

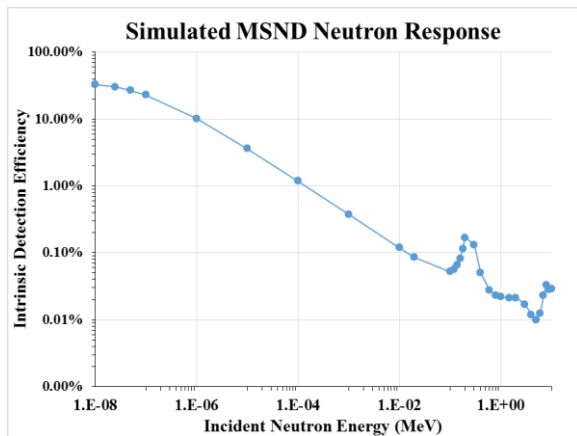


Microstructured Semiconductor Neutron Detector (MSND[®])

[Updated: March 20, 2020]

Description:

The MSND[®] technology implements ⁶Li conversion to yield a thermal neutron detection efficiency of 30%. Optimum HDPE moderator for ²⁵²Cf neutron source at 1-m is 3-4 cm in front and 3-6 cm behind the MSND[®] sensor.



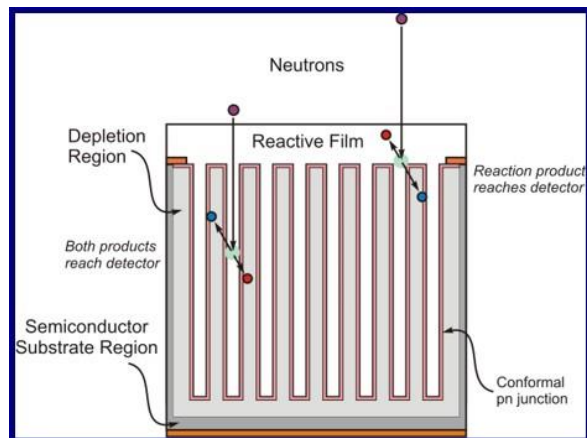
Features:

- Surface mount ceramic package
- Silver RF integrated shielding
- Thin form factor
- Dimensions: 12.6 x 12.6 x 2.4 mm
- 20-30% thermal neutron efficiency
- Low power
- Low voltage
- Solid State
- 1-cm² active area

Solid-State Neutron

Detection Applications:

Neutron detector applications include those for homeland security (e.g., border screening), fundamental research (e.g., neutron scattering beamlines), and industrial monitoring (e.g., personnel monitoring, water content in soil). Solid-state neutron detectors provide an alternative to the ³He-based detectors, maintaining a high thermal-neutron detection efficiency, at a fraction of the volume, mass, voltage, and power required from gas or liquid detectors. Recommend AC coupling to electronic readout circuit.





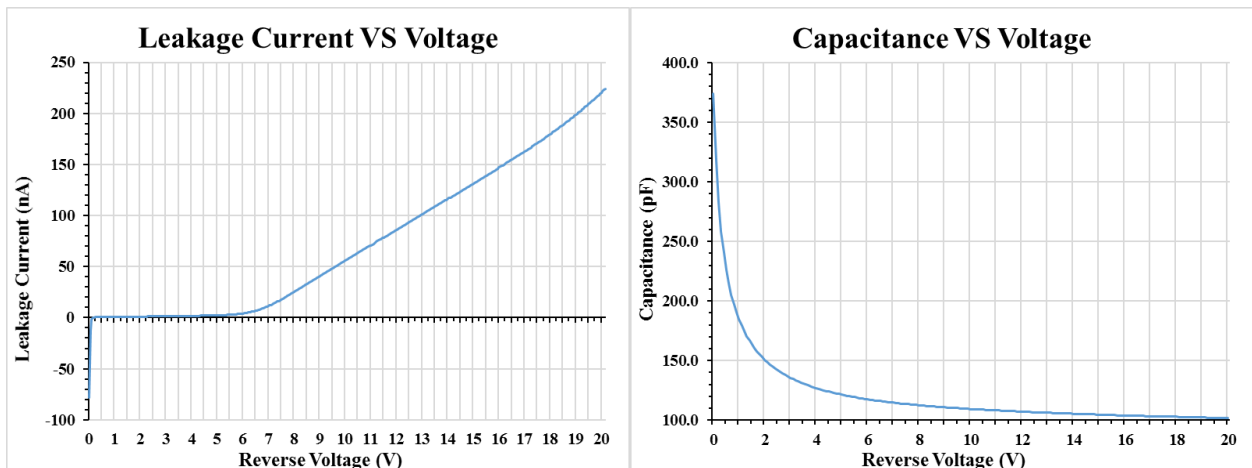
ABSOLUTE MAXIMUM RATINGS (T _a = 25°C)			
PARAMETER	SYMBOL	VALUE	UNIT
Reverse voltage	V _R	50	V
Operating temperature range	T _{amb}	-40 to 60	°C
Storage Temperature	T _{stg}	-40 to 100	°C

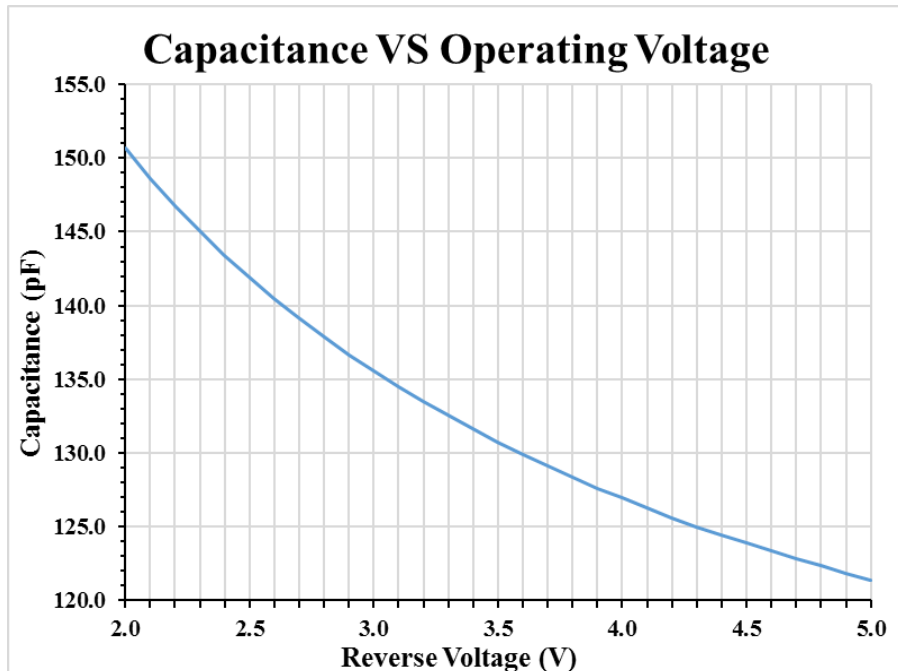
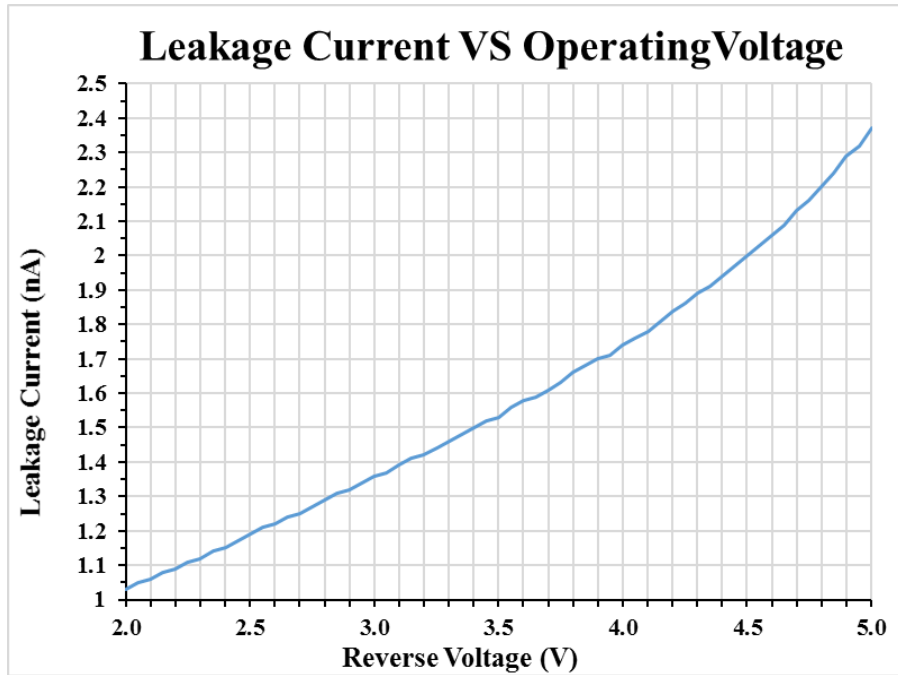
BASIC CHARACTERISTICS (T _a = 25°C)						
PARAMETER	TEST CONDITION	SYMBOL	MIN	TYP	MAX	UNIT
Forward Voltage	I _F = 50mA	V _F		1.05		V
Breakdown Voltage	I _R = 50μA	V _(BR)	28	60	>110	V
Diode Capacitance	V _R = 0V, f = 1MHz, E = 0	C _D		374		pF
	V _R = 5V, f = 1MHz, E = 0	C _D		121		pF
Leakage Current	V _R = 3V	I _L	3	8	20	nA
Leakage Current	V _R = 5V	I _L	17	31	240	nA
Operating Voltage	Recommended	V _R	1	2.5	5	V
Est. Average Charge Per Neutron Capture		Q _{av}		80		fC

BASIC CHARACTERISTICS (T _a = 55°C)						
PARAMETER	TEST CONDITION	SYMBOL	MIN	TYP	MAX	UNIT
Leakage Current	V _R = 2V	I _L	500	550	600	nA
Leakage Current	V _R = 3V	I _L	600	750	850	nA

