

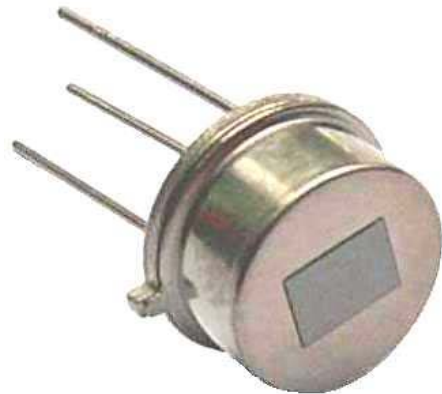


## KUBE AR172 Wideband Dual Pyroelectric Sensor

for flame detection and gas analysis applications in the 3 to 5 micron band

### Features:

- Two physically separated sensing elements (series opposed dual)
- Radiation falling on both active areas simultaneously is cancelled
- Optical bandwidth 3 to 5 Microns fits most flame detection and gas analysis applications
- TO-5 style sealed metal housing
- Includes JFET and optical filter window
- Excellent long term stability. Proven reliability under high humidity conditions
- Low cost due to high volume production
- RoHS conform



### Remarks:

- One element can be covered to avoid signal cancellation (see drawing)
- A gas-specific optical narrow band filter can be arranged in front of the sensor (required size min 3 x 4 mm)

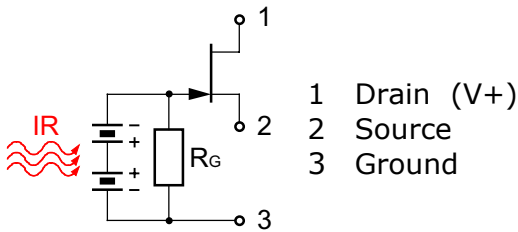
Characteristics	Value	Unit	Test Conditions
Element size (typ)	1.0 x 2.0	mm	nominal, each
Element spacing (typ)	1.0	mm	nominal
Optical wavelength	1.5 ... 25	$\mu\text{m}$	3 ... 5 $\mu\text{m}$ $\geq 90\%$ avg.
Responsivity (typ)	2700	V / W	3 ... 5 $\mu\text{m}$ @ 1Hz
Common mode rejection ratio (typ)	15:1 min 1:7		3 ... 5 $\mu\text{m}$ @ 1Hz
Noise (typ)	5.1	$\mu\text{V}$ / rt Hz	1.0 Hz rms, 1Hz
Operating voltage	2.2 ... 10	Vdc	$V_D$ to Ground
Offset voltage	0.3 ... 1.2	Vdc	$R_S = 100 \text{ k}\Omega$
Operating drain current (recommended)	0.2 ... 10	$\mu\text{A}$	
Thermal breakpoint $f_T$ (typ)	0.2	Hz	
Electrical breakpoint $f_e$ (typ)	0.05	Hz	
Recommended operating temperature	-10 ... +50	$^\circ\text{C}$	-30...+70 $^\circ$ with precautions
Storage temperature	-40 ... +80	$^\circ\text{C}$	change < 50 $^\circ\text{C}$ / minute

### Recommendations:

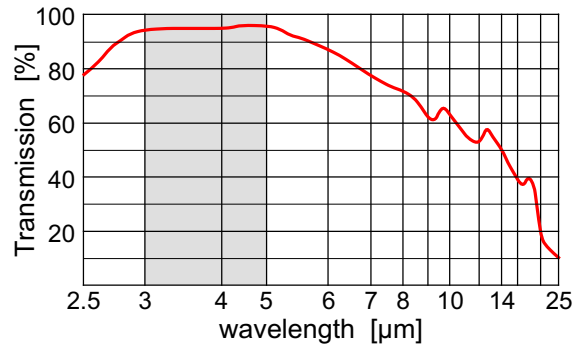
- A source resistor is needed to set the drain current and consequently the operating parameters of the internal JFET. A 47 k $\Omega$  or greater value resistor is recommended. For low power applications (0.2  $\mu\text{A}$ ), a source resistor of 3.3 M $\Omega$  can be used.
- Do not wave solder pyroelectric sensors. Avoid mechanical stresses on the leads.
- Clean window with alcohol, if needed, to remove flux and fingerprints.
- Do not apply varnish, lacquer, silicone or other transparent coatings on window, as these materials will not transmit IR.
- Optical filter window transmission optimized from 3 to 5 Microns, see graph



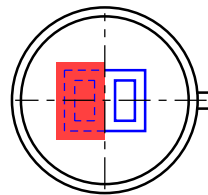
## Internal circuit and pinout



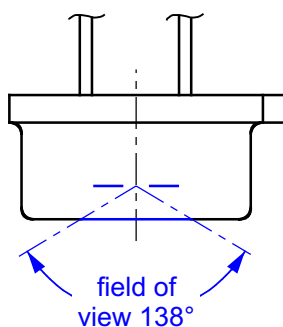
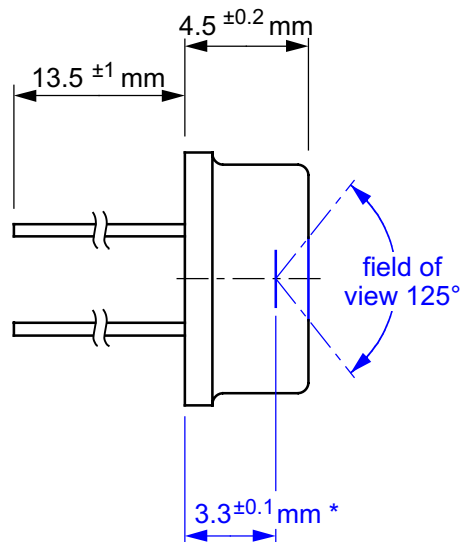
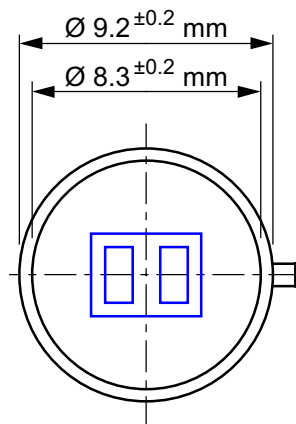
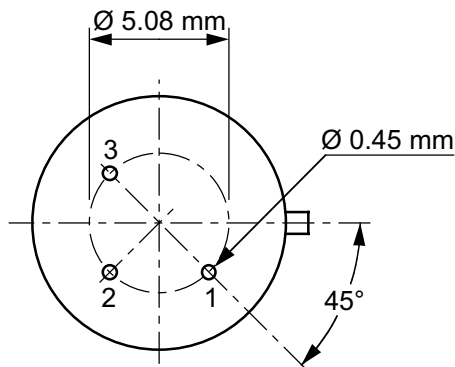
## Spectral response



When AR172 is used for flame detection or gas analysis, one sensing element serves for temperature compensation only and must be covered to prevent from common mode cancelling



## Drawings



\* optical (apparent) position of sensor elements