

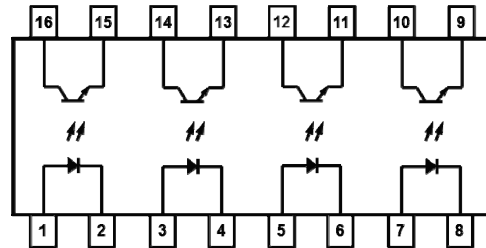
IS281- 4, IS281- 4GB



DESCRIPTION

The IS281-4 and IS281-5GB are four channel optical isolators with each channel consists of an infrared emitting diode optically coupled to an NPN silicon photo transistor.

These devices belong to Isocom Compact Range of Optocouplers.



FEATURES

- Half Pitch 1.27mm
- High AC Isolation voltage 3000V_{RMS}
- Wide Operating Temperature Range -55°C to 110°C
- Pb Free and RoHS Compliant
- UL Approval E91231 Package Code "THP4"

APPLICATIONS

- Hybrid Substrates with High Density Mounting
- Industrial System Controllers
- Measuring Instruments
- System Appliances

ORDER INFORMATION

- Available in Tape and Reel with 2000pcs per reel

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

Output Current	50mA
Collector to Emitter Voltage BV _{CEO}	80V
Emitter to Collector Voltage BV _{ECO}	7V
Power Dissipation	100mW

Total Package

Isolation Voltage	3000V _{RMS}
Total Power Dissipation	170mW
Operating Temperature	-55 to 110 °C
Storage Temperature	-55 to 150 °C
Lead Soldering Temperature (10s)	260°C

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IS281- 4, IS281- 4GB

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 _t	V _F = 0V, f = 1KHz		30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector-Emitter Breakdown Voltage	BV _{CEO}	I _F = 0, I _C = 0.1mA	80			V
Emitter-Collector Breakdown Voltage	BV _{ECO}	I _F = 0, I _E = 10μA	7			V
Collector-Emitter Dark Current	I _{CEO}	I _F = 0, V _{CE} = 48V			100	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	I _F = 5mA, V _{CE} = 5V IS281-4 IS281-4GB	50 100		600 600	%
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _F = 8mA, I _C = 2.4mA			0.4	V
Floating Capacitance	C _f	V _{CE} = 0V, f = 1MHz		0.6	1	pF
Output Rise Time	t _r	V _{CE} = 10V, I _c = 2mA, R _L = 100Ω		2	18	μs
Output Fall Time	t _f			3	18	
Turn-On Time	t _{ON}			3		
Turn-Off Time	t _{OFF}			3		
Turn-On Time	t _{ON}	V _{CE} = 5V, I _c = 16mA, R _L = 1.9kΩ		2		
Turn-Off Time	t _{OFF}			40		
Storage Time	t _s			25		

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input to Output Isolation Voltage	V _{ISO}	RH = 40% - 60%, t = 1 min Note 1	3000			V _{RMS}
Input to Output Isolation Resistance	R _{ISO}	RH = 40% - 60%, V _{IO} = 500V Note 1	5x10 ¹⁰	1x10 ¹¹		Ω

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

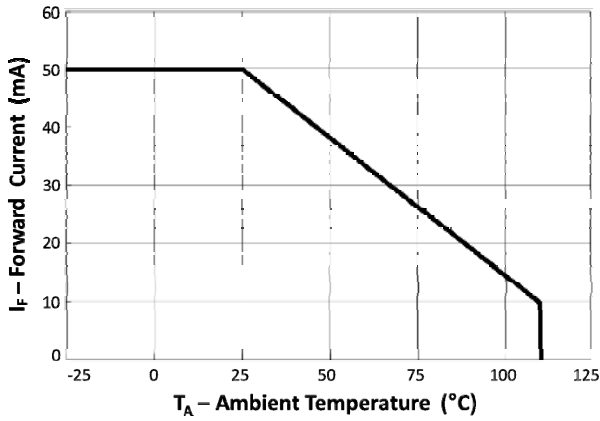


Fig 1 Forward Current vs T_A

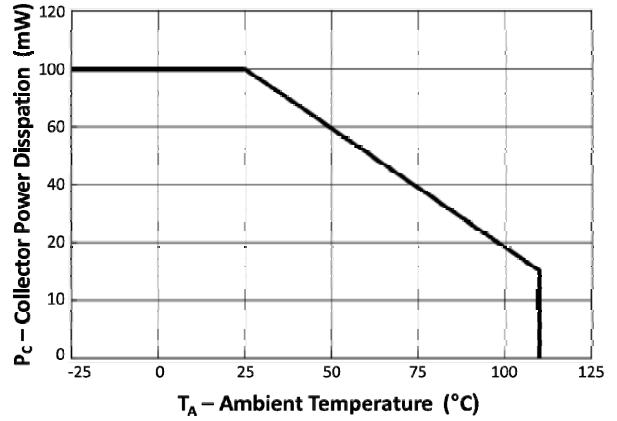


Fig 2 Collector Power Dissipation vs T_A

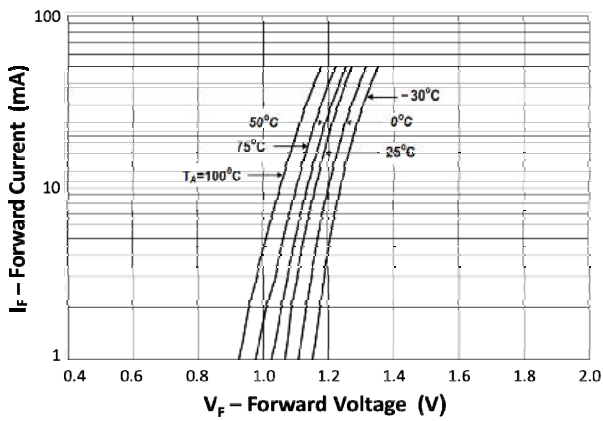


Fig 3 Forward Current vs Forward Voltage

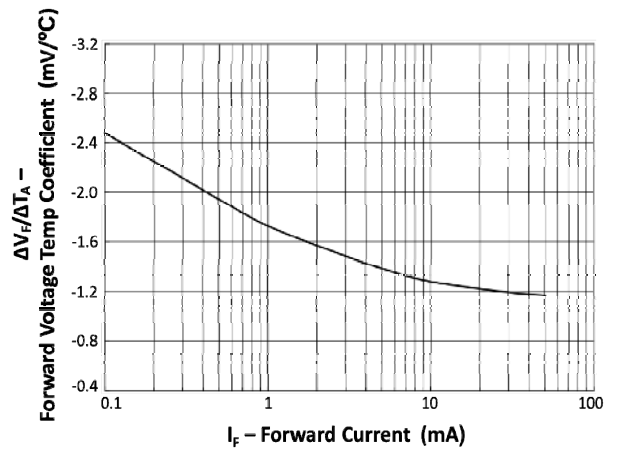


Fig 4 Forward Current Temperature Coefficient vs Forward Current

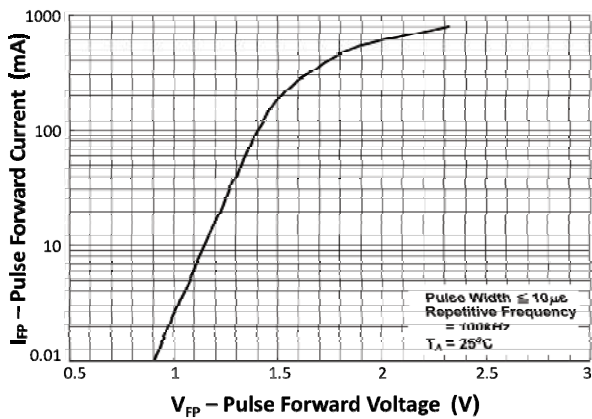


Fig 5 Pulse Forward Current vs Pulse Forward Voltage

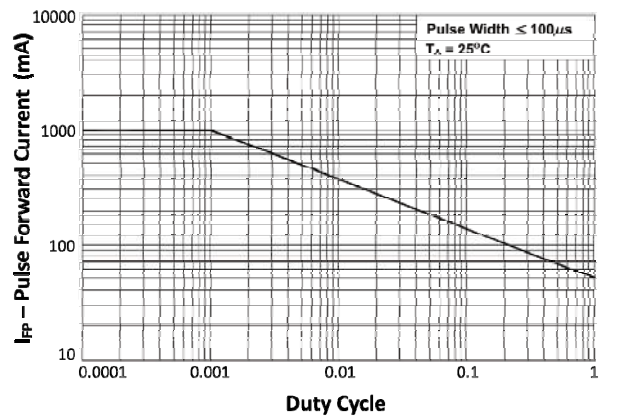


Fig 6 Pulse Forward Current vs Duty Cycle

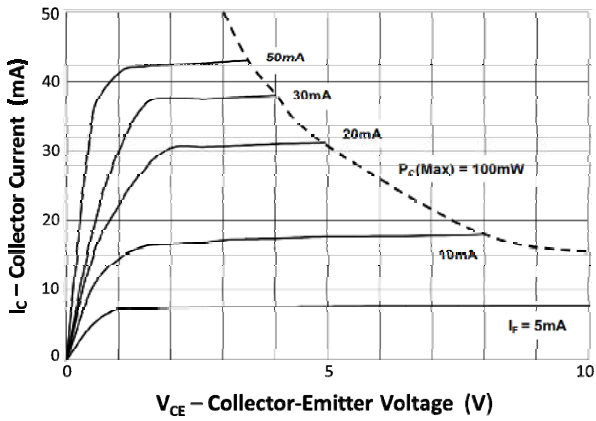


Fig 7 Collector Current vs Collector-Emitter Voltage

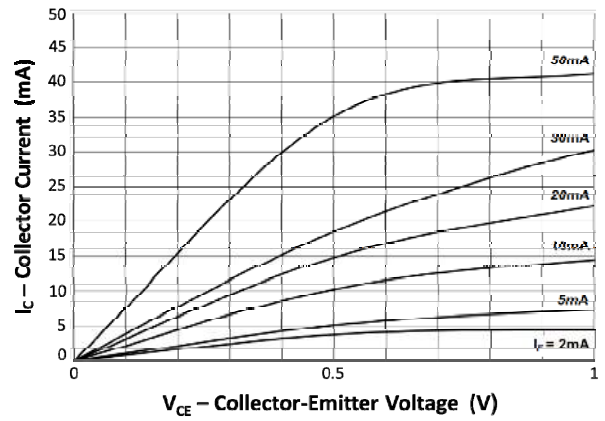


Fig 8 Collector Current vs Low Collector-Emitter Voltage

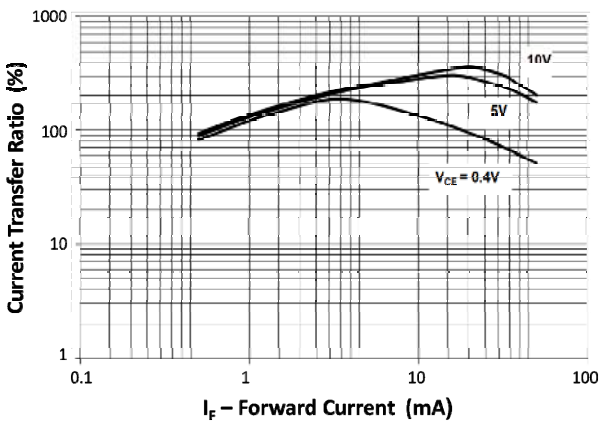


