



ST60 QUAD & ST60R QUAD

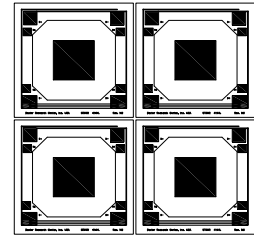
Silicon Based Thermopile Detector

Features: A four-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 four-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.

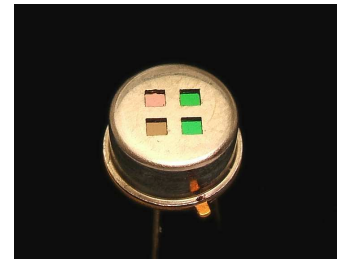
Options: **1)** See [Standard Windows and Filters](#) for list of optical filter options. **2)** **ST60R Quad** version offers a low-cost (20% tolerance) poly-silicon resistor to be used as a PTC thermistor. **3)** Internal 30kΩ 5% NTC chip thermistor provides ambient package temperature measurement.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

Applications: Gas analysis and laser targeting.

Benefit: Low cost in TO-5 package with small active area size with medium output.



Detector circuit overlay



ST60 Quad

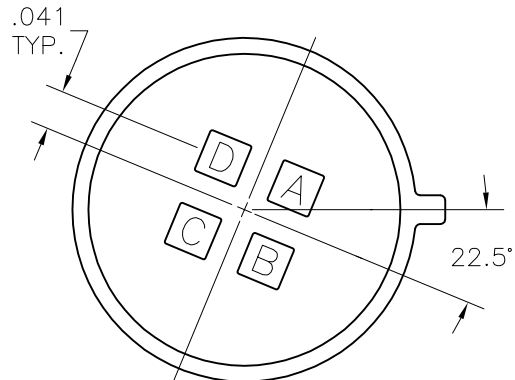
Technical Specifications

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

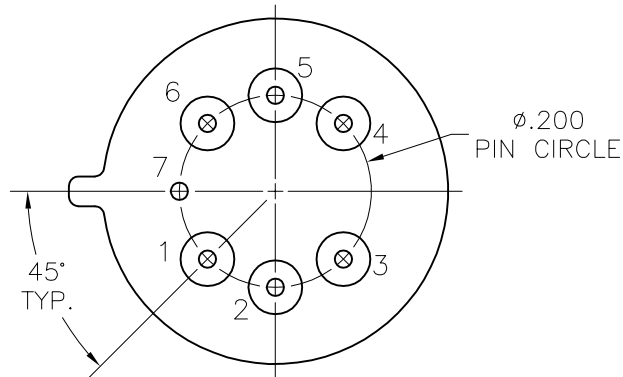
Parameter	Min	Typical	Max	Symbol	Units	Comments
Active Area size	.61 x .61			AA	mm	Hot junction size, per element.
Element Area	.37			A	mm ²	
Number of Junctions	80					Per element.
Number of Channels	4					Per detector package.
Output Voltage	50	62	74	V _s	μV	DC, H=330μW/cm ² (3)
Signal-to-Noise Ratio	1,381	1,981	2,044	SNR	√Hz	DC, SNR=V _s /V _n
Responsivity	40.7	50.5	60.3	ℜ	V/W	DC, ℜ=V _s /HA (2)
Resistance	40	60	80	R	kΩ	Detector element
Temperature Coefficient of 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	25.6	31.3	36.2	V _n	nV/√Hz	V _n ² =4kTR
Noise Equivalent Power	.42	.62	.89	NEP	nW/√Hz	DC, NEP= V _n HAV _s (2)
Detectivity	.69	.98	1.44	D*	10 ⁸ cm√Hz/W	DC, D*=V _s /V _n H√A (2)
Time Constant	18			τ	ms	Chopped, -3dB point (1)
Field of View	15°/47°			FOV	Degrees	See Assembly Drawings for FOV Description.
Package Type	TO-5,					Standard package hole size: (4) .046" X .046" sq. holes
Element Matching	10	15	25	ℳ	%	ℳ= V _A -V _B /V _B (2)
Element Separation	2.08				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/cm². Maximum incident radiance 0.1W/cm², damage threshold ≥ .5W/cm²

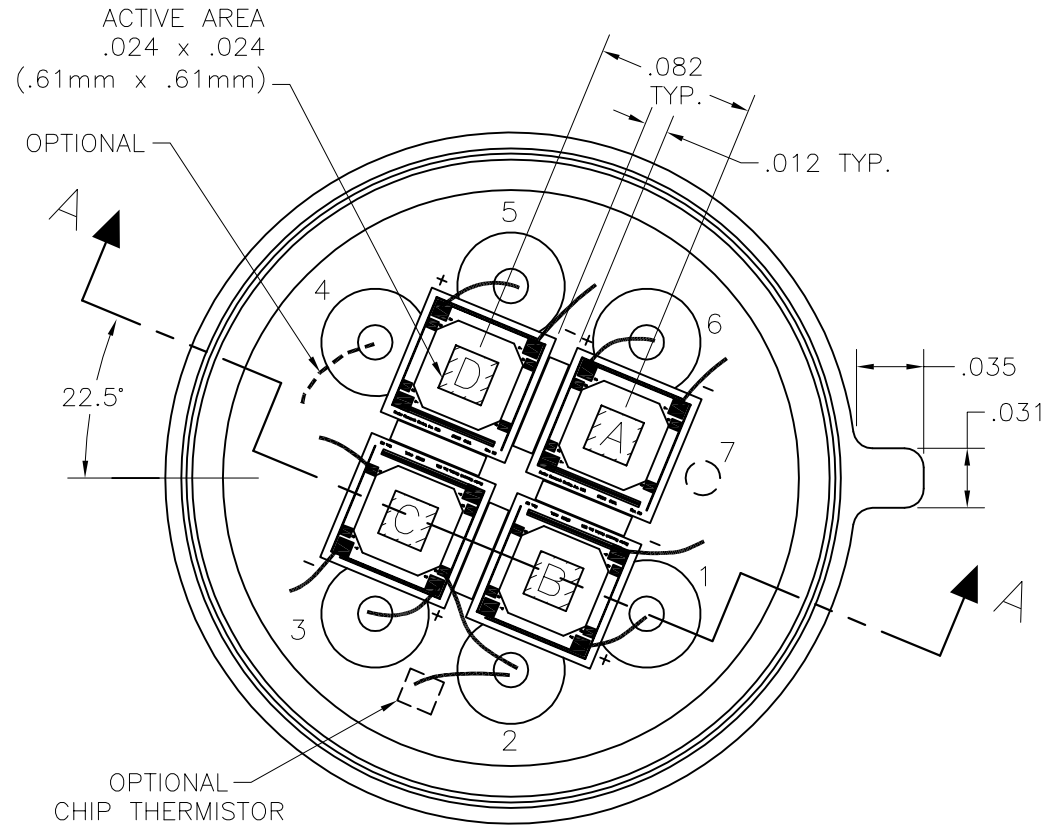
Notes: (1) Parameter is not 100% tested. 90% of all units meet these specifications. (2) A is detector area in cm². (3) Test Conditions: 500K Blackbody source; Detector active surface 10cm from 0.6513cm Diameter Blackbody Aperture.



