

Radiation Hardened High-Speed, Dual Output PWM

The Radiation Hardened HS-1825ARH Pulse Width Modulator is designed to be used in high frequency switched-mode power supplies and can be used in either current-mode or voltage-mode. It is well suited for single-ended boost converter applications.

Device features include a precision voltage reference, low power start-up circuit, high frequency oscillator, wide-band error amplifier, and fast current-limit comparator. The use of proprietary process capabilities and unique design techniques results in fast propagation delay times and high output current over a wide range of output voltages.

Constructed with the Intersil Rad Hard Silicon Gate (RSG) Dielectric Isolation BiCMOS process, the HS-1825ARH has been specifically designed to provide highly reliable performance when exposed to harsh radiation environments.

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

Detailed Electrical Specifications for the HS-1825ARH are contained in SMD 5962-99558. That document may be easily downloaded from our website. www.intersil.com/

Features

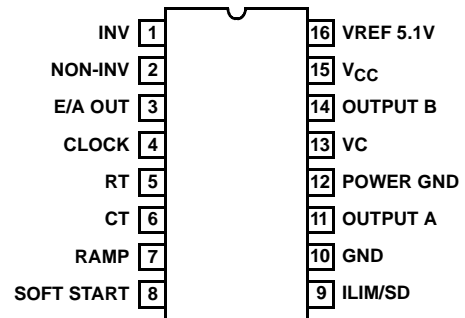
- Electrically Screened to DESC SMD # 5962-99558
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Environment
 - Maximum Total Dose 300 krad(SI)
 - Vertical Architecture Provides Low Dose Rate Immunity
 - DI RSG Process Provides Latch-Up Immunity
- Low Start-Up Current 100µA (Typ)
- Fast Propagation Delay 80ns (Typ)
- 12V to 30V Operation
- 1A (Peak) Dual Output Drive Capability
- 5.1V Reference
- Undervoltage Lockout
- Programmable Soft-Start
- Switching Frequencies to 500kHz
- Latched Overcurrent Comparator with Full Cycle Restart
- Programmable Leading Edge Blanking Circuit

Applications

- Current or Voltage Mode Switching Power Supplies
- Motor Speed and Direction Control

Pinout

**HS-1825ARH
SBDIP (CDIP2-T16) AND FLATPACK (CDFP4-F16)
TOP VIEW**



NOTE: Grounding the Soft-Start pin does not inhibit the outputs. The outputs may be inhibited by applying >1.26V to the ILIM/SD pin.

Ordering Information

| ORDERING NUMBER | INTERNAL MKT. NUMBER | TEMP. RANGE (°C) | PACKAGE | PKG. DWG. # |
|--------------------|----------------------|------------------|----------------|-------------|
| 5962F9955801V9A | HS0-1825ARH-Q | -50 to +125 | | |
| HS0-1825ARH/Sample | HS0-1825ARH/Sample | -50 to +125 | | |
| 5962F9955801VEC | HS1-1825ARH-Q | -50 to +125 | 16 Ld SBDIP | D16.3 |
| 5962F9955801QEC | HS1-1825ARH-8 | -50 to +125 | 16 Ld SBDIP | D16.3 |
| 5962F9955801VXC | HS9-1825ARH-Q | -50 to +125 | 16 Ld Flatpack | K16.A |
| 5962F9955801QXC | HS9-1825ARH-8 | -50 to +125 | 16 Ld Flatpack | K16.A |
| HS1-1825ARH/Proto | HS1-1825ARH/Proto | -50 to +125 | 16 Ld SBDIP | D16.3 |
| HS9-1825ARH/Proto | HS9-1825ARH/Proto | -50 to +125 | 16 Ld Flatpack | K16.A |

