

PHOTON COUPLED BILATERAL ANALOG FET

APPROVALS

- UL recognised, File No. E91231

'X' SPECIFICATION APPROVALS

- VDE 0884 in 2 available lead forms : -
- STD
- G form

DESCRIPTION

The IS610, IS611 are optically coupled isolators consisting of infrared light emitting diode and a symmetrical bilateral silicon photodetector. The detector is electrically isolated from the input and performs like an ideal isolated FET designed for distortion-free control of low level ac and dc analog signals. The IS610, IS611 are mounted in a standard 6pin dual in line plastic package.

FEATURES

- **Options :-**
10mm lead spread - add G after part no.
Surface mount - add SM after part no.
Tape&reel - add SMT&R after part no.

As a remote variable resistor

- $\leq 100\Omega$ to $\geq 300M\Omega$
- $\geq 99.9\%$ Linearity
- ≤ 15 pF Shunt Capacitance
- $\geq 100G\Omega$ I/O Isolation Resistance

As an Analog Signal Switch

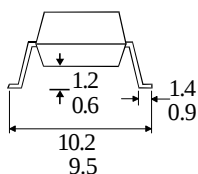
- Extremely low Offset Voltage
- 60V pk-pk Signal Capability
- No Charge Injection or Latchup
- $t_{on}, t_{off} \leq 15\mu s$

APPLICATIONS

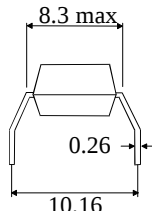
As a remote variable resistor

- Isolated variable attenuator
- Automatic gain control
- Active filter fine tuning / band switching

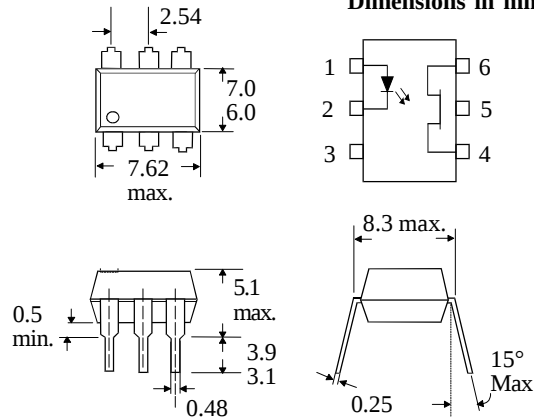
OPTION SM SURFACE MOUNT



OPTION G



Dimensions in mm



APPLICATIONS (cont.)

As an Analog Signal Switch

- Isolated sample and hold circuit
- Multiplexed, optically isolated A/D conversion

ABSOLUTE MAXIMUM RATINGS

(25°C unless otherwise specified)

Storage Temperature	-55°C to + 150°C
Operating Temperature	-55°C to + 100°C
Lead Soldering Temperature	(1/16 inch (1.6mm) from case for 10 secs) 260°C

INPUT DIODE

Forward Current	60mA
Reverse Voltage	6V
Power Dissipation	100mW

OUTPUT TRANSISTOR

Breakdown Voltage	$\pm 30V$
Detector Current (continuous)	$\pm 100mA$
Power Dissipation	300mW

POWER DISSIPATION

Total Power Dissipation	350mW
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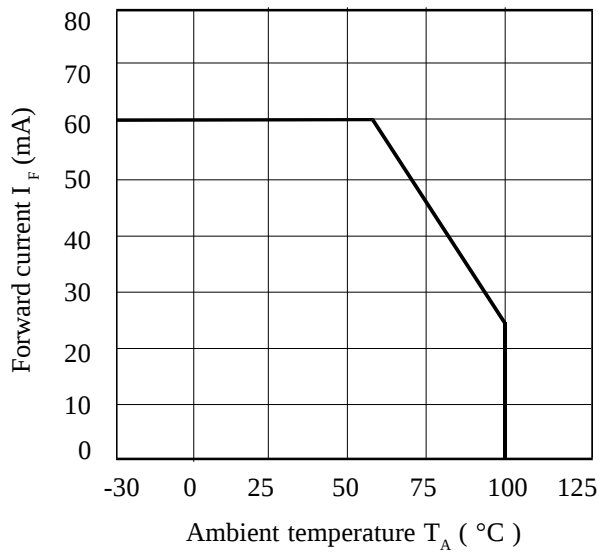
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITION
Input	Forward Voltage (V _F) Reverse Voltage (V _R) Reverse Current (I _R)	5	1.1	1.75 10	V V μA	I _F = 16mA I _R = 10μA V _R = 5V
Output (either polarity)	Breakdown Voltage - V(_{BR}) ₄₆ (Note 2)	30			V	I ₄₆ = 10μA, I _F = 0
	Off-state Dark Current - I ₄₆			50	nA	V ₄₆ = 15V, I _F = 0, T _A = 25°C
				50	μA	V ₄₆ = 15V, I _F = 0, T _A = 100°C
	Off-state Resistance - r ₄₆ Capacitance - C ₄₆	300		15	MΩ pF	V ₄₆ = 15V, I _F = 0 V ₄₆ = 0, I _F = 0, f = 1 MHz
Coupled	On-state Resistance - r ₄₆ (Note 2) IS611 IS610			170 200	Ω Ω	I _F = 16mA, I ₄₆ = 100μA I _F = 16mA, I ₄₆ = 100μA
	On-state Resistance - r ₆₄ (Note 2) IS611 IS610			170 200	Ω Ω	I _F = 16mA, I ₆₄ = 100μA I _F = 16mA, I ₆₄ = 100μA
	Input to Output Isolation Voltage V _{ISO}	5300 7500			V _{RMS} V _{PK}	See note 1 See note 1
	Input-output Isolation Resistance R _{ISO}	10 ¹¹			Ω	V _{IO} = 500V (note 1)
	Input-output Capacitance Cf			2	pF	V _{IO} = 0, f = 1MHz
	Turn-on Time ton			25	μs	I _F = 16mA, V ₄₆ = 5V,
	Turn-off Time toff			25	μs	R _L = 50Ω
	Resistance, non-linearity and asymmetry			0.1	%	I _F = 16mA, f = 1kHz I ₄₆ = 25μA RMS

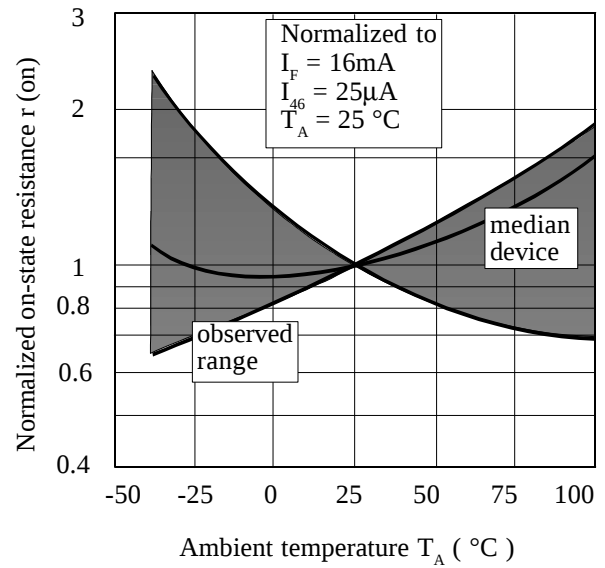
Note 1 Measured with input leads shorted together and output leads shorted together.

Note 2 Special Selections are available on request. Please consult the factory.

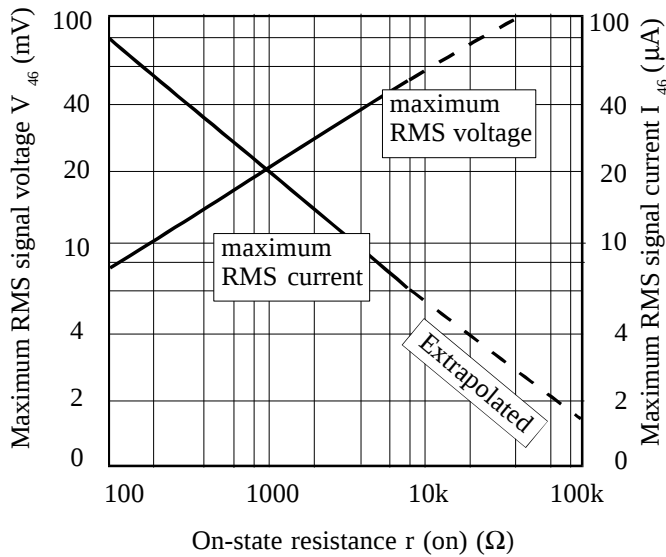
Forward Current vs. Ambient Temperature



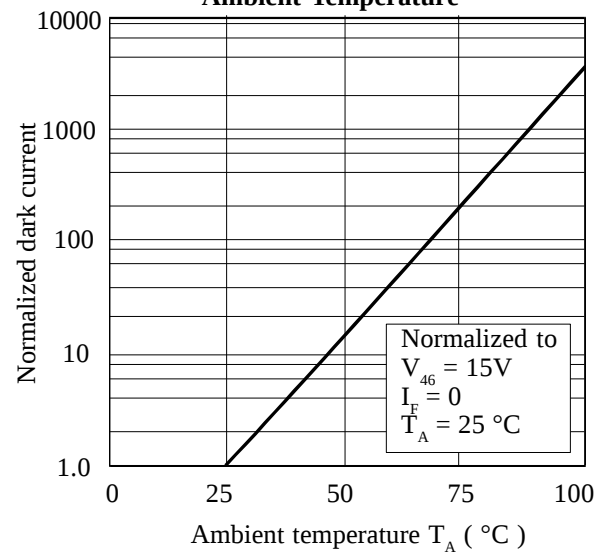
On-state Resistance vs. Ambient Temperature



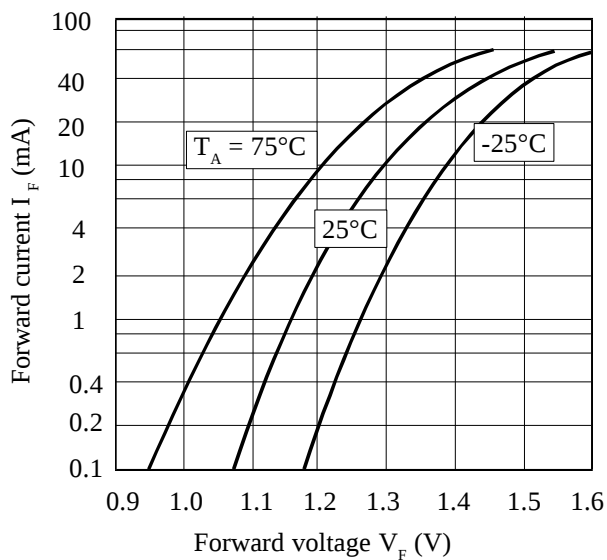
Region of Linear Resistance



Normalized Off-state current vs. Ambient Temperature



Input Current vs. Input Voltage



Resistive non-linearity vs. D.C. Bias

