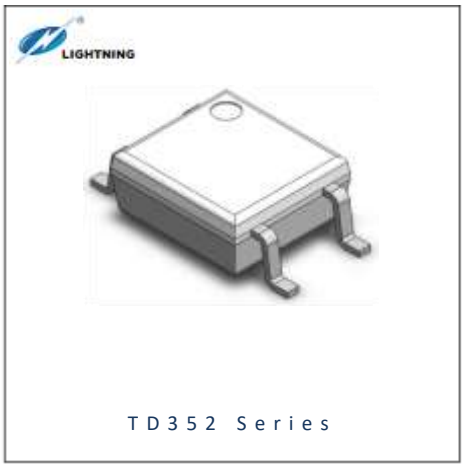
BRIGHTEK
BRIGHTEK (EUROPE) LIMITED
Brighten Up The World With LED!

PRODUCT DATASHEET

- ▶ DC Input Photo Coupler
- ▶ SOP4
- ▶ High Voltage Darlington Transistor

Release Date: 07 July 2025 Version: A00

TD352(T1)-GV



TD352 Series

TD352 Series

DESCRIPTION:

The TD352 series combines an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar high voltage Darlington phototransistor detector in a plastic SOP4 package.

With the robust coplanar double mold structure, TD352 series provide the most stable isolation feature.

APPLICATIONS:

- Sequence controller
- Telephone/FAX
- System appliances, measuring instrument
- Programmable logic controller

FEATURES:

- High isolation 3750Vrms
- DC 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
  - cUL - CSA Component Acceptance Service Notice 5A
- Packing: 16mm tape with 3000pcs/reel, ø330mm (13'')

Partner with: LIGHTNING

NAMING & ORDERING INFORMATION:

Naming Information:

TD352 (T1) - G V	
TD352	Part Number
T1	Selection: Tape and Reel Option (T1(default)/T2)
G	Green Option
V	VDE Option

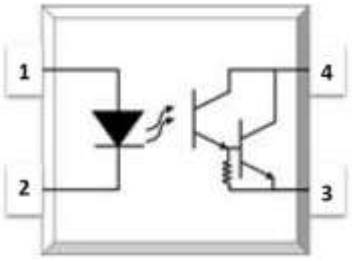
Ordering Information:

TD352(T1)-GV

Version No.	Original Release Date
Rev: A00	19/09/2024

SCHEMATIC DIAGRAM & MARKING:

Schematic Diagram:



PIN Definition	
1	Anode
2	Cathode
3	Emitter
4	Collector

Marking Information:

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

Labelling Information:

This product is manufactured by

LIGHTNING

for Brightek (Europe) Limited

ABSOLUTE CHARACTERISTICS:

Absolute Maximum Ratings:

Parameter	Symbol	Ratings	Unit
INPUT			
Forward Current	I_F	60	mA
Peak Forward Current	I_{FP}	1 *1	A
Reverse Voltage	V_R	6	V
Input Power Dissipation	P_I	100	mW
OUTPUT			
Collector-Emitter Voltage	V_{CEO}	350	V
Emitter-Collector Voltage	V_{ECO}	0.1	V
Collector Current	I_C	150	mA
Output Power Dissipation	P_O	150	mW
COMMON			
Total Power Dissipation	P_{tot}	200	mW
Isolation Voltage	V_{iso}	3750 *2	Vrms
Operating Temperature	T_{opr}	-55~+110	°C
Storage Temperature	T_{stg}	-55~+125	°C
Soldering Temperature	T_{sol}	260 *3	°C

*1. 100μs pulse, 100Hz frequency
*2. AC for 1 minute, R.H.=40~60%
*3. For 10 seconds

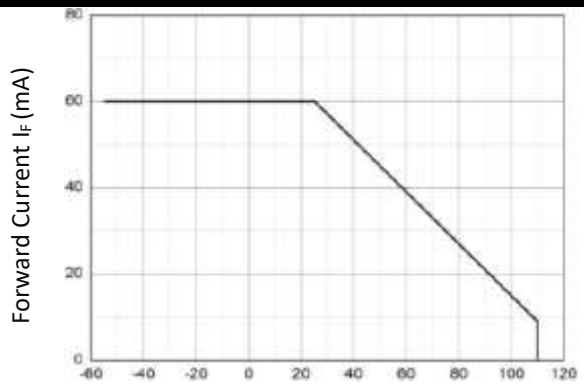
ELECTRICAL CHARACTERISTICS:

Electrical Optical Characteristics at T_a=25°C:

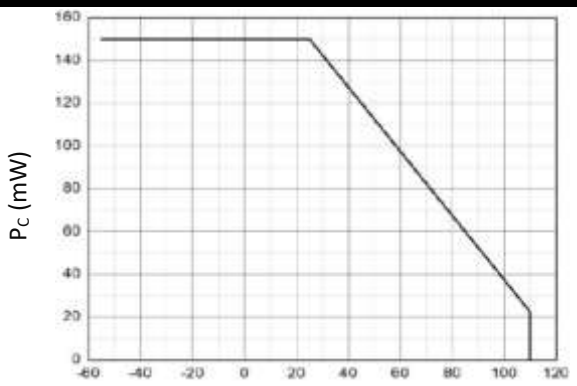
Parameter	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
INPUT						
Forward Voltage	V_F	---	1.24	1.4	V	I_F=10mA
Reverse Current	I_R	---	---	10	μA	V_R=6V
Input Capacitance	C_{IN}	---	10	---	pF	V=0, f=1kHz
OUTPUT						
Collector Dark Current	I_{CEO}	---	---	200	nA	V_{CE}=200V, I_F=0mA
Collector-Emitter Breakdown Voltage	BV_{CEO}	350	---	---	V	I_C=0.1mA, I_F=0mA
Emitter-Collector Breakdown Voltage	BV_{ECO}	0.1	---	---	V	I_E=0.1mA, I_F=0mA
TRANSFER CHARACTERISTICS						
Current Transfer Ratio	CTR	1000	---	15000	%	I_F=1mA, V_{CE}=2V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	---	---	1.2	V	I_F=20mA I_C=100mA
Isolation Resistance	R_{IO}	10^{12}	10^{14}	---	Ω	DC=500V 40~60% R.H.
Floating Capacitance	C_{IO}	---	0.6	1	pF	V=0, f=1MHz
Cutt-off Frequency	f_c	---	6	---	kHz	I_C=2mA, V_{CE}=2V R_L=100Ω, -3dB
Response Time (Rise)	t_r	---	91.5	300	μs	I_C=20mA, V_{CE}=2V R_L=100Ω
Response Time (Fall)	t_f	---	21.4	100	μs	I_C=20mA, V_{CE}=2V R_L=100Ω

CHARACTERISTIC CURVES:

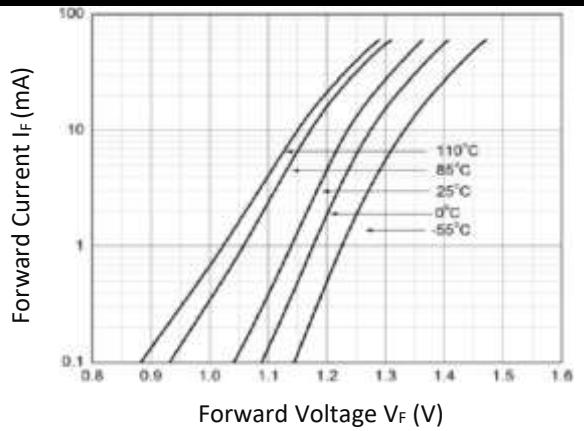
Forward Current v.s. Ambient Temperature



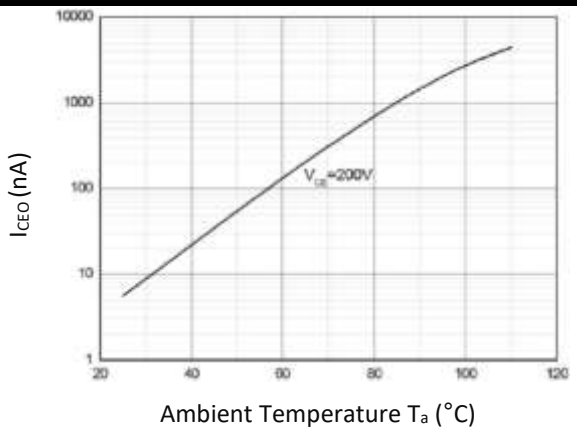
Collector Power Dissipation v.s. Ambient Temperature



