



ST60 DUAL & ST60R DUAL

Silicon Based Thermopile Detector

Features: A two-channel silicon-based thermopile detector in a TO-5 package. Each small active area size is 0.61mm x 0.61mm. This is our lowest-cost and fastest time constant two-channel detector. It delivers a time constant of 18ms with Nitrogen encapsulation gas combined with a very low Temperature Coefficient of Responsivity of $-0.04\%/^{\circ}\text{C}$. This detector has a very short thermal shock response to ambient temperature change.

Options: 1) See [Standard Windows and Filters](#) for list of optical filter options. **2)** **ST60R Dual** version offers a low-cost (20% tolerance) poly-silicon resistor to be used as a PTC thermistor. **3)** Internal 30k Ω 5% NTC chip thermistor provides ambient package temperature measurement. See [Thermistor Options](#) p/n: DC-4005. See [Thermopile Configuration Table](#) for more options.

Applications: Gas analysis in handheld gas monitors for automotive exhaust, industrial/environmental leak detection and air quality monitoring.

Benefits: Low cost and small active area size with medium output.

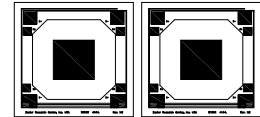
Technical Specifications

Specifications apply at 23°C with KBr Window and Nitrogen encapsulating gas

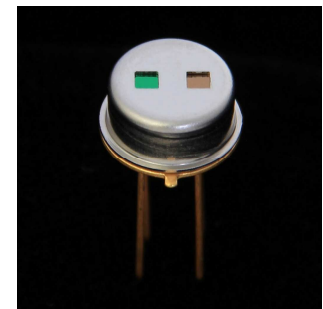
Parameter	Min	Typical	Max	Symbol	Units	Comments
Active Area size	.61 x .61			AA	mm	Hot junction size, per element.
Element Area	.37			A	mm ²	
Number of Junctions	80					Per element.
Number of Channels	2					Per detector package.
Output Voltage	78	93	108	V _s	μV	DC, H=330 $\mu\text{W}/\text{cm}^2$ (3)
Signal-to-Noise Ratio	2305	2969	3981	SNR	$\sqrt{\text{Hz}}$	DC, SNR=V _s /V _n
Responsivity	63.5	75.7	88.0	\mathcal{R}	V/W	DC, $\mathcal{R}=V_s/HA$ (2)
Resistance	45	60	70	R	k Ω	Detector element
Temperature Coefficient of \mathcal{R}	-.04				%/ $^{\circ}\text{C}$	Best linear fit, 0° to 85°C (1)
Temperature Coefficient of R	.11				%/ $^{\circ}\text{C}$	Best fit, 0° to 85°C (1)
Noise Voltage	27.1	31.3	33.8	V _n	nV/ $\sqrt{\text{Hz}}$	V _n ² =4kTR
Noise Equivalent Power	.31	.41	.53	NEP	nW/ $\sqrt{\text{Hz}}$	DC, NEP= V _n HA/V _s (2)
Detectivity	1.15	1.47	1.98	D*	10 ⁸ cm $\sqrt{\text{Hz}}/\text{W}$	DC, D*=V _s /V _n H \sqrt{A} (2)
Time Constant	18			\mathcal{T}	ms	Chopped, -3dB point (1)
Field of View	24°/52°			FOV	Degrees	See Assembly Drawings for FOV Description.
Package Type	TO-5,					Standard package hole size: (2) .060" X .060" sq. holes
Element Matching	5		10	\mathcal{M}	%	$\mathcal{M}= V_A-V_B /V_B$ (2)
Element Separation	3.02				mm	Center to Center
Operating Temperature	-50		100	T _a	$^{\circ}\text{C}$	
ST60R Thermistor Option	~24	30	~36	R _T	k Ω	PTC Poly-Silicon resistor on detector die.
ST60R Thermistor Temperature Coefficient of R	.107	.11	.113		%/ $^{\circ}\text{C}$	$\Delta R/(R\Delta T)$, Best fit, 0° to 85°C (1)

