

JORX213 Series

Rev.A.1.1

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

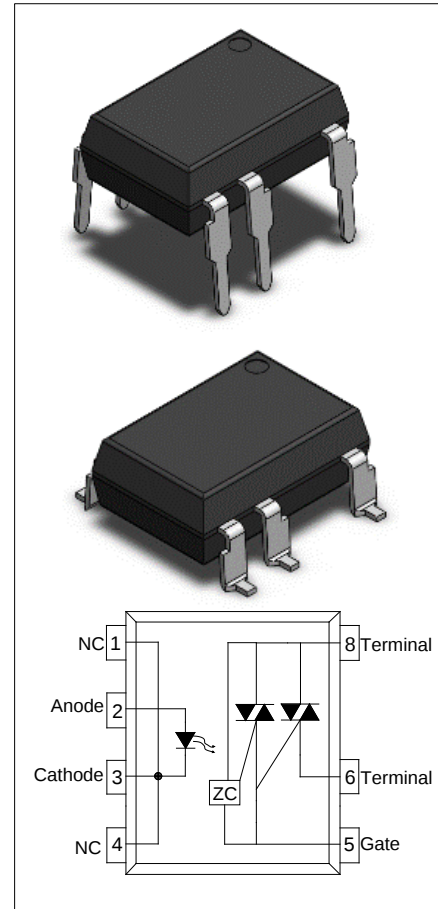
MSL class 2

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
	Critical rate of rise of on-state current		dI/dt	100	A/μs
	On-state RMS Current	JOR0213	I _{T(RMS)}	0.3	A
		JOR1213		0.6	
		JOR2213		0.9	
		JOR3213		1.2	
Non repetitive surge	JOR0213	I _{TSM}	3	A	

	peak on-state current (full cycle , t _p =20ms)	JOR1213		6	
		JOR2213		9	
		JOR3213		12	
Isolation Voltage			V _{iso}	5000 ^②	V _{rms}
Operating Temperature			T _{opr}	-40~85	℃
Storage Temperature			T _{stg}	-40~125	℃
Soldering Temperature			T _{sol}	260 ^③	℃

NOTE1 : 100 μ s pulse, 100Hz frequency

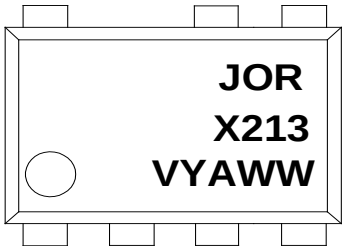
NOTE2 : AC for 1 minute, R.H.=40~60%

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 $I_F=0$, $T_J=85^\circ C$	1000	-	-	V/ μs
	Critical Rate of Rise of Commutating Voltage	$(dV/dt)_c$	$(dI/dt)_c$ $=1.5A/ms$, $T_J=85^\circ C$	10	-	-	V/ μs
Transfer Characteristics	LED Trigger Current	I_{FT}	Terminal Voltage=6V $R_L=100\Omega$	-	-	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}	$V_D=6V$, $R_L=100\Omega$, $I_F=20mA$	-	20	100	μs
Zero Crossing	Inhibit Voltage	V_{IH}	$I_F=10mA$	-	-	20	V
	Leakage in Inhibit State	I_{DRM2}	$I_F=10mA$, $V_{DRM}=600V$	-	-	500	μA

ORDERING AND MARKING INFORMATION

MARKING INFORMATION			
		JOR : Company Abbr. X213 : Part Number & Rank V : VDE Option Y : Fiscal Year A : Manufacturing Code WW : Work Week	
ORDERING INFORMATION			
JORX213(Y)(Z)-GV			
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)			
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

