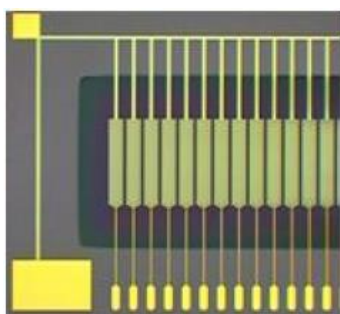


# Thin Film Pyroelectric Linear 128+1 Element Line Sensor Array

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 infrared wavelength range at a very affordable price. 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. An additional "+1" sensor element provides higher sensitivity on a discrete wavelength, e.g. for lubrication oil or foodstuffs. The +1 sensor is located for ATR and transmission use.



## Product Features

Wavelength range	0.1 to 100 $\mu\text{m}$ <sup>1</sup>
Operating temperature	Un-cooled operation
Number of pixels	128 sensor elements +1 sensor element
128 Pixel array dimensions	60 $\mu\text{m}$ x 500 $\mu\text{m}$ ; 100 $\mu\text{m}$ pitch
+1 sensor area	1 mm <sup>2</sup> (33x larger than array pixels)
Pixel operability	96% with no more than 2 bad 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

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

## Filters Available

128 Element Array:

- Linear Variable Filters, ranges: 2.5 to 5.0  $\mu\text{m}$ , 5.5 to 11.0  $\mu\text{m}$
- Broadband Filters: AR Si

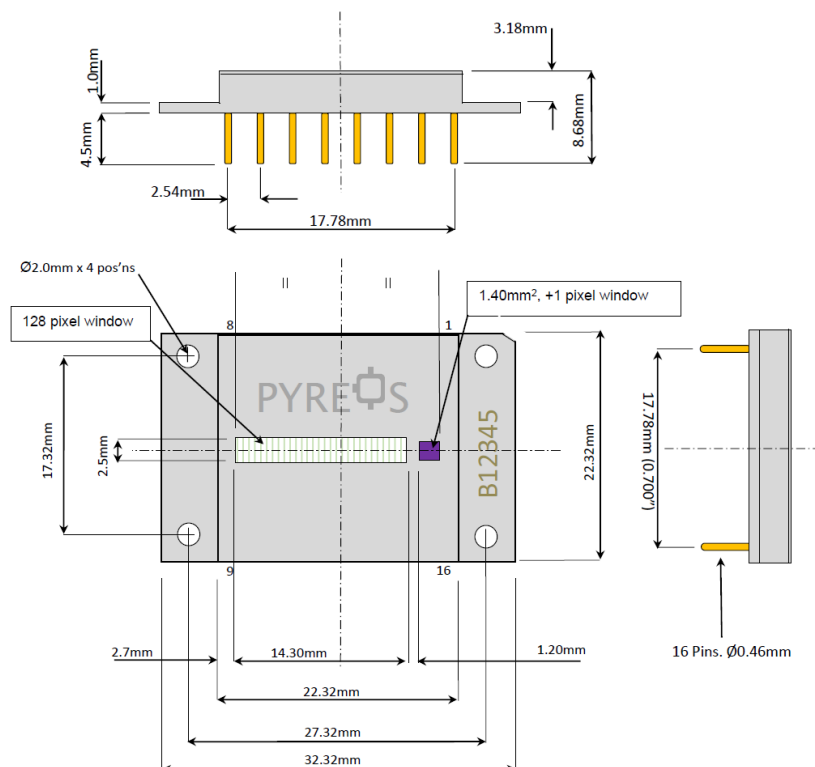
+1 Element: – Discrete wavelength either within or extending beyond the Linear Variable Filter range.

- 2.90 $\mu\text{m}$  / 300nm for water content (PY2004, includes 5.5-11  $\mu\text{m}$  array)
- 5.75 $\mu\text{m}$  / 100nm for fat "A" content (PY2075, includes 5.5-11  $\mu\text{m}$  array)

Please inquire for further options.

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. No responsibility is accepted for any consequential loss incurred. TPL640 128LT 256LT Pyreos Ltd, 14-16 The Curve, 32 Research Avenue North, Heriot Watt Research Park, Edinburgh EH14 4AP, UK. Tel: +44 131 322 0732, [www.pyreos.com](http://www.pyreos.com) Copyright Pyreos Ltd 2019

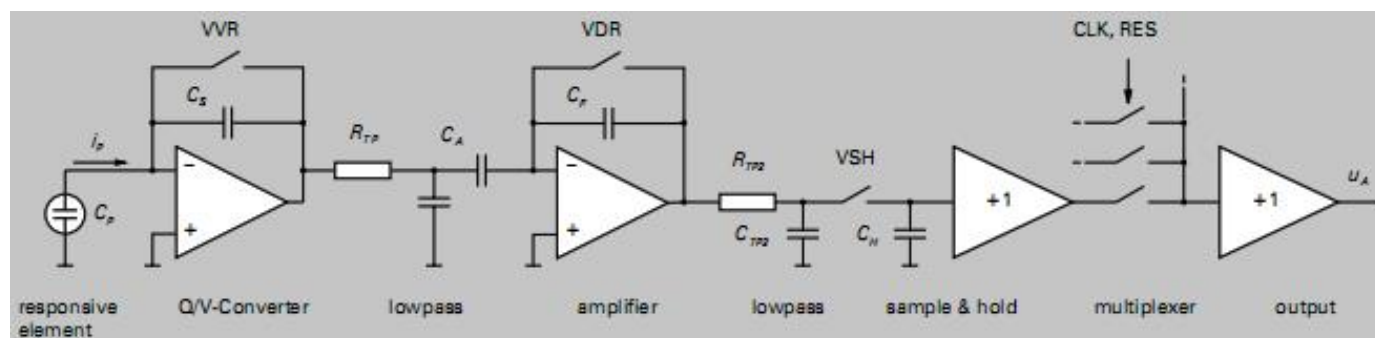
## Package Information



No.	Name	Comment
1.	CLK	Input clock CLK (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.	N/C	Not Connected
7.	AVDD	Operating voltage (+5 V)
8.	VD2	Operating voltage (+2.5 V)
9.	OUT	Analogue output (128 array)
10.	AGND	Ground
11.	OUT 1	Analogue output (+1 element)
12.	T+	Temperature sensor
13.	T-	Temperature sensor
14.	case	Case
15.	N/C	Not Connected
16.	DVDD	Operating voltage (+5 V)

## Circuit Diagram – 128 Array Readout

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.

## Order Information

Contact: [sales@pyreos.com](mailto:sales@pyreos.com)

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

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. No responsibility is accepted for any consequential loss incurred. TPL640 128LT 256LT Pyreos Ltd, 14-16 The Curve, 32 Research Avenue North, Heriot Watt Research Park, Edinburgh EH14 4AP, UK. Tel: +44 131 322 0732, [www.pyreos.com](http://www.pyreos.com) Copyright Pyreos Ltd 2019

## Clock Parameters – 128 Array Readout

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 $\mu s$

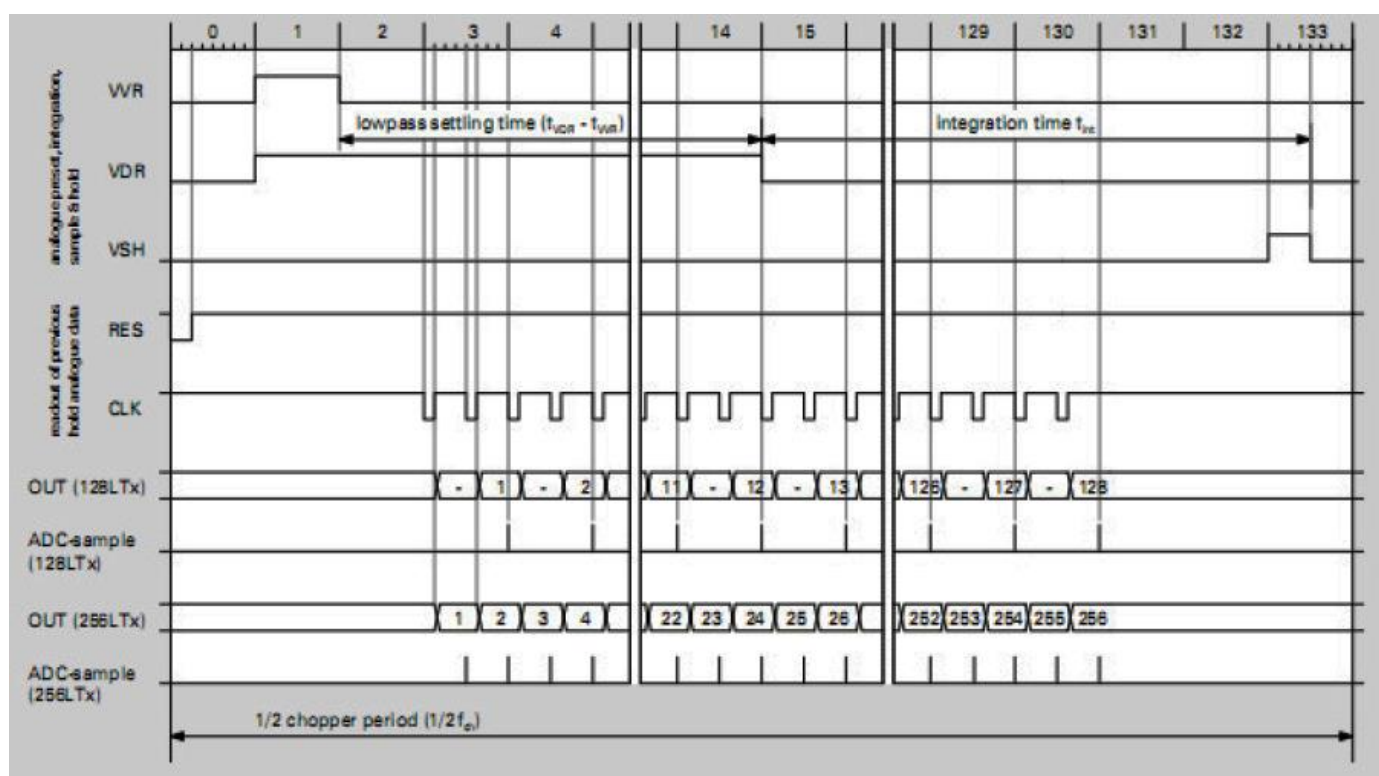
Maximum Settling Time at output  $t_{out}$  is 1  $\mu$  second

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

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

## Clock Diagram – 128 Array Readout

Pixel 1 is nearest pin 1 of the device.



# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Pyreos:](#)

[PY2004](#) [PY2075](#)