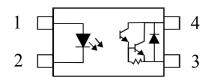


#### **DESCRIPTION**

The IS7000 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 standard 4 pin dual in line plastic package.



### **FEATURES**

- AC Isolation Voltage 5000V<sub>RMS</sub>
- High Current Transfer Ratio 1000% minimum
- Wide Operating Temperature Range –30°C to +100°C
- Lead Free and RoHS Compliant
- UL File No. E91231 Package Code "SS"
- VDE Approval Certificate No. 40028086

#### **APPLICATIONS**

- Modems
- Fax and Copying Machines
- Numerical Control Machines
- Signal Transmission between Systems of Different Potentials and Impedance

### **ORDER INFORMATION**

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

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

#### **Total Package**

Operating Temperature	-30 to +100 °C
Storage Temperature	-55 to +125 °C
Total Power Dissipation	200mW
Lead Soldering Temperature	260°C
(for 10s)	

#### **ISOCOM COMPONENTS 2004 LTD**

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e-mail sales@isocom.com.hk



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

### **INPUT**

Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
Forward Voltage	$V_{\rm F}$	$I_F = 10 \text{mA}$		1.2	1.4	V
Reverse Leakage Current	$I_R$	$V_R = 4V$			10	μΑ
Terminal Capacitance	$C_{t}$	V = 0V, $f = 1KHz$		30	250	pF

### **OUTPUT**

Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
Collector-Emitter Break- down Voltage	$\mathrm{BV}_{\mathrm{CEO}}$	$I_C = 0.1 \text{mA}, I_F = 0 \text{mA}$	300			V
Emitter-Collector Break- down Voltage	$\mathrm{BV}_{\mathrm{ECO}}$	$I_E = 0.01 \text{mA}, I_F = 0 \text{mA}$	0.1			V
Collector-Emitter Dark Current	$I_{CEO}$	$V_{CE} = 200V, I_F = 0mA$			200	nA

### **COUPLED**

Parameter	Symbol	Test Condition	Min	Тур.	Max	Unit
Current transfer ratio	CTR	$I_F = 1 \text{mA}, V_{CE} = 2V$	1000	4000		%
Collector—Emitter Saturation Voltage (1)	$V_{\text{CE(sat)}}$	$I_F = 20 \text{mA}, I_C = 100 \text{mA}$			1.2	V
Input to Output Isolation Voltage	$ m V_{ISO}$	See Note 1	5000			$V_{RMS}$
Input to Output Isolation Resistance	$R_{ISO}$	V <sub>IO</sub> = 500V See Note 1	5x10 <sup>10</sup>			Ω
Floating Capacitance	$C_{\mathrm{f}}$	V = 0V, $f = 1MHz$		0.6	1	pF
Output Rise Time	t <sub>r</sub>	$V_{CE} = 2V$ , $Ic = 20mA$ , $R_{I} = 100\Omega$		100		μs
Output Fall Time	$t_{\mathrm{f}}$	v <sub>CE</sub> - 2 v, 1c - 20mA, K <sub>L</sub> - 10022		20		μs

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



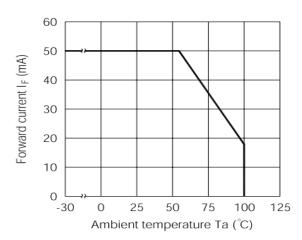


Fig 1 Forward Current vs  $T_A$ 

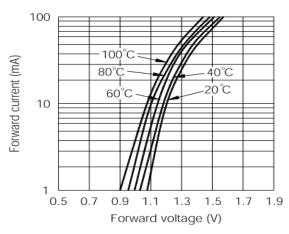


Fig 3 Forward Current vs Forward Voltage

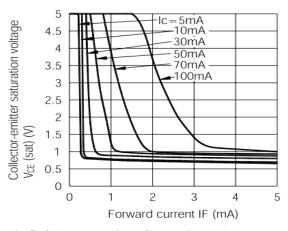


Fig 5 Collector-emitter Saturation Voltage vs Forward Current

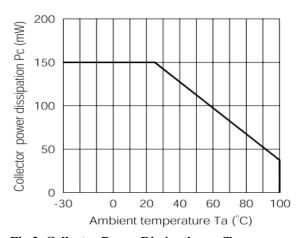


Fig 2 Collector Power Dissipation vs  $T_A$ 

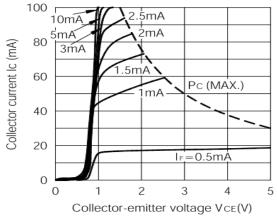


Fig 4 Collector Current vs Collector-Emitter Voltage

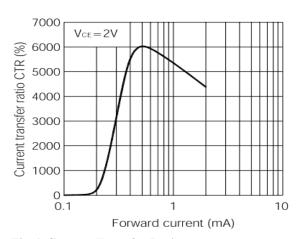


Fig 6 Current Transfer Ratio vs Forward Current



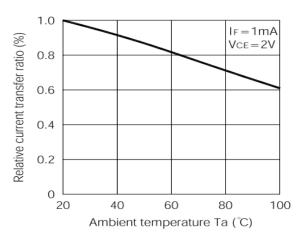


Fig 7 Relative CTR vs T<sub>A</sub>

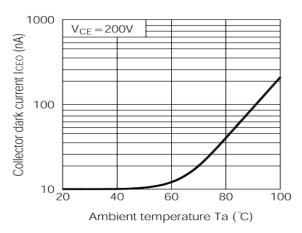


Fig 9 Collector Dark Current vs TA

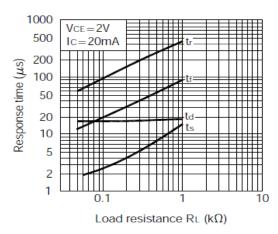


Fig 11 Response Time vs Load Resistance

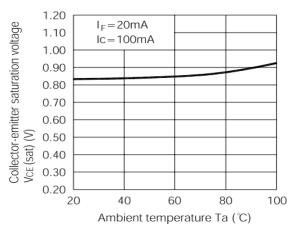


Fig 8 Collector-Emitter Saturation Voltage vs  $T_{\scriptscriptstyle A}$ 

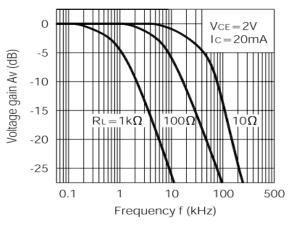
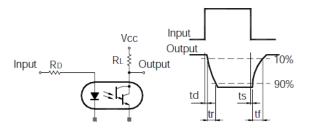


Fig 10 Frequency Response



**Response Time Test Circuit** 



### **ORDER INFORMATION**

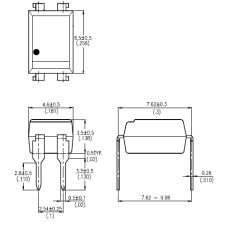
	IS7000 (UL Approval)				
After PN	PN	Description	Packing quantity		
None	IS7000	Standard DIP 4	100 pcs per reel		
G	IS7000G	10mm Lead Spacing	100 pcs per tube		
SM	IS7000SM	Surface Mount	100 pcs per tube		
SMT&R	IS7000SMT&R	Surface Mount Tape & Reel	1000 pcs per reel		

	IS7000X (UL and VDE Approval)				
After PN	PN	Description	Packing quantity		
None	IS7000X	Standard DIP 4	100 pcs per reel		
G	IS7000XG	10mm Lead Spacing	100 pcs per tube		
SM	IS7000XSM	Surface Mount	100 pcs per tube		
SMT&R	IS7000XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel		

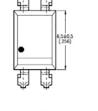


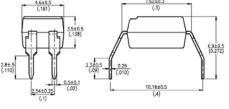
# PACKAGE DIMENSIONS (mm)

DIP

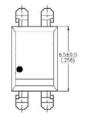


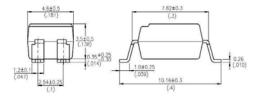
**G** Form





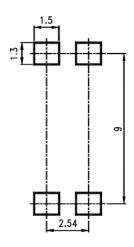
SMD



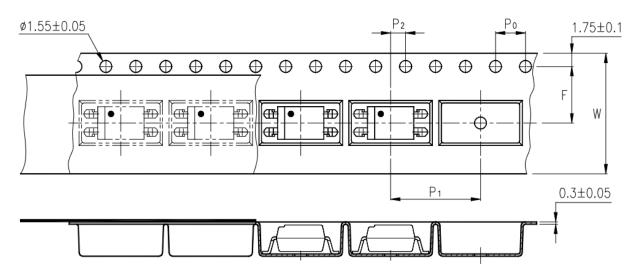




# RECOMMENDED SOLDER PAD LAYOUT FOR SMD (mm)



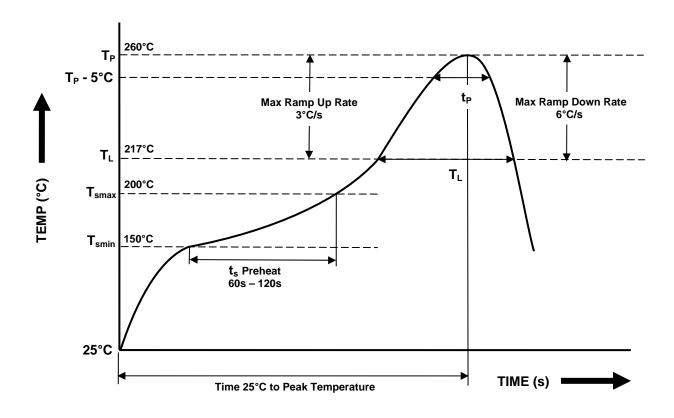
# **TAPE AND REEL PACKAGING (mm)**



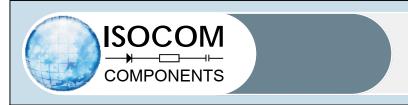
Description	Symbol	Dimensions in mm (inches)
Tape wide	W	$16 \pm 0.3 \ (.63)$
Pitch of sprocket holes	P <sub>0</sub>	4 ± 0.1 ( .15 )
Distance of commentment	F	$7.5 \pm 0.1 (.295)$
Distance of compartment	P <sub>2</sub>	$2 \pm 0.1 (.079)$
Distance of compartment to compartment	P <sub>1</sub>	$12 \pm 0.1 (.472)$



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

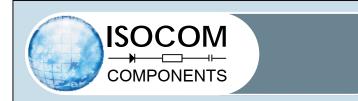


Profile Details	Conditions
$\begin{array}{l} \textbf{Preheat} \\ - \text{ Min Temperature } (T_{\text{SMIN}}) \\ - \text{ Max Temperature } (T_{\text{SMAX}}) \\ - \text{ Time } T_{\text{SMIN}} \text{ to } T_{\text{SMAX}} (t_s) \end{array}$	150°C 200°C 60s - 120s
$\begin{tabular}{ll} \textbf{Soldering Zone} \\ - & \begin{tabular}{ll} - & t$	260°C 217°C 30s 60s 3°C/s max 6°C/s max
Average Ramp Up Rate (T <sub>smax</sub> to T <sub>P</sub> )	3°C/s max
Time 25°C to Peak Temperature	8 minutes max



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- 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.



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