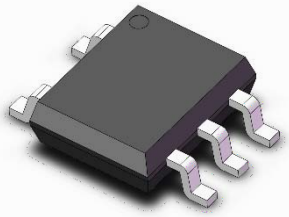
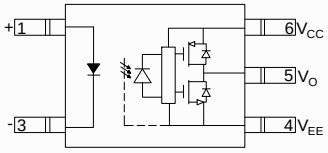
JOCDA3BB-M5

Rev.A.1.0

DESCRIPTION:

The products are gate driver opto-couplers in the SOP5 package. 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 for applications that require safety standard certification. An internal noise shield provides a guaranteed common-mode transient immunity of ±35 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.





MAIN FEATURES

3A maximum peak output current
High isolation 3750 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

Truth Table

LED	V_{CC}-V_{EE} (Positive Going)	V_{CC}-V_{EE} (Negative Going)	Output
OFF	0-30V	0-30V	Low
ON	0-6.9V	0-5.9V	Low
ON	6.9V-8.7V	5.9V-7.5V	TRANSITION
ON	8.7V-30V	7.5V-30V	HIGHT

ABSOLUTE MAXIMUM RATINGS (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	35	V
	Supply Voltage	V_{CC}	35	V
	Power Dissipation	P_C	400	mW
Isolation Voltage		V_{iso}	3750	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	

NOTE1 μ

NOTE2

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
	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}	V_O=V_{CC}-4V, Pulse width≤50μs	-1	-	-	A
			V_O=V_{CC}-15V, Pulse width≤10μs	-3	-	-	A
	Peak Low-level Output Current	I_{OPL}	V_O=V_{EE}+2.5V, Pulse width≤50μs	1	-	-	A
			V_O=V_{EE}+15V, Pulse width≤10μs	3	-	-	A
	High Level Supply Current	I_{CCH}	I_F=10mA V_{CC}=30V, V_O=Open,	-	1.2	2	mA
	Low Level Supply Current	I_{CCL}	I_F=0mA , V_{CC}=30V, V_O=Open,	-	1.1	2	mA

	High Level Output Voltage	V_{OH}	I_F=5mA, V_{CC}=10V, I_O=-100mA	6	8.4	-	V
	Low Level Output Voltage	V_{OL}	V_F=0.8V, V_{CC}=10V, I_O=100mA	-	0.3	1	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}	-	10	-	30	V
	UVLO Threshold	VUVLO+	V_O 2.5V, I_F=5mA	7.5	8.7	9.5	V
		VUVLO-	V_O 2.5V, I_F=5mA	7.5	8.4	9.5	V

SWITCHING SPECIFICATION

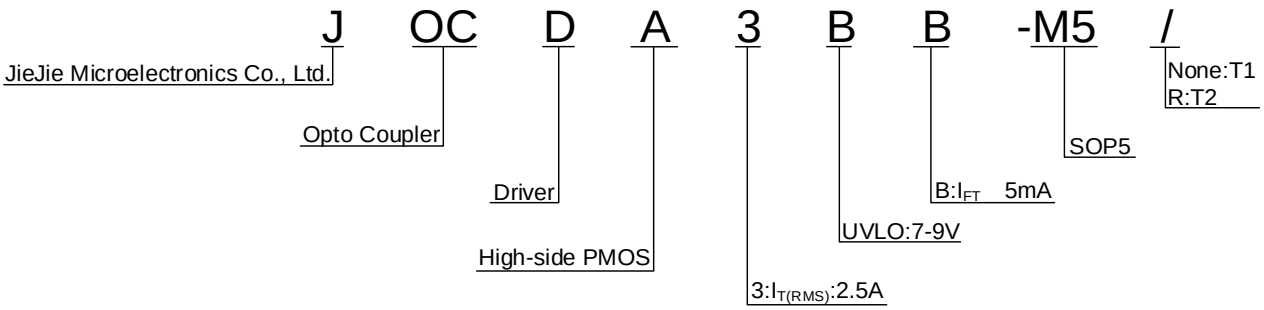
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Propagation Delay Time to High Output Level	t_{PLH}	R_g=47Ω, C_g=3nF, I_F=0→5mA, V_{CC}=30V	30	-	500	ns
Propagation Delay Time to Low Output Level	t_{PHL}	R_g=47Ω, C_g=3nF, I_F=5→0mA, V_{CC}=30V	30	-	500	
Propagation Delay Difference Between Any Two Parts	t_{PHL}- t_{PLH}	R_g=47Ω, C_g=3nF, I_F=0←→5mA, V_{CC}=30V	-	-	350	
Output Rise Time (10 to 90%)	t_r	R_g=47Ω, C_g=3nF, I_F=0→5mA, V_{CC}=30V	-	50	-	
Output Fall Time (90 to 10%)	t_f	R_g=47Ω, C_g=3nF, I_F=5→0mA, V_{CC}=30V	-	50	-	
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	±35	-	-	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	±35	-	-	kV/μs

