H11AA1, H11AA2, H11AA3, H11AA4

DESCRIPTION

The H11AAx series optocoupler consists of two infrared emitting diodes connected in inverse parallel and optically coupled to an NPN silicon transistor in a standard 6 pin dual in line plastic package.

FEATURES

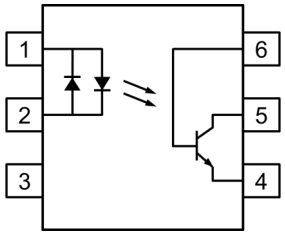
- High AC Isolation voltage 5000V_{RMS}
- Wide Operating Temperature Range
- −40°C to 100°C
- RoHS Compliant
- UL Approval E91231 Model “GG”
- VDE Approval 40028086

APPLICATIONS

- Computer Terminals
- Industrial System Controllers
- AC Input Response
- Signal Transmission between Systems of Different Potentials and Impedances

ORDER INFORMATION

- Add Suffix “X” for VDE Approval
- Add G after PN for 10mm lead spacing
- Add SM after PN for Surface Mount
- Add SMT&R after PN for Surface Mount Tape & Reel



1 Anode
2 Cathode
3 NC
4 Emitter
5 Collector
6 Base

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
Power Dissipation	70mW

Output

Collector Current	50mA
Collector to Emitter Voltage V_{CEO}	35V
Collector to Base Voltage V_{CBO}	35V
Emitter to Collector Voltage V_{ECO}	6V
Emitter to Base Voltage V_{EBO}	6V
Power Dissipation	150mW

Total Package

Total Power Dissipation	200mW
Isolation Voltage	5000V_{RMS}
Operating Temperature	−40 to 100°C
Storage Temperature	−55 to 125°C
Junction Temperature	125°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
Terminal Capacitance	C_t	V_F = 0V, f = 1kHz		50	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector-Emitter Breakdown Voltage	BV_{CEO}	I_C = 0.1mA, I_F = 0mA	35			V
Emitter-Collector Breakdown Voltage	BV_{ECO}	I_E = 10µA, I_F = 0mA	6			V
Collector Dark Current	I_{CEO}	V_{CE} = 20V, I_F = 0mA			100	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current transfer ratio	CTR	I_F = ±10mA, V_{CE} = 10V				%
		H11AA1	20			
		H11AA2	10			
		H11AA3	50			
		H11AA4	100			
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = ±20mA, I_C = 1mA			0.2	V
Floating Capacitance	C_f	V_{IO} = 0V, f = 1MHz		0.6	1	pF
Cut-Off Frequency	f_C	V_{CE} = 5V, I_C = 2mA R_L = 100Ω, −3dB	15	80		kHz
Output Rise Time	t_r	V_{CE} = 2V, I_C = 2mA R_L = 100Ω		4	18	µs
Output Fall Time	t_f			3	18	µs

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

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage	V_{ISO}	R.H. = 40% to 60%, t = 1 min Note 1	5000			V_{RMS}
Isolation Resistance	R_{I-O}	V_{I-O} = 500VDC R.H. = 40% to 60% Note 1	$5x10^{10}$	$1x10^{11}$		Ω

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

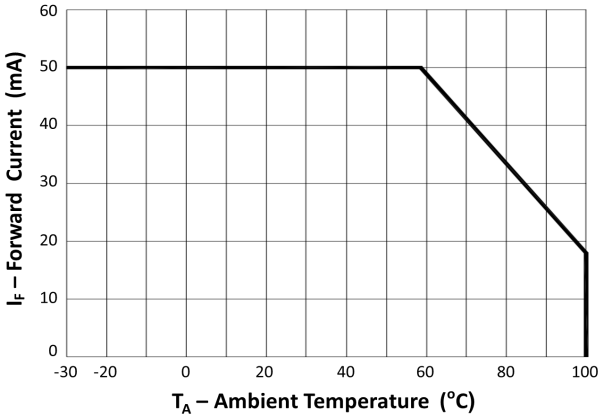


Fig 1 Forward Current vs Ambient Temperature

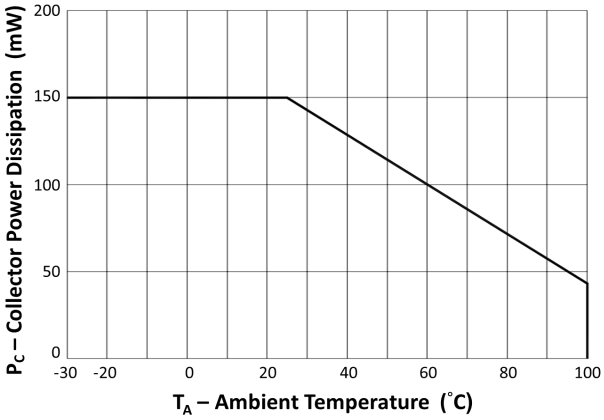


Fig 2 Collector Power Dissipation vs Ambient Temperature

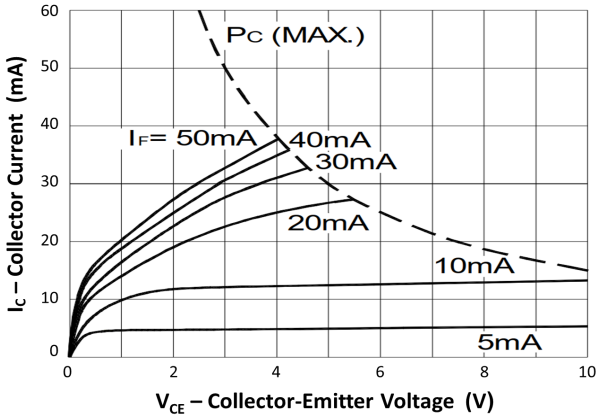


Fig 3 Collector Current vs Collector-Emitter Voltage

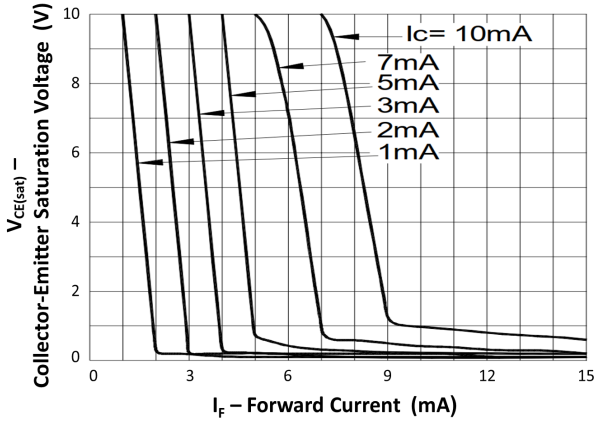


Fig 4 Collector-Emitter Saturation Voltage vs Forward Current

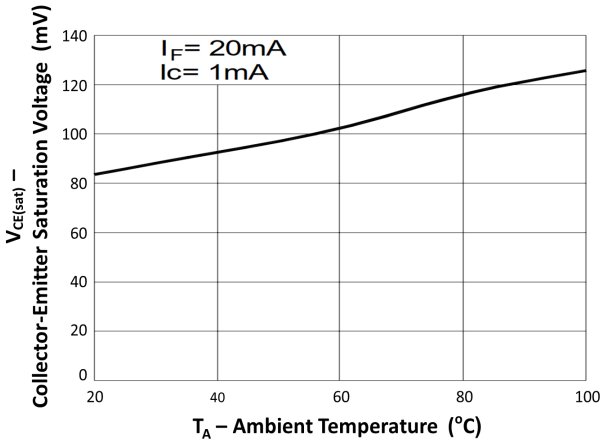


Fig 5 Collector-Emitter Saturation Voltage vs Ambient Temperature

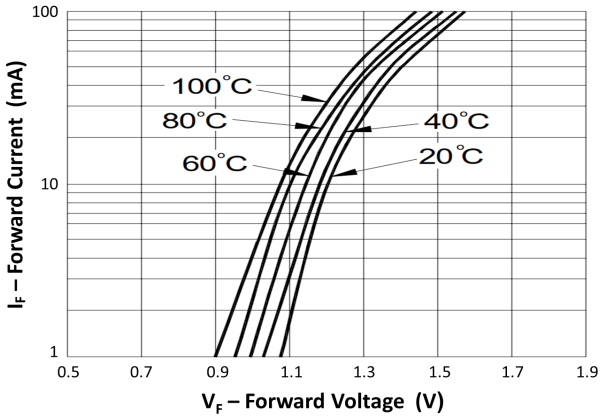


Fig 6 Forward Current vs Forward Voltage

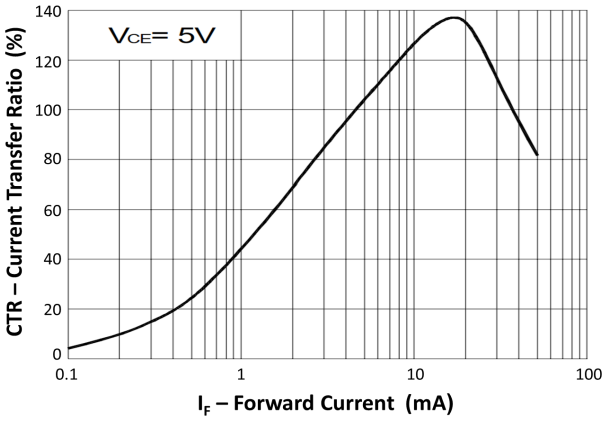


Fig 7 Current Transfer Ratio vs Forward Current

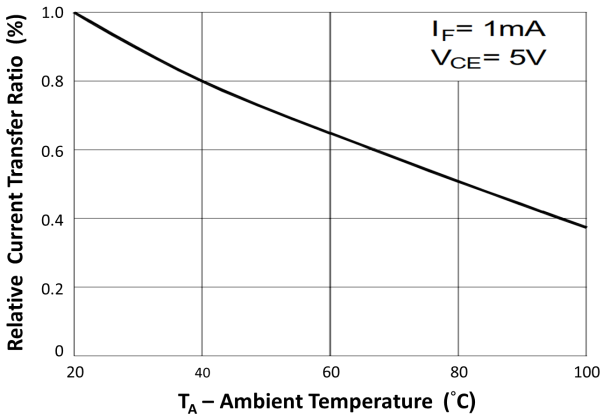


Fig 8 Relative Current Transfer Ratio vs Ambient Temperature

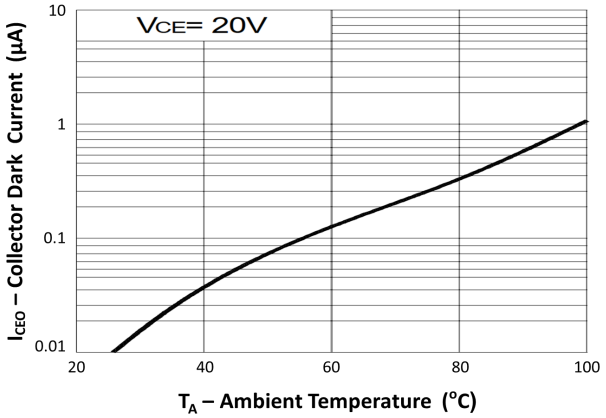


Fig 9 Collector Dark Current vs Ambient Temperature

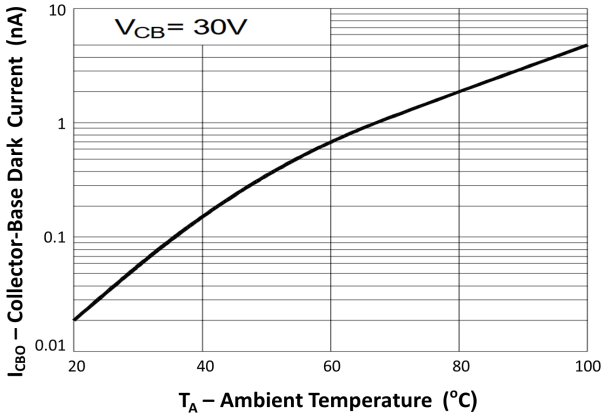


Fig 10 Collector-Base Dark Current vs Ambient Temperature

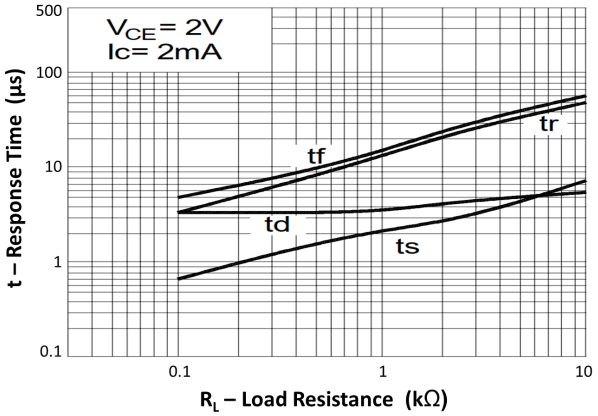


Fig 11 Response Time vs Load Resistance

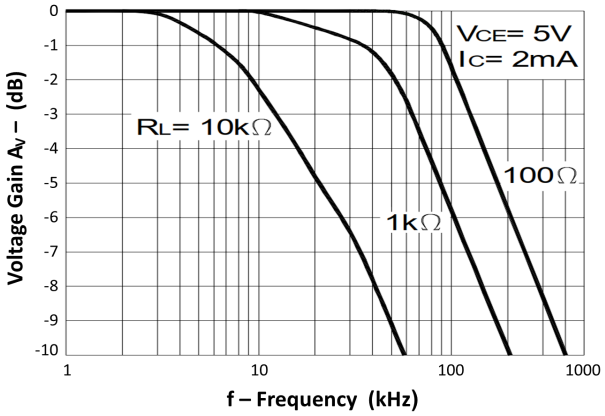


Fig 12 Frequency Response

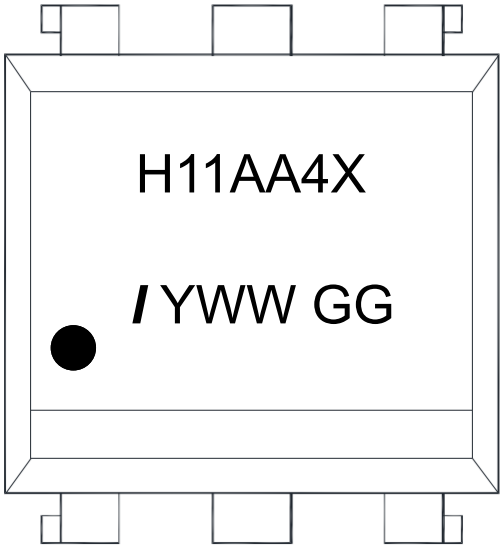
ORDER INFORMATION

H11AA1, H11AA2, H11AA3, H11AA4 (UL Approval)			
After PN	**PN**	**Description**	**Packing quantity**
None	H11AA1, H11AA2, H11AA3, H11AA4	Standard DIP6	65 pcs per tube
G	H11AA1G, H11AA2G H11AA3G, H11AA4G	10mm Lead Spacing	65 pcs per tube
SM	H11AA1SM, H11AA2SM H11AA3SM, H11AA4SM	Surface Mount	65 pcs per tube
SMT&R	H11AA1SMT&R, H11AA2SMT&R H11AA3SMT&R, H11AA4SMT&R	Surface Mount Tape and Reel	1000 pcs per reel

H11AA1X, H11AA2X, H11AA3X, H11AA4X (UL and VDE Approvals)			
After PN	**PN**	**Description**	**Packing quantity**
None	H11AA1X, H11AA2X H11AA3X, H11AA4X	Standard DIP6	65 pcs per tube
G	H11AA1XG, H11AA2XG H11AA3XG, H11AA4XG	10mm Lead Spacing	65 pcs per tube
SM	H11AA1XSM, H11AA2XSM H11AA3XSM, H11AA4XSM	Surface Mount	65 pcs per tube
SMT&R	H11AA1XSMT&R H11AA2XSMT&R H11AAX3SMT&R H11AA4XSMT&R	Surface Mount Tape and Reel	1000 pcs per reel

DEVICE MARKING

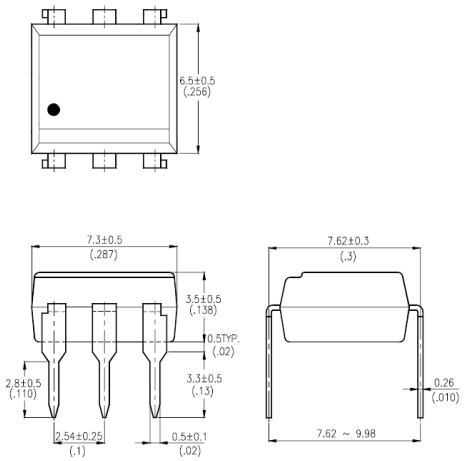
Example : H11AA4X



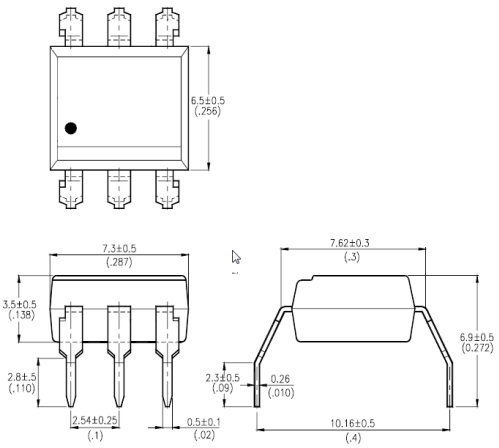
H11AA4X	denotes Device Part Number
I	denotes Isocom
Y	denotes 1 digit Year code
WW	denotes 2 digit Week code

PACKAGE DIMENSIONS (mm)

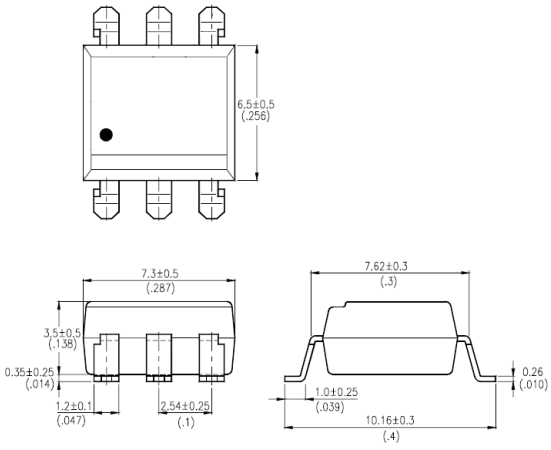
DIP



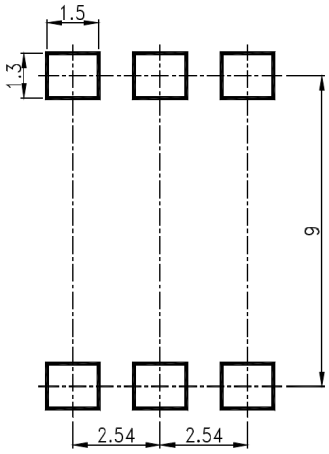
G Form



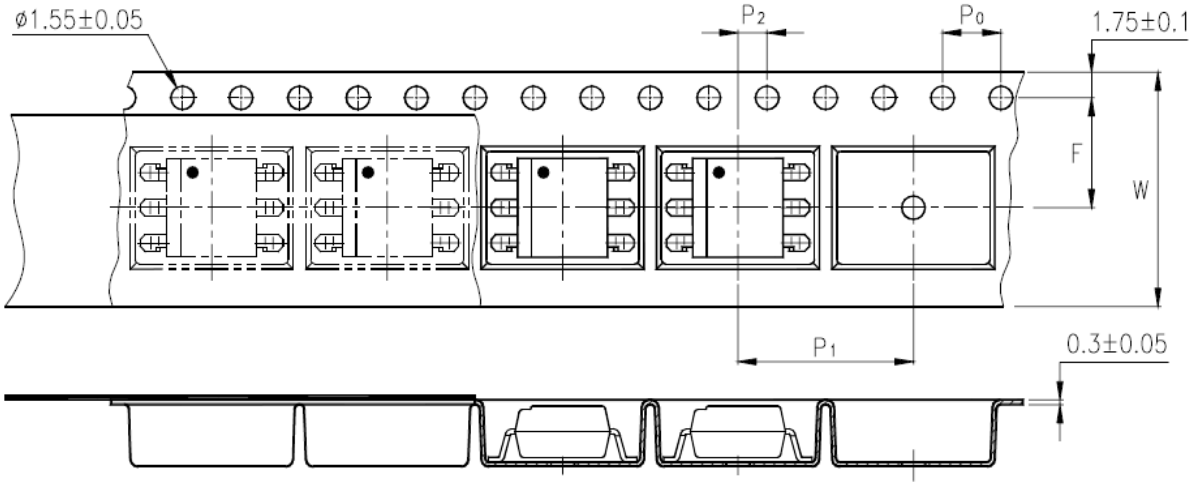
Surface Mount



RECOMMENDED PAD LAYOUT FOR SMD (MM)



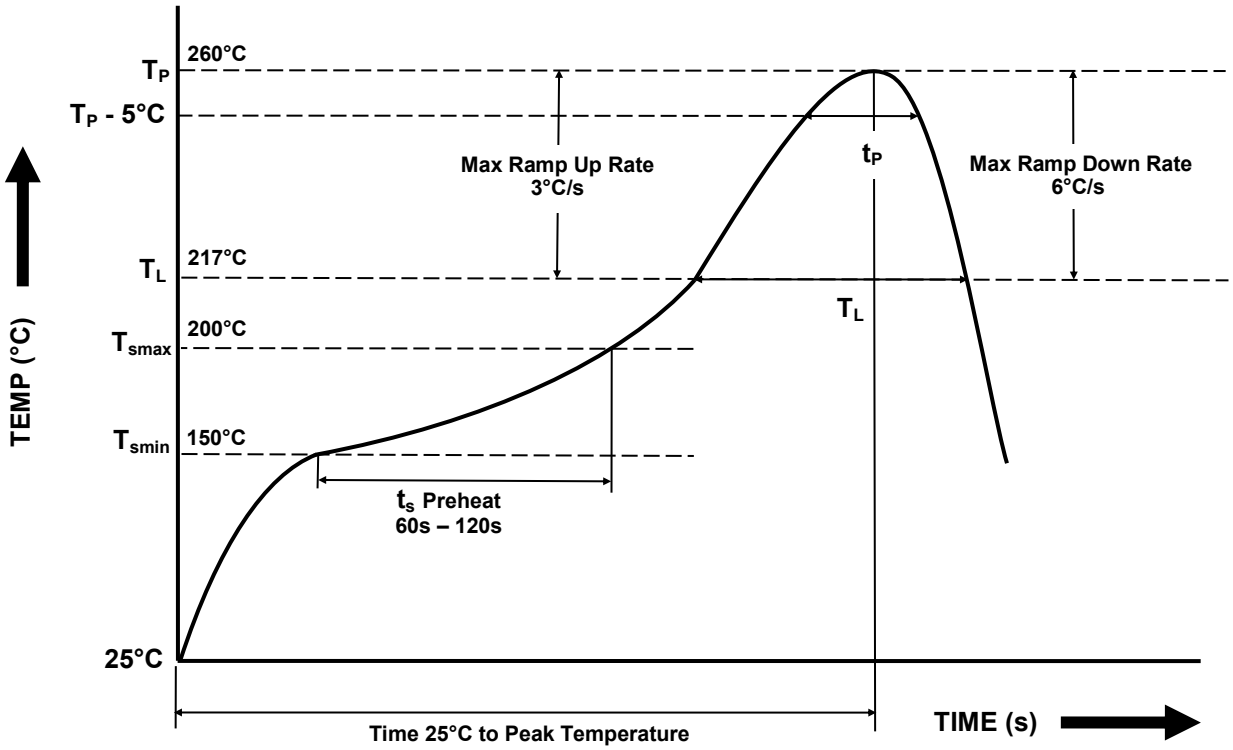
TAPE AND REEL PACKAGING



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 (0.472)

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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