Fig 9 Current Transfer Ratio vs Forward Current

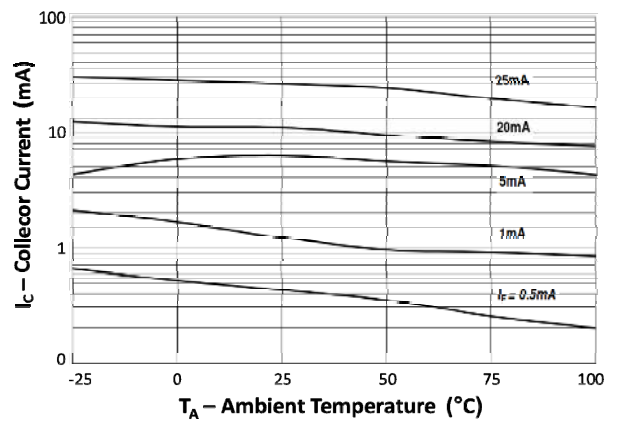


Fig 10 Collector Current vs T_A

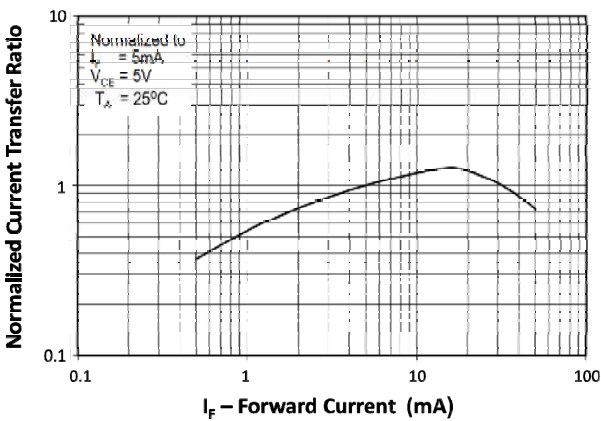


Fig 11 Normalized Current Transfer Ratio vs Forward Current

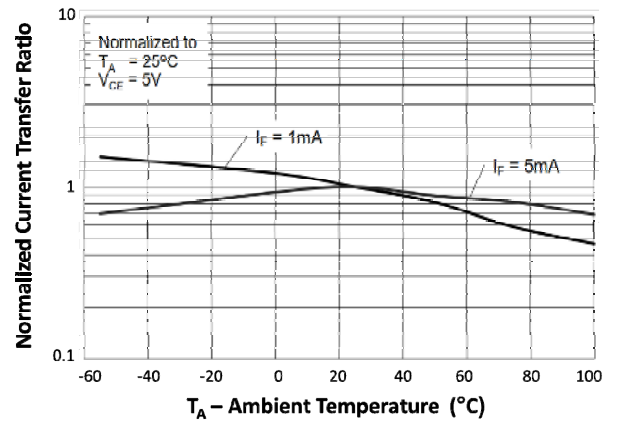


Fig 12 Normalized Current Transfer Ratio vs T_A

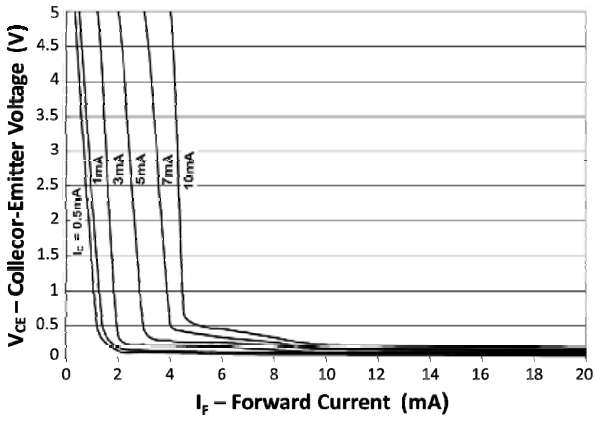


Fig 13 Collector-Emitter Voltage vs Forward Current

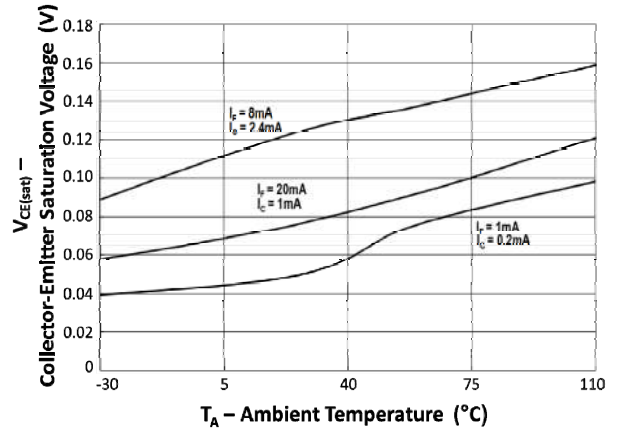


Fig 14 Collector-Emitter Saturation Voltage vs T_A

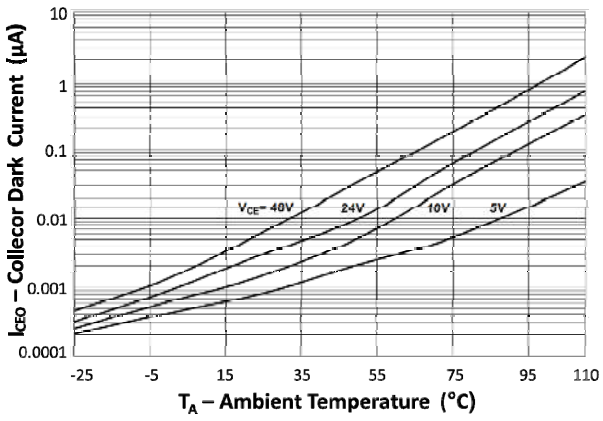


Fig 15 Collector Dark Current vs T_A

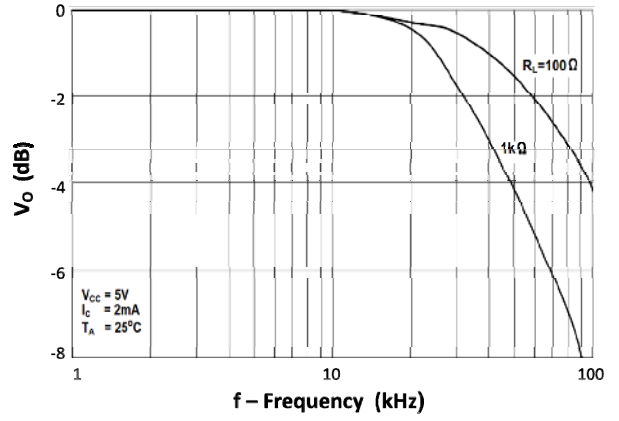


Fig 16 Frequency Response

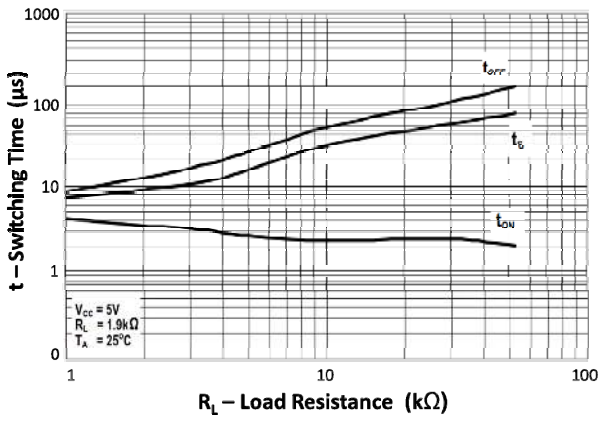


Fig 17 Switching Time vs Load Resistance

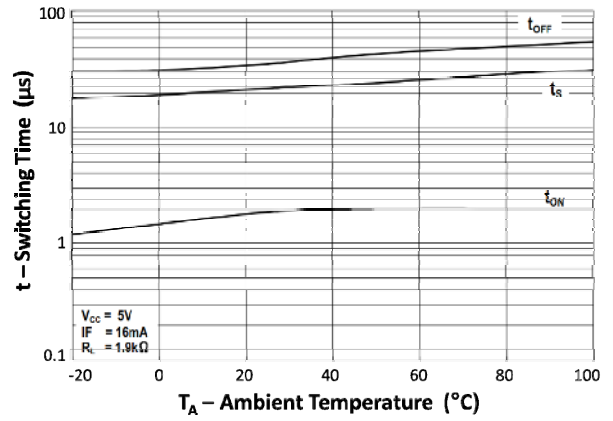
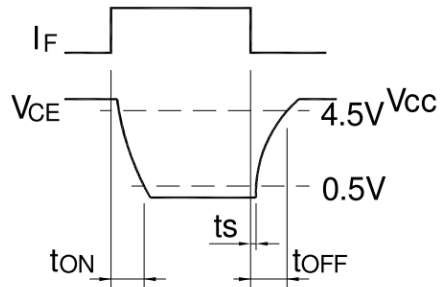
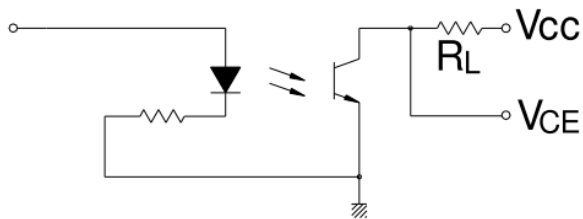


Fig 18 Switching Time vs TA



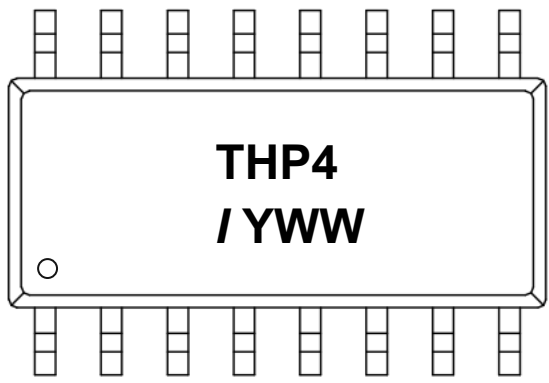
Switching Time Test Circuit

ORDER INFORMATION

UL Approval			
After PN	PN	Description	Packing quantity
None	IS281-4, IS281-4GB	Surface Mount Tape & Reel	2000 pcs per reel

DEVICE MARKING

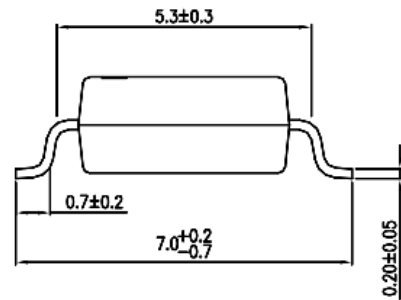
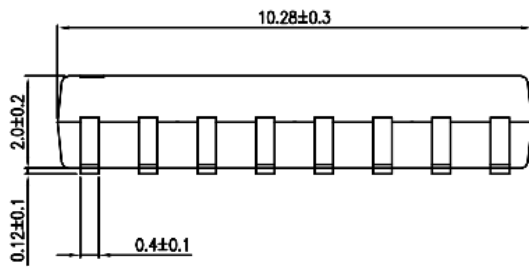
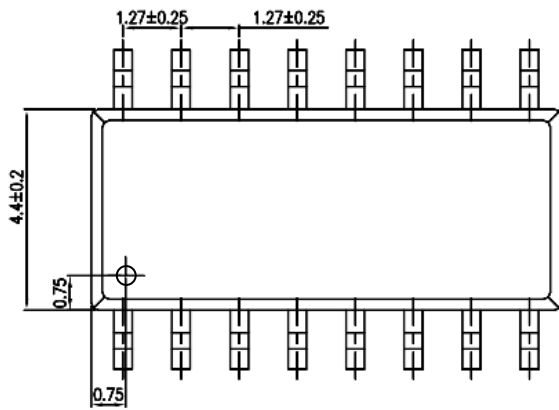
Example : IS281-4