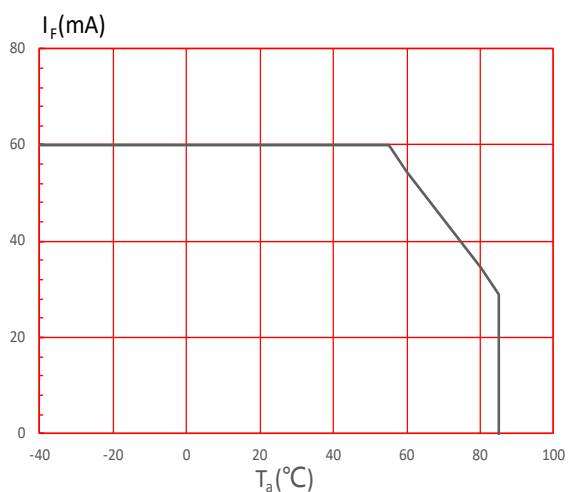


FIG.2: On-state Terminal Current vs. Ambient Temperature

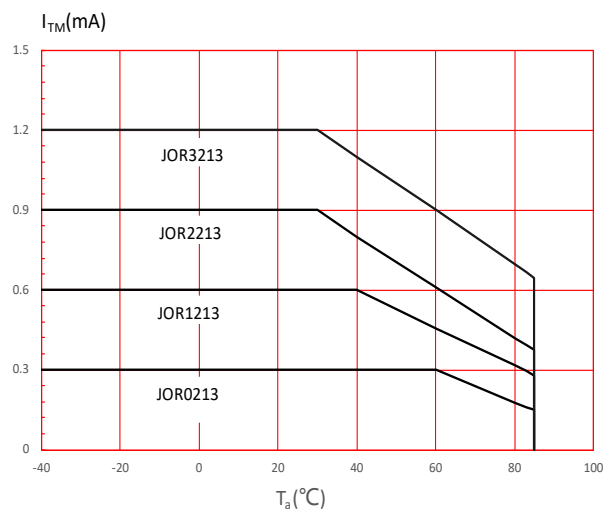


FIG.3: Forward Current vs. Forward Voltage

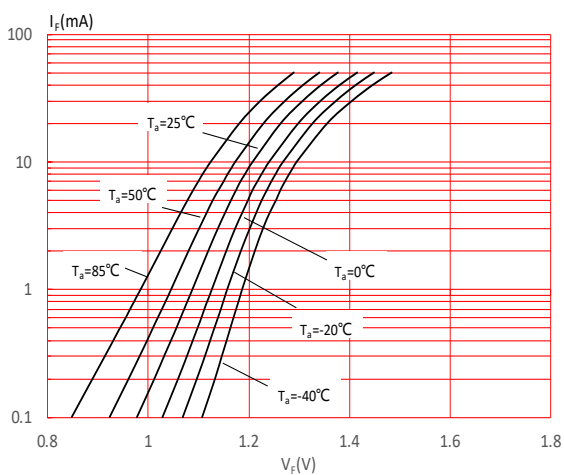


FIG.4: Forward Voltage vs. Ambient Temperature

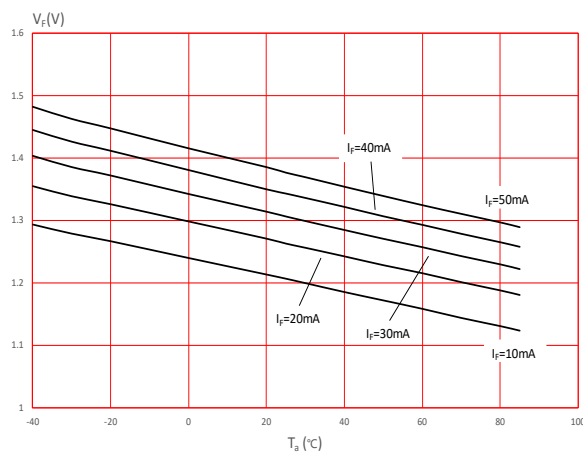


FIG.5: Off-state Terminal Current vs Off-state Terminal Voltage

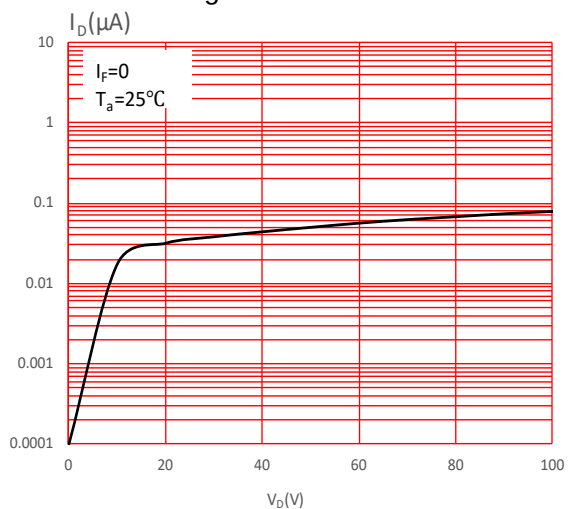


FIG.6: Normalized Trigger Current vs. Ambient Temperature

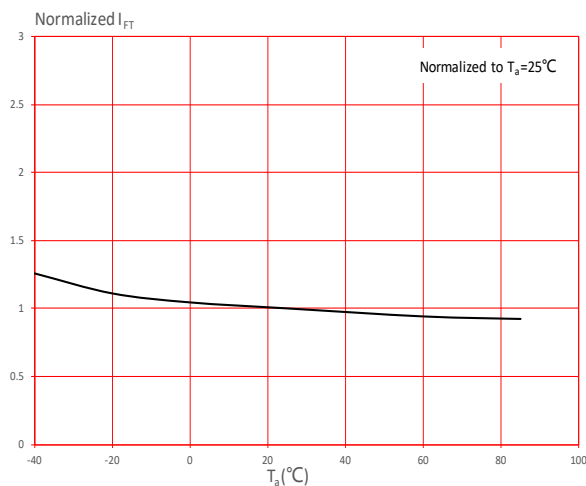


FIG.7: On-state Terminal Voltage vs. Ambient Temperature

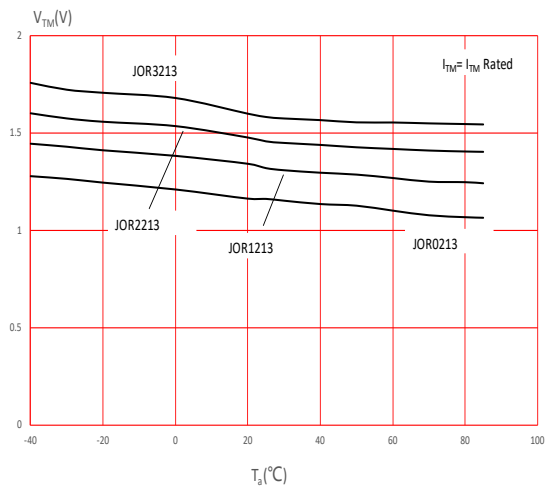


FIG.8: Normalized Holding Current vs. Ambient Temperature

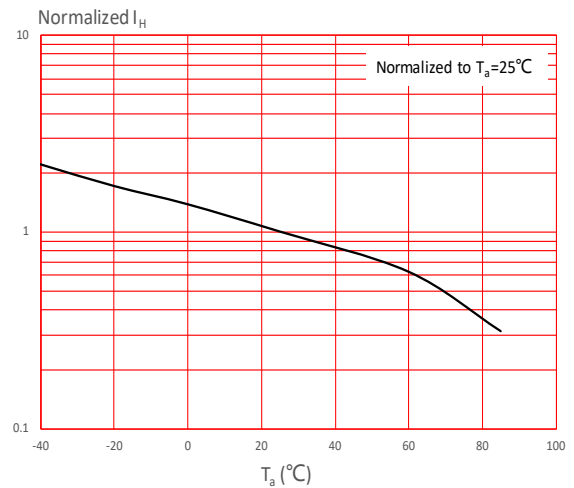


FIG.9: Turn On Time vs. Forward Current

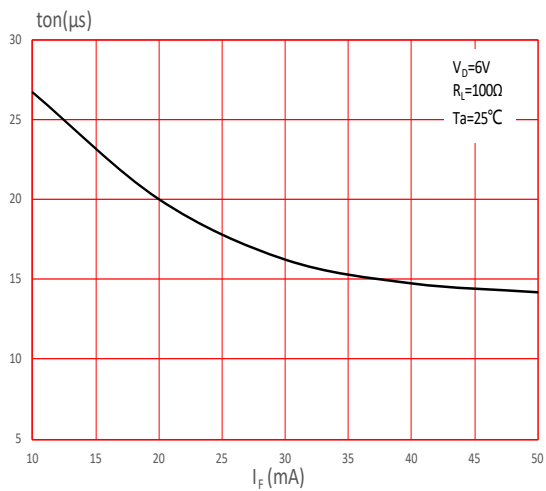
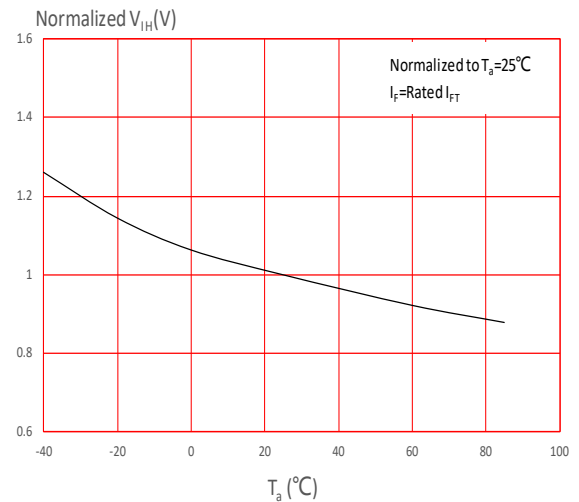


FIG.10: Normalized Inhibit Voltage vs. Ambient Temperature



TEST CIRCUITS

FIG.11: Test Circuits of Turn On Time

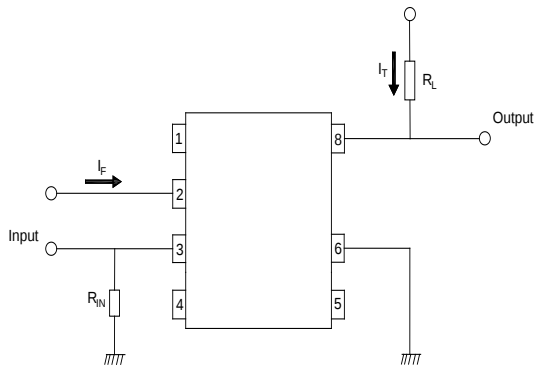
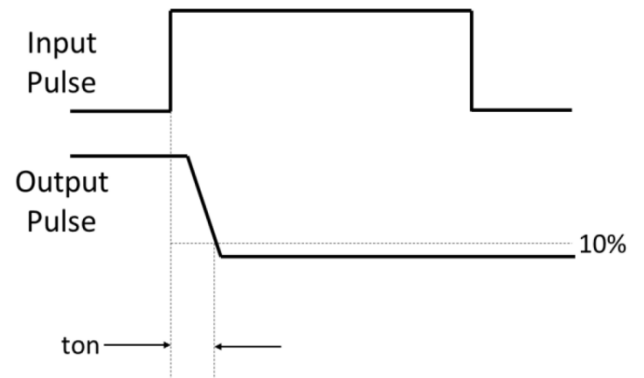
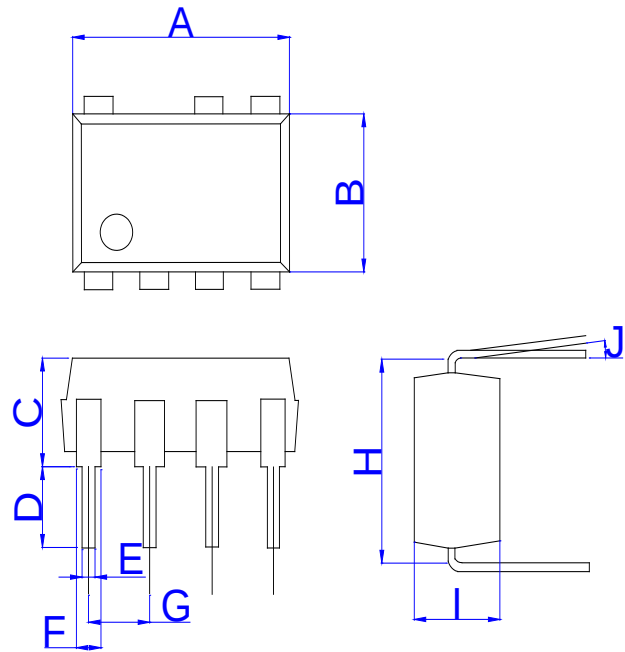


FIG.12: Waveforms of Turn On Time



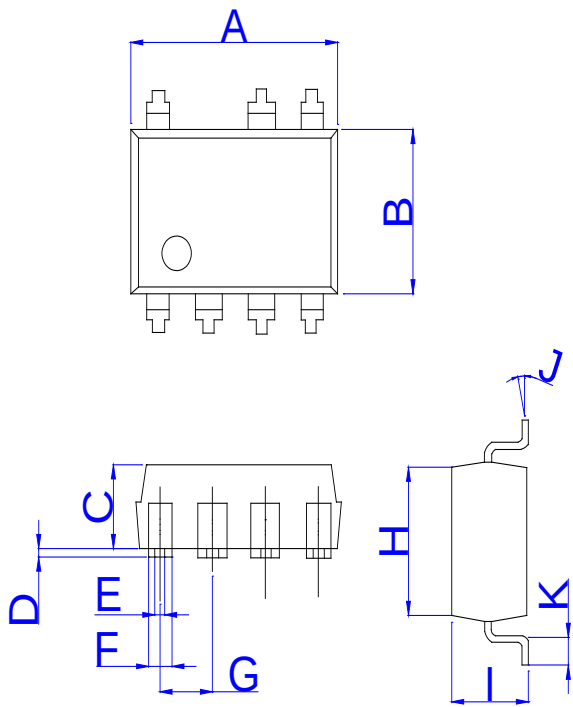
Package Dimension (Unit: mm)

Standard DIP Type:



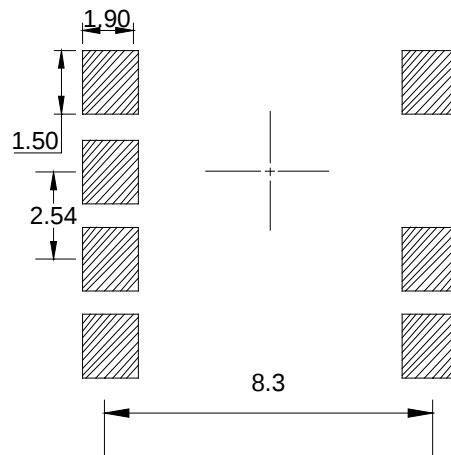
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.68	9.78	9.88	0.381	0.385	0.389
B	6.30	6.40	6.50	0.248	0.252	0.256
C	3.70	3.90	4.10	0.146	0.154	0.162
D	2.90	3.00	3.10	0.114	0.118	0.122
E	0.40	0.50	0.60	0.016	0.020	0.024
F	1.10	1.20	1.30	0.043	0.047	0.051
G	2.44	2.54	2.64	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:



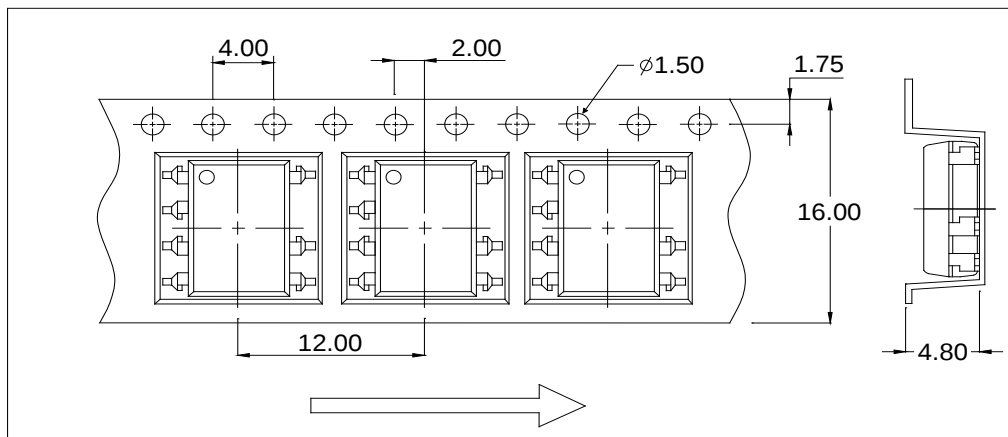
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.68	9.78	9.88		0.385	
B	6.30	6.40	6.50		0.252	
C	3.30	3.40	3.50		0.134	
D		0.20	0.40		0.008	0.016
E	0.40	0.50	0.60	0.156	0.020	0.024
F	1.10	1.20	1.30	0.043	0.047	0.051
G	2.44	2.54	2.64	0.096	0.100	0.104
H	7.52	7.62	7.72	0.296	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)

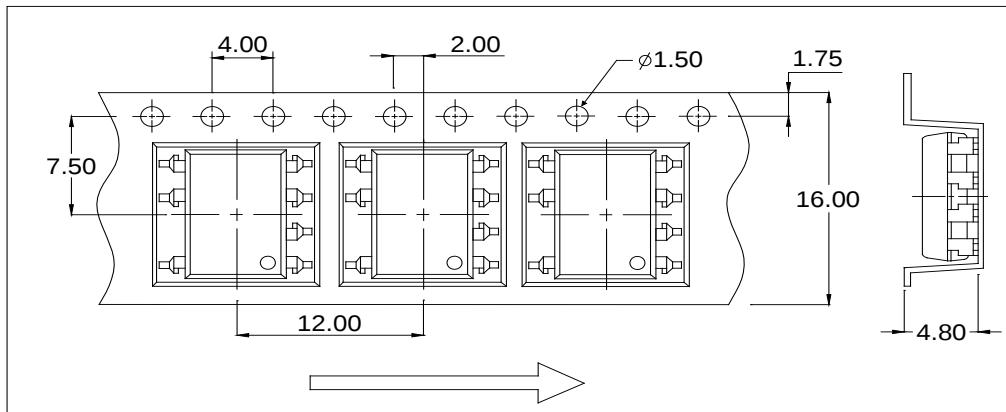


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

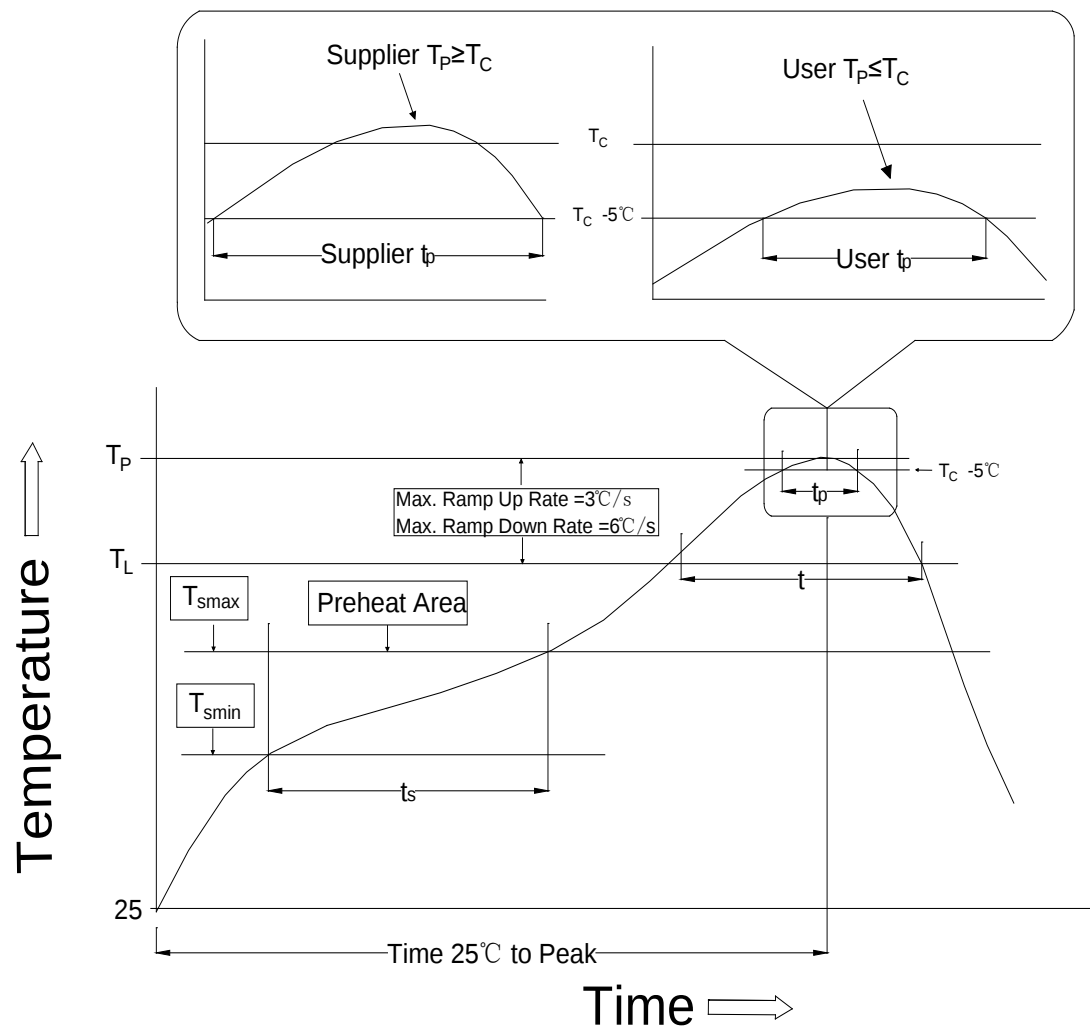
Option SL(T1)



Option SL(T2)

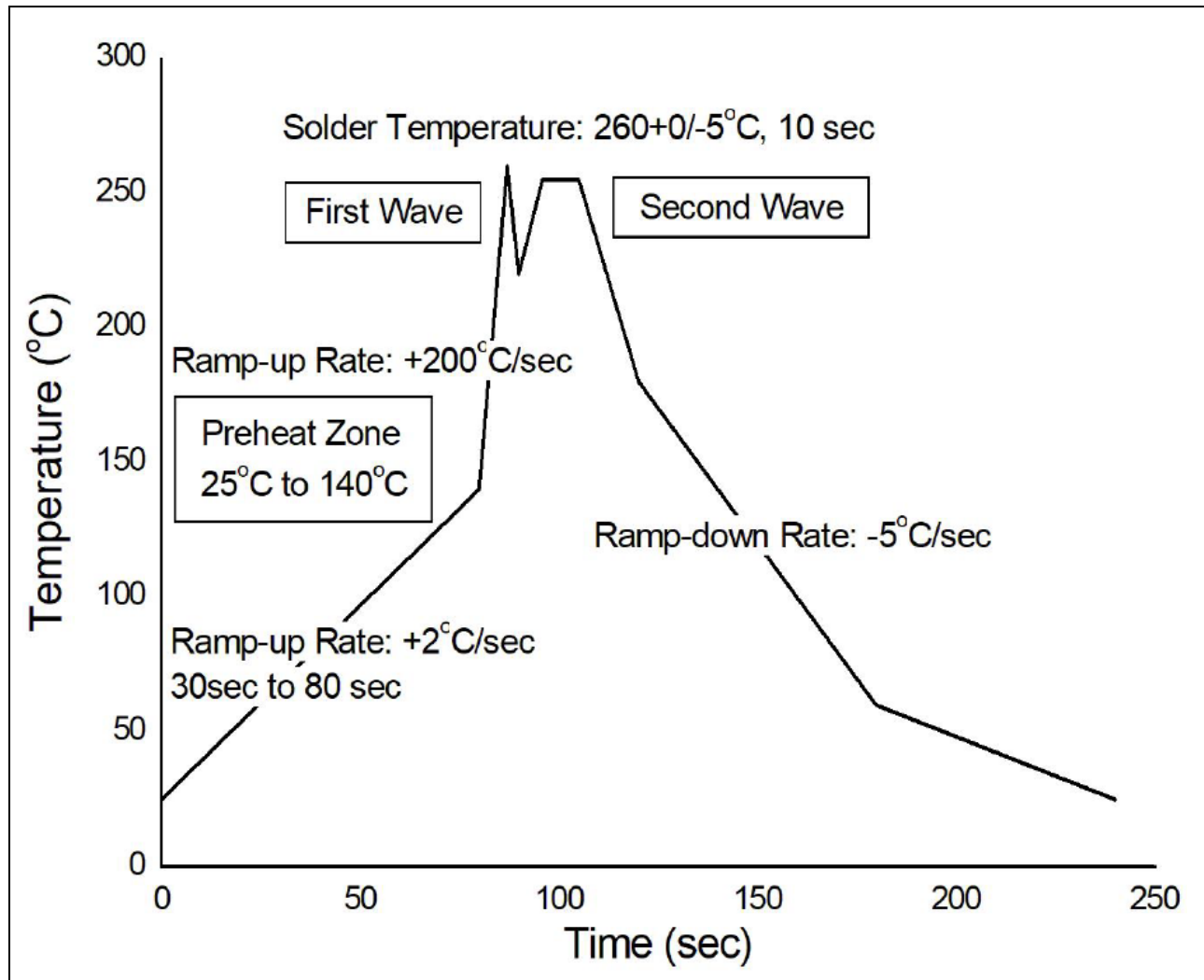


REFLOW INFORMATION



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.

WAVE SOLDERING



HAND SOLDERING BY SOLDERING IRON

Soldering Temperature	360±5°C
Soldering Time	3s max.

Document Revision History

Date	Revision	Changes
Feb.21, 2025	A.1.0	Last update
Nov.7, 2025	A.1.1	Add (dV/dt)c

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