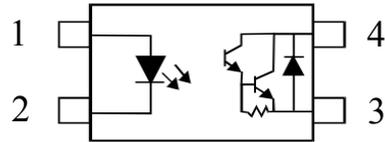




IS7000

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_{RMS}
- 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 _{CEO}	300V
Collector to Emitter Voltage BV _{Eco}	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 (for 10s)	260°C

ISOCOM COMPONENTS 2004 LTD

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Tel: +44 (0)1429 863 609 Fax : +44 (0)1429 863 581
e-mail: sales@isocom.co.uk
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Hong Kong Office,
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36 Tai Yau Street, San Po Kong, Kowloon, Hong Kong.
Tel: +852 2995 9217 Fax : +852 8161 6292
e-mail sales@isocom.com.hk



IS7000

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 Current	I_R	$V_R = 4\text{V}$			10	μA
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 Break-down Voltage	BV_{CEO}	$I_C = 0.1\text{mA}, I_F = 0\text{mA}$	300			V
Emitter-Collector Break-down Voltage	BV_{ECO}	$I_E = 0.01\text{mA}, I_F = 0\text{mA}$	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	4000		%
Collector—Emitter Saturation Voltage (1)	$V_{CE(sat)}$	$I_F = 20\text{mA}, I_C = 100\text{mA}$			1.2	V
Input to Output Isolation Voltage	V_{ISO}	See Note 1	5000			V_{RMS}
Input to Output Isolation Resistance	R_{ISO}	$V_{IO} = 500\text{V}$ See Note 1	5×10^{10}			Ω
Floating Capacitance	C_f	$V = 0\text{V}, f = 1\text{MHz}$		0.6	1	pF
Output Rise Time	t_r	$V_{CE} = 2\text{V}, I_C = 20\text{mA}, R_L = 100\Omega$		100		μs
Output Fall Time	t_f			20		μs

