

**EG&G ORTEC**

100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37831-0895 U.S.A. • TEL.: (615) 482-4411 • TELEX: 55-7450

QUALITY ASSURANCE DATA

Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>5/30/86</u> Serial No. <u>26-151C</u>	Alpha Resolution <u>18.2</u> KeV FWHM ^(a)
Model No. <u>AR-053-900-500</u>	Noise width <u>11.2</u> KeV FWHM ^(b)
Active Area (nominal) <u>900</u> mm ²	Shaping Time Constant <u>0.5</u> μ S
5.486 MeV Alpha Resolution <u>53</u> KeV FWHM ^(a)	Reverse Current <u>1.92</u> μ amps @ <u>200</u> volts
Noise width <u>48</u> KeV FWHM ^(b)	Temperature <u>21</u> °C
Temperature 22°C _____	Sensitive Thickness <u>2500</u> microns
Shaping Time Constant <u>0.5</u> μ S	Nominal Resistivity <u>19K</u> Ω cm
Sensitive Depth (minimum) <u>500</u> microns	Electrode Thickness: Au <u>80.0</u> μ gm/cm ²
Operating Bias <u>200</u> volts	Al <u>50.0</u> μ gm/cm ²
Pos <input type="checkbox"/> Neg <input checked="" type="checkbox"/>	

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 mo</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise 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^{-6} 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 loss 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>Reba Elliott</u>
<p>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_D is given by</p> $V_D = V - IR.$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_D reaches the recommended value.</p>	

Special Test Data _____

CLEANING PROCESS FOR R-SERIES DETECTORS

In case of contamination, it is possible to carefully clean the aluminum surface of your R-series detectors.

Procedure:

- a) Pour deionized water into clean beaker.
- b) Dip cotton swab into beaker of water and then carefully blot on clean tissue to remove excess moisture.
- c) GENTLY swab the aluminum surface of the detector.

DO NOT "scrub" detector. A gentle wiping of the detector's aluminum surface with a damp cotton swab a few times should pick up most of the removable contamination.

If Q-Tips are used, loosen cotton around stick and be careful not to allow end of stick to contact aluminum surface.

- d) Blow dry with clean air or nitrogen.

If contamination is due to substances which are not soluble in water, such as grease or oil, methanol may be used as a cleaning agent.

Follow the same procedure as above with greater emphasis on step C. A deionized-water cleaning procedure should follow as a final clean.

**EG&G ORTEC**100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37831-0895, U.S.A.
PHONE (615) 482-4411 • TELEX 499-3119 EGG OKRE UI

QUALITY ASSURANCE DATA

Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>9/30/87</u> Serial No. <u>27-462C</u>	Alpha Resolution <u>19.5</u> KeV FWHM ^(a)
Model No. <u>TB-050-900-1000-S</u>	Noise width <u>14.6</u> KeV FWHM ^(b)
Active Area (nominal) <u>900</u> mm ²	Shaping Time Constant <u>0.5</u> μs
5.486 MeV Alpha Resolution <u>050</u> KeV FWHM ^(a)	Reverse Current <u>1.03</u> μamps @ <u>250</u> volts
Noise width <u>40</u> KeV FWHM ^(b)	Temperature <u>21</u> °C
Temperature 22°C <u>-</u>	Sensitive Thickness <u>1017</u> microns
Shaping Time Constant <u>0.5</u> μs	Nominal Resistivity <u>16.3K</u> Ωcm
Sensitive Depth (minimum) <u>1017</u> microns	Electrode Thickness: Au <u>40.0</u> μgm/cm ²
Operating Bias <u>250</u> volts	Al <u>40.0</u> μgm/cm ²
Pos <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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 mo.</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise 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 10⁻⁶ 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 loss 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 _____	
<p>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_D is given by</p> $V_D = V - IR.$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_D reaches the recommended value.</p>	

Special Test Data _____

QUALITY ASSURANCE DATA

Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>6/12/85</u> Serial No. <u>23-680D</u>	Alpha Resolution <u>26.8</u> KeV FWHM ^(a)
Model No. <u>BA-045-900-100</u>	Noise width <u>22.8</u> KeV FWHM ^(b)
Active Area (nominal) <u>900</u> mm ²	Shaping Time Constant <u>0.5</u> μ s
5.486 MeV Alpha Resolution <u>45</u> KeV FWHM ^(a)	Reverse Current <u>39</u> μ amps @ <u>70</u> volts
Noise width <u>40</u> KeV FWHM ^(b)	Temperature <u>21</u> °C
Temperature 22°C <u>-</u>	Sensitive Thickness <u>>100</u> microns
Shaping Time Constant <u>0.5</u> μ s	Nominal Resistivity <u>4.8K</u> Ω cm
Sensitive Depth (minimum) <u>100</u> microns	Electrode Thickness: Au <u>40.0</u> μ gm/cm ²
Operating Bias <u>70</u> volts	Al <u>40.0</u> μ gm/cm ²
Poe <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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 Mo</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise to the claim. In no event shall ORTEC be liable for special or consequential damages.</p>	<ol style="list-style-type: none"> All detectors are operated in excess of 12 hours in vacuum of 10^{-4} mm of Hg before taking data shown. Surface barrier type detectors have a front surface dead layer no greater than that corresponding to 20 KeV energy loss from a 5.486 MeV alpha. <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>
<p>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_0 is given by</p> $V_0 = V - IR$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_0 reaches the recommended value.</p>	
<p>Special Test Data _____</p> <p>_____</p> <p>_____</p> <p>_____</p>	

**EG&G ORTEC**

100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37831-0895 U.S.A. • TEL.: (615) 482-4411 • TELEX: 55-7450

QUALITY ASSURANCE DATA

Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>9/9/86</u> Serial No. <u>26-151C</u>	Alpha Resolution <u>19.9</u> KeV FWHM ^(a)
Model No. <u>BR-053-900-500</u>	Noise width <u>13.0</u> KeV FWHM ^(b)
Active Area (nominal) <u>900</u> mm ²	Shaping Time Constant <u>0.5</u> μs
5.486 MeV Alpha Resolution <u>53</u> KeV FWHM ^(a)	Reverse Current <u>2.08</u> μamps @ <u>200</u> volts
Noise width <u>48</u> KeV FWHM ^(b)	Temperature <u>21</u> °C
Temperature 22°C <u>-</u>	Sensitive Thickness <u>±500</u> microns
Shaping Time Constant <u>0.5</u> μs	Nominal Resistivity <u>19K</u> Ωcm
Sensitive Depth (minimum) <u>500</u> microns	Electrode Thickness: Au <u>80.0</u> μgm/cm ²
Operating Bias <u>200</u> volts	Al <u>50.0</u> μgm/cm ²
Pos <input type="checkbox"/> Neg <input checked="" type="checkbox"/>	

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 mo.</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise to the claim. In no event shall ORTEC be liable for special or consequential damages.</p>	<ol style="list-style-type: none">All detectors are operated in excess of 12 hours in vacuum of 10⁻⁶ mm of Hg before taking data shown.Surface barrier type detectors have a front surface dead layer no greater than that corresponding to 20 KeV energy loss from a 5.486 MeV alpha.<ol style="list-style-type: none">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.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>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_b is given by</p> $V_b = V - IR.$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_b reaches the recommended value.</p>	<p>Data Certified by <u>CW</u></p>
<p>Special Test Data _____</p> <p>_____</p> <p>_____</p> <p>_____</p>	

CLEANING PROCESS FOR R-SERIES DETECTORS

In case of contamination, it is possible to carefully clean the aluminum surface of your R-series detectors.

Procedure:

- a) Pour deionized water into clean beaker.
- b) Dip cotton swab into beaker of water and then carefully blot on clean tissue to remove excess moisture.
- c) GENTLY swab the aluminum surface of the detector.
DO NOT "scrub" detector. A gentle wiping of the detector's aluminum surface with a damp cotton swab a few times should pick up most of the removable contamination.
If Q-Tips are used, loosen cotton around stick and be careful not to allow end of stick to contact aluminum surface.
- d) Blow dry with clean air or nitrogen.

If contamination is due to substances which are not soluble in water, such as grease or oil, methanol may be used as a cleaning agent.

Follow the same procedure as above with greater emphasis on step C. A deionized-water cleaning procedure should follow as a final clean.

