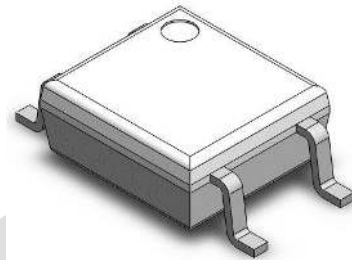


Specification for APC-301X, APC-302X, and APC-305X

APC-301X, APC-302X, APC-305X

SOP4, DC Input, Random-Phase Photo TRIAC Photo Coupler

The APC-301X, APC-302X and APC-305X series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a monolithic silicon random-phase photo TRIAC in a plastic SOP4 package. With the robust coplanar double mold structure, APC-301X, APC-302X and APC-305X series provide the most stable isolation feature.

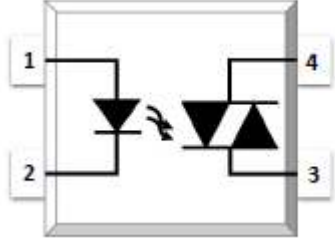


Features:

- High isolation V_{rms} : 3750V
- DC input with random-phase photo TRIAC output
- Operating temperature: - 40 °C to 100 °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:

- Solenoid/valve controls
- Lighting controls
- Motor controls
- Temperature controls
- Static AC power switches
- Solid state relays

Schematic Diagram	PIN Definition
	1. Anode 2. Cathode 3. Terminal 4. Terminal

Absolute Maximum Ratings				
Parameter	Symbol	Value	Unit	Note
Input				
Forward Current	I_F	60	mA	
Reverse Voltage	V_R	6	V	
Junction Temperature	V_R	125	°C	
Input Power Dissipation	P_I	100	mW	
Output				
Off-state Output Terminal Voltage	APC-301X	250	V	
	APC-302X	400		
	APC-305X	600		
Common				
Total Power Dissipation	P_{tot}	330	mW	
Isolation Voltage	V_{iso}	3750	V _{rms}	1
Operating Temperature	T_{opr}	-40~100	°C	
Storage Temperature	T_{stg}	-55~125	°C	
Soldering Temperature	T_{sol}	260	°C	2

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

Note 2. For 10 seconds



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Electrical Optical Characteristics at T _a =25°C							
Parameter	Symbol	min	Typ.	Max.	unit	Test Condition	Note
Input							
Forward Voltage	V _F	-	1.24	1.4	V	I _F =10mA	
Reverse Current	I _R	-	-	10	μA	V _R =6V	
Input Capacitance	C _{in}	-	8.5	250	pF	V=0, f=1kHz	
Output							
Peak off-state Current, Either direction	I _{DRM}	-	-	100	nA	V _{DRM} =Rated V _{DRM} I _F =0	3
Peak on-state Current, Either direction	V _{TM}	-	1.58	2.5	V	I _{TM} = 100 mA	
Critical Rate of Rise of Off-state Voltage	Dv/dt	1000	-	-	V/μs	V _{PEAK} = Rated V _{DRM}	4
Transfer Characteristics							
LED Trigger Current	APC-3010, APC-3021 APC-3051	I _{FT}	-	-	15	mA	Terminal Voltage = 3V I _{TM} = 100 mA
	APC-3011, APC-3022 APC-3052		-	-	10		
	APC-3012 APC-3023 APC-3053		-	-	5		
Holding Current	I _H	-	257	-	μA		
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	

Note 3. Test voltage must be applied within dV/dt rating

Note 4. Refer to Fig. 15 & Fig 16

Naming System:

APC-30KX

K: Indicated to the LED output voltage value listed on Page 2

X: Indicated to the LED trigger current value listed on Page 3

Characteristic Curves

Fig 1. Forward Current vs. Ambient Temperature

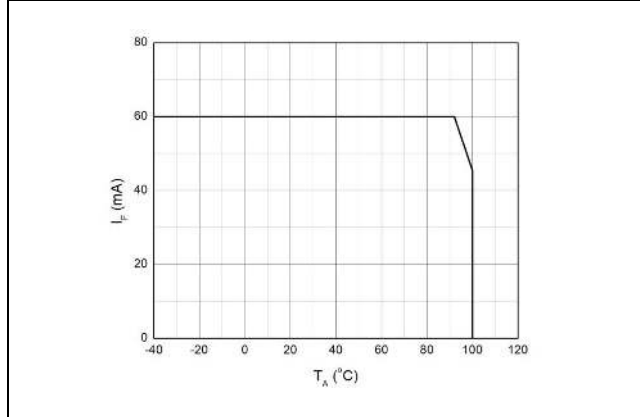


Fig 2. On-state Terminal Current vs. Ambient Temperature

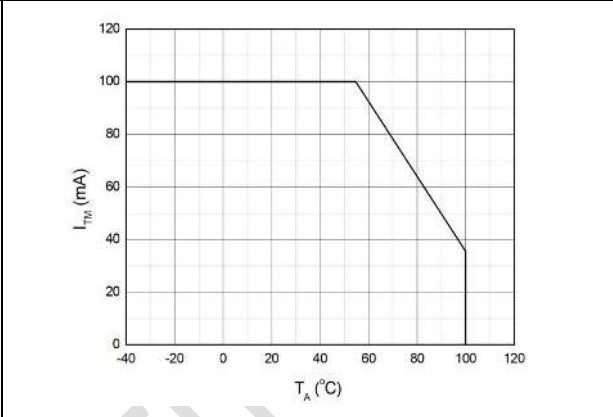


Fig 3. Forward Current vs. Forward Voltage

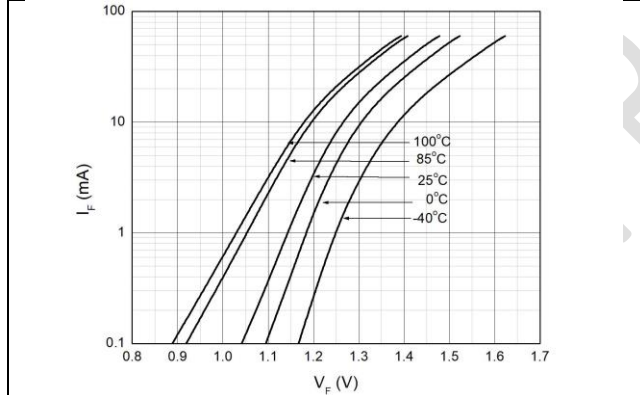


Fig 4. Off-state Terminal Current vs. Ambient Temperature

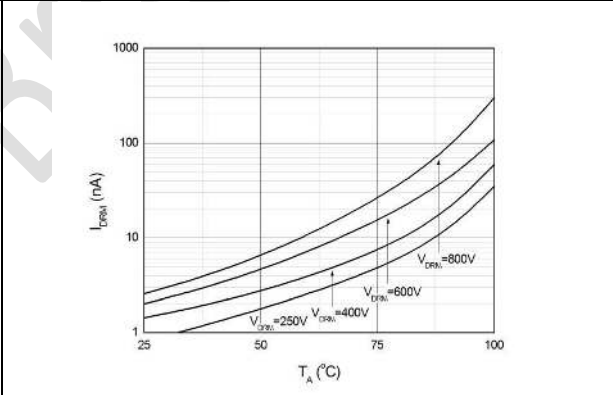


Fig 5. Normalized Off-state Terminal Voltage vs. Ambient Temperature

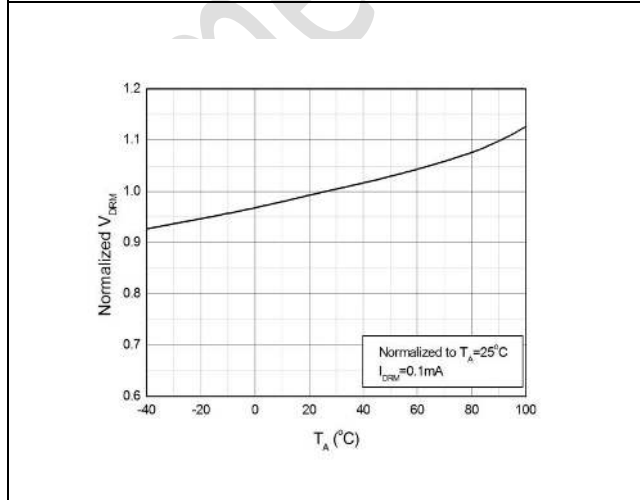


