

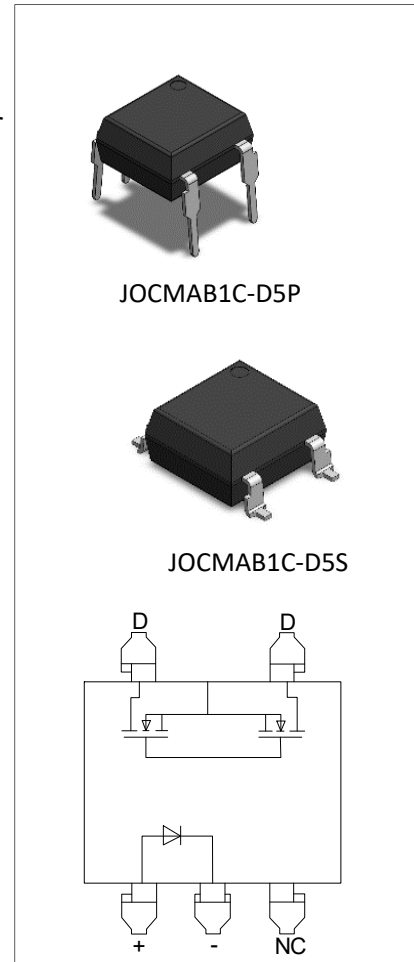


### DESCRIPTION:

The products are 5-pin optical relays. The device combines an AlGaAs infrared emitting diode input stage optically coupled to a high-voltage output detector circuit. The detector consists of a high-speed photovoltaic diode array and driver circuitry to switch on/off two discrete 1800V high voltage MOSFETs. The relay action with a minimum input current of 5mA through the input LED. The products are widely used in accumulation, automotive battery management system, automobile battery and power system insulation testing, industrial controls and EMR/reed relay replacement.

### MAIN FEATURES:

- High isolation 5000 Vrms
- Single channel normally on Single-Pole-Single-Throw Relay
- Operating temperature range -40°C to 125°C
- REACH & RoHS compliance
- HBM: H3A; MM: M4; CDM: C3
- CQC approved
- VDE approved
- UL approved



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

Parameter		Symbol	Value	Unit
Input	Forward Current	$I_F$	50	mA
	Peak Forward Current	$I_{FP}$	1 <sup>①</sup>	A
	Reverse Voltage	$V_R$	6	V
	Power Dissipation	$P_D$	75	mW
Output	Switching Voltage	$V_O$	1800	V
	Continuous Load Current	$I_O$	10	mA
	Power Dissipation	$P_C$	360	mW
Operating Temperature		$T_{opr}$	-40~125	°C
Junction Temperature		$T_j$	135	°C
Storage Temperature		$T_{stg}$	-55~125	°C

Total Power Dissipation	$P_{tot}$	450	mW
Isolation Voltage	$V_{iso}$	5000 <sup>②</sup>	Vrms
Soldering Temperature	$T_{sol}$	260	°C