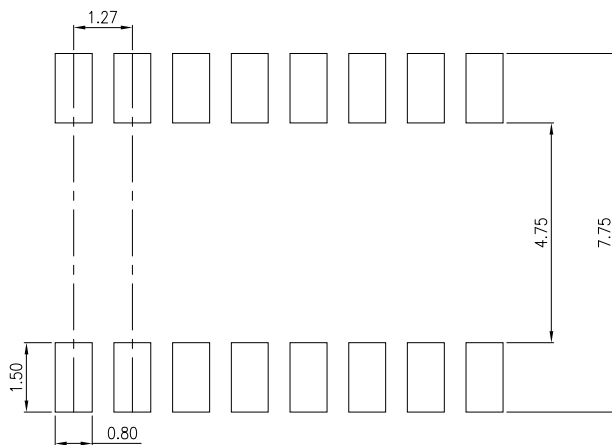
- THP4 denotes Device Part Number
- / denotes Isocom
- Y denotes 1 digit Year code
- WW denotes 2 digit Week code

IS281- 4, IS281- 4GB

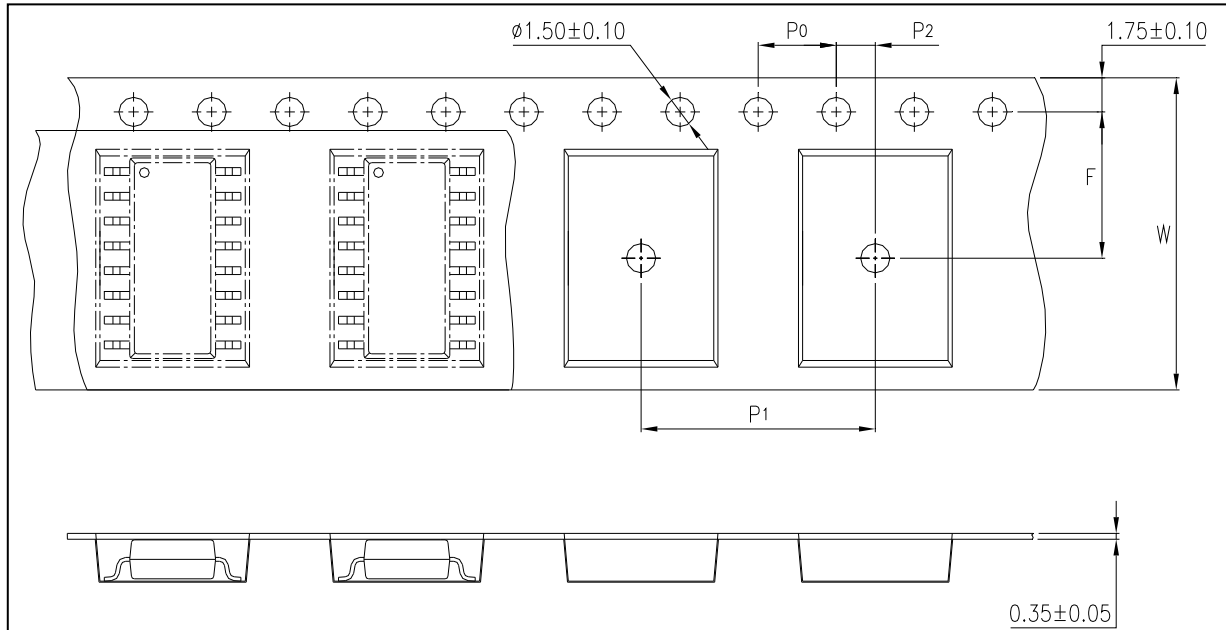
PACKAGE DIMENSIONS (mm)



RECOMMENDED SOLDER PAD LAYOUT (mm)



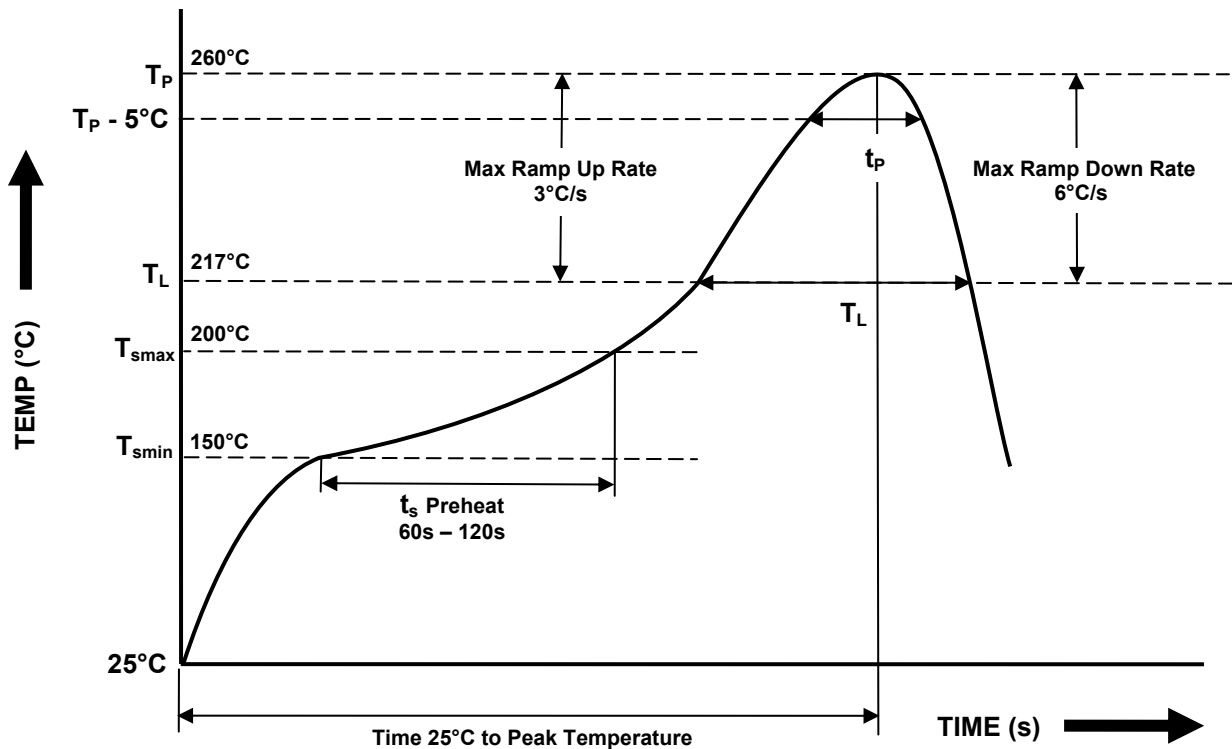
TAPE AND REEL PACKAGING



Description	Symbol	Dimension mm (inch)
Tape Width	W	16 ± 0.3 (0.63)
Pitch of Sprocket Holes	P ₀	4 ± 0.1 (0.15)
Distance of Compartment to Sprocket Holes	F	7.5 ± 0.1 (0.295)
	P ₂	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P ₁	12 ± 0.1 (0.47)



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}) - 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 ($T_P - 5^\circ C$) - 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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