

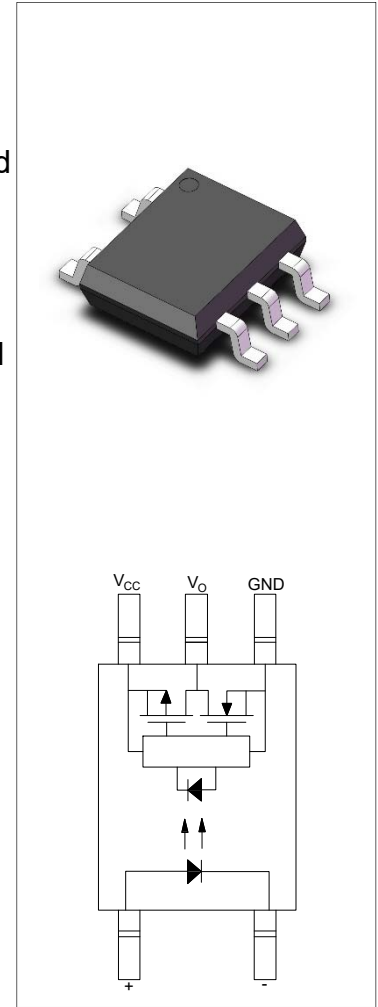


## JOCHC15B-M5

Rev.A.1.0

### DESCRIPTION:

The products are 15MBd high-speed opto-couplers in the SOP5 package. The device consists of a 850 nm AlGaAS LED, optically coupled to a very high speed integrated photo-detector logic gate with a strobable output. The output end of the product is a CMOS output, and the product has a strong common mode rejection capability. The coupled parameters are guaranteed over the temperature range of -40°C to +110°C. The products are widely used in communication interface, digital isolation for A/D, D/A conversion, high-voltage power systems, renewable energy inverters, medical imaging and patient monitoring.



### MAIN FEATURES

- High isolation 3750 VRMS
- High speed – 15MBd typical
- Operating temperature range -40°C to 110°C
- REACH & RoHS compliance
- HBM: H3A; MM: M4; CDM: C3
- CQC approved
- VDE approved
- UL approved

### Truth Table

LED	Output
ON	L
OFF	H

### 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

	Input Power Dissipation	$P_D$	100	mW
Output	Supply Voltage	$V_{CC}$	7	V
	Output Voltage	$V_O$	$V_{CC}+0.5$	V
	Output Current	$I_O$	10	mA
	Output Power Dissipation	$P_O$	22	mW
Total Power Dissipation		$P_{tot}$	130	mW
Isolation Voltage		$V_{iso}$	3750 <sup>②</sup>	V <sub>rms</sub>
Operating Temperature		$T_{opr}$	-40~110	°C
Junction Temperature		$T_j$	125	°C
Storage Temperature		$T_{stg}$	-55~125	°C
Soldering Temperature		$T_{sol}$	260	°C

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

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

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

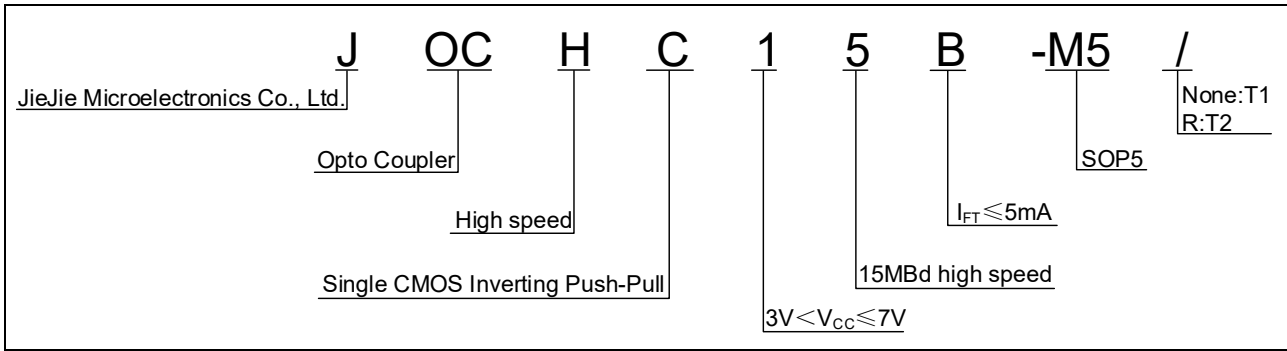
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	$V_F$	$I_F=10mA$	-	1.35	1.6	V
	Input Reverse Breakdown Voltage	$BV_R$	$I_R=10\mu A$	5	-	-	V
	Reverse Current	$I_R$	$V_R=6V$	-	-	1	$\mu A$
	Input Capacitance	$C_{in}$	$V=0, f=1MHz$	-	30	100	pF
Output	High Level Supply Current	$I_{CCH}$	$V_{CC}=5V, I_F=0mA$	-	-	6.5	mA
	Low Level Supply Current	$I_{CCL}$	$V_{CC}=5V, I_F=10mA$	-	-	6.5	mA
	Logic High Output Voltage	$V_{OH}$	$I_F=0mA, I_O=-20\mu A$	$V_{DD-0.1}$	$V_{DD}$	-	V
	Logic Low Output Voltage	$V_{OL}$	$I_F=7mA, I_O=20\mu A, V_{CC}=5V$	-	0.02	0.1	V
	Isolation Resistance	$R_{iso}$	DC500V 40~60%R.H.	$10^{12}$	-	-	$\Omega$
	Floating Capacitance	$C_{IO}$	$f=1MHz$	-	0.6	-	pF
Switching Characteristics	Trigger LED Current	$I_{FT}$	$V_{CC}=5V$	-	-	5	mA

	Propagation Delay Time to Logic Low	TPHL	$I_F=7mA, C_L=15pF$	-	70	100	ns
	Propagation Delay Time to Logic High	TPLH	$I_F=7mA, C_L=15pF$	-	55	100	ns
	Common Mode Transient Immunity at Logic High	CM <sub>H</sub>	$I_F=0mA,$ $V_{CM}=1000V_{pp},$ $C_L=15pF,$ $V_{CC}=5V$	20	-	-	kV/ $\mu$ s
	Common Mode Transient Immunity at Logic Low	CM <sub>L</sub>	$I_F=7mA,$ $V_{CM}=1000V_{pp},$ $C_L=15pF,$ $V_{DD}=5V$	20	-	-	kV/ $\mu$ s

### Recommended Operating Conditions

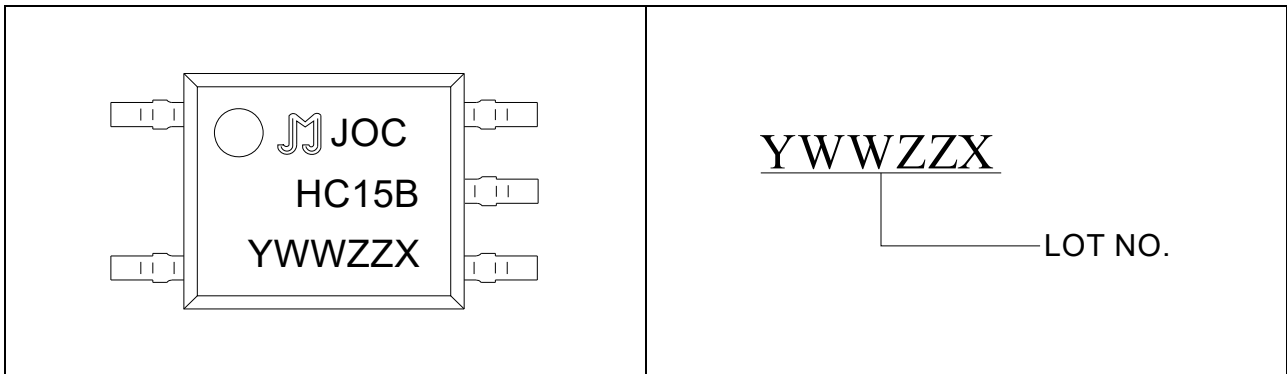
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operating Temperature	$T_a$	-40	-	105	$^{\circ}C$
Supply Voltage	$V_{CC}$	2.7	-	5.5	V
Low Level Input Current	$I_{FL}$	0	-	250	$\mu A$
High Level Input Current	$I_{FH}$	8	-	16	mA
Forward Voltage	$V_{F(OFF)}$	-	-	0.8	V

**ORDERING INFORMATION**



Packing Quantity	
Option	Quantity
None/R	3000 Units/Reel

**MARKING**



Characteristics Curves

FIG.1: Forward Current vs. Forward Voltage

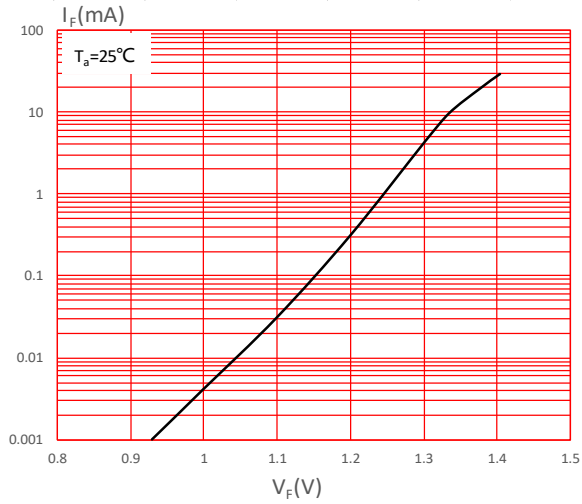


FIG.2: Max. Allowable LED Forward Current vs. Ambient Temperature

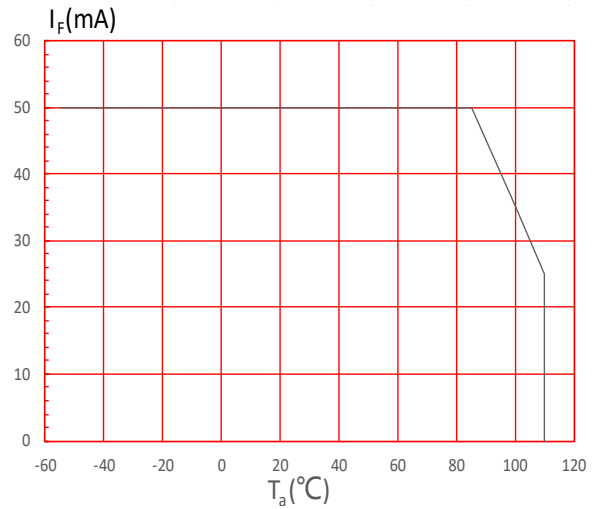


FIG.3: Logic High Output Supply Current vs. Ambient Temperature

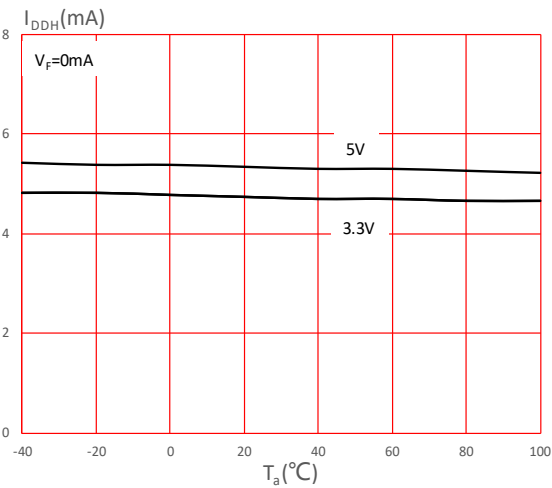


FIG.4: Logic Low Output Supply Current vs. Ambient Temperature

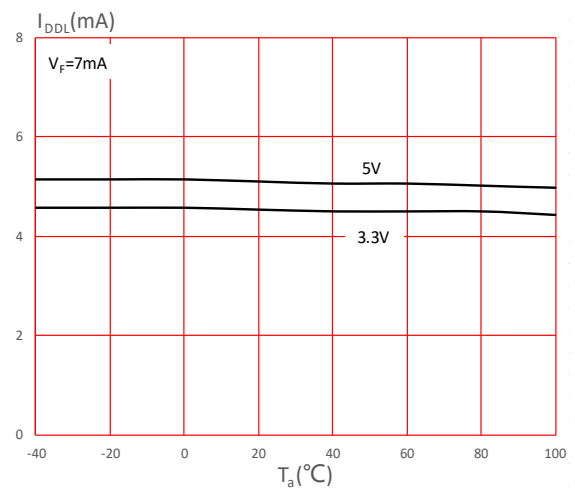


FIG.5: Propagation Delay vs. Ambient Temperature

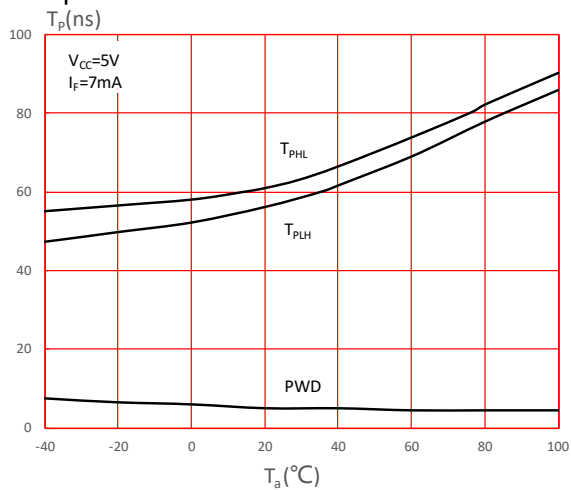


FIG.6: Input Threshold Current vs. Ambient Temperature

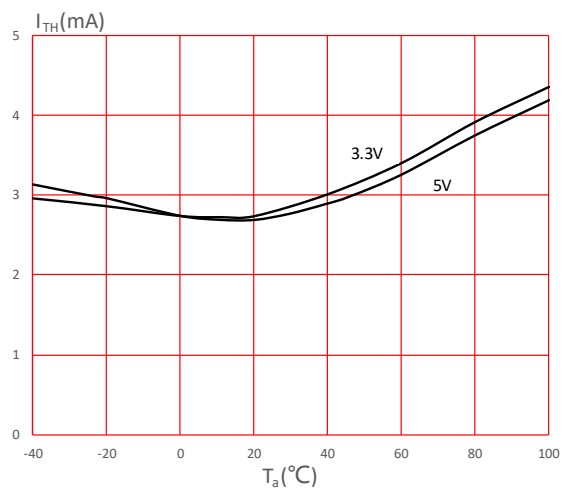


FIG.7: Propagation Delay vs. Ambient Temperature

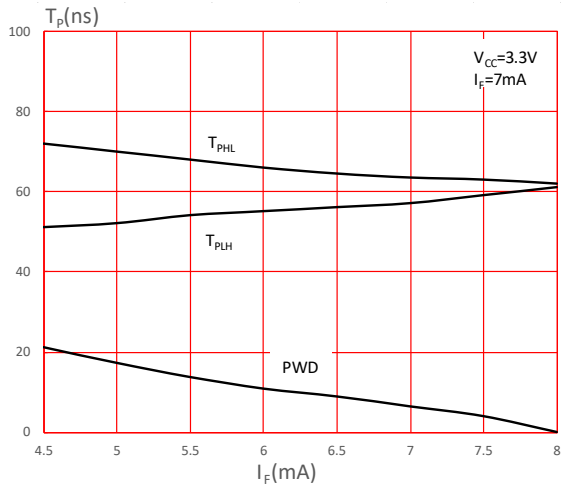


FIG.8: Propagation Delay vs. Ambient Temperature

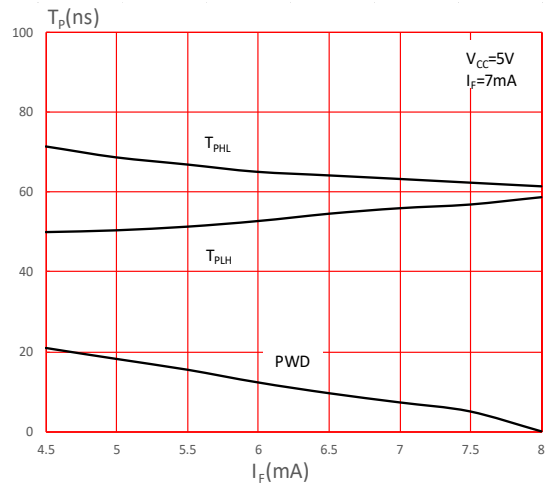


Fig.9: Switching Time Test Circuit and Waveform

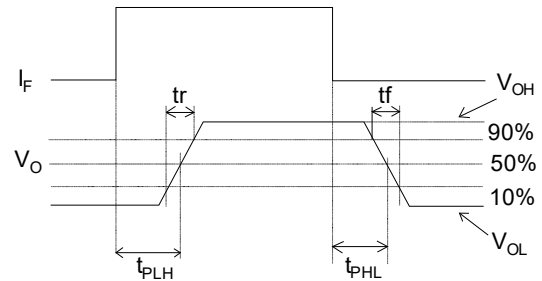
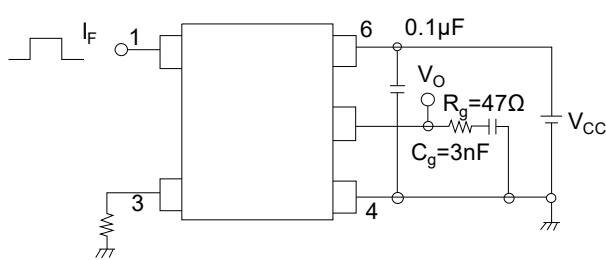
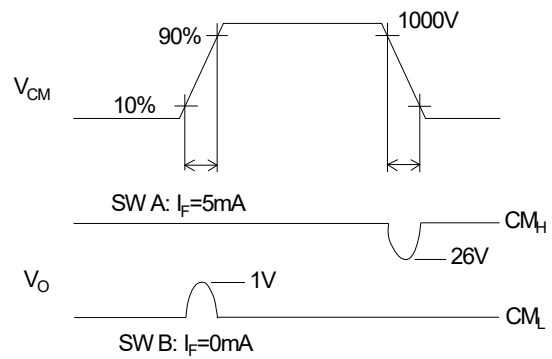
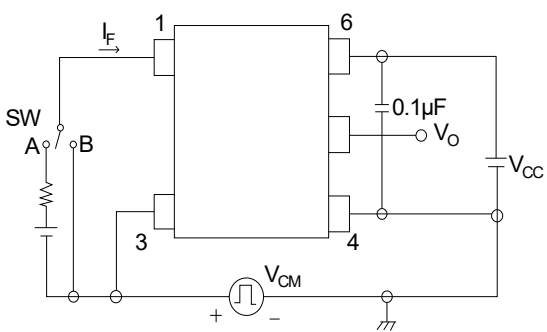
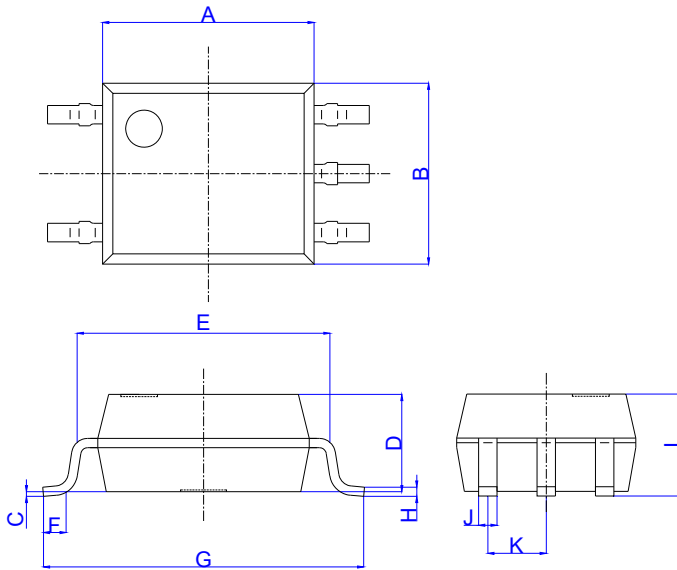


Fig.10: CMTI Test Circuit and Waveform

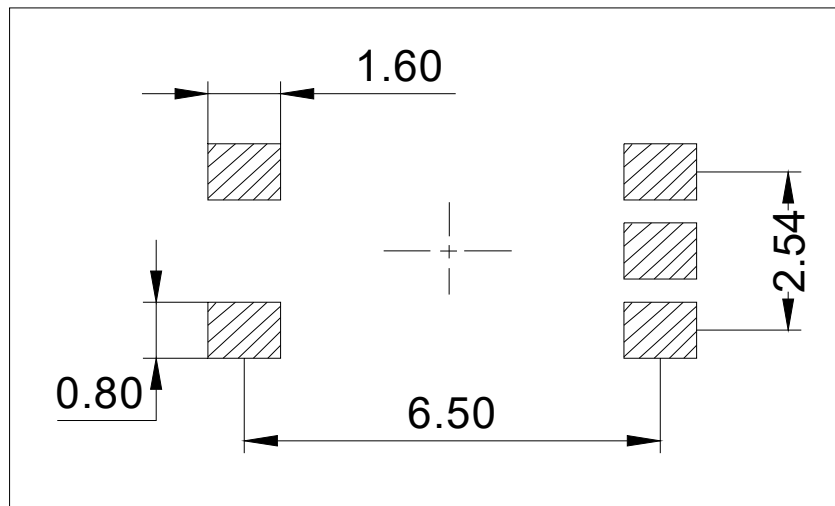


Package Dimension (Unit: mm)



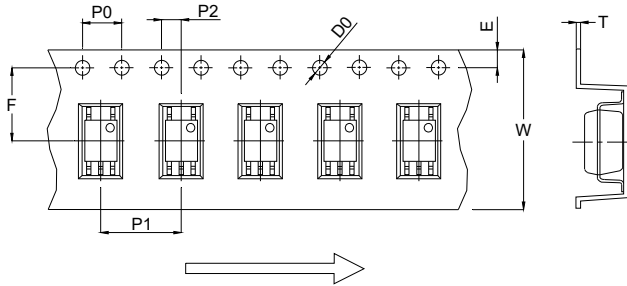
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.80	0.173		0.189
B	3.60		4.20	0.142		0.165
C	0.00		0.20	0.000		0.008
D	1.90		2.30	0.075		0.091
E	5.00		5.60	0.197		0.220
F	0.34		0.94	0.013		0.037
G	6.70		7.30	0.264		0.287
H	0.10		0.30	0.004		0.012
I	2.00		2.40	0.079		0.094
J	0.25		0.55	0.010		0.022
K	1.02		1.52	0.040		0.060

RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)



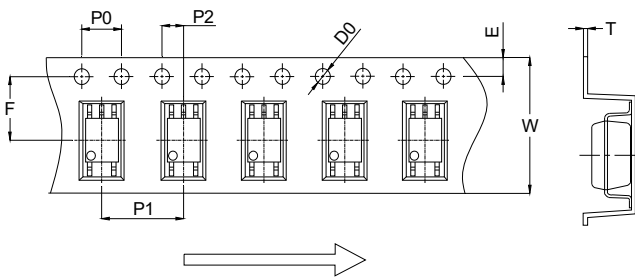
**CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)**

