



JOC824 Series

AC Input, Dual Channel Photo Transistor Coupler

Description

The JOC824 series combine two AlGaAs infrared emitting diodes as the AC input which is optically coupled to a silicon planar phototransistor detector in a plastic DIP8 package with different lead forming options. With the robust coplanar double mold structure, JOC824 series provide the most stable isolation feature.

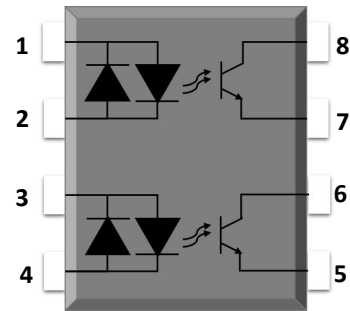
Features

- High isolation 5000 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Operating temperature range - 55 °C to 110 °C
- REACH compliance
- Halogen free
- MSL class 1
- Regulatory Approvals
 - UL
 - VDE

Applications

- AC line monitor
- Programmable controller
- Telephone line interface
- System appliance
- Measurement instrument

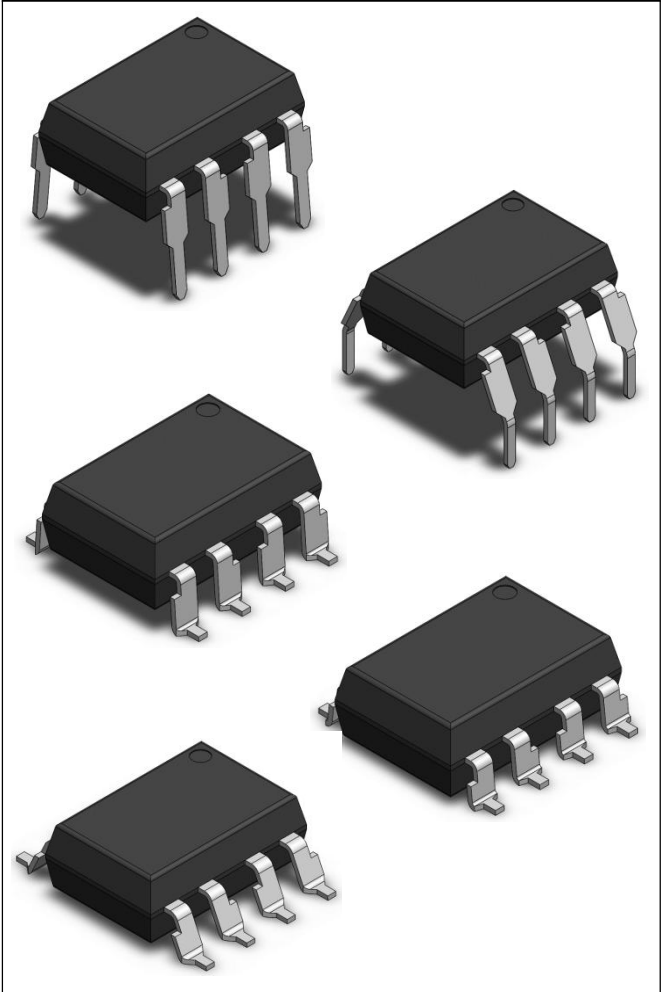
SCHEMATIC



PIN DEFINITION

1. Anode/Cathod	5. Emitter
2. Cathode/Anode	6. Collector
3. Anode/Cathod	7. Emitter
4. Cathode/Anode	8. Collector

PACKAGE OUTLINE



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT	NOTE
INPUT				
Forward Current	I_F	± 60	mA	
Peak Forward Current	I_{FP}	± 1	A	1
Reverse Voltage	V_R	6	V	
Input Power Dissipation	P_I	100	mW	
OUTPUT				
Collector - Emitter Voltage	V_{CEO}	80	V	
Emitter - Collector Voltage	V_{ECO}	7	V	
Collector Current	I_C	50	mA	
Output Power Dissipation	P_O	150	mW	
COMMON				
Total Power Dissipation	P_{tot}	200	mW	
Isolation Voltage	V_{iso}	5000	V _{rms}	2
Operating Temperature	T_{opr}	-55~110	°C	
Storage Temperature	T_{stg}	-55~125	°C	
Soldering Temperature	T_{sol}	260	°C	

Note 1. 100 μ s pulse, 100Hz frequency

Note 2. AC For 1 Minute, R.H. = 40 ~ 60%

ELECTRICAL OPTICAL CHARACTERISTICS at Ta=25°C							
PARAMETER	SYMBOL	MIN	TYP.	MAX.	UNIT	TEST CONDITION	NOTE
INPUT							
Forward Voltage	V_F	-	1.24	1.4	V	$I_F = \pm 10\text{mA}$	
Reverse Current	I_R	-	-	10	μA	$V_R = 6\text{V}$	
Input Capacitance	C_{in}	-	10	-	pF	$V = 0, f = 1\text{kHz}$	
OUTPUT							
Collector Dark Current	I_{CEO}	-	-	100	nA	$V_{CE} = 20\text{V}, I_F = 0$	
Collector-Emitter Breakdown Voltage	BV_{CEO}	80	-	-	V	$I_C = 0.1\text{mA}, I_F = 0$	
Emitter-Collector Breakdown Voltage	BV_{ECO}	7	-	-	V	$I_E = 0.1\text{mA}, I_F = 0$	
TRANSFER CHARACTERISTICS							
Current Transfer Ratio	JOC824	CTR	20	-	400	%	$I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$
	JOC824A		50	-	150		
	JOC824B		80	-	400		
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	-	0.06	0.2	V	$I_F = \pm 20\text{mA}, I_C = 1\text{mA}$	
Isolation Resistance	R_{ISO}	10^{12}	10^{14}	-	Ω	DC500V, 40 ~ 60% R.H.	
Floating Capacitance	C_{IO}	-	0.4	1	pF	$V = 0, f = 1\text{MHz}$	
Response Time (Rise)	t_r	-	3	18	μs	$V_{CE} = 2\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega$	3
Response Time (Fall)	t_f	-	4	18	μs		3
Cut-off Frequency	f_c	-	80	-	kHz	$V_{CE} = 2\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega, -3\text{dB}$	4

