CT3031, CT3032, CT3033
CT3041, CT3042, CT3043
250V/400V Zero Cross 4-Pin Phototriac Optocoupler

Features

- High isolation 5000 VRMS
- Peak Breakdown Voltage
  - 250V – CT3031,3032,3033
  - 400V – CT3041,3042,3043
- Temperature range - 55 °C to 100 °C
- RoHS compliance
- REACH compliance
- Halogen compliance
- Ext. creepage >7.5mm
- Int. creepage >5.0mm
- Distances through insulation >0.4mm
- Regulatory Approvals
- Regulatory Approvals
  - UL - UL1577 (E364000)
  - VDE - EN60747-5-5(VDE0884-5)
  - CQC – GB4943.1, GB8898
  - IEC60065, IEC60950

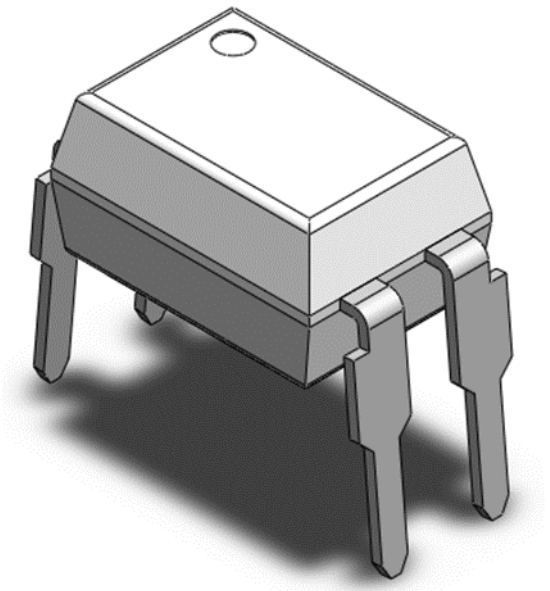
Description

The CT3031-4L, CT3032-4L, CT3033-4L, CT3041-4L, CT3042-4L and CT3043-4L consists of a Zero Cross Photo Triac optically coupled to a gallium arsenide Infrared-emitting diode in a 4-Pin DIP package with different lead forming options.

Applications

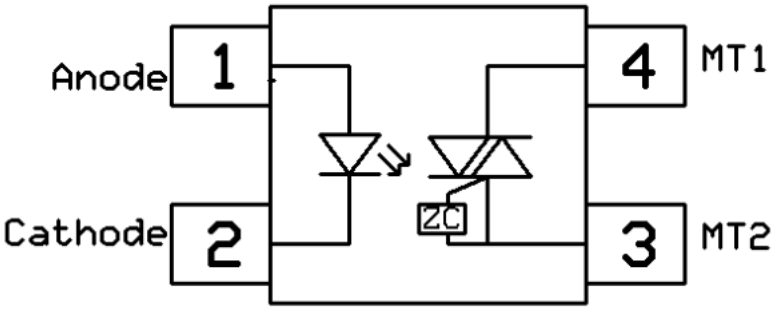
- Motor Controls
- Lamp ballasts
- Static AC Power Switch
- Solenoid/ Valve Control

Package Outline



Note: Different lead forming options available. See package dimension.

Schematic



Absolute Maximum Rating at 25°C

Symbol	*Parameters*		*Ratings*	*Units*	*Notes*
V_{ISO}	Isolation voltage		5000	V_{RMS}	
T_{OPR}	Operating temperature		-55 ~ +100	°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 (≤1μs P.W,300pps)		1	A	
V_R	Reverse voltage		6	V	
P_D	Power dissipation		100	mW	
Detector					
P_D	Power dissipation		300	mW	
V_{DRM}	Off-State Output Terminal Voltage	CT3031,3032,3033	250	V	
		CT3041,3042,3043	400	V	
I_{TSM}	Peak Repetitive Surge Current		1	A	

Electrical Characteristics T_A = 25°C (unless otherwise specified)

Emitter Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
V_F	Forward voltage	I_F=10mA	-	-	1.5	V	
I_R	Reverse Current	V_R = 6V	-	-	5	μA	
C_{IN}	Input Capacitance	f= 1MHz	-	45	-	pF	

Detector Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I_{DRM1}	Peak Blocking Current	I_F= 0mA, V_{DRM}= Rated V_{DRM}	-	-	100	nA	
I_{DRM2}	Inhibit Leakage Current	I_F= Rated $I_{FT,}$ V_{DRM}= Rated V_{DRM}	-	-	500	μA	
V_{INH}	Inhibit Voltage	I_F= Rated $I_{FT,}$	-	-	20	V	
V_{TM}	Peak On-State Voltage	I_F= Rated I_{FT}, I_{TM}= 100mA	-	-	3	V	
dv/dt	Critical Rate of Rise off-State Voltage	V_{PEAK}= Rated V_{DRM}	1000	-	-	V/μs	

Transfer Characteristics

Symbol	Parameters		Test Conditions	Min	Typ	Max	Units	Notes
I_{FT}	Input Trigger Current	CT3031, CT3041	Terminal Voltage = 3V I_{TM}=100mA	-	-	15	mA	
		CT3032, CT3042		-	-	10		
		CT3033, CT3043		-	-	5		
I_H	Holding Current			-	270	-	μA	
R_{IO}	Isolation Resistance		V_{IO}= 500V_{DC}	$1x10^{11}$	-	-	Ω	
C_{IO}	Isolation Capacitance		f= 1MHz	-	0.25	-	pF	

Typical Characteristic Curve

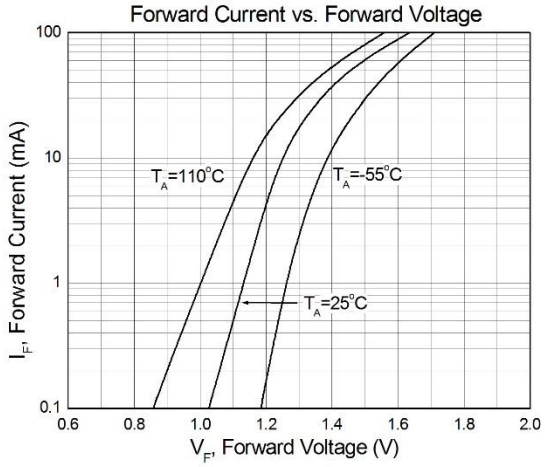


Figure 1

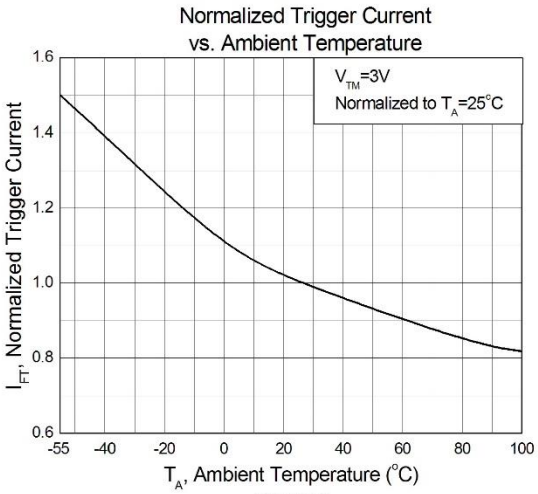


Figure 2

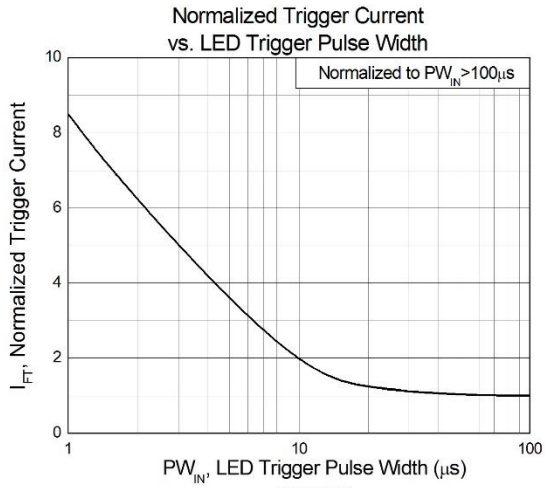


Figure 3

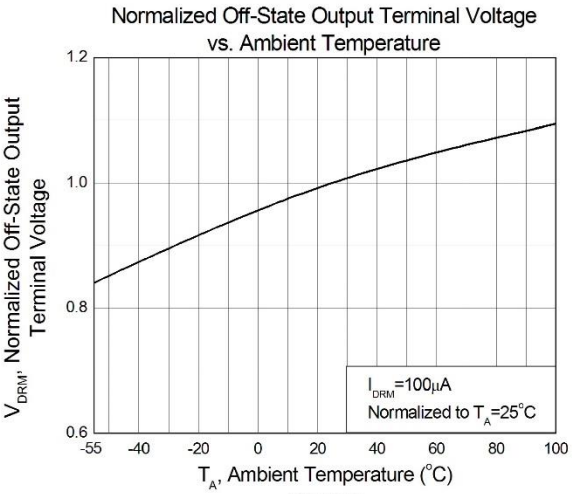


Figure 4

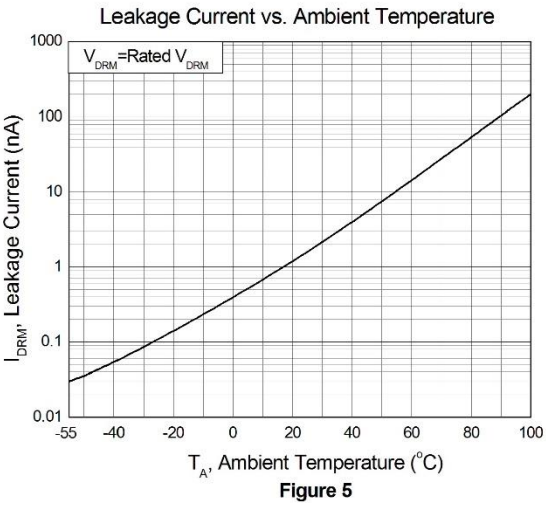


Figure 5

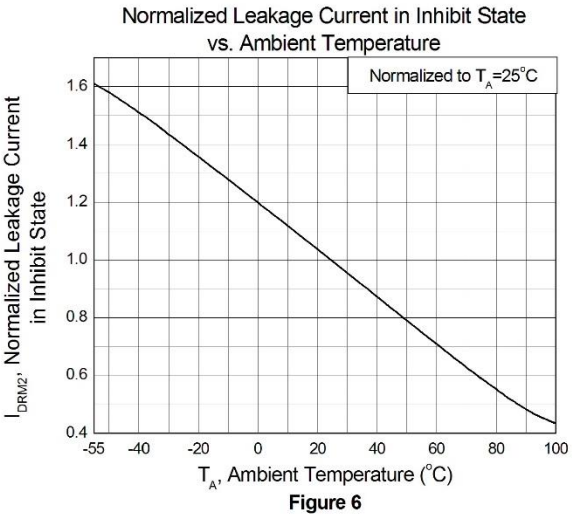


Figure 6

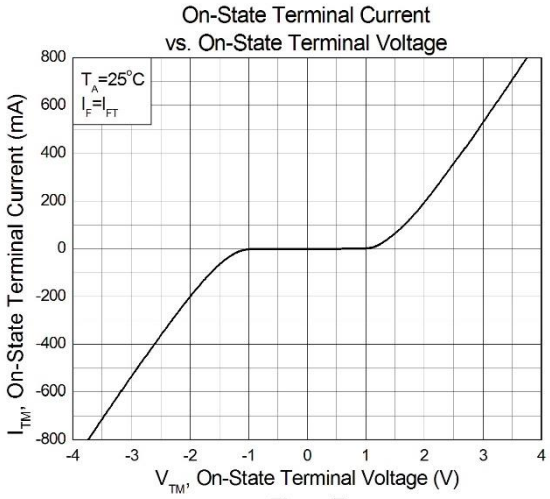


Figure 7

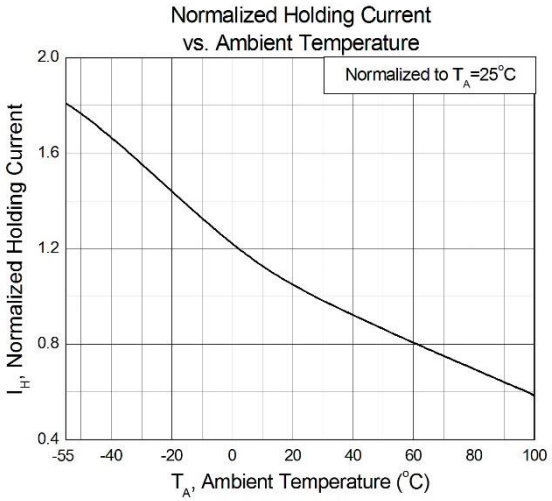


Figure 8

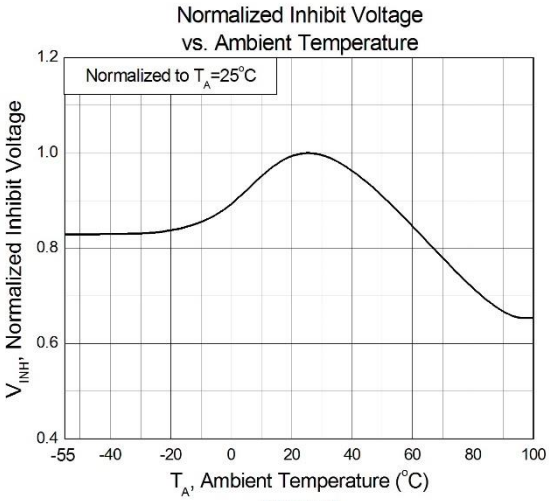
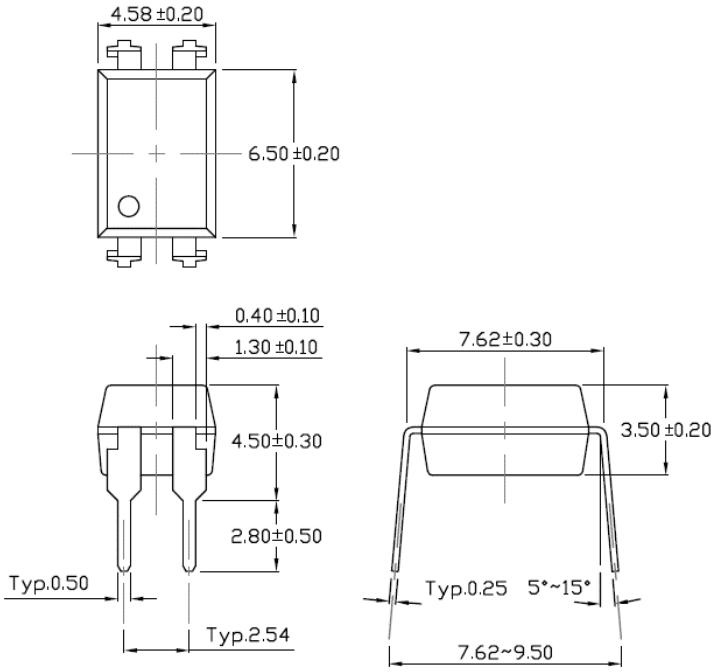


