

JORX213 Series

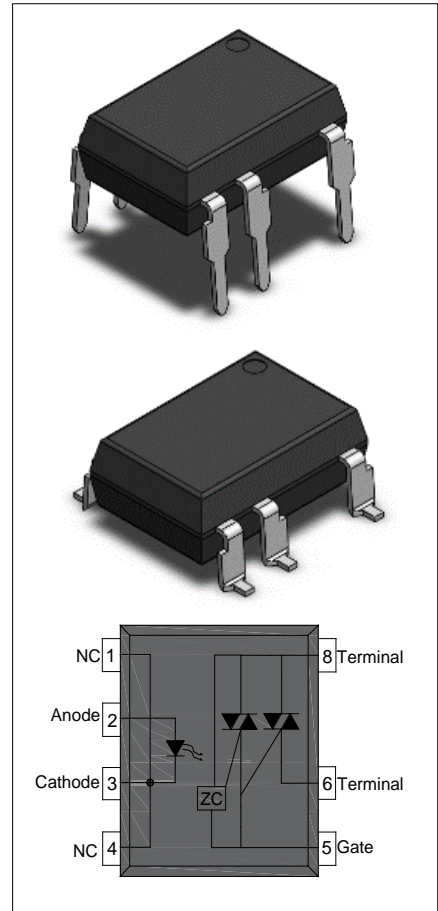
Rev.A.1.0

DESCRIPTION:

The JORX213 series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a monolithic silicon zero-cross photo triac to drive a power triac in a plastic DIP7 package with different lead forming options. The products are widely used in solenoid/valve controls, lighting controls, motor controls, temperature controls, static AC power switches, solid state relays, interfacing microprocessors to 265 V_{AC} peripherals.

MAIN FEATURES:

- High isolation 5000 Vrms
- DC input with triac output
- Operating temperature range - 40°C to 85 °C
- REACH & RoHS compliance
- MSL class 2
- HBM: H3A; MM: M4
- CQC approved
- VDE approved
- UL approved



ABSOLUTE MAXIMUM RATINGS (Temperature=25°C)

Parameter		Symbol	Value	Unit	
Input	Forward Current	I_F	60	mA	
	Peak Forward Current	I_{FP}	1 ^①	A	
	Reverse Voltage	V_R	6	V	
Output	Repetitive peak off-state voltage	V_{DRM}	600	V	
	Repetitive peak off-state voltage	V_{RRM}	600	V	
	On-state RMS Current	JOR0213	$I_{T(RMS)}$	0.3	A
		JOR1213		0.6	
		JOR2213		0.9	
		JOR3213		1.2	
Non repetitive surge peak on-state current	JOR0213	I_{TSM}	3	A	
	JOR1213		6		

	(full cycle , $t_p=20ms$)	JOR2213		9	
		JOR3213		12	
Isolation Voltage		V_{iso}		5000 ^②	Vrms
Operating Temperature		T_{opr}		-40~85	°C
Storage Temperature		T_{stg}		-40~125	°C
Soldering Temperature		T_{sol}		260 ^③	°C

NOTE1 : 100μs pulse, 100Hzfrequency

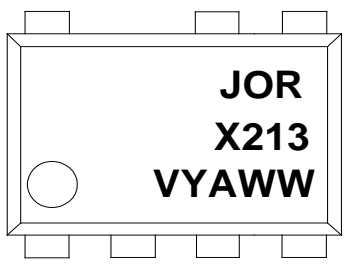
NOTE2 : AC for 1minute, R.H.=40~60%

NOTE3 : For 10 seconds

ELECTRICAL CHARACTERISTICS (Temperature=25°C)

