

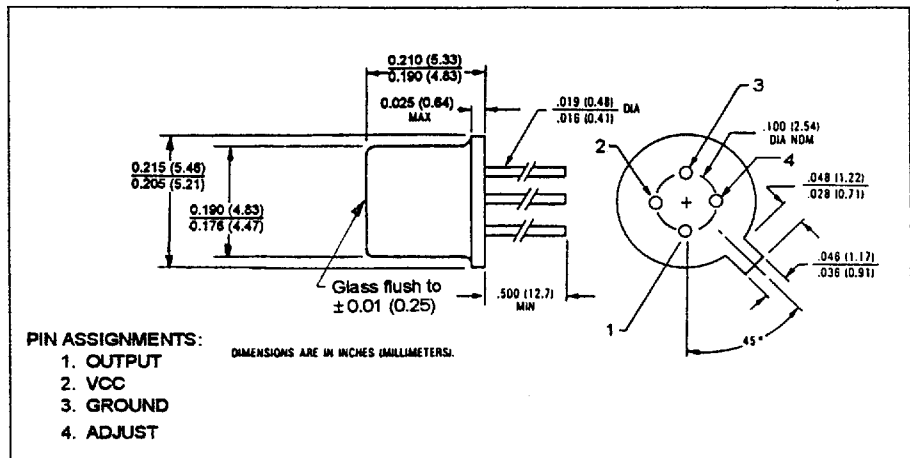
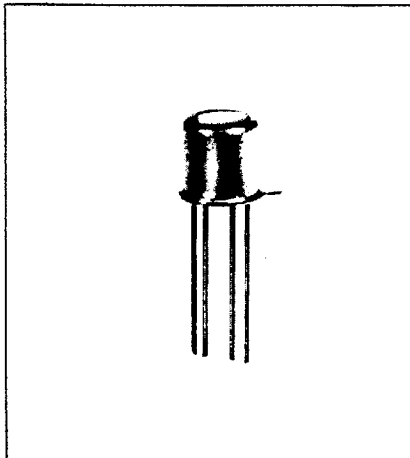
CLL133W Sensor

adjustable-gain, digital output IC sensor
inverter, open collector output



Clairex[®]
Technologies,
Incorporated

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features

- operates to +125°C
- low current drain
- 7:1 user accessible gain adjustment
- thermally compensated for IREDS
- 480nW sensitivity
- TO-72 header with flat lens

description

The CLL133W (inverter) sensor is an integrated optical sensor designed to provide a digital output from optical excitation. The CLL133W provides an OFF condition when input radiation is below the threshold level. It is optically compatible with all IREDS in the Clairex product line and is physically compatible with the CLE130, 230, and 330 families of IREDS. For additional information, call Clairex and ask for applications assistance.

absolute maximum ratings (T_A=25°C unless otherwise stated.)

storage temperature	-65°C to +150°C
operating temperature	-65°C to +125°C
lead soldering temperature ⁽¹⁾	240°C
V _{CC} supply voltage	-0.5 to +20V
V _{ADJ}	-0.5 to +3.0V
V _{OUT} ⁽²⁾	-0.5 to (V _{CC} +0.5)V
I _{OUT} ⁽³⁾	30mA

notes:

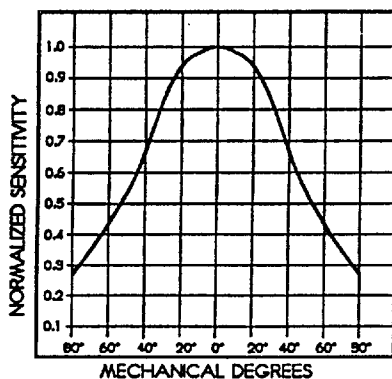
- 1/16" from the case for 5 seconds maximum. Maximum temperature can be 260°C if wave soldering.
- This rating applies when the output is in the OFF state only.
- This rating applies when the output is in the ON state only.

definition:

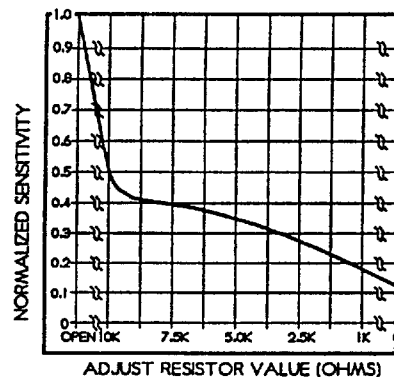
inverter - output is HIGH when input radiation is below the threshold level.

fundamental characteristics

angular response



normalized gain vs. adjust resistance



Clairex Technologies, Inc.,
Phone: 972-422-4676

1845 Summit Ave., #403
Fax: 972-423-8628

Plano, TX 75074-8148
<http://www.clairex.com>

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adjustable-gain, digital output IC sensor
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electrical characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

symbol	parameter	min	max	units	test conditions
I_{CC}	Supply current	1.5	2.9	mA	$V_{CC} = 5V, E_e = 0, \text{ADJ is open}$
I_{CC}	Supply current	1.8	3.5	mA	$V_{CC} = 5V, E_e > 1\text{mW}, \text{ADJ is open}$
I_{CC}	Supply current	2.9	5.6	mA	$V_{CC} = 18V, E_e = 0, \text{ADJ is open}$
I_{CC}	Supply current	2.2	4.4	mA	$V_{CC} = 18V, E_e > 1\text{mW}, \text{ADJ is open}$
E_{e+}	Optical threshold (dark to light) ⁽¹⁾⁽²⁾	320	790	nW	ADJ open, $4.5V \leq V_{CC} \leq 18V$
HYS	Hysteresis	1.2	1.5	-	
V_{OL}	Low-level output voltage	-	400	mV	ADJ open, $4.5V \leq V_{CC} \leq 18V$, OUTPUT = LO
t_{PDL}	Dark-to-light propagation delay	-	3.6	μs	$C_L = 15\text{pF}$
t_{PLD}	Light-to-dark propagation delay	-	4.0	μs	$C_L = 15\text{pF}$
t_r	Output rise time	-	600	ns	$C_L = 15\text{pF}$
t_f	Output fall time	-	30	ns	$C_L = 15\text{pF}$

notes:

- The optical threshold may be raised by connecting an external resistor between ADJUST and GROUND. Additionally in high-EMI environments, V_{CC} should be bypassed to ground as close to the device as possible.
- When using the ADJUST lead, maintain the shortest leads possible and route all traces away from the OUTPUT lead.

typical characteristics at $T_A = 25^\circ\text{C}$ (not guaranteed by test)

symbol	parameter	value	units	conditions
I_{CC}	Supply current	2.5	mA	$V_{CC} = 5V, \text{ADJ is open}$
I_{CC}	Supply current	4.0	mA	$V_{CC} = 18V, \text{ADJ is open}$
E_{e+}	Optical threshold (dark to light)	480	nW	ADJ open
HYS	Hysteresis	1.33	-	
V_{OL}	Low-level output voltage	290	mV	ADJ open, $4.5V \leq V_{CC} \leq 18V$, OUTPUT = LO
t_{PDL}	Dark-to-light propagation delay	1.8	μs	$C_L = 15\text{pF}$
t_{PLD}	Light-to-dark propagation delay	2.0	μs	$C_L = 15\text{pF}$
t_r	Output rise time	440	ns	$C_L = 15\text{pF}$
t_f	Output fall time	16	ns	$C_L = 15\text{pF}$

Clairex reserves the right to make changes at any time to improve design and to provide the best possible product.

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