



ST120 TO-5

Silicon Based Thermopile Detector

Features: A single-channel silicon-based thermopile provides lowest cost solutions in a small active area of 1.2mm x 1.2mm in a TO-5 package. Time constant of 25ms with Nitrogen encapsulation gas. Delivers 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) Internal 30kΩ 5% NTC chip thermistor provides ambient package temperature measurement. See [Thermistor Options](#) p/n: DC-4005. 4) 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 non-contact temperature, fire suppression, horizon sensor, and gas analysis.

Benefit: Low cost and small active area size with high output.

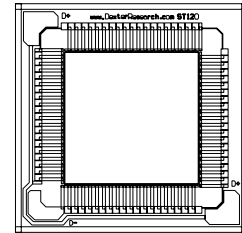
Technical Specifications

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

Parameter	Min	Typical	Max	Symbol	Units	Comments
Active Area size		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		1				Per detector package.
Output Voltage		180		V _s	μV	DC, H=330μW/cm ² (3)
Signal-to-Noise Ratio		4,660		SNR	√Hz	DC, SNR=V _s /V _n
Responsivity		37.9		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		.11			%/°C	Best fit, 0° to 85°C (1)
Noise Voltage		38.6		V _n	nV/√Hz	V _n ² =4kTR
Noise Equivalent Power		1.02		NEP	nW/√Hz	DC, NEP= V _n HA/V _s (2)
Detectivity		1.18		D*	10 ⁸ cm√Hz/W	DC, D*=V _s /V _n H√A (2)
Time Constant		25		T	ms	Chopped, -3dB point (1)
Field of View		52°/86°		FOV	Degrees	See Assembly Drawings for FOV Description.
Package Type		TO-5				Standard package hole size: ∅.150"
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/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.



Detector circuit overlay



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