**Option None**



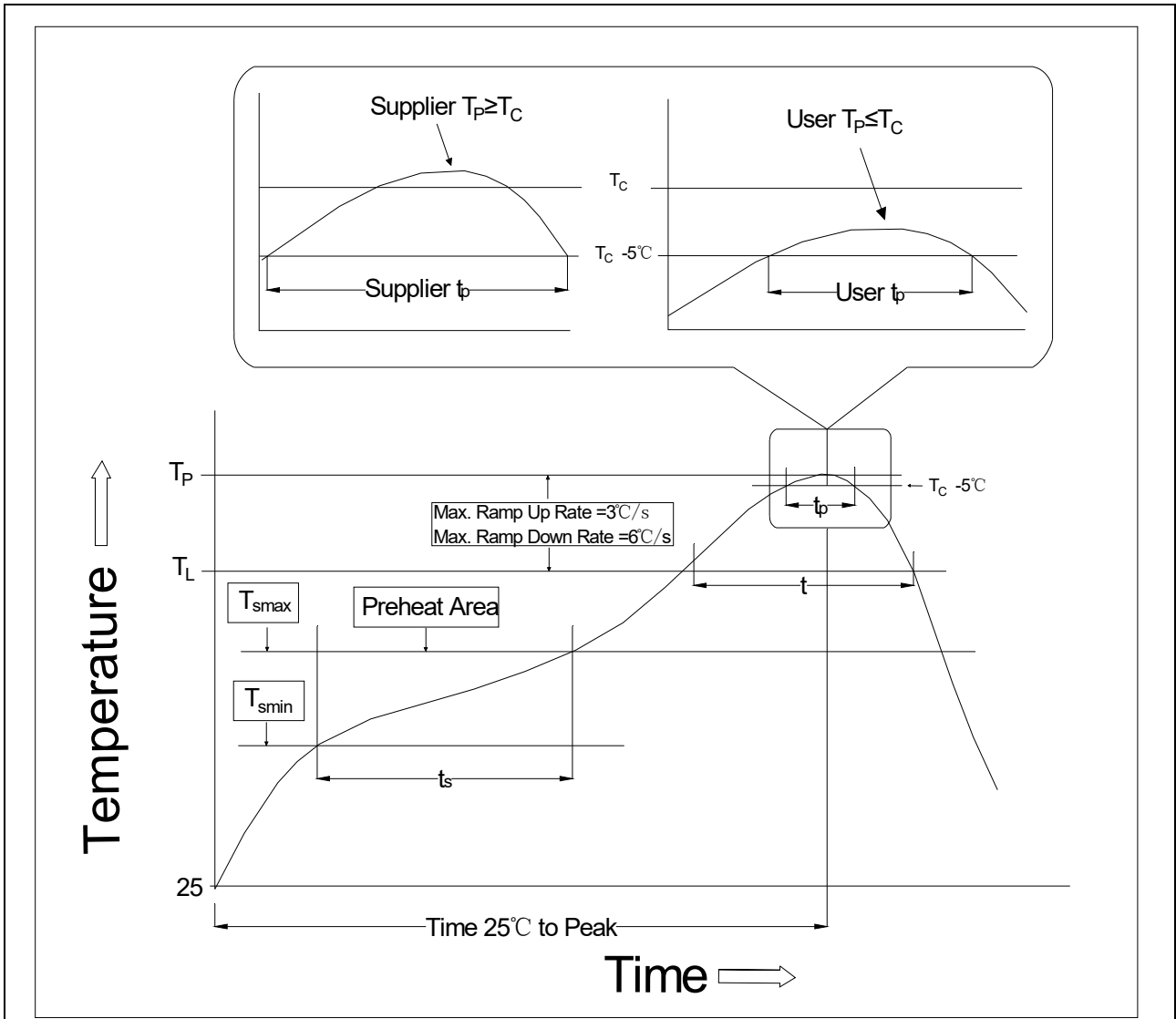
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.27	0.30	0.33	0.011	0.012	0.013
W	15.80	16.00	16.20	0.622	0.630	0.638

**Option R**



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	7.90	8.00	8.10	0.311	0.315	0.319
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	4.40	4.50	4.60	0.173	0.177	0.181
T	0.25	0.30	0.35	0.010	0.012	0.014
W	11.90	12.00	12.30	0.469	0.472	0.484

REFLOW INFORMATION




Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T <sub>smin</sub> )	100	150°C
Temperature Max. (T <sub>smax</sub> )	150	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	20 seconds	30 seconds
Ramp-down Rate (T <sub>P</sub> to T <sub>L</sub> )	6°C/second max.	6°C/second max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes 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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