

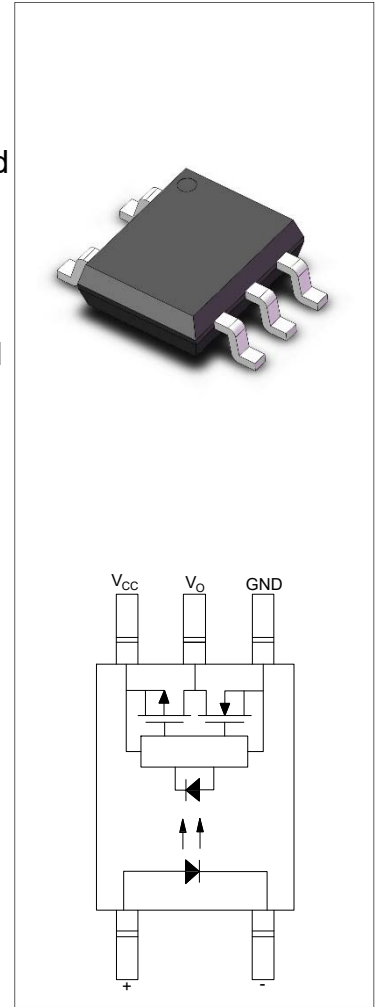


JOCHC15B-M5

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 ^①	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 ^②	V _{rms}
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 μ s pulse, 100Hz frequency

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

ELECTRICAL CHARACTERISTICS (Temperature=25°C)

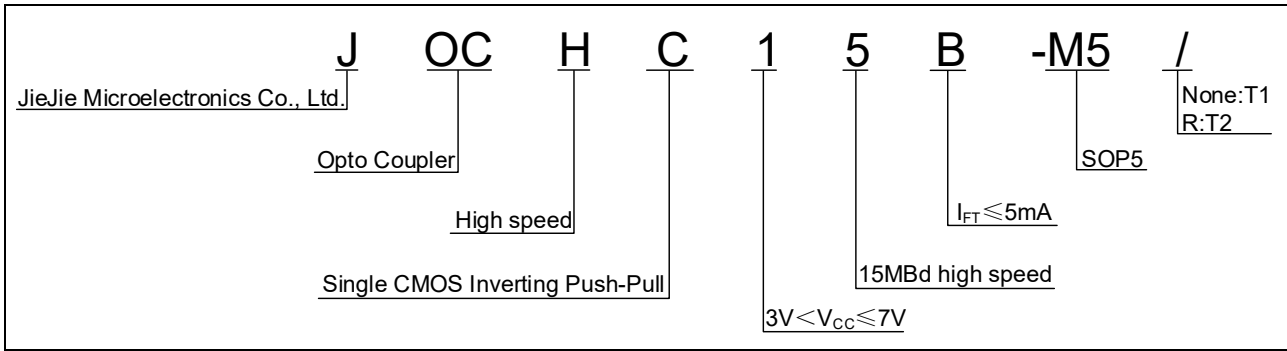
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	$I_F=10mA$	-	1.35	1.6	V
	Input Reverse Breakdown Voltage	BV_R	$I_R=10\mu A$	5	-	-	V
	Reverse Current	I_R	$V_R=6V$	-	-	1	μA
	Input Capacitance	C_{in}	$V=0, f=1MHz$	-	30	100	pF
Output	High Level Supply Current	I_{CCH}	$V_{CC}=5V, I_F=0mA$	-	-	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}	-	-	Ω
	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 _H	$I_F=0mA,$ $V_{CM}=1000V_{pp},$ $C_L=15pF,$ $V_{CC}=5V$	20	-	-	kV/ μ s
	Common Mode Transient Immunity at Logic Low	CM _L	$I_F=7mA,$ $V_{CM}=1000V_{pp},$ $C_L=15pF,$ $V_{DD}=5V$	20	-	-	kV/ μ s

Recommended Operating Conditions

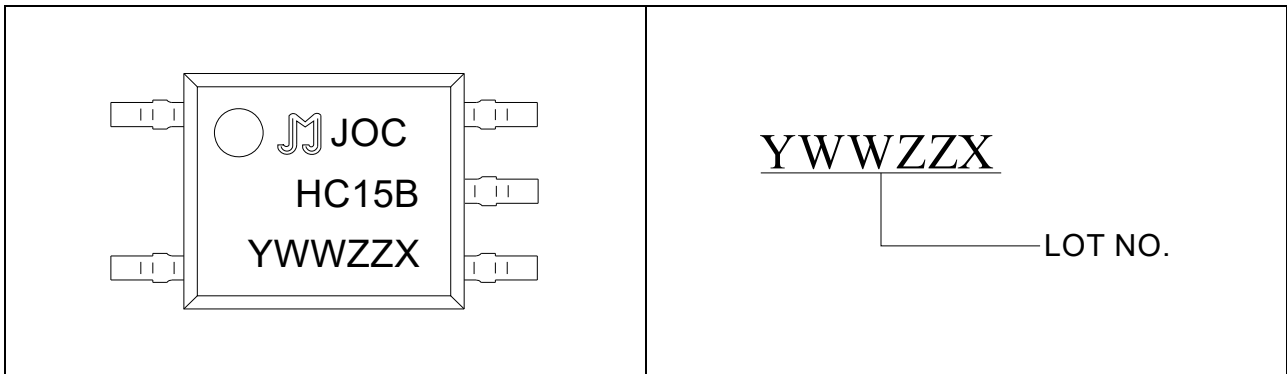
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operating Temperature	T_a	-40	-	105	$^{\circ}C$
Supply Voltage	V_{CC}	2.7	-	5.5	V
Low Level Input Current	I_{FL}	0	-	250	μA
High Level Input Current	I_{FH}	8	-	16	mA
Forward Voltage	$V_{F(OFF)}$	-	-	0.8	V

ORDERING INFORMATION



Packing Quantity	
Option	Quantity
None/R	3000 Units/Reel

MARKING



Characteristics Curves

FIG.1: Forward Current vs. Forward Voltage

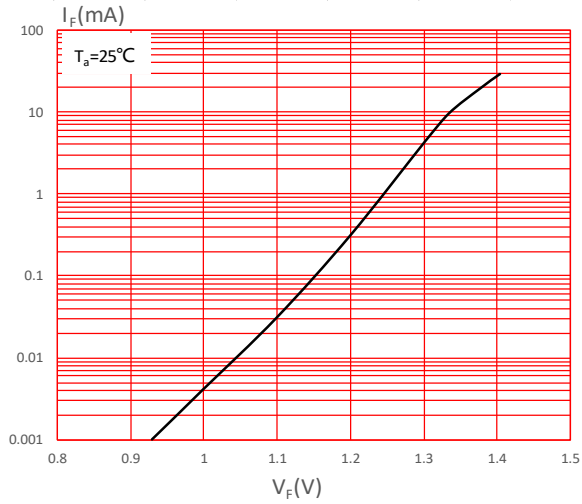


FIG.2: Max. Allowable LED Forward Current vs. Ambient Temperature

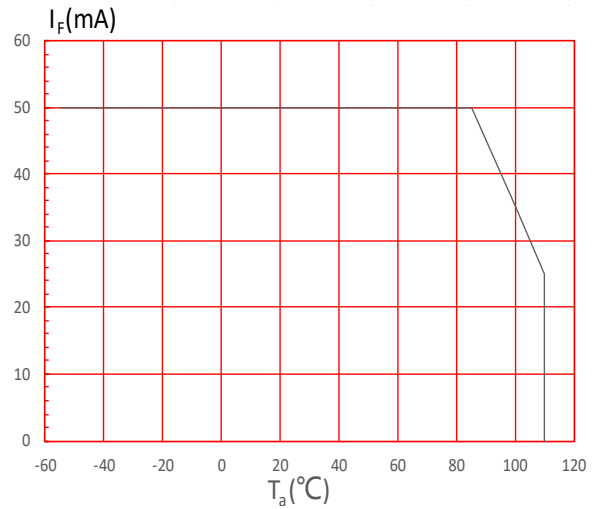


FIG.3: Logic High Output Supply Current vs. Ambient Temperature

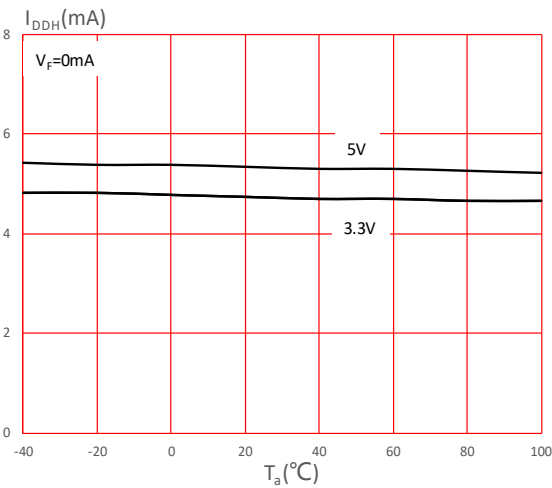


FIG.4: Logic Low Output Supply Current vs. Ambient Temperature

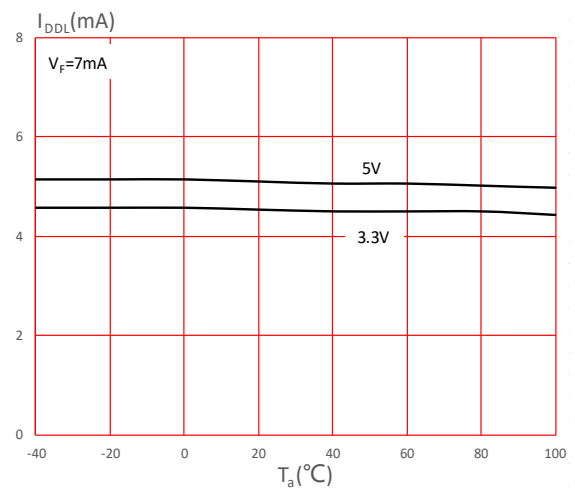


FIG.5: Propagation Delay vs. Ambient Temperature

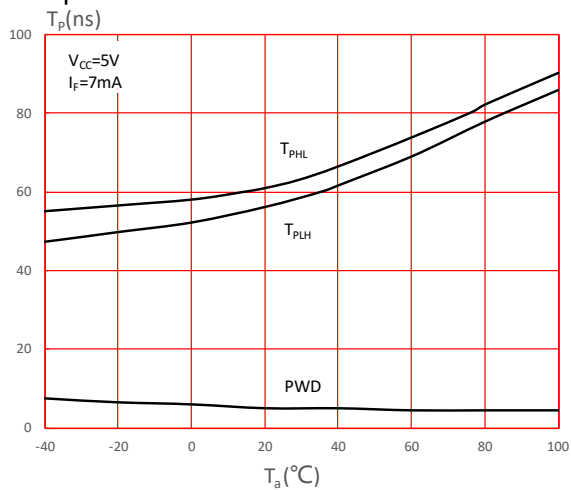


FIG.6: Input Threshold Current vs. Ambient Temperature

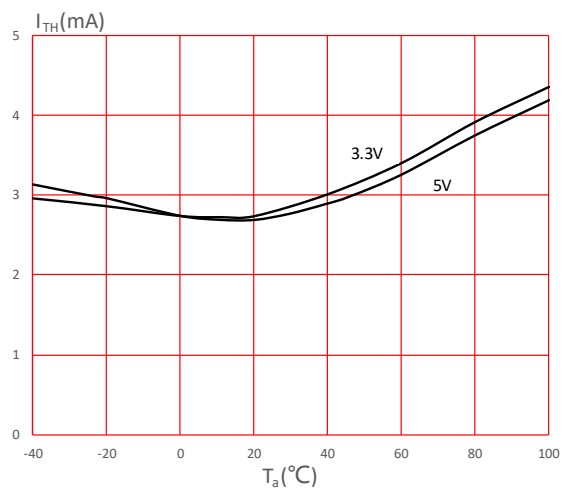


FIG.7: Propagation Delay vs. Ambient Temperature

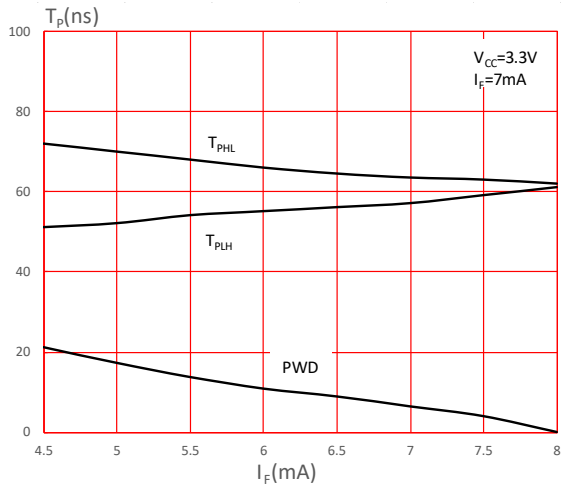


FIG.8: Propagation Delay vs. Ambient Temperature

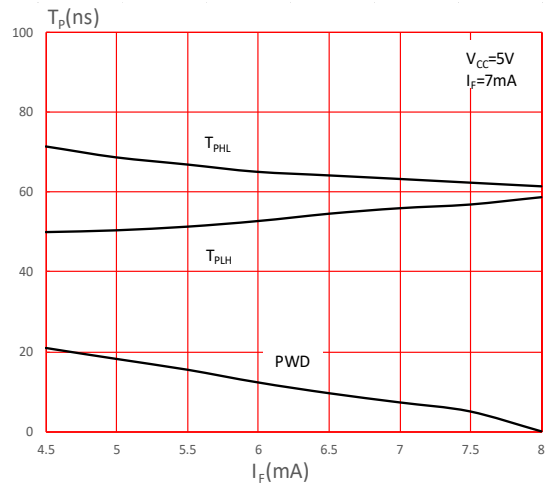


Fig.9: Switching Time Test Circuit and Waveform

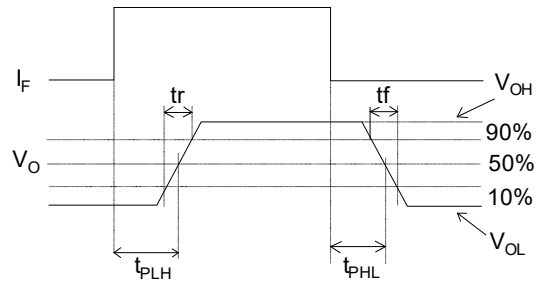
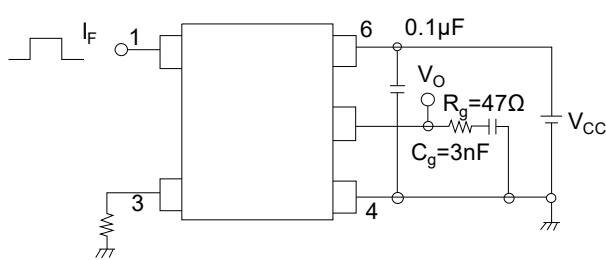
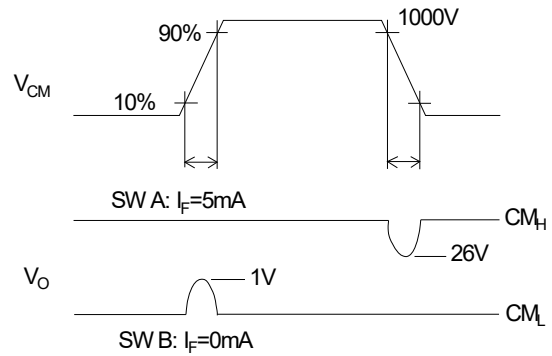
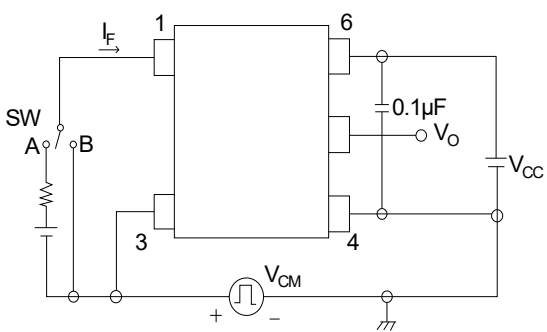
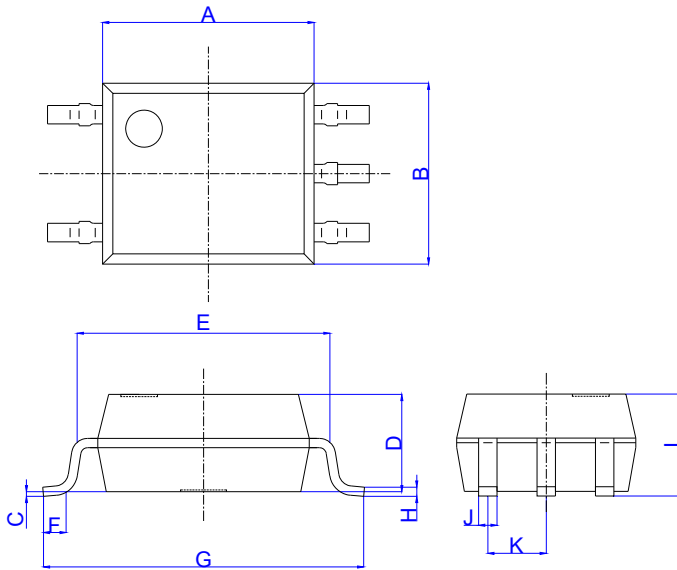


Fig.10: CMTI Test Circuit and Waveform

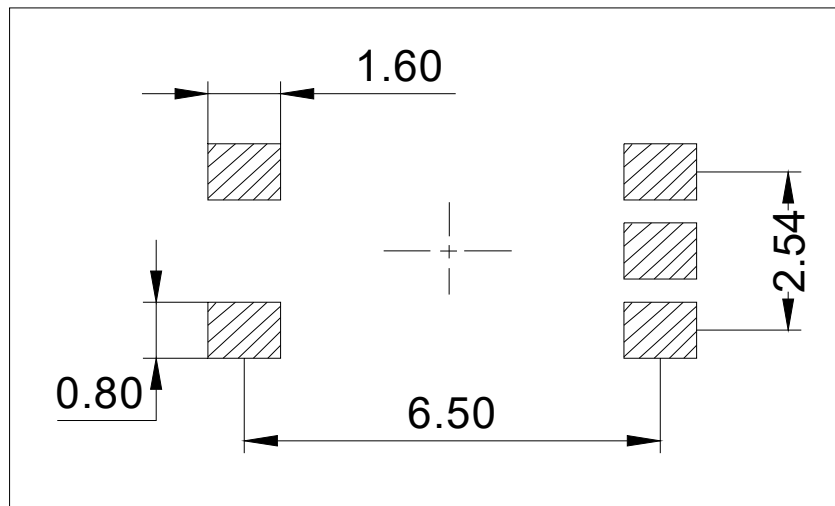


Package Dimension (Unit: mm)



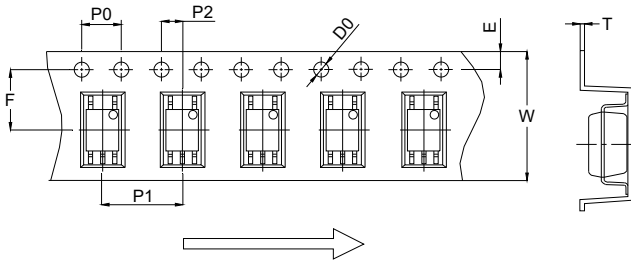
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.80	0.173		0.189
B	3.60		4.20	0.142		0.165
C	0.00		0.20	0.000		0.008
D	1.90		2.30	0.075		0.091
E	5.00		5.60	0.197		0.220
F	0.34		0.94	0.013		0.037
G	6.70		7.30	0.264		0.287
H	0.10		0.30	0.004		0.012
I	2.00		2.40	0.079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



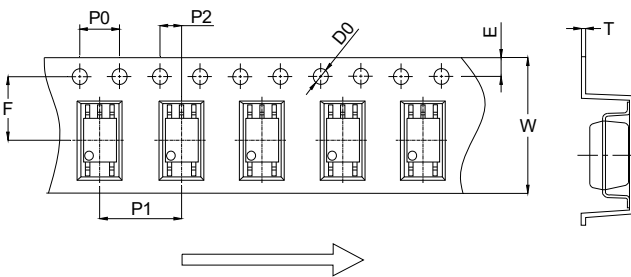
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option None



