

# Radiation Hardened High-Speed, Dual Output PWM

## HS-1825ARH, HS-1825AEH

The Radiation Hardened HS-1825ARH, HS-1825AEH 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, HS-1825AEH 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 Logistics Agency Land and Maritime (DLA). The SMD numbers listed below must be used when ordering.**

Detailed Electrical Specifications for the HS-1825ARH, HS-1825AEH are contained in SMD 5962-99558. That document may be easily downloaded from our website. [www.intersil.com/](http://www.intersil.com/)

## Features

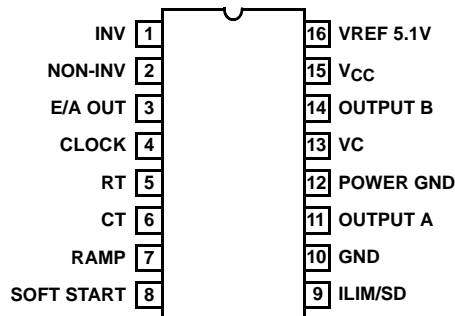
- Electrically Screened to DLA [SMD # 5962-99558](#)
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Environment
  - Maximum Total Dose . . . . . 300 krad(SI)
  - Vertical Architecture Provides Low Dose Rate Immunity
  - DI RSG Process Provides Latch-Up Immunity
- Low Start-Up Current . . . . . 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

## Pin Configuration

HS-1825ARH, HS-1825AEH  
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.

# HS-1825ARH, HS-1825AEH

## Ordering Information

ORDERING NUMBER	INTERNAL MKT. NUMBER (Note)	TEMP. RANGE (°C)	PACKAGE (RoHS Compliant)	PKG. DWG. #
5962F9955801V9A	HS0-1825ARH-Q	-50 to +125		
5962F9955802V9A	HS0-1825AEH-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
5962F9955802VEC	HS1-1825AEH-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
5962F9955802VXC	HS9-1825AEH-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

NOTE: 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.

## Typical Performance Curves

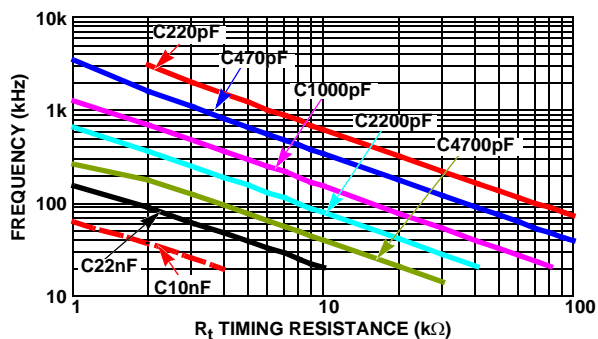


FIGURE 1. OSCILLATOR FREQUENCY vs  $R_t$  AND  $C_t$

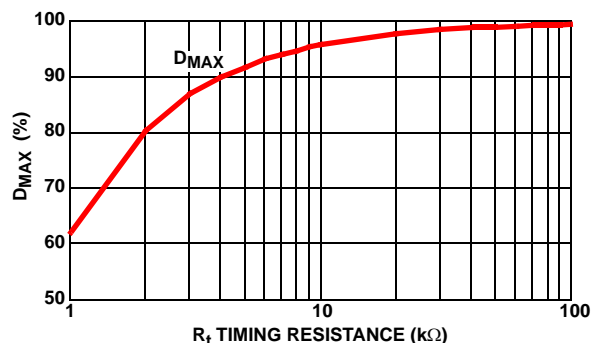


FIGURE 2. MAXIMUM DUTY CYCLE vs  $R_t$

# HS-1825ARH, HS-1825AEH

## Die Characteristics

### DIE DIMENSIONS

4710 $\mu$ m x 3570 $\mu$ m (185 mils x 140 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

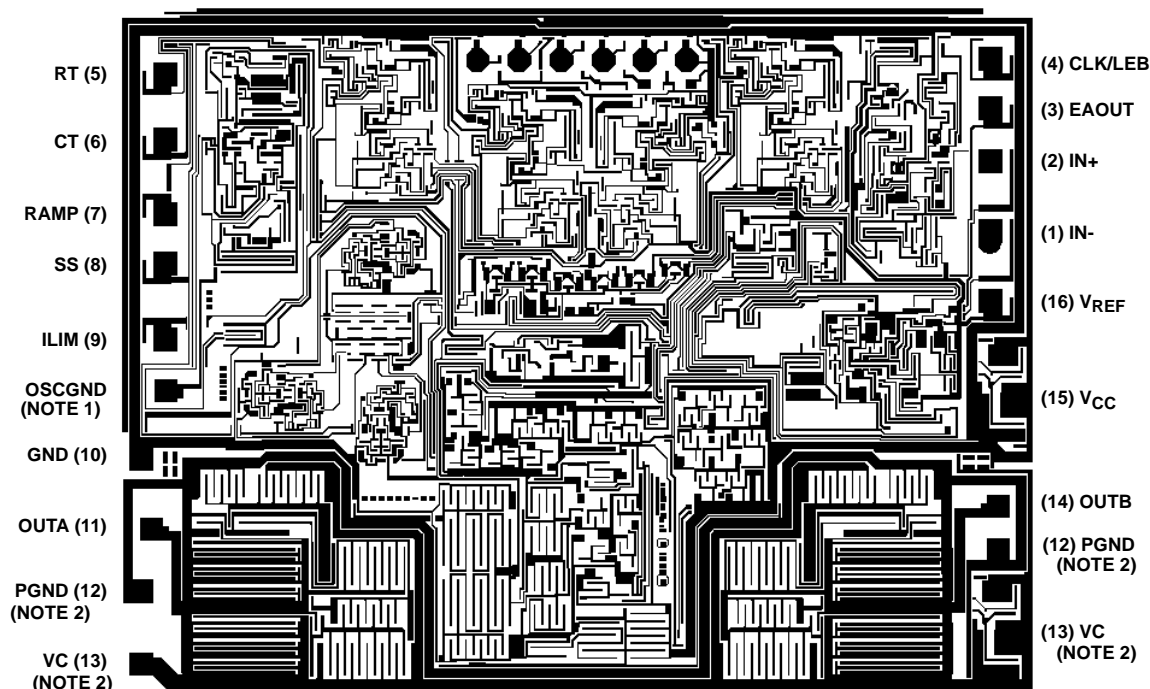
$<2.0 \times 10^5$  A/cm<sup>2</sup>

#### Transistor Count

225

## Metallization Mask Layout

HS-1825ARH,HS-1825AEH



### 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.

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