



## IS3H7

### DESCRIPTION

The IS3H7 series optocoupler consists of an infrared emitting diode optically coupled to an NPN silicon photo transistor.

This device belongs to Isocom Compact Range of Optocouplers.

### FEATURES

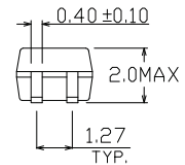
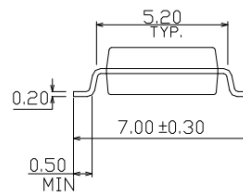
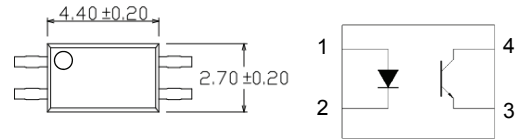
- Half Pitch 1.27mm
- High AC Isolation voltage 3750V<sub>RMS</sub>
- CTR Selections Available
- Wide Operating Temperature Range -55°C to 110°C
- Pb Free and RoHS Compliant
- UL Approval E91231, Model THP

### APPLICATIONS

- Switching Mode Power Supply
- Industrial System Controllers
- Measuring Instruments
- Signal Transmission between Systems of Different Potentials and Impedances

### ORDER INFORMATION

- Available in Tape and Reel with 1000pcs per reel



All dimensions in mm.

### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C)

#### Input Diode

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

#### Output Transistor

Collector to Emitter Voltage BV <sub>CEO</sub>	80V
Emitter to Collector Voltage BV <sub>ECO</sub>	7V
Collector Current	50mA
Power Dissipation	150mW

#### Total Package

Isolation Voltage	3750V <sub>RMS</sub>
Total Power Dissipation	200mW
Operating Temperature	-55 to 110 °C
Storage Temperature	-55 to 125 °C
Lead Soldering Temperature (10s)	260°C

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## IS3H7

### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

#### INPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Forward Voltage	$V_F$	$I_F = 20\text{mA}$		1.2	1.4	V
Reverse Current	$I_R$	$V_R = 4\text{V}$			10	$\mu\text{A}$
Input Capacitance	$C_{IN}$	$V_F = 0\text{V}, f = 1\text{KHz}$		30	250	pF

#### OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector-Emitter breakdown Voltage	$BV_{CEO}$	$I_C = 0.1\text{mA}, I_F = 0\text{mA}$	80			V
Emitter-Collector breakdown Voltage	$BV_{ECO}$	$I_E = 0.1\text{mA}, I_F = 0\text{mA}$	7			V
Collector-Emitter Dark Current	$I_{CEO}$	$V_{CE} = 20\text{V}, I_F = 0\text{mA}$			100	nA



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### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

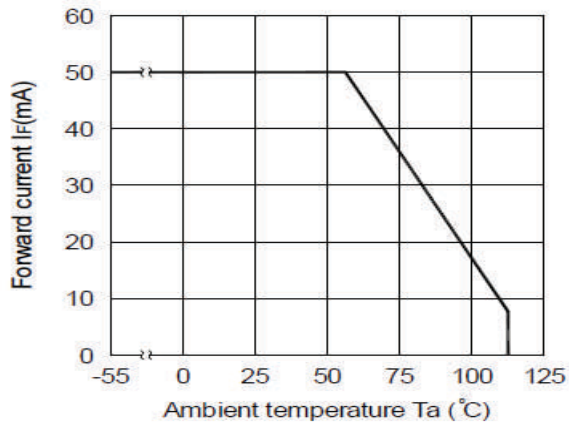
#### COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit	
Current transfer ratio	CTR	$I_F = 5\text{mA}$ , $V_{CE} = 5\text{V}$				%	
		IS3H&	50		600		
		IS3H&A	80		160		
		IS3H&B	130		260		
		IS3H&C	200		400		
		IS3H&D	300		600		
		IS3H&E	100		200		
		IS3H&F	150		300		
		$I_F = 10\text{mA}$ , $V_{CE} = 5\text{V}$					
		IS3H&H	40		80		
		IS3H&I	63		125		
		IS3H&J	100		200		
		IS3H&K	160		320		
		IS3H&GR	100		300		
IS3H&GB	100		600				
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 10\text{mA}$ , $I_C = 1\text{mA}$		0.1	0.2	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	$5 \times 10^{10}$			$\Omega$	
Floating Capacitance	$C_f$	$V_F = 0\text{V}$ , $f = 1\text{MHz}$		0.3		pF	
Output Rise Time	$t_r$	$V_{CE} = 2\text{V}$ , $I_c = 2\text{mA}$ , $R_L = 100\Omega$		6	18	$\mu\text{s}$	
Output Fall Time	$t_f$	$V_{CE} = 2\text{V}$ , $I_c = 2\text{mA}$ , $R_L = 100\Omega$		6	18	$\mu\text{s}$	

