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CCSMHx88x MEMS Micro-hotplate

DUAL MICRO-HOTPLATE (300µm Diameter)

Benefits and Features

- High stability + High temperature
- Built-in FET & temp-sensing diode option
- Fast thermal response <25ms
- Lifetime @ 550°C >10 years
- Power consumption <0.11mW/°C
(without sensing material)

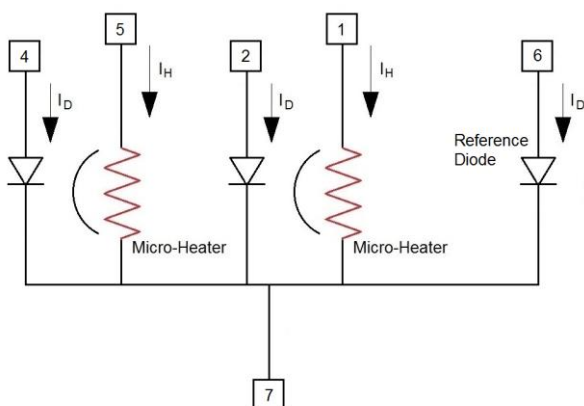
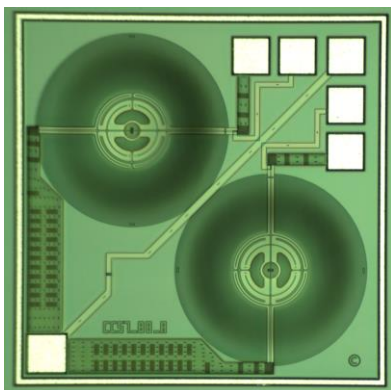
Sensing Applications

- Catalytic gases
- Medical
- Humidity
- Flow
- Multiple gases
- Micro-heating element

Packaging Options

- Bare Die
- SMD
- TO46
- TO39
- Array versions also available.

DUAL MEMS CMOS MICRO-HOTPLATE for Gas Sensing



Pin-outs may vary dependant on package chosen

Description

Basic high temperature micro-hotplate where the heater temperature can be controlled by appropriately adjusting the current or the supply voltage. The device is fabricated on a 1mm x 1mm silicon die as a single-chip solution and can incorporate a temperature-sensing diode and/or FET driver.

Electrical/Optical specifications (single device)

Parameter	Nominal Value
Power Consumption(DC) at 600°C	70mW ± 5mW
Thermal Rise Time (t ₉₀)	25ms ± 5ms
Thermal Fall Time (t ₁₀)	40ms ± 5ms
Operating Temperature	600°C
Ambient Resistance (R ₀)	40Ω ± 10Ω
Heater Resistance ^{Note1} (R) @ 600°C	78Ω ± 20Ω
Heater Voltage (V _H) @ 600°C	2.4V ± 0.3V
Heater Current (I _H) @ 600°C	30mA ± 4mA
Diode Temp Coefficient (d) @ 65µA	1.17mV/K
Sensing Area	0.05mm ² min
Life Time (MTTF) @ 600°C ^{Note2}	~ 50000 Hours

Note1

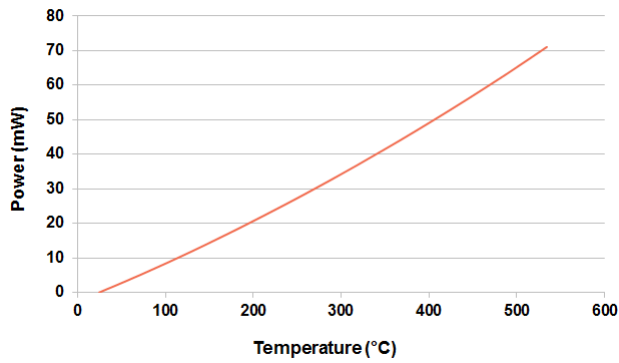
$$R = (R_0 - R_T)[1 + \alpha(T - T_0) + \beta(T - T_0)^2] + R_T$$

R_T (Track Resistance) = 11Ω ± 1Ω @ 25°C, $T_0 = 25°C$
 $\alpha = 2.05 \times 10^{-3} K^{-1}$, $\beta = 0.3 \times 10^{-6} K^{-2}$

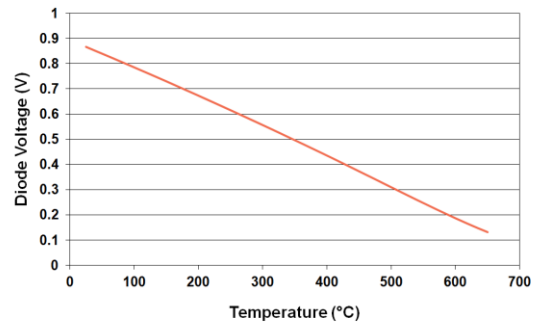
Note2

Without sensing material

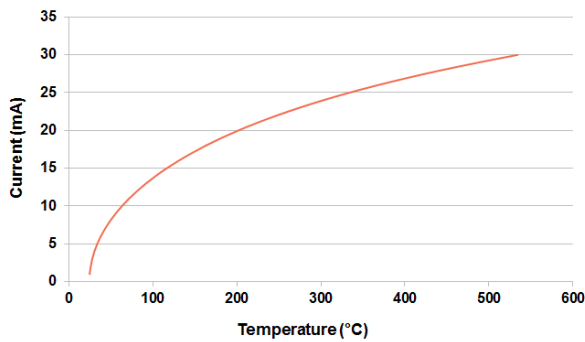
Power Consumption v Temperature



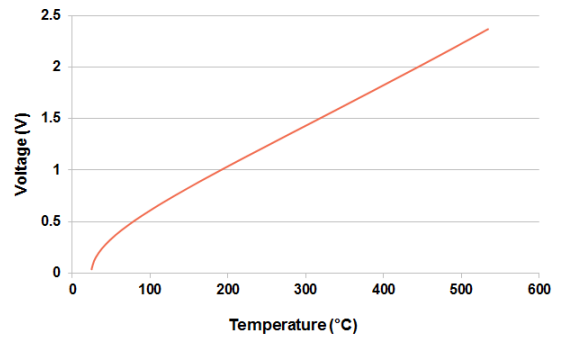
Diode characteristics



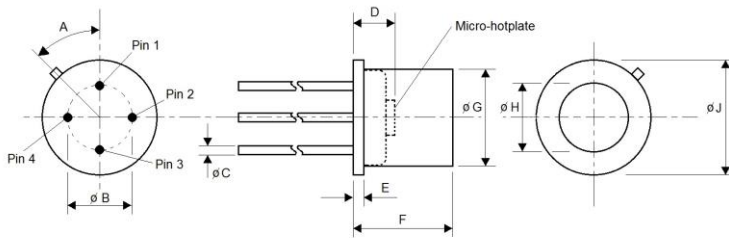
Current v Temperature



Voltage v Temperature

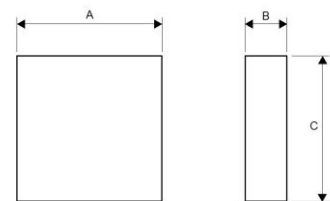


TO Package dimensions



	A	B	C	D	E	F	G	H	J
TO39	45 ⁰	5.08	0.45	1.92	0.38	4.35	8.31	5.30	9.20
TO46	45 ⁰	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

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v3.2