JORX213 Series

DIP7, DC Input, TRIAC Output, Solid State Relay

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 DIP8 package with different lead forming options.

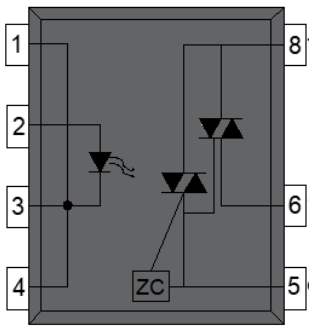
Features

- High isolation 5000 VRMS
- DC input with triac output
- Operating temperature range - 40 °C to 85 °C
- RoHS & REACH Compliance
- MSL class 1
- Regulatory Approvals
  - UL
  - VDE
  - CQC

Applications

- Solenoid/valve controls
- Lighting controls
- Motor controls
- Temperature controls
- Static AC power switches
- Solid state relays
- Interfacing microprocessors to 115 to 240VAC peripherals

SCHEMATIC



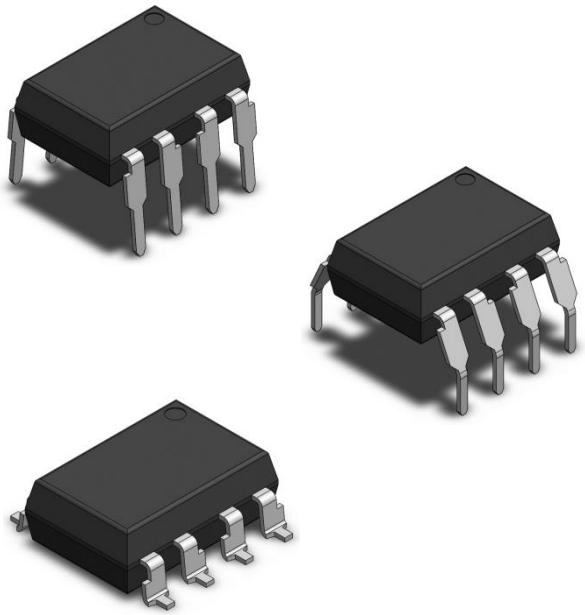
JORX213 Series

(ZC Type)

PIN DEFINITION

1. NC	8. Terminal
2. Anode	
3. Cathode	6. Terminal
4. NC	5. Gate

PACKAGE OUTLINE



ABSOLUTE MAXIMUM RATINGS					
PARAMETER		SYMBOL	VALUE	UNIT	NOTE
INPUT					
Forward Current		I_F	60	mA	
Reverse Voltage		V_R	6	V	
Junction Temperature		Tj	125	℃	
Input Power Dissipation		P_I	100	mW	
OUTPUT					
Off-state Output Terminal Voltage		V_{DRM}	600	V	
On-state RMS Current	JOR0213	$IT_{(RMS)}$	0.3	A	
	JOR1213		0.6		
	JOR2213		0.9		
	JOR3213		1.2		
Non-repetitive Surge Current PW=100μs, 120pps	JOR0213	I_{TSM}	3	A	
	JOR1213		6		
	JOR2213		9		
	JOR3213		12		
Junction Temperature		Tj	125	℃	
COMMON					
Total Power Dissipation		Ptot	400	mW	
Isolation Voltage		Viso	5000	Vrms	1
Operating Temperature		Topr	-40~85	℃	
Storage Temperature		Tstg	-40~125	℃	
Soldering Temperature		Tsol	260	℃	2

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	-	1.24	1.4	V	I_F=10mA	
Reverse Current	I_R	-	-	10	μA	V_R=6V	
Input Capacitance	Cin	-	30	-	pF	V=0, f=1kHz	
OUTPUT							
Peak Off-state Current, Either Direction	I_{DRM}	-	-	100	μA	V_{DRM}=600V I_F=0	3
Peak On-state Current, Either Direction	V_{TM}	-	1.7	2.5	V	I_{TM}= I_{TM} Rated	
Critical Rate of Rise of Off-state Voltage Breakdown Voltage	dV/dt	1000	-	-	V	V_{PEAK} =600V	
TRANSFER CHARACTERISTICS							
LED Trigger Current	I_{FT}	-	-	10	mA	Terminal Voltage = 6V RL=100Ω	
Holding Current Saturation Voltage	I_H	-	-	25	mA	-	
Isolation Resistance	Riso	10^12	10^14	-	Ω	DC500V, 40 ~ 60% R.H.	
Floating Capacitance	C_{IO}	-	0.25	1	pF	V=0, f=1MHz	
ZERO CROSSING							
Inhibit Voltage	V_{INH}	-	-	20	V	I_F=10mA	
Leakage in Inhibited State	I_{DRM2}	-	-	500	μA	I_F=10mA V_{DRM}=600V	
Response Time (Rise)	t_{on}	-	30	100	μs	V_D=6V RL=100Ω I_F=10mA	

Note3. Test voltage must be applied within dV/dt rating.

CHARACTERISTIC CURVES

Fig.1 Forward Current vs. Forward Voltage

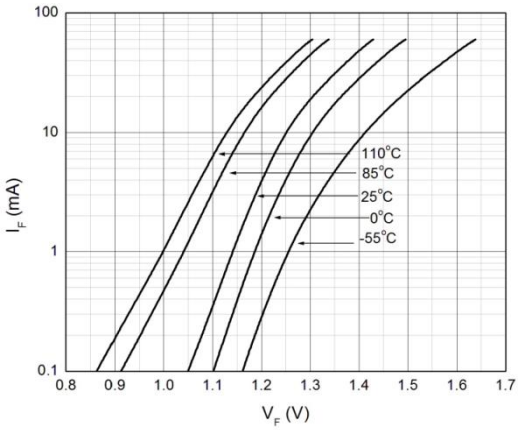


Fig.2 Off-state Terminal Current vs. Ambient Temperature

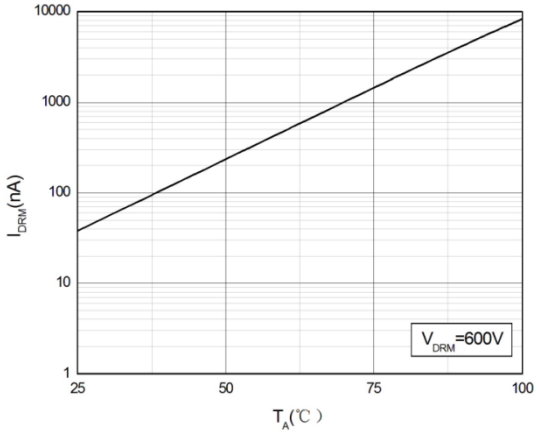


Fig.3 Normalized Off-state Terminal Voltage vs. Ambient Temperature

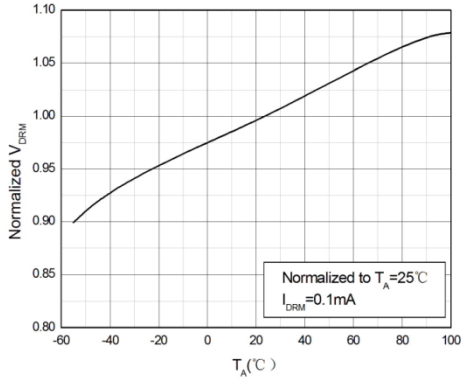


Fig.4 Normalized Trigger Current vs. LED Trigger Pulse Width

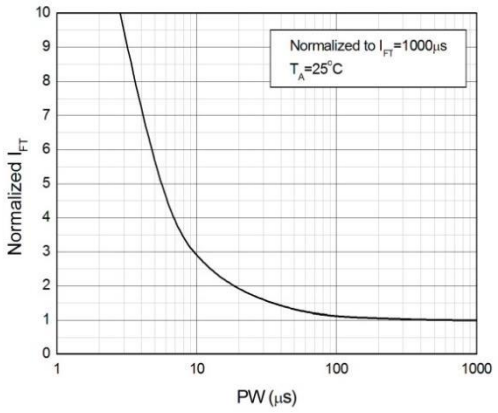


Fig.5 Normalized Trigger Current vs. Ambient Temperature

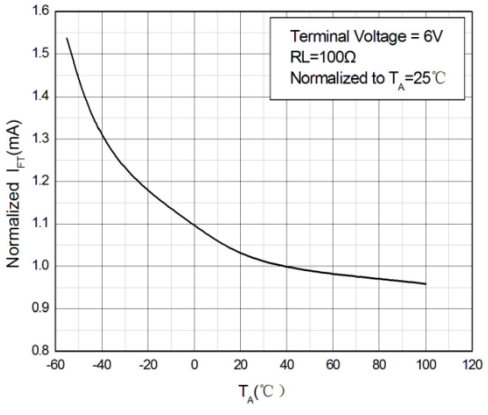
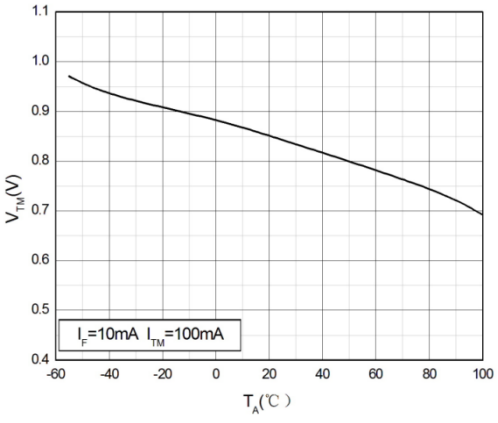


Fig.6 On-state Terminal Voltage vs. Ambient Temperature



CHARACTERISTIC CURVES

Fig.7 On-state Terminal Voltage vs. On-state Terminal Current

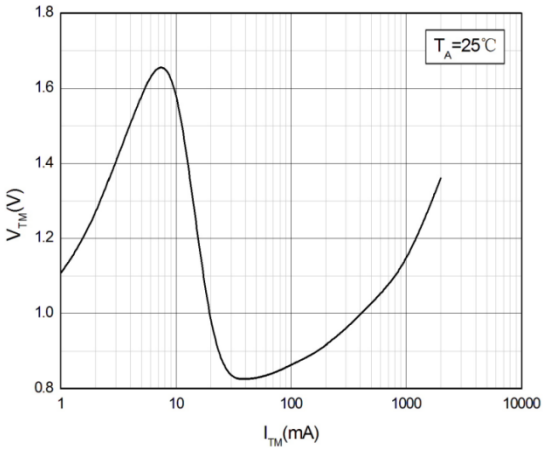


Fig.8 Holding Current vs. Ambient Temperature

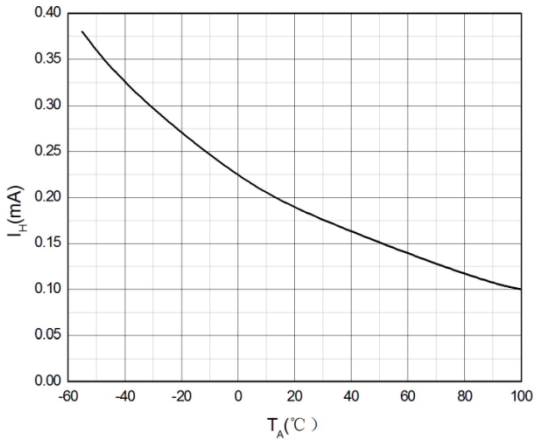


Fig.9 Normalized Inhibit Voltage vs. Ambient Temperature

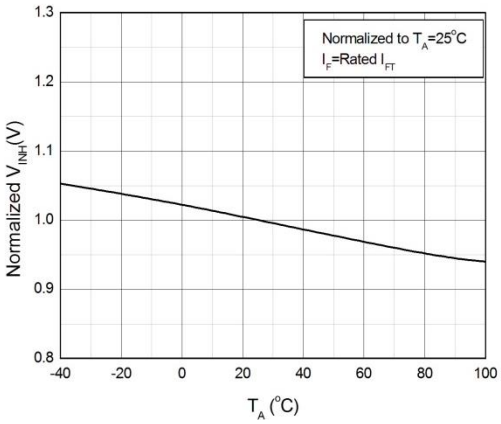


Fig.10 Normalized Leakage in Inhibit State vs. Ambient Temperature

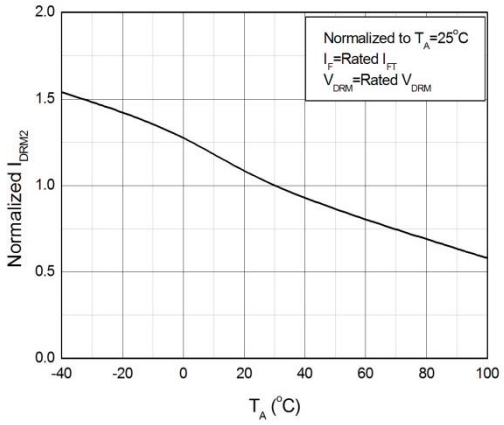


Fig.11 Turn On Time vs. Forward Current

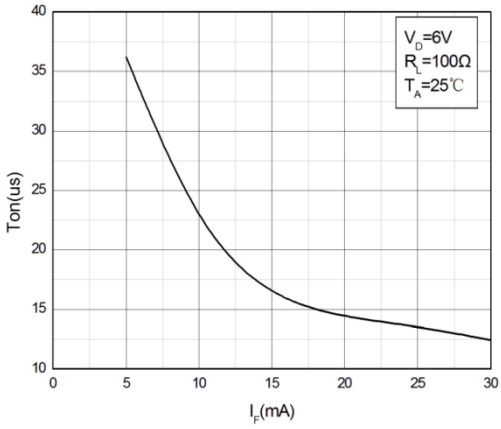
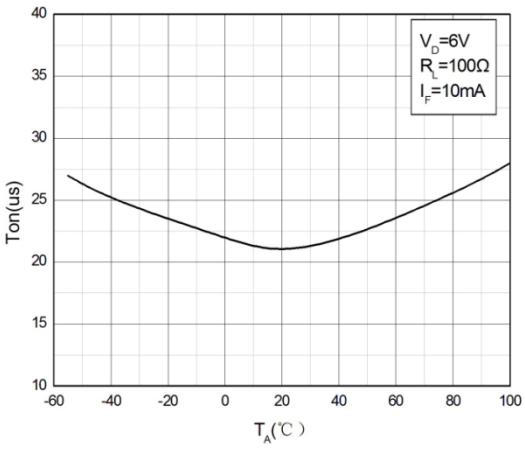


Fig.12 Turn On Time vs. Ambient Temperature



TEST CIRCUITS

Fig.13 Test Circuits of Turn On Time

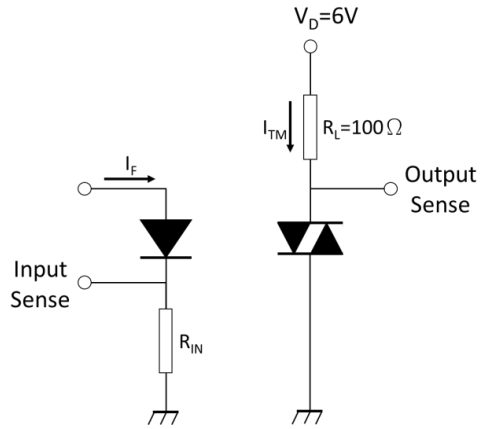


Fig.14 Waveforms of Turn On Time

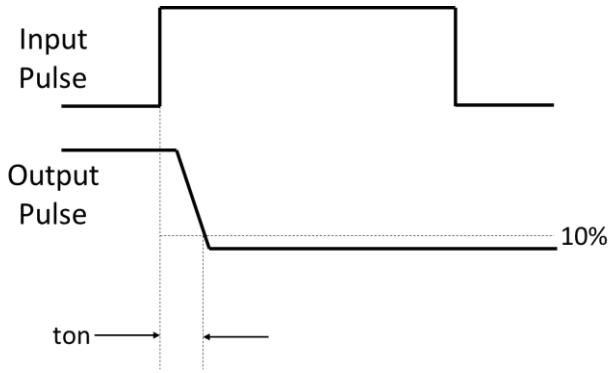


Fig.15 Test Circuits of dV/dt

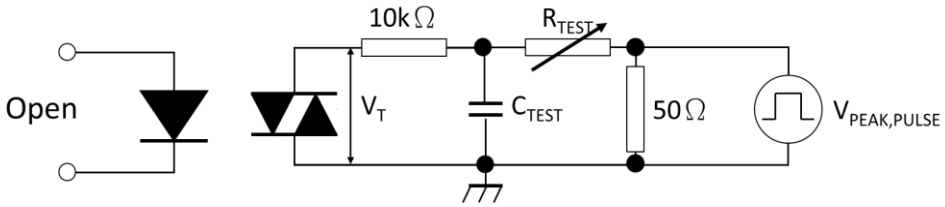
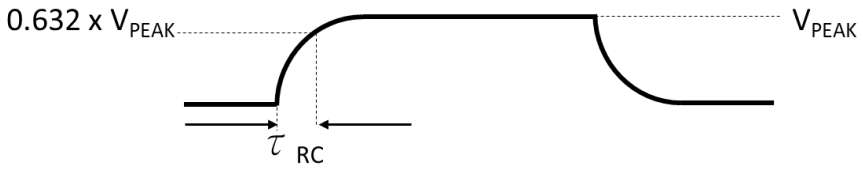


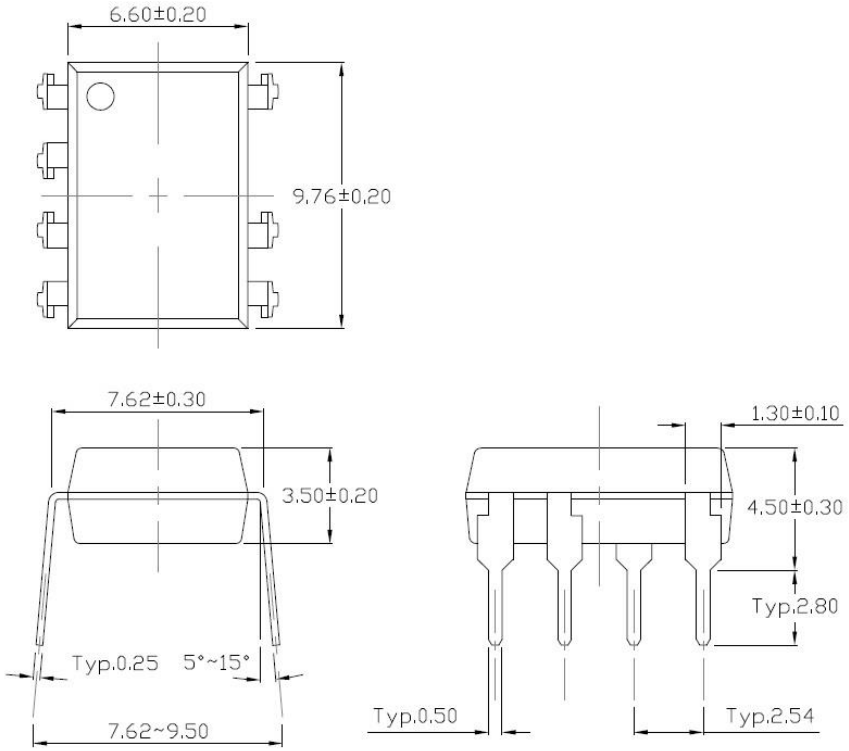
Fig.16 Waveforms of dV/dt



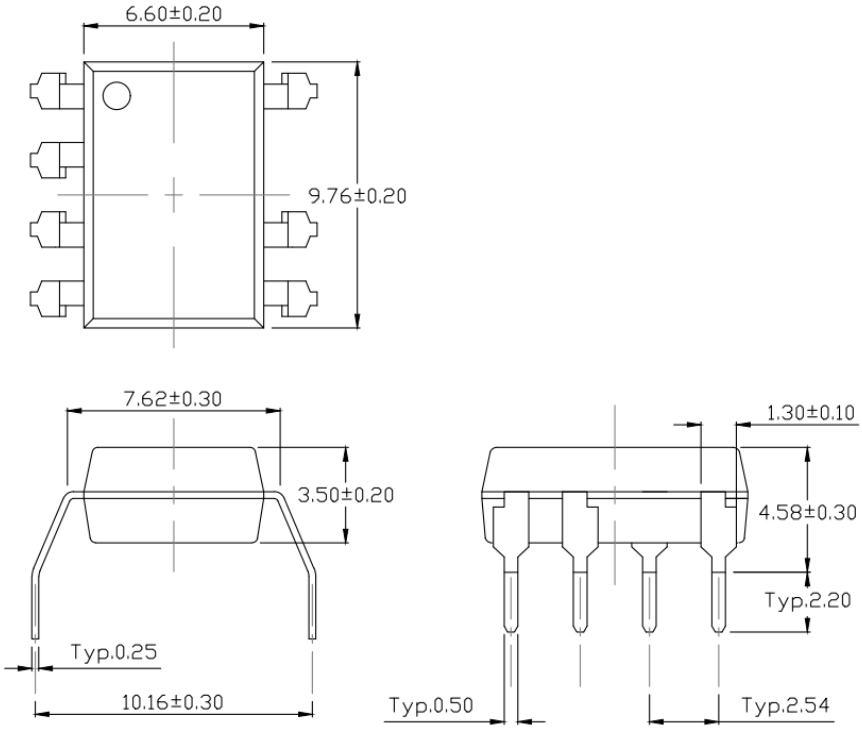
$$dv/dt = \frac{0.632 \times V_{PEAK}}{\tau_{RC}}$$

PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Standard DIP – Through Hole (DIP Type)

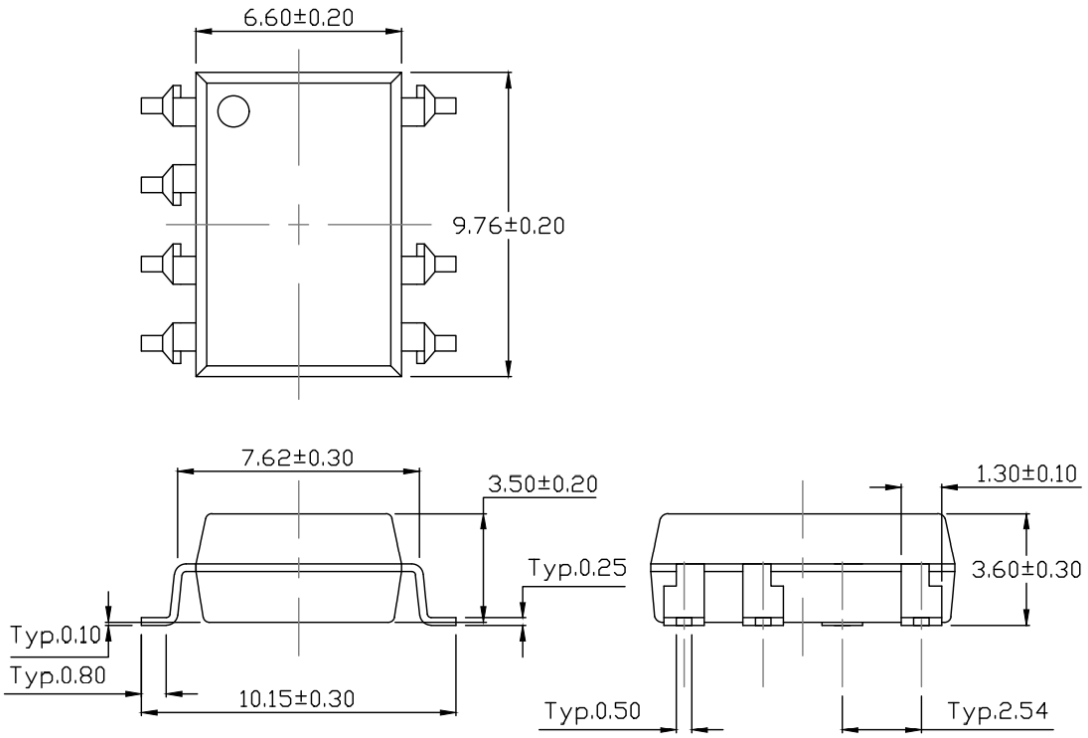


Gullwing (400mil) Lead Forming – Through Hole (M Type)



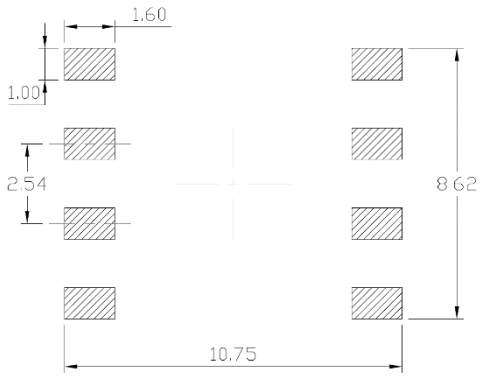
PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount (Low Profile) Lead Forming (SL Type)



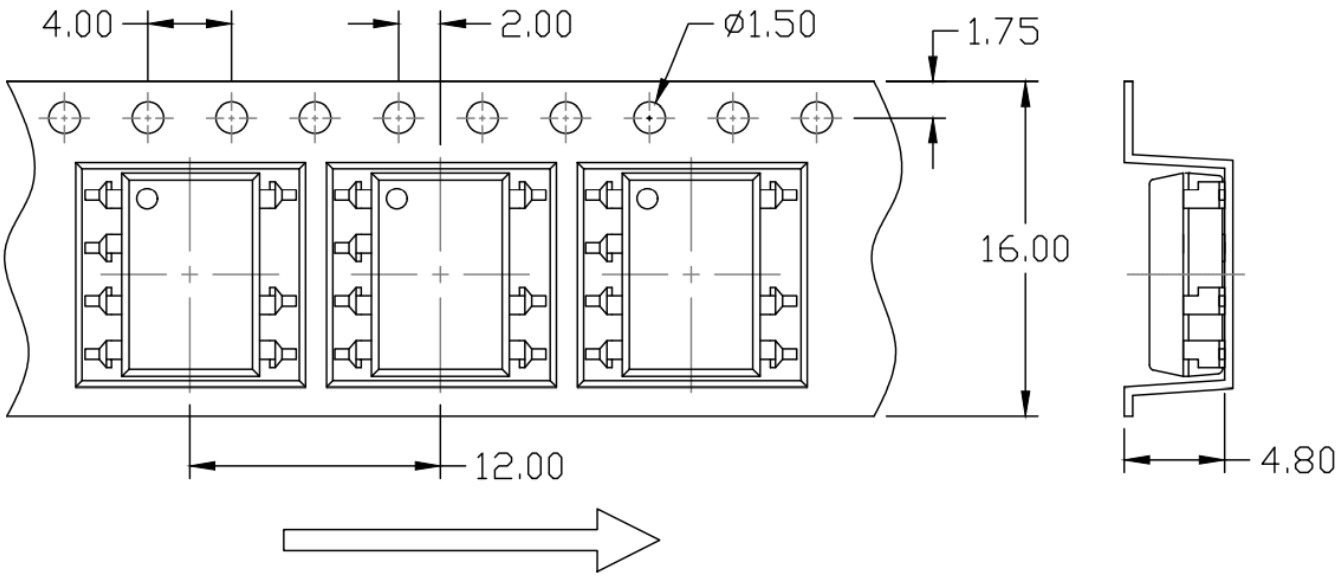
Recommended Solder Mask (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming

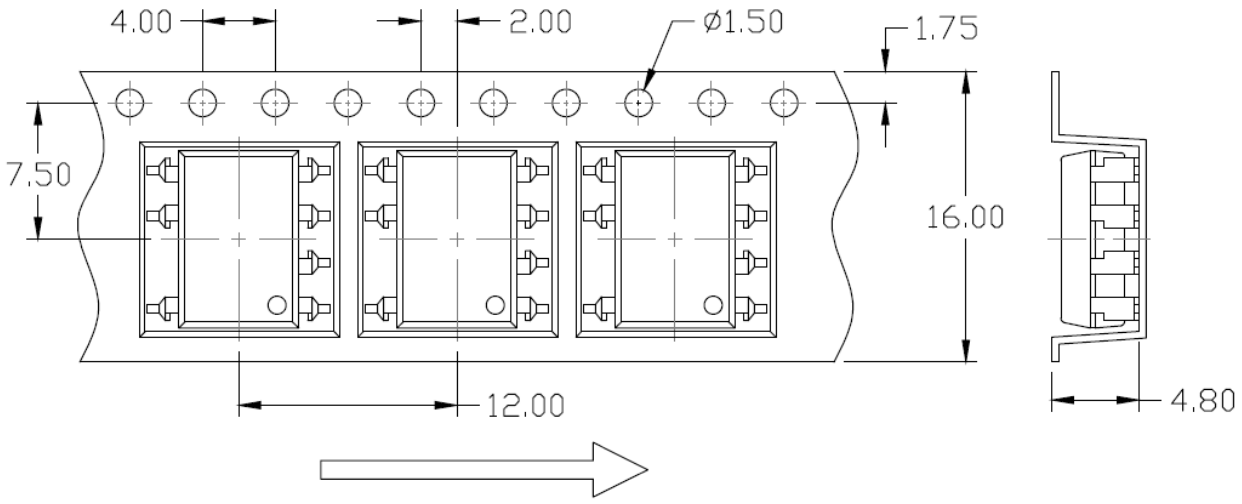


Carrier Tape Specifications (Dimensions in mm unless otherwise stated)

Option S(T1) & SL(T1)

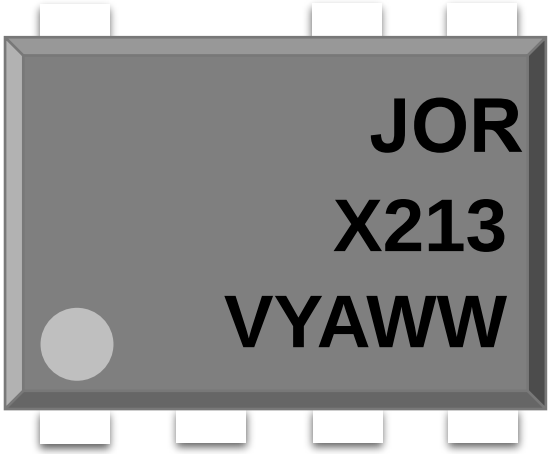


Option S(T2) & SL(T2)



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 (M/SL/None)
Z – Tape and Reel Option (T1/T2)
G – Material Option
(G:Green None: Non-Green)
V – VDE Option (V or None)

