



JOCMAB1Ch- D5P/S Series

Rev.A.1.0

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 high voltage MOSFETs. The relay action with a minimum input current of 5mA through the input LED. The relay reset with an input voltage of 0.8V or less. 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

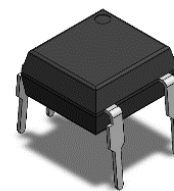
HBM: H3A; MM: M4; CDM: C3

CQC approved

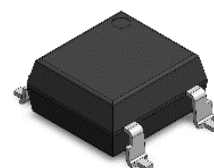
VDE approved

UL approved

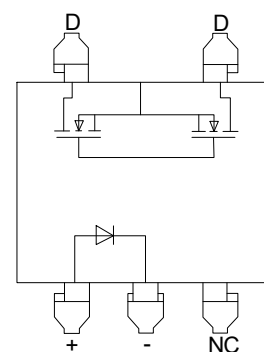
AECQ101 approved



JOCMAB1Ch-D5P



JOCMAB1Ch-D5S



ABSOLUTE MAXIMUM RATINGS (Temperature=25°C)

Parameter		Symbol	Value	Unit
Input	Forward Current	I_F	50	mA
	Peak Forward Current	I_{FP}	1 ^①	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 ^②	V _{rms}
Soldering Temperature	T_{sol}	260	°C

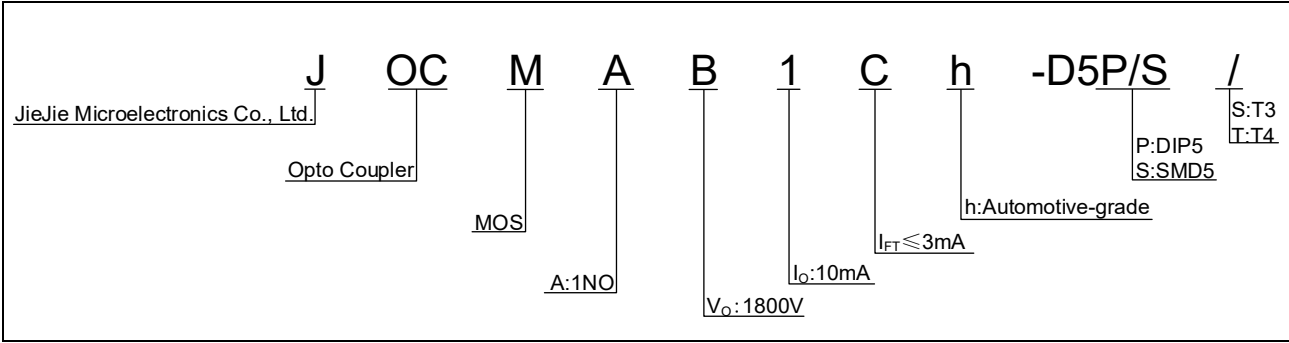
NOTE1 : 100μs pulse, 100Hz frequency

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

ELECTRICAL CHARACTERISTICS (Temperature=25°C)

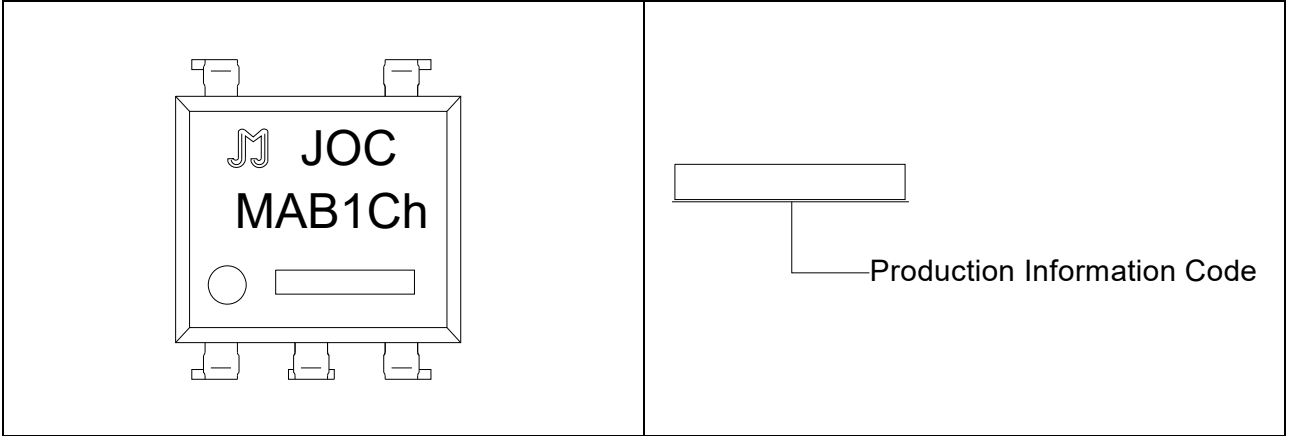
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	$I_F=10mA$	-	1.35	1.5	V
	Reverse Current	I_R	$V_R=6V$	-	-	1	μA
	Terminal Capacitance	C_t	$V=0, f=1MHz$	-	30	-	pF
Output	Off-state Leakage Current	I_{OFF}	$V_O=1800V$	-	-	10	μA
	ON Resistance	R_{ON}	$I_O=I_{O(MAX)}, I_F=5mA$	-	200	500	Ω
Transfer Characteristics	LED Trigger Current	I_{FT}	$I_O=I_{O(MAX)}$	-	-	3	mA
	Reset Current	$I_{F(OFF)}$	$I_O=I_{O(MAX)}$	0.4	-	-	mA
	Floating Capacitance	C_{IO}	$V=0, f=1MHz$	-	0.8	-	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}	$I_O=10mA, I_F=5mA$	-	0.2	1	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

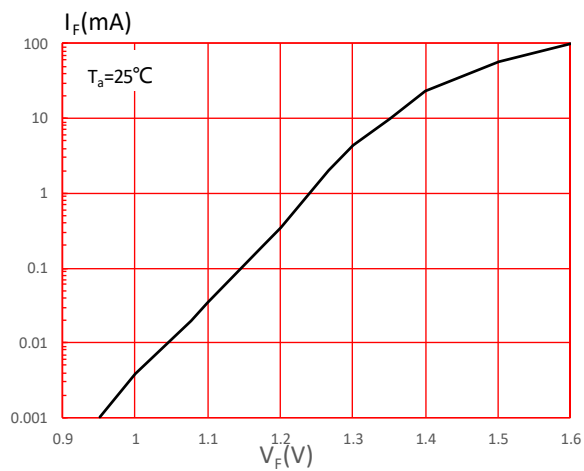


FIG.2: Max. Allowable LED Forward Current vs. Ambient Temperature

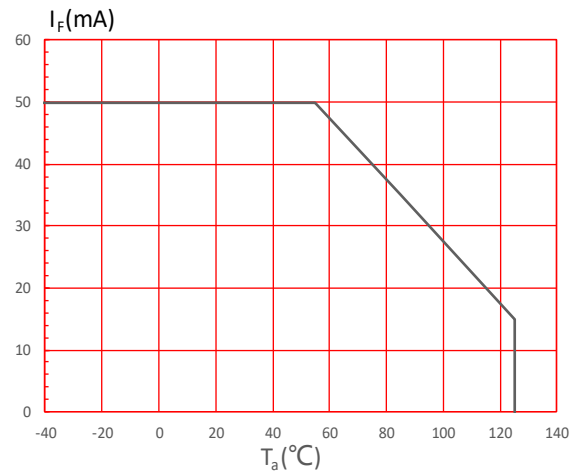


FIG.3: LED Operate Current vs. Ambient Temperature

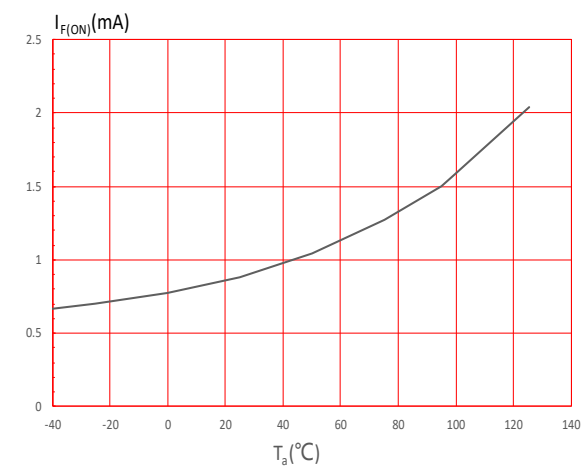


FIG.4: On Resistance vs. Ambient Temperature

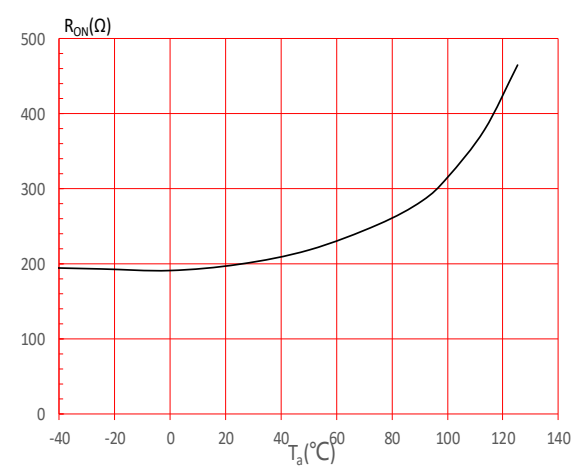


FIG.5: Turn On Time vs. Ambient Temperature

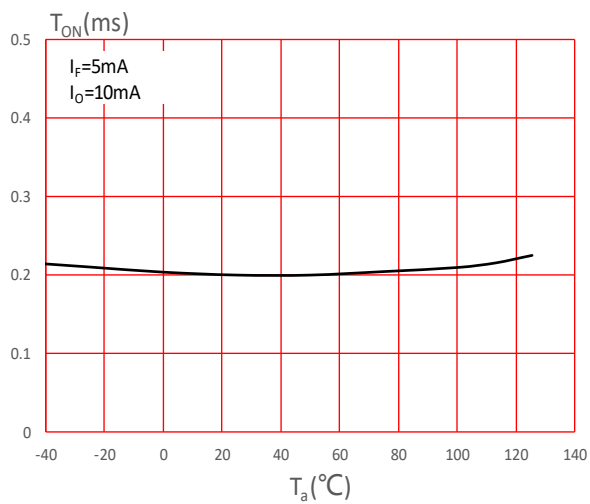


FIG.6: Turn Off Time vs. Ambient Temperature

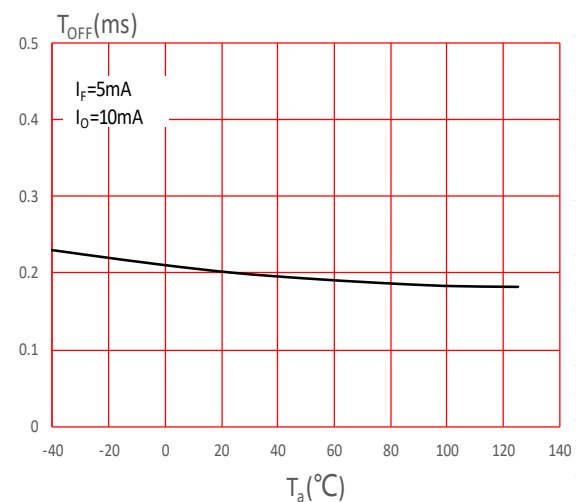


FIG.7: Output Current vs. Output Voltage

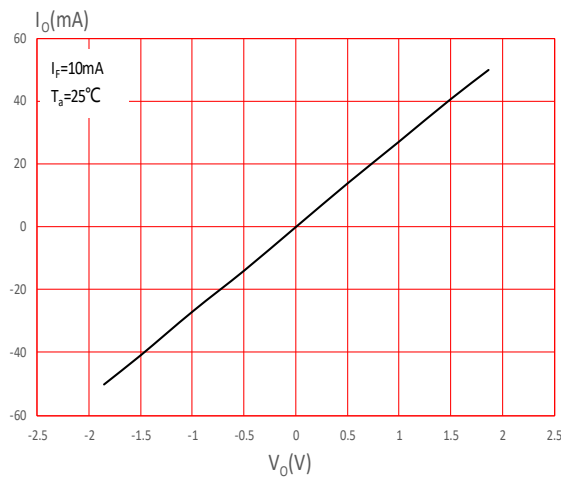
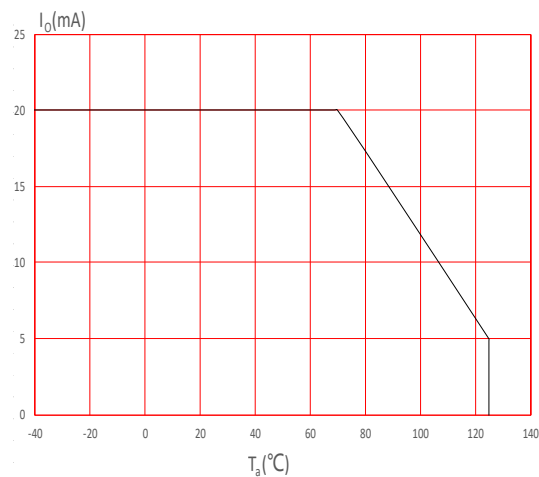
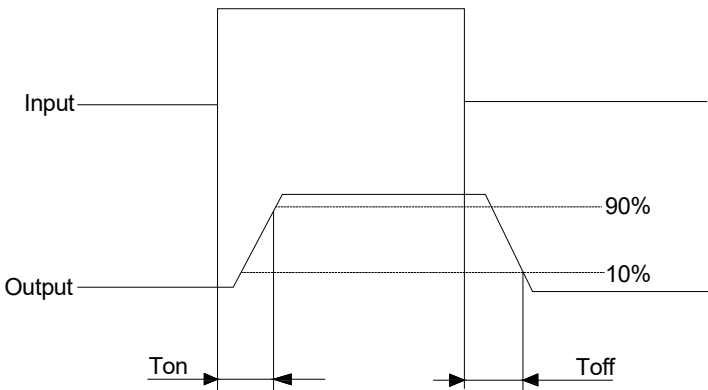


FIG.8: Output Current vs. Ambient Temperature



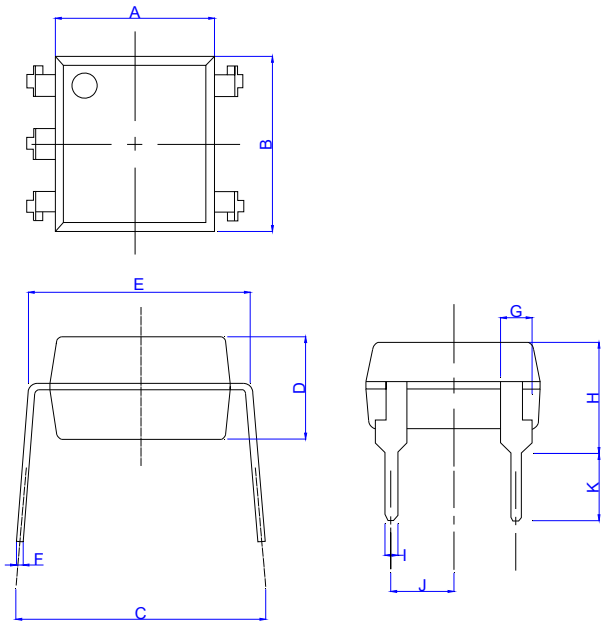
TEST CIRCUITS

FIG.9: The test method of Ton and Toff



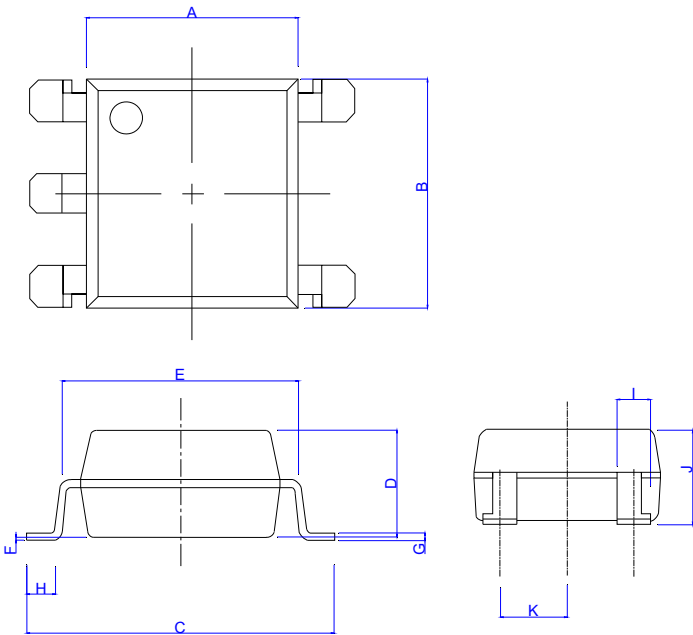
Package Dimension (Unit: mm)

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

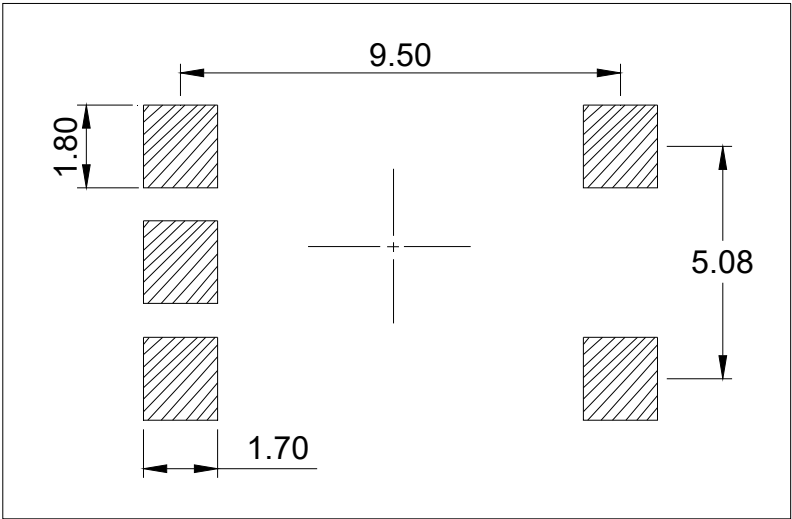
Option SMD Type:



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

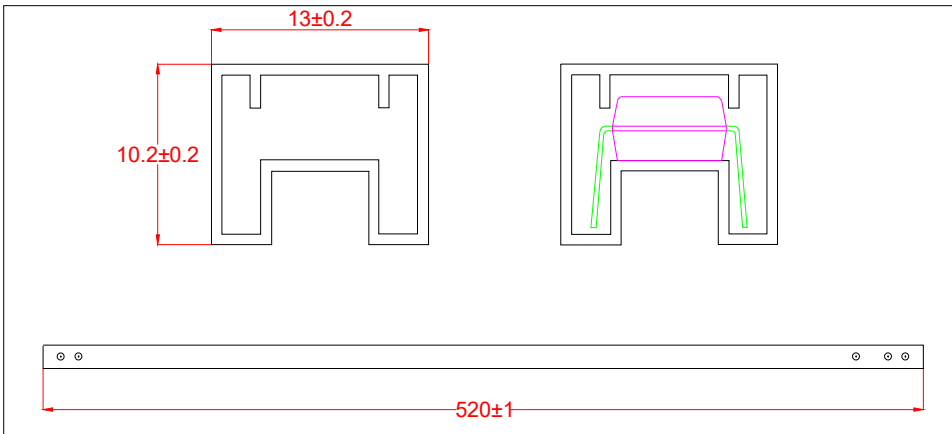
RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

Option SMD



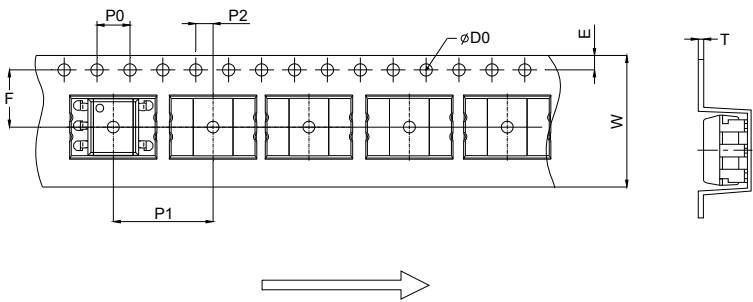
TUBE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Standard DIP



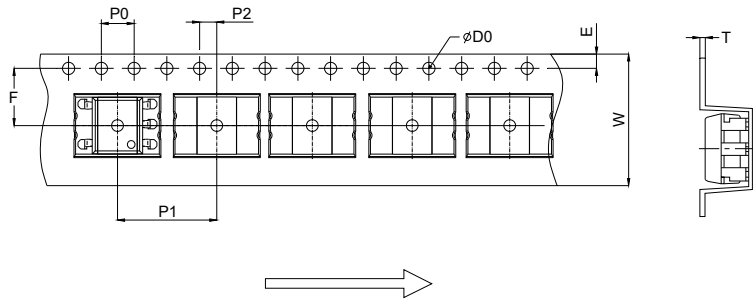
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S



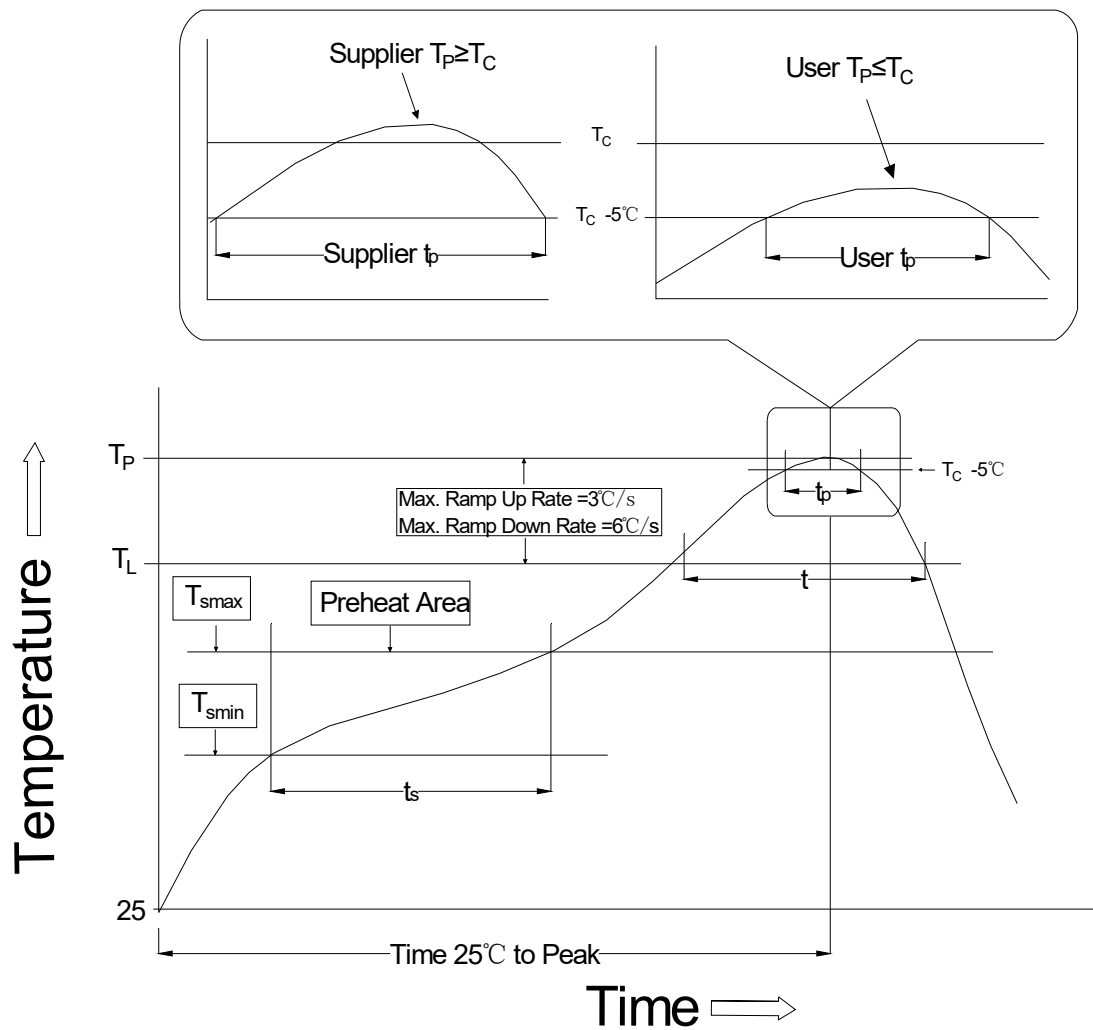
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	11.90	12.00	12.10	0.469	0.472	0.476
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.35	0.40	0.45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

Option L



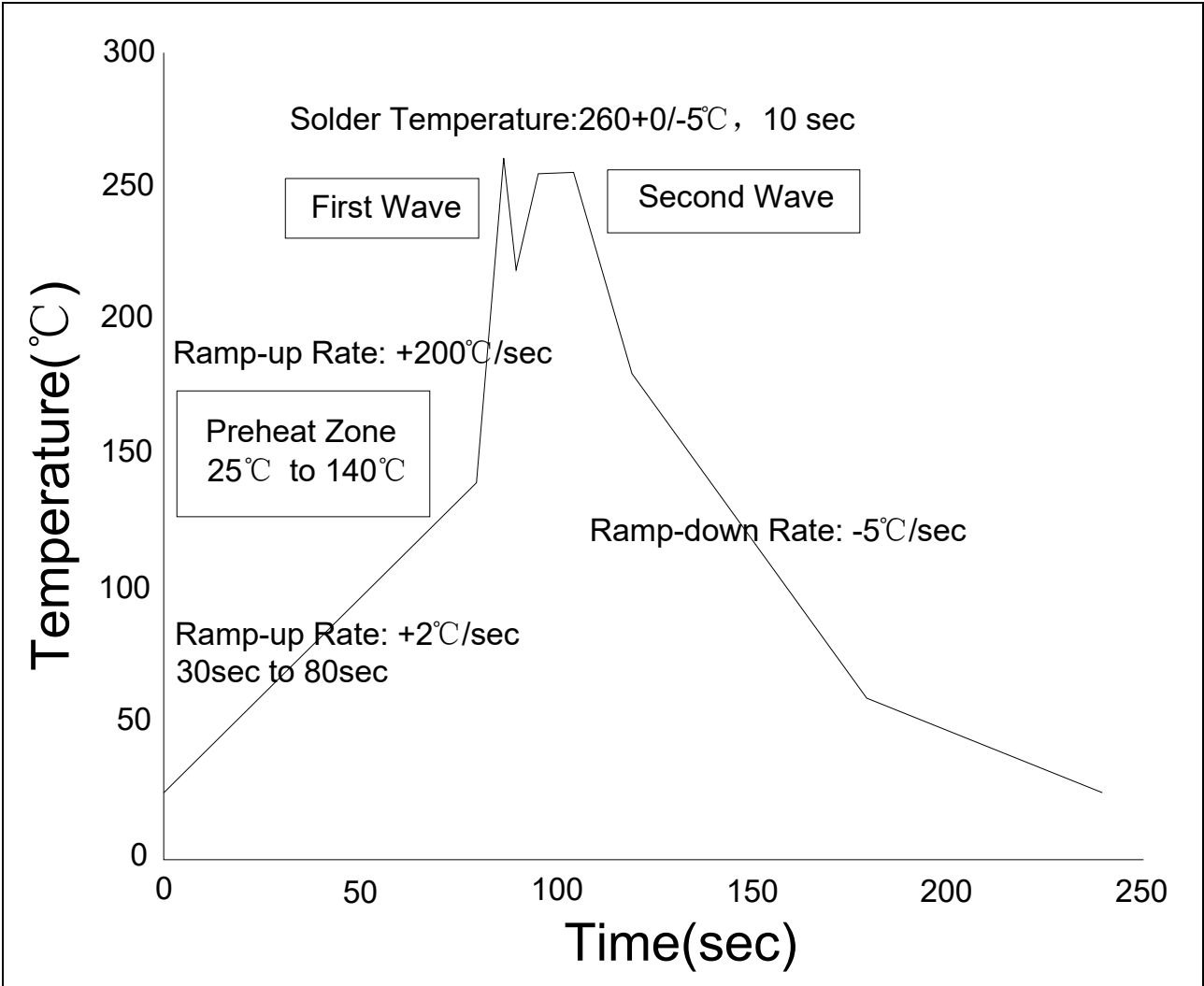
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	11.90	12.00	12.10	0.469	0.472	0.476
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.35	0.40	0.45	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_{smin})	100°C	150°C
Temperature Max. (T_{smax})	150°C	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up Rate (t_L to t_P)	$3^\circ\text{C/second max.}$	$3^\circ\text{C/second max.}$
Liquidus Temperature (T_L)	183°C	217°C
Time (t_L) Maintained Above (T_L)	60-150 seconds	60-150 seconds
Peak Body Package Temperature	$235^\circ\text{C} + 0^\circ\text{C} / -5^\circ\text{C}$	$260^\circ\text{C} + 0^\circ\text{C} / -5^\circ\text{C}$
Time (t_P) within 5°C of 260°C	10 seconds	10 seconds
Ramp-down Rate (T_P to T_L)	$3-6^\circ\text{C/second}$	$3-6^\circ\text{C/second}$
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

WAVE SOLDERING



HAND SOLDERING BY SOLDERING IRON	
Soldering Temperature	360±5℃
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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