



## 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.

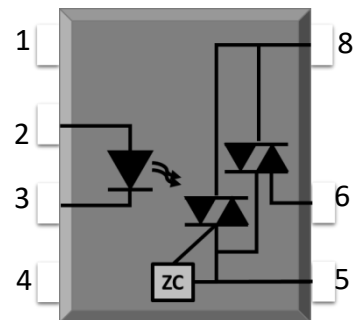
#### Features

- 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

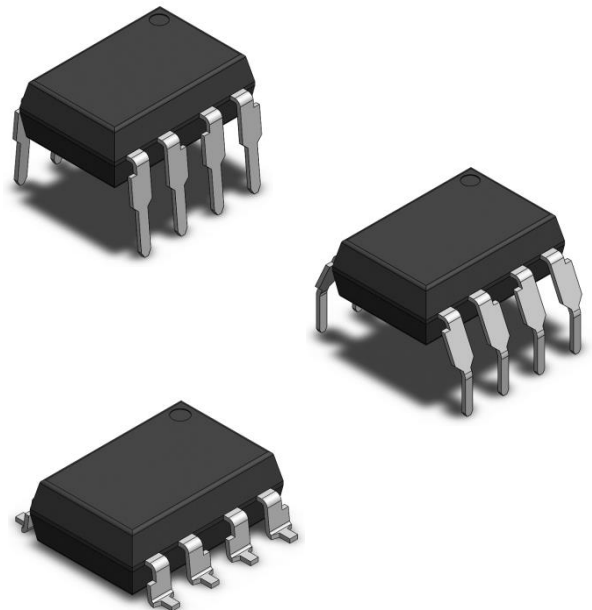


JORX213 Series  
(ZC Type)

#### 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	$T_j$	125	°C	
Input Power Dissipation	$P_i$	100	mW	
OUTPUT				
Off-state Output Terminal Voltage	$V_{DRM}$	600	V	
On-state RMS Current	JOR0213	0.3	A	
	JOR1213	0.6		
	JOR2213	0.9		
	JOR3213	1.2		
Non-repetitive Surge Current PW=100μs, 120pps	JOR0213	3	A	
	JOR1213	6		
	JOR2213	9		
	JOR3213	12		
Junction Temperature	$T_j$	125	°C	
COMMON				
Total Power Dissipation	$P_{tot}$	400	mW	
Isolation Voltage	$V_{iso}$	5000	$V_{rms}$	1
Operating Temperature	$T_{opr}$	-40~85	°C	
Storage Temperature	$T_{stg}$	-40~125	°C	
Soldering Temperature	$T_{sol}$	260	°C	2

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

Note 2. For 10 seconds

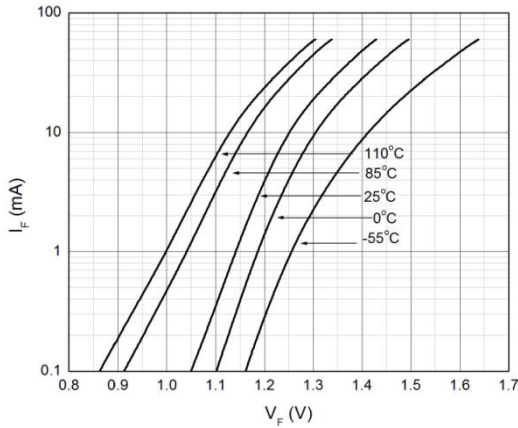


ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C							
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
INPUT							
Forward Voltage	V <sub>F</sub>	-	1.24	1.4	V	I <sub>F</sub> =10mA	
Reverse Current	I <sub>R</sub>	-	-	10	μA	V <sub>R</sub> =6V	
Input Capacitance	C <sub>in</sub>	-	30	-	pF	V=0, f=1kHz	
OUTPUT							
Peak Off-state Current, Either Direction	I <sub>DRM</sub>	-	-	100	μA	V <sub>DRM</sub> =600V I <sub>F</sub> =0	3
Peak On-state Current, Either Direction	V <sub>TM</sub>	-	1.7	2.5	V	I <sub>TM</sub> = I <sub>TM</sub> Rated	
Critical Rate of Rise of Off-state Voltage Breakdown Voltage	dV/dt	1000	-	-	V	V <sub>PEAK</sub> =600V	
TRANSFER CHARACTERISTICS							
LED Trigger Current	I <sub>FT</sub>	-	-	10	mA	Terminal Voltage = 6V R <sub>L</sub> =100Ω	
Holding Current Saturation Voltage	I <sub>H</sub>	-	-	25	mA	-	
Isolation Resistance	R <sub>iso</sub>	10 <sup>12</sup>	10 <sup>14</sup>	-	Ω	DC500V, 40 ~ 60% R.H.	
Floating Capacitance	C <sub>io</sub>	-	0.25	1	pF	V=0, f=1MHz	
ZERO CROSSING							
Inhibit Voltage	V <sub>INH</sub>	-	-	20	V	I <sub>F</sub> =10mA	
Leakage in Inhibited State	I <sub>DRM2</sub>	-	-	500	μA	I <sub>F</sub> =10mA V <sub>DRM</sub> =600V	
Response Time (Rise)	t <sub>on</sub>	-	30	100	μs	V <sub>D</sub> =6V R <sub>L</sub> =100Ω I <sub>F</sub> =10mA	

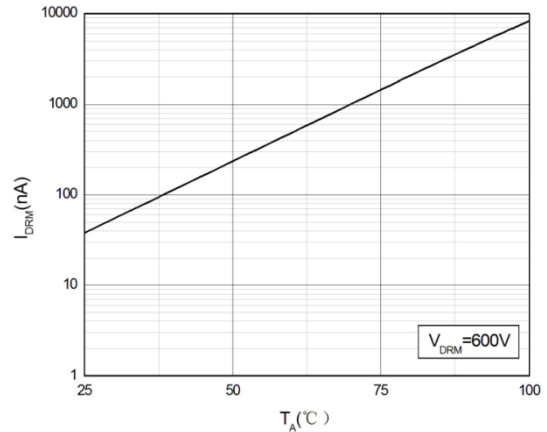
Note3. Test voltage must be applied within dV/dt rating.

**CHARACTERISTIC CURVES**

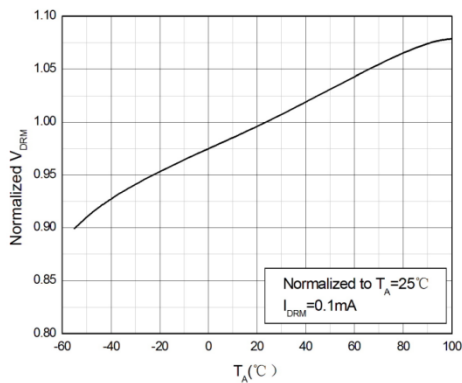
**Fig.1 Forward Current vs. Forward Voltage**



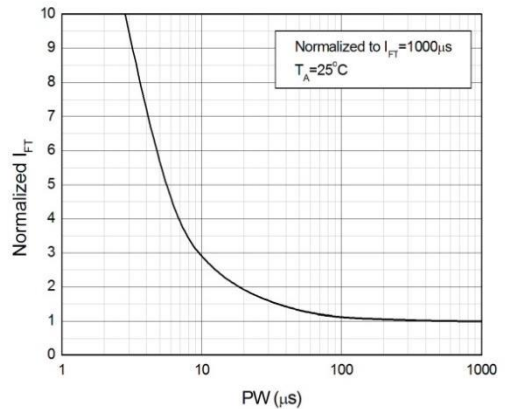
**Fig.2 Off-state Terminal Current vs. Ambient Temperature**



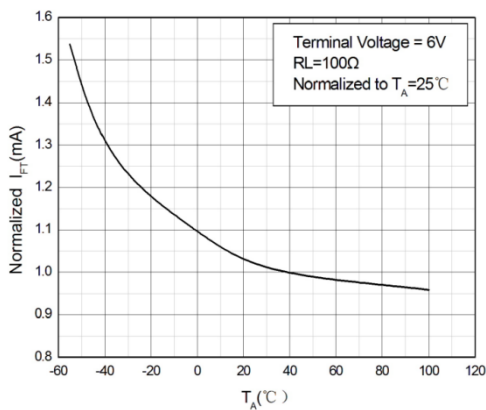
**Fig.3 Normalized Off-state Terminal Voltage vs. Ambient Temperature**



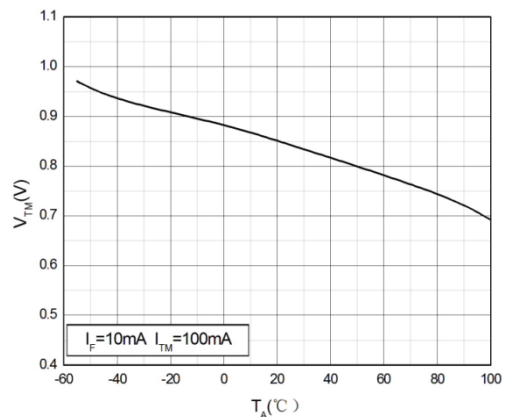
**Fig.4 Normalized Trigger Current vs. LED Trigger Pulse Width**



**Fig.5 Normalized Trigger Current vs. Ambient Temperature**

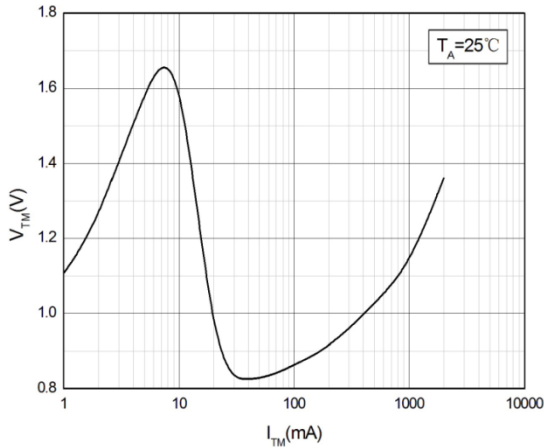


**Fig.6 On-state Terminal Voltage vs. Ambient Temperature**

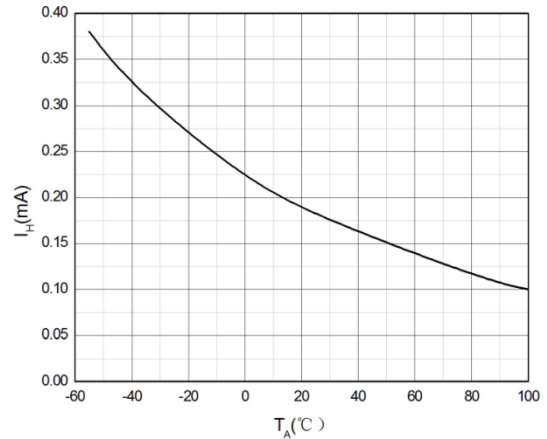


**CHARACTERISTIC CURVES**

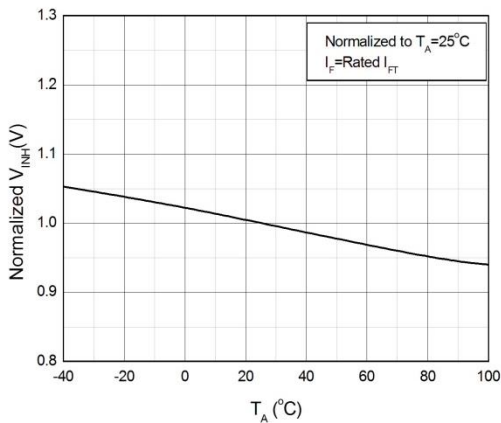
**Fig.7 On-state Terminal Voltage vs. On-state Terminal Current**



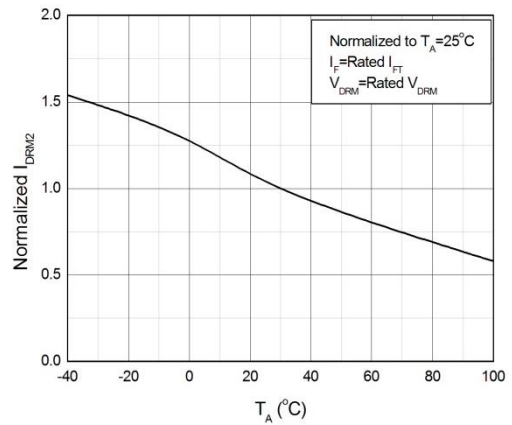
**Fig.8 Holding Current vs. Ambient Temperature**



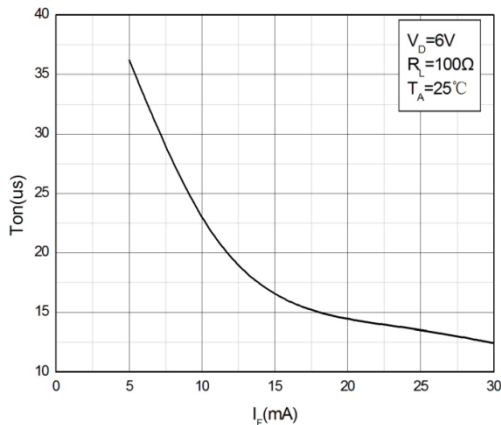
**Fig.9 Normalized Inhibit Voltage vs. Ambient Temperature**



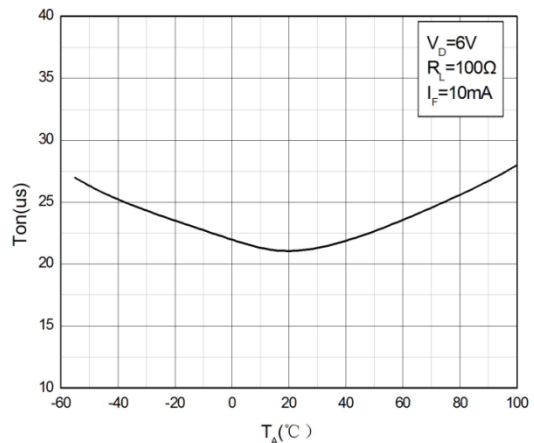
**Fig.10 Normalized Leakage in Inhibit State vs. Ambient Temperature**



**Fig.11 Turn On Time vs. Forward Current**

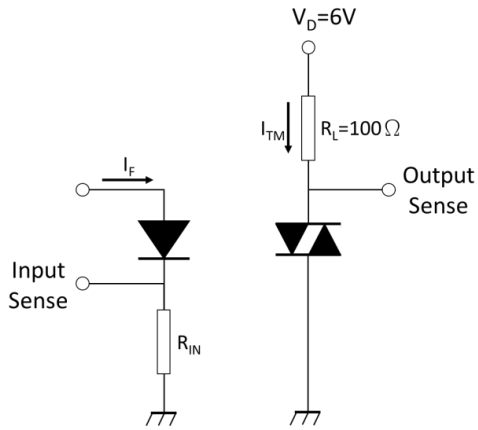


**Fig.12 Turn On Time vs. Ambient Temperature**

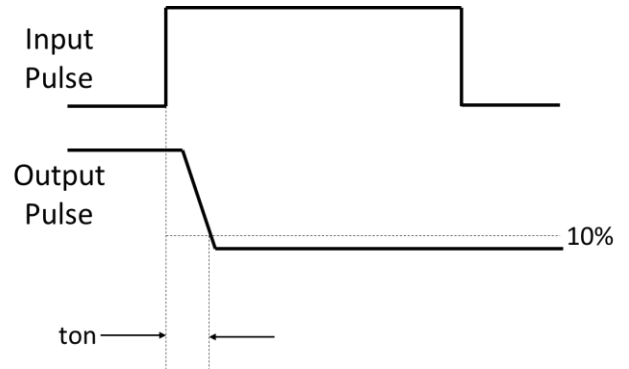


**TEST CIRCUITS**

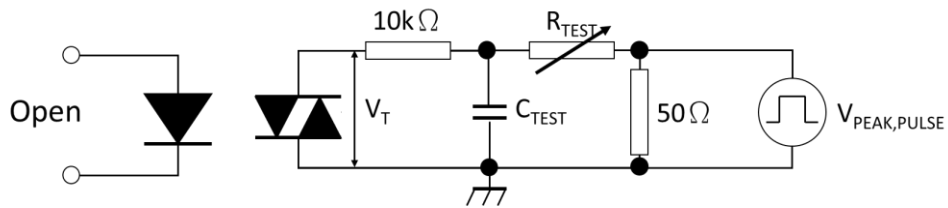
**Fig.13 Test Circuits of Turn On Time**



