

ISP816XGRSMT&R-GS



DESCRIPTION

The ISP816XGRSMT&R-GS, a special variation of our IS816 series of optically coupled isolators, consists of an infrared light emitting diode and an NPN silicon photo transistor in a space efficient Dual In Line Plastic Package.

This special variation features wider SMT lead-forming to maintain a minimum 8mm clearance between the SMT terminations.

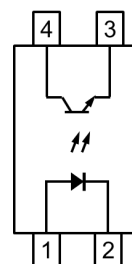
FEATURES

- AC Isolation Voltage 5000V_{RMS}
- CTR Selections Available
- Wide Operating Temperature Range
-55°C to +110°C
- RoHS Compliant
- UL File E91231 Package Code "EE"
- VDE Approval Certificate No. 40028086

APPLICATIONS

- Computer Terminals
- Industrial System Controllers
- Measuring Instruments
- Signal Transmission between Systems of Different Potentials and Impedances

ISP816XGRSMT&R-GS



- | | |
|---|-----------|
| 1 | Anode |
| 2 | Cathode |
| 3 | Emitter |
| 4 | Collector |

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Stresses exceeding the absolute maximum ratings can cause permanent damage to the device.

Exposure to absolute maximum ratings for long periods of time can adversely affect reliability.

Input

Forward Current	50mA
Peak Forward Current (100µs, 100Hz)	1A
Reverse Voltage	6V
Power dissipation	70mW
Junction Temperature	125 °C

Output

Collector to Emitter Voltage V _{CEO}	80V
Emitter to Collector Voltage V _{ECO}	6V
Collector Current	50mA
Power Dissipation	150mW
Junction Temperature	125 °C

Total Package

Isolation Voltage	5000V _{RMS}
Total Power Dissipation	200mW
Operating Temperature	-55 to 110 °C
Storage Temperature	-55 to 125 °C
Lead Soldering Temperature (10s)	260°C

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ISP816XGRSMT&R-GS

ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = 20\text{mA}$		1.2	1.4	V
Reverse Leakage	I_R	$V_R = 4\text{V}$			10	μA
Terminal Capacitance	C_t	$V = 0\text{V}, f = 1\text{KHz}$		30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector–Emitter Breakdown Voltage	BV_{CEO}	$I_C = 0.1\text{mA}, I_F = 0\text{mA}$	80			V
Emitter–Collector Breakdown Voltage	BV_{ECO}	$I_E = 10\mu\text{A}, I_F = 0\text{mA}$	6			V
Collector–Emitter Dark Current	I_{CEO}	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$			100	nA

**ISP816XGRSMT&R-GS****ELECTRICAL CHARACTERISTICS** (Ambient Temperature = 25°C unless otherwise specified)**COUPLED**

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	$I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$ Note: This is equivalent to the ISP816 “GR” Grade. For other grades of this leadform, please contact our sales team.	100		300	%
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 20\text{mA}$, $I_C = 1\text{mA}$		0.1	0.2	V
Floating Capacitance	C_f	$V = 0\text{V}$, $f = 1\text{MHz}$		0.6	1	pF
Cut-Off Frequency	f_c	$V_{CE} = 5\text{V}$, $I_C = 2\text{mA}$ $R_L = 100\Omega$ -3dB		80		kHz
Output Rise Time	t_r	$V_{CC} = 5\text{V}$ $I_C = 2\text{mA}$ $R_L = 100\Omega$		4	18	μs
Output Fall Time	t_f			3	18	

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input to Output Isolation Voltage	V_{ISO}	AC 1 minute, RH = 40% to 60%	5000			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	$V_{IO} = 500\text{VDC}$	5×10^{10}	1×10^{11}		Ω

Measure with input leads shorted together and output leads shorted together.



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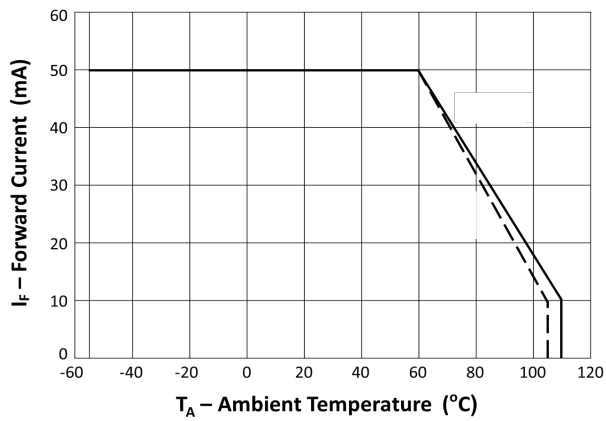


Fig 1 Forward Current vs Ambient Temperature

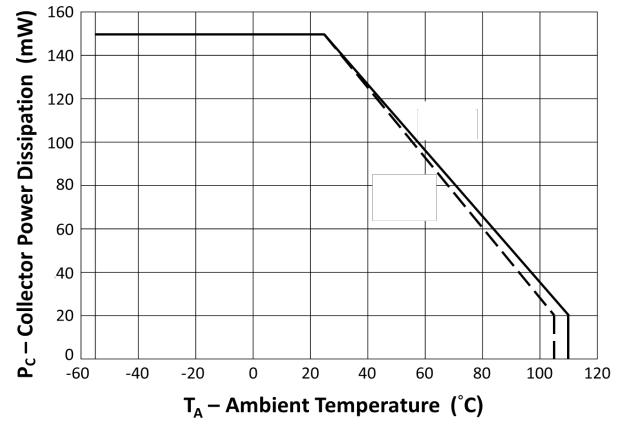


Fig 2 Collector Power Dissipation vs Ambient Temperature

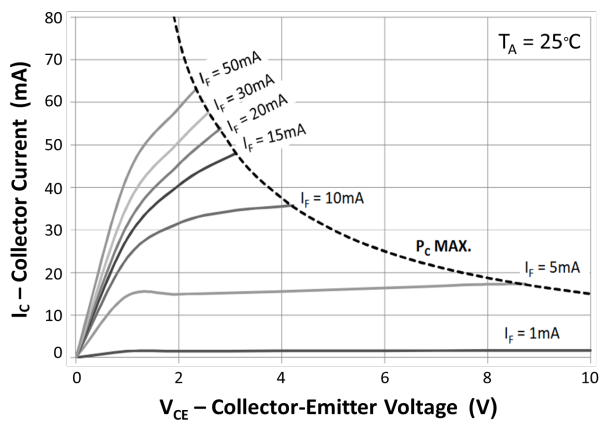


Fig 3 Collector Current vs Collector-Emitter Voltage (1)

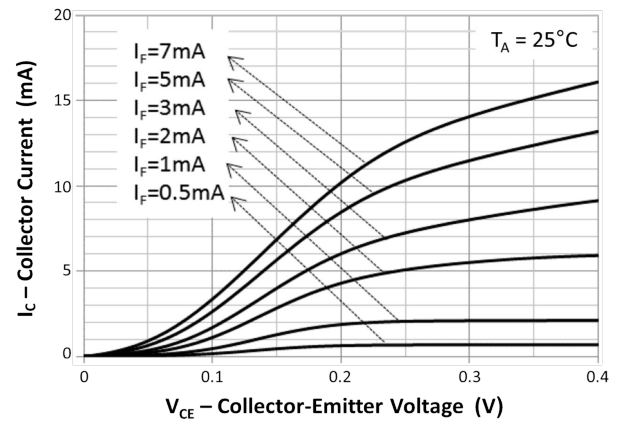


Fig 4 Collector Current vs Collector-Emitter Voltage (2)

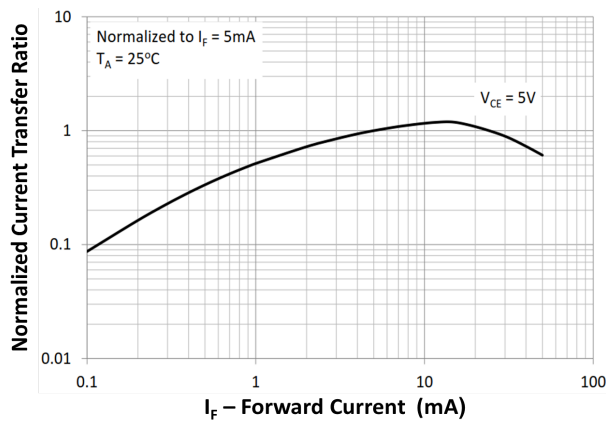


Fig 5 Normalized Current Transfer Ratio vs Forward Current

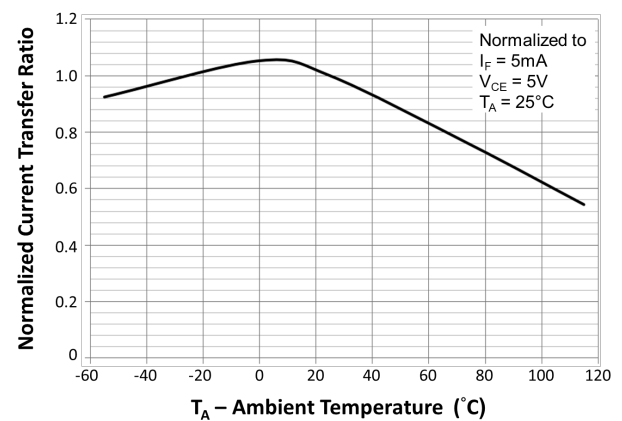


Fig 6 Normalized Current Transfer Ratio vs Ambient Temperature



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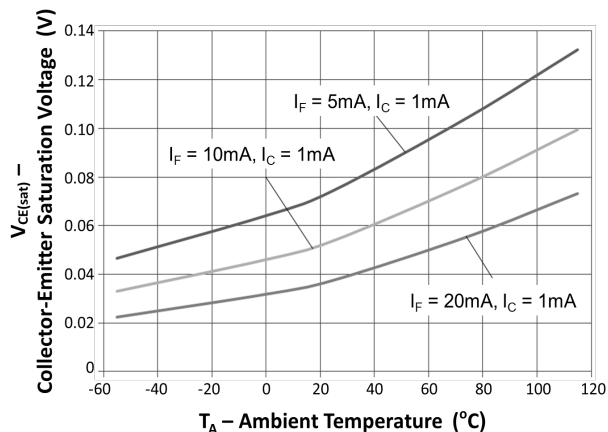


Fig Collector-Emitter Saturation Voltage vs Ambient Temperature

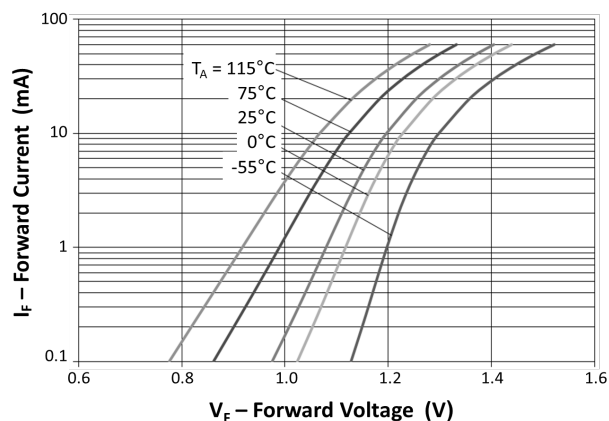


Fig 8 Forward Current vs Forward Voltage

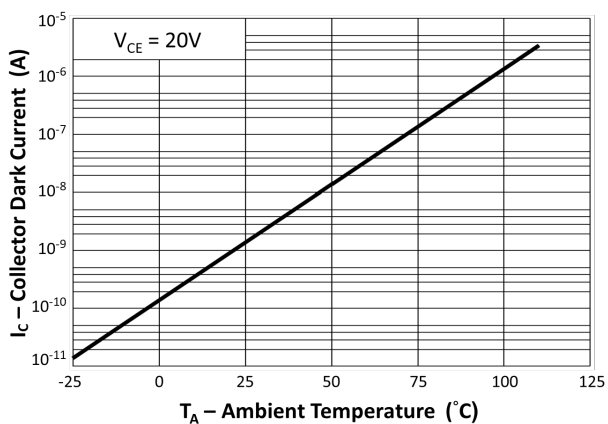


Fig 9 Collector Dark Current vs Ambient Temperature

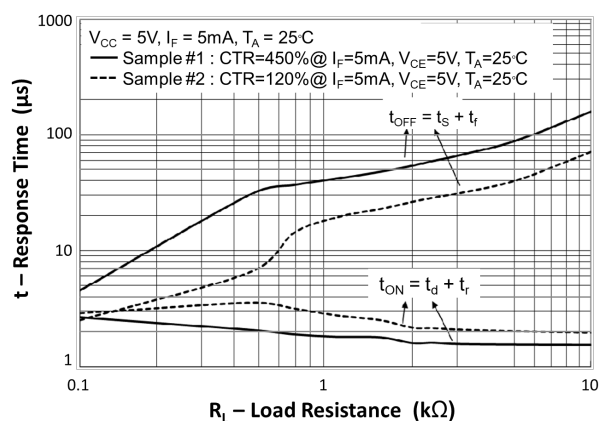


Fig 10 Switching Time vs Load Resistance

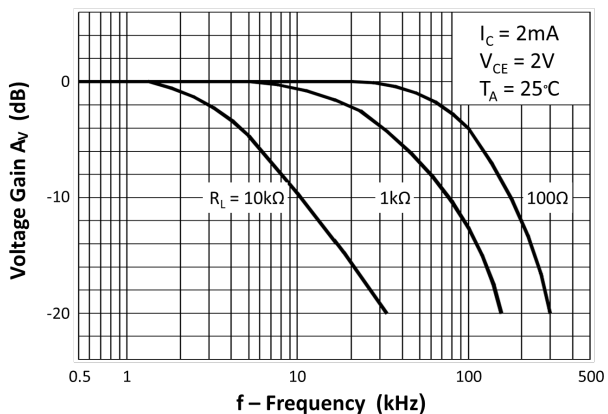
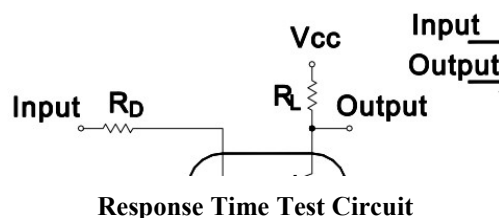
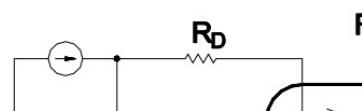


Fig 11 Frequency Response



Response Time Test Circuit



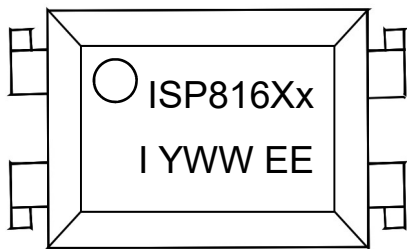
Frequency Response Test Circuit

ISP816XGRSMT&R-GS**ORDER INFORMATION**

ISP816XGRSMT&R-GS			
After PN	PN	Description	Packing quantity
None	ISP816XGRSMT&R-GS	Widened clearance SMD-4 Tape & Reel	2000 pcs per reel

