

**MISSION**

**LIFETIME**

**Semicoa's Proven Bipolar Transistors**

**RISK**

Jupiter

Long

Europa Clipper & Mars Missions  
Strategic Space

Low

GEO

Industry Benchmark  
Hardness Assurance Program

High LEO

Medium

Space Missions  
High/Low Dose Rate Qualified

Medium

Mid LEO

Military Systems  
Rad Hard

Low LEO

Short

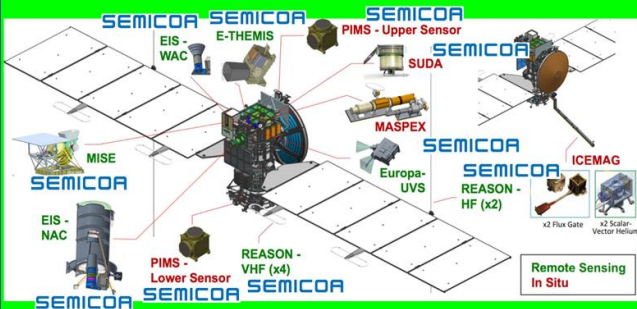
Low Cost  
Rad Tolerant

High

Commercial



## Semicoa Supports Europa Clipper Mission

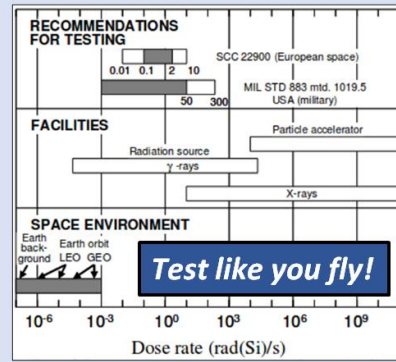


Ten Semicoa transistor part numbers on board!  
86 unique applications throughout the Payload and Spacecraft!

### Europa Clipper



## Semicoa Low Dose Rate Qualified Transistors



• Semicoa offers Low Dose Rate Qualified transistors

• Tested at 10 mrad/s

• 11 samples biased and 11 samples unbiased during exposure

• Parameter end points and deltas used for lot acceptance

• 0.99/90% Statistical acceptance

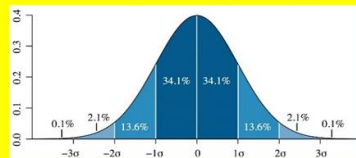
• Marked per MIL-PRF-19500 or Special Part Number

• Now offering JANSE (30Krad at 10 mrad/s), JANSK (50Krad at 10 mrad/s), and JANSU (100Krad at 10 mrad/s)

## Semicoa's Hardness Assurance Program is the Industry Benchmark!

Test 11 samples per wafer for all RHA Product!

KTL Statistics for Lot Acceptance 0.99/90%



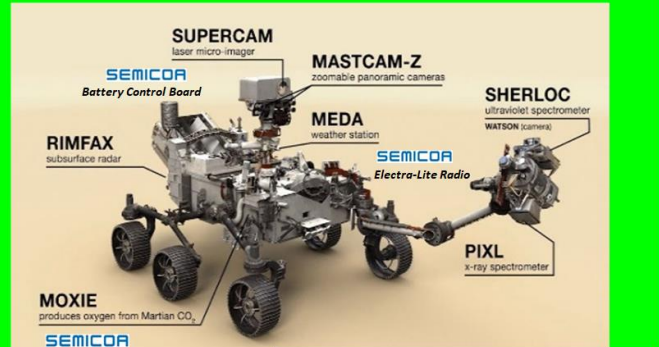
Group D endpoints plus  $\Delta P = P_{PostRad} - P_{PreRad}$

