



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 °C. It is physically smaller and compliant with international safety standards for reinforced insulation. It thus provides a smaller footprint solution for applications that require safety standard certification. An internal noise shield provides a guaranteed common-mode transient immunity of ± 20 kV/ μ s. 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

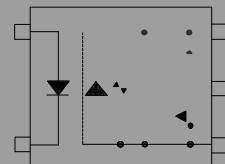
REACH & RoHS compliance

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}	1	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}	5000	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	

100 μ s pulse, 100Hz frequency

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

(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}	$R_g=47\Omega$, $C_g=3nF$, $I_F=0\rightarrow 5mA$, $V_{CC}=30V$	35	-	120	ns
Propagation Delay Time to Low Output Level	t_{PHL}	$R_g=47\Omega$, $C_g=3nF$, $I_F=5\rightarrow 0mA$, $V_{CC}=30V$	35	-	120	
Propagation Delay Difference Between Any Two Parts	$t_{PHL}-t_{PLH}$	$R_g=47\Omega$, $C_g=3nF$, $I_F=0\leftrightarrow 5mA$, $V_{CC}=30V$	-	-	40	
Output Rise Time (10 to 90%)	t_r	$R_g=47\Omega$, $C_g=3nF$, $I_F=0\rightarrow 5mA$, $V_{CC}=30V$	-	3	30	
Output Fall Time (90 to 10%)	t_f	$R_g=47\Omega$, $C_g=3nF$, $I_F=5\rightarrow 0mA$, $V_{CC}=30V$	-	3	30	
Common Mode Transient Immunity at High Level Output	$ CM_H $	$I_F=5mA$ $V_{CC}=30V$, $T_a=25^\circ C$, $V_O(min)=26V$ $V_{CM}=1000V_{pp}$	± 35	-	-	kV/ μs
Common Mode Transient Immunity at Low Level Output	$ CM_L $	$I_F=0mA$ $V_{CC}=30V$, $T_a=25^\circ C$, $V_O(max)=1V$ $V_{CM}=1000V_{pp}$	± 35	-	-	kV/ μs

All Typical values at $T_a=25^\circ C$ -

: Input signal ($f=25kHz$, $duty=50\%$, $t_r=t_f=5ns$ or less). C_L is less than 15 pF which includes probe and stray wiring capacitance.

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

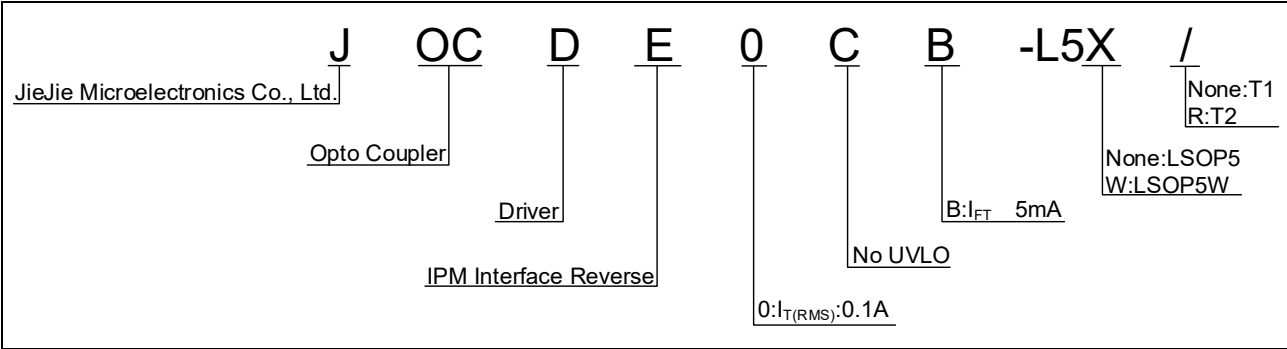
: The recommended operating conditions are given as a design guide necessary to obtain the intended performance of the device. Each parameter is an independent value. When creating a system design using this device, the electrical characteristics specified in this datasheet should also be considered.

: A ceramic capacitor(0.1 μ F) should be connected between pin 6 (V_{CC}) and pin 4 (GND) to stabilize the operation of a high-gain linear amplifier. Otherwise, this photocoupler may not switch properly. The bypass capacitor should be placed within 1 cm of each pin.

: The rise and fall times of the input on-current should be less than 0.5 μ s.

: If the rising slope of the supply voltage (V_{CC}) for the detector is steep, stable operation of the internal circuits cannot be guaranteed. Be sure to set 3 V/ μ s or less for a rising slope of the V_{CC} .

: Denotes the operating range, not the recommended operating condition.



None/R	3000 Units/Reel

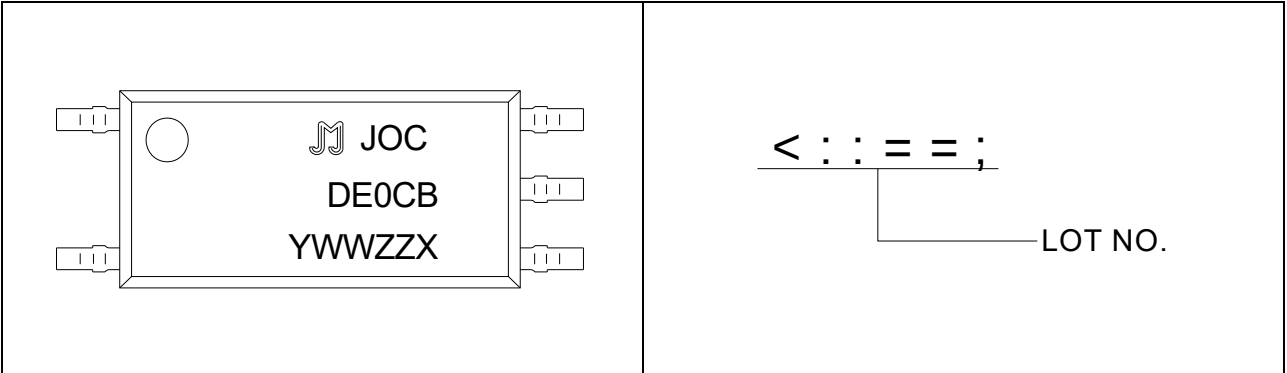


FIG.1: Forward Current vs. Forward Voltage

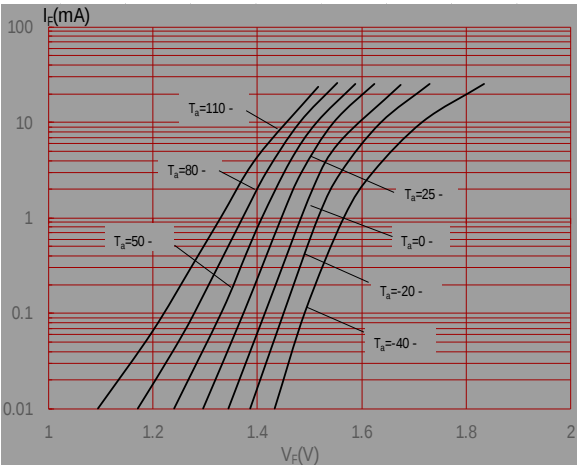


FIG.2: Max. Allowable LED Forward Current vs. Ambient Temperature

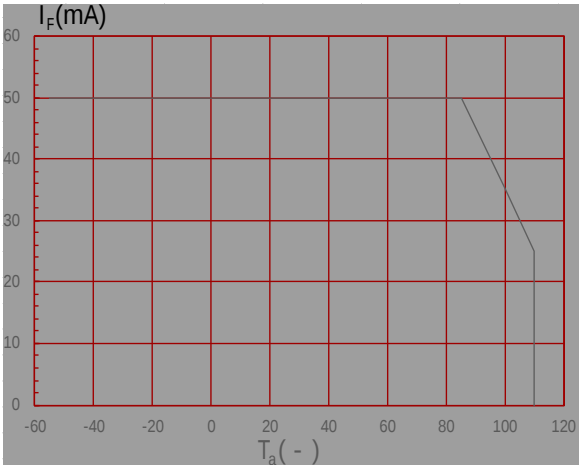


FIG.3: Collector Power Dissipation vs. Ambient Temperature

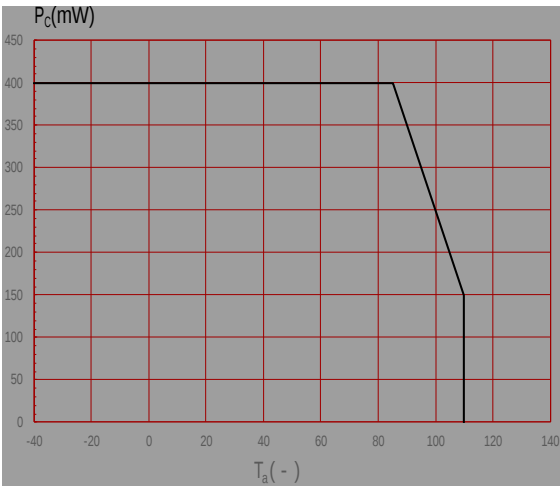
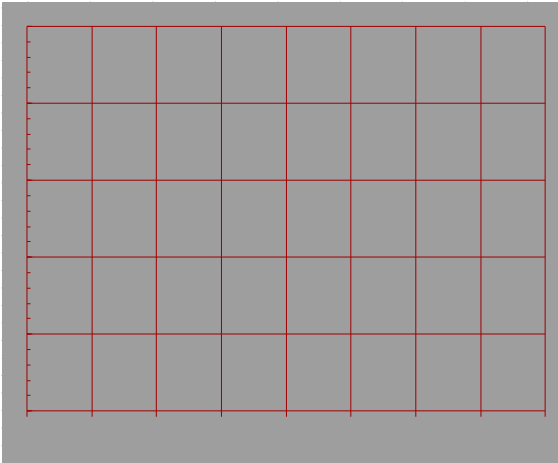


FIG.4: Threshold Input Current vs. Ambient Temperature



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

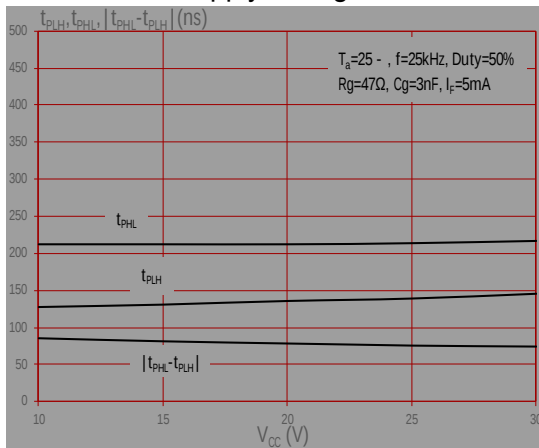


FIG.14: Switching Time Test Circuit and Waveform

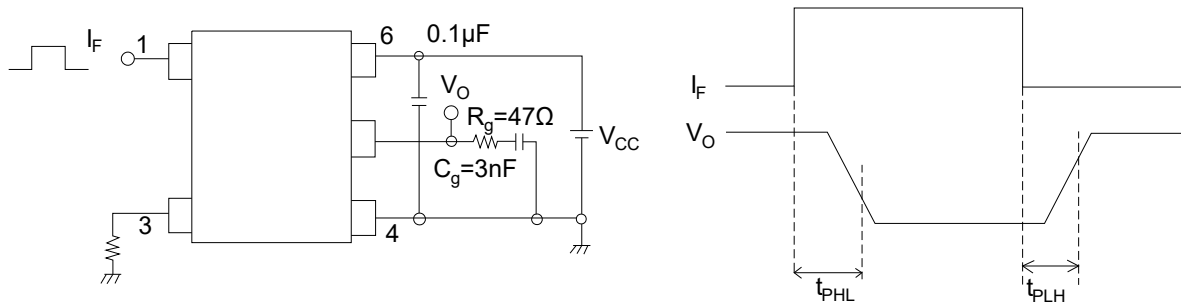
