IS127

DESCRIPTION

The IS127 is an optically coupled isolator consisting of an infrared light emitting diode and a high voltage NPN silicon photo darlington which has an integral base-emitter resistor to optimise switching speed and elevated temperature characteristics in a space efficient Mini Flat package.

FEATURES

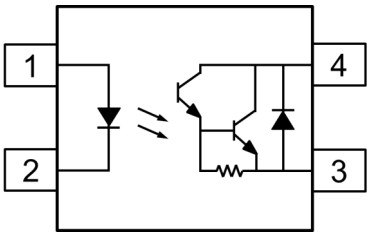
- Low Profile Package
- AC Isolation Voltage 3750V_{RMS}
- CTR Minimum 1000%
- High Collector-Emitter Voltage V_{CEO} 300V
- Wide Operating Temperature Range -55°C to +110°C
- RoHS Compliant
- UL File E91231 Package Code “FPH1”

APPLICATIONS

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

ORDER INFORMATION

- Available in Tape and Reel with 3000 pieces per 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}	300V
Emitter to Collector Voltage V_{ECO}	0.1V
Power Dissipation	150mW
Junction Temperature	125°C

Total Package

Total Power Dissipation	170mW
Isolation Voltage	3750V_{RMS}
Operating Temperature	−55 to 110°C
Storage Temperature	−55 to 150°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 Mansions
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 (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 = 0.1mA, I_F = 0mA	300			V
Emitter-Collector Breakdown Voltage	BV_{ECO}	I_E = 10µA, I_F = 0mA	0.1			V
Collector Dark Current	I_{CEO}	V_{CE} = 200V, I_F = 0mA			200	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current transfer ratio	CTR	I_F =1mA, V_{CE} = 2V	1000	5000		%
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_F = 20mA, I_C = 100mA			1.2	V
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

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	3750			V_{RMS}
Isolation Resistance	R_{ISO}	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.

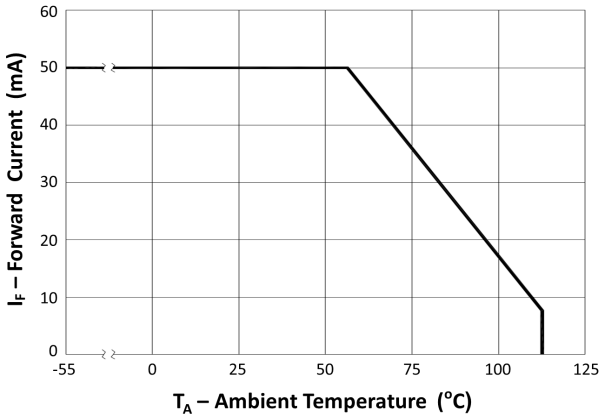


Fig 1 Forward Current vs Ambient Temperature

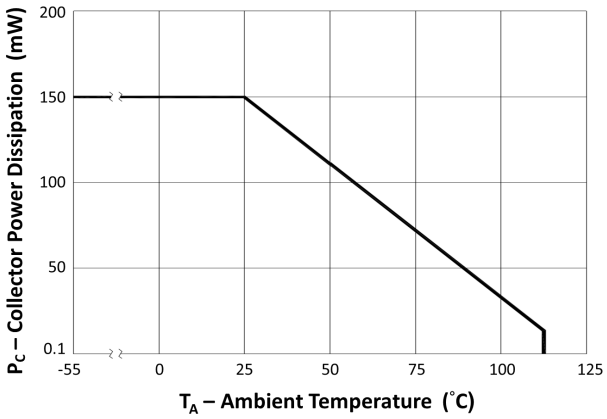


Fig 2 Collector Power Dissipation vs Ambient Temperature

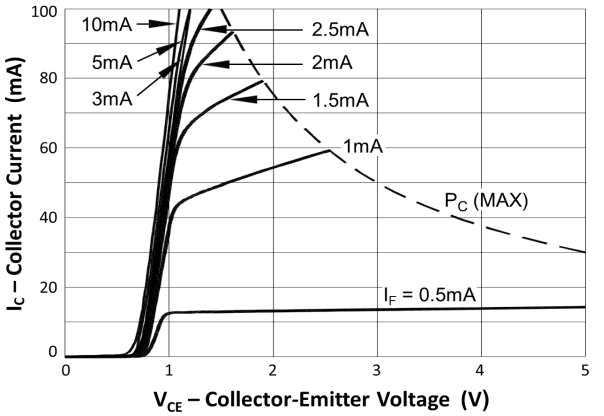


Fig 3 Collector Current vs Collector-Emitter Voltage

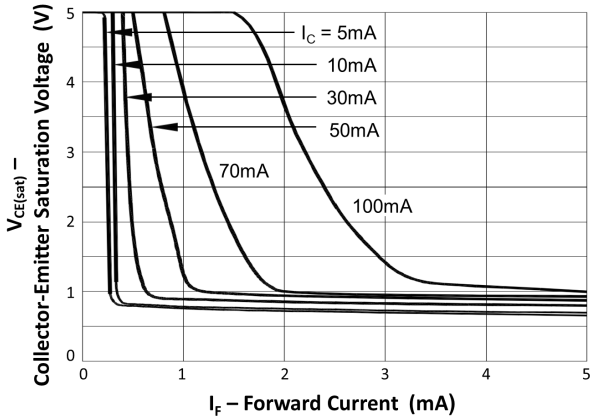


Fig 4 Collector-Emitter Saturation Voltage vs Forward Current

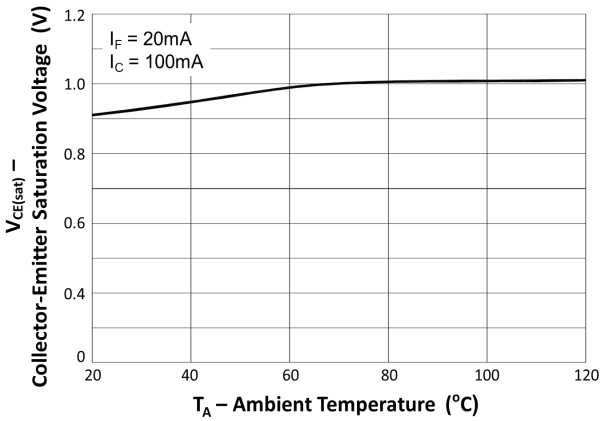


Fig 5 Collector-Emitter Saturation Voltage vs Ambient Temperature

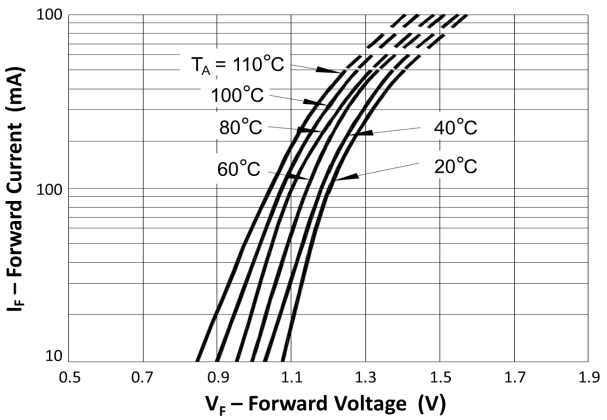


Fig 6 Forward Current vs Forward Voltage

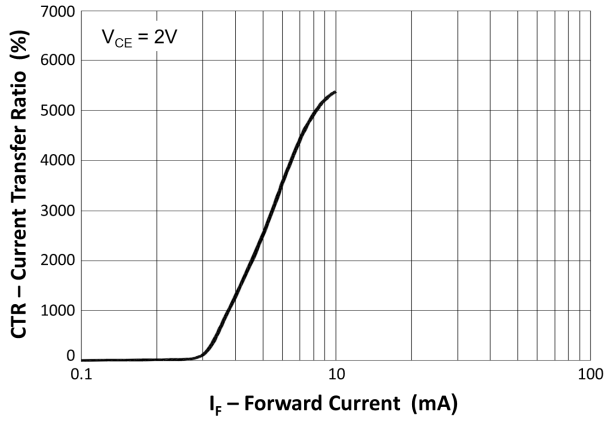


Fig 7 Current Transfer Ratio vs Forward Current

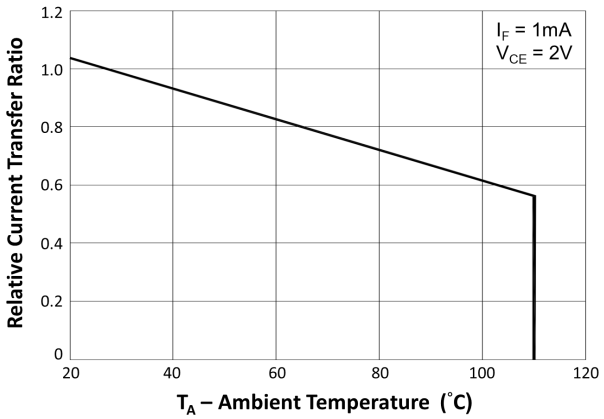


Fig 8 Relative Current Transfer Ratio vs Ambient Temperature

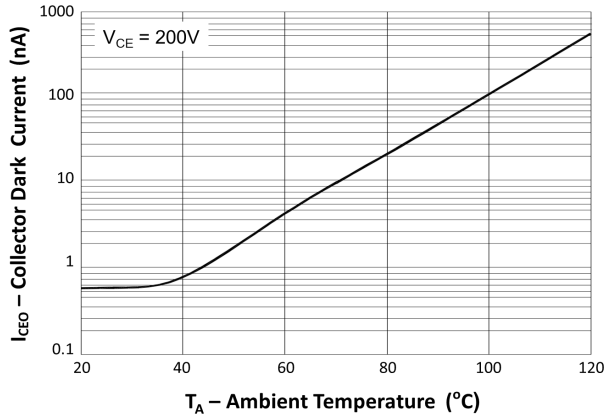


Fig 9 Collector Dark Current vs Ambient Temperature

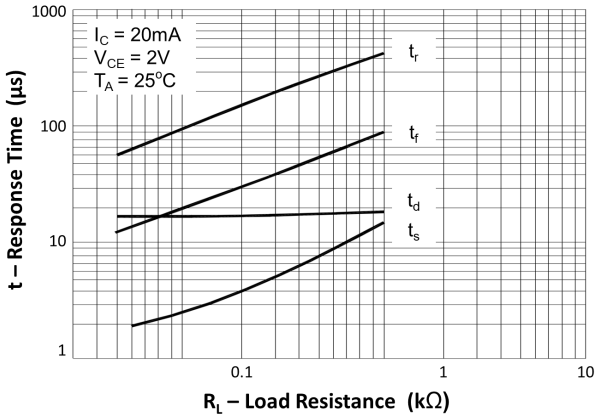


Fig 10 Response Time vs Load Resistance

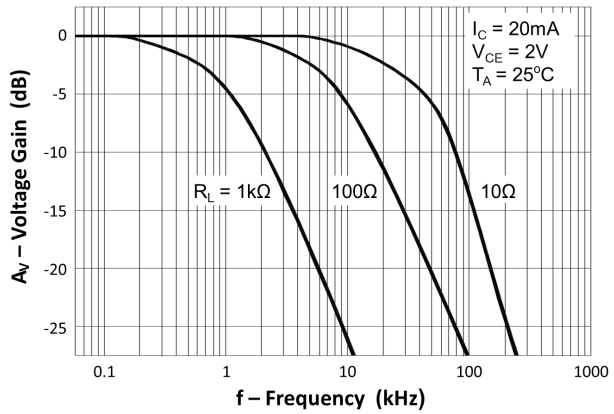
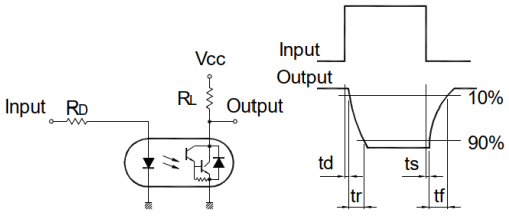
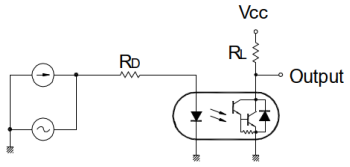