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DEVICE MARKING

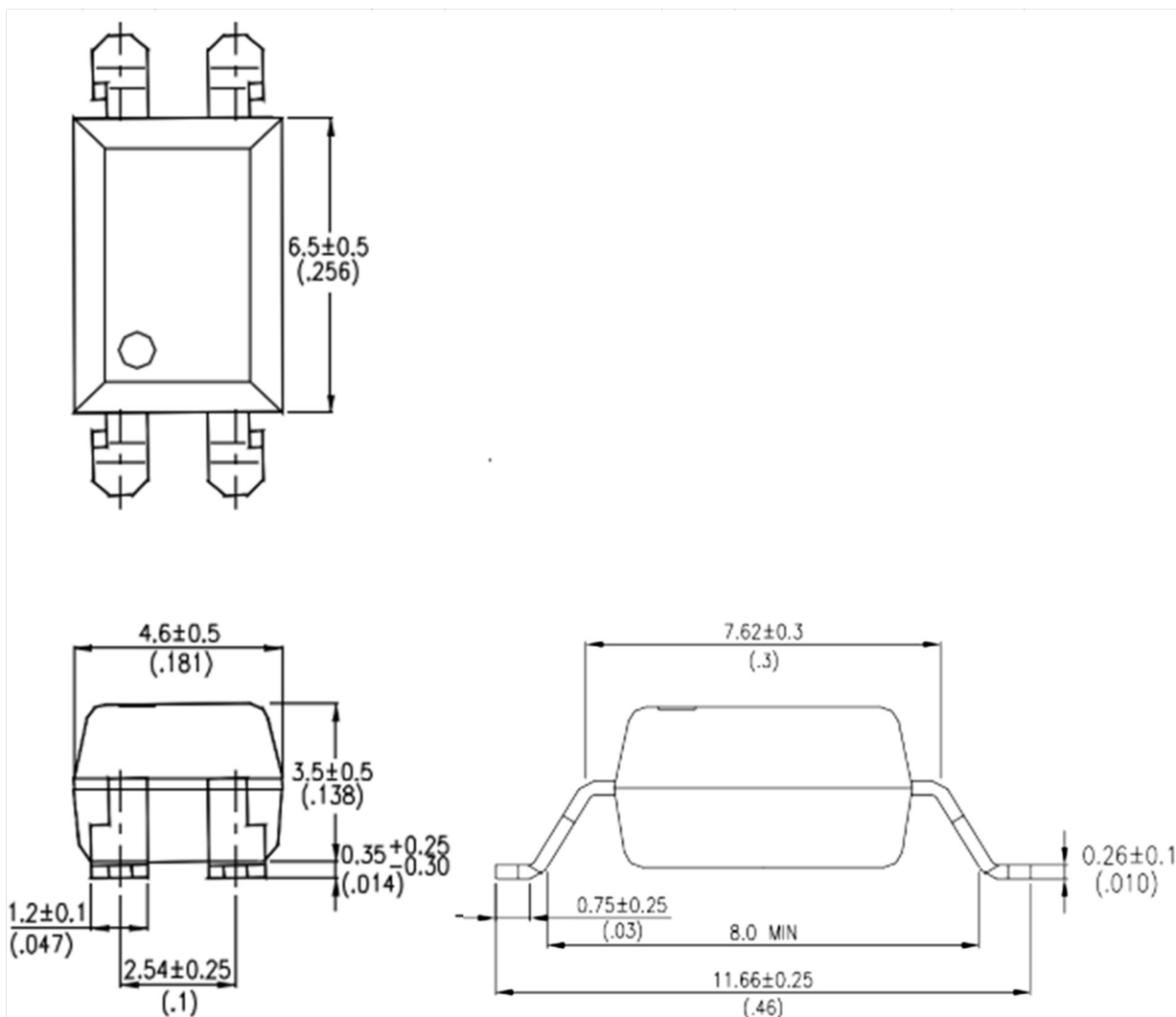


ISP816	Part Number for Single Channel
I	Isocom
Y	Year code (can be single or double digit)
WW	2 digit Week code
EE	UL Model



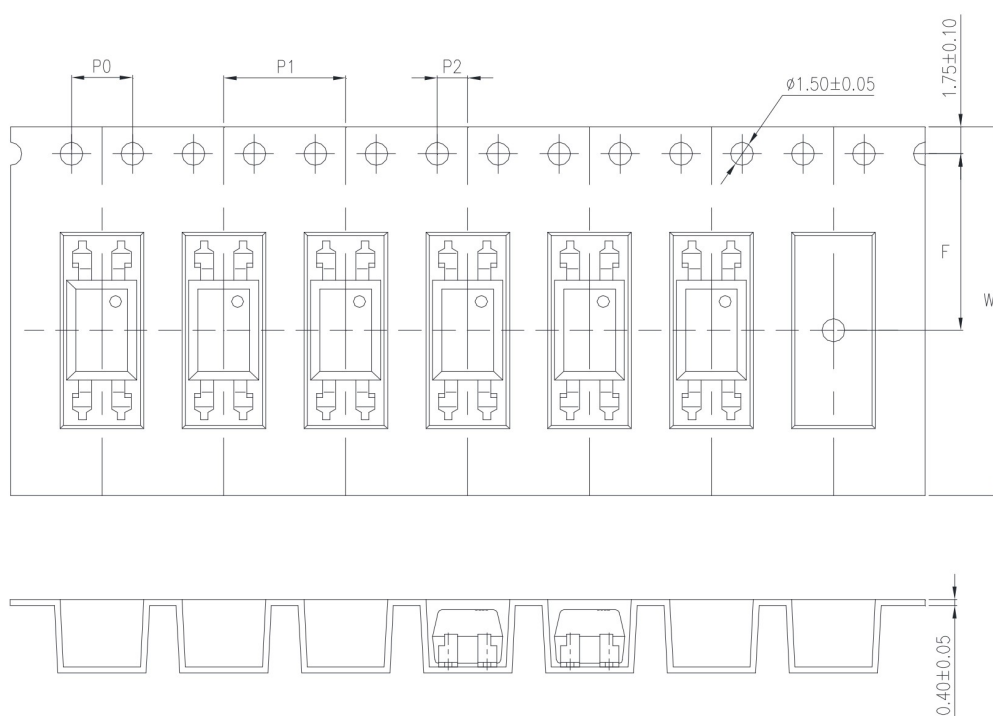
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PACKAGE DIMENSIONS in mm (inch)



