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/

Features

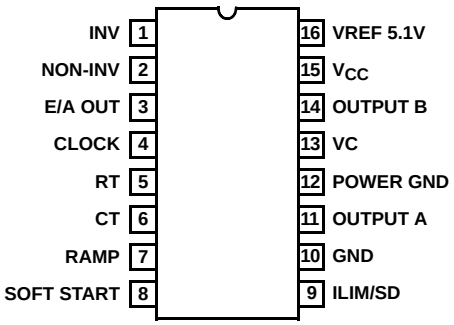
- Electrically Screened to DLA SMD # 5962-99558
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Environment
  - Maximum Total Dose . . . . . 300 krad(Si)
  - Vertical Architecture Provides Low Dose Rate Immunity
  - DI RSG Process Provides Latch-Up Immunity
- Low Start-Up Current . . . . .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

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

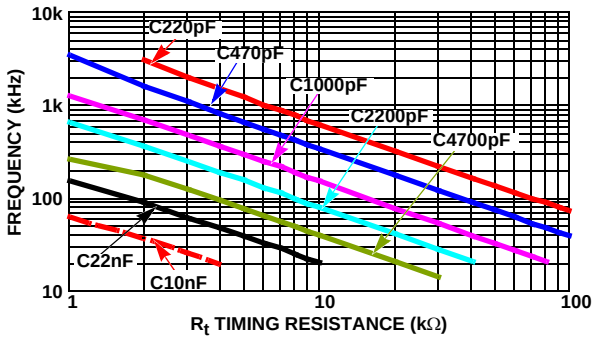


FIGURE 1. OSCILLATOR FREQUENCY vs R_t AND C_t

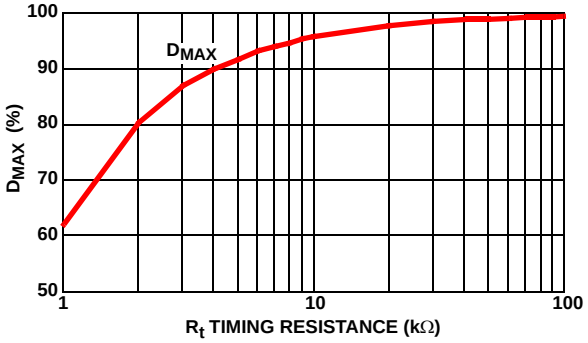


FIGURE 2. MAXIMUM DUTY CYCLE vs R_t

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

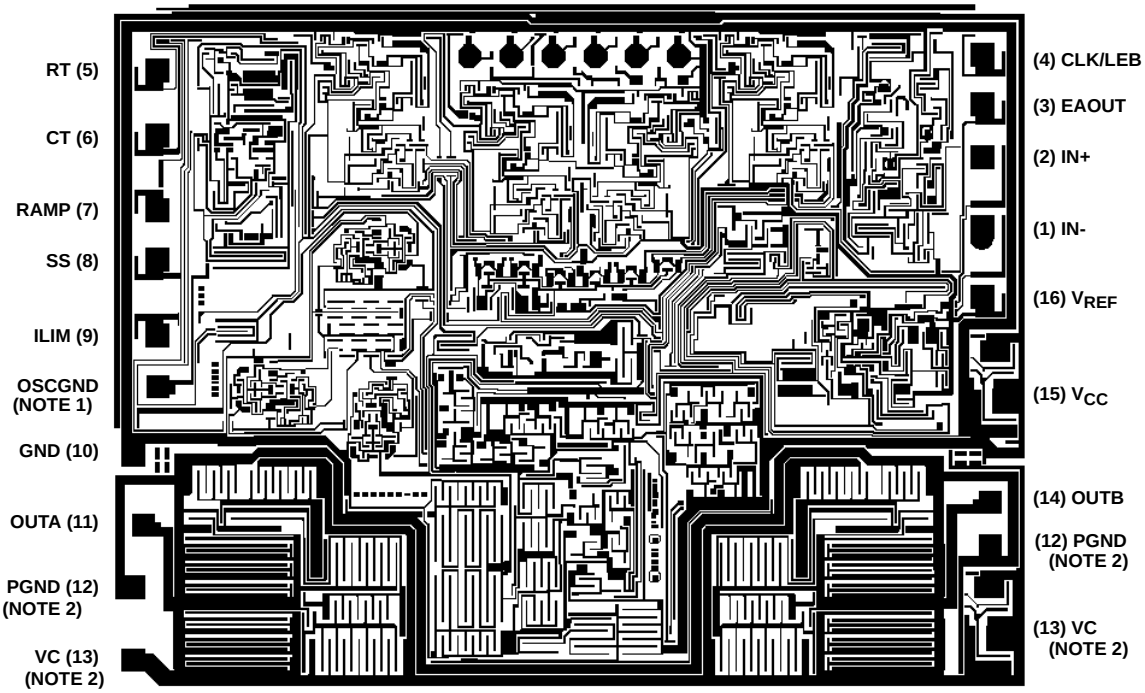
$< 2.0 \times 10^5$ A/cm^2

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.