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



IS7000

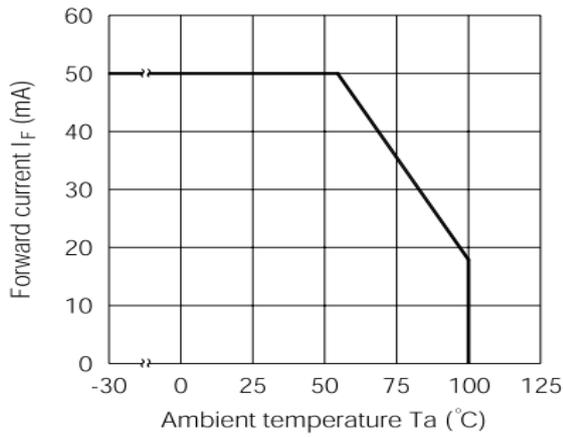


Fig 1 Forward Current vs T_A

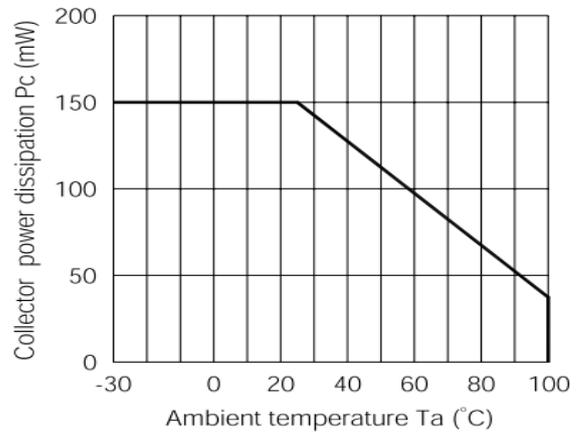


Fig 2 Collector Power Dissipation vs T_A

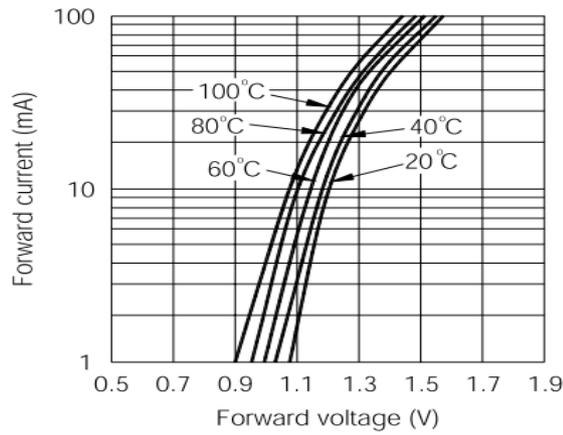


Fig 3 Forward Current vs Forward Voltage

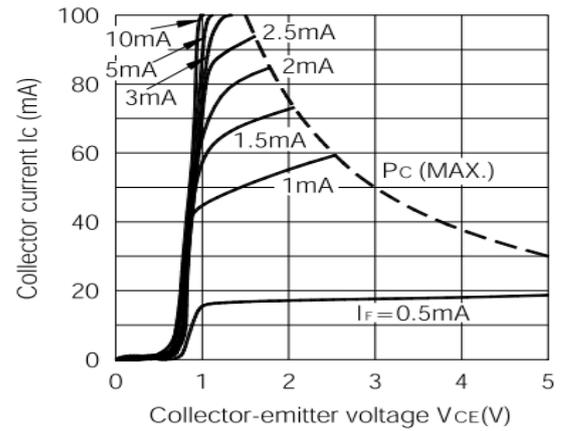


Fig 4 Collector Current vs Collector-Emitter Voltage

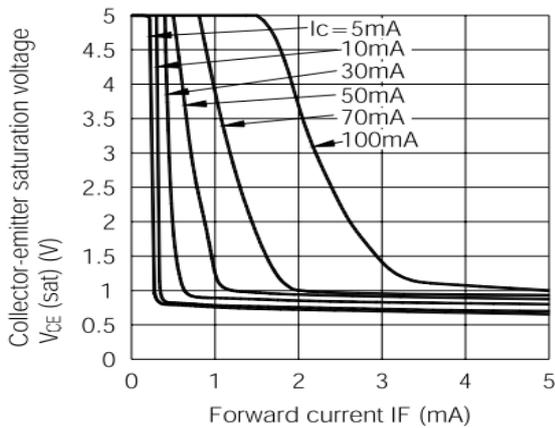


Fig 5 Collector-emitter Saturation Voltage vs Forward Current

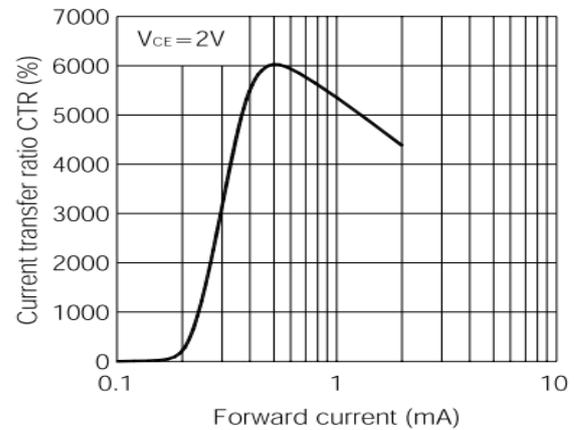


Fig 6 Current Transfer Ratio vs Forward Current



IS7000

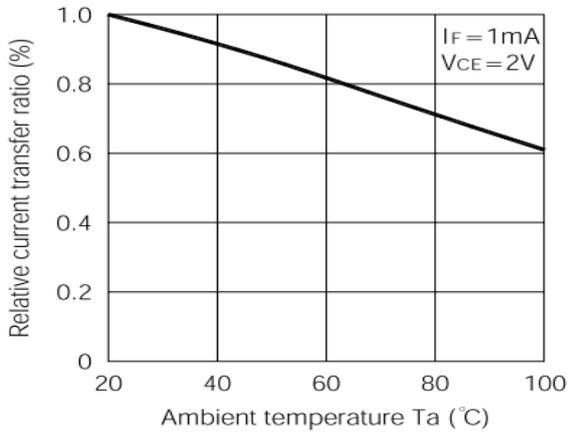


Fig 7 Relative CTR vs T_A

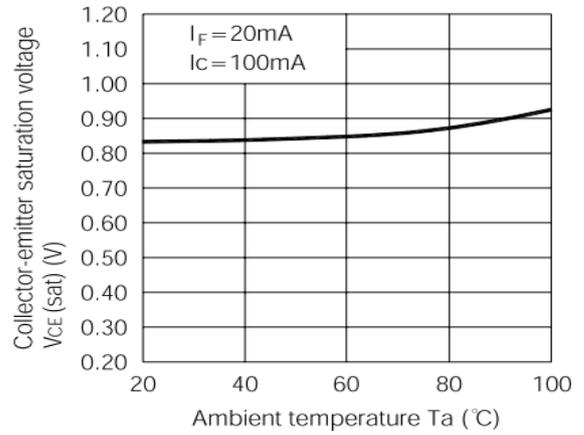


Fig 8 Collector-Emitter Saturation Voltage vs T_A

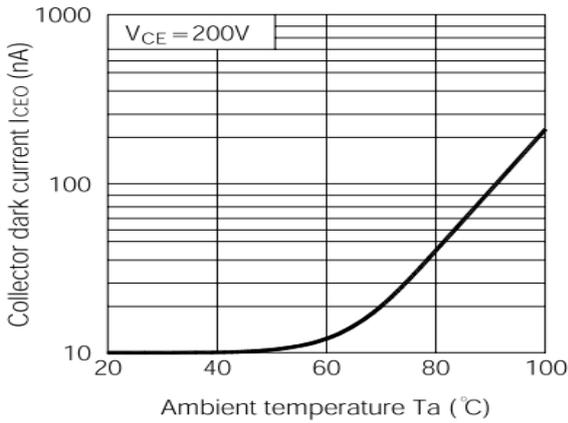


Fig 9 Collector Dark Current vs T_A

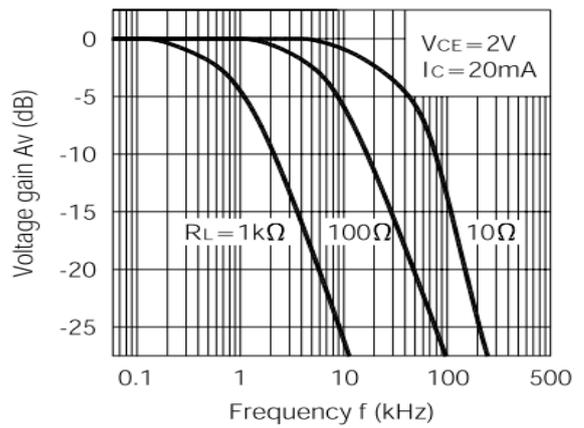


Fig 10 Frequency Response

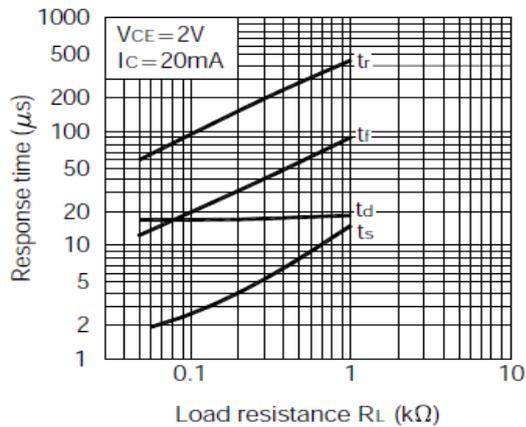
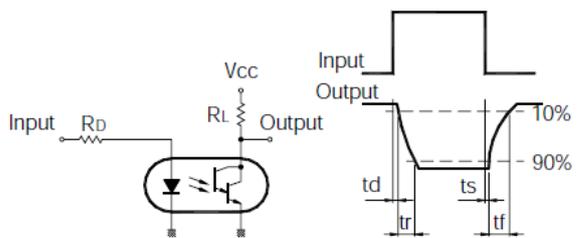


Fig 11 Response Time vs Load Resistance



Response Time Test Circuit



IS7000

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

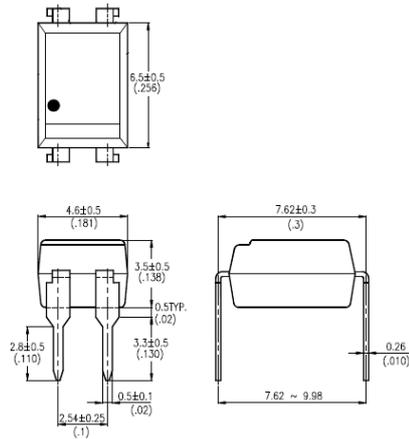
IS7000X (UL and VDE Approval)			
After PN	PN	Description	Packing quantity
None	IS7000X	Standard DIP 4	100 pcs per reel
G	IS7000XG	10mm Lead Spacing	100 pcs per tube
SM	IS7000XSM	Surface Mount	100 pcs per tube
SMT&R	IS7000XSMT&R	Surface Mount Tape & Reel	1000 pcs per reel



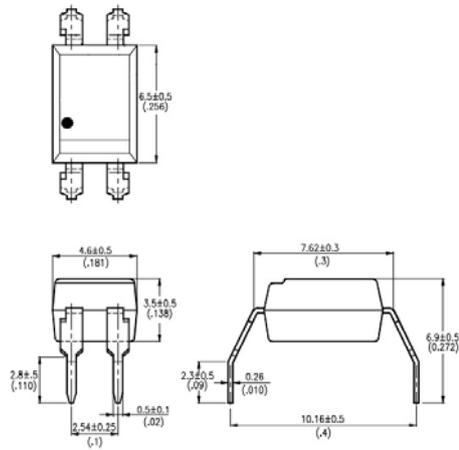
IS7000

PACKAGE DIMENSIONS (mm)

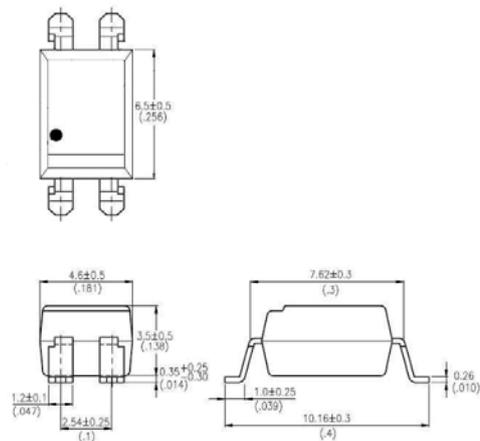
DIP



G Form



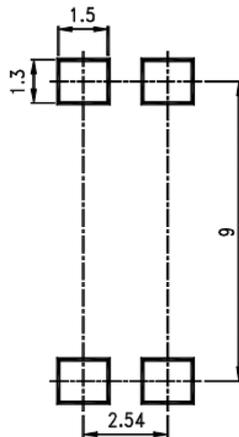
SMD



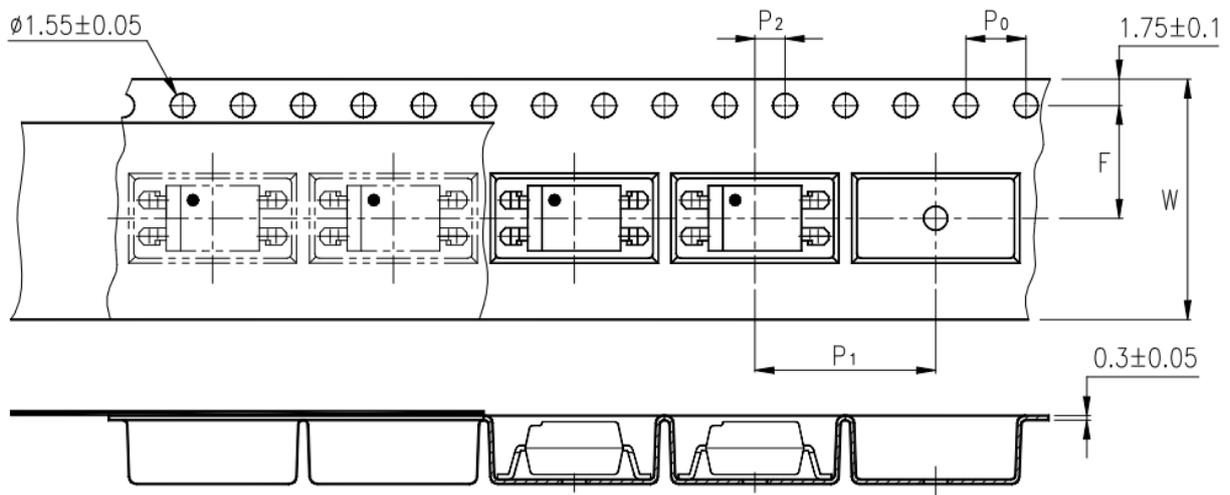


IS7000

RECOMMENDED SOLDER PAD LAYOUT FOR SMD (mm)



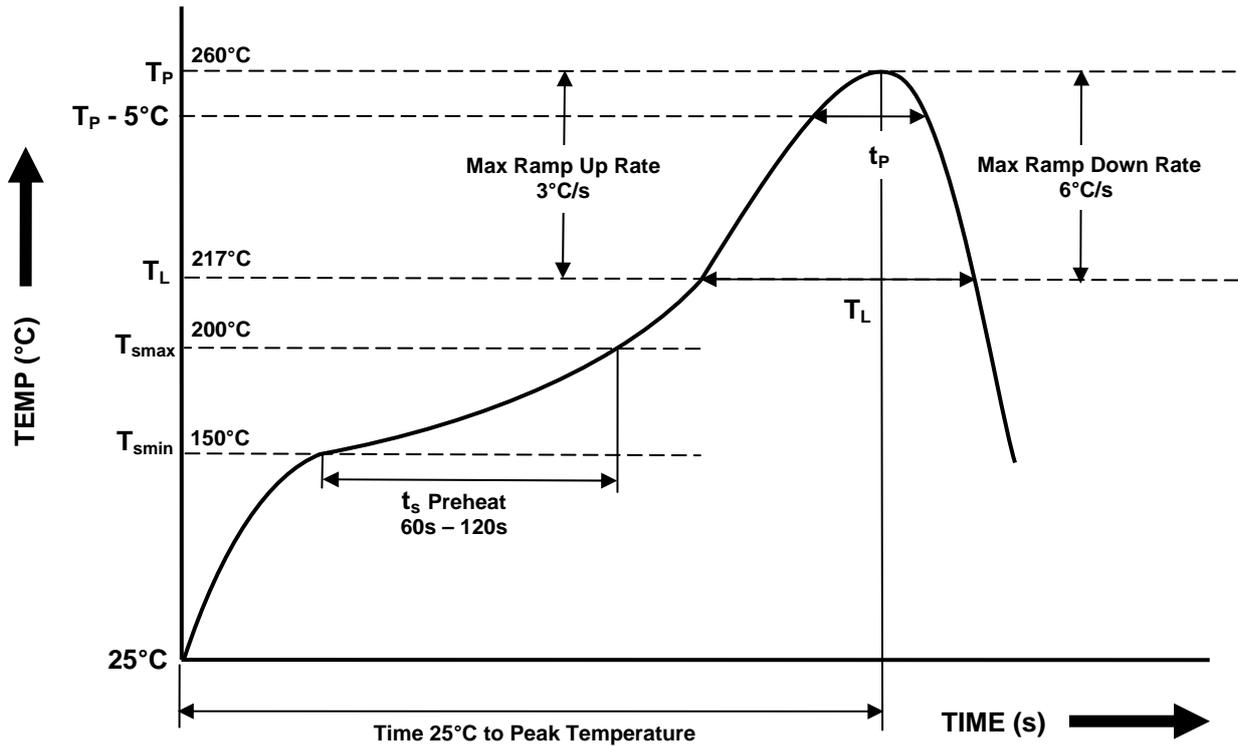
TAPE AND REEL PACKAGING (mm)



Description	Symbol	Dimensions in mm (inches)
Tape wide	W	16 ± 0.3 (.63)
Pitch of sprocket holes	P_0	4 ± 0.1 (.15)
Distance of compartment	F	7.5 ± 0.1 (.295)
Distance of compartment to compartment	P_2	2 ± 0.1 (.079)
Distance of compartment to sprocket hole	P_1	12 ± 0.1 (.472)



IR REFLOW SOLDERING TEMPERATURE PROFILE
(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) - 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 217°C 30s 60s 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