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TAPE AND REEL PACKAGING



Description	Symbol	Dimension mm (inch)
Tape Width	W	24 ± 0.3 (0.63)
Pitch of Sprocket Holes	P ₀	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	11.5 ± 0.1 (0.295)
	P ₂	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P ₁	8 ± 0.1 (0.472)

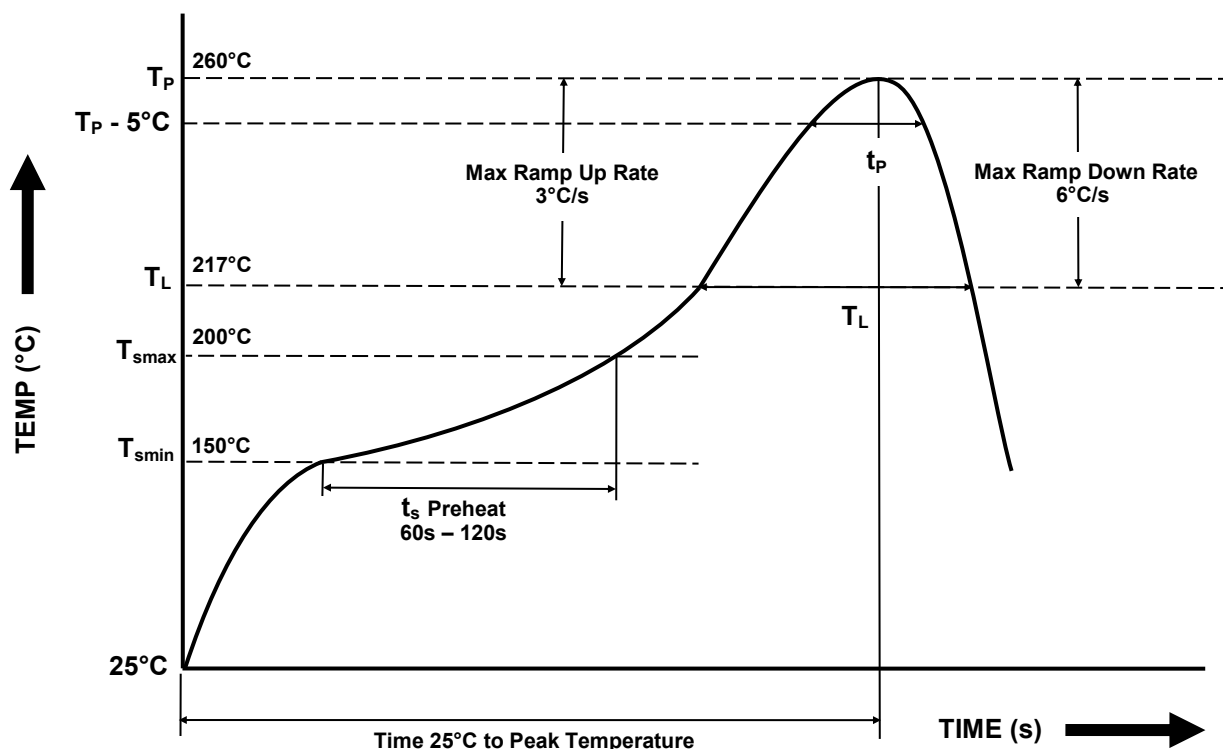


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IR REFLOW SOLDERING TEMPERATURE PROFILE FOR SMD

One Time Reflow Soldering is Recommended.

Do Not Immerse Device Body in Solder Paste.



Profile Details	Conditions
Preheat - Min Temperature (T_{SMIN}) - Max Temperature (T_{SMAX}) - Time T_{SMIN} to T_{SMAX} (t_s)	150°C 200°C 60s - 120s
Soldering Zone - Peak Temperature (T_P) - Time at Peak Temperature - Liquidous Temperature (T_L) - Time within 5°C of Actual Peak Temperature (T_P - 5°C) - Time maintained above T_L (t_L) - Ramp Up Rate (T_L to T_P) - Ramp Down Rate (T_P to T_L)	260°C 10s max 217°C 30s max 60s - 100s 3°C/s max 6°C/s max
Average Ramp Up Rate (T _{smax} to T _P)	3°C/s max
Time 25°C to Peak Temperature	8 minutes max

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