

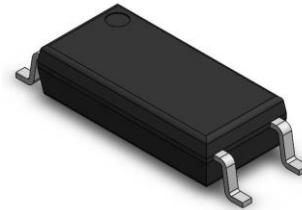
Specification for APC-101X Series

APC-101X

LSOP4, DC Input, Photo Transistor Coupler

The APC-101X series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic LSOP4 package.

With the robust coplanar double mold structure, APC-101X series provide the most stable isolation feature.



Features:

- High isolation V_{rms} : 5000V
- CTR flexibility available
- DC input with transistor output
- Operating temperature: - 55 °C to 110 °C
- RoHS & REACH Compliance
- MSL Class 1
- Halogen free (Optional)
- UL - UL1577
- VDE - EN60747-5-5(VDE0884-5)
- CQC - GB4943.1, GB8898
- cUL- CSA Component Acceptance Service Notice No. 5A

Applications:

- Switch mode power supplies
- Programmable controllers
- Household appliances
- Office equipment

Schematic Diagram	PIN Definition
	1. Anode 2. Cathode 3. Emitter 4. Collector

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}	250	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. 100μs pulse, 100Hz frequency

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

Electrical Optical Characteristics at T _a =25°C								
Parameter		Symbol	min	Typ.	Max.	unit	Test Condition	Note
Input								
Forward Voltage		V _F	-	1.45	1.6	V	I _F =50mA	
Reverse Current		I _R	-	-	10	μA	V _R =6V	
Input Capacitance		C _{in}	-	30	250	pF	V=0, f=1kHz	
Output								
Collector Dark Current		I _{CEO}	-	-	100	nA	V _{EC} =20V, I _F =0	
Collector – Emitter Breakdown Voltage		BV _{CEO}	80	-	-	V	I _C =0.1mA, I _F =0	
Emitter – Collector Breakdown Voltage		BV _{ECO}	6	-	-	V	I _E =0.1mA, I _F =0	
Transfer Characteristics								
Current Transfer Ratio	APC-1010	CTR	300	-	600	%	I _F =5mA, V _{CE} =5V	3
	APC-1015		50	-	150			
	APC-1016		100	-	300			
	APC-1017		80	-	160			
	APC-1018		130	-	260			
	APC-1019		200	-	400			
	APC-1011		60	-	300		I _F =10mA, V _{CE} =5V	
	APC-1012		63	-	125			
	APC-1013		100	-	200			
	APC-1014		160	-	320			
Collector – Emitter Saturation Voltage		V _{CE(sat)}	-	0.1	0.3	V	I _F =10mA, I _C =1mA	
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=1MHz	
Cut-off Frequency		F _c	-	80	-	kHz	V _{CE} =2V, I _C =2mA R _L =100Ω, -3dB	4
Response Time (rise)		Tr	-	6	18	μs	V _{CE} =2V, I _C =2mA R _L =100Ω	5
Response Time (fall)		Tf	-	8	18	μs		5

Note 3. CTR Value varies for each rank

Note 4. Fig.12&13

Note 5. Fig.14

Naming System:

APC-101X

X: Indicated to the CTR value listed on Page 3 (0/1/2/3/4/5/6/7/8/9)

Characteristic Curves

Fig 1. Forward Current vs. Ambient Temperature

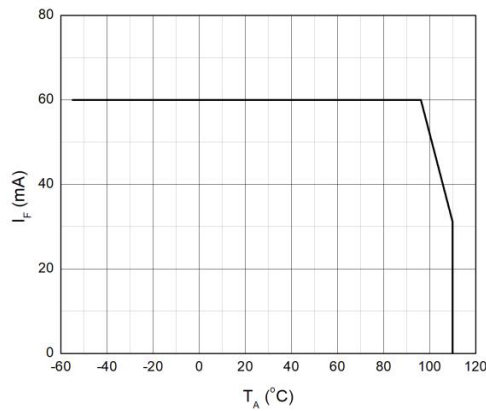


Fig 2. Collector Power Dissipation vs. Ambient Temperature

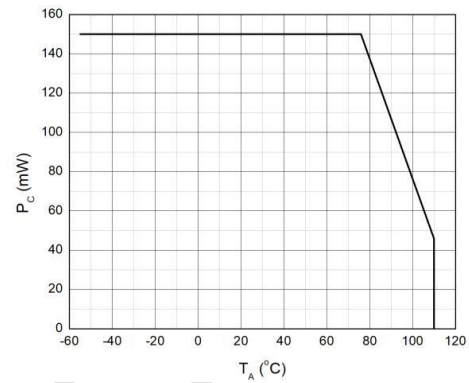


Fig 3. Forward Current vs. Forward Voltage

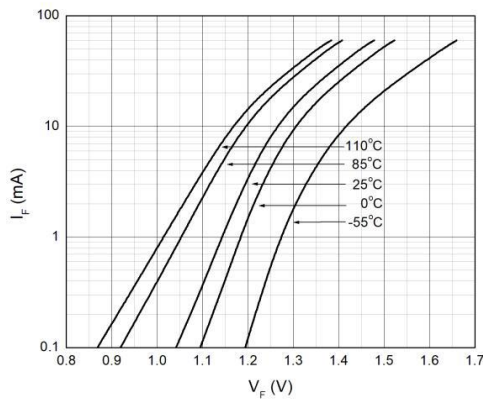


Fig 4. Collector Dark Current vs. Ambient Temperature

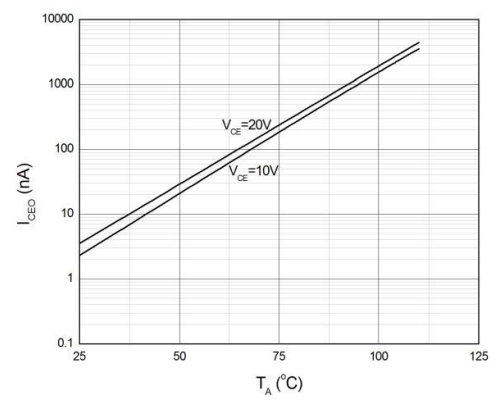


Fig 5. Collector Current vs. Collector-emitter Voltage

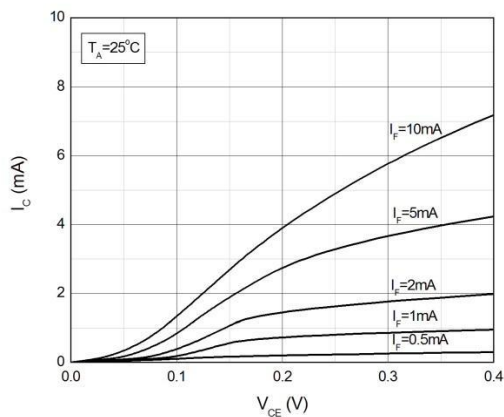


Fig 6. Collector Current vs. Collector-emitter Voltage

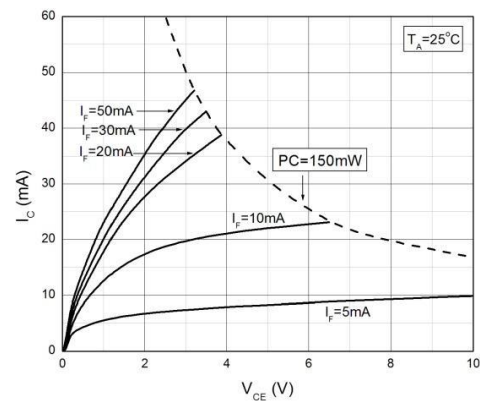


Fig 7. Normalized Current Transfer Ratio vs. Forward Current

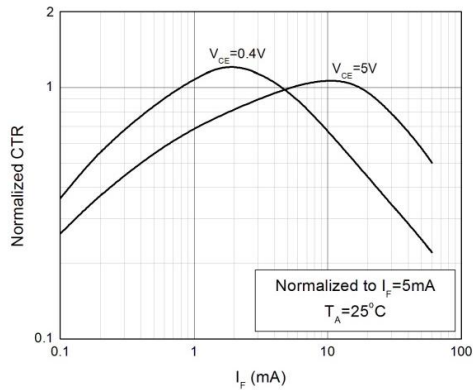


Fig 8. Normalized Current Transfer Ratio vs. Ambient Temperature

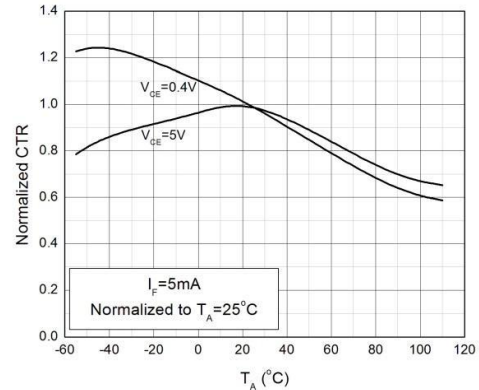


Fig 9. Collector-emitter Saturation Voltage vs. Ambient Temperature

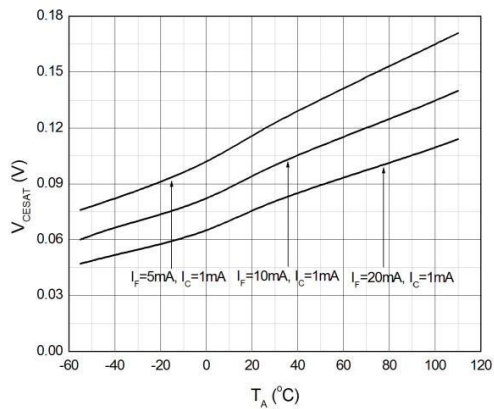


Fig 10. Switching Time vs. Load Resistance

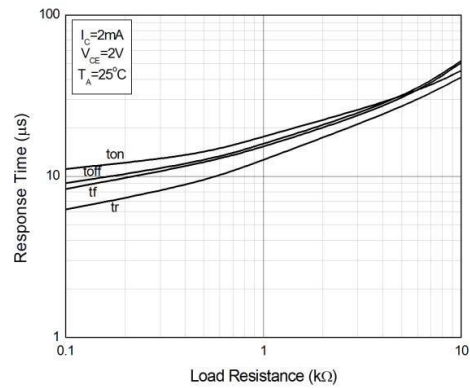


Fig 11. Frequency Response

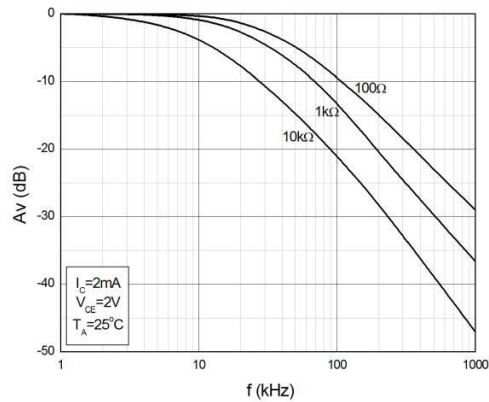
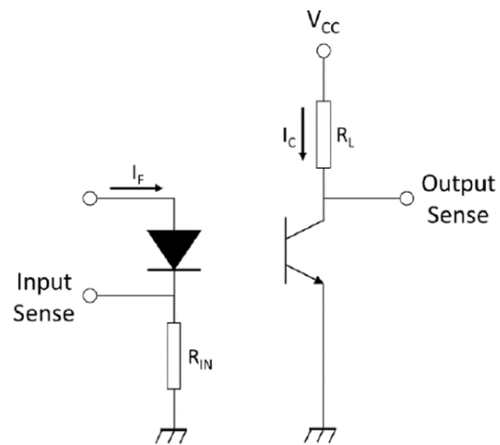


Fig 12. Test Circuits of Response Time





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Fig 13. Curves of Response Time

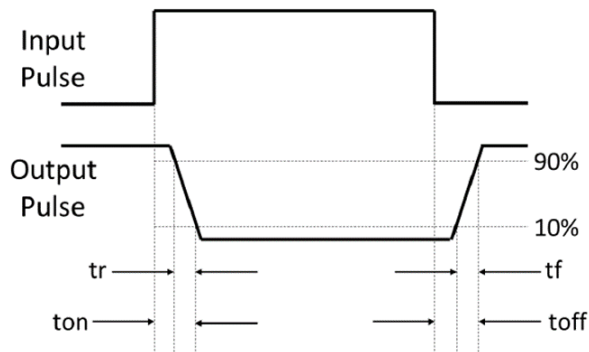
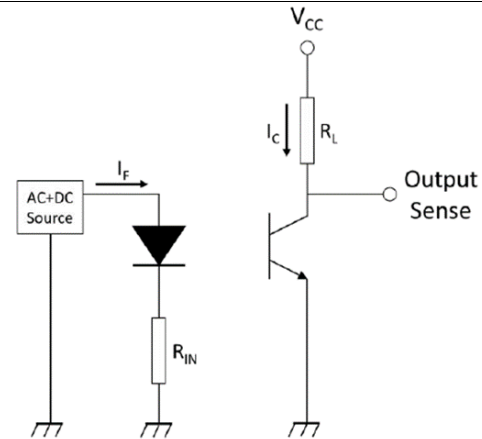
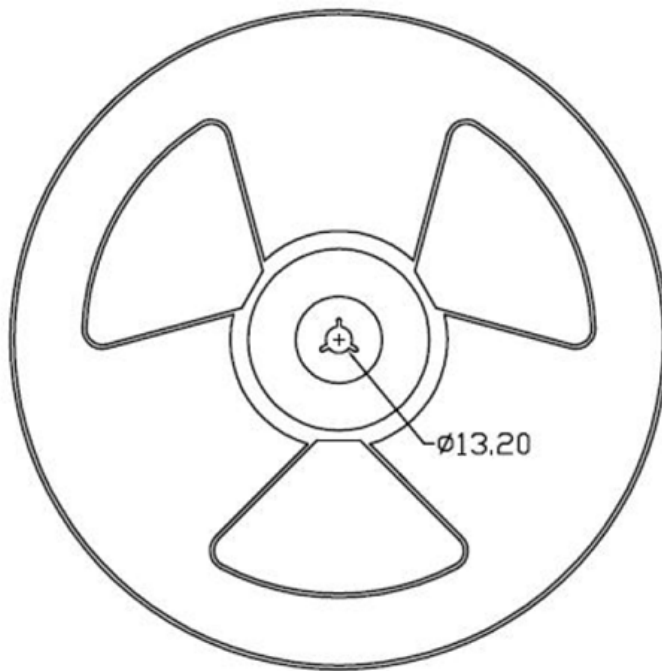


Fig 14. Test Circuits of Frequency Response

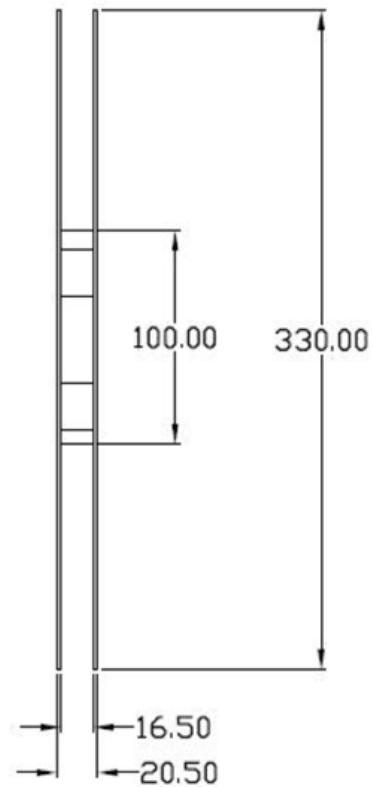


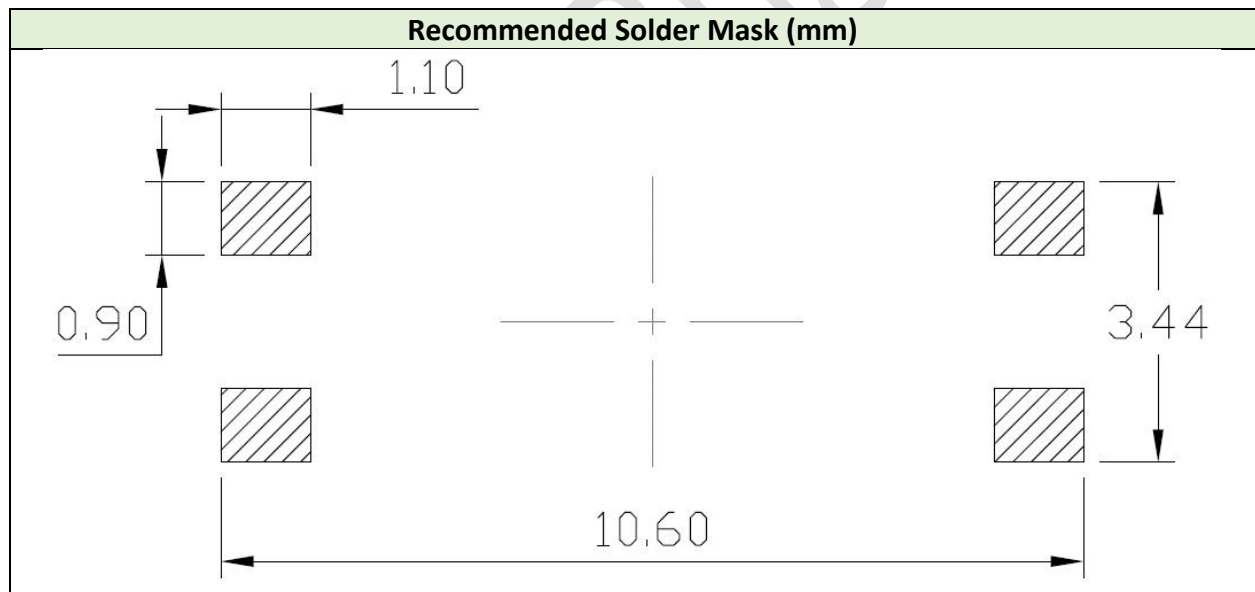
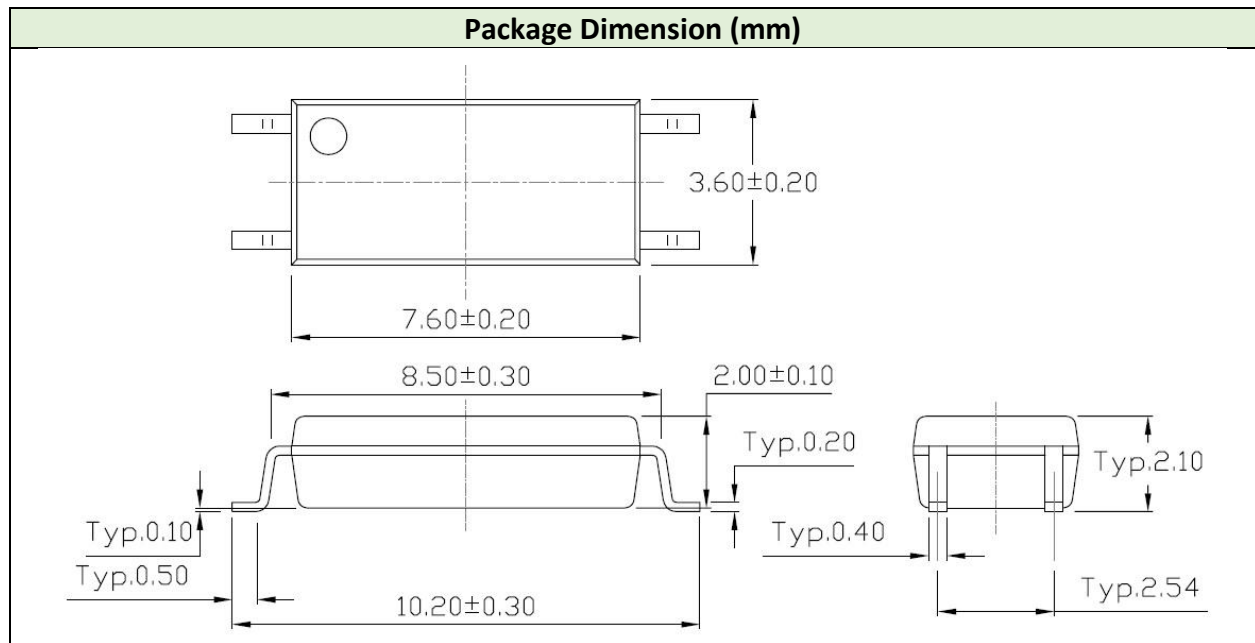
REEL SPECIFICATIONS (Dimensions in mm unless otherwise stated)

Option T1 & T2



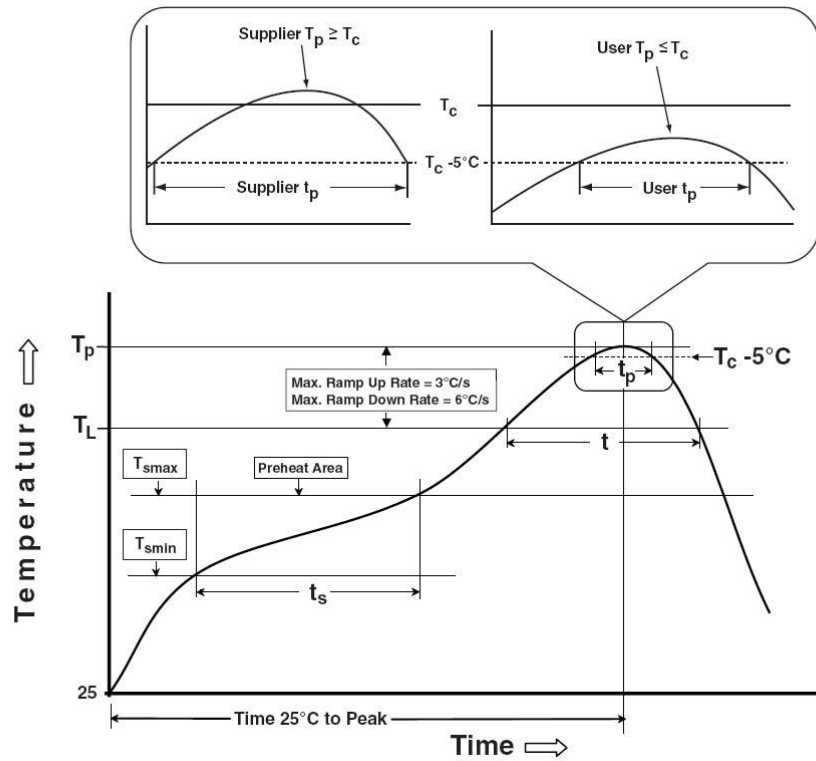
3000 pcs/ reel



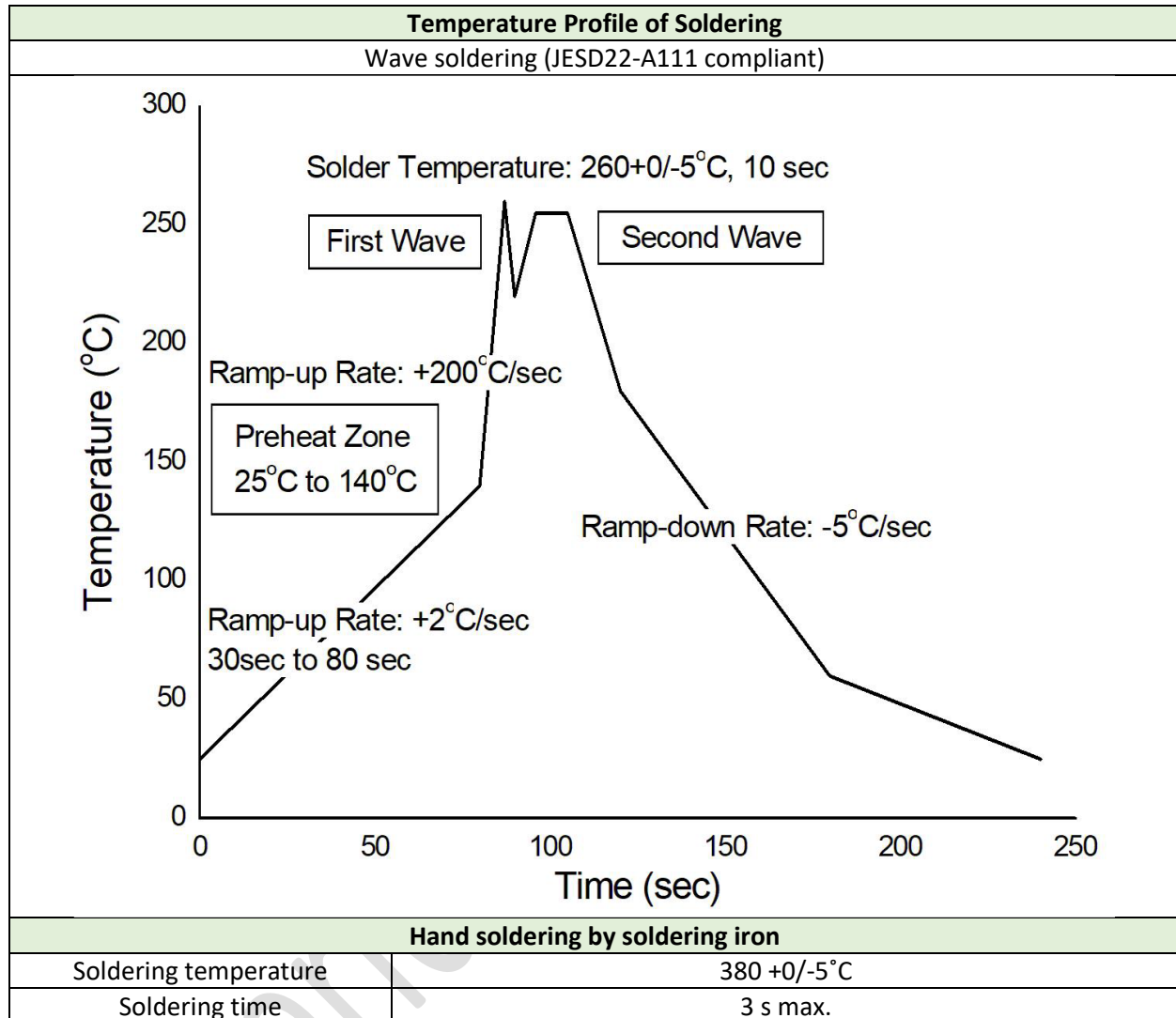


Reflow Information

Reflow Profile



Profile Feature	Sn-Pb Assembly Profile	Pb-free Assembly Profile
Temperature min. ($T_{s,min}$)	100°C	150°C
Temperature Max. ($T_{s,Max}$)	150°C	200°C
Time (t_s) from ($T_{s,min}$ to $T_{s,max}$)	60-120 s	60-120 s
Ramp-up Rate (t_L to t_P)	3°C/s max.	3°C/s max.
Liquidous Temperature (T_L)	183°C	217°C
Time (t_L) Maintained Above (T_L)	60-150 s	60-150 s
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 s	30 s
Ramp-down Rate (T_P to T_L)	6°C/s max.	6°C/s max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.



- One time soldering is recommended for all soldering method
- Do not solder more than three times for IR reflow soldering

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