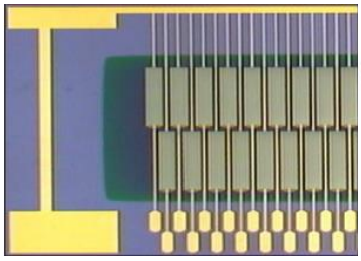
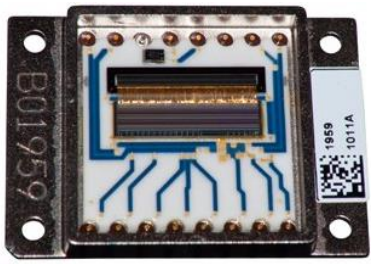
Thin Film Pyroelectric Linear 255 Element Line Sensor Array

With Integrated Read-Out Electronics

Introduction

The Pyreos line sensor array utilises our unique thin-film pyroelectric PZT material to offer performance with unbeatable resolution, with the potential to capture all wavelengths of light and performance across a wide wavelength range. The ASIC readout electronics output is a multiplexed, amplified and filtered analogue signal for each sensor element. The sensor is housed in a low profile hermetic metal package along with a temperature sensor and is fitted with the customer's choice of filter window.





Product Features

Wavelength range	0.1 to 100 µm
Operating temperature	Un-cooled operation
Number of pixels	255 sensor elements
Pixel sizes	50 µm x 417.5 µm pixels in 2 lines of 128 pixels *NO spectral gaps – all wavelengths captured!* Vertical separation between lines: 45 µm In line pixel pitch:100 µm
Pixel operability	96% with no more than 2 bad pixels in any 10
Dynamic range	>75 dB
Scan speed	10-1000 Hz

Applications

General IR spectroscopy	Portable, robust spectral engines
Lubricating oil monitoring	Quality, wear, adulteration,
Foodstuffs	Constitution, adulteration
Process monitoring	Wind turbine, petrochemical, pharmaceutical
Temperature measurement	Non-contact line scanning measurement
Imaging	Line scanning

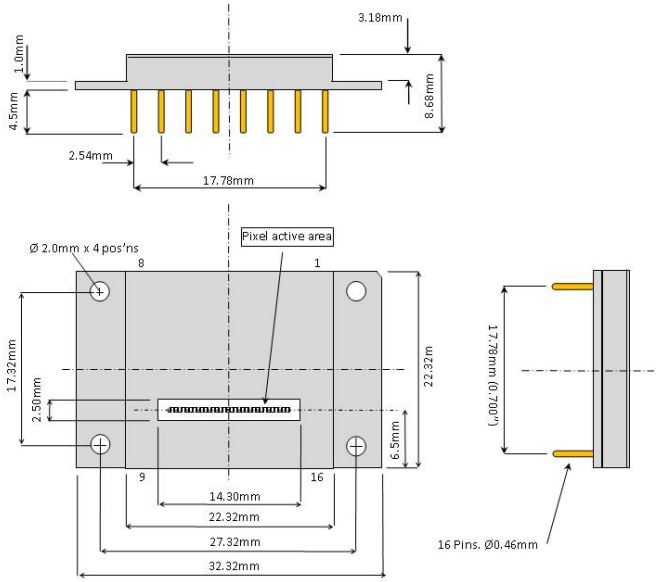
Filters Available

Part Number	PY0716
Filter Material	Silicon
Filter type	Broadband Antireflection coated Silicon

Order Information

Please quote PY-LA-S-255 and your desired customizations of this product. Contact: sales@pyreos.com

Package Information



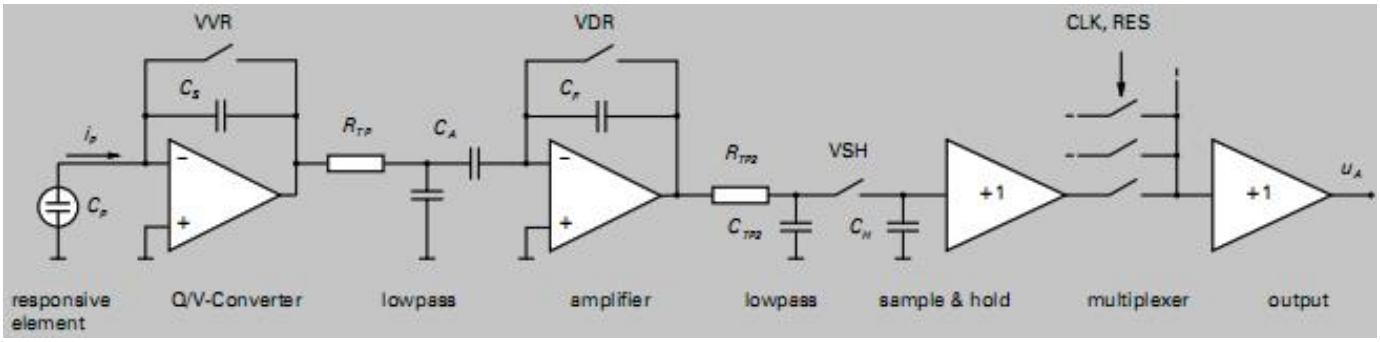
No.	*Name*	*Comment*
1.	**CLK**	Input clock CLK (trigger on rising edge)
2.	**RES**	Input clock RES (active low)
3.	**VVR**	Input clock VDR (active high)
4.	**VDR**	Input clock VDR (active high)
5.	**VSH**	Input clock VSH (active high)
6.	**VD2**	Operating voltage (+2.5 V)
7.	**AVDD**	Operating voltage (+5 V)
8.	**VD2**	Operating voltage (+2.5 V)
9.	**OUT**	Analogue signal output
10.	**AGND**	Ground
11.	**n.c.**	Not connected
12.	**T+**	Temperature sensor
13.	**T-**	Temperature sensor
14.	**case**	Case
15.	**DGND**	Ground
16.	**DVDD**	Operating voltage (+5 V)

Connect pin 6 to pin 8

Please remember to take ESD precautions when handling components

Circuit Diagram

The amplification circuit consists of low-noise preamplifiers for each individual sensor elements, analogue switches and an output amplifier. The pre-amplifiers transform the signal charges measured at each sensor element into a conditioned voltage. The amplified signal is then passed to sample and hold, multiplexer output buffer for the read-out process. The digital inputs are CMOS compatible. A 10k NTC thermistor is integrated within the package to monitor the line sensor temperature.



Thermistor is NTC, 1%. For more details check ERTJZEG103FA Datasheet on Industrial Panasonic website.

Clock Parameters

Similar to all pyroelectric sensors, the Pyreos thin-film pyroelectric line sensor array responds to and detects a change in infrared radiation intensity. It therefore requires a pulsed source of infrared radiation for measurement purposes.

Parameter[1]	Relative Value	Min. Values	Recommended Value
Chopping Frequency[2] f_{Ch}		10 Hz	128 Hz
Read-out Clock CLK f_{CLK} = 2* f_{Ch}*268	$1/t_{CLK}$	5.36 KHz	69 KHz
Reset clock low-impulse duration t_{RES}	1/2 t_{CLK}	1.8 µs	7.5 µs
Clock VVR high-impulse duration t_{VVR}	2 t_{CLK}	7.5 µs	30 µs
Clock VDR high-impulse duration t_{VDR}	28 t_{CLK}	200 µs	400 µs
Clock VSH high-impulse duration t_{VSH}	1 t_{CLK}	3.5 µs	15 µs
Maximum Settling Time at output t_{out} is 1 µ second			

[1]All values for VDD = 5 V, VD2 = 2.5V
[2]$t_{Ch\ low}$ = $t_{Ch\ high}$

Clock Diagram

Pixel 1 is nearest pin 1 of the device.