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.

FEATURES

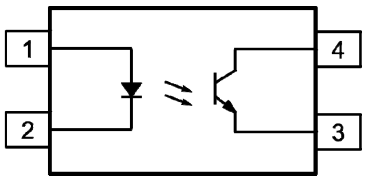
- Half Pitch 1.27mm
- High AC Isolation voltage 3750V_{RMS}
- CTR Selections Available
- Wide Operating Temperature Range -55°C to 110°C
- Pb Free and RoHS Compliant
- UL Approval E91231, Model “THP”

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



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
Reverse Voltage	6V
Power dissipation	70mW

Output

Collector to Emitter Voltage BV_{CEO}	80V
Emitter to Collector Voltage BV_{ECO}	7V
Collector Current	50mA
Power Dissipation	150mW

Total Package

Isolation Voltage	3750V_{RMS}
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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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

INPUT

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

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector-Emitter Breakdown Voltage	BV_{CEO}	I_C = 0.1mA, I_F =0 mA	80			V
Emitter-Collector Breakdown Voltage	BV_{ECO}	I_E = 0.1mA, I_F = 0mA	7			V
Collector-Emitter Dark Current	I_{CEO}	V_{CE} = 20V, I_F = 0mA			100	nA

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current transfer ratio	CTR	I_F = 5mA, V_{CE} = 5V				%
		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 = 10mA, V_{CE} = 5V				
		IS281H	40		80	
		IS281I	63		125	
		IS281J	100		200	
		IS281K	160		320	
		IS281GR	100		300	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = 10mA, I_C = 1mA		0.1	0.2	V
Floating Capacitance	C_f	V_F = 0V, f = 1MHz		0.3		pF
Output Rise Time	t_r	V_{CE} = 2V, Ic = 2mA, R_L = 100Ω		6	18	µs
Output Fall Time	t_f	V_{CE} = 2V, Ic = 2mA, R_L = 100Ω		6	18	µs

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage	V_{ISO}	R.H. = 40% to 60%, t = 1 min Note 1	3750			V_{RMS}
Input - Output Resistance	R_{I-O}	V_{I-O} = 500VDC R.H. = 40% to 60% Note 1	$5x10^{10}$			Ω

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

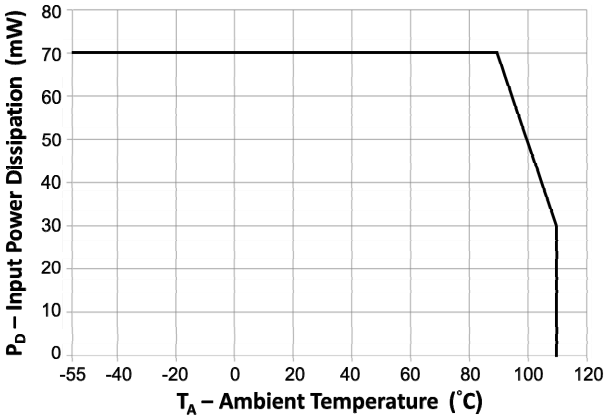


Fig 1 Input Power Dissipation vs Ambient Temperature

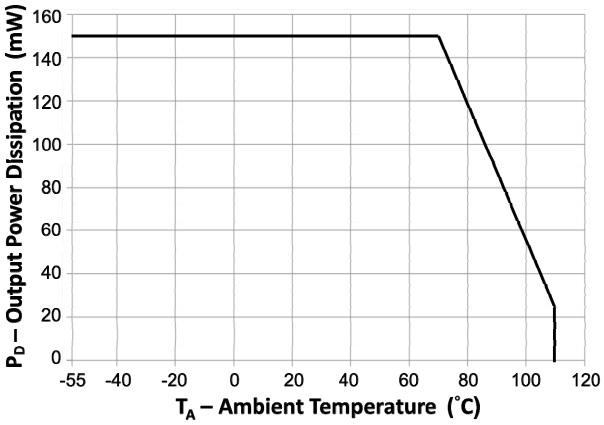


Fig 2 Output Power Dissipation vs Ambient Temperature

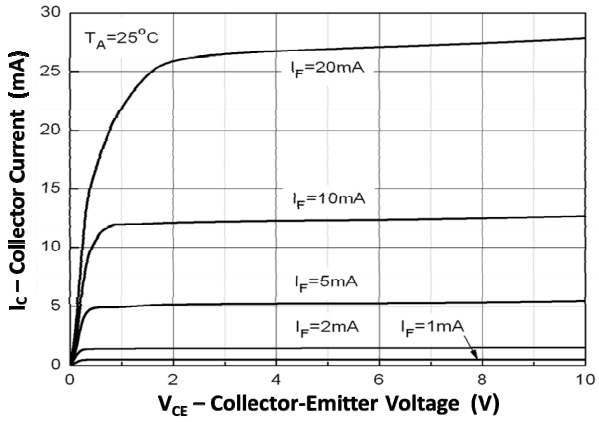


Fig 3 Collector Current vs Collector-Emitter Voltage (1)

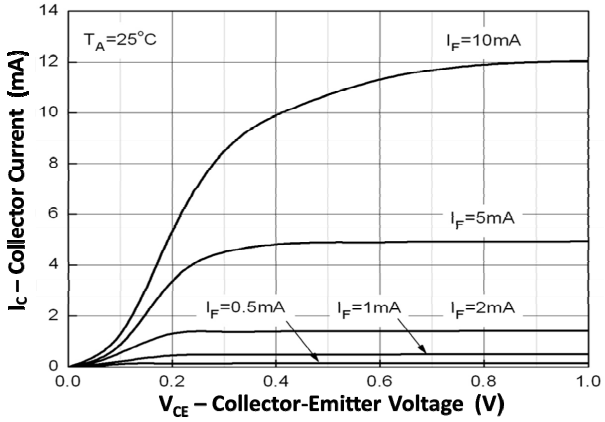


Fig 4 Collector Current vs Collector-Emitter Voltage (2)

