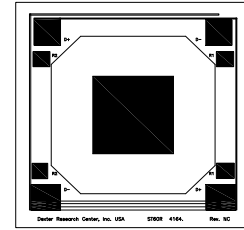




ST60 TO-18 & ST60R TO-18

Silicon Based Thermopile Detector

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



Detector circuit overlay

Options: 1) See [Standard Windows and Filters](#) for list of optical filter options. 2) **ST60R TO-18** version offers a low-cost (20% tolerance) poly-silicon resistor to be used as a PTC thermistor. 3) Internal 30k Ω 5% NTC chip thermistor provides ambient package temperature measurement. See [Thermistor Options](#) p/n: DC-4005. See [Thermopile Configuration Table](#) for more options.

Applications: Excellent for non-contact temperature, horizon sensor, tympanic ear thermometer, infant thermometer applications.

Benefit: High output, small active area, fast time constant in a small package.



ST60 TO-18

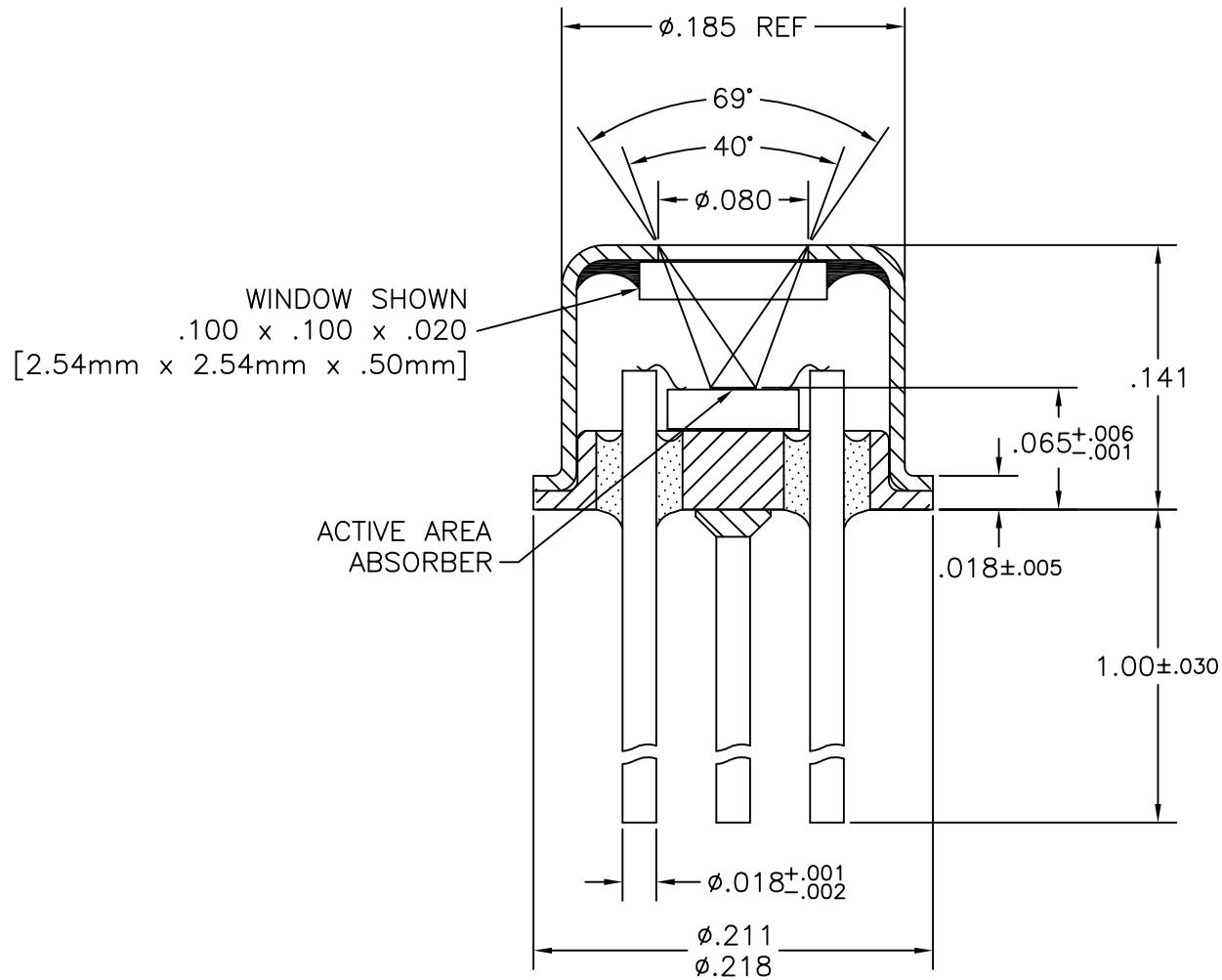
Technical Specifications

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	65	85	95	V _s	μV	DC, H=330 $\mu\text{W}/\text{cm}^2$ (3)
Signal-to-Noise Ratio	1,994	2,834	3,502	SNR	$\sqrt{\text{Hz}}$	DC, SNR=V _s /V _n
Responsivity	52.9	69.2	77.4	\mathcal{R}	V/W	DC, $\mathcal{R}=V_s/HA$ (2)
Resistance	45	55	65	R	k Ω	Detector element
Temperature Coefficient of \mathcal{R}		-.04			%/ $^{\circ}\text{C}$	Best linear fit, 0° to 85°C (1)
Temperature Coefficient of R		.105			%/ $^{\circ}\text{C}$	Best fit, 0° to 85°C (1)
Noise Voltage	27.1	30.0	32.6	V _n	nV/ $\sqrt{\text{Hz}}$	V _n ² =4kTR
Noise Equivalent Power	.35	.43	.62	NEP	nW/ $\sqrt{\text{Hz}}$	DC, NEP= V _n HA/V _s (2)
Detectivity	.99	1.41	1.74	D*	10 ⁹ cm $\sqrt{\text{Hz}}/\text{W}$	DC, D*=V _s /V _n H \sqrt{A} (2)
Time Constant		18		τ	ms	Chopped, -3dB point (1)
Field of View	40°/69°			FOV	Degrees	See Assembly Drawings for FOV Description.
Package Type	TO-18					Standard package hole size: $\varnothing.080"$
Operating Temperature	-50		100	T _a	$^{\circ}\text{C}$	
ST60R Thermistor Option	24	28	34	R _T	k Ω	PTC Poly-Silicon resistor on detector die.
ST60R Thermistor Temperature Coefficient of R	.100	.105	.110		%/ $^{\circ}\text{C}$	$\Delta R/(R\Delta T)$, Best fit, 0° to 85°C (1)

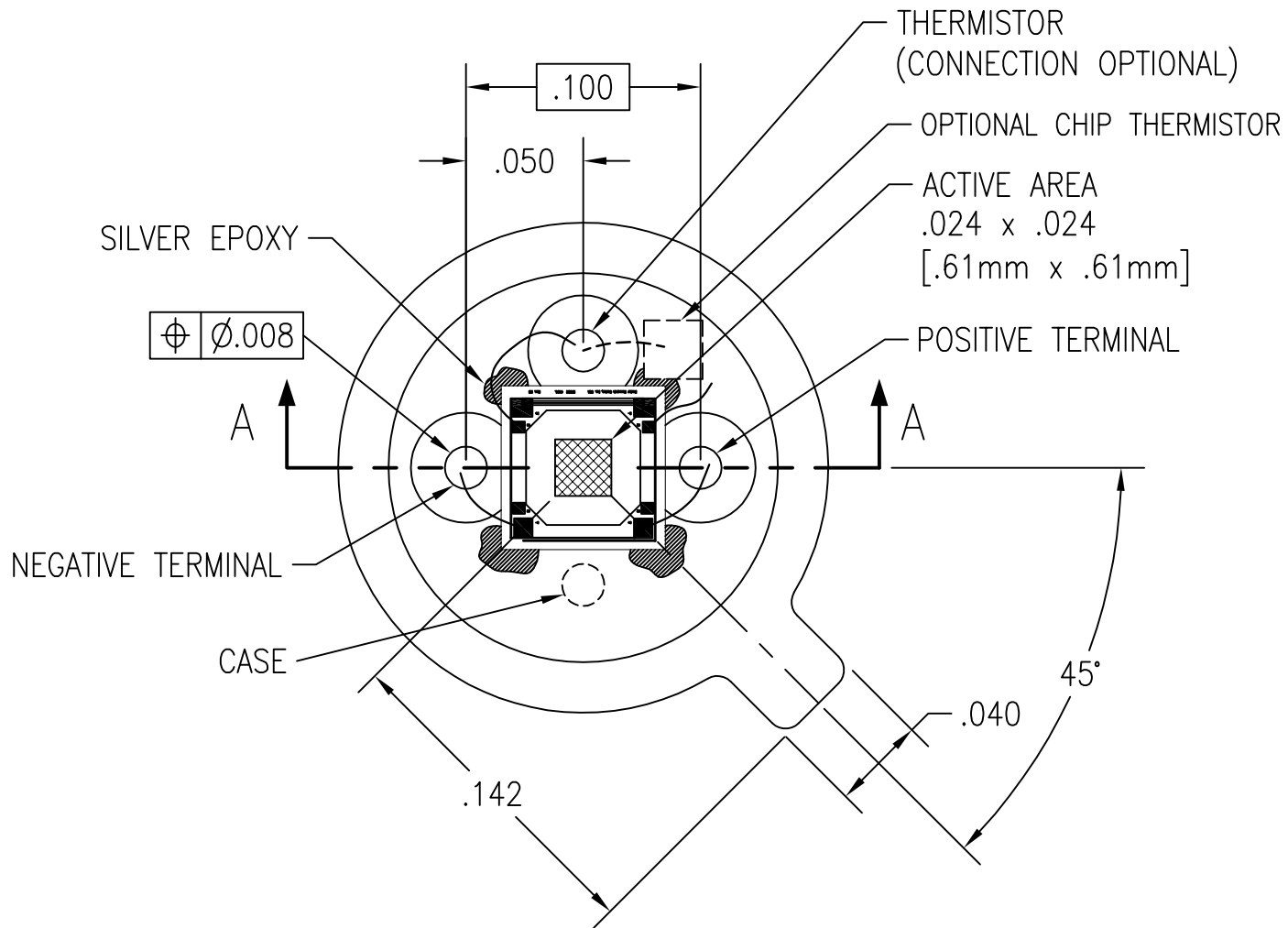
General Specifications: Flat spectral response from 100nm to > 100 μm . Linear signal output from 10⁻⁶ to 0.1W/cm². Maximum incident radiance 0.1W/cm², damage threshold $\geq .5\text{W}/\text{cm}^2$

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



NOTE: SEE DWG 1041.1 FOR TOP VIEW

UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES.			DEXTER RESEARCH CENTER, Inc.			
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FRACCTIONS ±	DECIMALS .XX ± .XXX ± .005	ANGLES ±	ASSEMBLY, ST60, TO-18, .141 TALL Ø.080 HOLE, CROSS SECTION			
APPROVALS	DATE					
DRAWN:	DLJ	10/19/07	SIZE:	SCALE:	DWG. NO.	REV. PAGE:
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ENGINEERED:			DRC PART NO.	MATERIAL:	FINISH:	
APPROVED:						



TOP VIEW
W/O COVER

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ASSEMBLY, ST60/ST60R, TO-18				
TOP VIEW				
SIZE: A	SCALE: 13" = 1"	DWG. NO. 1041.1	REV. E	PAGE: 1 OF 2
DRC PART NO.		MATERIAL:		FINISH: