

**NOT RECOMMENDED FOR NEW DESIGNS  
RECOMMENDED REPLACEMENT PART  
ISL7884XARH, ISL7884XAEH**

**IS-1845ASRH, IS-1845ASEH**

Single Event Radiation Hardened High Speed, Current Mode PWM

FN9001  
Rev 6.00  
October 16, 2015

The IS-1845ASRH, IS-1845ASEH are designed to be used in switching power supplies operating in current-mode. The rising edge of the on-chip oscillator turns on the output. Turn-off is controlled by the current sense comparator and occurs when the sensed current reaches a peak controlled by the error amplifier.

Constructed with Intersil's 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 at a high dose rate and 50krad(Si) total dose at a low dose rate.

Detailed Electrical Specifications for these devices are contained in the SMD [5962-01509](#). A "hot-link" is also provided on our website for downloading the SMD.

**Features**

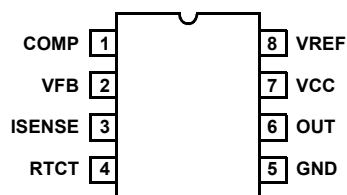
- Electrically Screened to DSCC SMD # [5962-01509](#)
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Environment
  - High Dose Rate . . . . . 300 krad(Si) (Max)
  - Low Dose Rate . . . . . 50 krad(Si) (Max)
  - SEL Immune . . . . . Dielectrically Isolated
  - SEU Immune . . . . . 35MeV/mg/cm<sup>2</sup>
  - SEU Cross-Section at 89MeV/mg/cm<sup>2</sup> . . . . . 5 x 10<sup>-6</sup>cm<sup>2</sup>
- Low Start-up Current . . . . . 100µA (Typ)
- Fast Propagation Delay . . . . . 80ns (Typ)
- Supply Voltage Range . . . . . 12V to 20V
- High Output Drive . . . . . 1A (Peak, Typ)
- Undervoltage Lockout . . . . . 8.8V Start (Typ), 8.2V Stop (Typ)

**Applications**

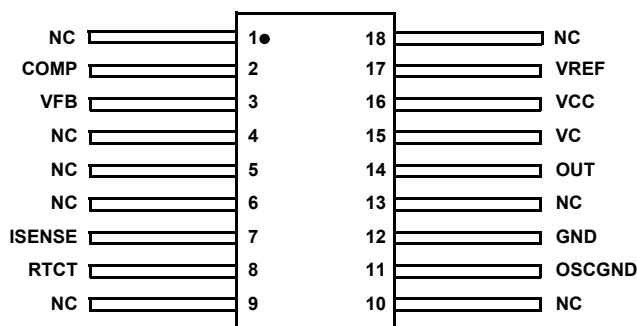
- Current-Mode Switching Power Supplies
- Control of High Current FET Drivers
- Motor Speed and Direction Control

**Pin Configurations**

IS7-1845ASRH, IS7-1845ASEH  
(8 LD CDIP2-T8 SBDIP)  
TOP VIEW



IS9-1845ASRH, IS9-1845ASEH  
(18 LD FLATPACK)  
TOP VIEW



**NOTES:**

1. Grounding the COMP pin does not inhibit the output. The output may be inhibited by applying >1.2V to the ISENSE pin.
2. This part should be operated with C<sub>t</sub> = 3.3nF and R<sub>t</sub> = 10k timing components only.

## Ordering Information

ORDERING NUMBER	INTERNAL MKT. NUMBER	TEMP. RANGE (°C)	PACKAGE	PKG. DWG. #
5962F0150901V9A	IS0-1845ASRH-Q	-50 to +125	Die	
5962F0150902V9A	IS0-1845ASEH-Q	-50 to +125	Die	
IS0-1845ASRH/Sample	IS0-1845ASRH/SAMPLE	-50 to +125	Die	
5962F0150901VPC	IS7-1845ASRH-Q	-50 to +125	8 Ld SBDIP	D8.3
5962F0150902VPC	IS7-1845ASEH-Q	-50 to +125	8 Ld SBDIP	D8.3
5962F0150901QPC	IS7-1845ASRH-8	-50 to +125	8 Ld SBDIP	D8.3
5962F0150901VXC	IS9-1845ASRH-Q	-50 to +125	18 Ld Flatpack	K18.B
5962F0150902VXC	IS9-1845ASEH-Q	-50 to +125	18 Ld Flatpack	K18.B
5962F0150901QXC	IS9-1845ASRH-8	-50 to +125	18 Ld Flatpack	K18.B
IS7-1845ASRH/Proto	IS7-1845ASRH/PROTO	-50 to +125	8 Ld SBDIP	D8.3
IS9-1845ASRH/Proto	IS9-1845ASRH/PROTO	-50 to +125	18 Ld Flatpack	K18.3

## Typical Performance Curves

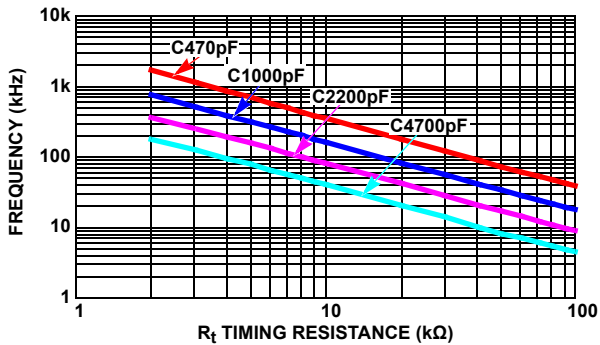


FIGURE 1. OSCILLATOR FREQUENCY vs  $R_t$  and  $C_t$

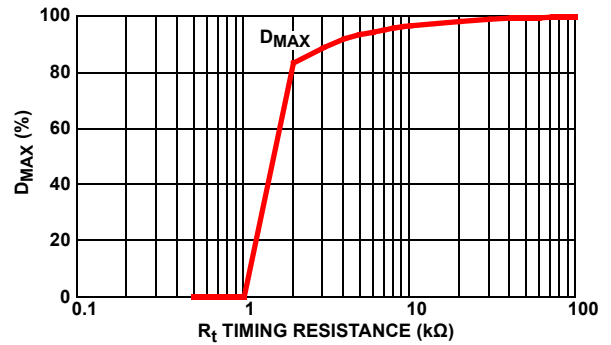


FIGURE 2. MAXIMUM DUTY CYCLE vs  $R_t$

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## Die Characteristics

### DIE DIMENSIONS

3090 $\mu$ m x 4080 $\mu$ m (121.6 mils x 159.0 mils)  
 Thickness: 483 $\mu$ m  $\pm$  25.4 $\mu$ m (19 mils  $\pm$  1 mil)

### INTERFACE MATERIALS

#### Glassivation

Type: Phosphorus Silicon Glass (PSG)  
 Thickness: 8.0kÅ  $\pm$  1.0kÅ

#### Top Metallization

Type: AlSiCu  
 Thickness: 16.0kÅ  $\pm$  2kÅ

### Substrate

Radiation Hardened Silicon Gate,  
 Dielectric Isolation

### Backside Finish

Silicon

### ASSEMBLY RELATED INFORMATION

#### Substrate Potential

Unbiased (DI)

### ADDITIONAL INFORMATION

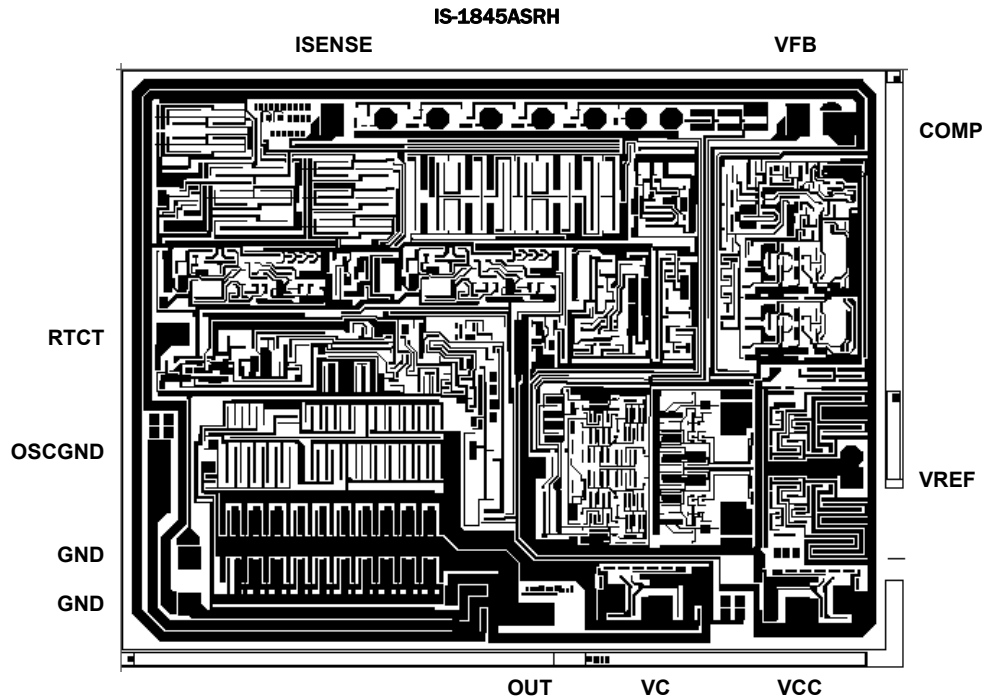
#### Worst Case Current Density

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

#### Transistor Count

582

## Metallization Mask Layout



### NOTES:

- Both the GND pads must be bonded to ground.
- The OUT double-sized bond pad must be double bonded for current sharing purposes.
- The OSCGND double-sized bond pad must be double bonded to ground for current sharing purposes.