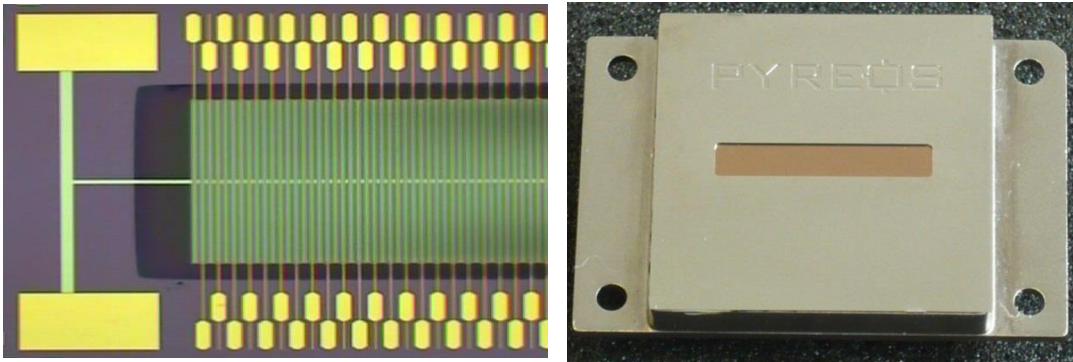




## Thin Film Pyroelectric Linear 510 Element Line Sensor Array with integrated read-out electronics

### Product Summary

The Pyreos line sensor 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 outputs a multiplexed, amplified and filtered analogue signal for each sensor element. The sensor is housed in a low profile 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 Choice of filter windows available
Operating Temperature	Un-cooled operation
Number of Pixels	510
Pixel Size	10µm x 867µm; 25µm pitch
Response Uniformity	>+/-3% pixel-to-pixel of array signal mean (@ 100Hz)
Pixel Operability	96% with no more than 2 bad in any 10
Dynamic Range	> 75 dB
Scan speed	10-1000 Hz

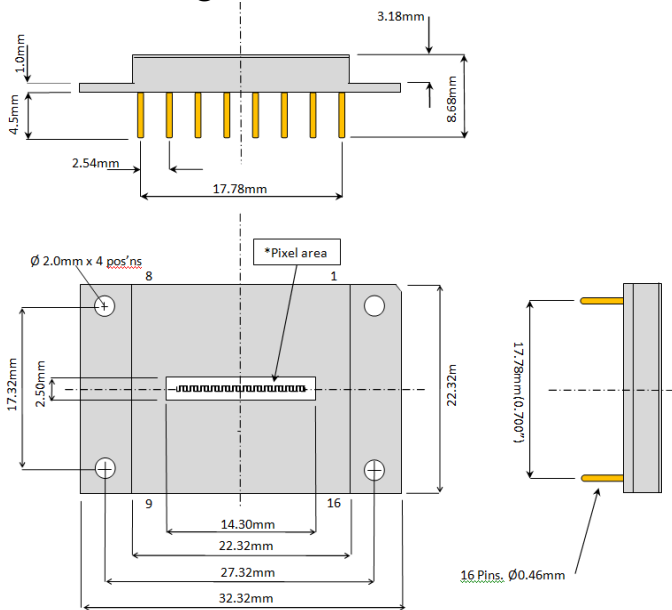
### Applications

IR Spectroscopy  
Medical diagnostics  
Laser line calibration  
Process Monitoring  
Terahertz imaging  
Security screening

Portable robust spectral engines  
Breath, blood and urine analysis  
Temperature measurement  
Wind turbine, petrochemical, pharmaceutical  
Near IR InGaAs replacement  
Optical telecom channel monitoring

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## Package Information



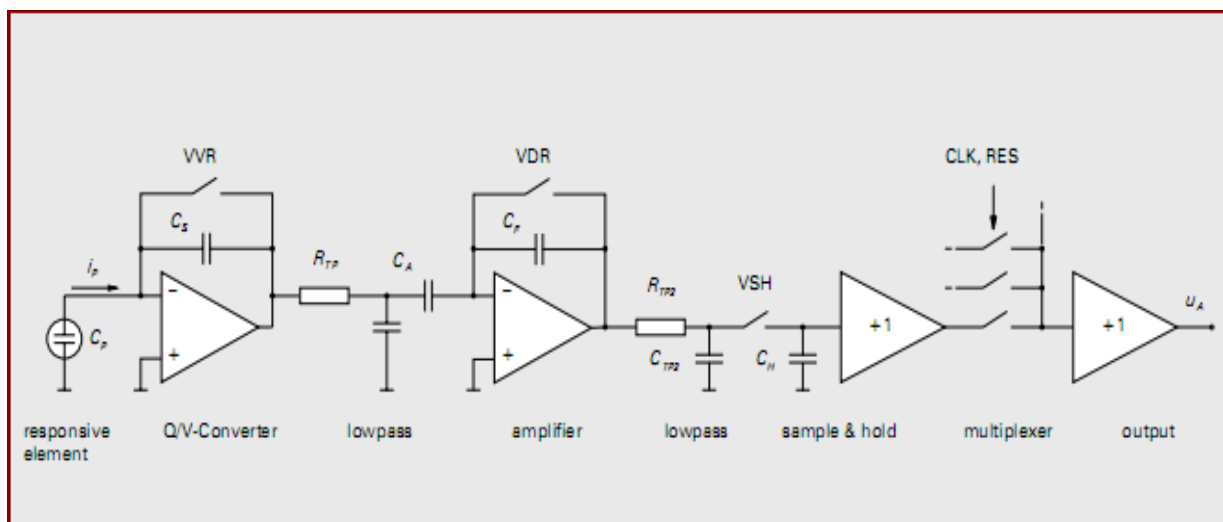
No	Name	Comment
1	CLK	Input clock CLK (trigger on rising edge)
2	RES	Input clock RES (active low)
3	VVR	Input clock VVR (active high)
4	VDR	Input clock VDR (active high)
5	VSH	Input clock VSH (active high)
6	VD2	Operating voltage (+2.5 V)
7	AVDD	Operating voltage (+5 V)
8	VD2	Operating voltage (+2.5 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)

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 element, 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 thermistor is integrated within the package to monitor the line sensor temperature.





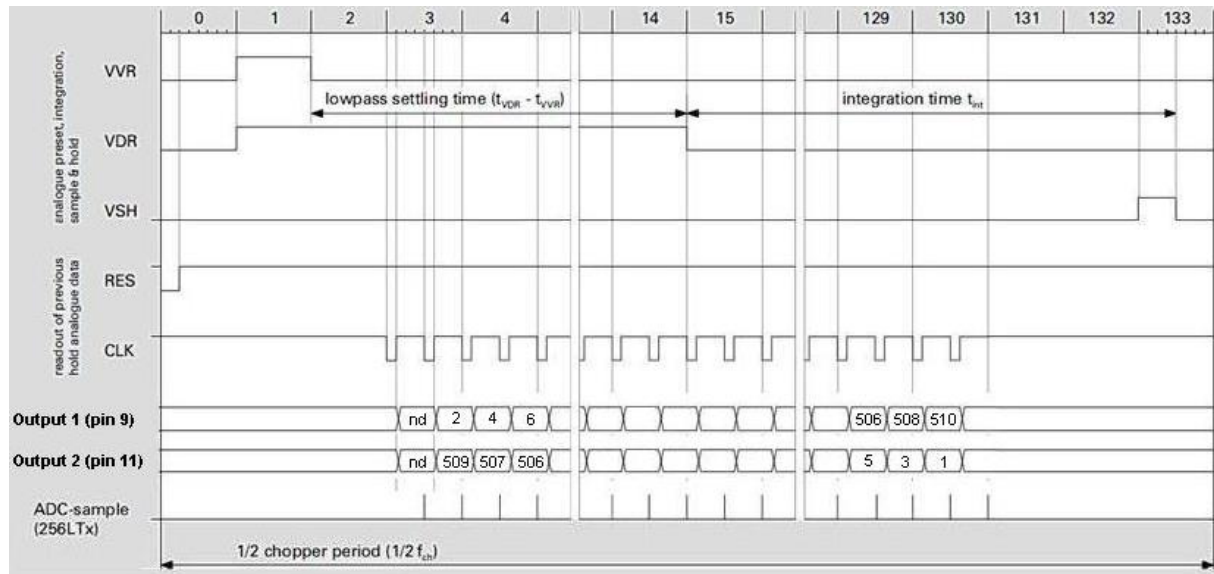
## Clock Parameters

Similar to all pyroelectric sensors, 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 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 $\mu s$	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 $\mu s$
<b>Maximum Settling Time at output <math>t_{out}</math> is 1 <math>\mu</math> second</b>			

<sup>1</sup>All values for  $VDD = 5 V$ ,  $VD2 = 2.5V$ . <sup>2</sup>  $t_{Ch low} = t_{Ch high}$ .

## 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*

**Please note:** the information contained in this document is subject to change without further notification. Pyreos reserves the right to alter the performance and specification. No responsibility is accepted for any consequential loss incurred.