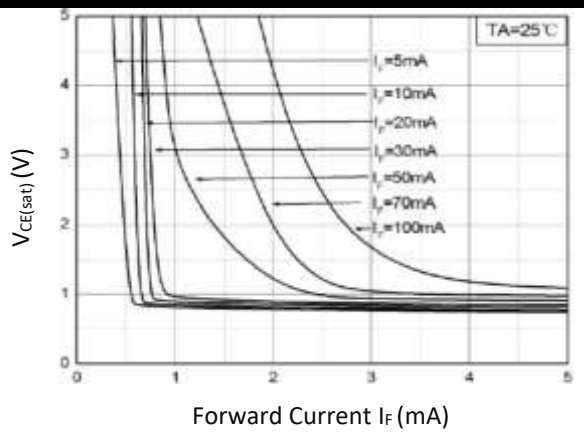
Forward Current v.s. Forward Voltage



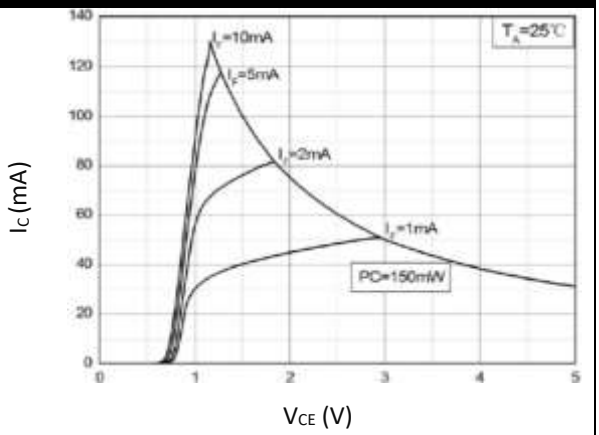
Collector Dark Current v.s. Ambient Temperature



Collector-Emitter Saturation Voltage v.s. Forward Current

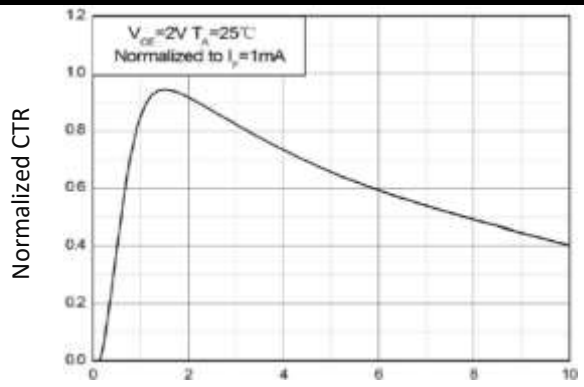


Collector Current v.s. Collector-Emitter Voltage

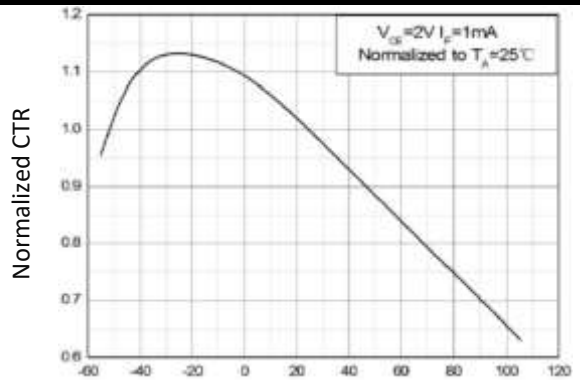


CHARACTERISTIC CURVES:

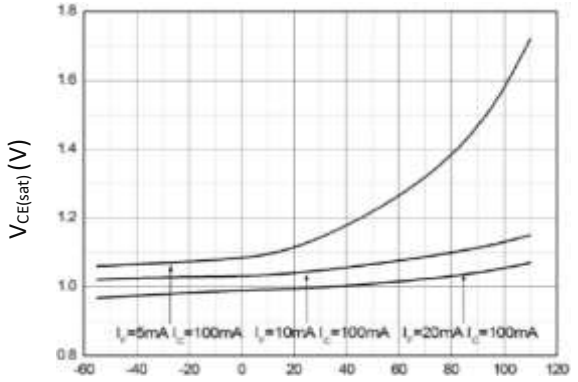
Normalized Current Transfer Ratio v.s. Forward Current



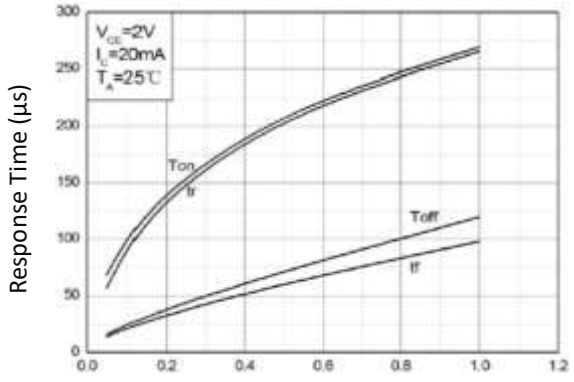
Normalized Current Transfer Ratio v.s. Ambient Temperature



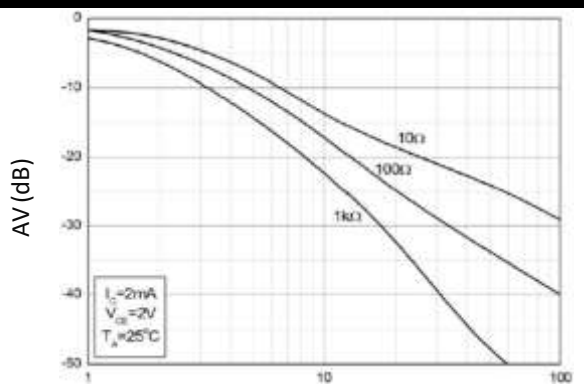
Collector-Emitter Saturation Voltage v.s. Ambient Temperature



Switching Time v.s. Load Resistance

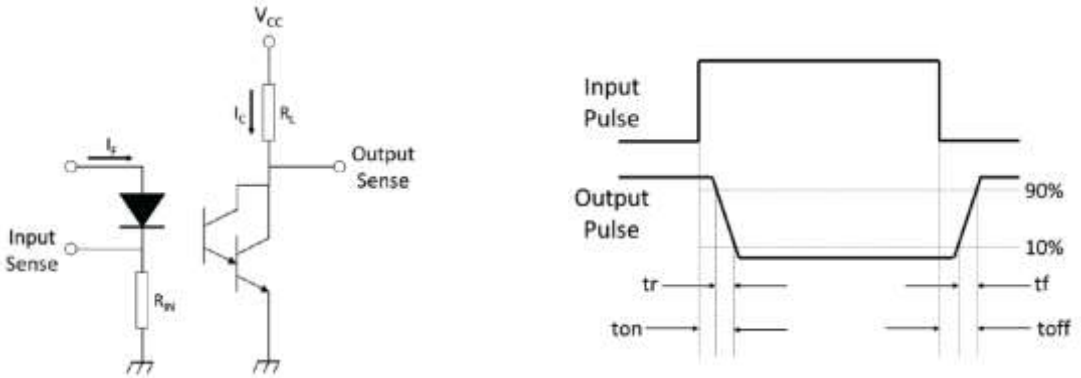


Frequency Response

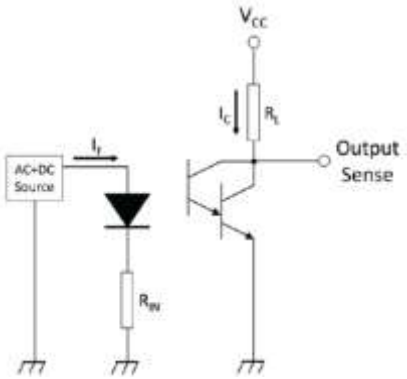


TEST CIRCUIT:

Test Circuit and Waveforms of Response Time:



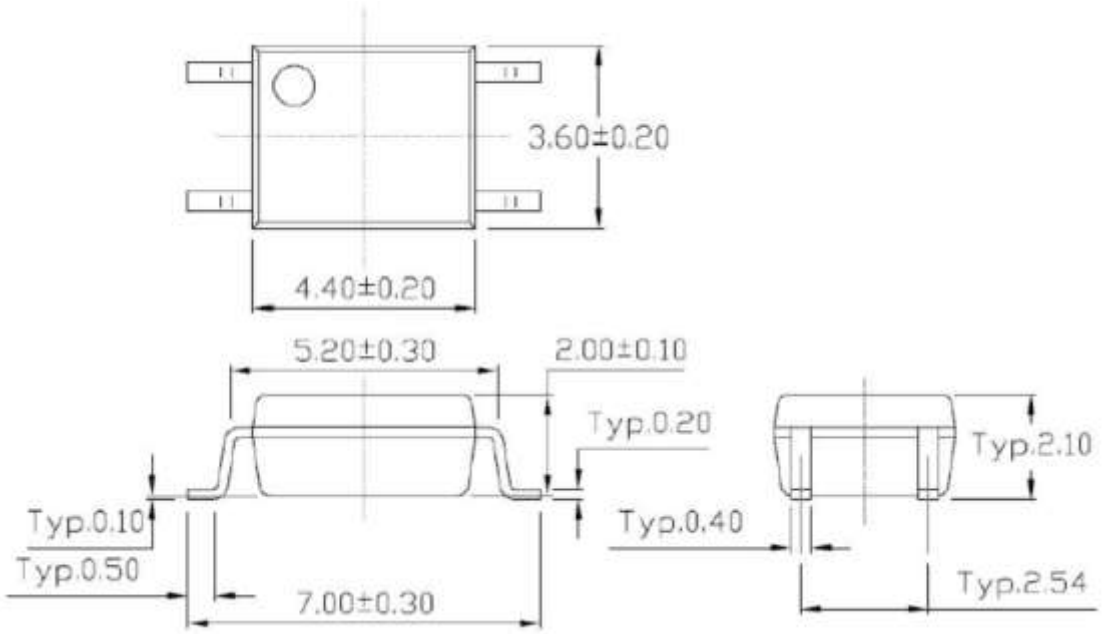
Test Circuit of Frequency Response:



OUTLINE DIMENSION:

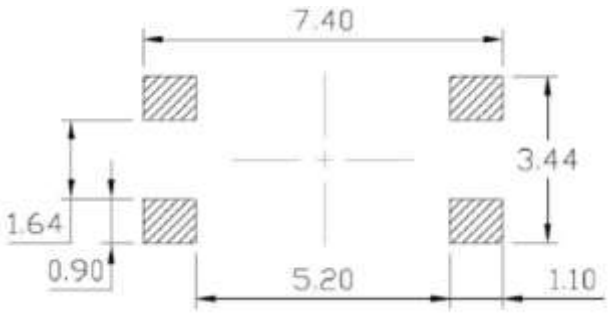
Package Dimension:

Surface Mount Lead Forming - SMD



1. All dimensions are in millimetre (mm).

Recommended Soldering Mask:



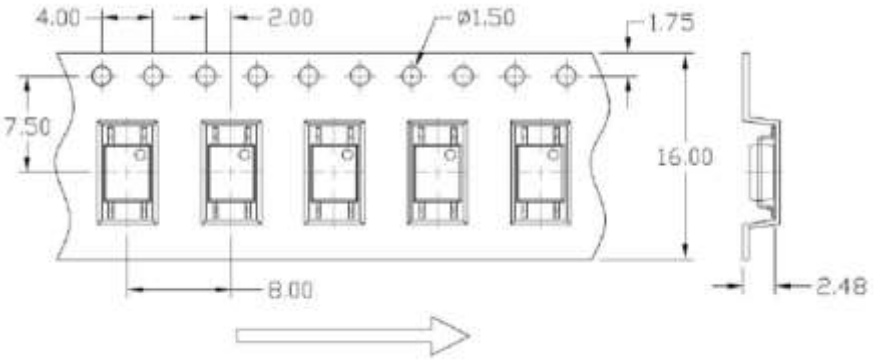
1. Dimensions are in millimetre (mm).

PACKING SPECIFICATION:

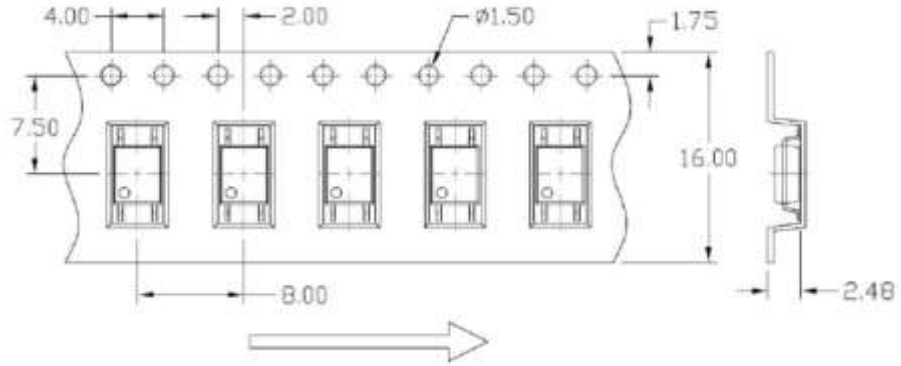
Reel Dimension:

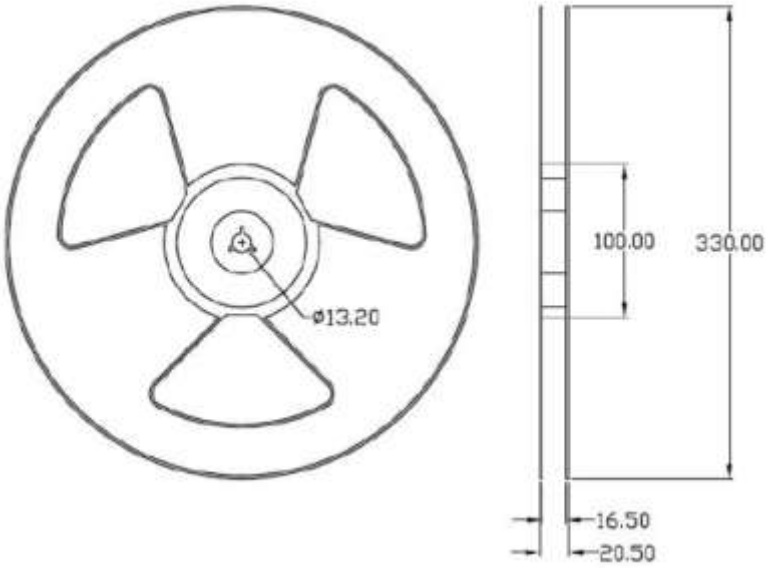
3000pcs/reel

Reel Option: T1 (default)



Reel Option: T2

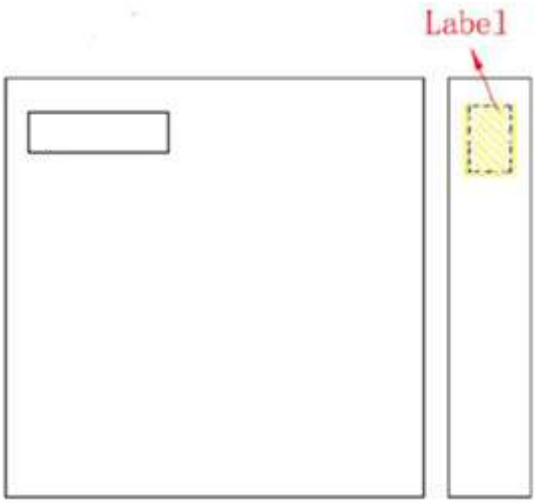




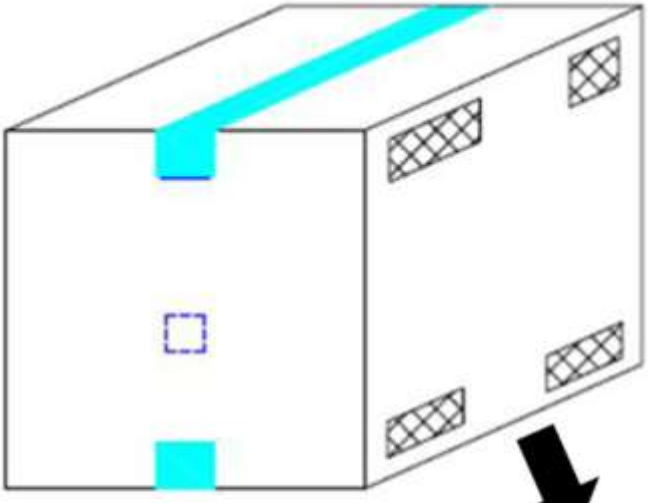
PACKING SPECIFICATION:

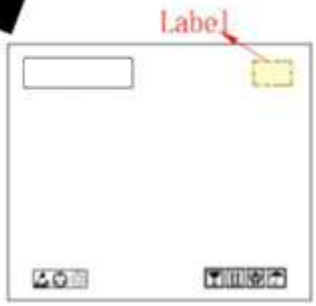
Box Dimension:

3 reel (3Kpcs)/inner box, 5 inner box (45Kpcs)/carton



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

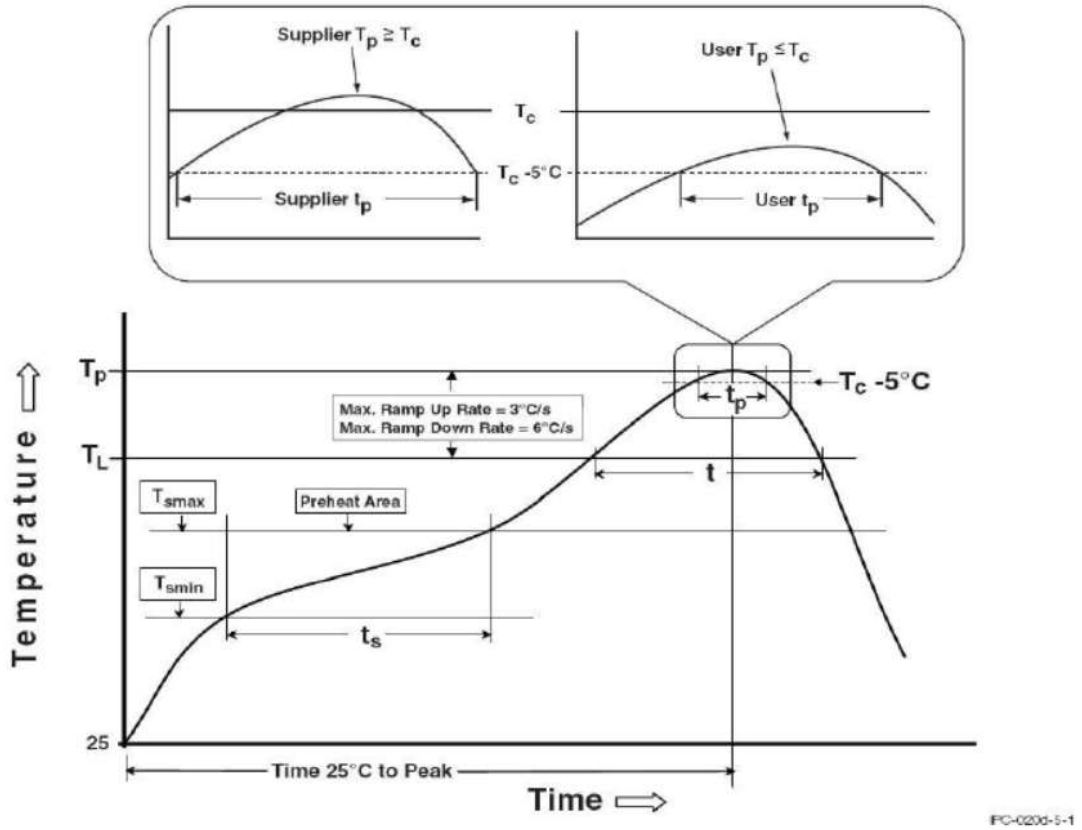




- L x W x H = 45cm x 38cm x 38cm

RECOMMENDED SOLDERING PROFILE:

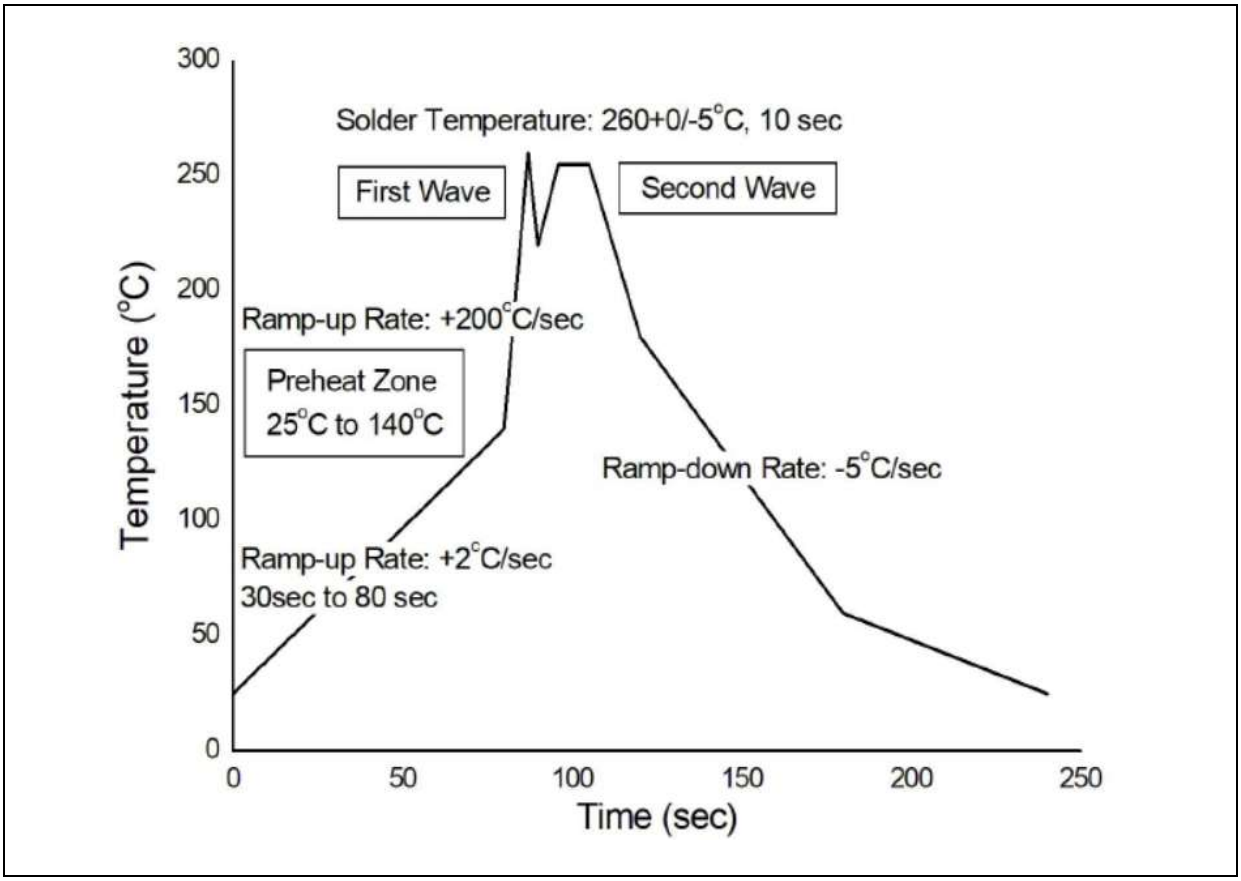
Reflow Information:



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.