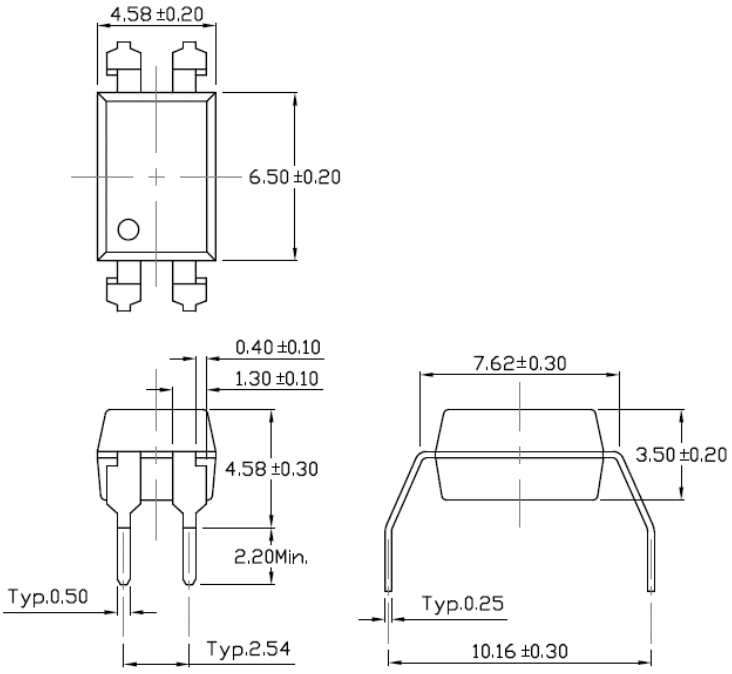
Figure 9

Package Dimension *Dimensions in mm unless otherwise stated*

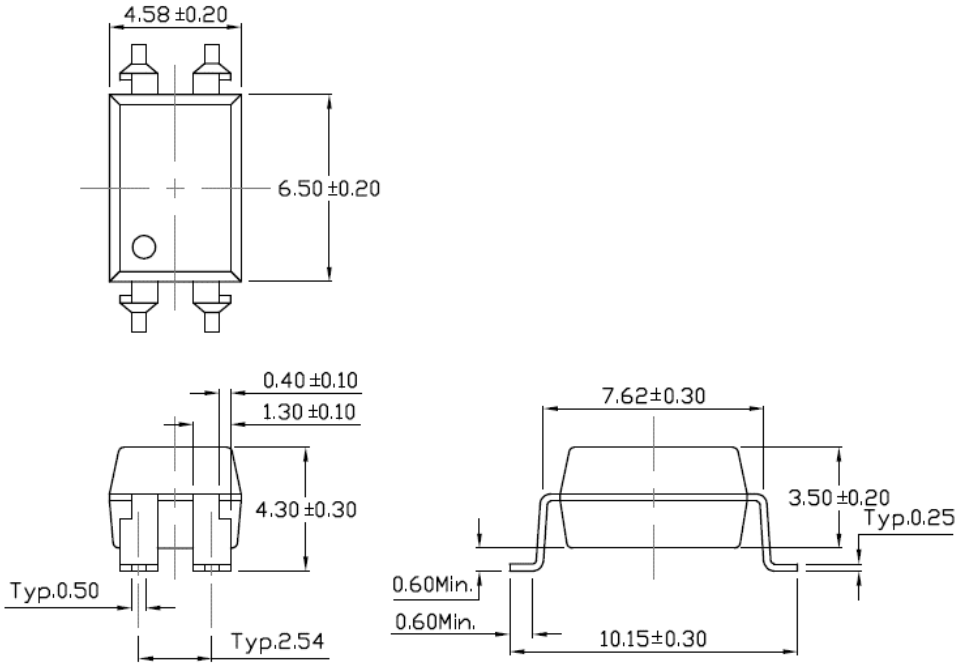
Standard DIP – Through Hole



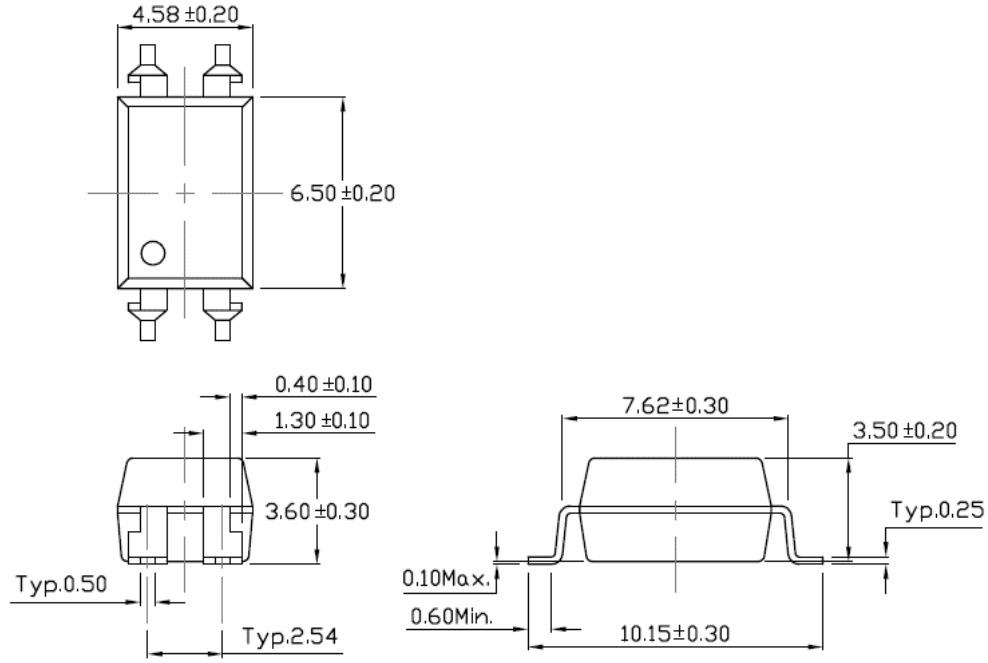
Gullwing (400mil) Lead Forming – Through Hole (M Type)



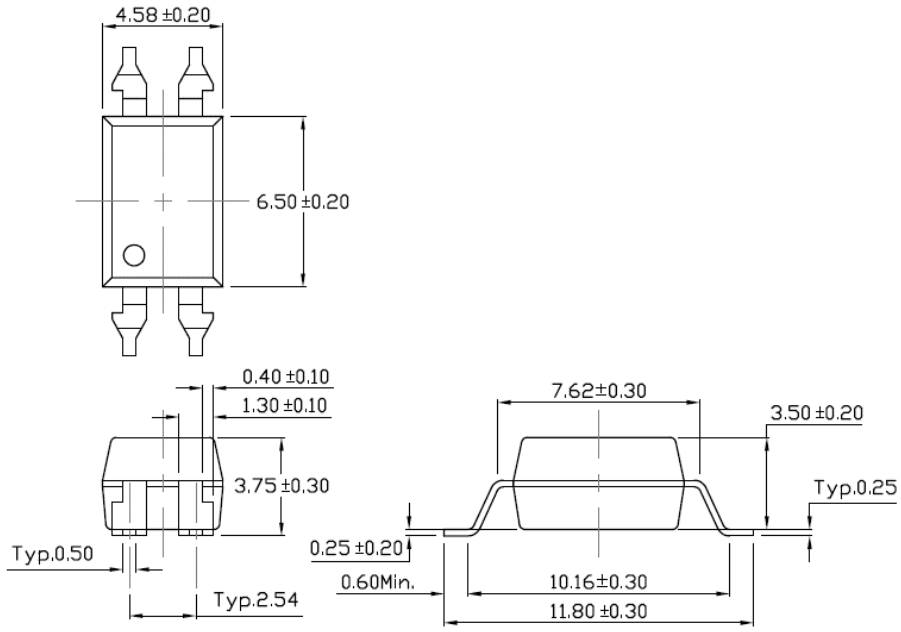
Surface Mount Lead Forming (S Type)



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

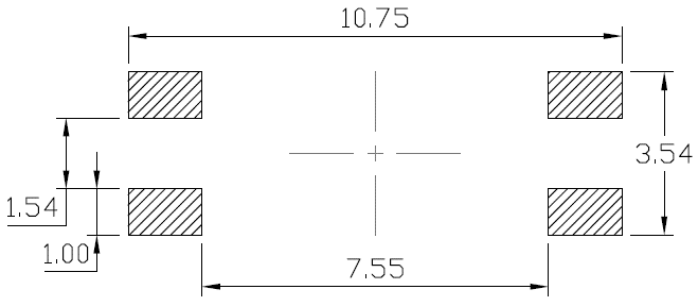


Surface Mount (Gullwing) Lead Forming (SLM Type)

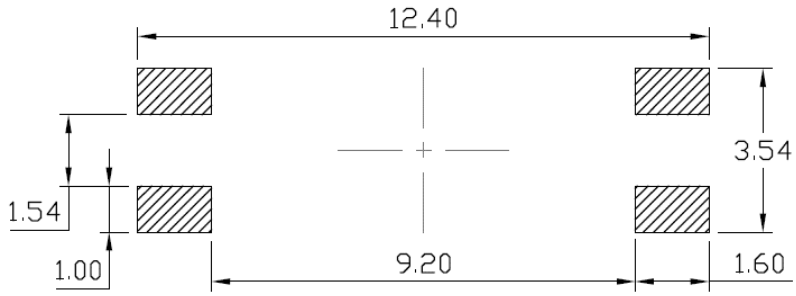


Recommended Solder Mask *Dimensions in mm unless otherwise stated*

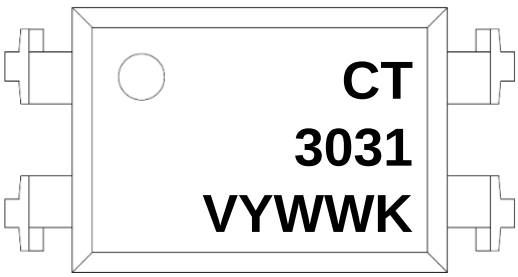
Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming



Surface Mount (Gullwing) Lead Forming



Marking Information



Note:

CT	: Denotes “CT Micro”
3031	: Part Number
V	: VDE Option
Y	: Fiscal Year
WW	: Work Week
K	: Manufacturing Code

Ordering Information

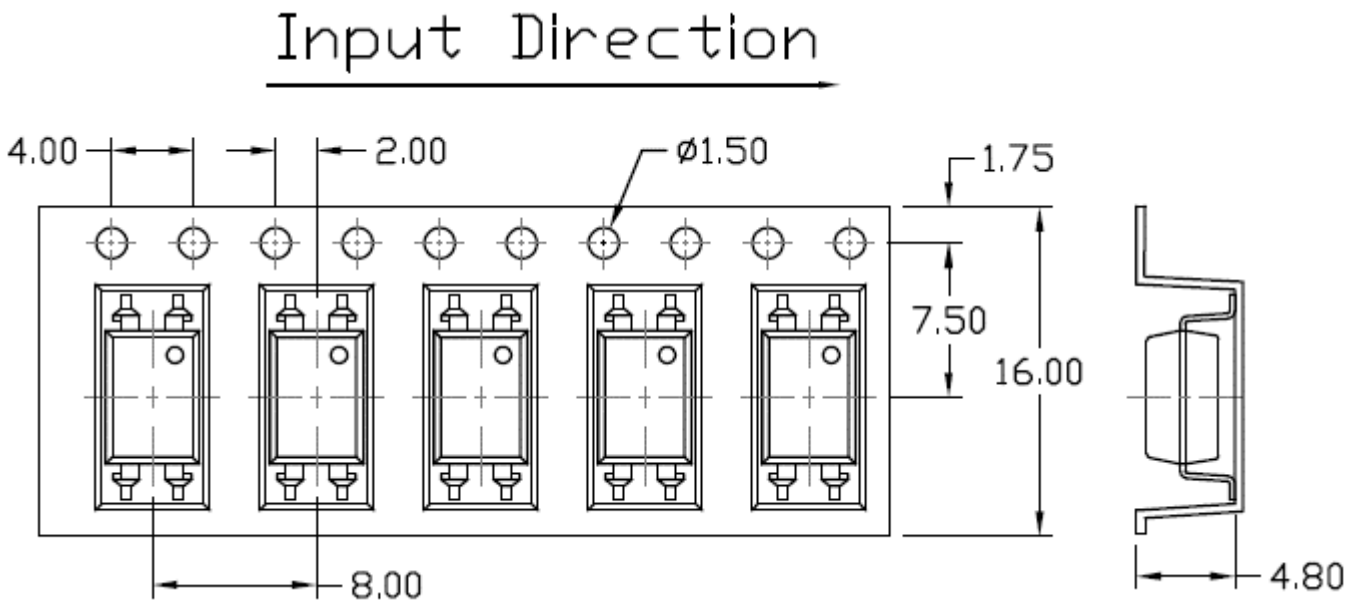
CT303X(V)(Y)(Z)-4L, CT304X(V)(Y)(Z)-4L

CT = Denotes “CT Micro”
303X = Part Numbers (Current Ration Option X=1, 2 or 3)
304X = Part Numbers (Current Ration Option X=1, 2 or 3)
V = VDE Option (V or None)
Y = Lead form option (S, SL, M, SLM or none)
Z = Tape and reel option (T1 or T2)
4L = 4-Lead DIP Package

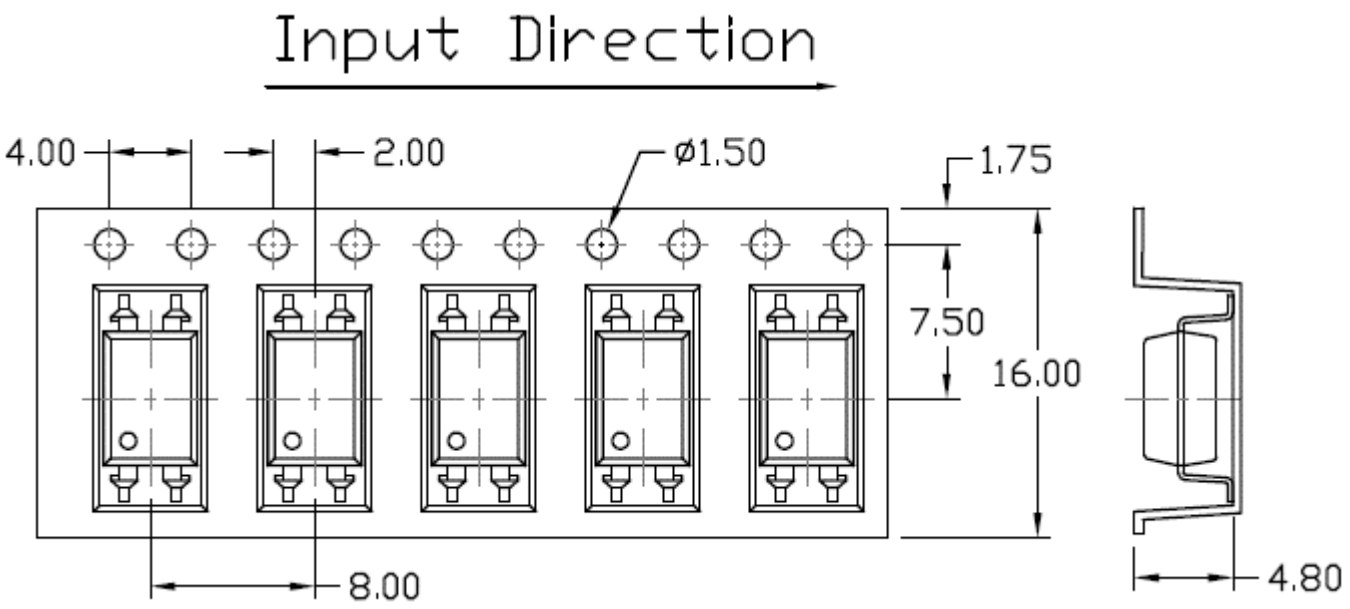
Option	***Description***	***Quantity***
None	Standard 4 Pin DIP	100 Units/Tube
M	Gullwing (400mil) Lead Forming	100 Units/Tube
S(T1)	Surface Mount Lead Forming – With Option 1 Taping	1500 Units/Reel
S(T2)	Surface Mount Lead Forming – With Option 2 Taping	1500 Units/Reel
SL(T1)	Surface Mount (Low Profile)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

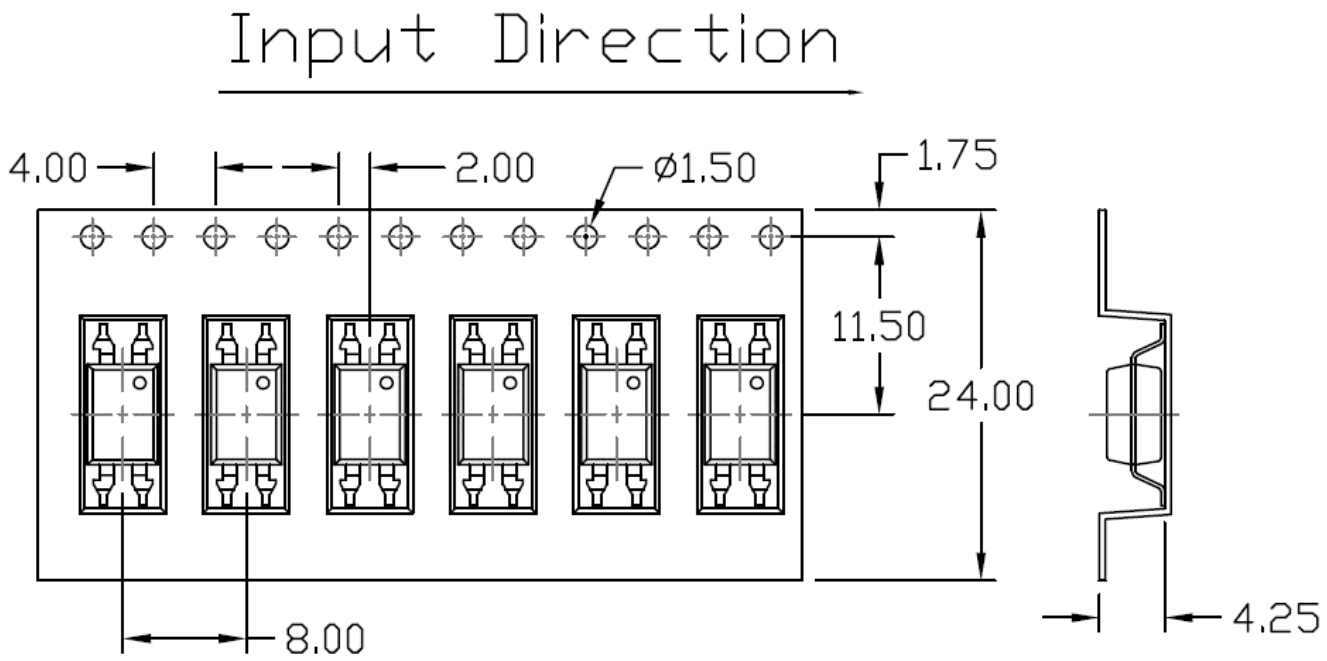
Option S(T1) & SL(T1)