### Semicoa's Rad Hard Bipolar Transistor Product Offering

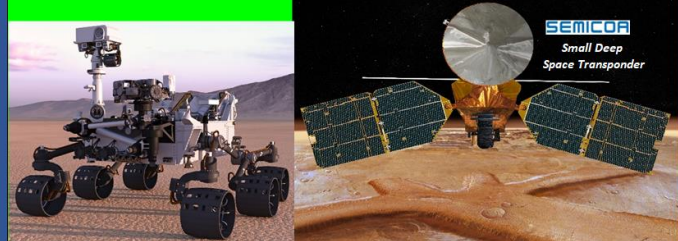
JANS Part Number & Packages	Polarity	Rad Level	JANS Part Number & Packages	Polarity	Rad Level
2N2218, A, AL	NPN	100 Krad(Si)	2N3810, L, U	PNP	100 Krad(Si)
2N2219, A, AL	NPN	100 Krad(Si)	2N3811, L, U	PNP	100 Krad(Si)
2N2221A, AL, AUA, AUB, AUC	NPN	300 Krad(Si)	2N3906, A, UB, AUB	NPN	300 Krad(Si)
2N2222A, AL, AUA, AUB, AUC	NPN	300 Krad(Si)	2N3906A, UB	NPN	100 Krad(Si)
2N2369A, AUB, AUC	NPN	300 Krad(Si)	2N3906A, UB	PNP	100 Krad(Si)
2N2484, UB, UBC	NPN	300 Krad(Si)	2N4029	PNP	300 Krad(Si)
2N2857, UB	NPN	300 Krad(Si)	2N4033, UB	PNP	300 Krad(Si)
2N2904A, AL	PNP	300 Krad(Si)	2N4051, UB, UBC	PNP	300 Krad(Si)
2N2905A, AL	PNP	300 Krad(Si)	2N4449	NPN	300 Krad(Si)
2N2906A, AL, AUA, AUB, AUC	PNP	300 Krad(Si)	2N4957, UB	PNP	300 Krad(Si)
2N2907A, AL, AUA, AUB, AUC	PNP	300 Krad(Si)	2N5151, L	NPN	300 Krad(Si)
2N2919, L, U	NPN	300 Krad(Si)	2N5152, L	NPN	300 Krad(Si)
2N2920, L, U	NPN	300 Krad(Si)	2N5153, L	PNP	300 Krad(Si)
2N2946A	PNP	100 Krad(Si)	2N5154, L	NPN	300 Krad(Si)
2N3019, S	NPN	300 Krad(Si)	2N5466, S*	NPN	300 Krad(Si)
2N3057A	NPN	300 Krad(Si)	2N5794AIC, AUC	NPN	300 Krad(Si)
2N3501, L, UB	NPN	300 Krad(Si)	2N6193	PNP	300 Krad(Si)
2N3635, L, UB	PNP	300 Krad(Si)	2N6987	PNP	300 Krad(Si)
2N3637, L, UB	PNP	300 Krad(Si)	2N6988	PNP	300 Krad(Si)
2N3700, UB	NPN	300 Krad(Si)	2N6989	NPN	100 Krad(Si)
2N3735, L	NPN	300 Krad(Si)	2N6990	NPN	100 Krad(Si)
2N3737, UB	NPN	300 Krad(Si)	2N918, UB	NPN	300 Krad(Si)

All devices available in JANIXV and JANS plus Radiation Hardness  
Semicoa has the Broadest Rad Hard Product Offering on MIL-PRF-19500!

## Semicoa Supports Mission to Mars



### Mars Reconnaissance Orbiter

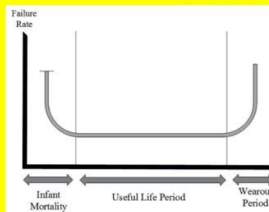


## Semicoa's Military & Space Heritage



## Semicoa's New Space Devices

- Low Cost alternative to MIL-PRF-19500, at a fraction of the cost
- Wafer sample evaluation for Hi/Low Temp, AC parameters, HTRB, Burn-In, High Temp Life, and Steady State Op Life
  - 100% DC parameter tested
- Wafer Fab, Assembly, and Test in government QML facility
  - Laser marked, Pick&Place friendly
  - Rad Tolerant, 30Krad (typical)



Infant Mortality reduced through testing!!



**SEMICOA**  
A DIVISION OF OSI OPTOELECTRONICS