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www.boselec.com Heimann@boselec.com

HEIMANN Sensor

Pyroelectric Infrared Detectors

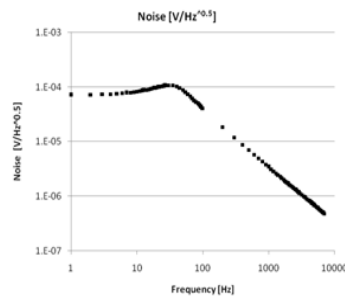
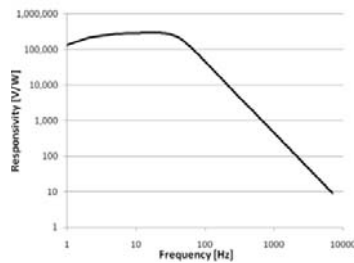
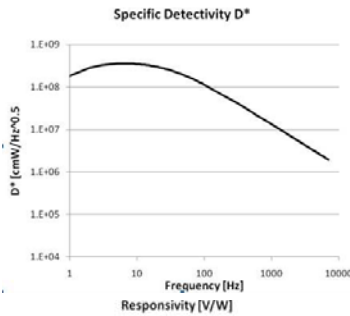
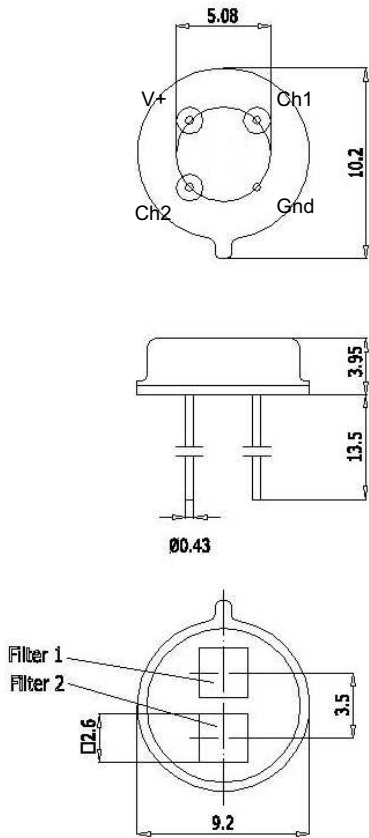
**High performance devices with D^* to
 1×10^9 at 10 Hz**





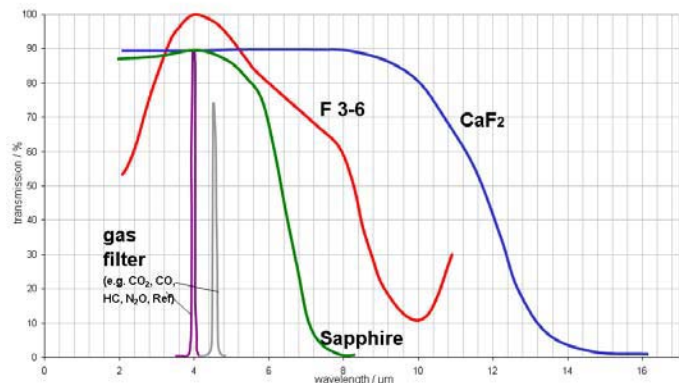
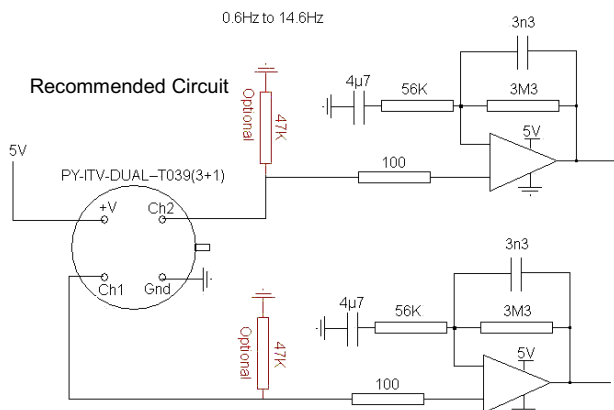
HPS DUAL CHANNEL PYROELECTRIC Sensor for Gas Analysis

Heimann Sensor thin film pyroelectric gas sensors combine very high responsivity and specific detectivity with low microphonic effect in a small, TO-5 type package. Various different narrow band filters can adapt the sensor to a wide variety of different environmental gases. Using a compensation channel, the sensor can be made insensitive to both ambient temperature and long term drift effects. On request our application team will offer you a suitable IR radiation source for your special gas application.

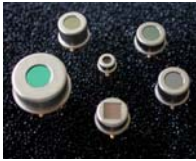


element size	1.0 ²	mm ²
filter aperture	2.6 ²	mm ²
filter	Various standard and customized filters on demand	
responsivity ¹	150000	V/W
noise ^{1,2}	60	µV/Hz ^{1/2}
specific detectivity ^{1,2}	3.5 x 10 ⁸	cm Hz ^{1/2} /W
time constant ²	~ 12	ms
max. voltage ²	8.0	V
min. voltage ²	2.7	V
microphonics ³	~ 2	µV/g at 10 Hz
housing	TO 39	
operating temperature	-20 to 70	°C
storage temperature	-20 to 110	°C
IR Filter	CO₂	Ref.
Centre wave length	4.26µm	3.91µm
Responsivity V/W (500K, 10Hz)	~ 7500	~ 3900
Noise 10Hz µV√Hz	~ 60	~ 60

- 1) 10 Hz normalized without windows and optics
- 2) Op amp with 10 GOhm feedback resistor
- 3) Output Voltage Normalised around mid rail

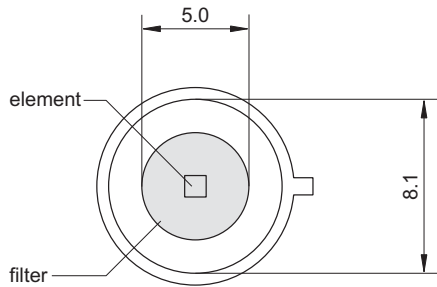
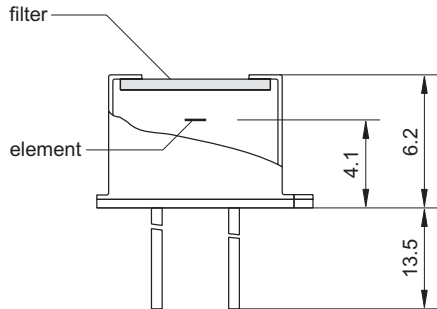
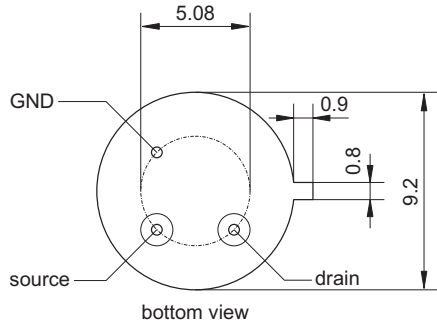


Modifications reserved Rev.01 / 23.08.2010



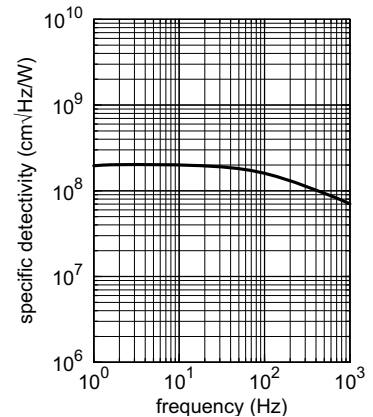
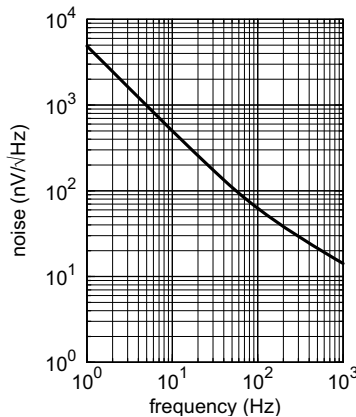
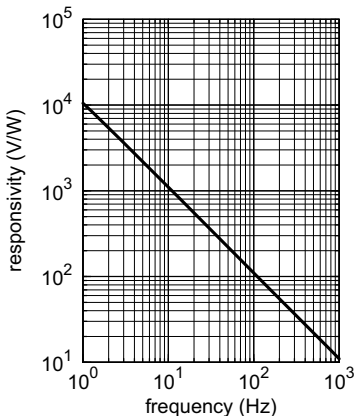
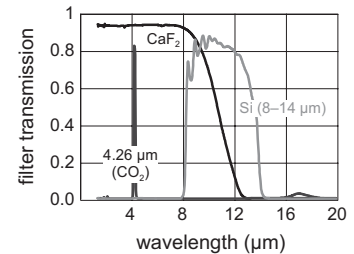
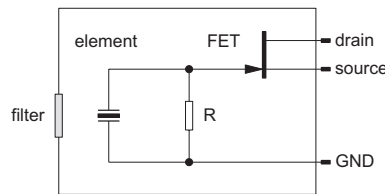
HPS A01B

Pyroelectric Single Element Detector for Measurement Applications

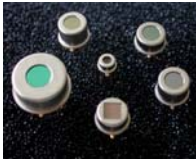


element size	1 mm × 1 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>1100 V/W
noise ¹	<500 nV/√Hz
specific detectivity ^{1,2}	>2 · 10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

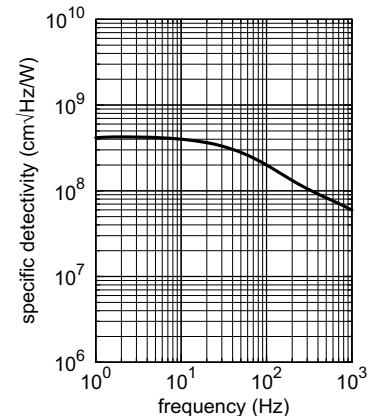
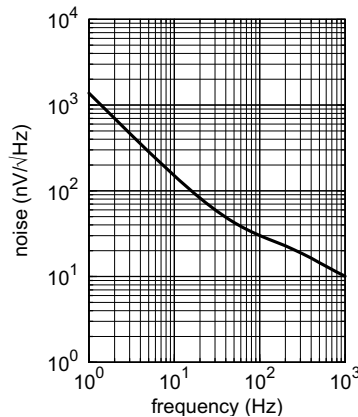
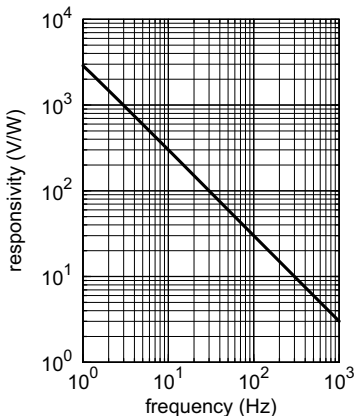
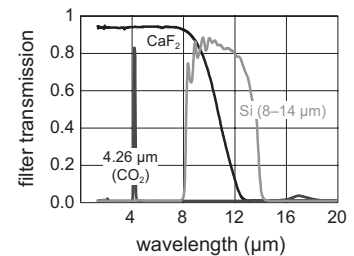
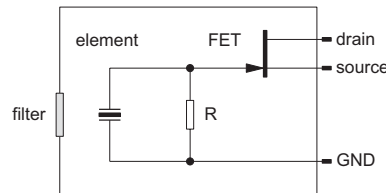
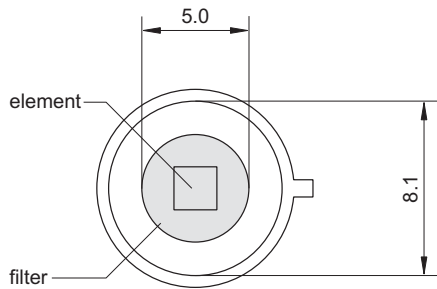
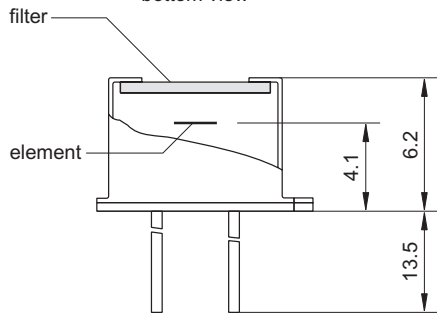
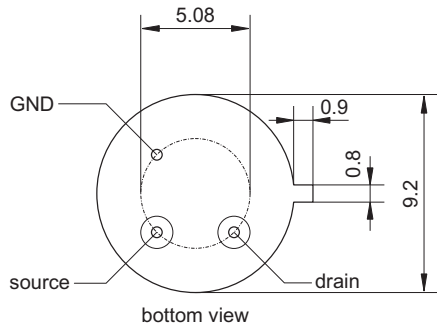


Further developments may entail modifications of indicated data without notification. Revision 01/2007.
12012007 boselec_hpsa01b_eng



HPS A01E

Pyroelectric Single Element Detector for Measurement Applications



element size	2 mm × 2 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>300 V/W
noise ¹	<150 nV/√Hz
specific detectivity ^{1,2}	>4 · 10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

1) frequency: 10 Hz, detector temperature: 25 °C

2) black body source temperature: 500 K, filter transmission: 100 %

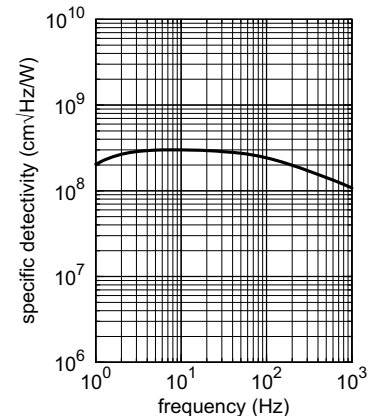
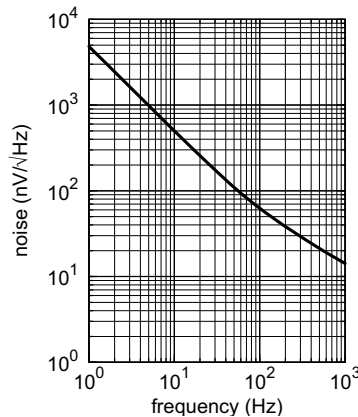
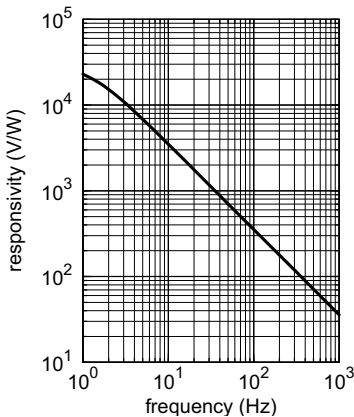
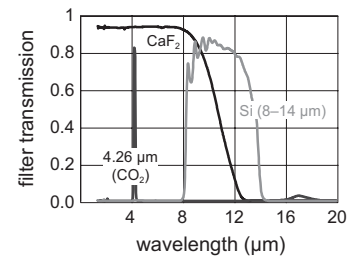
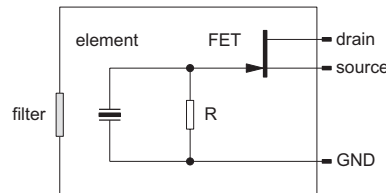
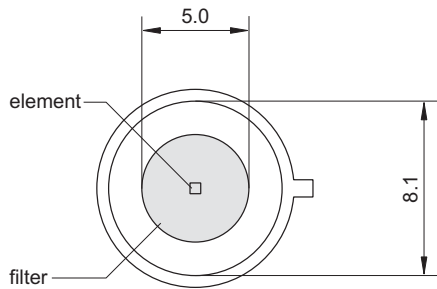
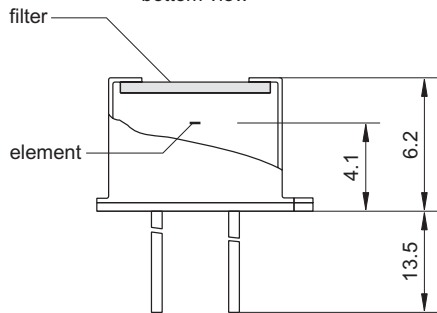
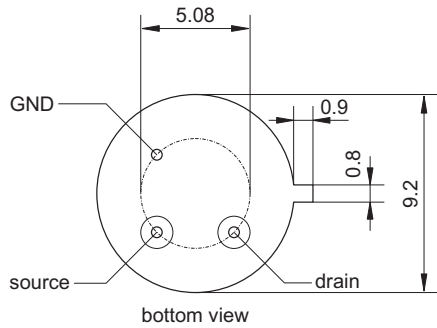
3) other filters on request

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12012007 boselec_hpsa01e_eng



HPS A02A

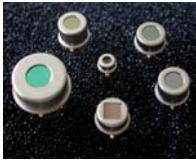
Pyroelectric Single Element Detector for Measurement Applications



element size	0.5 mm × 0.5 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>3500 V/W
noise ¹	<500 nV/√Hz
specific detectivity ^{1,2}	>3·10 ⁸ cm√Hz/W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

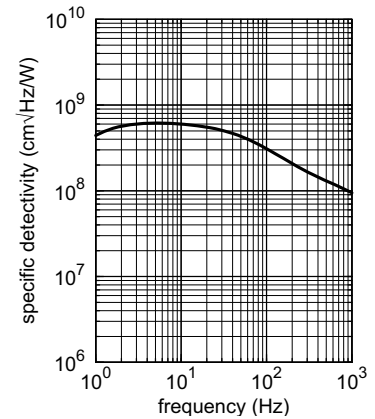
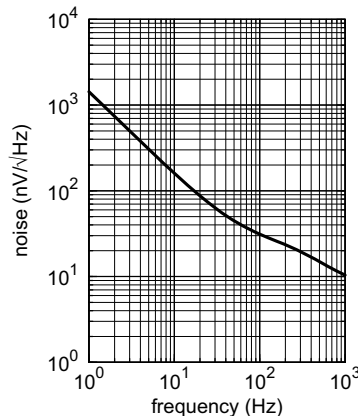
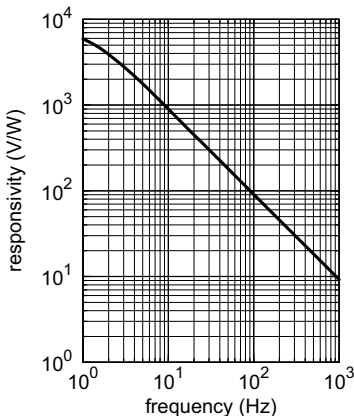
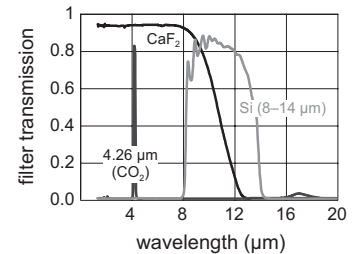
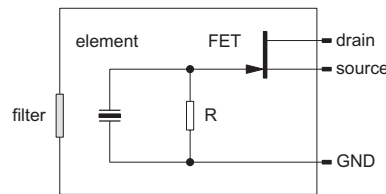
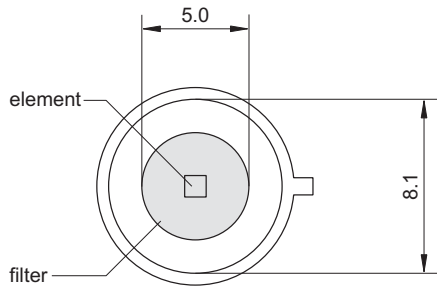
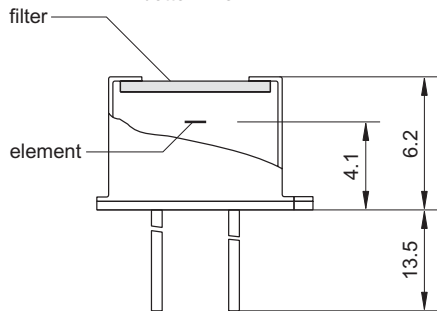
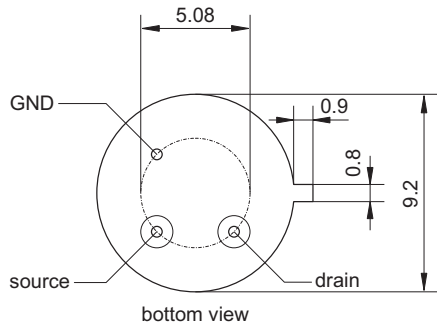
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

Further developments may entail modifications of indicated data without notification. Revision 01/2007.
12012007 boselec_hpsa02a_eng



HPS A02B

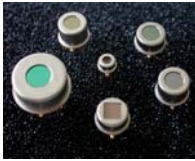
Pyroelectric Single Element Detector for Measurement Applications



element size	1 mm × 1 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>900 V/W
noise ¹	<160 nV/√Hz
specific detectivity ^{1,2}	>6 · 10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

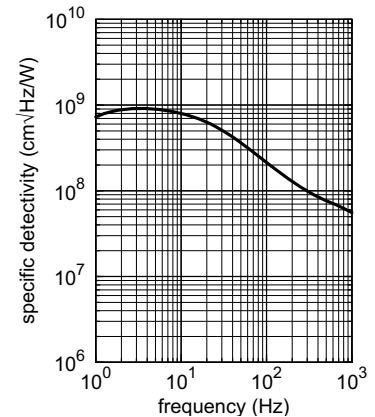
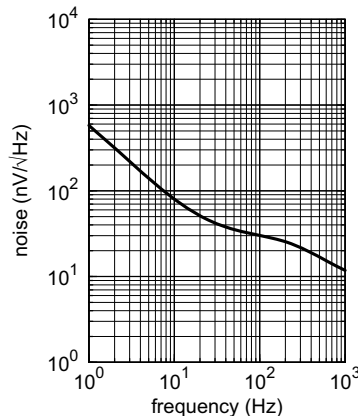
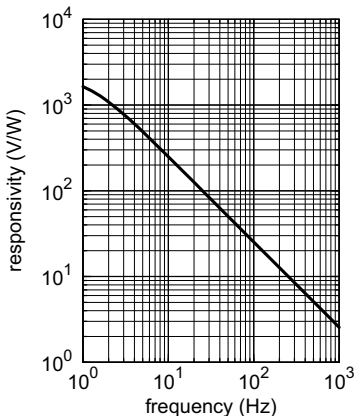
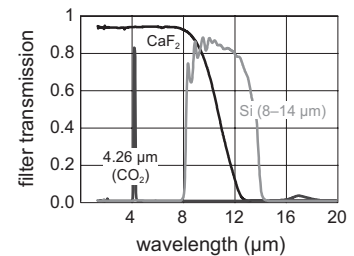
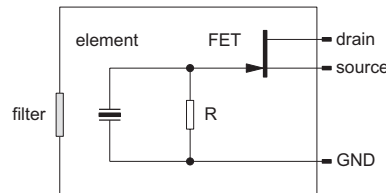
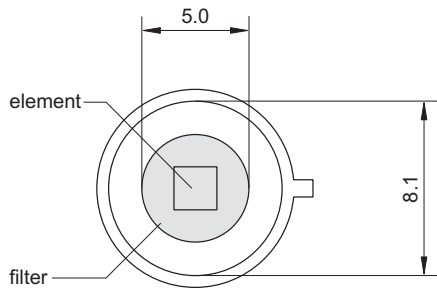
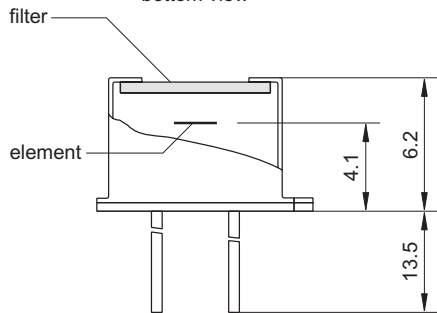
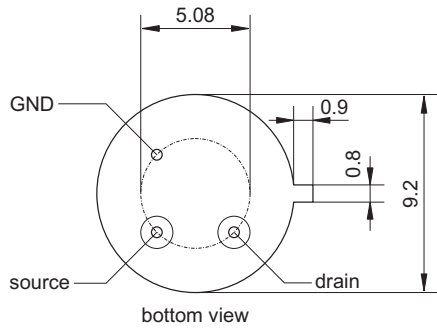
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

Further developments may entail modifications of indicated data without notification. Revision 01/2007.
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HPS A02E

