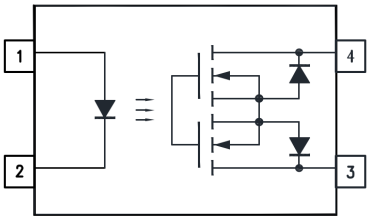
IS172G

DESCRIPTION

The IS172G is a Single Channel Solid State Relay (Photo MOSFET) which consists of an infrared emitting diode optically coupled to a high voltage output detector. The detector consists of a Photo Voltaic Diode Array and high voltage output MOSFETs.

This Single Channel Output configuration is equivalent to 1 Form A of Electro-mechanical Relay.



1 Anode
2 Cathode
3 Drain
4 Drain

FEATURES

- Normally Open 1 Form A
- High Output Voltage 350V Min
- ON-State Resistance 35Ω Max
- ON-State Current 110mA max
- High AC Isolation Voltage 3750V_{RMS}
- Wide Operating Temperature Range
- -40°C to 110°C
- RoHS Compliant
- Safety Approvals Pending

APPLICATIONS

- Battery Management System (BMS)
- Factory Automation
- Security Systems
- Measuring Instruments
- Smart Meters
- Mechanical Relay Replacement

ORDER INFORMATION

- Supplied in Tape and Reel

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
Peak Forward Current Pulse = 100µs, 100pps	1A
Reverse Voltage	6V
Power dissipation	70mW
Junction Temperature	125°C
Output	
OFF-State Output Terminal Voltage	350V
ON-State Current	110mA
Pulsed On State Current Pulse = 100ms, Duty Cycle 10%	0.33A
Power dissipation	300mW
Total Package	
Isolation Voltage	3750V_{RMS}
Operating Temperature	-40 to 110 °C
Storage Temperature	-55 to 125 °C
Lead Soldering Temperature (10s)	260°C

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Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Supply Voltage	V_{DD}			280	V
Forward Current	I_F	5	7.5	25	mA
ON-State Current	I_{ON}			110	mA
Operating Temperature	T_A	−20		100	°C

NOTE :

Recommended operating conditions are given as a design guideline to obtain expected performance of the device.

Each item is an independent guideline.

Please also refer to specified characteristics in this document.

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	1.0	1.18	1.3	V
Reverse Current	I_R	V_R = 5V			10	µA

OUTPUT

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Off State Current	I_{OFF}	V_{OFF} = 350V			100	nA

COUPLED

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Trigger LED Current	I_{FT}	I_{ON} = 110mA		0.8	3	mA
Return LED Current	I_{FC}	I_{OFF} = 100µA	0.1	0.6		mA
On Resistance	$R_{d(ON)}$	I_F = 5mA, I_{ON} = 110mA t < 1s		25	35	Ω
		I_F = 5mA, I_{ON} = 110mA		35	50	
Turn On Time	t_{ON}	I_F = 5mA, V_{DD} = 20V R_L = 200Ω		0.15	1	ms
Turn Off time	t_{OFF}			0.1	0.5	

ISOLATION

Parameter	Symbol	Test Condition	Min	Typ.	Max	Unit
Isolation Voltage Input-Output	V_{ISO}	RH = 40% to 60%, t = 1 min Note 1	3750			V_{RMS}
Isolation Resistance	R_{ISO}	V_{ISO} = 500VDC RH = 40% to 60% Note 1	$5x10^{10}$			Ω

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

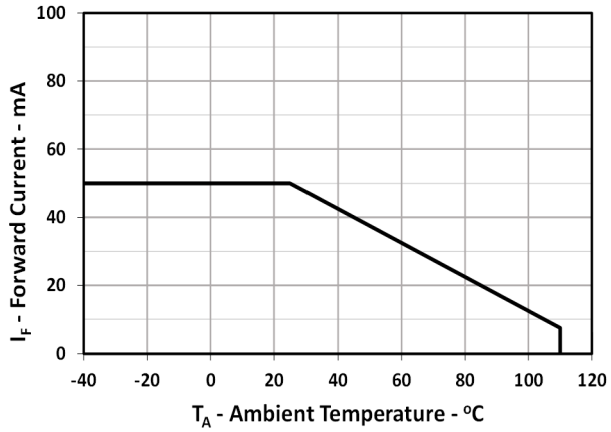


Fig 1 Forward Current vs Ambient Temperature

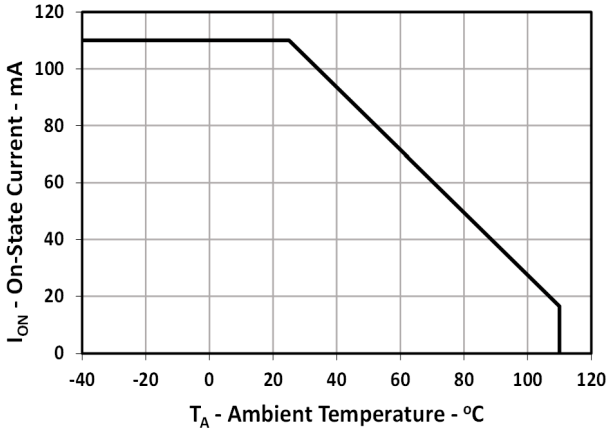


Fig 2 On-State Current vs Ambient Temperature

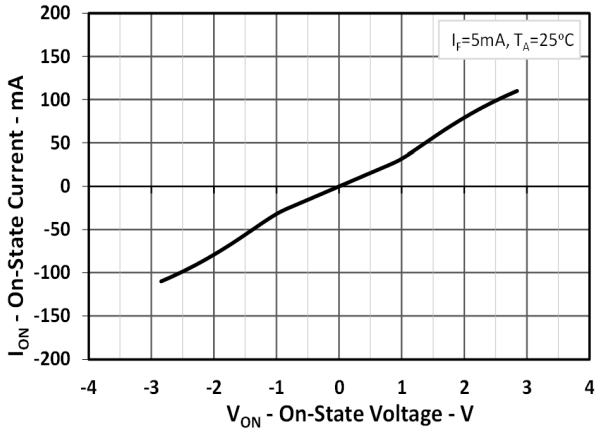


Fig 3 On-State Current vs On-State Voltage

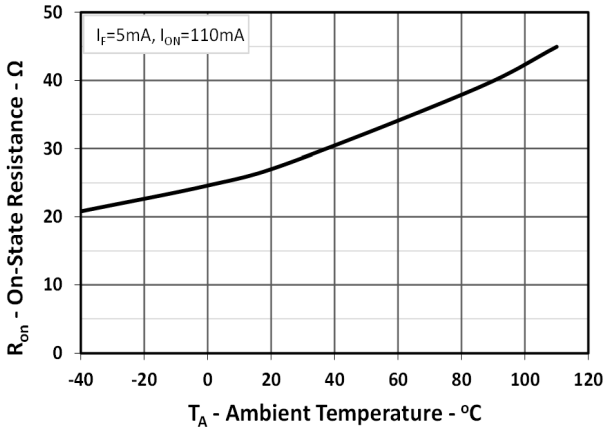


Fig 4 On-State Resistance vs Ambient Temperature

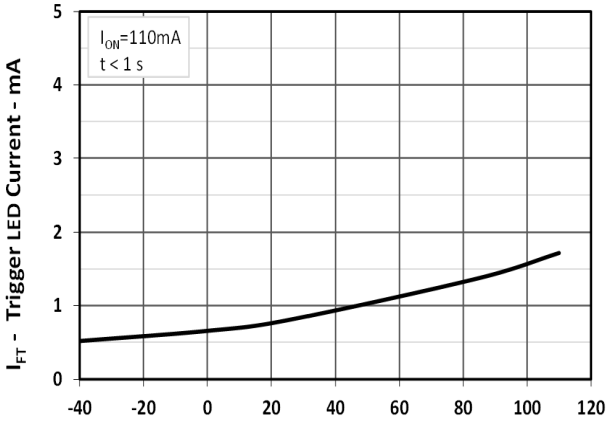


Fig 5 Trigger LED Current vs Ambient Temperature

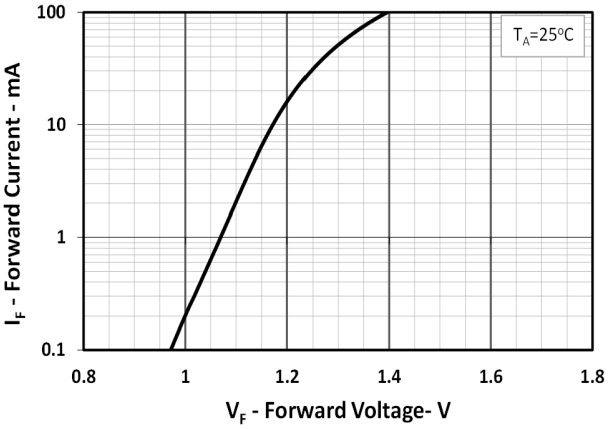


Fig 6 Forward Current vs Forward Voltage

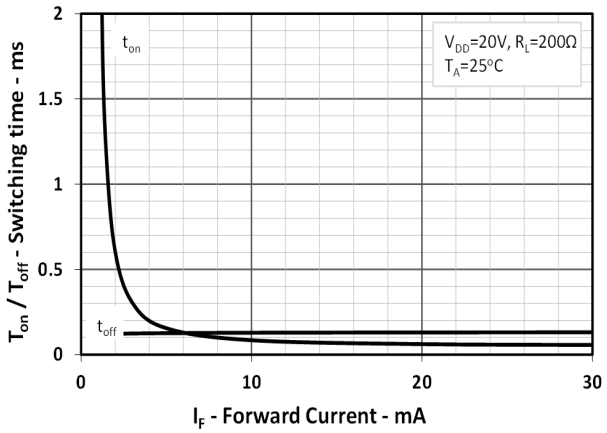


Fig 7 Switching time vs Forward Current

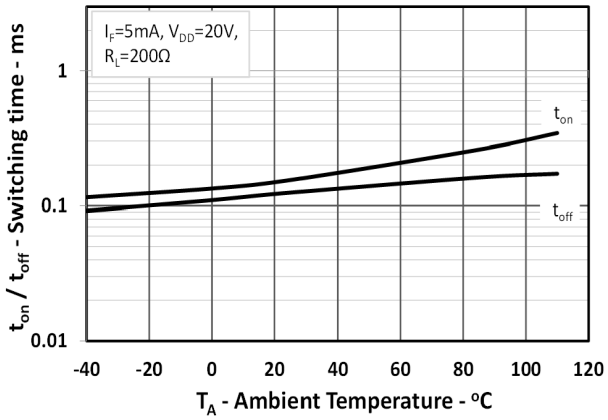


Fig 8 Switching time vs Ambient Temperature

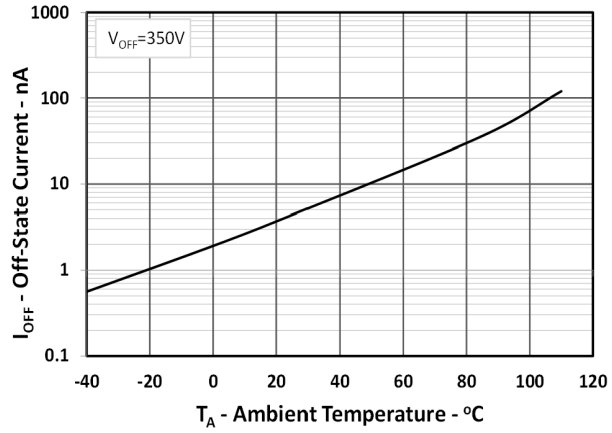
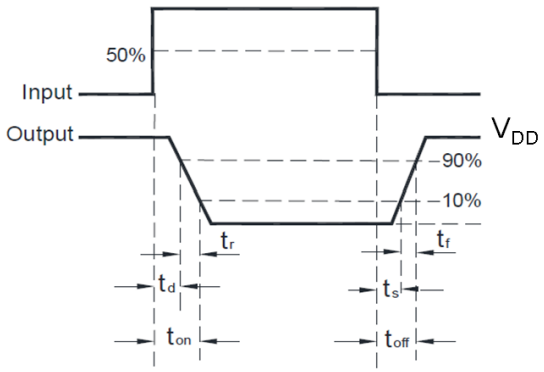


Fig 9 Off-State Current vs Ambient Temperature

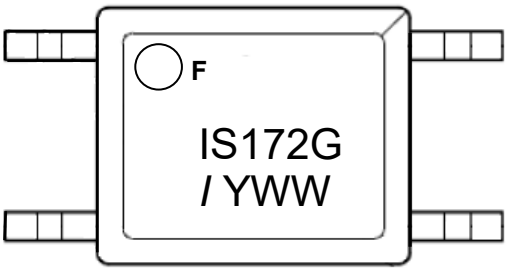
Turn on / Turn off Time



ORDER INFORMATION

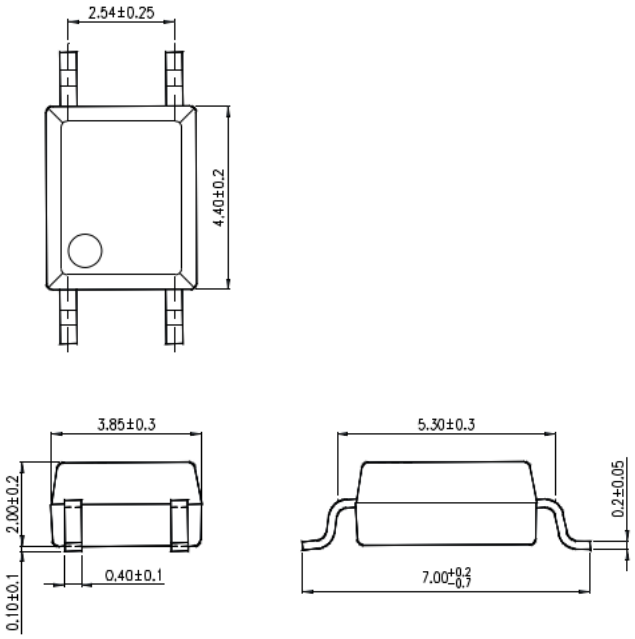
IS172G			
After PN	**PN**	**Description**	**Packing quantity**
None	IS172G	Surface Mount Tape & Reel	3000 pcs per tube

DEVICE MARKING

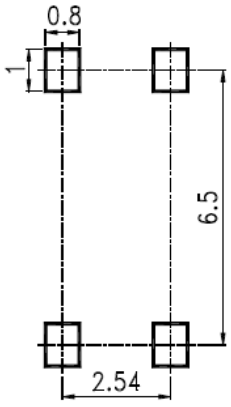


IS172G	Device Part Number
F	Factory Code
/	Isocom Components 2004 Ltd.
Y	1 digit Year code, A = 2010, B = 2011, etc…..
WW	2 digit Week code, from 01 to 53

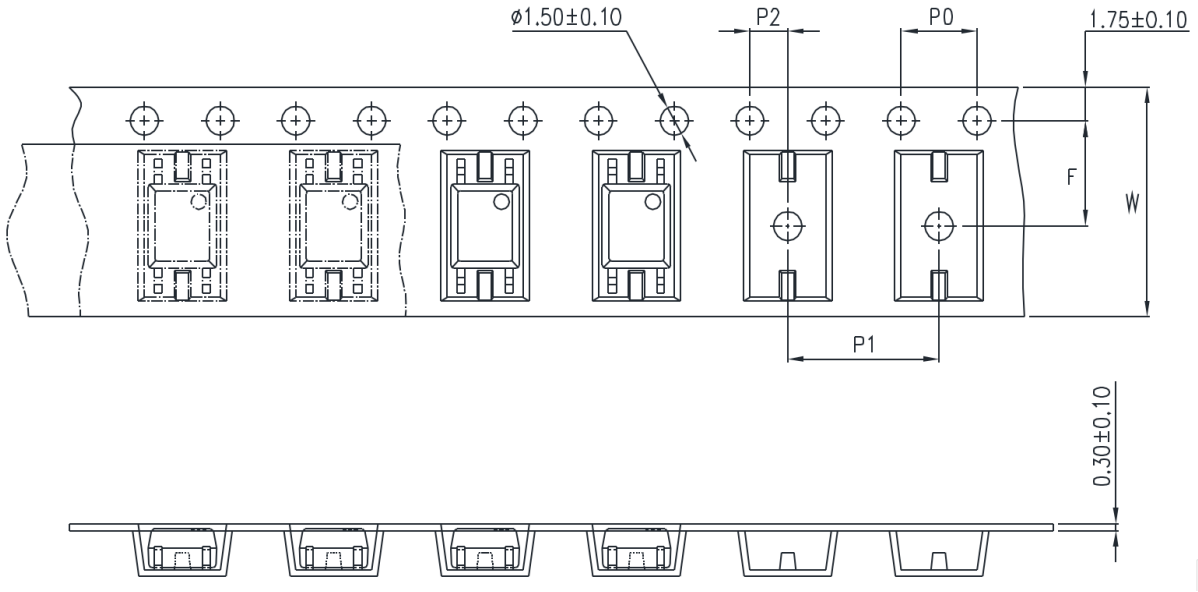
PACKAGE DIMENSIONS (mm)