Fig 6. Normalized Trigger Current vs. LED Trigger Pulse Width

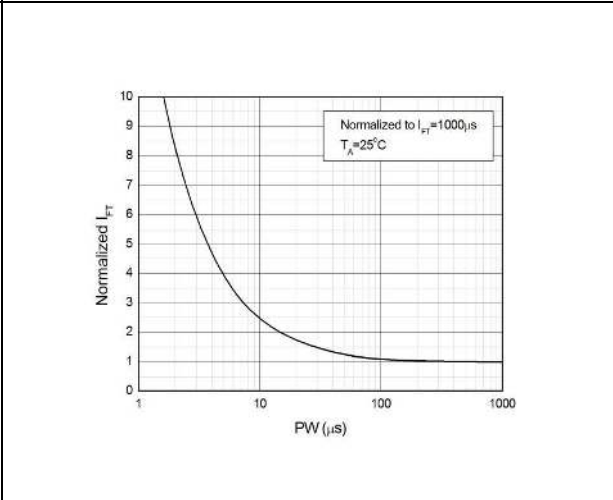


Fig 7. Normalized Trigger Current vs. Ambient Temperature

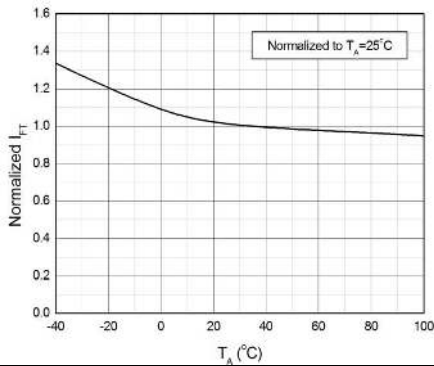


Fig 8. On-state Terminal Voltage vs. Ambient Temperature

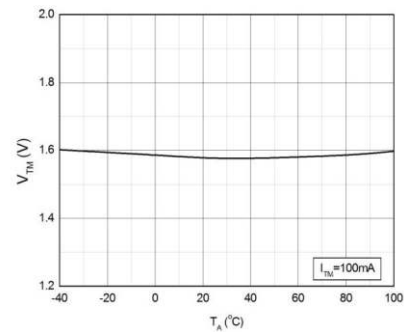


Fig 9. On-state Terminal Voltage vs. On-state Terminal Current

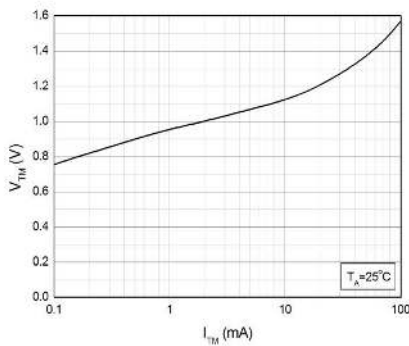


Fig 10. Holding Current vs. Ambient Temperature

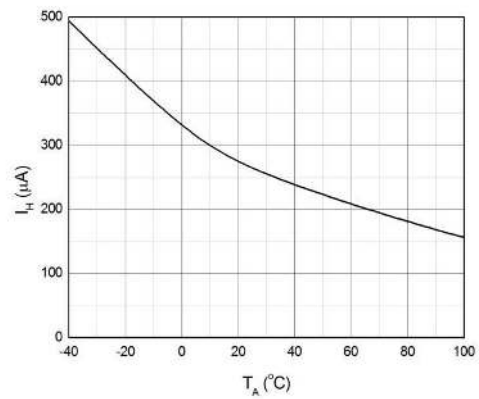


Fig 11. Turn On Time vs. Forward Current

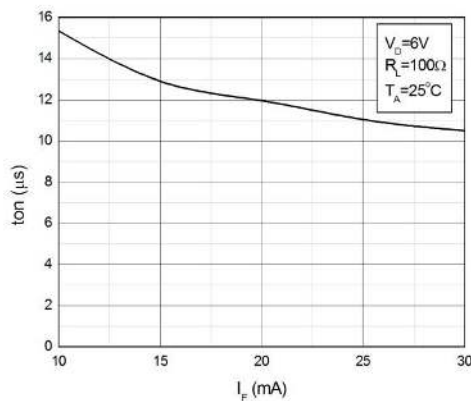
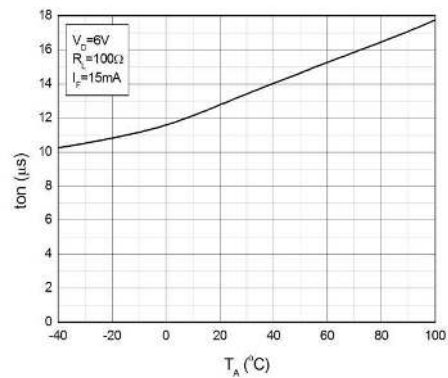


