

Description

The TD618 series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a photo diode in a plastic DIP4 package with different lead forming options. With the robust coplanar double mold structure, TD618 series provide the most stable isolation feature.

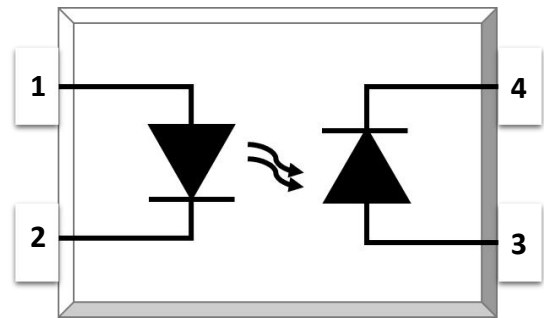
Features

- High isolation 5000 VRMS
- DC input with PD output
- Operating temperature range - 55 °C to 110 °C
- REACH compliance
- Halogen free
- MSL class 1
- Regulatory Approvals
 - UL - UL1577
 - VDE - EN60747-5-5(VDE0884-5)
 - CQC - GB4943.1, GB8898
 - cUL- CSA Component Acceptance Service Notice No. 5A

Applications

- Low cost analog isolation
- Monitor motor supply voltage
- Digital telephone isolation
- Transducer isolation

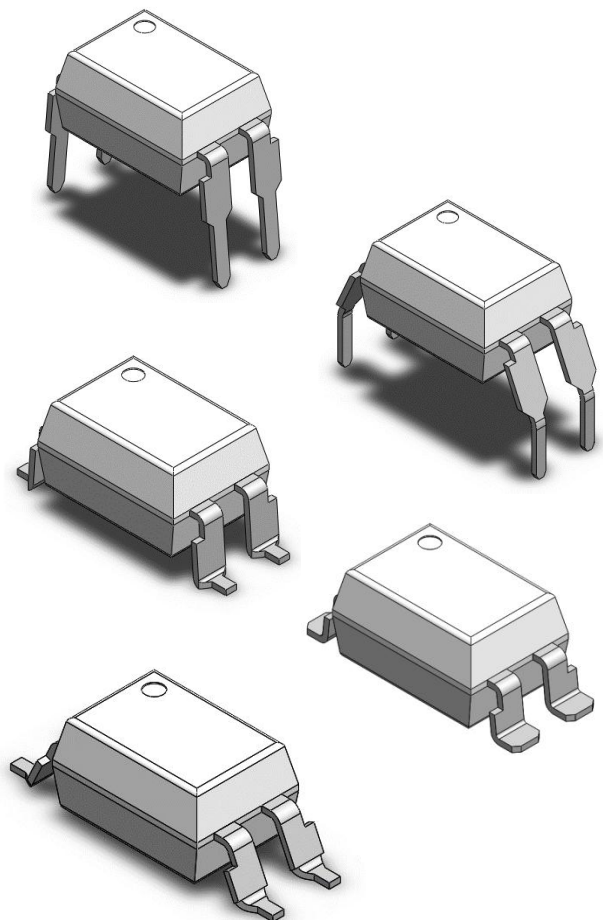
SCHEMATIC



PIN DEFINITION

1. LED Anode
2. LED Cathode
3. PD Anode
4. PD Cathode

PACKAGE OUTLINE





ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	VALUE	UNIT	NOTE
INPUT				
Forward Current	I _F	60	mA	
Peak Forward Current	I _{FP}	1	A	1
Reverse Voltage	V _R	6	V	
Input Power Dissipation	P _I	100	mW	
OUTPUT				
Output Photodiode Voltage	V _{PD}	80	V	
COMMON				
Total Power Dissipation	P _{tot}	200	mW	
Isolation Voltage	V _{iso}	5000	V _{rms}	2
Operating Temperature	T _{opr}	-55~110	°C	
Storage Temperature	T _{stg}	-55~150	°C	
Soldering Temperature	T _{sol}	260	°C	

Note 1. 100µs pulse, 100Hz frequency

Note 2. AC For 1 Minute, R.H. = 40 ~ 60%



ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C							
PARAMETER	SYMBOL	MIN	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
INPUT							
Forward Voltage	V _F	-	1.24	1.4	V	I _F =10mA	
Reverse Current	I _R	-	-	10	μA	V _R =6V	
Input Capacitance	C _{in}	-	10	-	pF	V=0, f=1kHz	
OUTPUT							
Photo Diode Leakage Current	I _{LK}	-	0.5	25	nA	V _{KA} =15V, I _F =0mA	
Cathode-anode breakdown voltage	BV _{KAO}	30	-	-	V	I _{KA} =0.1mA, I _F =0mA	
Anode - cathode breakdown voltage	BV _{AKO}	0.5	-	-	V	I _{AK} =0.1mA, I _F =0mA	
TRANSFER CHARACTERISTICS							
Current Transfer Ratio	TD618	CTR	0.5	-	1	%	I _F =10mA, V _{KA} =5V
Photo Diode Capacitance	C _{PD}	-	22	-	pF	V=0, f=1kHz	
Isolation Resistance	R _{ISO}	10 ¹²	10 ¹⁴	-	Ω	DC500V, 40 ~ 60% R.H.	
Floating Capacitance	C _{IO}	-	0.4	1	pF	V=0, f=1MHz	
Response Time (Rise)	t _r	-	1.3	10	μs	VCC=3.3V, R _D =510Ω	3
Response Time (Fall)	t _f	-	1.1	10	μs	R _L =20kΩ, f=115200Hz	3

Note 3. Refer to Fig.7 & Fig.8

CHARACTERISTIC CURVES

Fig.1 Forward Current vs. Forward Voltage

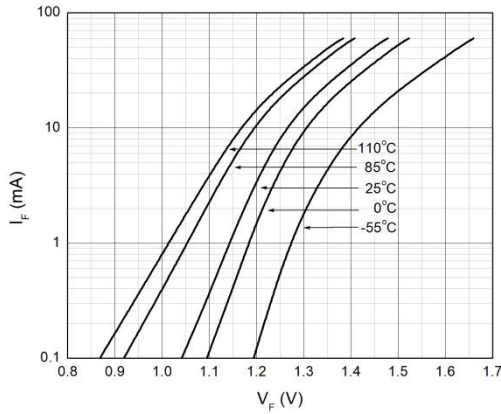


Fig.2 Photo Diode Leakage Current vs. Ambient Temperature

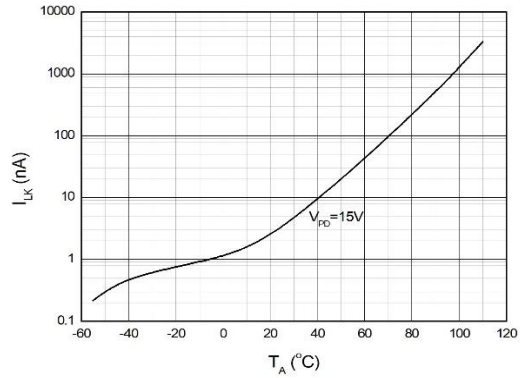


Fig.3 Normalized Current Transfer Ratio vs. Photo Diode Voltage

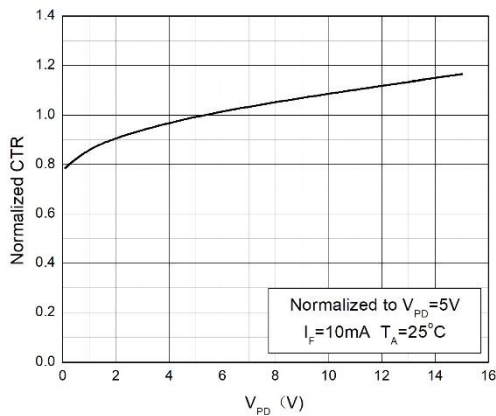


Fig.4 Normalized Current Transfer Ratio vs. Forward Current

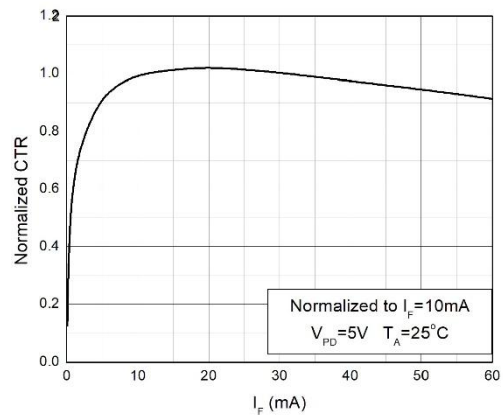


Fig.5 Normalized Current Transfer Ratio vs. Ambient Temperature

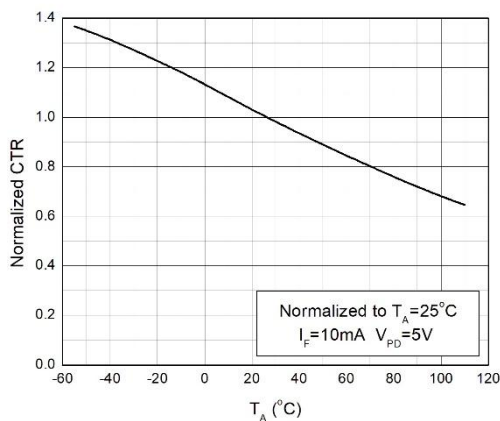
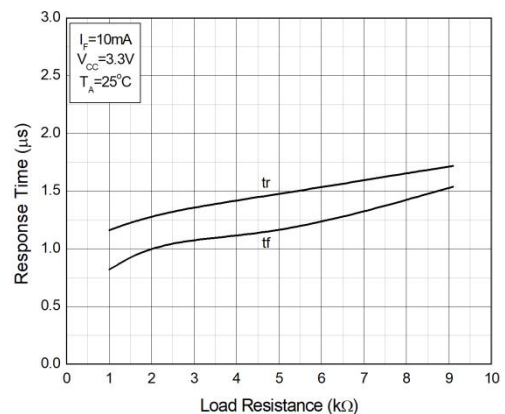
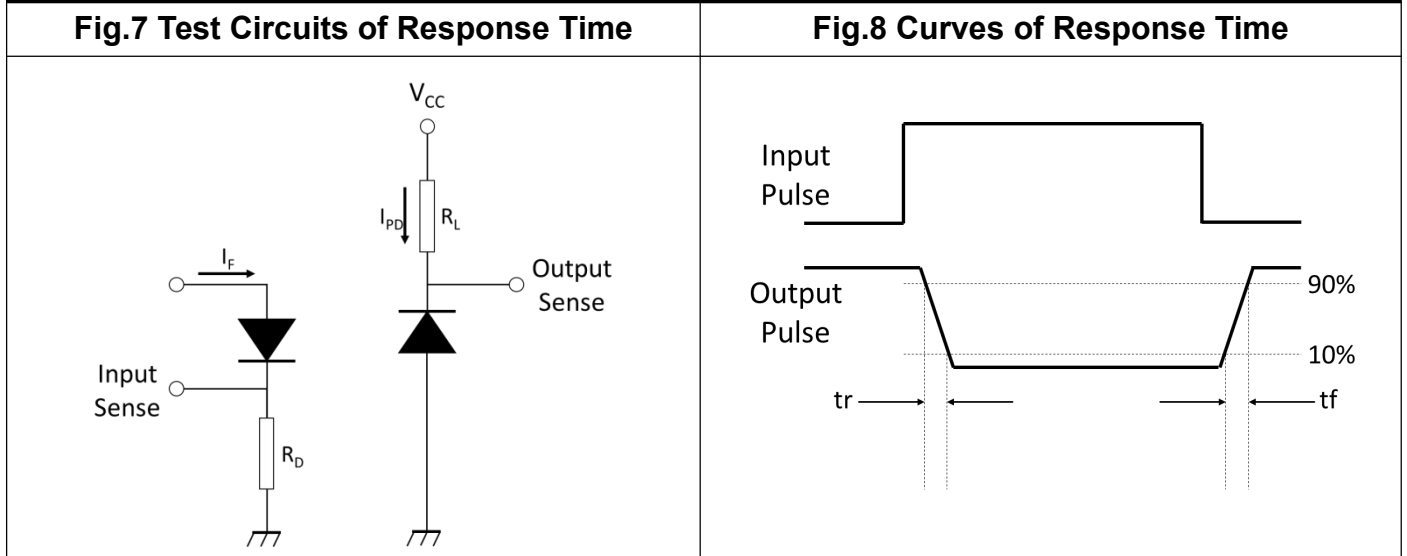


Fig.6 Normalized Current Transfer Ratio vs. Ambient Temperature

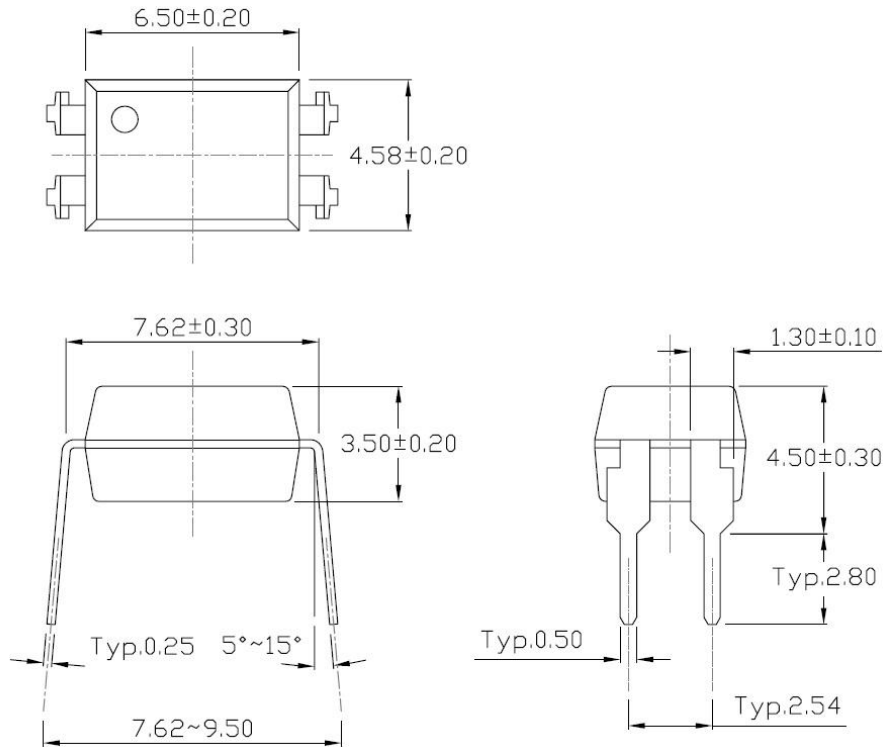


TEST CIRCUITS

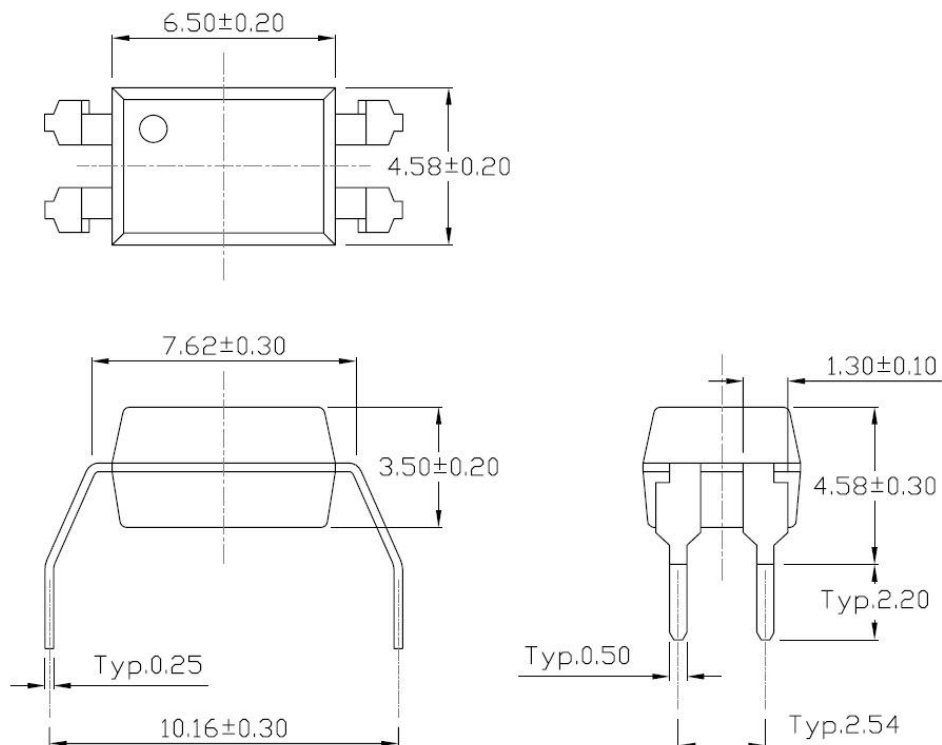


PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Standard DIP – Through Hole (DIP Type)

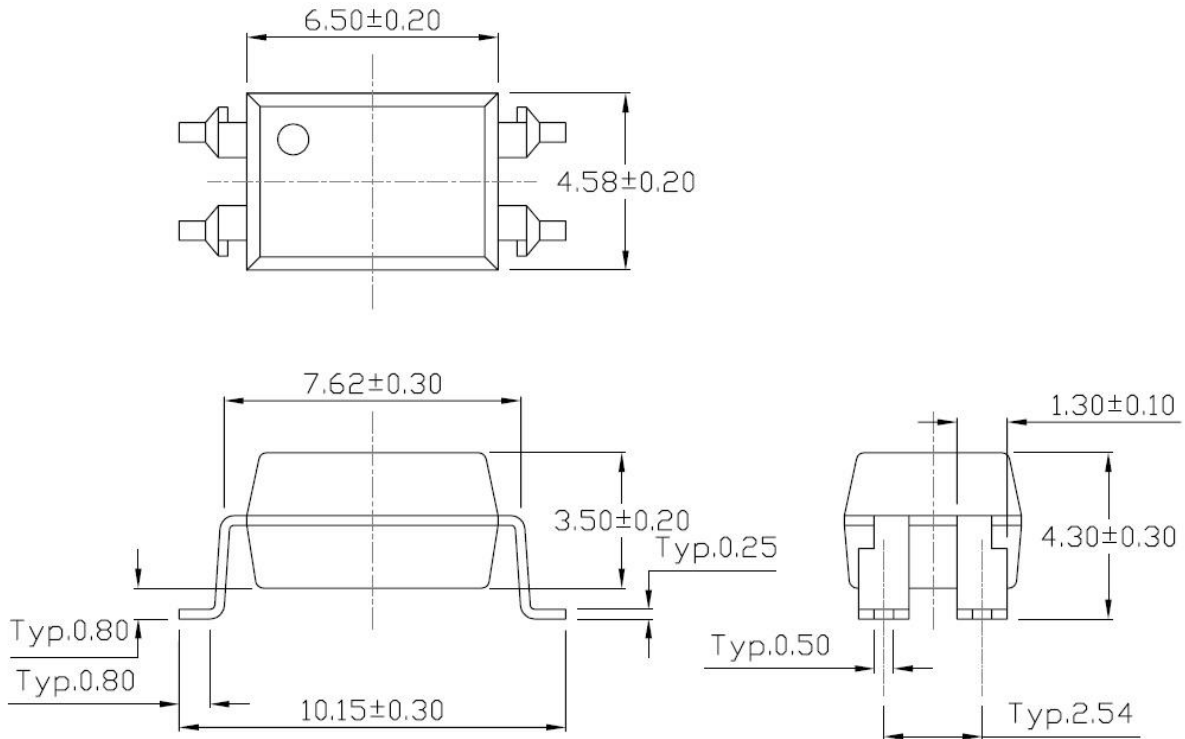


Gullwing (400mil) Lead Forming – Through Hole (M Type)

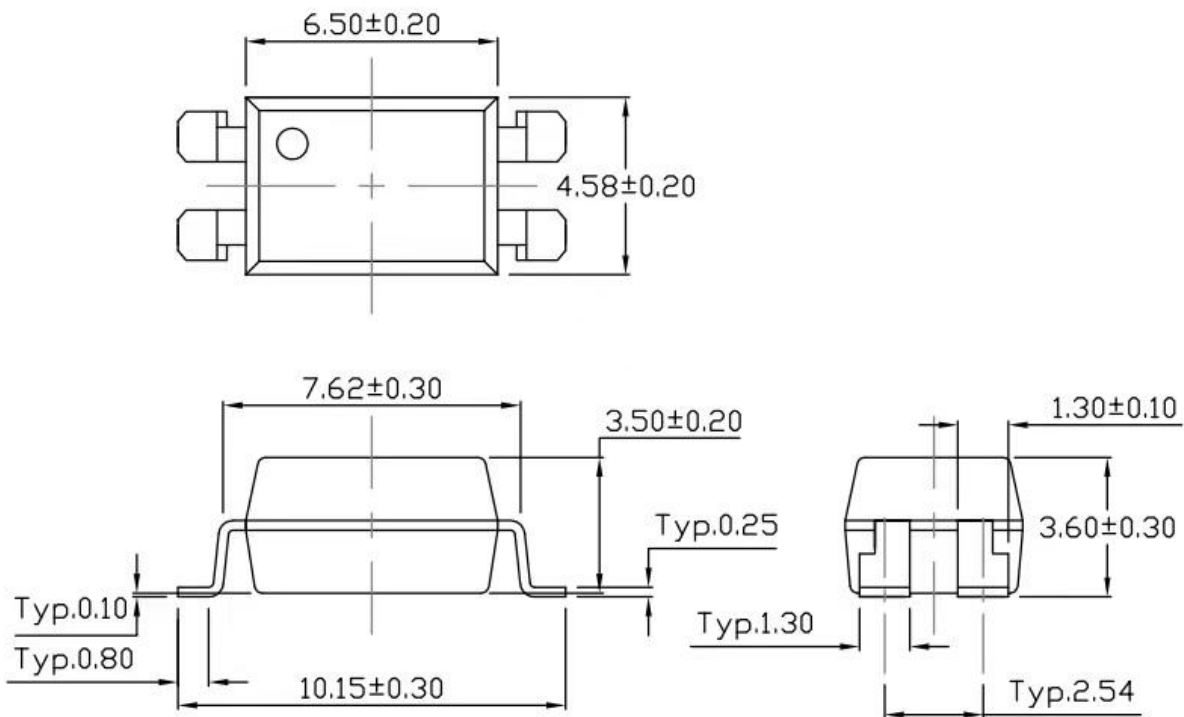


PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming (S Type)

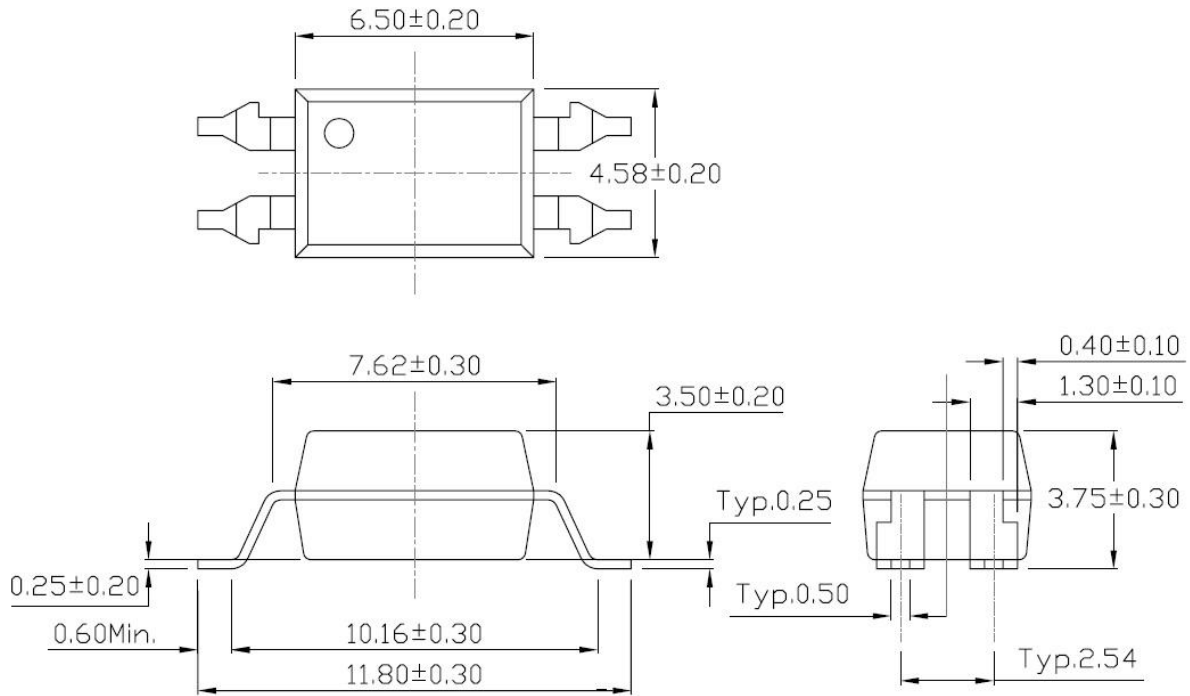


Surface Mount (Low Profile) Lead Forming (SL Type)



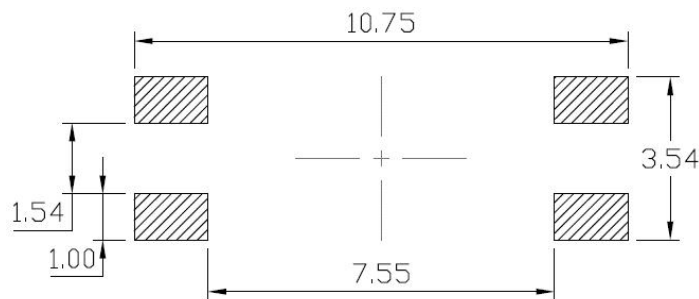
PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount (Gullwing) Lead Forming (SLM Type)

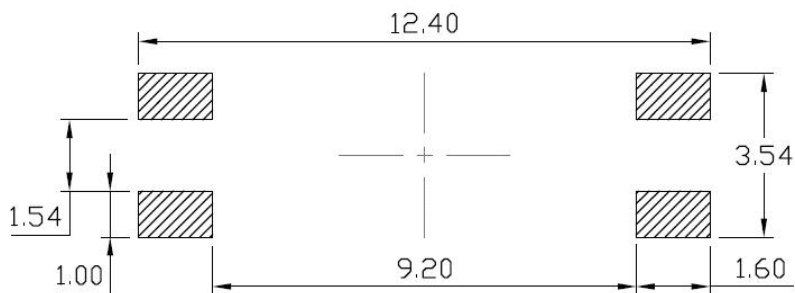


RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

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

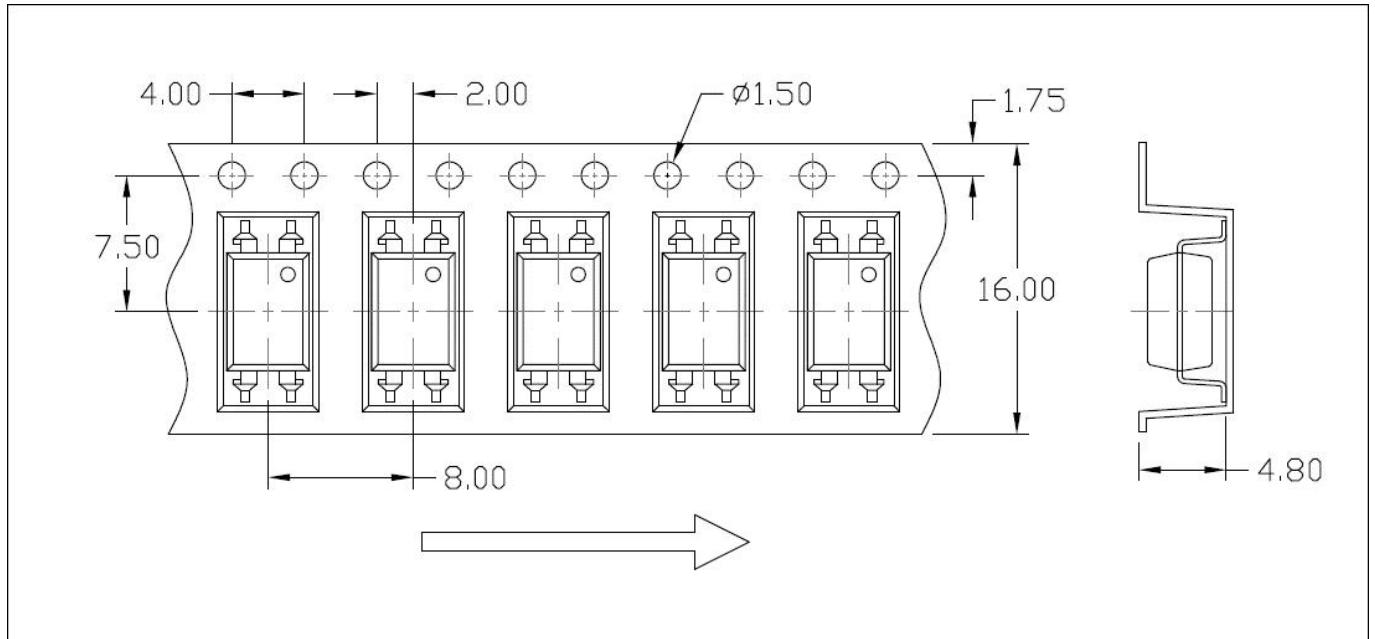


Surface Mount (Gullwing) Lead Forming

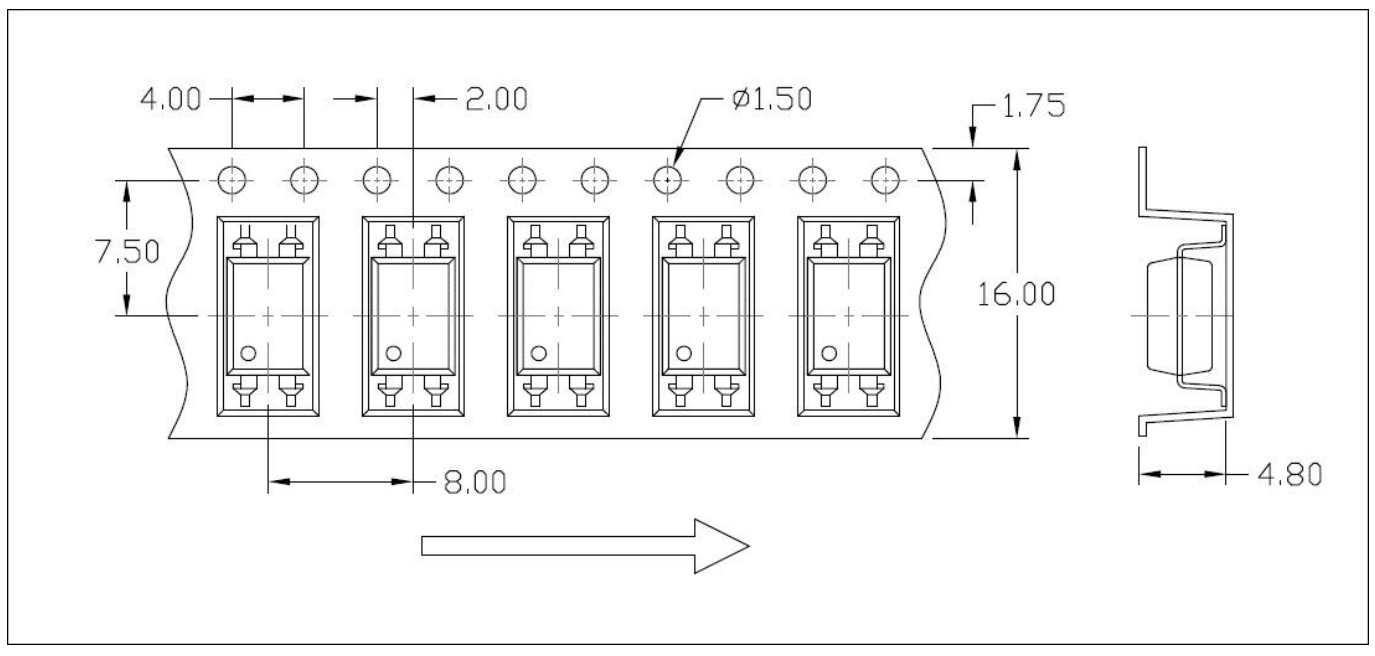


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S(T1) & SL(T1)

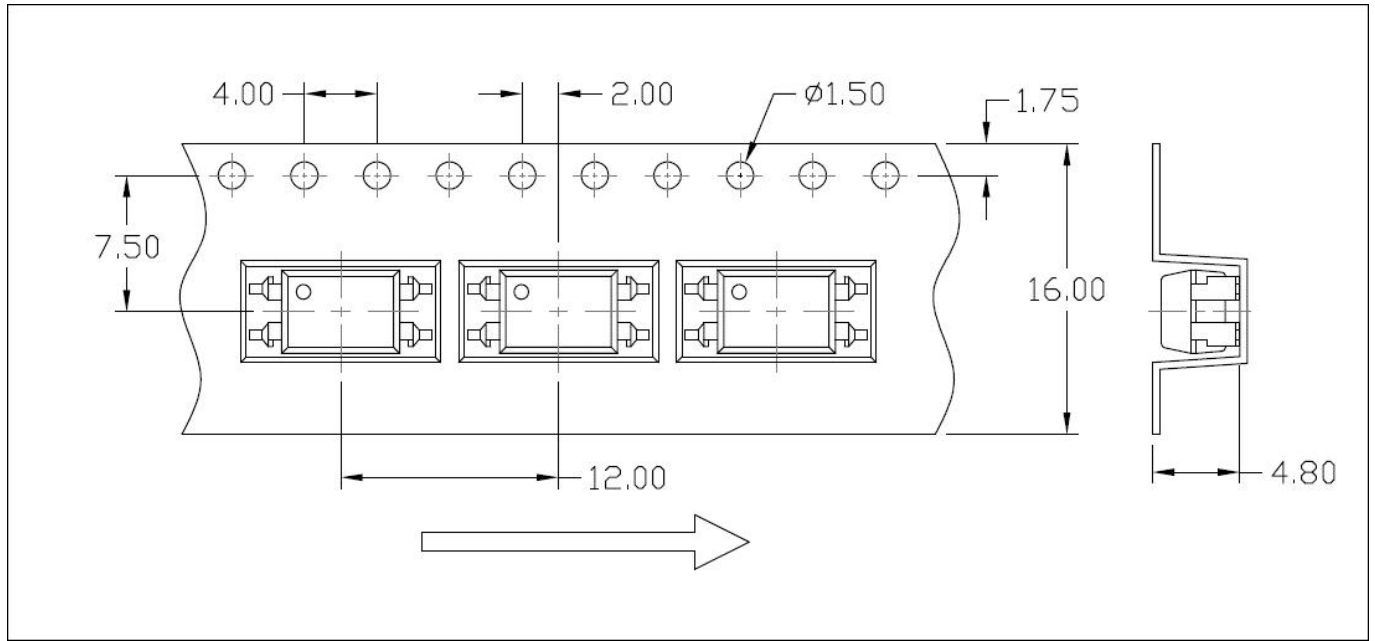


Option S(T2) & SL(T2)

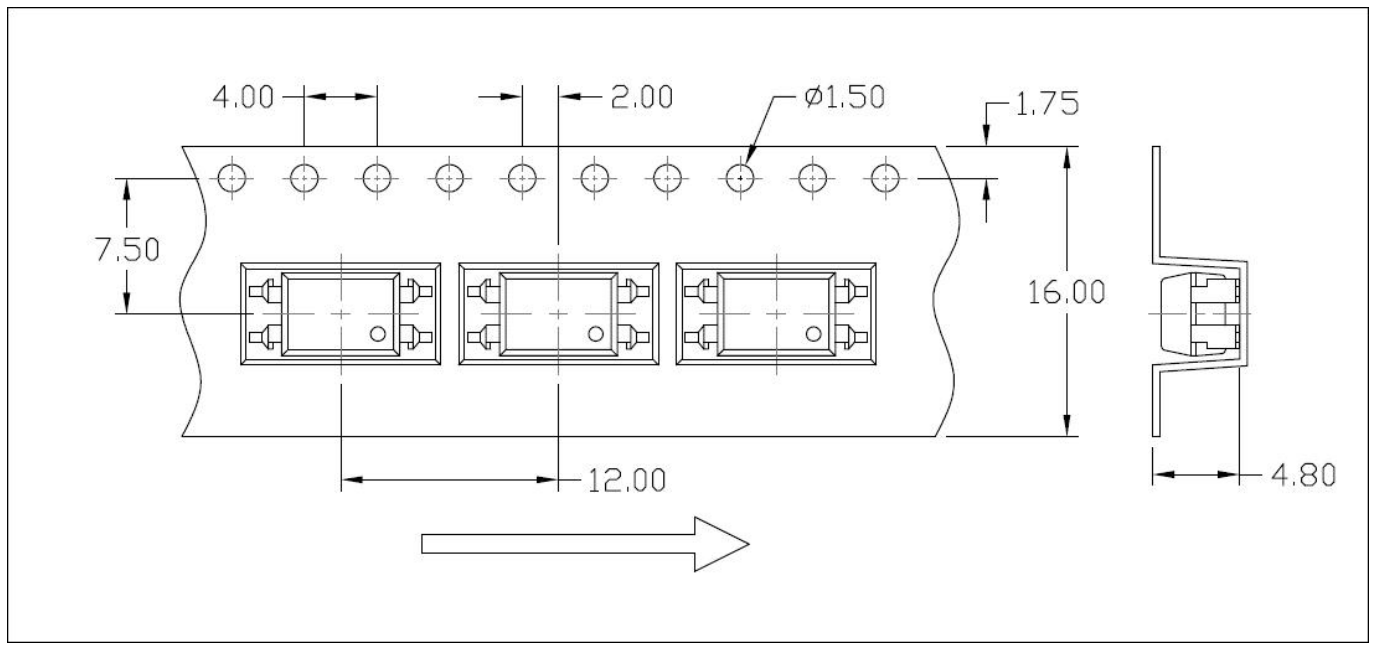


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S(T3) & SL(T3)

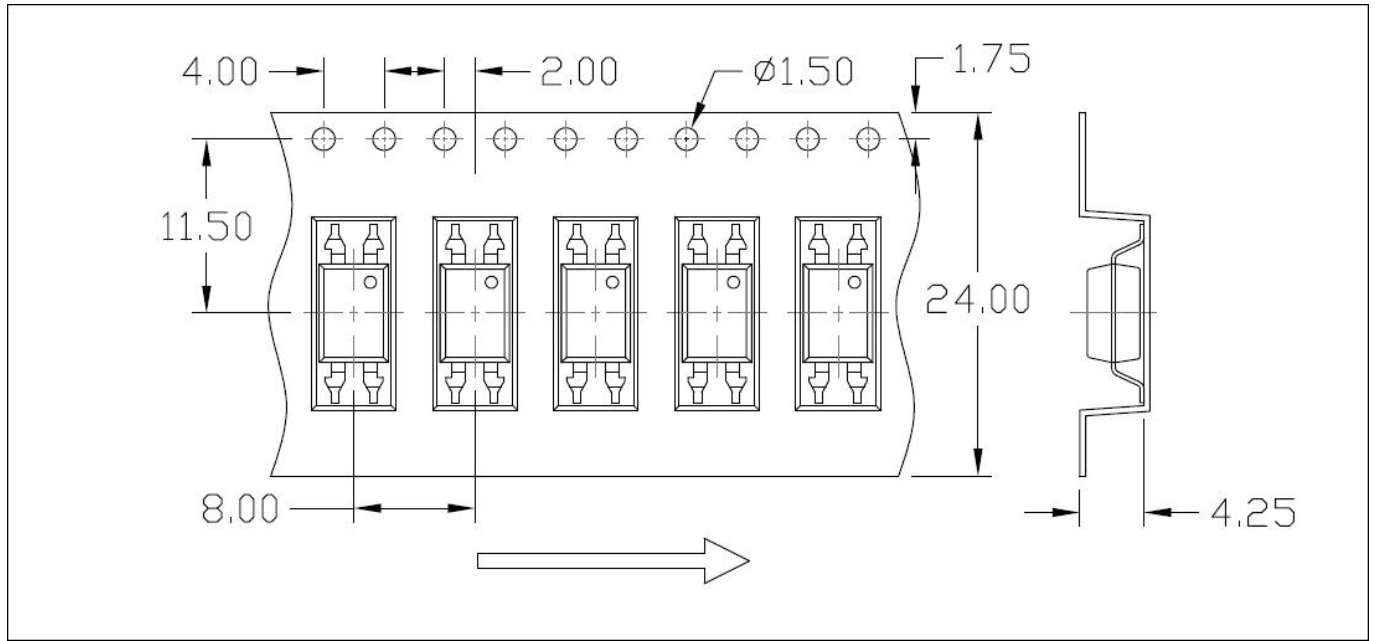


Option S(T4) & SL(T4)

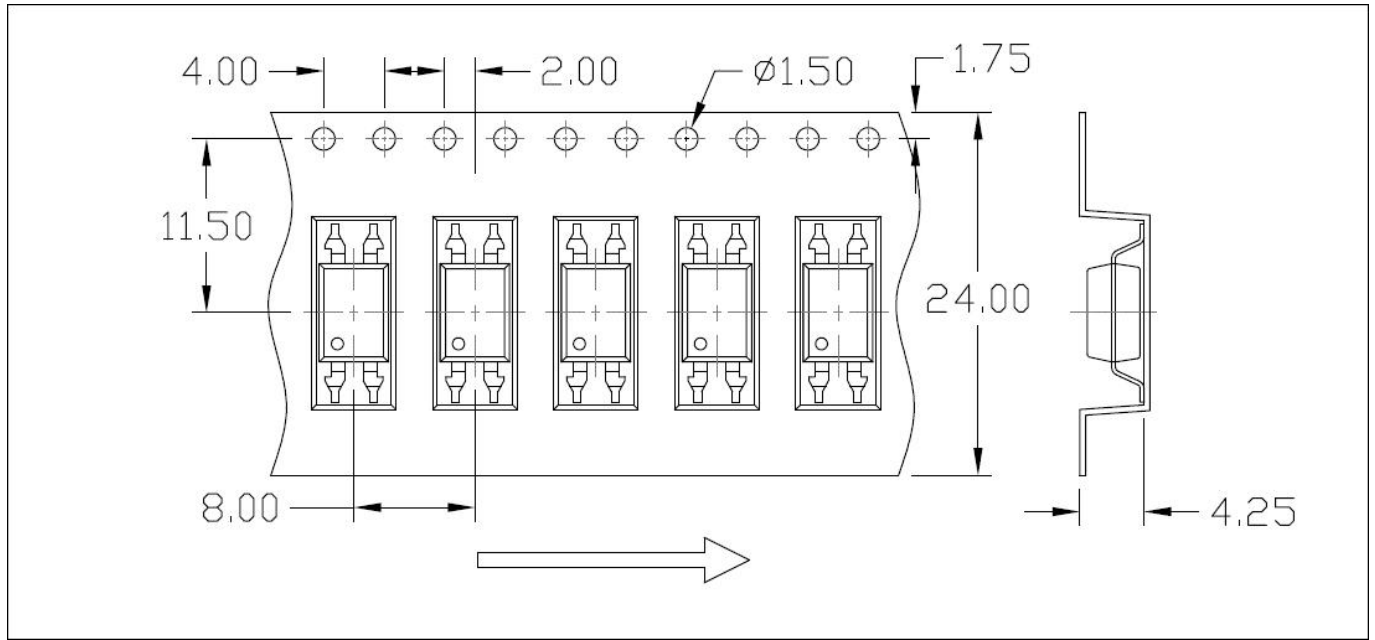


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option SLM(T1)

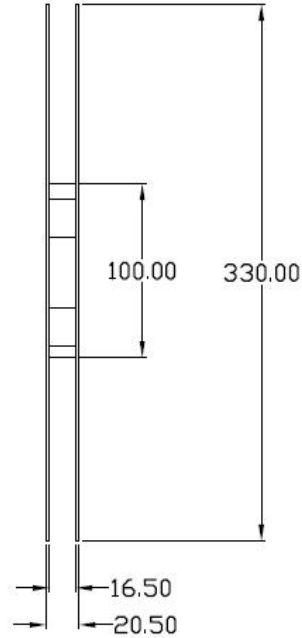
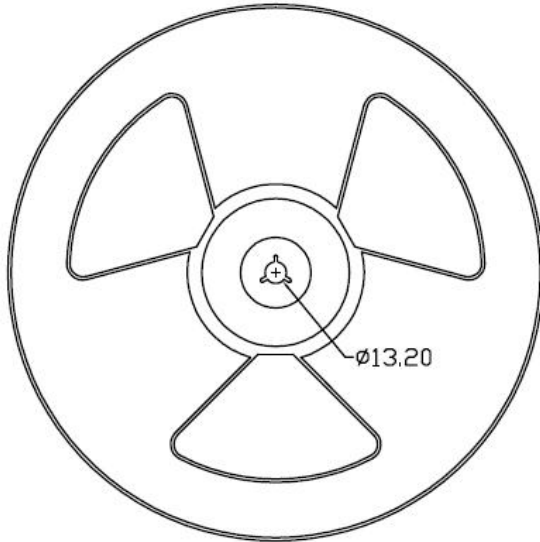


Option SLM(T2)

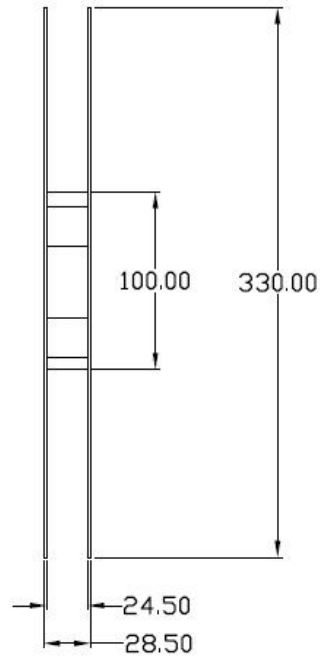
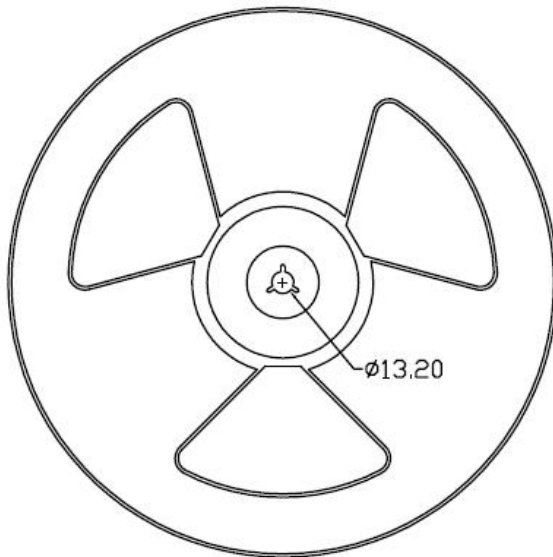


REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S & Option SL

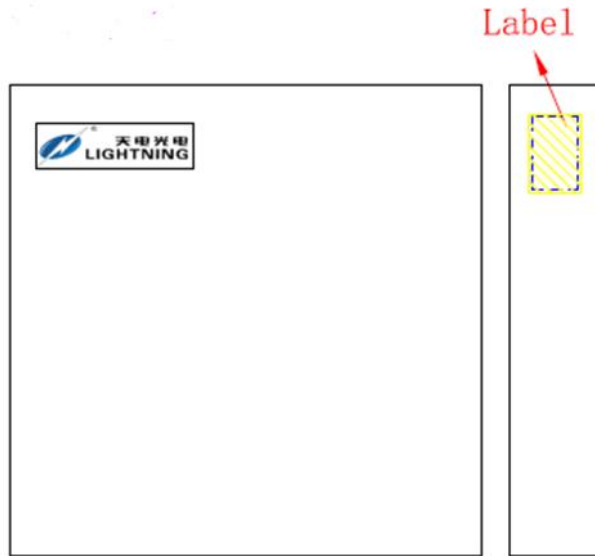


Option SLM



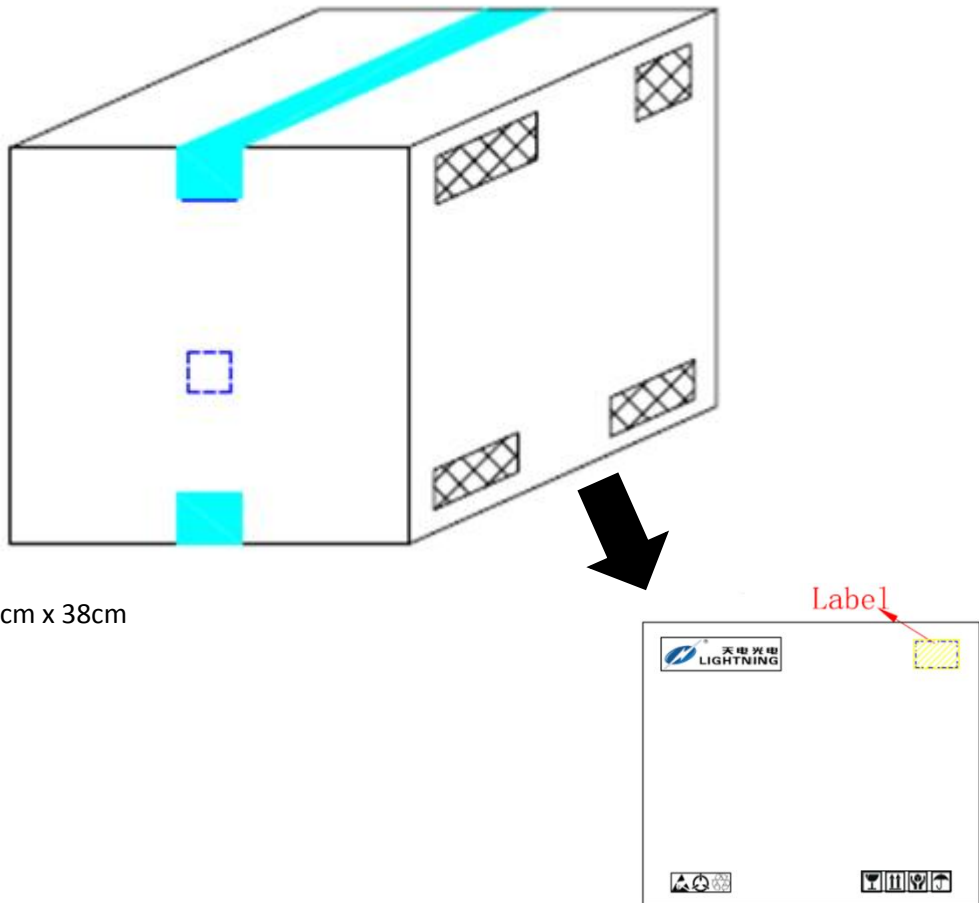
BOX SPECIFICATIONS (Reel Type)

Inner Box



- L x W x H = 36cm x 36cm x 6.9cm

Outer Box



- L x W x H = 45cm x 38cm x 38cm



ORDERING AND MARKING INFORMATION

MARKING INFORMATION



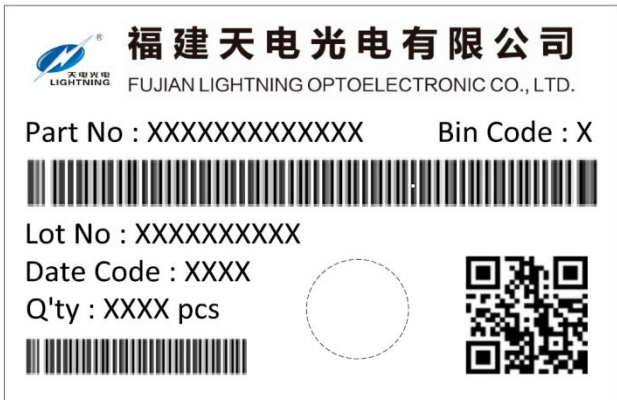
TD : Company Abbr.
618 : Part Number
F : Leadframe Option
V : VDE Option
Y : Fiscal Year
A : Manufacturing Code
WW : Work Week

ORDERING INFORMATION

TD618(Y)(Z)-FGV

TD – Company Abbr.
 618 – Part Number
 Y – Lead Form Option (M/S/SL/SLM/None)
 Z – Tape and Reel Option (T1/T2/T3/T4)
 F – Leadframe Option (F:Iron, None:Copper)
 G – Green
 V – VDE Option (V or None)

LABEL INFORMATION

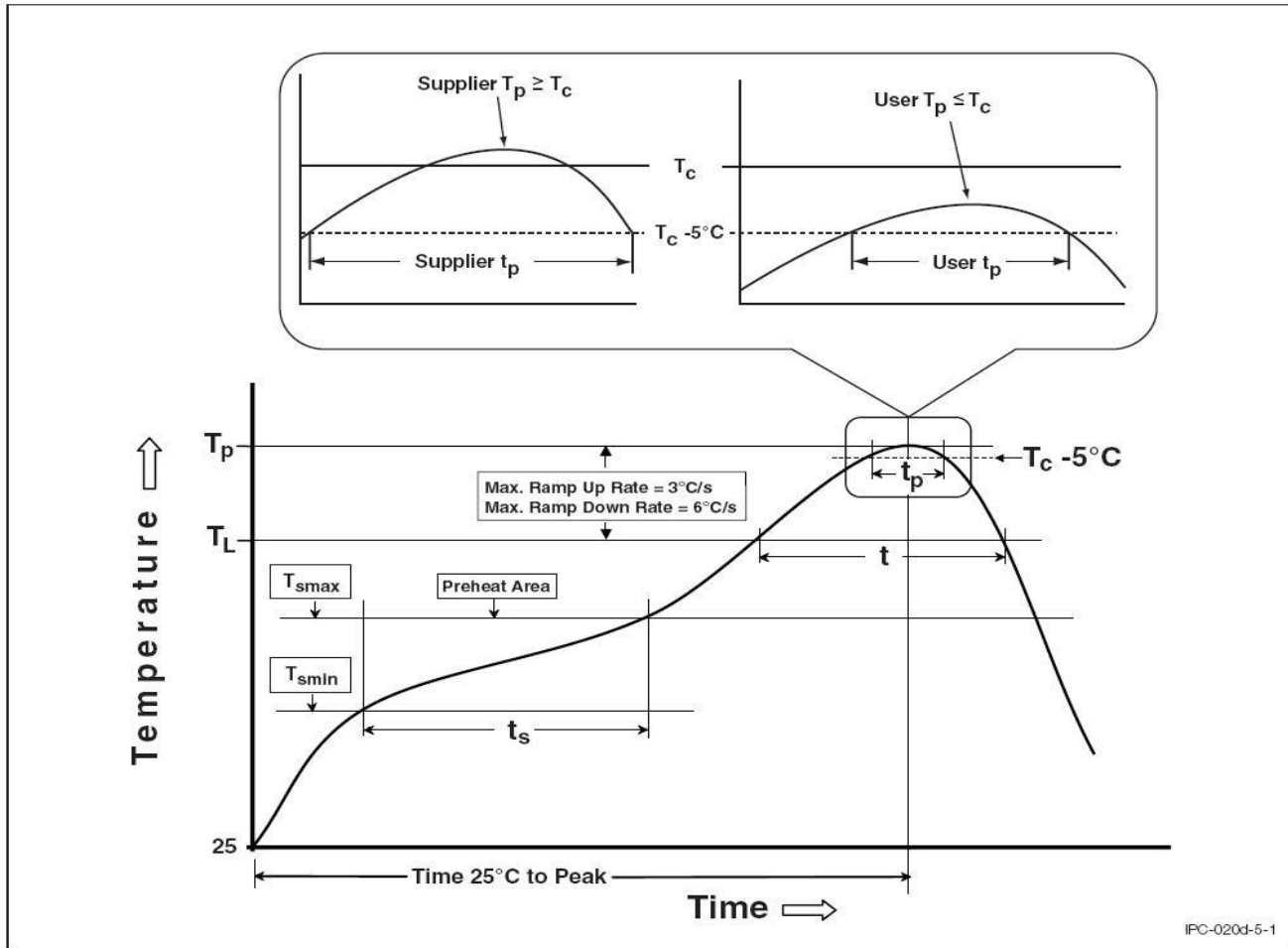


Packing Quantity

Option	Quantity	Quantity – Inner box	Quantity – Outer box
None	100 Units/Tube	32 Tubes/Inner box	10 Inner box/Outer box = 32k Units
M	100 Units/Tube	32 Tubes/Inner box	10 Inner box/Outer box = 32k Units
S(T1)	1500 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 22.5k Units
S(T2)	1500 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 22.5k Units
S(T3)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
S(T4)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SL(T1)	1500 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 22.5k Units
SL(T2)	1500 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 22.5k Units
SL(T3)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SL(T4)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SLM(T1)	1500 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 22.5k Units
SLM(T2)	1500 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 22.5k Units

REFLOW INFORMATION

REFLOW PROFILE

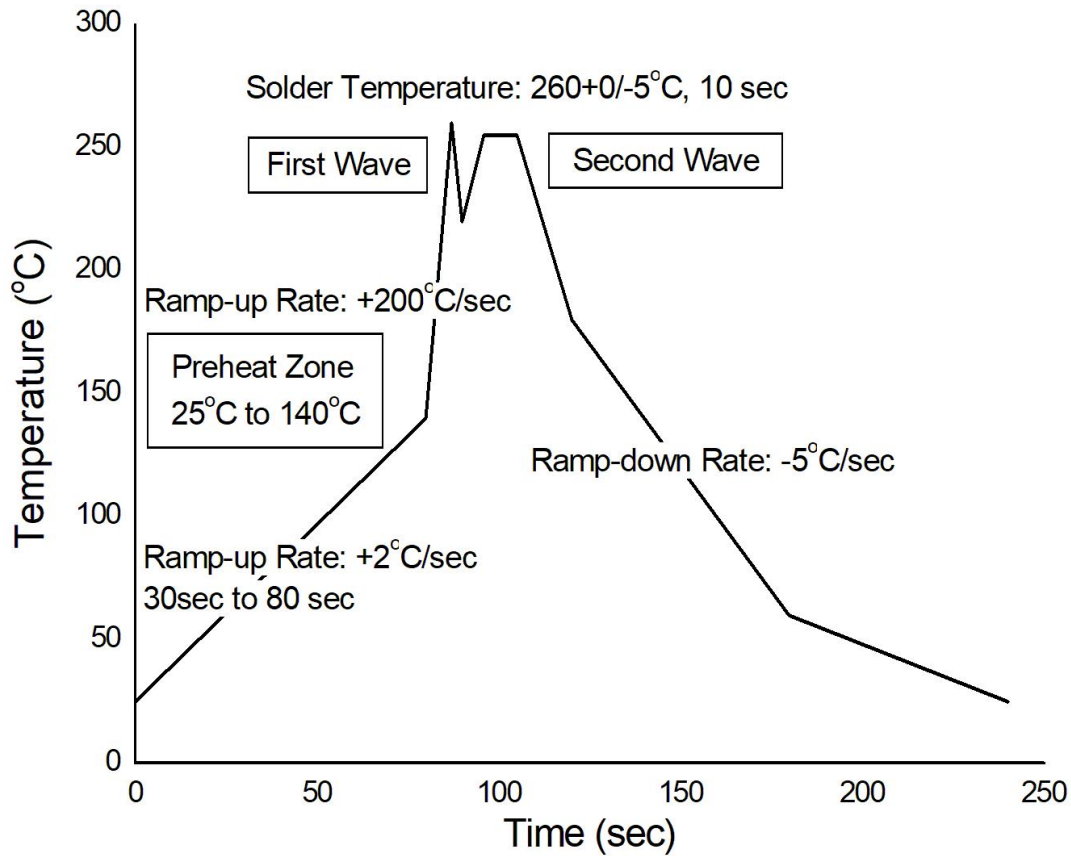


Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T _{smin})	100	150°C
Temperature Max. (T _{smax})	150	200°C
Time (t _s) from (T _{smin} to T _{smax})	60-120 seconds	60-120 seconds
Ramp-up Rate (t _L to t _P)	3°C/second max.	3°C/second max.
Liquidous Temperature (T _L)	183°C	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (t _P) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (T _P to T _L)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.



TEMPERATURE PROFILE OF SOLDERING

WAVE SOLDERING (JESD22-A111 COMPLIANT)



HAND SOLDERING BY SOLDERING IRON

Soldering Temperature	$380+0/-5^{\circ}\text{C}$
Soldering Time	3 sec max.

- One time soldering is recommended for all soldering method.
- Do not solder more than three times for IR reflow soldering.



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- This product is not intended to be used for military, aircraft, automotive, medical, life sustaining or lifesaving applications or any other application which can result in human injury or death.
- Please contact LIGHTNING sales agent for special application request.
- Immerge unit's body in solder paste is not recommended.
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- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.