Note1

Note2

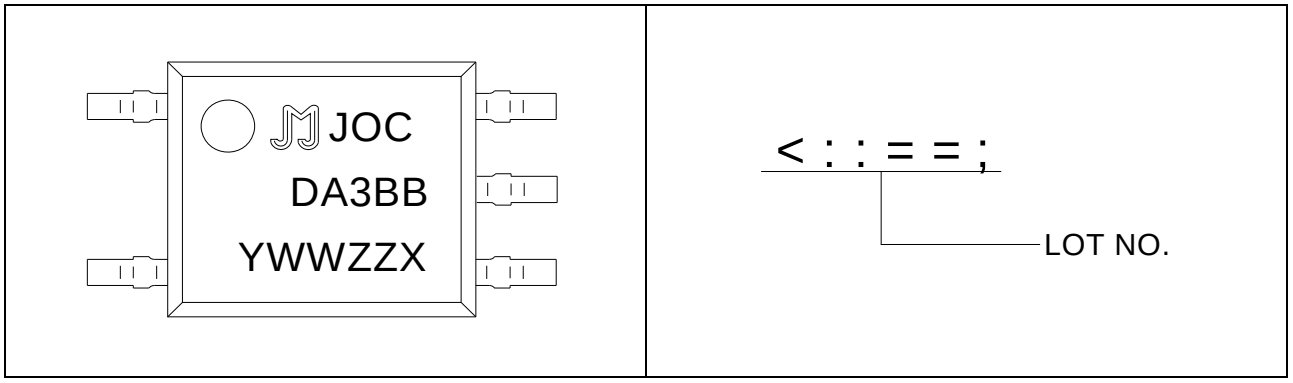
Note3

ORDERING INFORMATION



Packing Quantity	
Option	**Quantity**

MARKING



Characteristics Curves

FIG.1: Forward Current vs. Forward Voltage

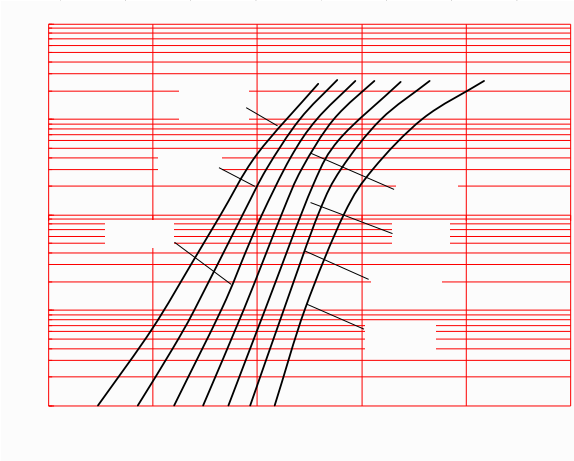


FIG.2: Max. Allowable LED Forward Current vs. Ambient Temperature

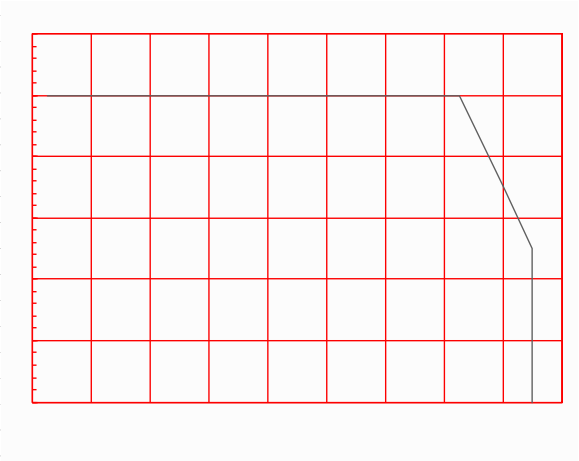


FIG.3: Collector Power Dissiption vs. Ambient Temperature

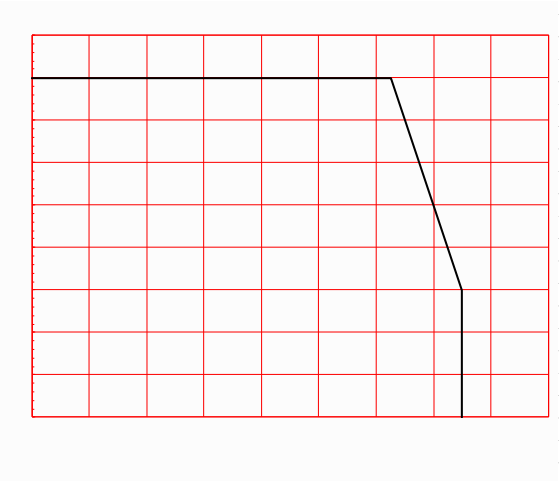


FIG.4: Threshold Input Current vs. Ambient Temperature

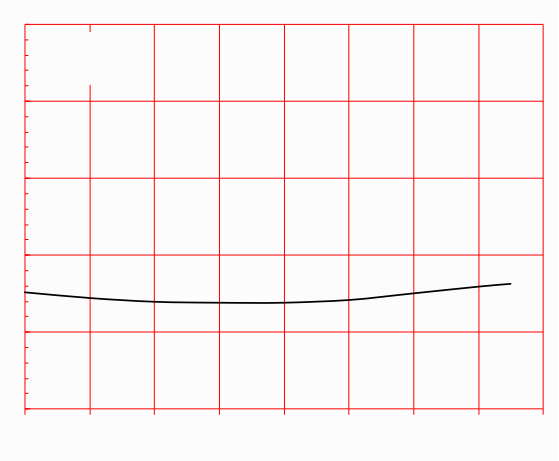


FIG.5: Low-level Supply Current vs. Ambient Temperature

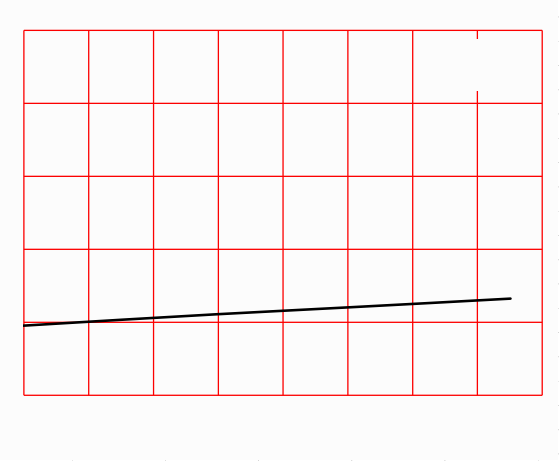


FIG.6: High-level Supply Current vs. Ambient Temperature

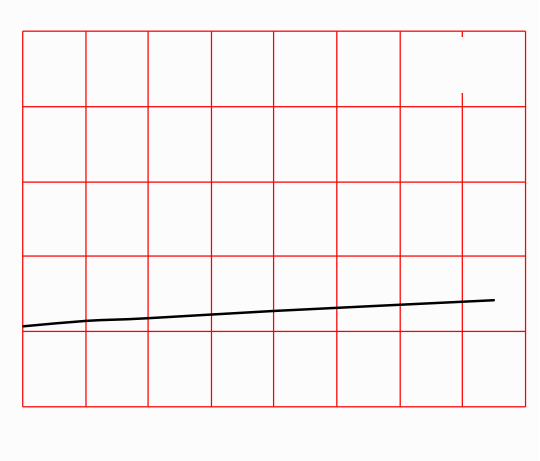


FIG.7: Low-level Output Voltage vs. Ambient Temperature