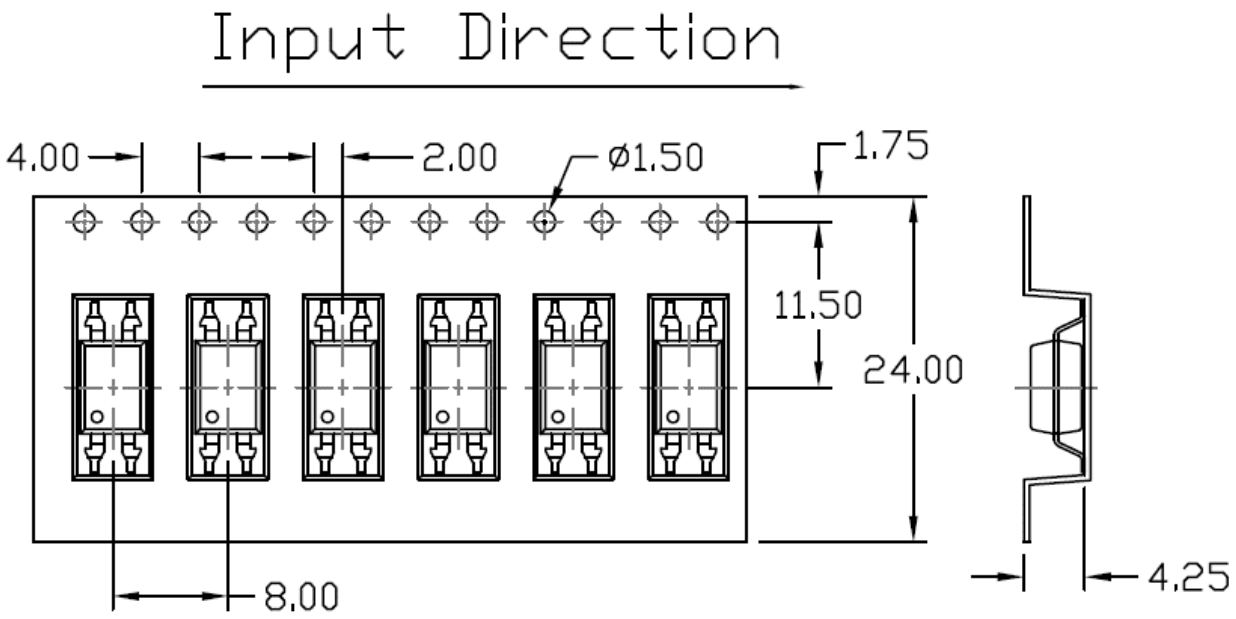
Option S(T2) & SL(T2)



Option SLM(T1)