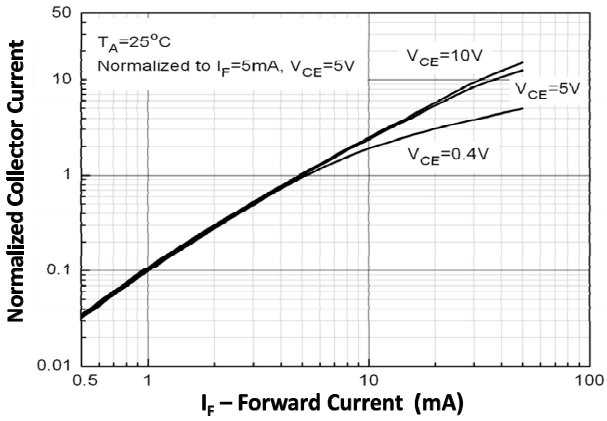


Fig 5 Normalized Collector Current vs Forward Voltage

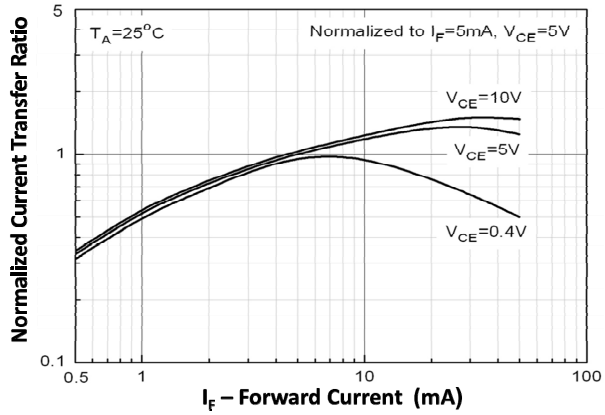


Fig 6 Collector Current Transfer Ratio vs Forward Current

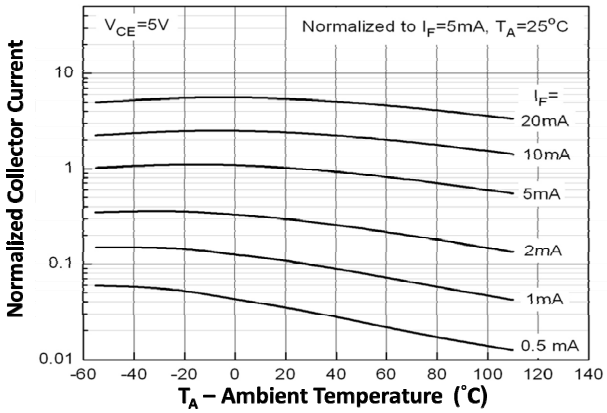


Fig 7 Normalized Collector Current vs Ambient Temperature

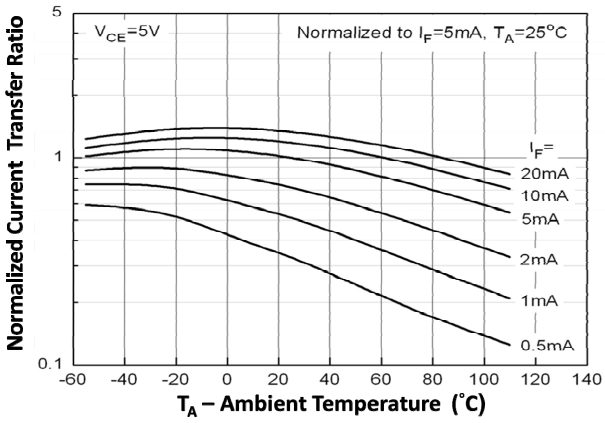


Fig 8 Normalized Current Transfer Ratio vs Ambient Temperature

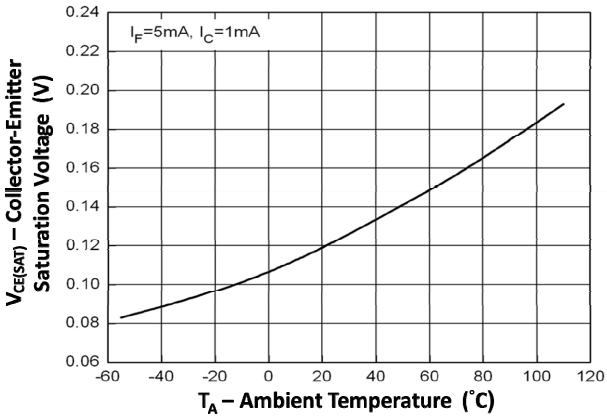


Fig 9 Collector-Emitter Voltage vs Ambient Temperature

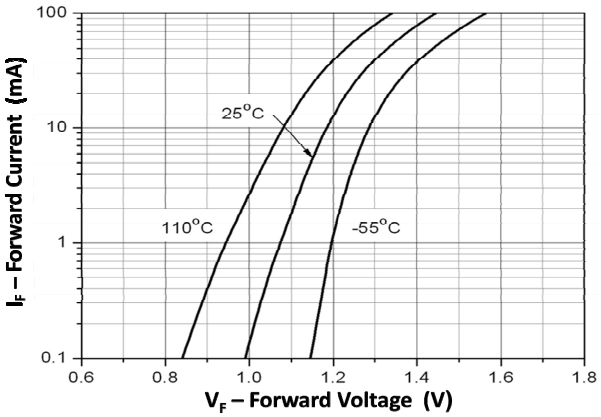


Fig 10 Forward Current vs Forward Voltage

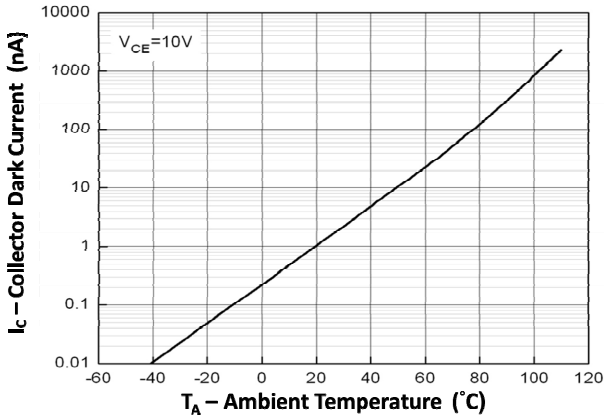


