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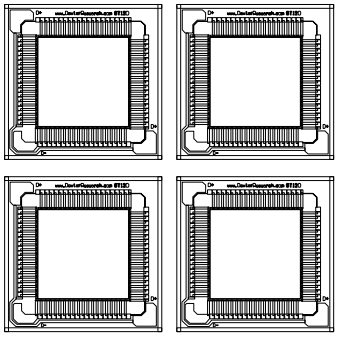
ST120 QUAD

Silicon Based Thermopile Detector



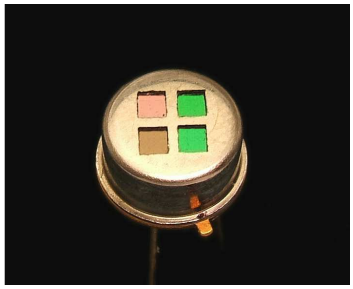
Detector circuit overlay

Features: A four-channel silicon-based thermopile in a TO-5 package. Each small active area is 1.2mm x 1.2mm. Time constant of 25ms with Nitrogen encapsulation gas. Delivers a very low Temperature Coefficient of Responsivity of -0.04%/℃. 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)** Internal 30kΩ 5% NTC chip thermistor provides ambient package temperature measurement. *See* Thermistor Options p/n: DC-4005. **3)** Internal aperture precisely defines active area for applications with FOV and/or spot size requirements. See Aperture Options for available sizes. See Thermopile Configuration Table for more options.

Applications: Excellent for gas analysis, position sensor, and horizon sensor.

Benefit: Low cost with high output.



ST120 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		1.2 x 1.2		AA	mm	Hot junction size, per element.
Element Area		1.44		A	mm^2	
Number of Junctions		80				Per element.
Number of Channels		4				Per detector package.
Output Voltage		140		V_s	µV	DC, H=330µW/cm^2 (3)
Signal-to-Noise Ratio		3,649		SNR	√Hz	DC, SNR=V_s/V_n
Responsivity		29.5		ℜ	V/W	DC, ℜ=V_s/HA (2)
Resistance		90		R	kΩ	Detector element
Temperature Coefficient of ℜ		-.04			%/°C	Best linear fit, 0° to 85°C (1)
Temperature Coefficient of R		.02			%/°C	Best fit, 0° to 85°C (1)
Noise Voltage		38.4		V_n	nV/√Hz	V_n^2=4kTR
Noise Equivalent Power		1.30		NEP	nW/√Hz	DC, NEP= V_n HA/V_s (2)
Detectivity		0.92		D*	10^8cm√Hz/W	DC, D*=V_s/ V_n H√A (2)
Time Constant		25		$\mathcal{T}$	ms	Chopped, -3dB point (1)
Field of View		9°/63°		FOV	Degrees	See Assembly Drawings for FOV Description.
Package Type		TO-5				Standard package hole size: .060" x .060"
Element Matching		25		$\mathcal{M}$	%	$\mathcal{M}$ =|V_A-V_B|/V_B (2)
Element Separation		2.08			mm	Center to Center
Operating Temperature	-50		125	T_a	°C	

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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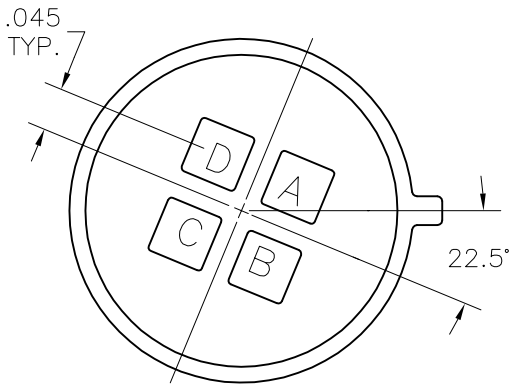
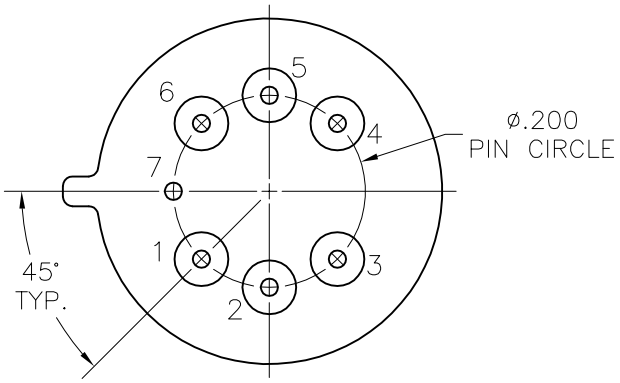
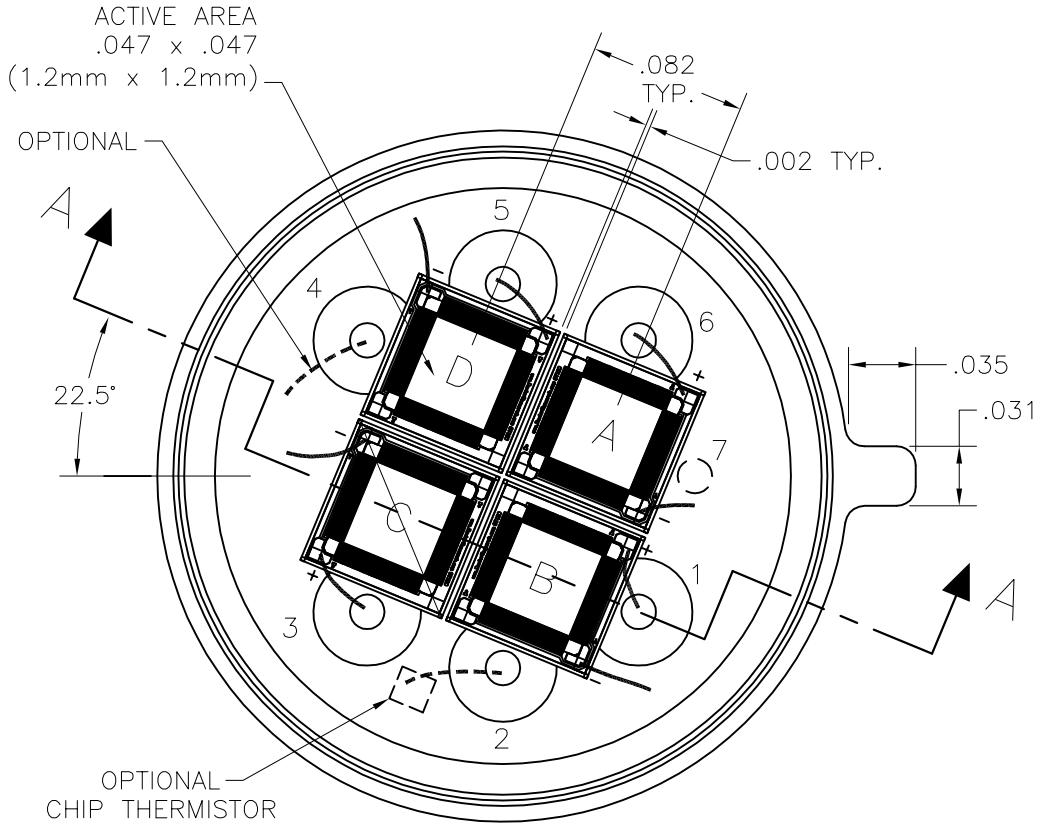


TOP VIEW
WITH COVER



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	OPTIONAL THERMISTOR		
7	CASE GROUND AND OPTIONAL THERMISTOR		

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:	

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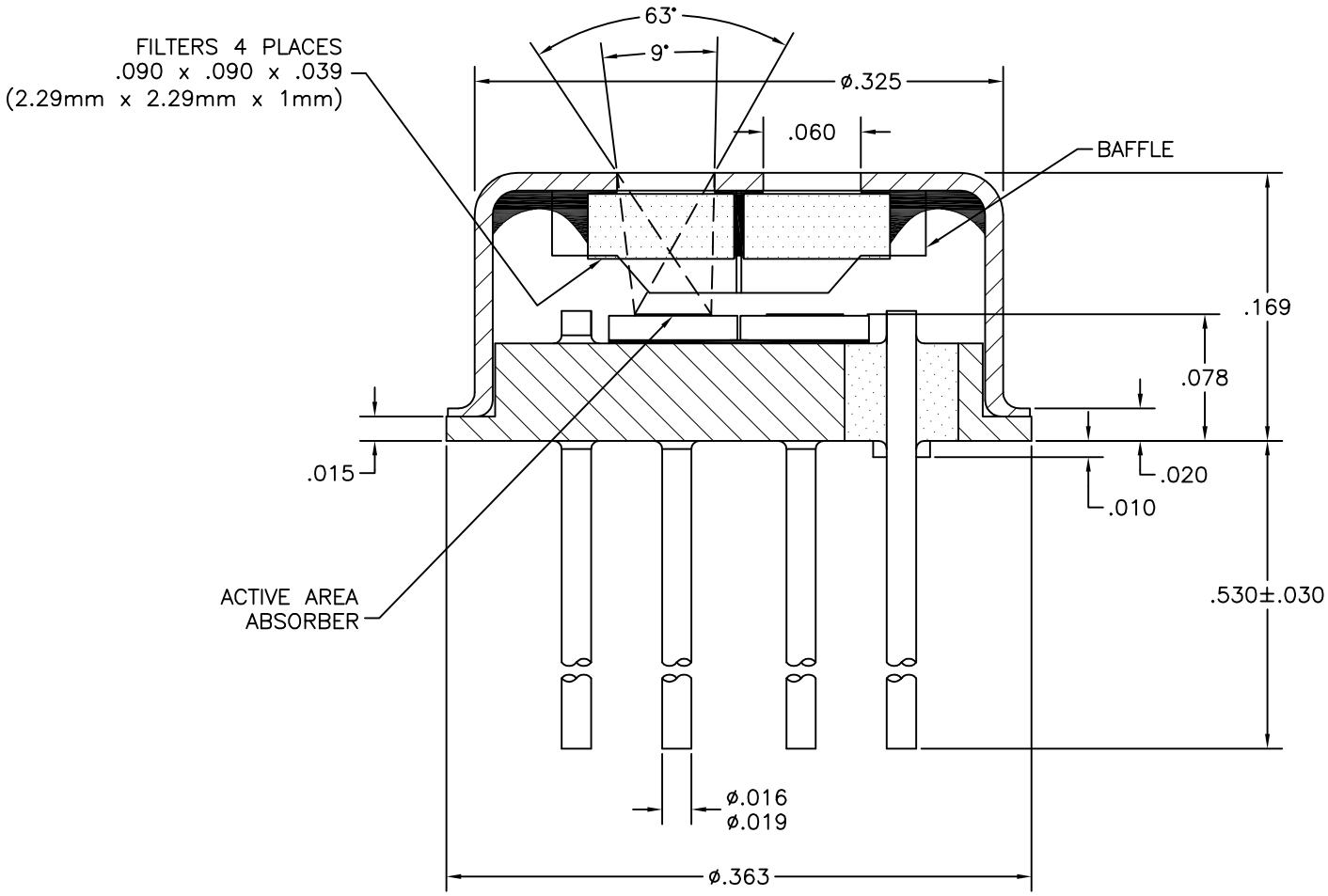
ASSEMBLY, ST120 QUAD,
TO-5, TOP VIEW

SIZE:	SCALE:	DWG. NO.	REV.	PAGE:
A	10" : 1"	1199.1	C	1 OF 2

DRC PART NO.	MATERIAL:	FINISH:



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, ST120 QUAD, TO-5, CROSS SECTION

SIZE:	SCALE:	DWG. NO.	REV.	PAGE:
A	9" : 1"	1199.2	C	2 OF 2

DRC PART NO.	MATERIAL:	FINISH: