

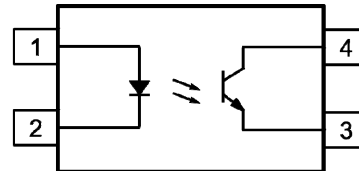
## IS281



### DESCRIPTION

The IS281 series optocoupler consists of an infrared emitting diode optically coupled to an NPN silicon photo transistor.

This device belongs to Isocom Compact Range of Optocouplers.



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

### FEATURES

- Half Pitch 1.27mm
- High AC Isolation voltage 3750V<sub>RMS</sub>
- CTR Selections Available
- Wide Operating Temperature Range -55°C to 110°C
- Pb Free and RoHS Compliant
- UL Approval E91231, Model "THP"

### APPLICATIONS

- Switching Mode Power Supply
- Industrial System Controllers
- Measuring Instruments
- Signal Transmission between Systems of Different Potentials and Impedances

### ORDER INFORMATION

- Available in Tape and Reel with 1000pcs per reel

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 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
Reverse Voltage	6V
Power dissipation	70mW

#### Output

Collector to Emitter Voltage BV <sub>CEO</sub>	80V
Emitter to Collector Voltage BV <sub>ECO</sub>	7V
Collector Current	50mA
Power Dissipation	150mW

#### Total Package

Isolation Voltage	3750V <sub>RMS</sub>
Total Power Dissipation	200mW
Operating Temperature	-55 to 110 °C
Storage Temperature	-55 to 150 °C
Lead Soldering Temperature (10s)	260°C

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## IS281

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ 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 Current	$I_R$	$V_R = 4\text{V}$			10	$\mu\text{A}$
Terminal Capacitance	$C_{IN}$	$V = 0\text{V}, f = 1\text{KHz}$		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	$BV_{ECO}$	$I_E = 0.1\text{mA}, I_F = 0\text{mA}$	7			V
Collector-Emitter Dark Current	$I_{CEO}$	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$			100	nA

## IS281

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

#### COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit	
Current transfer ratio	CTR	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$				%	
		IS281	50		600		
		IS281A	80		160		
		IS281B	130		260		
		IS281C	200		400		
		IS281D	300		600		
		IS281E	100		200		
		IS281F	150		300		
		IS281GB	100		600		
		$I_F = 10\text{mA}, V_{CE} = 5\text{V}$					
		IS281H	40		80		
		IS281I	63		125		
		IS281J	100		200		
		IS281K	160		320		
IS281GR	100		300				
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 10\text{mA}, I_C = 1\text{mA}$		0.1	0.2	V	
Floating Capacitance	$C_f$	$V_F = 0\text{V}, f = 1\text{MHz}$		0.3		pF	
Output Rise Time	$t_r$	$V_{CE} = 2\text{V}, I_c = 2\text{mA}, R_L = 100\Omega$		6	18	$\mu\text{s}$	
Output Fall Time	$t_f$	$V_{CE} = 2\text{V}, I_c = 2\text{mA}, R_L = 100\Omega$		6	18	$\mu\text{s}$	

#### ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage	$V_{ISO}$	R.H. = 40% to 60%, $t = 1\text{ min}$ Note 1	3750			$V_{RMS}$
Input - Output Resistance	$R_{I-O}$	$V_{I-O} = 500\text{VDC}$ R.H. = 40% to 60% Note 1	$5 \times 10^{10}$			$\Omega$

Note 1 : Measured with input leads shorted together and output leads shorted together.

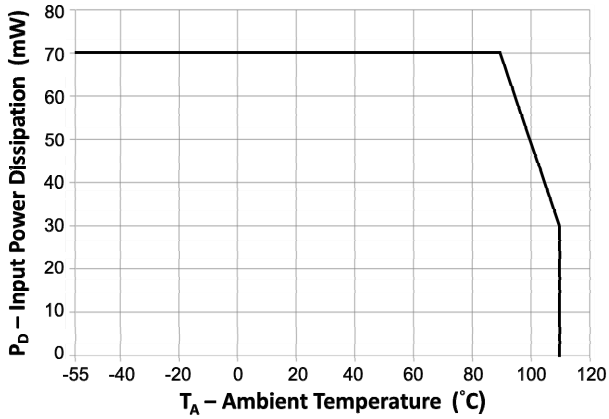


Fig 1 Input Power Dissipation vs Ambient Temperature

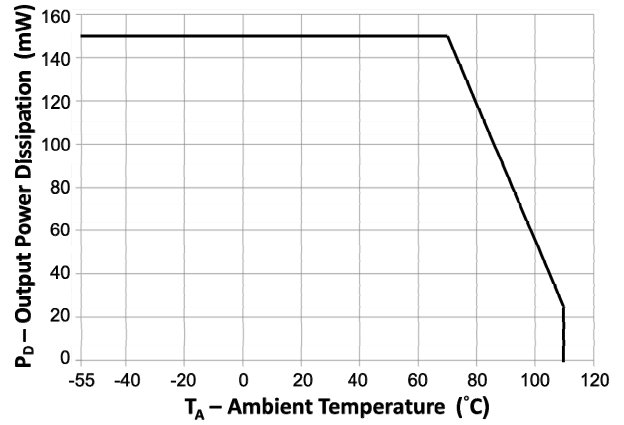


Fig 2 Output Power Dissipation vs Ambient Temperature

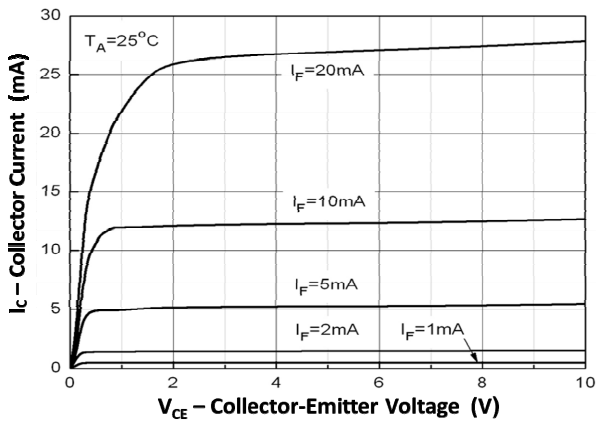


Fig 3 Collector Current vs Collector-Emitter Voltage (1)

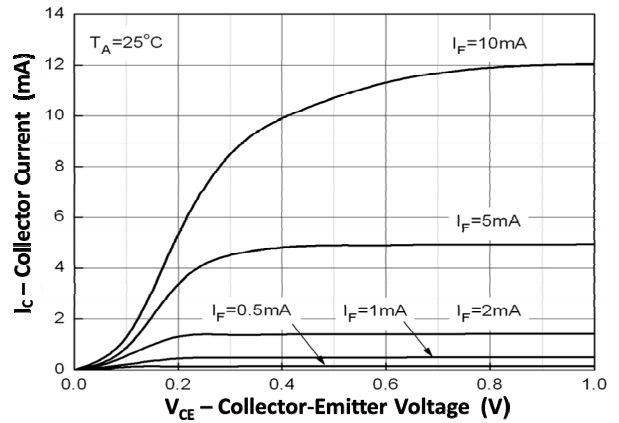


Fig 4 Collector Current vs Collector-Emitter Voltage (2)

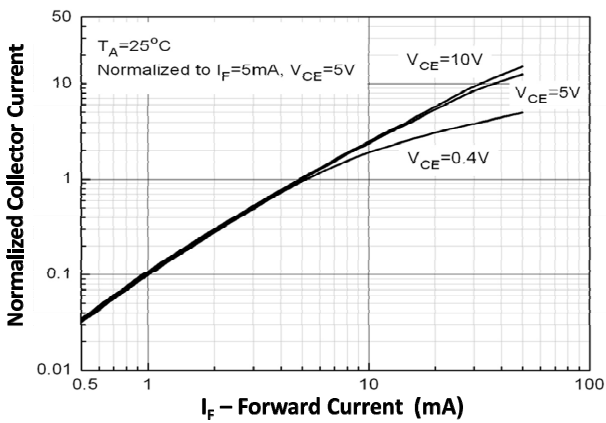


Fig 5 Normalized Collector Current vs Forward Voltage

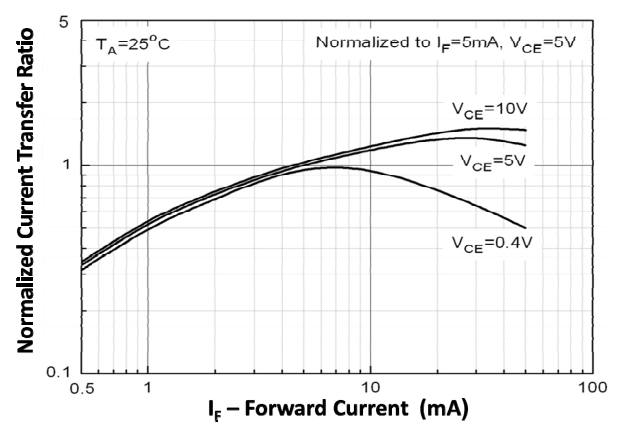


Fig 6 Collector Current Transfer Ratio vs Forward Current

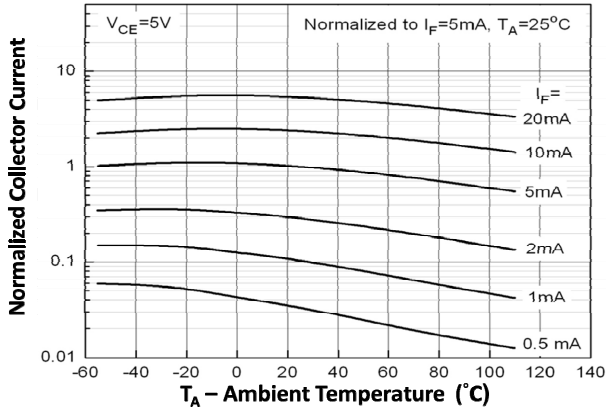


Fig 7 Normalized Collector Current vs Ambient Temperature

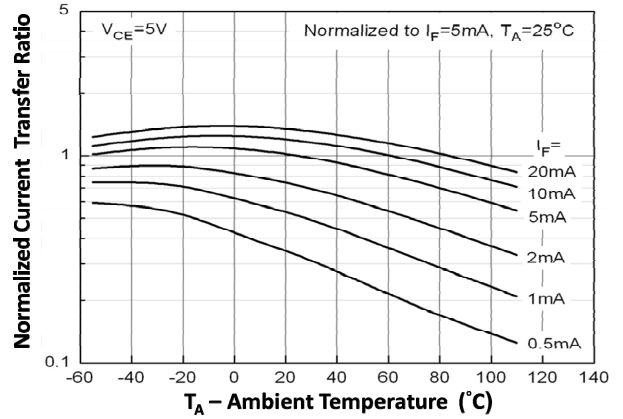


Fig 8 Normalized Current Transfer Ratio vs Ambient Temperature

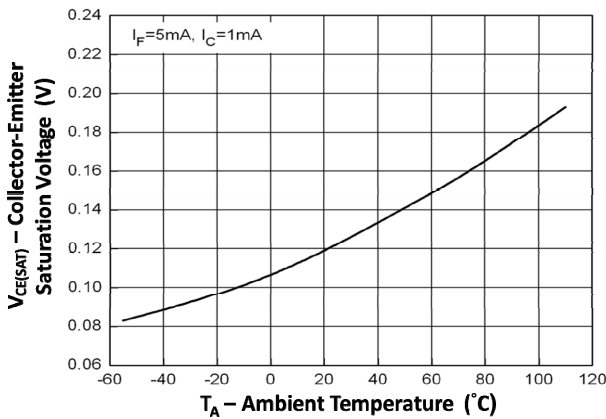


Fig 9 Collector-Emitter Voltage vs Ambient Temperature

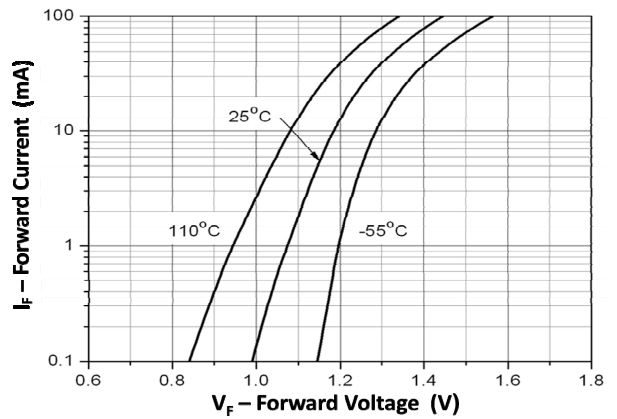


Fig 10 Forward Current vs Forward Voltage

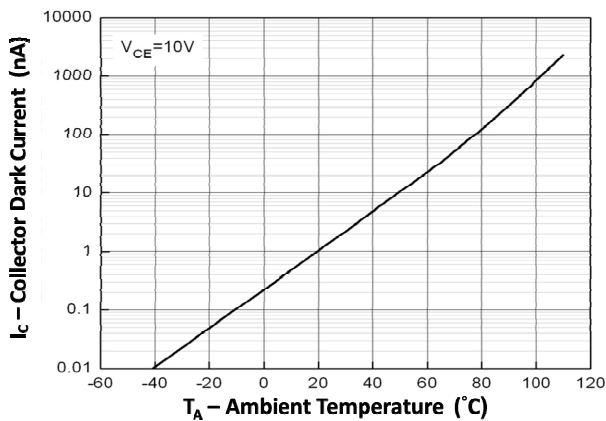


Fig 11 Collector Dark Current vs Ambient Temperature



## IS281

### ORDER INFORMATION

IS281			
After PN	PN	Description	Packing quantity
None	IS281	Surface Mount Tape & Reel	1000 pcs per reel
Any CTR Grade	IS281A, IS281B, IS281C, IS281D, IS281E, IS281F, IS281H, IS281I, IS281J, IS281K, IS281GR, IS281GB	Surface Mount Tape & Reel	1000 pcs per reel

**NOTE : Multiple Grades may be supplied to meet the requested specification**

### DEVICE MARKING



THP\_ denotes Device Part Number where “\_” denotes CTR Grade

I denotes Isocom

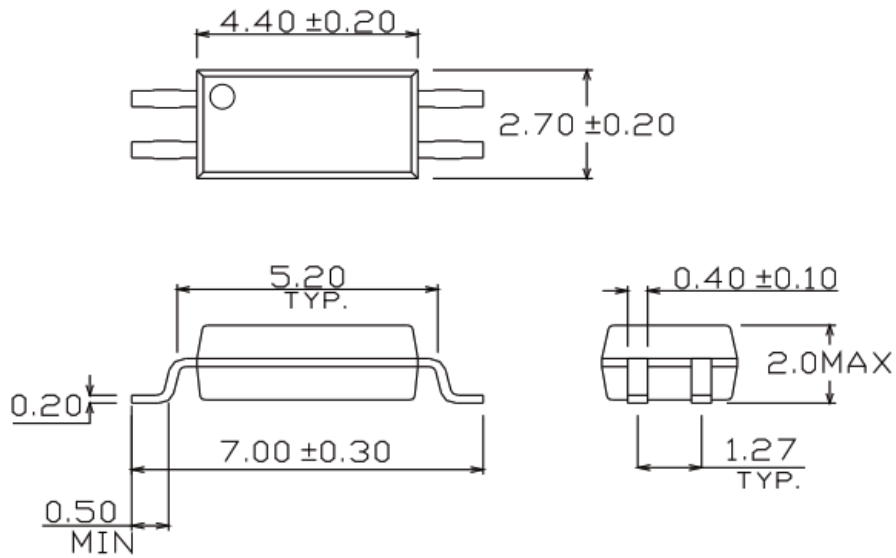
Y denotes 1 digit Year code

WW denotes 2 digit Week code

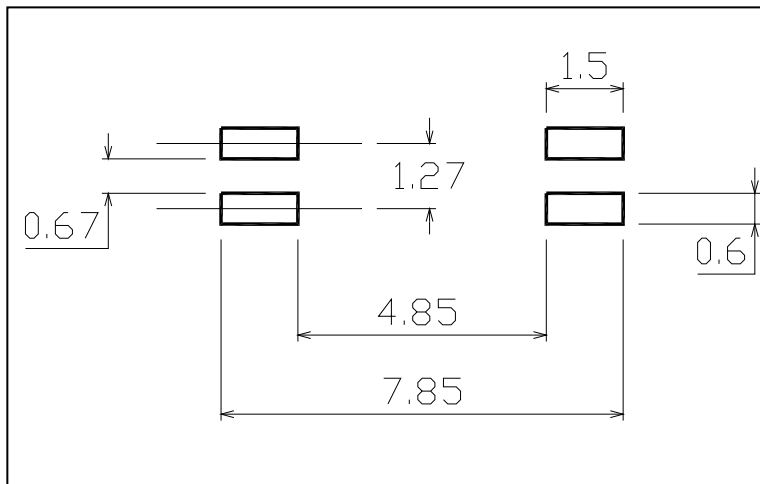
<b>Note :</b>	<b>Device</b>	<b>Optional Marking</b>
	IS281	THP1
	IS281B	THP3
	IS281F	THP10

# IS281

## PACKAGE DIMENSIONS (mm)

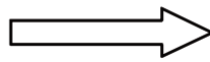
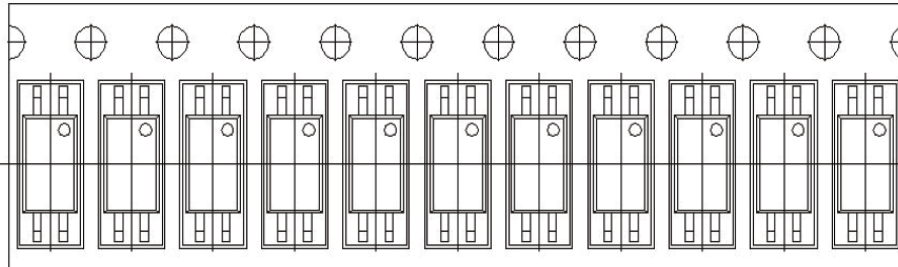


## RECOMMENDED SOLDER PAD LAYOUT (mm)

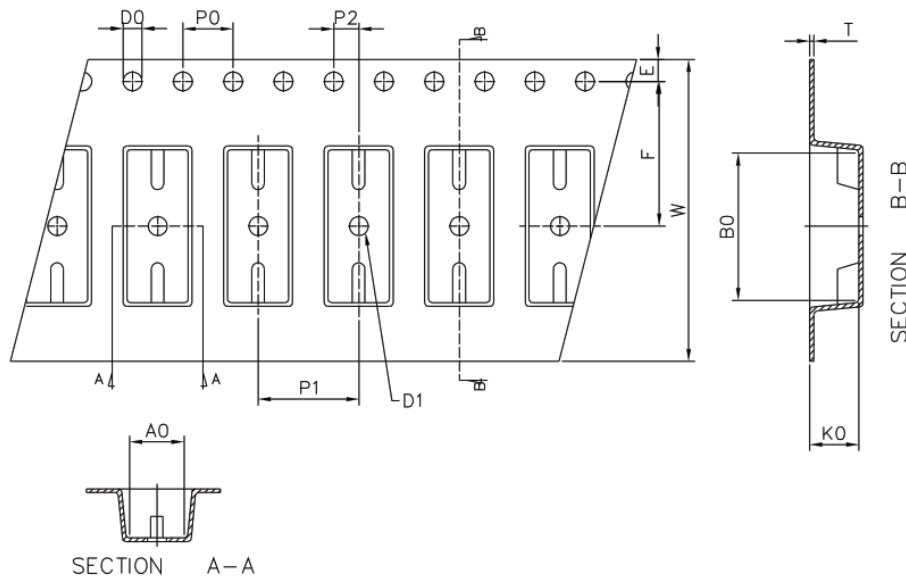




Tape and Reel Packaging



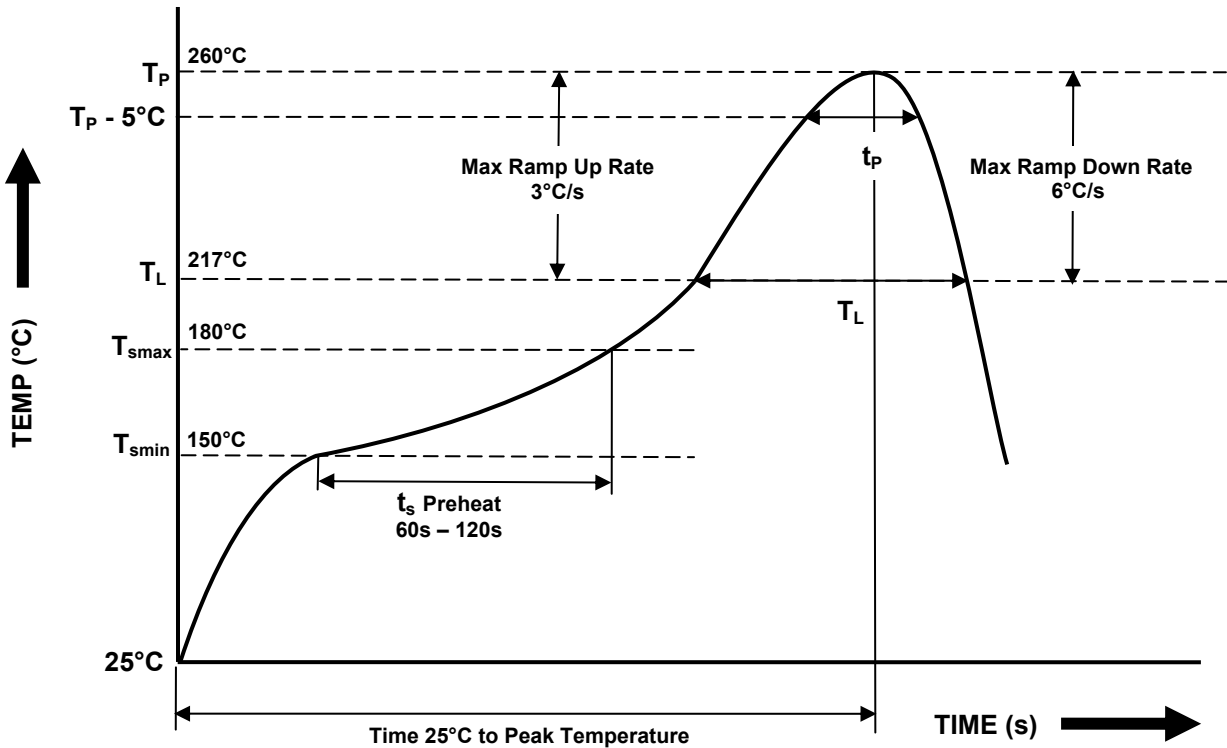
Direction of feed from reel



Dimension No.	<b>A0</b>	<b>B0</b>	<b>D0</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension( mm)	3.00±0.10	7.45±0.10	1.50+0.1/-0	1.50±0.10	1.75±0.10	5.5±0.10
Dimension No.	<b>P0</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K0</b>
Dimension (mm)	4.00±0.15	4.00±0.10	2.00±0.10	0.30±0.05	12.1±0.2	2.45±0.1

**IR REFLOW SOLDERING TEMPERATURE PROFILE**

One Time Reflow Soldering is Recommended.  
Do not immerse device body in solder paste.



Profile Details	Conditions
<b>Preheat</b> - Min Temperature (T <sub>SMIN</sub> ) - Max Temperature (T <sub>SMAX</sub> ) - Time T <sub>SMIN</sub> to T <sub>SMAX</sub> (t <sub>s</sub> )	150°C 180°C 60s - 120s
<b>Soldering Zone</b> - Peak Temperature (T <sub>P</sub> ) - Liquidous Temperature (T <sub>L</sub> ) - Time within 5°C of Actual Peak Temperature (T <sub>P</sub> - 5°C) - Time maintained above T <sub>L</sub> (t <sub>L</sub> ) - Ramp Up Rate (T <sub>L</sub> to T <sub>P</sub> ) - Ramp Down Rate (T <sub>P</sub> to T <sub>L</sub> )	260°C 217°C 20s 60s 3°C/s max 3 - 6°C/s
Average Ramp Up Rate (T <sub>smax</sub> to T <sub>P</sub> )	3°C/s max
Time 25°C to Peak Temperature	8 minutes max



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