Fig 11 Collector Dark Current vs Ambient Temperature

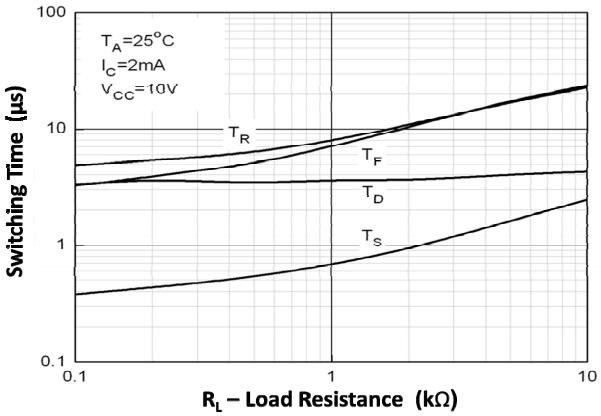
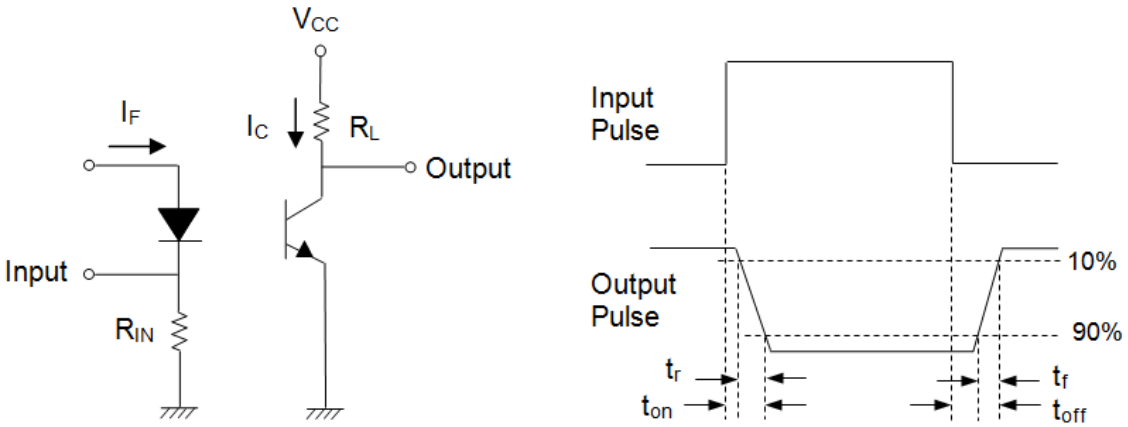


Fig 12 Switching Time vs Load Resistance



Switching Time Test Circuit

ORDER INFORMATION

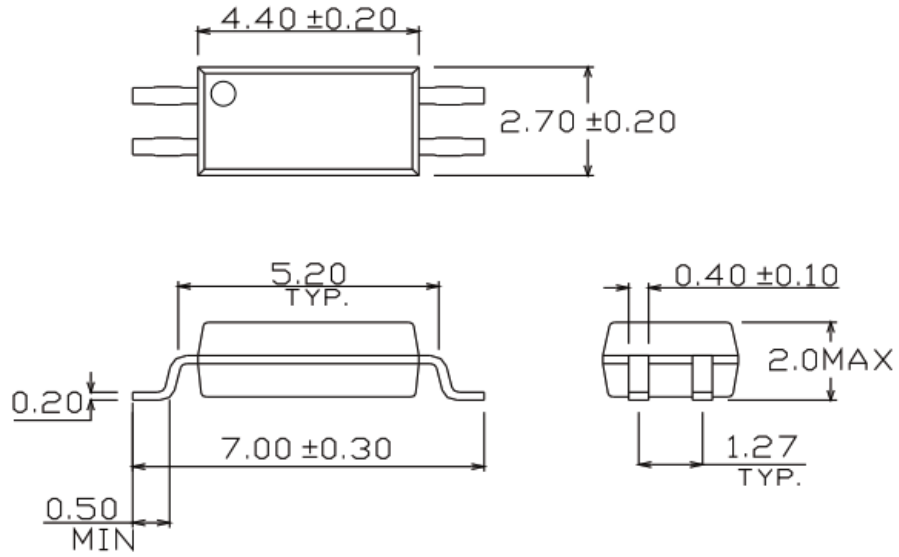
IS281			
After PN	**PN**	**Description**	**Packing quantity**
None	IS281	Surface Mount Tape & Reel	1000 pcs per reel
Any CTR Grade	IS281A, IS281B, IS281C, IS281D, IS281E, IS281F, IS281H, IS281I, IS281J, IS281K, IS281GR, IS281GB	Surface Mount Tape & Reel	1000 pcs per reel
NOTE : Multiple Grades may be supplied to meet the requested specification			

DEVICE MARKING

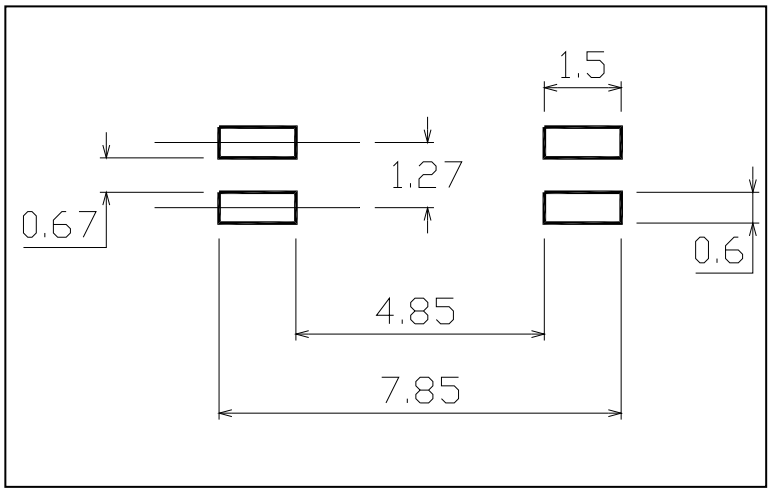
THP_	denotes Device Part Number where "_" denotes CTR Grade
I	denotes Isocom
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code

Note :	**Device**	**Optional Marking**
	IS281	THP1
	IS281B	THP3
	IS281F	THP10

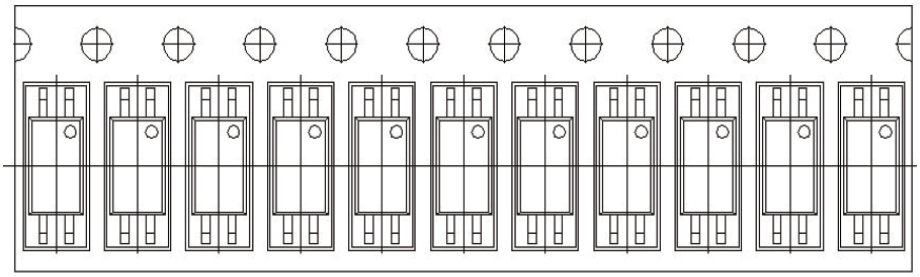
PACKAGE DIMENSIONS (mm)



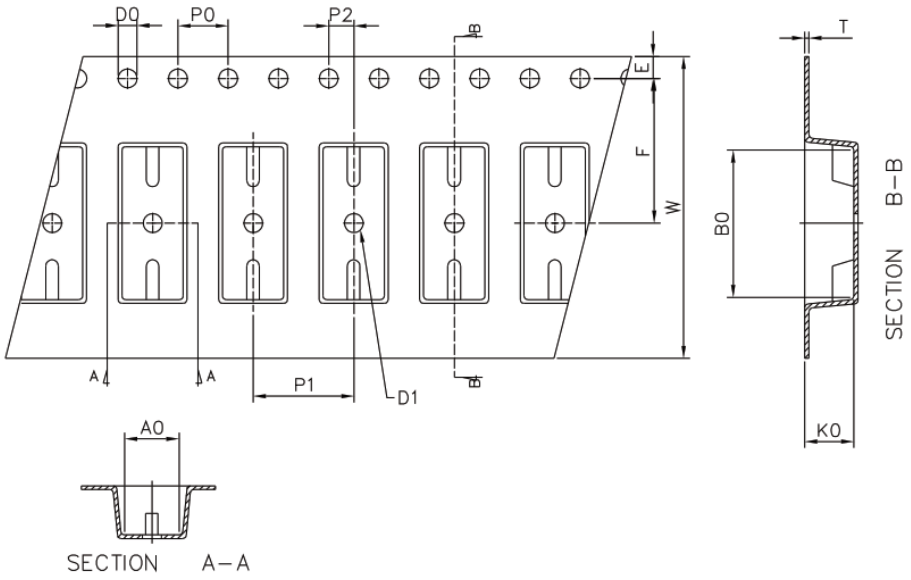
RECOMMENDED SOLDER PAD LAYOUT (mm)



