Data Sheet June 1999 File Number 4739.1

Radiation Hardened Dual, Non-Inverting Power MOSFET Drivers

The Radiation Hardened HS-4424RH and HS-4424BRH are non-inverting, dual, monolithic high-speed MOSFET drivers designed to convert TTL level signals into high current outputs at voltages up to 18V.

The inputs of these devices are TTL compatible and can be directly driven by our HS-1825ARH PWM device or by our ACS/ACTS and HCS/HCTS type logic devices. The fast rise times and high current outputs allow very quick control of high gate capacitance power MOSFETs, like our Rad Hard FS055, in high frequency applications.

The high current outputs minimize power losses in MOSFETs by rapidly charging and discharging the gate capacitance. The output stage incorporates a low voltage lock-out circuit that puts the outputs into a three-state mode when the supply voltage drops below 10V for the HS-4424RH and 7.5V for the HS-4424BRH.

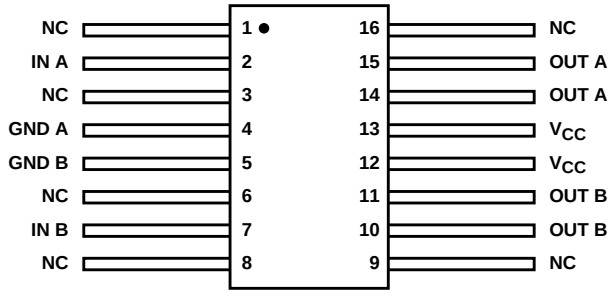
Constructed with the Intersil dielectrically isolated Rad Hard Silicon Gate (RSG) BiCMOS process, these devices are immune to Single Event Latch-up and have been specifically designed to provide highly reliable performance in harsh radiation environments.

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 these devices are contained in SMD 5962-99560. A “hot-link” is provided on our homepage for downloading. www.intersil.com/spacedefense/space.asp

Pinout

HS-4424RH, HS-4424BRH (FLATPACK CDFP4-F16)
TOP VIEW



NOTE: Pins 4 and 5, 10 and 11, 12 and 13, 14 and 15 are double-bonded to their same electrical points on the die.

Features

- Electrically Screened to DESC SMD # 5962-99560
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Environment
  - Total Dose (Max). . . . . 3×10^5 RAD(SI)
  - Latch-Up Immune
  - Low Dose Rate Immune
- I_{PEAK} . . . . . >2A (Min)
- Matched Rise and Fall Times (C_L = 4300pF) . . . 75ns (Max)
- Low Voltage Lock-Out Feature
  - HS-4424RH . . . . . < 10.0V
  - HS-4424BRH . . . . . < 7.5V
- Wide Supply Voltage Range. . . . . 12V to 18V
- Prop Delay . . . . . .250ns (Max)
- Consistent Delay Times with V_{CC} Changes
- Low Power Consumption
  - 40mW with Inputs High
  - 20mW with Inputs Low
- Low Equivalent Input Capacitance . . . . . .3.2pF (Typ)
- ESD Protected . . . . . >4000V

Applications

- Switching Power Supplies
- DC/DC Converters
- Motor Controllers

Ordering Information

ORDERING NUMBER	INTERNAL MKT. NUMBER	TEMP. RANGE (^oC)
5962F9956001VXC	HS9-4424RH-Q	-55 to 125
5962F9956001QXC	HS9-4424RH-8	-55 to 125
HS9-4424RH/Proto	HS9-4424RH/Proto	-55 to 125
5962F9956002VXC	HS9-4424BRH-Q	-55 to 125
5962F9956002QXC	HS9-4424BRH-8	-55 to 125
HS9-4424BRH/Proto	HS9-4424BRH/Proto	-55 to 125

CAUTION: These devices are sensitive to electrostatic discharge; follow proper IC Handling Procedures.
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Die Characteristics

DIE DIMENSIONS:

4890µm x 3370µm (193 mils x 133 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:

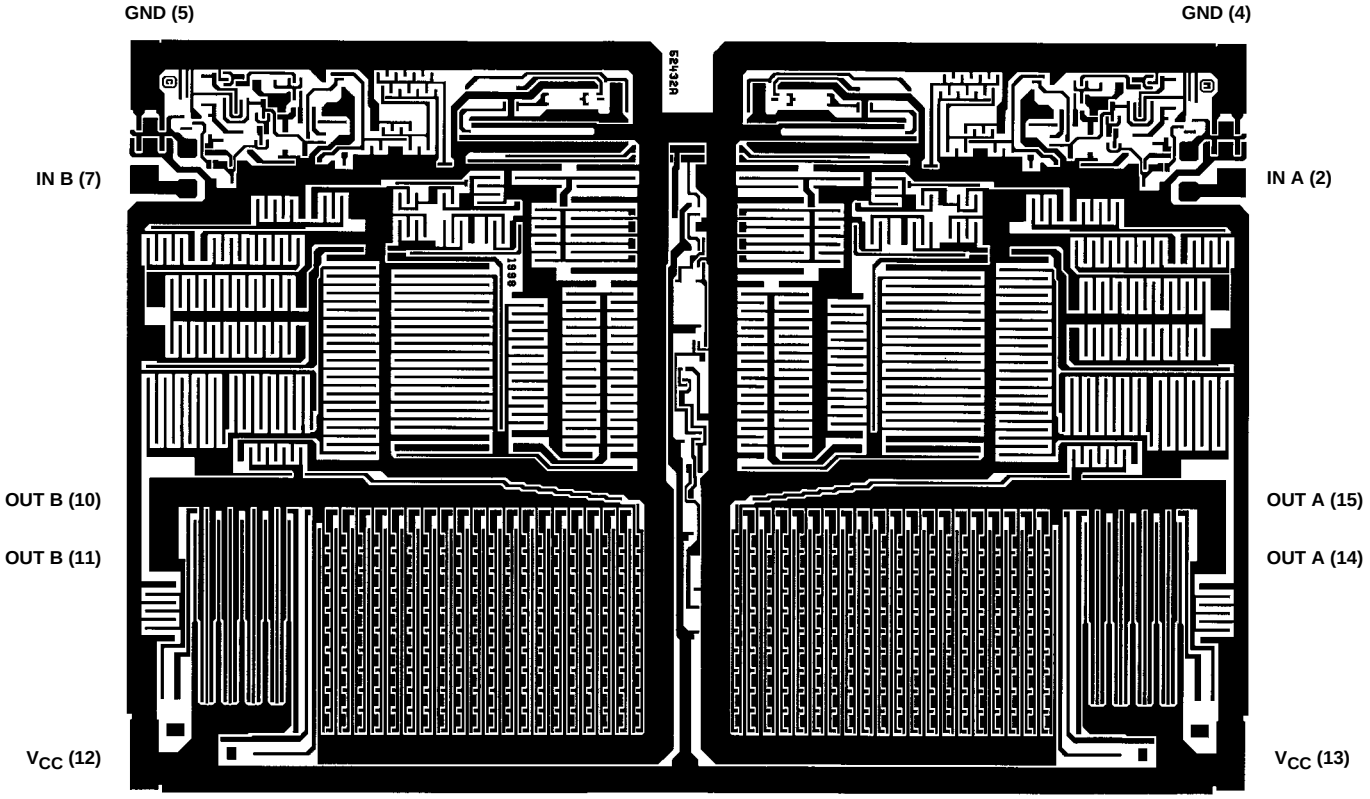
$<2.0 \times 10^5$ A/cm^2

Transistor Count:

125

Metallization Mask Layout

HS-4424RH, HS-4424BRH



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