RENESAS

INTERSIL SPACE PRODUCTS

Highly Reliable, Efficient, Accurate Radiation Hardened and Radiation Tolerant ICs

2024.06

intersil™

WHEN FAILURE IS NOT AN OPTION™

INTERSIL SPACE ICs

Highly reliable, efficient and accurate radiation-hardened ICs for space applications and other radiation environments.

More than 70 unique Intersil rad-hard ICs were onboard the July 30 liftoff of NASA's Mars 2020 Perseverance rover.

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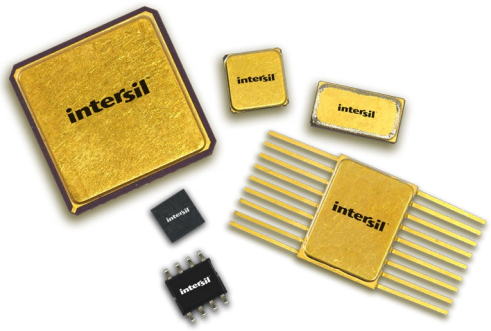


Seven Decades of Flight Experience

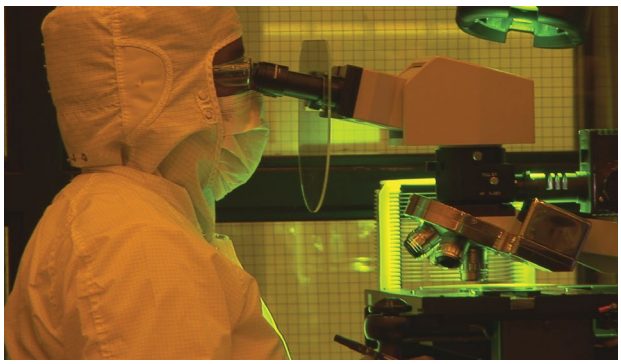
Renesas' (formerly Intersil) history and experience in the space and defense industries spans almost seven decades beginning with the founding of Radiation, Inc. in 1950. Today, we continue to support and release new SMD-based, Class-V/Q radiation hardened (rad-hard) products for Hi-Reliability, and Space marketplaces.

The low dose rate ionizing dose response of semiconductors has become a key issue in space applications. We are addressing this changed market with wafer-by-wafer low dose rate acceptance testing as a complement to current high dose rate acceptance testing.

All of our SMD products are MIL-PRF-38535/QML compliant and are 100% burned in.

By leveraging our latest technology for the consumer marketplace, Intersil space products group is releasing Class V/Q products that are revolutionizing the Hi-Reliability and Space marketplaces.

Intersil Space IC Benefits



Reliable, Proven Supply Chain

Proven proprietary processes and package technologies, shipping over 1 billion ICs per year.

- Strong technology development
  - Proprietary process and package technologies
- Multi-sourcing strategy
  - Sourcing from multiple leading-edge semiconductor foundries & assembly/test partners ensures a steady product supply and reduced risk
- Industry-leading quality & reliability metrics
  - Billion+ ICs shipped every year
  - Less than 1.0 DPPM (defective parts per million) and improving
  - Decades of experience handling military/space products and delivering world-class quality and reliability metrics
  - ISO/TS16949 and AEC-Q100
  - MIL-PRF-38535 compliant and 100% burned in

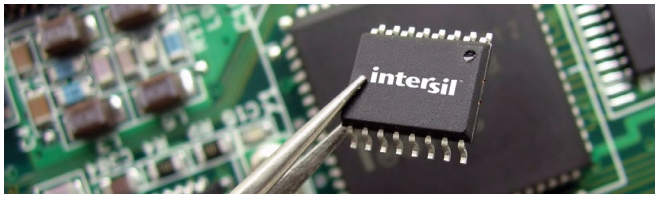
Highest Standards

As a major supplier to the military and aerospace industries, our Intersil product development methodologies reflect experience designing products to meet the highest standards for reliability and performance in challenging environments. Intersil products can be found in virtually every satellite sent into space.

- All products are MIL-PRF-38535/QML compliant
- All products are 100% burned in
- Consistent design and manufacturing in our MIL-PRF-38535-qualified facility in Palm Bay, Florida
- We are one of only a few RHA Defense Logistics Agency (Land and Maritime) QML suppliers
- All products are fully Class V (space level) compliant
- All products are on individual DLA SMD drawings

Assured Product Supply

Long life cycles ensure steady flow of product. We still support customer programs with products in production for over 40 years.



RAD-HARD QML SMD

STANDARD DATA PACKAGE	Class Q	Class V			
Nomenclature, Example	RH Packaged Part	RH Packaged Part	EH Packaged Part	RH Die - Authorized Die Processors Only	EH Die - Authorized Die Processors Only
Part Types	"RH-8" "RHQ" XXXXRH-8 in the part #	"MSR" "NSR" "RHV" "RH-Q" XXXXRH-Q in the part #	"EHV" "EH-Q" XXXXEH-Q in the part #	HS0-XXXXRH-Q IS0-XXXXRH-Q ISL7XXXXRHVX "HSR" or "HMSR" in the part #	HS0-XXXXEH-Q IS0-XXXXEH-Q ISL7XXXXEHVX in the part #
Shipper/Pack Slip	X	X	X	X	X
P.O. Number	X	X	X	X	X
Customer Part Number, Rev (as applicable on the P.O.)	X	X	X	X	X
Intersil Part Number	X	X	X	X	X
Lot Date Code / Trace Code	X	X	X		
Lot Number	X	X	X	X	X
Quantity	X	X	X	X	X
Certificate of Conformance	X	X	X	X	X
Screening Attributes Data		X	X	X	X
Post seal thru end of 100% screening operations		X	X		
Test Operations		X	X		
Test Methods		X	X		
Quantity of units in/out by operation		X	X		
Date of each test		X	X		
PDA as applicable		X	X		
Visual Inspection		X	X	X	X
Document Review		X	X	X	X
Screening Variables & Delta Data - Variables data for all read/record and/or delta operations pre/post burn-in @25°C are provided on electronic media.		X	X		
Group A Attributes (located in Screening Attribute Data if performed)		X	X		
Group B Attributes Summary		X	X		
Group C Attributes Summary		X	X		
Group C Variables & Delta Data - Variables data for all read/record and/or delta operations pre/post life test are provided on electronic media.			X		
Group D Attributes Summary		X	X		
Group E Variables Data for HDR & LDR - Variables data for all read/record operations pre/post rad are provided on electronic media.			X		X
SEM C of C & Photos (if performed)		X	X	X	X
Radiation C of C (High Dose Rate and/or Low Dose Rate)	HDR	HDR	HDR & LDR	HDR	HDR & LDR
X-Ray Report (Film kept on file and available on request. Request must be documented on P.O.)		X	X		

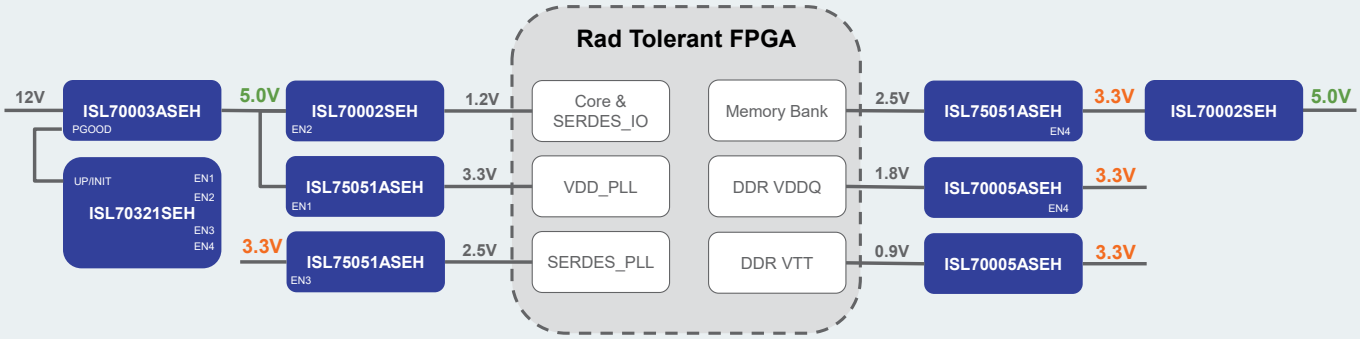
★ All EH product shipments will now come with Group C and E variables data in the data package.

RAD-HARD AND RAD-TOLERANT FPGA POWER SOLUTIONS

Due to their flexibility in design and cost effectiveness compared to ASICs, FPGA-based systems have become increasingly common in space applications as the requirement to do more on-board processing is increasing.

Equally important is the power solution of these multi-rail digital loads. The power supply must be stable and efficient even in the harsh environments of space, which includes total ionizing dose and single event effects. Couple-in the need for a smaller, light-weight power solution and you will find us at the forefront developing leading edge point-of-load (POL) regulators that meet the demands to power these high performance FPGA's.

POWER SOLUTION FOR RADIATION TOLERANT FPGA



Switching Regulators

Part Number	Description	V_{IN} Range	Switching Frequency	SYNC Capable	Current Sharing	High Dose Rate (HDR)	Low Dose Rate (LDR)	DSEE (MeV.cm²/mg)	Qualification Level
ISL73006SLH	Rad Hard Small Form Factor 1A PoL	3 – 18V	500kHz	No	No	N/A	75	86.4	QML-V Equiv.
ISL73007SLH	Rad Hard Small Form Factor 3A PoL	3 – 18V	300kHz - 1MHz	No	No	N/A	75	86.4	QML-V Equiv.
ISL70001ASEH	6A, Rad-Hard Sync Buck Converter	3 - 5.5V	1MHz	Yes	No	100krad(Si)	50krad(Si)	86.4	QML Class V
ISL70002SEH	18A, Rad-Hard Sync Buck Converter	3 - 5.5V	500kHz/1MHz	Yes	Yes	100krad(Si)	50krad(Si)	86.4	QML Class V
ISL70003ASEH	9A, Rad-Hard Sync Buck Converter	3 - 13.2V	300kHz/500kHz	Yes	No	100krad(Si)	50krad(Si)	86.4	QML Class V
ISL70005SEH	Rad-Hard Dual Output Point-of-Load, Int. Sync Buck and Low Dropout Regulator	3 - 5.5V	100kHz - 1MHz	Yes	No	100krad(Si)	75krad(Si)	86.4	QML Class V

Low Dropout Regulators

Part Number	Description	V_{IN} Range	Dropout @ 1A	Output Option	Quiescent Current	High Dose Rate (HDR)	Low Dose Rate (LDR)	DSEE (MeV.cm²/mg)	Qualification Level
ISL75051ASEH	3A, Rad-Hard, Positive, Ultra-Low Dropout Regulator	2.2 - 6V	65mV	Adjustable	11mA	100krad(Si)	50krad(Si)	86.4	QML Class V
ISL73051ASEH	3A, Rad-Hard, Positive, Ultra-Low Dropout Regulator	2.2 - 6V	65mV	Adjustable	11mA	N/A	50krad(Si)	86.4	QML Class V

Power Supply Sequencers

Part Number	Description	V_{IN} Range	Quiescent Current	Rising/ Falling Delay	PGOOD Timer	High Dose Rate (HDR)	Low Dose Rate (LDR)	DSEE (MeV.cm²/mg)	Qualification Level
ISL70321SEH	Rad-Hard Quad Power Supply Sequencers	3 - 13.2V	3.5mA	2 -20ms	4 - 40ms	100krad(Si)	75krad(Si)	86.4	QML Class V
ISL73321SEH	Rad-Hard Quad Power Supply Sequencers	4 - 13.2V	3.5mA	2 -20ms	4 - 40ms	N/A	75krad(Si)	86.4	QML Class V

Radiation Hardened

RAD-HARD POWER

Radiation Hardened GaN Power Solutions

Robust Core Power Solutions for High Performance FPGAs and ASICs

The ISL73847SEH, ISL73041SEH and ISL70020SEH work together to provide a robust and precise power solution for core power rails that have tight tolerances.

ISL73847SEH: Dual Phase PWM Controller

- 4.5V to 19V supply voltage
- ±0.67% regulation accuracy (worst case)
- True differential remote sensing of V_{OUT}
- Single or Multiphase Operation

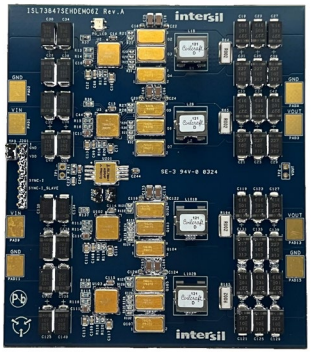
ISL73041SEH: Half Bridge GaN Driver

- Programmable gate drive: 4.5V to 5.5V
- Highly matched & fast driver propagation delays
- 4.75V to 13.2V supply voltage
- Bi-directional fault communication with ISL73847SEH

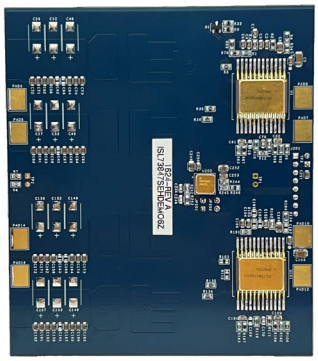
ISL70020SEH: 40V GaN FET

- Ultra Low RDSON: 3.5mΩ (typ)
- Ultra low total gate charge: 19nC (typ)
- Small footprint hermetically sealed 4Ld SMD package

ISL73847SEHDEMO6Z: 4 Phase 0.8V, 100A+ Power Supply (94mm x 107mm)



Front



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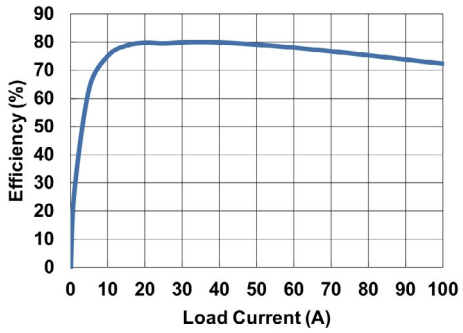


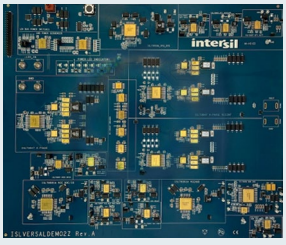
V_{IN} = 5V, V_{OUT} = 0.8V, F_{SW} = 1MHz

Complete Power Management Solution for AMD Space-Grade Versal™ Adaptive SoC

ISLVERSALDEMO2Z is an easy to use rad hard reference design that includes all the power management needed for the AMD Xilinx Space Grade Versal ACAP AI Core VC1902.

For ordering information, schematics, GERBER files and more, visit renesas.com/islversaldemo2z

See more information on page 15.



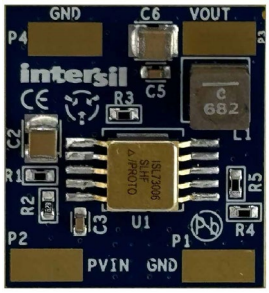
ISLVERSALDEMO2Z

Small Form Factor Point of Load Regulators

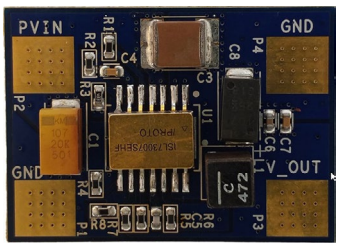
The ISL73006SLH and ISL73007SEH are 1A and 3A point of load regulators (respectively) that are capable of an input voltage between 3V and 18V and can regulate a voltage down to 0.6V. It features a precision voltage reference that offers ±1% regulation accuracy over temperature, radiation and life in an ultra compact form factor. The total solution size including the output inductor, capacitors and other passives is 23 x 21.5mm for the ISL73006SLH and 25.4 x 25.4 mm for the ISL73007SEH.

Features

- Input Voltage Range: 3V – 18V
- Output Current
  - ISL73006SLH – 1A
  - ISL73007SEH – 3A
- Supply Rail Undervoltage Lockout
- ±1% Output Regulation Accuracy (across temp, rad and life)
- Switching Frequency
  - ISL73006SLH – 500kHz (fixed)
  - ISL73007SEH – 300kHz to 1MHz



ISL73006SLHDEMO2Z: 12V to 3.3V,1A @ 500kHz (23mm x 21.5mm)



ISL73007SEHDEMO3Z: 12V to 3.3V,3A @ 500kHz (25.4mm x 25.4mm)

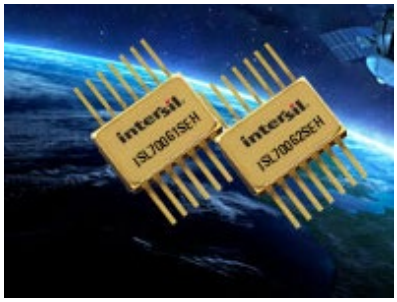
NMOS and PMOS Load Switches

Radiation Hardened 10A PMOS Load Switch

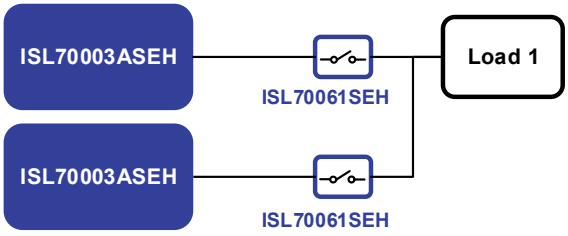
The ISL70061SEH is a radiation hardened single channel load switch featuring ultra-low r_{ON} and controlled rise time. The ISL70061SEH device uses a PMOS and the ISL70062SEH device uses a NMOS pass device as the main switch that operates across an input voltage range. Both devices can support a maximum of 10A continuous current. Simple ON/OFF digital control inputs make the device capable of interfacing directly with low voltage control signals from a FPGA, MCU, or processor.

Features

- Integrated high speed load switch
  - Turn-off time of 3µs
- Ultra-low ON-resistance (r_{ON}) of 14mΩ typical (ISL70061SEH)
- Continuous 10A switch current
- Controlled rise time to minimize inrush current
- Reverse current protection
- Simple ON/OFF logic control
- Undervoltage lockout
- Selectable 122Ω discharge MOSFET
- QML Class V Qualification



Redundant Source Switch Application

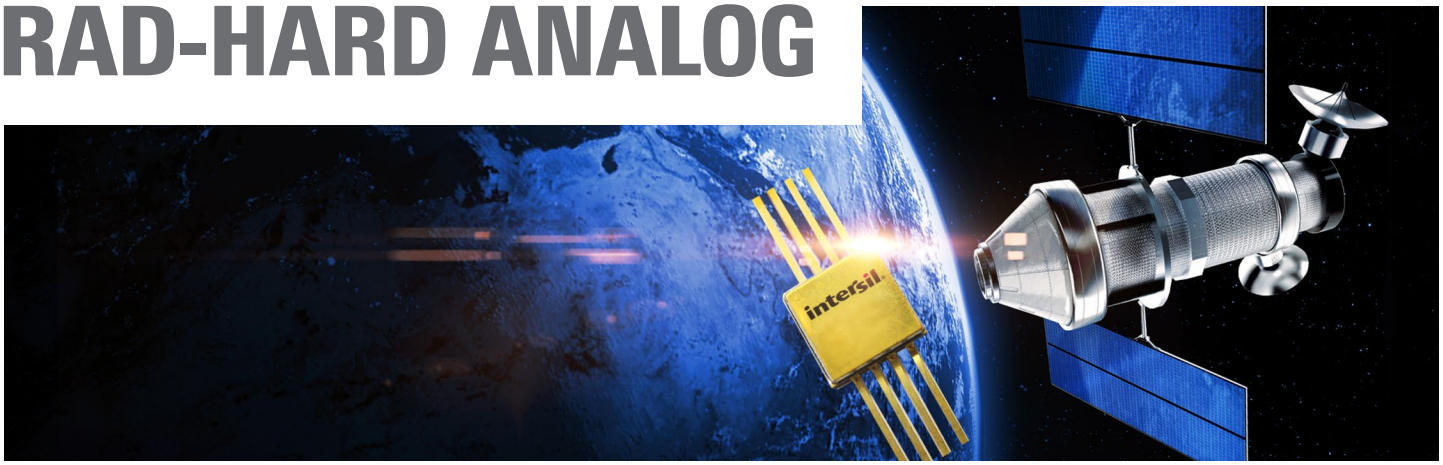


Load Switch Family

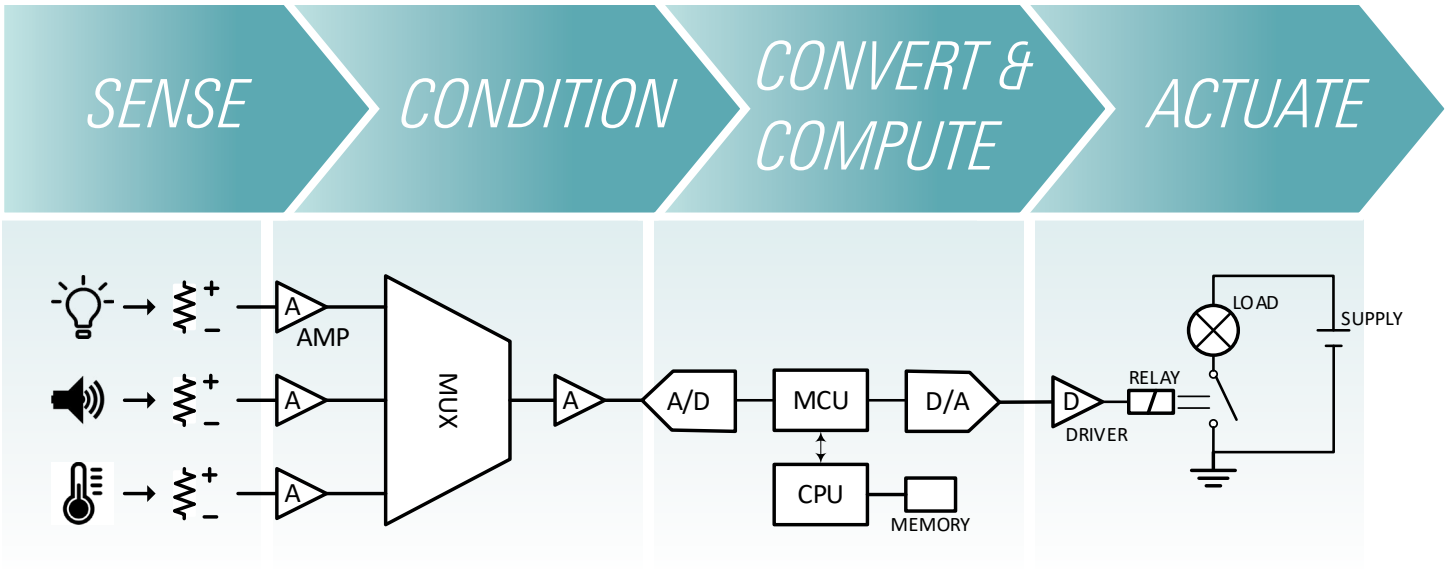
Part Number	FET Pass Device Type	Input Voltage Range (V)	Vcc Range (V)	Continuous Output Current (A)	Ron (mΩ) Typ	Iq (µA) Typ	Class	LDR krad (Si)	DSEE (MeV/ mg/cm²)	Qualification Level	Temp Range (°C)	Package Type
ISL70062SEH, ISL73062SEH	NMOS	Vcc - 2	3 - 5.5	10	25	0.76	V, /PROTO	75	86	QML Class V (space)	-55 to +125	14pin-CFP
ISL70061SEH, ISL73061SEH	PMOS	3 - 5.5	-	10	14	31	V, /PROTO	75	86	QML Class V (space)	-55 to +125	14pin-CFP

Radiation Hardened

RAD-HARD ANALOG



LEADERS IN ANALOG SIGNAL PROCESSING



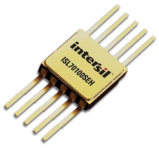
For over 70 years, Renesas has been an industry leader offering the most comprehensive selection of leading-edge QML Class V products for signal processing applications. These fundamental building blocks provide the reliability, accuracy and precision required in Command & Telemetry; Thermal Control; Altitude Control; Imaging and many other satellite subsystems.

All subsystems employing analog signal processing can be reduced to four fundamental functions:

SENSE	Sensors convert parameters such as temperature, pressure, light, sound, etc. to an electrical signal.
CONDITION	The signal is amplified and filtered. In multi-sensor systems, a multiplexer allows sampling each source in repeated intervals.
CONVERT & COMPUTE	Digital conversion, movement, storage and processing of the data occur. Resultant data is converted back to an analog signal.
ACTUATE	The system performs an action, such as driving relays or switches, based on the results.

SENSE

Current Sense Amplifiers



Amplifier Specifically Designed for Current Sensing Application

ACCURATE - Ultra-low input offset voltage

The ISL70100SEH has an ultra-low input offset voltage specification of 10µV (typical) at 25°C, allowing designers to achieve their required accuracy without increasing the sense resistor value and wasting unnecessary power.

RELIABLE - Can monitor currents from a 28V bus voltage

The input common mode voltage range is -0.3V to 40V independent of the power supply used to bias the CSA. This allows the user to power the CSA from 3.3V, but monitor currents from a 28V bus voltage.

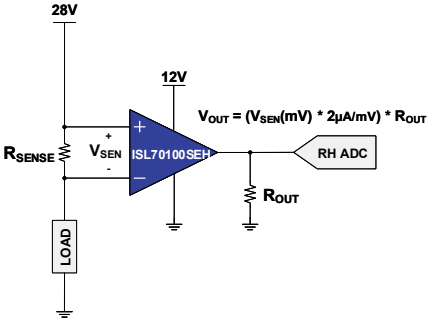
SIMPLE - Only one additional resistor is required

Besides the sense resistor, only one additional resistor on the output is required to set the overall gain of CSA. This eliminates the need for external output-to-input gain resistors, thus reducing component count and board space.

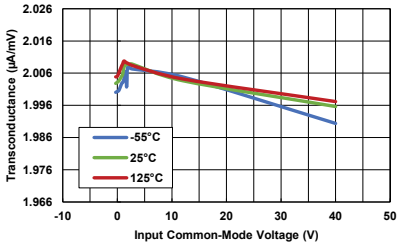
Features

- Power supply range: 2.7V to 40V
- Input common-mode range: -0.3V to 40V
- Transconductance: 2µA/mV (typical)
  - ±1% accuracy (T_A = 25°C)
  - ±1.5% accuracy (T_A = -55°C, 125°C)
- Voltage offset: 10µV (typical), V+ = 12V
- Adjustable gain with a single resistor

Typical Application: High-Side Current Sense for 28V Supply Rail



Transconductance , V+ = 12V



Part Number	V_S Range	I_S (per amp)	BW	Features	Max Offset Voltage	Common Mode Input Range	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package Type
ISL70100SEH	2.7 to 40V	250µA	500kHz	Low/High Side Capable	400µV	-0.3 to 40V	100	75	86.4	-55 to +125	V, /PROTO	QML Class V (space)	10pin-FP
ISL73100SEH							N/A						

Temperature Sensors

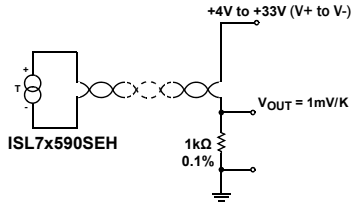
Radiation Hardened Temperature Sensor

The ISL71590SEH and ISL73590SEH are temperature-to-current transducers possessing two terminals. They have a high impedance current output that allows them to be insensitive to voltage drops across long lines. When provided a differential voltage between 4V and 33V, the devices act as constant current regulators that generate a current equal to 1µA/Kelvin (K).

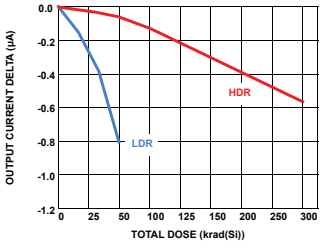
Features

- Wide operating supply range: 4V to 31V
- Linear output current: 1µA/K
- High ESD level: 3kV HBM
- ±1.7°C absolute error from -55°C to +125°C
- < -1°C error over radiation
- High output impedance to reject variations in supply
- SOI process to eliminate single event latch-up
- Best-in-class radiation performance

Typical Application



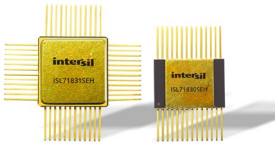
Linear Output Current (1µA/K)



Part Number	Linear Output Current	Power Consumption	Ambient Error Accuracy	PSRR	HDR krad(Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package Type
ISL71590SEH	1µA/K	1.5mW	-0.05°C	0.10µA/V	300	50	86.4	-55 to +125	V, /PROTO	QML Class V (Space)	2pin-FP
ISL73590SEH					N/A						

CONDITION

Multiplexers



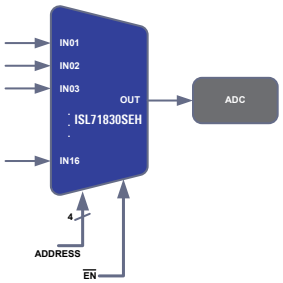
5V Multiplexers Provide Industry's Best ESD Protection and Signal Processing Performance

The ISL71830SEH (16-ch) and ISL71831SEH (32-ch) are radiation tolerant, single supply 5V multiplexers. The 5V multiplexers address the growing trend toward reduced system voltage rails. They provide data acquisition systems with the industry's best electrostatic discharge (ESD) protection, and deliver lower R_{ON} and input leakage for reduced power consumption and higher signal integrity.

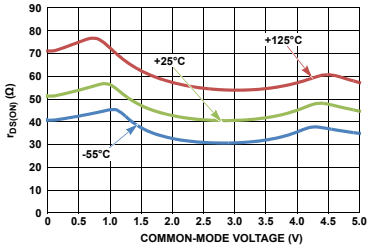
Features

- 3V to 5.5V single supply operation with adjustable logic threshold control
- Delivers 5kV human body model (HBM) ESD protection
- Rail-to-rail switch input provides wide dynamic range for extra design flexibility
- Over-voltage shutoff protects upstream/downstream devices when a switch goes 1V-2V past the rails
- Cold sparing and analog overvoltage range from -0.4V to 7V
- Switch input off leakage of 120nA and low R_{ON} of 120Ω (max) reduces power consumption, and improves signal integrity

Typical 16-channel Multiplexer Application



Very Low $r_{DS(ON)}$ Allows for Improved Signal Integrity and Reduced Power Losses



$r_{DS(ON)}$ vs Common-Mode Voltage (V+ = 5V)

Part Number	Channels	$r_{DS(ON)}$ (Ω) Typ	Input Voltage Range (V)	LDR krad(Si)	DSEE (MeV/mg/cm²)	Temperature Range (°C)	Class	Qualification Level	Package Type
ISL71830SEH	16	40	3 – 5.5	75	60	-55 to +125	V, /PROTO	QML Class V (Space)	28pin-CDFP
ISL71831SEH	32	40	3 – 5.5	75	60	-55 to +125	V, /PROTO	QML Class V (Space)	48pin-CQFP

CONVERT & COMPUTE

AD Converters

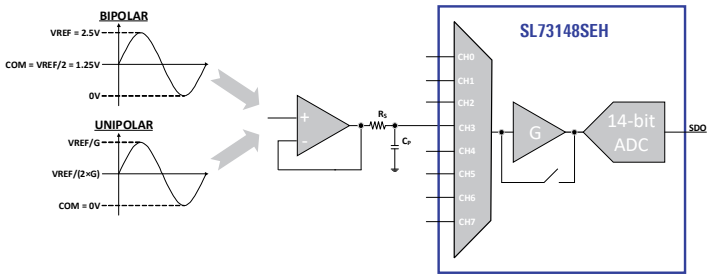
Rad-Hard 8-Channel 14-Bit 900/480ksps SAR ADC with Integrated PGA

The ISL73148SEH has the best-in-class performance, including low noise, high-resolution, and excellent linearity. It operates on a 5V supply, with an independent supply for the digital interface, allowing for a high level of interoperability with MPU/MCU/FPGA.

Features

- Low noise: 82dBFS (PGA bypassed), 77dBFS SNR (PGA Gain = 2)
- High resolution: 14-bit resolution with 13.4-bit ENOB
- Excellent linearity: ±0.5 LSB DNL, ±1.5 LSB INL
- Integrated 8-channel MUX and PGA
  - Pin programmable channel and gain setting selection
  - Reduces external components and cost
- High precision to meet the accuracy requirements of next-gen payloads

Typical Application Example Circuit



Part Number	Product Title	Ch (#)	Reso-lution (bits)	Conversion Rate (Max) (kSPS)	Power Consumption (mW)	Analog Supply Voltage (V)	Integral NonLinearity LSB	Differential NonLinearity LSB	Package Type
ISL71148M	Rad Tolerant 8-Channel 14-Bit 900/480ksps SAR ADC	8	14	900	88	5	0.4	0.2	48 Ld TQFP
ISL73141SEH	Rad-Hard 14-Bit 1MSPS SAR ADC	1	14	1000	28	3 - 5.5	0.5	0.2	14 Ld CDFP
ISL73148SEH	Rad-Hard 14-Bit 900ksps SAR ADC w/ Int. PGA	8	14	960	90	5	1	0.5	28 Ld CDFP

For more detail specifications, refer to "AD Converters" on page 17

ACTUATE

Source Drivers

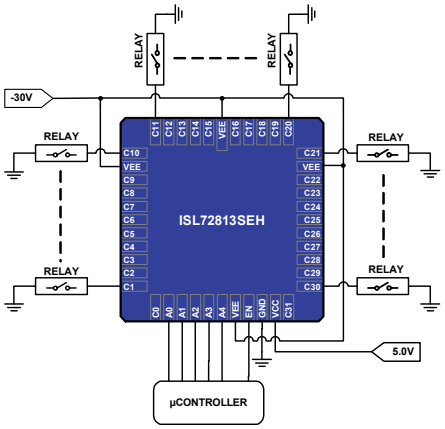
ISL72813SEH: Single-Chip Rad Hard 32-Channel Driver with Integrated Decoder for Satellite Applications Reduces Command and Telemetry Solution Size by 50%

The ISL72813SEH is the industry's first high current driver to integrate the decoder, level shifter and driver array in a single monolithic IC, allowing satellite manufacturers to significantly increase system capacity and reduce solution size by up to 50%. The device offers a 4x higher density channel count compared to the nearest competitor, and the integrated level shifter eliminates several peripheral components.

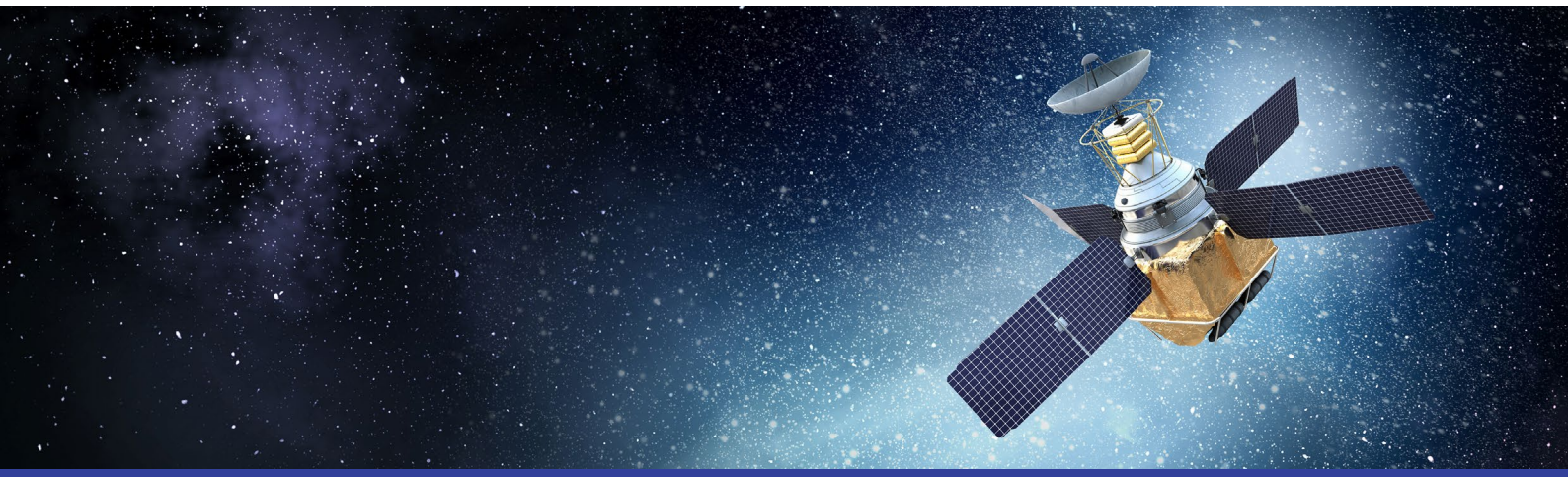
Features

- Acceptance tested to 50krad(Si) LDR, wafer-by-wafer
- Integrated 5-bit to 32-channel decoder and level shifting circuit
- High collector current outputs to 600mA
- Low V_{CE} saturation of 1.5V with IC of 530mA
- High voltage outputs up to -40V
- V_{CC} supply range of 3V to 5.5V
- Extended operating temperature range of -55°C to +125°C
- HDR radiation tolerance of 100krad(Si) and LDR of 50krad(Si)
- SEB LET_{TH} (V_{CE} = 33V) immune up to 86.4MeV•cm²/mg

Typical Application



Part Number	Output Channels	Max Channel Voltage	Integrated Decoder	Output Saturation Voltage @350mA	Class	HDR krad(Si)	LDR krad(Si)	DSEE (MeV/mg/cm²)	SEB (MeV/mg/cm²)	Qualification Level	Temperature Range (°C)	Package Type
ISL73814SEH	16	42V	Yes	1.3V	V, /PROTO	N/A	75	DSEE free	86	QML Class V (space)	-55 to +125	28pin-CFP
ISL72814SEH	16	42V	Yes	1.3V	V, /PROTO	100	75	DSEE free	86	QML Class V (space)	-55 to +125	28pin-CFP
ISL72813SEH	32	42V	Yes	1.4V	V, /PROTO	100	50	DSEE free	86	QML Class V (space)	-55 to +125	44pin-CLCC



intersil

Space-Grade Plastic Packages

RADIATION TOLERANT PLASTIC PACKAGE ICs

Cost Effective Solutions for Short Duration Low Earth Orbit (LEO) Mission Profiles

The ISL71xxxM family of radiation-tolerant plastic-package ICs is designed to support the emerging field of small satellites that will provide solutions such as high-speed Internet connections to hundreds of millions of users in communities, governments, and businesses worldwide. Fleets of hundreds of small satellites will create mega-constellation networks to deliver broadband Internet links from low Earth orbit (LEO) to every corner of the globe, including rural areas without wireless connectivity access.

Our rad-tolerant plastic packaging flow leverages the company's more than 60 years of spaceflight experience developing rad-hard (>75krad) and rad-tolerant (<75krad) products for extremely harsh environments. The upfront radiation effects characterization and AEC-Q100 automotive-like qualification give customers the utmost confidence to design Intersil radiation-tolerant plastic parts into cost-sensitive small satellites for LEO mission profiles up to five-years. The ISL71xxxM are also well suited for high altitude (>40km) avionic systems, launch vehicles that are prone to heavy ions, and medical equipment where radiation is a concern.

Rad-Tolerant Analog

Multiplexers	
ISL71030M	Radiation Tolerant 16-input, 3V-5.5V Multiplexer
CAN Bus Transceiver	
ISL71026M	3.3V CAN Transceiver, 1Mbps, Listen Mode, Loopback
Operational Amplifiers	
ISL71444M	40V Quad Rail-to-Rail Input-Output, Low-Power Op Amp
ISL71218M	Dual 36V Precision, Rail-to-Rail Output, Low-Power Op Amp
Voltage References	
ISL71010B25	Ultra-Low Noise, 2.5V Precision Voltage Reference
ISL71010B50	Ultra-Low Noise, 5V Precision Voltage Reference

Rad-Tolerant Digital

Digital Isolators	
ISL71610M	Radiation Tolerant Passive-Input Digital Isolator
ISL71710M	Radiation Tolerant Active-Input High Speed Digital Isolator

Rad-Tolerant Power

PWM Controller	
ISL71043M	Radiation Tolerant Single-Ended Current Mode PWM Controller
ISL71041M	Radiation Tolerant Single-Ended Current Mode PWM Controller
Switching Regulator	
ISL71001M	6A Synchronous Buck Regulator with Integrated MOSFETs
GaN FET Driver	
ISL71040M	Radiation Tolerant Low-Side GaN FET Driver

RADIATION HARDENED PLASTIC PACKAGE ICs

Save Up to 50% of Board Area While Maintaining the Reliability and Radiation Assurance for Higher Orbit Missions

Renesas' Intersil plastic-packaged radiation-hardened devices are optimized for satellite power management systems. Combining rad-hard assurance levels with the board area savings and cost advantages of plastic packaging, the new portfolio brings space grade solutions to MEO/GEO missions with longer lifetime requirements, as well as small satellites (smallsats) and higher density electronics, while reducing size, weight, and power (SWaP) costs.

ISL73033SLHM
100V Low Side GaN Driver + FET

81 ball 8x8mm BGA

- Combines world-class GaN FET driver and GaN FET in a single package to simplify gate design and improve efficiency
- Reduces area size by 20% compared with an SMD 0.5 rad-hard MOSFET
- V_{DS} = 100V & I_{DS} = 30A with 7.5mΩ (typ) R_{DSON}
- Ultra low total gate charge: 14nC (typ)

ISL71001SLHM/SEHM
6A Sync Buck Regulator

64 Ld 12x12mm TQFP

- 6A synchronous POL regulator enables high power conversion efficiency in a smaller package
- Highly efficient: 95% peak efficiency
- Fixed 1MHz switching frequency
- Adjustable output voltage

ISL71610SLHM
Passive Input Digital Isolator

ISL71710SLHM
Active Input Digital Isolator

8 Ld 5mm x 4mm SOIC

- Giant Magneto Resistive (GMR) isolation technology delivers better radiation tolerance compared with existing space grade optocouplers on the market
- 2.5kV_{RMS} Isolation
- Up to 100Mbps data rates for the ISL71610SLHM and 150Mbps for the ISL71710SLHM
- 1.3mA quiescent current and low EMI with no carrier or clock noise

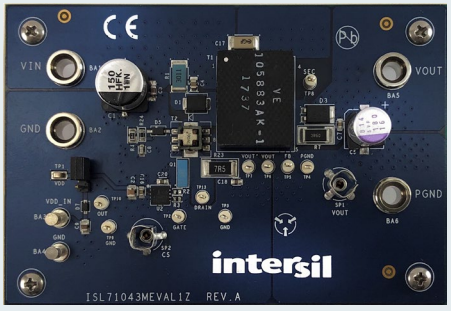
Visit renesas.com/radhardplastics for more details.

REFERENCE DESIGNS

Renesas offers reference designs to help solve our customers' system level application challenges in space-grade systems. For more information, visit www.renesas.com/space or contact your local sales office.

Radiation Tolerant GaN Based Flyback Reference Design

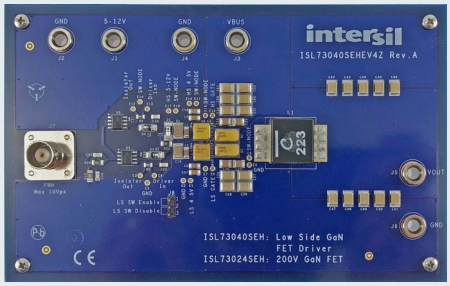
Part Number	ISL71043M
Description	The ISL71043MEVAL1Z evaluation platform is designed to evaluate the ISL71043M and ISL71040M in a flyback power supply configuration. The ISL71043M is a radiation tolerant drop-in replacement for the popular 28C4x and 18C4x PWM controllers suitable for a wide range of power conversion applications including boost, flyback, and isolated output configurations. This evaluation board is a flyback power supply.
Doc Number	R12UZ0044EU0100



ISL71043MEVAL1Z Evaluation Board

100V Half-Bridge GaN Power Stage

Part Number	ISL73040SEH, ISL73024SEH, ISL71610M
Description	The ISL73040SEHEV4Z evaluation board demonstrates how to build a half-bridge power stage with the ISL73040SEH low-side GaN driver and the ISL73024SEH 200V GaN FET. The ISL73040SEH has a 4.5V gate drive voltage (VDRV) generated using an internal regulator that prevents the gate voltage from exceeding the maximum gate-source rating of the ISL73024SEH GaN FET. The ISL73024SEH is a 200V GaN FET capable of 7.5A drain current.
Doc Number	UG186



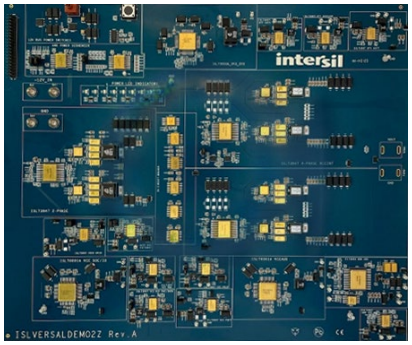
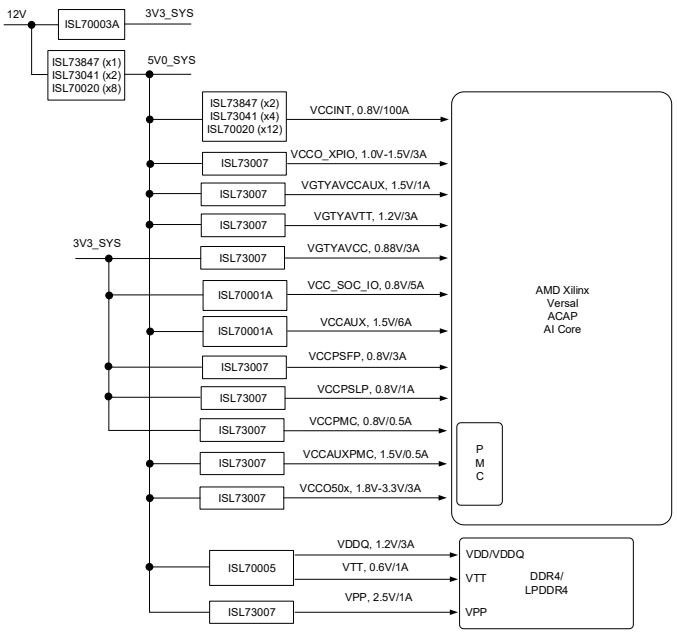
ISL73040SEHEV4Z Evaluation Board

RTG4 FPGA Development Kit

Part Number	ISLRTG4DEMO1ZA
Description	Microchip's RTG4 development platform allow users to prototype and evaluate the FPGA's performance in different applications. The board includes two 1 GB Double Data Rate 3 (DDR3) memories and two 1 GB SPI flash memories. The board also has several standard and advanced peripherals, such as PCIe x4 edge connector, two FMC connectors for using several off-the-shelf daughter cards, USB, Philips inter-integrated circuit (I^2C), gigabit Ethernet port, serial peripheral interface (SPI), and UART.
White paper number	R34WP0002

ISLRTG4DEMO1ZA

Power Management for the AMD Xilinx Space Grade Versal™ ACAP AI Core VC1902

Part Number	ISLVERSALDEMO2Z
Description	The ISLVERSALDEMO2Z evaluation board provides the power management for the AMD Xilinx Space Grade Versal™ ACAP AI Core VC1902 using Renesas' Radiation Hardened Power Management devices. The Versal ACAP system requires various supply rails, including the core, digital, analog and DDR memory. The ISLVERSALDEMO2Z provides all these rails for the user to evaluate the performance against the Versal ACAP DC and AC electrical specifications. • Radiation hardened QMLV power solution by Renesas (MIL-PRF-38535) • Designed to power AMD Xilinx Space Grade Versal ACAP AI Core VC1902 • Includes regulators for all VC1902 rails, DDR4 Memory and general +5V/+3.3V bus • Power Supply Sequencing up and down on all rails
	 ISLVERSALDEMO2Z
	AMD Xilinx Versal ACAP Full Power Management Specification  	Renesas Radiation Hardened parts used on ISLVERSALDEMO2Z ■ ISL73847SEH 12V PWM Dual Phase Controller ■ ISL73041SEH 12V GaN Half Bridge Driver ■ ISL70020SEH 40V, 65A, 3.5mΩ GaN FET ■ ISL70001ASEH 5V, 6A Integrated FET Synchronous Buck ■ ISL70003ASEH 12V, 9A Integrated FET Synchronous Buck ■ ISL73007SEH 12V, 3A Integrated FET Synchronous Buck ■ ISL70005SEH 5V, 3A Synchronous Buck + 1A Source and Sink LDO ■ ISL70321SEH Quad Channel Supply Sequencer ■ ISL70218SEH Dual 36V Precision Rail to Rail Output Operational Amplifier
Doc Number	R34UZ0015EU0100
Product Page	renesas.com/ISLVERSALDEMO2Z

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SPACE-GRADE PRODUCTS LIST

Radiation Hardened Analog Products

Qualification Level
Military = QML Class Q
Space = QML Class V
Space Lower Level = QML Class T

Comparators

Part Number	Supply Voltage (V)	Max Input Offset Voltage (mV)	Comparator Type	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temperature Range (°C)	Class	Qualification Level	Package
ISL7119RH	5 to 15	8	Dual	300	-	-	-55 to +125	V, Q, /PROTO	Military, Space	10pin-CFP
ISL7119EH					50			V, /PROTO	Space	
IS-139ASRH	9 to 30	5	Single or Dual	300	-	83	-55 to +125	V, Q, /PROTO	Military, Space	20pin-CFP
IS-139ASEH					50					
HS-139RH	5 to 30	2	Single or Dual	300	-	-	-55 to +125	V, Q, /PROTO	Military, Space	14pin-CFP, 14pin-SBDIP
HS-139EH					50			V, /PROTO	Space	

Interface (RS-422 - Quad Differential Line Drivers)

Part Number	Supply Range (V)	Input Low Voltage Range (V)	Input High Voltage Range (V)	Input Rise and Fall Time (ns)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package
HS-26CT32RH	5	0.8	VDD/2	500	100	-	100	-55 to +125	V, Q, /PROTO	Military, Space Lower Level, Space	16pin-CFP, 16pin-SBDIP
HS-26CT32EH						50				Military, Space	
HS-26CT31RH	5	0.8	VDD/2	500	300	-	-	-55 to +125	V, Q, /PROTO	Military, Space Lower Level, Space	16pin-CFP, 16pin-SBDIP
HS-26CT31EH						50			V, /PROTO	Space	
HS-26CLV32RH	3.0 to 3.6	0.3 VDD	0.7 VDD	500	300	-	100	-55 to +125	V, Q, /PROTO	Military, Space	16pin-CFP, 16pin-SBDIP
HS-26CLV32EH						50			V, /PROTO	Space	
HS-26CLV31RH	3.0 to 3.6	0.3 VDD	0.7 VDD	500	300	-	100	-55 to +125	V, Q, /PROTO	Military, Space	16pin-CFP, 16pin-SBDIP
HS-26CLV31EH						50			V, /PROTO	Space	
HS-26C32RH-T	5	0.3 VDD	0.7 VDD	500	100	-	100	-55 to +125	-	Space Lower Level	16pin-CFP, 16pin-SBDIP
HS-26C32RH					300		-		V, Q, /PROTO	Military, Space	
HS-26C32EH					300		-		V, /PROTO	Space	
HS-26C31RH-T	5	0.3 VDD	0.7 VDD	500	100	-	100	-55 to +125	-	Space Lower Level	16pin-CFP, 16pin-SBDIP
HS-26C31RH					300		-		V, Q, /PROTO	Military, Space	
HS-26C31EH					300		-		V, /PROTO	Space	

Transistor Arrays

Part Number	Number of NPN Transistors	Number of PNP Transistors	NPN Gain Bandwidth Product (GHz)	PNP Gain Bandwidth Product (GHz)	Noise figure (50Ω) at 1GHz (dB)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temperature Range (°C)	Class	Qualification Level	Package
ISL73128RH	5	-	8	-	3.5	100	-	-	-55 to +125	V, Q, /PROTO	Space	16pin-CFP
ISL73128EH							50			V, Q		
ISL73127RH	-	5	-	5.5	3.5	100	-	-	-55 to +125	V, Q, /PROTO	Space	16pin-CFP
ISL73127EH							50			V, Q		
ISL73096RH	3	2	8	5.5	3.5	100	-	-	-55 to +125	V, Q, /PROTO	Space	16pin-CFP
ISL73096EH							50			V, Q		

Qualification Level
Military = QML Class Q
Space = QML Class V
Space Lower Level = QML Class T

Sample and Hold

Part Number	Max Acquisition Time (10V Step to 0.1%)	Max Acquisition Time (10V Step to 0.01%	Maximum Drift Current Over Temperature	PSRR	HDR krad (Si)	ELDR krad (Si)	DSEE (MeV/mg/cm²)	Temperature Range (°C)	Class	Qualification Level	Package
HS-2420EH	4µs	6µs	10nA	≥80dB	100	100	DSEE free	-55 to +125	V, /PROTO	Space	14pin-SBDIP

Temperature Sensors

Part Number	Linear Output Current (µA/k)	Power Supply Input Range (V+ to V-) (V)	Low Power Consumption at 5V (mW)	50 krad(Si) Low Dose Rate (LDR) Shift (°C)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temperature Range (°C)	Class	Qualification Level	Package
ISL73590SEH	1	4	1.5	<1	-	50	86.4	-55 to +125	V, /PROTO	Space	2pin-CFP
ISL71590SEH	1	33	1.5	<1	300	50	86.4	-55 to +125	V, /PROTO	Space	2pin-CFP

Voltage References

Part Number	Reference Output Voltage	Tempco (Max) (ppm/°C)	Input Voltage Range (V)	Supply Current (µA)	Output Current Capability (mA)	Output Voltage Noise	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package
ISL71091SEH40	4.096V ±0.05%	6	6.0 to 30	300	10 / -5	6.2µV$_{P-P}$ typ (0.1Hz to 10Hz)	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL71091SEH33	3.3V ±0.05%	6	4.6 to 30	300	10 / -5	5.2µV$_{P-P}$ typ (0.1Hz to 10Hz)	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL71091SEH20	2.048V ±0.05%	6	4.2 to 30	300	10 / -5	3.8µV$_{P-P}$ typ (0.1Hz to 10Hz)	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL71091SEH10	10.0V ±0.05%	6	12 to 30	300	10 / -5	14.8µV$_{P-P}$ typ (0.1Hz to 10Hz)	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL71090SEH75	7.5V ±0.05%	10	9.2 to 30	930	20 / -10	1.0µV$_{P-P}$ typ (0.1Hz to 10Hz)	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL71090SEH50	5.0V ±0.05%	10	7.0 to 30	930	20 / -10	1.1µV$_{P-P}$ typ (0.1Hz to 10Hz)	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL71090SEH25	2.5V ±0.05%	10	4.0 to 30	930	20 / -10	1.9µV$_{P-P}$ typ (0.1Hz to 10Hz)	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL71090SEH12	1.25V ±0.05%	10	4.0 to 30	930	20	1.0µV$_{P-P}$ typ (0.1Hz to 10Hz)	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP

Buffers

Part Number	Wide -3dB Bandwidth	Voltage Gain	Supply Current	Gain Flatness	Gain Accuracy	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package
HS-1115RH	225MHz	+2, +1, -1	6.9mA	±0.1dB	0.99V/V	300	-	DSEE Free	-55 to +125	V, Q, / PROTO	Space	8pin-CERDIP

Current Sources

Part Number	Operating Voltage Range (V)	Output Current	Accuracy (%)	Output Impedance	Applications	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package
ISL73592SEH	3 to 40	1mA	±0.3	14 MΩ	High Side, Low Side, Dual Side	-	75	86	-55 to +125	V	Space	4pin-CFP
ISL73591SEH	3 to 40	100µA	±0.36	189 MΩ	High Side, Low Side, Dual Side	-	75	86	-55 to +125	V	Space	4pin-CFP
ISL70592SEH	3 to 40	1mA	±0.3	14 MΩ	High Side, Low Side, Dual Side	100	75	86	-55 to +125	V, /PROTO	Space	4pin-CFP
ISL70591SEH	3 to 40	100µA	±0.36	189 MΩ	High Side, Low Side, Dual Side	100	75	86	-55 to +125	V, /PROTO	Space	4pin-CFP

DA Converters

Part Number	Speed	Resolution	LSB Accuracy at 25°C	LSB Accuracy Over Temp	Max Gain Drift (ppm/°C)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package
HS-565BRH	Settles to 0.5LSB in 500ns (Max)	12 bits	±0.125	±0.75	50	100	-	DSEE free	-55 to +125	V, Q, / PROTO	Space	24pin-CFP, 24pin-SBDIP
HS-565BEH							50			V, /PROTO		

AD Converters

Part Number	Maximum Sampling Rate	ENoB (bits)	SNR (dBFS)	INL (LSB)	DNL (LSB)	HDR krad (Si)	LDR krad (Si)	DSEE/SEB (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package
ISL73141SEHMFN ISL73141SEHMF7	1MSPS	13.3	82	±1	±0.5	-	75	86	-55 to +125	V Equivalent, /PROTO	Space	14pin-CDFP
ISL73148SEHMF	900kHz	13.4	82	±1.5	±0.5	-	75	86	-55 to +125	V Equivalent, / PROTO	Space	28pin-CDFP

Part Number	Product Description	Channels (#)	Resolution (bits)	Conversion Rate (Max) (ksps)	Power Consumption (mW)	Analog Supply Voltage (V)	Integral NonLinearity LSB	Differential NonLinearity LSB	Package
ISL71148M	Rad Tolerant 8-Channel 14-Bit 900/480ksps SAR ADC	8	14	900	88	5	0.4	0.2	48 Ld TQFP

Radiation Hardened Analog Products *(continued)*

Qualification Level
Military = QML Class Q
Space = QML Class V
Space Lower Level = QML Class T

Multiplexers

Part Number	Multiplexer Configuration	Recommended Supply Voltage Range	Supply Current (max, post-rad)	Transition Time (max, post-rad)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temperature Range (°C)	Class	Qualification Level	Package
ISL73841SEH	Single 32:1 Mux	±10.8V to ±16.5V	±400µA	800ns	-	50	86.4	-55 to +125	V, /PROTO	Space	48pin-CQFP
ISL73840SEH	Single 16:1 Mux	±10.8V to ±16.5V	±350µA	800ns	-	50	86.4	-55 to +125	V, /PROTO	Space	28pin-CFP
ISL71841SEH	Single 32:1 Mux	±10.8V to ±16.5V	±400µA	800ns	100	50	86.4	-55 to +125	V, /PROTO	Space	44pin-CLCC, 48pin-CQFP
ISL71840SEH	Single 16:1 Mux	±10.8V to ±16.5V	±350µA	800ns	100	50	86.4	-55 to +125	V, /PROTO	Space	28pin-CFP
ISL71831SEH	Single 32:1 Mux	3V to 5.5V	+300µA	70ns	-	75	60	-55 to +125	V, /PROTO	Space	48pin-CQFP
ISL71830SEH	Single 16:1 Mux	3V to 5.5V	+300µA	70ns	-	75	60	-55 to +125	V, /PROTO	Space	28pin-CFP
HS-508BRH	Single 8:1 Mux	±15V	+2.0mA/ -1.0mA	3µs	300	-	Latch-up free (DI)	-55 to +125	V, Q, /PROTO	Military, Space	16pin-CFP, 16pin-SBDIP
HS-508BEH	Single 8:1 Mux	±15V	+2.0mA/ -1.0mA	3µs	300	50	Latch-up free (DI)	-55 to +125	V, /PROTO	Space	16pin-CFP, 16pin-SBDIP
HS-1840BRH	Single 16:1 Mux	±12V±10%	±500µA	1.5µs	300	-	Latch-up free (DI)	-55 to +125	V, Q, /PROTO	Military, Space	28pin-CFP, 28pin-SBDIP
HS-1840BEH						50			V, /PROTO	Space	
HS-1840ARH-T	Single 16:1 Mux	±15V	±500µA	1.5µs	100	-	Latch-up free (DI)	-55 to +125	T, /PROTO	Space Lower Level	28pin-SBDIP
HS-1840ARH					300	-			V, Q, /PROTO	Military, Space	28pin-CFP, 28pin-SBDIP
HS-1840AEH					300	50			V, /PROTO	Space	28pin-CFP, 28pin-SBDIP
HS-0548RH	Single 8:1 Mux	±15V	+2.0mA/ -1.0mA	1.0µs	10	-	Latch-up free (DI)	-55 to +125	V, Q, /PROTO	Space	16pin-SBDIP
HS-0547RH	Single 16:1 Mux	±15V	+2.0mA/ -1.0mA	1.0µs	10	-	Latch-up free (DI)	-55 to +125	V, Q, /PROTO	Space	28pin-CFP
HS-0546RH	Differential 8:1 Mux	±15V	+2.0mA/ -1.0mA	1.0µs	10	-	Latch-up free (DI)	-55 to +125	V, Q, /PROTO	Space	28pin-CFP

Switches

Part Number	Supply Voltage Range	Supply Voltage of Specification Limits	Supply Current (max, post-rad)	t_{ON} (max, post-rad)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temperature Range (°C)	Class	Qualification Level	Package
HS-303CEH	±15V	±15V	+150µA/ -100µA	1000ns	100	50	DSEE free	-55 to +125	V, Q, /PROTO	Military, Space	14pin-CFP
HS-303BRH	±15V	±12V	+150µA/ -100µA	450ns	300	-	DSEE free	-55 to +125	V, Q, /PROTO	Military, Space	14pin-CFP, 14pin-SBDIP
HS-303BEH						50					
HS-303ARH	±15V	±15V	+150µA/ -100µA	450ns	300	-	DSEE free	-55 to +125	V, Q, /PROTO	Military, Space	14pin-CFP, 14pin-SBDIP
HS-303AEH						50					
HS-302AEH	±15V	±15V	+150µA/ -100µA	1000ns	100	50	DSEE free	-55 to +125	V, /PROTO	Space	14pin-CFP
HS-201HSRH	±15V	±15V	12mA	80ns	300	-	DSEE free	-55 to +125	V, Q, /PROTO	Military, Space	16pin-CFP, 16pin-SBDIP
HS-201HSEH						50			V, /PROTO	Space	

Qualification Level
Military = QML Class Q
Space = QML Class V
Space Lower Level = QML Class T

Op Amps

Temperature Range: -55°C to +125°C

Part Number	# of Devices/ Channels	Bandwidth (MHz)	Slew Rate (V/µs)	V_S Range (V)	I_S per Amp (mA)	Noise V_N (nV/√Hz)	I_{BIAS} (max) (nA)	Max Offset Voltage	I_{OUT} (mA)	Rail-to-Rail Input/Output	PSRR (dB)	CMRR (dB)	AVOL (dB)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Class	Qualification Level	Package
ISL73444SEH	4	19	60	2.7 to 40	2.4	11.3	650	400µV	10	Yes	123	92	118	-	50	86.4	V, /PROTO	Space	14pin-CFP
ISL73419SEH	4	1.5	0.5	4.5 to 36	0.44	8	15	110µV	43	No	120	120	129	-	50	DSEE Free	V, /PROTO	Space	14pin-CFP
ISL73244SEH	2	19	60	2.7 to 40	1.2	12.3	650	500µV	8	Yes	123	92	118	-	50	86.4	V, /PROTO	Space	10pin-CFP
ISL7124SRH	4	1.2	0.4	5 to 30	3	-	400	10mV	10	No	70	70	86	300	-	DSEE Free	V, Q, /PROTO	Military, Space	14pin-CFP
ISL7124SEH															50		V, /PROTO	Space	
ISL70444SEH	4	19	60	2.7 to 40	2.4	11.3	650	400µV	10	Yes	123	92	118	100	50	86.4	V, /PROTO	Space	14pin-CFP
ISL70419SEH	4	1.5	0.5	4.5 to 36	0.44	8	15	110µV	43	No	120	120	129	300	50	DSEE Free	V, /PROTO	Space	14pin-CFP
ISL70417SEH	4	1.5	0.5	4.5 to 40	0.44	8	5	110µV	43	No	120	120	129	300	50	DSEE Free	V, /PROTO	Space	14pin-CFP
ISL70244SEH	2	19	60	2.7 to 40	1.2	12.3	650	500µV	8	Yes	123	92	118	300	50	86.4	V, /PROTO	Space	10pin-CFP
ISL70227SRH	2	10	3.6	4.5 to 36	2.8	2.5	12	100µV	45	No	110	115	120	100	-	86	M, /PROTO	Military	10pin-CFP
ISL70227SEH															50	DSEE Free	V, /PROTO	Space	
ISL70219ASEH	2	1.5	0.5	4.5 to 36	0.49	8	15	110µV	41	No	145	145	143	300	100	DSEE Free	V, /PROTO	Space	10pin-CFP
ISL70218SRH	2	4	1.2	3 to 36	1.4	5.6	75	290µV	10	No	100	97	115	100	-	86.4	M, /PROTO	Military	10pin-CFP
ISL70218SEH															50	DSEE Free	V, /PROTO	Space	
ISL28417SEH	4	1.5	0.5	4.5 to 40	0.44	8	-	8.5µV	43	No	145	145	143	-	50	73.9	Military (Non-QML)	Standard	14pin-CFP
ISL28227SEH	2	10	3.6	4.5 to 36	2.8	2.5	10	75µV	45	No	117	120	123	-	50	86.4	Military (Non-QML)	Standard	10pin-CFP
HS-OP470AEH	4	8	3	10 to 30	1.375	6	630	2.6mV	10	No	80	80	92	100	50	DSEE Free	V	Space	14pin-CFP
HS-5104AEH	4	8	3	10 to 30	1.875	6	550	5mV	10	No	80	80	92	100	50	DSEE Free	V, /PROTO	Space	14pin-CFP, 14pin-SBDIP
HS-3530ARH	1	0.75	0.25	6 to 30	0.16	-	100	5mV	2.5	No	80	80	80	300	-	DSEE Free	V, Q, /PROTO	Military, Space	10pin-CFP, 8pin-CAN
HS-3530AEH															50		V, /PROTO	Space	
HS-1145RH	1	300	1000	10	6.5	3.5	25000	10mV	28	No	46	44	92	300	-	DSEE Free	V, Q, /PROTO	Space	8pin-SBDIP
HS-1135RH	1	360	1200	10	6.9	3.5	25000	10mV	28	No	46	44	92	300	-	DSEE Free	V, Q, /PROTO	Space	14pin-CFP, 8pin-SBDIP

Instrumentation Amplifiers

Temperature Range: -55°C to +125°C

Part Number	Output	BW (MHz)	Slew Rate (V/µs)	V_S Range (V)	I_S per Amp (mA)	Noise V_N (nV/√Hz)	I_{BIAS} (max) (ns)	Max Offset Voltage (µV)	I_{OUT} (mA)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Class	Qualification Level	Package
ISL70617SEH	Differential	5.5	4	8 to 40	4.3	8.6	25	300	45	-	75	DSEE Free	V, /PROTO	Space	24pin-CFP
ISL70517SEH	Single-Ended	5.5	4	8 to 40	4.3	8.6	25	300	45	-	75	DSEE Free	V, /PROTO	Space	24pin-CFP

CAN Bus Transceivers

Temperature Range: -55°C to +125°C

Part Number	V_S Range (V)	Common Mode Range (V)	Max Number of Nodes	Transmit/Receive Bus Speeds Up To (Mbps)	Loopback Feature	V_{REF} Output	Listen Mode	Shutdown Mode	Maximum VTHRLM (mV)	Minimum VTHFLM (mV)	Minimum VHYSLM (mV)	Max I_S (Listen Mode) (mA)	Max I_S (Shutdown Mode) (µA)	Maximum Leakage Current (µA)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Class	Qualification Level	Package
ISL72028SEH	3.0 to 3.6	-7 to 12	120	5	No	Yes	No	Yes	-	-	-	-	50	±25	-	75	60	V, /PROTO	Space	8pin-CFP
ISL72028BSEH															100		86.4			
ISL72027SEH	3.0 to 3.6	-7 to 12	120	5	No	Yes	Yes	No	1150	525	50	2	-	±25	-	75	60	V, /PROTO	Space	8pin-CFP
ISL72027BSEH															100		86.4			
ISL72026SEH	3.0 to 3.6	-7 to 12	120	5	Yes	No	Yes	No	1150	525	50	2	-	-	-	75	60	V, /PROTO	Space	8pin-CFP
ISL72026BSEH															100		86.4			

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Radiation Hardened Power Products

Qualification Level
Military = QML Class Q
Space = QML Class V
Space Lower Level = QML Class T

GaN FETs

Part Number	V_{DS} (V)	I_{DS} (A)	$V_{GS(TH)}$ (Max) (V)	V_{GS} (Max) (V)	R_{DSON} (Typ) (mΩ)	Q_G (Typ) (nC)	Thermal Resistance θJC (°C/W)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/ mg/cm²)	Tempera- ture Range (°C)	Class	Qualification Level	Package
ISL73024SEH	200	7.5	2.5	6	45	14	18.7	-	75	86	-55 to +125	Mod-Class V, /PROTO	Modified Class V	4pin-CLCC
ISL70024SEH								100						
ISL73023SEH	100	60	2.5	6	5	2.5	3.1	-	75	86	-55 to +125	Mod-Class V, /PROTO	Modified Class V	4pin-CLCC
ISL70023SEH								100						
ISL73020SEH	40	65	2.5	6	3.5	19	3.1	-	75	86	-55 to +125	Mod-Class V, /PROTO	Modified Class V	4pin-CLCC
ISL70020SEH								100						

Linear Regulators

Part Number	I_{OUT} (Max) (A)	V_{IN} (Min) (V)	V_{IN} (Max) (V)	V_{OUT} (Min) (V)	V_{OUT} (Max) (V)	V_{DO} @ I_{OUT} (Typ) (V)	Iq (Typ) (mA)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/ mg/cm²)	Temperature Range (°C)	Class	Qualifica- tion Level	Package
ISL75052SEH	1.5	4	13.2	0.6	12.7	0.225	6	100	50	86	-55 to +125	V, Q, / PROTO	Space	16pin-CFP
ISL73052SEH								-				V, /PROTO		
ISL75051ASEH	3	2.2	6	0.8	5	0.225	11	100	50	86.3	-55 to +125	V, /PROTO	Space	18pin-CFP
ISL73051ASEH								-						
ISL72991RH	1	-3	-30	-2.25	-26	1	6	300	Report Available	DSEE free	-55 to +125	V, Q, / PROTO	Military, Space	28pin-CFP
HS-117RH	1.25	4	40	1.25	37	4	N/A	300	Report Available	DSEE free	-55 to +125	V, Q, / PROTO	Military, Space	3pin-CAN, 3pin-CLCC, 3pin-TO-257
HS-117EH									50			V, /PROTO	Space	

Switching Regulators

Part Name	# of Out- puts	Topol- ogy	V_{IN} (Min) (V)	V_{IN} (Max) (V)	V_{OUT} (Min) (V)	V_{OUT} (Max) (V)	I_{OUT} (Max) (V)	Max Duty Cycle (%)	Peak Effi- ciency (%)	Control Type	Switch- ing Freq. Range (MHz)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/ mg/ cm²)	Temp Range (°C)	Class	Qualifi- cation Level	Package
ISL73006SLH	1	Buck	3	18	0.6	See (EQ1) Below	1	See (EQ2) Below	96%	Current Mode	0.5	N/A	75	86	-55 to +125	V Equivalent, /PROTO	Space	10 Ld CDFP
ISL73007SEH	1	Buck	3	18	0.6	See (EQ1) below	3	See (EQ2) below	95	Current Mode	0.3 to 1	-	75	86	-55 to +125	V Equivalent, /PROTO	Space	14 Ld CDFP
ISL73005SEH	2	Buck	3	5.5	0.6	85% x V_{IN}	3	85	94	Voltage Mode	0.1 to 1	-	75	86.4	-55 to +125	V, /PROTO	Space	28pin-CFP
ISL70005SEH	2	Buck	3	5.5	0.6	85% x V_{IN}	3	85	94	Voltage Mode	0.1 to 1	100	75	86.4	-55 to +125	V, /PROTO	Space	28pin-CFP
ISL70003ASEH	1	Buck	3	13.2	0.6	85% x VIN	9	88	95	Voltage Mode	0.3, 0.5	100	100	86.4	-55 to +125	V, /PROTO	Space	64pin-CQFP
ISL70002SEH	1	Buck	3	5.5	0.6	85% x V_{IN}	12	90	92	Current Mode	0.5, 1.0	100	100	86.4	-55 to +125	V, /PROTO	Space	64pin-CQFP
ISL70001SRH	1	Buck	3	5.5	0.6	85% x V_{IN}	6	90	94	Current Mode	1 to 1	100	-	86.4	-55 to +125	V, Q, / PROTO	Military, Space	48pin-CQFP
ISL70001SEH													50			V, /PROTO	Space	
ISL70001ASEH													100			V, /PROTO	Space	

(EQ1) $$Vin * \frac{(t_{PERIOD} - t_{MIN\text{-}OFF})}{t_{PERIOD}}$$

(EQ2) $$\frac{(t_{PERIOD} - t_{MIN\text{-}OFF})}{t_{PERIOD}}$$

GaN FET Drivers

Part Name	Type	V_{IN} (Min) (V)	V_{IN} (Max) (V)	Gate Drive (V)	Peak Source Current (A)	Peak Sink Current (A)	Rise Time (ns)	Fall Time (ns)	Prop Delay (ns)	Prop Delay Matching (ns) (Typ)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package
ISL73041SEH	Half Bridge	4.75	13.2	4.5	2/4	4/8	18/14	15/10	29	1	-	75	86	-55 to +125	V Equivalent, /PROTO	Space	16 Ld CLCC
ISL73040SEH	Low Side	4.5	13.2	4.5	3	4	12.5	7.5	40	1	-	75	86	-55 to +125	V, /PROTO	Space	8pin-CLCC
ISL70040SEH											100						

MOSFET Drivers

Part Number	Driver Type	# of Ch	Output Type	Peak I_{OUT} (Typ) (A)	Input V_{CC} (Min) (V)	Input V_{CC} (Max) (V)	Bus Voltage (Max) (V)	Rise Time (Typ) (ns)	Fall Time (Typ) (ns)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package
ISL7457SRH	Low Side	4	Non-inverting	2	4.5	16.5	N/A	23, CL = 1nF	20, CL = 1nF	10	-	40	-55 to +125	V, Q, / PROTO	Military, Space	16pin-CFP
ISL74422BRH	Low Side	1	Non-inverting	9	8	18	N/A	135, CL = 10nF	135, CL = 10nF	-	-	-	-55 to +125	-	Military, Space	16pin-CFP
ISL74422ARH	Low Side	1	Non-inverting	9	7	18	N/A	135, CL = 10nF	90, CL = 10nF	300	-	DSEE free	-55 to +125	V, Q, / PROTO	Military, Space	16pin-CFP
IS-2100ARH	Half Bridge	N/A	Synchronous	1.5	12	20	130	60, CL = 1nF	60, CL = 1nF	300	-	DSEE free	-55 to +125	V, Q, / PROTO	Military, Space	16pin-CFP
IS-2100AEH											50			V, /PROTO	Space	
IS-1715ARH	Low Side	2	Comple-mentary	3	10	18	N/A	50, CL = 2.2nF	50, CL = 2.2nF	300	-	DSEE free	-55 to +125	V, Q, / PROTO	Military, Space	16pin-CFP
IS-1715AEH											50			V	Space	
HS-4424RH	Low Side	2	Non-inverting	2	12	18	N/A	75, CL = 4.3nF	75, CL = 4.3nF	300	-	DSEE free	-55 to +125	V, /PROTO	Military, Space lower level, Space	16pin-CFP
HS-4424EH											50			V	Space	
HS-4424DRH	Low Side	2	Non-inverting	2	8	18	N/A	75, CL = 4.3nF	75, CL = 4.3nF	300	-	DSEE free	-55 to +125	V, /PROTO	Space	16pin-CFP
HS-4424DEH											50			V		
HS-4424BRH	Low Side	2	Non-inverting	2	12	18	N/A	75, CL = 4.3nF	75, CL = 4.3nF	300	-	DSEE free	-55 to +125	V, Q, / PROTO	Military, Space	16pin-CFP
HS-4424BEH											50			V	Space	
HS-4423RH, HS-4423BRH	Low Side	2	Inverting	2	12	18	N/A	75, CL = 4.3nF	75, CL = 4.3nF	300	-	DSEE free	-55 to +125	V, Q, / PROTO	Military, Space lower level, Space	16pin-CFP
HS-4423EH, HS-4423BEH											50			V	Space	16pin-CFP
HS-4080AEH	Full Bridge	N/A	Synchronous	2.5	12	15	80	65, CL = 1nF	60, CL = 1nF	300	50	DSEE free	-55 to +125	V	Space	20pin-CFP

Supervisory

Part Number	Precision Supply Voltage Monitor (V)	Precision Threshold Detector (V)	Independent Watchdog Output	Manual Reset	$\overline{RST}$ OUTPUT	RST Output	$\overline{RST\_OD}$	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/mg/cm²)	Temp Range (°C)	Class	Qualification Level	Package
ISL705AEH	4.65	1.25	Yes	Yes	Push-Pull	-	-	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL705ARH												V, Q, /PROTO	Military, Space	
ISL705BEH	4.65	1.25	Yes	Yes	-	Push-Pull	-	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL705BRH												V, Q, /PROTO	Military, Space	
ISL705CEH	4.65	1.25	Yes	Yes	-	-	Open-Drain	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL705CRH												V, Q, /PROTO	Military, Space	
ISL706AEH	3.08	0.6	Yes	Yes	Push-Pull	-	-	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL706ARH												V, Q, /PROTO	Military, Space	
ISL706BEH	3.08	0.6	Yes	Yes	-	Push-Pull	-	100	100	86	-55 to +125	V, /PROTO	Space	8pin-CFP
ISL706BRH												V, Q, /PROTO	Military, Space	
ISL706CEH	3.08	0.6	Yes	Yes	-	-	Open-Drain	100	100	86	-50 to +125	V, /PROTO	Space	8pin-CFP
ISL706CRH												V, Q, /PROTO	Military, Space	

Radiation Hardened Power Products *(continued)*

Qualification Level
Military = QML Class Q
Space = QML Class V
Space Lower Level = QML Class T

Power Sequencers

Part Number	V_{DD} Supply Range (V)	V_{DD} Supply Current (mA)	# of Controlled Supplies	Output Type	Cascadable	Program-mable Delay	P_{GOOD} Timer	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/ mg/cm²)	Temp Range (°C)	Class	Qualifi-cation Level	Package
ISL73321SEH	3 to 13.2	3.5	4	Enable Open Drain	Yes	Yes	Yes	-	75	DSEE Free	-55 to +125	V, /PROTO	Space	18pin-CFP
ISL70321SEH	3 to 13.2	3.5	4	Enable Open Drain	Yes	Yes	Yes	100	75	DSEE Free	-55 to +125	V, /PROTO	Space	18pin-CFP

