

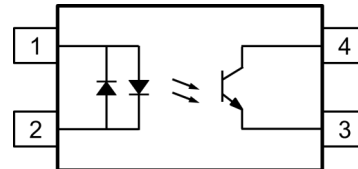
IS3H4



DESCRIPTION

The IS3H4 is an optically coupled isolator consists of two infrared emitting diodes in reverse parallel connection and optically coupled to an NPN silicon photo transistor.

This device belongs to Isocom Compact Range of Optocouplers.



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

FEATURES

- Half Pitch 1.27mm
- High AC Isolation voltage $3750V_{RMS}$
- Wide Operating Temperature Range $-55^{\circ}C$ to $100^{\circ}C$
- RoHS Compliant
- UL Approval E91231, Model "AHP"

APPLICATIONS

- Telephone Line Interface
- Programmable Controllers
- Measuring Instruments
- AC Line Monitor

ORDER INFORMATION

- Available in Tape and Reel with 1000pcs per reel

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^{\circ}C$)

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	$\pm 50mA$
Peak Forward Current ($t=10\mu s$)	1A
Power Dissipation	70mW
No Derating required up to $T_A = 100^{\circ}C$	

Output

Collector to Emitter Voltage V_{CEO}	80V
Emitter to Collector Voltage V_{ECO}	6V
Power Dissipation	150mW
Power Dissipation Derating Factor (above $T_A = 80^{\circ}C$)	$3.7mW/^{\circ}C$

Total Package

Isolation Voltage	$3750V_{RMS}$
Total Power Dissipation	200mW
Operating Temperature	-55 to $100^{\circ}C$
Storage Temperature	-55 to $125^{\circ}C$
Lead Soldering Temperature (10s)	$260^{\circ}C$

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

INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	V_F	$I_F = \pm 20\text{mA}$		1.2	1.4	V
Input Capacitance	C_{IN}	$V = 0\text{V}, f = 1\text{kHz}$		50	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}	$I_E = 0.01\text{mA}, I_F = 0\text{mA}$	6			V
Collector-Emitter Dark Current	I_{CEO}	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$			100	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current Transfer Ratio	CTR	$I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$	20		300	%
CTR Symmetry		$I_F = \pm 1\text{mA}, V_{CE} = 5\text{V}$	0.5		2.0	
Collector – Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = \pm 20\text{mA}, I_C = 1\text{mA}$		0.1	0.2	V
Floating Capacitance	C_f	$V_{IO} = 0, f = 1\text{MHz}$		0.6	1.0	pF
Output Rise Time	t_r	$V_{CE} = 2\text{V},$ $I_C = 2\text{mA},$ $R_L = 100\Omega$			18	μs
Output Fall Time	t_f				18	

ISOLATION

Parameter	Symbol	Test Condition	Min	*Typ.	Max	Unit
Input to Output Isolation Voltage	V_{ISO}	AC 1 minute, RH = 40% to 60% Note 1	3750			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	$V_{IO} = 500\text{Vdc}$, RH = 40% to 60% Note 1	5×10^{10}	1×10^{11}		Ω

Note 1 : Measured with input leads shorted together and output leads shorted together, R.H 40% to 60%

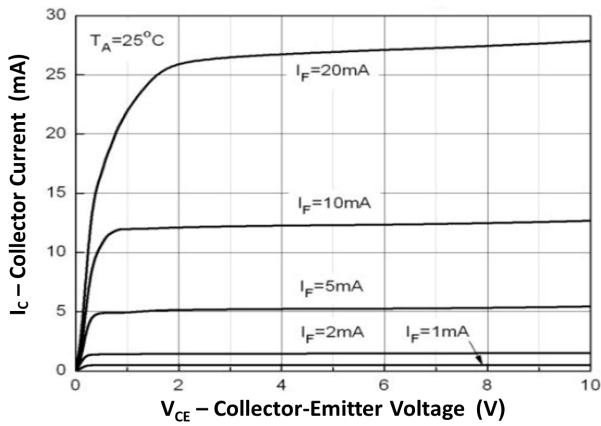


Fig 1 Collector Current vs Collector-Emitter Voltage (1)

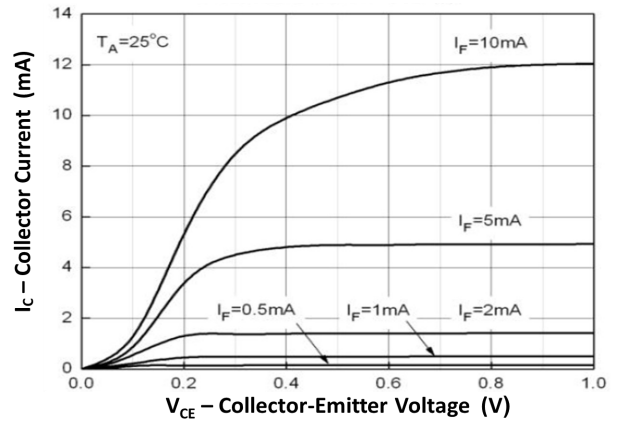


Fig 2 Collector Current vs Collector-Emitter Voltage (2)

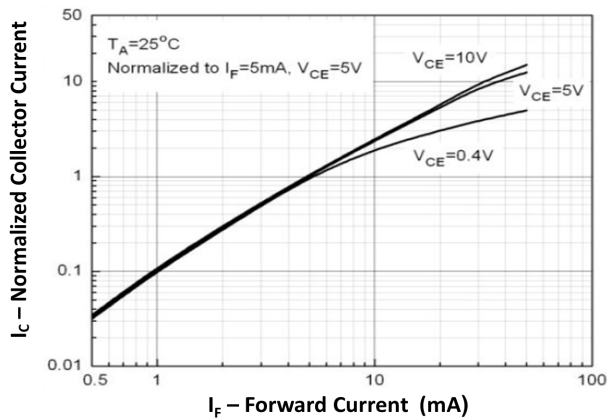


Fig 3 Normalized Collector Current vs Forward Current

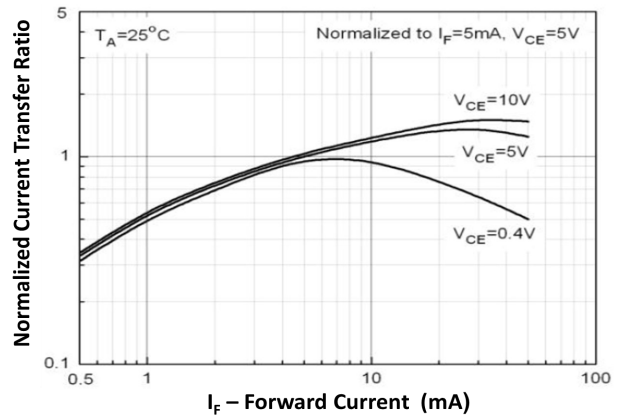


Fig 4 Normalized Current Transfer Ratio vs Forward Current

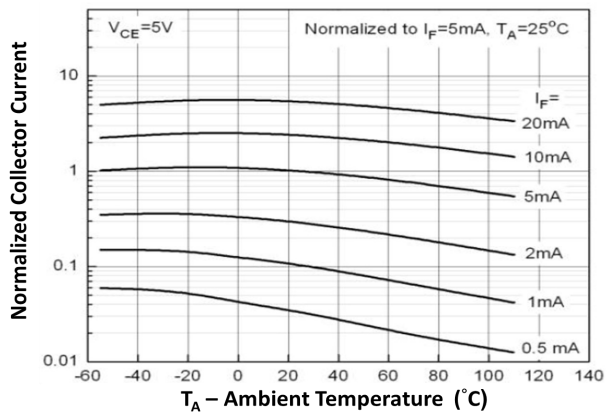


Fig 5 Normalized Collector Current vs Ambient Temperature

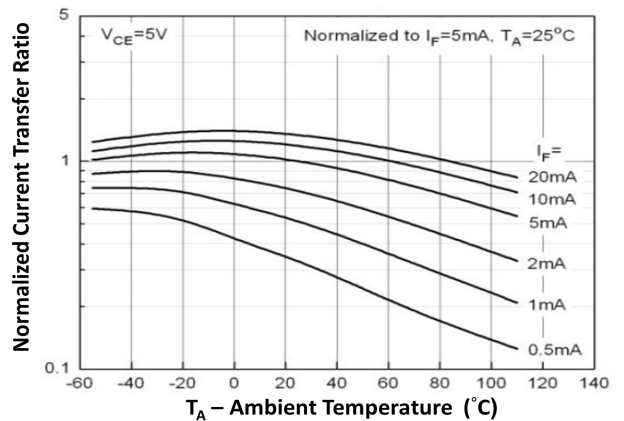


Fig 6 Normalized Current Transfer Ratio vs Ambient Temperature

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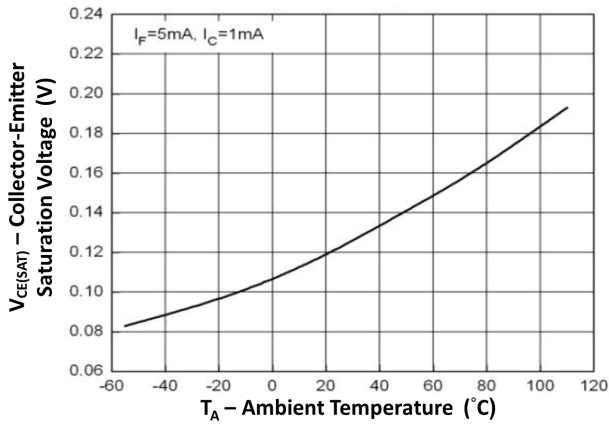


Fig 7 Collector-Emitter Saturation Voltage vs Ambient Temperature

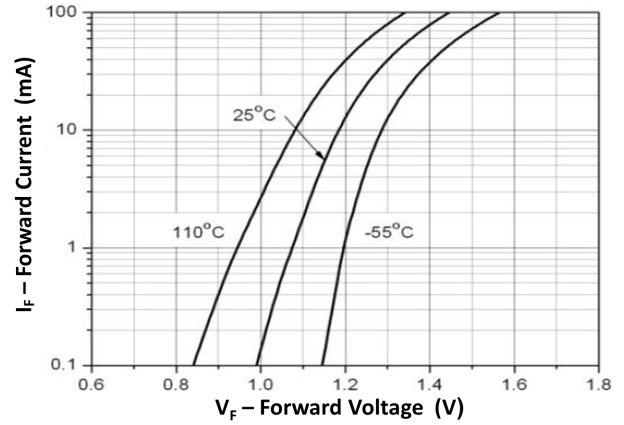


Fig 8 Forward Current vs Forward Voltage

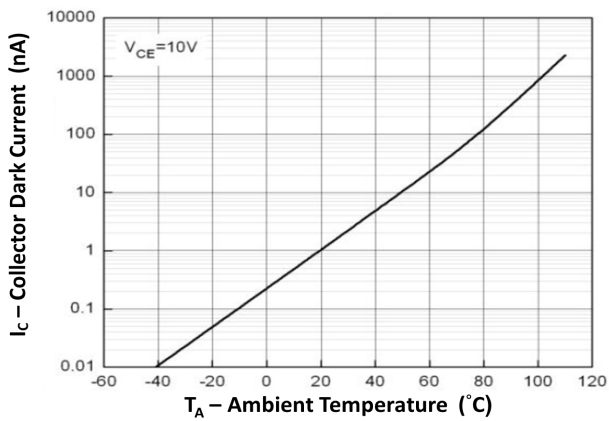


Fig 9 Collector Dark Current vs Ambient Temperature

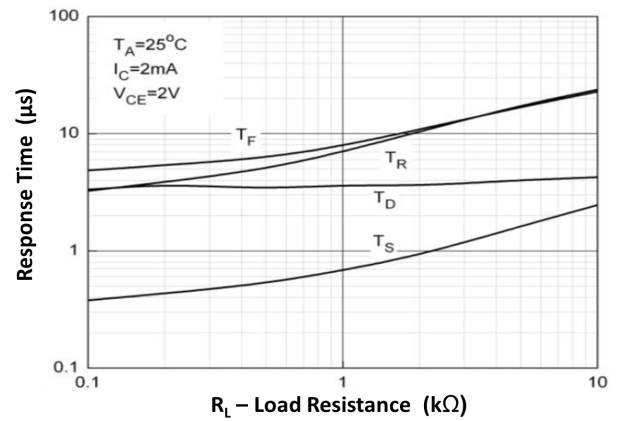
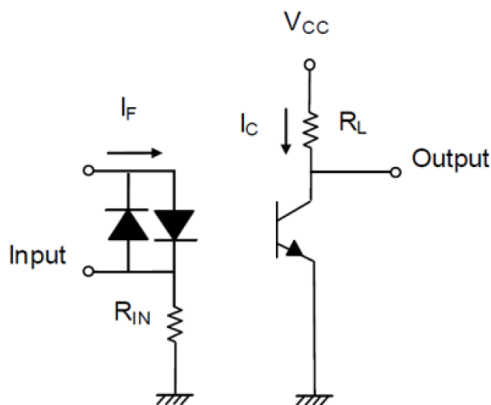
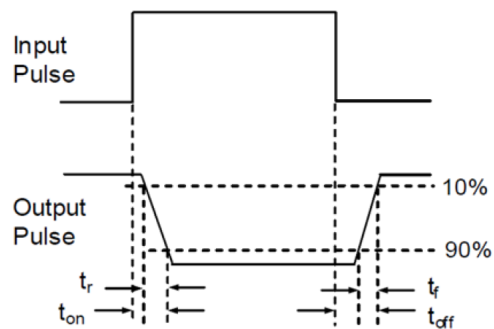


Fig 10 Response Time vs Load Resistance



Switching Time Test Circuit

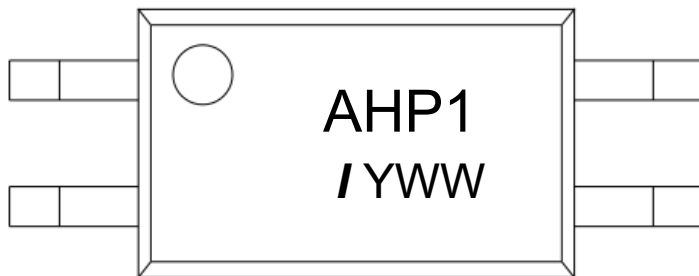


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ORDER INFORMATION

IS3H4			
After PN	PN	Description	Packing quantity
None	IS3H4	Surface Mount Tape & Reel	1000 pcs per reel

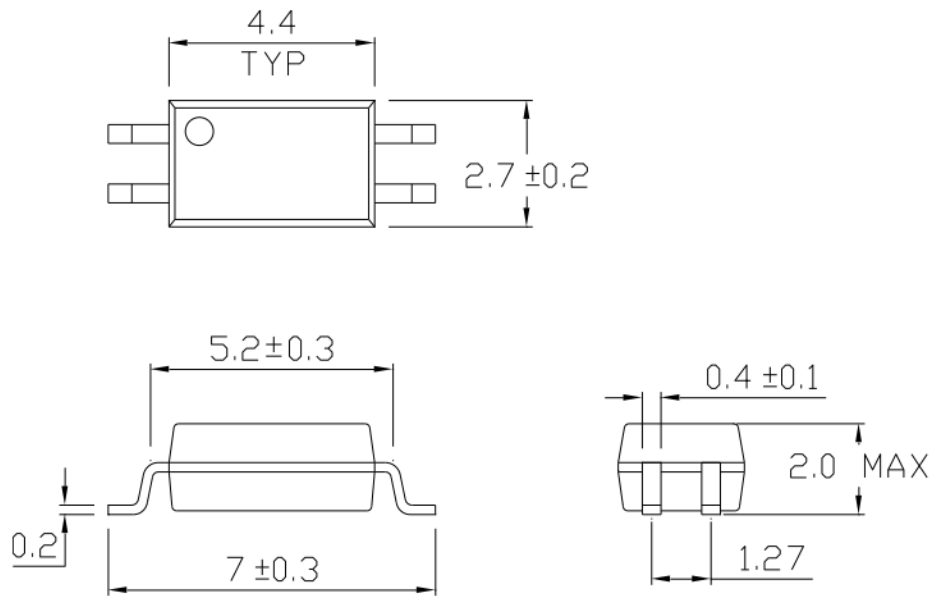
DEVICE MARKING



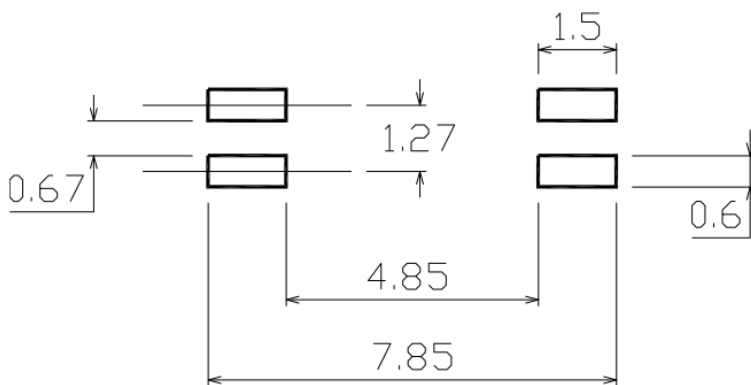
AHP1	Product Code for IS3H4
I	Isocom Components 2004 Ltd.
Y	1 digit Year code
WW	2 digit Week code

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PACKAGE DIMENSIONS (mm)



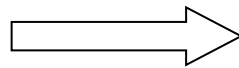
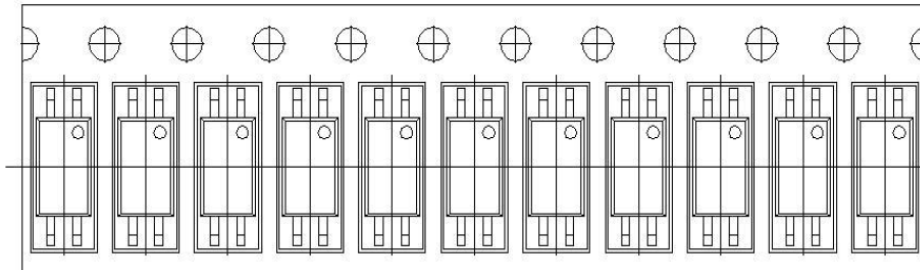
RECOMMENDED SOLDER PAD LAYOUT (mm)



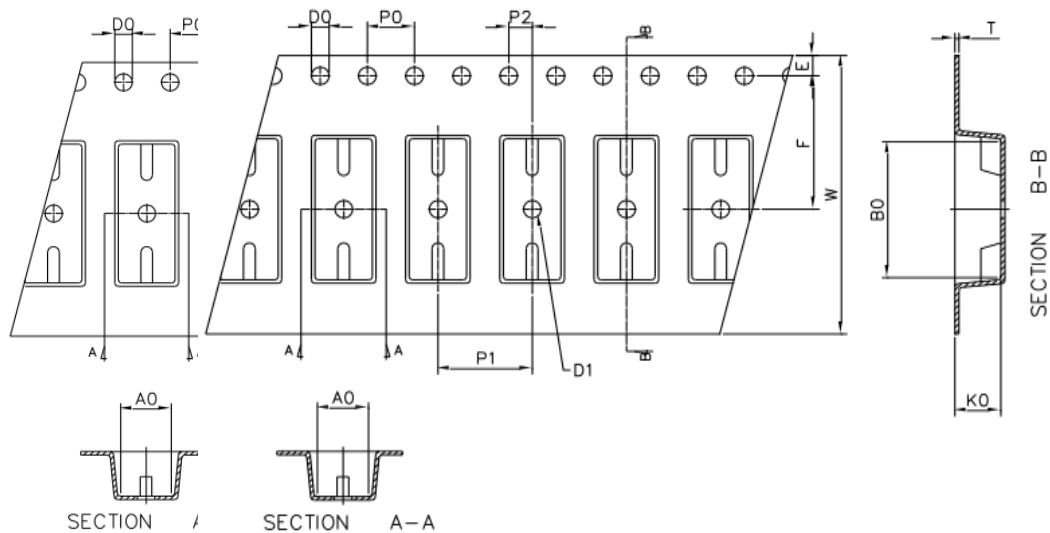


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TAPE AND REEL PACKAGING



Direction of Feed from Reel

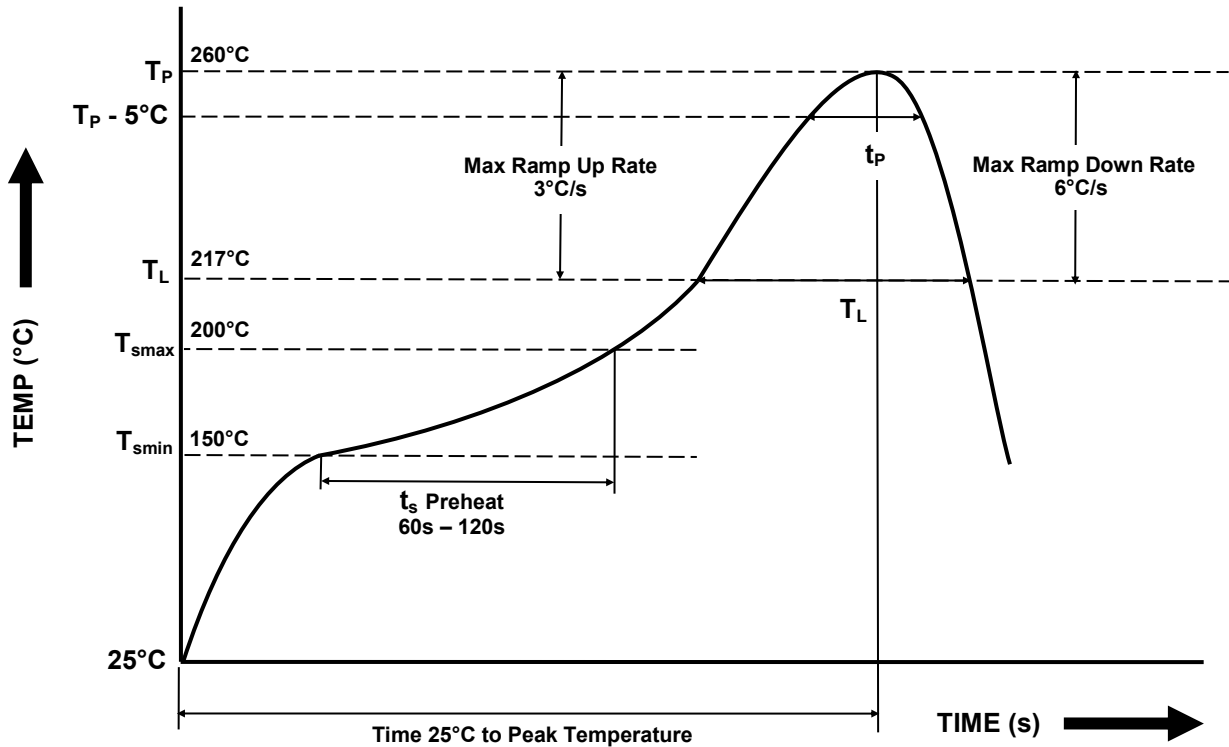


Dimension No.	A0	B0	D0	D1	E	F
Dimension(mm)	3.00±0.10	7.45±0.10	1.50+0.1/-0	1.50±0.10	1.75±0.10	5.5±0.10
Dimension No.	P0	P1	P2	t	W	K0
Dimension (mm)	4.00±0.15	4.00±0.10	2.00±0.10	0.30±0.05	12.1±0.2	2.45±0.1



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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) - Liquidous Temperature (T_L) - Time within 5°C of Actual Peak Temperature ($T_P - 5^\circ\text{C}$) - 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 217°C 30s 60s 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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