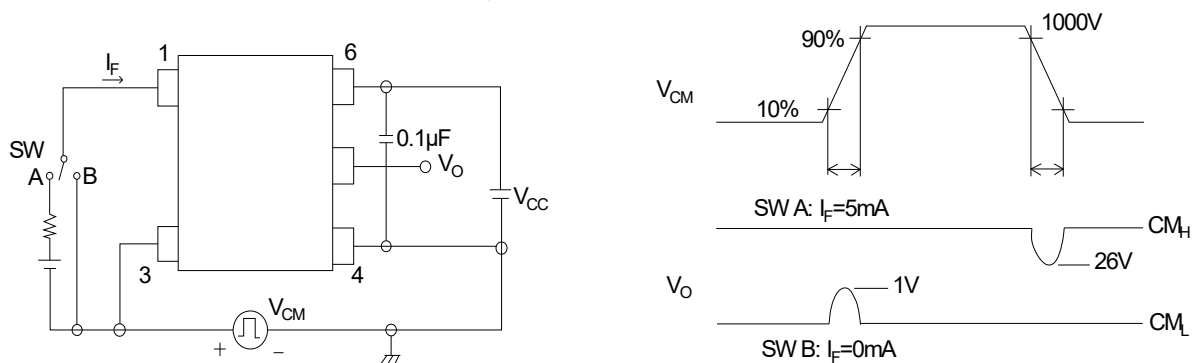
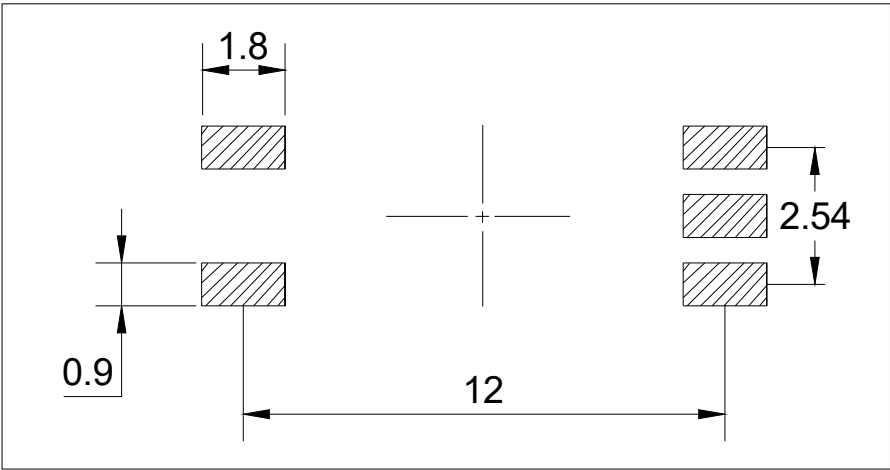
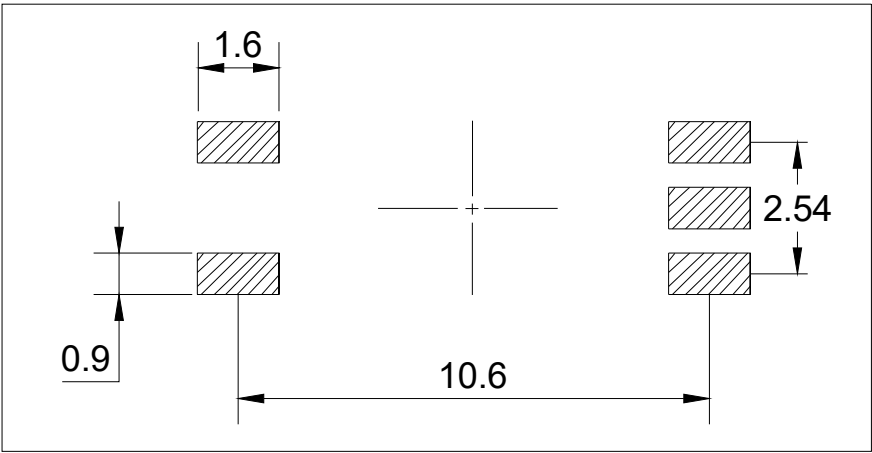


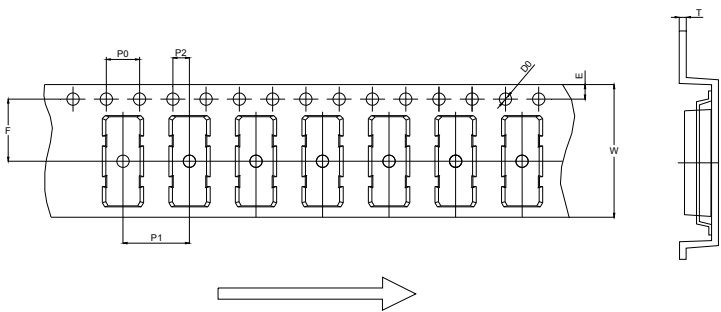
FIG.15: Common-Mode Transient Immunity Test Circuit and Waveform