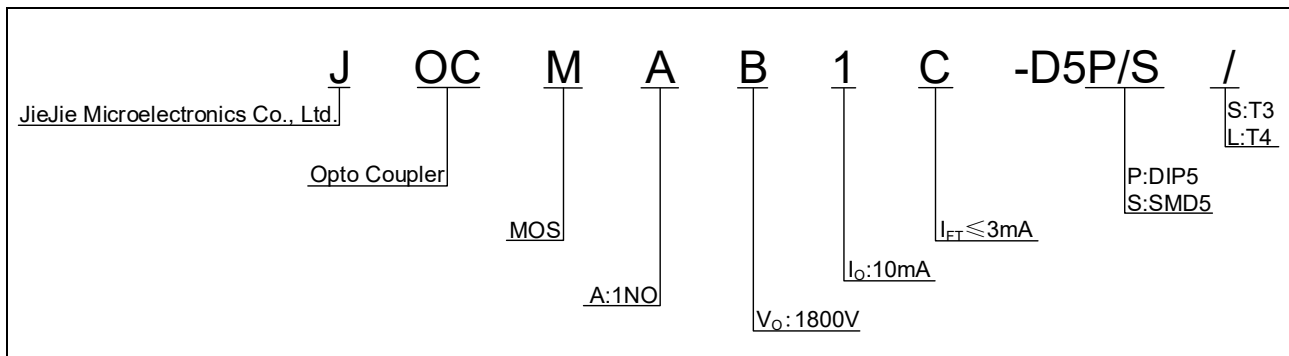
**NOTE1** : 100μs pulse, 100Hzfrequency

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

**ELECTRICAL CHARACTERISTICS** (Temperature=25°C)

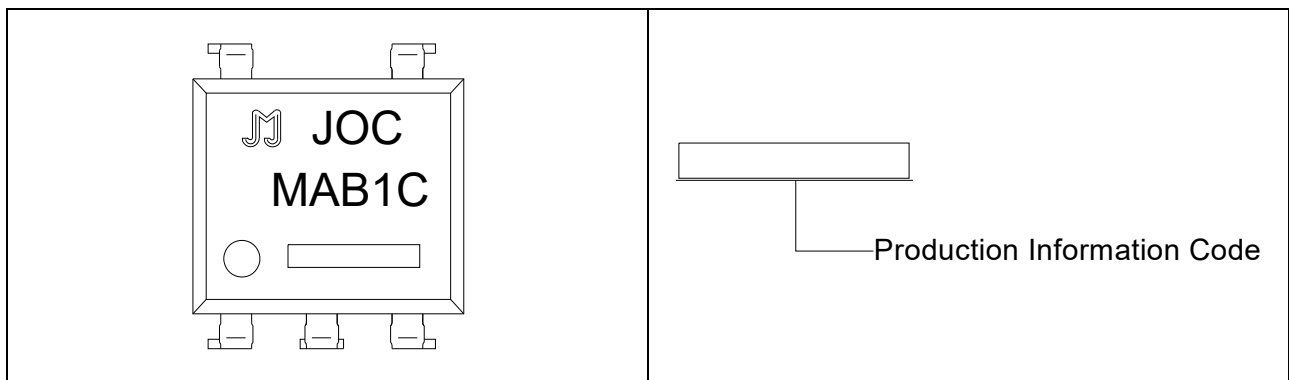
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	$V_F$	$I_F=10mA$	-	1.2	1.5	V
	Reverse Current	$I_R$	$V_R=6V$	-	-	1	μA
	Terminal Capacitance	$C_t$	$V=0, f=1MHz$	-	30	-	pF
	Reset Current	$I_{F(OFF)}$	$I_O=I_{O(MAX)}$	0.4	-	-	mA
Output	Off-state Leakage Current	$I_{OFF}$	$V_O=1800V$	-	-	10	μA
	ON Resistance	$R_{ON}$	$I_O=I_{O(MAX)}, I_F=5mA$	-	200	500	Ω
Transfer Characteristics	LED Trigger Current	$I_{FT}$	$I_O=I_{O(MAX)}$	-	-	3	mA
	Floating Capacitance	$C_{IO}$	$V=0, f=1MHz$	-	3	-	pF
	Isolation Resistance	$R_{ISO}$	DC500V 40~60%R.H.	$10^{12}$	-	-	Ω
	Turn On Time	$t_{on}$	$I_O=10mA, I_F=5mA$	-	0.2	1	ms
	Turn Off Time	$t_{off}$	$I_O=10mA, I_F=5mA$	-	0.1	0.2	ms

**ORDERING INFORMATION**



Packing Quantity			
Option	Quantity	Quantity – Inner box	Quantity –Outer box
DIP	60 Units/Tube	40 Tubes/Inner box	5 Inner box/Outer box =12k Units
SMD	1200 Units/Reel	2 Reels/Inner box	5 Inner box/Outer box =12k Units

**MARKING**



Characteristics Curves

FIG.1: Forward Current vs. Forward Voltage

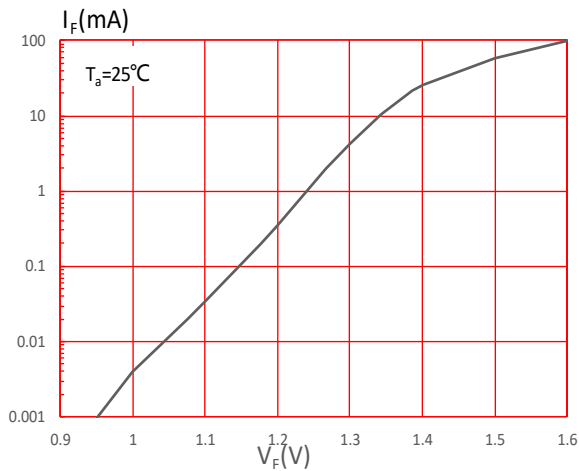


FIG.2: Max. Allowable LED Forward Current vs. Ambient Temperature

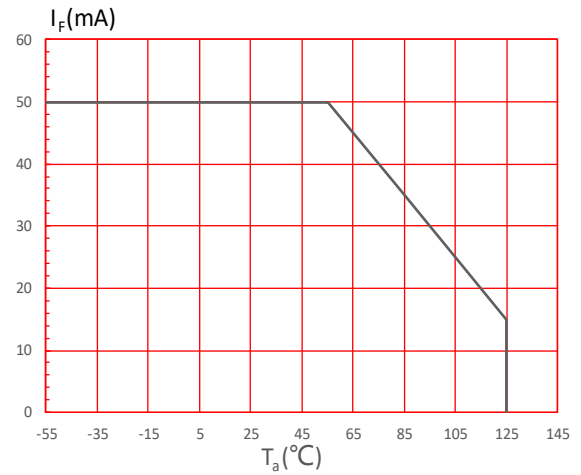


FIG.3: LED Operate Current vs. Ambient Temperature

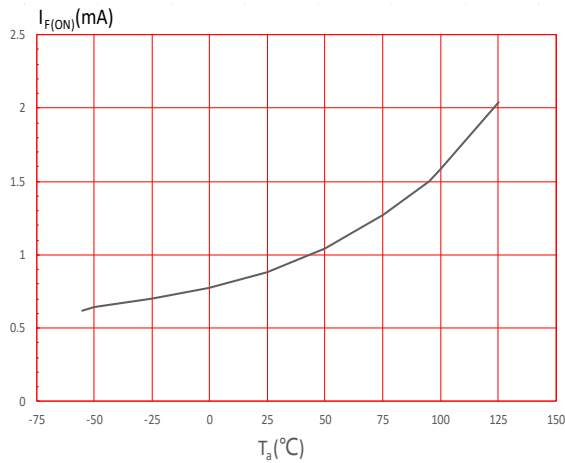


FIG.4: On Resistance vs. Ambient Temperature

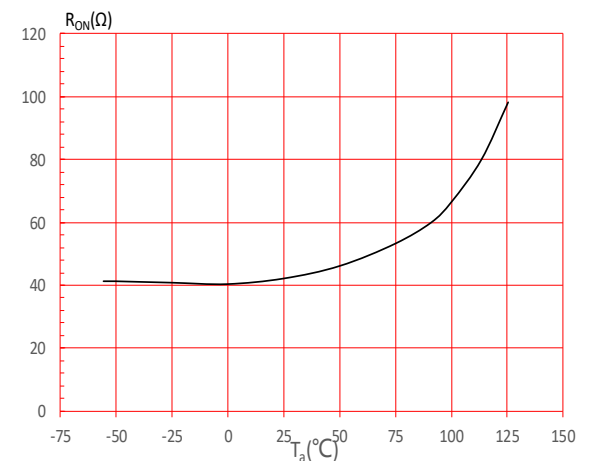


FIG.5: Turn On Time vs. Ambient Temperature

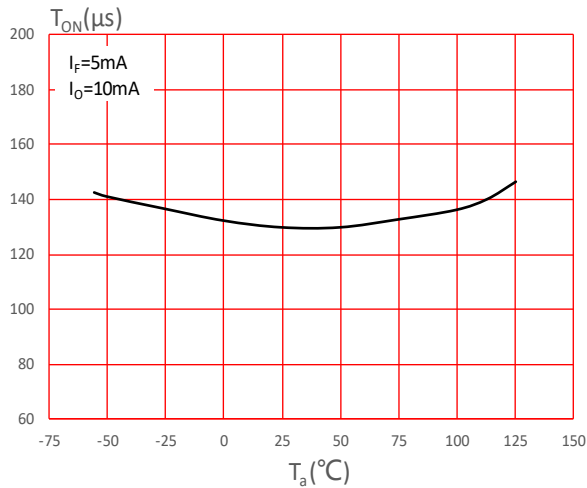


FIG.6: Turn Off Time vs. Ambient Temperature

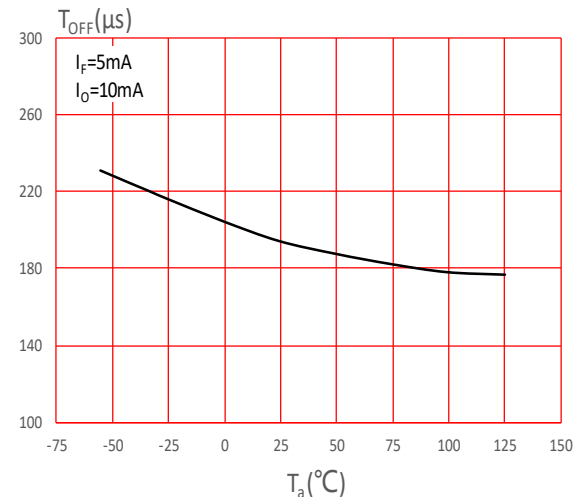


FIG.7: Output Current vs. Output Voltage

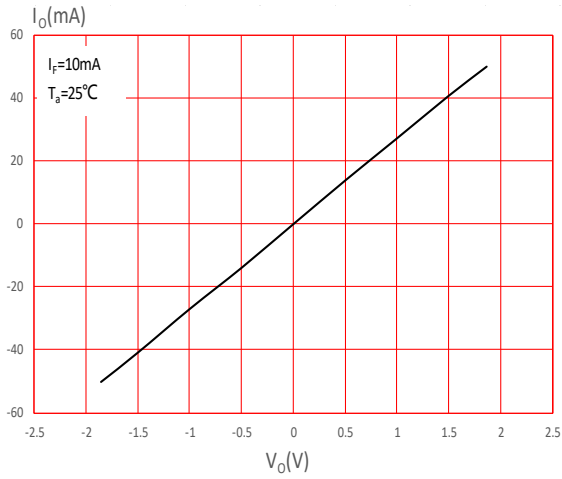
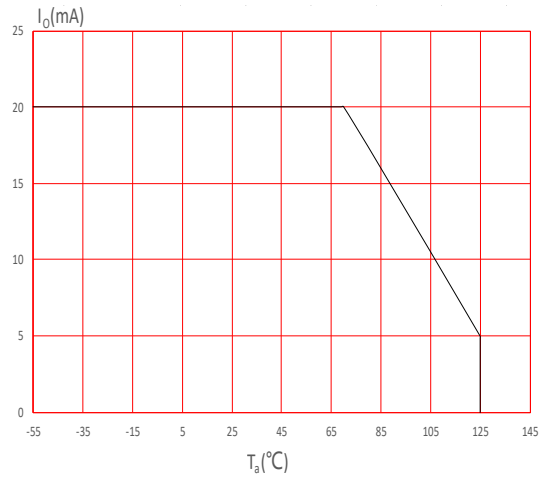


FIG.8: Output Current vs. Ambient Temperature



TEST CIRCUITS

FIG.9: Wiring diagram

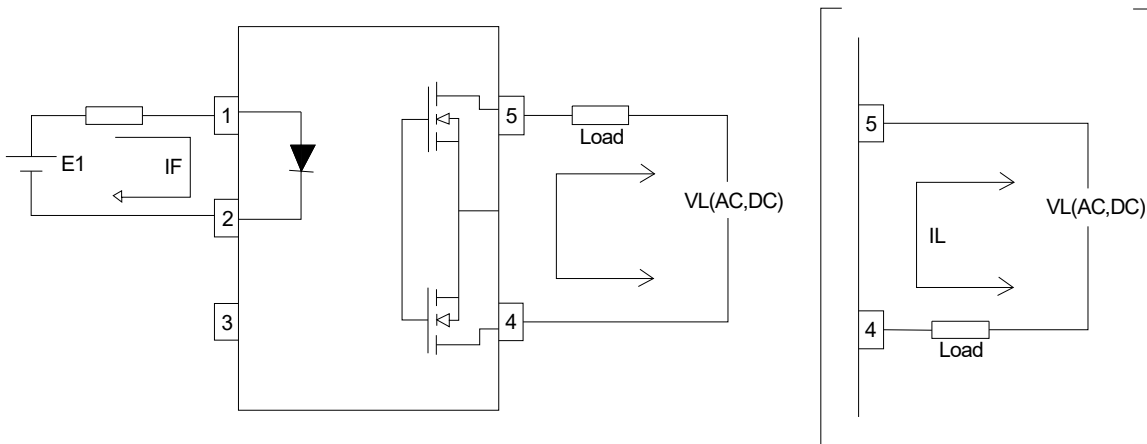
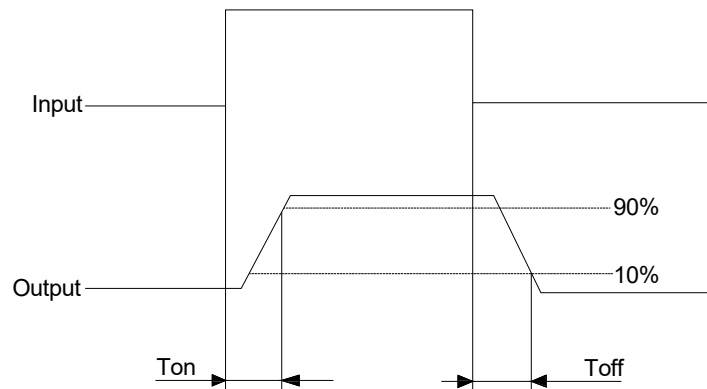
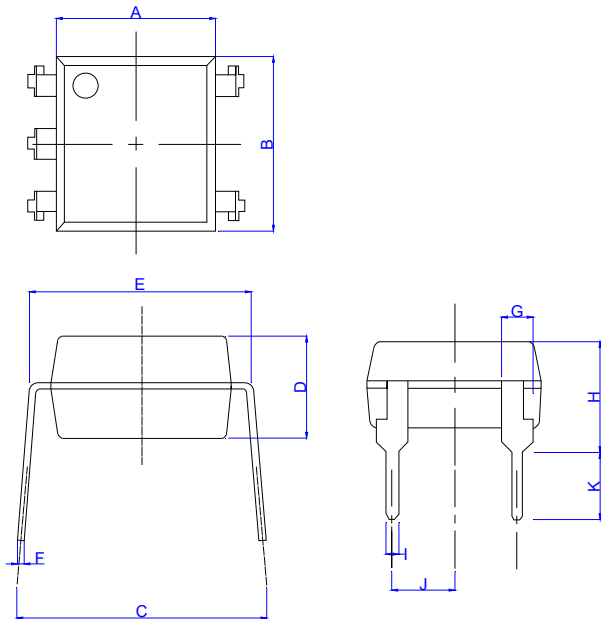


FIG.10: The test method of Ton and Toff



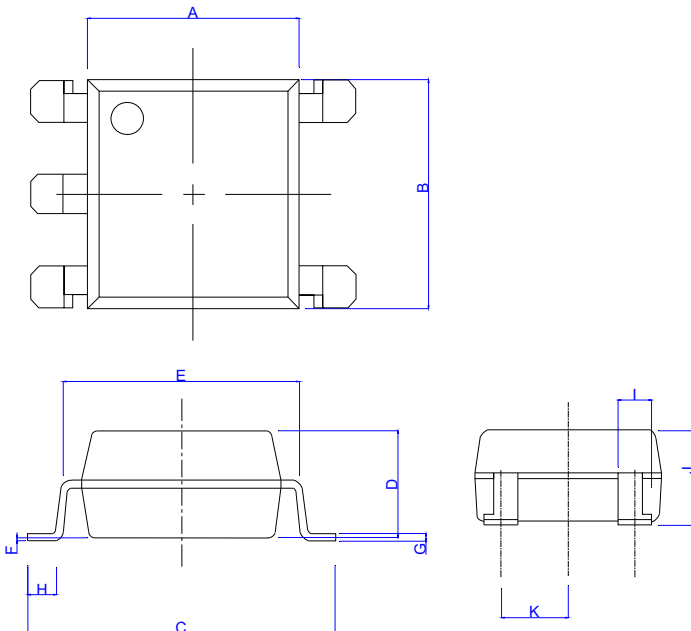
Package Dimension (Unit: mm)

Standard DIP Type:



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.20		6.60	0.244		0.260
B	6.92		7.32	0.272		0.288
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	1.15		1.35	0.045		0.053
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

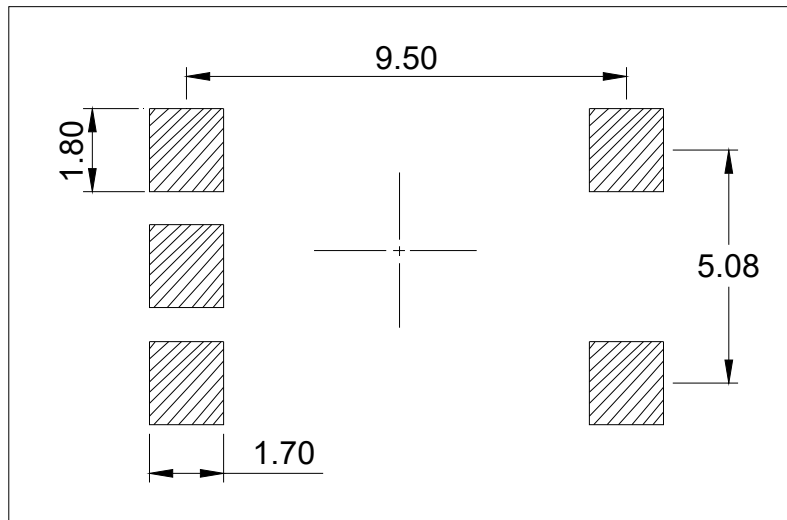
Option SMD Type:



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.20		6.60	0.244		0.260
B	6.92		7.32	0.272		0.288
C	9.50		10.50	0.375		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

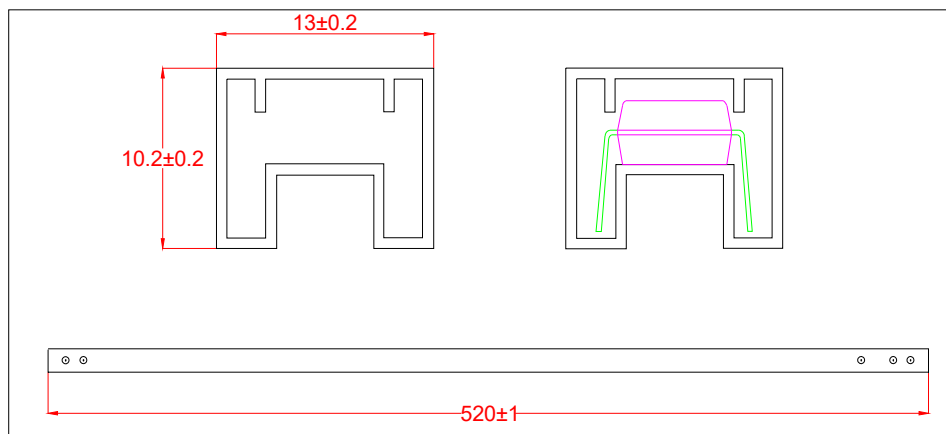
**RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)**

Option SMD



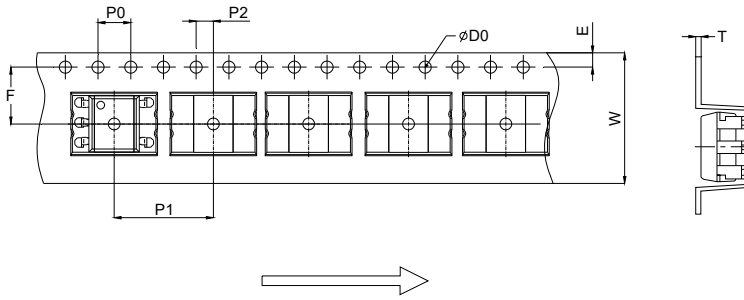
**TUBE SPECIFICATIONS (Dimensions in mm unless otherwise stated)**

Standard DIP



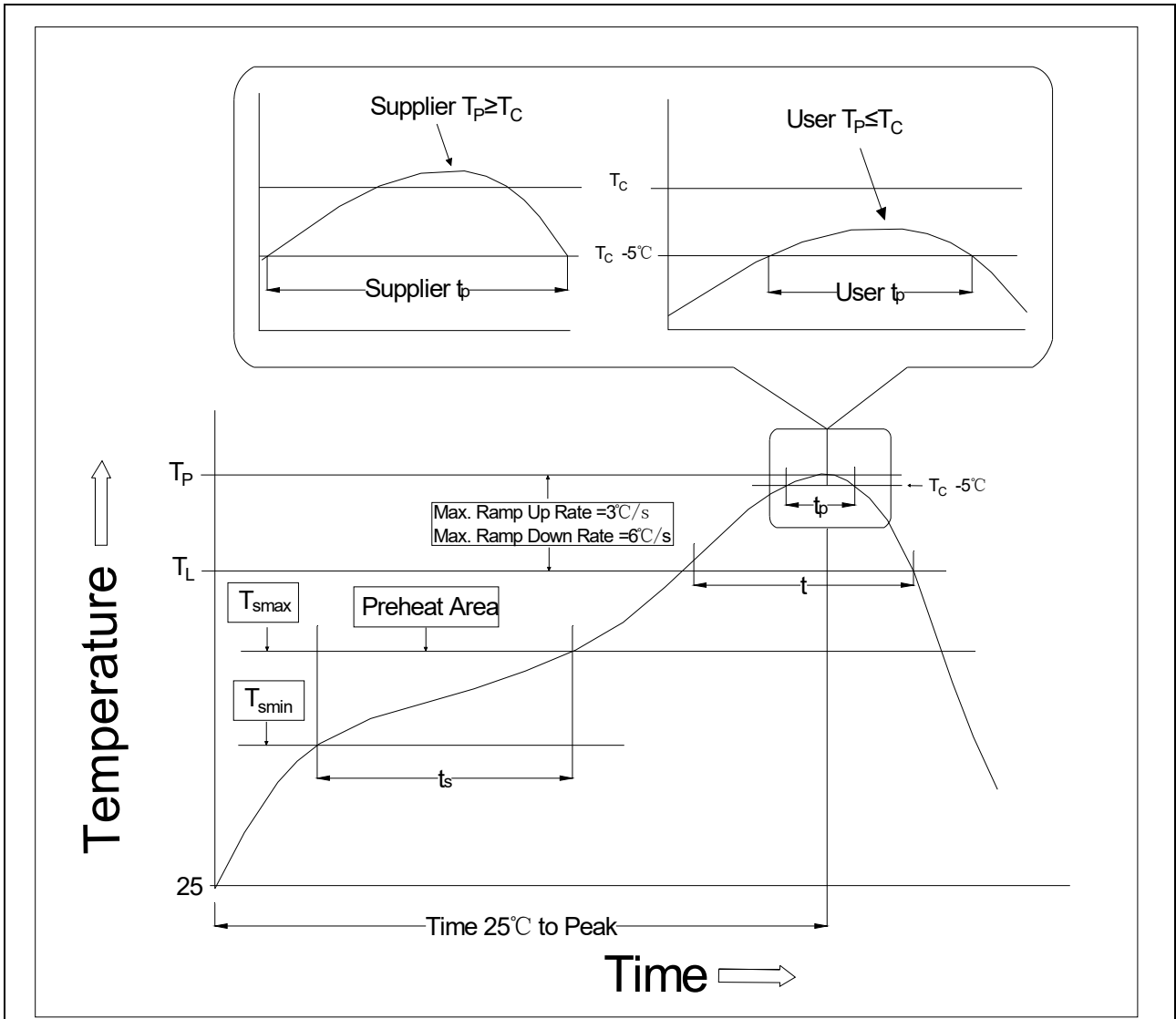
**CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)**

