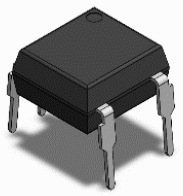
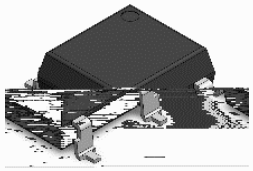
DESCRIPTION:

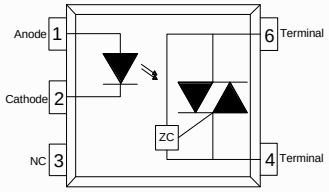
The products are 5-pin thyristor opto-couplers. The device combines an AIGaAs infrared emitting diode as the emitter which is optically coupled to a monolithic silicon zero-crossing photo triac in a plastic DIP5 package with different lead forming options. The products are widely used in solenoid/valve controls, lighting controls, motor controls, temperature controls, static AC power switches, solid state relays, interfacing microprocessors up to 265 V_{AC} peripherals.



JOCSZX1X-D5P



JOCSZX1X-D5S



MAIN FEATURES

High isolation 5000 VRMS
DC input with zero-crossing photo triac output
Operating temperature range -55 to 110
REACH & RoHS compliance
HBM: H3A; MM: M4; CDM: C3
CQC approved
VDE approved
UL approved

ABSOLUTE MAXIMUM RATINGS (Temperature=25°C)

Input	Forward Current	I_F		50	mA
	Peak Forward Current	I_{FP}		1	A
	Reverse Voltage	V_R		6	V
	Power Dissipation	P_D		75	mW
Output	Off-state Output Terminal Voltage	V_{OFF}	JOCSZ21X	600	V
			JOCSZ31X	800	
	Peak On−state Current (100μs pulse, 120 pps)	I_{TP}		2	A
	On-state RMS Current	$I_{T(RMS)}$		100	mA
	Peak Repetitive Surge Current (P_W=10 ms)	I_{TSM}		1.2	A
	Output Power Dissipation	P_O		250	mW
Total Power Dissipation		P_{tot}		325	mW
Isolation Voltage		V_{iso}		5000	Vrms

Operating Temperature	T_{opr}	-55~110	
Junction Temperature	T_j	125	
Storage Temperature	T_{stg}	-55~125	
Soldering Temperature	T_{sol}	260	
Peak pulse voltage (T_j=25 ; non-repetitive,off-state)	V_{pp}	1	kV

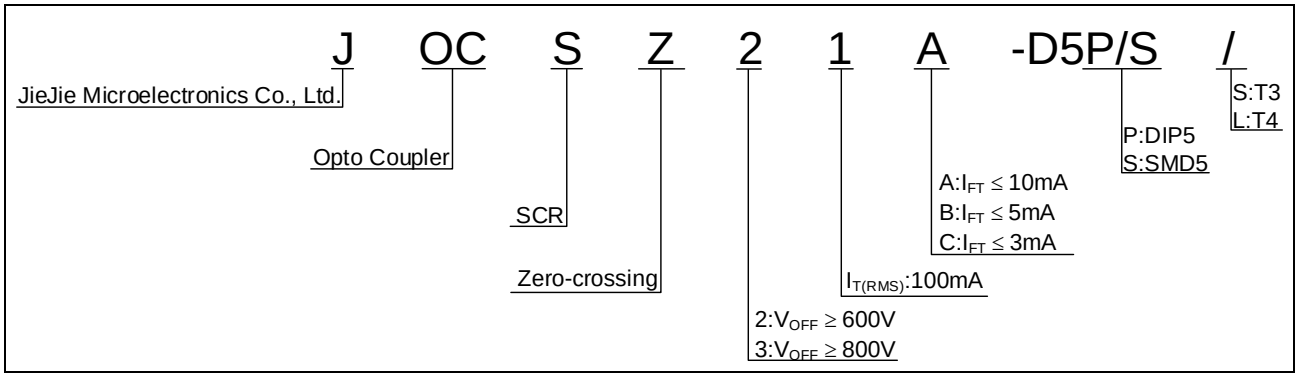
NOTE1: 100μs pulse, 100Hz frequency **NOTE2**: AC for 1minute, R.H.=40~60%

ELECTRICAL CHARACTERISTICS (Temperature=25°C)

Input	Forward Voltage		V_F	I_F=10mA	-	1.2	1.5	V
	Reverse Current		I_R	V_R=6V	-	-	1	μA
	Input Capacitance		C_{in}	V=0, f=1kHz	-	10	-	pF
Output	Peak Off-state Current, Either Direction		I_{OFF}	V_{OFF}=Rated V_{OFF} I_F=0	-	-	100	nA
	Peak On-state Voltage, Either Direction		V_{TM}	I_{TM}=100mA	-	1.7	2.5	V
	Critical Rate of Rise of Off-state voltage		dV/dt	V_{PEAK}= Rated V_{PEAK} I_F=0	2000	-	-	V/μs
Transfer Characteristics	LED Trigger Current	JOCSZ21A JOCSZ31A	I_{FT}	Terminal Voltage=3V I_{TM}=100mA	-	-	10	mA
		JOCSZ21B JOCSZ31B			-	-	5	
		JOCSZ21C JOCSZ31C			-	-	3	
	Holding Current		I_H	I_{TM}=2mA, I_F=Rated I_{FT}	-	500	-	μA
	Isolation Resistance		R_{ISO}	DC500V 40~60%R.H.	10^{12}	10^{14}	-	Ω
	Floating Capacitance		C_{IO}	V=0, f=1MHz	-	10	-	pF
	Response Time		t_{on}	V_D=6V, R_L=100Ω, I_F=20mA	-	15	50	μs
Zero-crossing Characteristics	Inhibit Voltage		V_{IH}	I_F=Rated I_{FT}	-	-	20	V
	Leakage in Inhibited State		I_{OFF2}	I_F=Rated I_{FT}, V_{OFF}=Rated V_{OFF}	-	-	1.5	mA

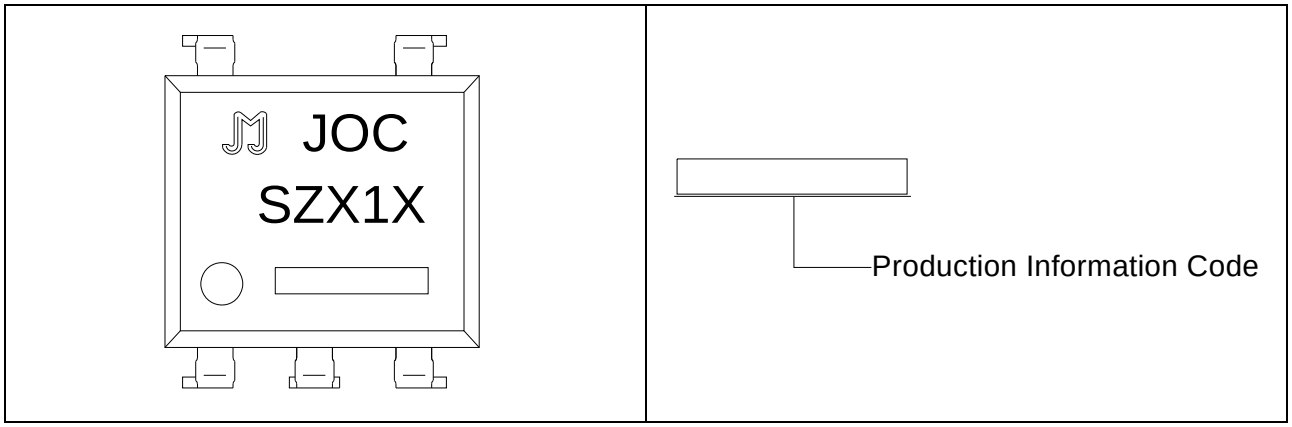
NOTE3: Test voltage must be applied within dV/dt ratings. **NOTE4**: Refer to Fig.14 & Fig.15

ORDERING INFORMATION



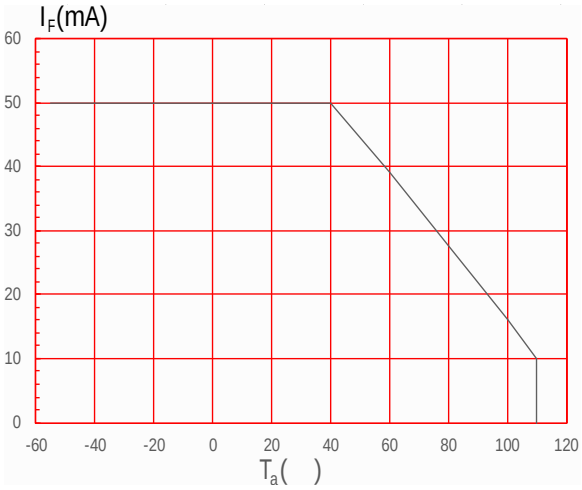
Packing Quantity			
Option	**Quantity**	**Quantity – Inner box**	**Quantity –Outer box**
DIP	60 Units/Tube	40 Tubes/Inner box	5 Inner box/Outer box =12k Units
SMD	1200 Units/Reel	2 Reels/Inner box	5 Inner box/Outer box =12k Units

