

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

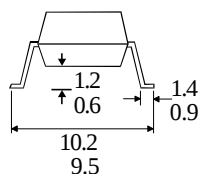
- Extremely low Offset Voltage
- 60V pk-pk Signal Capability
- No Charge Injection or Latchup
- ton, toff $\leq 15\mu s$

APPLICATIONS

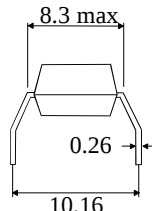
As a remote variable resistor

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

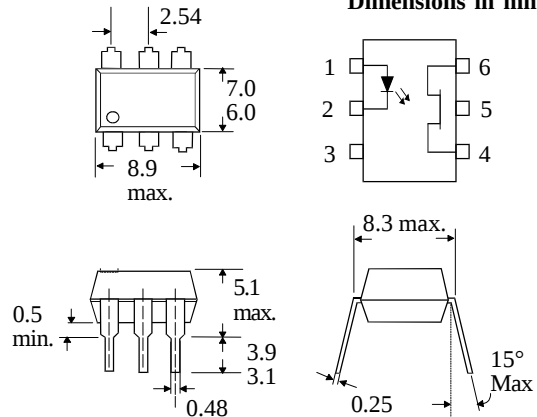
OPTION SM SURFACE MOUNT



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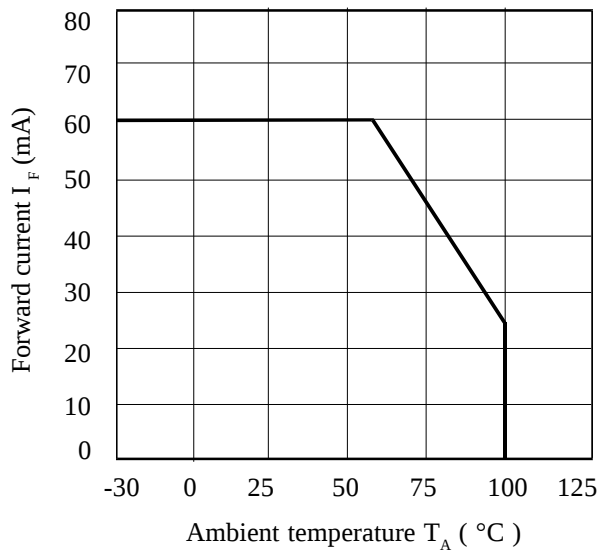
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITION
Input	Forward Voltage (V_F)		1.1	1.75	V	$I_F = 16\text{mA}$
	Reverse Voltage (V_R)	5			V	$I_R = 10\mu\text{A}$
	Reverse Current (I_R)			10	μA	$V_R = 5\text{V}$
Output (either polarity)	Breakdown Voltage - $V_{(BR)_{46}}$ (Note 2)					
	H11F1, H11F2	30			V	$I_{46} = 10\mu\text{A}, I_F = 0$
	H11F3	15			V	$I_{46} = 10\mu\text{A}, I_F = 0$
	Off-state Dark Current - I_{46}			50	nA	$V_{46} = 15\text{V}, I_F = 0,$ $T_A = 25^\circ\text{C}$
				50	μA	$V_{46} = 15\text{V}, I_F = 0,$ $T_A = 100^\circ\text{C}$
Coupled	Off-state Resistance - r_{46}	300			M Ω	$V_{46} = 15\text{V}, I_F = 0$
	Capacitance - C_{46}			15	pF	$V_{46} = 0, I_F = 0,$ $f = 1\text{ MHz}$
	On-state Resistance - r_{46} (Note 2)					
	H11F1			200	Ω	$I_F = 16\text{mA}, I_{46} = 100\mu\text{A}$
	H11F2			330	Ω	
	H11F3			470	Ω	
	On-state Resistance - r_{64} (Note 2)					
	H11F1			200	Ω	$I_F = 16\text{mA}, I_{64} = 100\mu\text{A}$
	H11F2			330	Ω	
	H11F3			470	Ω	
	Input to Output Isolation Voltage V_{ISO}	5300			V_{RMS}	See note 1
		7500			V_{PK}	See note 1
	Input-output Isolation Resistance R_{ISO}	10^{11}			Ω	$V_{IO} = 500\text{V}$ (note 1)
	Input-output Capacitance C_f			2	pF	$V_{IO} = 0, f = 1\text{MHz}$
	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	%	

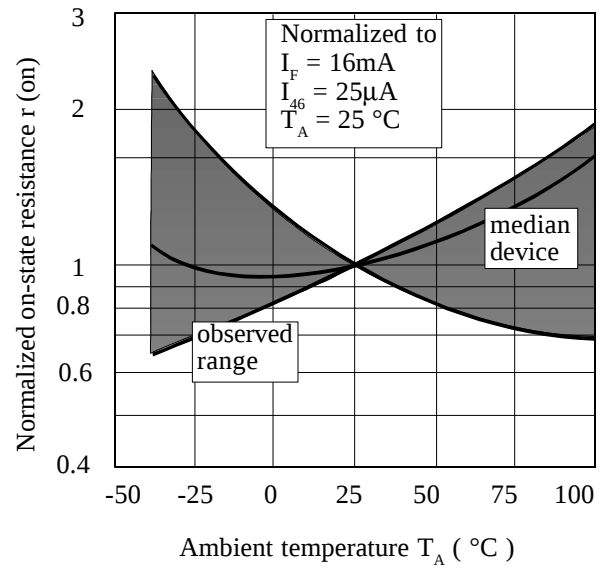
Note 1 Measured with input leads shorted together and output leads shorted together.

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

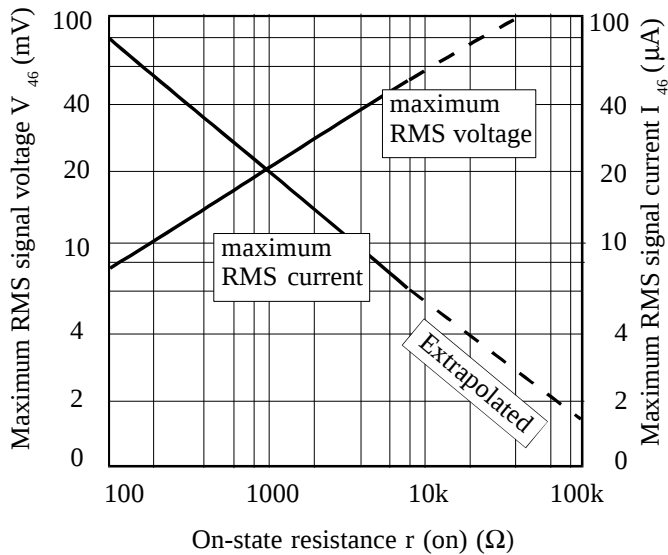
Forward Current vs. Ambient Temperature



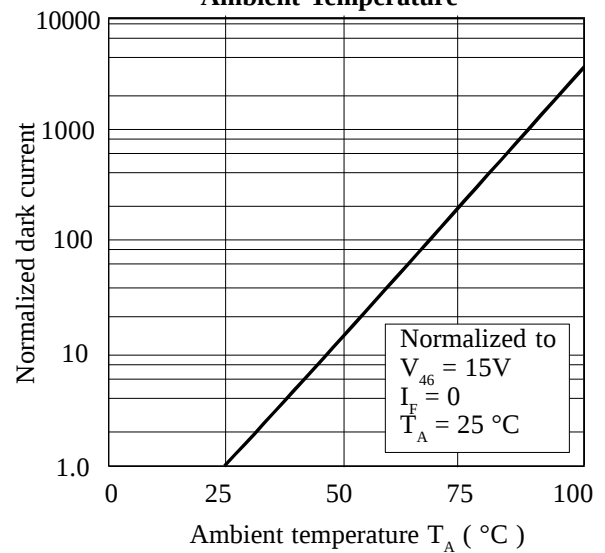
On-state Resistance vs. Ambient Temperature



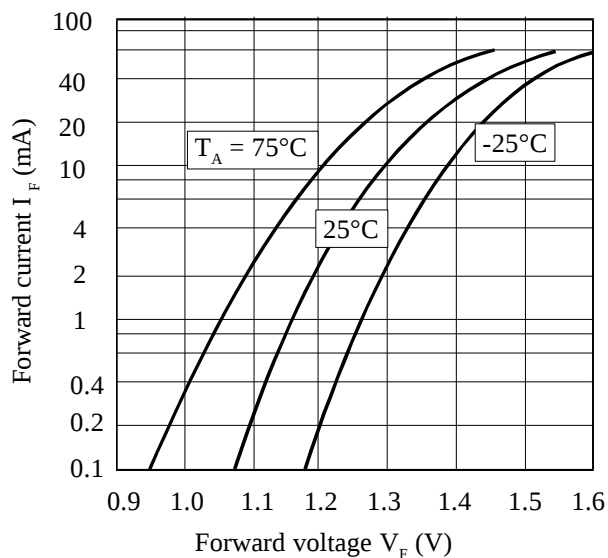
Region of Linear Resistance



Normalized Off-state current vs. Ambient Temperature



Input Current vs. Input Voltage



Resistive non-linearity vs. D.C. Bias

