

**IS610X, IS611X
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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
- $\leq 15\text{ pF}$ Shunt Capacitance
- $\geq 100G\Omega$ I/O Isolation Resistance

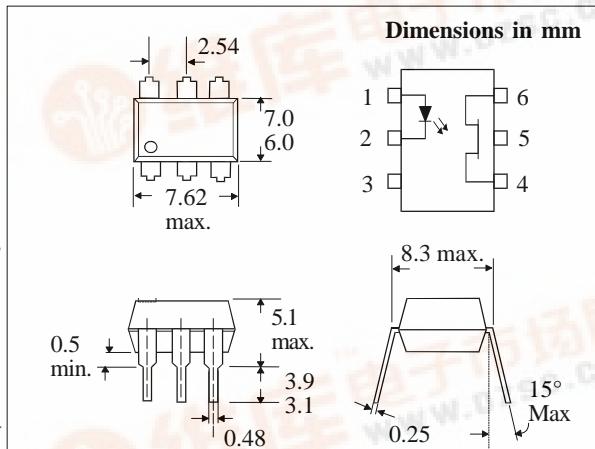
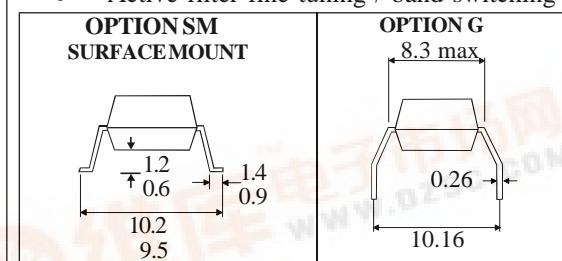
As an Analog Signal Switch

- 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



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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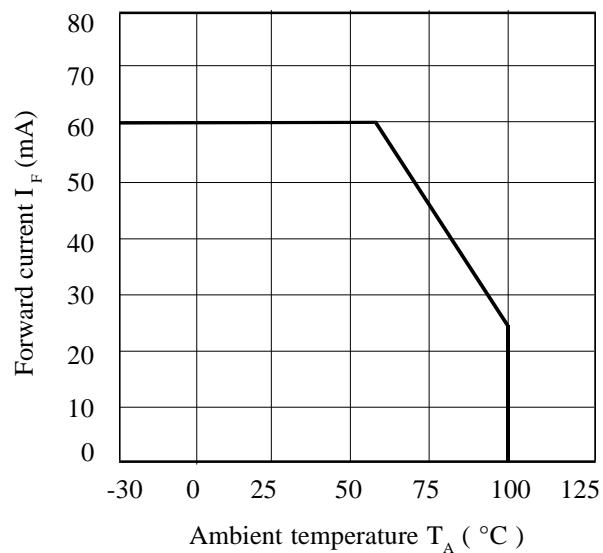
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

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	$I_F = 16\text{mA}$ $I_R = 10\mu\text{A}$ $V_R = 5\text{V}$
Output (either polarity)	Breakdown Voltage - $V_{(BR)_{46}}$ (Note 2) Off-state Dark Current - I_{46} Off-state Resistance - r_{46} Capacitance - C_{46}	30		50 50	V nA μA	$I_{46} = 10\mu\text{A}, I_F = 0$ $V_{46} = 15\text{V}, I_F = 0,$ $T_A = 25^\circ\text{C}$ $V_{46} = 15\text{V}, I_F = 0,$ $T = 100^\circ\text{C}$ $V_{46} = 15\text{V}, I_F = 0$ $V_{46} = 0, I_F = 0,$ $f = 1 \text{ MHz}$
Coupled	On-state Resistance - r_{46} (Note 2) IS611 IS610 On-state Resistance - r_{64} (Note 2) IS611 IS610 Input to Output Isolation Voltage V_{ISO} Input-output Isolation Resistance R_{ISO} Input-output Capacitance C_f Turn-on Time t_{on} Turn-off Time t_{off} Resistance, non-linearity and asymmetry			170 200 170 200 5300 7500 10 ¹¹ 2	Ω Ω Ω Ω V_{RMS} V_{PK} Ω $p\text{F}$	$I_F = 16\text{mA}, I_{46} = 100\mu\text{A}$ $I_F = 16\text{mA}, I_{46} = 100\mu\text{A}$ $I_F = 16\text{mA}, I_{64} = 100\mu\text{A}$ $I_F = 16\text{mA}, I_{64} = 100\mu\text{A}$ See note 1 See note 1 $V_{IO} = 500\text{V}$ (note 1) $V_{IO} = 0, f = 1\text{MHz}$ $I_F = 16\text{mA}, V_{46} = 5\text{V},$ $R_L = 50\Omega$ $I_F = 16\text{mA}, f = 1\text{kHz}$ $I_{46} = 25\mu\text{A RMS}$

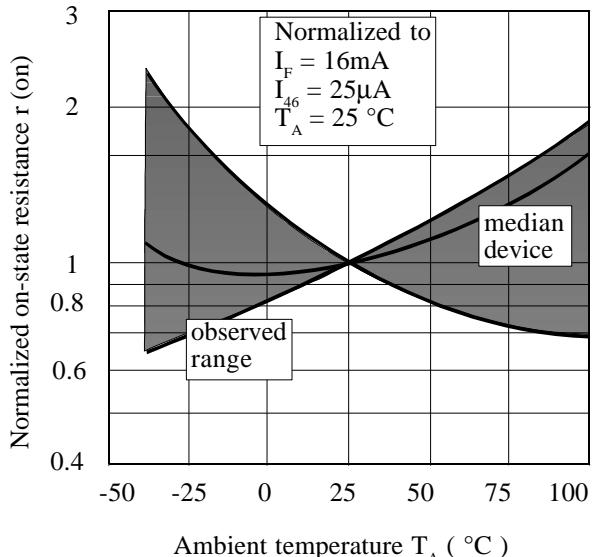
Note 1 Measured with input leads shorted together and output leads shorted together.

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

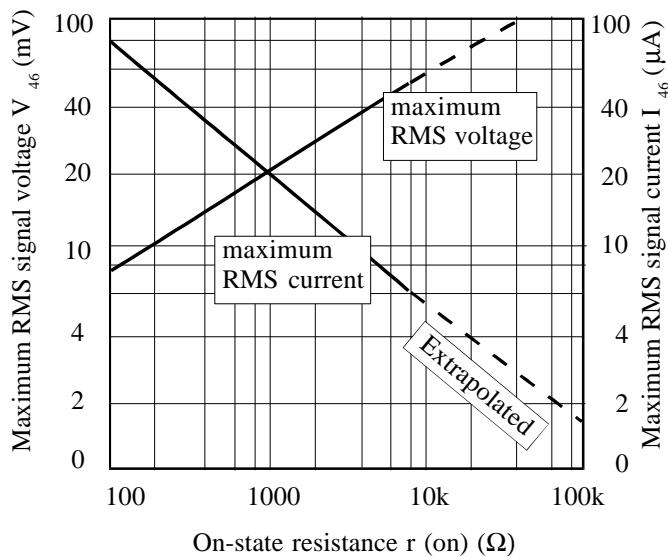
Forward Current vs. Ambient Temperature



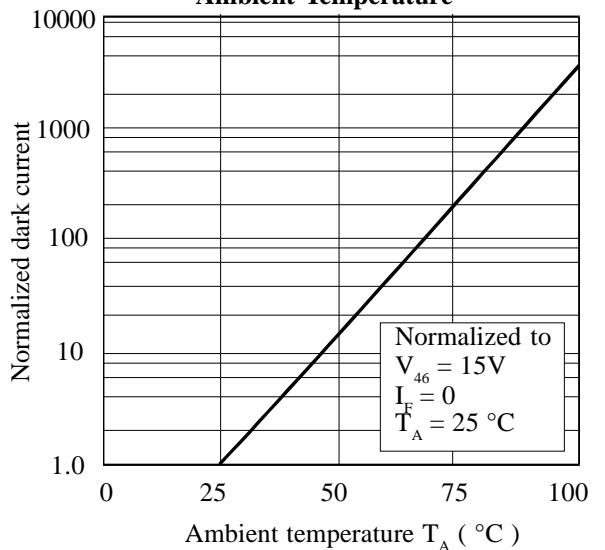
On-state Resistance vs. Ambient Temperature



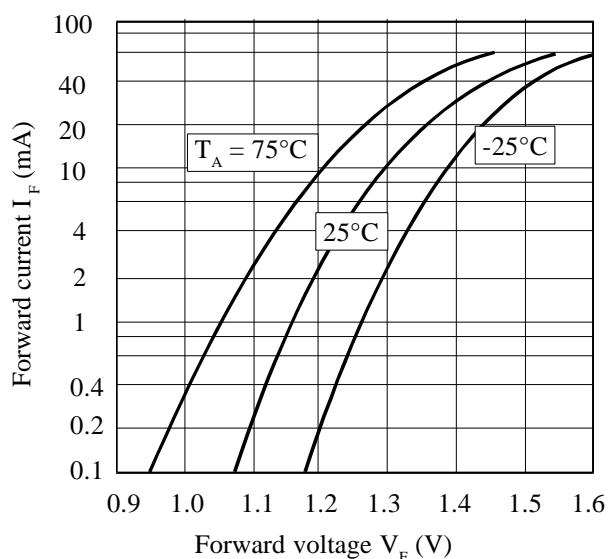
Region of Linear Resistance



Normalized Off-state current vs. Ambient Temperature



Input Current vs. Input Voltage



Resistive non-linearity vs. D.C. Bias

