

**HS-4424RH, HS-4424EH, HS-4424BRH, HS-4424BEH**

Radiation Hardened Dual, Non-Inverting Power MOSFET Drivers

FN4739

Rev 2.00

September 24, 2013

The Radiation Hardened HS-4424RH, HS-4424EH, HS-4424BRH and HS-4424BEH 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 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, HS-4424EH and 7.5V for the HS-4424BRH, HS-4424BEH.

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 Logistics Agency Land and Maritime (DLA). The SMD numbers listed here must be used when ordering.**

Detailed Electrical Specifications for these devices are contained in SMD [5962-99560](#).

**Features**

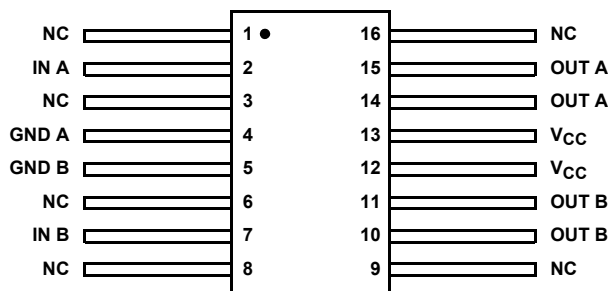
- Electrically screened to DESC SMD # [5962-99560](#)
- QML qualified per MIL-PRF-38535 requirements
- EH version acceptance tested to 50krad(Si) (LDR)
- Radiation environment
  - High dose rate (50-300rad(Si)/s) . . . . . 300krad(Si)
  - Latch-up immune
  - Low dose rate immune
- I<sub>PEAK</sub> . . . . . >2A (min)
- Matched rise and fall times (C<sub>L</sub> = 4300pF) . . . . . 75ns (max)
- Low voltage lock-out feature
  - HS-4424RH, HS-4424EH . . . . . < 10.0V
  - HS-4424BRH, HS-4424BEH . . . . . < 7.5V
- Wide supply voltage range . . . . . 12V to 18V
- Prop delay . . . . . 250ns (max)
- Consistent delay times with V<sub>CC</sub> 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

**Pin Configuration**

HS-4424RH, HS-4424EH, HS-4424BRH, HS-4424BEH  
(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.

## Ordering Information

ORDERING SMD NUMBER (Note 2)	PART NUMBER (Note 1)	TEMPERATURE RANGE (°C)	PACKAGE (RoHS Compliant)	PKG. DWG. #
5962F9956004V9A	HS0-4424BEH-Q	-55 to +125	DIE	
5962F9956002V9A	HS0-4424BRH-Q	-55 to +125	DIE	
HS0-4424BRH/SAMPLE	HS0-4424BRH/SAMPLE	-55 to +125	DIE SAMPLE	
5962F9956003V9A	HS0-4424EH-Q	-55 to +125	DIE	
5962F9956001V9A	HS0-4424RH-Q	-55 to +125	DIE	
HS0-4424RH/SAMPLE	HS0-4424RH/SAMPLE	-55 to +125	DIE SAMPLE	
5962F9956001VXC	HS9-4424RH-Q	-55 to +125	16 Ld Flatpack	K16.A
5962F9956004VXC	HS9-4424BEH-Q	-55 to +125	16 Ld Flatpack	K16.A
5962F9956003VXC	HS9-4424EH-Q	-55 to +125	16 Ld Flatpack	K16.A
5962F9956002QXC	HS9-4424BRH-8	-55 to +125	16 Ld Flatpack	K16.A
5962F9956002VXC	HS9-4424BRH-Q	-55 to +125	16 Ld Flatpack	K16.A
HS9-4424BRH/PROTO	HS9-4424BRH/PROTO	-55 to +125	16 Ld Flatpack	K16.A
HS9-4424RH/PROTO	HS9-4424RH/PROTO	-55 to +125	16 Ld Flatpack	K16.A
5962F9956001QXC	HS9-4424RH-8	-55 to +125	16 Ld Flatpack	K16.A

### NOTES:

1. These Intersil Pb-free Hermetic packaged products employ 100% Au plate - e4 termination finish, which is RoHS compliant and compatible with both SnPb and Pb-free soldering operations.
2. Specifications for Rad Hard QML devices are controlled by the Defense Logistics Agency Land and Maritime (DLA). The SMD numbers listed in the "Ordering Information" table on page 2 must be used when ordering..

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## Die Characteristics

### DIE DIMENSIONS:

4890 $\mu$ m x 3370 $\mu$ m (193 mils x 133 mils)  
Thickness: 483 $\mu$ m  $\pm$  25.4 $\mu$ m (19 mils  $\pm$  1 mil)

### INTERFACE MATERIALS:

#### Glassivation:

Type: PSG (Phosphorous Silicon Glass)  
Thickness: 8.0k $\text{Å}$   $\pm$  1.0k $\text{Å}$

#### Top Metallization:

Type: AlSiCu  
Thickness: 16.0k $\text{Å}$   $\pm$  2k $\text{Å}$

#### 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<sup>2</sup>

#### Transistor Count:

125

## Metallization Mask Layout

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