



## 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

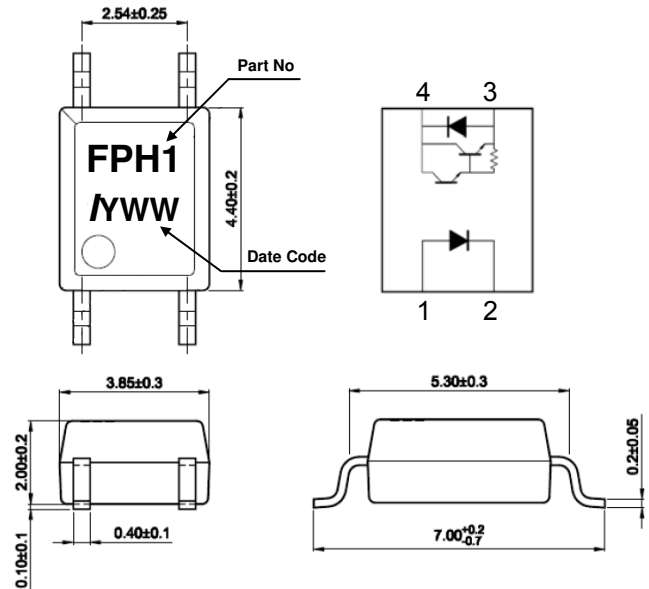
- Low Profile Package
- AC Isolation Voltage 3750V<sub>RMS</sub>
- CTR Minimum 1000%
- High Collector-Emitter Voltage V<sub>CEO</sub> 300V
- Wide Operating Temperature Range -55°C to +110°C
- Lead Free and RoHS Compliant
- UL File E91231 Package Code "FPH1"

### APPLICATIONS

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

### ORDER INFORMATION

- Available in Tape and Reel with 750 pieces per reel



### ABSOLUTE MAXIMUM RATINGS

#### Input Diode

Forward Current	50mA
Reverse Voltage	6V
Power dissipation	70mW

#### Output Transistor

Collector to Emitter Voltage BV <sub>CEO</sub>	300V
Emitter to Collector Voltage BV <sub>ECO</sub>	0.1V
Collector Current	150mA
Power Dissipation	150mW

#### Total Package

Operating Temperature	-55 to +110 °C
Storage Temperature	-55 to +150 °C
Total Power Dissipation	170mW
Lead Soldering Temperature (for 10s)	260°C

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## IS127

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

#### INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	$V_F$	$I_F = 10\text{mA}$		1.2	1.4	V
Reverse Leakage	$I_R$	$V_R = 4\text{V}$			10	$\mu\text{A}$
Terminal Capacitance	$C_t$	$V = 0\text{V}, f = 1\text{KHz}$		30	250	pF

#### OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector-Emitter breakdown Voltage	$BV_{CEO}$	$I_C = 0.1\text{mA}, I_F = 0\text{mA}$	300			V
Emitter-Collector breakdown Voltage	$BV_{ECO}$	$I_E = 10\mu\text{A}, I_F = 0\text{mA}$	0.1			V
Collector-Emitter Dark Current	$I_{CEO}$	$V_{CE} = 200\text{V}, I_F = 0\text{mA}$			200	nA

#### COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Current transfer ratio	CTR	$I_F = 1\text{mA}, V_{CE} = 2\text{V}$	1000			%
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 20\text{mA}, I_C = 100\text{mA}$			1.2	V
Input to Output Isolation Voltage	$V_{ISO}$	See note 1	3750			$V_{RMS}$
Input to Output Isolation Resistance	$R_{ISO}$	$V_{IO} = 500\text{V}$ See note 1	$5 \times 10^{10}$			$\Omega$
Output Rise Time	$t_r$	$V_{CE} = 2\text{V}, I_c = 20\text{mA},$ $R_L = 100\Omega$		100	300	$\mu\text{s}$
Output Fall Time	$t_f$	$V_{CE} = 2\text{V}, I_c = 20\text{mA},$ $R_L = 100\Omega$		20	100	$\mu\text{s}$

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



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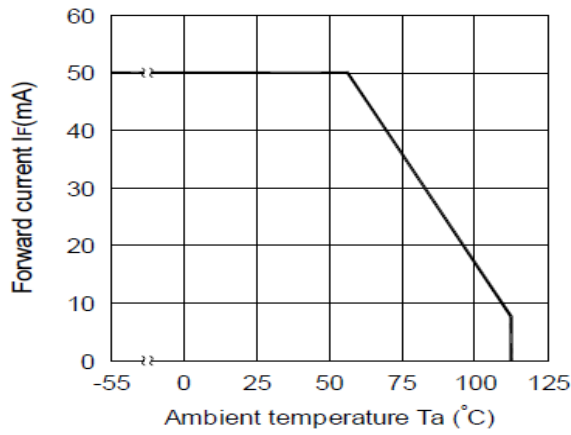


Fig 1 Forward Current vs  $T_A$

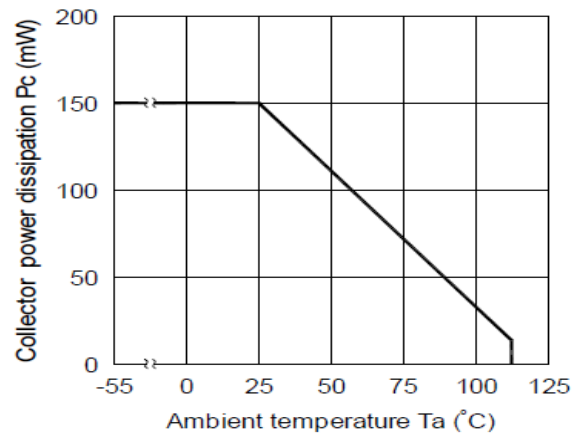


Fig 2 Collector Power Dissipation vs  $T_A$

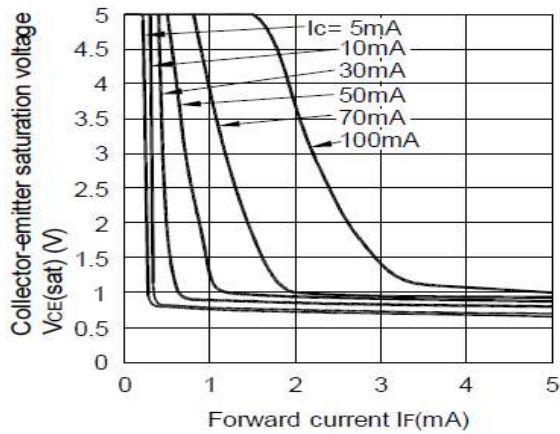


Fig 3 Collector-emitter Saturation Voltage vs Forward Current

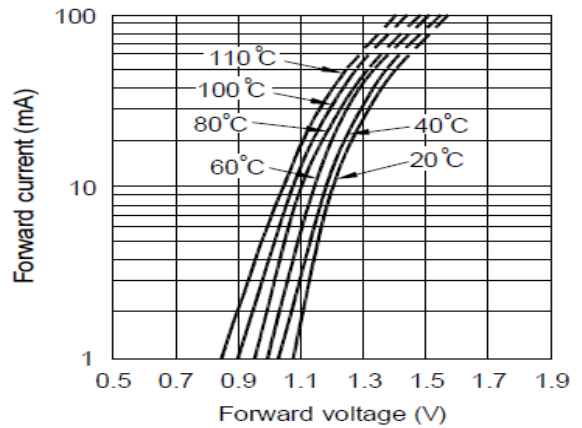


Fig 4 Forward Current vs Forward Voltage

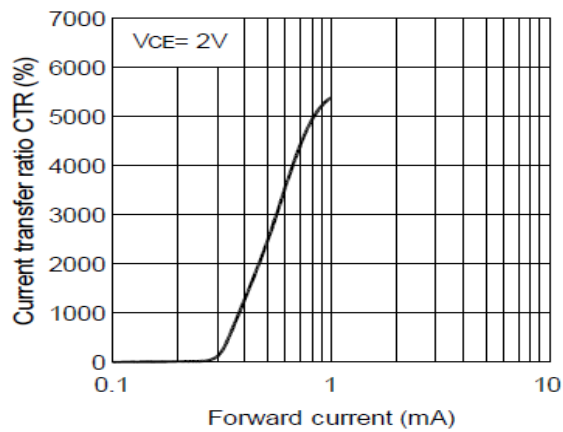


Fig 5 Current Transfer Ratio vs Forward Current

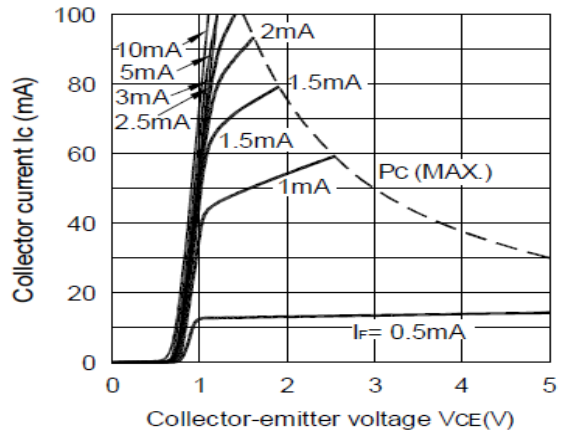


Fig 6 Collector Current vs Collector-Emitter Voltage



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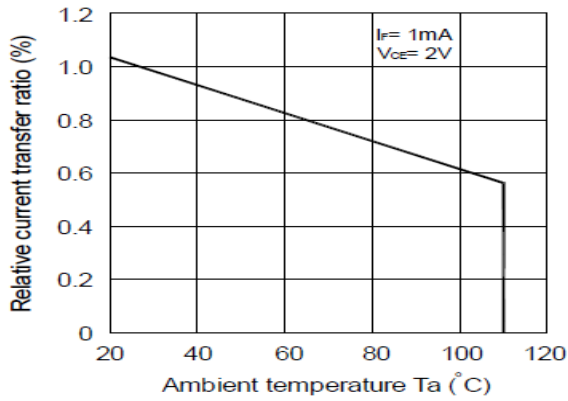


Fig 7 Relative CTR vs  $T_A$

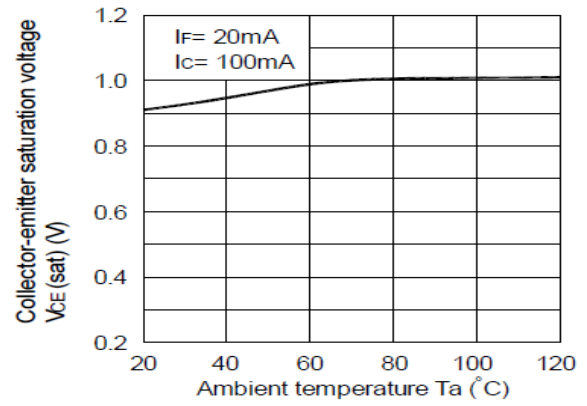


Fig 8 Collector-Emitter Saturation Voltage vs  $T_A$

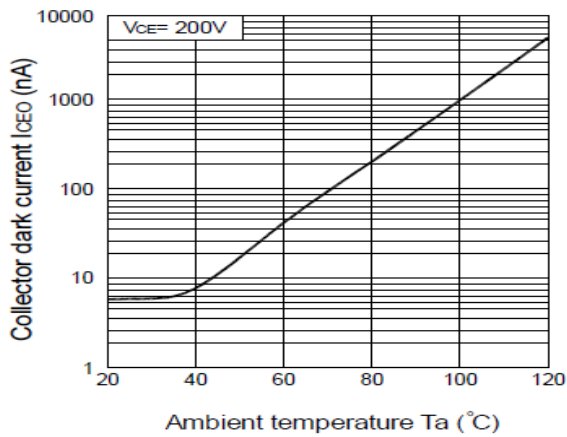


Fig 9 Collector Dark Current vs  $T_A$

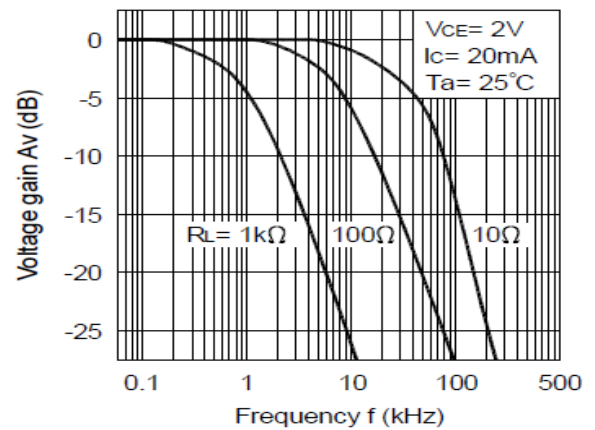


Fig 10 Frequency Response

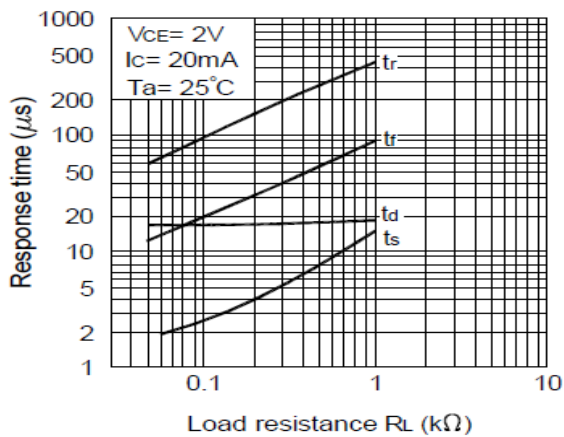
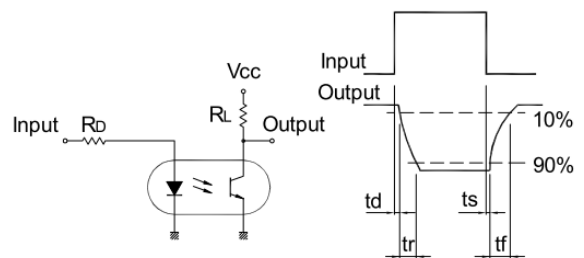


Fig 11 Response Time vs Load Resistance



Response Time Test Circuit

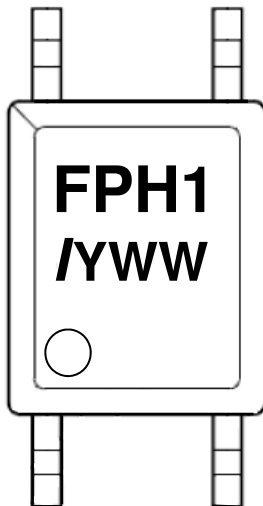


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### STANDARD PACKING QUANTITY

IS127			
After PN	PN	Description	Packing quantity
None	IS127	Surface Mount Tape & Reel	750 pcs per reel

### DEVICE MARKING

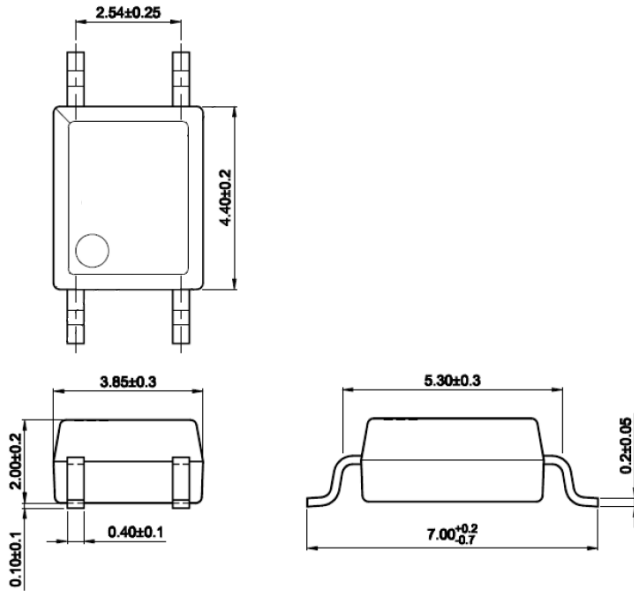


FPH1 denotes Device Part Number where “#” is internal control number  
/ denotes Isocom  
Y denotes 1 digit Year code  
WW denotes 2 digit Week code

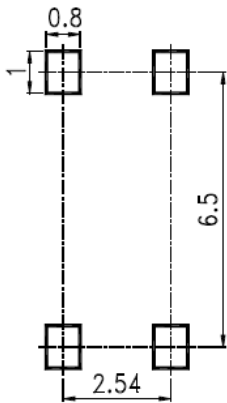


## IS127

### PACKAGE DIMENSIONS (mm)



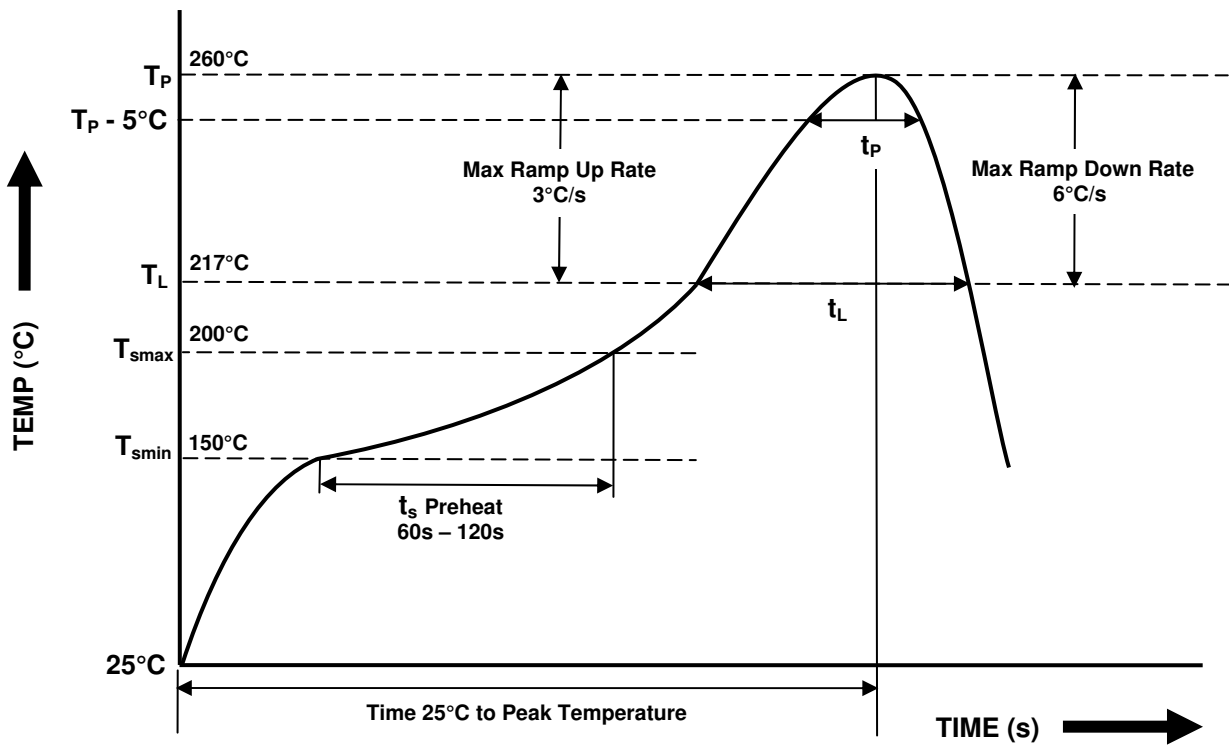
### RECOMMENDED SOLDER PAD LAYOUT (mm)





**IS127**

**IR REFLOW SOLDERING TEMPERATURE PROFILE**  
(One Time Reflow Soldering is Recommended)

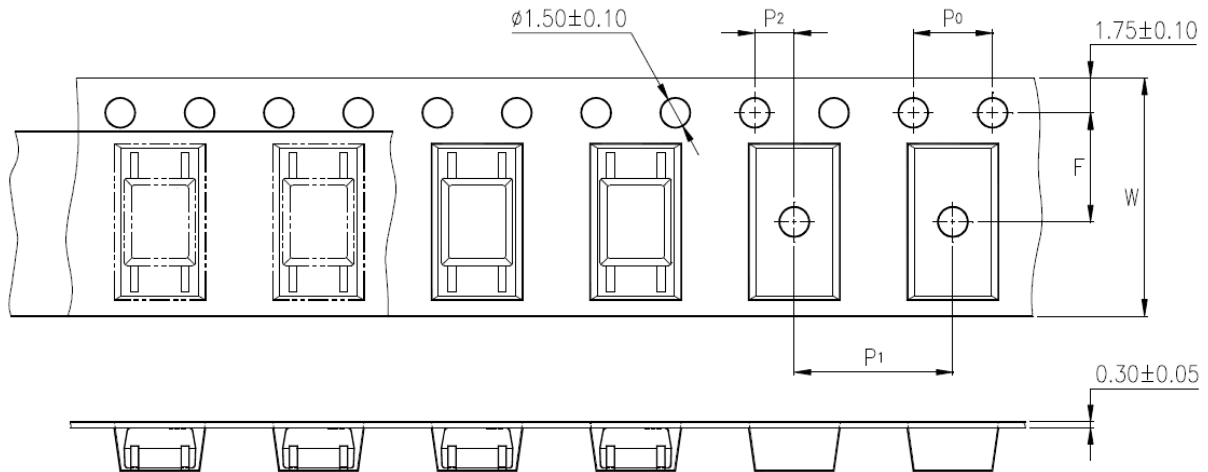


Profile Details	Conditions
<b>Preheat</b> - Min Temperature ( $T_{SMIN}$ ) - Max Temperature ( $T_{SMAX}$ ) - Time $T_{SMIN}$ to $T_{SMAX}$ ( $t_s$ )	150°C 200°C 60s - 120s
<b>Soldering Zone</b> - Peak Temperature ( $T_P$ ) - Liquidous Temperature ( $T_L$ ) - Time within 5°C of Actual Peak Temperature ( $T_P - 5^\circ\text{C}$ ) - 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 20s 60s 3°C/s max 3 - 6°C/s
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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### TAPE AND REEL PACKAGING (mm)



Description	Symbol	Dimensions in mm ( inches )
Tape wide	W	$12 \pm 0.3$ ( .47 )
Pitch of sprocket holes	$P_0$	$4 \pm 0.1$ ( .15 )
Distance of compartment	F	$5.5 \pm 0.1$ ( .217 )
	$P_2$	$2 \pm 0.1$ ( .079 )
Distance of compartment to compartment	$P_1$	$8 \pm 0.1$ ( .315 )





**ISOCOM**  
COMPONENTS

## IS127

### NOTES :

- Isocom is continually improving the quality, reliability, function or design and Isocom reserves the right to make changes without further notices.
- The products shown in this publication are designed for the general use in electronic applications such as office automation equipment, communications devices, audio/visual equipment, electrical application and instrumentation.
- For equipment/application where high reliability or safety is required, such as space applications, nuclear power control equipment, medical equipment, etc., please contact our sales representatives.
- When requiring a device for any "specific" application, please contact our sales for advice.
- The contents described herein are subject to change without prior notice.
- Do not immerse device body in solder paste.