SFH628A-2, SFH628A-3, SFH628A-4

DESCRIPTION

The SFH628-2, SFH628A-3 and SFH628A-4 series of optocouplers consist of two infrared light emitting diodes connected in reverse parallel optically coupled to an NPN silicon photo transistor in a space efficient Dual In Line Plastic Package.

FEATURES

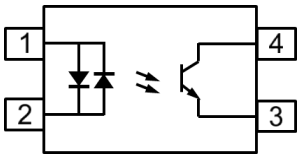
- AC Isolation Voltage 5000V_{RMS}
- Wide Operating Temperature Range −50°C to +110°C
- RoHS Compliant
- UL File E91231 Model “EE”
- VDE Approval Certificate No. 40028086

APPLICATIONS

- Computer Terminals
- Industrial System Controllers
- Measuring Instruments
- Signal Transmission between Systems of Different Potentials and Impedances

ORDER INFORMATION

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



1 Anode/Cathode
2 Cathode/Anode
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
Power dissipation	70mW

Output

Collector to Emitter Voltage BV_{CEO}	80V
Emitter to Collector Voltage BV_{ECO}	6V
Collector Current	50mA
Power Dissipation	150mW

Total Package

Isolation Voltage	5000V_{RMS}
Total Power Dissipation	200mW
Operating Temperature	-50 to 110 °C
Storage Temperature	-55 to 125 °C
Junction Temperature	125°C
Lead Soldering Temperature (10s)	260°C

ISOCOM COMPONENTS 2004 LTD
Unit 25B, Park View Road West, Park View Industrial Estate
Hartlepool, Cleveland, TS25 1PE, United Kingdom
Tel : +44 (0)1429 863 609 Fax : +44 (0)1429 863 581
e-mail : sales@isocom.co.uk
http://www.isocom.com

ISOCOM COMPONENTS ASIA LTD
Hong Kong Office
Block A, 8/F, Wah Hing Industrial Mansion
36 Tai Yau Street, San Po Kong, Kowloon, Hong Kong
Tel : +852 2995 9217 Fax : +852 8161 6292
e-mail : sales@isocom.com.hk

ELECTRICAL CHARACTERISTICS (Ambient Temperature = 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 = 0V, f = 1KHz		30	250	pF

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector—Emitter breakdown Voltage	BV_{CEO}	I_C = 0.1mA, I_F = 0mA	80			V
Emitter—Collector breakdown Voltage	BV_{ECO}	I_E = 10µA, I_F = 0mA	6			V
Collector-Emitter 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	SFH628A-2 I_F = ±1mA, V_{CE} = 0.5V I_F = ±0.5mA, V_{CE} = 1.5V SFH628A-3 I_F = ±1mA, V_{CE} = 0.5V I_F = ±0.5mA, V_{CE} = 1.5V SFH628A-4 I_F = ±1mA, V_{CE} = 0.5V I_F = ±0.5mA, V_{CE} = 1.5V	 63 32 100 50 160 80		 200 320 500	%
Collector—Emitter Saturation Voltage	$V_{CE(sat)}$	SFH628A-2 I_F = ±1mA, I_C = 0.5mA SFH628A-3 I_F = ±1mA, I_C = 0.8mA SFH628A-4 I_F = ±1mA, I_C = 1.25mA			0.4 0.4 0.4	V
Floating Capacitance	C_f	V = 0V, f= 1MHz		0.6	1	pF
Output Rise Time	t_r	V_{CE} = 2V I_C = 2mA R_L = 100Ω		4	18	µs
Output Fall Time	t_f			3	18	

ELECTRICAL CHARACTERISTICS (Ambient Temperature = 25°C unless otherwise specified)

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Input to Output Isolation Voltage	V_{ISO}	R.H. = 40% to 60% t = 1 min	5000			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	V_{IO} = 500VDC R.H. = 40% to 60%	5×10^{10}	1×10^{11}		Ω

Device is considered a two terminal device : Input pins are shorted together and Output pins are shorted together.

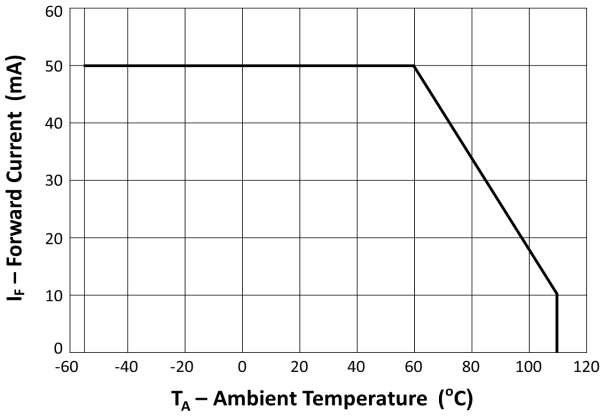


Fig 1 Forward Current vs Ambient Temperature

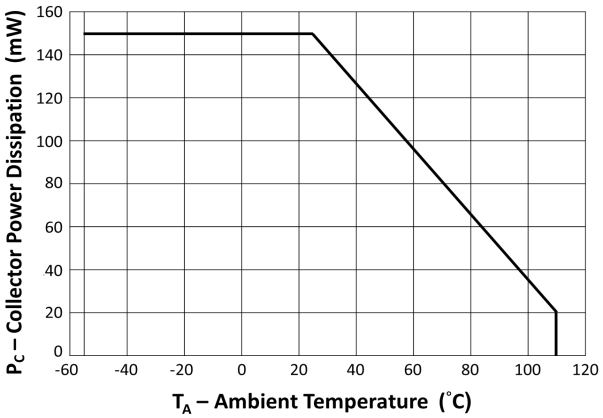


Fig 2 Collector Power Dissipation vs Ambient Temperature

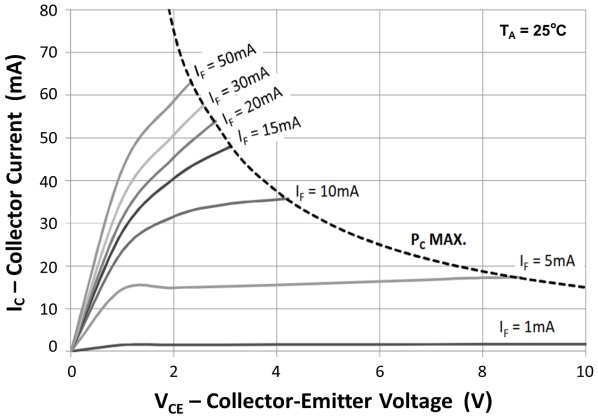


Fig 3 Collector Current vs Collector-Emitter Voltage (1)

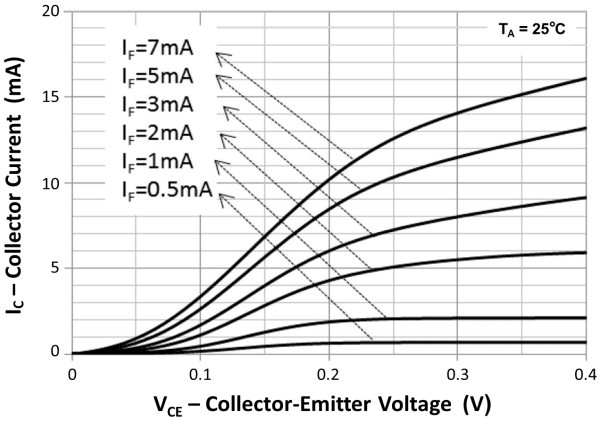


Fig 4 Collector Current vs Collector-Emitter Voltage (2)

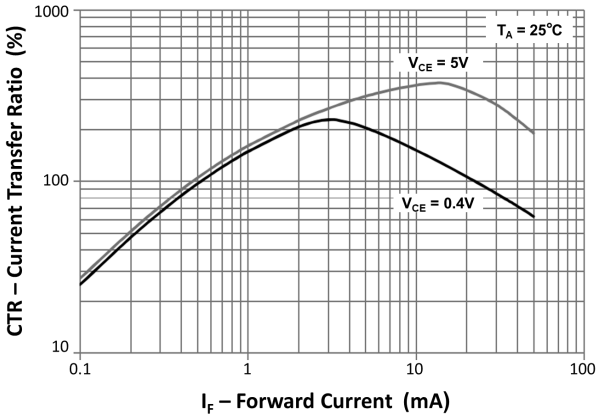


Fig 5 Current Transfer Ratio vs Forward Current

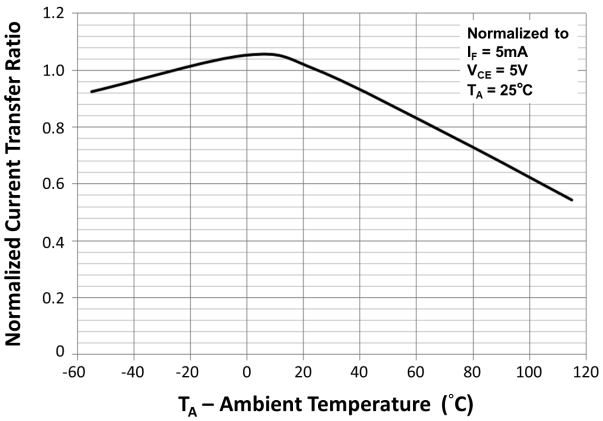


Fig 6 Normalized Current Transfer Ratio vs Ambient Temperature

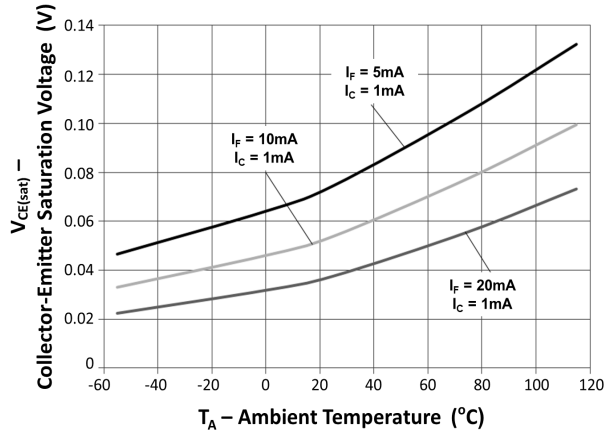


Fig 7 Collector-Emitter Saturation Voltage vs Ambient Temperature

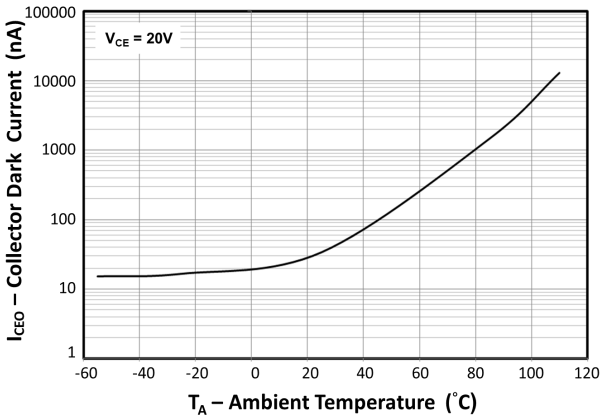


Fig 8 Collector Dark Current vs Ambient Temperature

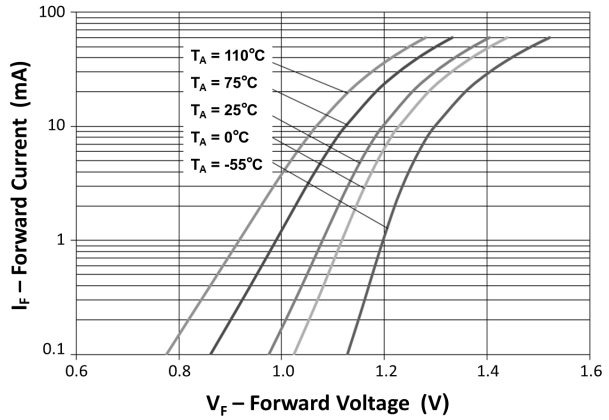


Fig 9 Forward Current vs Forward Voltage

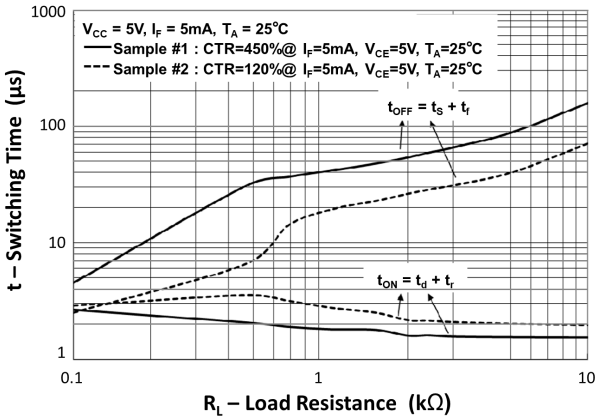


Fig 10 Switching Time vs Load Resistance

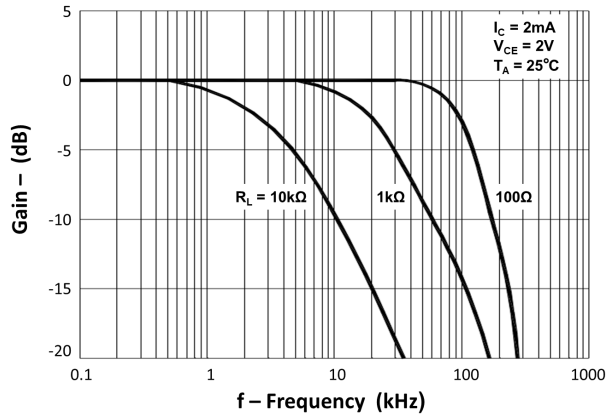
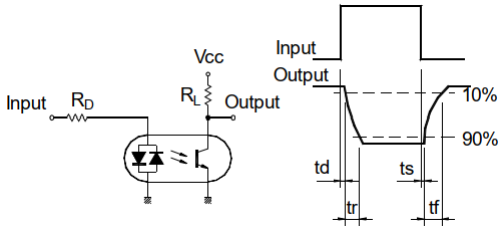
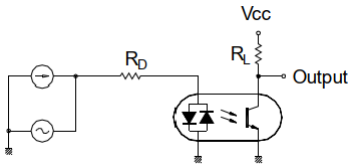


Fig 11 Frequency Response



Response Time Test Circuit



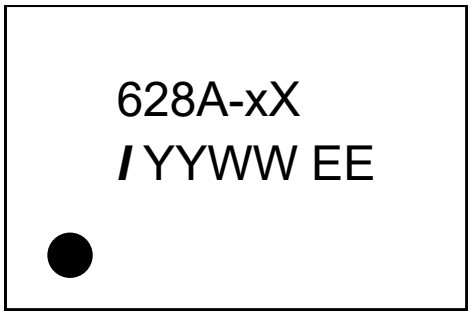
Frequency Response Test Circuit

ORDER INFORMATION

SFH628A-2, SFH628A-3, SFH628A-4 (UL Approval)			
After PN	**PN**	**Description**	**Packing quantity**
None	SFH628A-2 SFH628A-3 SFH628A-4	Standard DIP4	100 pcs per tube
G	SFH628A-2G SFH628A-3G SFH628A-4G	10mm Lead Spacing	100 pcs per tube
SM	SFH628A-2SM SFH628A-3SM SFH628A-4SM	Surface Mount	100 pcs per tube
SMT&R	SFH628A-2SMT&R SFH628A-3SMT&R SFH628A-4SMT&R	Surface Mount Tape & Reel	1000 pcs per reel

SFH628A-2, SFH628A-3, SFH628A-4 (UL and VDE Approval)			
After PN	**PN**	**Description**	**Packing quantity**
None	SFH628A-2X SFH628A-3X SFH628A-4X	Standard DIP4	100 pcs per tube
G	SFH628A-2XG SFH628A-3XG SFH628A-4XG	10mm Lead Spacing	100 pcs per tube
SM	SFH628A-2XSM SFH628A-3XSM SFH628A-4XSM	Surface Mount	100 pcs per tube
SMT&R	SFH628A-2XSMT&R SFH628A-3XSMT&R SFH628A-4XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel

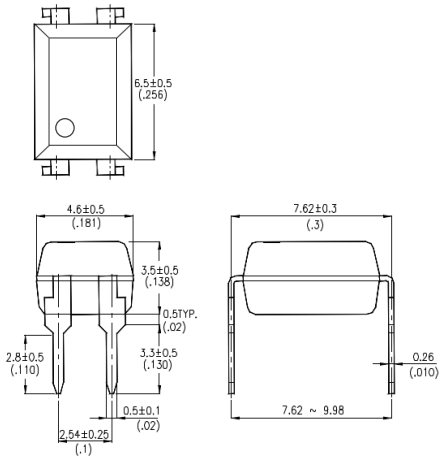
DEVICE MARKING



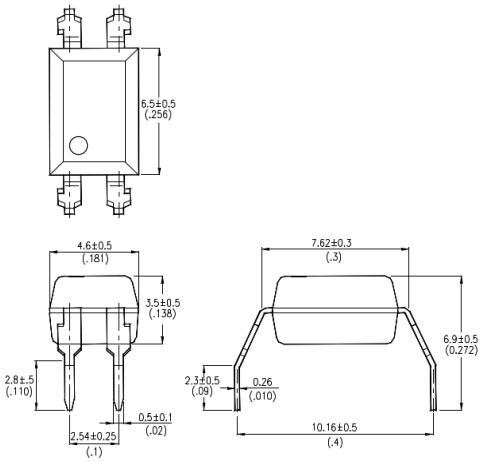
628A-x	Device Part Number where “x” denotes CTR Gr
X	VDE Option
/	Isocom
YY	2 digit Year code (22, 23, etc.)
WW	2 digit Week code
EE	UL Model

PACKAGE DIMENSIONS in mm (inch)

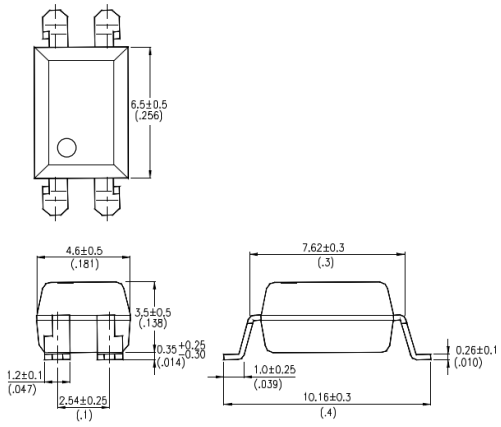
DIP



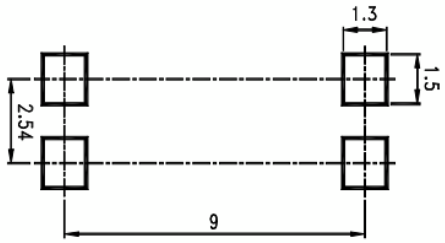
G Form



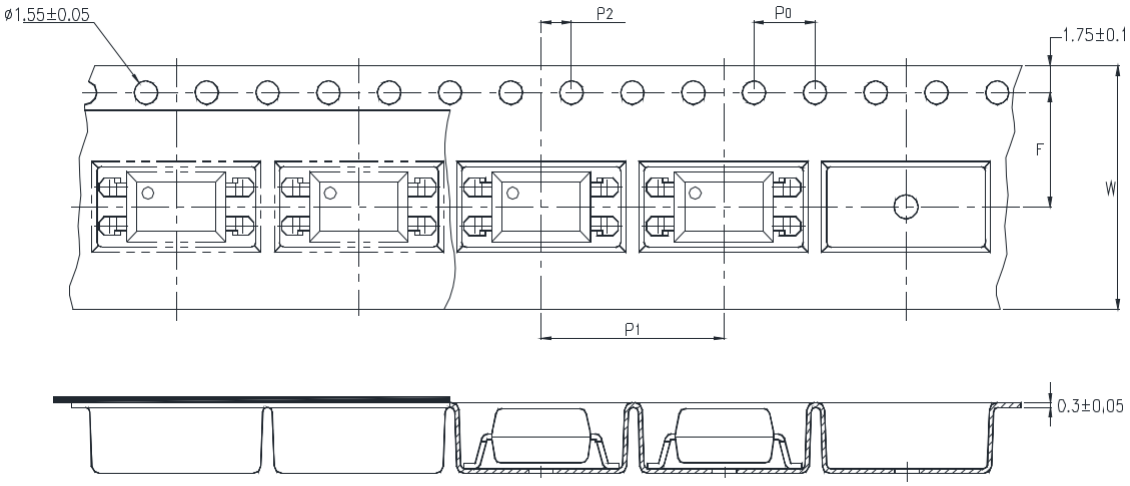
SMD



RECOMMENDED PAD LAYOUT FOR SMD (mm)

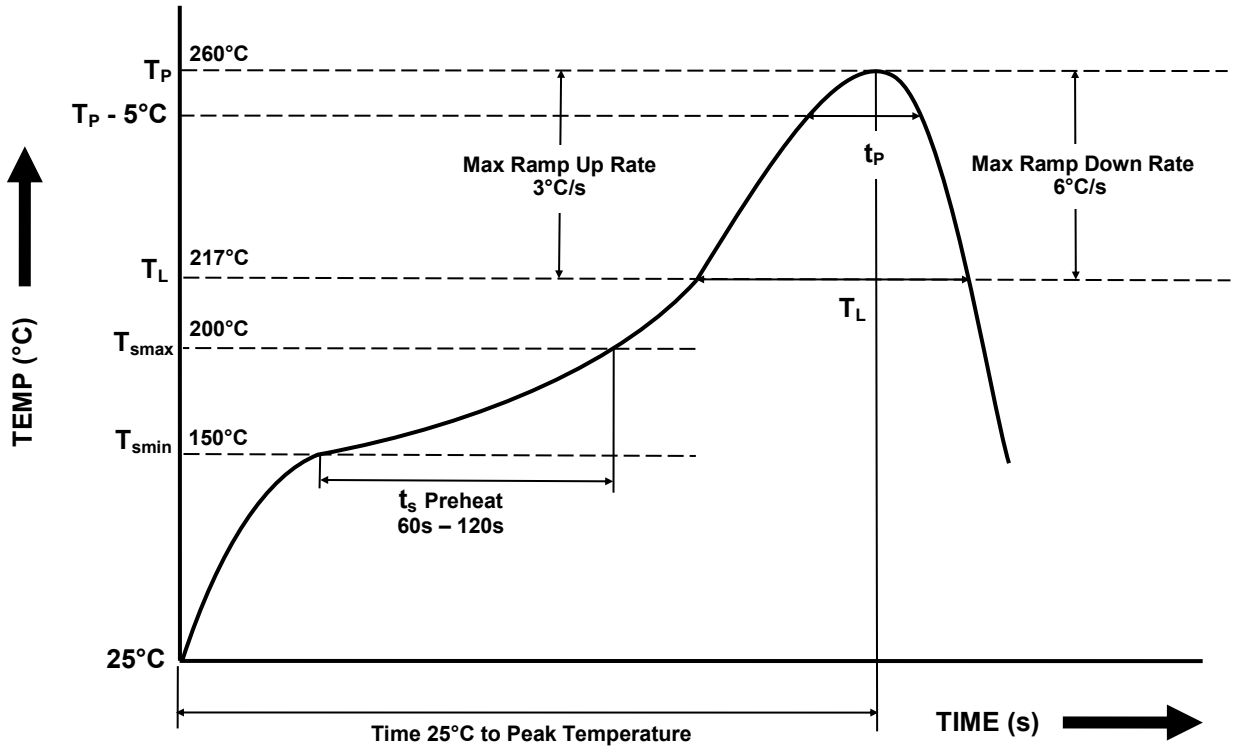


TAPE AND REEL PACKAGING



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 FOR SMD
(One Time Reflow Soldering is Recommended)



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

DISCLAIMER

Isocom Components is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing Isocom Components products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such Isocom Components products could cause loss of human life, bodily injury or damage to property.

In developing your designs, please ensure that Isocom Components products are used within specified operating ranges as set forth in the most recent Isocom Components products specifications.

The Isocom Components products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These Isocom Components products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation Instruments, traffic signal instruments, combustion control instruments, medical Instruments, all types of safety devices, etc... Unintended Usage of Isocom Components products listed in this document shall be made at the customer’s own risk.

Gallium arsenide (GaAs) is a substance used in the products described in this document. GaAs dust and fumes are toxic. Do not break, cut or pulverize the product, or use chemicals to dissolve them. When disposing of the products, follow the appropriate regulations. Do not dispose of the products with other industrial waste or with domestic garbage.

The products described in this document are subject to the foreign exchange and foreign trade laws.

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by Isocom Components for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of Isocom Components or others.

The information contained herein is subject to change without notice.