Note 3. Fig.12&13

Note 4. Fig.14

CHARACTERISTIC CURVES

Fig.1 Forward Current vs. Ambient Temperature

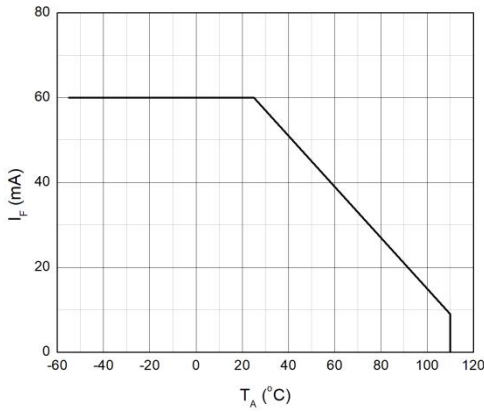


Fig.2 Collector Power Dissipation vs. Ambient Temperature

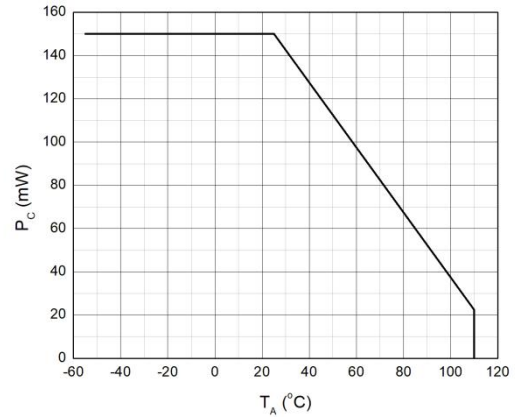


Fig.3 Forward Current vs. Forward Voltage

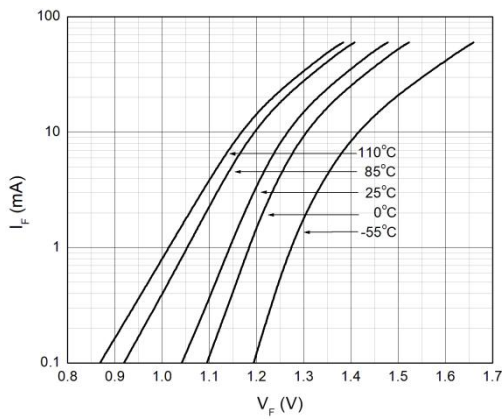


Fig.4 Collector Dark Current vs. Ambient Temperature

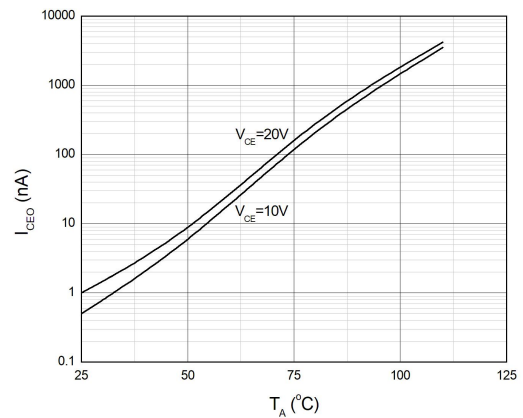


Fig.5 Collector Current vs. Collector-emitter Voltage

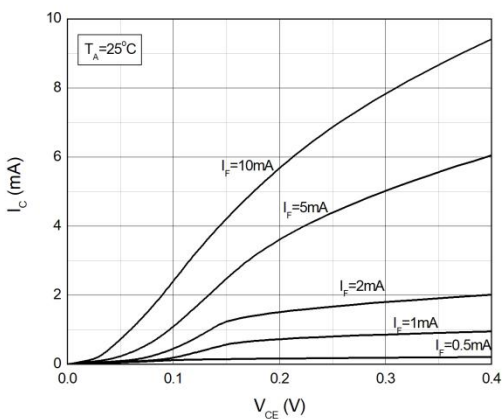
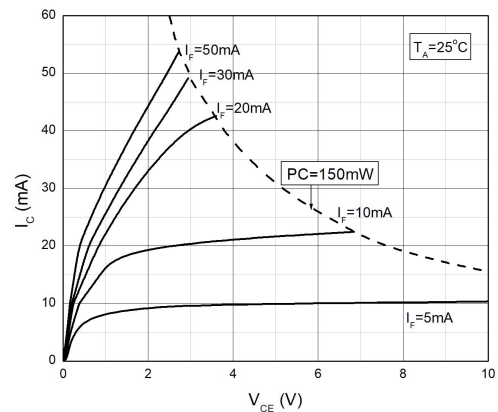