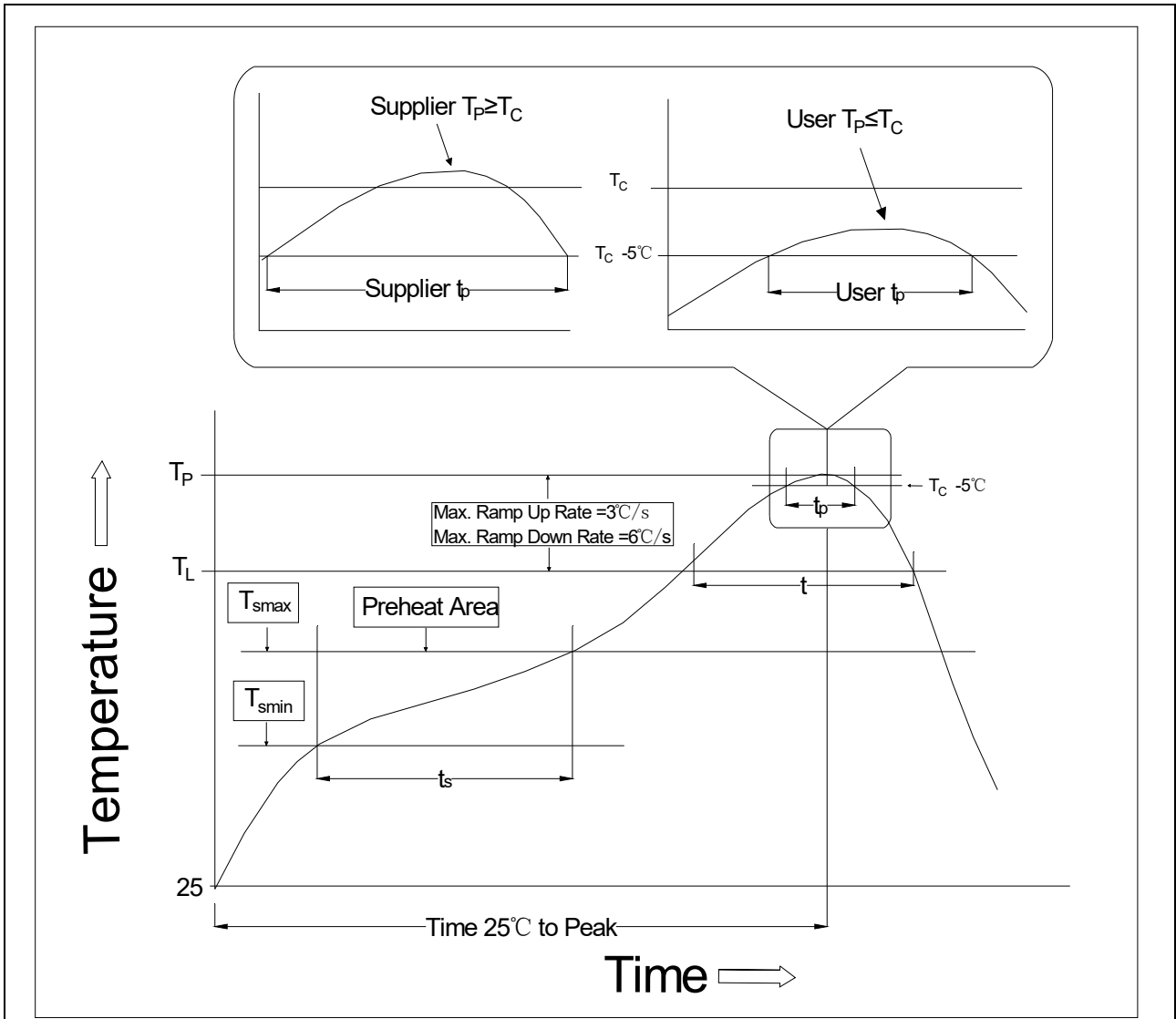
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0		1.50	1.60		0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
E	1.65	1.75	1.85	0.065	0.069	0.073
F	4.40	4.50	4.60	0.173	0.177	0.181
T	0.25	0.30	0.35	0.010	0.012	0.014
W	11.90	12.00	12.30	0.469	0.472	0.484

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 _{smin})	100	150°C
Temperature Max. (T _{smax})	150	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°C/second max.	3°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°C+0°C/-5°C	260°C+0°C/-5°C
Time (t _P) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (T _P to T _L)	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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