Switching Controllers

Part Number	Topology	V_{CC} Max (V)	V_{IN} Min (V)	Operating Freq. (Max) (MHZ)	Duty Cycle (Max) (%)	Oper-ating Current (Typ) (mA)	UVLO SStart Threshold (Typ) (V)	Number of Outputs	Phase of Outputs	HDR krad (Si)	LDR krad (Si)	DSEE (MeV/ mg/ cm²)	Temp Range (°C)	Class	Qualifi-cation Level	Package
ISL73847SEH	Half Bridge Current Mode	-	4.5	1.5	97	12	4.2	1	Out of Phase	100	75	DSEE FREE	-55 to 125°C	V Equivalent, /PROTO	Space	24 Ld CDFP
ISL78845ASRH	Boost, Flyback, Isolated	13.2	9	0.5	50	2.9	8.4	1	-	100	-	43	-55 to +125	V, Q, /PROTO	Military, Space	8pin-CFP 8pin-SBDIP
ISL78845ASEH											50			V, /PROTO	Space	
ISL738845ASEH										-						8pin-CFP
ISL78843ASRH	Boost, Flyback, Isolated	13.2	9	1	100	2.9	8.4	1	-	100	-	43	-55 to +125	V, Q, /PROTO	Military, Space	8pin-CFP 8pin-SBDIP
ISL78843ASEH											50			V, /PROTO	Space	
ISL738843ASEH										-						8pin-CFP
ISL78841ASRH	Boost, Flyback, Isolated	13.2	9	1.5	50	2.9	7	1	-	100	-	43	-55 to +125	V, Q, /PROTO	Military, Space	8pin-CFP 8pin-SBDIP
ISL78841ASEH											50			V, /PROTO	Space	
ISL738841ASEH										-						8pin-CFP
ISL78840ASRH	Boost, Flyback, Isolated	13.2	9	1	100	2.9	7	1	-	100	-	43	-55 to +125	V, Q, /PROTO	Military, Space	8pin-CFP 8pin-SBDIP
ISL78840ASEH											50			V, /PROTO	Space	
ISL738840ASEH										-						8pin-CFP
ISL71823BSRH	Boost, Flyback, Isolated	20	12	1	100	25	8.6	2	In Phase	300	-	DSEE FREE	-50 to +125	V, Q, /PROTO	Military, Space	16pin-SBDIP 20pin-CFP
ISL71823ASRH	Voltage or Current Mode Switching Power Supplies	20	12	1	100	25	8.6	2	In Phase	300		DSEE FREE	-50 to +125	V, Q, /PROTO	Military, Space	20 LD FP, 16 LD SBDIP
IS-1825ASRH	Voltage or Current Mode Switching Power Supplies	20	12	0.5	50	25	8.6	2	Out of Phase	300	In Qualifi-cation	DSEE FREE	-50 to +125	V, Q, /PROTO	Military, Space	16pin-SBDIP 20pin-CFP
IS-1825BSRH											-			V, Q, /PROTO	Military, Space	
IS-1825BSEH											50			V, /PROTO	Space	
IS-1845ASRH	Current Mode Switching Power Supplies	20	12	0.5	50	17	8.8	1	-	300	-	DSEE FREE	-50 to +125	V, Q, /PROTO	Military, Space	18pin-CFP 8pin-SBDIP
IS-1845ASEH											50			V, /PROTO	Space	
HS-1825ARH	Voltage or Current Mode Switching Power Supplies	30	12	1	100	36	8.4	2	Out of Phase	300	-	DSEE FREE	-50 to +125	V, Q, /PROTO	Military, Space	16pin-CFP 16pin-SBDIP
HS-1825AEH														V, /PROTO	Space	

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Radiation Tolerant Plastic Products

Rad-Tolerant Analog

Part Number	Description	Isolation Voltage (min)	Data Rate (Mbps)	Output Format	Supply Voltage Range (V)	Propa-gation Delay	Input Type	LDR (krad (Si))	DSEE (MeV* cm²/mg)	Temp Range (°C)	Qualification Level	Package
CAN Bus Transceivers												
ISL71026M	Rad-Tolerant 3.3V CAN Transceiver, 1Mbps, Listen Mode, Loopback	-	-	-	3 to 3.6	-	-	30	43	-55 to +125	RT Plastic	14pin-TSSOP

Multiplexers

Part Number	Description	Channels per device (#)	V_{CC} (Single) (V)	t_{AHL} (Max) (ns)	Switch Input Off Leakage (Max) (nA)	Charge Injection (pC)	LDR (krad (Si))	DSEE (MeV* cm²/mg)	Temp Range (°C)	Qualification Level	Package
ISL71030M	Rad-Tolerant 5V 16-Channel Analog Multiplexer	16	3 - 5.5	70	120	5	30	43	-55 to +125	RT Plastic	32 Ld TQFP

Operational Amplifiers

Part Number	Description	Channels (#)	Bandwidth (MHz)	Slew Rate (V/µs)	V_S (Min) (V)	V_S (Max) (V)	I_S (per amp) (mA)	Noise VN (nV/√Hz)	Offset Voltage (Max) (mV)	I_{OUT} (A)	Rail-to-Rail Input	Rail-to-Rail Output	PSRR (db)	CMRR (dB)	AVOL (dB)	LDR (krad (Si))	DSEE (MeV*cm²/mg)	Temp Range (°C)	Qualification Level	Package
ISL71218M	Dual 36V Precision Single-Supply, Low-power Op Amp	2	4	1.2	3	36	1.4	5.6	0.29	0.01	No	Yes	100	97	115	30	43	-55 to +125	RT Plastic	8 Ld SOICN
ISL71444M	19MHz 40V Quad Low-power Op Amp	4	19	60	2.7	40	1.1	11.3	0.5	0.01	Yes	Yes	130	113	130	30	43	-55 to +125	RT Plastic	14 Ld TSSOP

Voltage References

Part Number	Description	V_{OUT} (V)	Tempco (ppm/°C) (max)	I_S (Typ) (µA)	Vs Range (V)	Accuracy over temperature/ radiation	Output Noise (Typ)	Output Current Capabil-ity	LDR (krad (Si))	DSEE (MeV* cm²/mg)	Temp Range (°C)	Qualifi-cation Level	Package
ISL71010B25	Ultra Low Noise, 2.5V Precision Voltage Reference	2.5V ±0.05%	10	930	4-30	±0.15%	1.9µV_{P-P} (0.1Hz to 10Hz)	20mA	30	43	-55 to +125	RT Plastic	8 Ld SOICN
ISL71010B50	Ultra Low Noise, 5V Precision Voltage Reference	5.0V ±0.05%	10	930	7-30	±0.15%	4.2µV_{P-P} (0.1Hz to 10Hz)	930µA	30	43	-55 to +125	RT Plastic	8 Ld SOICN

RF Switches

Part Number	Description	Frequency Range (GHz)	Isolation (dB)	Insertion Loss (dB)	IP0.1dB (dBm)	IIP2 (dBm)	IIP3 (dBm)	LDR (krad (Si))	DSEE (MeV*cm²/mg)	Temp Range (°C)	Qualifica-tion Level	Package
ISL71934M	Rad-Tolerant DC-8GHz SPDT RF Switch	DC - 8	67	0.79	32	111	64	30	43	-55 to 105	RT Plastic	16 Ld QFN

AD Converters

Part Number	Maximum Sampling Rate	ENoB (bits)	SNR (dBFS)	INL (LSB)	DNL (LSB)	HDR krad (Si)	LDR krad (Si)	SEL/DSEE	Temp Range (°C)	Qualification Level	Package
ISL71148M	900ksps	13.5	83.2	0.4	0.2	N/A	30 / 50	46	-55 to +125	RT Plastic	48-pin TQFP

Rad-Tolerant Digital

Part Number	Description	Isolation Voltage (min)	Data Rate (Mbps)	Output Format	Supply Voltage Range (V)	Propa-gation Delay	Input Type	LDR (krad (Si))	DSEE (MeV* cm²/mg)	Temp Range (°C)	Qualification Level	Package
Digital Isolators												
ISL71710M	Rad-Tolerant Active-Input High Speed Digital Isolator	2.5kVrms	150	CMOS	3 to 5	10	High Impedance	30	43	-55 to +125	RT Plastic	8pin-SOICN
ISL71610M	Rad-Tolerant Passive-Input Digital Isolator	2.5kVrms	100	CMOS	3 to 5	8	Passive	30	43	-55 to +125	RT Plastic	8pin-SOICN

Rad-Tolerant Power

PWM Controllers

Part Number	Description	Topology [Rail 1]	Topology	Control Mode	V_{DD} (V)	Operating Current (mA)	Start-up Current (Typ) (µA)	Duty Cycle (%)	LDR (krad (Si))	DSEE (MeV* cm²/mg)	Temp Range (°C)	Qualifi-cation Level	Package
ISL73847M	Dual Phase PWM Controller for Core Power	-	Buck	Current Mode	4.5 - 19	12	11	See (EQ2) Below	30 / 50	43	-55 to +125	Space	24 Ld SOIC
ISL71043M	Rad-Tolerant Single-Ended Current Mode PWM Controller	Boost, Forward, Single-Ended	Flyback	Peak Current Mode	9 - 13.2	2.9	90	100	30	43	-55 to +125	RT Plastic	8 Ld SOICN, 8 Ld TDFN
ISL71041M	Rad-Tolerant Single-Ended Current Mode PWM Controller	Single-Ended	Flyback		9 - 13.2	2.9	90	50	30	43	-55 to +125	RT Plastic	8 Ld TDFN

(EQ2) $$\frac{(t_{PERIOD} - t_{MIN\text{-}OFF})}{t_{PERIOD}}$$

Switching Regulators

Part Number	Description	Topology [Rail 1]	Outputs (#)	Input Voltage (Min) (V)	Input Voltage (Max) (V)	Output Voltage (Min) (V)	Output Voltage (Max) (V)	Output Current (Max) [Rail 1] (A)	I_Q (mA)	Switching Frequency (KHz)	Peak Efficiency (%)	SYNCH Capability	Control Type	LDR (krad (Si))	DSEE (MeV *cm²/mg)	Temp Range (°C)	Qualifi-cation Level	Package
ISL71001M	6A Rad-Tolerant Sync Buck Regulator with Int. MOSFETs	Buck	1	3	5.5	0.85	4.675	6	1.4	1.18	95	Yes	Current Mode	30	43	-55 to +125	RT Plastic	64 Ld TQFP-EP

GaN FET Drivers

Part Number	Description	Type	V_{IN} (min) (V)	V_{IN} (max) (V)	Gate Drive (V)	Peak Source Current (A)	Peak Sink Current (A)	Rise Time (ns)	Fall Time (ns)	Prop Delay (ns)	Prop Delay Matching (ns) (Typ)	HDR krad (Si)	LDR krad (Si)	DSEE (MeV* cm²/ mg)	Temp Range (°C)	Qualifi-cation Level	Package
ISL71441M	Radiation Tolerant 12V Half-Bridge GaN FET Driver	Half Bridge	4.75	13.2	4.5	2/4	4/8	15/10	1.5	29	1	-	30/50	43	-55 to +125	RT Plastic	20 Ld QFN
ISL71040M	Rad-Tolerant Low-Side GaN FET Driver	Low Side	4.5	13.2	4.5	3	4	7.5	1.4	40	1	-	30/50	43	-55 to +125	RT Plastic	8 Ld TDFN

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