BASIC CHARACTERISTICS (T _a = 60°C)						
PARAMETER	TEST CONDITION	SYMBOL	MIN	TYP	MAX	UNIT
Leakage Current	V _R = 3V	I _L	1000	1150	1500	nA

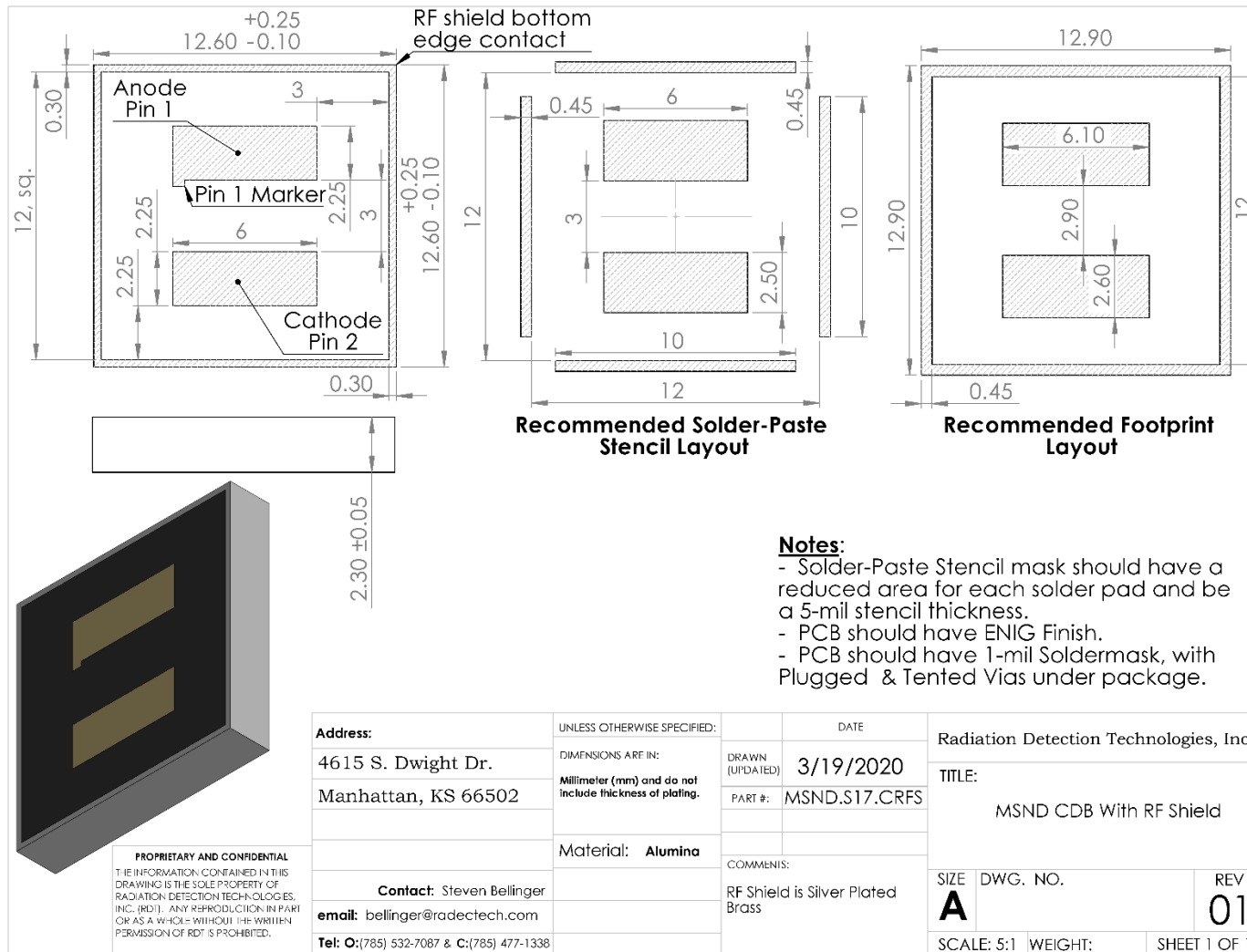
BASIC CHARACTERISTICS (T_a = 25°C)







AGF-series MSND Package Drawing



Address:	UNLESS OTHERWISE SPECIFIED:	DATE	Radiation Detection Technologies, Inc.	
4615 S. Dwight Dr.	DIMENSIONS ARE IN:	DRAWN (UPDATED)	TITLE:	
Manhattan, KS 66502	Millimeter (mm) and do not include thickness of plating.	3/19/2020	MSND CDB With RF Shield	
	Material: Alumina	PART #:	MSND.S17.CRFS	
Contact: Steven Bellinger		COMMENTS:	SIZE	DWG. NO.
email: bellinger@radectech.com		RF Shield is Silver Plated Brass	A	
Tel: O:(785) 532-7087 & C:(785) 477-1338				01
			SCALE: 5:1	WEIGHT:
				SHEET 1 OF 1