

9 Marzo 2011



Advanced Measurement Technology, Inc.

ORTEC®

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AMETEK®

Quality Assurance Data Sheet Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>2011</u>	Alpha Resolution <u>14.5</u> keV FWHM ^(a)
Serial No. <u>48-163 E</u>	Noise width <u>6.7</u> keV FWHM ^(a)
Model No. <u>TB-016-050-1000</u>	Shaping Time Constant <u>0.5</u> μs
Active Area (nominal) <u>50</u> mm ²	Reverse Current <u>0.14</u> μamps @ <u>150</u> volts
5.486 MeV Alpha Resolution <u>16</u> keV FWHM ^(a)	Temperature <u>22</u> °C <i>OK</i>
Noise Width <u>9</u> keV FWHM ^(a)	Sensitive Thickness <u>1014</u> microns
Temperature 22°C <u>22</u>	Nominal Resistivity <u>> 17 K</u> Ωcm
Shaping Time Constant <u>0.5</u> μs	Electrode Thickness: Au <u>40.6</u> μgm/cm ²
Sensitive Depth (minimum) <u>950 - 1050</u> microns	Al <u>40.7</u> μgm/cm ²
Operating Bias <u>150</u> volts	
Pos [X] <u>Neg []</u>	

14.2 keV
OK
6.3 keV
90%
OK

NOTES:

WARRANTY TERMS	GENERAL SPECIFICATIONS
<p>Detectors are guaranteed to meet the minimum specifications of the warranty basis data above for a period of <u>12 MONTHS</u> from the date of shipment if used in careful laboratory conditions as outlined in the ORTEC Detector Instruction Manual. During the term of the original warranty period the detector will be repaired or replaced at ORTEC option, at no charge to the user with service credit extended for unused portion of warranty period from date of notification of failure.</p> <p>ORTEC makes no other warranties, express or implied, and specifically NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.</p> <p>ORTEC's exclusive liability is limited to repairing or replacing, at ORTEC's option, items found by ORTEC to be defective in workmanship or materials within one year from the date of delivery. ORTEC's liability on any claim of any kind, including negligence, loss or damages arising out of, connected with, or from the performance or breach thereof, or from the manufacture, sale, delivery, resale, repair, or use of any item or services covered by this agreement of purchase order shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives use to the claim. In no event shall ORTEC be liable for special or consequential damages.</p>	<p>1. All detectors are operated in excess of 12 hours in vacuum of 10⁻⁴ mm of Hg before taking data shown.</p> <p>2. Surface barrier type detectors have a front surface dead layer no greater than that corresponding to 20 keV energy isos from a 5.486 MeV alpha.</p> <p>a. Alpha resolution is the full-width at half-maximum (FWHM) of a 5.486 MeV thin ²⁴¹Am alpha source spectrum line measured with detector and source in vacuum with stated high voltage and includes the noise contribution of an ORTEC Amplifier System.</p> <p>b. Noise Width is the FWHM of an ORTEC precision pulse generator line spectrum with detector connected as a noise source to input of an ORTEC Amplifier System, and at stated bias voltage. Noise width is generally somewhat less than alpha resolution, and is very nearly equal to beta or proton resolution for totally absorbed particles.</p>
	Data Certified by: <u>J. P. Thomas</u>

When the bias voltage is applied to the detector through the preamplifier, the voltage drop across the bias resistor of the preamplifier should be accounted for. Thus, if R is the value of this resistor (see Preamplifier's Instruction Manual), V the applied voltage, and I the leakage current, then the effective bias voltage on the detector V_e is given by:

$$V_e = V - IR$$

In some cases IR may not be negligible when compared with V, and consequently, the value of V must be increased until V_e reaches the recommended value.

Special Test Data _____