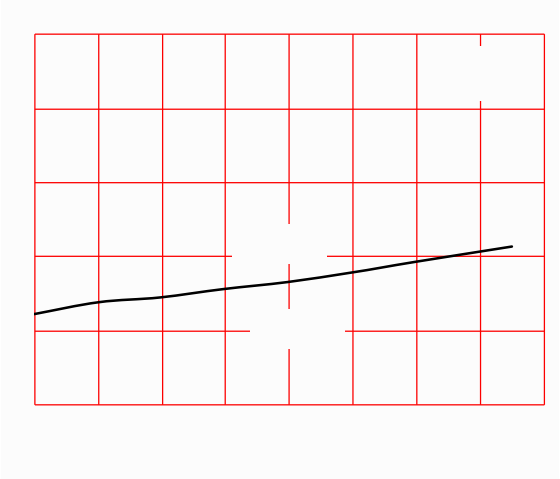


FIG.8: High-level Output Voltage vs. Ambient Temperature

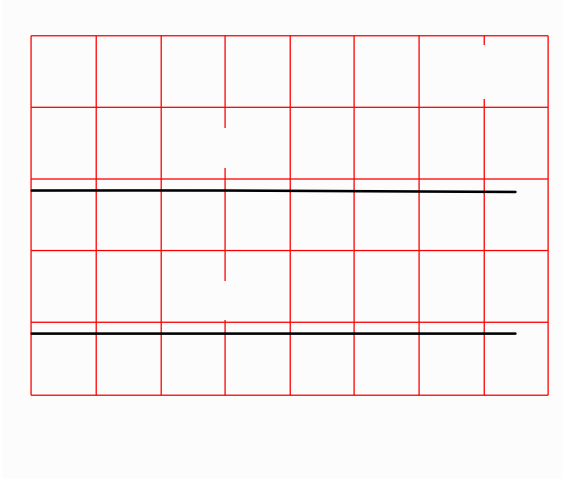


FIG.9: Low-level Output Voltage vs. Peak Low-level Output Current

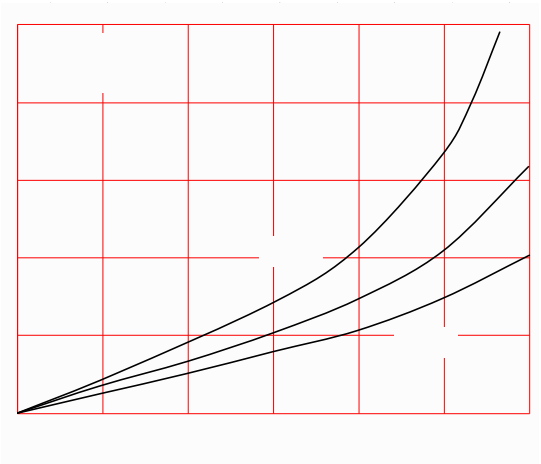


FIG.10: High-level Output Voltage Drop vs. Peak High-level Output Current

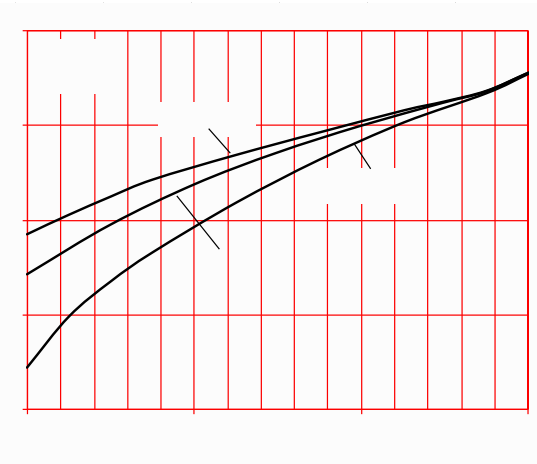


FIG.11: Propagation Delay Time,Pulse Width Distortion vs. Ambient Temperature

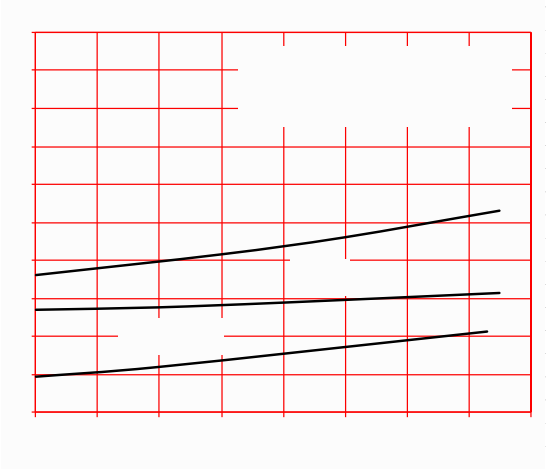


FIG.12: Propagation Delay Time,Pulse Width Distortion vs. Forward Current

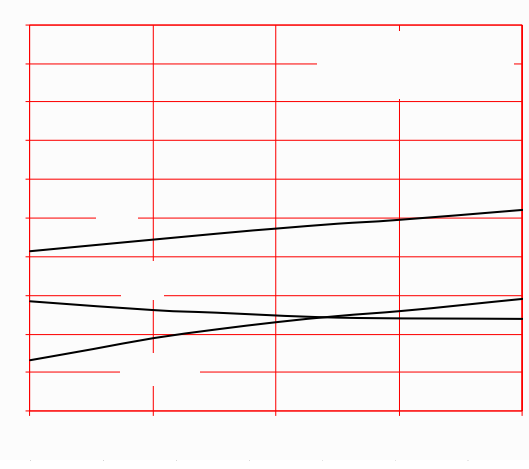
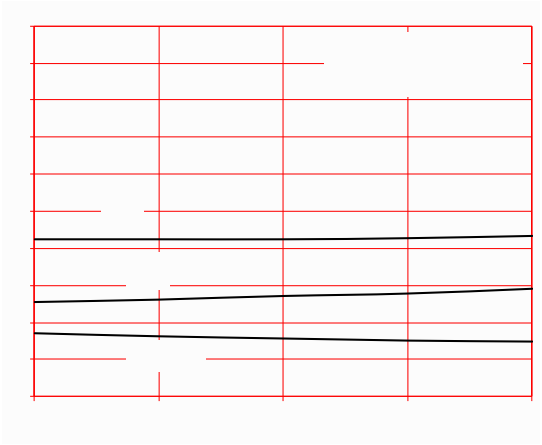
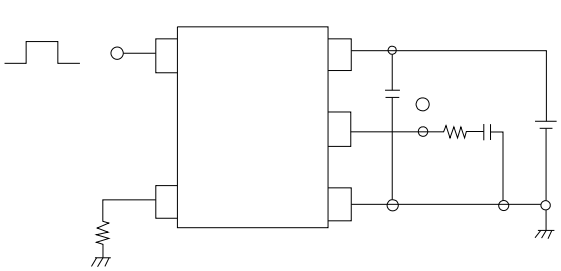


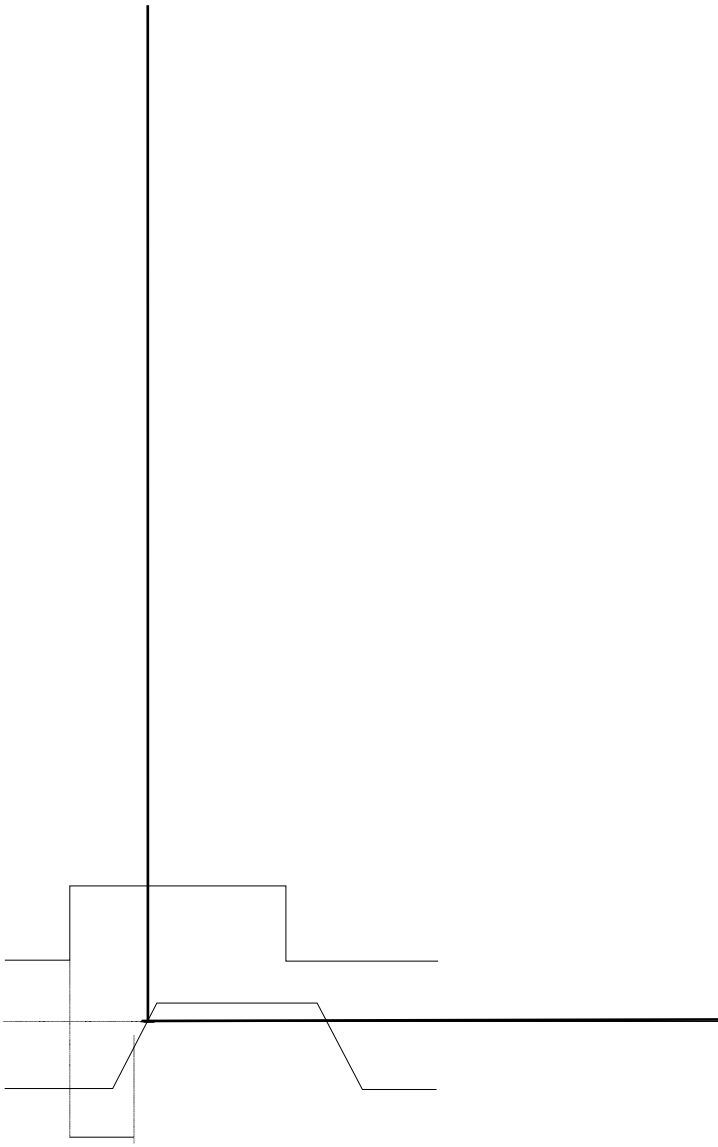
FIG.13: Propagation Delay Time,Pulse Width Distortion vs. Supply Voltage



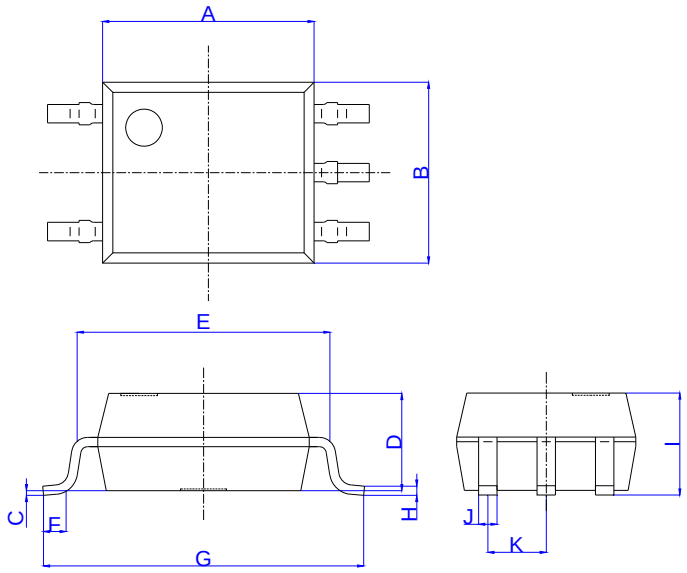
Test Circuits

FIG.14: Switching Time Test Circuit and Waveform



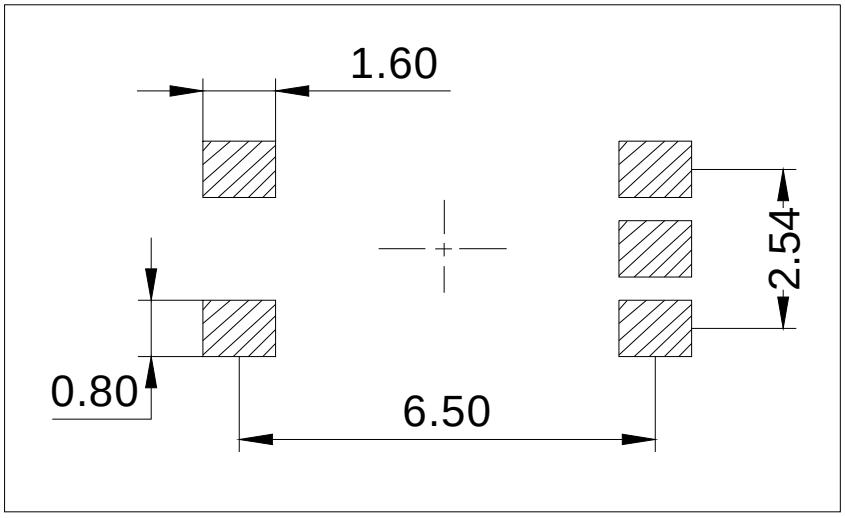


Package Dimension (Unit: mm)



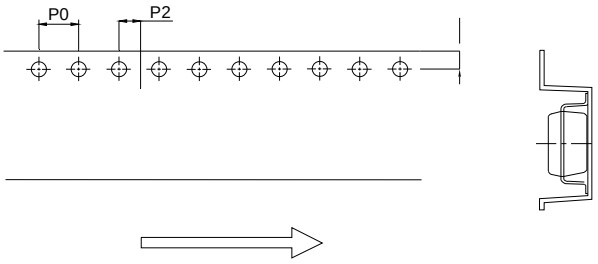
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.80	0.173		0.189
B	3.60		4.20	0.142		0.165
C	0.00		0.20	0.000		0.008
D	1.90		2.30	0.075		0.091
E	5.00		5.60	0.197		0.220
F	0.34		0.94	0.013		0.037
G	6.70		7.30	0.264		0.287
H	0.10		0.30	0.004		0.012
I	2.00		2.40	0.079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

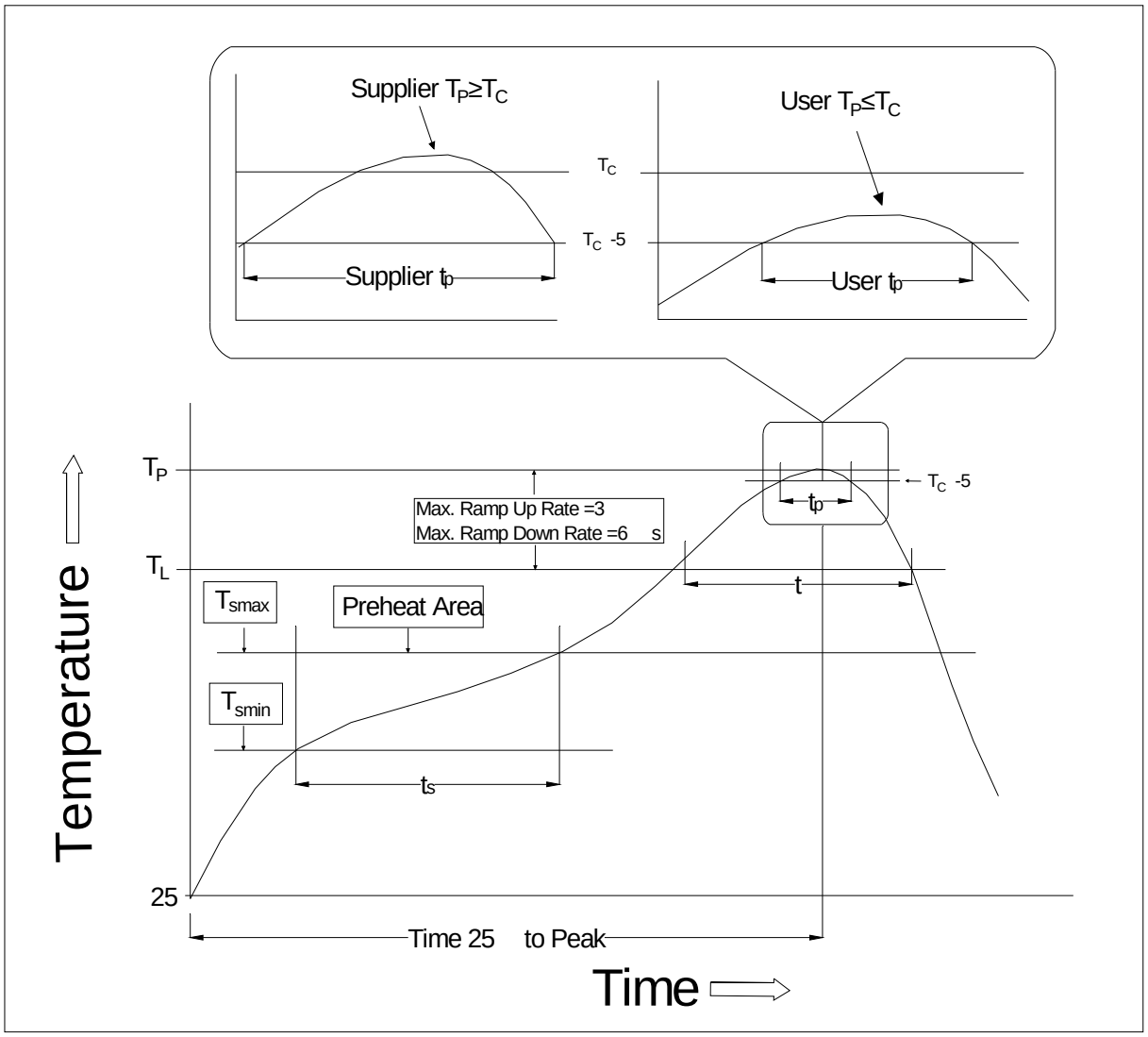


CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option None



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