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	$I_F=20mA$	-	1.25	1.4	V
	Reverse Current	I_R	$V_R=6V$	-	-	1	μA
Output	Peak Off-state Current, Either Direction	I_{DRM}	$V_{DRM}/V_{RRM}=600V, I_F=0$	-	-	10	μA
		I_{RRM}		-	-	10	
	Peak On-state Voltage, Either Direction	V_{TM}	$I_{TM}=I_{TM}$ Rated	-	-	2	V
	Critical Rate of Rise of Off-state voltage	dV/dt	$V_D=400V,$ Gate Open $I_F=0,$ $T_j=85°C$	1000	-	-	V/μs
Transfer Characteristics	LED Trigger Current	I_{FT}	Terminal Voltage=6V $R_L=100Ω$	-	-	10	mA
	Holding Current	I_H	$V_D=6V$	-	-	25	mA
	Isolation Resistance	R_{ISO}	DC500V 40~60%R.H.	10^{12}	10^{14}	-	Ω
	Response Time	t_{on}	$V_D=6V,$ $R_L=100Ω,$ $I_F=20mA$	-	20	100	μs
Zero Crossing	Inhibit Voltage	V_{IH}	$I_F=10mA$	-	-	20	V
	Leakage in Inhibit State	I_{DRM2}	$I_F=10mA,$ $V_{OFF}=600V$	-	-	500	μA

ORDERING AND MARKING INFORMATION

MARKING INFORMATION			
		<p>JOR : Company Abbr. X213 : Part Number & Rank V : VDE Option Y : Fiscal Year A : Manufacturing Code WW : Work Week</p>	
ORDERING INFORMATION			
JORX213(Y)(Z)-GV			
<p>JOR – Company Abbr. X213 – Part Number & Rank (X=0/1/2/3) Y – Lead Form Option (SL/None) Z – Tape and Reel Option (T1/T2) G – Green Option (G or None) V – VDE Option (V or None)</p>			
Packing Quantity			
Option	Quantity	Quantity – Inner box	Quantity –Outer box
None	50 Units/Tube	27 Tubes/Inner box	12 Inner box/Outer box =16.2k Units
SL(T1)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box =15k Units
SL(T2)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box =15k Units

