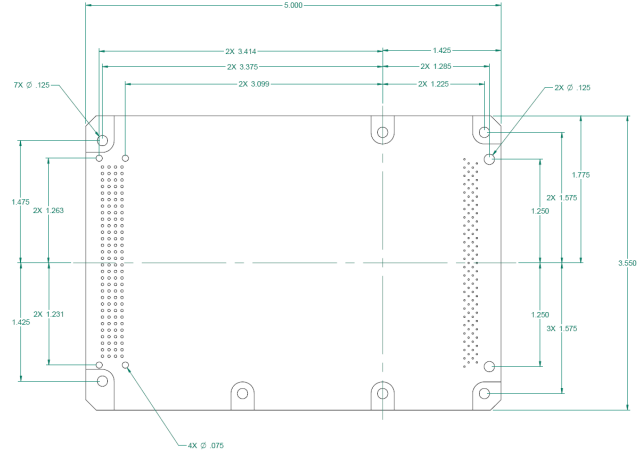


Space Radiation Dosimeter MicroRAD101™

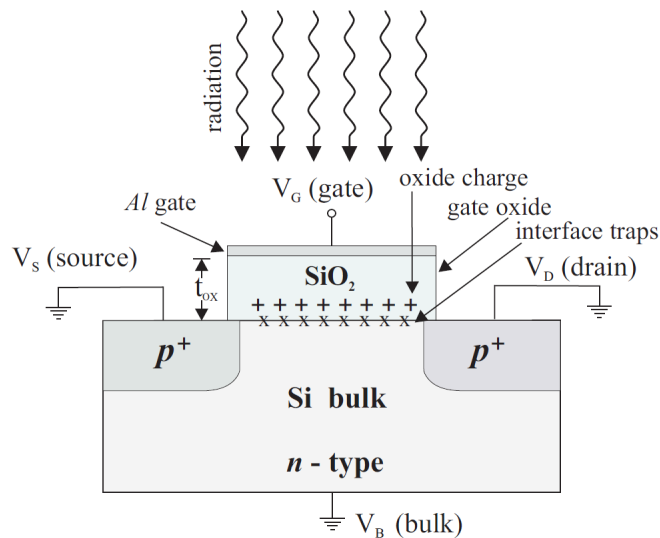
Space Micro's next generation space radiation dosimeter, the MicroRAD101™, represents the state-of-the-art solution for measuring and monitoring total dose radiation effects in space.

The MicroRAD101™ is a low power, high performance space dosimeter solution that meets the challenges of space and satellite harsh environment platforms. By utilizing Space Micro's patented radiation hardening technologies on commercial microelectronics that need space radiation mitigation, the MicroRAD101™ is able to provide industry superior performance in radiation monitoring and measurement along with ultra-low power utilization, all while avoiding highly custom and inherently high cost solutions.



PCI-104S Form Factor

Theory of Operation:



Basic RadFET Dosimeter Cell

Space Micro Inc

MicroRAD101™

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San Diego, CA 92121
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Phone: 858-332-0700
Fax: 858-332-0709



Space Radiation Dosimeter

Benefits:

Lowest Power: Measures incoming radiation while functionally “idle”. Creates and maintains a record of incident radiation while in an idle state, and requires minimal additional current to make a reading.

Lower Cost Potential: The use of standard interfaces and COTS sensors minimizes non-recurring and special component costs.

Maximum Flexibility: Employs a standard PCI-104 interface; the architecture facilitates integration and scaling. The MicroRAD101™ can be manufactured in various form factors, including 3U cPCI and 6U cPCI.

Space Radiation Detector Comparison

<i>Type</i>	<i>Measurement</i>	<i>Dynamic Range</i>	<i>Advantages</i>	<i>Disadvantages</i>
PIN Diode	TID, Dose Rate, particle sensor	Range 10^{14} #/cm ² Sensitivity 10^9 /cm ² -nA	Detection of dose rate events, Fluence	Requires support hardware for dosimetry, Analog
RadFET <i>Thick Oxide</i>	TID	1 krad Sensitivity 1 rad	Small, Unpowered while sensing	Not in Human range, Analog
RadFET <i>Thin Oxide</i>	TID	10 Mrad Sensitivity 10s rad	Small, Unpowered while sensing	Not in Human range, Analog
OSL	TID	μrad- 10 krad	Wide range accurate, Proven	Passive, Destructive readout
Geiger	TID/Dose Rate	μrad- 500rad/hr	Wide range, Proven	Requires accumulation electronics

Applications:

- Space Industry
 - Military, Civil, or Commercial
 - Manned or Unmanned
 - LEO, GEO, or Interplanetary
- Nuclear Industry
 - Power Plants

Space Radiation Dosimeter MicroRAD101™

MicroRAD101™ Dosimetry Card Detailed Features:

- Radiation Measurement Sensitivity, TID
1 Rad to 100 kRad (Si)
- Single Event Latchup (SEL) Immunity
>70 LET (MeV*cm²/mg)
- >100 kRad (Si) Total Dose Tolerance
- Programmable Readout (per
minute/day/orbit/etc.)
- FPGA Processing
- Temperature Sensor for Read
Compensation
- Passive RadFet Sensors
- Permanent Physical Record of Data
- Dimensions = 5" x 3.550"
- Weight = <12 ounces
- Input Voltage = Entirely PCI Bus
powered, requires no additional power
supply
- Power:
 - "Read" Mode = 3W
 - "Standby" Mode = 0.4W
Rad Measurements Occur While
Card is in "Standby" Mode
- Compact PCI-104S Form Factor
 - 33 MHz PCI Internal and External
(v 2.1) Bus
 - 400 kbps IIC Single Master
 - Synchronous Serial Interface
- Temperature Range
 - Operating: -40°C to +85°C
 - Storage: -55°C to +125°C
- Available with COTS or MIL-SPEC
Components

Part Ordering Information:

Part Number

MicroRAD101-EM
MicroRAD101-MIL
MicroRAD101-COTS

Description

Engineering Model
MIL-SPEC components
Space COTS components

Please contact Space Micro Inc for application specific configurations or further details.