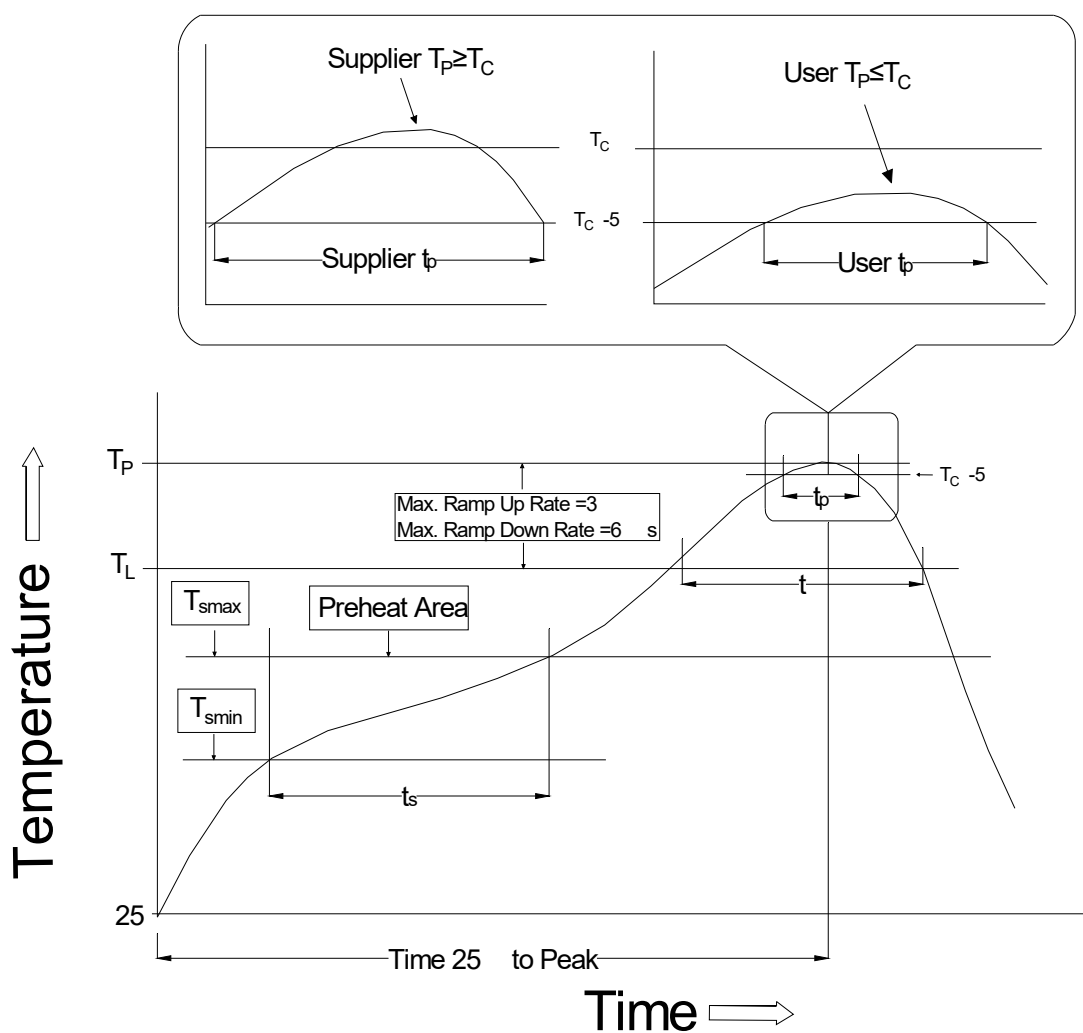


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	7.40		7.80	0.291		0.307
B	3.40		3.80	0.134		0.150
C	0.00		0.20	0.000		0.008
D	1.80		2.20	0.071		0.087
E	8.10		8.70	0.319		0.343
F	0.40		1.00	0.016		0.039
G	9.90		10.50	0.390		0.413
H	0.10		0.30	0.004		0.012
I	1.80		2.40	0.071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





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. (T_{smin})	100	150
Temperature Max. (T_{smax})	150	200
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds
Ramp-up Rate (t_L to t_P)	3 /second max.	3 /second max.
Liquidus Temperature (T_L)	183	217
Time (t_L) Maintained Above (T_L)	60-150 seconds	60-150 seconds
Peak Body Package Temperature	235 +0 /-5	260 +0 /-5
Time (t_P) within 5 of 260	20 seconds	30 seconds
Ramp-down Rate (T_P to T_L)	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.

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