



BRIGHTTEK

BRIGHTTEK (EUROPE) LIMITED

Brighten up The World With LED!



ISO/TS 16949:2009



BS EN ISO 14001:2004



QC 90000 IECQ HS1998

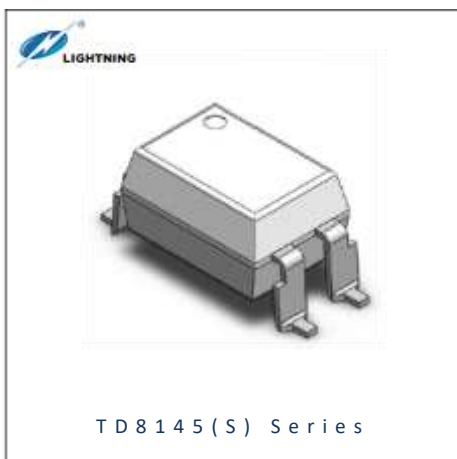
Release Date: 04 July 2025 Version: V0.2

PRODUCT DATASHEET



- ▶ AC Input Photo Coupler
- ▶ SMD4
- ▶ Darlington Transistor

TD8145(S)(T1)-GV



TD8145(S) Series

DESCRIPTION:



The TD8145(S) series combines two AlGaAs infrared emitting diodes as the emitter which is optically coupled to a silicon planar Darlington phototransistor detector in a plastic DIP4 package with SMD4 lead forming option.

With the robust coplanar double mold structure, TD8145(S) series provide the most stable isolation feature.

FEATURES:

APPLICATIONS:

- Sequence controller
- Telephone/FAX
- System appliances
- Measuring instrument
- Programmable logic controller

- High isolation 5000Vrms
- AC input with transistor output
- Operating temperature range -55°C to +110°C
- REACH & RoHS compliance; Halogen free
- MSL class 1
- Regulatory Approvals:
 - UL - UL1577
 - VDE - EN60747-5-5 (VDE0884-5)
 - CQC - GB4943.1, GB8898
- Packing: T1/T2: 1500pcs/reel; T3/T4: 1000pcs/reel



Partner with: LIGHTNING

NAMING & ORDERING INFORMATION:

Naming Information:

TD8145 (S) (T1) - G V	
TD8145	Part Number
S	Lead Form Option: SMD4
T1	Selection: Tape and Reel Option (T1(default)/T2/T3/T4)
G	Green Option
V	VDE Option

Ordering Information:

TD8145(S)(T1)-GV

Version No.	Original Release Date
Rev: V0.2	08/09/2020

SCHEMATIC DIAGRAM & MARKING:

Schematic Diagram:

PIN Definition	
1	Anode/Cathode
2	Cathode/Anode
3	Emitter
4	Collector

Marking Information:

Marking Definition	
TD	Manufacturer Code
8145	Part Number
V	VDE Applicable
Y	Fiscal Year
A	Manufacturing Code
WW	Work Week

Labelling Information:

 BRIGHTTEK BRIGHTTEK (EUROPE) LIMITED  LIGHTNING Part No.: XXXXXXXXXXXX Bin Code: X  Lot No.: XXXXXXXX Date Code: XXXX QTY: XXX PCS  MSL: 1 Made in Quanzhou Fujian        	This product is manufactured by
	 for Brighttek (Europe) Limited

ABSOLUTE CHARACTERISTICS:

Absolute Maximum Ratings:

Parameter	Symbol	Ratings	Unit
INPUT			
Forward Current	I_F	60	mA
Peak Forward Current (100 μ s pulse, 100Hz frequency)	I_{FP}	1	A
Reverse Voltage	V_R	6	V
Input Power Dissipation	P_I	100	mW
OUTPUT			
Collector - Emitter Voltage	V_{CEO}	40	V
Emitter - Collector Voltage	V_{ECO}	6	V
Collector Current	I_C	80	mA
Output Power Dissipation	P_O	150	mW
COMMON			
Total Power Dissipation	P_{tot}	200	mW
Isolation Voltage	V_{iso}	5000 *1	Vrms
Operating Temperature	T_{opr}	-55~+110	°C
Storage Temperature	T_{stg}	-55~+125	°C
Soldering Temperature	T_{sol}	260 *2	°C

*1. AC for 1 minute, R.H.=40~60%.

*2. For 10 seconds max.

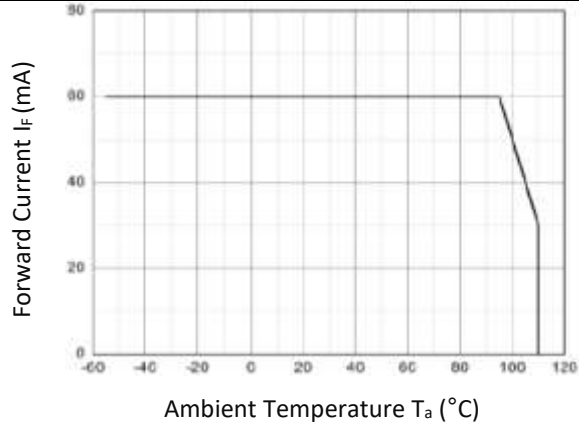
ELECTRICAL CHARACTERISTICS:

Electrical Optical Characteristics at $T_a=25^{\circ}\text{C}$:

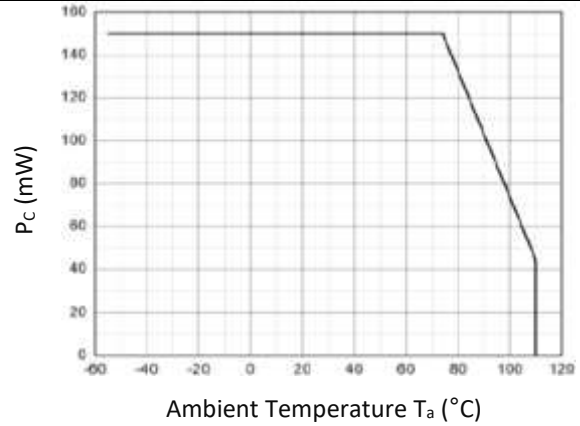
Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
INPUT						
Forward Voltage	V _F	---	1.24	1.4	V	I _F =±10mA
Input Capacitance	C _{IN}	---	10	---	pF	V=0, f=1kHz
OUTPUT						
Collector Dark Current	I _{CEO}	---	---	100	nA	V _{CE} =10V, I _F =0
Collector-Emitter Breakdown Voltage	BV _{CEO}	40	---	---	V	I _C =0.1mA, I _F =0
Emitter-Collector Breakdown Voltage	BV _{ECO}	6	---	---	V	I _E =0.1mA, I _F =0
TRANSFER CHARACTERISTICS						
Current Transfer Ratio	CTR	600	---	7500	%	I _F =±1mA, V _{CE} =2V
CTR Symmetry	SYM	0.3	1	3.0	---	CTR ₁ /CTR ₂
Collector-Emitter Saturation Voltage	V _{CE(sat)}	---	0.8	1.0	V	I _F =±1mA, I _C =2mA
Isolation Resistance	R _{ISO}	10^12	10^14	---	Ω	DC=500V, 40~60% R.H.
Floating Capacitance	C _{IO}	---	0.4	1	pF	V=0, f=1MHz
Cut-Off Frequency	f _c	---	6	---	kHz	V _{CE} =5V, I _C =2mA R _L =100Ω, -3dB
Response Time (Rise)	t _r	---	60	18	μs	V _{CE} =2V, I _C =10mA R _L =100Ω
Response Time (Fall)	t _r	---	53	18	μs	

CHARACTERISTIC CURVES:

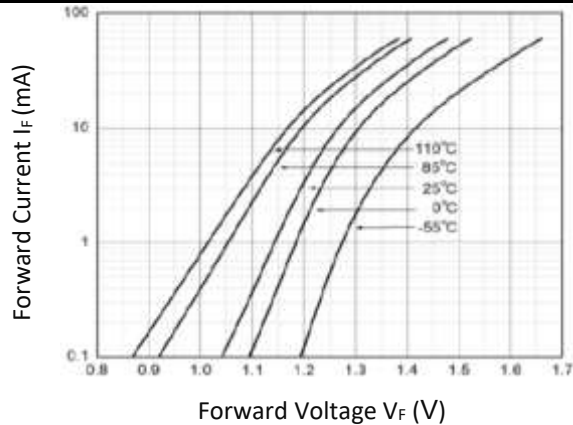
Forward Current v.s. Ambient Temperature



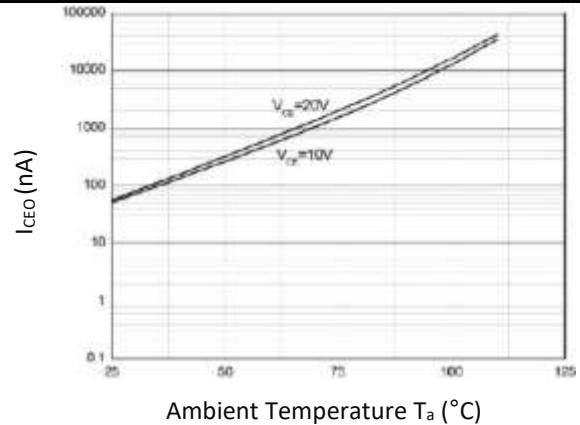
Collector Power Dissipation v.s. Ambient Temperature



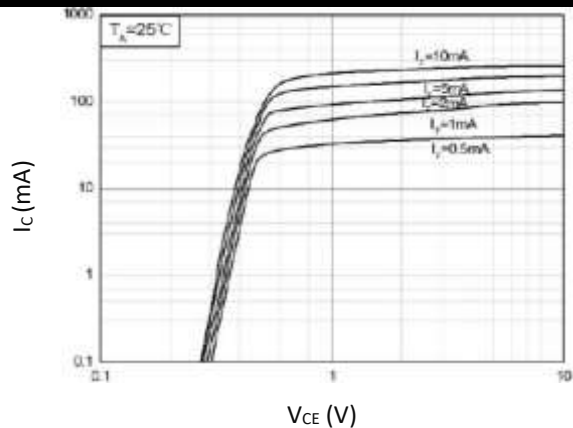
Forward Current v.s. Forward Voltage



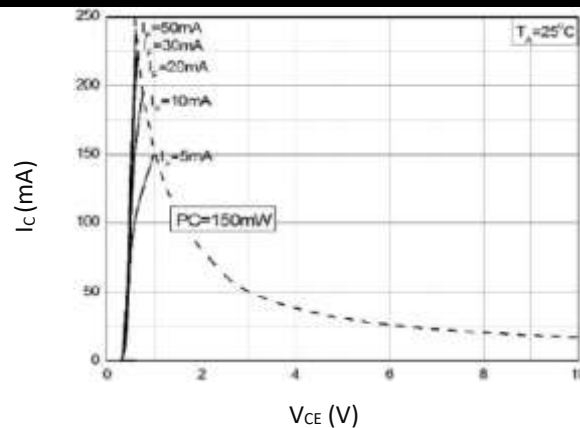
Collector Dark Current v.s. Ambient Temperature



Collector Current v.s. Collector-Emitter Voltage

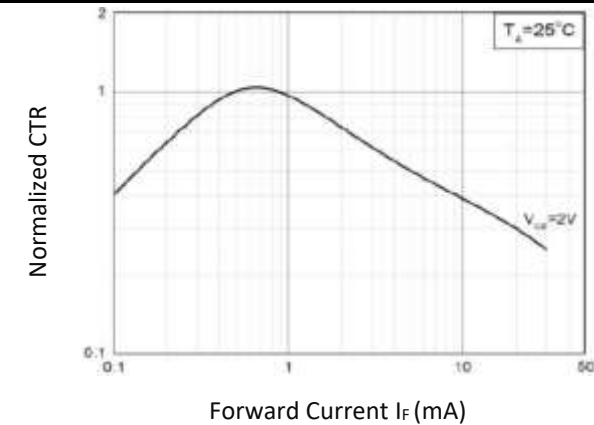


Collector Current v.s. Collector-Emitter Voltage

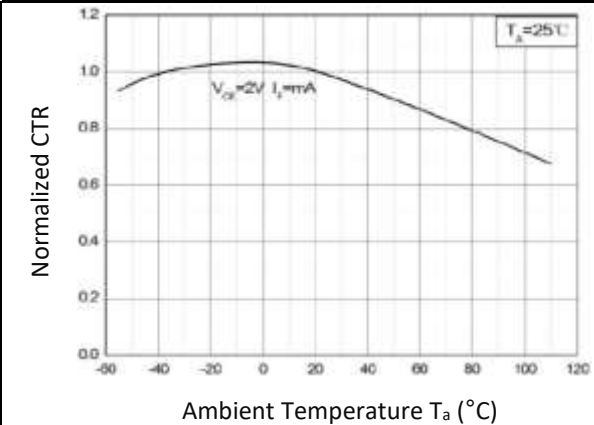


CHARACTERISTIC CURVES:

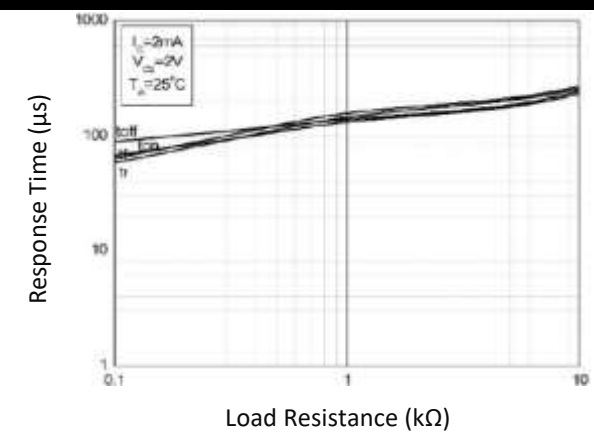
Normalized Current Transfer Ratio v.s. Forward Current



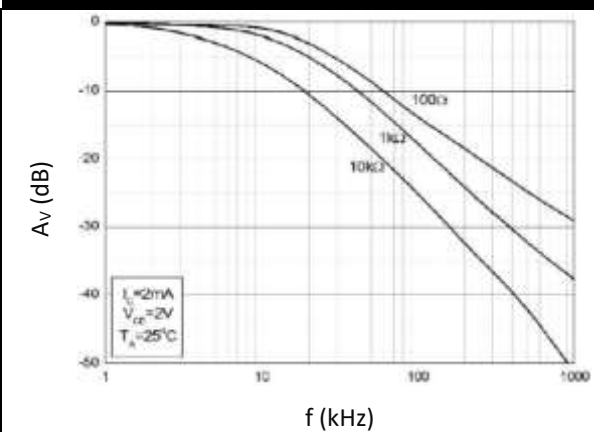
Normalized Current Transfer Ratio v.s. Ambient Temperature



Switching Time v.s. Load Resistance

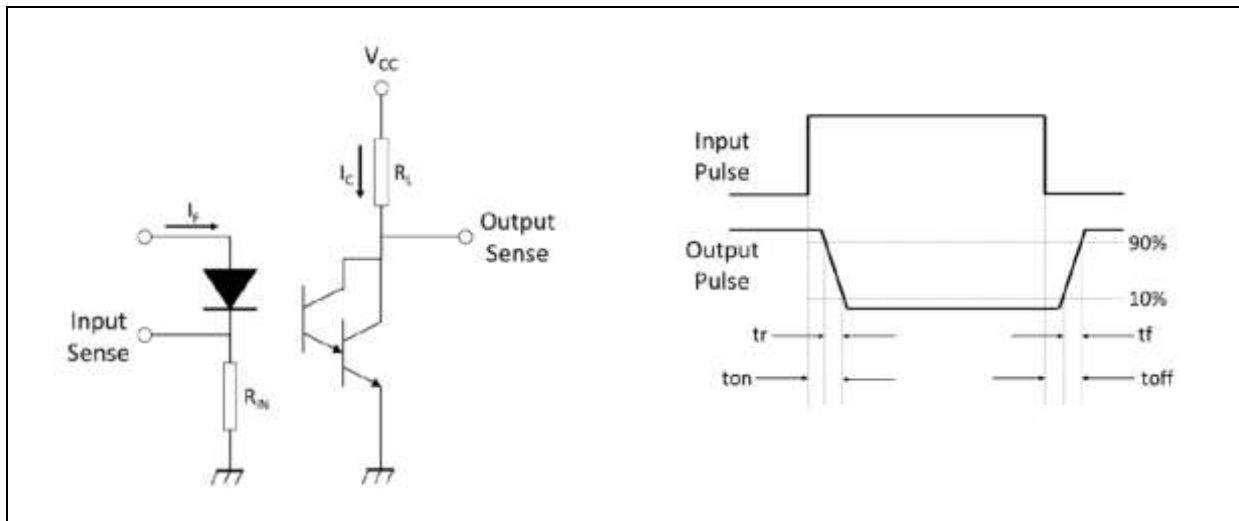


Frequency Response

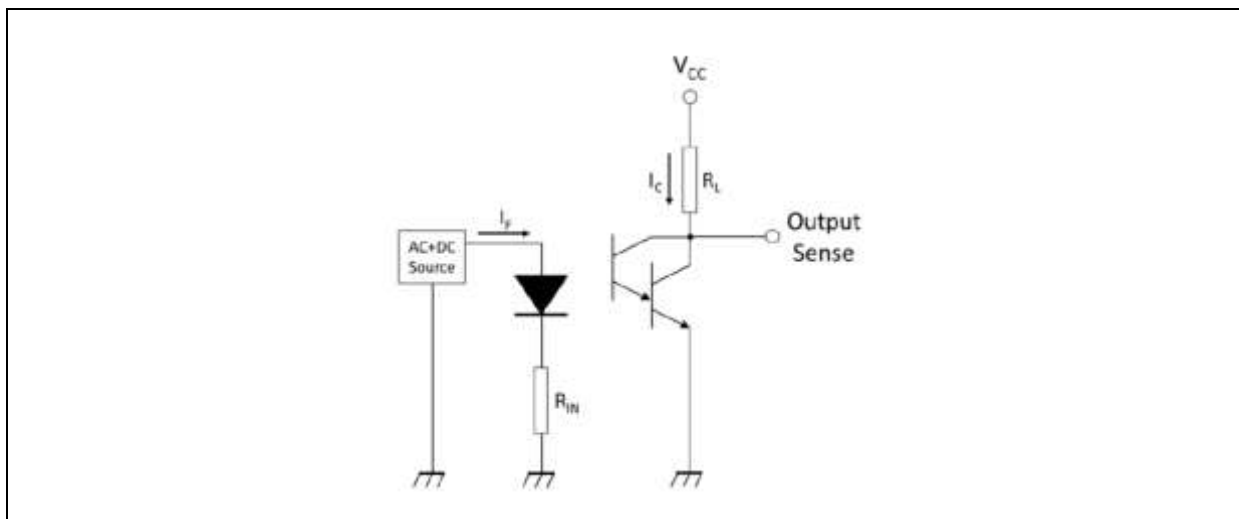


TEST CIRCUIT:

Test Circuit and Waveforms of Response Time:



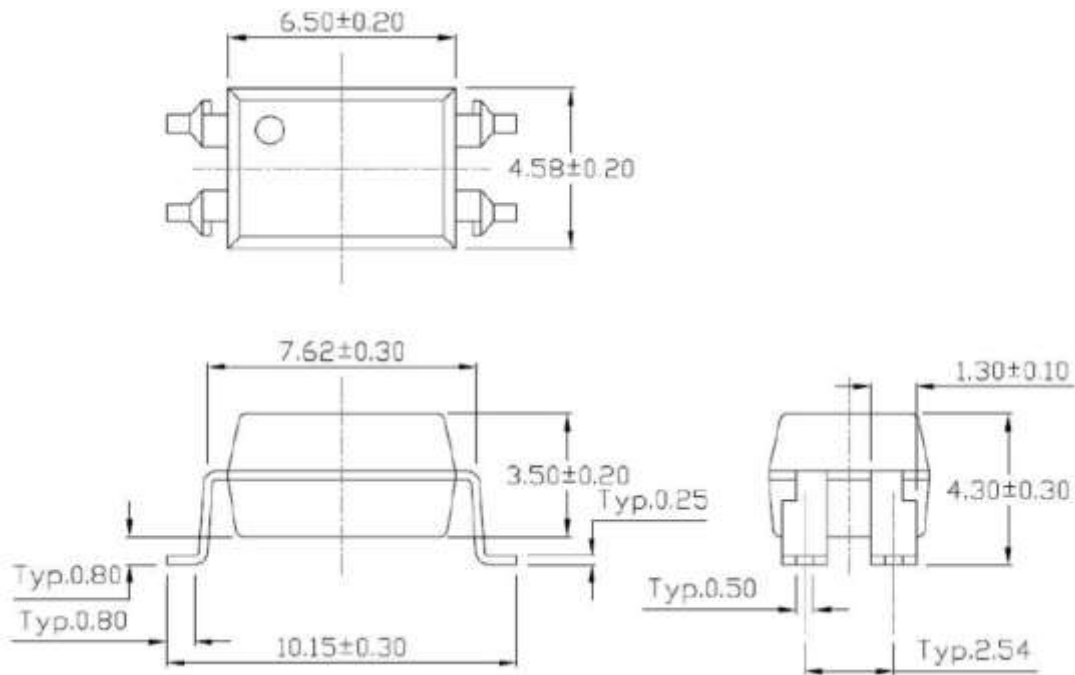
Test Circuit of Frequency Response:



OUTLINE DIMENSION:

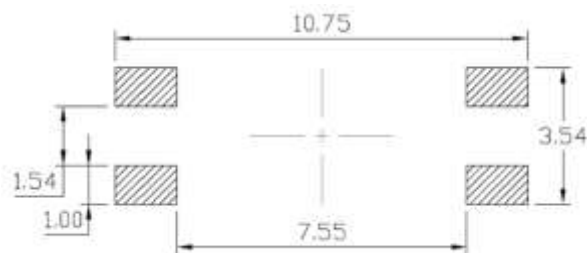
Package Dimension:

Surface Mount Lead Forming - SMD (S Type)



1. All dimensions are in millimetre (mm).

Recommended Soldering Mask:



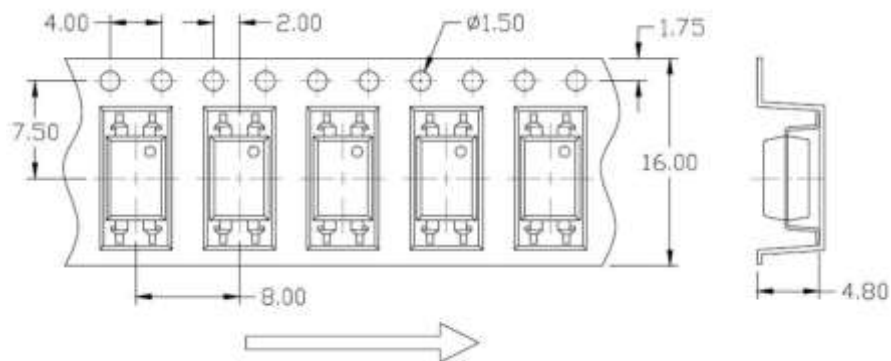
1. Dimensions are in millimetre (mm).

PACKING SPECIFICATION:

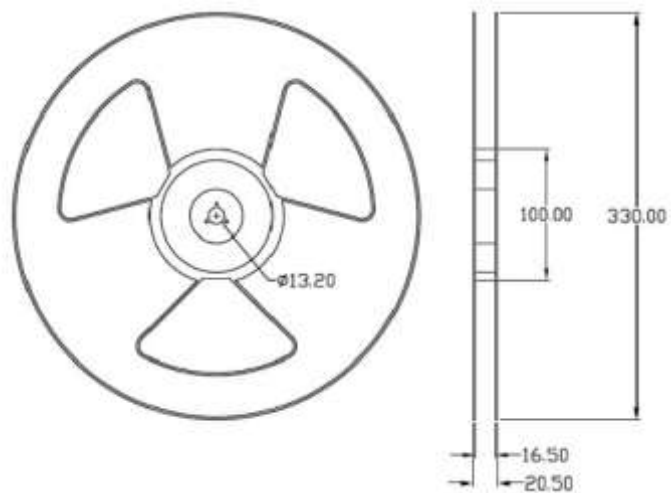
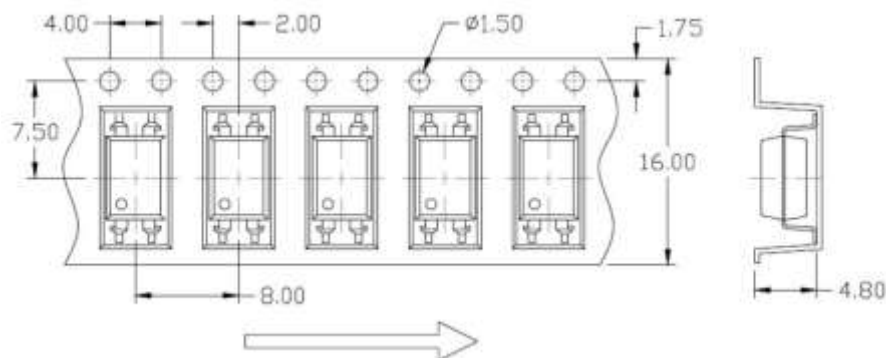
Reel Dimension:

T1(default)/T2: 1500pcs/reel

Reel Option: T1(default)



Reel Option: T2

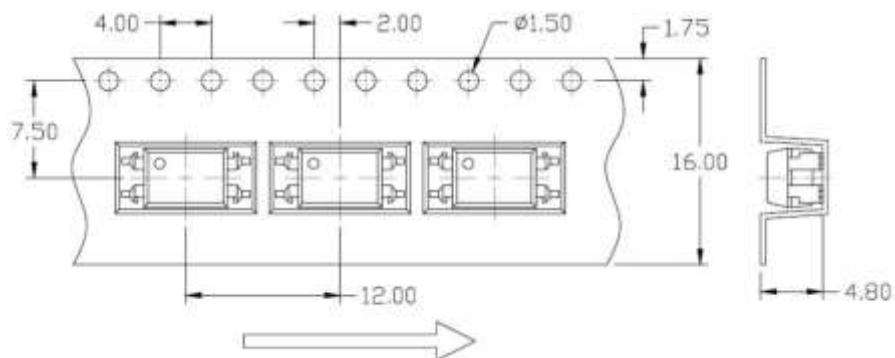


PACKING SPECIFICATION:

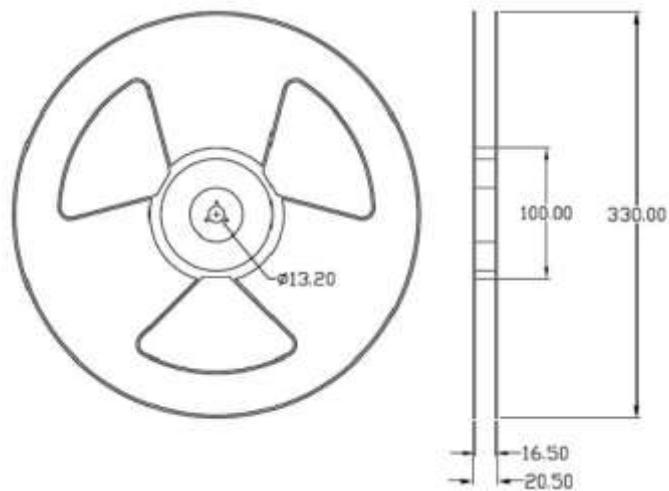
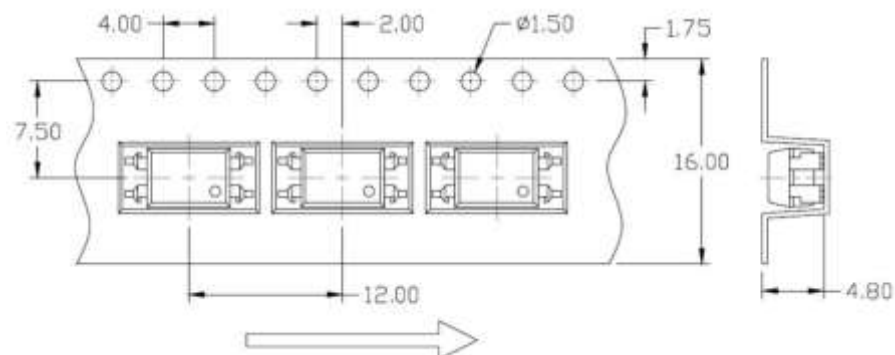
Reel Dimension:

T3/T4: 1000pcs/reel

Reel Option: T3



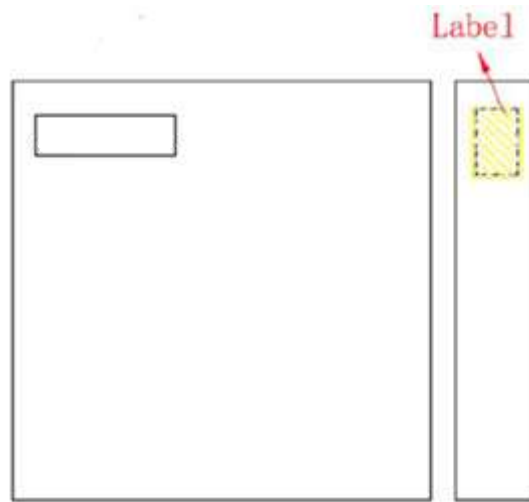
Reel Option: T4



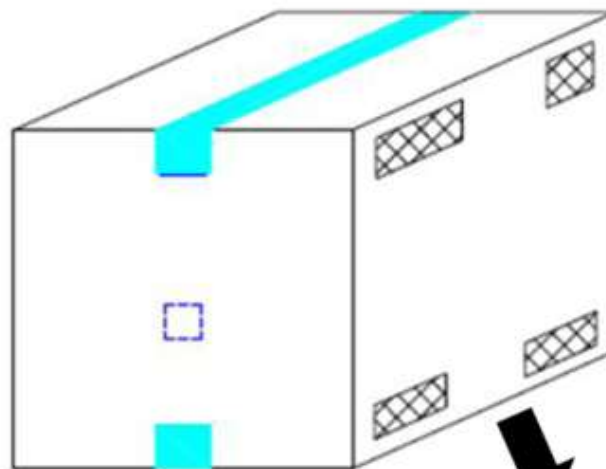
PACKING SPECIFICATION:

Box Dimension:

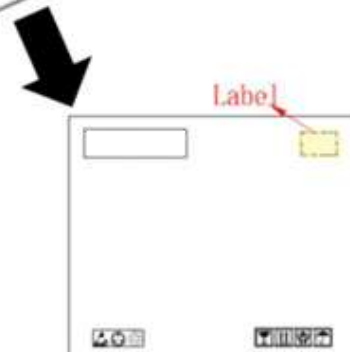
T1/T2: 3 reels (4.5Kpcs)/inner box, 5 inner boxes (22.5Kpcs)/carton
 T3/T4: 3 reels (3Kpcs)/inner box, 5 inner boxes (15Kpcs)/carton



● L x W x H = 36cm x 36cm x 6.9cm

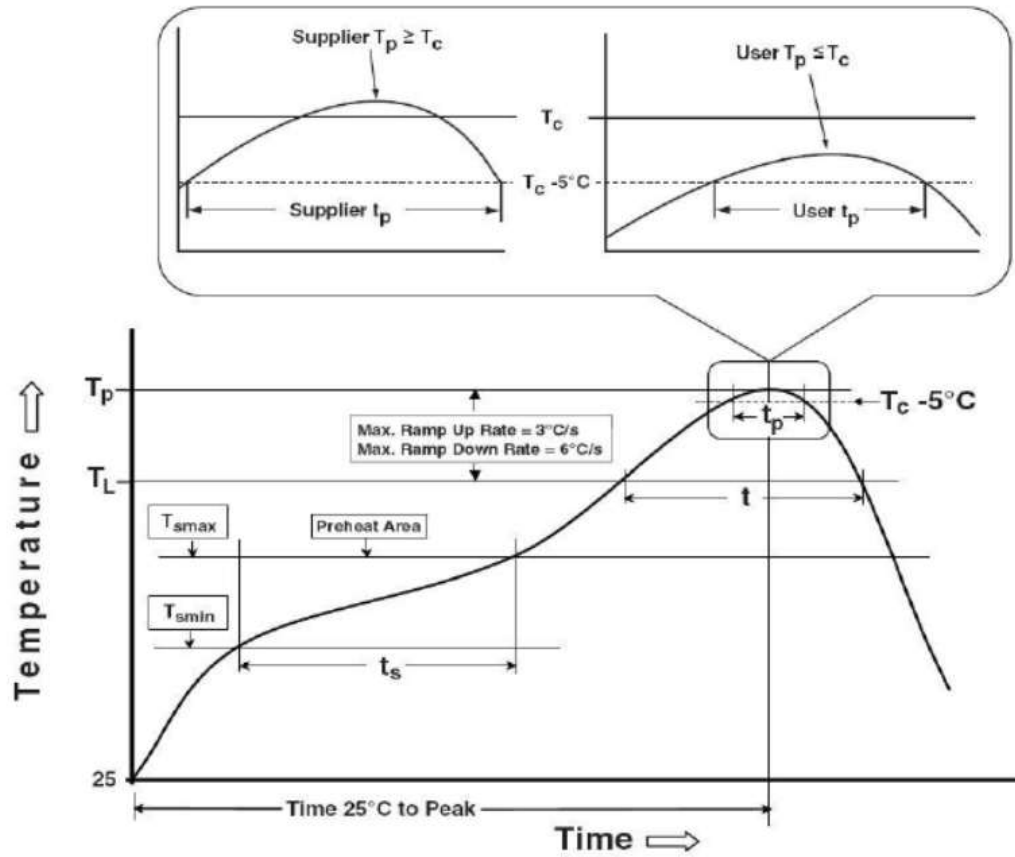


● L x W x H = 45cm x 38cm x 38cm



RECOMMENDED SOLDERING PROFILE:

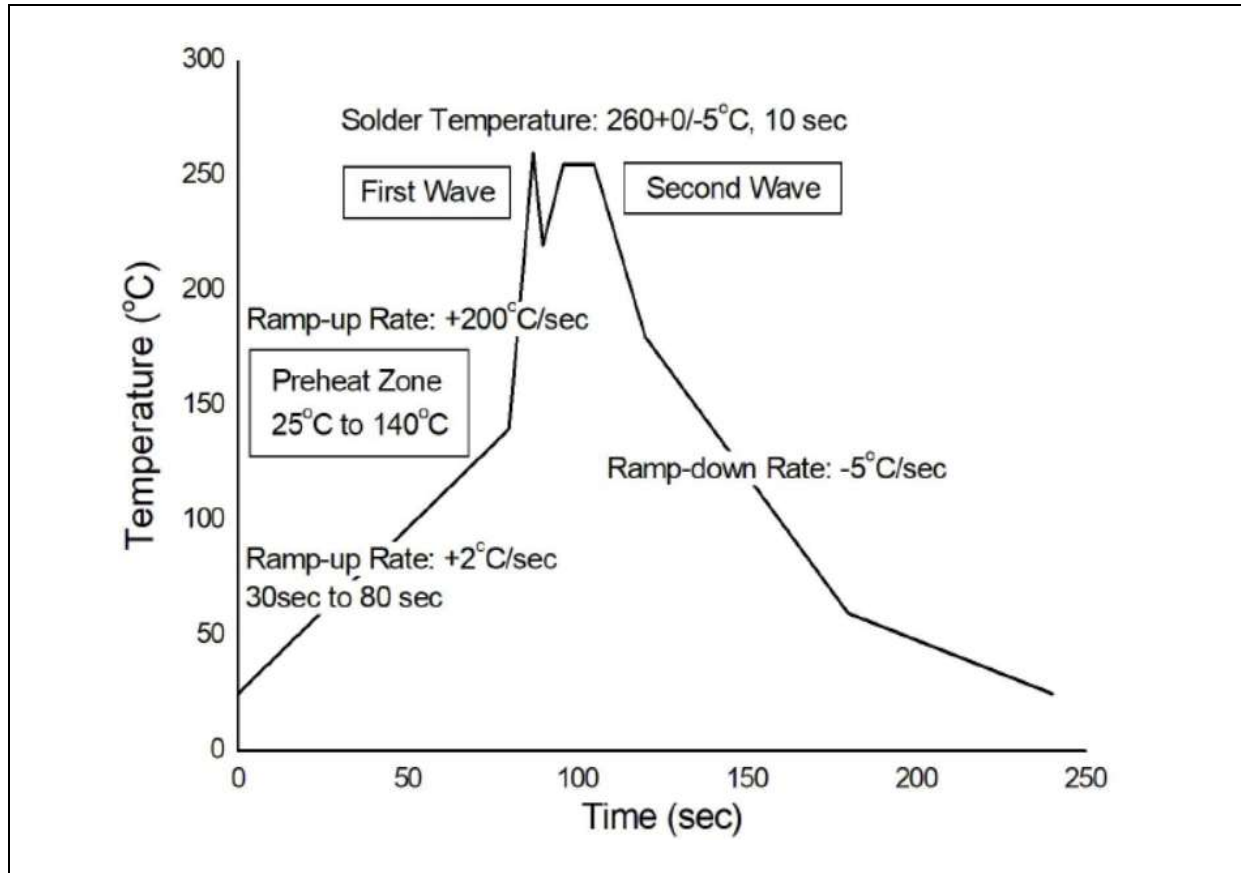
Reflow Information:



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	100°C	150°C
Temperature Max. (T_{smax})	150°C	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.

RECOMMENDED SOLDERING PROFILE:

Wave Soldering (JESD22-A111 Compliant):



Hand Soldering:

Soldering Temperature	380±5°C
Soldering Time	3 sec max.

Note:

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