Fig.6 Collector Current vs. Collector-emitter Voltage



CHARACTERISTIC CURVES

Fig.7 Normalized Current Transfer Ratio vs. Forward Current

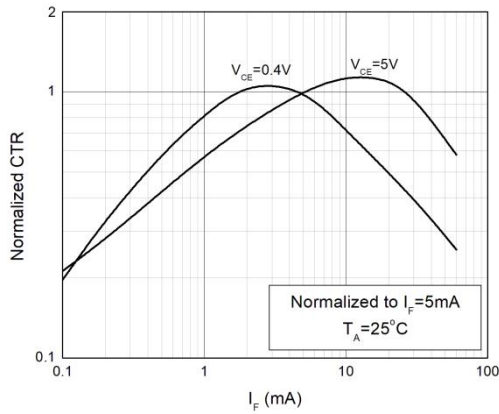


Fig.8 Normalized Current Transfer Ratio vs. Ambient Temperature

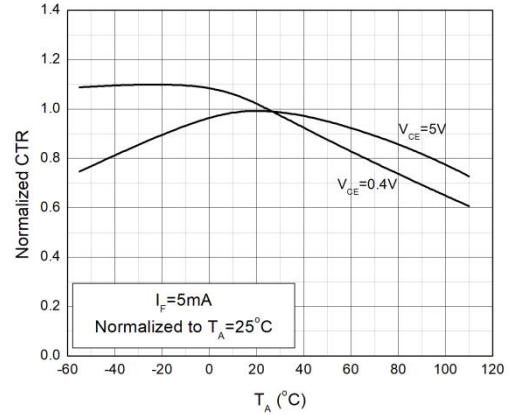


Fig.9 Collector-emitter Saturation Voltage vs. Ambient Temperature

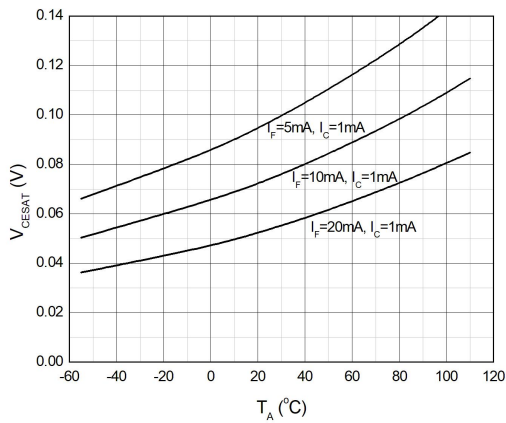


Fig.10 Switching Time vs. Load Resistance

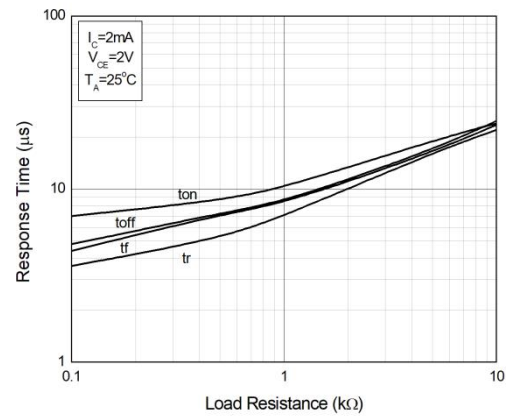
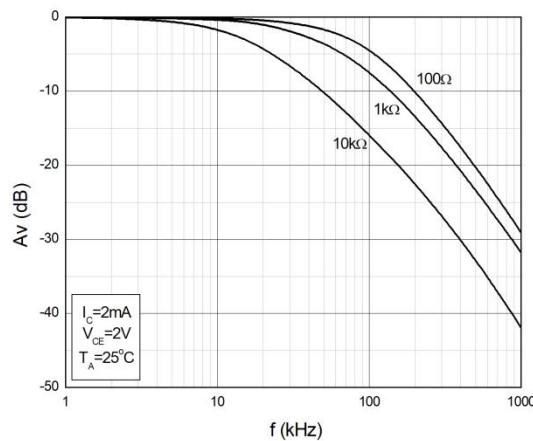


Fig.11 Frequency Response



TEST CIRCUITS

Fig.12 Test Circuits of Response Time

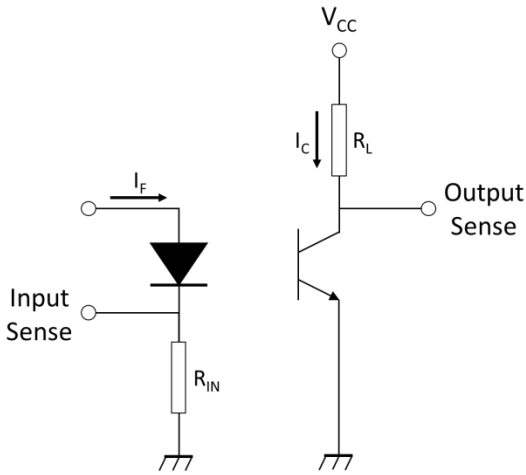


Fig.13 Curves of Response Time

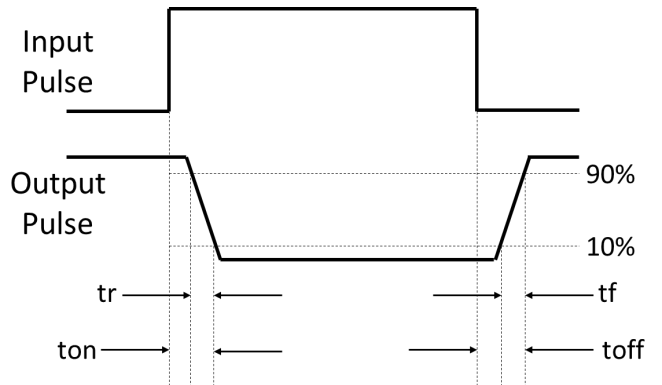
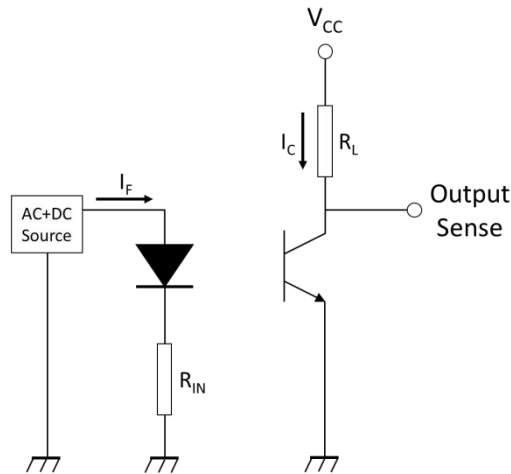
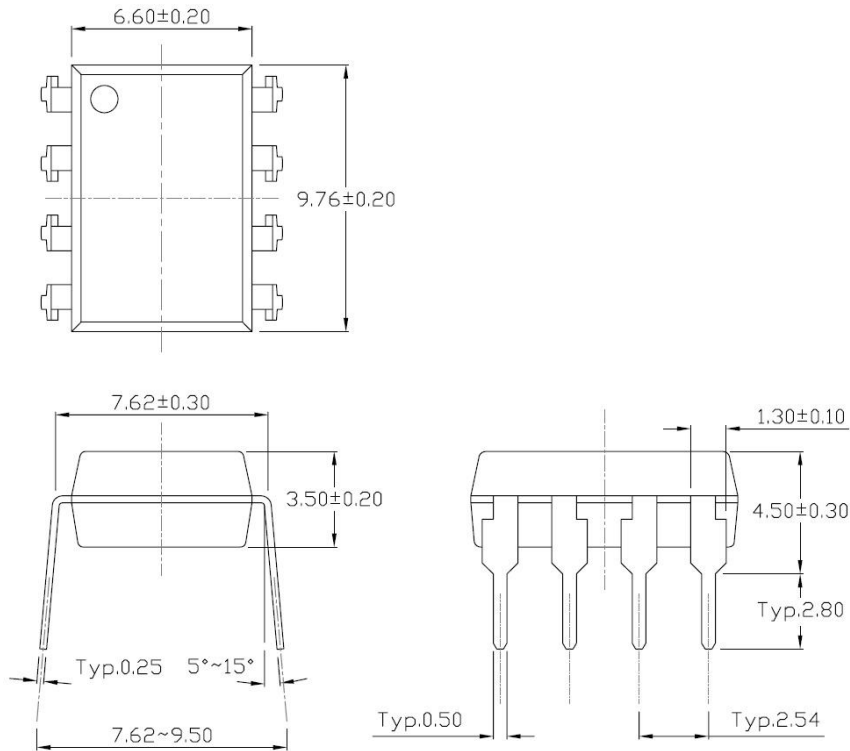