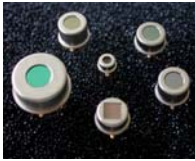
Pyroelectric Single Element Detector for Measurement Applications



element size	2 mm × 2 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>250 V/W
noise ¹	<80 nV/√Hz
specific detectivity ^{1,2}	>8 · 10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

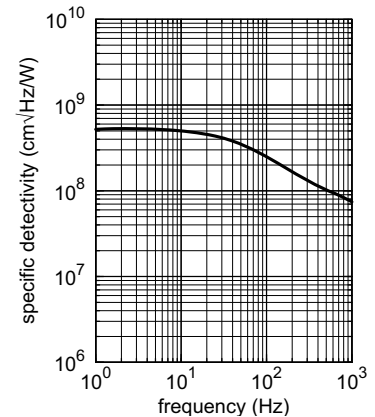
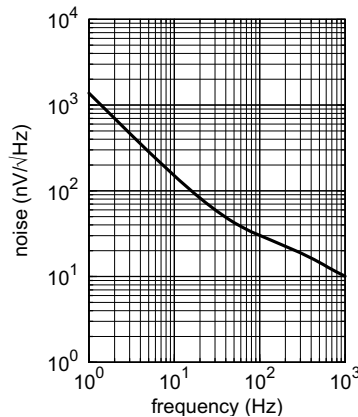
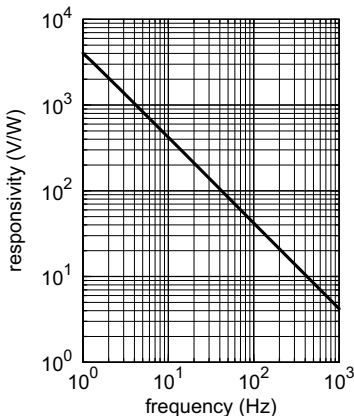
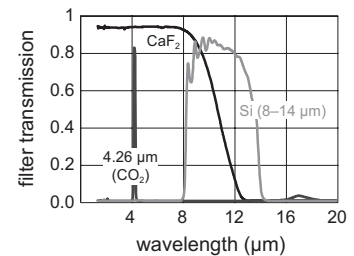
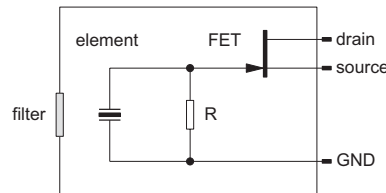
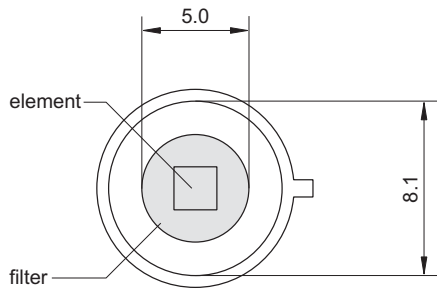
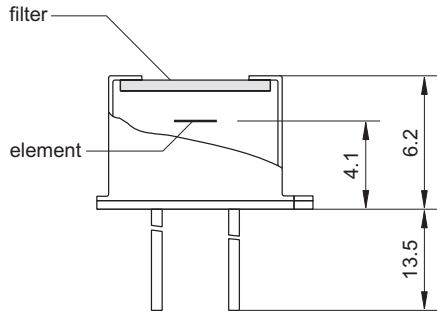
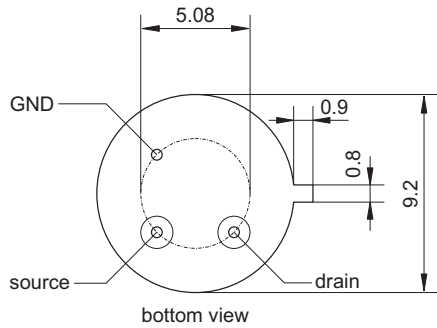
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

Further developments may entail modifications of indicated data without notification. Revision 01/2007.
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HPS A03E

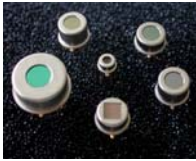
Pyroelectric Single Element Detector for Measurement Applications



element size	2 mm × 2 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>420 V/W
noise ¹	<150 nV/√Hz
specific detectivity ^{1,2}	>5·10 ⁸ cm√Hz/W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 60 °C
storage temperature	-20 to 60 °C

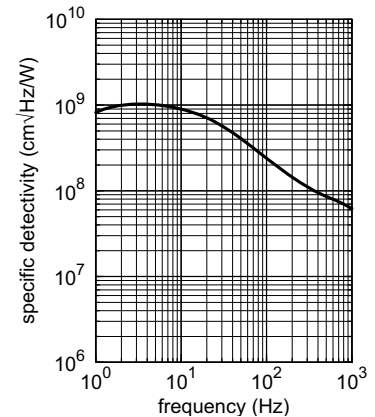
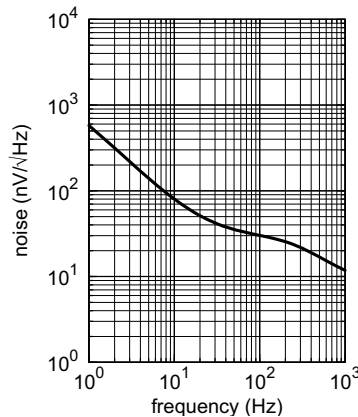
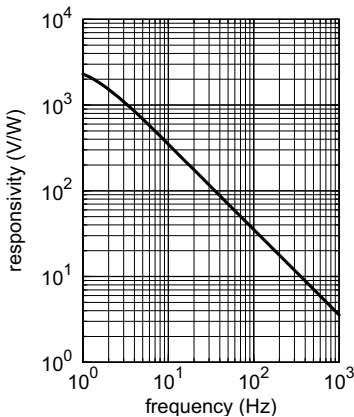
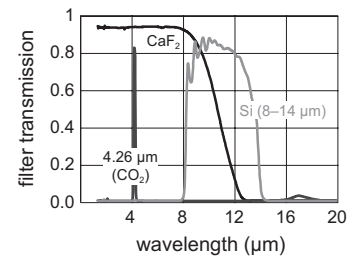
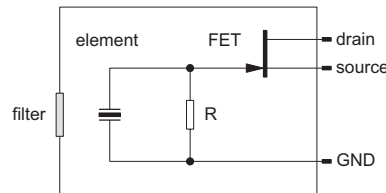
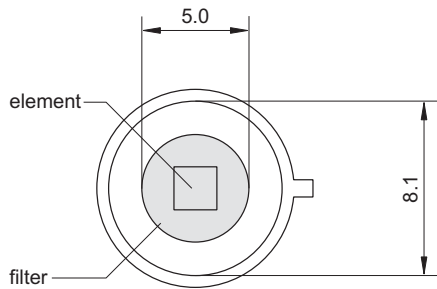
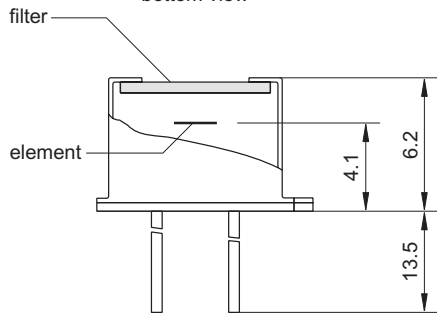
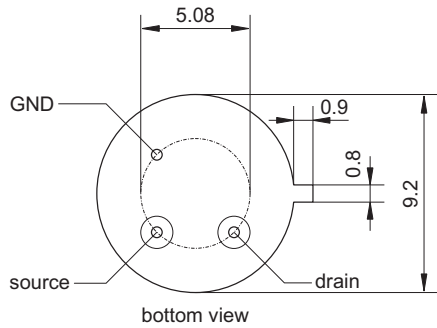
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

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HPS A04E

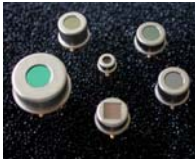
Pyroelectric Single Element Detector for Measurement Applications



element size	2 mm × 2 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>350 V/W
noise ¹	<80 nV/√Hz
specific detectivity ^{1,2}	>9·10 ⁸ cm√Hz/W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 60 °C
storage temperature	-20 to 60 °C

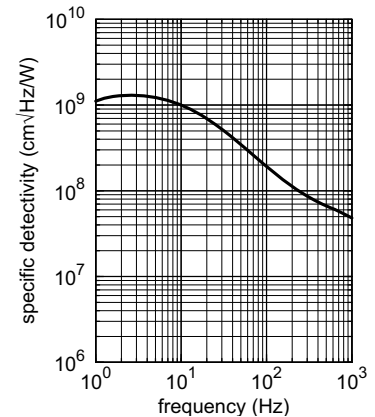
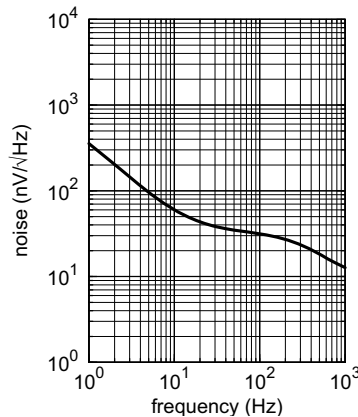
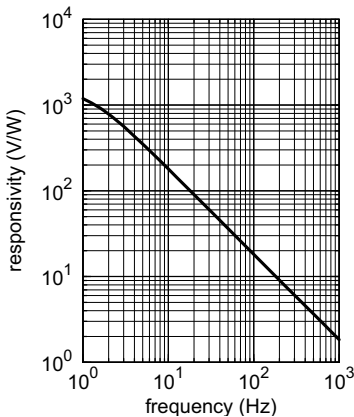
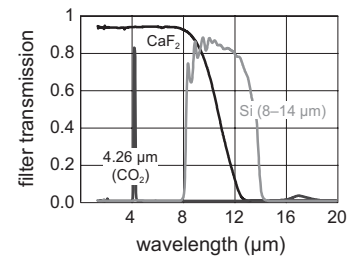
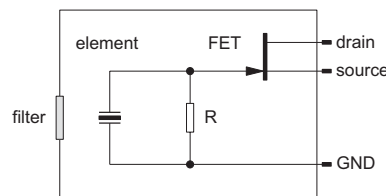
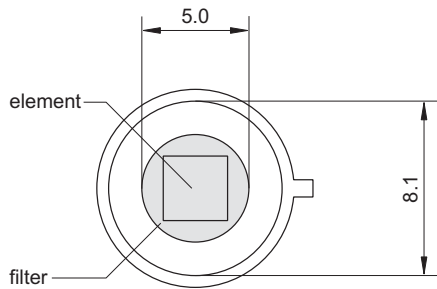
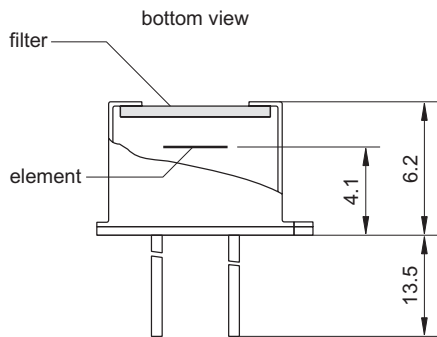
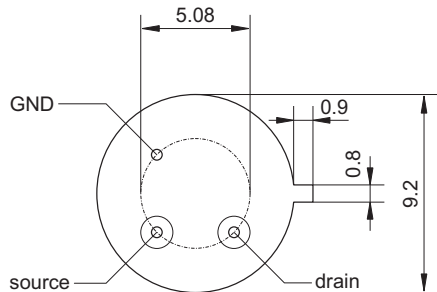
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

Further developments may entail modifications of indicated data without notification. Revision 01/2007.
12012007 boselec_hpsa04e_eng



HPS A04G

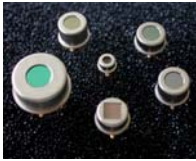
Pyroelectric Single Element Detector for Measurement Applications



element size	3 mm × 3 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>180 V/W
noise ¹	<60 nV/√Hz
specific detectivity ^{1,2}	>10 · 10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 60 °C
storage temperature	-20 to 60 °C

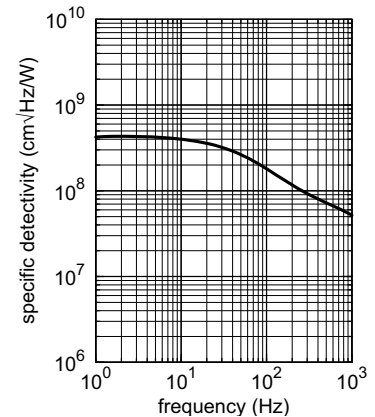
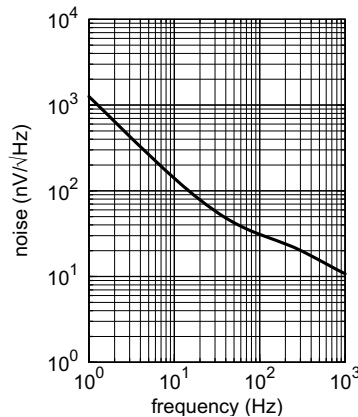
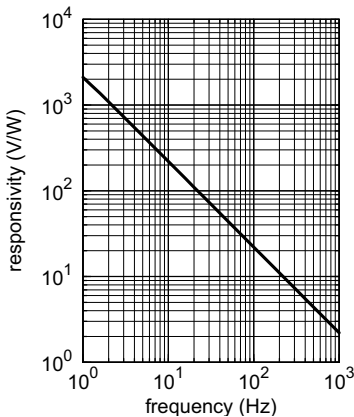
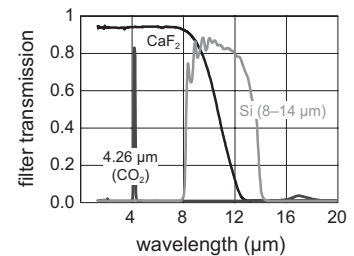
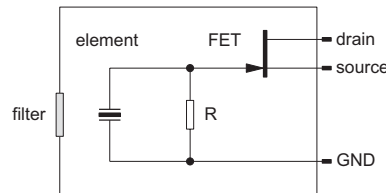
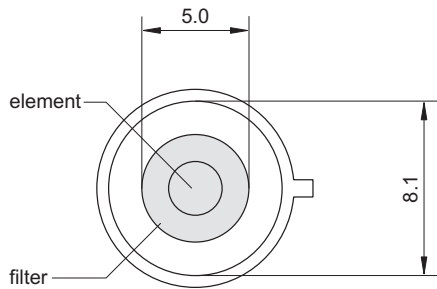
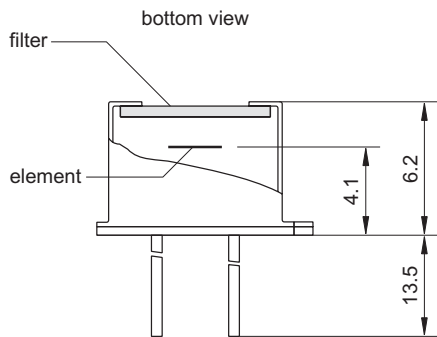
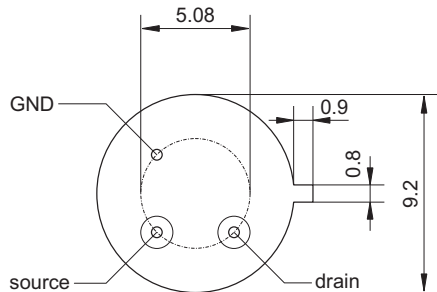
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

Further developments may entail modifications of indicated data without notification. Revision 01/2007.
12012007 boselec_hpsa04g_eng



HPS A05F

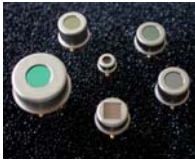
Pyroelectric Single Element Detector for Measurement Applications



element size	∅ 2.5 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>220 V/W
noise ¹	<140 nV/√Hz
specific detectivity ^{1,2}	>4 · 10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

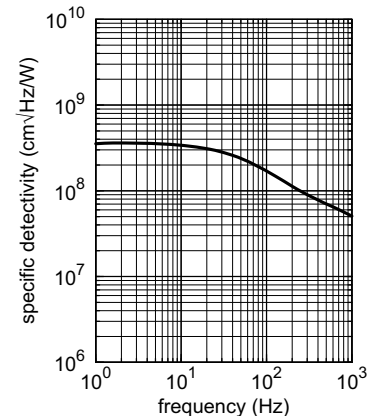
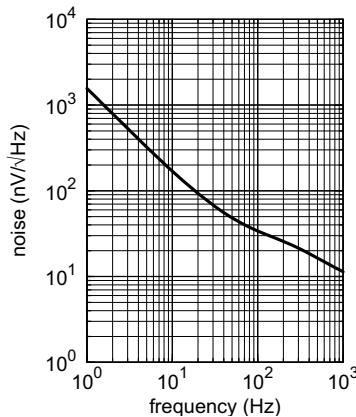
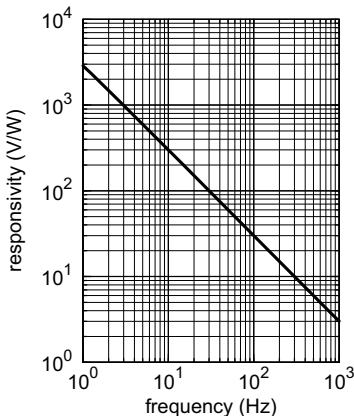
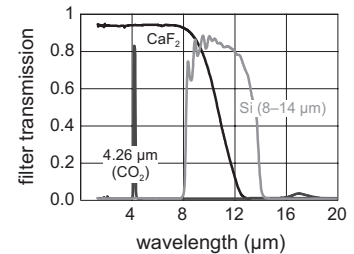
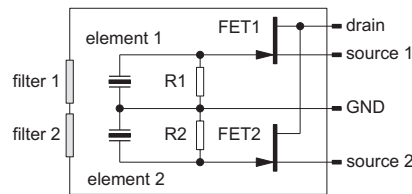
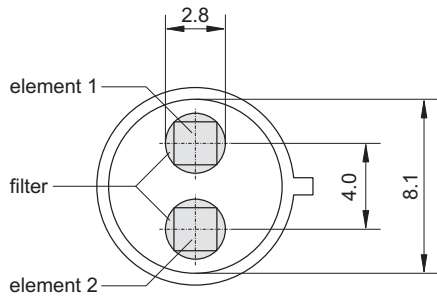
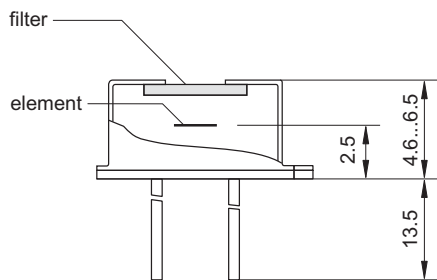
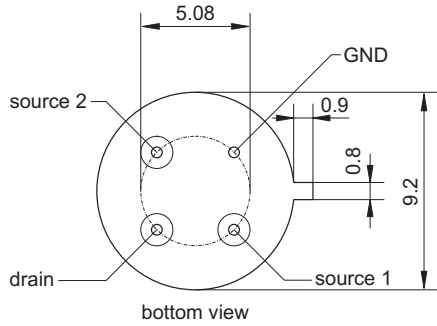
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

Further developments may entail modifications of indicated data without notification. Revision 01/2007.
12012007 boselec_hpsa05f_eng



HPS D10E

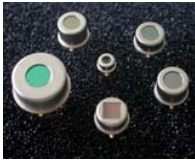
Pyroelectric Dual Channel Detector for Measurement Applications



element size	2 mm × 2 mm
aperture	2.8 mm
filter ³	custom-designed
responsivity ^{1,2}	>300 V/W
noise ¹	<170 nV/√Hz
specific detectivity ^{1,2}	>3.4·10 ⁸ cm√Hz/W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

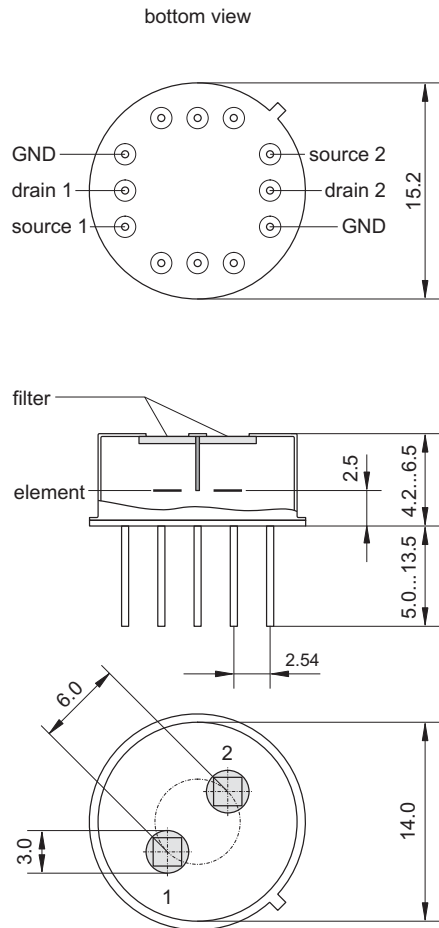
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

Further developments may entail modifications of indicated data without notification. Revision 01/2007.
12012007 boselec_hpsd10e_eng



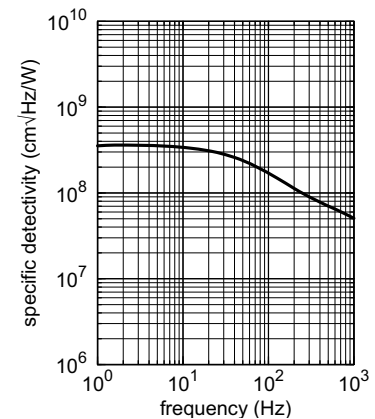
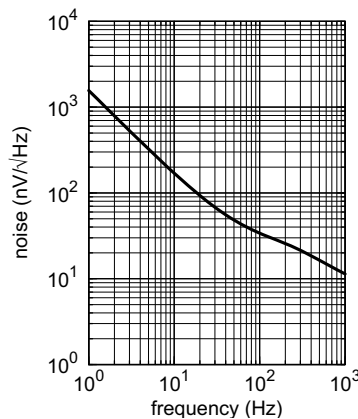
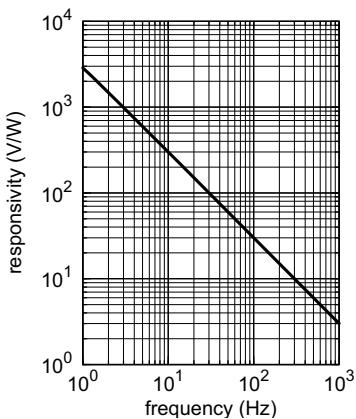
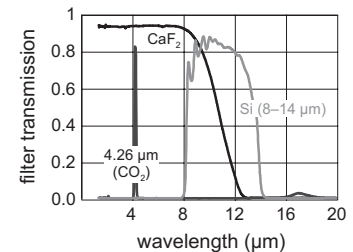
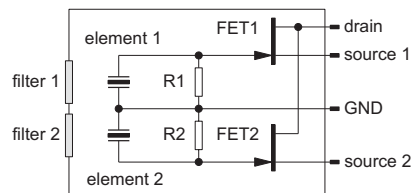
HPS DS10E

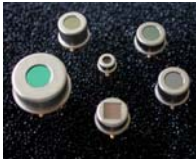
Pyroelectric Dual Channel Detector for Measurement Applications



element size	2 mm × 2 mm
aperture	3.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>300 V/W
noise ¹	<170 nV/√Hz
specific detectivity ^{1,2}	>3.4 · 10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 V to 18 V
housing	TO 8
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

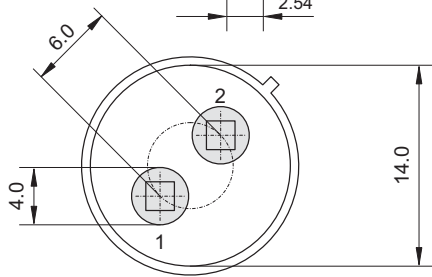
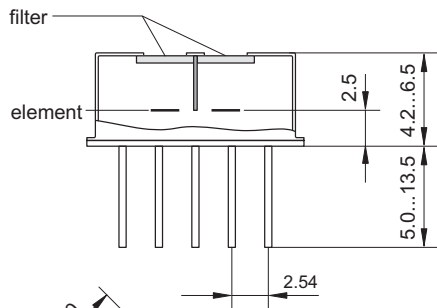
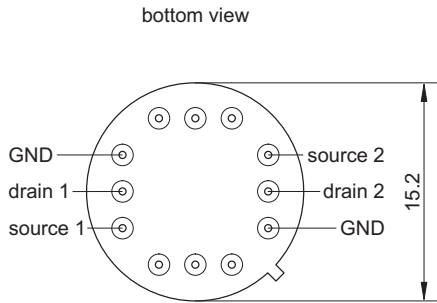
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request





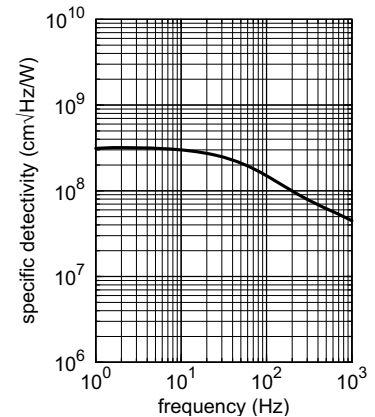
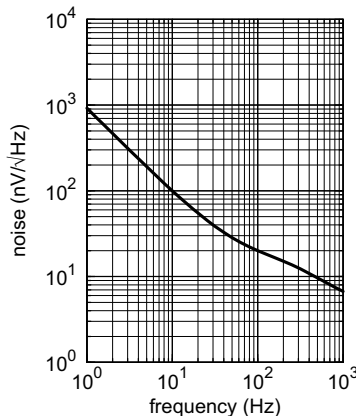
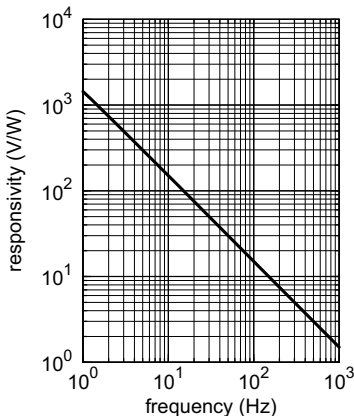
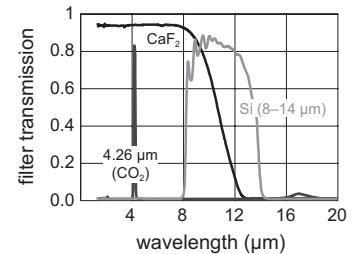
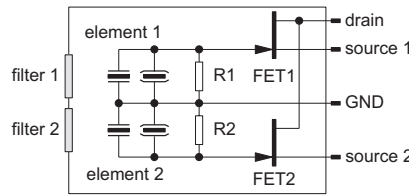
HPS D30E

Pyroelectric Dual Channel Detector for Measurement Applications

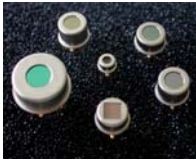


element size	2 mm × 2 mm
aperture	4.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>150 V/W
noise ¹	<100 nV/√Hz
specific detectivity ^{1,2}	>3·10 ⁸ cm √Hz/W
thermal compensation	parallel
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 8
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

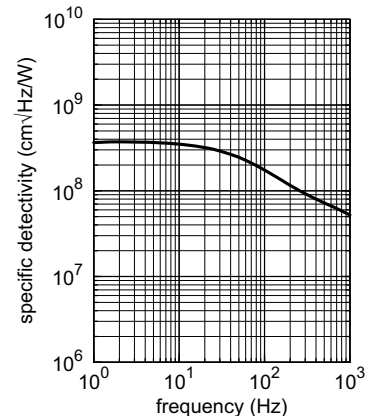
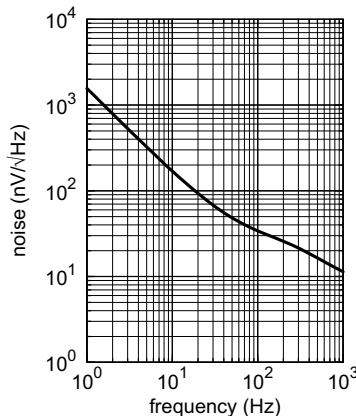
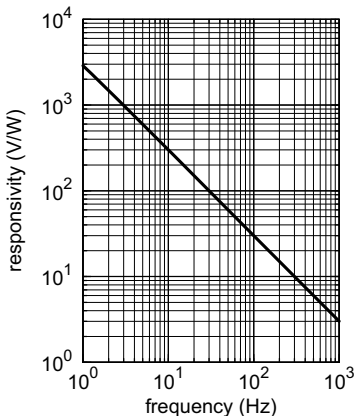
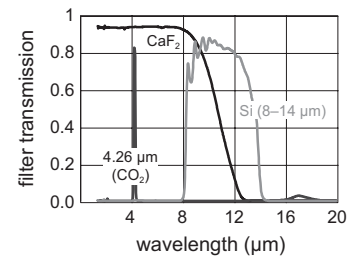
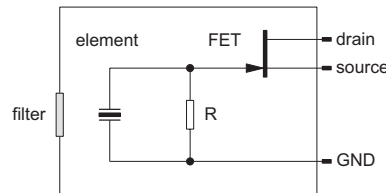
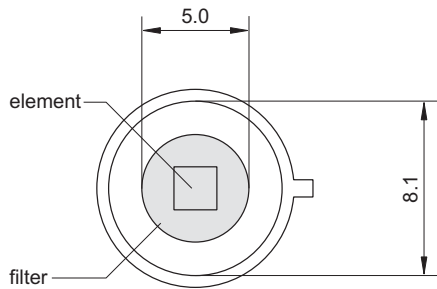
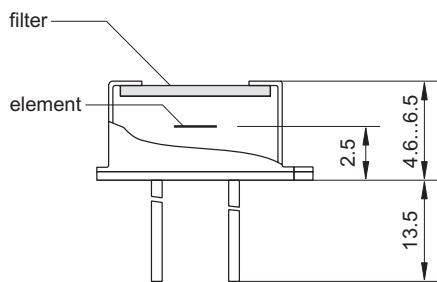
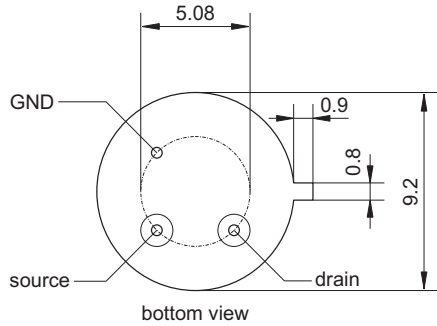


Further developments may entail modifications of indicated data without notification. Revision 01/2007. 12012007 boselec_hpsd30e_eng



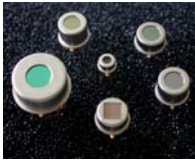
HPS E09E

Pyroelectric Single Element Detector for Measurement Applications



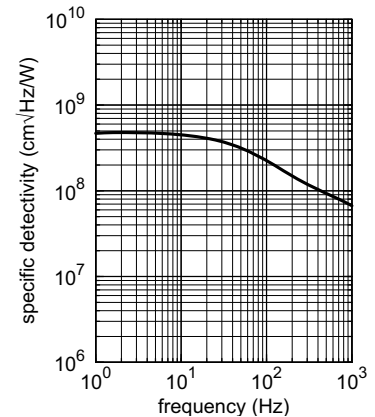
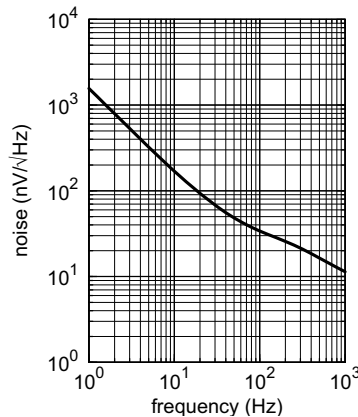
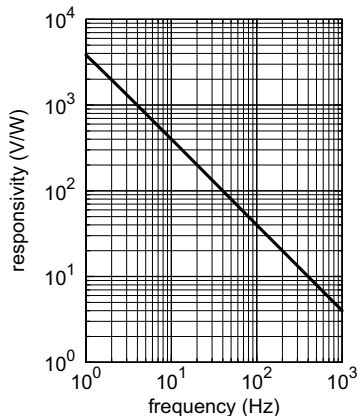
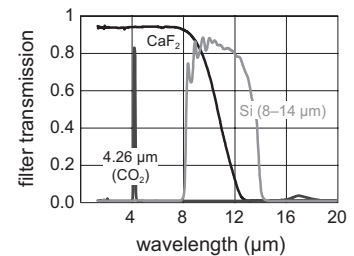
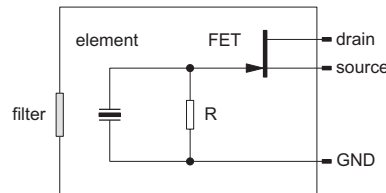
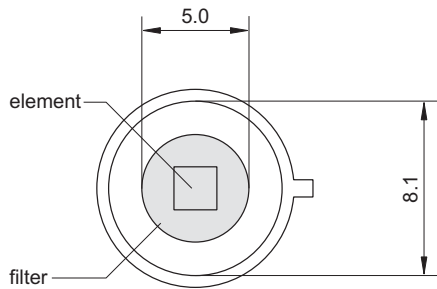
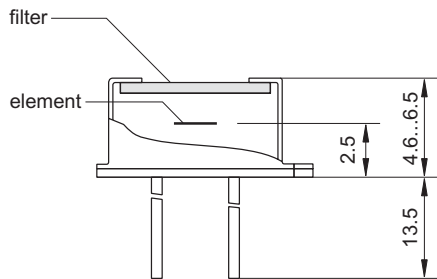
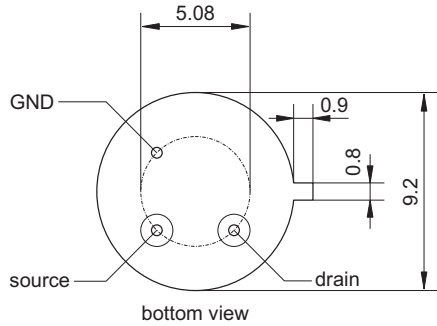
element size	2 mm × 2 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>300 V/W
noise ¹	<170 nV/√Hz
specific detectivity ^{1,2}	>3.5 · 10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request



HPS E10E

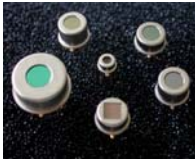
Pyroelectric Single Element Detector for Measurement Applications



element size	2 mm × 2 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>400 V/W
noise ¹	<170 nV/√Hz
specific detectivity ^{1,2}	>4.5 · 10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

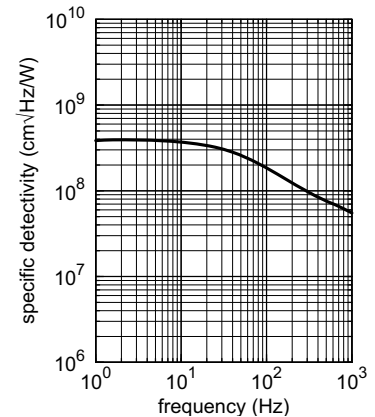
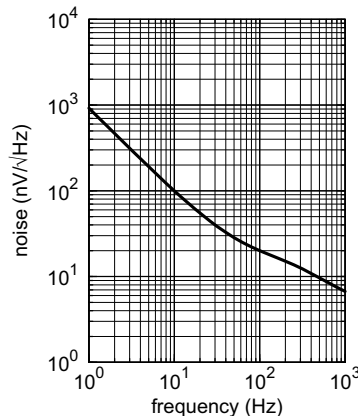
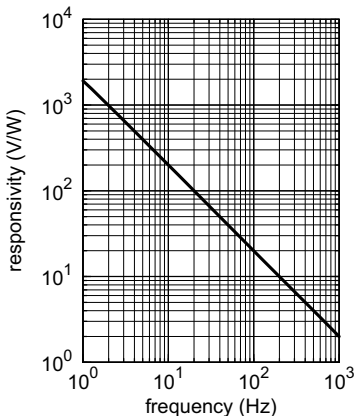
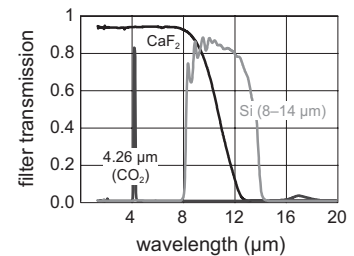
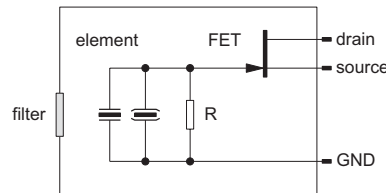
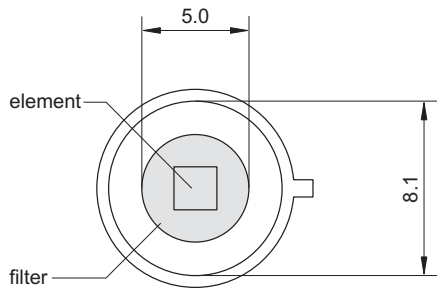
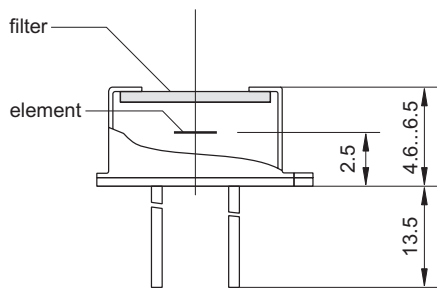
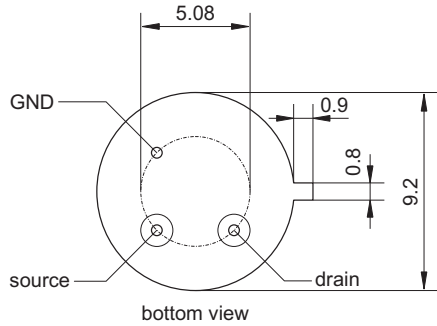
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

Further developments may entail modifications of indicated data without notification. Revision 01/2007.
12012007 boselec_hpse10e_eng



HPS E29E

Pyroelectric Single Element Detector for Measurement Applications



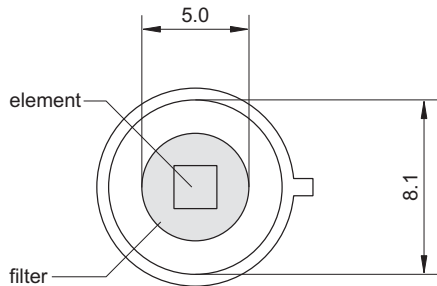
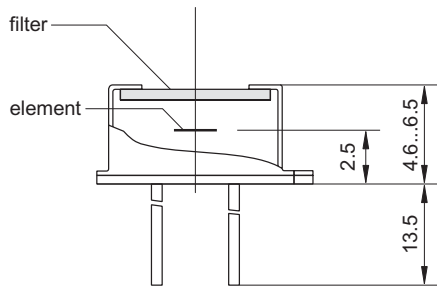
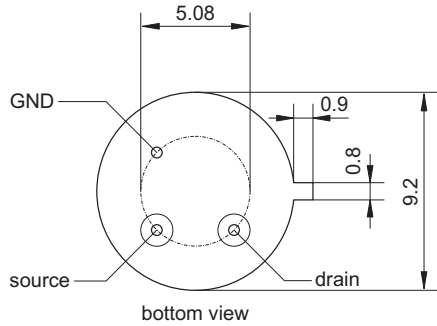
element size	2 mm × 2 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>200 V/W
noise ¹	<100 nV/√Hz
specific detectivity ^{1,2}	>3.7·10 ⁸ cm√Hz/W
thermal compensation	parallel
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

Further developments may entail modifications of indicated data without notification. Revision 01/2007.
12012007 boselec_hpse29e_eng

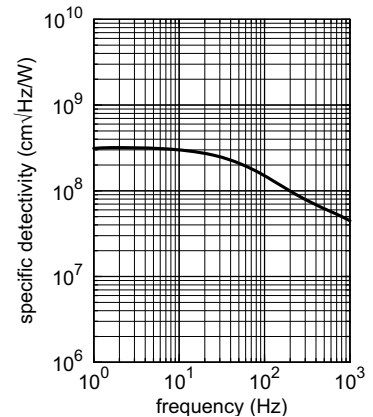
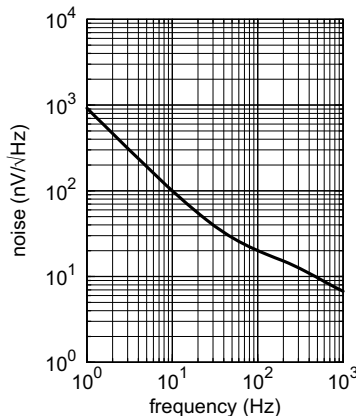
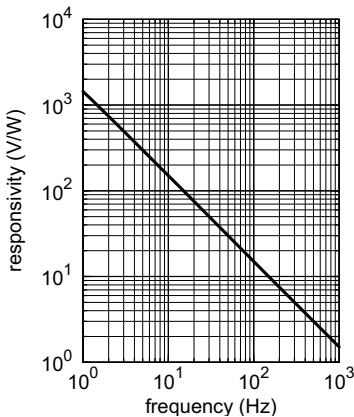
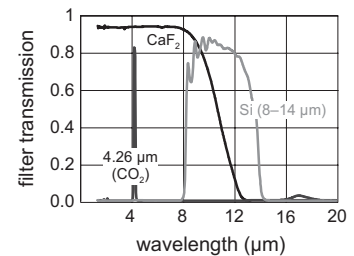
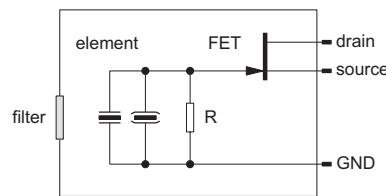
HPS E30E

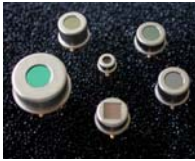
Pyroelectric Single Element Detector for Measurement Applications



element size	2 mm × 2 mm
aperture	5.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>150 V/W
noise ¹	<100 nV/√Hz
specific detectivity ^{1,2}	>3·10 ⁸ cm √Hz / W
thermal compensation	parallel
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 39
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

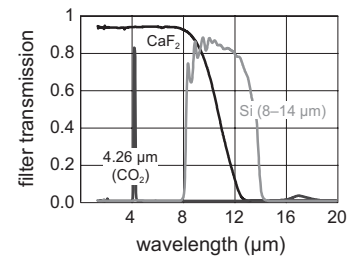
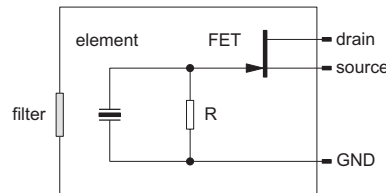
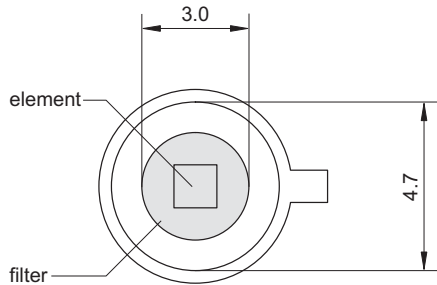
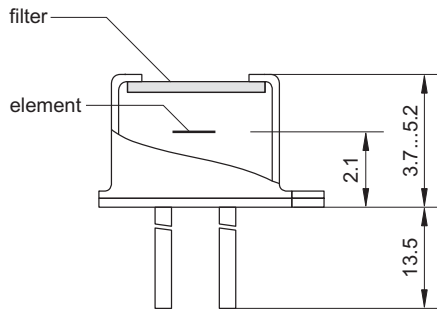
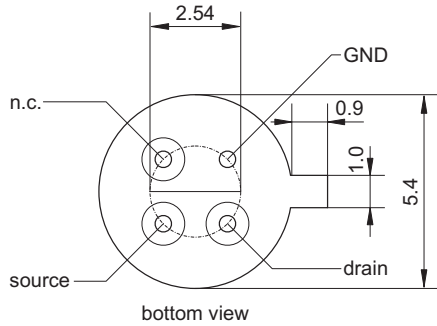
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request





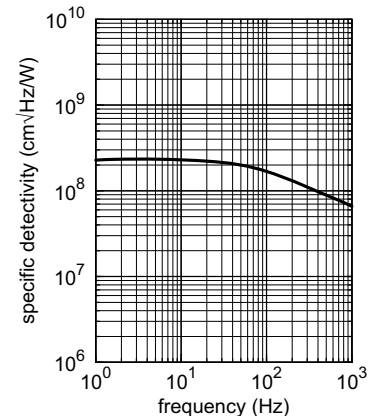
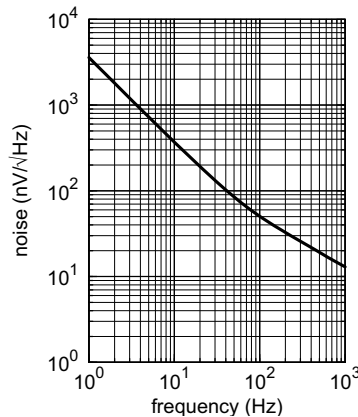
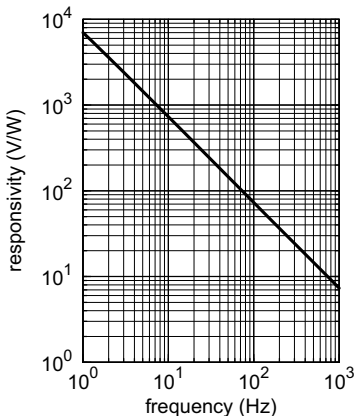
HPS K09C

Pyroelectric Single Element Detector for Measurement Applications

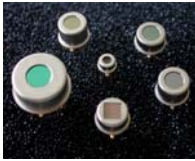


element size	1.2 mm × 1.2 mm
aperture	3.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>730 V/W
noise ¹	<370 nV/√Hz
specific detectivity ^{1,2}	>2.3·10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 18
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request

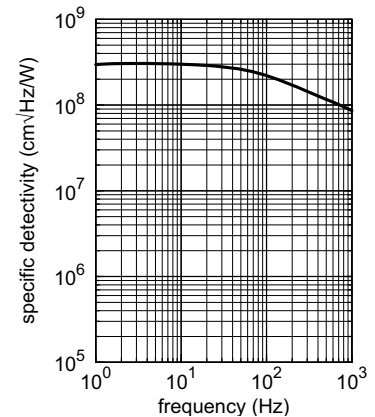
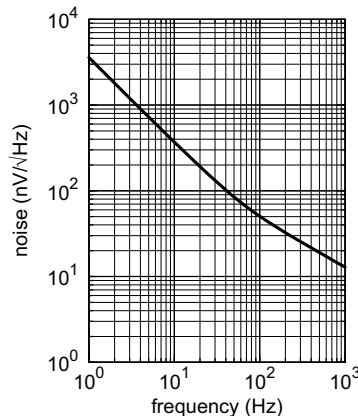
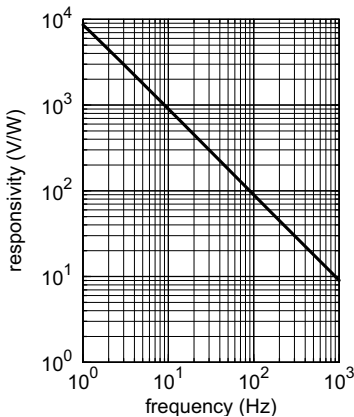
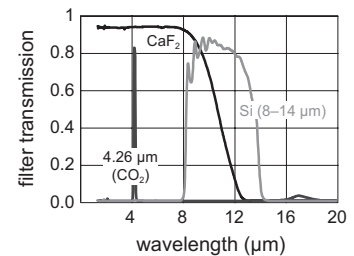
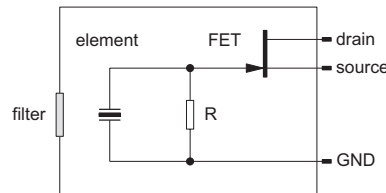
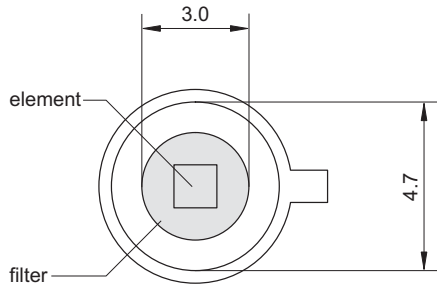
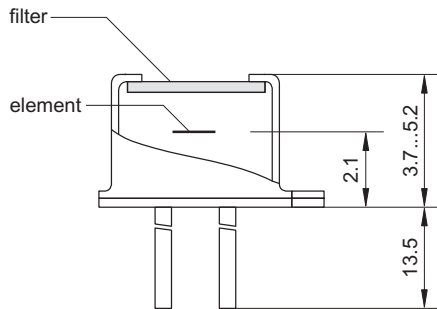
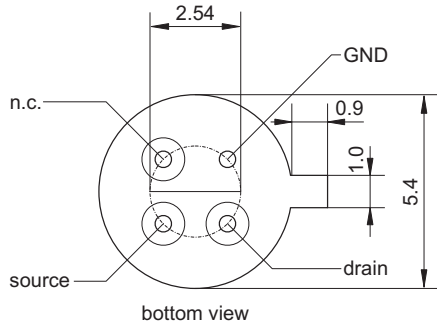


Further developments may entail modifications of indicated data without notification. Revision 01/2007.
12012007 boselec_hpsk09c_eng



HPS K10C

Pyroelectric Single Element Detector for Measurement Applications



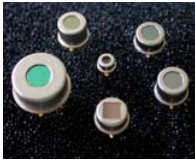
element size	1.2 mm × 1.2 mm
aperture	3.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>900 V/W
noise ¹	<370 nV/√Hz
specific detectivity ^{1,2}	>3·10 ⁸ cm√Hz/W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 18
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

1) frequency: 10 Hz, detector temperature: 25 °C

2) black body source temperature: 500 K, filter transmission: 100 %

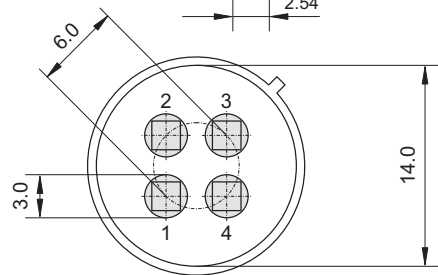
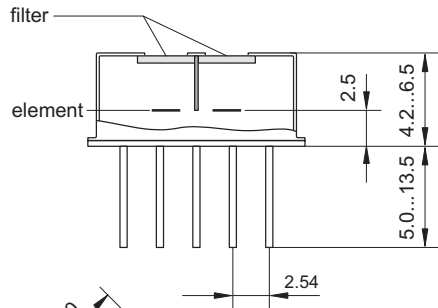
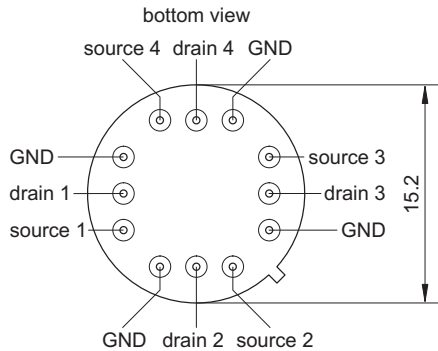
3) other filters on request

Further developments may entail modifications of indicated data without notification. Revision 01/2007. 12012007 boselec_hpsk10c_eng



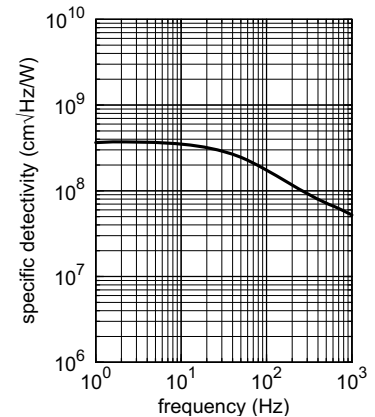
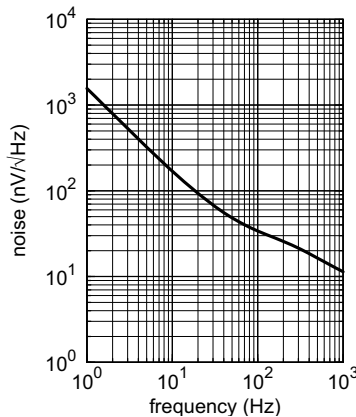
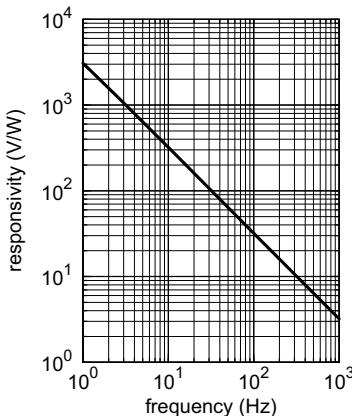
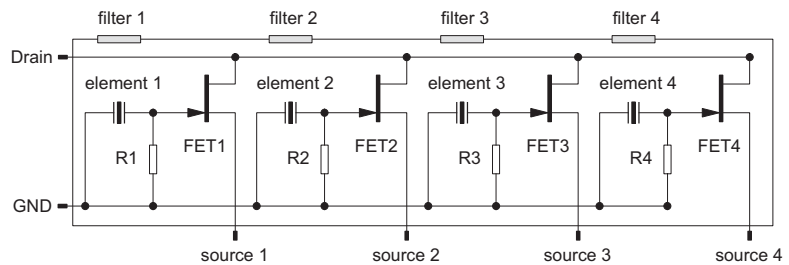
HPS Q10E

Pyroelectric Four Channel Detector for Measurement Applications



element size	2 mm × 2 mm
aperture	3.0 mm
filter ³	custom-designed
responsivity ^{1,2}	>320 V/W
noise ¹	<170 nV/√Hz
specific detectivity ^{1,2}	>3.5 · 10 ⁸ cm √Hz / W
offset voltage	0.4 to 1.5 V
operating voltage	2 to 18 V
housing	TO 8
operating temperature	-20 to 70 °C
storage temperature	-20 to 70 °C

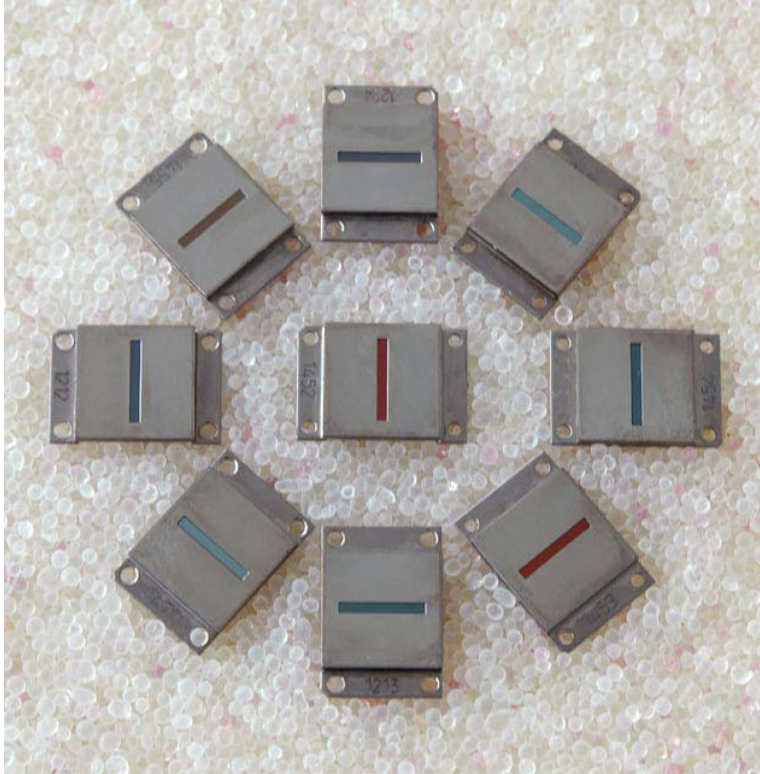
- 1) frequency: 10 Hz, detector temperature: 25 °C
- 2) black body source temperature: 500 K, filter transmission: 100 %
- 3) other filters on request



Further developments may entail modifications of indicated data without notification. Revision 01/2007. 12012007 boselec_hpsq10e_eng

Pyroelectric Linear Arrays HPL 128/HPL 256

with 128 or 256 elements and integrated CMOS multiplexer



Features

- 128 or 256 elements arranged in one line
- NEP (128 Hz) down to 1.1 nW
- Dynamic range > 75 dB
- Modulation frequency up to 512 Hz
- Integrated CMOS multiplexer
- High long-term stability
- Simple mode of operation
- Operation at ambient temperature
- Small package
- Coated silicon or germanium as infrared window
- Broad band windows (>1.4 μm) or special filters are possible on request
- Customised arrays with up to 256 elements with special sizes
- Modules with linear arrays

Description

The pyroelectric linear arrays HPL 128 and HPL 256 are hybrid detectors with 128 or 256 elements and an integrated CMOS multiplexer.

The pyroelectric chip is made from lithium tantalate (LiTaO_3) with pixel widths of 90 μm (HPL 128) or 42 μm (HPL 256) and lengths of 100 μm , 500 μm or 1000 μm .

The multiplexer includes low-noise preamplifiers for each pixel, analogue switches and an output amplifier. The preamplifiers transform the signal charges of each pixel into a signal voltage, include bandwidth limiting and pass the amplified signal to the sample & hold for the read-out process. The digital inputs are CMOS compatible.

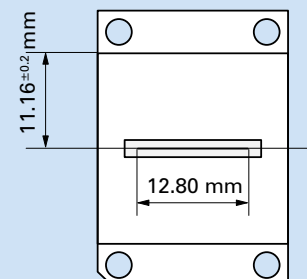
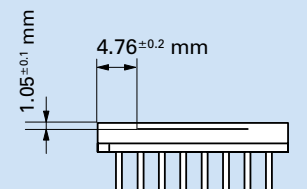
For measurement of the detector temperature a sensor (type AD 590) is integrated into the package. It provides an output current which is proportional to the temperature.

The pyroelectric chip and the read-out circuit are arranged in a metal hermetic package with an infrared window which determines the spectral responsivity.

In common with all pyroelectric detectors, the incoming infrared radiation needs to be pulsed for a measurement to be made.

Typical applications can be found in the fields of temperature measurement and spectrometry.

Position of pixels

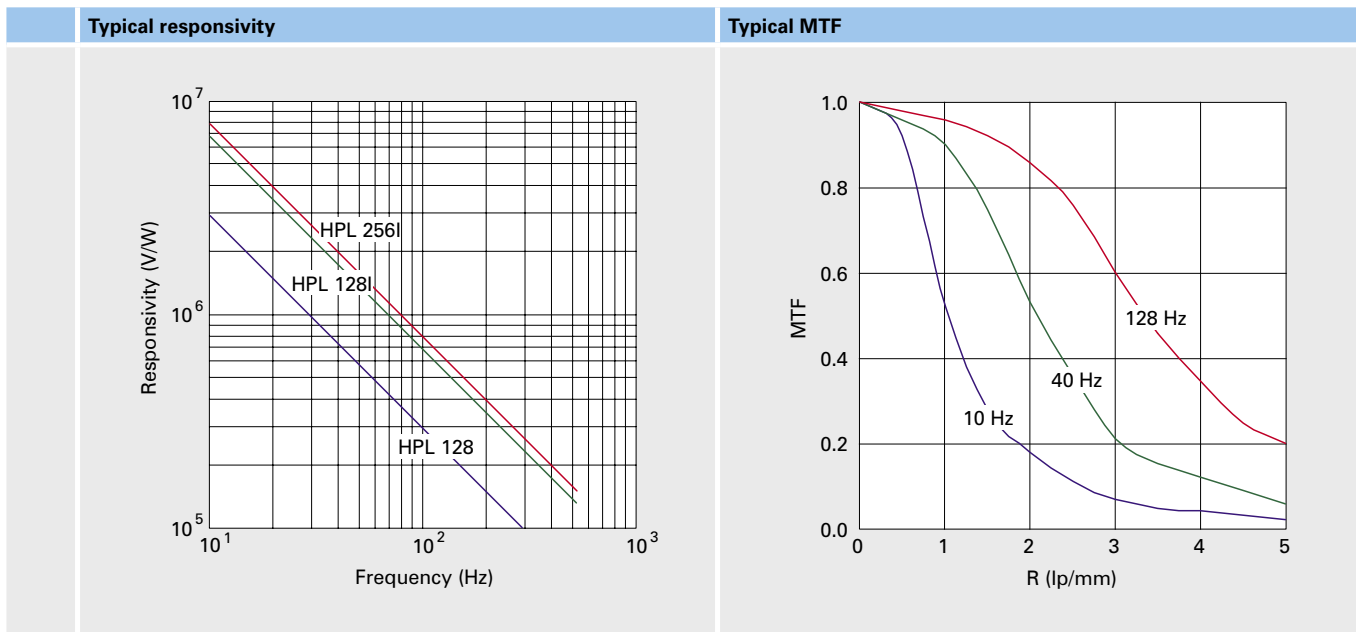


Optical specification										
Type	HPL 128-100	HPL 128I-100	HPL 128-500	HPL 128I-500	HPL 128-1000	HPL 128I-1000	HPL 256I-100	HPL 256I-500	HPL 256I-1000	
Pixel number	128	128	128	128	128	128	256	256	256	
Pixel width in μm	90	90	90	90	90	90	42	42	42	
Pixel length in μm	100	100	500	500	1000	1000	100	500	1000	
Pitch in μm	100	100	100	100	100	100	50	50	50	

Electro-optical specification ¹										
Type	HPL 128-100	HPL 128I-100	HPL 128-500	HPL 128I-500	HPL 128-1000	HPL 128I-1000	HPL 256I-100	HPL 256I-500	HPL 256I-1000	
Responsivity S_V in V/W	230000	540000	230000	540000	230000	540000	620000	620000	620000	
Noise voltage U_N in mV	0.7	0.8	0.9	1.2	1.1	1.9	0.7	0.9	1.1	
NEP in nW	3.0	1.5	3.9	2.2	4.9	3.5	1.1	1.4	1.8	
MTF (R = 3 lp/mm)	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	
Uniformity ² of S_V in %	5	5	5	5	5	5	5	5	5	

¹ Typical values, rectangular chopping with 128 Hz, array temperature 25 °C, black body source temperature 400 °C, filter transmission 100 %.

² No defective elements.

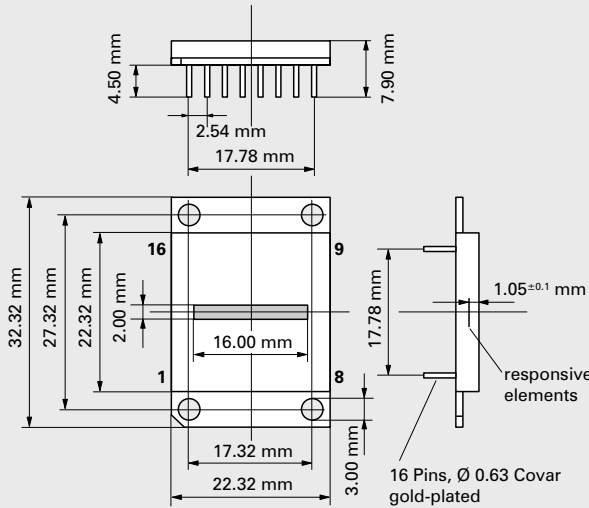


Maximum/minimum conditions ¹		
Parameter	Maximum/minimum value	Unit
VDD, VD2	-0.3 to 7	V
Digital inputs CLK, RES, VVR, VDR, VSH	-0.3 to VDD + 0.3	V
Chopping frequency f_{ch}	10 to 512	Hz
AD590+ to AD590-	-20 to 44	V
Analog output ²	± 5	mA
Maximum irradiance	50	mW/mm ²
Soldering temperature	300	°C
Storage temperature	-20 to 80	°C
Operating temperature	-15 to 70	°C

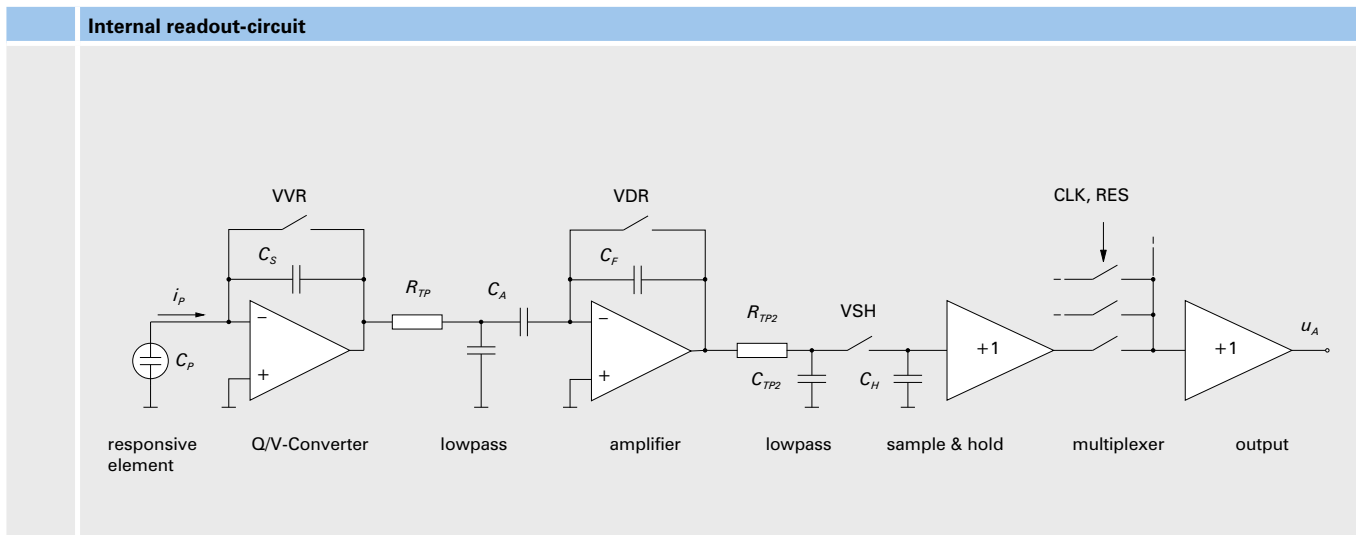
¹ All voltages refer to ground (pin 10, 15). ² Not short resistive.

Electrical parameters ¹				
Parameter	Minimum value	Typical value	Maximum value	Unit
VDD	4.75	5.0	5.25	V
VD2	2.4	2.5	2.6	V
Digital inputs, low voltage	0		0.3 VDD	V
Digital inputs, high voltage	0.7 VDD		VDD	V
Digital inputs, switching threshold		0.5 VDD		V
Digital inputs, leakage current			±1	μA
Current consumption		8		mA
AD590 operating voltage ²			30	V

¹ All Values for VDD = 5 V, VD2 = 2.5V. ² See data sheet of Analog Devices.

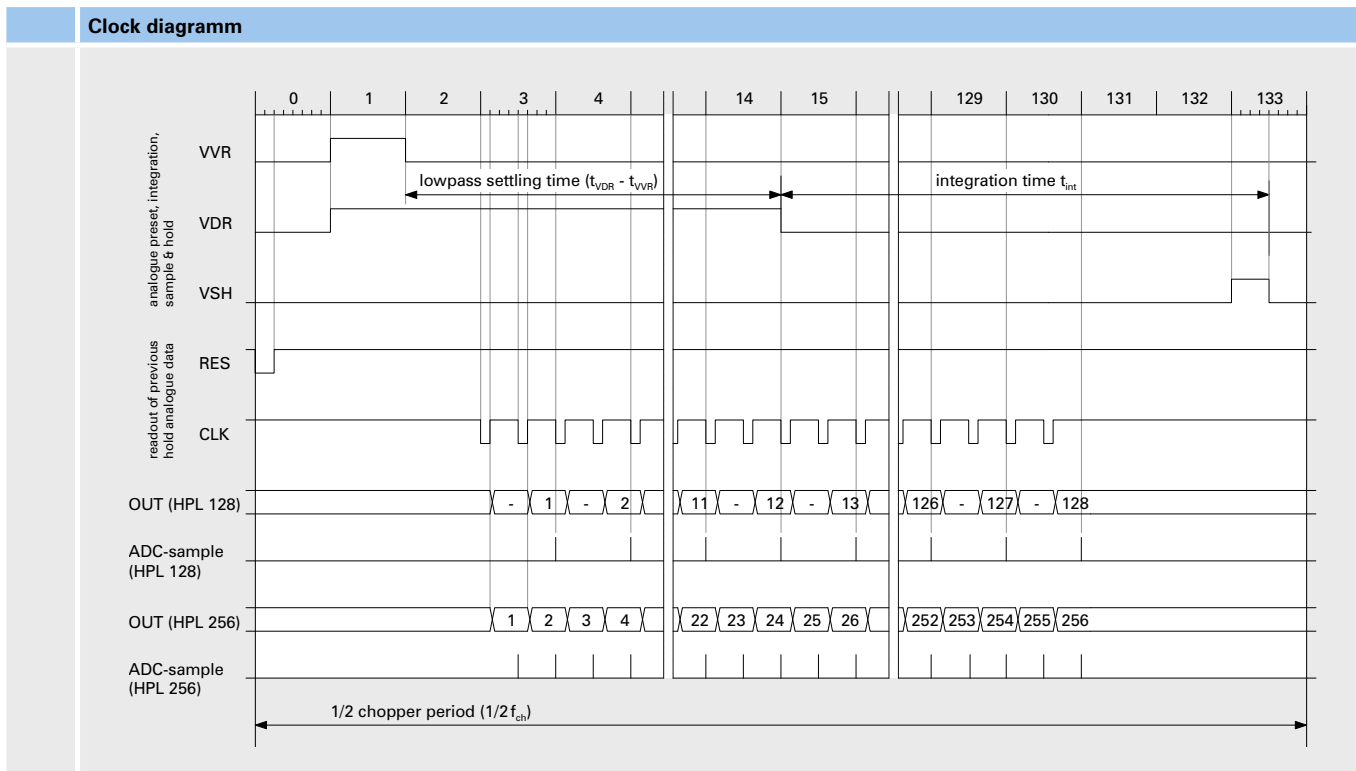
Pins				Package
Number	Name	Remark		
1	CLK	Input clock CLK (trigger on rising edge)		 <p>Dimensions: 4.50 mm, 2.54 mm, 17.78 mm, 7.90 mm, 32.32 mm, 27.32 mm, 22.32 mm, 2.00 mm, 16.00 mm, 17.78 mm, 1.05±0.1 mm, 16 Pins, Ø 0.63 Covar gold-plated, 3.00 mm, 17.32 mm, 22.32 mm.</p>
2	RES	Input clock RES (active 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	VDD	Operating voltage (+5 V)		
8	VD2	Operating voltage (+2.5 V)		
9	OUT	Analog signal output		
10	GND	Ground		
11	n.c.	not connected		
12	AD590+	Temperature sensor		
13	AD590-	Temperature sensor		
14	case	Case		
15	GND	Ground		
16	VDD	Operating voltage (+5 V)		

Connect pin 6 to pin 8 (VD2), pin 7 to pin 16 (VDD), pin 10 to pin 15 (GND).

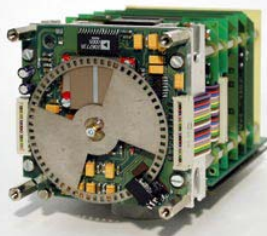


Clock parameters ¹					
Parameter	Relative value	Minimum value	Typical value	Maximum value	Unit
Chopping frequency ² f_{Ch}		10	128	512	Hz
Readout clock CLK $f_{CLK} = 2 \cdot f_{Ch} \cdot 268$	$1/t_{CLK}$	0	69	300	kHz
Reset clock low-impulse duration t_{RES}	$1/2 t_{CLK}$	1.8	7.5		μs
Clock VVR high-impulse duration t_{VVR}	$2 t_{CLK}$	7.5	30		μs
Clock VDR high-impulse duration ³ t_{VDR}	$28 t_{CLK}$	200	400		μs
Clock VSH high-impulse duration t_{VSH}	$1 t_{CLK}$	3.5	15		μs
Setting time at the output t_{out}				1	μs

¹ All values for VDD = 5 V, VD2 = 2.5V. ² $t_{Ch\ low} = t_{Ch\ high}$. ³ For $f_{Ch} = 512$ Hz t_{VDR} should be $56 \cdot t_{CLK} = 200 \mu s$.



Module MES-M3 with linear array



Features

- 128 or 256 elements
- 256 Hz chopper frequency
- Power supply and clock generator
- 16 bit analogue to digital converter
- Digital signal processor
- Serial interface RS232/RS422 or Fast Ethernet
- Windows® software