General Specifications: Flat spectral response from 100nm to > 100 μm . Linear signal output from 10⁻⁶ to 0.1W/cm². Maximum incident radiance 0.1W/cm², damage threshold \geq .5W/cm²

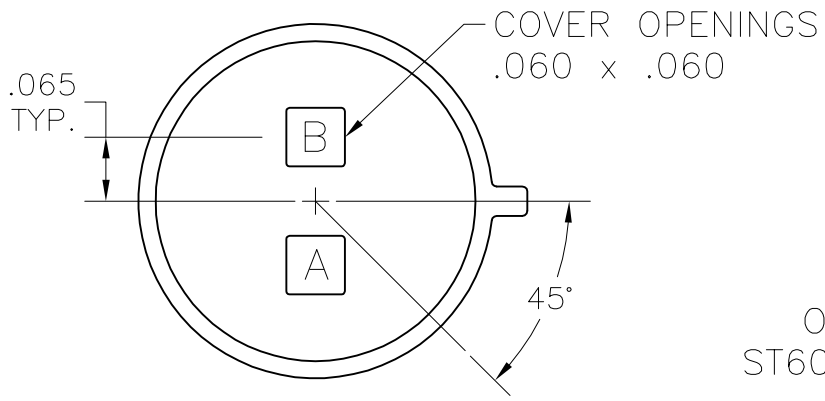
Notes: (1) Parameter is not 100% tested. 90% of all units meet these specifications. (2) A is detector area in cm². (3) Test Conditions: 500K Blackbody source; Detector active surface 10cm from 0.6513cm Diameter Blackbody Aperture.



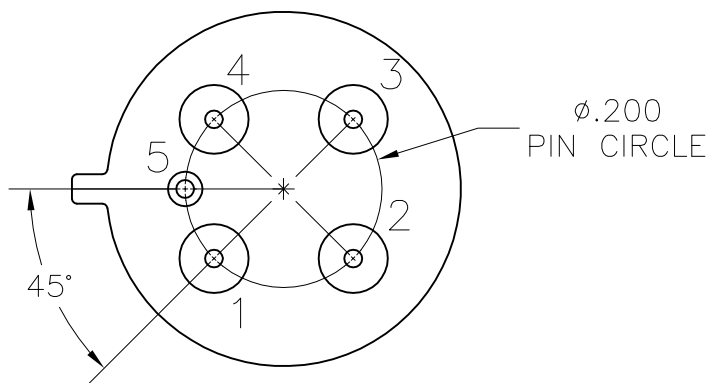
Detector circuit overlay



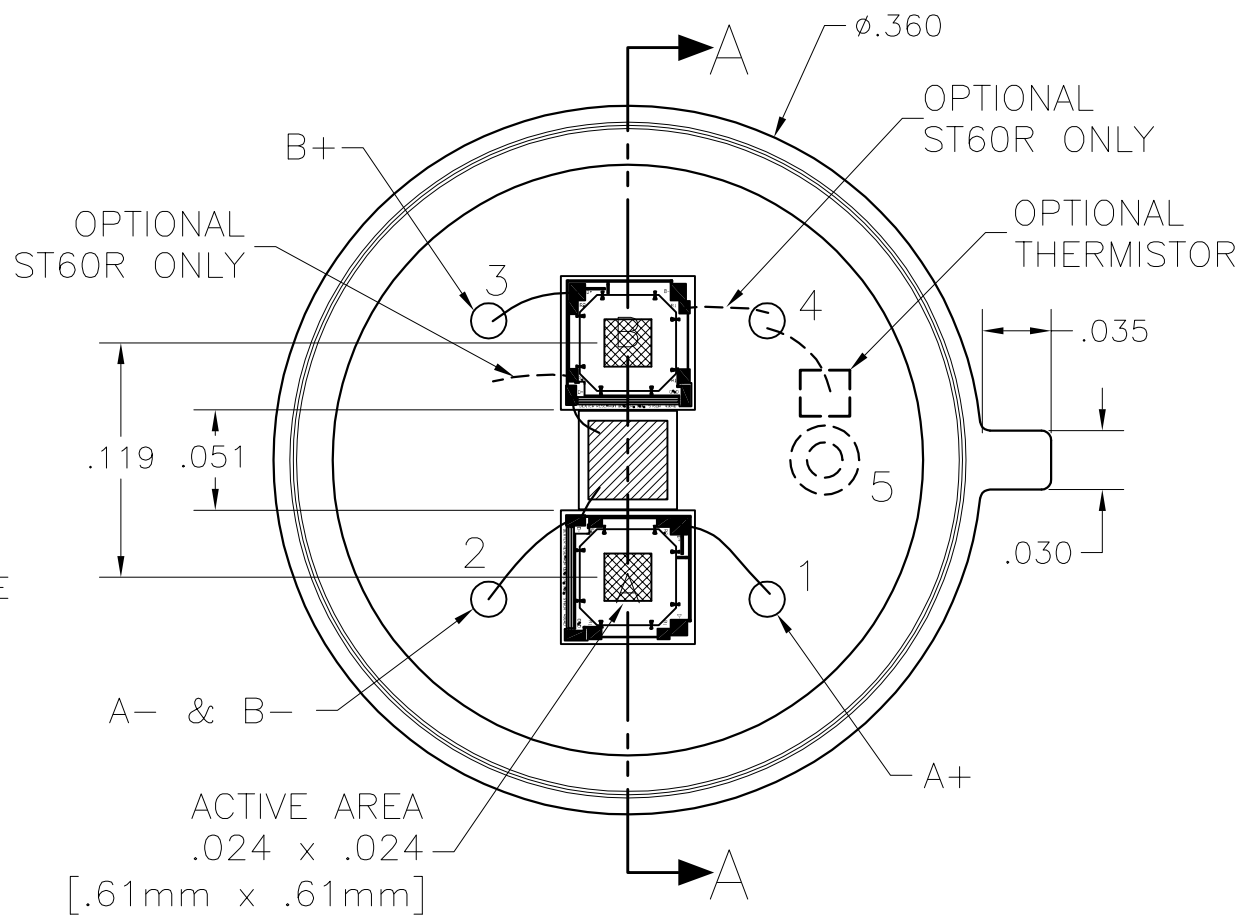
ST60 Dual



TOP VIEW WITH COVER



PIN OUT BOTTOM VIEW

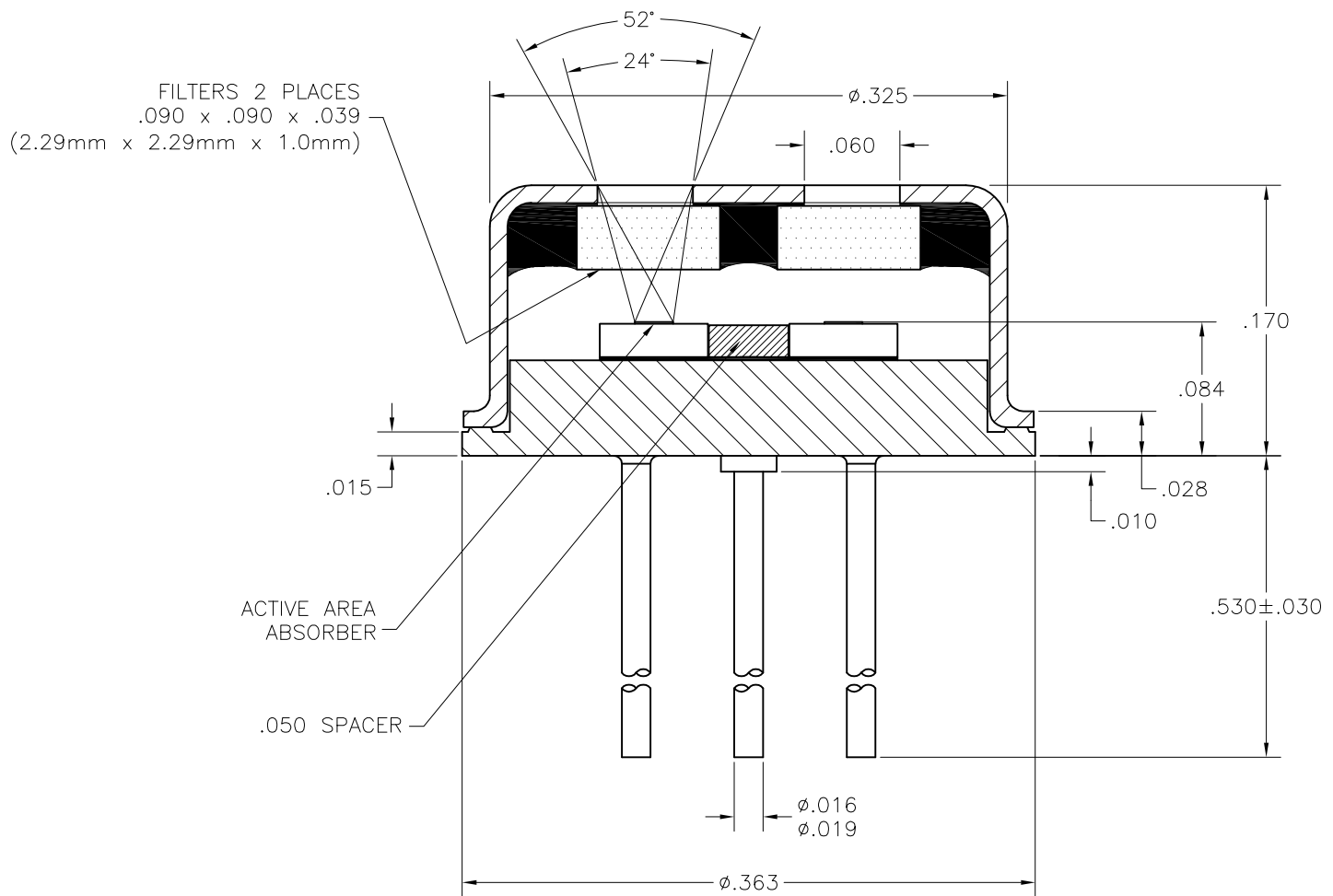


TOP VIEW WITHOUT COVER

PIN	ELEMENT	DESCRIPTION	P/N
1	A+		
2	DETECTOR COMMON (A- & B-)		
3	B+		
4	RESISTOR "ST60R"* OR THERMISTOR		
5	CASE GROUND, RESISTOR "ST60R"* OR THERMISTOR		

* DETECTOR DIE POLY-SILICON RESISTOR

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS DECIMALS ANGLES ± .XX ± .01 ± .XXX ± .005		DEXTER RESEARCH CENTER, Inc. 7300 Huron River Dr., Dexter, MI 48130, ph. 734-426-3921 fax 734-426-5090			
APPROVALS		DATE		ASSEMBLY, ST60/ST60R DUAL, TOP VIEW	
DRAWN: DLJ		10/9/12		SIZE: A	SCALE:
CHECKED:				DWG. NO. 1383.1	REV. NC
ENGINEERED:				PAGE: 1 OF 2	
APPROVED:				DRC PART NO.	MATERIAL:
				FINISH:	



FILTERS 2 PLACES
 .090 x .090 x .039
 (2.29mm x 2.29mm x 1.0mm)

ACTIVE AREA
 ABSORBER

 .050 SPACER

VIEW A-A

NOTE: SOME FEATURES NOT SHOWN FOR CLARITY

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.			DEXTER RESEARCH CENTER, Inc.			
TOLERANCES ARE:			7300 Huron River Dr., Dexter, MI 48130, ph. 734-426-3921 fax 734-426-5090			
FRACTIONS ±	DECIMALS .XX ± .01 .XXX ± .002	ANGLES ±	ASSEMBLY, ST60/ST60R DUAL CROSS SECTION			
APPROVALS	DATE	SIZE: SCALE: DWG. NO. REV. PAGE:				
DRAWN: DLJ	10/9/12	A 9" : 1"		1383.2	NC 2 OF 2	
CHECKED:		DRC PART NO.		MATERIAL:	FINISH:	
ENGINEERED:						
APPROVED:						