



## ST120 DUAL

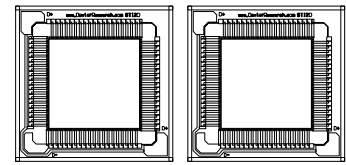
### Silicon Based Thermopile Detector

**Features:** A two-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  $-0.04\%/^{\circ}\text{C}$ . This detector has a very short thermal shock response to ambient temperature change.

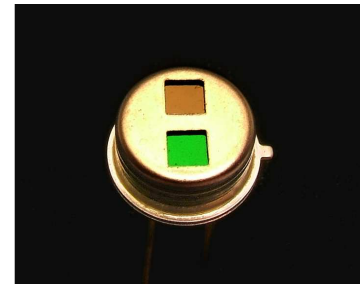
**Options:** **1)** See [Standard Windows and Filters](#) for list of optical filter options. **2)** Internal  $30\text{k}\Omega$  5% NTC chip thermistor provides ambient package temperature measurement. See [Thermistor Options](#) p/n: DC-4005. **3)** Internal aperture precisely defines active area 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, fire suppression, non-contact temperature, and horizon sensor.

**Benefit:** Low cost with high output.



Detector circuit overlay



ST120 DUAL

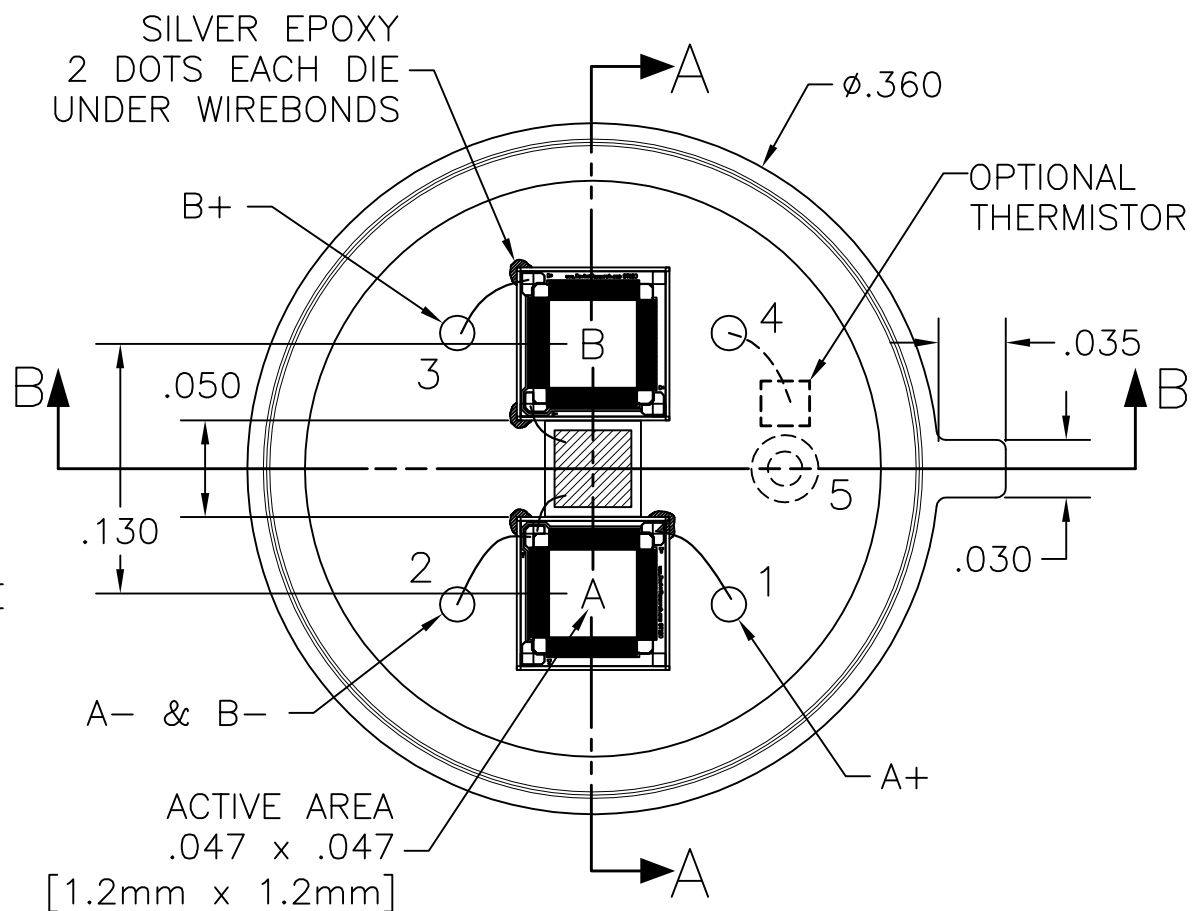
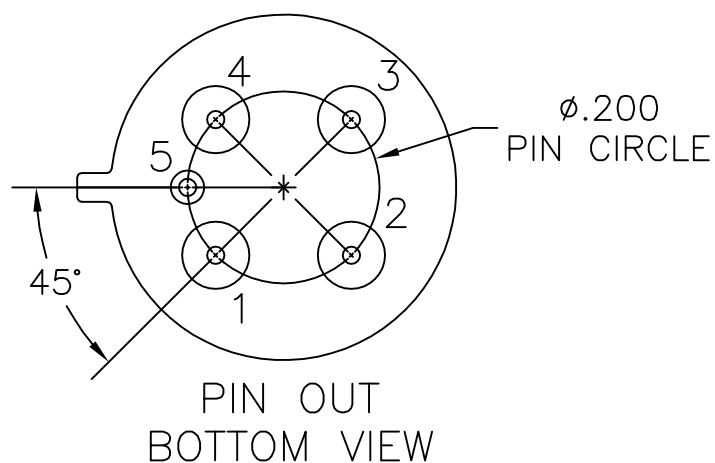
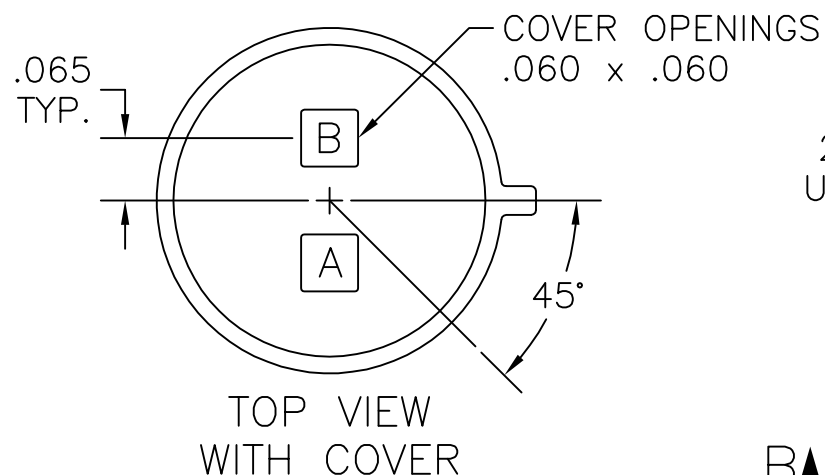
### Technical Specifications

Specifications apply at  $23^{\circ}\text{C}$  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	$\text{mm}^2$	
Number of Junctions		80				Per element.
Number of Channels		2				Per detector package.
Output Voltage		165		$V_s$	$\mu\text{V}$	DC, $H=330\mu\text{W}/\text{cm}^2$ (3)
Signal-to-Noise Ratio		4,301		SNR	$\sqrt{\text{Hz}}$	DC, $\text{SNR}=V_s/V_n$
Responsivity		34.7		$\mathcal{R}$	$\text{V}/\text{W}$	DC, $\mathcal{R}=V_s/HA$ (2)
Resistance		90		R	$\text{k}\Omega$	Detector element
Temperature Coefficient of $\mathcal{R}$		-.04			$\%/^{\circ}\text{C}$	Best linear fit, $0^{\circ}$ to $85^{\circ}\text{C}$ (1)
Temperature Coefficient of R		.02			$\%/^{\circ}\text{C}$	Best fit, $0^{\circ}$ to $85^{\circ}\text{C}$ (1)
Noise Voltage		38.4		$V_n$	$\text{nV}/\sqrt{\text{Hz}}$	$V_n^2=4\text{kTR}$
Noise Equivalent Power		1.10		NEP	$\text{nW}/\sqrt{\text{Hz}}$	DC, $\text{NEP}=V_n HA/V_s$ (2)
Detectivity		1.09		$D^*$	$10^8\text{cm}^2\sqrt{\text{Hz}}/\text{W}$	DC, $D^*=V_s/V_n H\sqrt{A}$ (2)
Time Constant		25		$\mathcal{T}$	ms	Chopped, -3dB point (1)
Field of View		$27^{\circ}/77^{\circ}$		FOV	Degrees	See Assembly Drawings for FOV Description.
Package Type		TO-5				Standard package hole size: .090" x .090"
Element Matching		25		$\mathcal{M}$	%	$\mathcal{M}= V_A-V_B /V_B$ (2)
Element Separation		3.30			mm	Center to Center
Operating Temperature	-50		125	$T_a$	$^{\circ}\text{C}$	

**General Specifications:** Flat spectral response from 100nm to  $>100\mu\text{m}$ . Linear signal output from  $10^{-6}$  to  $0.1\text{W}/\text{cm}^2$ . Maximum incident radiance  $0.1\text{W}/\text{cm}^2$ , damage threshold  $\geq .5\text{W}/\text{cm}^2$

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



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

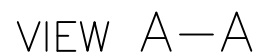
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FRACTIONS ±	DECIMALS .XX ± .01 .XXX ± .005	ANGLES ±	
APPROVALS	DATE		
DRAWN:	DLJ	10/9/12	
CHECKED:			
ENGINEERED:			
APPROVED:			

DEXTER RESEARCH CENTER, Inc.

7300 Huron River Dr., Dexter, MI 48130, ph. 734-426-3921 fax 734-426-5090

ASSEMBLY, ST120 DUAL  
.090 HOLES, TOP VIEW

SIZE: <b>A</b>	SCALE: 10" = 1"	DWG. NO. 1209.1	REV. B	PAGE: 1 OF 2
DRC PART NO.		MATERIAL:		FINISH:



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