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CAMBRIDGE CMOS SENSORS

CCSIRx79x
Wideband Infrared Source

MID-IR SOURCE (800µm Diameter)

Benefits and Features

High-stability broadband radiation source
Radiation 2 – 14µm
Built-in temperature-sensing diode
Switching speed up 70Hz
Lifetime @ 450ºC >10 years
Built-in FET Driver option
Power consumption <0.33mW/ºC

Applications

NDIR Gas Sensor
CO, CO_2, NOx, SOx
Hydro-carbon
Medical
HVAC
FTIR Spectroscopy
ATR

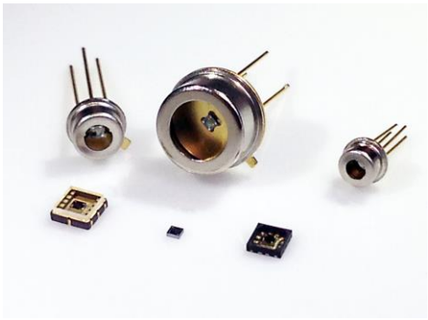
Packaging Options

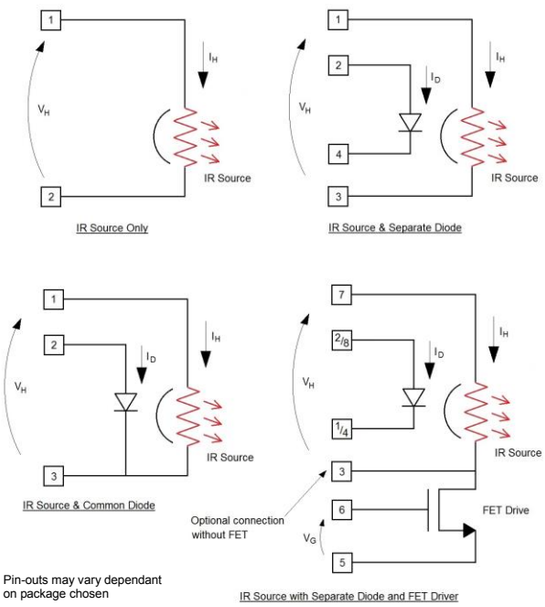
Bare Die
SMD
TO39
TO46

Options for reflectors, filters, sealing and encapsulation.

Array versions also available.

MEMS CMOS IR radiation Source For Gas Sensing





Description

Basic Infrared Source where the heater temperature can be controlled by appropriately adjusting the current or the supply voltage. The device is fabricated on a 1.76mm x 1.76mm silicon die as a single-chip solution and can incorporate a temperature-sensing diode and/or FET driver.

Electrical/Optical specifications

Parameter	Nominal Value
Power Consumption(DC) at 500ºC	155mW ± 15mW
Thermal Rise Time (t_{90})	40ms ± 10ms
Thermal Fall Time (t_{10})	54ms ± 10ms
Operating Temperature	500ºC
Ambient Resistance (R_0)	11Ω ± 2.5Ω
Heater Resistance Note1 (R) @ 500ºC	23Ω ± 5Ω
Heater Voltage (V_H) @ 500ºC	1.9V ± 0.3V
Heater Current (I_H) @ 500ºC	82mA ± 15mA
Diode Temp Coefficient (d) @ 65µA	1.17mV/K
Minimum Emissivity	~ 0.7
Heated Area	0.5mm^2 min
Modulation Frequency	DC to 70Hz
Frequency at 50% Modulation	~ 20Hz
Life Time (MTTF) @ 500°C	~ 50000 Hours

Note1: $R = (R_0\text{-}R_T)[1 + \alpha(T - T_0) + \beta(T - T_0)^2] + R_T$

R_T (Track Resistance) = 2.7Ω ± 0.5Ω@ 25ºC, T_0 = 25ºC
$\alpha = 2.05 \times 10^{-3}\ K^{-1}$, $\beta = 0.3 \times 10^{-6}\ K^{-2}$

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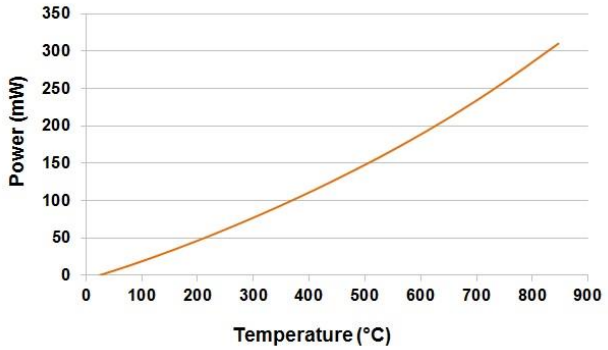
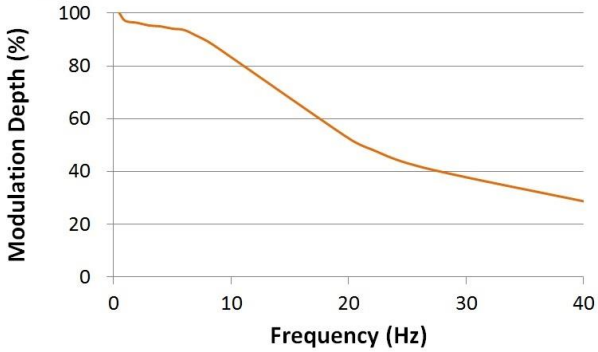
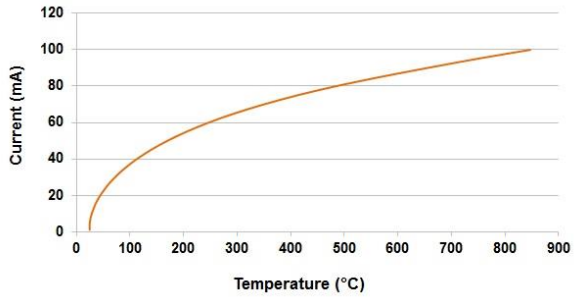
Power Consumption v Temperature



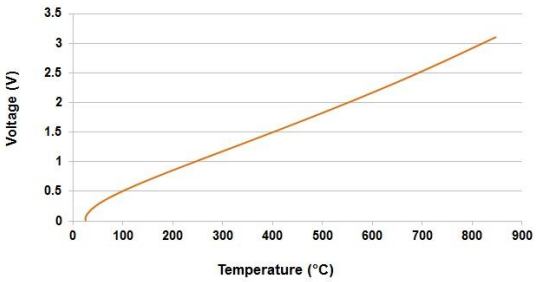
Modulation Depth v Frequency



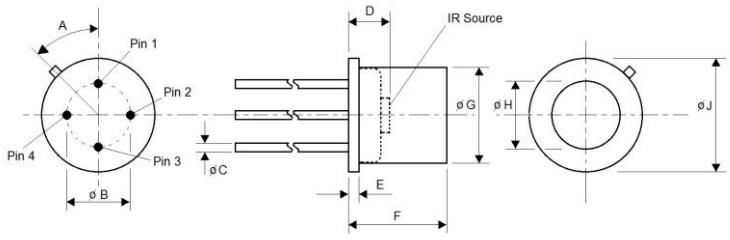
Current v Temperature



Voltage v Temperature

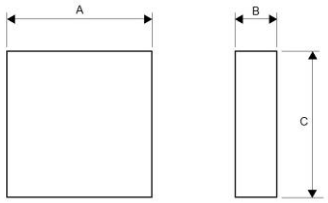


TO Package dimensions



	A	B	C	D	E	F	G	H	J
TO39	45°	5.08	0.45	1.92	0.38	4.35	8.31	5.30	9.20
TO46	45°	2.54	0.45	1.55	0.25	2.70	4.70	2.55	5.40

SMD Package dimensions



	A	B	C
LCC	3.80	1.45	3.80

Various pin-outs available