



Features

- High isolation 5000 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Operating Temperature range - 55 °C to 110 °C
- Regulatory Approvals
 - UL - UL1577 (E364000)
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC – GB4943.1, GB8898
 - IEC60065, IEC60950

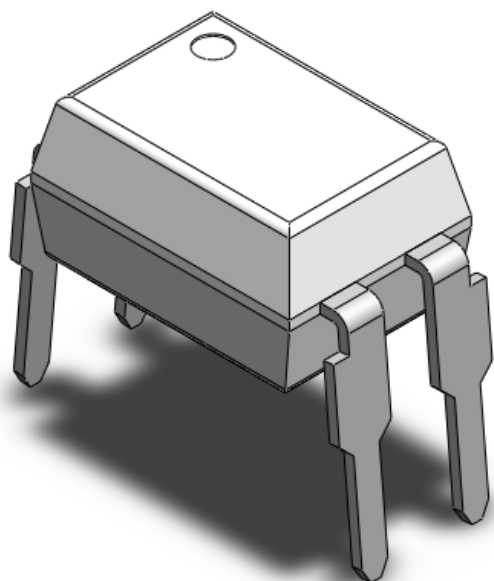
Applications

- Switch mode power supplies
- Computer peripheral interface
- Microprocessor system interface

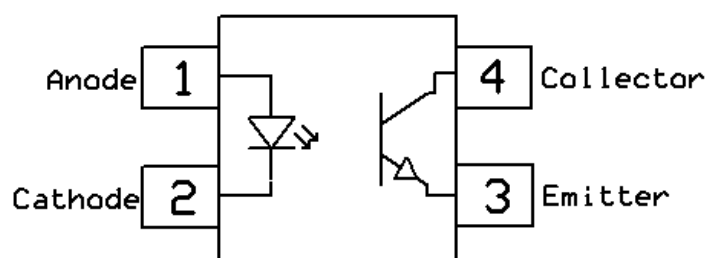
Description

The CT816 series consists of a photo transistor optically coupled to a gallium arsenide Infrared-emitting diode in a 4-lead DIP package with bending options.

Package Outline



Schematic



**Absolute Maximum Rating at 25°C**

Symbol	Parameters	Ratings	Units	Notes
V _{ISO}	Isolation voltage	5000	V _{RMS}	
P _{TOT}	Total power dissipation	200	mW	
T _{OPR}	Operating temperature	-55 ~ +110	°C	
T _{STG}	Storage temperature	-55 ~ +150	°C	
T _{SOL}	Soldering temperature	260	°C	
Emitter				
I _F	Forward current	60	mA	
I _{F(TRANS)}	Peak transient current (≤1 μs P.W,300pps)	1	A	
V _R	Reverse voltage	6	V	
P _D	Emitter power dissipation	100	mW	
Detector				
P _D	Detector power dissipation	150	mW	
B _{VCEO}	Collector-Emitter Breakdown Voltage	80	V	
B _{VECO}	Emitter-Collector Breakdown Voltage	6	V	
I _C	Collector Current	50	mA	



Electrical Characteristics $T_A = 25^\circ\text{C}$ (unless otherwise specified)

Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_F	Forward voltage	$I_F = 10\text{mA}$		1.24	1.4	V	
I_R	Reverse Current	$V_R = 6\text{V}$	-	-	5	μA	
C_{IN}	Input Capacitance	$f = 1\text{MHz}$	-	30	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$B_{V_{CEO}}$	Collector-Emitter Breakdown	$I_C = 100\mu\text{A}$	80	-	-	V	
$B_{V_{ECO}}$	Emitter-Collector Breakdown	$I_E = 100\mu\text{A}$	6	-	-	V	
I_{CEO}	Collector-Emitter Dark Current	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$	-	-	100	nA	

Transfer Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes	
CTR	Current Transfer Ratio	CT816	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$	50		600	%	
		CT816A		80		160		
		CT816B		130		260		
		CT816C		200		400		
		CT816D		300		600		
CTR	Current Transfer Ratio	CT816I	$I_F = 10\text{mA}, V_{CE} = 5\text{V}$	63		125	%	
		CT816J		100		200		
		CT816K		160		320		
		CT816I	$I_F = 1\text{mA}, V_{CE} = 5\text{V}$	22				
		CT816J		34				
		CT816K		56				
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	$I_F = 20\text{mA}, I_C = 1\text{mA}$	-	0.1	0.2	V		
R_{IO}	Isolation Resistance	$V_{IO} = 500\text{V}_{DC}$	5×10^{10}			Ω		
C_{IO}	Isolation Capacitance	$f = 1\text{MHz}$		0.25	1	pF		



Switching Characteristics

<i>Symbol</i>	<i>Parameters</i>	<i>Test Conditions</i>	<i>Min</i>	<i>Typ</i>	<i>Max</i>	<i>Units</i>	<i>Notes</i>
t_r	Rise Time	$I_C = 2\text{mA}, V_{CE} = 2\text{V}, R_L = 100$	-	6	-	μs	
t_f	Fall Time		-	8	-		



Typical Characteristic Curves

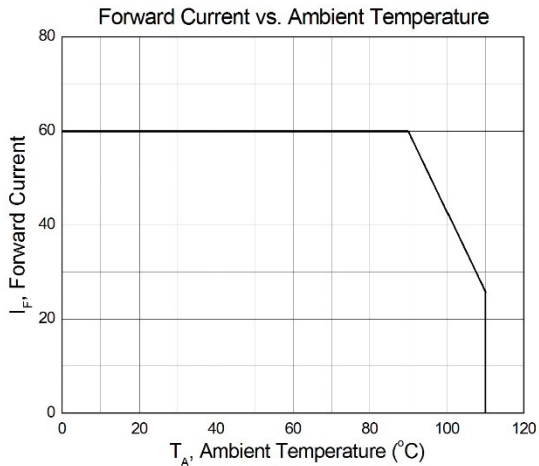


Figure 1

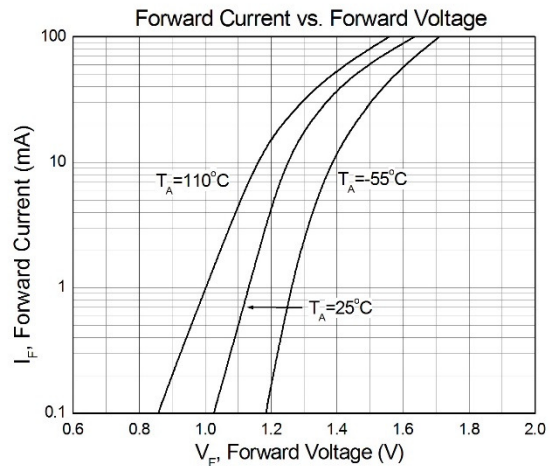


Figure 2

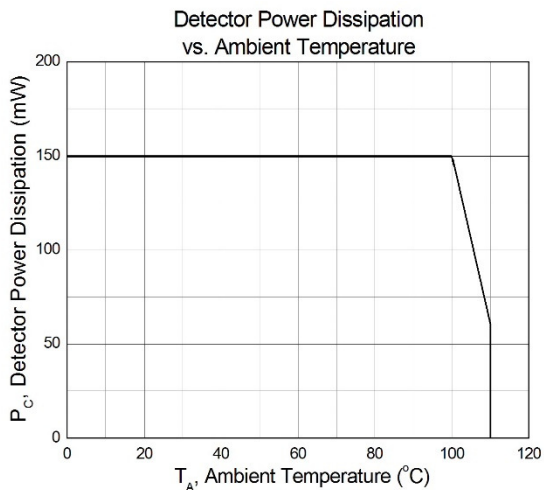


Figure 3

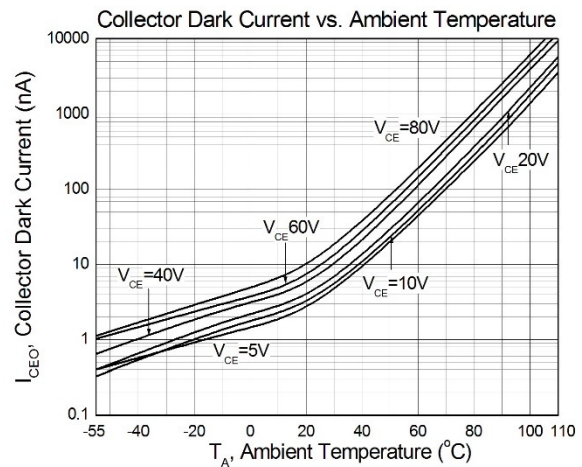


Figure 4

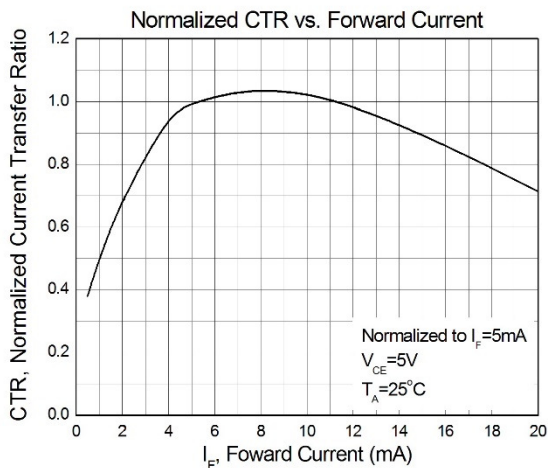


Figure 5

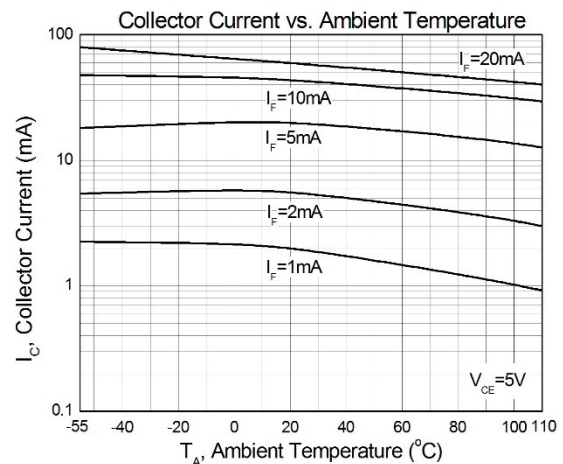


Figure 6

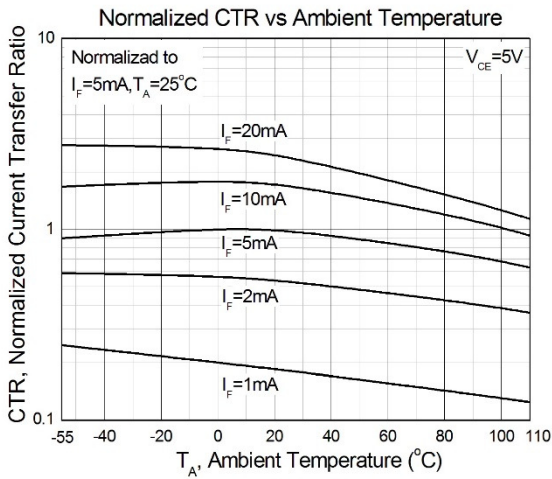


Figure 7

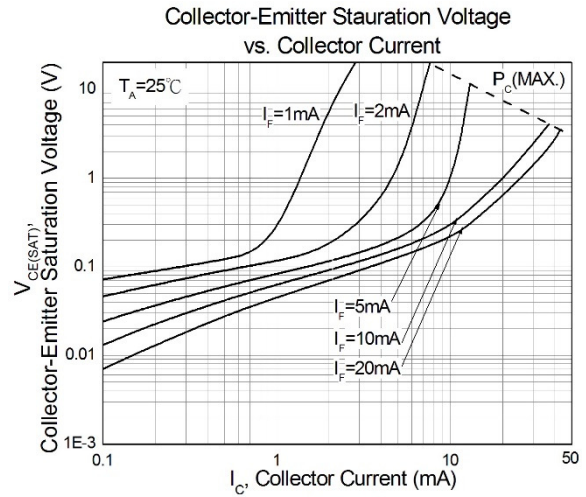


Figure 8

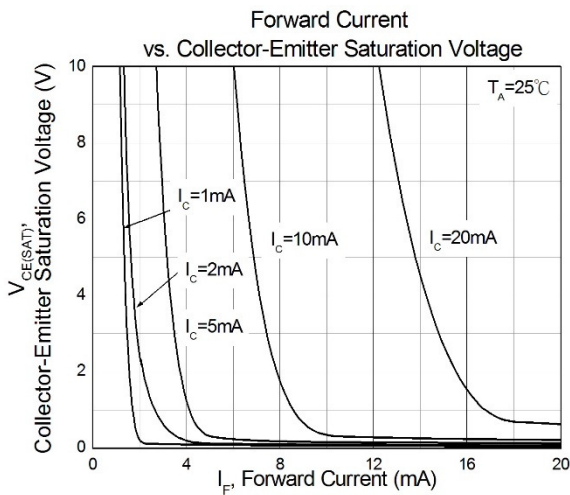


Figure 9

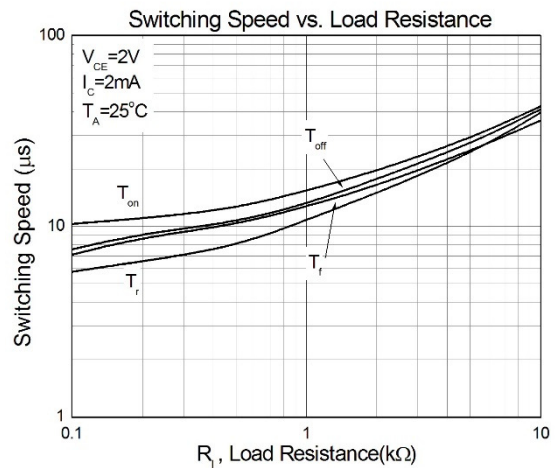


Figure 10

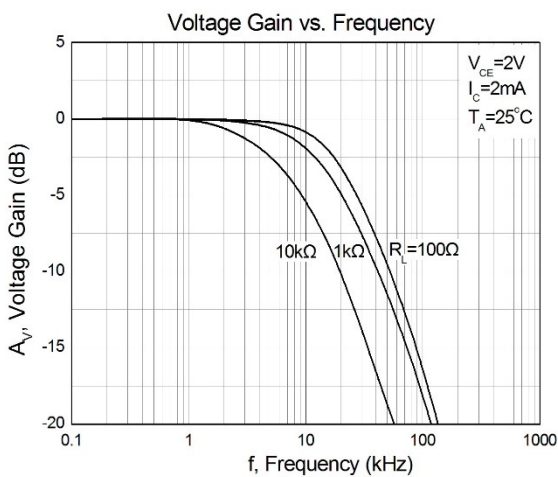


Figure 11



Test Circuit

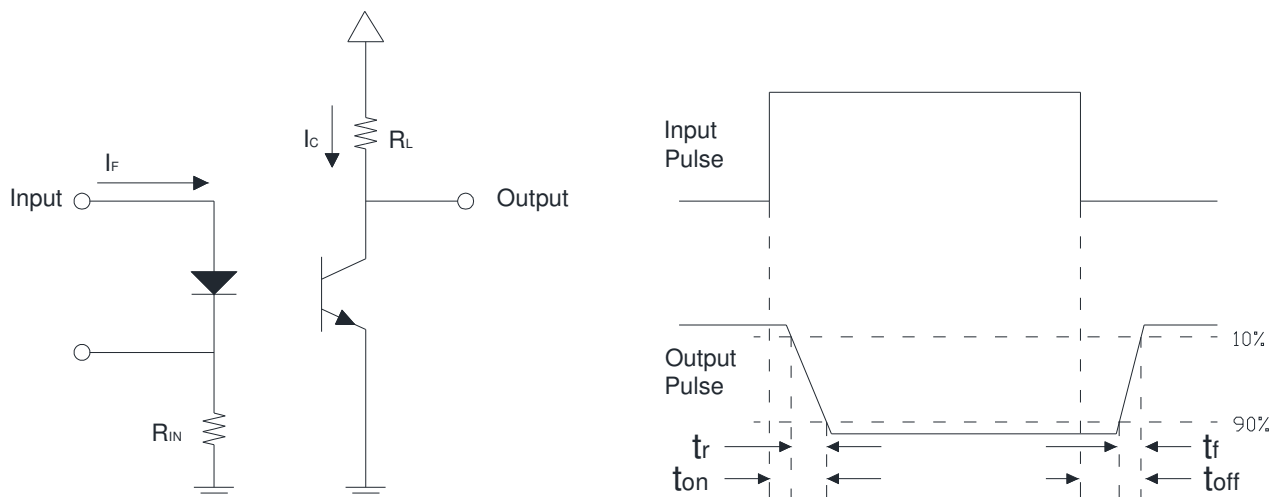
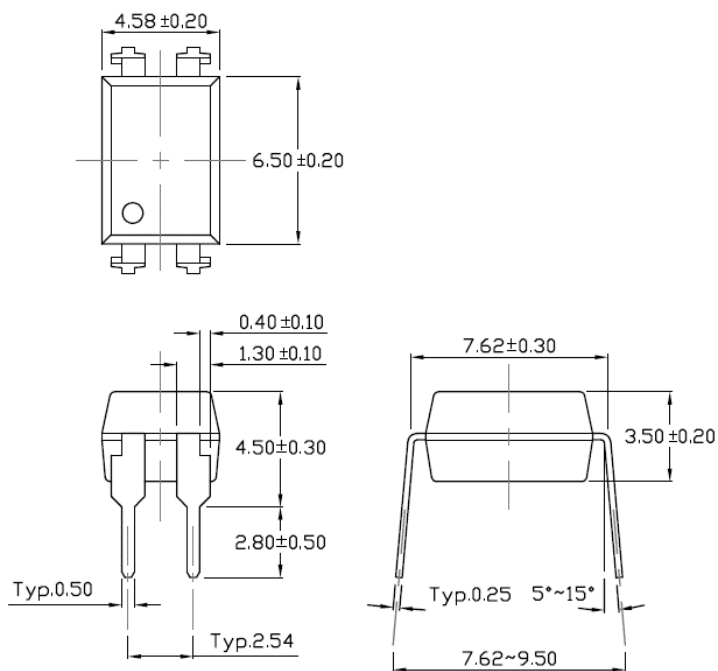


Figure 12: Switching Time Test Circuits

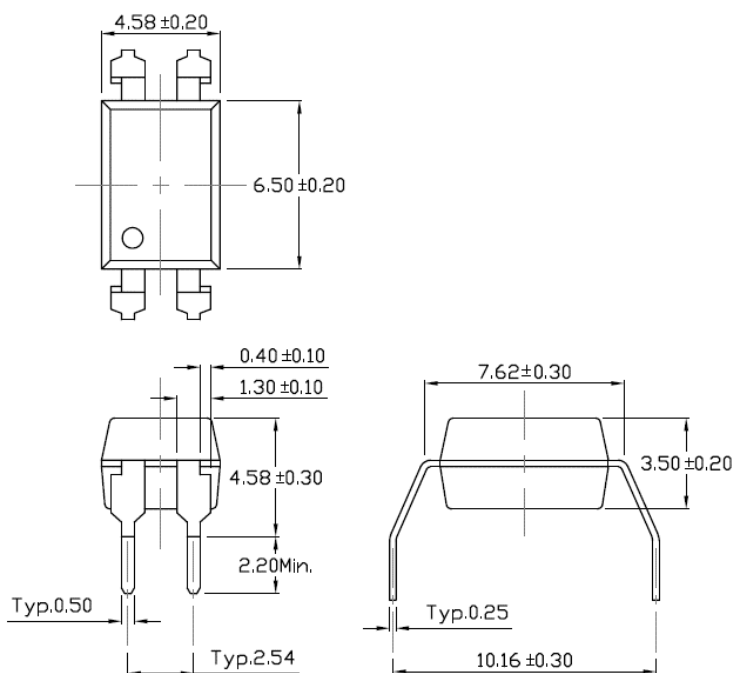


Package Dimension *Dimensions in mm unless otherwise stated*

Standard DIP – Through Hole

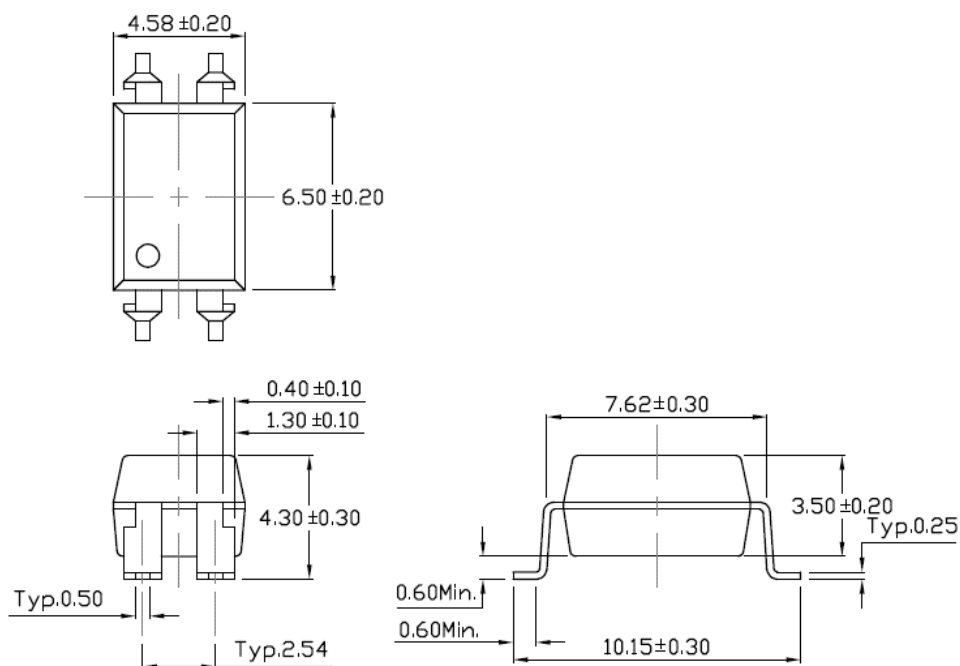


Gullwing (400mil) Lead Forming – Through Hole (M Type)

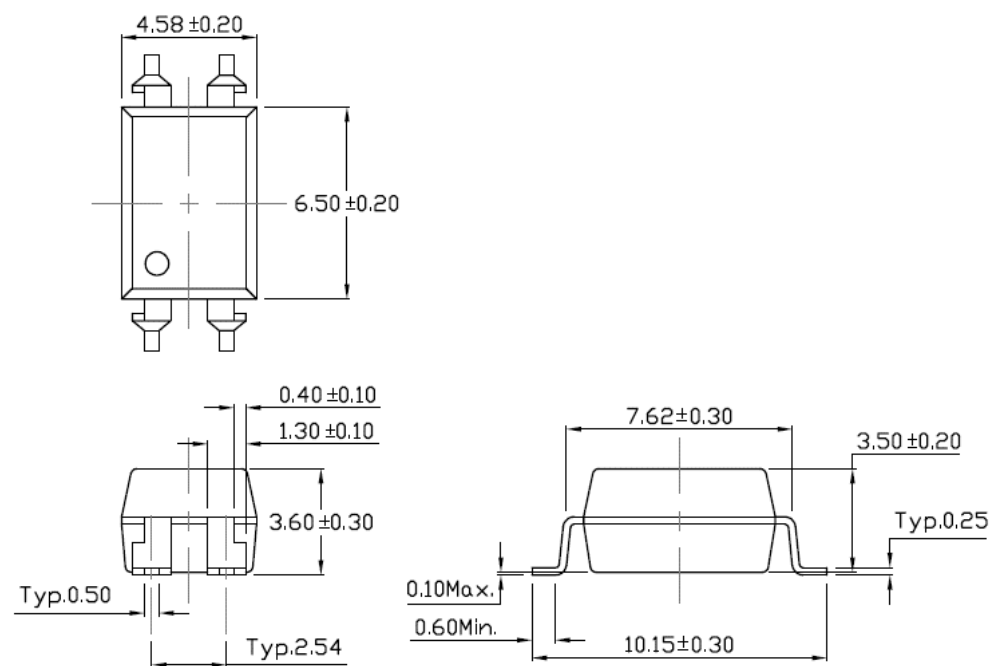




Surface Mount Lead Forming (S Type)

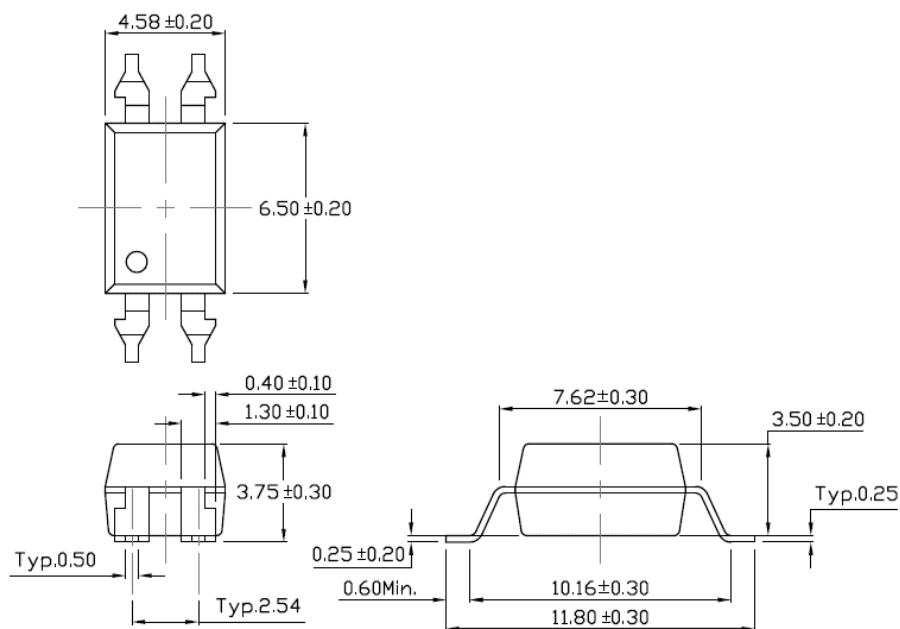


Surface Mount (Low Profile) Lead Forming (SL Type)





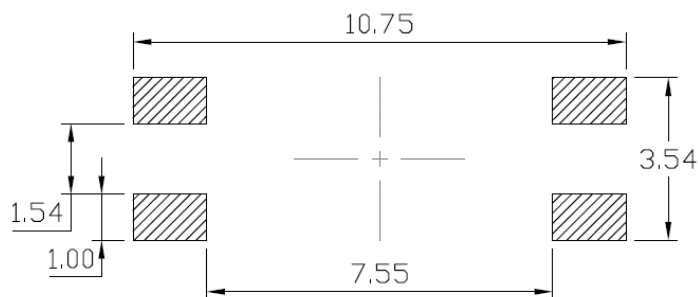
Surface Mount (Gullwing) Lead Forming (SLM Type)



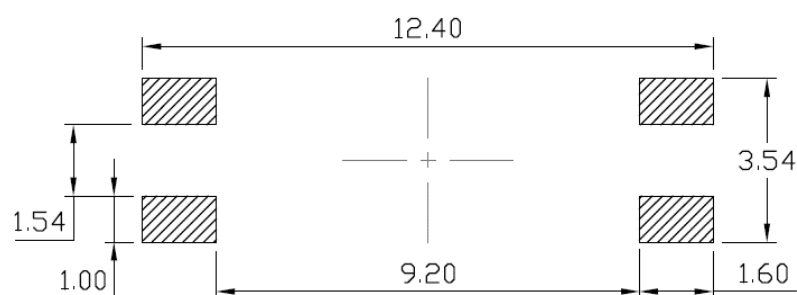


Recommended Solder Mask *Dimensions in mm unless otherwise stated*

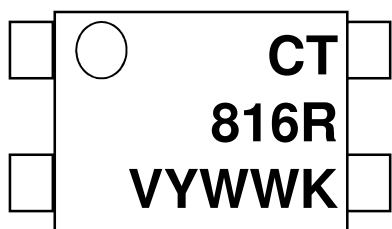
Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming



Surface Mount (Gullwing) Lead Forming



Marking Information



Note:

- CT : Denotes "CT Micro"
- 816 : Part Number
- V : VDE Option
- R : CTR Rank
- Y : Fiscal Year
- WW : Work Week
- K : Manufacturing Code

**Ordering Information****CT816X(V)(Y)(Z)-HG**

X = Part No. (X=A, B, C, D, I, J, K, None)

V = VDE Option (V or None)

Y = Lead form option (S, SL, M, SLM or none)

Z = Tape and reel option (T1, T2, T3, T4 or none)

H = Lead frame option (H: Iron, None: Copper)

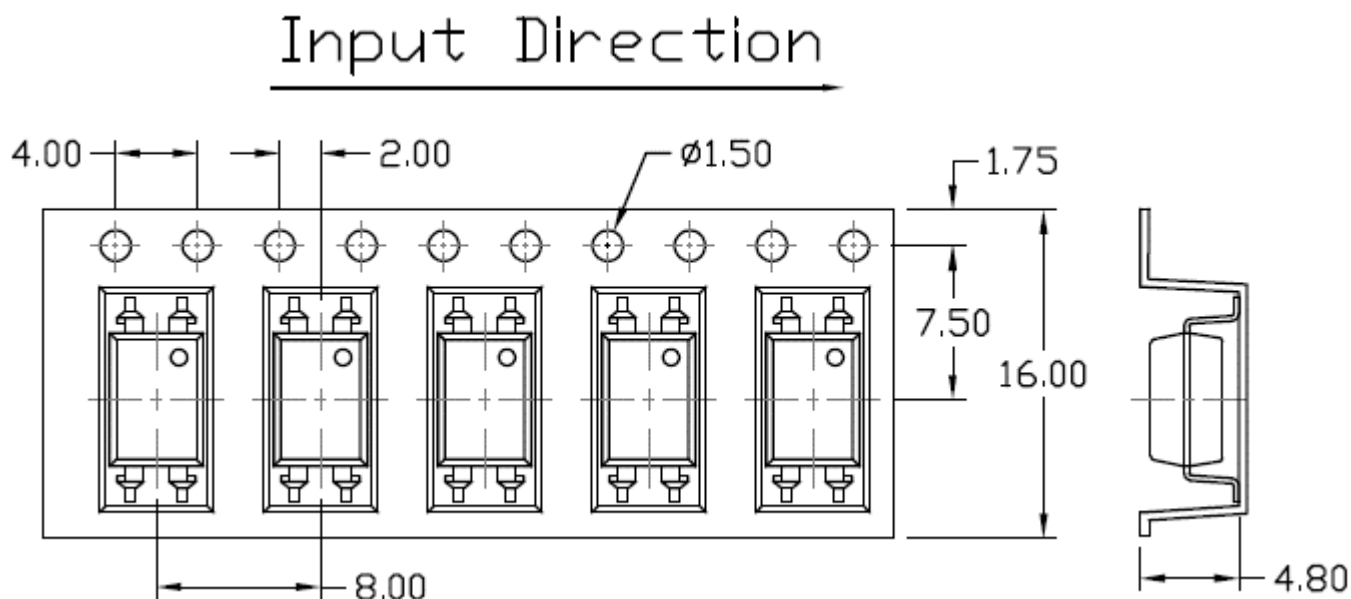
G= Material option (G: Green, None: Non-green)

Option	Description	Quantity
None	Standard 4 Pin DIP	100 Units/Tube
M	Gullwing (400mil) Lead Forming	100 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1500 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1500 Units/Reel
S(T3)	Surface Mount Lead Forming – With Option 3 Taping	1000 Units/Reel
S(T4)	Surface Mount Lead Forming – With Option 4 Taping	1000 Units/Reel
SL(T1)	Surface Mount (Low Profile) Lead Forming– With Option 1 Taping	1500 Units/Reel
SL(T2)	Surface Mount (Low Profile) Lead Forming – With Option 2 Taping	1500 Units/Reel
SL(T3)	Surface Mount (Low Profile) Lead Forming– With Option 3 Taping	1000 Units/Reel
SL(T4)	Surface Mount (Low Profile) Lead Forming – With Option 4 Taping	1000 Units/Reel
SLM(T1)	Surface Mount (Gullwing) Lead Forming– With Option 1 Taping	1500 Units/Reel
SLM(T2)	Surface Mount (Gullwing) Lead Forming – With Option 2 Taping	1500 Units/Reel

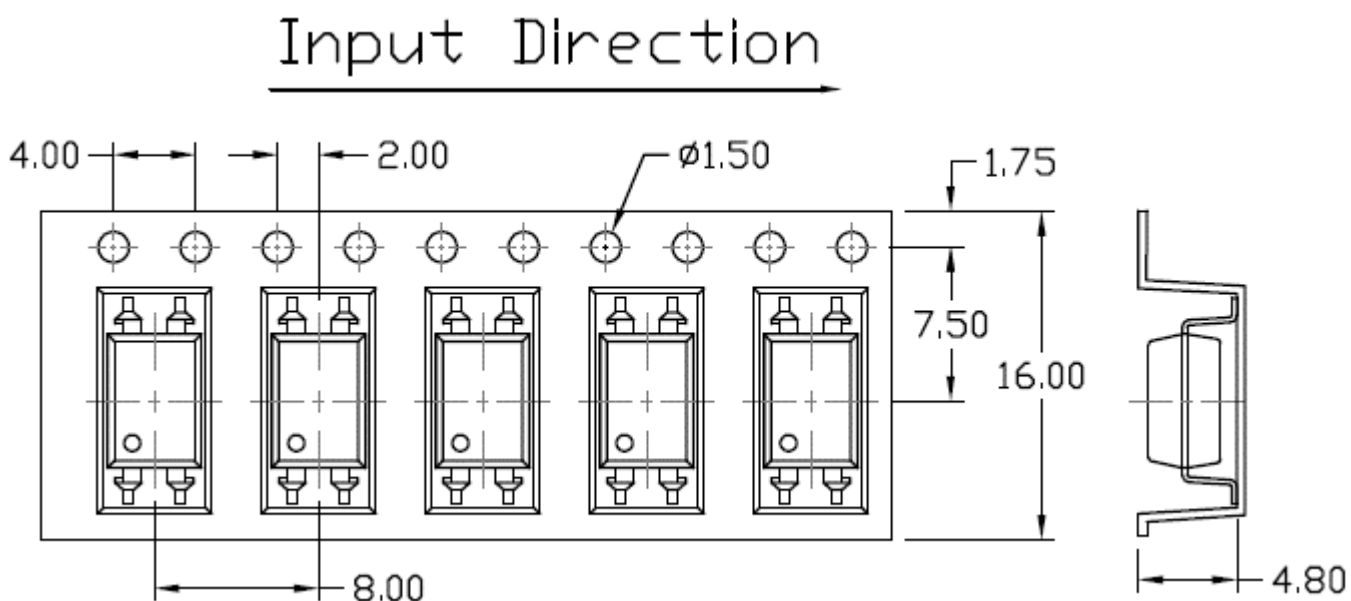


Carrier Tape Specifications *Dimensions in mm unless otherwise stated*

Option S(T1) & SL(T1)

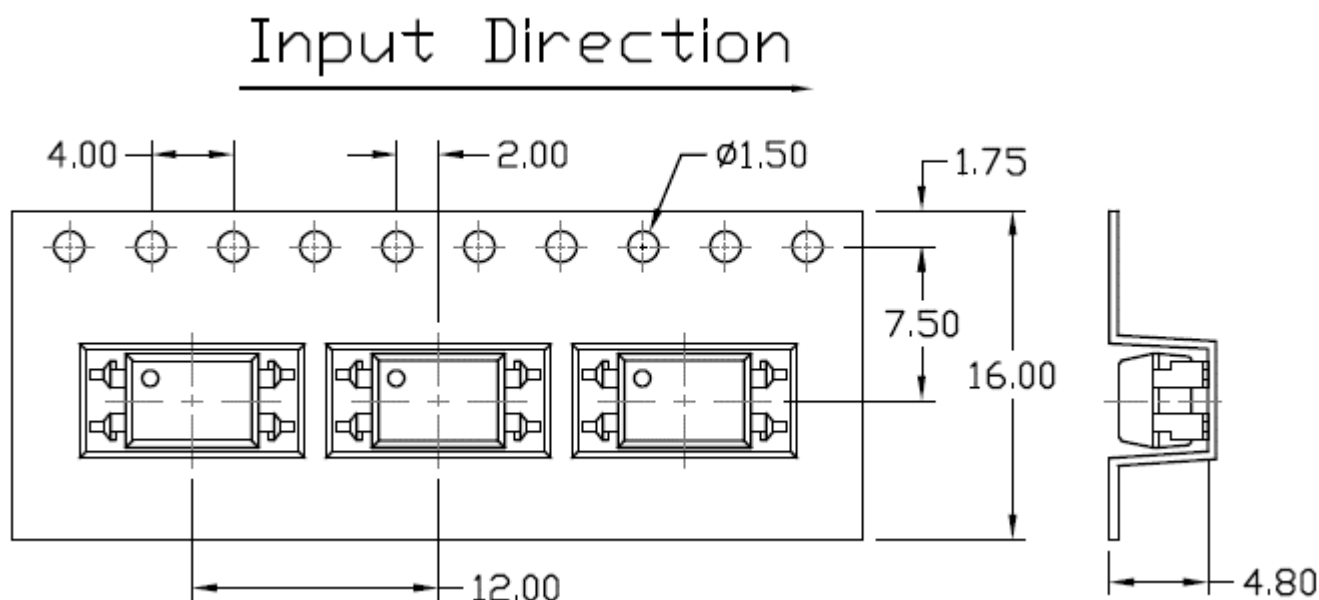


Option S(T2) & SL(T2)

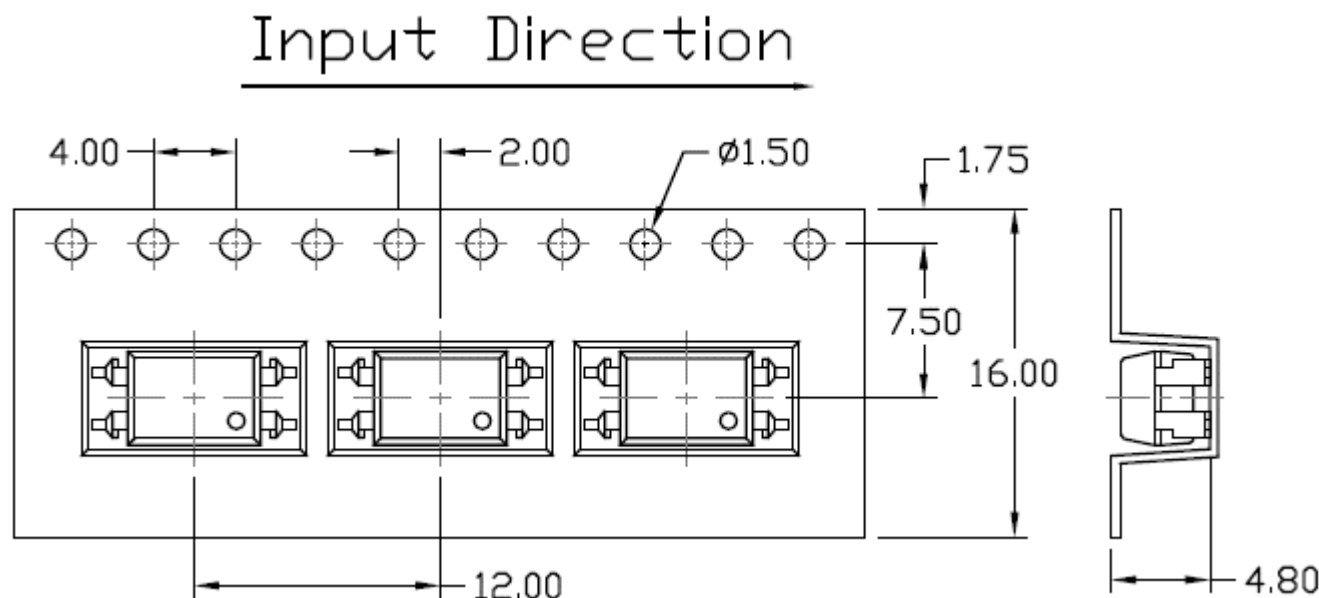




Option S(T3) & SL(T3)



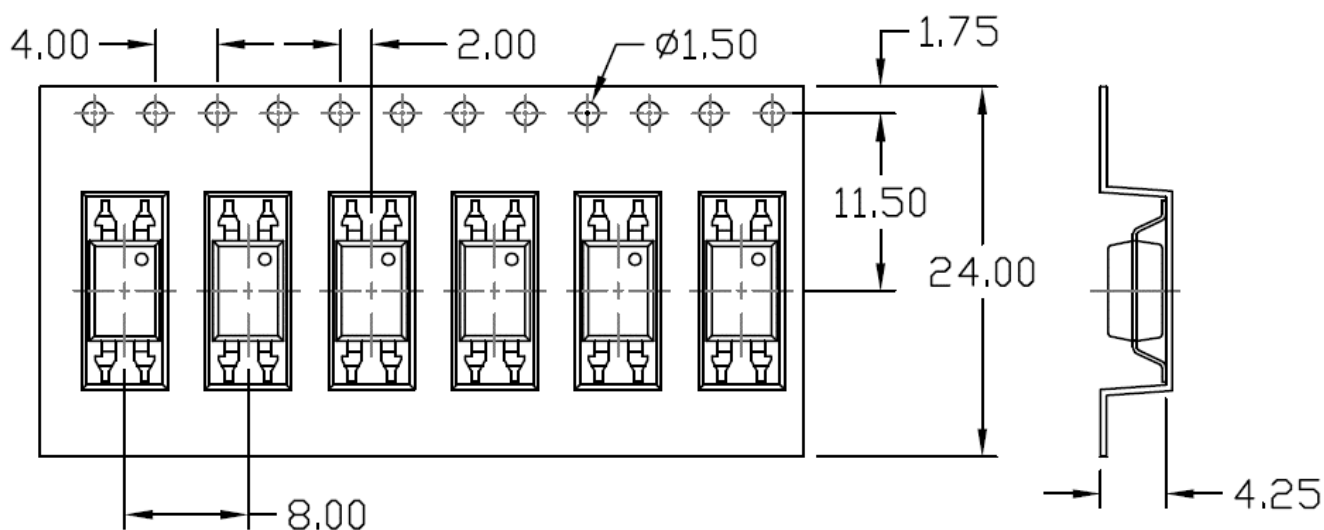
Option S(T4) & SL(T4)





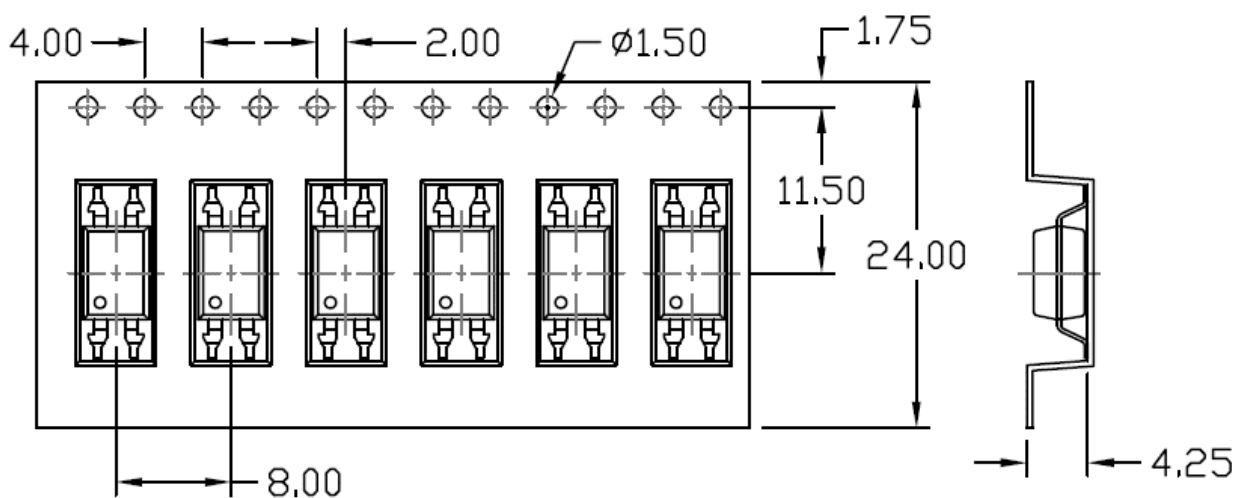
Option SLM(T1)

Input Direction



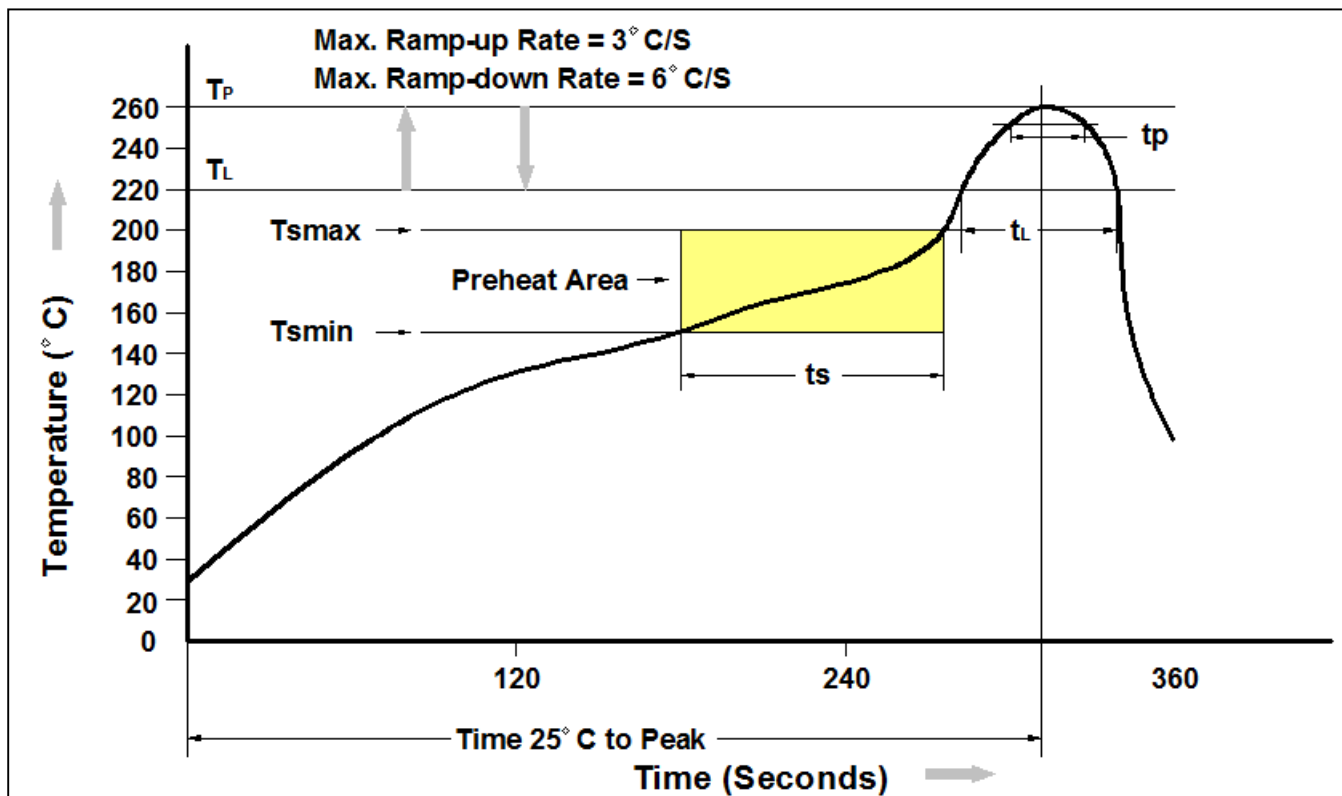
Option SLM(T2)

Input Direction





Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmín)	150 °C
Temperature Max. (Tsmáx)	200 °C
Time (ts) from (Tsmín to Tsmáx)	60-120 seconds
Ramp-up Rate (tL to tP)	3 °C/second max.
Liquidous Temperature (TL)	217 °C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Body Package Temperature	260 °C +0 °C / -5 °C
Time (tP) within 5 °C of 260 °C	30 seconds
Ramp-down Rate (TP to TL)	6 °C/second max
Time 25 °C to Peak Temperature	8 minutes max.



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