

### Single Event and Total Dose Hardened, High-Speed, Dual Output PWMs

The single event and total dose hardened IS-1825ASRH and ISL71823ASRH pulse width modulators are designed to be used in high frequency, switching power supplies in either voltage or current-mode configurations. Both designs include a precision voltage reference, a low power start-up circuit, a high frequency oscillator, a wide-band error amplifier and a fast current-limit comparator.

The IS-1825ASRH features dual, alternating outputs operating from zero to less than 50% duty-cycle, while the ISL71823ASRH features dual, in-phase outputs operating from zero to less than 100% duty cycle.

Constructed with the Intersil Rad-hard Silicon Gate (RSG) dielectrically isolated BiCMOS process, these devices are immune to single event latch-up and have been specifically designed to provide a high level of immunity to single event transients. All specified parameters are guaranteed and tested for 300krad(Si) total dose performance.

**Detailed Electrical Specifications for these devices are contained in SMD 5962-02511. A “hot-link” is provided on our website for downloading the SMD.**

### Features

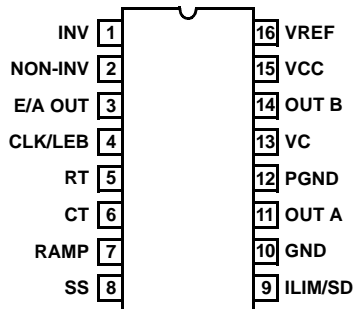
- Electrically Screened to DSCC SMD # 5962-02511
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Environment
  - Total Dose . . . . . 300krad(Si) (max)
  - Latch-up Immune . . . . . Dielectrically Isolated
  - SEU immune . . . . . LET = 35MeV/mg/cm<sup>2</sup>(max)
- Oscillator Frequency . . . . . 1MHz(max)
- High Output Drive Current . . . . . 1A peak(typ)
- Low Start-up Current . . . . . 300µA(max)
- Undervoltage Lockout
  - Start Threshold . . . . . 8.8V(max)
  - Stop Threshold . . . . . 7.6V(min)
  - Hysteresis . . . . . 300mV(min)
- Improved Soft-Start Function Compared with Commercial 1825A/1823A Types
- Pulse-by-Pulse Current Limiting
- Latched Overcurrent Comparator with Full Cycle Restart
- Programmable Leading Edge Blanking

### Applications

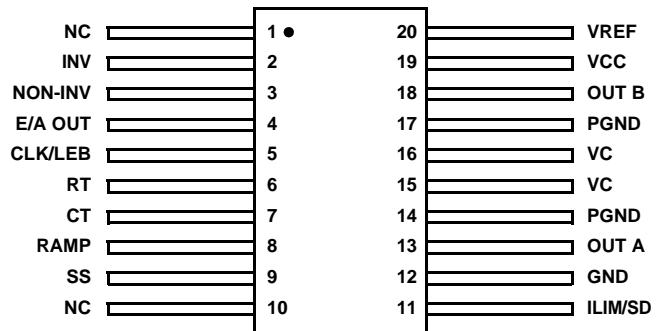
- Voltage or Current-Mode Switching Power Supplies
- Control of High Current MOSFET Drivers
- Motor Speed and Direction Control

### Pinouts

**IS1-1825ASRH, ISL71823ASRHQD**  
(CDIP2-T16 SBDIP)  
TOP VIEW



**IS9-1825ASRH, ISL71823ASRHQF**  
(CDFP4-F20 FLATPACK)  
TOP VIEW



Ordering Information

ORDERING NUMBER	INTERNAL MKT. NUMBER	TEMP. RANGE (°C)	PACKAGE	PKG DWG. #
ISO-1825ASRH/SAMPLE	ISO-1825ASRH/SAMPLE	-50 to +125		
5962F0251101V9A	ISO-1825ASRH-Q	-50 to +125		
5962F0251101QEC	IS1-1825ASRH-8	-50 to +125	16 Ld SBDIP	D16.3
5962F0251101QXC	IS9-1825ASRH-8	-50 to +125	20 Ld Flatpack	K20.A
5962F0251101VEC	IS1-1825ASRH-Q	-50 to +125	16 Ld SBDIP	D16.3
5962F0251101VXC	IS9-1825ASRH-Q	-50 to +125	20 Ld Flatpack	K20.A
IS1-1825ASRH/Proto	IS1-1825ASRH/Proto	-50 to +125	16 Ld SBDIP	D16.3
IS9-1825ASRH/Proto	IS9-1825ASRH/Proto	-50 to +125	20 Ld Flatpack	K20.A
5962F0251102QEC	ISL71823ASRHQD	-50 to +125	16 Ld SBDIP	D16.3
5962F0251102QXC	ISL71823ASRHQF	-50 to +125	20 Ld Flatpack	K20.A
5962F0251102VEC	ISL71823ASRHVD	-50 to +125	16 Ld SBDIP	D16.3
5962F0251102VXC	ISL71823ASRHVF	-50 to +125	20 Ld Flatpack	K20.A
ISL71823ASRH/Proto	ISL71823ASRH/Proto	-50 to +125	16 Ld SBDIP	D16.3
ISL71823ASRH/Proto	ISL71823ASRH/Proto	-50 to +125	20 Ld Flatpack	K20.A

Typical Performance Curves

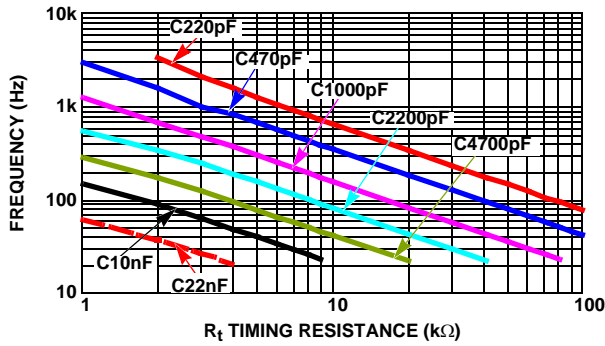


FIGURE 1. OSCILLATOR FREQUENCY vs  $R_t$  and  $C_t$

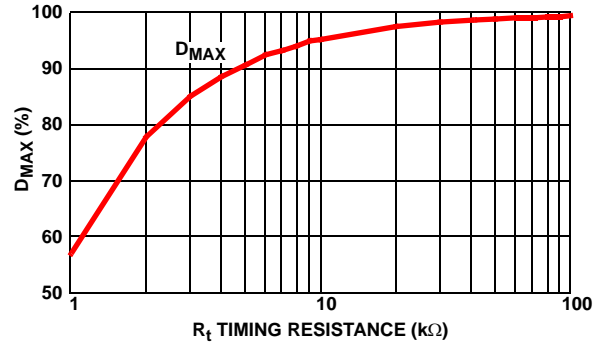


FIGURE 2. MAXIMUM DUTY CYCLE vs  $R_t$

**Die Characteristics**

**DIE DIMENSIONS:**

4310µm x 5840µm (170 mils x 230 mils)  
 Thickness: 483µm ± 25.4µm (19 mils ± 1 mil)

**INTERFACE MATERIALS**

**Glassivation**

Type: Phosphorus Silicon Glass (PSG)  
 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:**

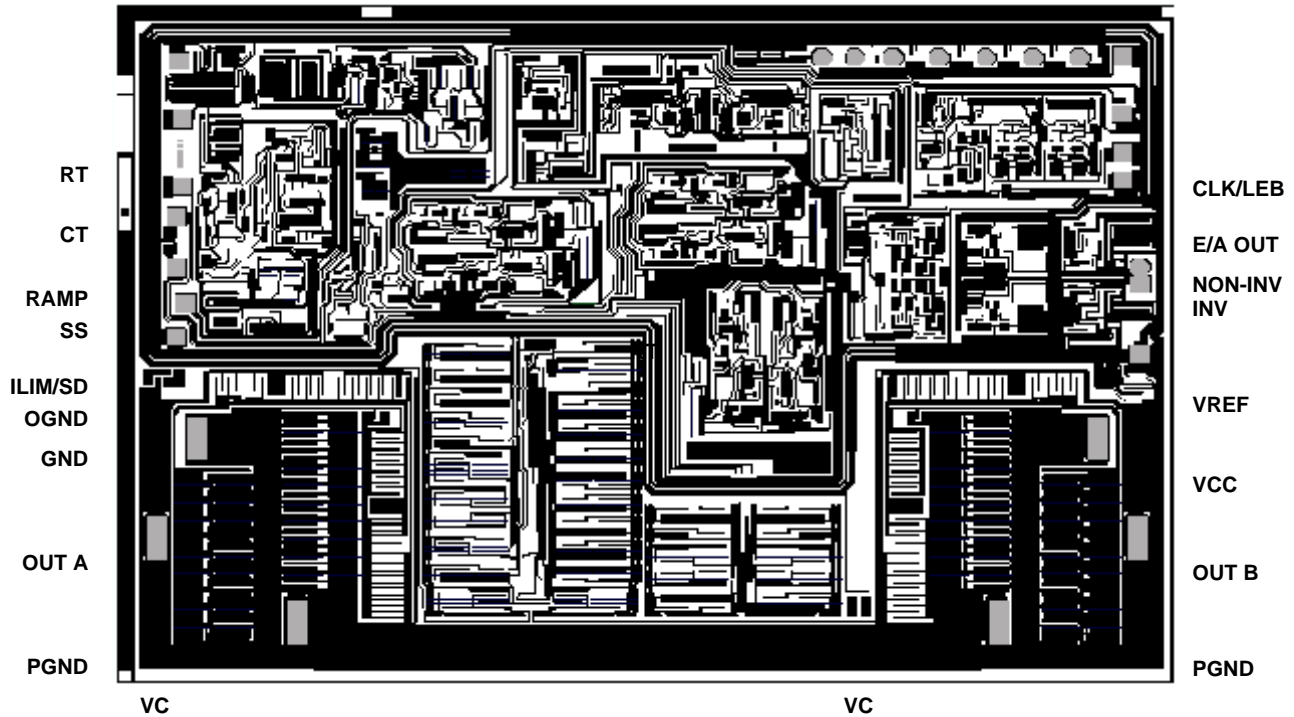
$<2.0 \times 10^5 \text{ A/cm}^2$

**Transistor Count:**

585

**Metallization Mask Layout**

IS-1825ASRH/ISL71823ASRH



**Notes:**

- Both the OGND (oscillator ground) and the GND (control circuit ground) pads must be bonded to ground. These pads are both bonded to the GND pin on the packaged devices.
- All double-sized bond pads must be double bonded for current sharing purposes.

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