Characteristics Curves

FIG.1: Forward Current vs. Ambient Temperature

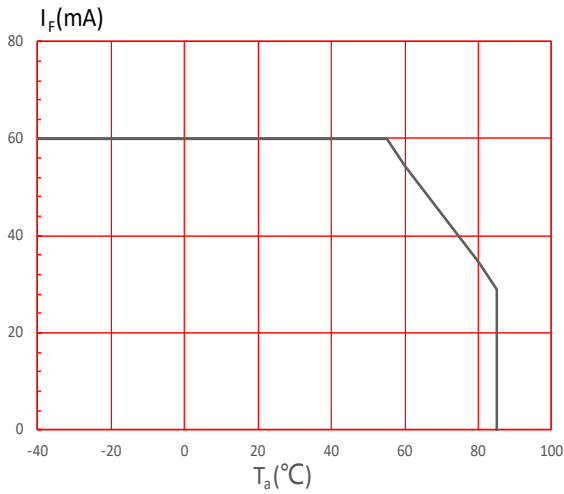


FIG.3: Forward Current vs. Forward Voltage

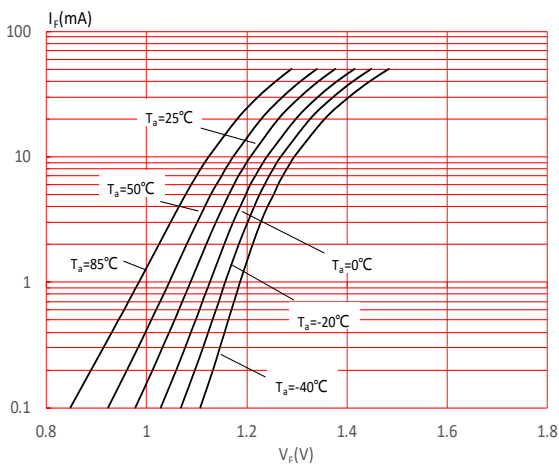


FIG.5: Off-state Terminal Current vs Off-state Terminal Voltage

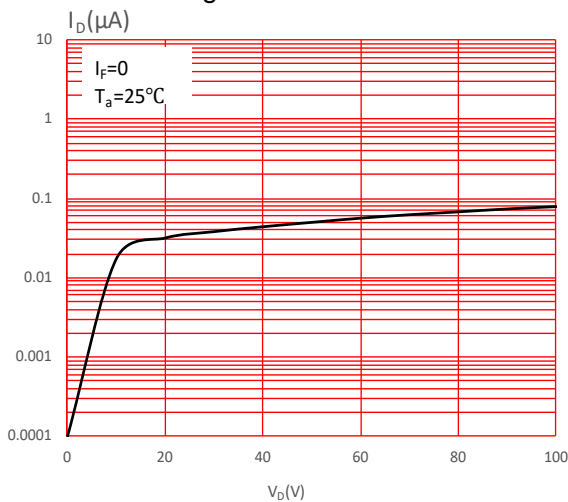


FIG.2: On-state Terminal Current vs. Ambient Temperature

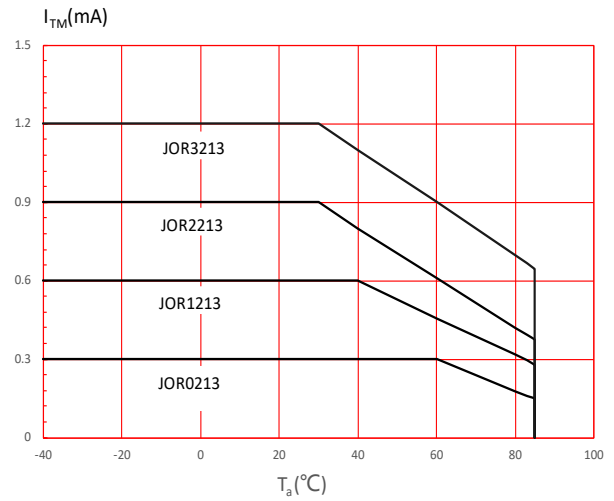


FIG.4: Forward Voltage vs. Ambient Temperature

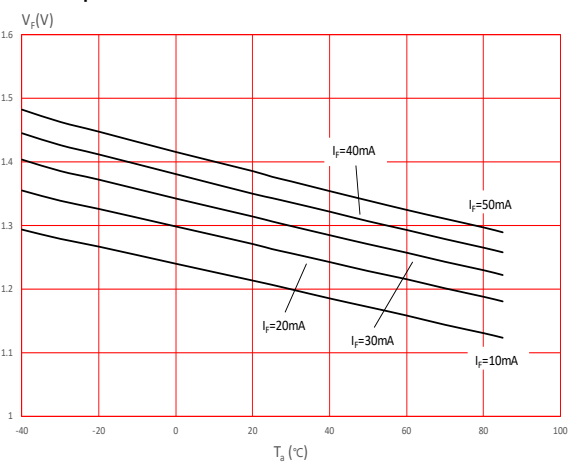


FIG.6: Normalized Trigger Current vs. Ambient Temperature

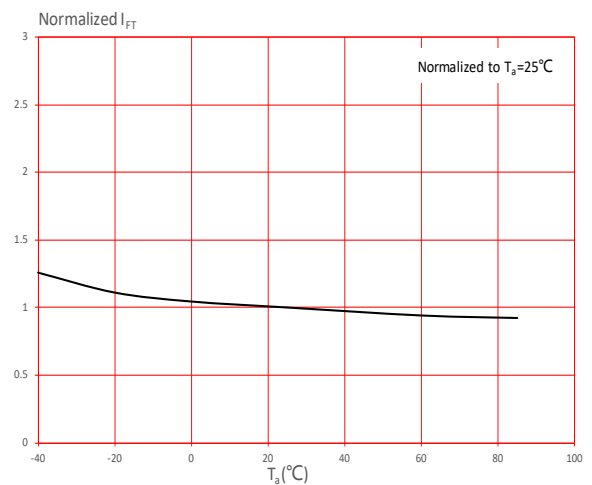


FIG.7: On-state Terminal Voltage vs. Ambient Temperature

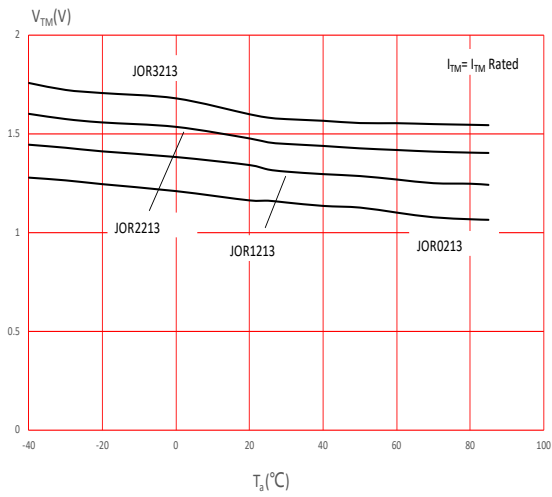


FIG.8: Normalized Holding Current vs. Ambient Temperature

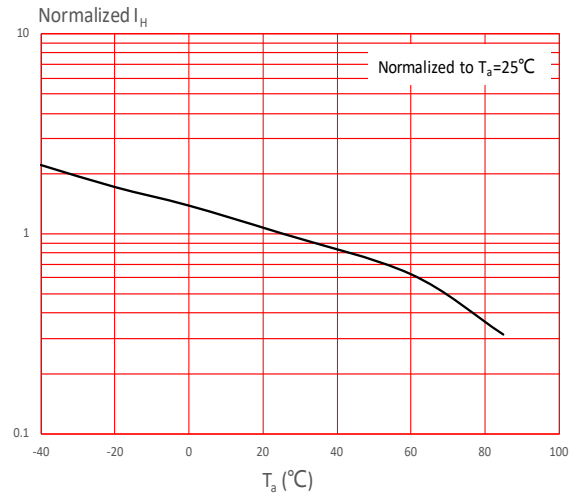


FIG.9: Turn On Time vs. Forward Current

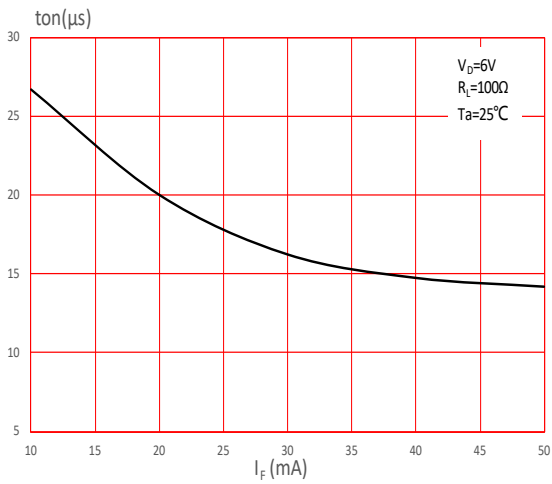
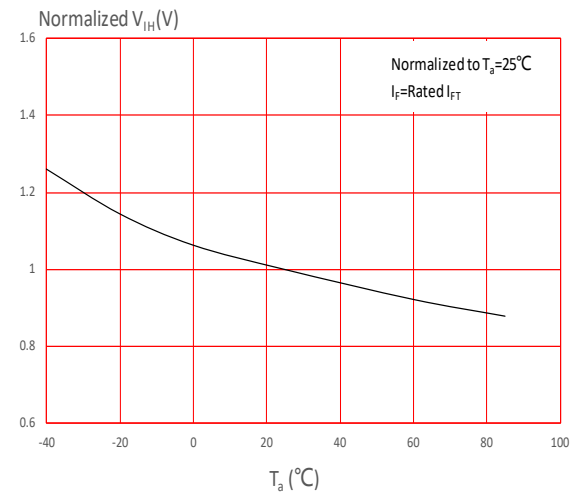


FIG.10: Normalized Inhibit Voltage vs. Ambient Temperature



TEST CIRCUITS

FIG.11: Test Circuits of Turn On Time

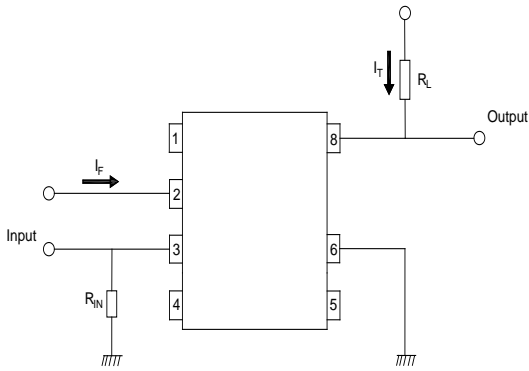
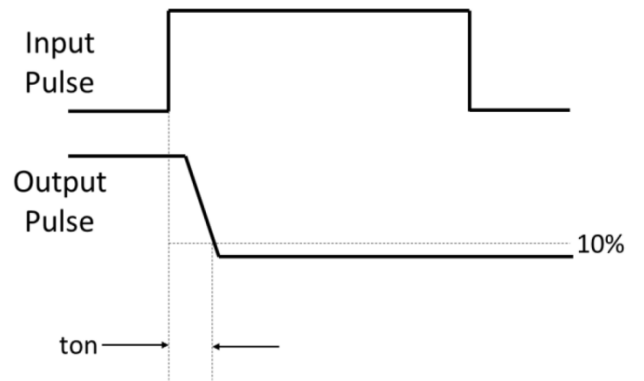
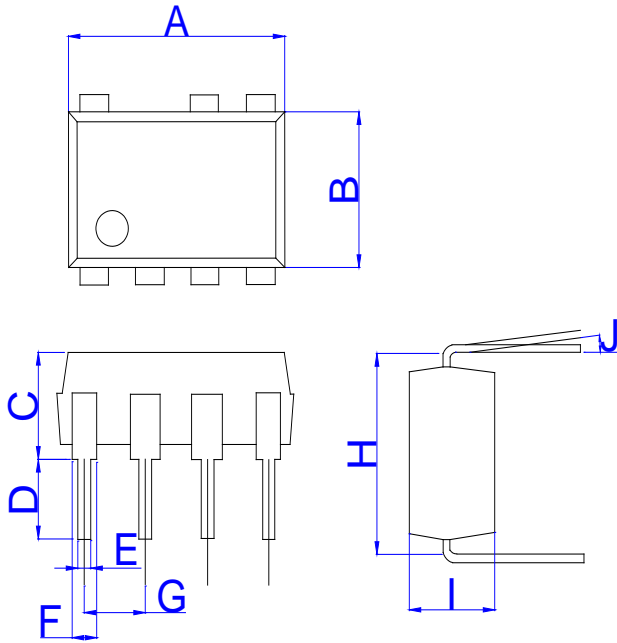


FIG.12: Waveforms of Turn On Time



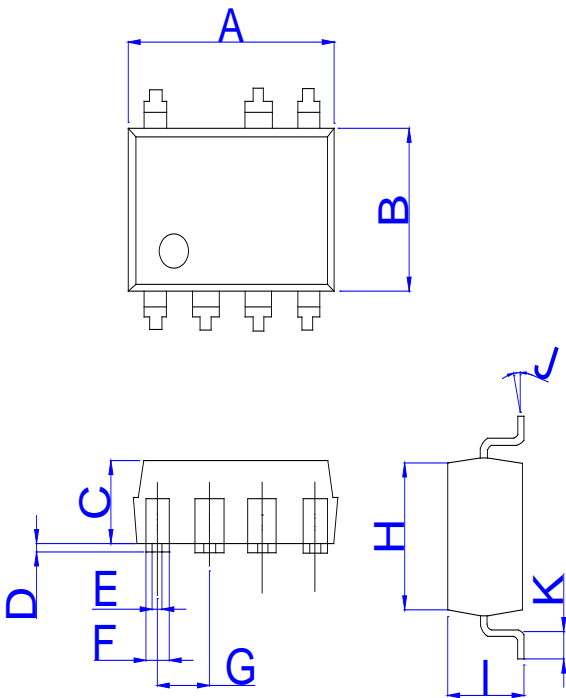
Package Dimension (Unit: mm)

Standard DIP Type:



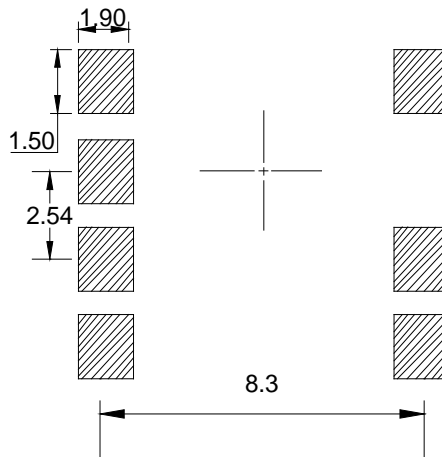
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.68	9.78	9.88	0.381	0.385	0.389
B	6.30	6.40	6.50	0.248	0.252	0.256
C	3.70	3.90	4.10	0.146	0.154	0.162
D	2.90	3.00	3.10	0.114	0.118	0.122
E	0.40	0.50	0.60	0.016	0.020	0.024
F	1.10	1.20	1.30	0.043	0.047	0.051
G	2.44	2.54	2.64	0.096	0.100	0.104
H	7.52	7.62	7.72	0.296	0.300	0.304
I	3.30	3.40	3.50	0.130	0.134	0.138
J			10°			

Option SL Type:



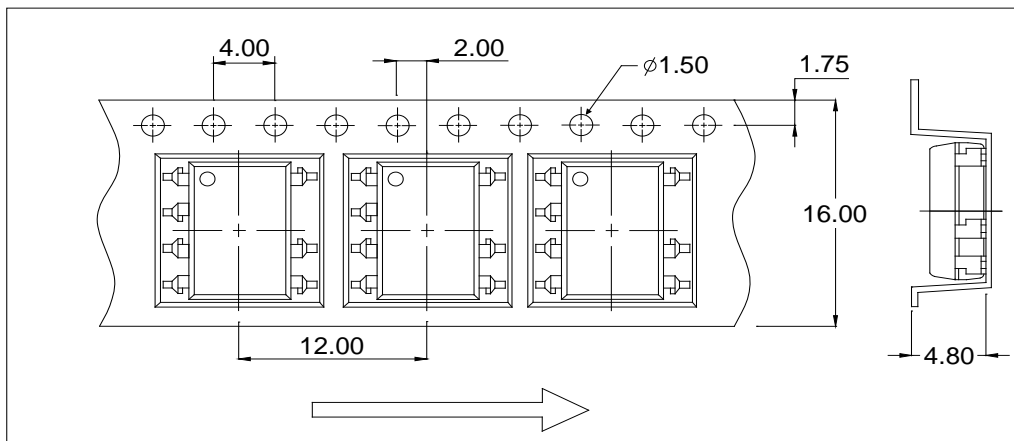
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.68	9.78	9.88		0.385	
B	6.30	6.40	6.50		0.252	
C	3.30	3.40	3.50		0.134	
D		0.20	0.40		0.008	0.016
E	0.40	0.50	0.60	0.156	0.020	0.024
F	1.10	1.20	1.30	0.043	0.047	0.051
G	2.44	2.54	2.64	0.096	0.100	0.104
H	7.52	7.62	7.72	0.296	0.300	0.304
I	3.30	3.40	3.50	0.130	0.134	0.138
J			10°			
K	0.9	1.00	1.10	0.035	0.039	0.043

RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

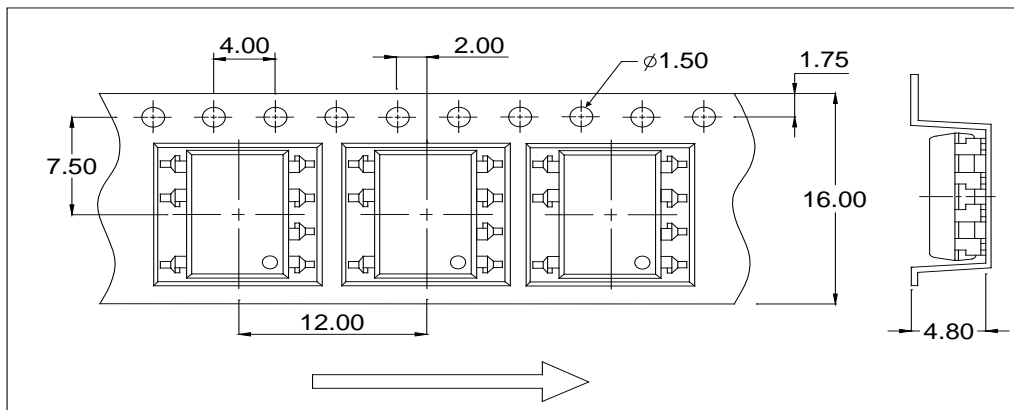


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

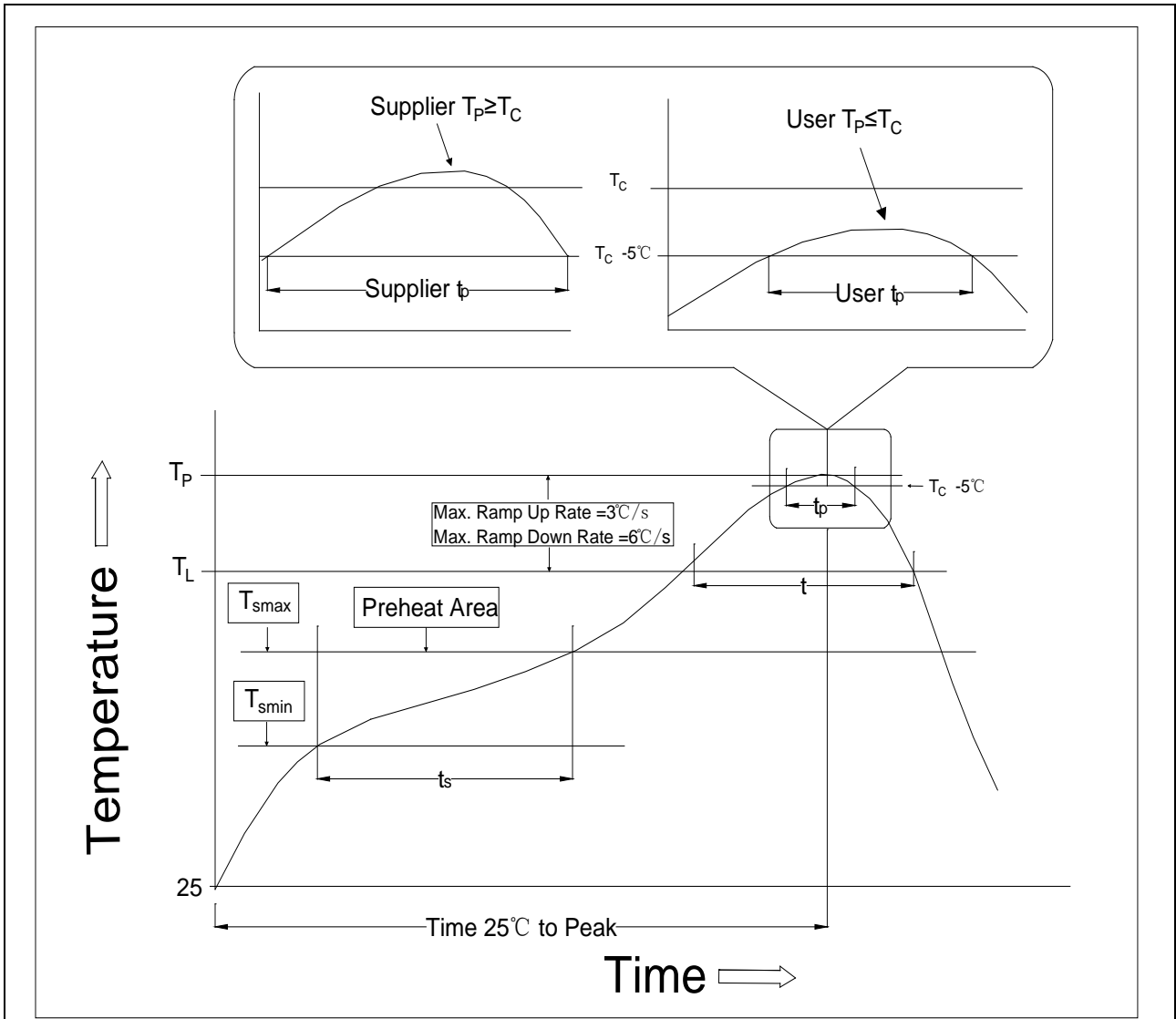
Option SL(T1)



Option SL(T2)




REFLOW INFORMATION



Temperature Min. (T _{smin})	150 °C
Temperature Max. (T _{smax})	200 °C
Time (t _s) from (T _{smin} to T _{smax})	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)	60-120 seconds
Peak Body Package Temperature	260 °C +0 °C / -5 °C
Time (t _P) within 5 °C of 260 °C	10 seconds
Ramp-down Rate (T _P to T _L)	6°C/second max.

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