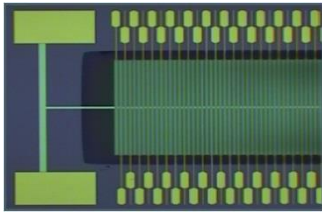


# Thin Film Pyroelectric Linear 510 Element Line Sensor Array

With Integrated Read-Out Electronics

## Introduction



The Pyreos line sensor array (Linear Array) utilises our unique thin-film pyroelectric PZT material to offer class leading resolution and performance across a wide wavelength range at a very affordable price. The ASIC readout

electronics output a multiplexed, amplified and filtered analogue signal for each sensor element. The sensor is housed in a low profile sealed metal package along with a temperature sensor and is fitted with the customer's choice of filter window.



## Product Features

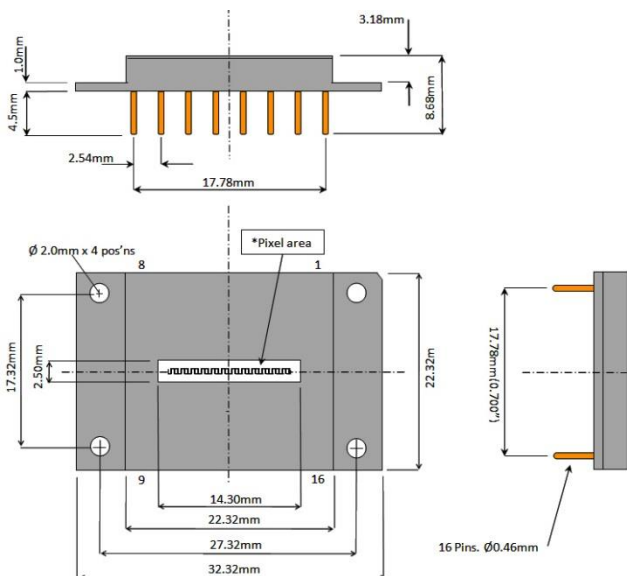
Wavelength range	0.1->100 microns <sup>1</sup>
Operating temperature	Un-cooled operation
Number of pixels	510 sensor elements
Pixel size	10µm x 867µm; 25µm pitch
Pixel operability	98% with no more than 2 bad in any 10
Dynamic range	>75dB
Scan speed	10-1000Hz

<sup>1</sup>Choice of filter windows available

## 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

## Package Information

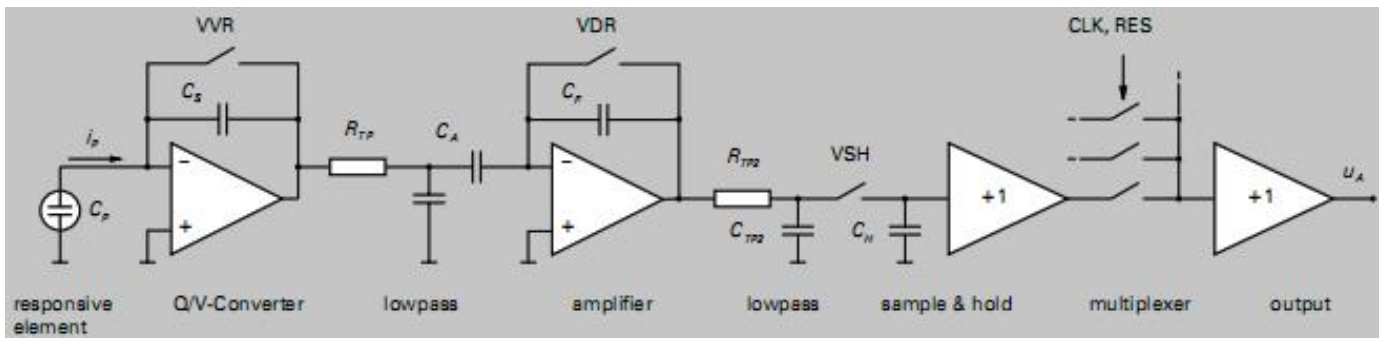


No.	Name	Comment
1.	CLK	Input clock CLK (trigger on rising edge)
2.	RES	Input clock RES (active low)
3.	VVR	Input clock VDR (active high)
4.	VDR	Input clock VDR (active high)
5.	VSH	Input clock VSH (active high)
6.	VD2	Operating voltage (+2.5 V)
7.	AVDD	Operating voltage (+5 V)
8.	VD2	Operating voltage (+2.5 V)
9.	OUT1	Analogue signal output
10.	AGND	Ground
11.	OUT2	Analogue signal out
12.	T+	Temperature sensor
13.	T-	Temperature sensor
14.	case	Case
15.	DGND	Ground
16.	DVDD	Operating voltage(+5 V)

Please note: the information contained in this document is subject to change without further notification. Pyreos reserves the right to alter the performance and any resulting specification. Pyreos may choose not to supply any engineering sample devices as a commercial product.

## 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 & hold, multiplexer and output buffer for the read-out process. There are two analogue outputs, all the even numbered channel signals appear on OUT 1 and all the odd numbered channels appear on OUT 2. The digital inputs are 5V CMOS compatible. A NTC thermistor is integrated within the package to monitor the line sensor temperature. Its part number is susceptible to the filter listed on the Filter Table below.



## 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 <sup>1</sup>	Relative Value	Min. Values	Recommended Value
Chopping Frequency <sup>2</sup> $f_{ch}$		10 Hz	128 Hz
Read-out Clock $f_{CLK} = 2 * f_{ch} * 268$	$1/t_{CLK}$	5.36 KHz	69 KHz
Reset clock low-impulse duration $t_{RES}$	$\frac{1}{2} t_{CLK}$	1.8 $\mu s$	7.5 $\mu s$
Clock VVR high-impulse duration $t_{VVR}$	$2 t_{CLK}$	7.5 $\mu s$	30 $\mu s$
Clock VDR high-impulse duration $t_{VDR}$	$28 t_{CLK}$	200 $\mu s$	400 $\mu s$
Clock VSH high-impulse duration $t_{VSH}$	$1 t_{CLK}$	3.5 $\mu s$	15 $\mu s$

Maximum Settling Time at output tout is 1  $\mu$  second

<sup>1</sup>All values for VDD = 5 V, VD2 = 2.5V

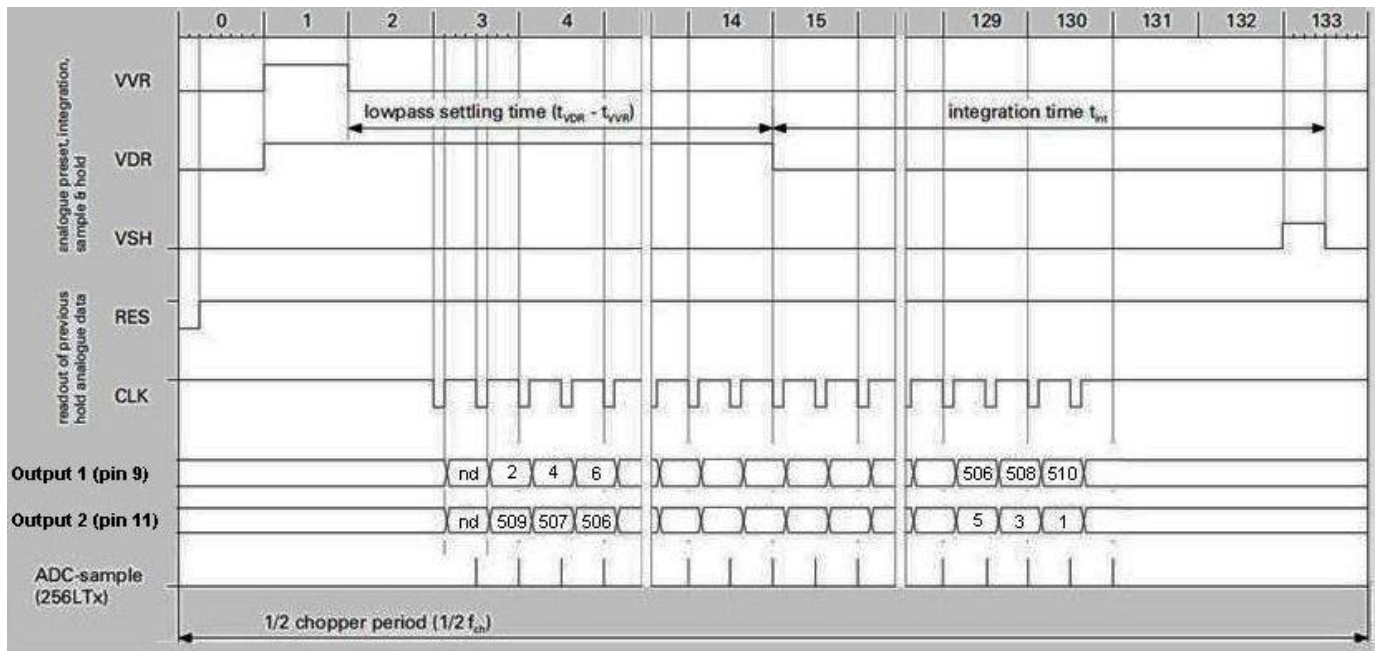
<sup>2</sup> $t_{Ch low} = t_{Ch high}$

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## Clock Diagram

The 510 channel line sensor contains two multiplexed analogue outputs, each one providing data from 255 channels. The first output (pin 9) provides data from all the even numbered pixels, counting upwards from 2 to 510. The second output (pin 11) provides data from all the odd numbered pixels, starting at pixel 509 and counting downwards to pixel 1. The clock diagram above shows which pixel numbers are available from each output as the device is clocked.

Pixel 1 is nearest pin 1 of the device.



## Filters Available

Part Number	PY0294
Filter Material	Silicon
Filter type	Broadband Antireflection coated Silicon

## Order Information

Please quote PY-LA-S-510 and your desired customizations of this product.

Search terms: FPI Spectroscopy Etalon LVF FTIR Spectrometer-on-a-chip

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