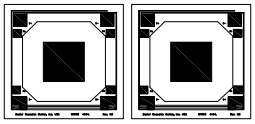
We're Everywhere It Matters…

ST60 DUAL & ST60R DUAL

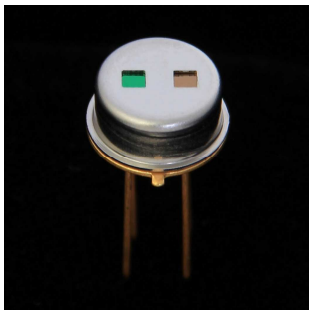
Silicon Based Thermopile Detector



Detector circuit overlay

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%/°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 30kΩ 5% NTC chip thermistor provides ambient package temperature measurement. *See* Thermistor Options p/n: DC-4005. See Thermopile Configuration Table for more options.



ST60 Dual

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=330µW/cm^2 (3)
Signal-to-Noise Ratio	2305	2969	3981	SNR	√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	kΩ	Detector element
Temperature Coefficient of $\mathcal{R}$		-.04			%/°C	Best linear fit, 0° to 85°C (1)
Temperature Coefficient of R		.11			%/°C	Best fit, 0° to 85°C (1)
Noise Voltage	27.1	31.3	33.8	V_n	nV/√Hz	$V_n^2=4kTR$
Noise Equivalent Power	.31	.41	.53	NEP	nW/√Hz	DC, NEP= $V_n HA/V_s$ (2)
Detectivity	1.15	1.47	1.98	D*	10^8cm√Hz/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	$\mathcal{M}$	%	$\mathcal{M}=\lvert V_A-V_B\rvert/V_B$ (2)
Element Separation		3.02			mm	Center to Center
Operating Temperature	-50		100	T_a	°C	
ST60R Thermistor Option	~24	30	~36	R_T	kΩ	PTC Poly-Silicon resistor on detector die.
ST60R Thermistor Temperature Coefficient of R	.107	.11	.113		%/°C	ΔR/(RΔT), Best fit, 0° to 85°C (1)

General Specifications: Flat spectral response from 100nm to > 100µm. Linear signal output from 10^{-6} to 0.1W/cm^2. Maximum incident radiance 0.1W/cm^2, damage threshold ≥ .5W/cm^2

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

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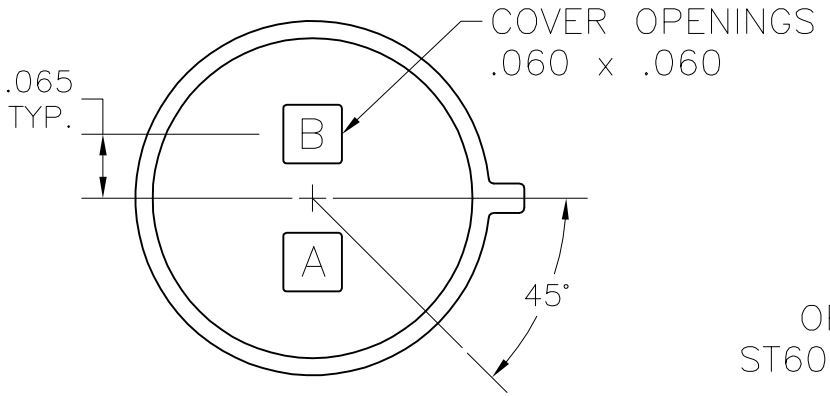
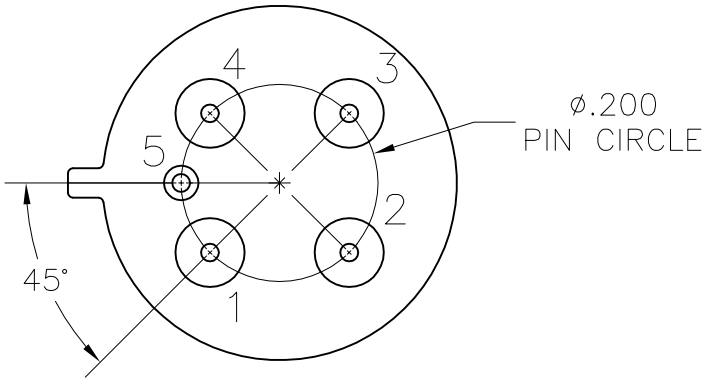
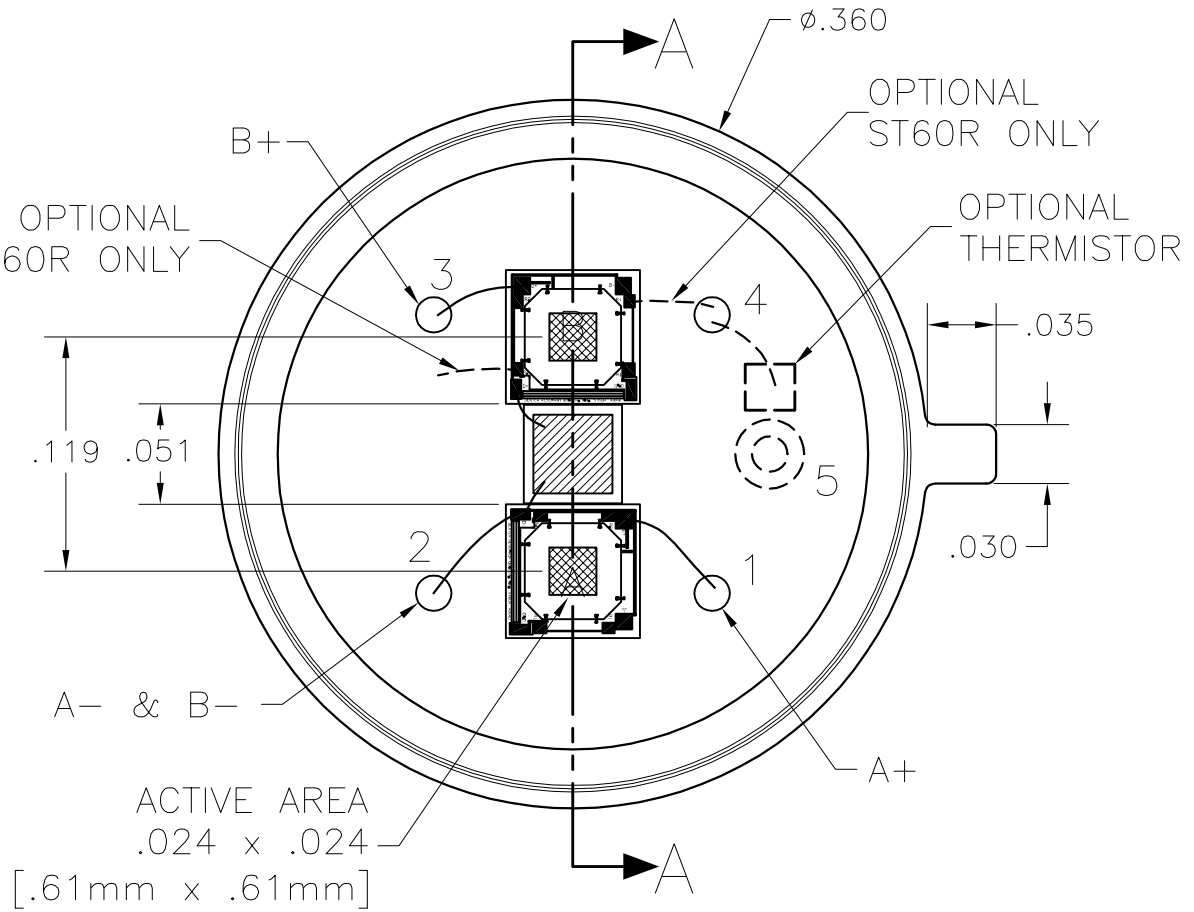


TOP VIEW
WITH COVER



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 .XX ± .01, .XXX ± .005 | ANGLES ±

APPROVALS		DATE
DRAWN:	DLJ	10/9/12
CHECKED:		
ENGINEERED:		
APPROVED:		

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ASSEMBLY, ST60/ST60R DUAL,
TOP VIEW

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A		1383.1	NC	1 OF 2

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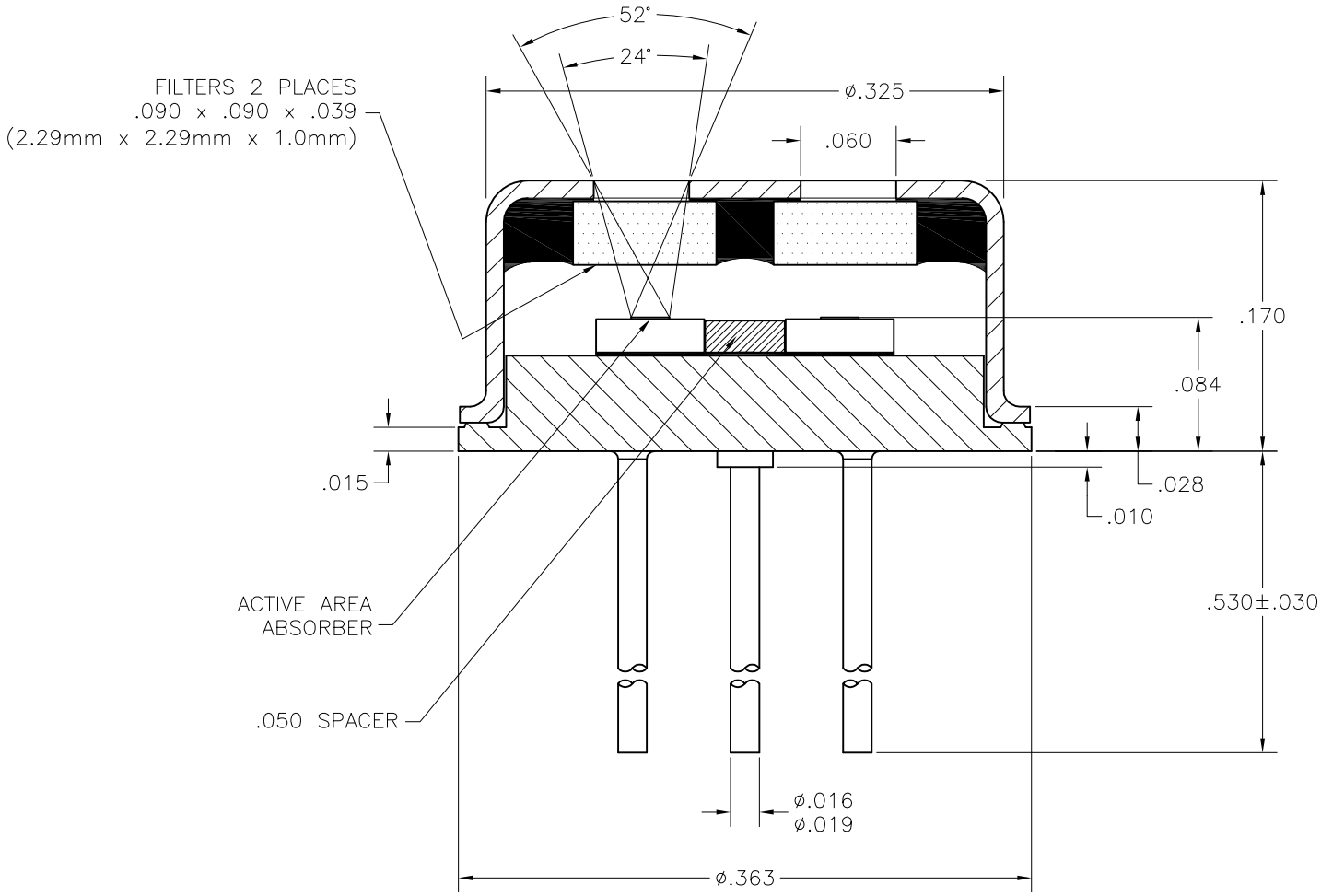

VIEW A—A

NOTE: SOME FEATURES NOT SHOWN FOR CLARITY

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .01 .XXX ± .002 ANGLES ±	
APPROVALS	DATE
DRAWN: DLJ	10/9/12
CHECKED:	
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APPROVED:	

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ASSEMBLY, ST60/ST60R DUAL CROSS SECTION

SIZE:	SCALE:	DWG. NO.	REV.	PAGE:
A	9" : 1"	1383.2	NC	2 OF 2

DRC PART NO.	MATERIAL:	FINISH: