

Radiation Hardened High Frequency Half Bridge Driver

The Radiation Hardened IS-2100ARH is a high frequency, 150V Half Bridge N-Channel MOSFET Driver IC, which is a functional, pin-to-pin replacement for industry standard 2110 types. The low-side and high-side gate drivers are independently controlled. This gives the user maximum flexibility in dead-time selection and driver protocol.

In addition, the device has on-chip error detection and correction circuitry, which monitors the state of the high-side latch and compares it to the HIN signal. If they disagree, a set or reset pulse is generated to correct the high-side latch. This feature protects the high-side latch from single event upsets (SEUs).

Undervoltage on the high-side supply forces HO low. When that supply returns to a valid voltage, HO will go to the state of HIN. Undervoltage on the low-side supply forces both LO and HO low. When that supply becomes valid, LO returns to the LIN state and HO returns to the HIN state.

Specifications for Rad Hard QML devices are controlled by the Defense Supply Center in Columbus (DSCC). The SMD numbers listed here must be used when ordering.

Detailed Electrical Specifications for the IS-2100ARH are contained in SMD 5962-99536.

Ordering Information

ORDERING NUMBER	INTERSIL MKT. NUMBER	TEMP. RANGE (°C)
5962F9953602VXC	IS9-2100ARH-Q	-55 to 125
5962F9953602QXC	IS9-2100ARH-8	-55 to 125
IS9-2100ARH/Proto	IS9-2100ARH/Proto	-55 to 125

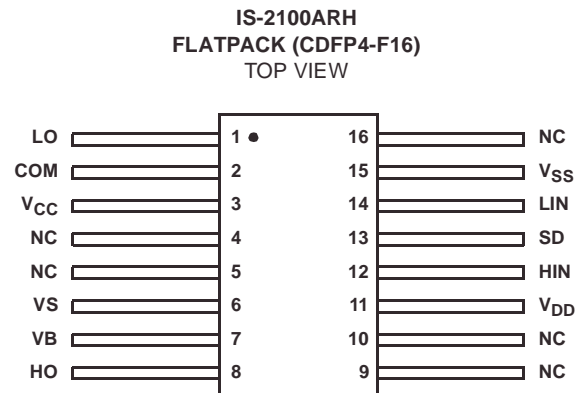
Features

- Electrically Screened to DSCC SMD # 5962-99536
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Environment
 - Maximum Total Dose 300krad(SI)
 - DI RSG Process Provides Latch-up Immunity
 - SEU Rating. 82MeV/mg/cm²
 - Vertical Device Architecture Provides Improved Low Dose Rate Immunity
- Bootstrap Supply Max Voltage to 170V
- Drives 1000pF Load at 1MHz with Rise and Fall Times of 30ns (Typ)
- 1.5A (Typ) Peak Output Current
- Independent Inputs for Non-Half Bridge Topologies
- Low DC Power Consumption. 60mW (Typ)
- Operates with V_{DD} = V_{CC} Over 12V to 20V Range
- Supply Undervoltage Protection

Applications

- High Frequency Switch-Mode Power Supplies
- Drivers for Inductive Loads
- DC Motor Drivers

Pinout



Die Characteristics

DIE DIMENSIONS:

4820μm x 3300μm (190 mils x 130 mils)
 Thickness: 483μm ±25.4μm (19 mils ±1 mil)

INTERFACE MATERIALS:

Glassivation:

Type: PSG (Phosphorous Silicon Glass)
 Thickness: 8.0kÅ ±1.0kÅ

Top Metallization:

Type: ALSiCu
 Thickness: 16.0kÅ ±2kÅ

Substrate:

Radiation Hardened Silicon Gate,
 Dielectric Isolation

Backside Finish:

Silicon

ASSEMBLY RELATED INFORMATION:

Substrate Potential:

Unbiased (DI)

ADDITIONAL INFORMATION:

Worst Case Current Density:

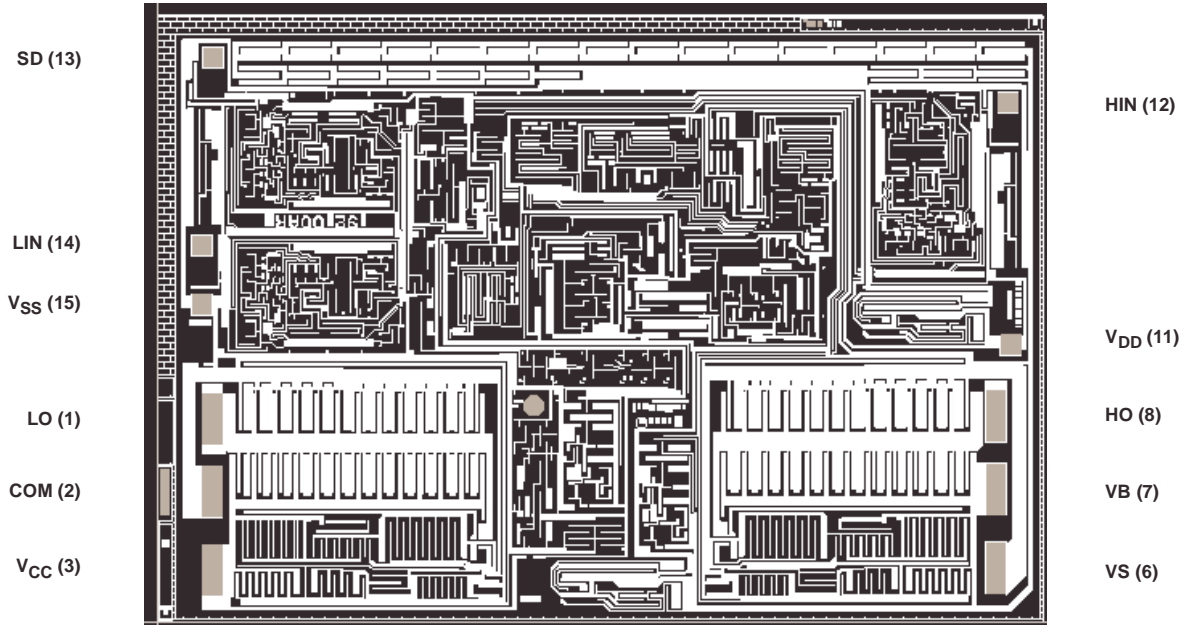
<2.0 x 10⁵ A/cm²

Transistor Count:

542

Metallization Mask Layout

IS-2100ARH



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IS-2100ARH

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Rad-Hard High Frequency Half Bridge Driver

DS Datasheets, Related Docs & Simulations	Description	Key Features	PT Parametric Data	Application Diagrams	Related Devices
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Ordering Information

Pb RoHS/Pb-Free/Green Device

Part No.	Design-In Status	Temp.	Package	MSL	SMD	Price US \$	
IS0-2100ARH-Q	Active	Mil	16 Ld Die (Military Visual)	N/A	5962F9953602VXC	Contact Us	Buy
IS9-2100ARH-8	Active	Mil	16 Ld FlatPack	N/A	5962F9953602QXC	Contact Us	Buy
IS9-2100ARH-Q	Active	Mil	16 Ld FlatPack	N/A	5962F9953602VXC	Contact Us	Buy

The price listed is the manufacturer's suggested retail price for quantities between 100 and 999 units. However, prices in today's market are fluid and may change without notice.

MSL = Moisture Sensitivity Level - per IPC/JEDEC J-STD-020

SMD = Standard Microcircuit Drawing

Description

The Radiation Hardened IS-2100ARH is a high frequency, 130V Half Bridge N-Channel MOSFET Driver IC, which is functionally similar to industry standard 2110 types. The lowside and high-side gate drivers are independently controlled. This gives the user maximum flexibility in dead-time selection and driver protocol.

In addition, the device has on-chip error detection and correction circuitry, which monitors the state of the high-side latch and compares it to the HIN signal. If they disagree, a set or reset pulse is generated to correct the high-side latch. This feature protects the high-side latch from single event upsets (SEUs).

Specifications for Rad Hard QML devices are controlled by the Defense Supply Center in Columbus (DSCC). The SMD numbers listed here must be used when ordering. Detailed Electrical Specifications for the IS-2100ARH are contained in SMD 5962-99536. A "hotlink" is provided on our website for downloading.

Key Features

- Electrically Screened to DSCC SMD # 5962-99536
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Environment
 - Maximum Total Dose 300krad(SI)
 - DI RSG Process Provides Latch-up Immunity
 - SEU Rating 82MeV/mg/cm²
 - Vertical Device Architecture Reduces Sensitivity to Low Dose Rates
- Bootstrap Supply Max Voltage to 150V
- Drives 1000pF Load at 1MHz with Rise and Fall Times of 30ns (Typ)
- 1.5A (Typ) Peak Output Current
- Independent Inputs for Non-Half Bridge Topologies
- Low DC Power Consumption 60mW (Typ)
- Operates with VDD = VCC Over 12V to 20V Range
- Low-side Supply Undervoltage Protection

Related Documentation

- DS** Datasheet(s):
- [Radiation Hardened High Frequency Half Bridge Driver](#)

- SMD** Military SMD(s):
- [Radiation Hardened High Frequency Half Bridge Driver](#)

- TH** Technical Homepage:
- [Military/Space ICs](#)

Other:

- [Single Event Effects Testing of the IS-2100ARH Half Bridge MOSFET Driver](#)

PT Parametric Data

RH Level	300
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Application Block Diagrams

- [Satellite Power Management](#)

Applications

- High Frequency Switch-Mode Power Supplies
- Drivers for Inductive Loads
- DC Motor Drivers