

IS610X, IS611X
IS610, IS611



**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

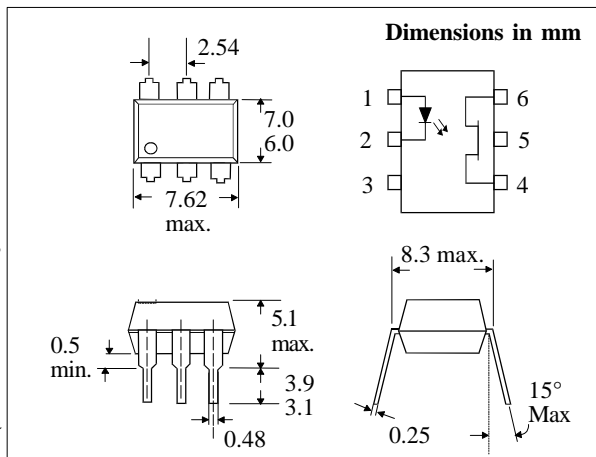
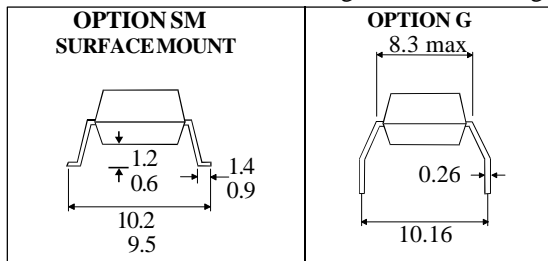
As an Analog Signal Switch

- Extremely low Offset Voltage
- 60V pk-pk Signal Capability
- No Charge Injection or Latchup
- ton, toff $\leq 15\mu s$

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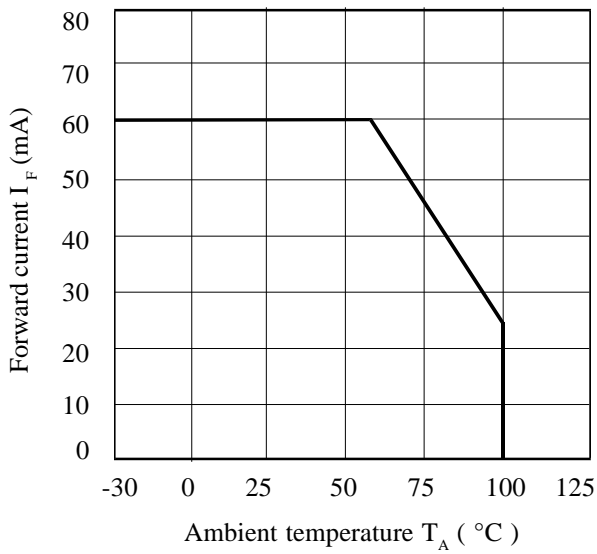
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITION	
Input	Forward Voltage (V_F)		1.1	1.75	V	$I_F = 16\text{mA}$ $I_R = 10\mu\text{A}$ $V_R = 5\text{V}$	
	Reverse Voltage (V_R)	5			V		
	Reverse Current (I_R)			10	μA		
Output (either polarity)	Breakdown Voltage - $V_{(BR)46}$ (Note 2)	30			V	$I_{46} = 10\mu\text{A}, I_F = 0$	
	Off-state Dark Current - I_{46}			50	nA	$V_{46} = 15\text{V}, I_F = 0,$ $T_A = 25^\circ\text{C}$ $V_{46} = 15\text{V}, I_F = 0,$ $T_A = 100^\circ\text{C}$	
					50		μA
	Off-state Resistance - r_{46}	300			$\text{M}\Omega$	$V_{46} = 15\text{V}, I_F = 0$	
Capacitance - C_{46}				15	pF	$V_{46} = 0, I_F = 0,$ $f = 1\text{MHz}$	
Coupled	On-state Resistance - r_{46} (Note 2)			170	Ω	$I_F = 16\text{mA}, I_{46} = 100\mu\text{A}$	
				IS611	200		Ω
	On-state Resistance - r_{64} (Note 2)				170	Ω	$I_F = 16\text{mA}, I_{64} = 100\mu\text{A}$
					IS611	200	
	Input to Output Isolation Voltage V_{ISO}				5300	V_{RMS}	See note 1
					7500	V_{PK}	
	Input-output Isolation Resistance R_{ISO}				10^{11}	Ω	$V_{IO} = 500\text{V}$ (note 1) $V_{IO} = 0, f = 1\text{MHz}$
	Input-output Capacitance C_f				2	pF	
	Turn-on Time t_{on}				25	μs	$I_F = 16\text{mA}, V_{46} = 5\text{V},$ $R_L = 50\Omega$ $I_F = 16\text{mA}, f = 1\text{kHz}$ $I_{46} = 25\mu\text{A RMS}$
	Turn-off Time t_{off}				25	μs	
Resistance, non-linearity and asymmetry				0.1	%		

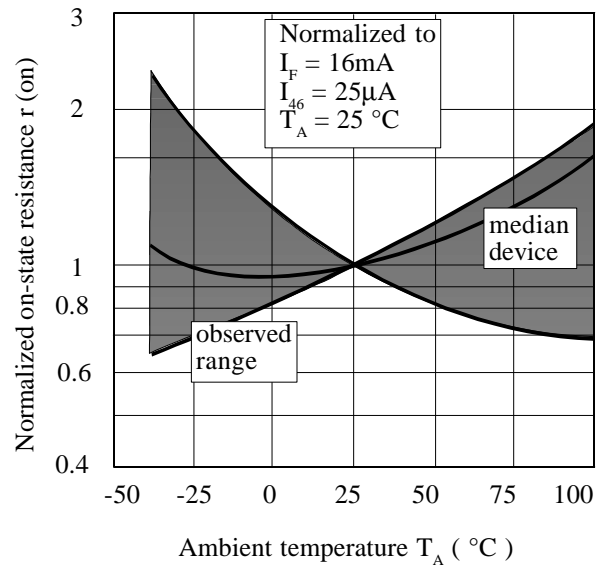
Note 1 Measured with input leads shorted together and output leads shorted together.

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

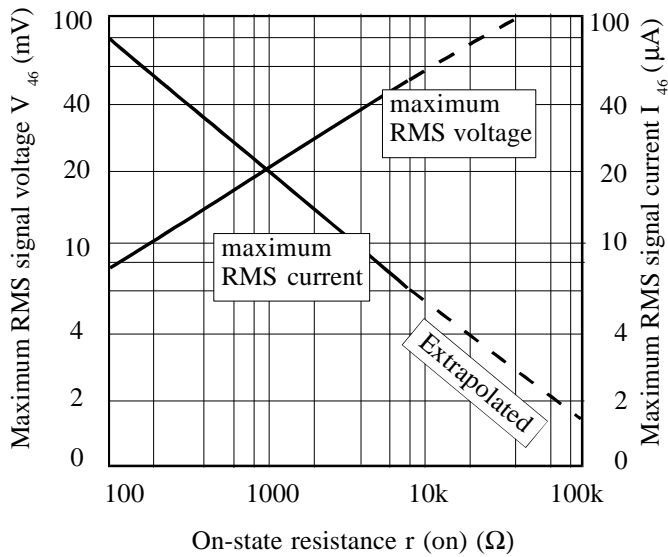
Forward Current vs. Ambient Temperature



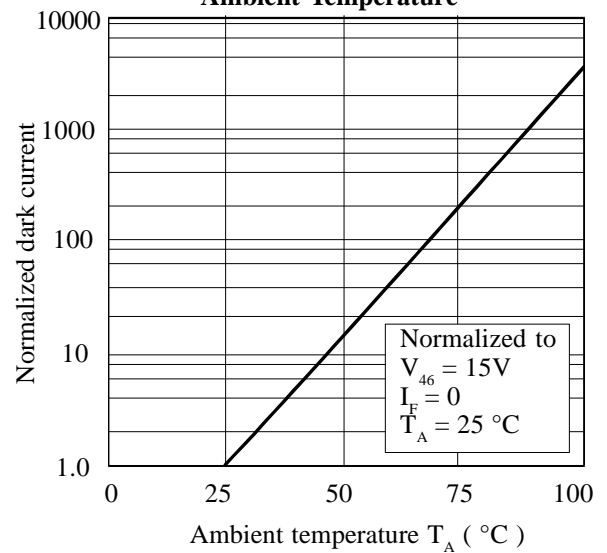
On-state Resistance vs. Ambient Temperature



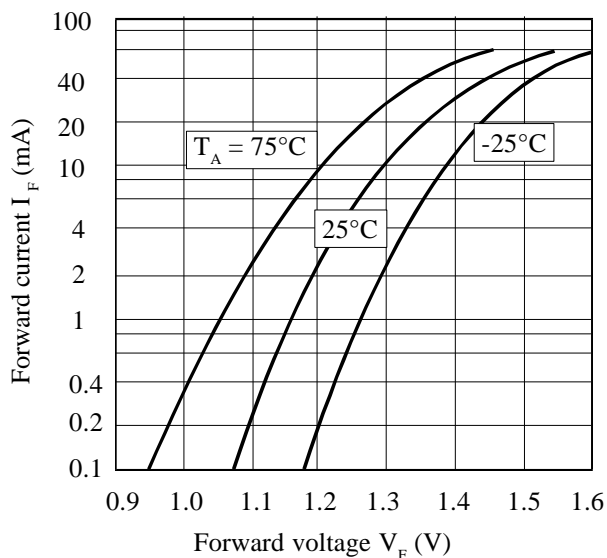
Region of Linear Resistance



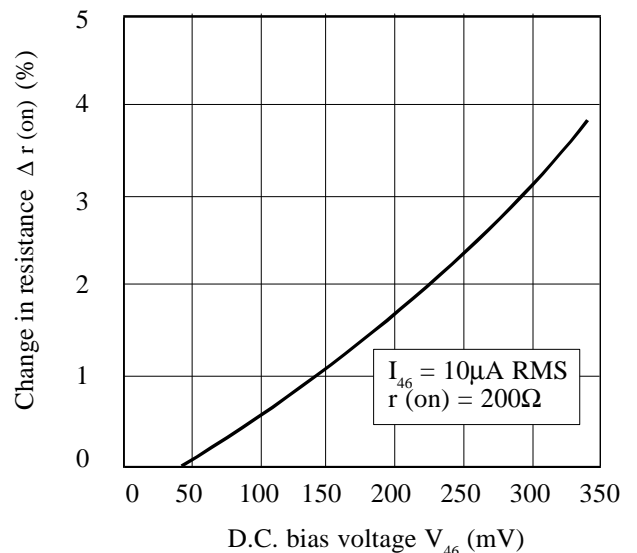
Normalized Off-state current vs. Ambient Temperature



Input Current vs. Input Voltage



Resistive non-linearity vs. D.C. Bias



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