MARKING

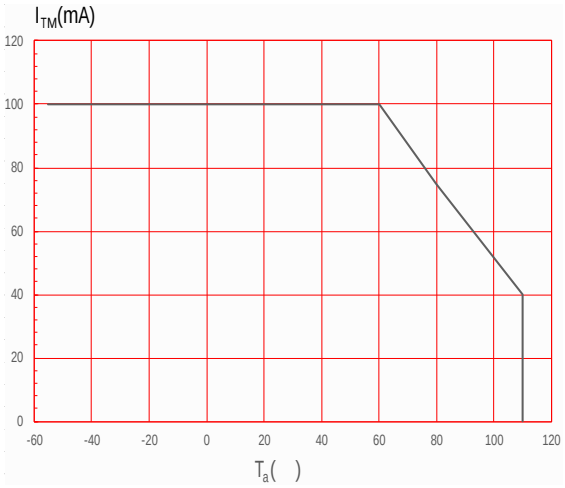


Characteristics Curves

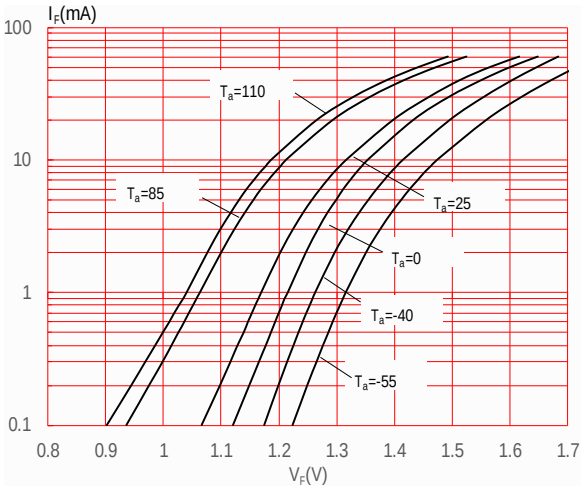
Max. Allowable LED Forward Current vs. Ambient Temperature



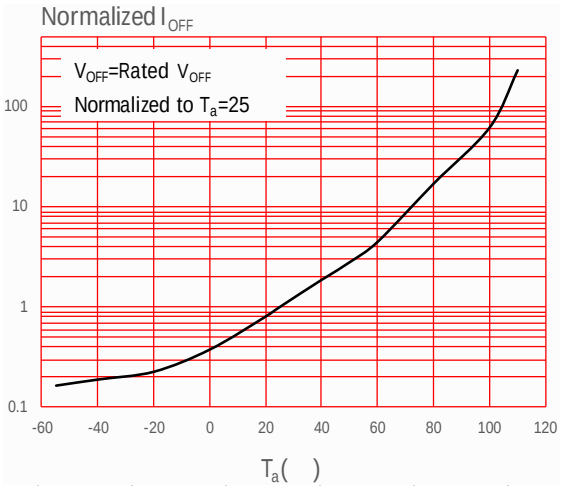
On-state Terminal Current vs. Ambient Temperature



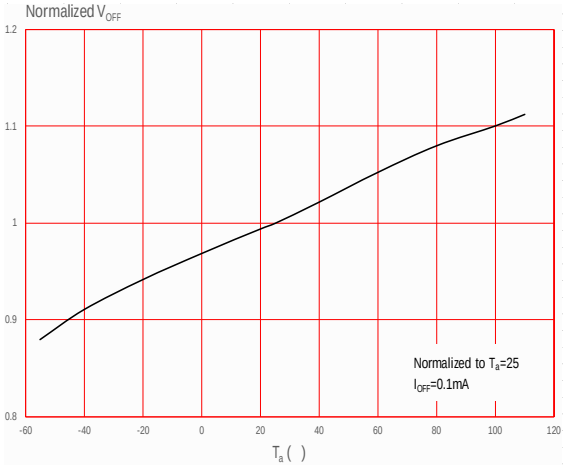
Forward Current vs. Forward Voltage



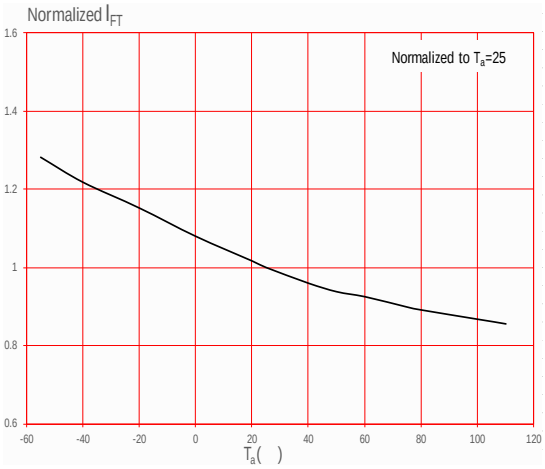
Normalized Off-state Terminal Current vs. Ambient Temperature



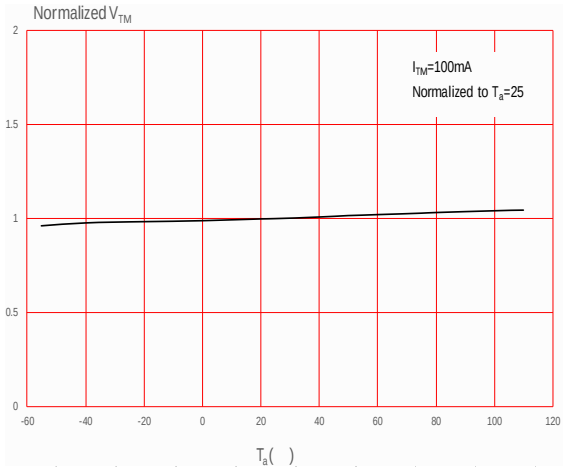
Normalized Off-state Terminal Voltage vs. Ambient Temperature



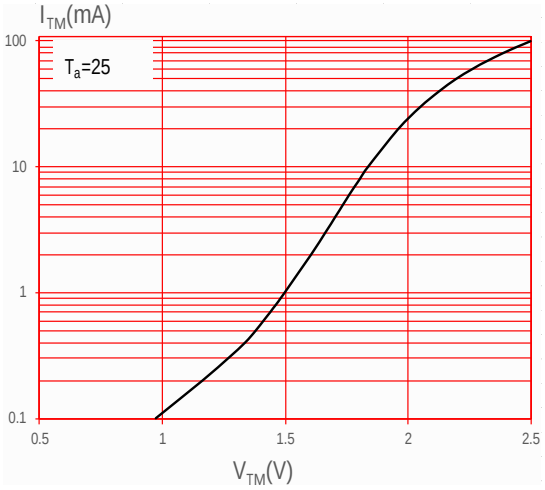
Normalized Trigger Current vs. Ambient Temperature



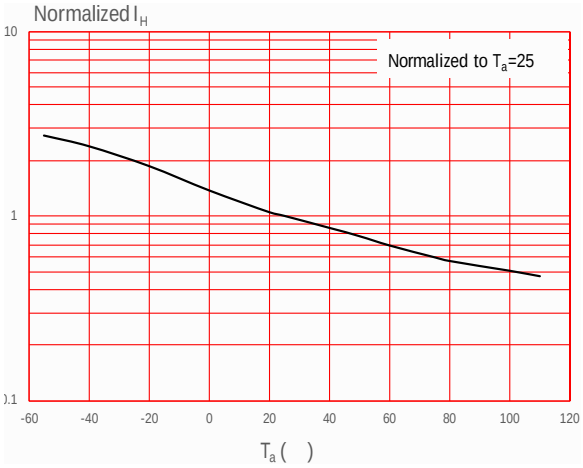
Normalized On-state Terminal Voltage vs. Ambient Temperature



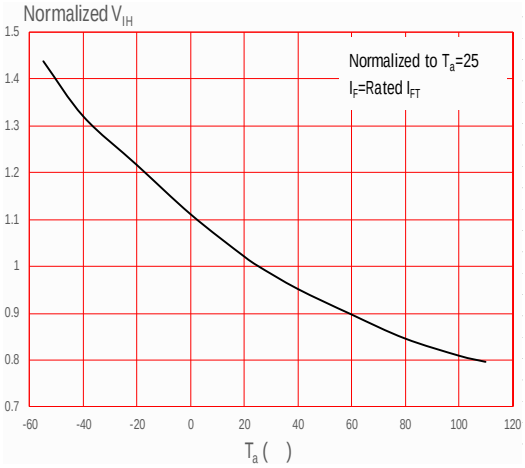
On-state Terminal Voltage vs. On-state Terminal Current



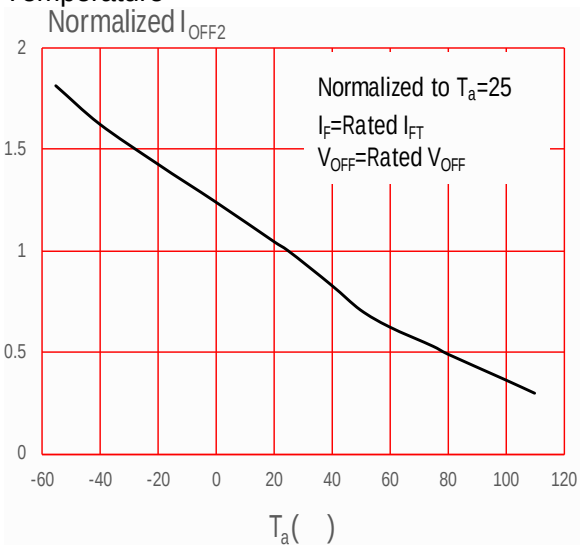
Normalized Holding Current vs. Ambient Temperature



Normalized Leakage in Inhibit State vs. Ambient Temperature

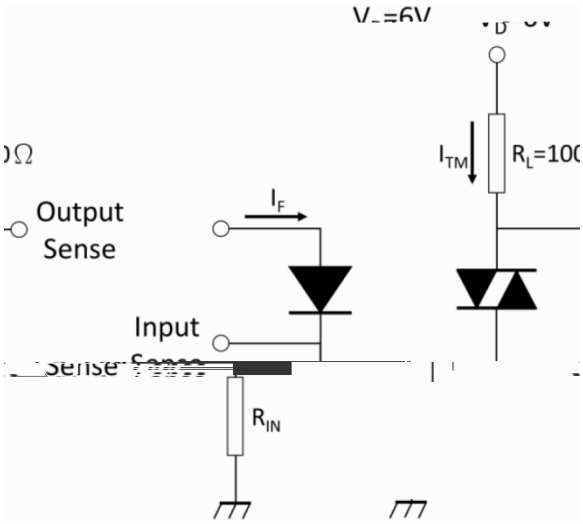


Normalized Inhibit Voltage vs. Ambient Temperature

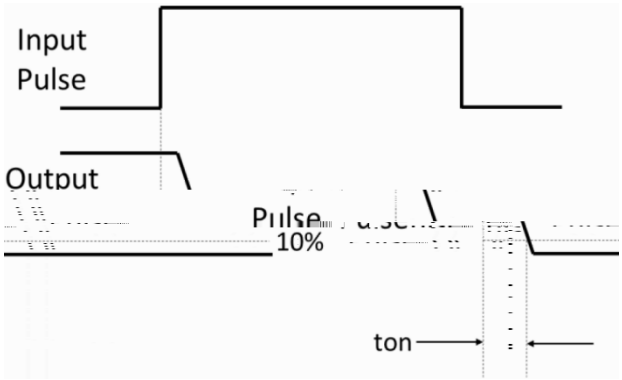


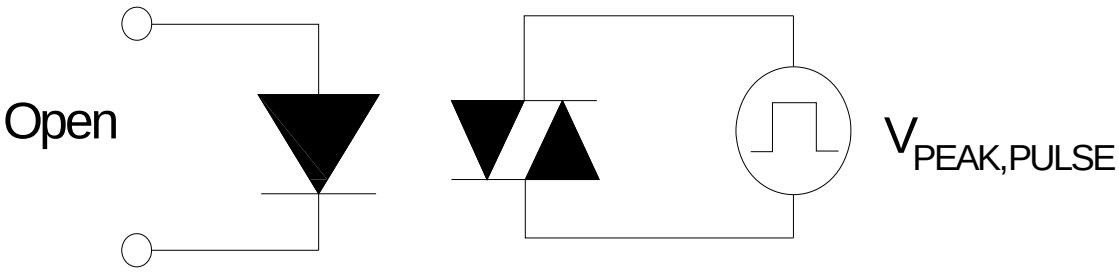
TEST CIRCUITS

Test Circuits of Turn On Time



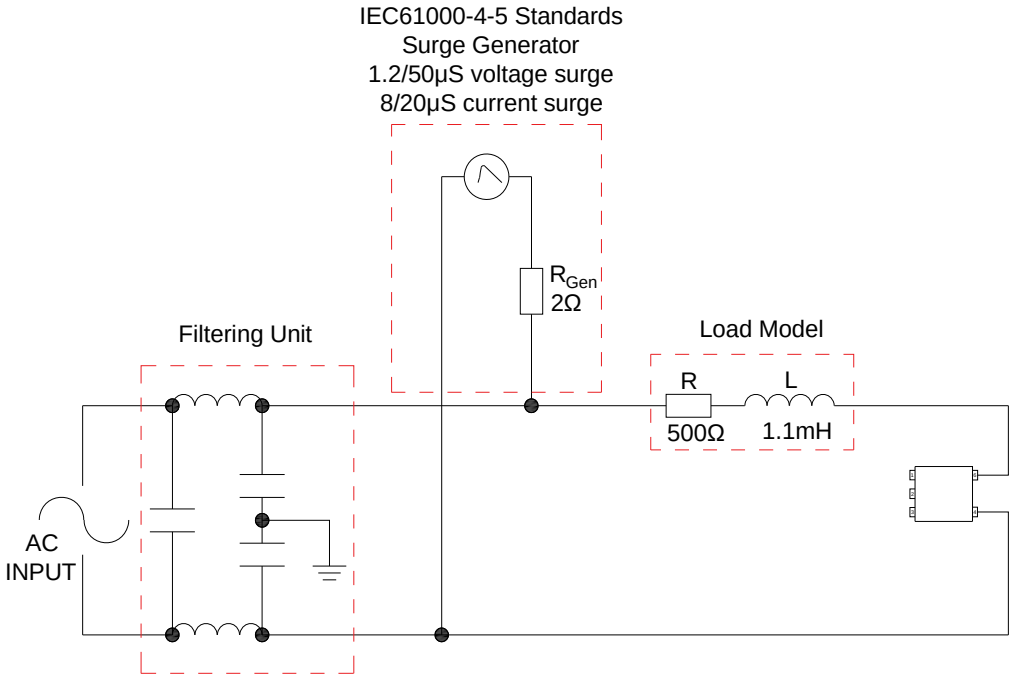
Waveforms of Turn On Time



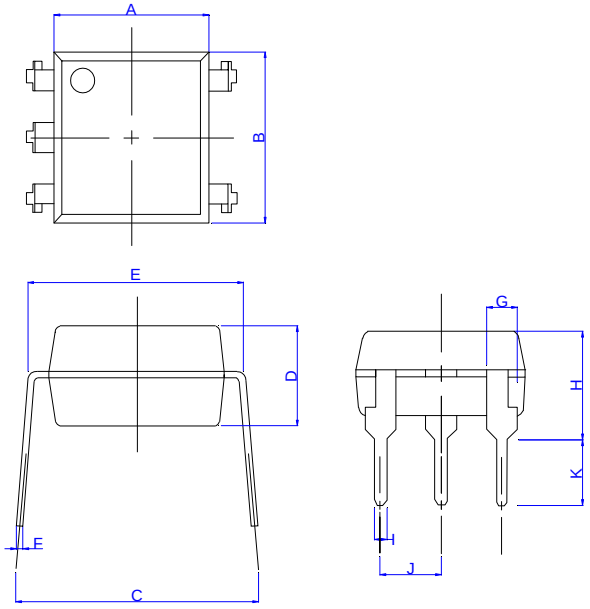


$$dV/dt=\frac{0.667 \times V_{PEAK}}{\tau}$$

Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



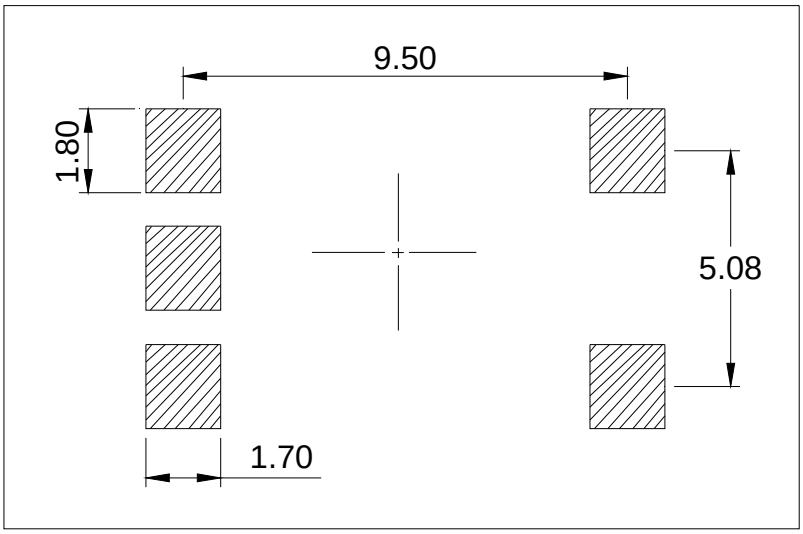
Package Dimension (Unit: mm)



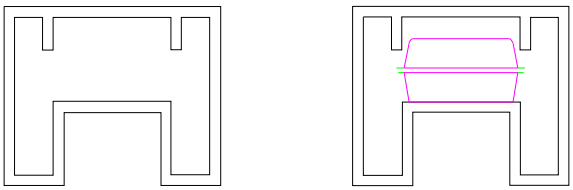
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.20		6.60	0.244		0.260
B	6.92		7.32	0.272		0.288
C	7.15		8.95	0.281		0.352
D	3.20		3.60	0.126		0.142
E	7.32		7.92	0.288		0.312
F	0.15		0.35	0.006		0.014
G	1.15		1.35	0.045		0.053
H	3.90		4.50	0.154		0.177
I	0.40		0.60	0.016		0.024
J	2.29		2.79	0.090		0.110
K	2.24		3.24	0.088		0.128

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.20		6.60	0.244		0.260
B	6.92		7.32	0.272		0.288
C	9.50		10.50	0.375		0.413
D	3.20		3.60	0.126		0.142
E	7.32		7.92	0.288		0.312
.	3.	0	3.16	)	-	. P.2
G						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
I	0.90		1.50	0.035		0.059
K						

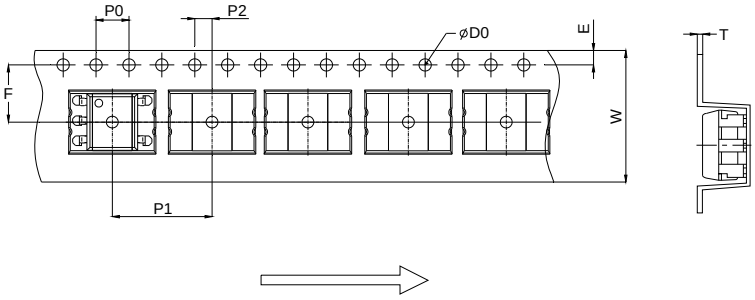
RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)



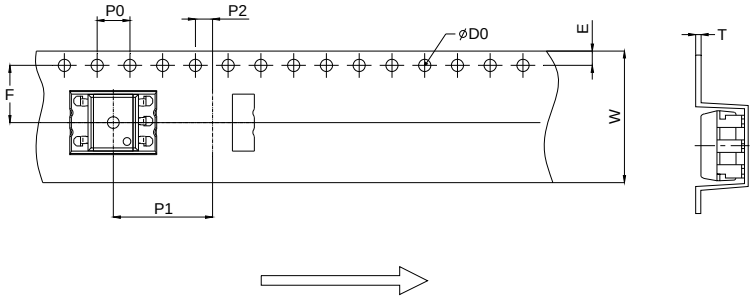
TUBE SPECIFICATIONS (Dimensions in mm unless otherwise stated)



CARRIER TAPE SPECIFICATIONS (Dimensions in mm unless otherwise stated)



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	11.90	12.00	12.10	0.469	0.472	0.476
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	15.70	16.00	16.30	0.618	0.630	0.642



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	11.90	12.00	12.10	0.469	0.472	0.476
P2	1.90	2.00	2.10	0.075	0.079	0.083
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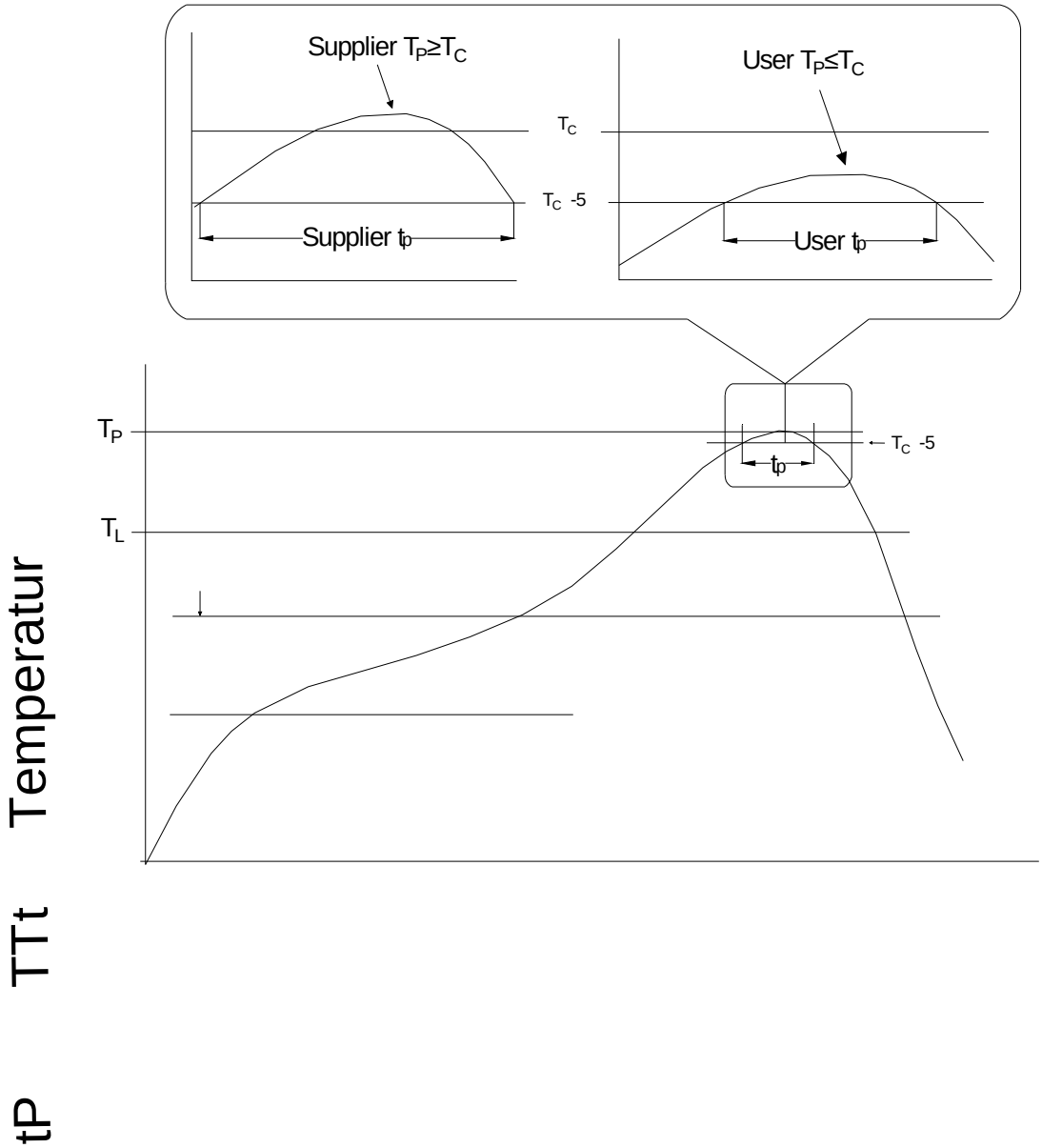
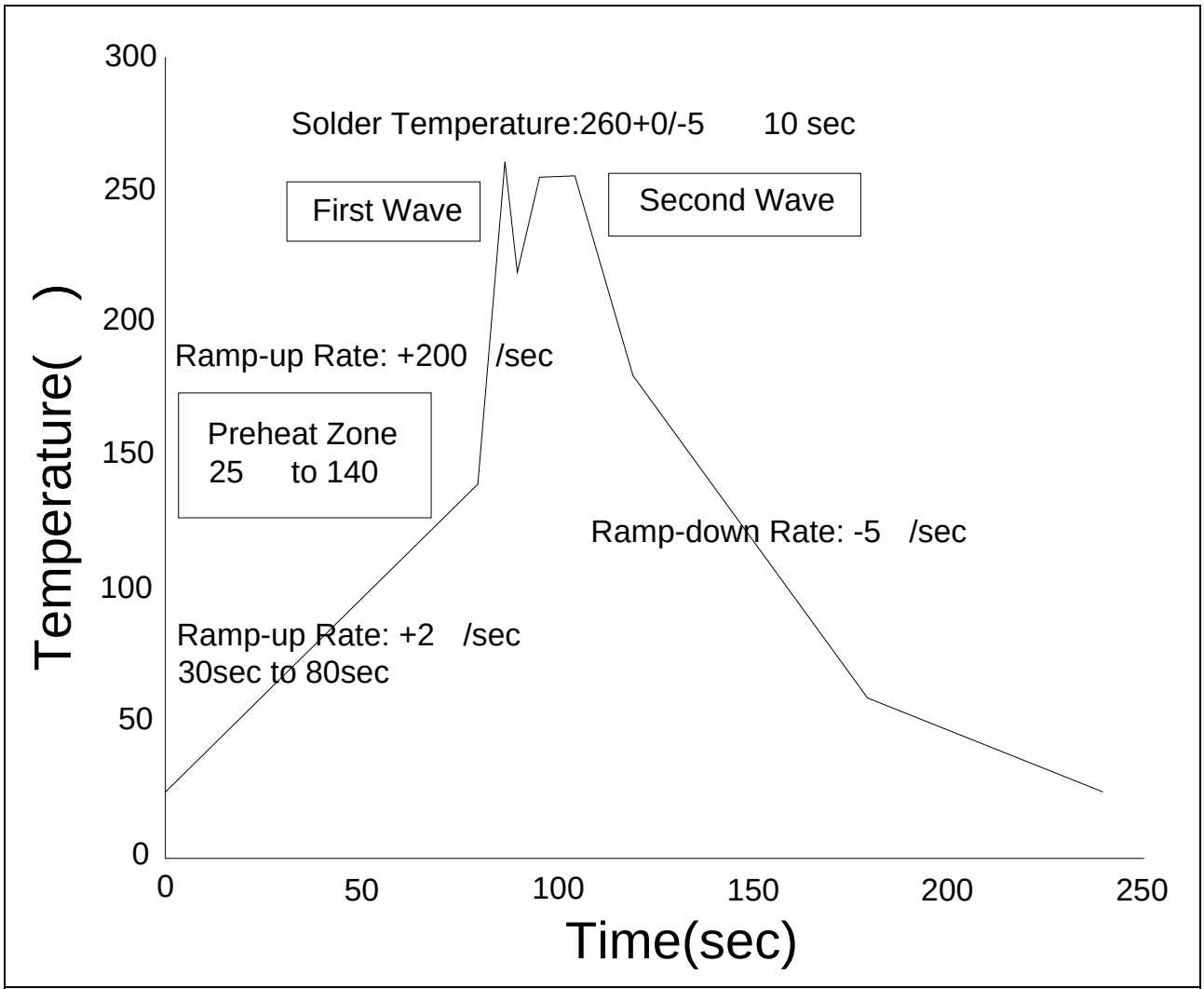
F	7.40	7.50	7.60	0.291	0.295	0.299
T	0.35	0.40	0.45	0.014	0.016	0.018
W	15.70	16.00	16.30	0.618	0.630	0.642

REFLOW INFORMATION



WAVE SOLDERING



HAND SOLDERING BY SOLDERING IRON	
Soldering Temperature	360 ± 5
Soldering Time	3s 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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