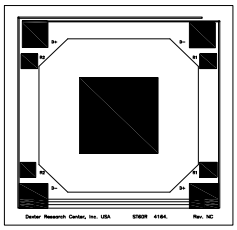
Dexter Research Center, Inc.

We're Everywhere It Matters…

ST60 TO-5 & ST60R TO-5

Silicon Based Thermopile Detector



Detector circuit overlay

Features: A single-channel silicon-based thermopile provides lowest cost solutions in a small active area of 0.61mm x 0.61mm in a TO-5 package. Time constant of 18ms 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) ST60R TO-5** 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. **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.

ST60 TO-5

Applications: Excellent for non-contact temperature, fire suppression, horizon sensor, and gas analysis.

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

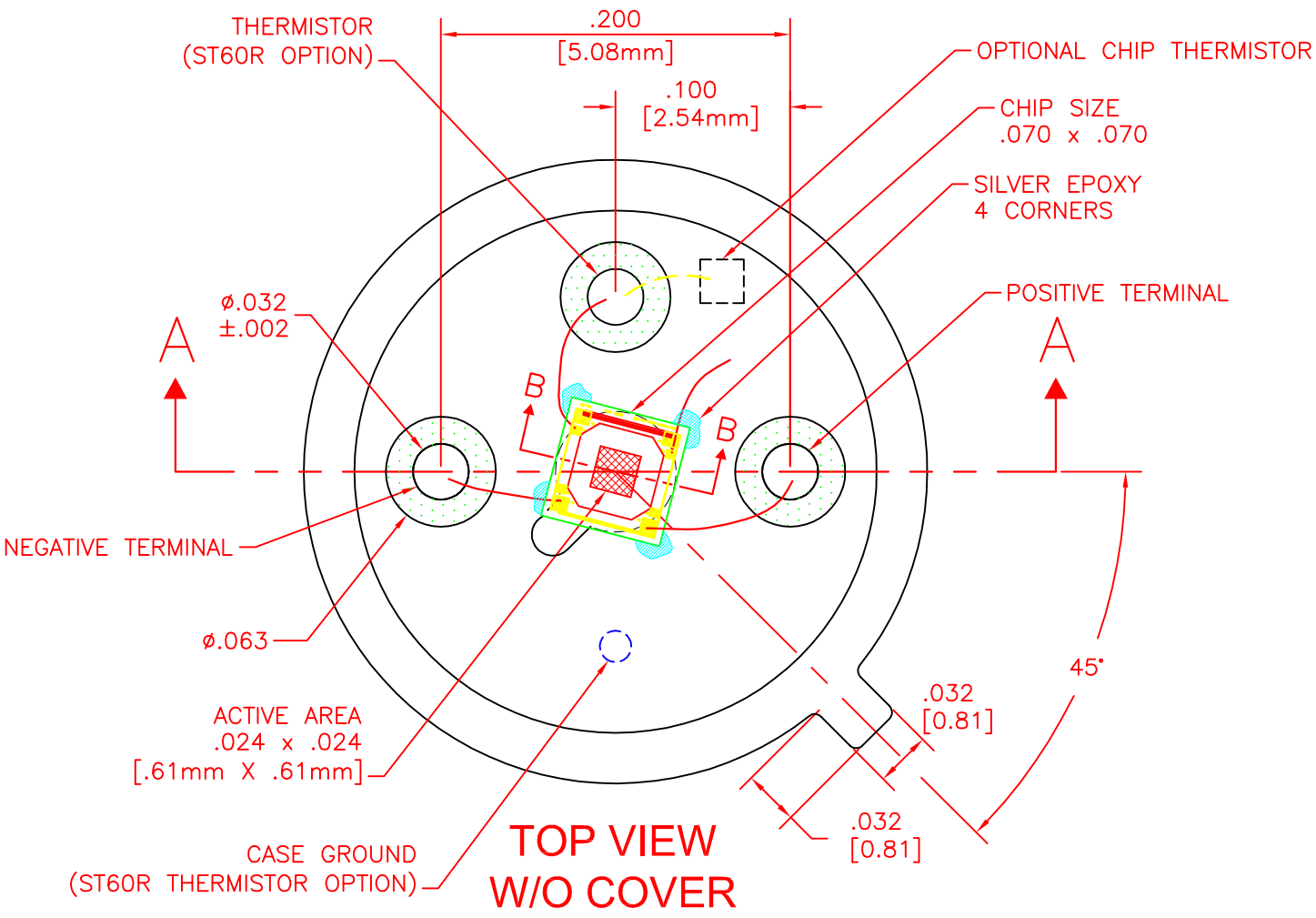
Technical Specifications

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

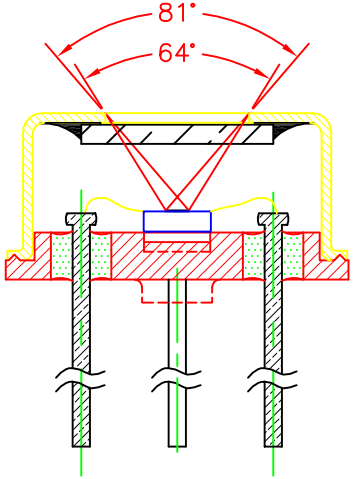
Parameter	Min	Typical	Max	Symbol	Units	Comments
Active Area size		.61 x .61		AA	mm	Hot junction size, per element.
Element Area		.37		A	mm^2	
Number of Junctions		80				Per element.
Number of Channels		1				Per detector package.
Output Voltage	80	120	130	V_s	µV	DC, H=330µW/cm^2 (3)
Signal-to-Noise Ratio	2,365	3,831	4,792	SNR	√Hz	DC, SNR=V_s/V_n
Responsivity	65.2	97.7	105.9	ℜ	V/W	DC, ℜ=V_s/HA (2)
Resistance	45	60	70	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	27.1	31.3	33.8	V_n	nV/√Hz	V_n^2=4kTR
Noise Equivalent Power	.26	.32	.52	NEP	nW/√Hz	DC, NEP= V_n HA/V_s (2)
Detectivity	1.17	1.90	2.38	D*	10^8cm√Hz/W	DC, D*=V_s/ V_n H√A (2)
Time Constant		18		𝒯	ms	Chopped, -3dB point (1)
Field of View		64°/81°		FOV	Degrees	See Assembly Drawings for FOV Description.
Package Type		TO-5				Standard package hole size: ∅.150"
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

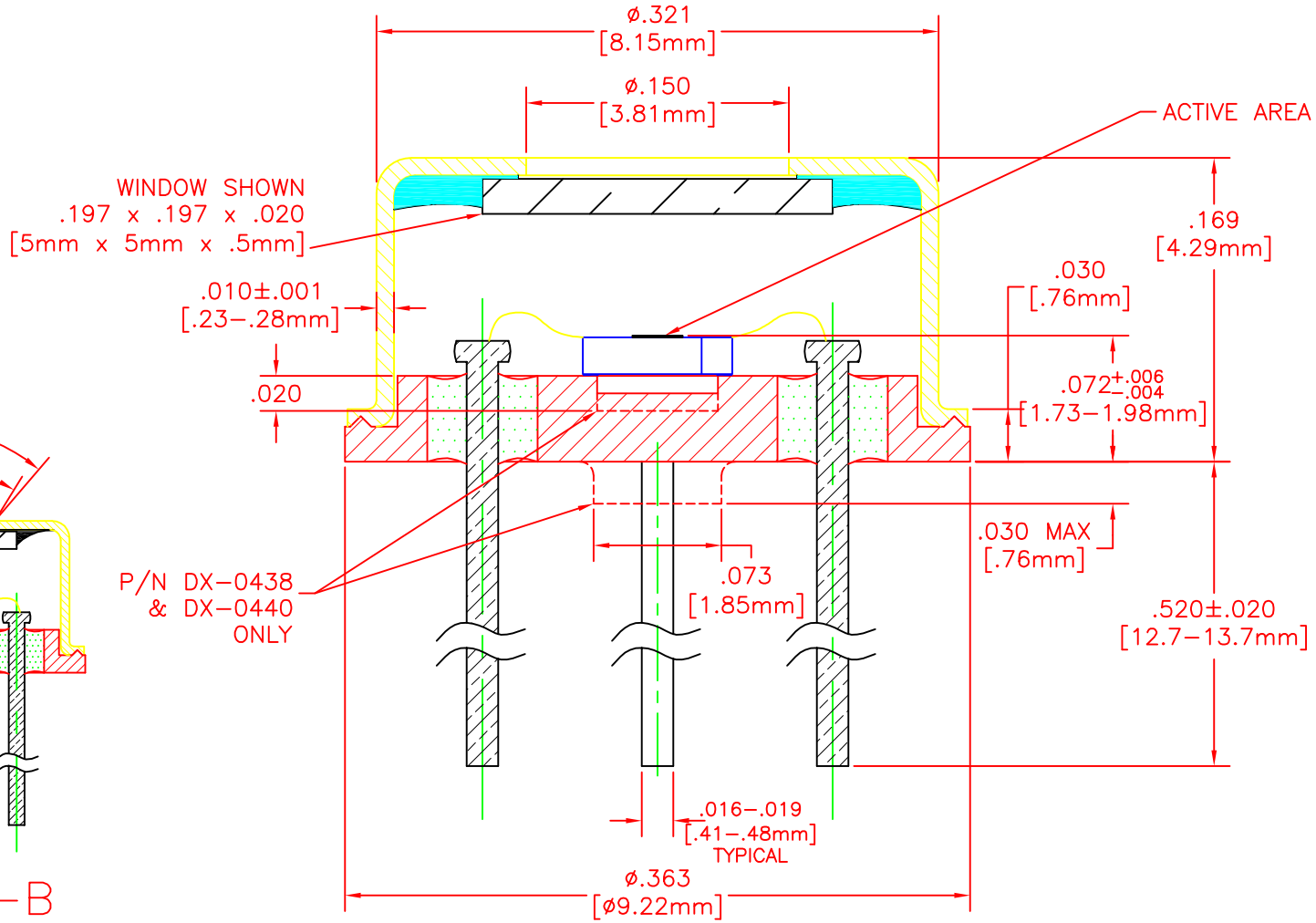
Notes: **(1)** Parameter is not 100% tested. 90% of all units meet these specifications. **(2)** A is detector area in cm^2. **(3)** Test Conditions: 500K Blackbody source; Detector active surface 10cm from 0.6513cm Diameter Blackbody Aperture.



UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .01 .XXX ± .005 ANGLES ±		DEXTER RESEARCH CENTER, Inc. 7300 Huron River Dr., Dexter, MI 48130, ph. 734-426-3921 fax 734-426-5090	
APPROVALS	DATE	ASSEMBLY, ST60/ST60R, TO-5 RW, TOP VIEW	
DRAWN: DLJ	3/29/04		
CHECKED:		SIZE: A / SCALE: 10" = 1 " / DWG. NO. 1023.3 / REV. D / PAGE: 2 OF 2	
ENGINEERED:		DRC PART NO. / MATERIAL: / FINISH:	
APPROVED:			



SECTION B–B
.5X SCALE



SECTION A–A

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APPROVALS	DATE	ASSEMBLY, ST60/ST60R, TO–5 RW CROSS SECTION, .150 TALL COVER			
DRAWN: DLJ	12/16/10	SIZE: A	SCALE: 10" = 1 "	DWG. NO. 1023.1	REV. E	PAGE: 1 OF 2
CHECKED:		MATERIAL:		FINISH:	
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APPROVED:					