The Future of Radiation Hardened Power Manage IC’s

2008 JAXA Workshop
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Marketing Director – High Rel Products
The History of Intersil

1950
Radiation Inc. founded

1954
GE Solid State begins operations

1956
RCA Solid State begins operations

1967
Harris merges with Radiation Inc.

1967
Intersil founded in Cupertino, California

1967
Intersil acquires GE Solid State

1976
Harris acquires GE Solid State (GE, RCA and Intersil)

1980
Intersil becomes independent company

1986
GE Solid State merges with RCA Solid State

1988
Intersil sells discrete power business to Fairchild

1999
Intersil acquires Elantec

2000
Intersil completes largest IPO for a US semiconductor company

2001
Intersil sells wireless network products group

2002
Intersil acquires Xicor

2003
Intersil acquires Xicor

2004
Intersil sells wireless network products group

2005
Intersil – a pure-play analog company

2008
Dave Bell becomes new CEO

2008
Intersil acquires Xicor

Company Confidential
Intersil Today – The Evolution of Analog

- Pure-play high performance analog company
  - Headquartered in Milpitas, CA
  - ~1400 employees worldwide
  - Design centers N.A., U.K., India
  - Sales locations around the globe
  - 2008 forecasted revenues over $800M
- Market leadership in attractive markets that require Analog differentiation
  - Over 40 diverse product families
- Experts in efficient Power Management
- >40 years supplying high reliability IC’s into Space and Military applications
- Stable balance sheet
Intersil Rad Hard Space Overview

- ~300 Space qualified radiation hardened products available
- 26 new space products developed since CY 2000
- Consistent manufacturing in Intersil’s QML-38535 qualified facility located in Palm Bay, Florida
- All parts are fully compliant to Class V (space level) requirements
- All products on individual DSCC SMD drawings
- TID (total Ionizing dose) rad tested and guaranteed to Method 1019 using in-house Gammacell 220™
- ELDRS characterizations are underway in-house J. L. Shepherd and Associates model 484 low dose rate ⁶⁰Co irradiator can be found at www.Intersil.com
- SEE characterization are underway at Texas A&M and completed reports can be found at www.Intersil.com
• TID and SEE hardened IC products for Space applications
  – **Data Acquisition**: DACs, Multiplexers, Switches
  – **Data Bus**: Line Drivers, Line Receivers
  – **Linear**: Buffers, Comparators, Op Amps, References, Sample & Hold, Transistor Arrays
  – **Power Management**: Full-bridge Drivers, Half-bridge Drivers, Low-side Drivers, Power-up Reset, PWM Controllers, Source Drivers, Synchronous-rectifier Drivers, Voltage Regulators, Voltage References
  – **Memory**: PROMs
  – **Microprocessor and Peripherals**: 80C86 and supporting peripherals
  – **Logic**: CD4xxx, ACS/ACTS, HCS/HCTS

• Development roadmap focused on the “state of the art” high efficiency low voltage power management IC for distribution applications

• Detailed information is available in the “Intersil Solutions for Space Products” brochure and on line at WWW.INTERSIL.COM
New rad hard process for great new PM circuits

- Process was developed as a 6” process at Intersil’s Palm Bay, Fl facility in 2000
  - 30V 0.6um BiMOS (bipolar, NMOS and DMOS)
  - Integrated MOSFET available
- Transferred as to 8” in IBM (Vermont) foundry in early 2002
  - Moved to make process commercially cost competitive
  - Intersil wholly owned proprietary process
- Process of choice for Laptop and Handheld/Battery PM
  - Over 3 billion commercial parts delivered since the transfer
- Validated as a high potential for making “state of the art” voltage high efficiency radiation hardened POL DC/DC converters in late 2007 on commercial designs on RH enhanced process.
  - TID and ELDRS proven >100K rad(Si)
  - SET/SEL demonstrated to >40Mev
  - SEB/SEL demonstrated >80Mev
Roadmap focused on high efficiency PM

- Family of POL DC/DC Converters (Sync Buck Regulators (with integrated MOSFETs), Controllers and Linear Regs) are in development
- Focus on radiation hardened low voltage, high efficiency space POL DC/DC converter applications – in line with Intersil’s core competencies
- Initial part (ISL70001SRH) to be available as a fully compliant SMD in 2009
  - Sync Buck PWM Regulator w/6A integrated MOSFET
  - Validation to complete in February; Samples in March
  - Fully compliant MIL-PRF-38535 QML Class V hermetic CFP and Die in December
- The switching regulators and controllers will be capable of regulating to <1V with >93% efficiencies over the full mil temp range and TID/ELDRS >100K rad(si)
- SEE immunity is being design in for SET/SEU>80Mev with better than to 95% regulation and SEL/SEL> 80Mev.
All Intersil Space parts are:

- SMD controlled and fully compliant to DSCC QML requirements
- Built in MIL-PRF-38535 QML facilities in Palm Bay, FL and IBM in Vermont.
- Radiation tested and qualified by wafer per the SMD for TID in the PB facility using the same test solutions as used to deliver the final product
- Are being characterized for ELDRS sensitivity in an Intersil owned <10mrad/s JL Shepherd Low Dose Irradiator in the PB facility
- Delivered with a complete data pack on CD with Compliance Certification and lot attribute history
- Lot history traceable through the entire manufacturing process with individual units traceable to the wafer level
- We don’t sell upscreened commercial parts screened to be compliant.
Sales Channels and Support

• Sales offices in the US, Europe, Japan, India, China and SE Asia
• Indirect sales through a network of highly skilled and recognized Reps and Distributors
• Customer Service provided by an Customer Network of inside sale representative to answer questions on pricing, lead times, delivery and order status
• Technical support provide through:
  – Fields Aps Engineers in the sales offices
  – Technical resources at the approved Sales Reaps and Distributors
  – On-line FAQ's and over the phone assistance by our trained Centralized Applications Engineering Services
  – Direct contact with Product Line Applications Engineers
Summary

• For 40+ years, Intersil has been serving radiation hardened marketplace with a broad spectrum of Class-V Space products

• Current portfolio of radiation MIL-PRF-38535 QML parts are recognized by our long list of customers for their a history of success in space under the harshest environments.

• Intersil has proven expertise in “latest technology” commercial power management applications, radiation hard products and their requirements, and our long history of delivering DSCC compliant products.

• Using this expertise, Intersil is actively developing new products POL DC/DC power management products capable of operating in these environments and delivering dependable long term efficient service.

...when failure is not an option!!™