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CCSMHx61x MEMS Micro-hotplate

MICRO-HOTPLATE (600µm Diameter)

Benefits and Features

- High stability + High temperature
- Fast thermal response <20ms
- Lifetime @ 450°C >10 years
- Power consumption <0.36mW/°C
(without sensing material)
- 4-wire measurement option

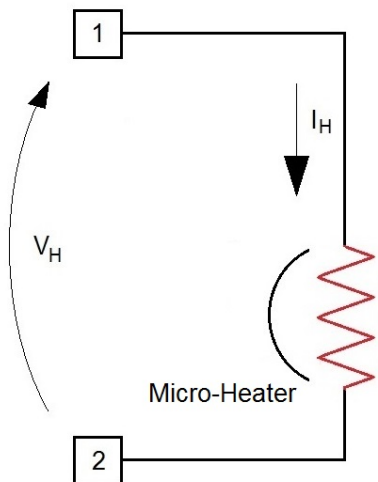
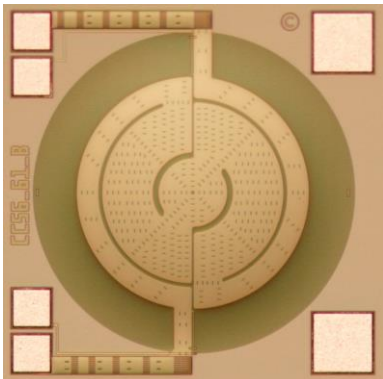
Sensing Applications

- Catalytic gases
- Medical
- Flow
- IR Radiation Source
- Micro-heating element

Packaging Options

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

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.

Electrical/Optical specifications

Parameter	Nominal Value
Power Consumption(DC) at 500°C	160mW ± 15mW
Thermal Rise Time (t ₉₀)	20ms ± 5ms
Thermal Fall Time (t ₁₀)	45ms ± 5ms
Operating Temperature	500°C
Ambient Resistance (R ₀)	17.5Ω ± 3.5Ω
Heater Resistance ^{Note1} (R) @ 500°C	33Ω ± 8Ω
Heater Voltage (V _H) @ 500°C	2.3V ± 0.3V
Heater Current (I _H) @ 500°C	70mA ± 15mA
Heated Area	0.28mm ² min
Life Time (MTTF) ^{Note2}	~ 50000 Hours

Note1

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

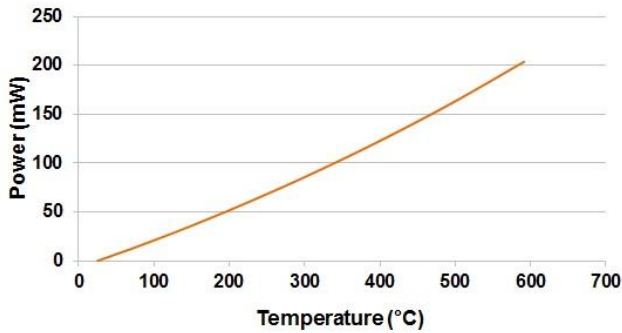
R_T (Track Resistance) = 4Ω ± 0.5Ω @ 25°C, T₀ = 25°C
 $\alpha = 2.05 \times 10^{-3} \text{ K}^{-1}$, $\beta = 0.3 \times 10^{-6} \text{ K}^{-2}$

Note2

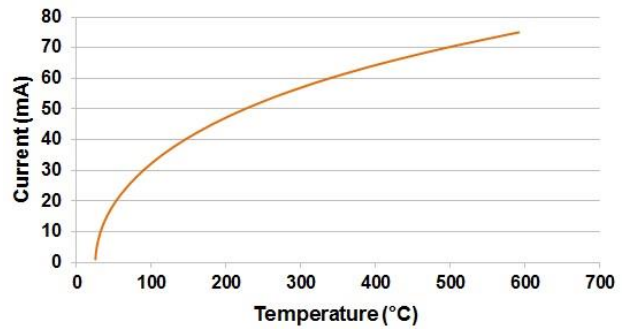
Without sensing material



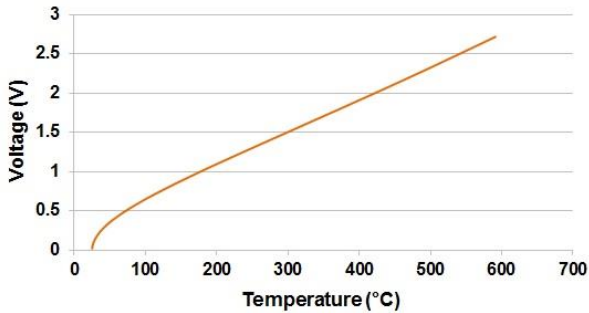
Power Consumption v Temperature



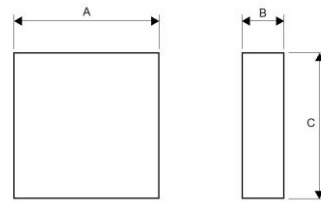
Current v Temperature



Voltage v Temperature



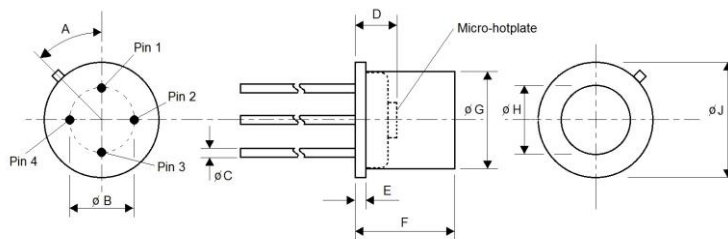
SMD Package dimensions



	A	B	C
LCC	3.80	1.45	3.80
QFN	3.00	0.84	3.00

Various pin-outs available

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
Micro TO	-	1.80	0.30	1.28	0.38	2.30	3.10	1.80	4.10

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