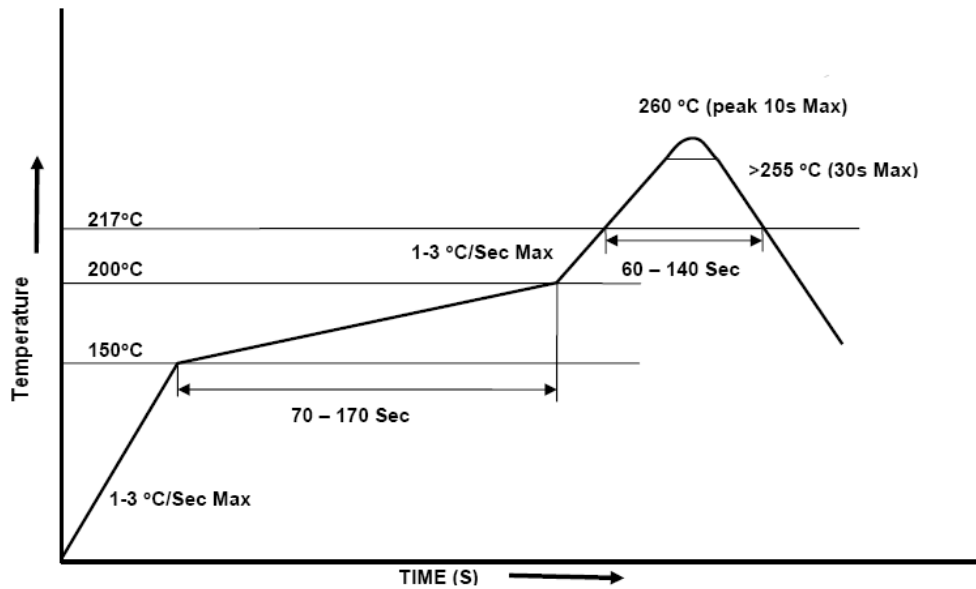




Test Circuit for Response Time



Solder Profile & Footprint:



Recommended Solder Footprint for SMD Leadform

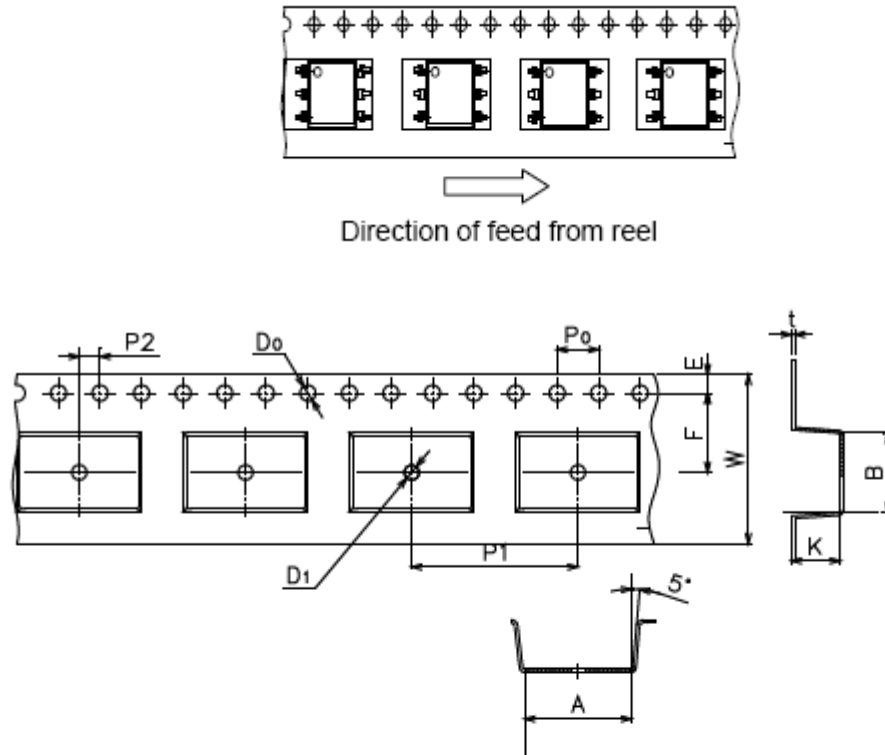
Units: mm

tolerance: +/- 0.1mm

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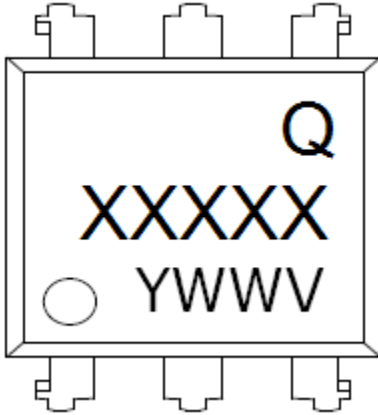
Packing & Labeling:

Tape Dimensions:



Dimension No.	A	B	Do	D1	E	F
Dimension (mm)	10.4±0.1	7.52±0.1	1.5±0.1	1.5+0.1/-0	1.75±0.1	7.5±0.1

Dimension No.	Po	P1	P2	t	W	K
Dimension (mm)	4.0±0.15	16.0±0.1	2.0±0.1	0.35±0.03	16.0±0.2	4.5±0.1

Device Marking:

Q = QT-Brightek Corporation

XXXXXX = Device Part Number (X: TIL111, TIL117, MCT2 or MCT2E)

Y = Year

WW = Week

V = VDE Option

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Ordering Information:

Part Number	Orderable Part Number	Options	Description	Quantity per packing
TIL111	TIL111	None	Standard 6pin DIP	60pcs / Tube
	TIL111V	None	Standard 6pin DIP With VDE marking	60pcs / Tube
	TIL111TA	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	TIL111TAV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	TIL111STA	S	SMD lead form with tape and reel option	1000pcs / reel
	TIL111STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel
TIL117	TIL117	None	Standard 6pin DIP	60pcs / Tube
	TIL117V	None	Standard 6pin DIP With VDE marking	60pcs / Tube
	TIL117TA	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	TIL117TAV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	TIL117STA	S	SMD lead form with tape and reel option	1000pcs / reel
	TIL117STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel

Part Number	Orderable Part Number	Options	Description	Quantity per packing
MCT2	MCT2	None	Standard 6pin DIP	60pcs / Tube
	MCT2V	None	Standard 6pin DIP With VDE marking	60pcs / Tube
	MCT2TA	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	MCT2TAV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	MCT2STA	S	SMD lead form with tape and reel option	1000pcs / reel
	MCT2STAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel
MCT2E	MCT2E	None	Standard 6pin DIP	60pcs / Tube
	MCT2EV	None	Standard 6pin DIP With VDE marking	60pcs / Tube
	MCT2ETA	W	Wide lead bend (0.4 inch spacing)	60pcs / Tube
	MCT2ETAV	W	Wide lead bend (0.4 inch spacing) + VDE marking	60pcs / Tube
	MCT2ESTA	S	SMD lead form with tape and reel option	1000pcs / reel
	MCT2ESTAV	S	SMD lead form with tape and reel option + VDE marking	1000pcs / reel

Revision History:

Description:	Revision #	Revision Date
Initial of TIL111/TIL117/MCT2/MCT2E	1.0	4/27/2010
Feature, certification & compliance and ordering information updates	1.1	02/01/2011

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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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