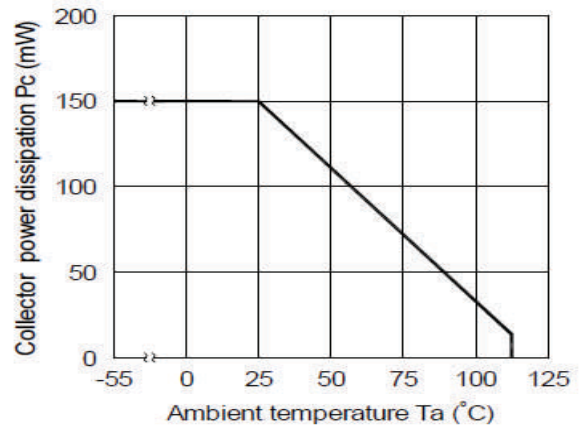
Note 1 : Measured with input leads shorted together and output leads shorted together, R.H 40% to 60%



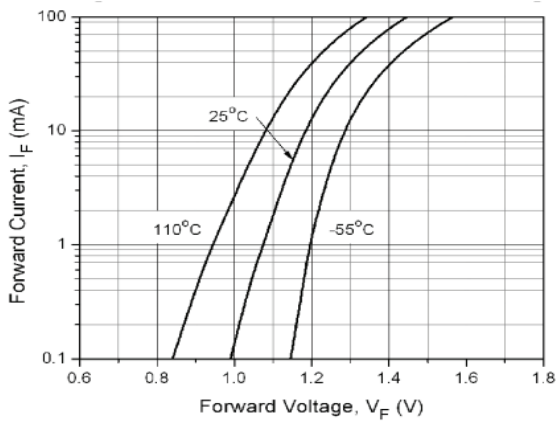
**IS3H7**



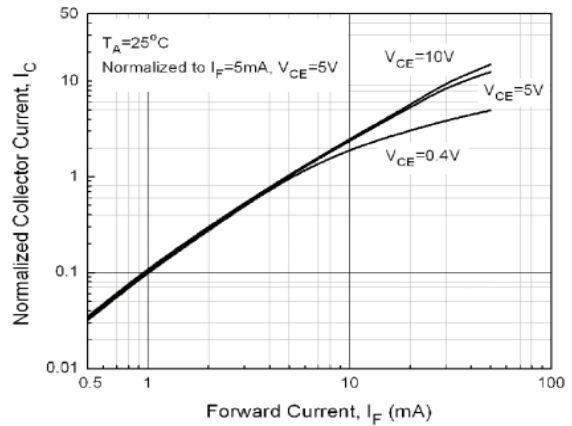
**Fig 1 Forward Current vs Ambient Temperature**



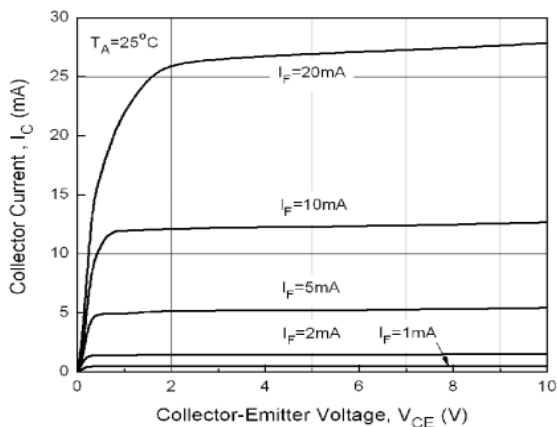
**Fig 2 Collector Power Dissipation vs  $T_A$**



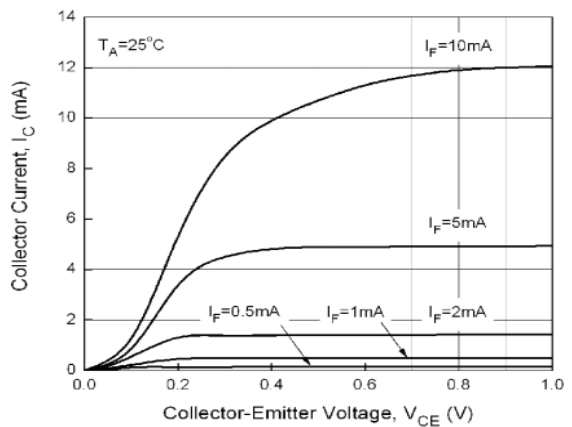
**Fig 3 Forward Current vs Forward Voltage**



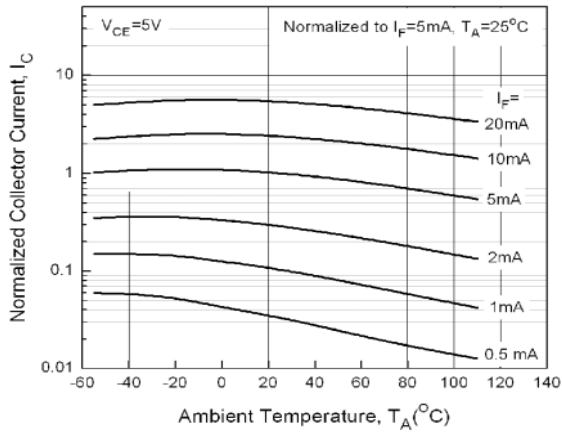
**Fig 4 Normalized Collector Current vs Forward Current**



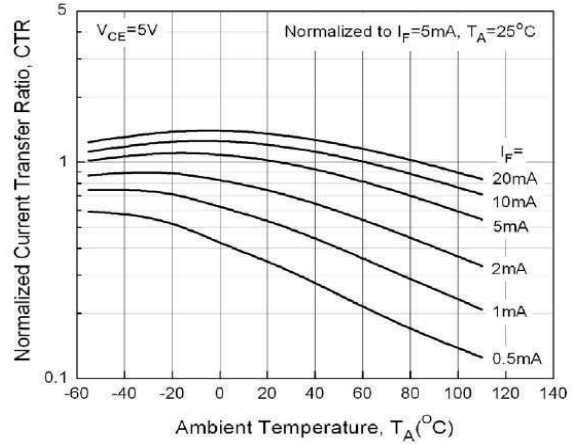
**Fig 5 Collector Current vs Collector-Emitter Voltage (1)**



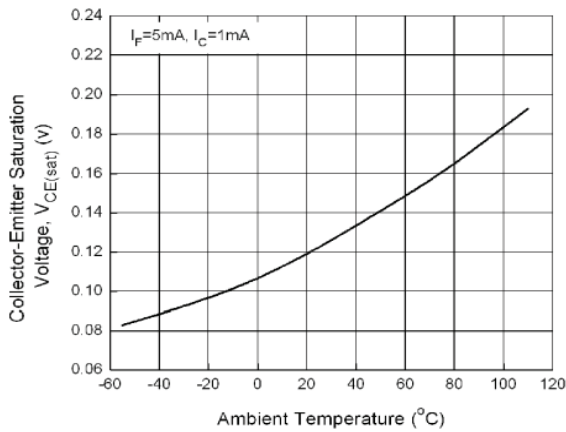
**Fig 6 Collector Current vs Collector-Emitter Voltage (2)**



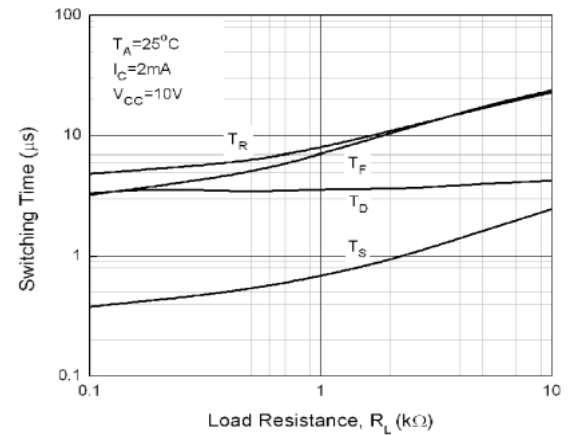
**Fig 7 Normalized Collector Current vs Ambient Temperature**



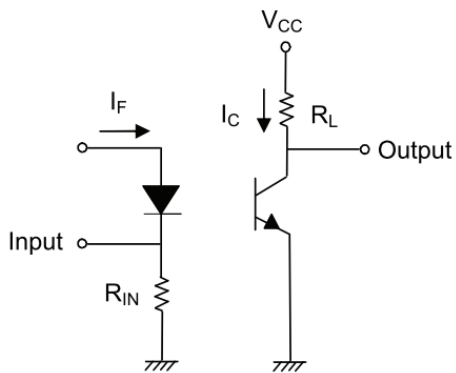
**Fig 8 Normalized CTR vs Ambient Temperature**



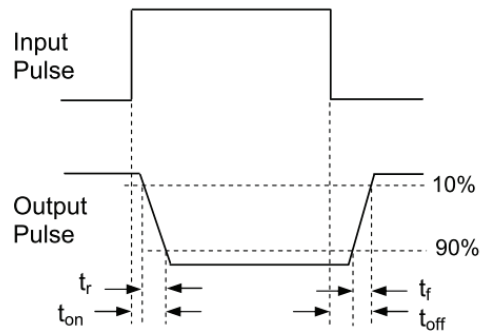
**Fig 9 Collector-Emitter Voltage vs Ambient Temperature**



**Fig 10 Switching Time vs Load Resistance**



**Switching Time Test Circuit**



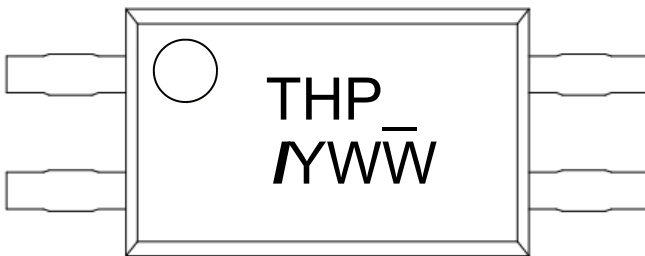


## IS3H7

### ORDER INFORMATION

IS3H&			
After PN	PN	Description	Packing quantity
None	IS3H&	Surface Mount Tape & Reel	1000 pcs per reel
Any CTR Grade	IS3H&A, IS3H&B, IS3H&C, IS3H&D, IS3H&E, IS3H&F, IS3H&H, IS3H&I, IS3H&J, IS3H&K, IS3H&GR, IS3H&GB	Surface Mount Tape & Reel	1000 pcs per reel

### DEVICE MARKING

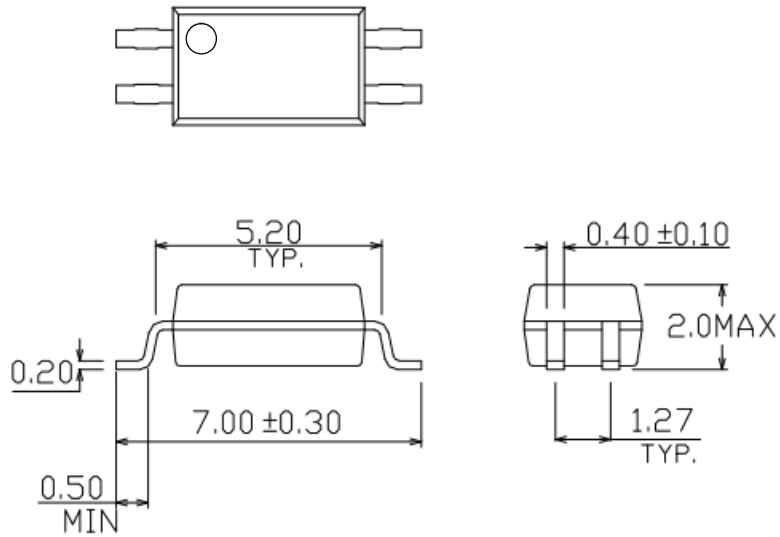


THP\_ denotes Device Part Number where “\_” denoted CTR Grade  
 I denotes Isocom  
 Y denotes 1 digit Year code  
 WW denotes 2 digit Week code

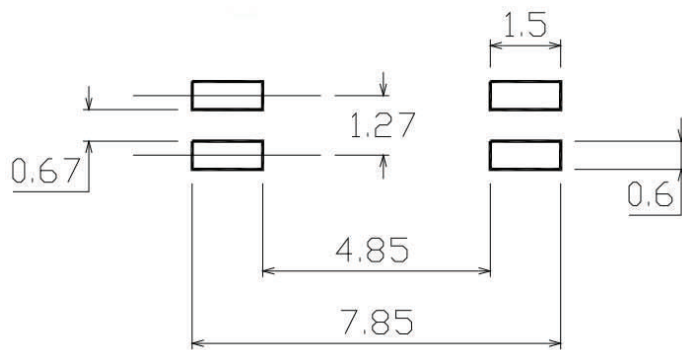


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### PACKAGE DIMENSIONS (mm)



### RECOMMENDED SOLDER PAD LAYOUT (mm)

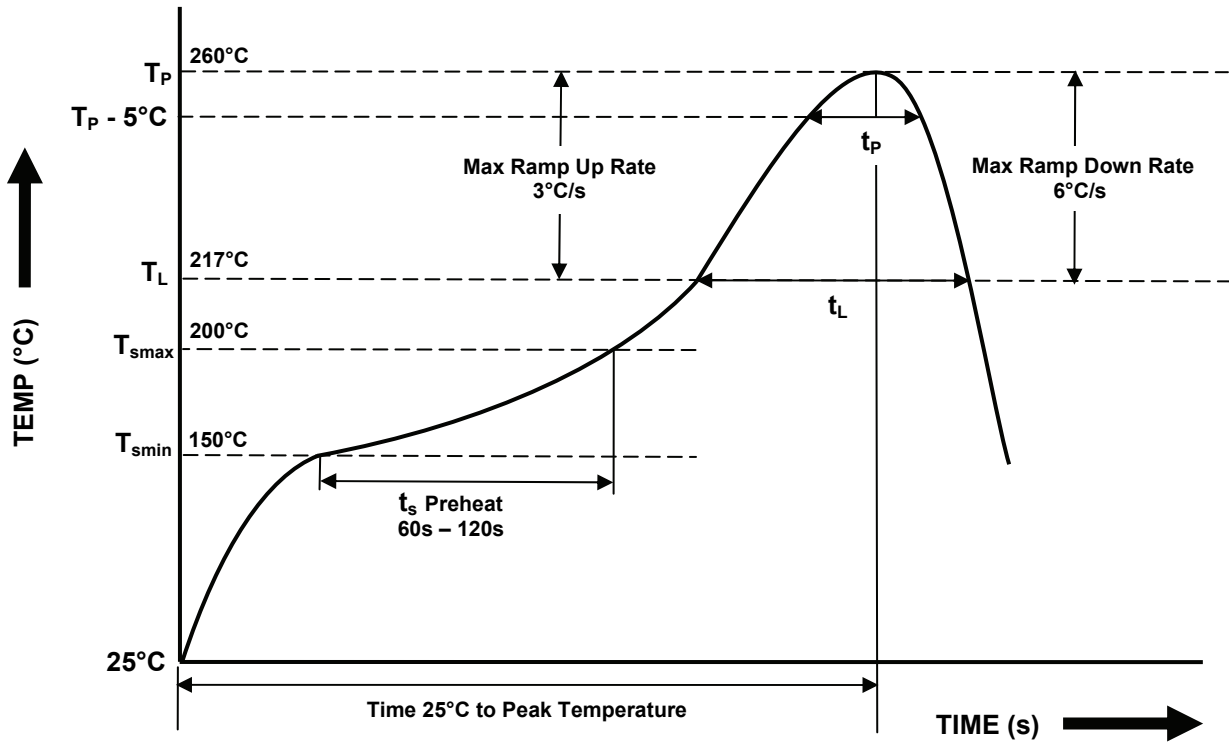




**IS3H7**

**IR REFLOW SOLDERING TEMPERATURE PROFILE**

(One Time Reflow Soldering is Recommended)



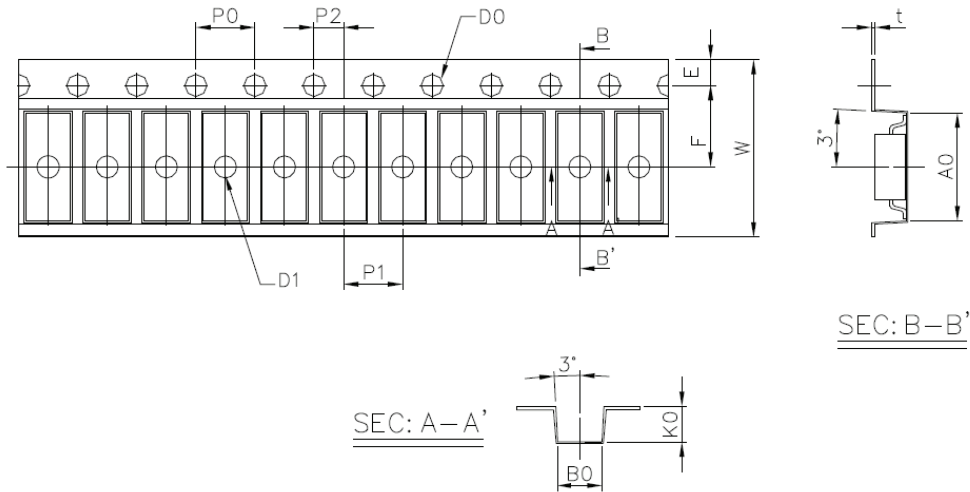
Profile Details	Conditions
<b>Preheat</b> - Min Temperature ( $T_{SMIN}$ ) - Max Temperature ( $T_{SMAX}$ ) - Time $T_{SMIN}$ to $T_{SMAX}$ ( $t_s$ )	150°C 200°C 60s – 120s
<b>Soldering Zone</b> - Peak Temperature ( $T_P$ ) - Liquidous Temperature ( $T_L$ ) - Time within 5°C of Actual Peak Temperature ( $T_P - 5^\circ\text{C}$ ) - 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 30s 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





**IS3H7**

**Tape and Reel Packaging**



Dimension No.	<b>A</b>	<b>B</b>	<b>Do</b>	<b>D1</b>	<b>E</b>	<b>F</b>
Dimension (mm)	3.0 ± 0.1	7.3 ± 0.1	1.5 + 0.1/-0	1.5 ± 0.1	1.75 ± 0.1	5.5 ± 0.1
Dimension No.	<b>Po</b>	<b>P1</b>	<b>P2</b>	<b>t</b>	<b>W</b>	<b>K</b>
Dimension (mm)	4.0 ± 0.15	4.0 ± 0.1	2.0 ± 0.1	0.25 ± 0.03	12.0 ± 0.2	2.4 ± 0.1

