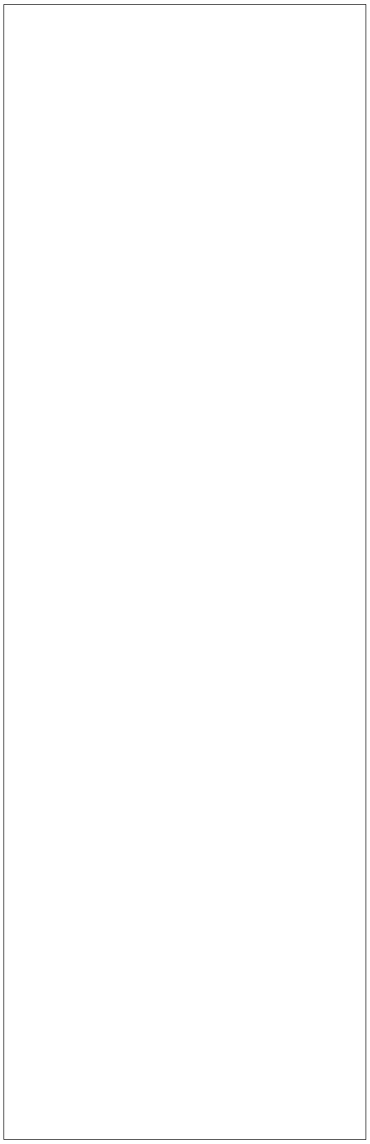
JOCDE0CB-L5X Series

Rev.A.1.0

The products are gate driver opto-couplers in LSOP5 and LSOP5W packages. The device consists of an infrared LED optically coupled to an integrated high-gain, high-speed photodetector IC chip. It provides guaranteed performance and specifications at temperature up to 110℃. It is physically smaller and compliant with international safety standards for reinforced insulation. It thus provides a smaller footprint solution pplications that require safety standard certification. An internal noise shield provides a guaranteed common-mode transient immunity of ±20 kV/μs. It is ideal for small class IGBT and power MOSFET gate drive. The products are widely used in industrial inverters, IGBT gate drivers, MOSFET gate drivers, induction cooktop and home appliances.



High isolation 5000 VRMS
Buffer logic type
Operating temperature range -40°C to 110°C
REACH & RoHS compliance
HBM: H3A; MM: M4; CDM: C3
CQC approved
VDE approved
UL approved

Input	LED	Output
H	ON	L
L	OFF	H

(Temperature=25°C)

Parameter		Symbol	Value	Unit
LED	Forward Current	I_F	50	mA
	Peak Forward Current	I_{FP}	1①	A
	Reverse Voltage	V_R	6	V
	Power Dissipation	P_D	100	mW

Detector	Output Voltage	V_O	30	V
	Supply Voltage	V_{CC}	30	V
	Power Dissipation	P_C	400	mW
Isolation Voltage		V_{iso}	5000②	Vrms
Operating Temperature		T_{opr}	-40~110	℃
Junction Temperature		T_j	125	℃
Storage Temperature		T_{stg}	-55~125	℃
Total Power Dissipation		P_{tot}	500	mW
Soldering Temperature		T_{sol}	260	℃

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(Temperature=25°C)

Parameter		Symbol	Condition	Min.	Typ.	Max.	Unit
Input	Forward Voltage	V_F	I_F=10mA	-	1.35	1.6	V
	Reverse Current	I_R	V_R=6V	-	-	1	μA
	Terminal Capacitance	C_t	V=0,f=1MHz	-	60	-	pF
Output	Peak High-level Output Current	I_{OPH}	I_F=3mA, V_{CC}=5.5V, V_O=GND	-	-350	-150	mA
			I_F=3mA, V_{CC}=20V, V_O=GND	-	-350	-160	mA
	Peak Low-level Output Current	I_{OPL}	V_{CC}=V_O=5.5V	150	270	-	mA
			V_{CC}=V_O=20V	160	300	-	mA
	High Level Supply Current	I_{CCH}	I_F=3mA, V_{CC}=5.5V	-	2.1	3	mA
			I_F=3mA, V_{CC}=30V	-	2.35	3	mA
	Low Level Supply Current	I_{CCL}	V_{CC}=5.5V	-	2.1	3	mA
			V_{CC}=30V	-	2.35	3	mA
	High Level Output Voltage	V_{OH}	I_F=3mA, I_O=-3.5mA	V_{CC}-0.2	V_{CC}-0.03	-	V
			I_F=3mA, I_O=-6.5mA	V_{CC}-0.4	V_{CC}-0.05	-	V
	Low Level Output Voltage	V_{OL}	V_F=0.8V, I_O=3.5mA	-	0.026	0.2	V

			V_F=0.8V, I_O=6.5mA	-	0.047	0.4	V
	Threshold Input Current	I_{FLH}	V_{CC}=15V, V_O＞1V	-	1.2	5	mA
	Threshold Input Voltage	V_{FHL}	V_{CC}=15V, V_O＜1V	0.8	-	-	V
	Supply Voltage	V_{CC}	-	4.5	-	30	V

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Propagation Delay Time to High Output Level	t_{PLH} '	R_g=47Ω, C_g=3nF, I_F=0→5mA, V_{CC}=30V	35	-	120	ns
Propagation Delay Time to Low Output Level	t_{PHL} '	R_g=47Ω, C_g=3nF, I_F=5→0mA, V_{CC}=30V	35	-	120	
Propagation Delay Difference Between Any Two Parts	t_{PHL}- t_{PLH} '	R_g=47Ω, C_g=3nF, I_F=0←→5mA, V_{CC}=30V	-	-	40	
Output Rise Time (10 to 90%)	t_r '	R_g=47Ω, C_g=3nF, I_F=0→5mA, V_{CC}=30V	-	3	30	
Output Fall Time (90 to 10%)	t_f '	R_g=47Ω, C_g=3nF, I_F=5→0mA, V_{CC}=30V	-	3	30	
Common Mode Transient Immunity at High Level Output	$\|CM_H\|$	I_F=5mA V_{CC}=30V, T_a=25℃, V_O(min)=26V V_{CM}=1000Vpp	±30	±50	-	kV/μs
Common Mode Transient Immunity at Low Level Output	$\|CM_L\|$	I_F=0mA V_{CC}=30V, T_a=25℃, V_O(max)=1V V_{CM}=1000Vpp	±30	±50	-	kV/μs

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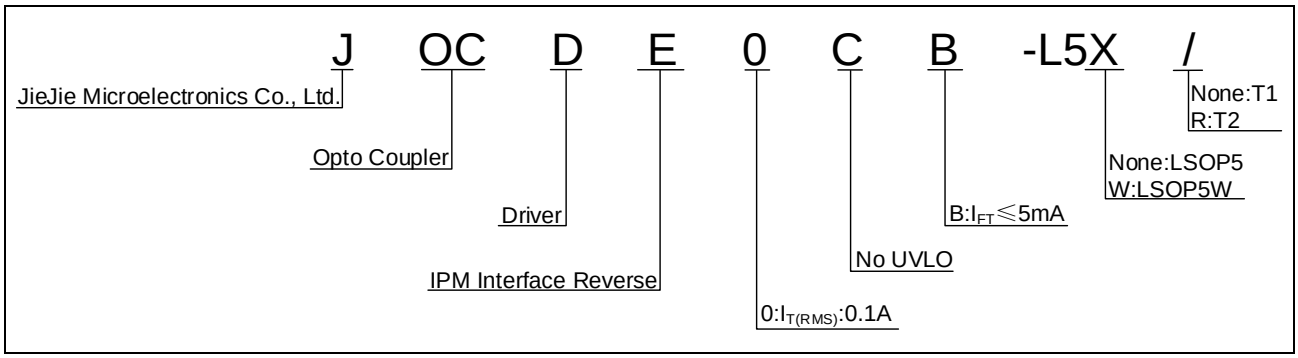
Characteristics	Symbol	Min.	Typ.	Max.	Unit
Input On-state Current	$I_{F(ON)}$ ③	7	-	15	mA
Input Off-state Voltage	$V_{F(OFF)}$	0	-	0.8	V
Supply Voltage	V_{CC} ④	4.5	-	30	V
Operating Frequency	f ⑤	-	-	25	kHz


J OC D E 0 C B -L5X /
JieJie Microelectronics Co., Ltd.
Opto Coupler
Driver
IPM Interface Reverse
0:I$_{T(RMS)}$:0.1A
No UVLO
B:I$_{FT}$≤5mA
None:LSOP5
W:LSOP5W
None:T1
R:T2

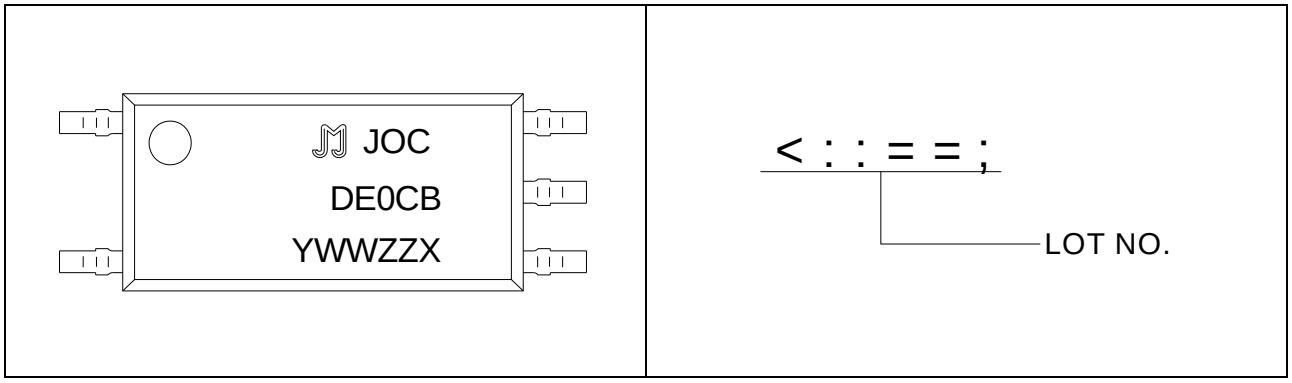

JOC
DE0CB
YWWZZX
< : : = = ;
LOT NO.

FIG.1: Forward Current vs. Forward Voltage

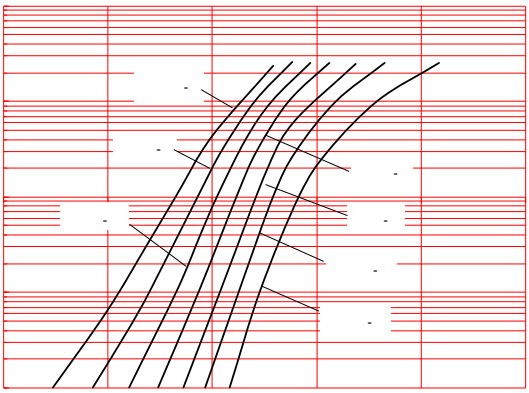


FIG.2: Max. Allowable LED Forward Current vs. Ambient Temperature

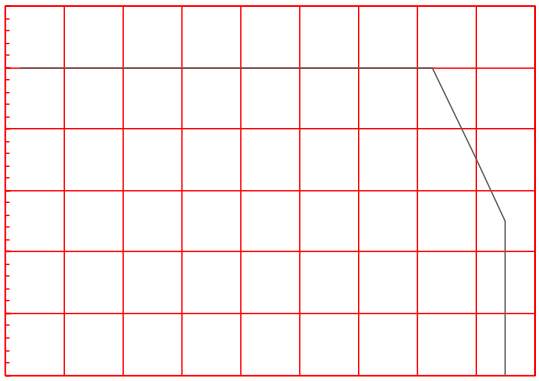


FIG.3: Collector Power Dissiption vs. Ambient Temperature

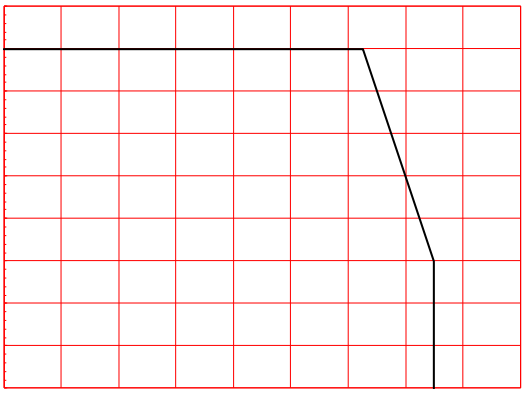


FIG.4: Threshold Input Current vs. Ambient Temperature

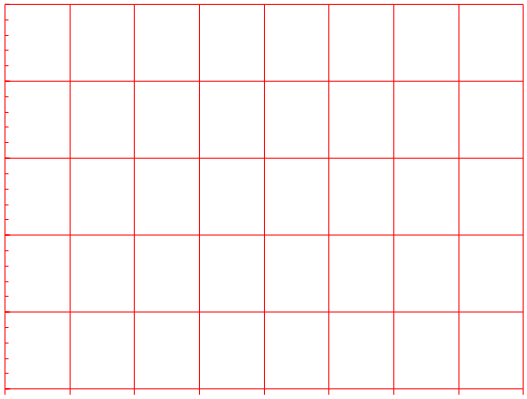


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FIG.13: Propagation Delay Time,Pulse Width Distortion vs. Supply Voltage

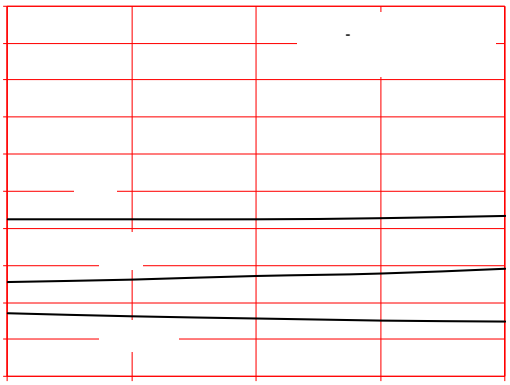


FIG.14: Switching Time Test Circuit and Waveform

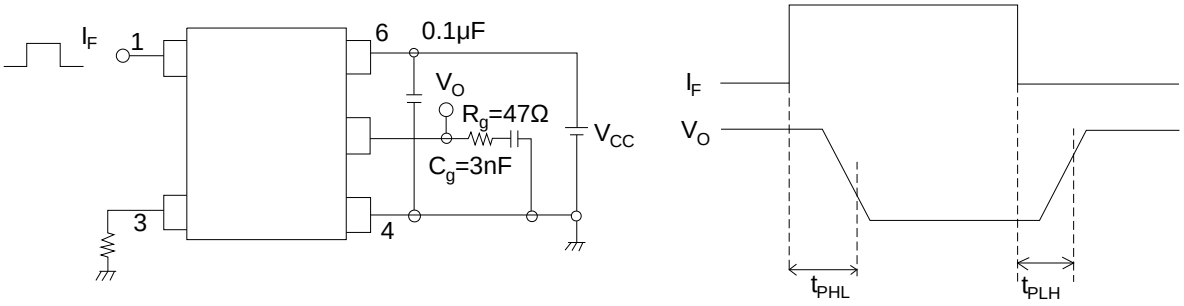
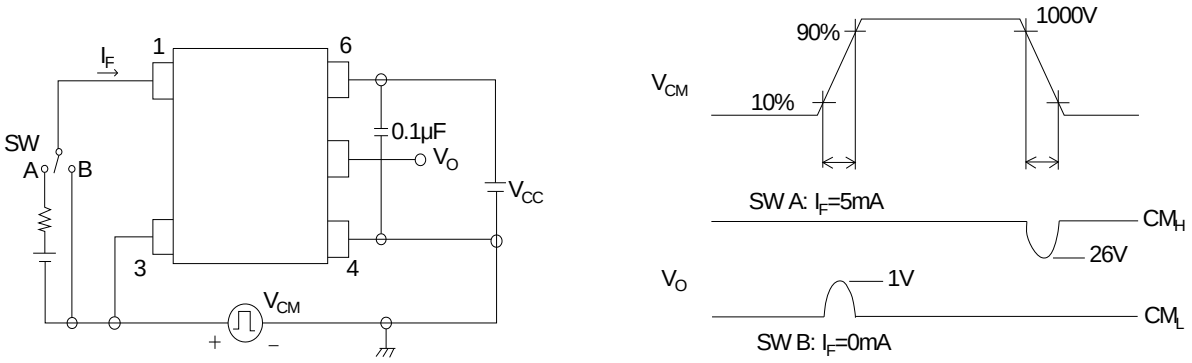
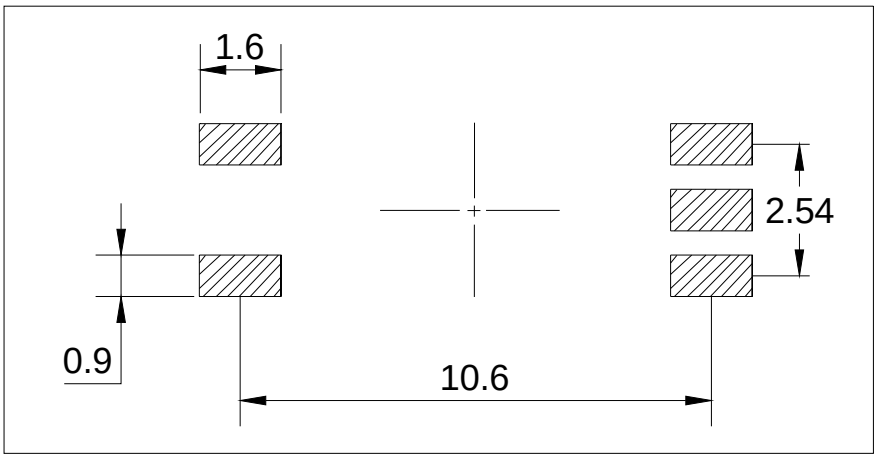
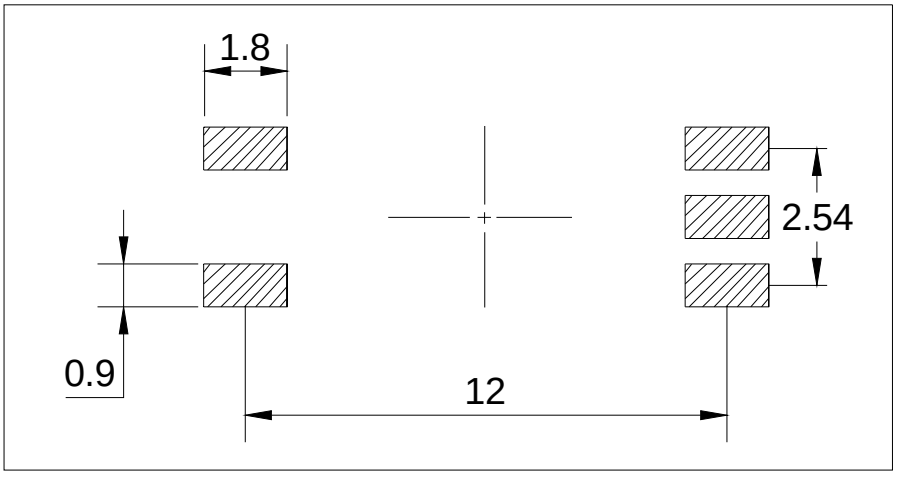


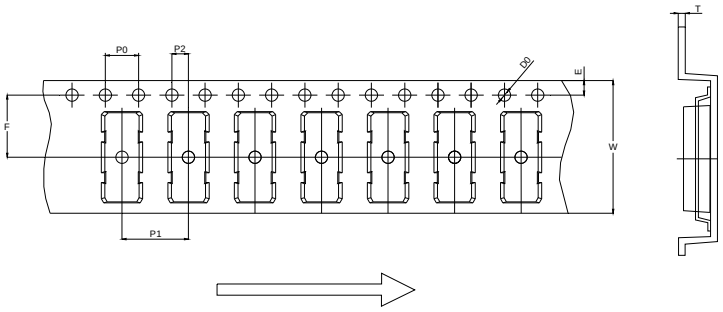
FIG.15: Common-Mode Transient Immunity Test Circuit and Waveform



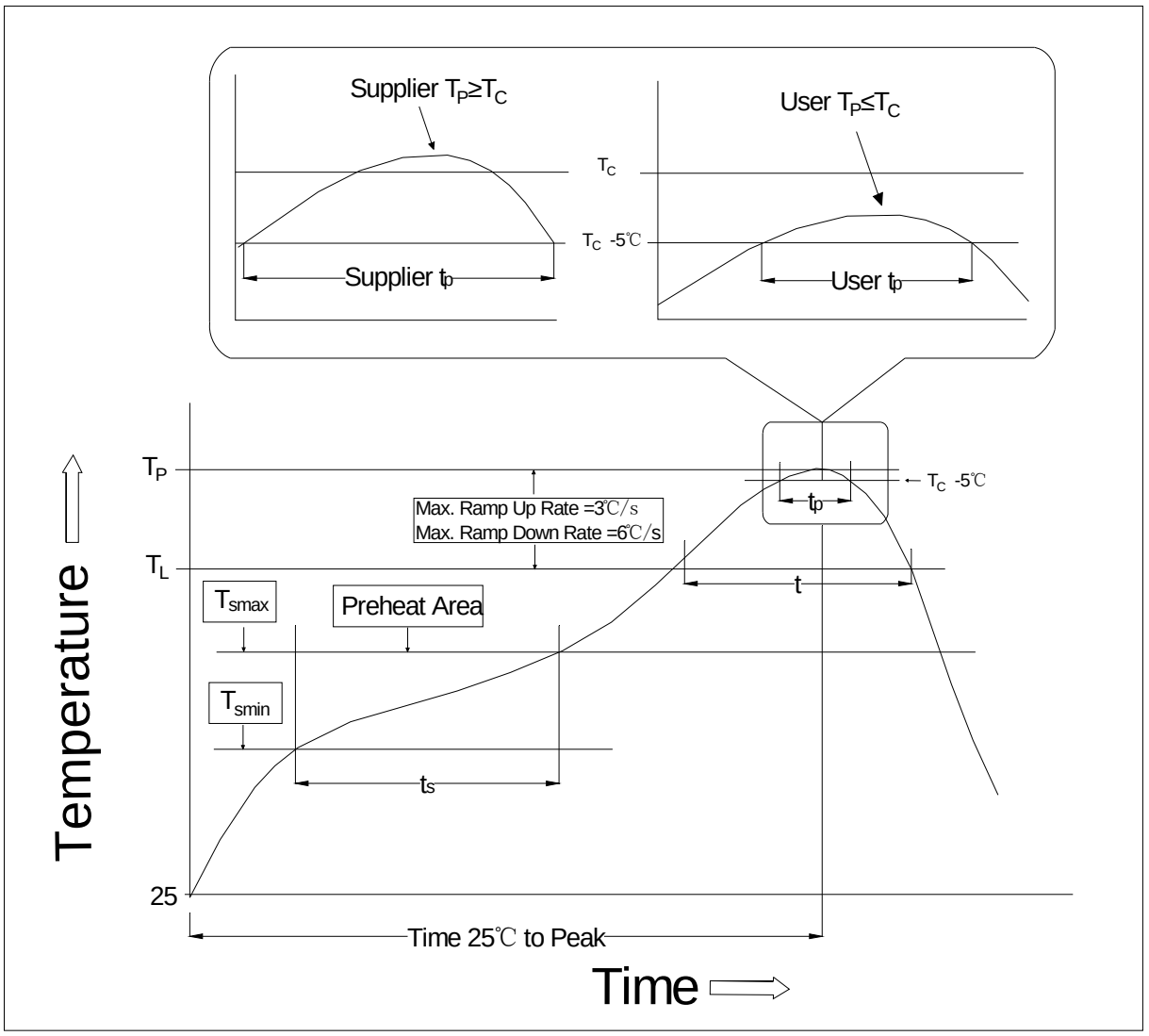
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	7.40		7.80	0.291		0.307
B	3.40		3.80	0.134		0.150
C	0.00		0.20	0.000		0.008
D	1.80		2.20	0.071		0.087
E	8.10		8.70	0.319		0.343
F	0.40		1.00	0.016		0.039
G	9.90		10.50	0.390		0.413
H	0.10		0.30	0.004		0.012
I	1.80		2.40	0.071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


1.6
2.54
0.9
10.6


1.8
2.54
0.9
12



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



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