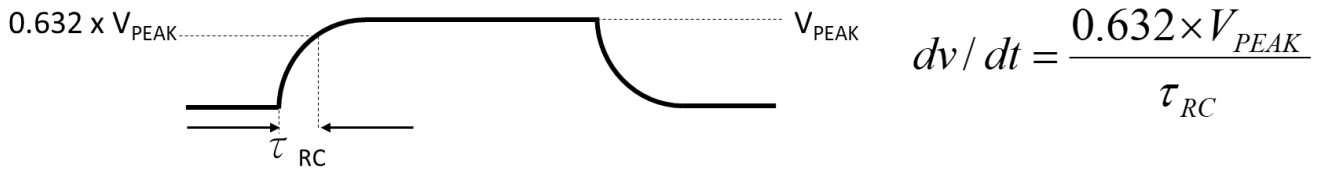
**Fig.14 Waveforms of Turn On Time**



**Fig.15 Test Circuits of dV/dt**

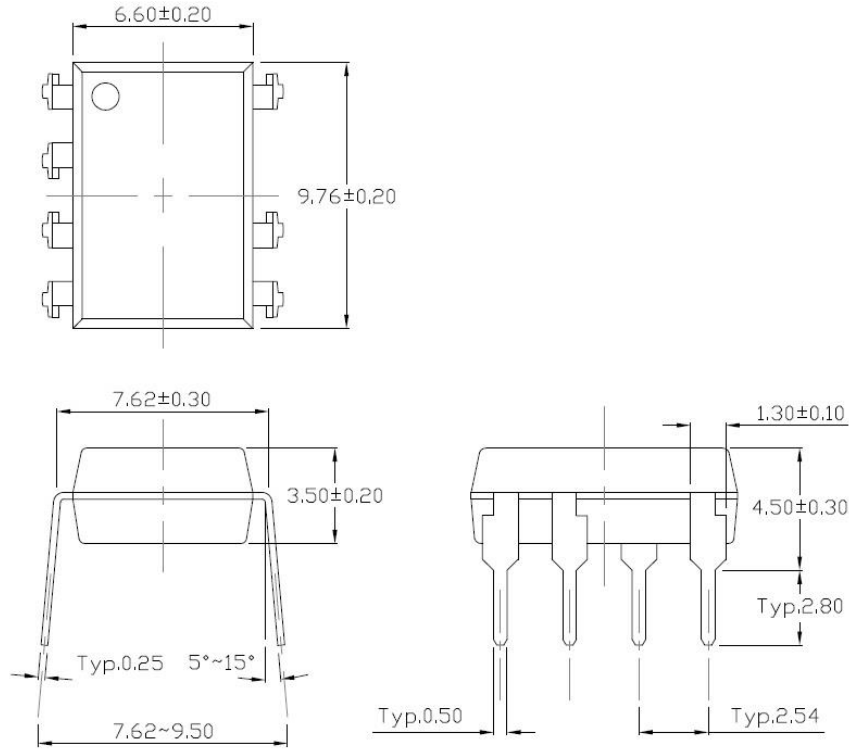


**Fig.16 Waveforms of dV/dt**

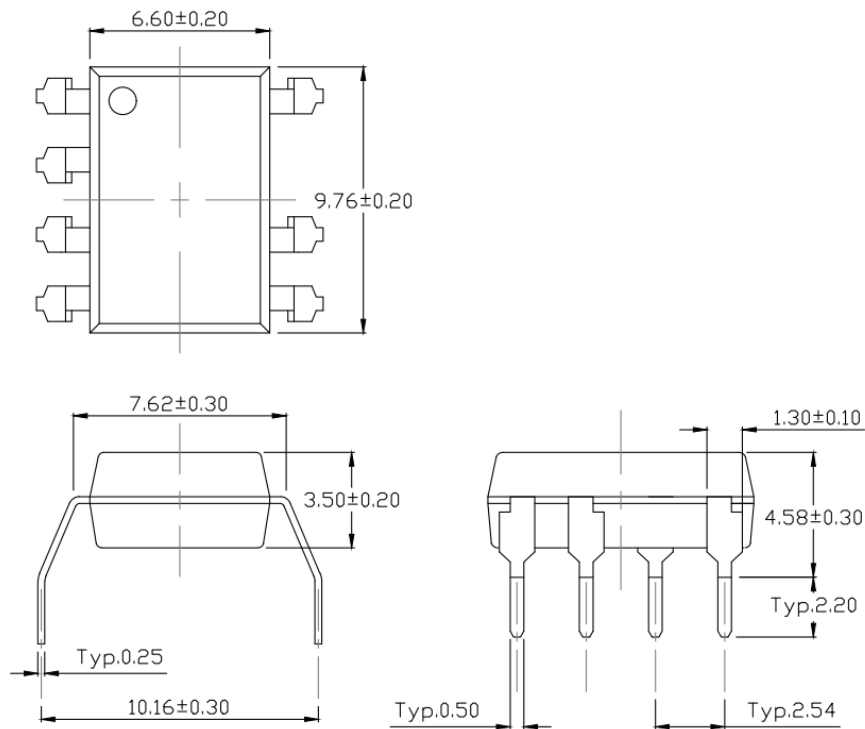


**PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)**

**Standard DIP – Through Hole (DIP Type)**

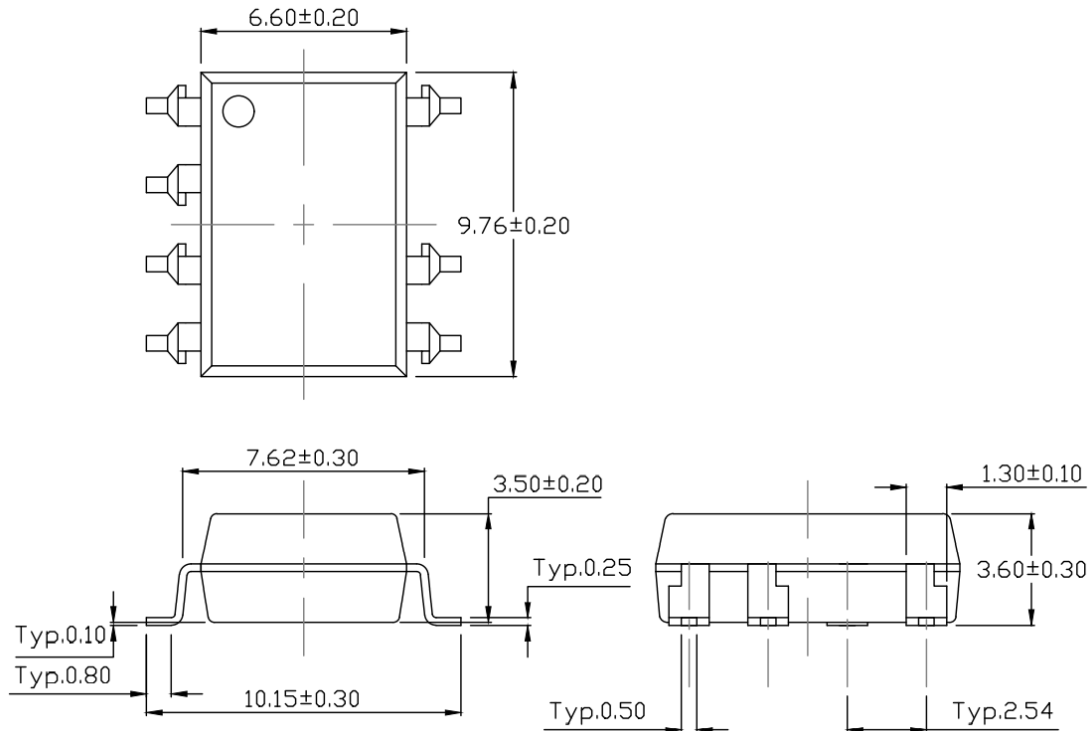


**Gullwing (400mil) Lead Forming – Through Hole (M Type)**



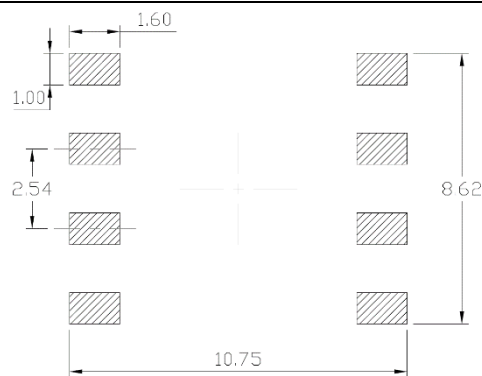
**PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)**

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



**Recommended Solder Mask (Dimensions in mm unless otherwise stated)**

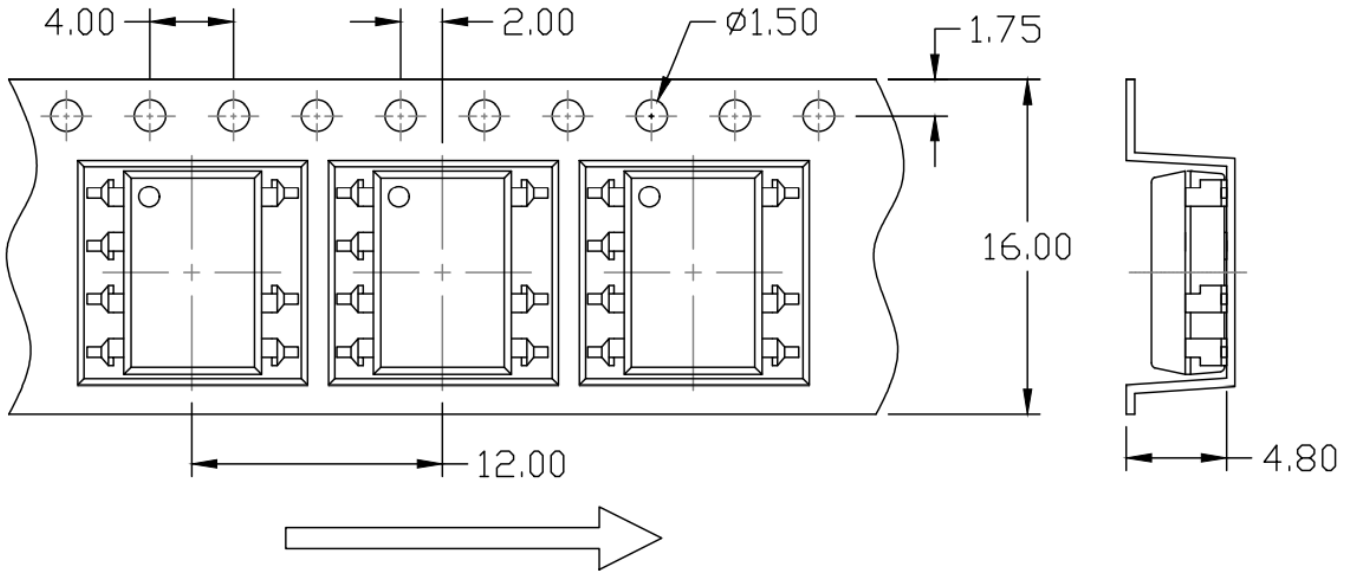
**Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming**



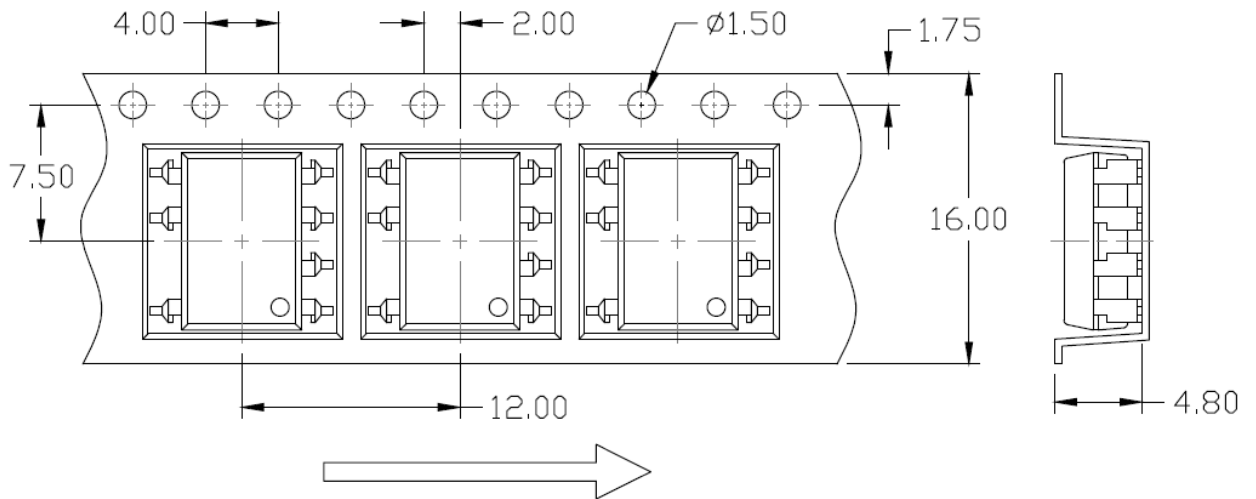


**Carrier Tape Specifications (Dimensions in mm unless otherwise stated)**

**Option S(T1) & SL(T1)**

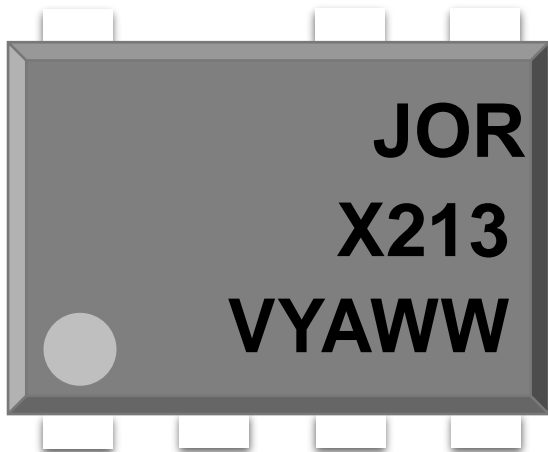


**Option S(T2) & SL(T2)**



**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**

**LABEL 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)

 捷捷微电（深圳）有限公司  
 JIEJIE MICROELECTRONICS (Shenzhen) Co Ltd

Part No.:XXXXXXXXX Bin Code: X



Lot No.: XXXXXXXXXXXX

Date Code: XXXX

QTY: XXX PCS

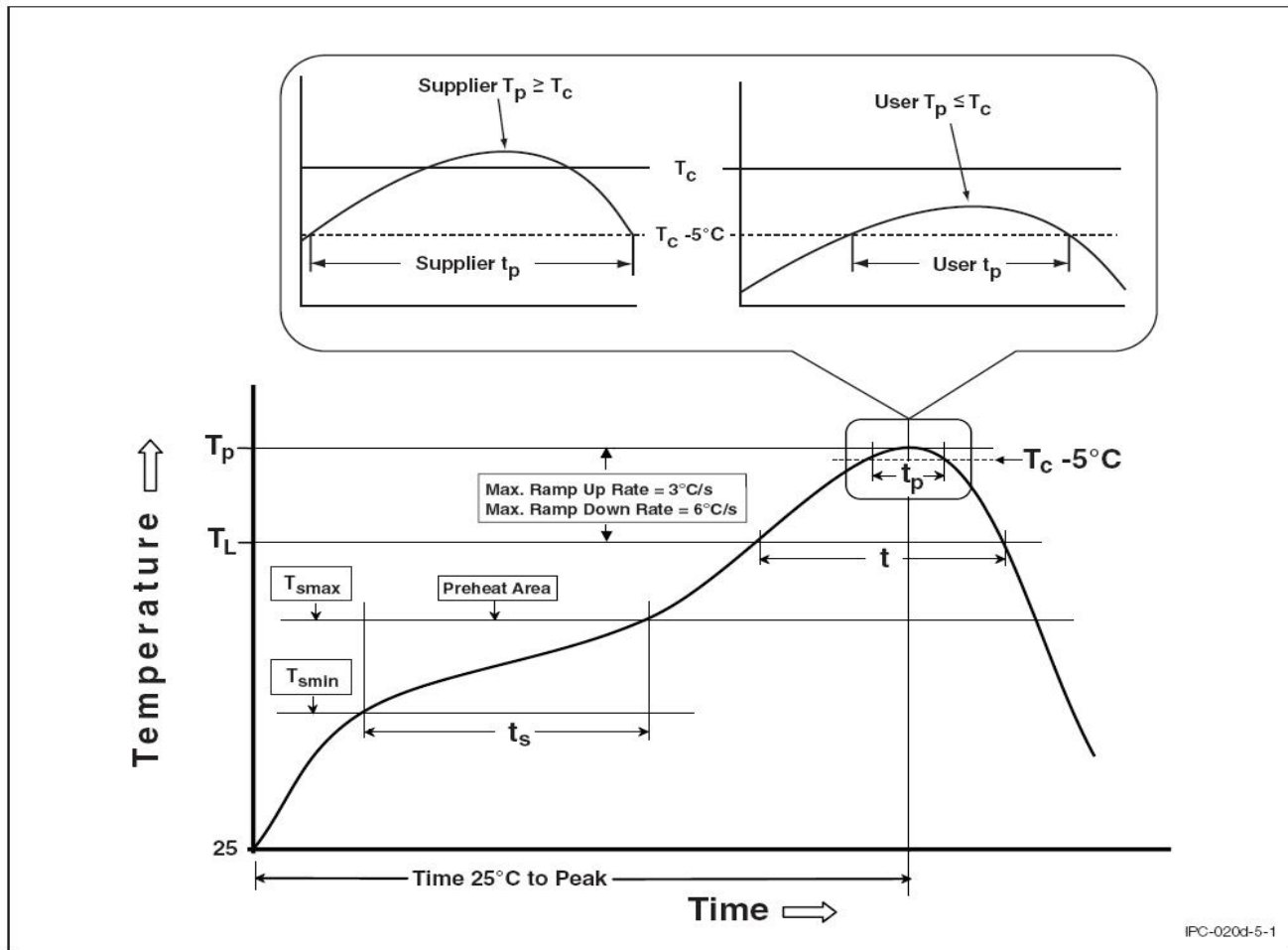


**PACKING QUANTITY**

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. (Tsmmin)	100	150°C
Temperature Max. (Tsmmax)	150	200°C
Time (ts) from (Tsmmin to Tsmmax)	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**

- JIEJIE is continually improving the quality, reliability, function and design. JIEJIE reserves the right to make changes without further notices.
- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
- JIEJIE makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, JIEJIE disclaims (a) any and all liability arising out of the application or use of any product, (b) any and all liability, including without limitation special, consequential or incidental damages, and (c) any and all implied warranties, including warranties of fitness for particular
- The products shown in this publication are designed for the general use in electronic applications such as office automation, equipment, communications devices, audio/visual equipment, electrical application and instrumenttation purpose, non-infringement and merchantability.
- 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.
- Parameters provided in datasheets may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated in each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify JIEJIE's terms and conditions of purchase, including but not limited to the warranty expressed therein.