Description

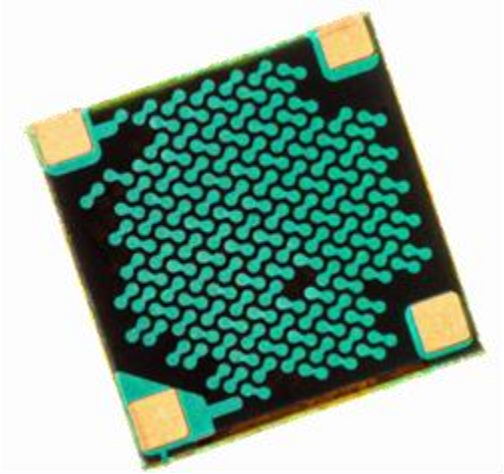
JonDeTech's new generation thermopiles generates a direct, proportional voltage response when subjected to infrared radiation heat. The sensors register wavelengths from 250nm – 22,5µm i.e. visual light up to the mid infrared region. This can be customized

The *unique geometrical configuration* where the thermocouples are "vertically" arranged enables the sensor to measure heat flux as well as temperature, i.e. the heat gradient over the thickness of the thermopile chip is measured.

The sensor is 0.16 mm thin and can be used "bare", without extra protective housing such as a metal container.

Features

- IR responsivity & heat-flux sensitivity of high specified tolerance (+/- 5%)
- Made to fit – Thickness of the sensor is only 0.16 mm
- Easy to mount – The sensors can be surface mounted to most PCBs
- Multi measurements – The sensor can be used to measure both thermal radiation and heat flux
- Minimal footprint – Standard module dimensions are 3×3 mm (JIRS30H)
- Fully customizable – Can be manufactured in any desirable shape
- Arrays of sensors can be mounted side-by-side on a PCB to create the required detector area



1 Technical data JonDeTech infrared thermopile sensor

Entity	Units	Value
Sensor model		JIRS30H
Type of sensor		infrared/heatflux
No. of thermopile elements		1
Width of full thermopile module	mm	3.0×3.0 (max 3.1×3.1)
Thickness of thermopile	mm	typ. 0.16
Side of connection pads		back
Side of absorber layer		front
Thermopile module area	mm^2	9.0
Active thermopile area	mm^2	7.0
No. of thermocouples		152
Max allowed peak temp. (4 min)	°C	250
Max allowed temperature in continuous operation [2]	°C	<125
Electrical resistance	kΩ	typ. 2.5
IR Responsivity [a)]	V/W	0.109-0.120
Voltage response [a)]	Vmm^2/W	0.98-1.08
NEP (noise equivalent power)	$nW/\sqrt{Hz}$	<20
Time constant	ms	30
S_{40} (obj. temp. 40°C, ambient 25°C)	µV/K	>12
Heat-flux sensitivity, S_{hf} [b)]	µV / (W/m2)	1.288 - 1.424
Heat-flux resolution [b) c)]	W/m2	1.40 - 1.55
Absolute Thermal Resistance [b) d)]	K/W	~ 66

a) Measured without filter using a black body source at 120 °C with an emissivity of 0.95. The sensor is mounted as described in section 7.
b) Values for the sensor mounted with thermal conduction to a heat source as shown in section 6.
c) Assuming ADC LSB resolution of 2 µV.
d) Assuming full cold sink contact to backside.

2 Absolute Maximum Ratings

Operating Temperature
-20°C ~ 100°C

Storage Temperature
-40°C ~120°C

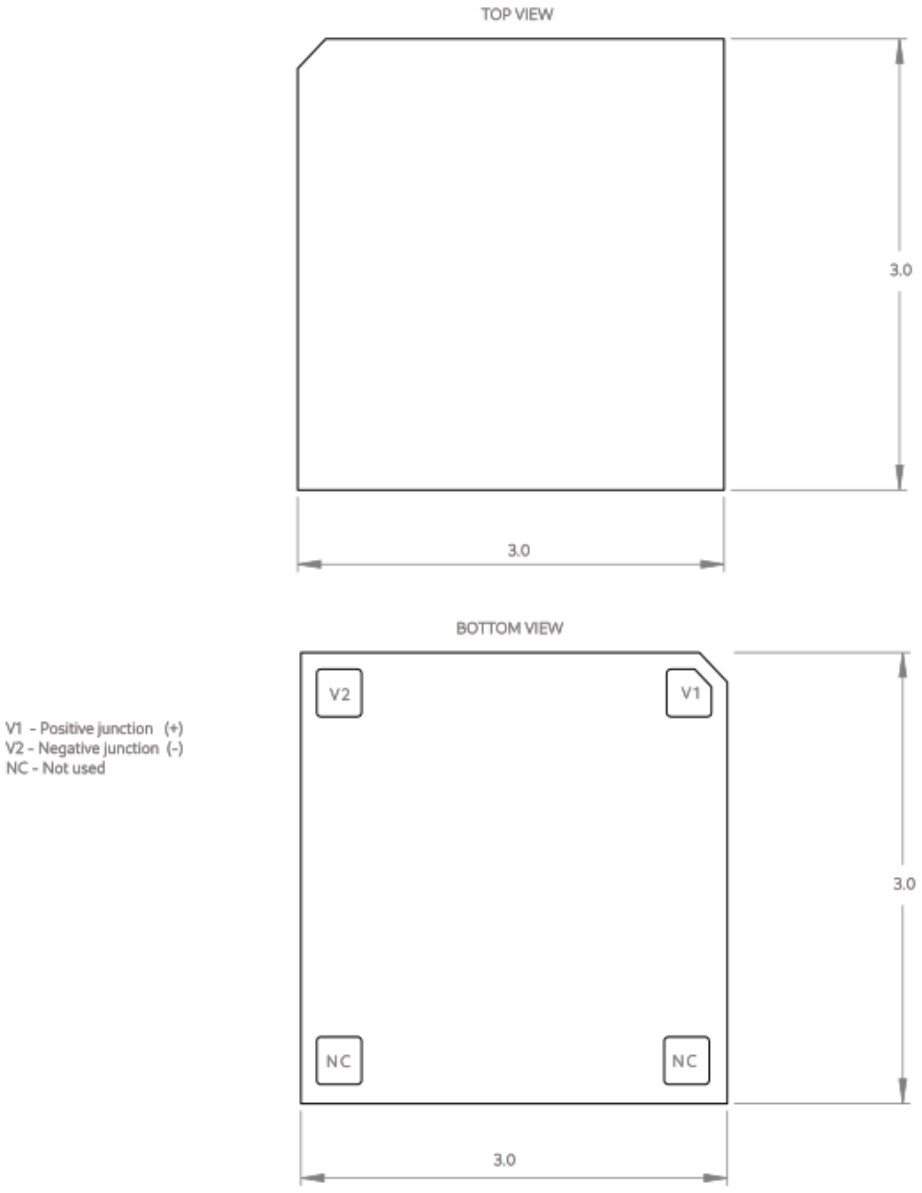
3 Manufacturability

JIRS30H is a MSL-2 device.

Products are qualified and classified regarding moisture sensitivity level as well as soldering technology and solderability according to IPC/JEDEC J-STD-020.

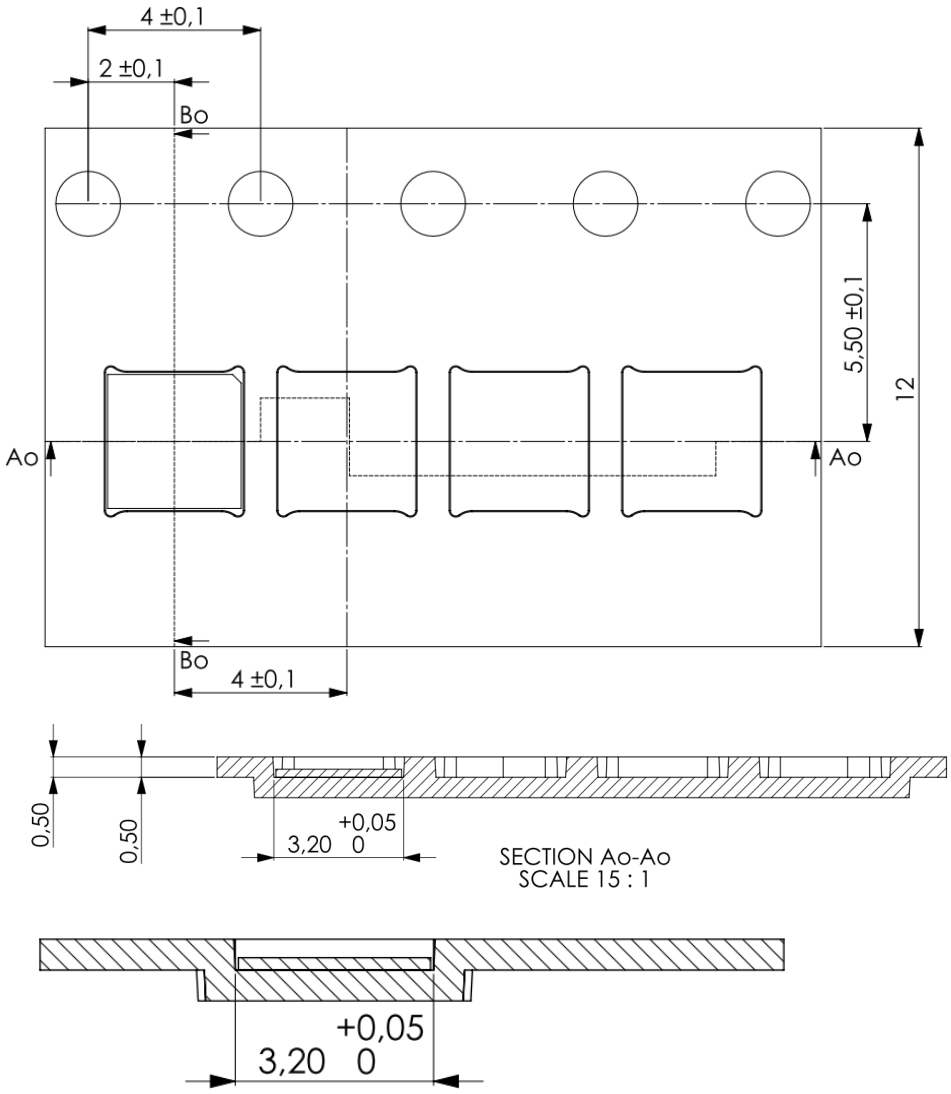
Maximum peak temperature during soldering is 250°C.

4 Sensor geometry

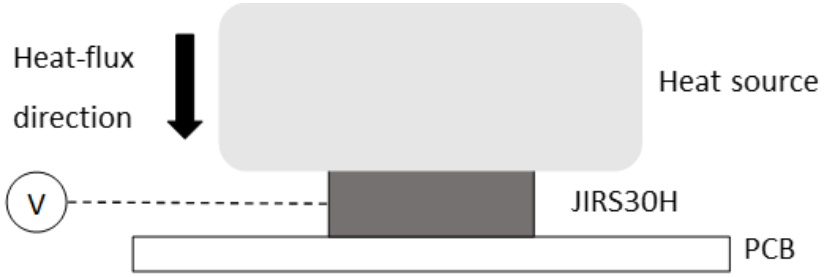


All dimensions in mm.

5 Tape and reel information



6 Heat-flux measurement principle

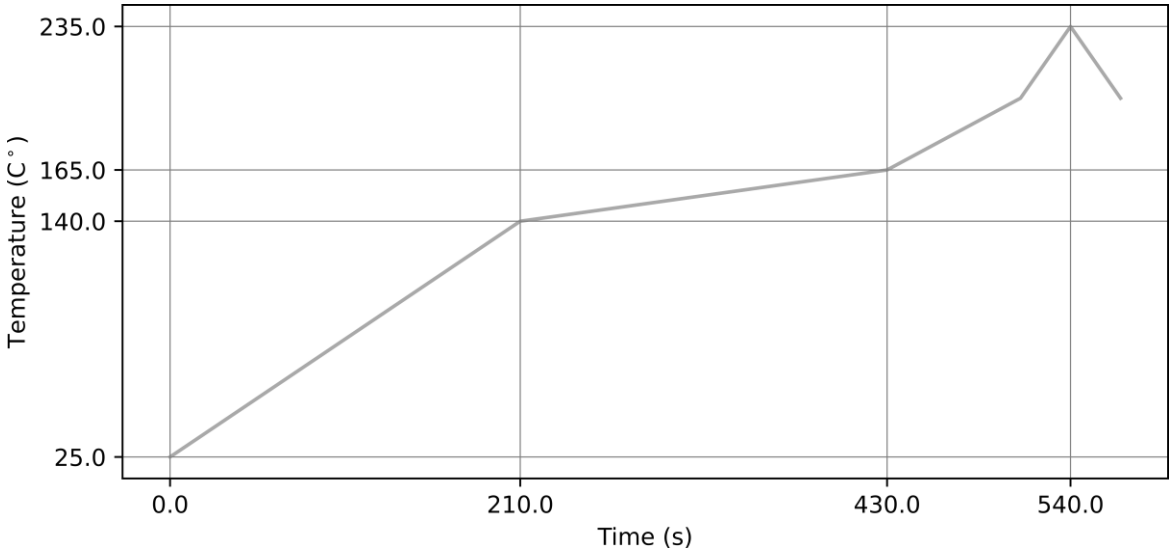


The heat-flux, Q, passing the sensor can be calculated from the voltage response, V, from the following equation,

$Q = V / S_{hf}$,

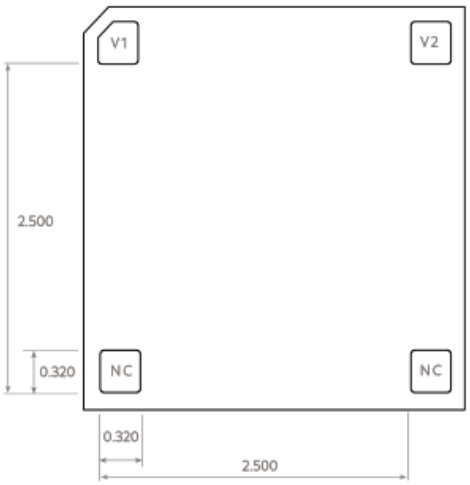
where S_{hf} is the heat-flux sensitivity.

7 Recommended soldering procedure



Use lead free SAC305 solder paste, follow nominal solder reflow profile as shown in figure. Use metal stencil for solder paste printing with a thickness of 0.12 mm. Use the same metal stencil aperture dimensions, 0.320 x 0.320 mm, as for the land pattern described in section 8.

8 Land pattern



All dimensions in mm.