



## JOCSZ2XBM-D7P/S Series

Rev.A.1.0

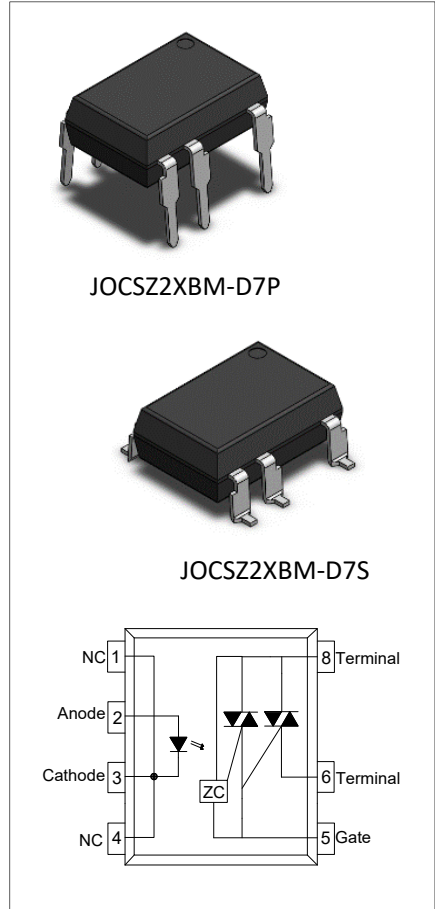
### DESCRIPTION:

The products are 7-pin solid-state relay opto-couplers. The device combines an AlGaAs infrared emitting diode as the emitter which is optically coupled to a monolithic silicon zero-crossing 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<sub>AC</sub> peripherals.

### MAIN FEATURES:

- High isolation 5000 Vrms
- DC input with triac output
- Operating temperature range - 40°C to 110 °C
- REACH & RoHS compliance
- HBM: H3B; MM: M4; CDM:C3
- CQC approved
- VDE approved
- UL approved



### ABSOLUTE MAXIMUM RATINGS (Temperature=25°C)

Parameter		Symbol	Value	Unit	
Input	Forward Current	I <sub>F</sub>	50	mA	
	Peak Forward Current	I <sub>FP</sub>	1 <sup>①</sup>	A	
	Reverse Voltage	V <sub>R</sub>	6	V	
	Power Dissipation	P <sub>D</sub>	75	mW	
Output	Repetitive peak off-state voltage	V <sub>DRM</sub>	600	V	
	Repetitive peak reverse voltage	V <sub>RRM</sub>	600	V	
	Critical rate of rise of on-state current	di/dt	100	A/μs	
	On-state RMS Current	JOCSZ23BM (T <sub>a</sub> ≤96°C)	I <sub>T(RMS)</sub>	0.3	A
		JOCSZ26BM (T <sub>a</sub> ≤76°C)		0.6	
JOCSZ29BM (T <sub>a</sub> ≤58°C)		0.9			
JOCSZ2CBM (T <sub>a</sub> ≤40°C)		1.2			

Non repetitive surge peak on-state current (full cycle , $t_p=20ms$ )	JOCSZ23BM	$I_{TSM}$	3	A
	JOCSZ26BM		6	
	JOCSZ29BM		9	
	JOCSZ2CBM		12	
junction to case (AC)		$R_{th(j-c)}$	40	$^{\circ}C/W$
Isolation Voltage		$V_{iso}$	5000 <sup>②</sup>	$V_{rms}$
Operating Temperature		$T_{opr}$	-40~110	$^{\circ}C$
Junction Temperature		$T_j$	125	$^{\circ}C$
Storage Temperature		$T_{stg}$	-40~125	$^{\circ}C$
Soldering Temperature		$T_{sol}$	260	$^{\circ}C$
Peak pulse voltage ( $T_j=25^{\circ}C$ ; non-repetitive,off-state)		$V_{pp}$	3	kV

**NOTE1** : 100 $\mu s$  pulse, 100Hz frequency

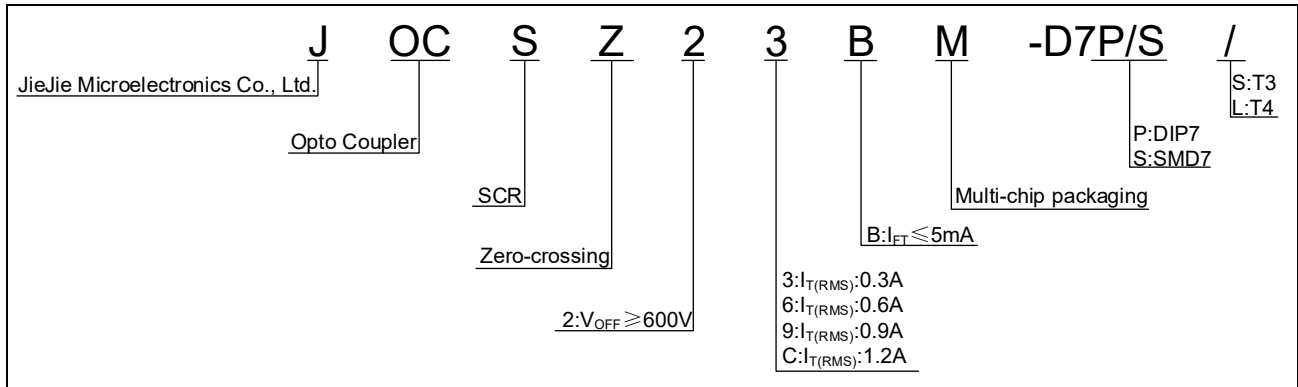
**NOTE2** : AC for 1minute, R.H.=40~60%

**ELECTRICAL CHARACTERISTICS** (Temperature=25 $^{\circ}C$ )

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit	
Input	Forward Voltage	$V_F$	$I_F=10mA$	-	1.2	1.5	V	
	Reverse Current	$I_R$	$V_R=6V$	-	-	1	$\mu A$	
Output	Peak Off-state Current, Either Direction	$I_{DRM}$	$V_{DRM} / V_{RRM} = 600V, I_F=0$	-	-	5	$\mu A$	
		$I_{RRM}$		-	-	5		
	Peak On-state Voltage, Either Direction	JOCSR23BM	$V_{TM}$	$I_{TM}=0.3A$	-	-	1.2	V
		JOCSR26BM		$I_{TM}=0.6A$	-	-	1.4	
		JOCSR29BM		$I_{TM}=0.9A$	-	-	1.45	
		JOCSR2CBM		$I_{TM}=1.2A$	-	-	1.5	
	Critical Rate of Rise of Off-state voltage		$dV/dt$	$V_D=400V$ , Gate Open $I_F=0$ , $T_j=125^{\circ}C$	1000	-	-	$V/\mu s$
Critical Rate of Rise of Commutating Voltage		$(dV/dt)_c$	$(dI/dt)_c = 1.5A/ms$ , $T_j=125^{\circ}C$	10	-	-	$V/\mu s$	
Transfer Characteristics	LED Trigger Current	$I_{FT}$	Terminal Voltage=6V $R_L=100\Omega$	-	-	5	mA	
	Holding Current	$I_H$	$V_D=6V$	-	-	25	mA	
	Isolation Resistance	$R_{iso}$	DC500V 40~60%R.H.	$10^{12}$	$10^{14}$	-	$\Omega$	

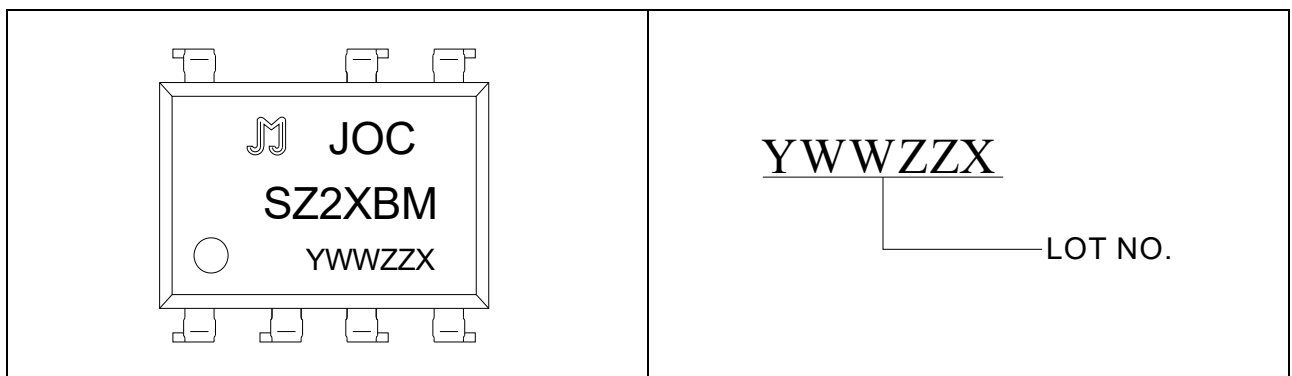
	Response Time	$t_{on}$	$V_D=6V,$ $R_L=100\Omega,$ $I_F=20mA$	-	20	100	$\mu s$
Zero Crossing	Inhibit Voltage	$V_{IH}$	$I_F=10mA$	-	-	20	V
	Leakage in Inhibit State	$I_{DRM2}$	$I_F=10mA,$ $V_{DRM}=600V$	-	-	500	$\mu A$

**ORDERING INFORMATION**



Packing Quantity	
Option	Quantity
DIP	50 Units/Tube
SMD	1200 Units/Reel

**MARKING**



Characteristics Curves

FIG.1: Max. Allowable LED Forward Current vs. Ambient Temperature

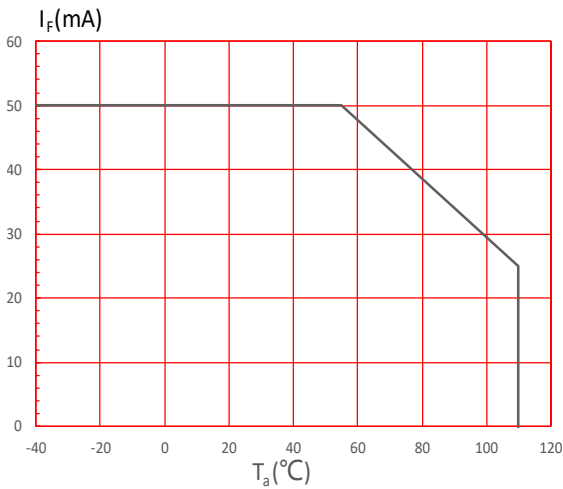


FIG.3: Forward Current vs. Forward Voltage

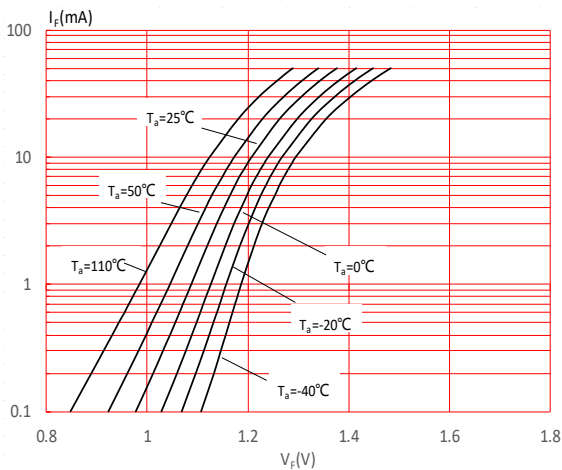


FIG.5: Off-state Terminal Current vs. Off-state Terminal Voltage

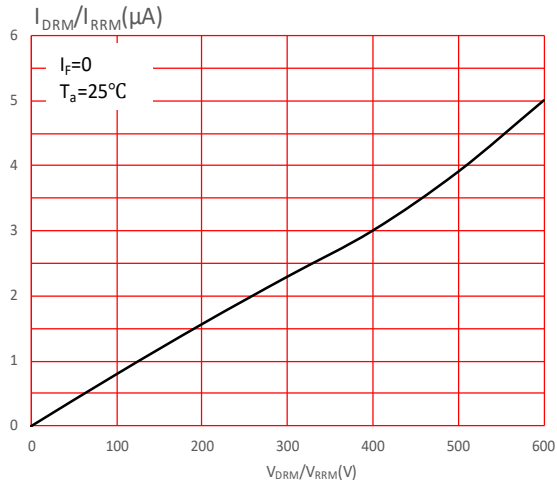


FIG.2: On-state Terminal Current vs. Ambient Temperature

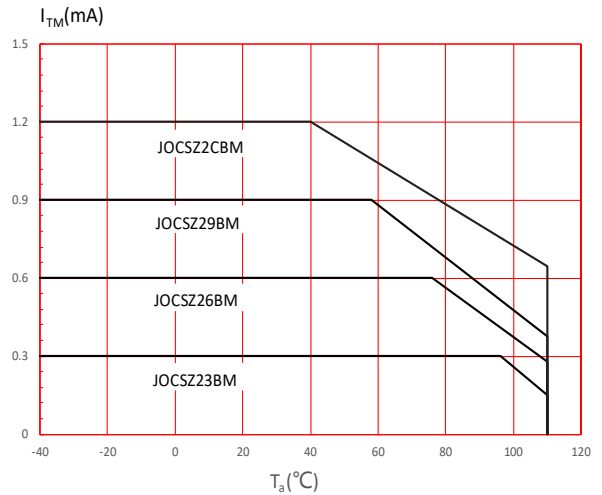


FIG.4: Forward Voltage vs. Ambient Temperature

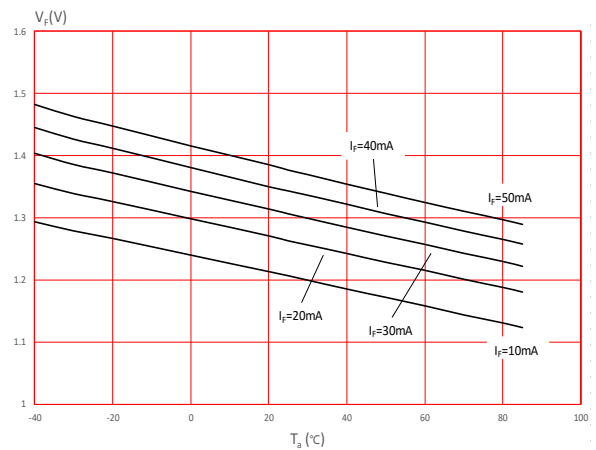


FIG.6: Normalized Trigger Current vs. Ambient Temperature

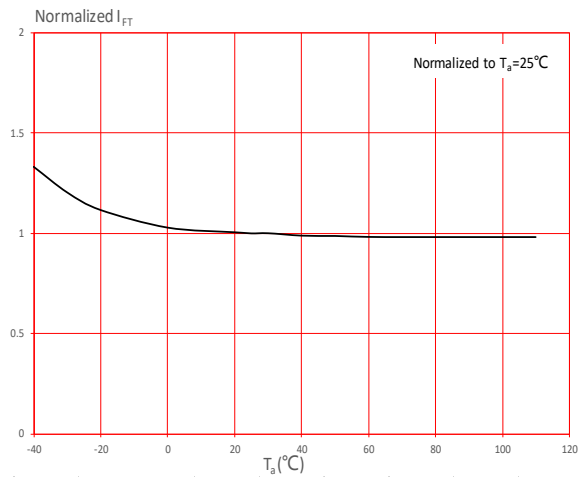


FIG.7: On-state characteristics

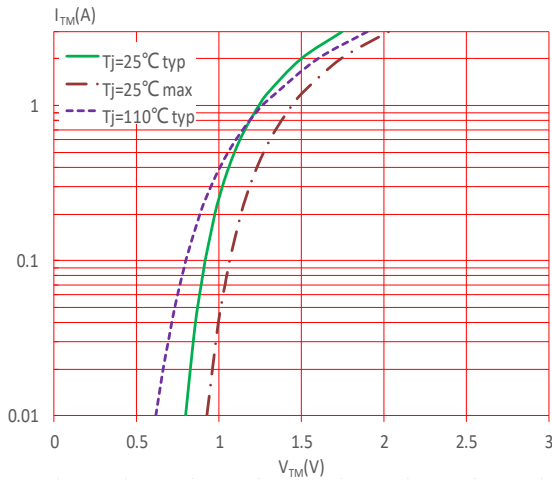


FIG.8: Normalized Holding Current vs. Ambient Temperature

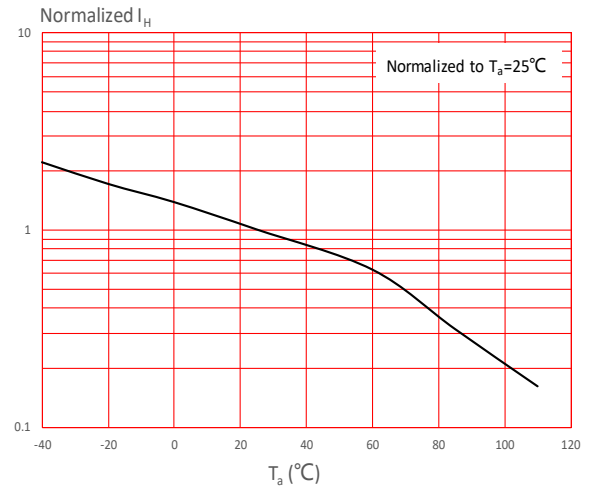


FIG.9: Turn On Time vs. Forward Current

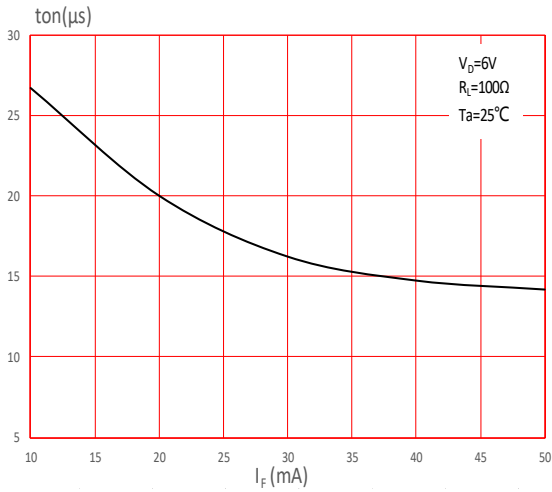
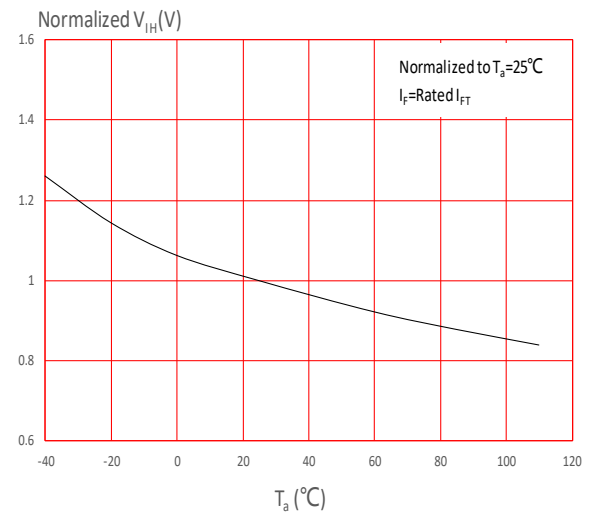


FIG.10: Normalized Inhibit Voltage vs. Ambient Temperature



TEST CIRCUITS

FIG.11: Test Circuits of Turn On Time

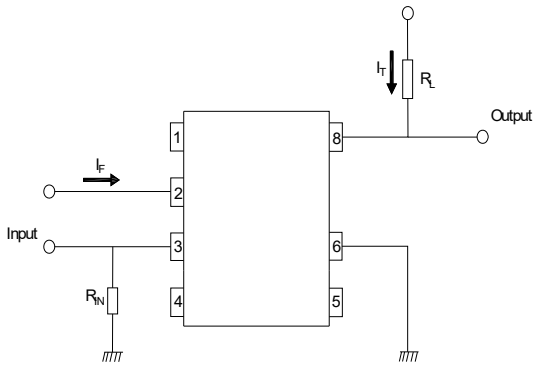
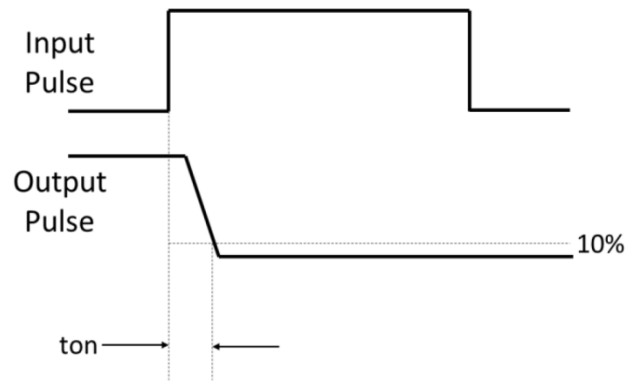
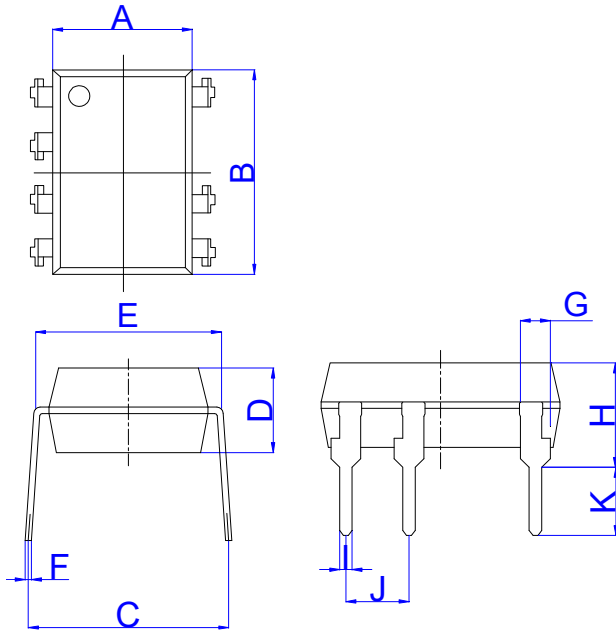


FIG.12: Waveforms of Turn On Time



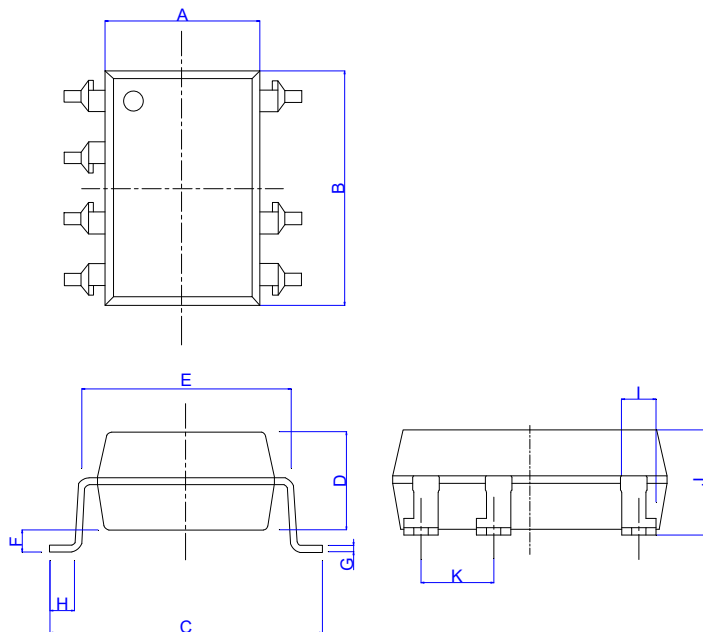
Package Dimension (Unit: mm)

Standard DIP Type:



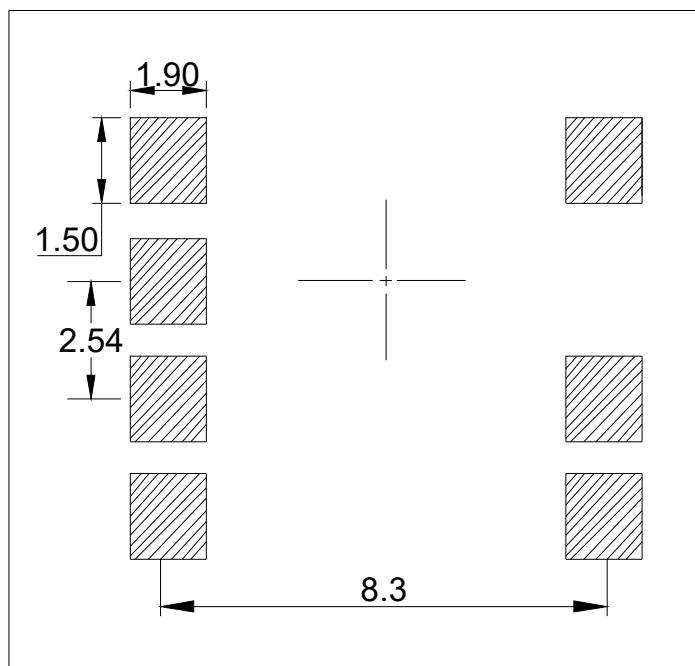
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.20		6.60	0.244		0.260
B	9.40		9.80	0.370		0.386
C	7.15		8.95	0.281		0.352
D	3.20		3.60	0.126		0.142
E	7.32		7.92	0.288		0.312
F	0.15		0.35	0.006		0.014
G	0.90		1.50	0.035		0.059
H	3.90		4.50	0.154		0.177
I	0.40		0.60	0.016		0.024
J	2.29		2.79	0.090		0.110
K	2.24		3.24	0.088		0.128

Option SMD Type:



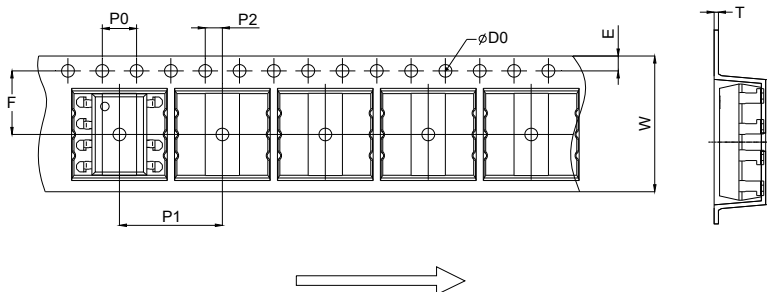
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.20		6.60	0.244		0.260
B	9.40		9.80	0.370		0.386
C	9.50		10.50	0.374		0.413
D	3.20		3.60	0.126		0.142
E	7.32		7.92	0.288		0.312
F	0.05		0.35	0.002		0.014
G	0.16		0.36	0.006		0.014
H	0.60		1.40	0.024		0.055
I	0.90		1.50	0.035		0.059
J	3.30		3.90	0.130		0.154
K	2.29		2.79	0.090		0.110

RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)



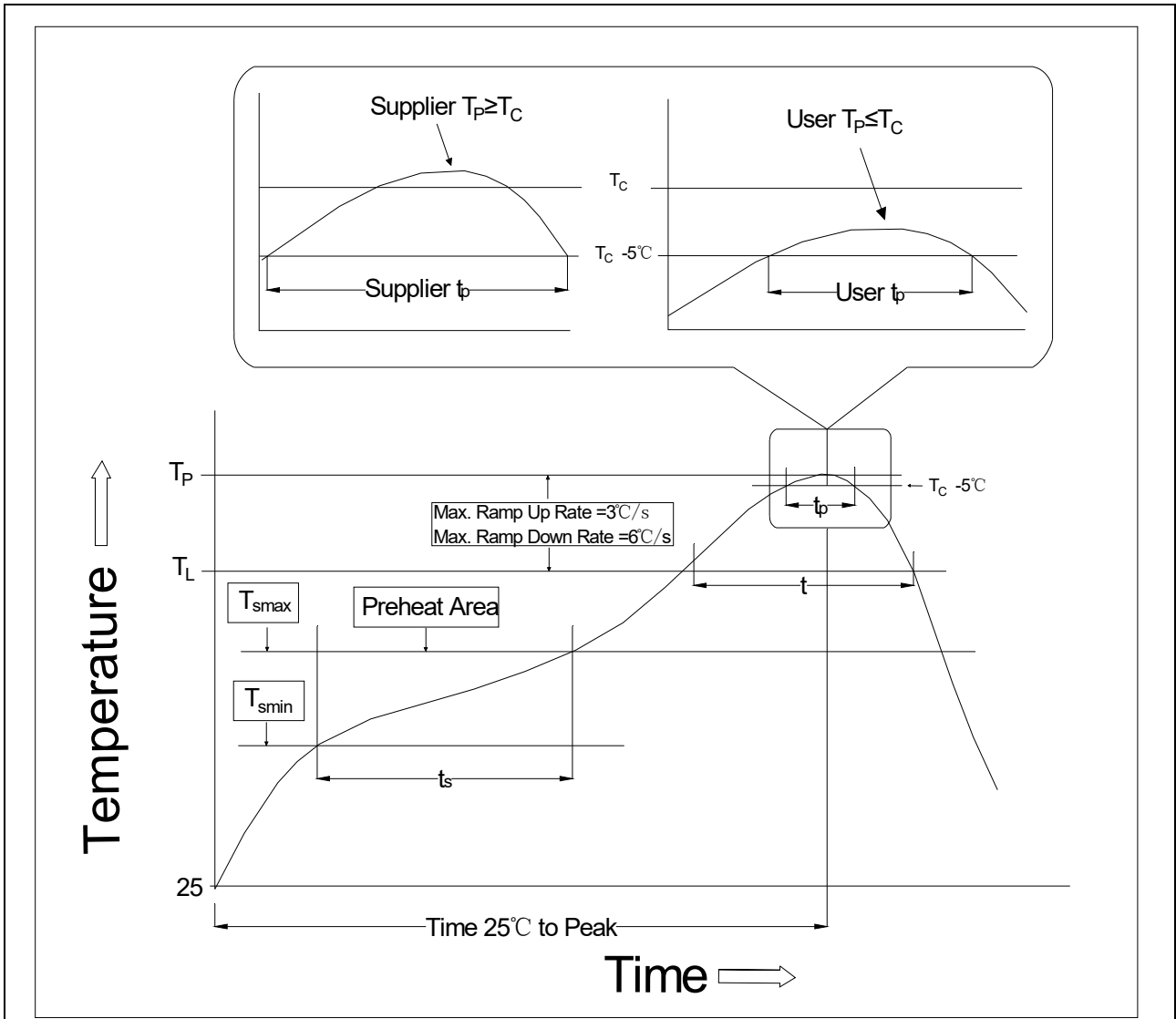
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S/L



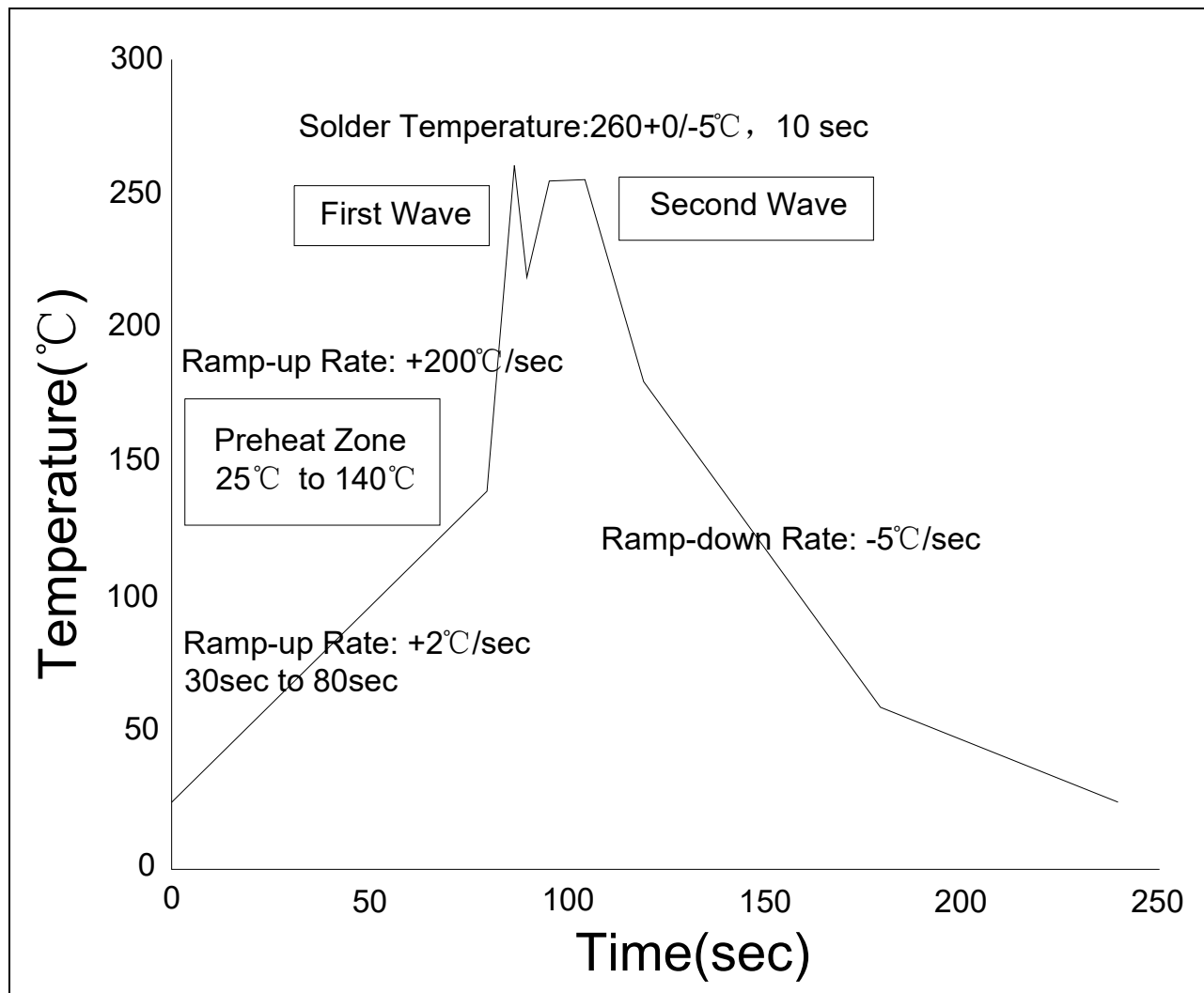
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	11.90	12.00	12.10	0.469	0.472	0.476
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.35	0.40	0.45	0.014	0.016	0.018
W	15.90	16.00	16.20	0.626	0.630	0.638

REFLOW INFORMATION



Temperature Min. (T <sub>smin</sub> )	150 °C
Temperature Max. (T <sub>smax</sub> )	200 °C
Time (t <sub>s</sub> ) from (T <sub>smin</sub> to T <sub>smax</sub> )	60-120 seconds
Ramp-up Rate (t <sub>L</sub> to t <sub>P</sub> )	3°C/second max.
Liquidous Temperature (T <sub>L</sub> )	217 °C
Time (t <sub>L</sub> ) Maintained Above (T <sub>L</sub> )	60-120 seconds
Peak Body Package Temperature	260 °C +0 °C / -5 °C
Time (t <sub>P</sub> ) within 5 °C of 260 °C	10 seconds
Ramp-down Rate (T <sub>P</sub> to T <sub>L</sub> )	6°C/second max.

**WAVE SOLDERING**



**HAND SOLDERING BY SOLDERING IRON**

Soldering Temperature	$360 \pm 5^{\circ}\text{C}$
Soldering Time	3s max.

Note:

1. Reflow soldering is recommended at the temperatures and times shown, no more than three times.
2. Avoid direct contact between the epoxy body and any tools or surfaces exceeding its maximum storage temperature.
3. Application of pressure on the epoxy body is prohibited at elevated temperatures. In specific scenarios, any applied force must not exceed 2.5N.
4. Ensure the component has cooled to ambient temperature before proceeding with any subsequent manufacturing steps.
5. The component has a shelf life of one year when stored under standard conditions.
6. Recommend storage Temp.: 0~40°C;  
Recommend storage humidity: <60%;  
MSL level: MSL 1

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