Typical Performance Curves

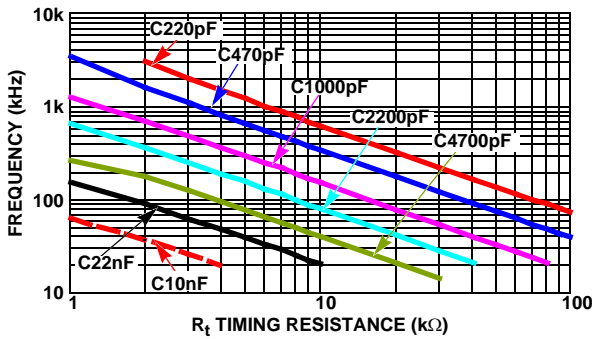


FIGURE 1. OSCILLATOR FREQUENCY vs R_t AND C_t

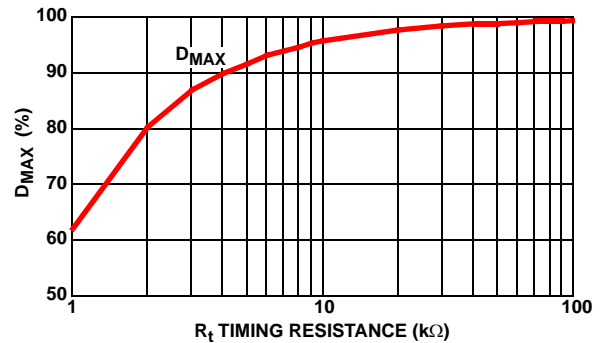


FIGURE 2. MAXIMUM DUTY CYCLE vs R_t

Die Characteristics

DIE DIMENSIONS

4710µm x 3570µm (185 mils x 140 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

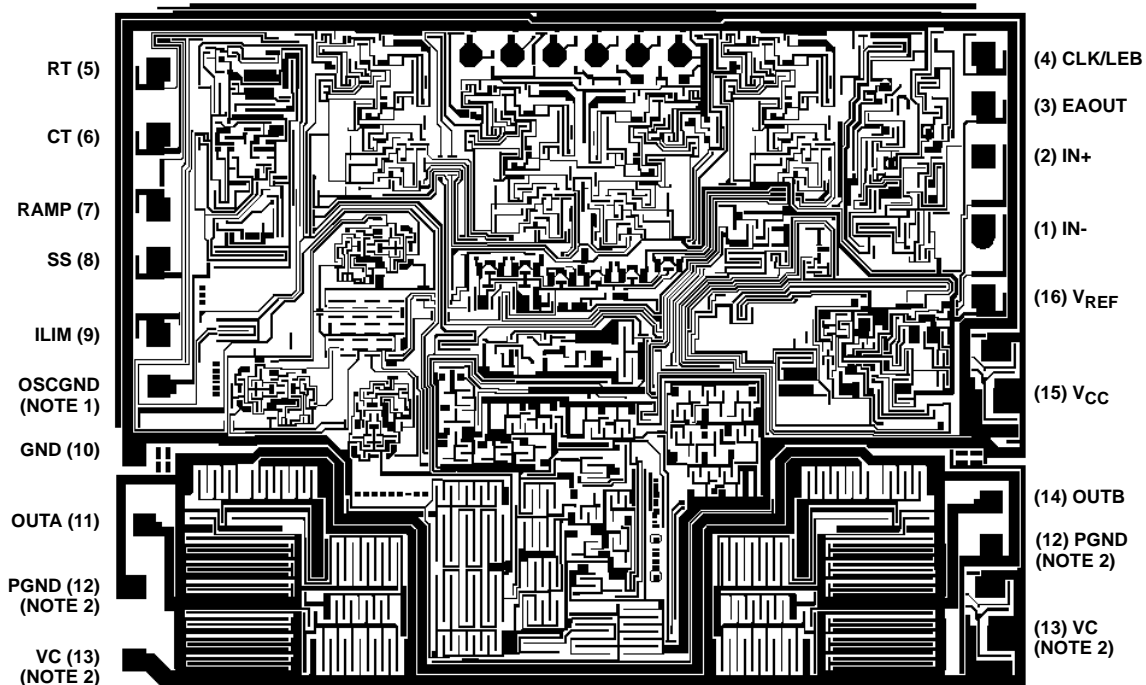
<2.0 x 10⁵ A/cm²

Transistor Count

225

Metallization Mask Layout

HS-1825ARH



NOTES:

1. This is the oscillator ground (OSCGND) bond pad and must be connected to GND.
2. PGND and VC each require two bond pad connections.

All Intersil U.S. products are manufactured, assembled and tested utilizing ISO9000 quality systems.
 Intersil Corporation's quality certifications can be viewed at www.intersil.com/design/quality

Intersil products are sold by description only. Intersil Corporation reserves the right to make changes in circuit design, software and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that data sheets are current before placing orders. Information furnished by Intersil is believed to be accurate and reliable. However, no responsibility is assumed by Intersil or its subsidiaries for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Intersil or its subsidiaries.

For information regarding Intersil Corporation and its products, see www.intersil.com