TDRM214 Series

SOP4, DC Input, 400V Normally Open PhotoMOS Relay

Description

The TDRM214series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a photovoltaic chip to drive two MOSFET in a plastic SOP4 package with different lead forming options.

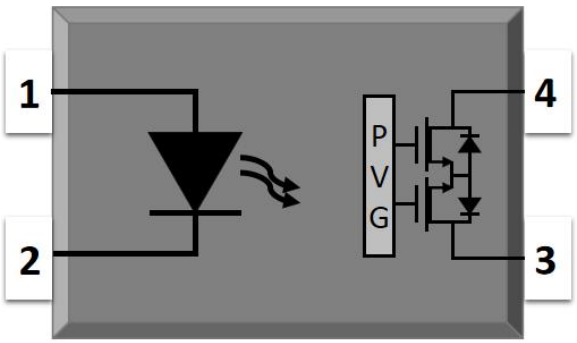
Features

- Normally open signal pole signal throw relay
- Low operating current
- 400V output withstand voltage
- Low on resistance
- High isolation 3750 VRMS
- Operating temperature range - 40 °C to 85 °C
- RoHS & REACH Compliance
- 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

- Computer peripheral interface
- Telephone equipment
- Data communication equipment
- Computers

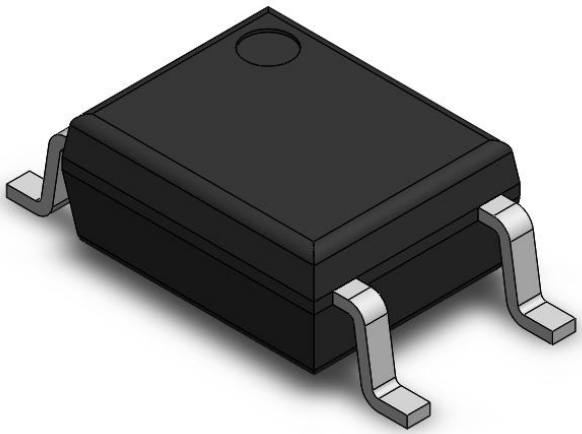
SCHEMATIC



PIN DEFINITION

1.LED Anode	3.MOSFET Drain
2.LED Cathode	4.MOSFET Drain

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				
Load Voltage	V_L	400	V	
Continuous Load Current	I_L	130	mA	
Peak Load Current	I_{PEAK}	250	mA	
Output Power Dissipation	P_O	500	mW	
COMMON				
Total Power Dissipation	Ptot	550	mW	
Isolation Voltage	Viso	3750	Vrms	2
Operating Temperature	Topr	-40~85	°C	
Storage Temperature	Tstg	-40~125	°C	
Soldering Temperature	Tsol	260	°C	

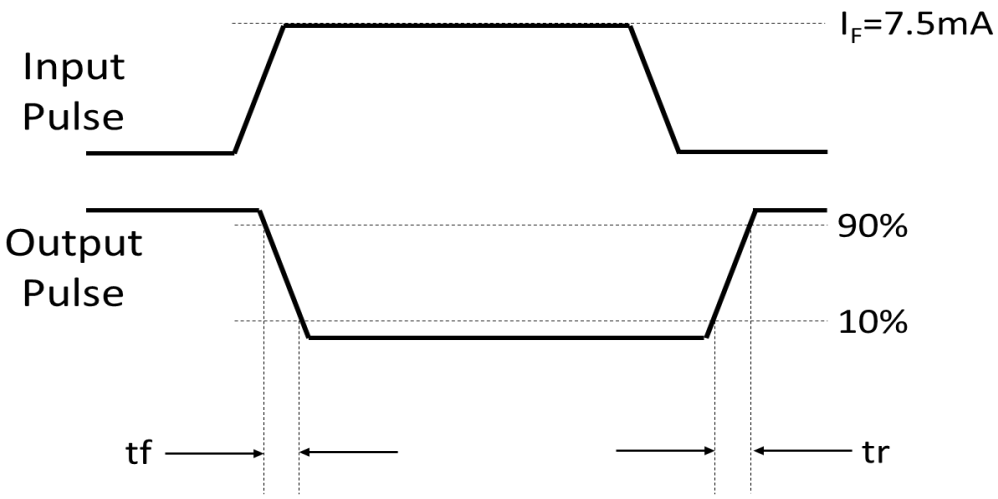
Note 1. AC For 1 Minute, R.H. = 40 ~ 60%

Note 2. For 10 seconds

ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C							
PARAMETER	SYMBOL	MIN	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
INPUT							
Forward Voltage	V_F	-	1.3	1.5	V	IF=10mA	
Reverse Current	I_R	-	-	1	μA	VR=5V	
OUTPUT							
Off State Leakage Current	I_{LEAK}	-	-	1	μA	V_L=Rated V_L, IF=0	
On Resistance	$Rd_{(ON)}$	-	23	30	Ω	IF=5mA, IL=130mA t=1s	
Output Capacitance	C_{OUT}	-	50	-	pF	VL=0, f=1MHz	
TRANSFER CHARACTERISTICS							
Isolation Resistance	R_{ISO}	10^10	-	-	Ω	DC500V, 40 ~ 60% R.H.	
Floating Capacitance	C_{IO}	-	1.5	-	pF	VL=0, f=1MHz	
LED turn on Current	I_F(on)	-	0.8	3	mA	IL=130mA	
LED turn off Current	I_F(off)	0.3	0.7	-	mA		
Turn On Time	Ton	-	0.3	3	ms	IF=10mA, IL=130mA RL=200Ω	
Turn Off Time	Toff	-	0.3	1	ms		

TEST CIRCUITS

Waveforms of tr, tf



CHARACTERISTIC CURVES

Fig.1 Forward Current vs. Ambient Temperature

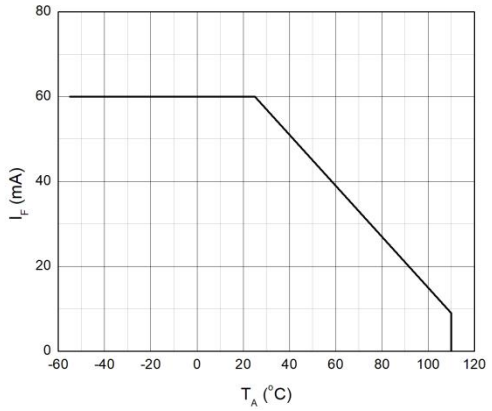


Fig.2 Collector Power Dissipation vs. Ambient Temperature

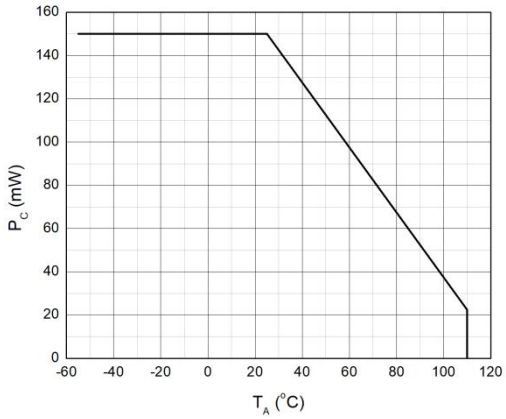


Fig.3 Forward Current vs. Forward Voltage

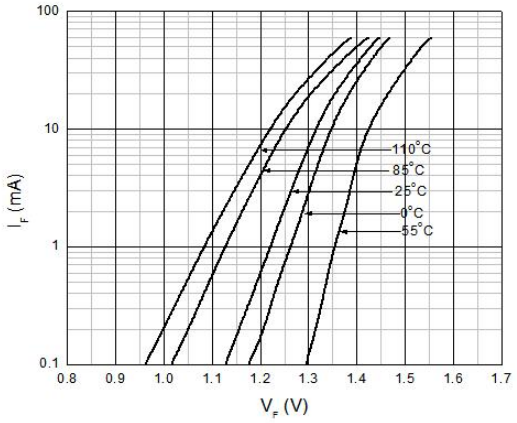


Fig.4 On Resistance vs. Ambient Temperature

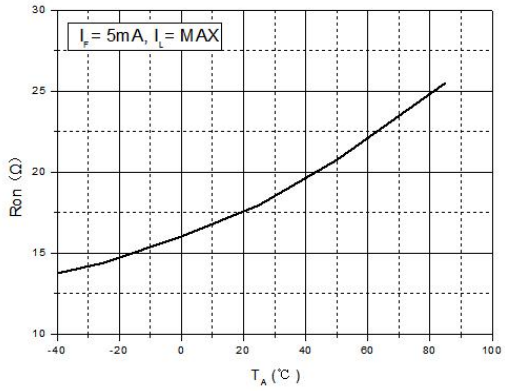


Fig.5 Switching Time vs. Ambient Temperature

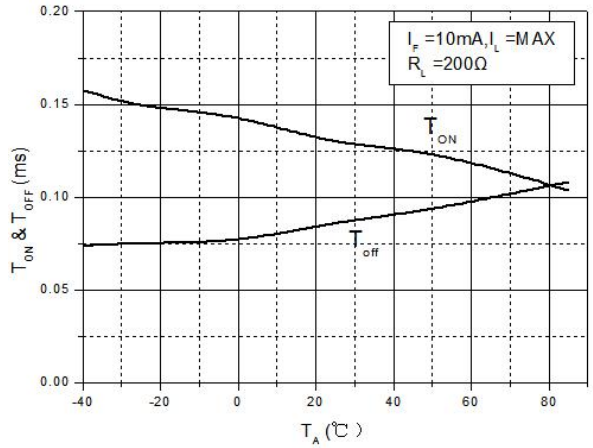
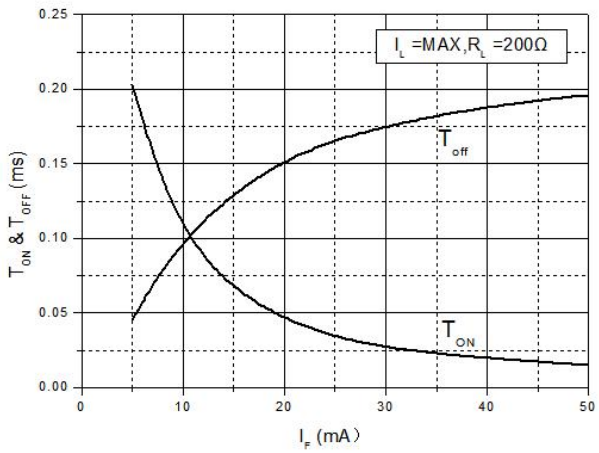


Fig.6 Switching Time vs.LED Forward Current



CHARACTERISTIC CURVES

Fig.7 LED turn on&off Current vs. Ambient Temperature

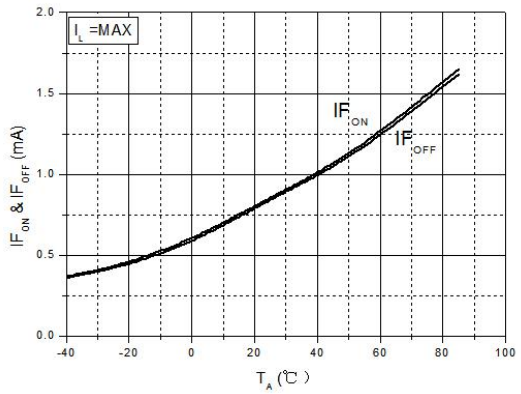


Fig.8 Load Current vs. Load voltage

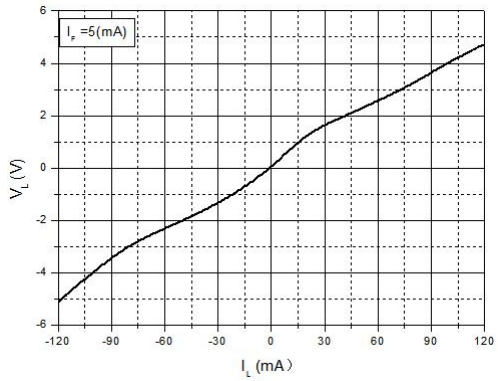


Fig.9 Off State Leakage Current vs. Load voltage

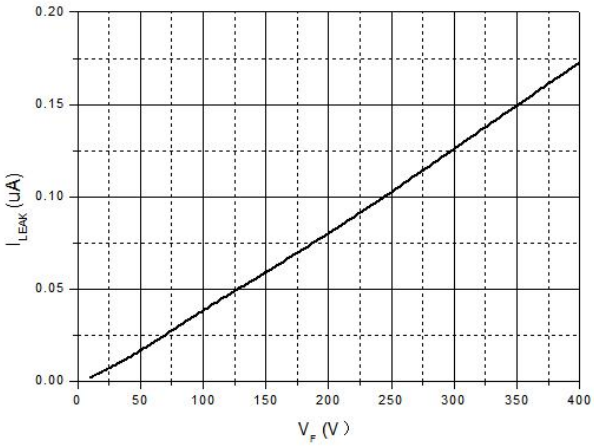
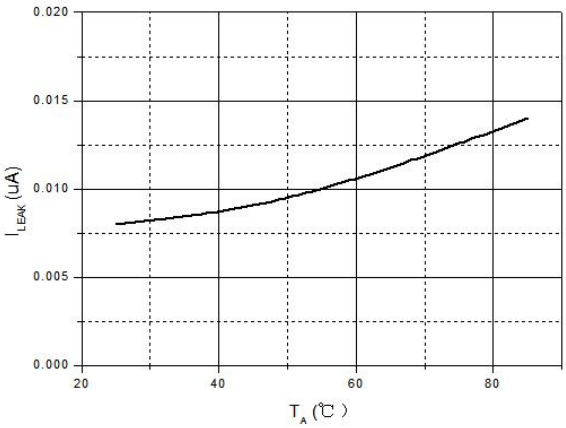
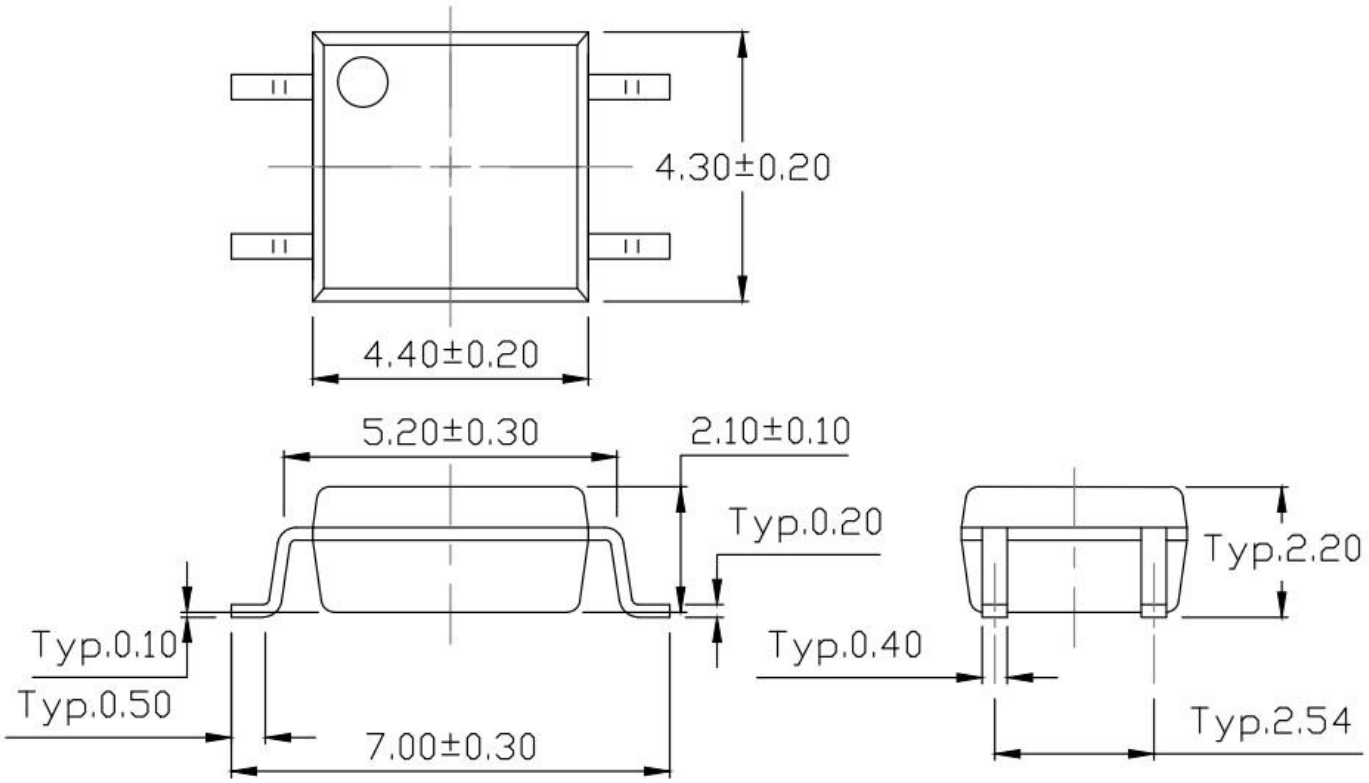


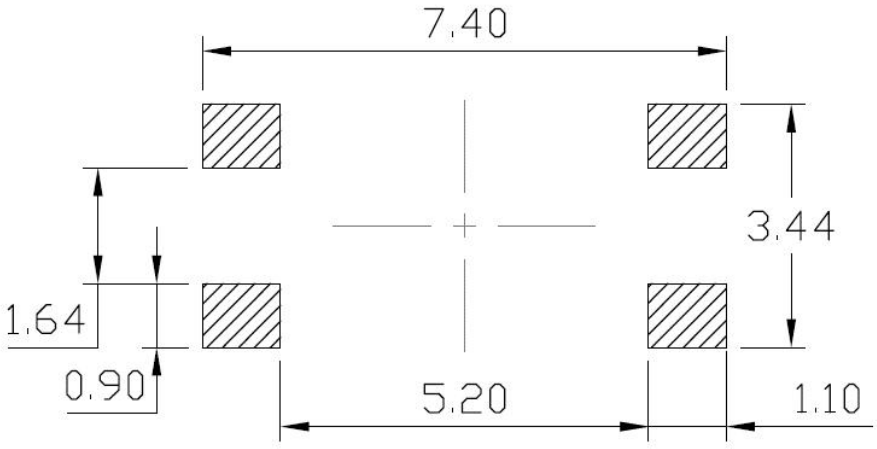
Fig.10 Off State Leakage Current vs. Ambient Temperature



PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

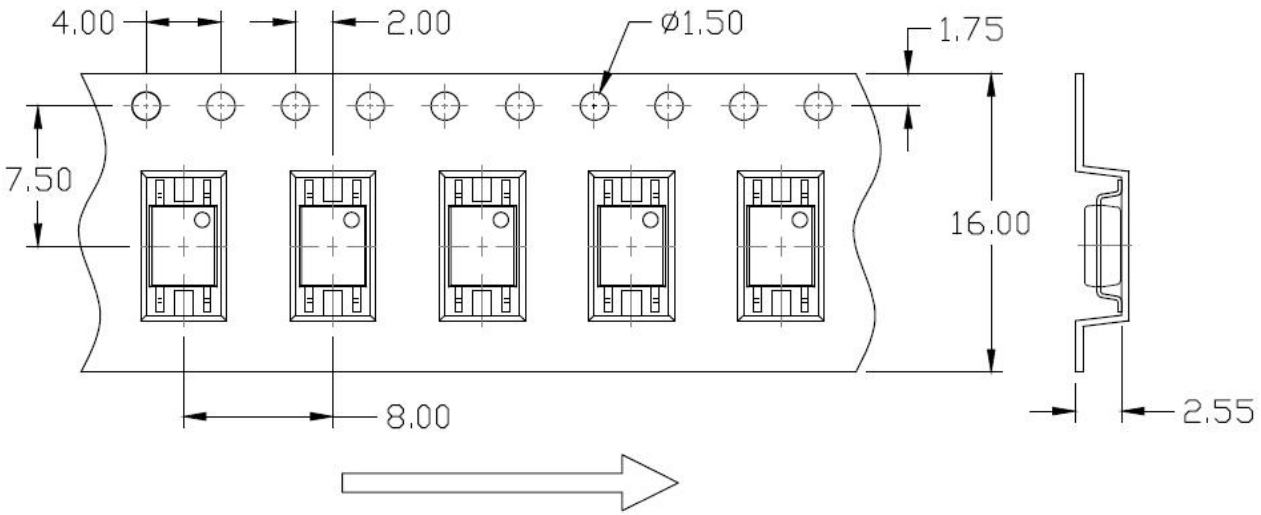


Recommended Solder Mask (Dimensions in mm unless otherwise stated)

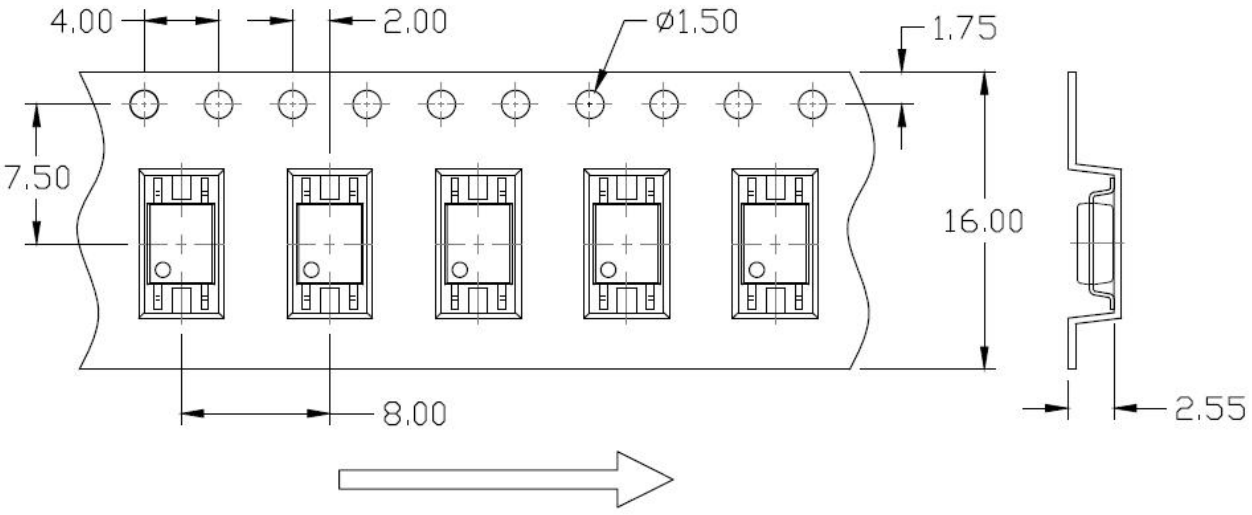


Carrier Tape Specifications (Dimensions in mm unless otherwise stated)

Option (T1)

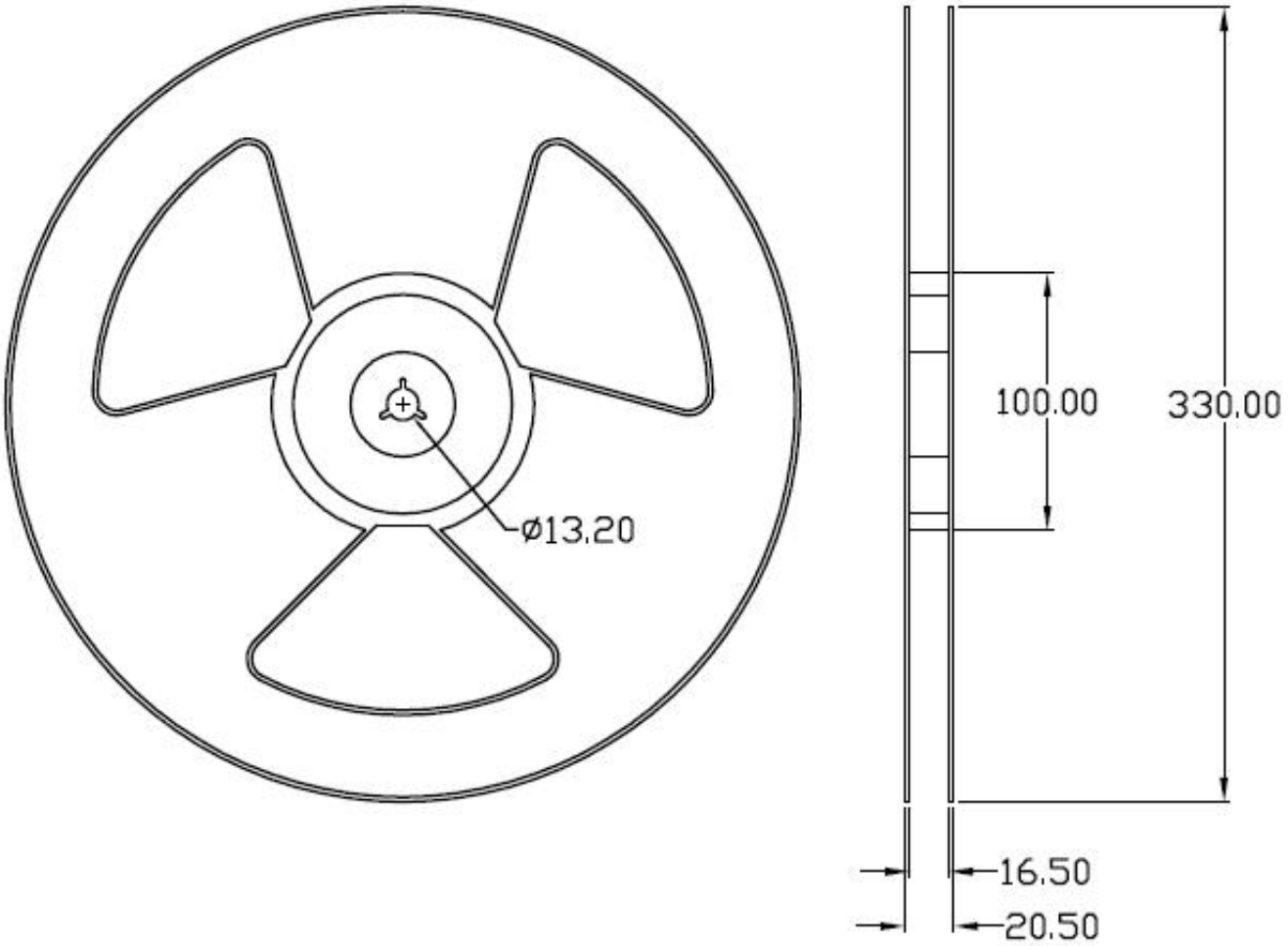


Option (T2)



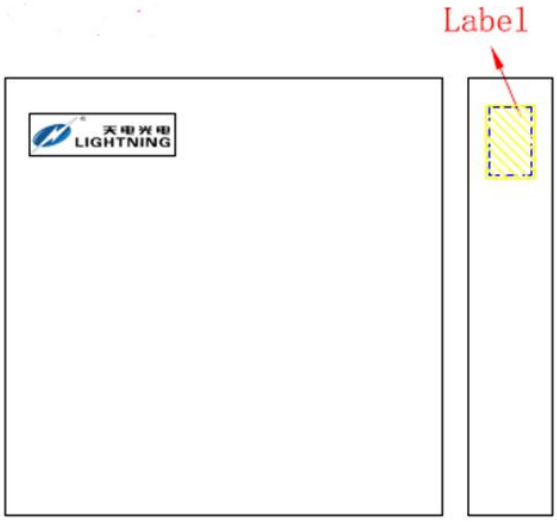
REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option T1 & T2



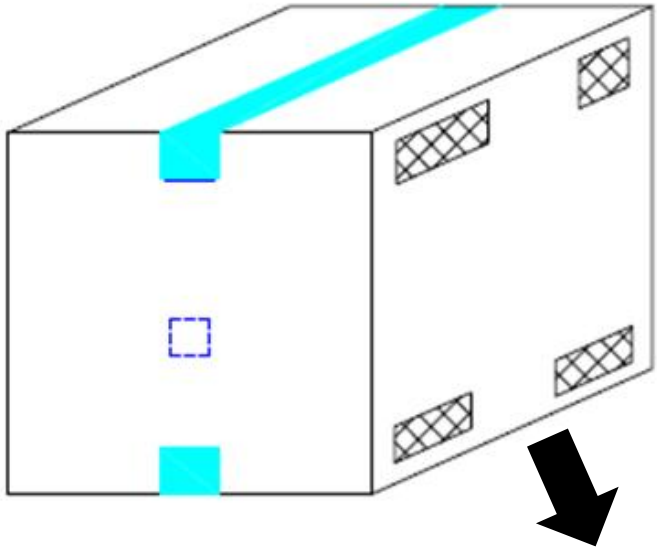
BOX SPECIFICATIONS (Reel Type)

Inner Box

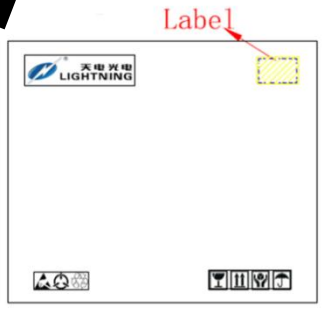


- L x W x H = 36cm x 36cm x 6.9cm

Outer Box



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



ORDERING AND MARKING INFORMATION

MARKING INFORMATION

TD : Company Abbr.
R214 : Part Number & Rank
V : VDE Option
Y : Fiscal Year
A : Manufacturing Code
WW : Work Week

ORDERING INFORMATION

TDRM214(Z)-GV

TD – Company Abbr.
RM214 – Part Number
Z – Tape and Reel Option (T1/T2)
G – Green
V – VDE Option (V or None)

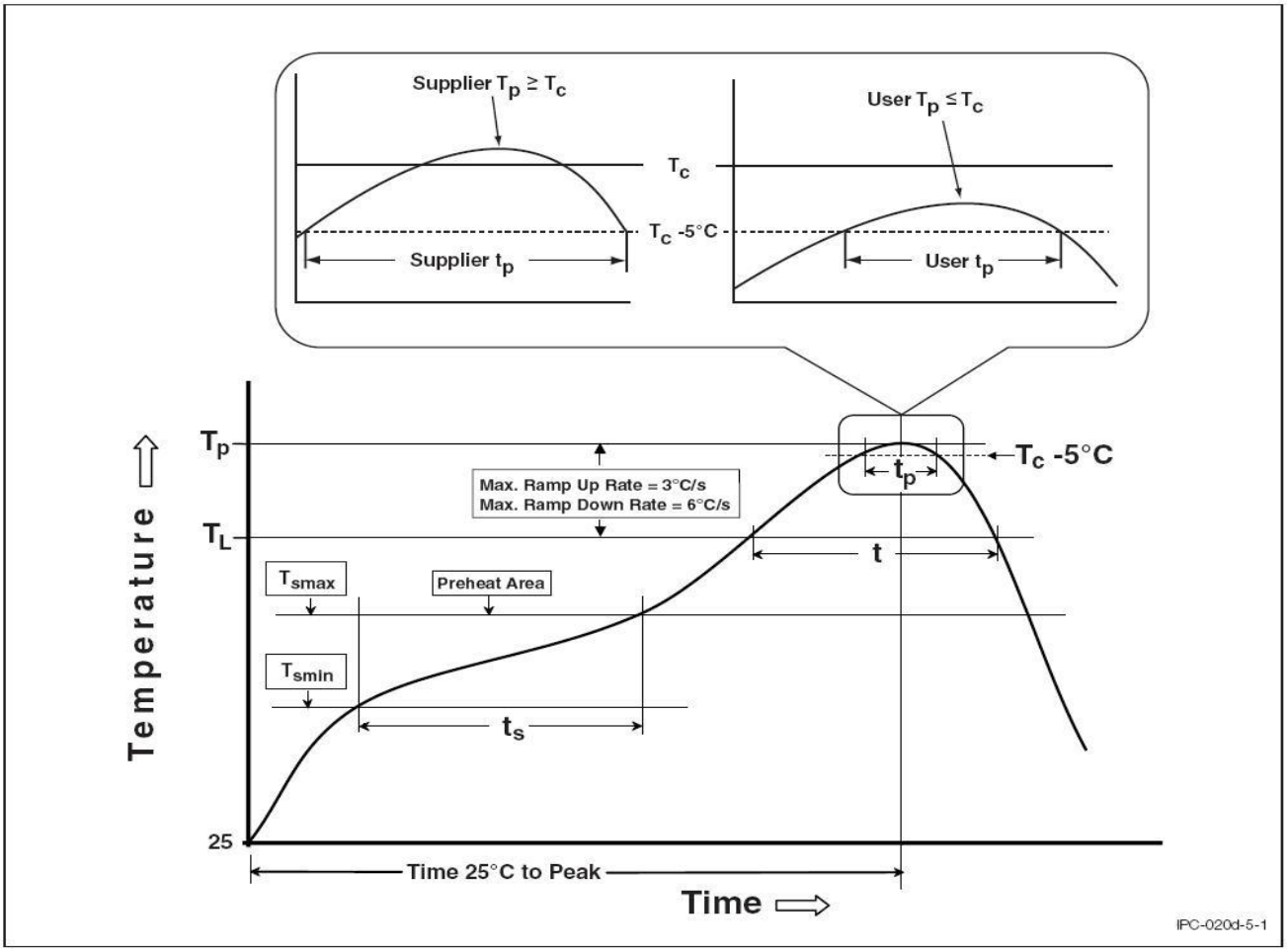
LABEL INFORMATION

PACKING QUANTITY

Option	Quantity	Quantity – Inner box	Quantity – Outer box
T1	3000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 45k Units
T2	3000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 45k Units

REFLOW INFORMATION

REFLOW PROFILE



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	100	150°C
Temperature Max. (Tsmax)	150	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds	60-120 seconds
Ramp-up Rate (tL to tP)	3°C/second max.	3°C/second max.
Liquidous Temperature (TL)	183°C	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (tP) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

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- Immerge unit's body in solder paste is not recommended.
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