TOP VIEW
WITH COVER



BOTTOM VIEW



TOP VIEW
WITHOUT COVER

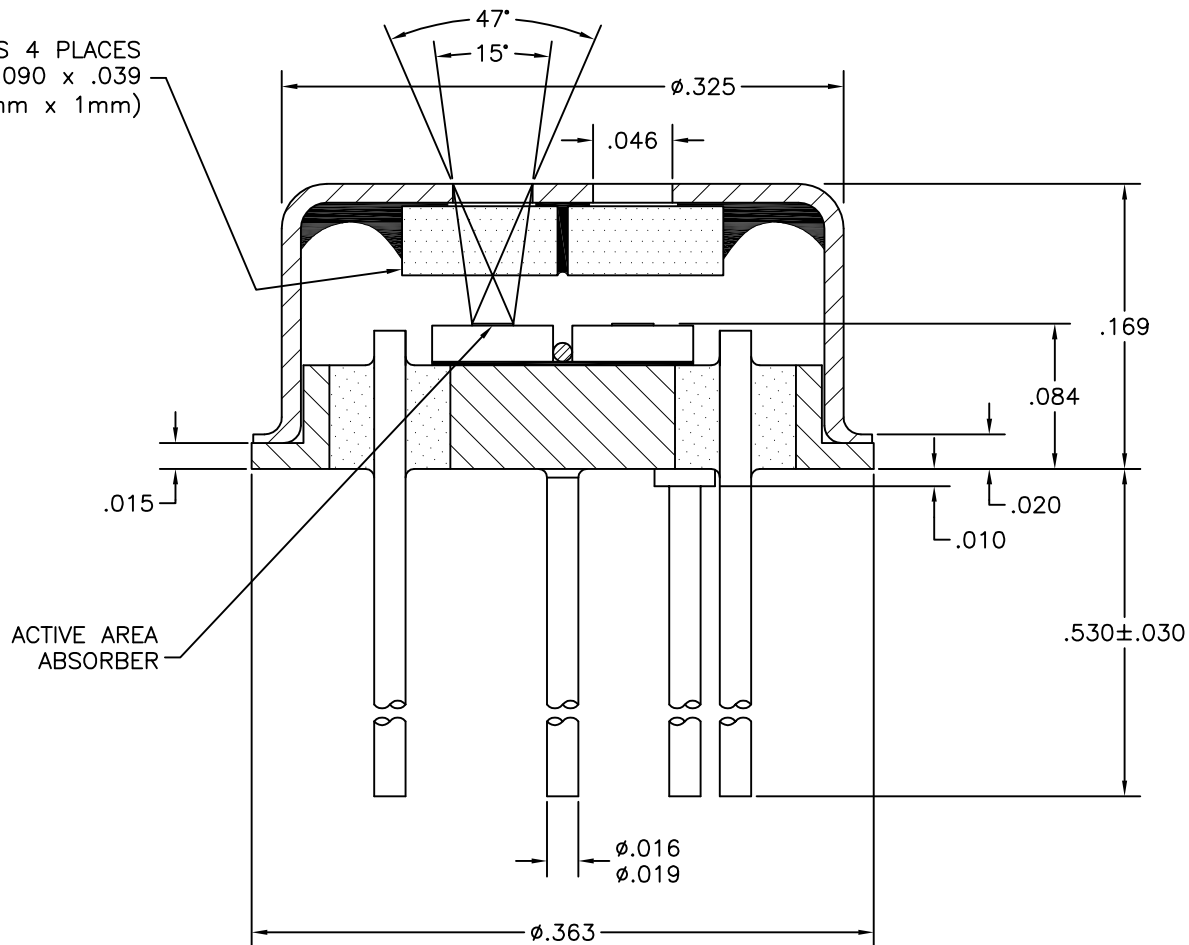
PIN	ELEMENT	DESCRIPTION	P/N
1	B+		
3	C+		
4	OPTIONAL DETECTOR COMMON WITH CASE GROUND		
5	D+		
6	A+		
2	RESISTOR "ST60R"* OR THERMISTOR		
7	CASE GROUND, RESISTOR "ST60R"* OR THERMISTOR		

* DETECTOR DIE POLY-SILICON RESISTOR

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.		
TOLERANCES ARE:		
FRACTIONS ±	DECIMALS .XX ± .01 .XXX ± .003	ANGLES ±
APPROVALS	DATE	
DRAWN: DLJ	3/15/10	
CHECKED:		
ENGINEERED:		
APPROVED:		

DEXTER RESEARCH CENTER, Inc.			
7300 Huron River Dr., Dexter, MI 48130, ph. 734-426-3921 fax 734-426-5090			
ASSEMBLY, ST60/ST60R QUAD, TO-5, TOP VIEW, NEW DIE			
SIZE: A	SCALE: 10" : 1"	DWG. NO. 1083.1	REV. PAGE: G 1 OF 2
DRC PART NO.		MATERIAL:	FINISH:

FILTERS 4 PLACES
 .090 x .090 x .039
 (2.29mm x 2.29mm x 1mm)



ACTIVE AREA
 ABSORBER

VIEW A-A

NOTE: RECOMMENDED FILTER THICKNESS 1mm TO
 MINIMIZE CROSS TALK
 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	12/16/10
CHECKED:		
ENGINEERED:		
APPROVED:		

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ASSEMBLY, ST60/ST60R QUAD,
 TO-5, CROSS SECTION, 4-HOLE

SIZE: A	SCALE: 9" : 1"	DWG. NO. 1083.2	REV. J	PAGE: 2 OF 2
DRC PART NO.		MATERIAL:		FINISH: