

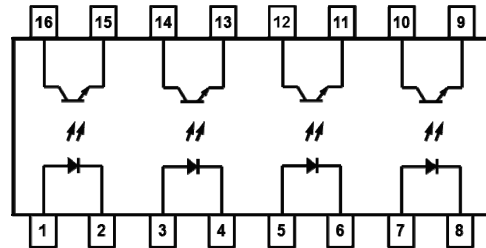
IS281- 4, IS281- 4GB



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 ($T_A = 25^\circ\text{C}$ 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	μA
Terminal Capacitance	C_t	$V_F = 0\text{V}, f = 1\text{KHz}$		30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector-Emitter Breakdown Voltage	BV_{CEO}	$I_F = 0, I_C = 0.1\text{mA}$	80			V
Emitter-Collector Breakdown Voltage	BV_{ECO}	$I_F = 0, I_E = 10\mu\text{A}$	7			V
Collector-Emitter Dark Current	I_{CEO}	$I_F = 0, V_{CE} = 48\text{V}$			100	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	$I_F = 5\text{mA}, V_{CE} = 5\text{V}$ IS281-4 IS281-4GB	50 100		600 600	%
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 8\text{mA}, I_C = 2.4\text{mA}$			0.4	V
Floating Capacitance	C_f	$V_{CE} = 0\text{V}, f = 1\text{MHz}$		0.6	1	pF
Output Rise Time	t_r	$V_{CE} = 10\text{V},$ $I_C = 2\text{mA},$ $R_L = 100\Omega$		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}	$V_{CE} = 5\text{V},$ $I_C = 16\text{mA},$ $R_L = 1.9\text{k}\Omega$		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}	$RH = 40\% - 60\%, t = 1 \text{ min}$ Note 1	3000			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	$RH = 40\% - 60\%, V_{IO} = 500\text{V}$ Note 1	5×10^{10}	1×10^{11}		Ω

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

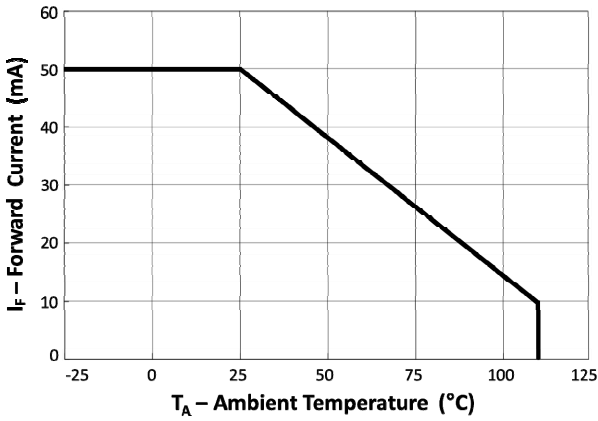


Fig 1 Forward Current vs T_A

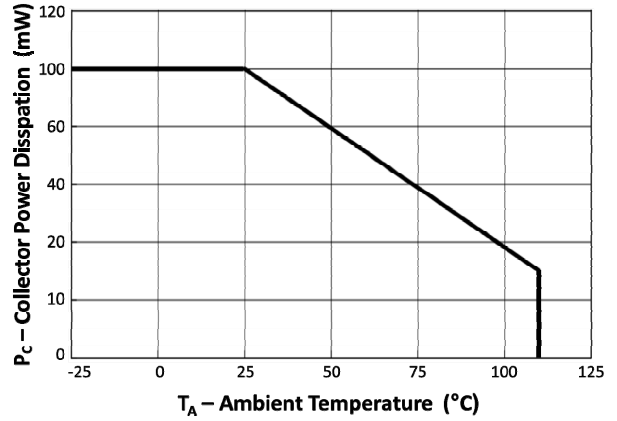


Fig 2 Collector Power Dissipation vs T_A

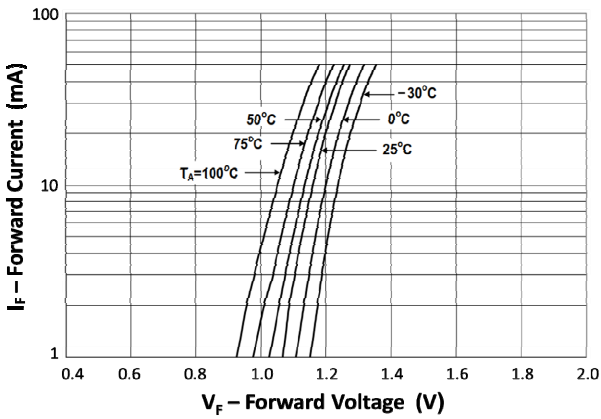


Fig 3 Forward Current vs Forward Voltage

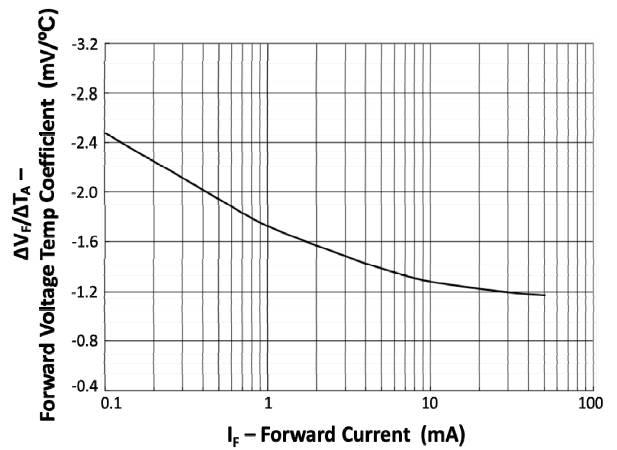


Fig 4 Forward Current Temperature Coefficient vs Forward Current

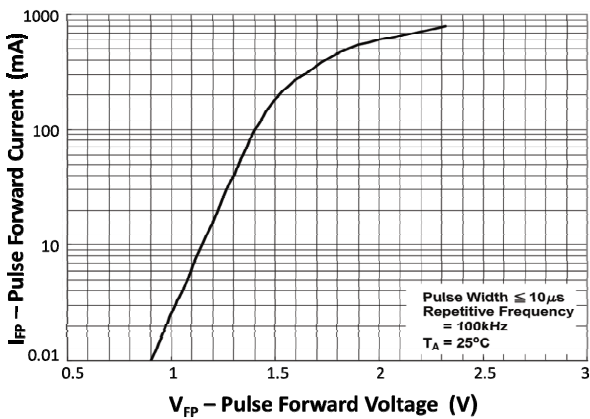


Fig 5 Pulse Forward Current vs Pulse Forward Voltage

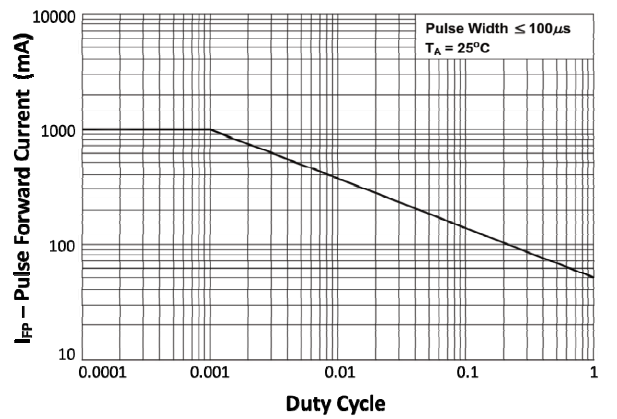


Fig 6 Pulse Forward Current vs Duty Cycle

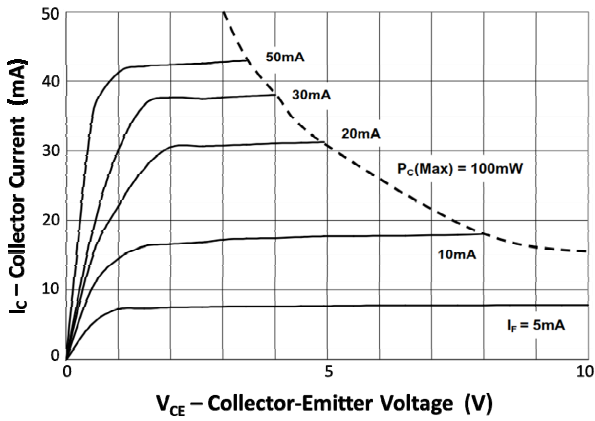


Fig 7 Collector Current vs Collector-Emittor Voltage

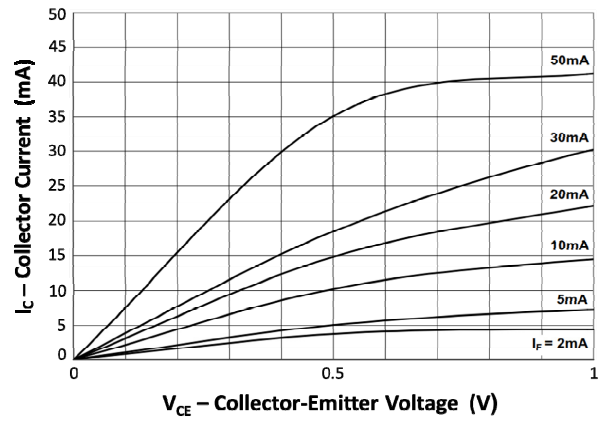


Fig 8 Collector Current vs Low Collector-Emittor Voltage

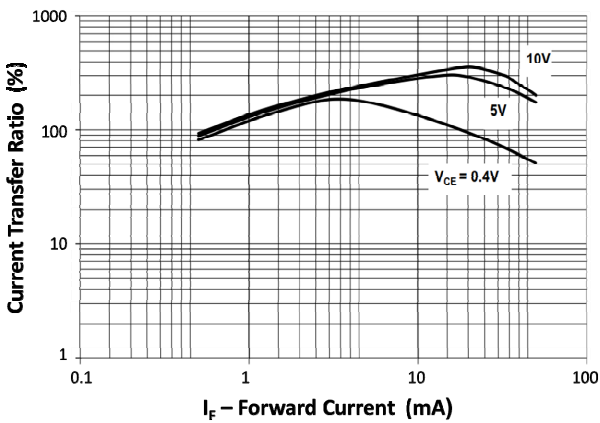


Fig 9 Current Transfer Ratio vs Forward Current

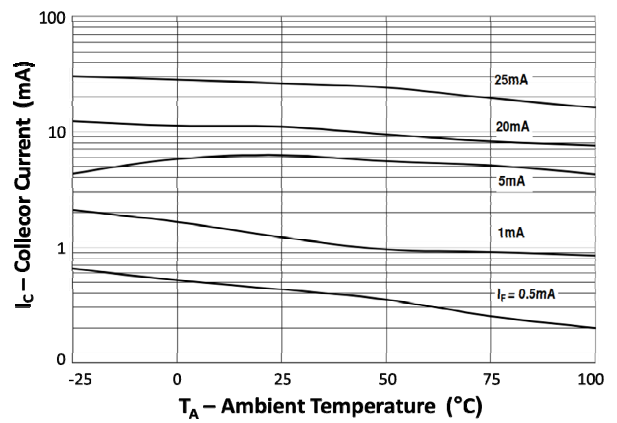


Fig 10 Collector Current vs T_A

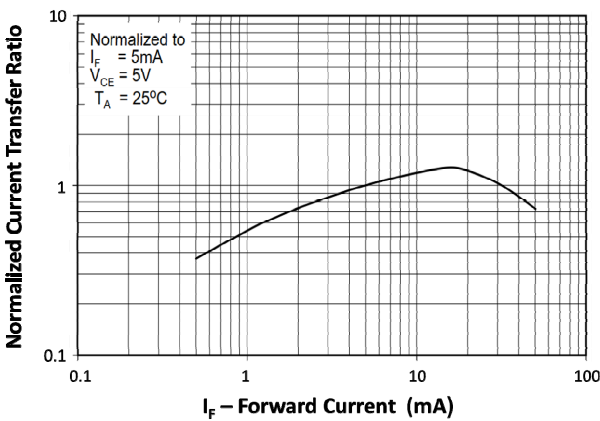


Fig 11 Normalized Current Transfer Ratio vs Forward Current

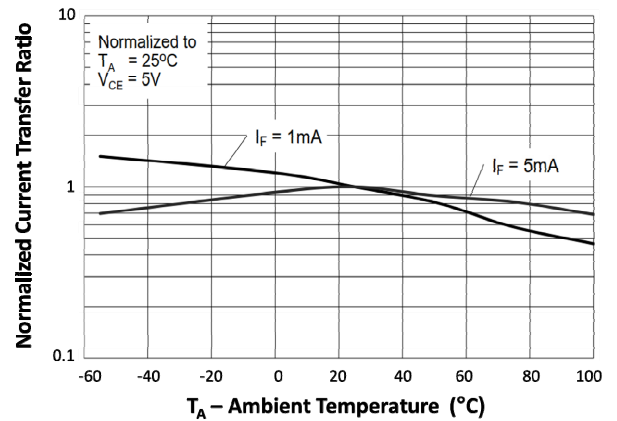


Fig 12 Normalized Current Transfer Ratio vs T_A

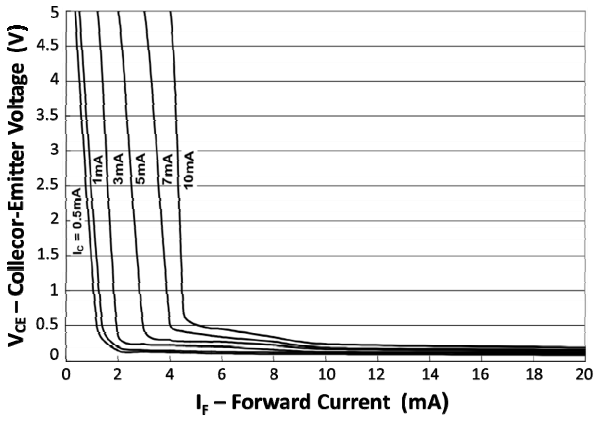


Fig 13 Collector-Emitter Voltage vs Forward Current

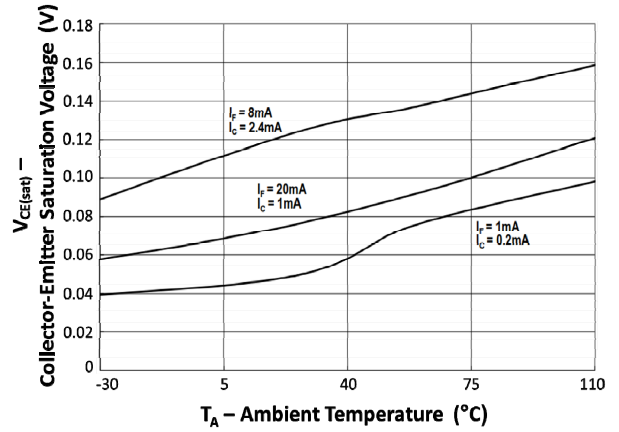


Fig 14 Collector-Emitter Saturation Voltage vs T_A

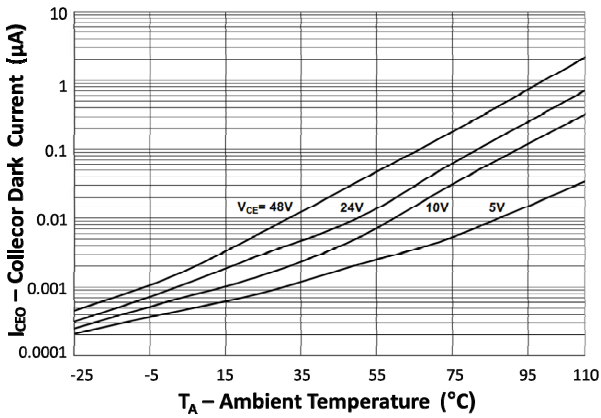


Fig 15 Collector Dark Current vs T_A