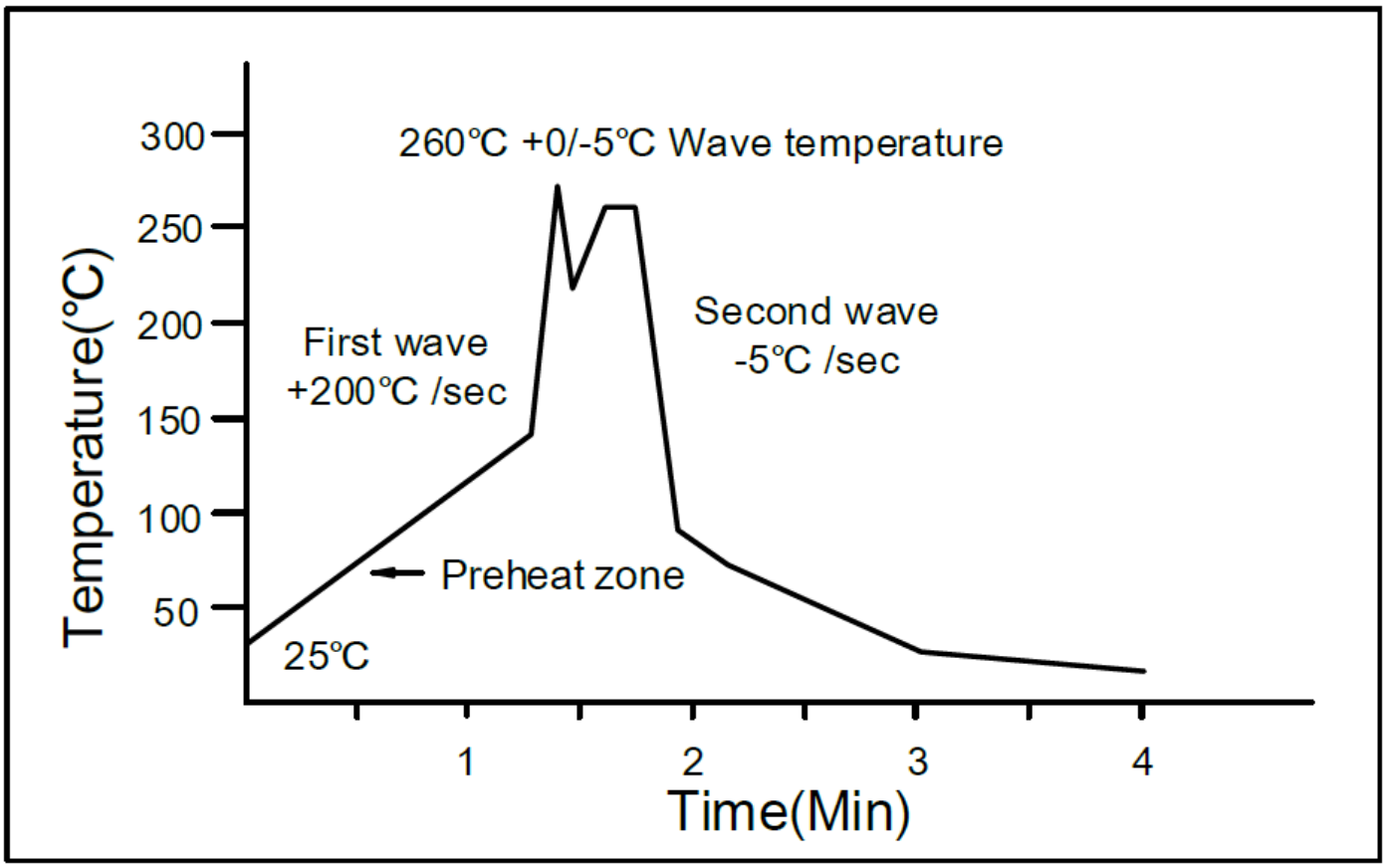


Option SLM(T2)



Wave soldering (JEDEC22A111 compliant)

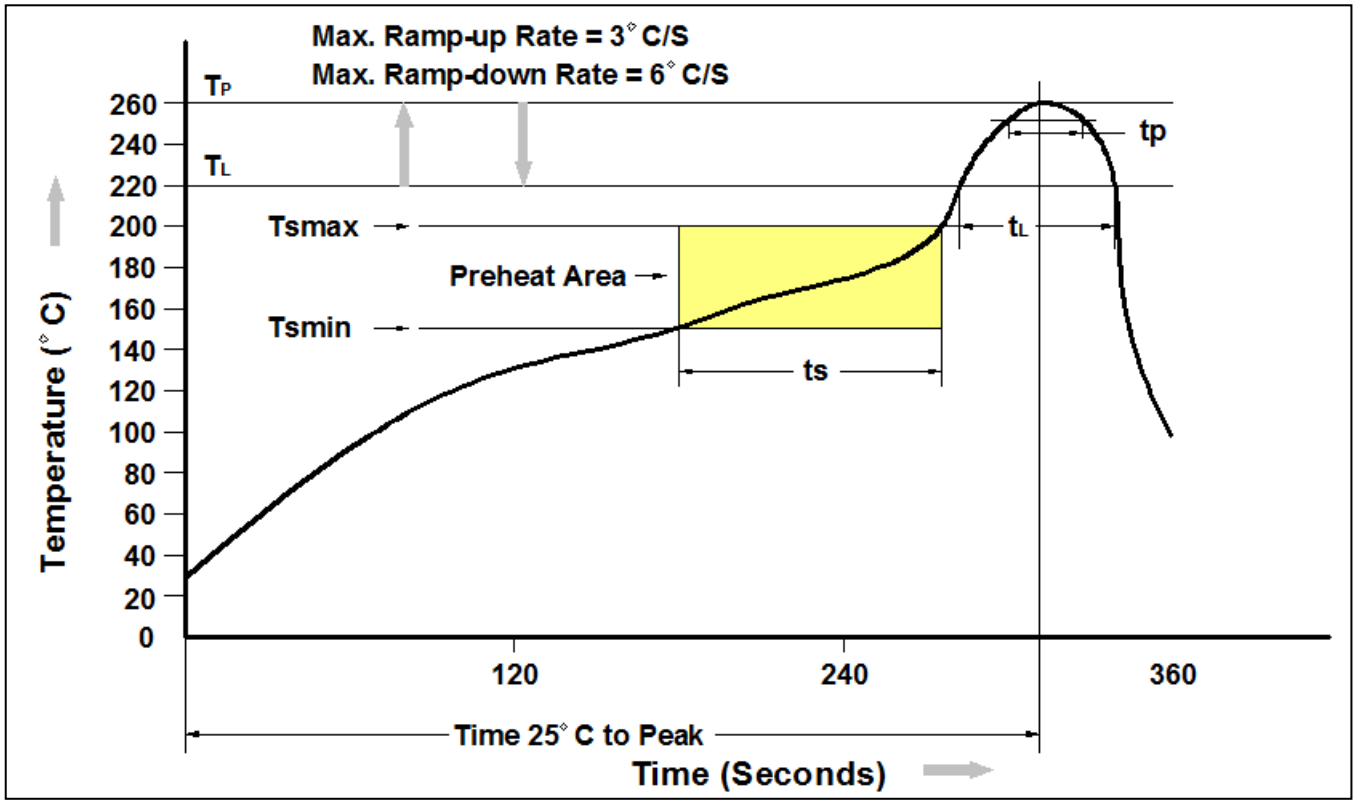
One time soldering is recommended within the condition of temperature.
Temperature: 260+0/-5˚C.
Time: 10 sec.
Preheat temperature:25 to 140˚C.
Preheat time: 30 to 80 sec.



Hand soldering by soldering iron

Allow single lead soldering in every single process.
One time soldering is recommended. Temperature: 350+0/-5˚C
Time: 3 sec max.

Reflow Profile



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

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