Fig 12. Turn On Time vs. Ambient Temperature



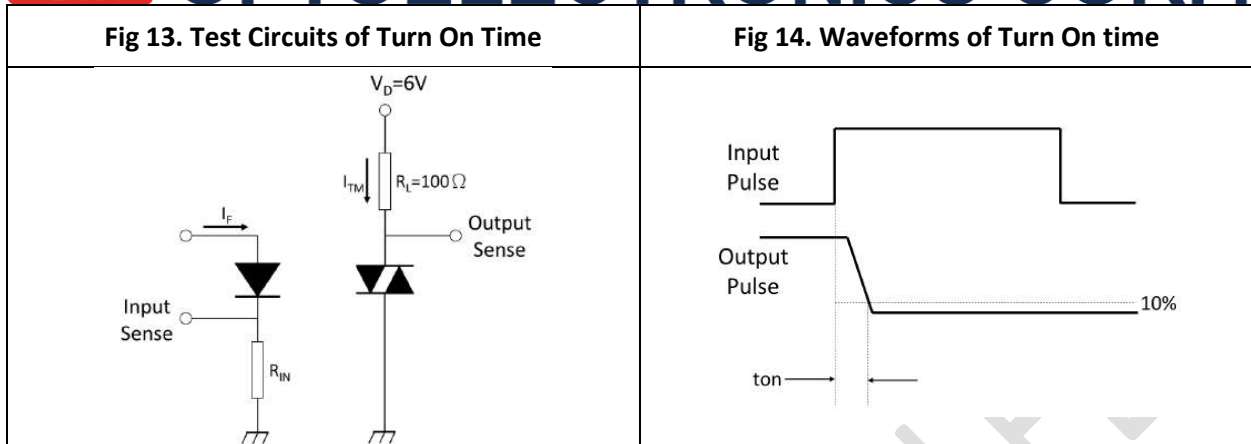


Fig 15. Test Circuits of dV/dt

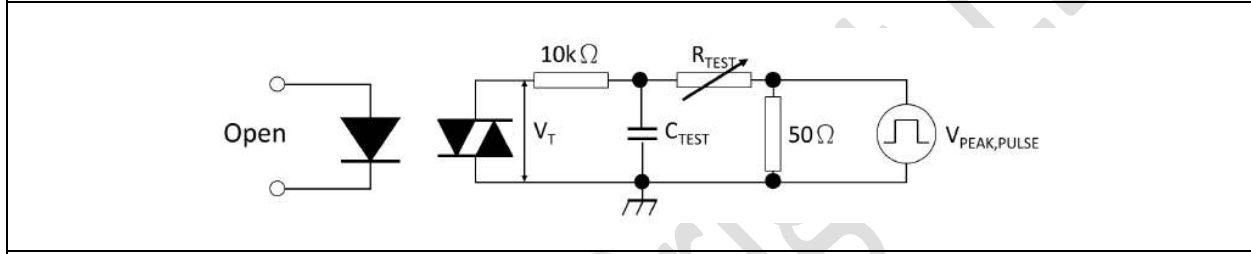
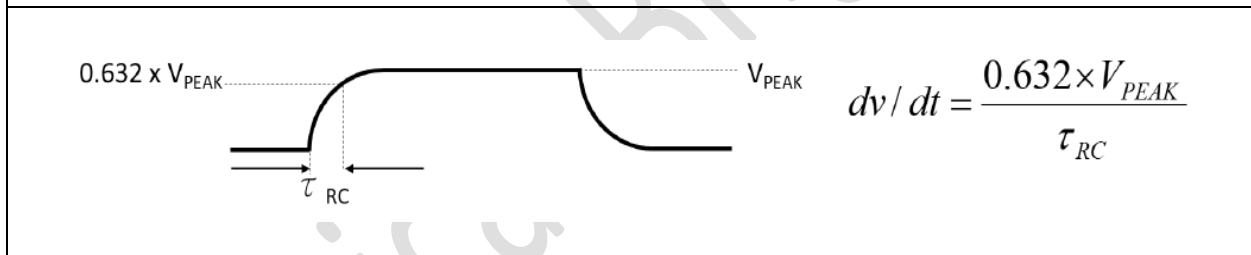
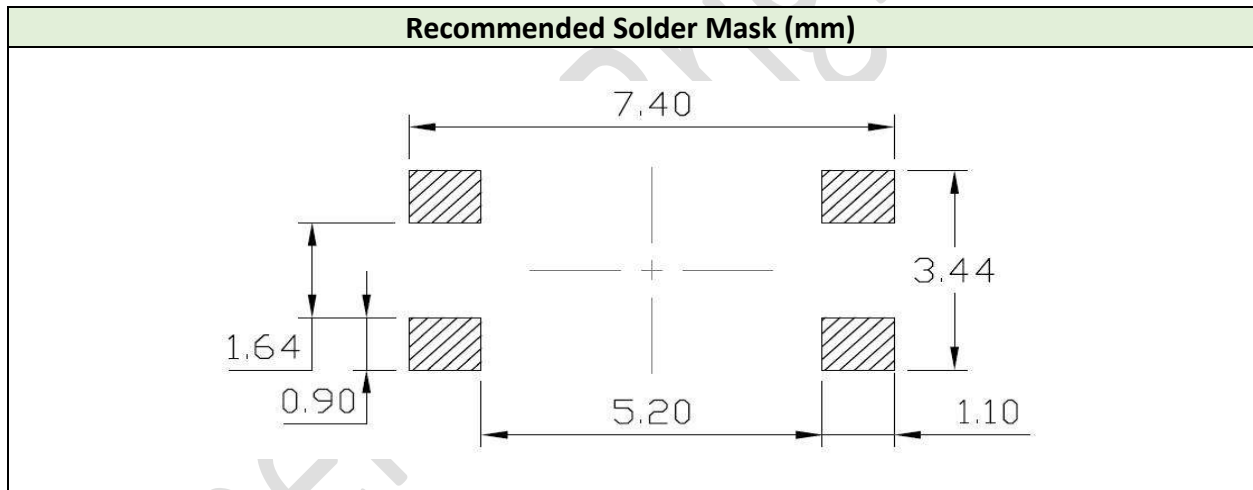
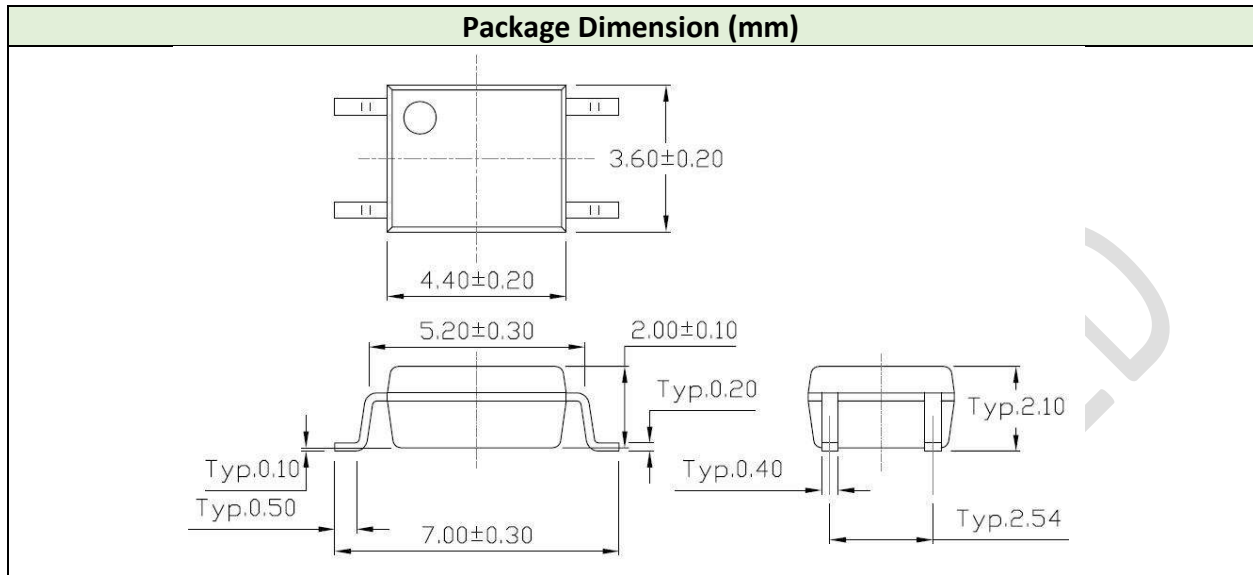


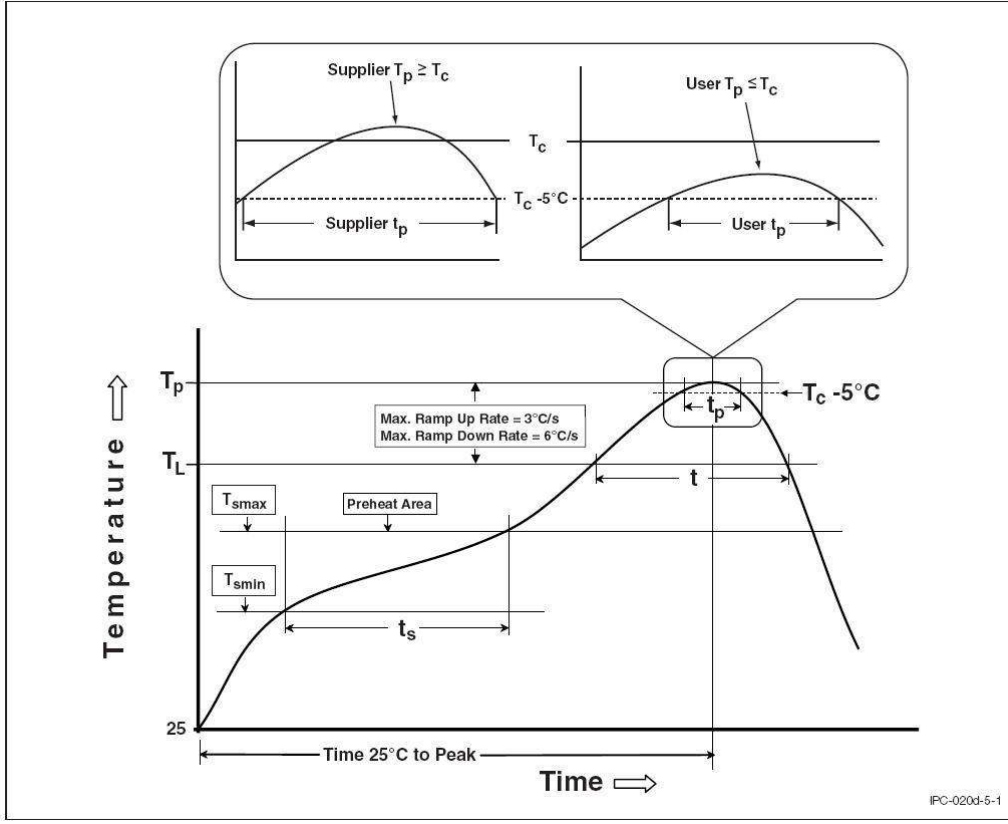
Fig 16. Waveforms of dV/dt





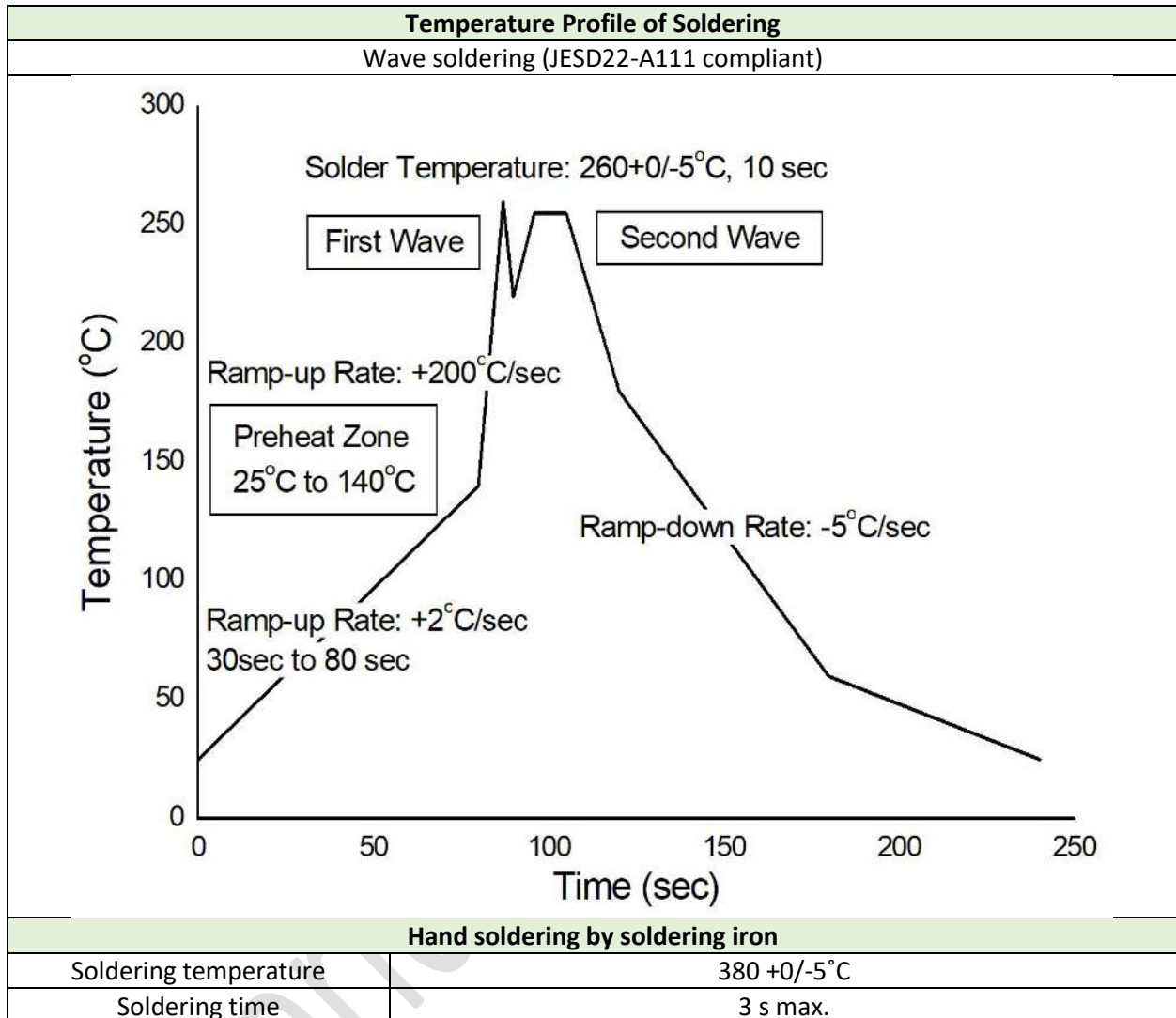
Reflow Information

Reflow Profile



IPC-0203-5-1

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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