Features

- High isolation 3750 VRMS
- CTR flexibility available see order information
- DC input with transistor output
- Operating temperature range - 40°C to 110 °C
- REACH compliance
- Halogen free
- MSL class 1
- Regulatory Approvals
  - UL - UL1577
  - VDE - EN60747-5-5(VDE0884-5)
  - CQC - GB4943.1

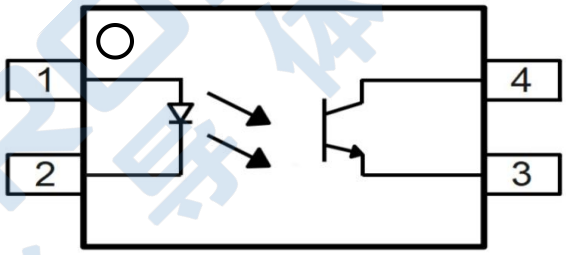
Applications

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

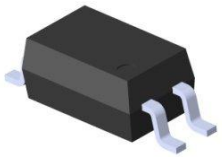
Description

The IS281x series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a silicon planar phototransistor detector in a plastic SSOP4 package with different lead forming options.

With the robust coplanar double mold structure, IS281x series provide the most stable isolation feature.

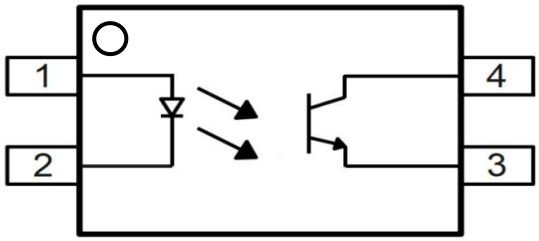


ORDERING INFORMATION

Outline	Part Number	Package	Marking	Packing	Packing Size	Quantity
	IS281A	SSOP4	THPX /YWW	Reel	13 "	3000
	IS281B					
	IS281C					
	IS281D					

CONTENTS

PIN CONFIGURATION AND FUNCTIONS



Pin	Name
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}	200	mW	
Isolation Voltage	V_{iso}	3750	Vrms	2
Operating Temperature	T_{opr}	-40~110	°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(T_a = 25°C)

Parameter		Symbol	Min	Typ.	Max.	Unit	Test Condition	Note
INPUT								
Forward Voltage		V_F	-	-	1.4	V	I_F=10mA	
Reverse Current		I_R	-	-	10	μA	V_R=6V	
Input Capacitance		C_{in}	-	10	-	pF	V=0, f=1kHz	
OUTPUT								
Collector Dark Current		I_{CEO}	-	-	100	nA	V_{CE}=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}	7	-	-	V	I_E=0.1mA, I_F=0	
TRANSFER CHARACTERISTICS								
Current Transfer Ratio	281A	CTR	80	-	160	%	I_F=5mA, V_{CE}=5V	
	281B		130	-	260			
	281C		200	-	400			
	281D		300	-	600			
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	-	0.1	0.2	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	
Response Time (Rise)		t_r	-	3	18	μs	V_{CE}=2V, I_C=2mA	3
Response Time (Fall)		t_f	-	4	18	μs	R_L=100Ω	3
Cut-off Frequency		f_c	-	80	-	kHz	V_{CE}=2V, I_C=2mA R_L=100Ω,-3dB	4

Note 3. Fig.12&13

Note 4. Fig.14

CHARACTERISTIC CURVES

Fig.1 Forward Current vs. Ambient Temperature

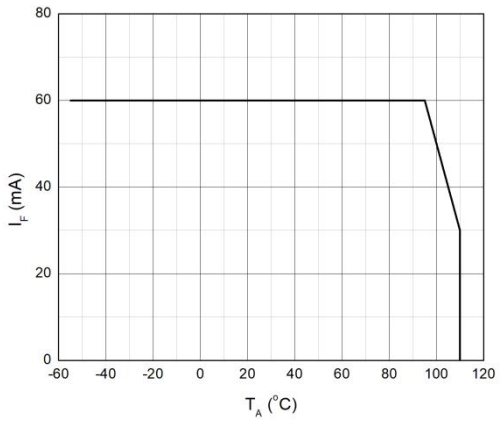


Fig.2 Collector Power Dissipation vs. Ambient Temperature

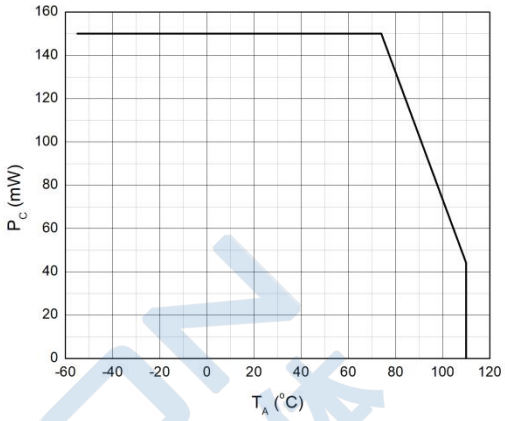


Fig.3 Forward Current vs. Forward Voltage

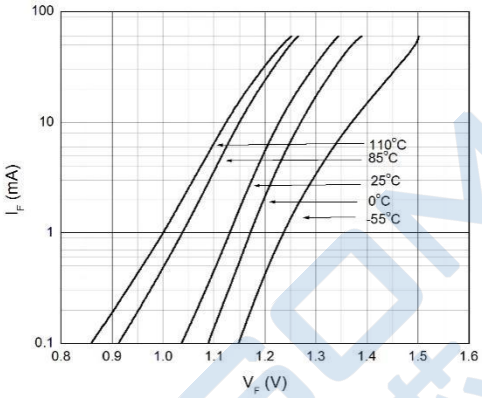


Fig.4 Collector Dark Current vs. Ambient Temperature

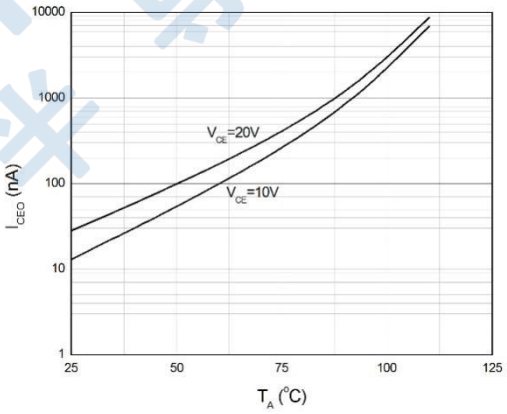


Fig.5 Collector Current vs. Collector-emitter Voltage

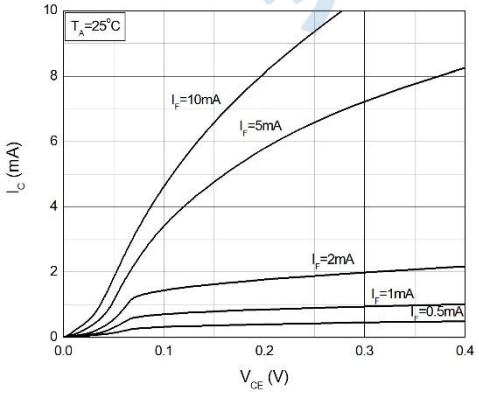


Fig.6 Collector Current vs. Collector-emitter Voltage

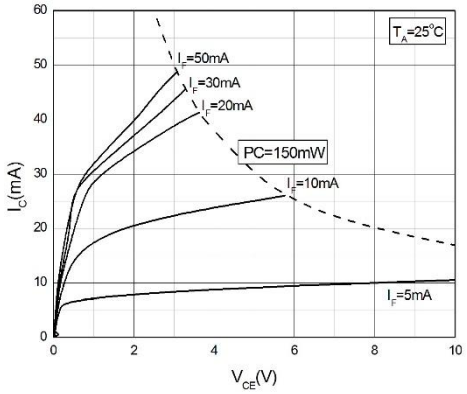


Fig.7 Normalized Current Transfer Ratio vs. Forward Current

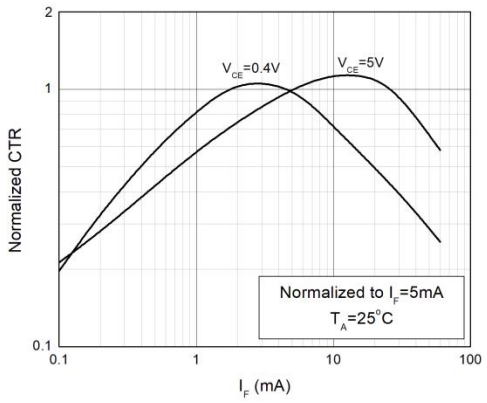


Fig.8 Normalized Current Transfer Ratio vs. Ambient Temperature

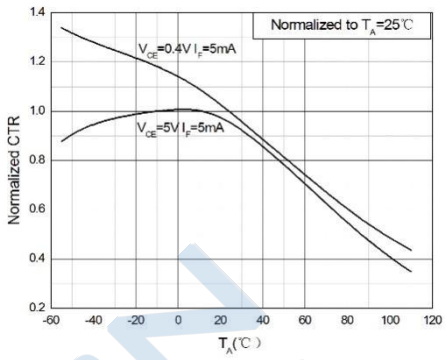


Fig.9 Collector-emitter Saturation Voltage vs. Ambient Temperature

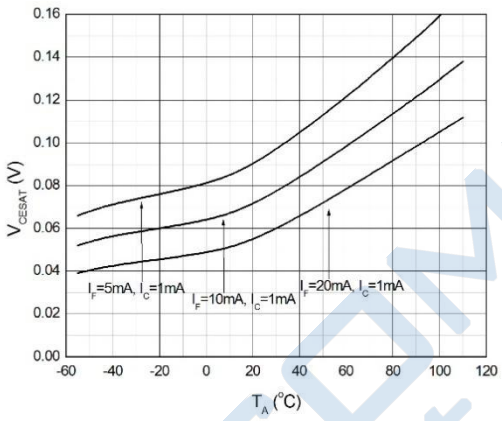


Fig.10 Switching Time vs. Load Resistance

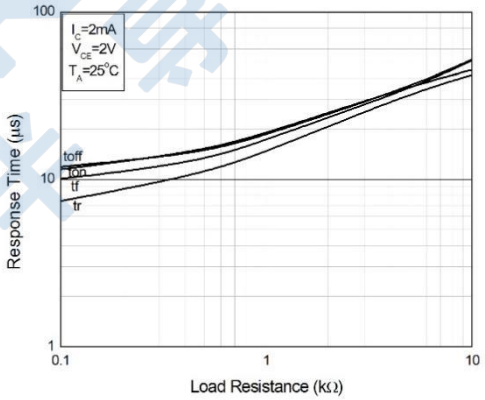
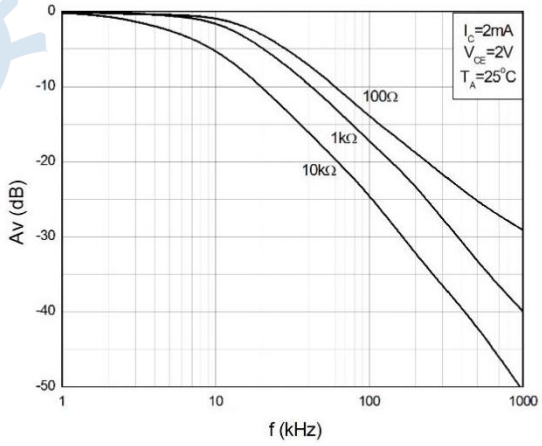


Fig.11 Frequency Response



TEST CIRCUITS

Fig.12 Test Circuits of Response Time

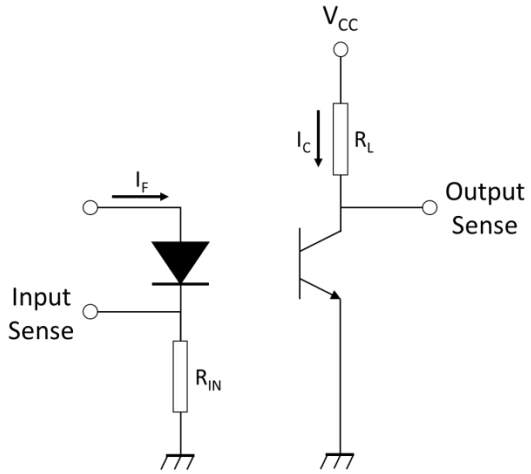


Fig.13 Curves of Response Time

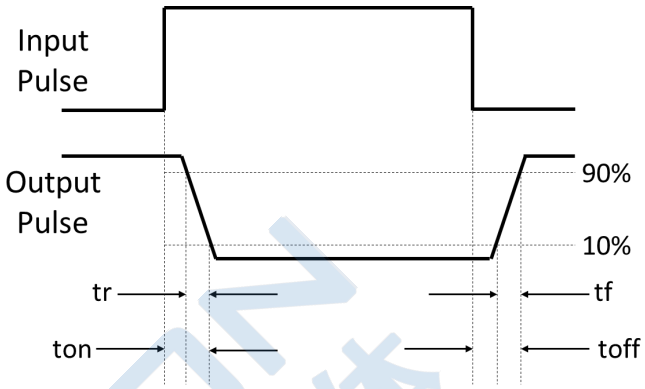
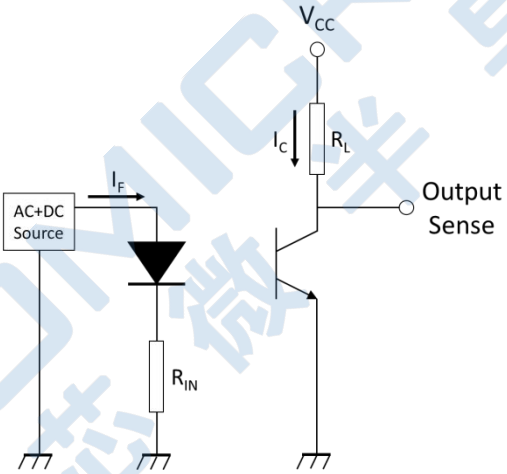
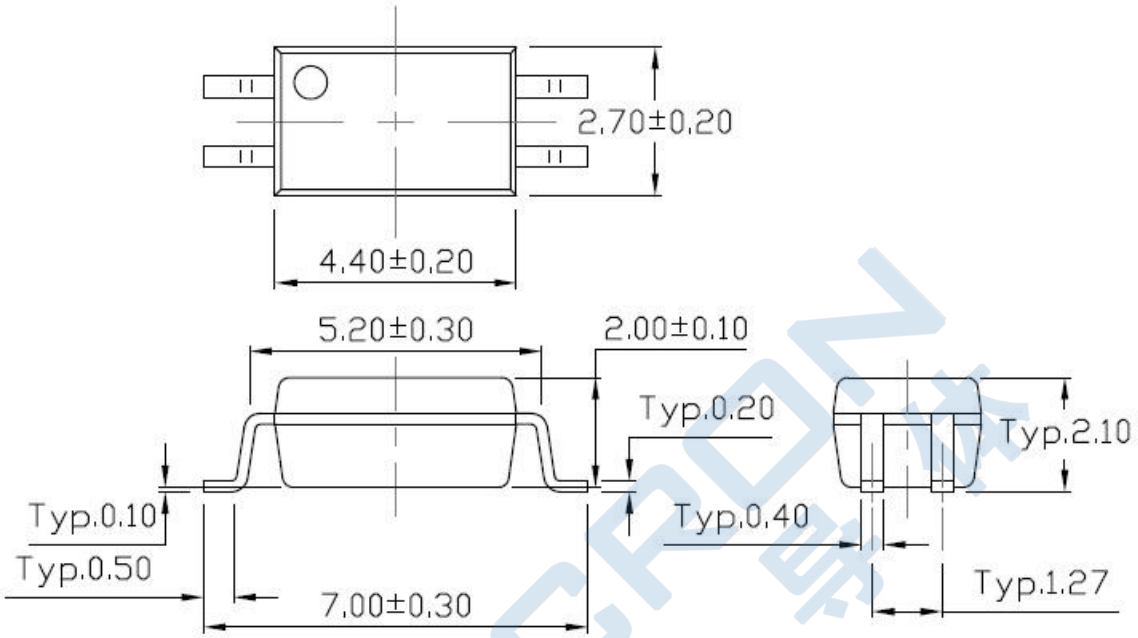


Fig.14 Test Circuits of Frequency Response

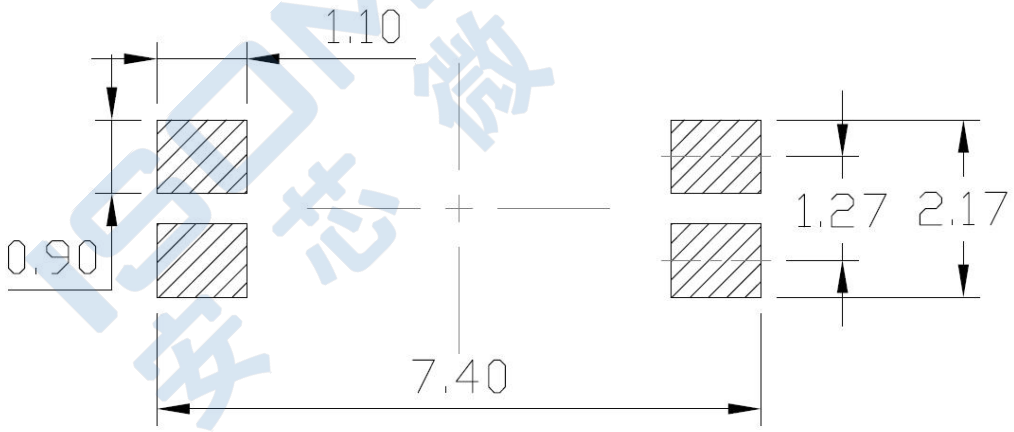


PACKAGE DIMENSIONS

Surface Mount (Low Profile) - (SSOP4)



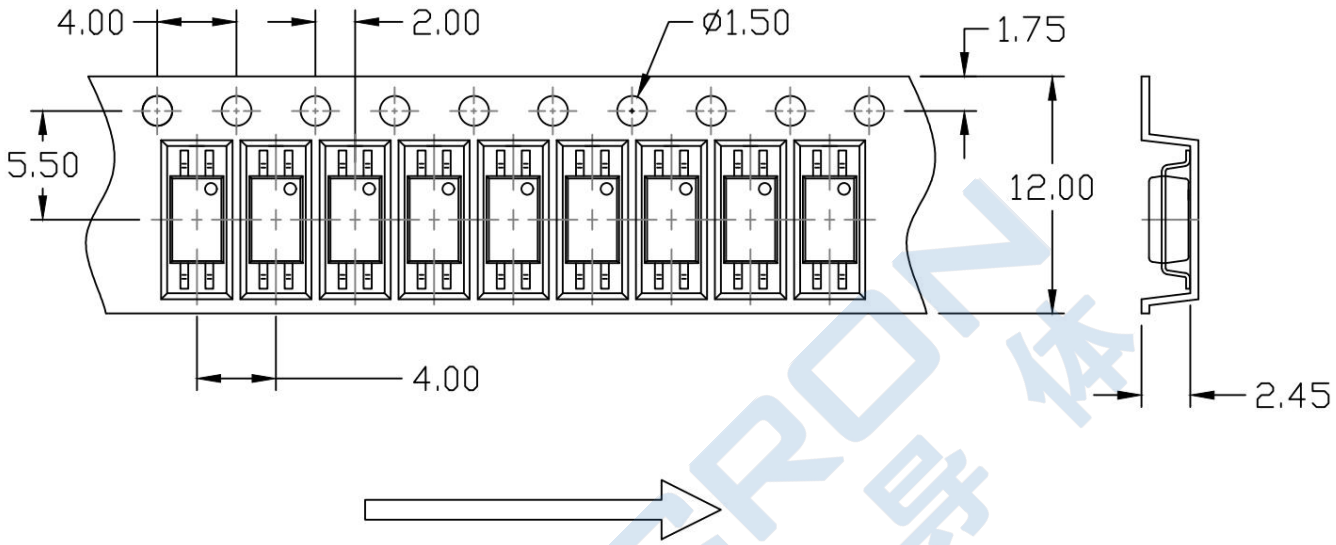
Recommended Solder Mask



- **Dimensions in mm unless otherwise stated**

CARRIER TAPE SPECIFICATIONS

Option SSOP4



- **Dimensions in mm unless otherwise stated**

ORDERING AND MARKING INFORMATION

Marking Information

THP	:	Part Number
X	:	CTR Grade（A:A，2:B，3:C ，4:D ）
/	:	ISOMICRON
Y	:	Fiscal Year（M:2022,N:2023...）
WW	:	Work Week

Order Code

IS 281 X - X X

Company Abbr.

Part Number

CTR Rank:
A/B/C/D

Halogen Free:
E/None: Halogen-free,Lead-free
Z: Halogen, Lead-free

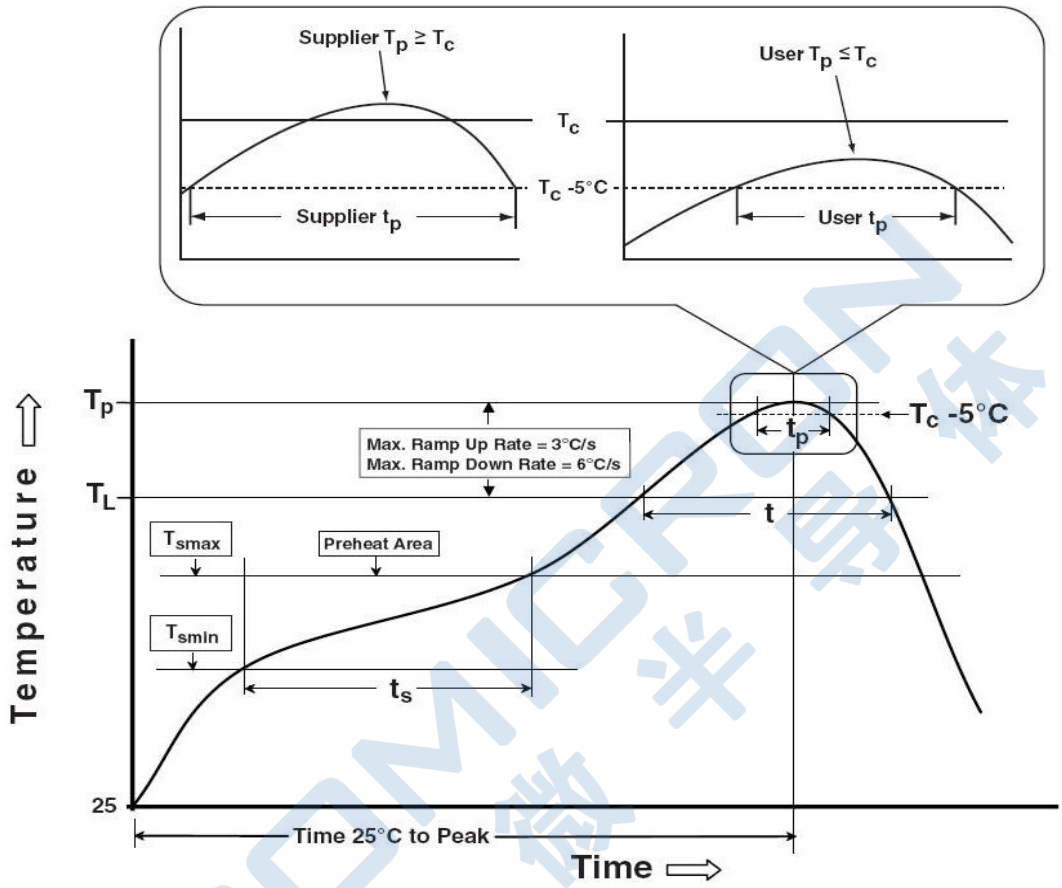
Performance:
N: Enhanced
None: Normal

Packing Quantity

Option	Quantity	Quantity – Inner box	Quantity – Outer box
SSOP4	3000 Units/Reel	2 Reels/Inner box	5 Inner box/Outer box = 30k Units

REFLOW INFORMATION

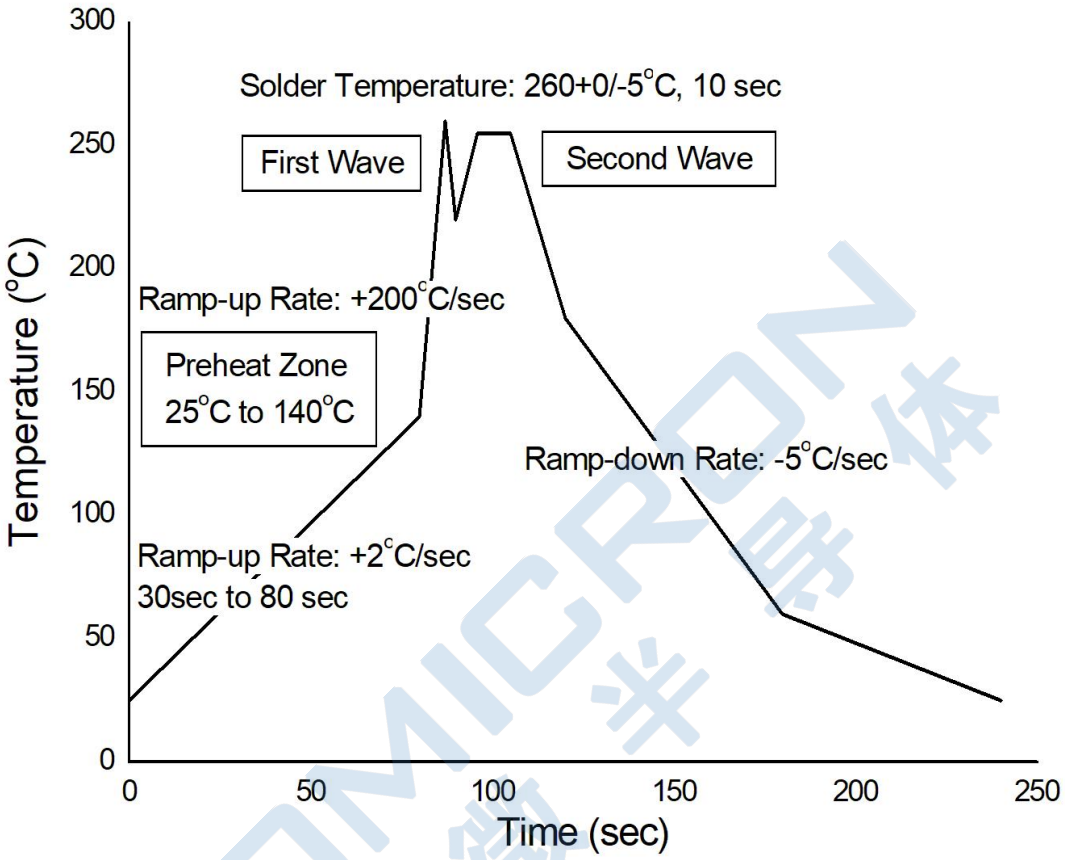
Reflow Profile



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	100	150°C
Temperature Max. (Tsmax)	150	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds	60-120 seconds
Ramp-up Rate (tL to tP)	3°C/second max.	3°C/second max.
Liquidous Temperature (TL)	183°C	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds	60 – 150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time (tP) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max	6°C/second max
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

TEMPERATURE PROFILE OF SOLDERING

Wave Soldering (JESD22-A111 COMPLIANT)



Hand Soldering By Soldering Iron	
Soldering Temperature	380+0/-5°C
Soldering Time	3 sec max.

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

DISCLAIMER

- ISOMICRON is continually improving the quality, reliability, function and design. ISOMICRON reserves the right to make changes without further notices.
- The characteristic curves shown in this datasheet are representing typical performance which are not guaranteed.
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- Please contact ISOMICRON sales agent for special application request.
- Immerge unit's body in solder paste is not recommended.
- Parameters provided in datasheets may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated in each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify ISOMICRON's terms and conditions of purchase, including but not limited to the warranty expressed therein.
- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.