H11G1, H11G2, H11G3

DESCRIPTION

The H11GX Series consists of high-gain NPN Darlington optocouplers with an integral base resistor to optimise speed and performance. These devices also feature an external base lead, offering additional flexibility for various applications.

Housed in a standard 6-pin DIP package, the H11GX Series ensures reliable and efficient signal transfer, making it ideal for demanding systems requiring fast switching and high output gain.

FEATURES

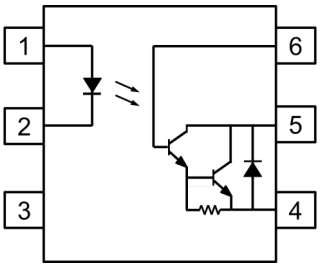
- CTR Minimum 1000%
- High Collector-Emitter Voltage
  H11G1 - V_{CEO} 300V
- Wide Operating Temperature Range
  −55°C to +100°C
- AC Isolation Voltage 5000V_{RMS}
- RoHS Compliant
- UL File E91231 Model “JJ”
- VDE File 40028076 for H11G1

APPLICATIONS

- Modems
- Copiers, Fascimiles
- Numerical Machines
- Signal Transmission between Systems of Different Potentials and Impedances

ORDER INFORMATION

- Add X after PN for VDE Approval for H11G1X
- 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 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
Junction Temperature	125°C

Output

Collector Current		150mA
Collector to Emitter Voltage V_{CEO}		
	H11G1	300V
	H11G2	80V
	H11G3	55V
Emitter to Collector Voltage V_{ECO}		0.1V
Power Dissipation		300mW

Total Package

Total Power Dissipation	350mW
Isolation Voltage	5000V_{RMS}
Operating Temperature	−55 to 100°C
Storage Temperature	−55 to 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 = 10mA		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_C = 1mA, I_F = 0mA H11G1 H11G2 H11G3	 300 80 55			V
Collector Dark Current V_{CE} = 200v IF = 0mA	I_{CEO}	V_{CE} = 80V H11G1 V_{CE} = 60V H11G2 V_{CE} = 30V H11G3			 1 1 1	µA

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

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current transfer ratio	CTR	H11G1 / H11G2				%
		I_F =10mA, V_{CE} = 1.2V	1000			
		I_F =1mA, V_{CE} = 5V	500			
		H11G3				
		I_F =1mA, V_{CE} = 2V	200			
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	H11G1 / H11G2				V
		I_F =1mA, I_C = 1mA			1.0	
		I_F =16mA, I_C = 50mA			1.2	
		H11G3				
		I_F =20mA, I_C = 50mA			1.2	
Floating Capacitance	C_f	V = 0V, f = 1MHz		0.6	1	pF
Cut-Off Frequency	f_C	V_{CE} = 2V, I_C = 20mA R_L = 100Ω, −3dB	1	7		kHz
Output Rise Time	t_r	V_{CE} = 2V, I_C = 20mA R_L = 100Ω		100	300	µs
Output Fall Time	t_f			20	100	µs

ISOLATION

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

Measured with input leads shorted together and output leads shorted together.

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

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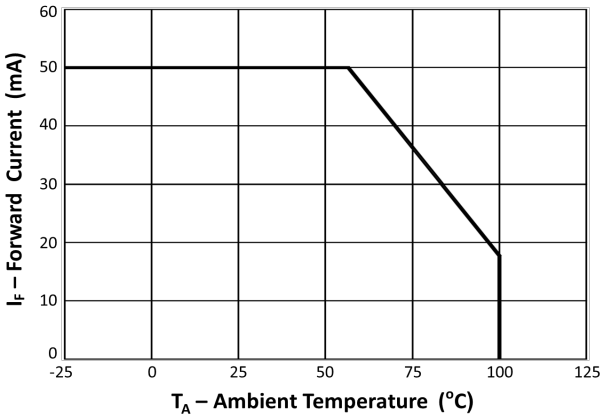


Fig 1 Forward Current vs Ambient Temperature

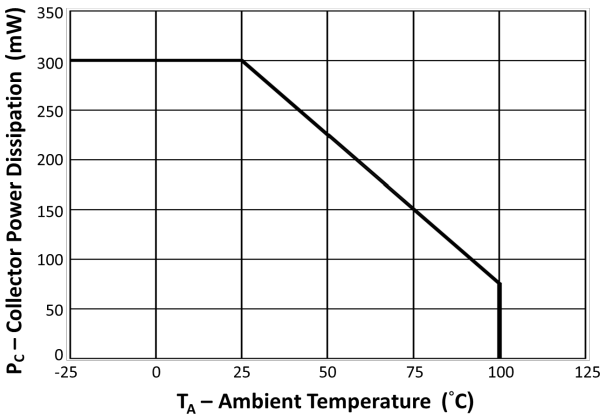


Fig 2 Collector Power Dissipation vs Ambient Temperature

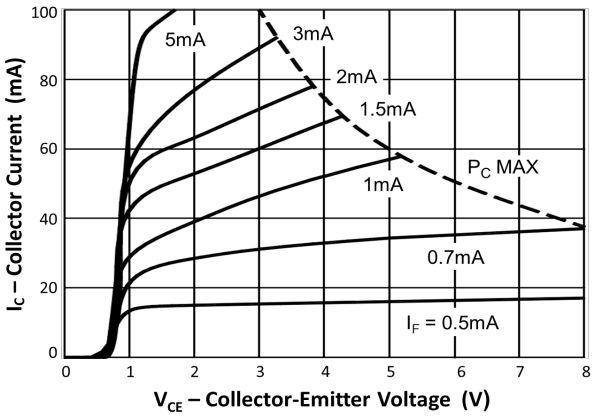


Fig 3 Collector Current vs Collector-Emitter Voltage

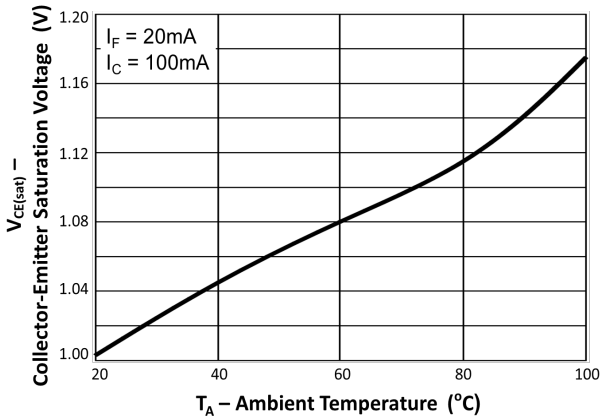


Fig 4 Collector-Emitter Saturation Voltage vs Ambient Temperature

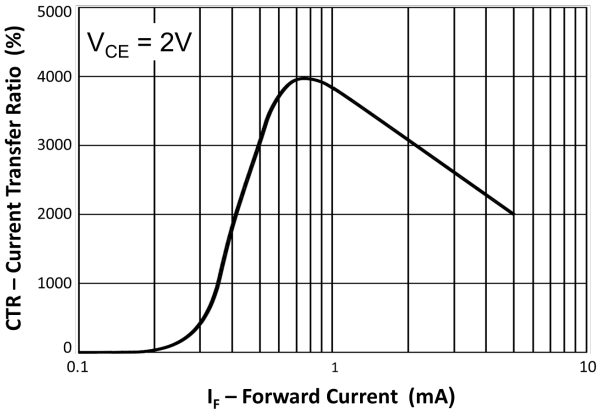


Fig 5 Current Transfer Ratio vs Forward Current

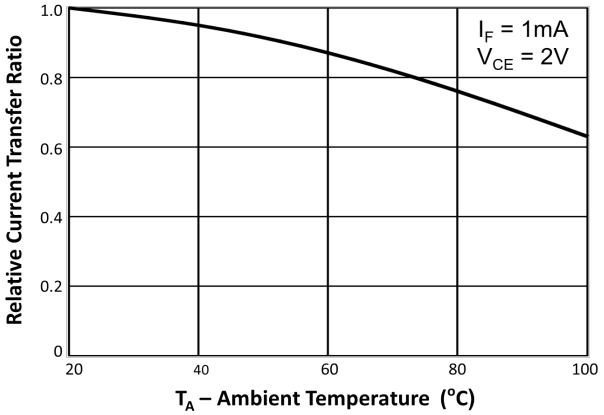


Fig 6 Relative Current Transfer Ratio vs Ambient Temperature

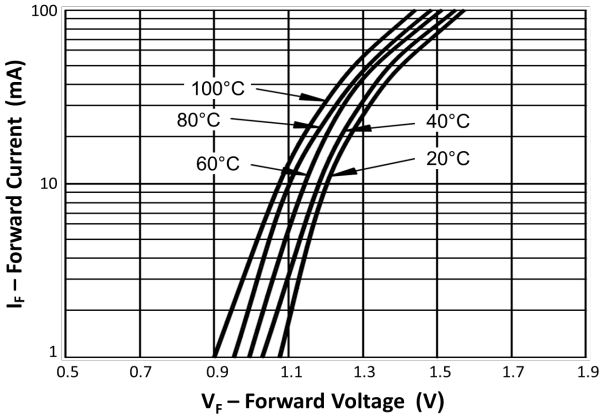


Fig 7 Forward Current vs Forward Voltage

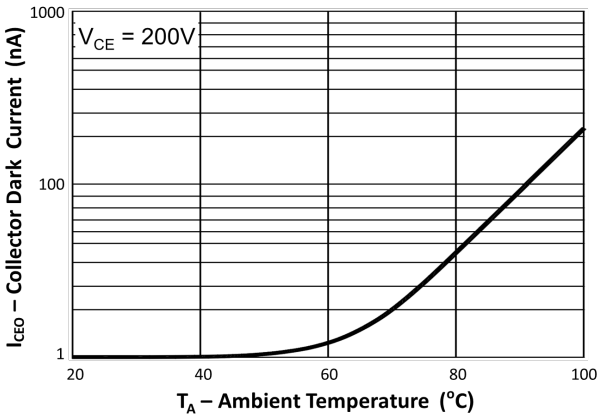


Fig 8 Current Dark Current vs Ambient Temperature

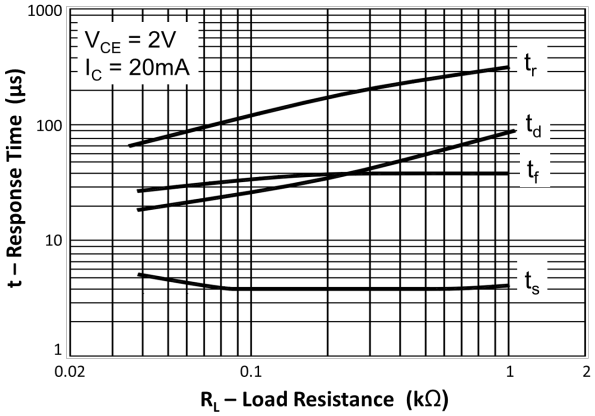


Fig 9 Response Time vs Load Resistance

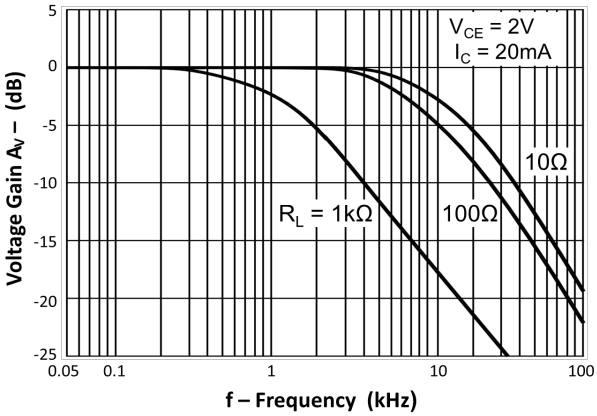
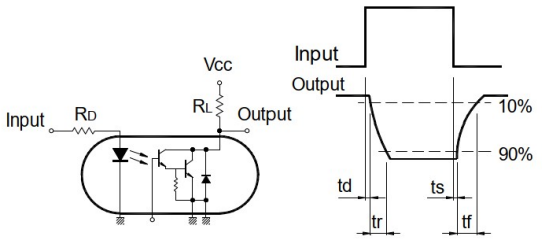
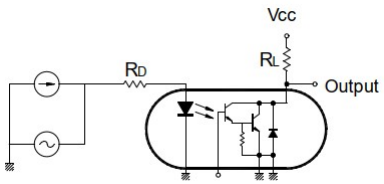


Fig 10 Frequency Response



Response Time Test Circuit



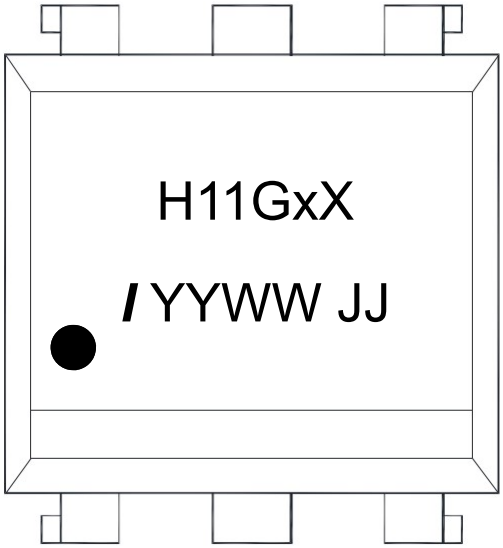
Frequency Response Test Circuit

ORDER INFORMATION

H11G1, H11G2, H11G3 (UL Approval)			
After PN	**PN**	**Description**	**Packing quantity**
None	H11G1, H11G2, H11G3	Standard DIP6	65 pcs per tube
G	H11G1G, H11G2G, H11G3G	10mm Lead Spacing	65 pcs per tube
SM	H11G1SM, H11G2SM H11G3SM	Surface Mount	65 pcs per tube
SMT&R	H11G1SMT&R H11G2SMT&R H11G3SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

H11G1 (UL and VDE Approval)			
After PN	**PN**	**Description**	**Packing quantity**
None	H11G1X	Standard DIP6	65 pcs per tube
G	H11G1XG	10mm Lead Spacing	65 pcs per tube
SM	H11G1XSM	Surface Mount	65 pcs per tube
SMT&R	H11G1XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

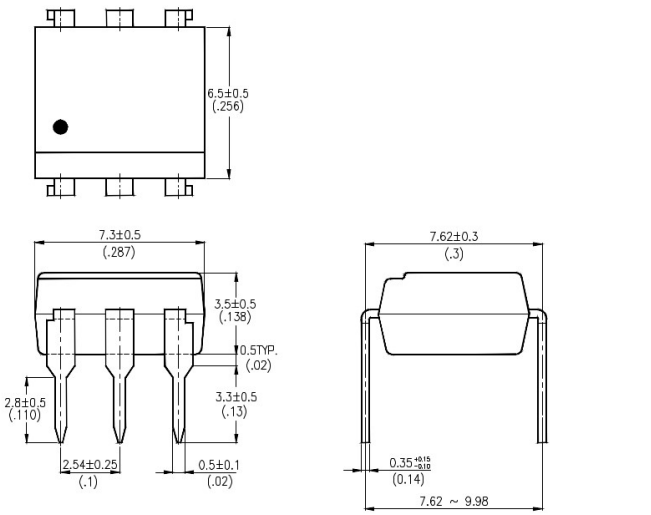
DEVICE MARKING



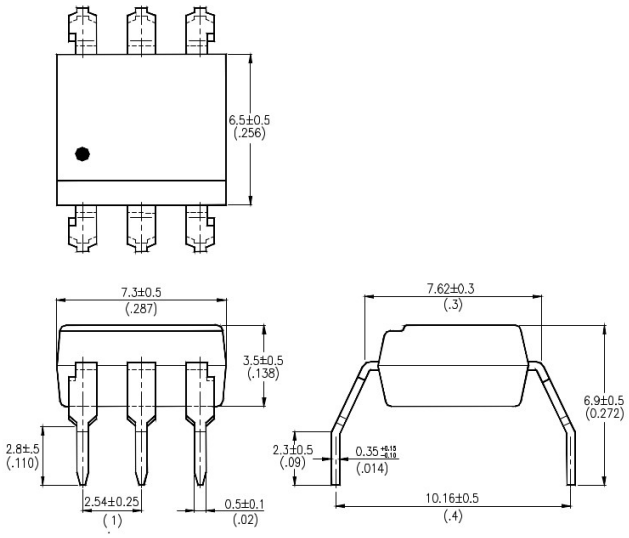
H11GxX	Device Part Number where “x” denotes CTR Grade
I	Isocom
YY	2 digit Year code (22, 23, etc.)
WW	2 digit Week code
JJ	UL Model

PACKAGE DIMENSIONS in mm (inch)

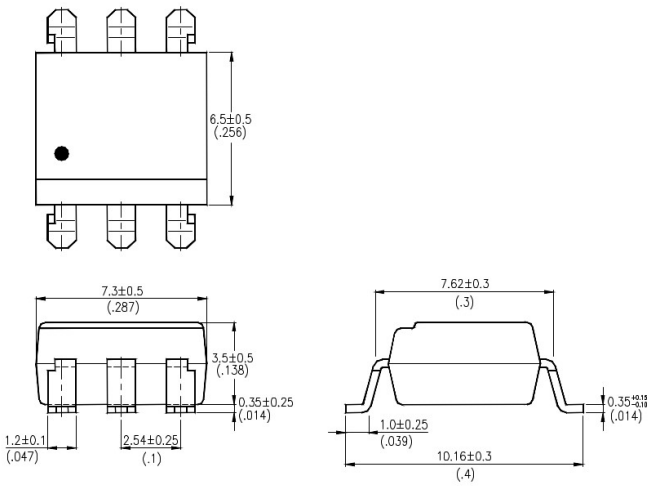
DIP



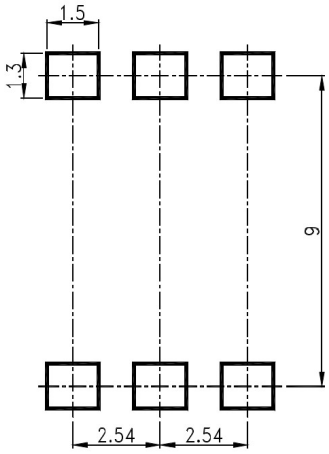
G Form



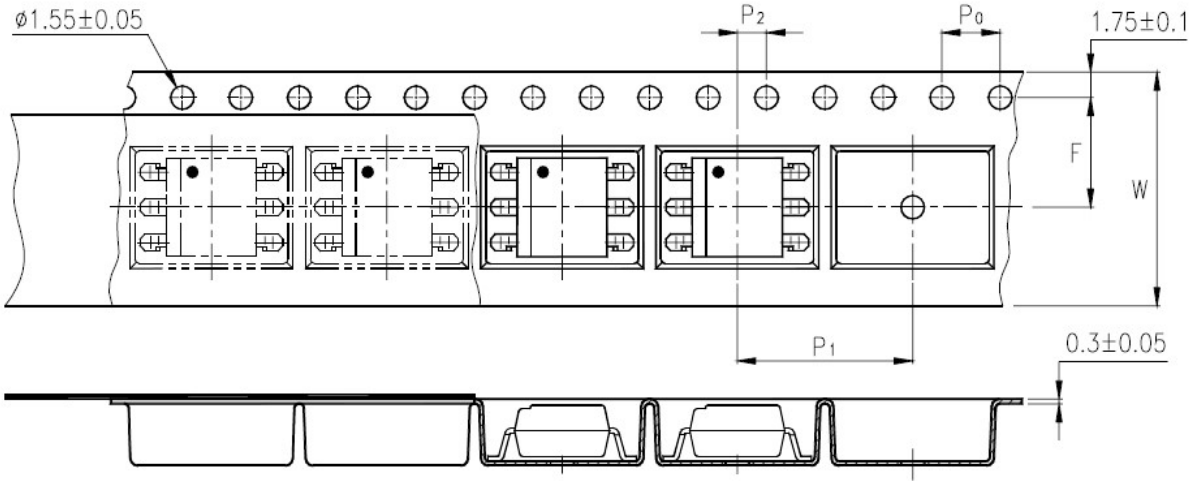
SMD



RECOMMENDED SOLDER PAD LAYOUT (mm)



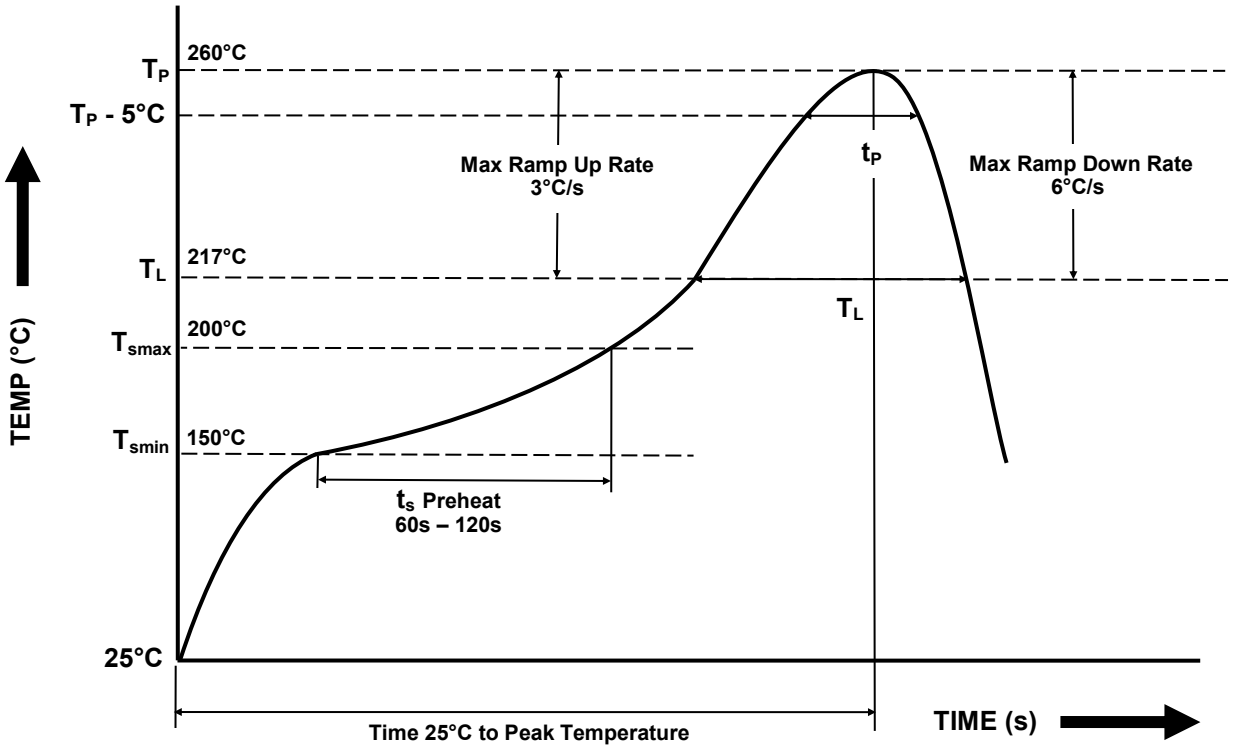
TAPE AND REEL PACKAGING



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 (0.472)

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

ISOCOM COMPONENTS

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