Fig.14 Test Circuits of Frequency Response

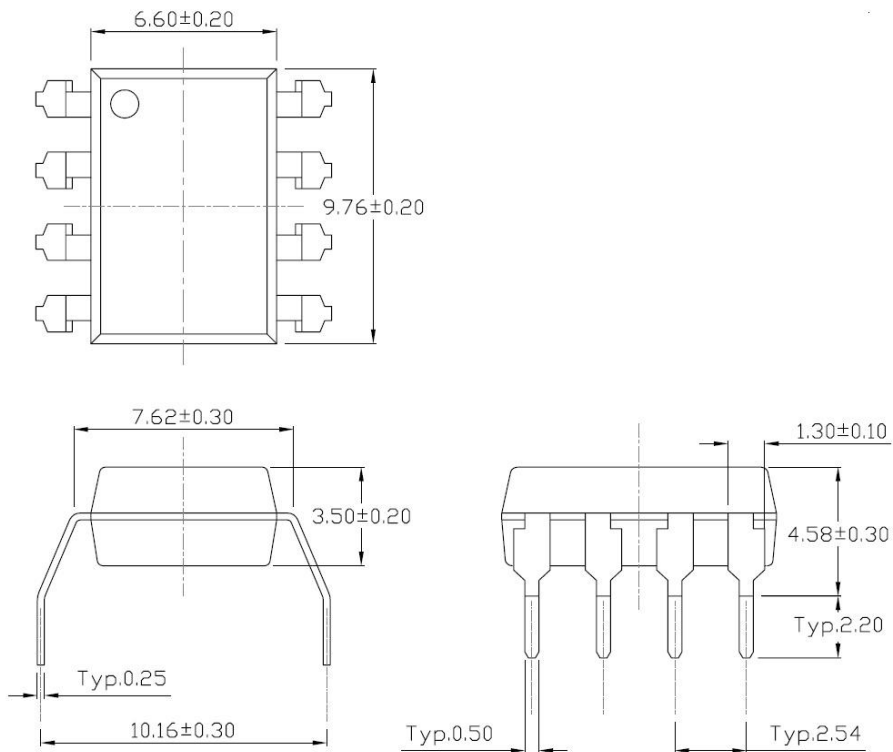


PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Standard DIP – Through Hole (DIP Type)

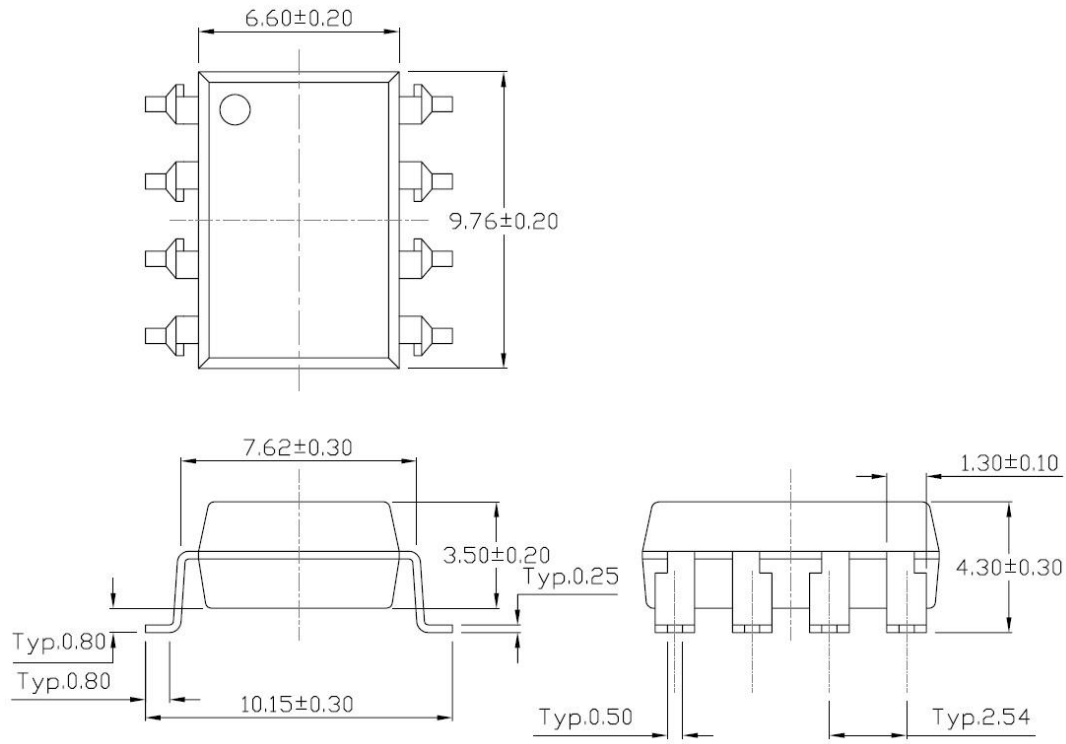


Gullwing (400mil) Lead Forming – Through Hole (M Type)

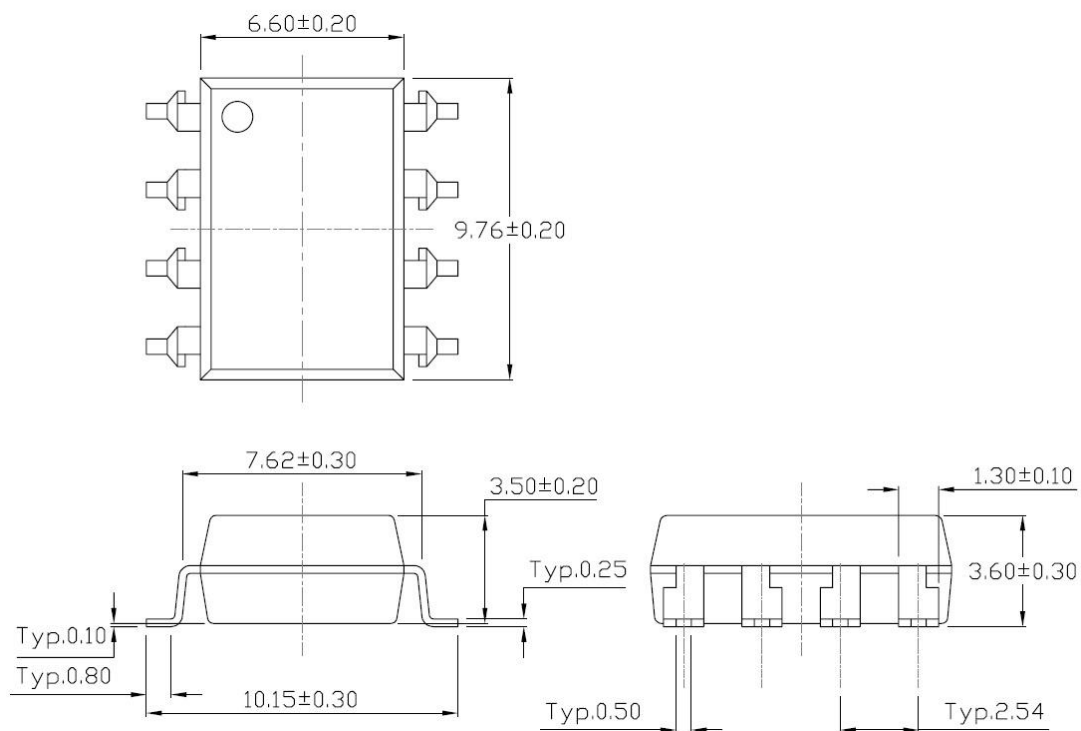


PACKAGE DIMENSIONS (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming (S Type)

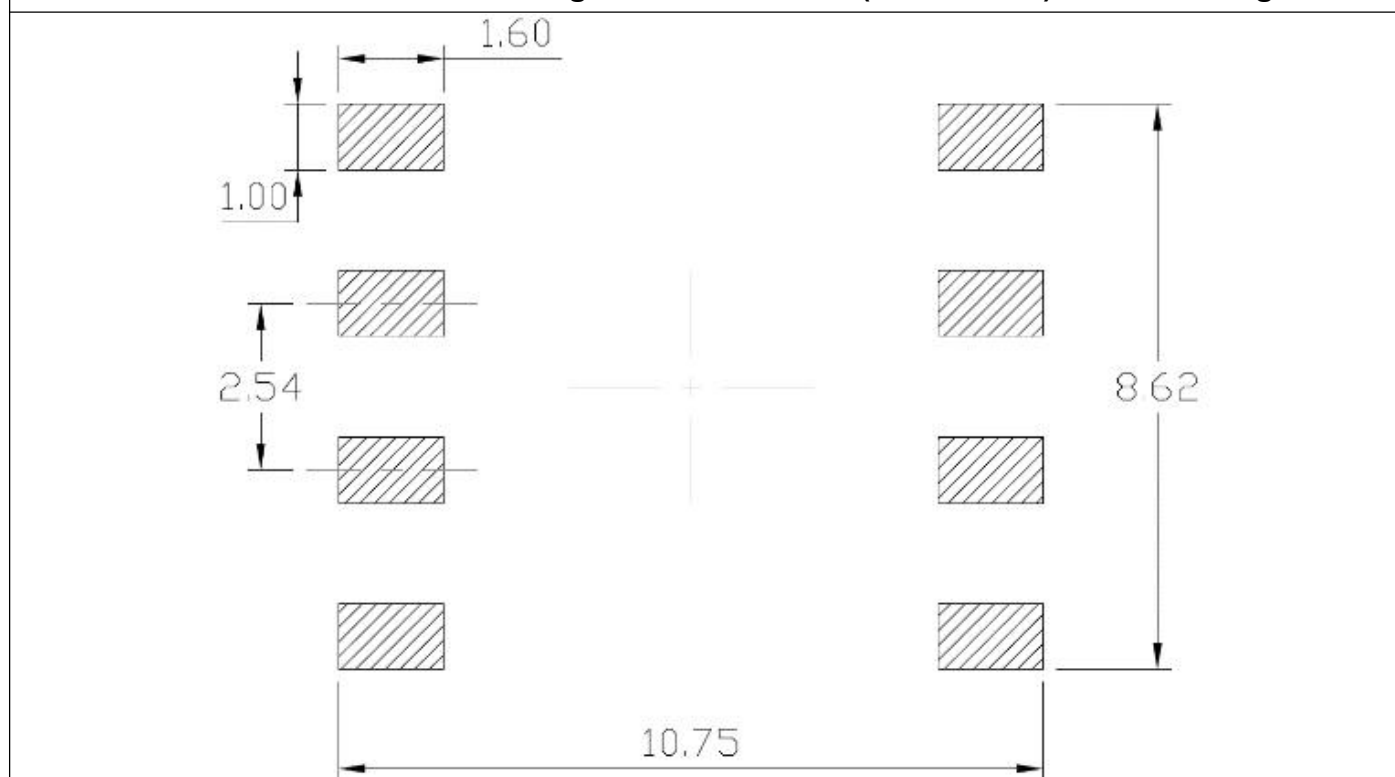


Surface Mount (Low Profile) Lead Forming (SL Type)



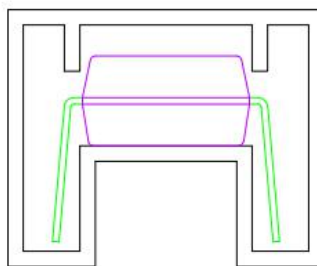
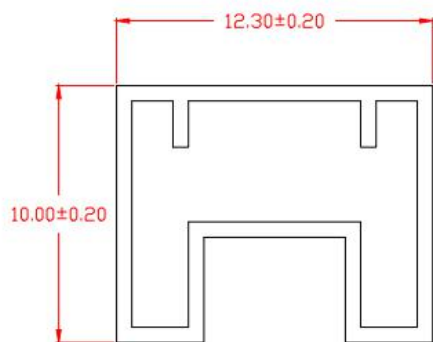
RECOMMENDED SOLDER MASK (Dimensions in mm unless otherwise stated)

Surface Mount Lead Forming & Surface Mount (Low Profile) Lead Forming



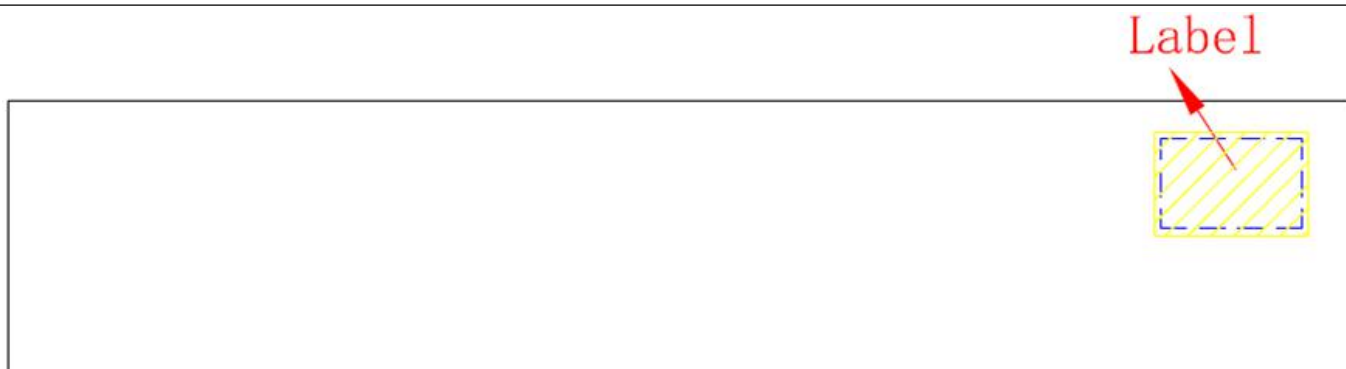
TUBE SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Standard DIP



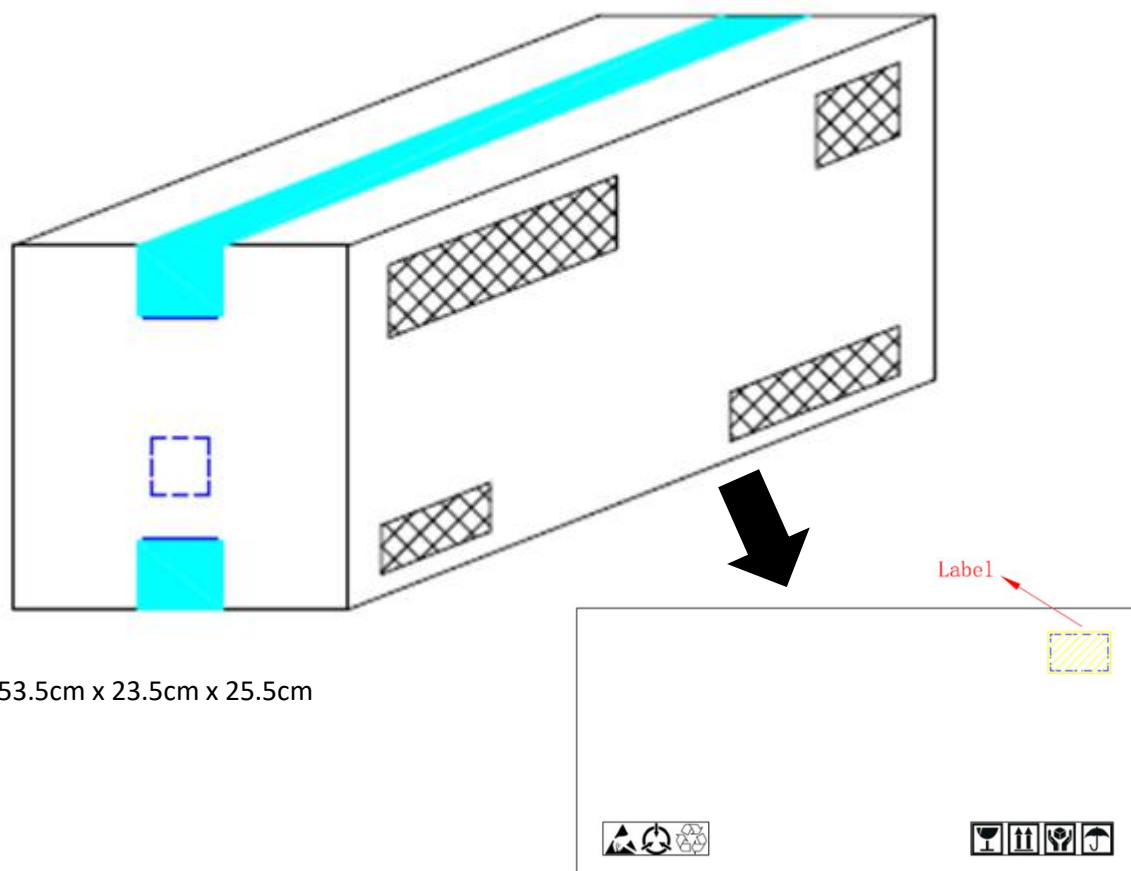
BOX SPECIFICATIONS (Tube Type)

Inner Box



- L x W x H = 52.5cm x 10.7cm x 4.7cm

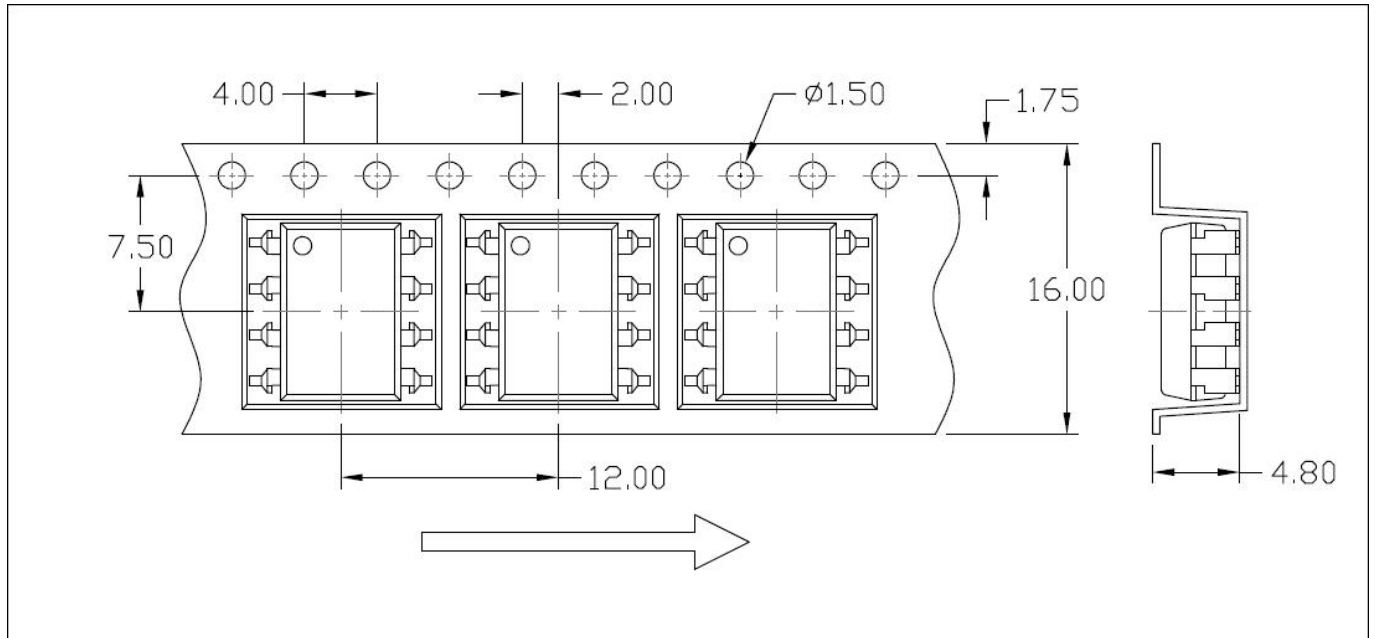
Outer Box



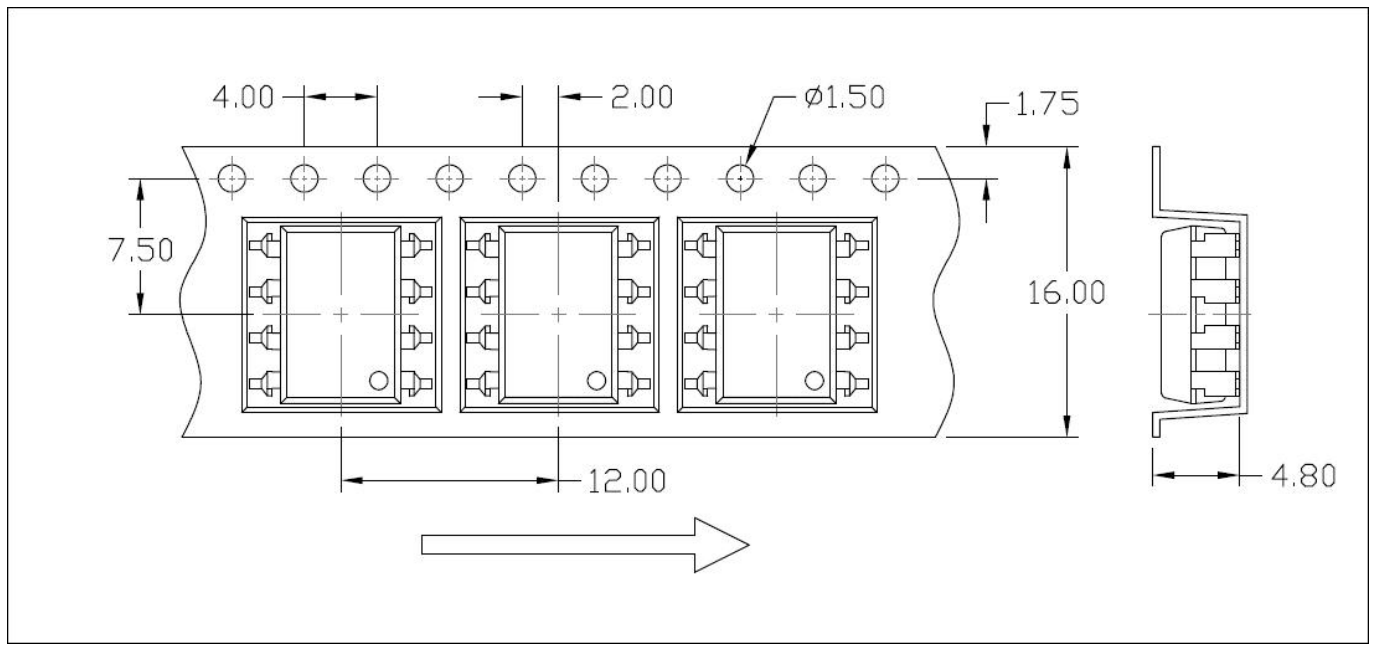
- L x W x H = 53.5cm x 23.5cm x 25.5cm

Carrier Tape Specifications (Dimensions in mm unless otherwise stated)

Option S(T1) & SL(T1)

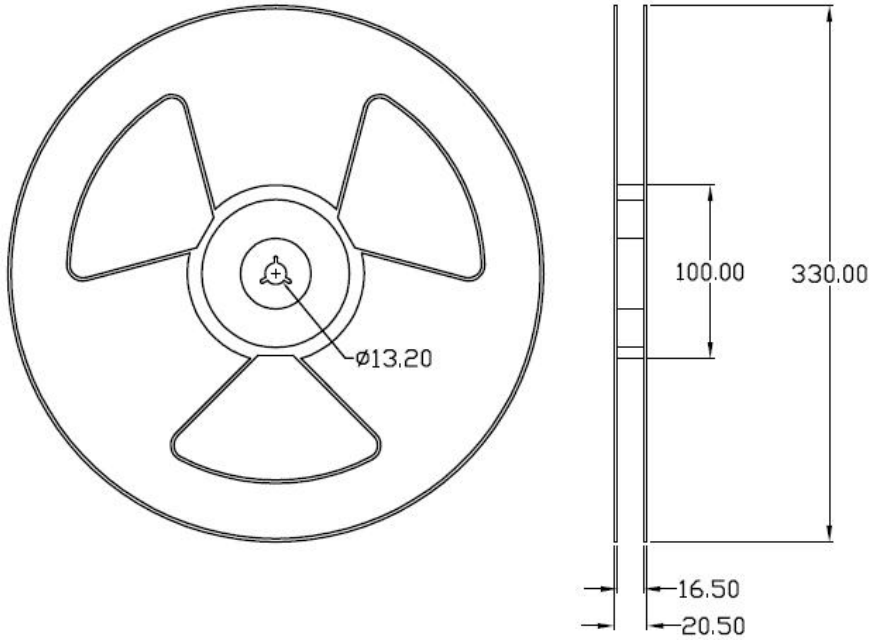


Option S(T2) & SL(T2)



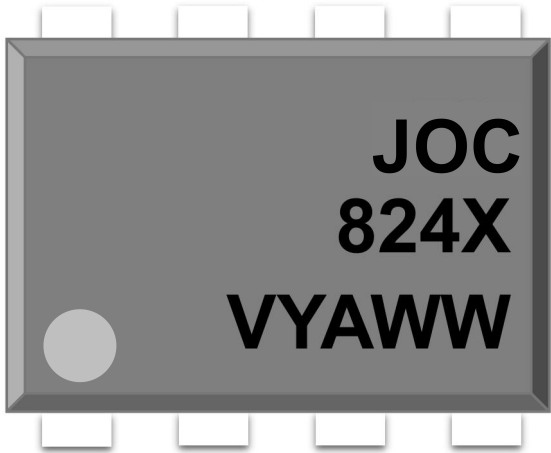
REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option S & Option SL



ORDERING AND MARKING INFORMATION

MARKING INFORMATION



JOC : Company Abbr.
824 : Part Number
X : Rank
V : VDE Option
Y : Fiscal Year
A : Manufacturing Code
WW : Work Week

ORDERING INFORMATION

JOC824X(Y)(Z)-GV

JOC – Company Abbr.
 824 – Part Number
 X – Rank(A/B or None)
 Y – Lead Form Option (M/S/SL/None)
 Z – Tape and Reel Option (T1/T2)
 G – Material Option
 (G: Green, None: Non-Green)
 V – VDE Option (V or None)

LABEL INFORMATION

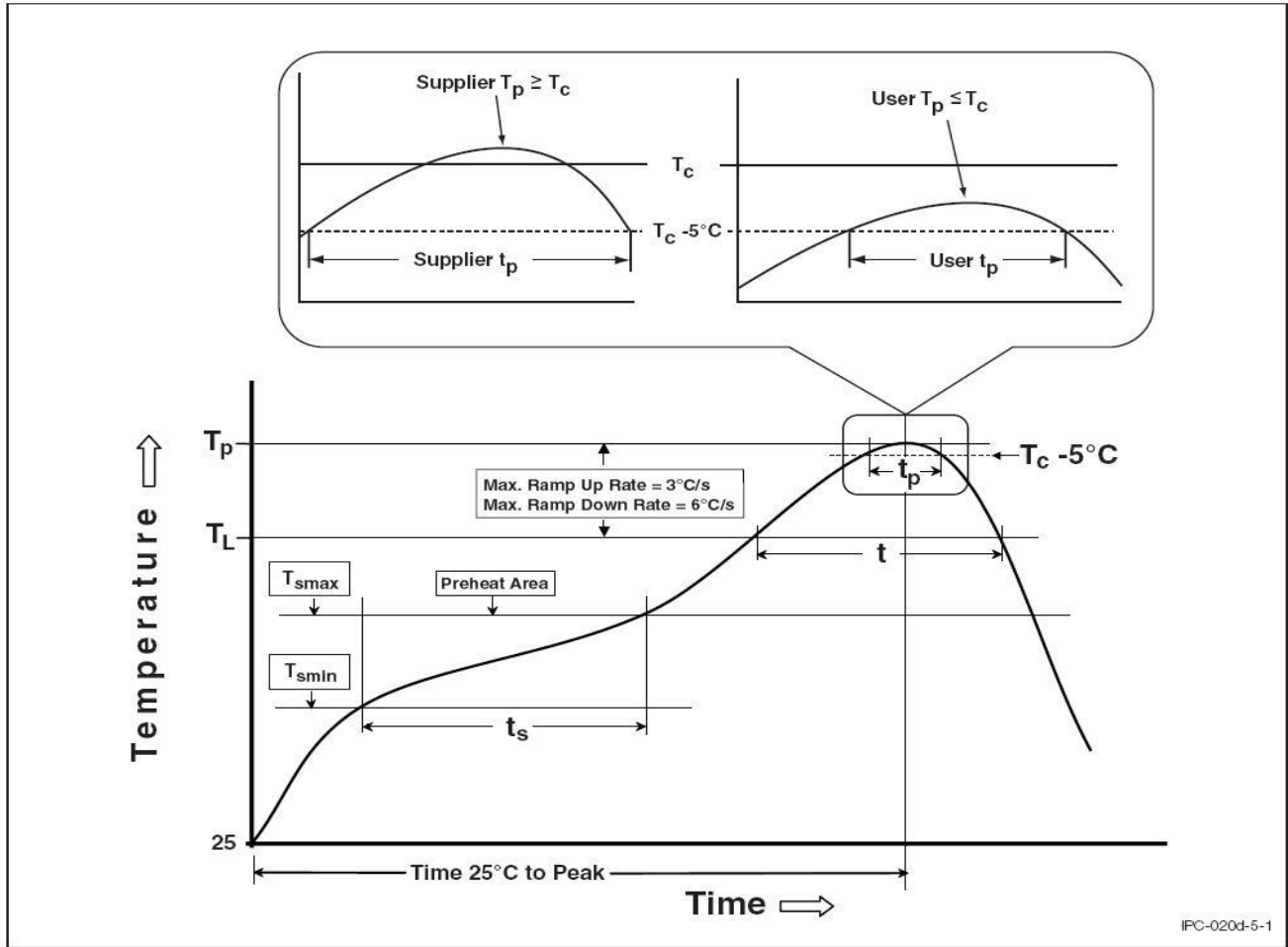


PACKING QUANTITY

Option	Quantity	Quantity – Inner box	Quantity – Outer box
None	50 Units/Tube	32 Tubes/Inner box	10 Inner box/Outer box = 16k Units
M	50 Units/Tube	32 Tubes/Inner box	10 Inner box/Outer box = 16k Units
S(T1)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
S(T2)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SL(T1)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units
SL(T2)	1000 Units/Reel	3 Reels/Inner box	5 Inner box/Outer box = 15k Units

REFLOW INFORMATION

REFLOW PROFILE



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (T _{sm} in)	100	150°C
Temperature Max. (T _{sm} ax)	150	200°C
Time (t _s) from (T _{sm} in to T _{sm} ax)	60-120 seconds	60-120 seconds
Ramp-up Rate (t _L to t _P)	3°C/second max.	3°C/second max.
Liquidous Temperature (T _L)	183°C	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (t _P) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (T _P to T _L)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

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