Tape and Reel Packaging



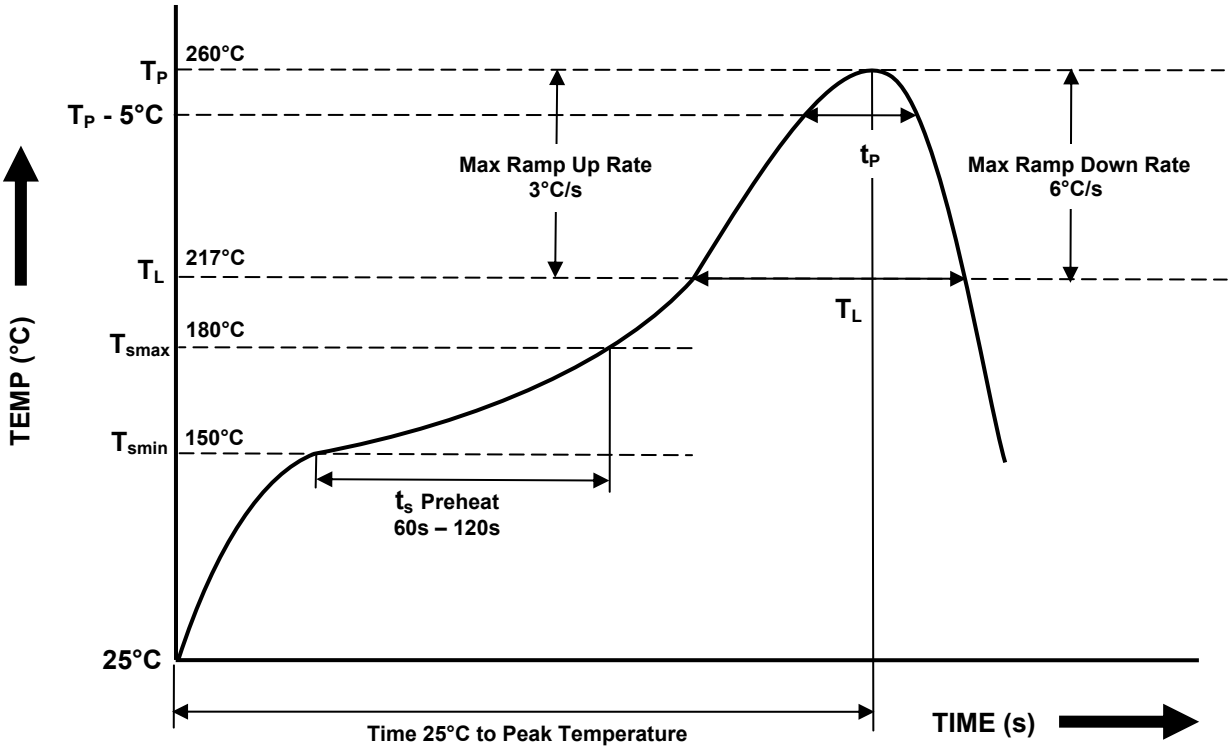
Direction of feed from reel



Dimension No.	A0	B0	D0	D1	E	F
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.	P0	P1	P2	t	W	K0
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
Preheat	
- Min Temperature (T_{SMIN})	150°C
- Max Temperature (T_{SMAX})	180°C
- Time T_{SMIN} to T_{SMAX} (t_s)	60s - 120s
Soldering Zone	
- Peak Temperature (T_P)	260°C
- Liquidous Temperature (T_L)	217°C
- Time within 5°C of Actual Peak Temperature (T_P – 5°C)	20s
- Time maintained above T_L (t_L)	60s
- Ramp Up Rate (T_L to T_P)	3°C/s max
- Ramp Down Rate (T_P to T_L)	3 - 6°C/s
Average Ramp Up Rate (T_{smax} to T_P)	3°C/s max
Time 25°C to Peak Temperature	8 minutes max

ISOCOM COMPONENTS

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