Option S/L



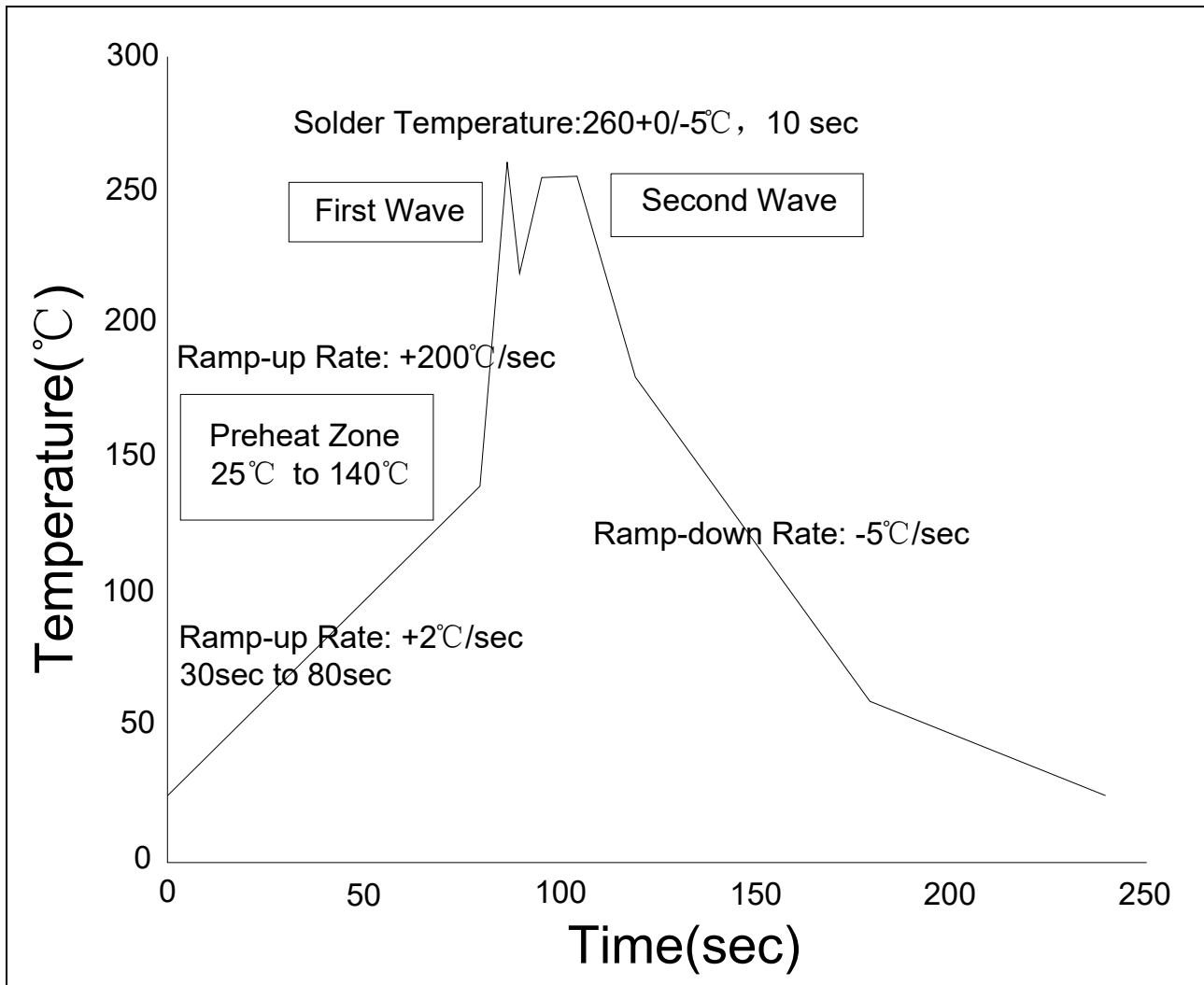
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	11.90	12.00	12.10	0.469	0.472	0.476
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.35	0.40	0.45	0.014	0.016	0.018
W	15.70	16.00	16.30	0.618	0.630	0.642

REFLOW INFORMATION



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T <sub>smin</sub> )	100°C	150°C
Temperature Max. (T <sub>smax</sub> )	150°C	200°C
Time (t <sub>s</sub> ) from (T <sub>smin</sub> to T <sub>smax</sub> )	60-120 seconds	60-120 seconds
Ramp-up Rate (t <sub>L</sub> to t <sub>P</sub> )	3°C/second max.	3°C/second max.
Liquidus Temperature (T <sub>L</sub> )	183°C	217°C
Time (t <sub>L</sub> ) Maintained Above (T <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Body Package Temperature	235°C+0°C/-5°C	260°C+0°C/-5°C
Time (t <sub>P</sub> ) within 5°C of 260°C	10 seconds	10 seconds
Ramp-down Rate (T <sub>P</sub> to T <sub>L</sub> )	3-6°C/second	3-6°C/second
Time 25°C to Peak Temperature	6 minutes max.	8 minutes 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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