

# PYREOS

## Thin Film Pyroelectric Linear 128 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 output 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-> 100 microns Several filter windows available
Operating Temperature	Un-cooled operation
Number of Pixels	128 sensor elements
Pixel Sizes Available	a) 60µm x 500µm; 100µm pitch single line b) 60µm x 500µm; 200µm pitch 2 lines-40µm separation
Response Uniformity	>+/-3% pixel-to-pixel of array signal mean
Pixel Operability	98% with no 2 contiguous bad pixels
Dynamic Range	> 75 dB
Scan speed	10-1000Hz

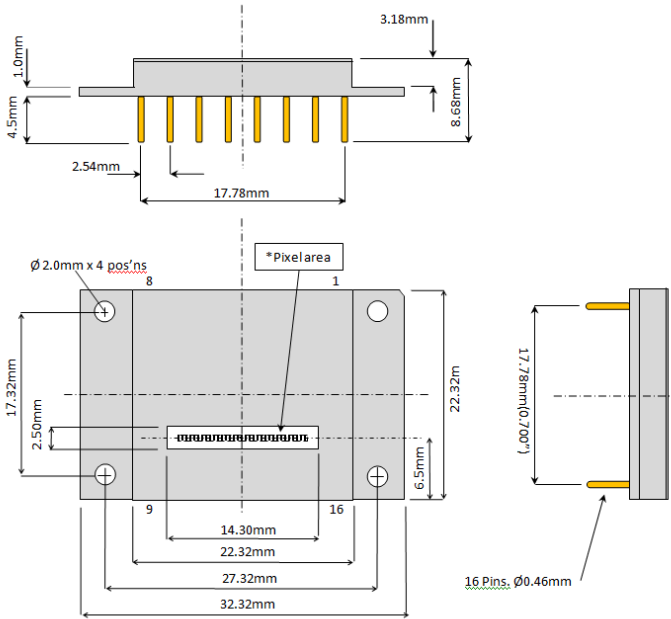
### Applications

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

# PYREOS

## Package Information



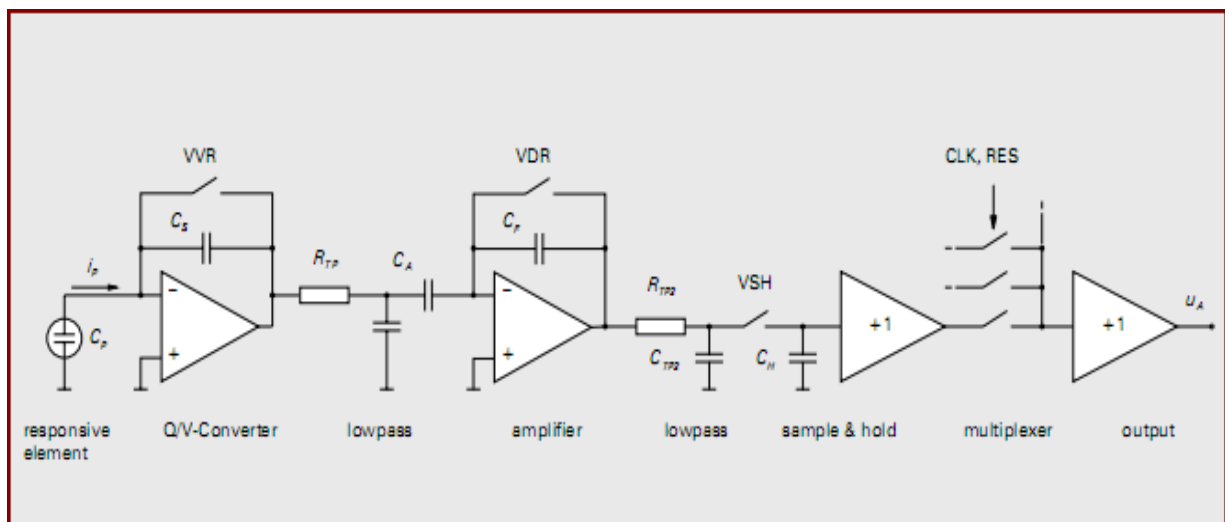
No	Name	Comment
1	CLK	Input clock CLK (trigger on rising edge)
2	RES	Input clock RES (active low)
3	VVR	Input clock VVR (active high)
4	VDR	Input clock VDR (active high)
5	VSH	Input clock VSH (active high)
6	VD2	Operating voltage (+2.5 V)
7	AVDD	Operating voltage (+5 V)
8	VD2	Operating voltage (+2.5 V)
9	OUT	Analog 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 & hold, multiplexer out-put buffer for the read-out process. The digital inputs are CMOS compatible. A temperature sensor is integrated within the package to monitor the line sensor temperature and outputs a current value which is proportional to the temperature.



# PYREOS

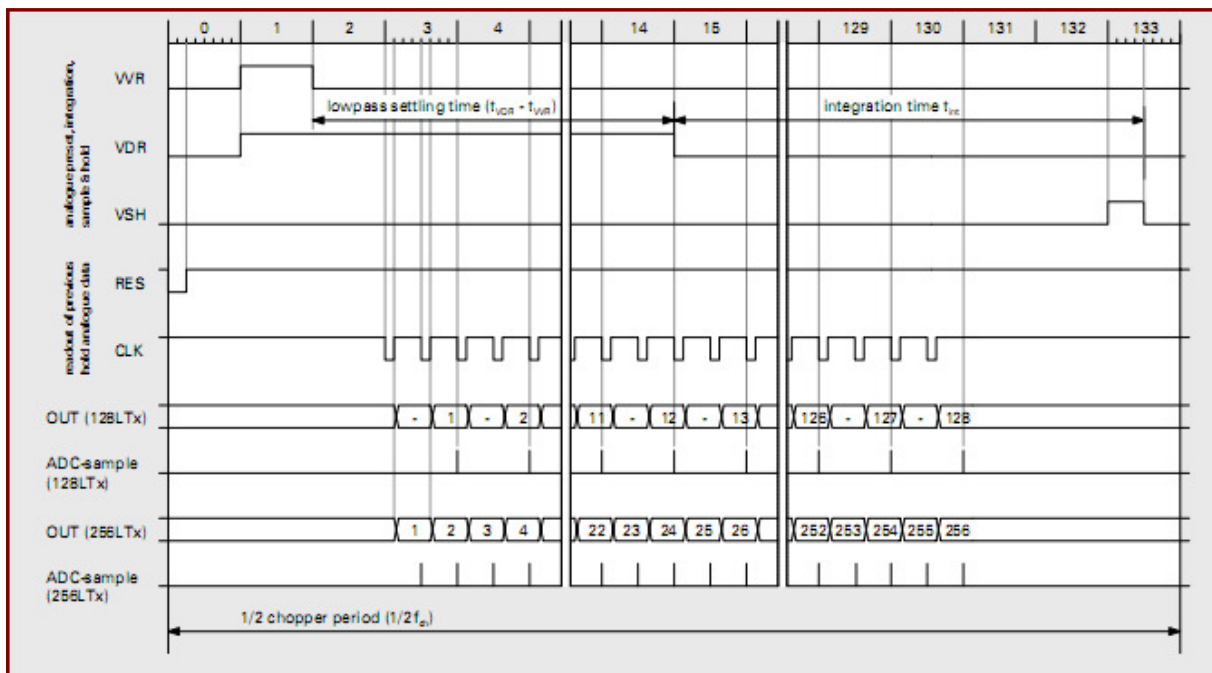
## Clock Parameters

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 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



Pixel1 is nearest Pin 1

**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.