Fig 11 Frequency Response



Response Time Test Circuit



Frequency Response Test Circuit

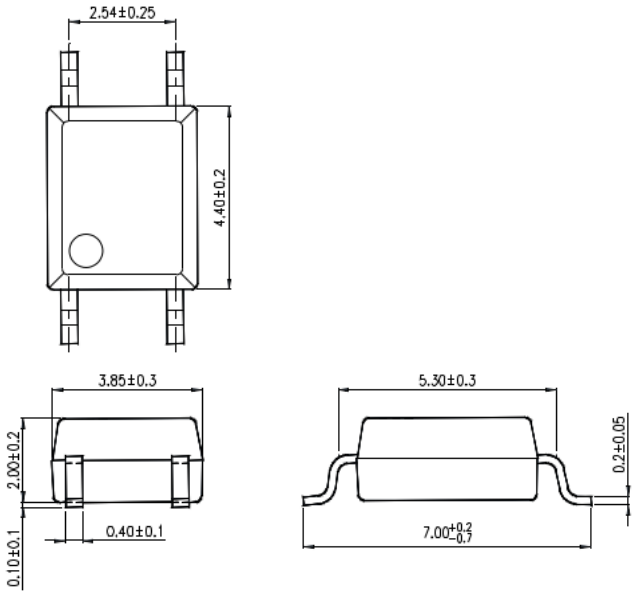
ORDER INFORMATION

IS127			
After PN	**PN**	**Description**	**Packing quantity**
None	IS127	Surface Mount Tape and Reel	3000 pcs per tube

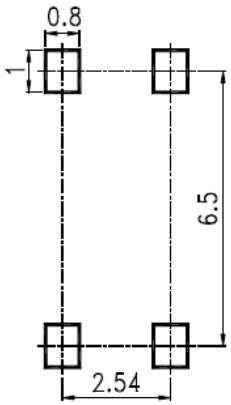
DEVICE MARKING

FPH1	Device Part Number
/	Isocom
Y	1 digit Year code
WW	2 digit Week code

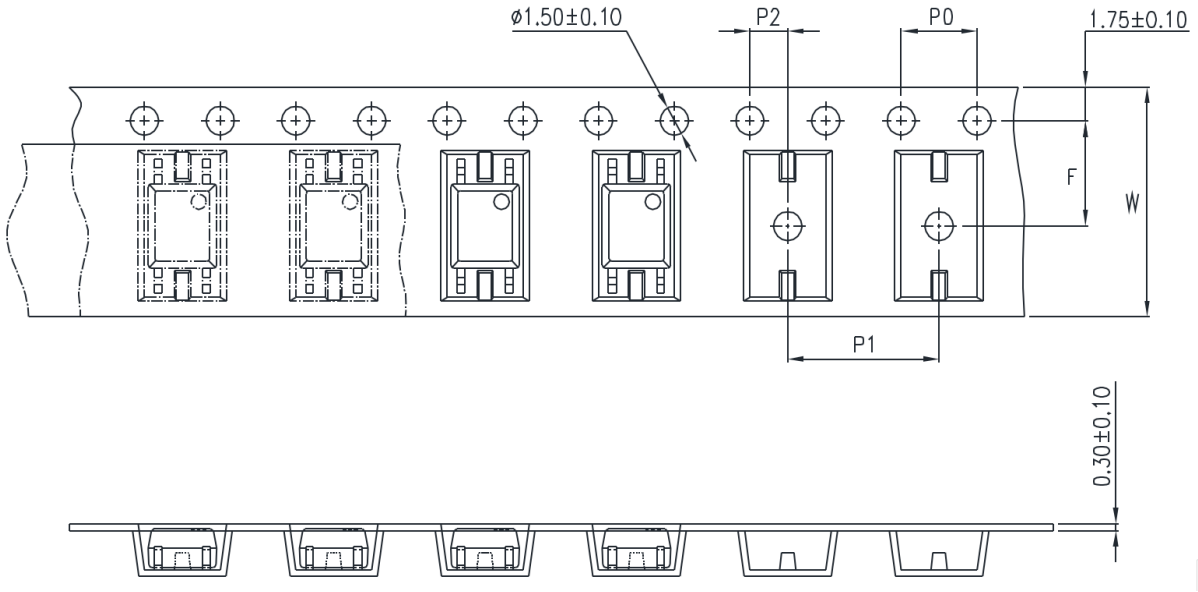
PACKAGE DIMENSIONS in mm (inch)



RECOMMENDED SOLDER PAD LAYOUT (mm)



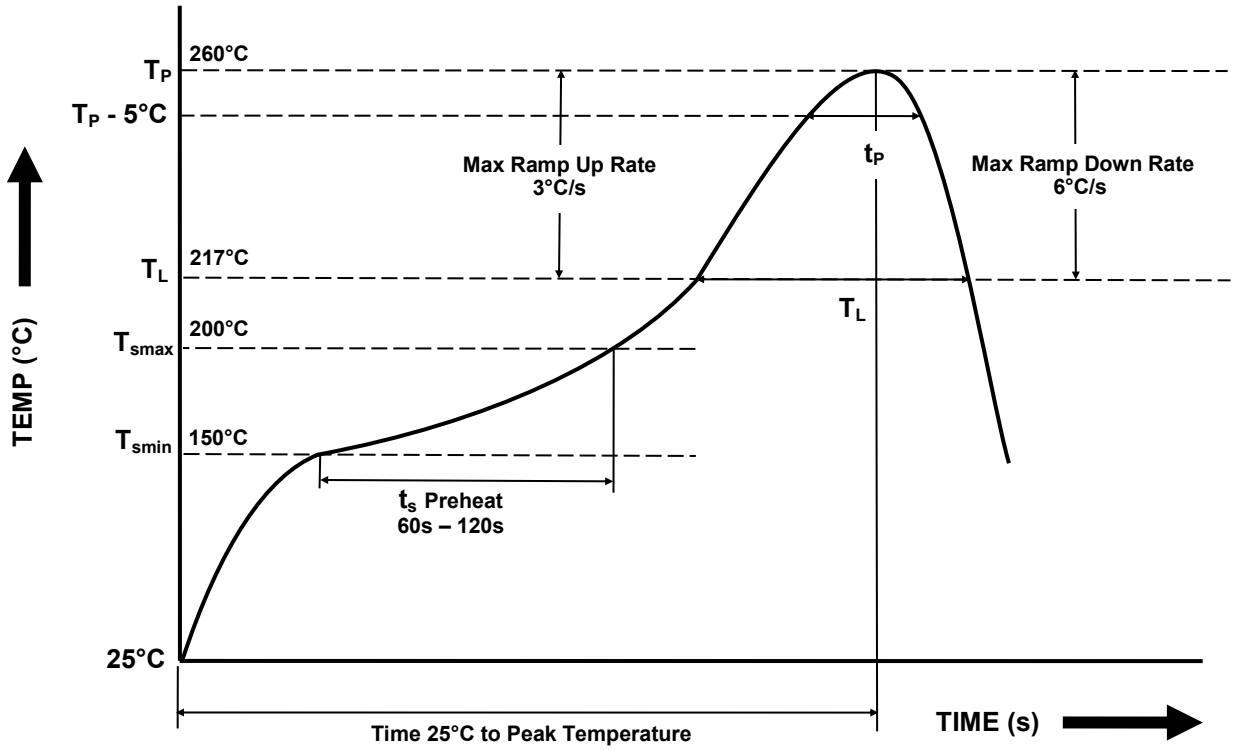
TAPE AND REEL PACKAGING



Description	Symbol	Dimension mm (inch)
Tape Width	W	12 ± 0.3 (0.47)
Pitch of Sprocket Holes	P_0	4 ± 0.1 (0.157)
Distance of Compartment to Sprocket Holes	F	5.5 ± 0.1 (0.217)
	P_2	2 ± 0.1 (0.079)
Distance of Compartment to Compartment	P_1	8 ± 0.1 (0.315)

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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