COOL EYE™
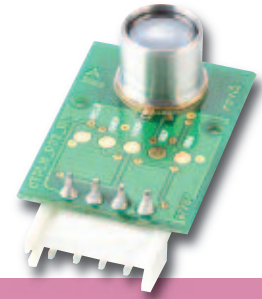## THERMOPILE ARRAY MODULES WITH INTEGRAL OPTICS FOR SAFETY AND SECURITY

TPL 08T 2146 L3.9, TPL 16T 3246 L3.9 G10 – Thermopile Line, TPA 16T 4146 L3.9 Thermopile Array "Cool Eye"

Target Applications

- Presence detection
- Non-contact temperature measurement
- Temperature dependent switch for alarm or thermostatic applications
- Household appliances like microwave oven, toaster, hair dryer

Features and Benefits

- Digital SMBus interface
- Factory calibration
- Temperature signal
- Ambient temperature output signal
- Programmable emissivity
- Noise reduction filter
- Module with connector
- E2PROM configuration and data storage
- Optics included, various viewing angles
- Can be adapted to your specific requirements

Product Description

With the Cool Eye™ family PerkinElmer offers thermopile arrays in various configurations. All are module types on a PCB with communication interface and a 4-pin connector. For line arrays, we offer 8 elements and 16 elements in two different lens configurations, with 3.9 mm focus and 5.5 mm focus. The spatial design provides for 4 x 4 elements and comes with recommended 3.9 mm or 5.5 mm focal length optics.

The thermopile line or array modules consist of a 1 x 8, 1 x 16 or 4 x 4 element thermopile chip connected to an integrated multiplexing and signal conditioning circuit, E2PROM and microcontroller with an integrated A/D converter for signal processing and interfacing. Lenses for different field of views are available on demand. The sensor is equipped with an internal reference temperature sensor for correct target temperature determination.

The temperature accuracy by digital signal processing in combination with the numeric ambient temperature compensation algorithm outperforms any discrete solution. The sensor module provides an output signal which is representing real temperature data for each pixel.

Customer specific modifications are possible.

For the various object temperature ranges we offer the following pre-calibrated modules:

L3.9 types
- 0 ... 60° C: TPL 08T 2146 L3.9 OAA060
- 0 ... 60° C: TPA 16T 4146 L3.9 OAA060
- 0 ... 60° C: TPL 16T 3246 L3.9 G10 OAA060

L5.5 types
- 0 ... 150° C: TPL 08T 2146 L5.5 OAA150
- 0 ... 60° C: TPA 16T 4146 L5.5 OAA060

Customization: As the modules are always calibrated to target temperature range customized versions are available.

A temperature reference output is included. On request the modules can be supplied as an "OBA" version, which is calibrated but without internal temperature compensation. In this case the customer will do the temperature compensation externally with the use of the supplied reference output.
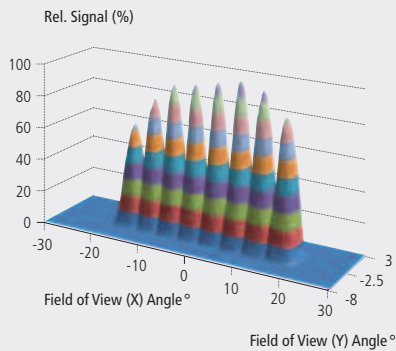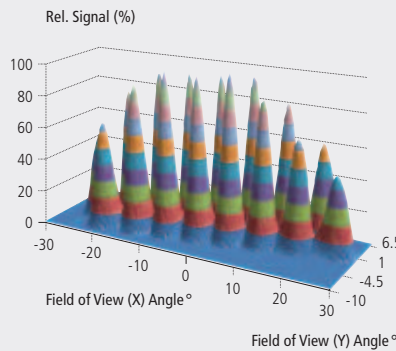
Filter

Transmission (%)

— Lens with G10 Coating   — Lens
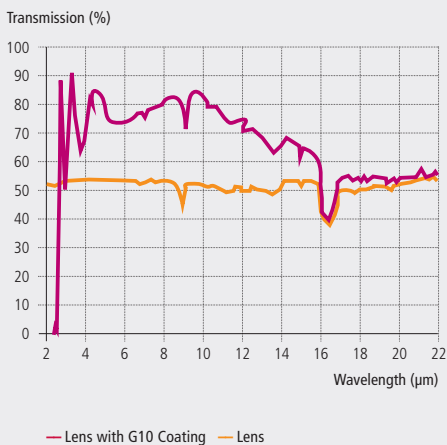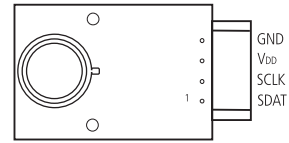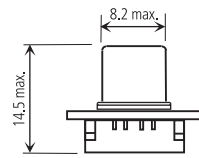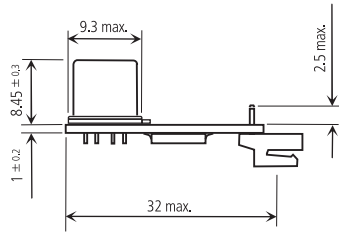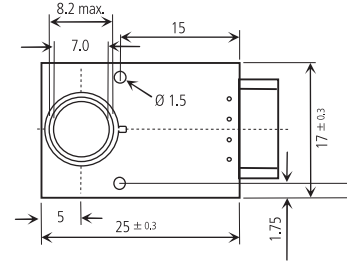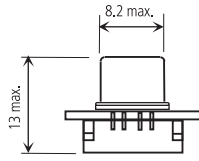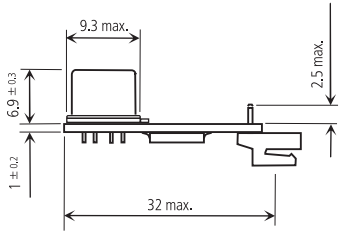
Dimensions TPX YY L5.5
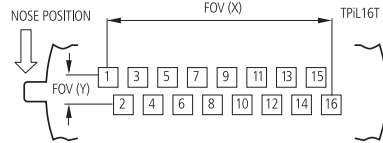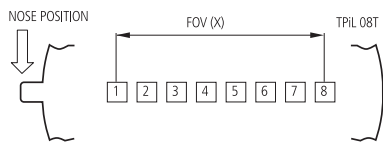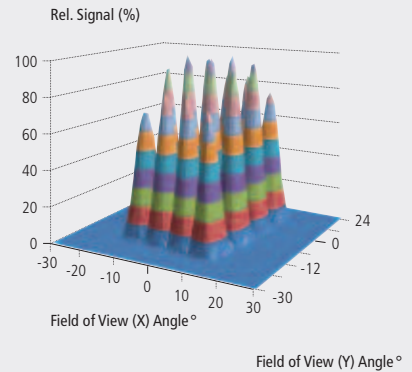
Connection Information for all TPX Modules

GND
V_DD
SCLK
SDAT

| **Field of View TPL 08** | **Field of View TPL 16T** | **Field of View TPA 16T** |
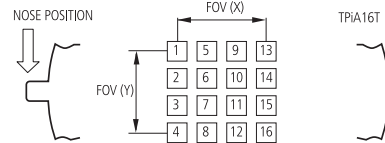
Rel. Signal (%)

Field of View (X) Angle °
Field of View (Y) Angle °

Rel. Signal (%)

Field of View (X) Angle °
Field of View (Y) Angle °

Rel. Signal (%)

Field of View (X) Angle °
Field of View (Y) Angle °

NOSE POSITION   FOV (X)   TPiL 08T

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

NOSE POSITION   FOV (X)   TPiL16T

FOV (Y)

| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 |
| 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 |

NOSE POSITION   FOV (X)   TPiA16T

FOV (Y)

1	5	9	13
2	6	10	14
3	7	11	15
4	8	12	16

TPL 08T 2146 L3.9, TPL 16T 3246 L3.9 G10 – Thermopile Line, TPA 16T 4146 L3.9 Thermopile Array "Cool Eye"

Parameter	Symbol	TPL 08 T	TPL 16 T	TPA 16 T	Unit	Remark
Storage temperature range			-40 … +100		°C	
Operating temperature range			-25 … +100		°C	
Supply voltage	V_{DD}		4.5 … 5.5		V	
Supply current	I_{DD}		5		mA	typ.
Field of view X / L3.9	FOV_X	50	49	30	°	Refer to FOV definitions
Field of view Y / L3.9	FOV_Y	NA	6	22	°	Refer to FOV definitions
Field of view X / L5.5	FOV_X	33	31	21	°	Refer to FOV definitions
Field of view Y / L5.5	FOV_Y	NA	3.5	14	°	Refer to FOV definitions
Digital interface type			SMBus			
Object temperature accuracy		± 1.5			K	For calibration conditions
Signal refresh time	t_{PXrefr}	250	400	400	ms	All pixels and ambient temperature