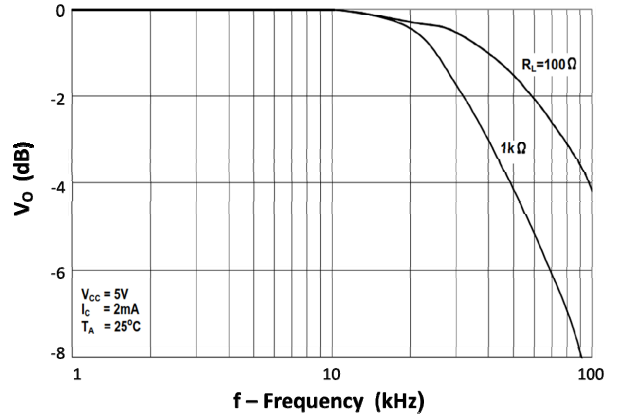


Fig 16 Frequency Response

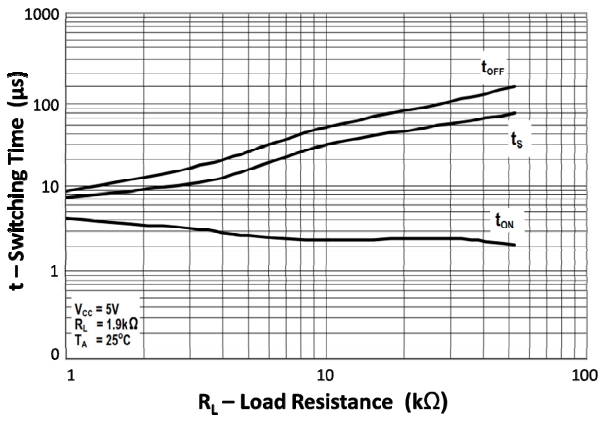


Fig 17 Switching Time vs Load Resistance

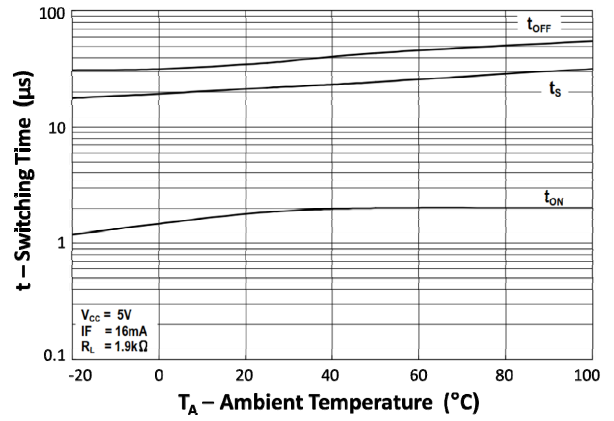
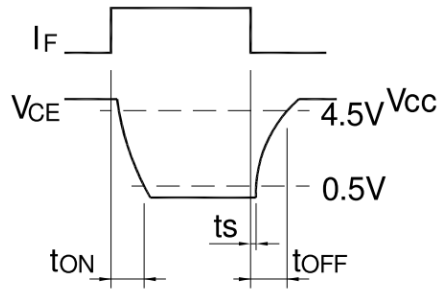
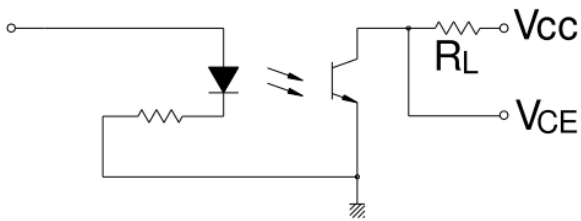


Fig 18 Switching Time vs T_A



Switching Time Test Circuit

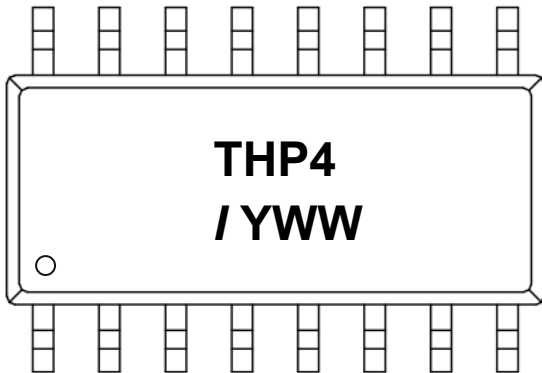
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ORDER INFORMATION

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

DEVICE MARKING

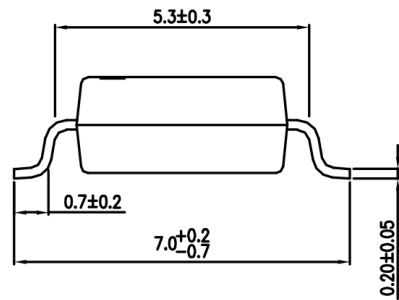
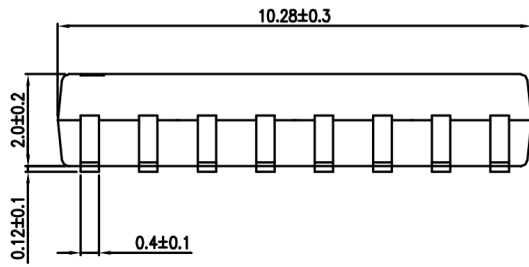
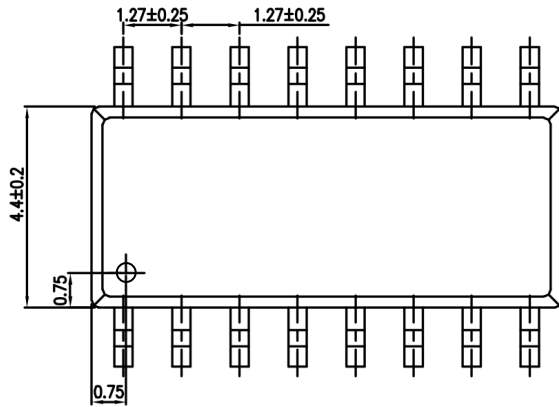
Example : IS281-4



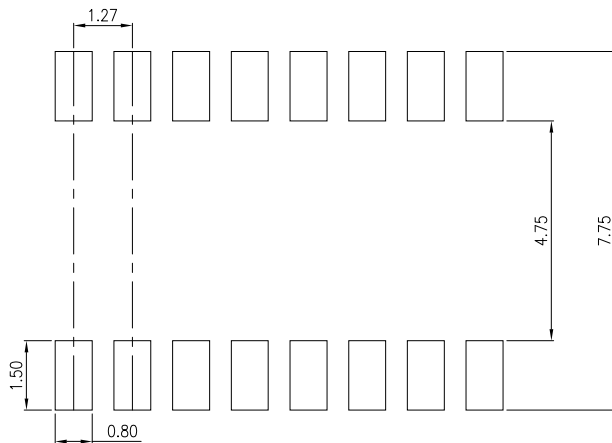
THP4 denotes Device Part Number
 / denotes Isocom
 Y denotes 1 digit Year code
 WW denotes 2 digit Week code

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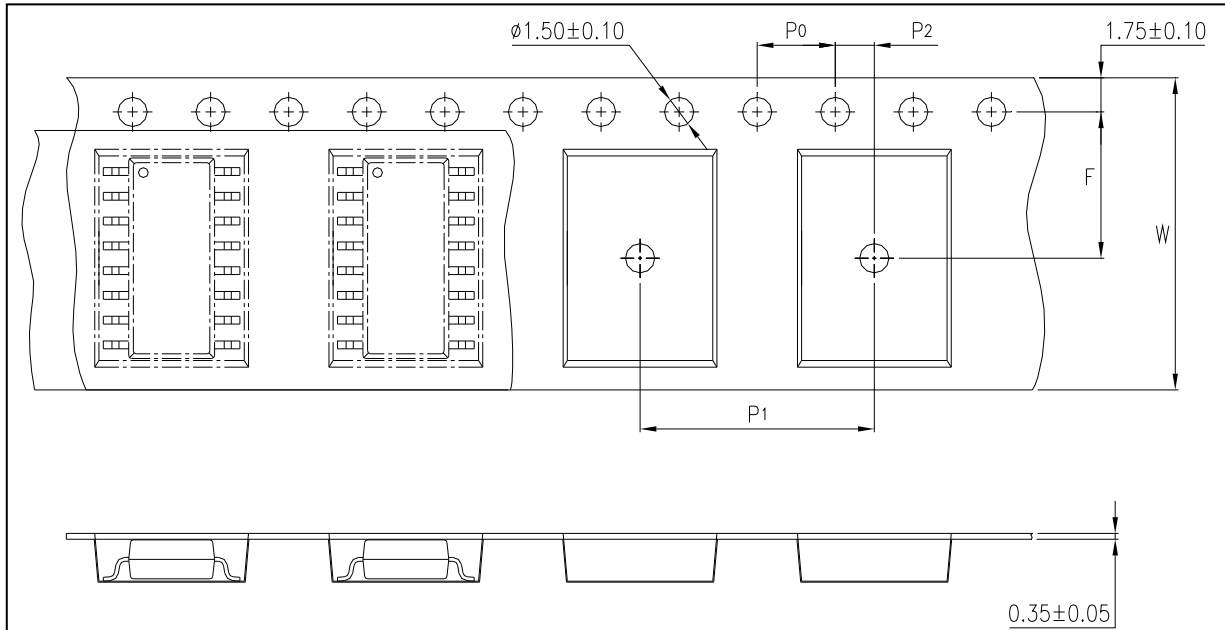
PACKAGE DIMENSIONS (mm)



RECOMMENDED SOLDER PAD LAYOUT (mm)

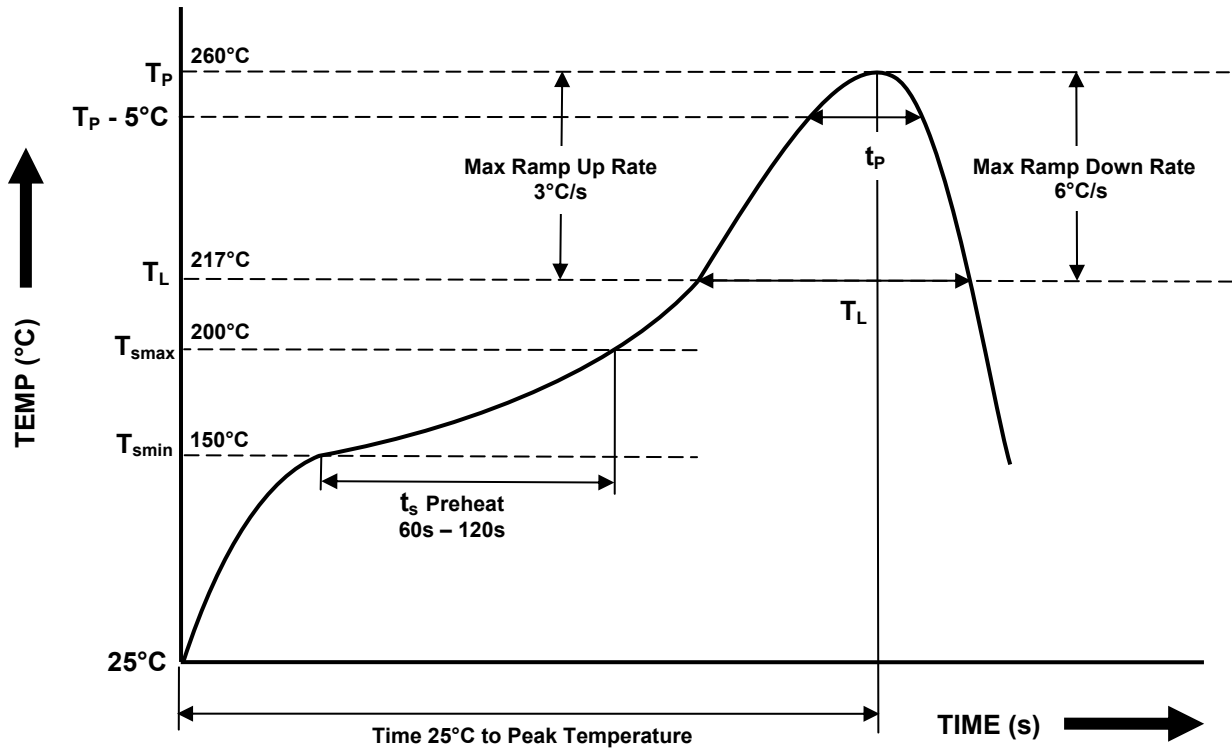


TAPE AND REEL PACKAGING



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°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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