RECOMMENDED SOLDER PAD LAYOUT (mm)

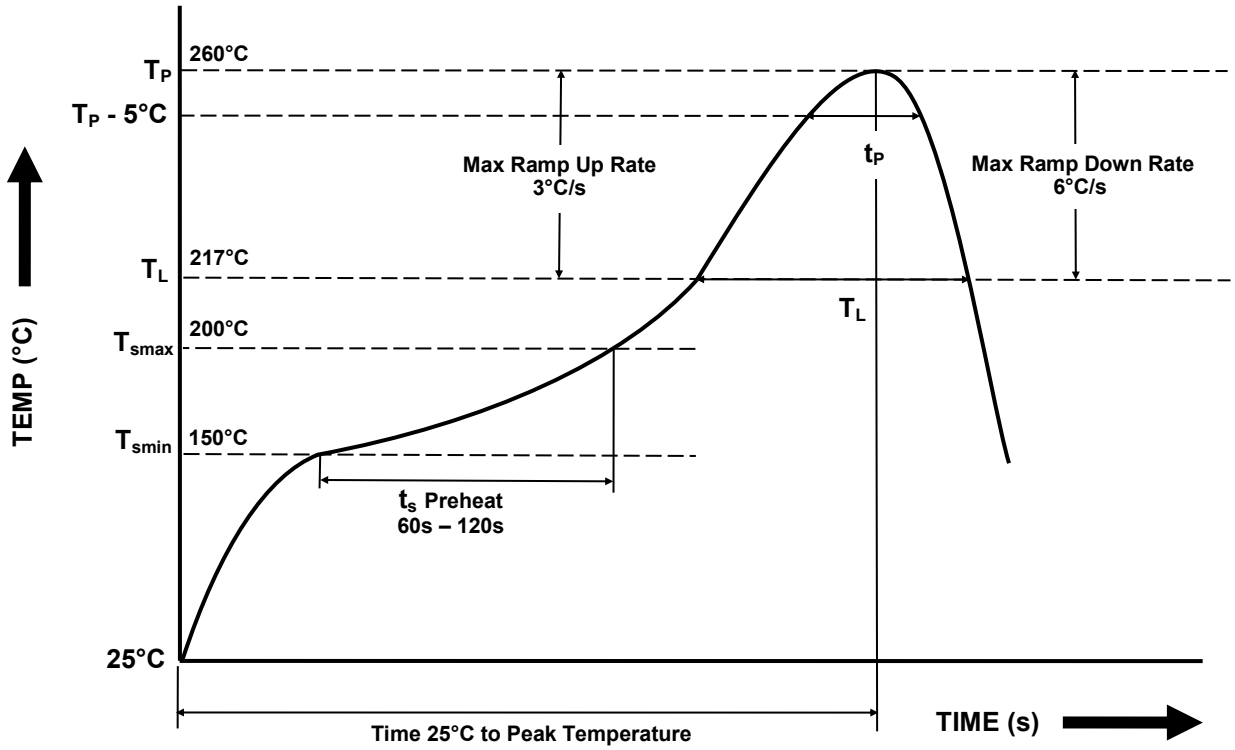


TAPE AND REEL PACKAGING



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) - 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 - 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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