

**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/](http://www.intersil.com/)**

**Features**

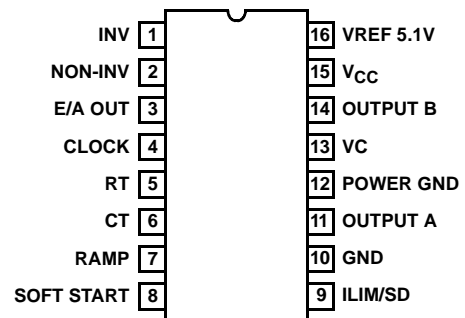
- Electrically Screened to DESC SMD # 5962-99558
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Environment
  - Maximum Total Dose . . . . . 300 krad(SI)
  - Vertical Architecture Provides Low Dose Rate Immunity
  - DI RSG Process Provides Latch-Up Immunity
- Low Start-Up Current . . . .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

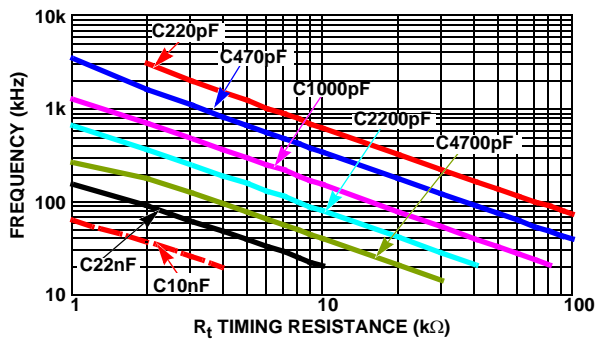


FIGURE 1. OSCILLATOR FREQUENCY vs  $R_t$  AND  $C_t$

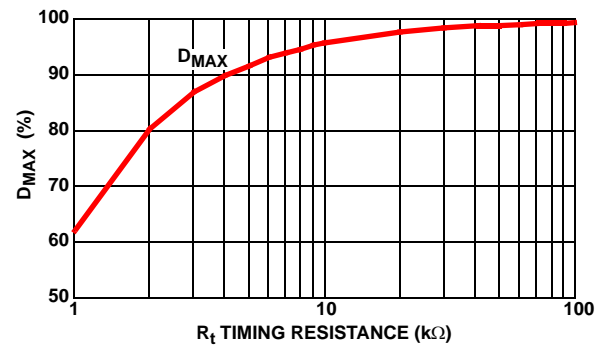


FIGURE 2. MAXIMUM DUTY CYCLE vs  $R_t$

**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**

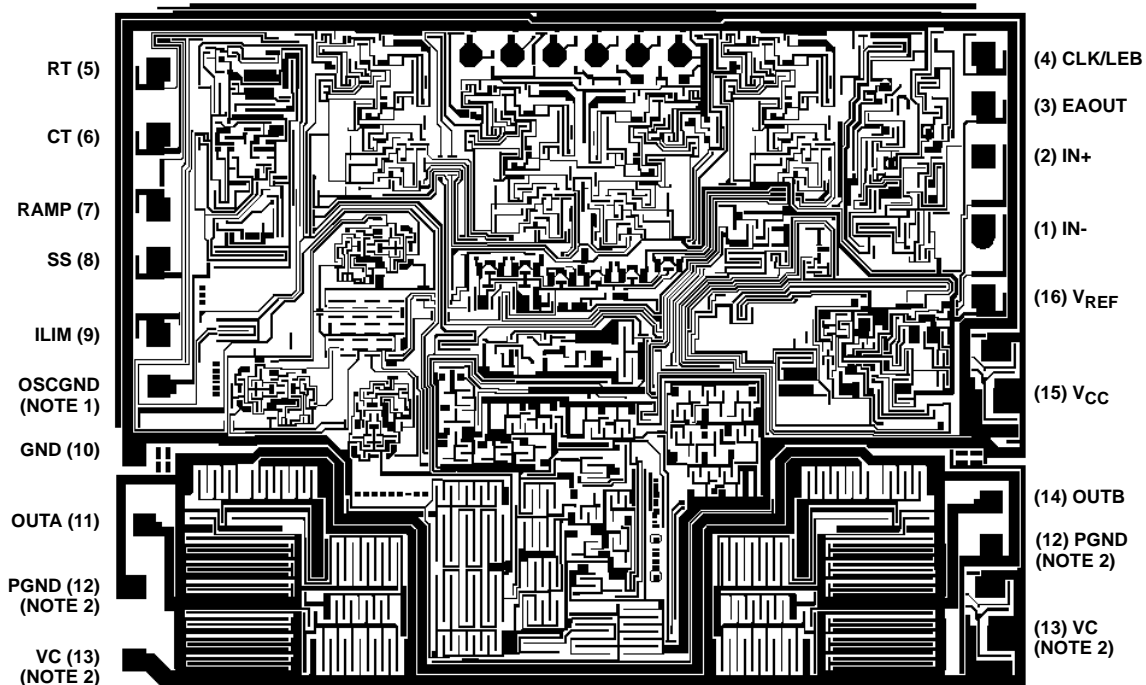
<2.0 x 10<sup>5</sup> A/cm<sup>2</sup>

**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.

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 Intersil Corporation's quality certifications can be viewed at [www.intersil.com/design/quality](http://www.intersil.com/design/quality)

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