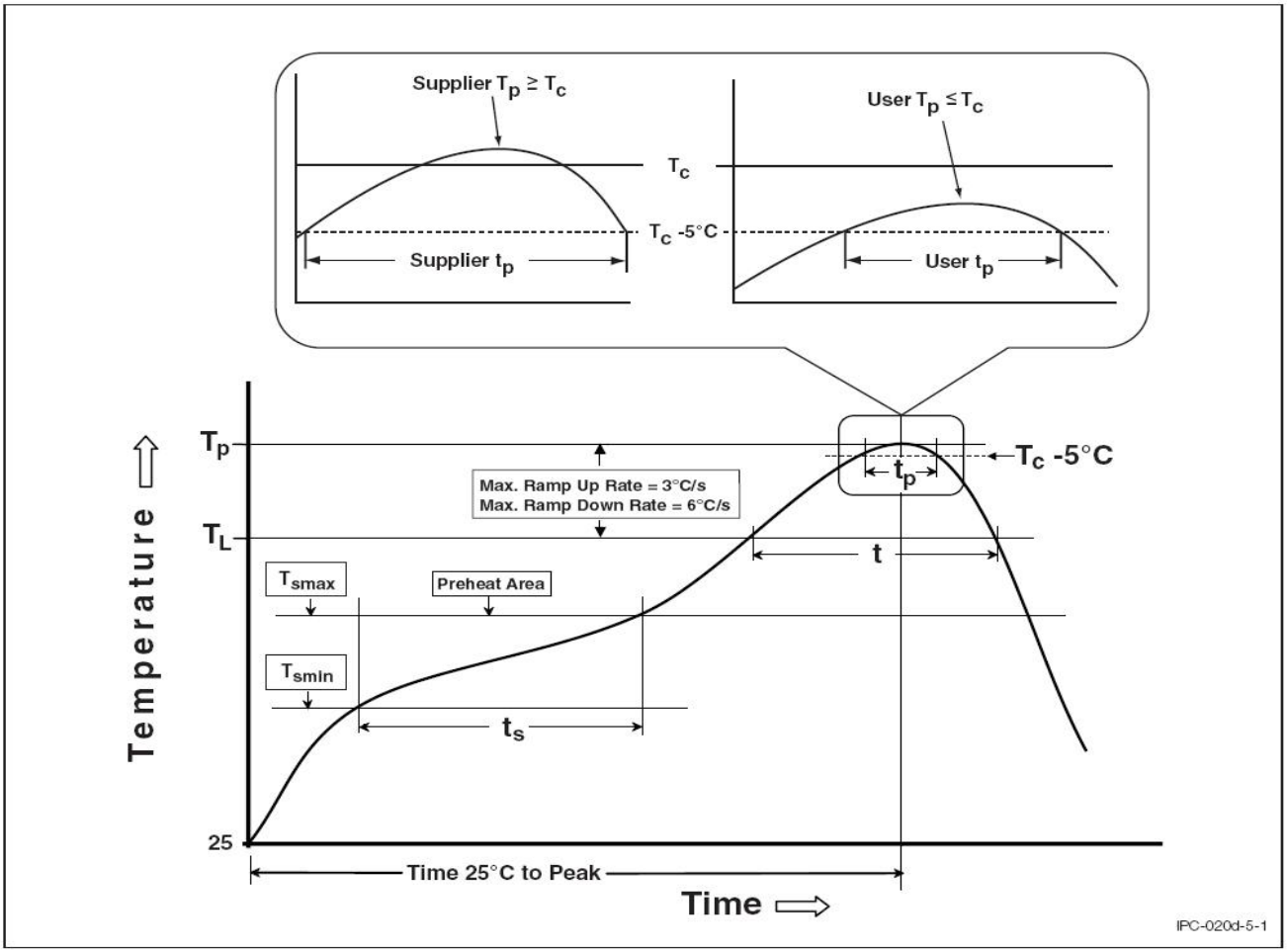
LABEL INFORMATION

PACKING QUANTITY

Option	Description	Quantity
None	Standard 8 Pin Dip	40Units/Tube
M	Gullwing(400mil) Lead Forming	40Units/Tube
SL(T1)	Surface Mount Lead Forming(Low Profile) – With Option 1 Taping	1000 Units/Reel
SL(T2)	Surface Mount Lead Forming(Low Profile) – With Option 2 Taping	1000 Units/Reel

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.

DISCLAIMER

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- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
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- This product is not intended to be used for military, aircraft, automotive, medical, life sustaining or lifesaving applications or any other application which can result in human injury or death.
- Please contact JIEJIE sales agent for special application request.
- Immerge unit’s body in solder paste is not recommended.
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