



PHOTON COUPLED BILATERAL ANALOG FET

APPROVALS

- UL recognised, File No. E91231

DESCRIPTION

The H11F_ series 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 H11F_ series 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

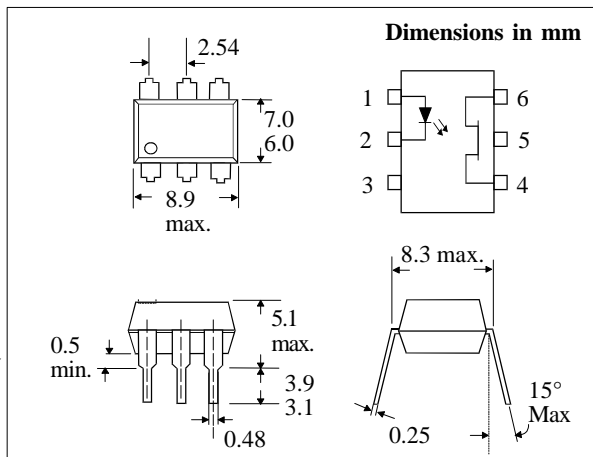
As an Analog Signal Switch

- 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

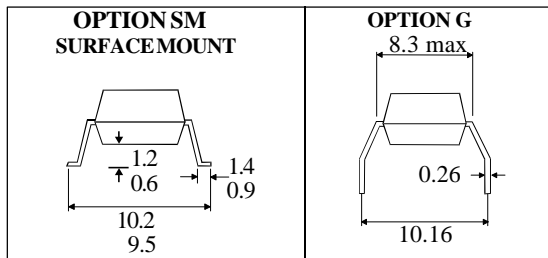
Forward Current	60mA
Reverse Voltage	6V
Power Dissipation	100mW

OUTPUT TRANSISTOR

Breakdown Voltage	
H11F1, H11F2	$\pm 30V$
H11F3	$\pm 15V$
Detector Current (continuous)	$\pm 100mA$
Power Dissipation	300mW

POWER DISSIPATION

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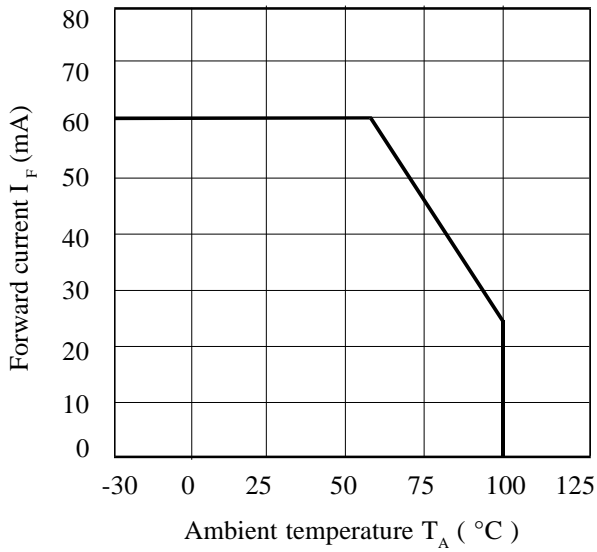
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

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)					$I_{46} = 10\mu\text{A}, I_F = 0$ $I_{46} = 10\mu\text{A}, I_F = 0$ $V_{46} = 15\text{V}, I_F = 0,$ $T_A = 25^\circ\text{C}$ $V_{46} = 15\text{V}, I_F = 0,$ $T_A = 100^\circ\text{C}$ $V_{46} = 15\text{V}, I_F = 0$ $V_{46} = 0, I_F = 0,$ $f = 1\text{MHz}$	
	H11F1, H11F2	30			V		
	H11F3	15			V		
	Off-state Dark Current - I_{46}			50	nA		
				50	μA		
	Off-state Resistance - r_{46}	300			M Ω		
	Capacitance - C_{46}			15	pF		
Coupled	On-state Resistance - r_{46} (Note 2)					$I_F = 16\text{mA}, I_{46} = 100\mu\text{A}$	
	H11F1			200	Ω		
	H11F2			330	Ω		
	H11F3			470	Ω		
	On-state Resistance - r_{64} (Note 2)					$I_F = 16\text{mA}, I_{64} = 100\mu\text{A}$	
	H11F1			200	Ω		
	H11F2			330	Ω		
	H11F3			470	Ω		
	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	See note 1 $V_{IO} = 500\text{V}$ (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		%		

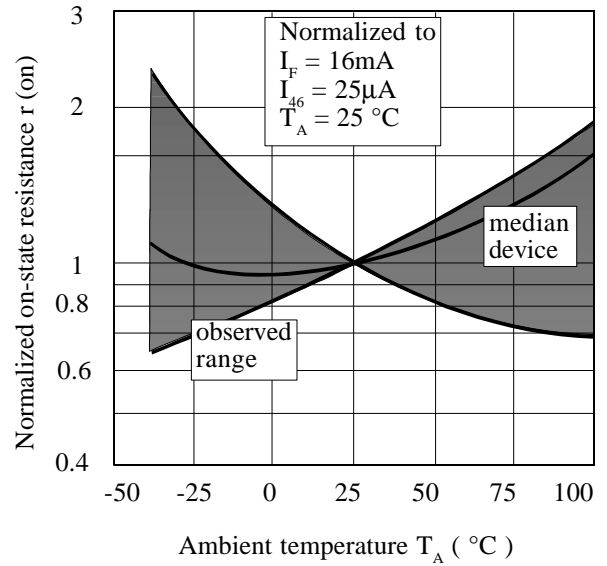
Note 1 Measured with input leads shorted together and output leads shorted together.

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

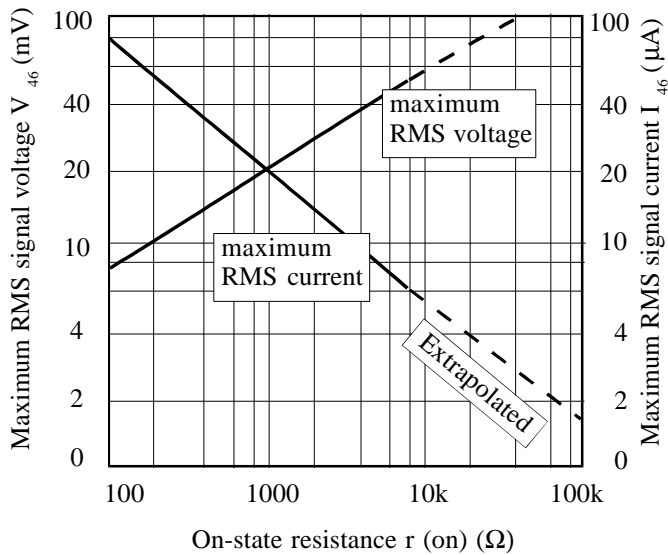
Forward Current vs. Ambient Temperature



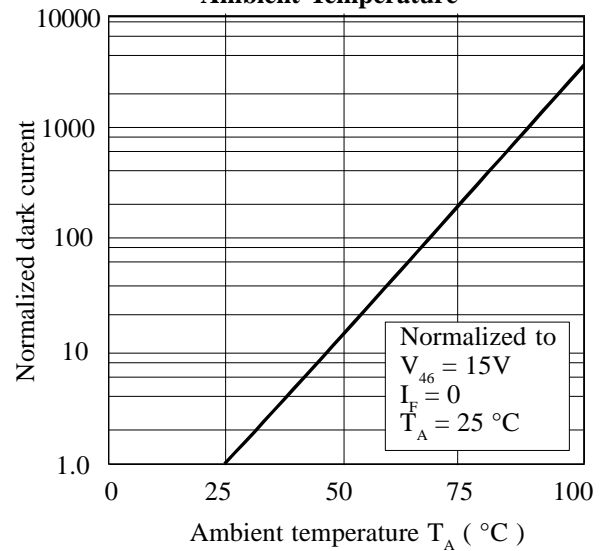
On-state Resistance vs. Ambient Temperature



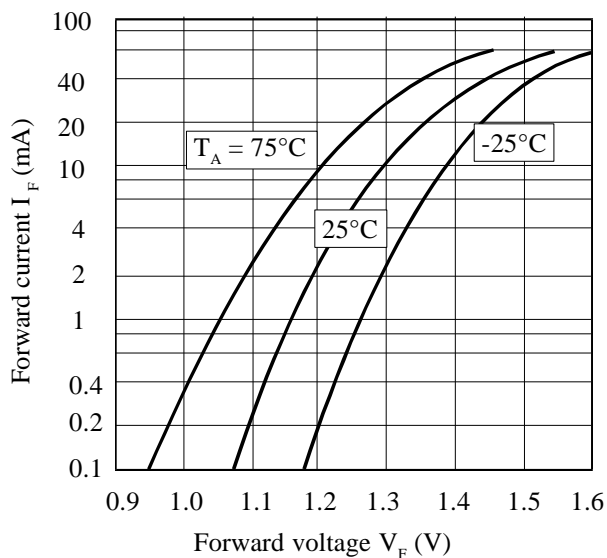
Region of Linear Resistance



Normalized Off-state current vs. Ambient Temperature



Input Current vs. Input Voltage



Resistive non-linearity vs. D.C. Bias