FICHE D'ASSURANCE QUALITÉ

DETECTEURS DE RADIATIONS A BARRIERE DE SURFACE

VALEURS GARANTIES

Date d'expédition 11 Jan 1972 N° de série 10-309
 Modèle n° BA 022 050 700
 Surface active (nominale) 50 mm²
 Résolution alpha 22 kev (1mh)
 Largeur de bruit 18 kev (1mh)
 Profondeur désertée (minimum) 700 microns
 Polarisation de travail 200 volts
 Positif ☒ Négatif ☐

VALEURS MESUREES

Résolution alpha 18.3 kev (1mh)
 Largeur de bruit 14.2 kev (1mh)
 Epaisseur sensible 700 microns
 Résistivité nominale 9900 Ω cm
 Courant inverse 0.57 μA à 200 volts
 Epaisseur des électrodes : Au 40.4 μg/cm²
 Al 40.1 μg/cm²

Notes : Le détecteur est garanti aux spécifications de base ci-dessus pour une période de 12 mois à partir de la date d'expédition, s'il est utilisé soigneusement dans les conditions requises par le manuel d'instructions ORTEC. Durant cette période, le détecteur sera réparé ou remplacé (choix étant laissé à ORTEC), sans frais pour l'utilisateur, avec reconduction de la période de garantie non utilisée. La responsabilité d'ORTEC est limitée à la réparation ou au remplacement. Les frais d'expédition sont à la charge du client.

SPECIFICATIONS GENERALES

- Tous les détecteurs ont fonctionné au minimum 12 h dans un vide de 10⁻⁸ Torr avant mesure de leurs spécifications.
- Les détecteurs barrière de surface ont une couche morte de face avant inférieure à celle correspondant à une perte d'énergie de 20 kev pour des alphas de 5,5 Mev.

Notes :

- La résolution alpha est la largeur à mi-hauteur (1mh) du spectre obtenu à partir d'une source mince d'²⁴¹Am à 5,5 Mev, mesuré avec détecteur et source dans le vide, à la polarisation spécifiée, y compris l'élargissement dû au bruit d'une chaîne d'amplification ORTEC.
- La largeur de bruit est la largeur à mi-hauteur d'un pic obtenu avec un générateur d'impulsions de précision, relié à l'entrée d'une chaîne d'amplification ORTEC, à la polarisation spécifiée. La largeur de bruit est généralement un peu inférieure à la résolution α et est très proche de la résolution pour β ou protons, pour des particules totalement absorbées.

Spécifications certifiées par [Signature]

Tests spéciaux :

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100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37830
INCORPORATED PHONE (615) 482-4411 TWX 810-572-1078

QUALITY ASSURANCE DATA

SEMICONDUCTOR RADIATION DETECTORS

WARRANTY BASIS

Shipment Date Jan 11, 1972 Serial No. 10-309
Model No. BA 022 050-700
Active Area (nominal) 50 mm²
Alpha Resolution 22 Kev FWHM^(a)
Noise width 18 Kev FWHM^(b)
Sensitive Depth (minimum) 700 microns
Operating Bias 200 volts
Pos ☒ Neg ☐

ACTUAL MEASUREMENTS

Alpha Resolution 18.3 Kev FWHM^(a)
Noise width 14.2 Kev FWHM^(b)
Sensitive Thickness 700 microns
Nominal Resistivity 9900 Ω cm.
Reverse Current 0.57 μ amps @ 200 volts
Electrode Thickness: Au 40.4 μ gm/cm²
Al 40.1 μ gm/cm²

NOTES:

WARRANTY TERMS

Detectors are guaranteed to meet the minimum specifications of the warranty basis data above for a period of 12 mo 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. ORTEC liability is limited to repair or replacement, at ORTEC option of the detector during the term of the original warranty period only. Shipping expense during warranty is to the account of the customer. No consequential liability for malfunction beyond said repair or replacement can be assumed.

GENERAL SPECIFICATIONS

1. All detectors are operated in excess of 12 hours in vacuum of 10⁻⁶ mm of Hg before taking data shown.
2. Surface barrier type detectors have a front surface dead layer no greater than that corresponding to 20 Kev energy loss from a 5.5 Mev alpha.

NOTES:

- a. Alpha Resolution is the full-width at half-maximum (FWHM) of a 5.5 Mev thin Am²⁴¹ alpha source spectrum line, measured with detector and source in vacuum, with stated bias voltage, and includes the noise contribution of an ORTEC Amplifier System.
- b. Noise Width is the FWHM of an ORTEC precision pulse generator line spectrum with detector connected as a noise source to input of 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.

Data Certified by Elling

Special Test Data _____

ORTEC

INCORPORATED

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PHONE (615) 482-4411 TWX 810-572-1078

QUALITY ASSURANCE DATA

SEMICONDUCTOR RADIATION DETECTORS

WARRANTY BASIS

Shipment Date 12-9-70 Serial No. 10-311
Model No. A-022-050-700
Active Area (nominal) 50 mm²
Alpha Resolution 22 Kev FWHM^(a)
Noise width 18 Kev FWHM^(b)
Sensitive Depth (minimum) 700 microns
Operating Bias 225 volts
Pos ☒ Neg ☐

ACTUAL MEASUREMENTS

Alpha Resolution 16.9 Kev FWHM^(a)
Noise width 11.5 Kev FWHM^(b)
Sensitive Thickness 700 microns
Nominal Resistivity 8600 Ω cm.
Reverse Current .60 μ amps @ 225 volts
Electrode Thickness: Au 40.4 μ gm/cm²
Al 40.1 μ gm/cm²

NOTES:

WARRANTY TERMS

Detectors are guaranteed to meet the minimum specifications of the warranty basis data above for a period of 12 mo. 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. ORTEC liability is limited to repair or replacement, at ORTEC option of the detector during the term of the original warranty period only. Shipping expense during warranty is to the account of the customer. No consequential liability for malfunction beyond said repair or replacement can be assumed.

GENERAL SPECIFICATIONS

1. All detectors are operated in excess of 12 hours in vacuum of 10⁻⁶ mm of Hg before taking data shown.
2. Surface barrier type detectors have a front surface dead layer no greater than that corresponding to 20 Kev energy loss from a 5.5 Mev alpha.

NOTES:

a. Alpha Resolution is the full-width at half-maximum (FWHM) of a 5.5 Mev thin Am²⁴¹ alpha source spectrum line, measured with detector and source in vacuum, with stated bias voltage, and includes the noise contribution of an ORTEC Amplifier System.

b. Noise Width is the FWHM of an ORTEC precision pulse generator line spectrum with detector connected as a noise source to input of 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.

Data Certified by R. E. Elliott

Special Test Data _____

**EG&G ORTEC**

100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37830

QUALITY ASSURANCE DATA

Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>2-8-80</u> Serial No. <u>20-103B</u>	Alpha Resolution <u>16.0</u> KeV FWHM ^(a)
Model No. <u>TB-016-050-1500</u>	Noise width <u>7.2</u> KeV FWHM ^(b)
Active Area (nominal) <u>50</u> mm ²	Time Constant <u>0.5</u> μ S
5.486 MeV Alpha Resolution <u>16.0</u> KeV FWHM ^(a)	Reverse Current <u>.33</u> μ amps @ <u>350</u> volts
Noise width <u>8.0</u> KeV FWHM ^(b)	Temperature <u>20</u> °C
Temperature 22°C _____	Sensitive Thickness <u>1484</u> microns
Time Constant <u>0.5</u> μ S	Nominal Resistivity <u>25,000</u> Ω cm
Sensitive Depth (minimum) <u>1484</u> microns	Electrode Thickness: Au <u>40.0</u> μ gm/cm ²
Operating Bias <u>350</u> volts	Al <u>40.0</u> μ gm/cm ²
Pos <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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 mos.</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise to the claim. In no event shall ORTEC be liable for special or consequential damages.</p>	<ol style="list-style-type: none">All detectors are operated in excess of 12 hours in vacuum of 10^{-9} mm of Hg before taking data shown.Surface barrier type detectors have a front surface dead layer no greater than that corresponding to 20 KeV energy loss from a 5.486 MeV alpha.<ol style="list-style-type: none">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.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.

Data Certified by Ruba Elliott

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_D is given by

$$V_D = V - IR.$$

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

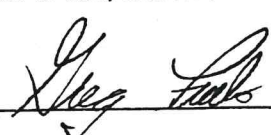
Special Test Data _____

QUALITY ASSURANCE DATA

Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>9-27-78</u> Serial No. <u>180636</u>	Alpha Resolution <u>14.0</u> KeV FWHM ^(a)
Model No. <u>TB-016-050-150-</u>	Noise width <u>6.0</u> KeV FWHM ^(b)
Active Area (nominal) <u>50</u> mm ²	Time Constant <u>0.5</u> μs
5.486 MeV Alpha Resolution <u>16</u> KeV FWHM ^(a)	Reverse Current <u>.11</u> μamps @ <u>120</u> volts
Noise width <u>7</u> KeV FWHM ^(b)	Temperature <u>21</u> °C
Temperature 22°C _____	Sensitive Thickness <u>146</u> microns
Time Constant <u>0.5</u> μs	Nominal Resistivity <u>2000</u> Ωcm
Sensitive Depth (minimum) <u>146</u> microns	Electrode Thickness: Au <u>40.2</u> μgm/cm ²
Operating Bias <u>120</u> volts	Al <u>40.0</u> μgm/cm ²
Pos <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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>12mo</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise 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 loss 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>
<p>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_D is given by</p> $V_D = V - IR.$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_D reaches the recommended value.</p>	
<p>Data Certified by <u></u></p>	

Special Test Data _____

SBF-363
SPA



100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37830 TEL. (615) 482-4411

QUALITY ASSURANCE DATA Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>5/13/81</u> Serial No. <u>20-103-A</u>	Alpha Resolution <u>15.4</u> KeV FWHM ^(a)
Model No. <u>TB-18-50-1500</u>	Noise width <u>8.0</u> KeV FWHM ^(b)
Active Area (nominal) <u>50</u> mm ²	Shaping Time Constant <u>0.5</u> μ S
5.486 MeV Alpha Resolution <u>18</u> KeV FWHM ^(a)	Reverse Current <u>.50</u> μ amps @ <u>375</u> volts
Noise width <u>10</u> KeV FWHM ^(b)	Temperature <u>20</u> °C
Temperature 22° C _____	Sensitive Thickness <u>1481</u> microns
Shaping Time Constant <u>0.5</u> μ S	Nominal Resistivity <u>25K</u> Ω cm
Sensitive Depth (minimum) <u>1481</u> microns	Electrode Thickness: Au <u>40.0</u> μ gm/cm ²
Operating Bias <u>375</u> volts	Al <u>40.0</u> μ gm/cm ²
Pos <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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>1 year</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise 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^{-6} 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 loss 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>
<p>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_D is given by</p> $V_D = V - IR.$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_D reaches the recommended value.</p>	
Special Test Data _____	



100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37830 TEL. (615) 482-4411

QUALITY ASSURANCE DATA Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>3-19-82</u> Serial No. <u>22-113F</u>	Alpha Resolution <u>14.6</u> KeV FWHM ^(a)
Model No. <u>TRB-18-50-1500</u>	Noise width <u>7.8</u> KeV FWHM ^(b)
Active Area (nominal) <u>50</u> mm ²	Shaping Time Constant <u>0.5</u> μ s
5.486 MeV Alpha Resolution <u>18</u> KeV FWHM ^(a)	Reverse Current <u>.57</u> μ amps @ <u>560</u> volts
Noise width <u>10</u> KeV FWHM ^(b)	Temperature <u>21</u> °C
Temperature 22° C _____	Sensitive Thickness <u>1500</u> microns
Shaping Time Constant <u>0.5</u> μ s	Nominal Resistivity <u>17K</u> Ω cm
Sensitive Depth (minimum) <u>1500</u> microns	Electrode Thickness: Au <u>40.0</u> μ gm/cm ²
Operating Bias <u>560</u> volts	Al <u>40.0</u> μ gm/cm ²
Pos <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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 mo.</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise to the claim. In no event shall ORTEC be liable for special or consequential damages.</p>	<ol style="list-style-type: none">All detectors are operated in excess of 12 hours in vacuum of 10^{-9} mm of Hg before taking data shown.Surface barrier type detectors have a front surface dead layer no greater than that corresponding to 20 KeV energy loss from a 5.486 MeV alpha.<ol style="list-style-type: none">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.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>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_D is given by</p> $V_D = V - IR.$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_D reaches the recommended value.</p>	<p>Data Certified by <u>Reba Elliott</u></p>

Special Test Data _____



100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37830 TEL. (615) 482-4411

QUALITY ASSURANCE DATA Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>5/13/81</u> Serial No. <u>21-089F</u>	Alpha Resolution <u>23.4</u> KeV FWHM ^(a)
Model No. <u>TD-15-25-50</u>	Noise width <u>12.5</u> KeV FWHM ^(b)
Active Area (nominal) <u>50</u> mm ²	Shaping Time Constant <u>0.5</u> μ S
5.486 MeV Alpha Resolution <u>—</u> KeV FWHM ^(a)	Reverse Current <u>.05</u> μ amps @ <u>20</u> volts
Noise width <u>15</u> KeV FWHM ^(b)	Temperature <u>21</u> °C
Temperature 22° C <u>—</u>	Sensitive Thickness <u>54.7</u> microns
Shaping Time Constant <u>0.5</u> μ S	Nominal Resistivity <u>600</u> Ω cm
Sensitive Depth (minimum) <u>54.7</u> microns	Electrode Thickness: Au <u>40.0</u> μ gm/cm ²
Operating Bias <u>20</u> volts	Al <u>40.0</u> μ gm/cm ²
Pos <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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>1 year</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise 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^{-6} 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 loss 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>
<p>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_D is given by</p> $V_D = V - IR.$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_D reaches the recommended value.</p>	
Data Certified by <u>Reba Elliott</u>	
Special Test Data _____	



100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37830 TEL. (615) 482-4411

QUALITY ASSURANCE DATA Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>3-19-82</u> Serial No. <u>21-506-D</u>	Alpha Resolution <u>16.3</u> KeV FWHM ^(a)
Model No. <u>TD-15-50-50</u>	Noise width <u>9.0</u> KeV FWHM ^(b)
Active Area (nominal) <u>50</u> mm ²	Shaping Time Constant <u>0.5</u> μ s
5.486 MeV Alpha Resolution <u>—</u> KeV FWHM ^(a)	Reverse Current <u>.17</u> μ amps @ <u>20</u> volts
Noise width <u>15</u> KeV FWHM ^(b)	Temperature <u>21</u> °C
Temperature 22°C <u>—</u>	Sensitive Thickness <u>54.0</u> microns
Shaping Time Constant <u>0.5</u> μ s	Nominal Resistivity <u>408</u> Ω cm
Sensitive Depth (minimum) <u>54.0</u> microns	Electrode Thickness: Au <u>40.0</u> μ gm/cm ²
Operating Bias <u>20</u> volts	Al <u>40.0</u> μ gm/cm ²
Pos <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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>1 year</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise 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^{-9} 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 loss 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>
<p>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_D is given by</p> $V_D = V - IR.$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_D reaches the recommended value.</p>	
Data Certified by <u>Reba Elliott</u>	
Special Test Data _____	



100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37830 TEL. (615) 482-4411

QUALITY ASSURANCE DATA Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>5/13/81</u> Serial No. <u>21-089-E</u>	Alpha Resolution <u>18.6</u> KeV FWHM ^(a)
Model No. <u>TD-15-25-50</u>	Noise width <u>6.7</u> KeV FWHM ^(b)
Active Area (nominal) <u>50</u> mm ²	Shaping Time Constant <u>0.5</u> μ S
5.486 MeV Alpha Resolution <u>-</u> KeV FWHM ^(a)	Reverse Current <u>.05</u> μ amps @ <u>25</u> volts
Noise width <u>15</u> KeV FWHM ^(b)	Temperature <u>20</u> °C
Temperature 22° C _____	Sensitive Thickness <u>54.8</u> microns
Shaping Time Constant <u>0.5</u> μ S	Nominal Resistivity <u>510</u> Ω cm
Sensitive Depth (minimum) <u>54.8</u> microns	Electrode Thickness: Au <u>40.0</u> μ gm/cm ²
Operating Bias <u>25</u> volts	Al <u>40.0</u> μ gm/cm ²
Pos <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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>1 year</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise 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^{-6} 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 loss 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>
<p>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_D is given by</p> $V_D = V - IR.$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_D reaches the recommended value.</p>	
Data Certified by <u>Reba Elliott</u>	
Special Test Data _____	

**EG&G ORTEC**

100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37830 TEL. (615) 482-4411

QUALITY ASSURANCE DATA Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>3-19-82</u> Serial No. <u>22-113-C</u>	Alpha Resolution <u>17.1</u> KeV FWHM ^(a)
Model No. <u>TB-18-50-1500</u>	Noise width <u>9.1</u> KeV FWHM ^(b)
Active Area (nominal) <u>50</u> mm ²	Shaping Time Constant <u>0.5</u> μ s
5.486 MeV Alpha Resolution <u>18</u> KeV FWHM ^(a)	Reverse Current <u>49</u> μ amps @ <u>500</u> volts
Noise width <u>10</u> KeV FWHM ^(b)	Temperature <u>21</u> °C
Temperature 22°C _____	Sensitive Thickness <u>1509</u> microns
Shaping Time Constant <u>0.5</u> μ s	Nominal Resistivity <u>17K</u> Ω cm
Sensitive Depth (minimum) <u>1509</u> microns	Electrode Thickness: Au <u>40.0</u> μ gm/cm ²
Operating Bias <u>560</u> volts	Al <u>40.0</u> μ gm/cm ²
Pos <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise to the claim. In no event shall ORTEC be liable for special or consequential damages.</p>	<ol style="list-style-type: none">All detectors are operated in excess of 12 hours in vacuum of 10^{-6} mm of Hg before taking data shown.Surface barrier type detectors have a front surface dead layer no greater than that corresponding to 20 KeV energy loss from a 5.486 MeV alpha.<ol style="list-style-type: none">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.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>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_b is given by</p> $V_b = V - IR.$ <p>In some cases IR may not be negligible when compared with V, and consequently the value of V must be increased until V_b reaches the recommended value.</p>	
Data Certified by <u>Reba Elliott</u>	

Special Test Data _____

**EG&G ORTEC**

100 MIDLAND ROAD, OAK RIDGE, TENNESSEE 37830

QUALITY ASSURANCE DATA

Semiconductor Radiation Detectors

WARRANTY BASIS	ACTUAL MEASUREMENTS
Shipment Date <u>2-8-80</u> Serial No. <u>18-072 C</u>	Alpha Resolution <u>15.6</u> KeV FWHM ^(a)
Model No. <u>TD-015-050-050</u>	Noise width <u>7.2</u> KeV FWHM ^(b)
Active Area (nominal) <u>50</u> mm ²	Time Constant <u>0.5</u> μ s
5.486 MeV Alpha Resolution <u>25.0</u> KeV FWHM ^(a)	Reverse Current <u>.05</u> μ amps @ <u>45</u> volts
Noise width <u>15.0</u> KeV FWHM ^(b)	Temperature <u>20</u> °C
Temperature 22°C _____	Sensitive Thickness <u>56.6</u> microns
Time Constant <u>0.5</u> μ s	Nominal Resistivity <u>484</u> Ω cm
Sensitive Depth (minimum) <u>56.6</u> microns	Electrode Thickness: Au <u>40.0</u> μ gm/cm ²
Operating Bias <u>45</u> volts	Al <u>40.4</u> μ gm/cm ²
Pos <input checked="" type="checkbox"/> Neg <input type="checkbox"/>	

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 MOS</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 or purchase order, shall in no case exceed the price allocable to the item or service furnished or any part thereof that gives rise to the claim. In no event shall ORTEC be liable for special or consequential damages.</p>	<ol style="list-style-type: none">All detectors are operated in excess of 12 hours in vacuum of 10^{-6} mm of Hg before taking data shown.Surface barrier type detectors have a front surface dead layer no greater than that corresponding to 20 KeV energy loss from a 5.486 MeV alpha.<ol style="list-style-type: none">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.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.

Data Certified by Reba E. Elliott

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_D is given by

$$V_D = V - IR.$$

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

Special Test Data _____