ISL74422BRH

Radiation Hardened, 9A, Non-Inverting Power MOSFET Driver

FN6057
Rev 0.00
October 2003

The radiation hardened ISL74422BRH is a non-inverting, monolithic high-speed MOSFET driver designed to convert a 5V CMOS logic input signal into a high current output at voltages up to 18V. Its fast rise/fall times and high current output allow very quick control of even the largest power MOSFETs in high frequency applications.

The input of the ISL74422BRH can be directly driven by our IS-1825ASRH and IS-1845ASRH PWM devices. The 9A high current output minimizes power losses in MOSFETs by rapidly charging and discharging large gate capacitances. A supply UVLO (Under Voltage Lock Out) circuit insures predictable turn-on and turn-off of the driver.

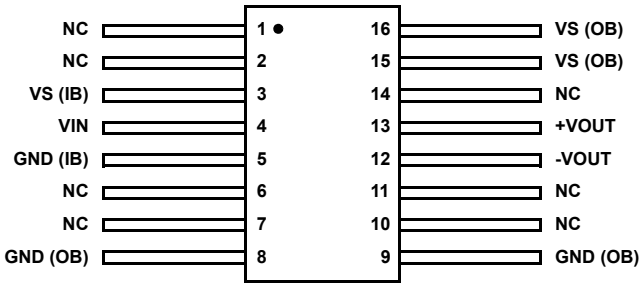
Constructed with the Intersil dielectrically isolated Rad-Hard Silicon Gate (RSG) BiCMOS process, these devices are immune to single event latch-up and have been specifically designed to provide highly reliable performance in harsh radiation environments.

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 5962-03248. A “hot-link” is provided on our website for downloading.

Pinout

ISL74422BRHF (FLATPACK CDFP4-F16)
TOP VIEW



NOTES:

1. Pin 3 provides the supply voltage for the control logic. It is not internally connected to pins 15 and 16 for noise immunity purposes, but it must be connected externally.
2. Pin 5 is the control logic return. It is not internally connected to pins 8 and 9 for noise immunity purposes, but it must be connected externally.
3. Pins 8 and 9 must be connected to GND.
4. Pins 12 and 13 must be externally connected.
5. Pins 15 and 16 must be connected to VS.

Features

- QML Qualified per MIL-PRF-38535 Requirements
- Electrically Screened to DSCC SMD # 5962-03248
- Radiation Environment
  - Total Dose (Max) . . . . . 300krad(SI)
  - Latch-Up Immune
- I_{PEAK} . . . . . 9A (Min)
- T_{FALL} (C_L = 10nF) . . . . . 135ns (Max)
- T_{RISE} (C_L = 10nF) . . . . . 135ns (Max)
- Prop Delay High-Low (C_L = 10nF) . . . . . 175ns (Max)
- Prop Delay Low-High (C_L = 10nF) . . . . . 175ns (Max)
- Rising UVLO Threshold . . . . . 7.5V (Max)
- Falling UVLO Threshold. . . . . .6.0V (Min)
- UVLO Hysteresis . . . . . .0.3V (Min)
- Wide Supply Voltage Range . . . . . 8V to 18V
- Low Stand-by Current Consumption
  - Input Low . . . . . .2.1mA (Max)
  - Input High . . . . . .2.7mA (Max)

Applications

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

Ordering Information

ORDERING NUMBER	INTERNAL MKT. NUMBER	TEMP. RANGE (^oC)
5962F0324801VXC	ISL74422BRHVF	-55 to 125
5962F0324801QXC	ISL74422BRHQF	-55 to 125
ISL74422BRHF/PROTO	ISL74422BRHF/PROTO	-55 to 125

Die Characteristics

DIE DIMENSIONS:

4191µm x 4826µm (165 mils x 190 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:

40

Metallization Mask Layout

ISL74422BRH