JOCHC15B-L5X Series

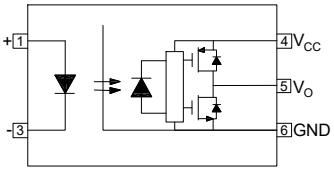
Rev.A.1.0

DESCRIPTION:

The products are 15MBd high-speed opto-couplers in the LSOP5 and LSOP5W package. The device consists of a 850 nm AlGaAS LED, optically coupled to a very high speed integrated photo-detectorlogic gate. The output end of the device is a CMOS outoput, and the device has a strong common mode rejection capability. The products are widely used in communication interface, digital isolation for A/D,D/A conversion, renewable energy inverters, medical imaging and patient monitoring.

JOCHC15B-L5

JOCHC15B-L5W



MAIN FEATURES

High isolation 5000 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 V_O
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}	1①	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}	5000②	Vrms
Operating Temperature		T_{opr}	-40~110	℃
Junction Temperature		T_j	125	℃
Storage Temperature		T_{stg}	-55~125	℃
Soldering Temperature		T_{sol}	260	℃

NOTE1: 100μs pulse, 100Hz frequency
NOTE2: AC for 1minute, R.H.=40~60%

ELECTRICAL CHARACTERISTICS (Temperature=25°C)

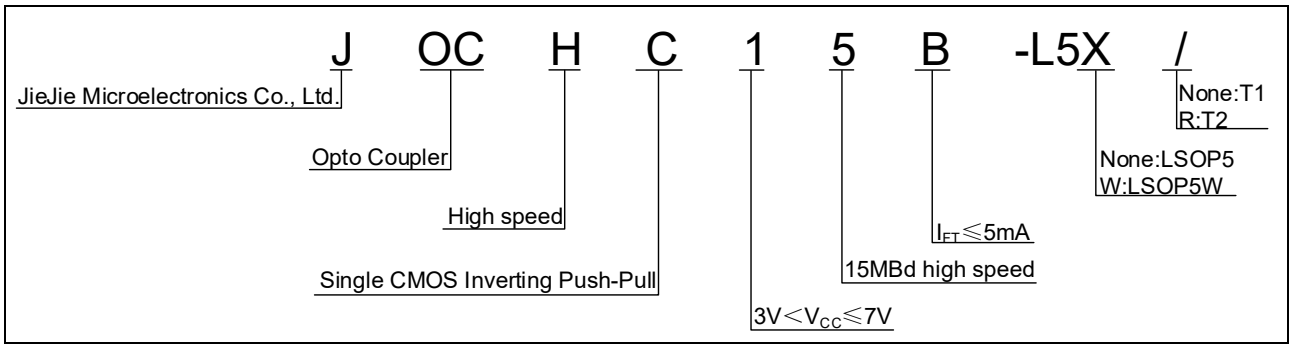
Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	I_F=10mA	-	1.35	1.6	V
	Input Reverse Breakdown Voltage	BV_R	I_R=10μA	5	-	-	V
	Reverse Current	I_R	V_R=6V	-	-	1	μA
	Input Capacitance	C_{in}	V=0, f=1MHz	-	30	100	pF
Output	High Level Supply Current	I_{CCH}	V_{CC}=5V, I_F=0mA	-	-	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=-20μA	V_{DD}-0.1	V_{DD}	-	V
	Logic Low Output Voltage	V_{OL}	I_F=7mA, I_O=20μA, 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}=1000Vpp, C_L=15pF, V_{CC}=5V	20	-	-	kV/μs
	Common Mode Transient Immunity at Logic Low	CM_L	I_F=7mA, V_{CM}=1000Vpp, C_L=15pF, V_{CC}=5V	20	-	-	kV/μs
	Output Rise Time	t_r	I_F=7mA,C_L=15pF	-	10	-	ns
	Output Fall Time	t_f		-	10	-	

Recommended Operating Conditions

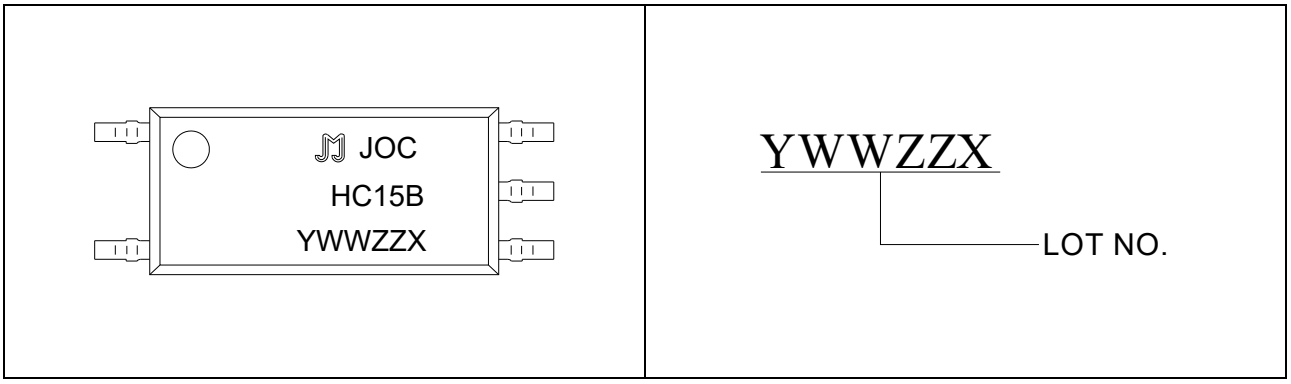
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Operating Temperature	T_a	-40	-	105	℃
Supply Voltage	V_{CC}	2.7	-	5.5	V
Low Level Input Current	I_{FL}	0	-	250	μA
High Level Input Current	I_{FH}	8	-	16	mA
Forward Voltage	$V_{F(OFF)}$	-	-	0.8	V

ORDERING INFORMATION



Packing Quantity	
Option	**Quantity**
None/R	3000 Units/Reel

MARKING



Characteristics Curves

FIG.1: Forward Current vs. Forward Voltage

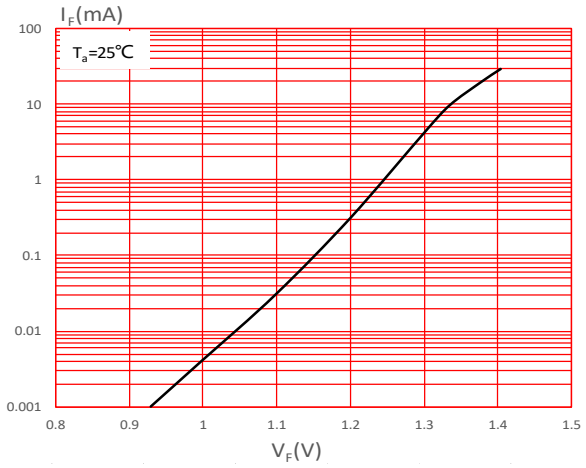


FIG.2: Max. Allowable LED Forward Current vs. Ambient Temperature

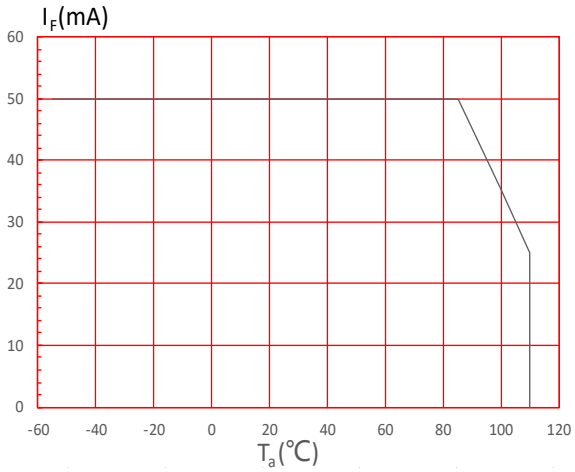


FIG.3: Logic High Output Supply Current vs. Ambient Temperature

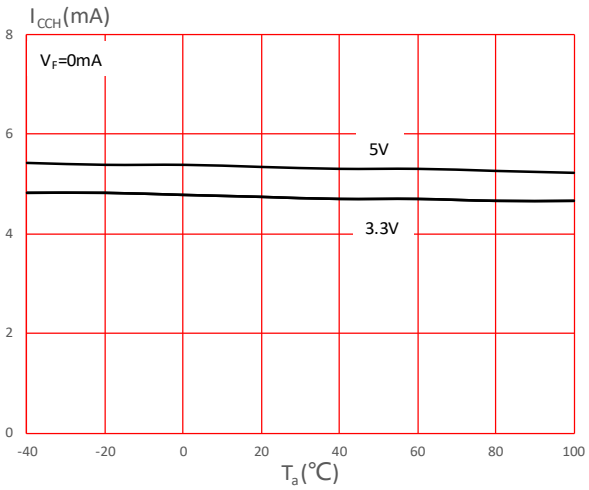


FIG.4: Logic Low Output Supply Current vs. Ambient Temperature

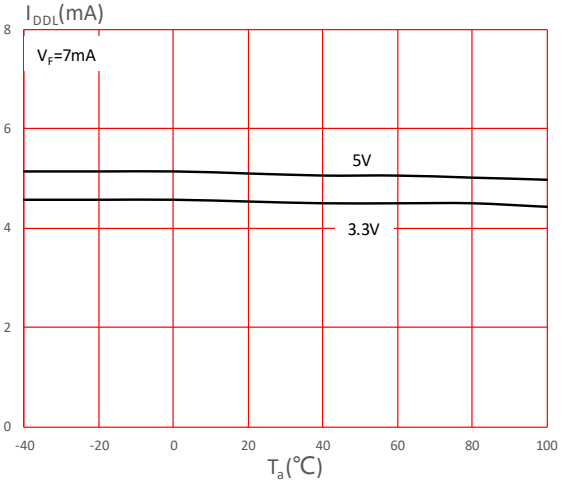


FIG.5: Propagation Delay vs. Ambient Temperature

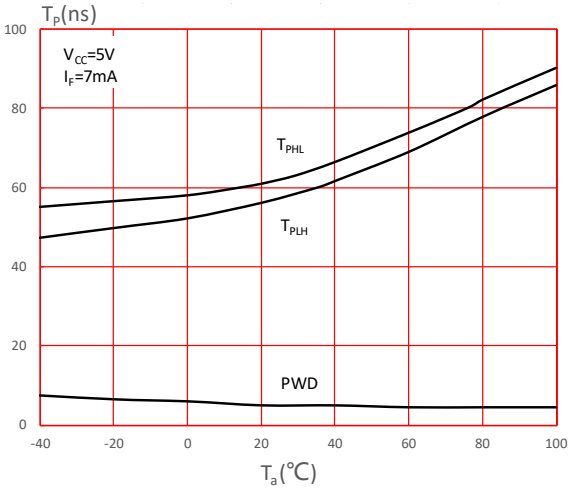


FIG.6: Input Threshold Current vs. Ambient Temperature

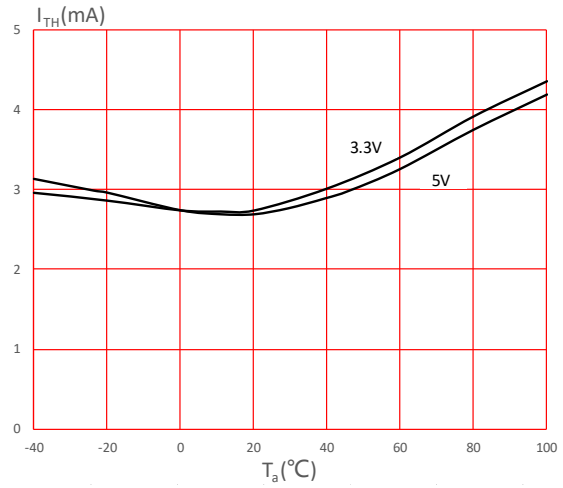


FIG.7: Propagation Delay vs. Ambient Temperature

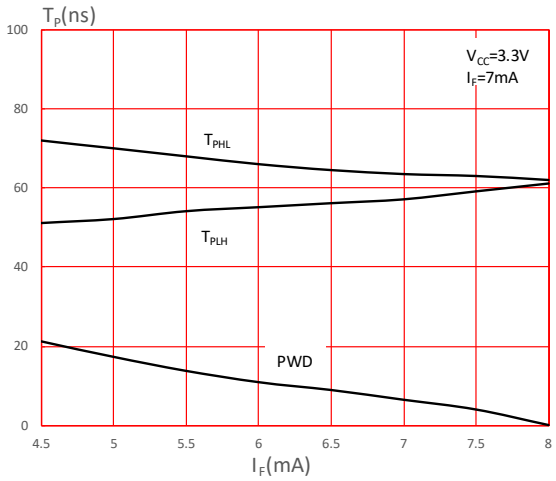
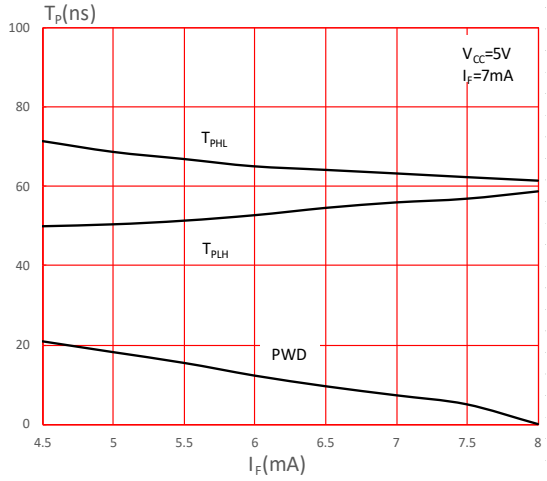
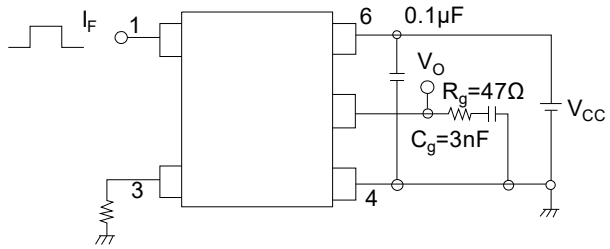


FIG.8: Propagation Delay vs. Ambient Temperature



TEST CIRCUITS

Fig.9: Switching Time Test Circuit and Waveform



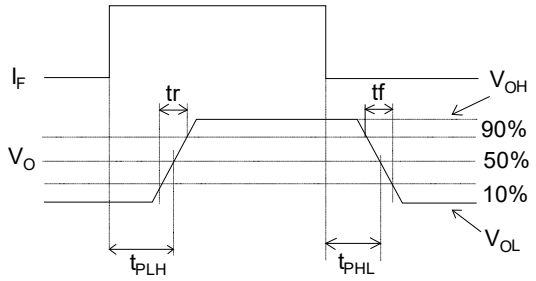
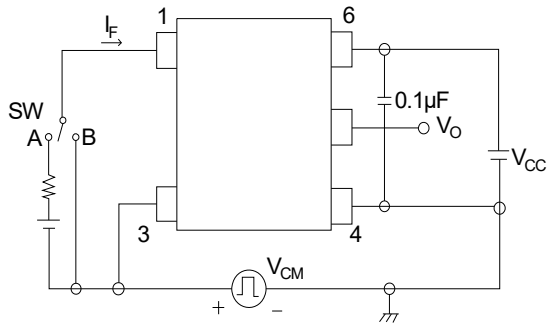
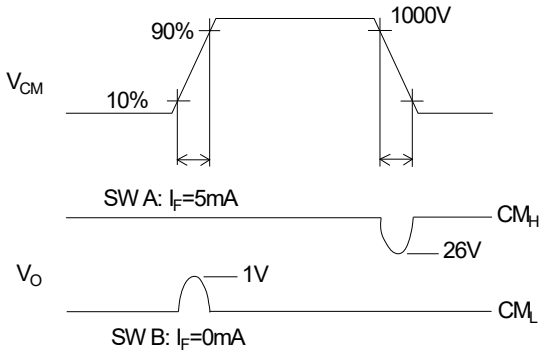


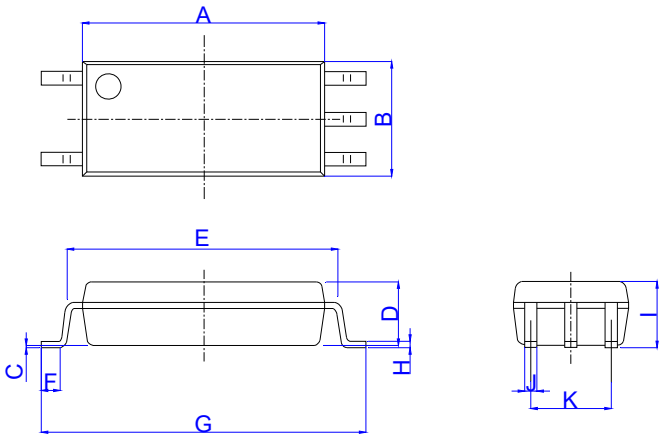
Fig.10: CMTI Test Circuit and Waveform





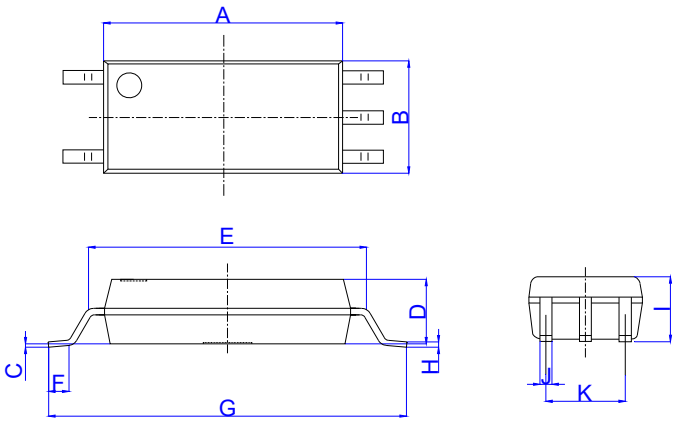
Package Dimension (Unit: mm)

LSOP5



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	7.40		7.80	0.291		0.307
B	3.40		3.80	0.134		0.150
C	0.00		0.20	0.000		0.008
D	1.80		2.20	0.071		0.087
E	8.10		8.70	0.319		0.343
F	0.40		1.00	0.016		0.039
G	9.90		10.50	0.390		0.413
H	0.10		0.30	0.004		0.012
I	1.80		2.40	0.071		0.094
J	0.25		0.55	0.010		0.022
K	2.29		2.79	0.090		0.110

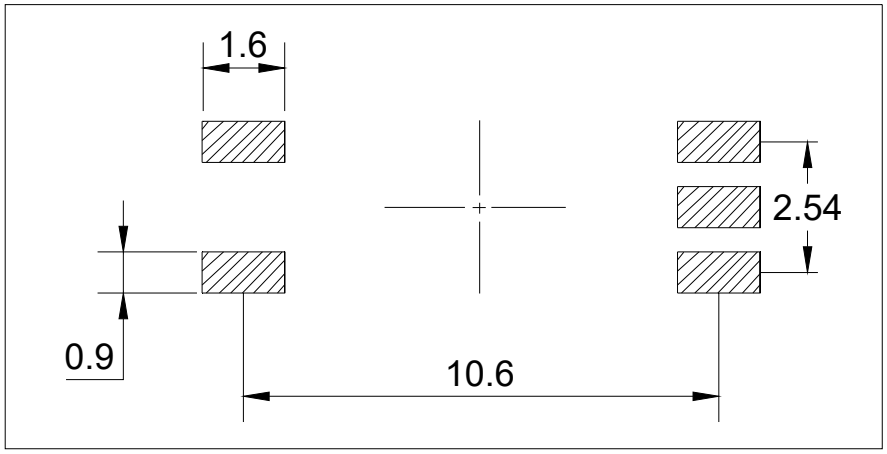
LSOP5W



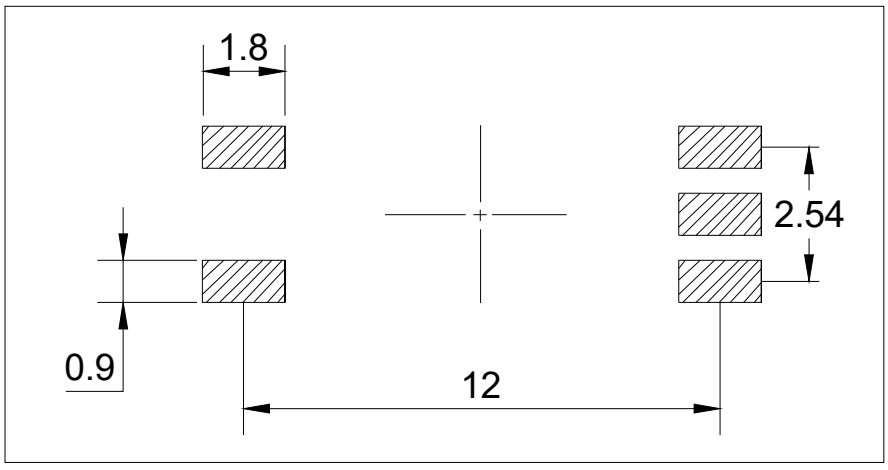
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	7.40		7.80	0.291		0.307
B	3.40		3.80	0.134		0.150
C	0.00		0.20	0.000		0.008
D	1.80		2.20	0.071		0.087
E	8.10		8.70	0.319		0.343
F	0.55		1.15	0.022		0.045
G	10.78		11.38	0.424		0.448
H	0.06		0.26	0.002		0.010
I	1.80		2.40	0.071		0.094
J	0.25		0.55	0.010		0.022
K	2.29		2.79	0.090		0.110

RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

LSOP5

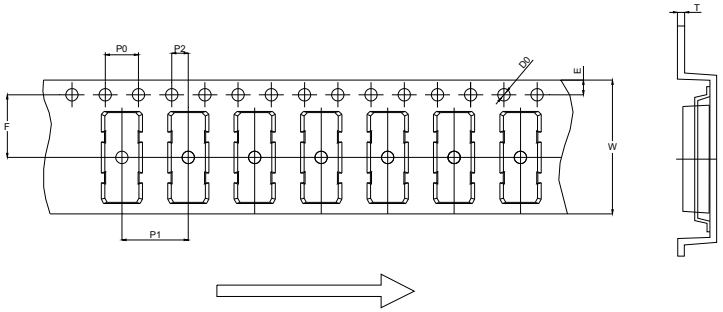


LSOP5W



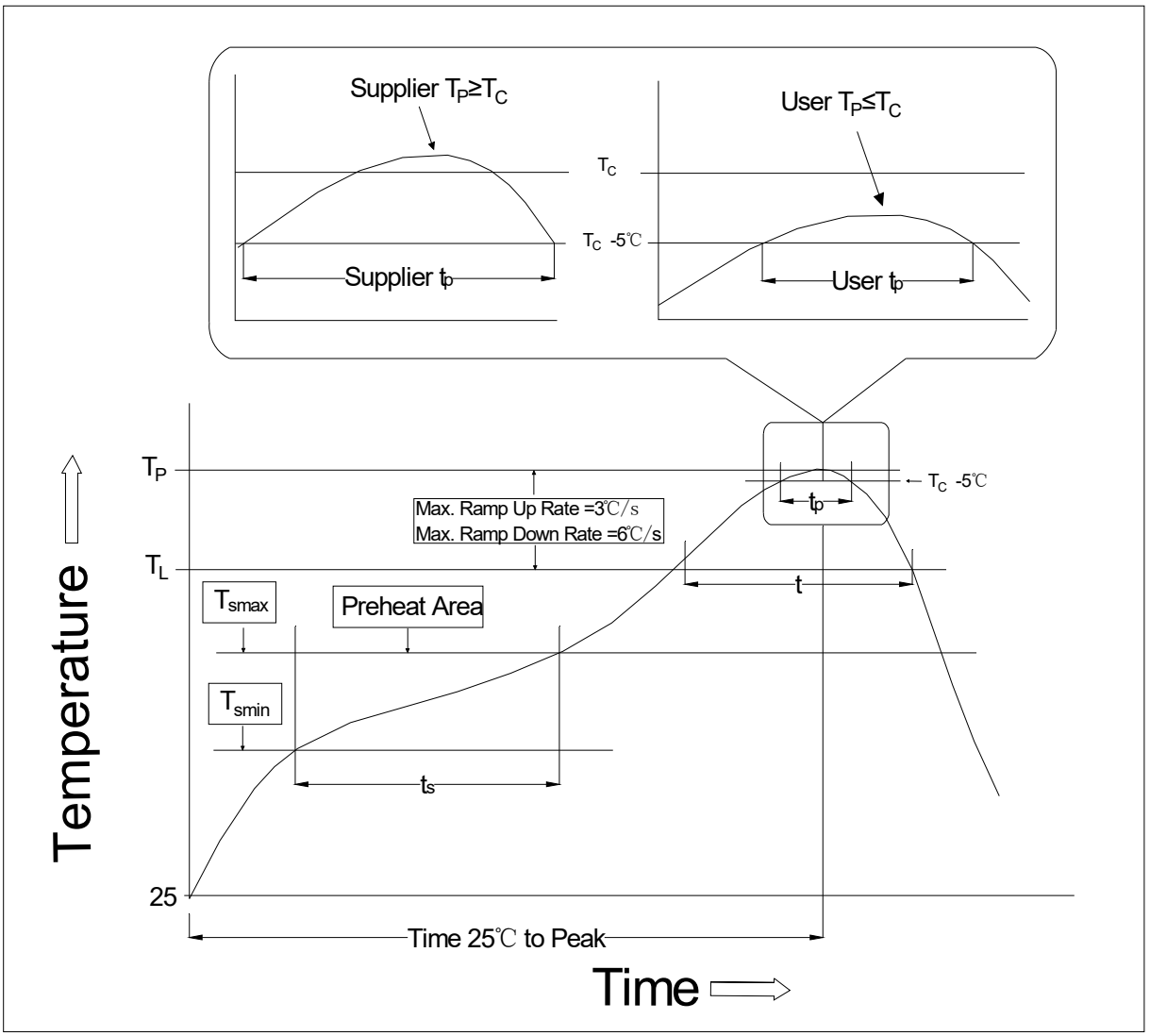
CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option None/R



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D0	1.50	1.55	1.60	0.059	0.061	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	0.35	0.40	0.45	0.014	0.016	0.018
W	15.80	16.00	16.20	0.622	0.630	0.638

REFLOW INFORMATION



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	100	150℃
Temperature Max. (Tsmax)	150	200℃
Time (ts) from (Tsmin to Tsmax)	60-120 seconds	60-120 seconds
Ramp-up Rate (tL to tP)	3℃/second max.	3℃/second max.
Liquidus Temperature (TL)	183℃	217℃
Time (tL) Maintained Above (TL)	60-150 seconds	60-150 seconds
Peak Body Package Temperature	235℃+0℃/-5℃	260℃+0℃/-5℃
Time (tP) within 5℃ of 260℃	20 seconds	30 seconds
Ramp-down Rate (TP to TL)	6℃/second max.	6℃/second max.
Time 25℃ 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