

**IS-1009RH, IS-1009EH**

Radiation Hardened 2.5V Reference

FN4780  
Rev 7.00  
Nov 19, 2015

The Radiation Hardened [IS-1009RH](#), [IS-1009EH](#) are a 2.5V shunt regulator diode is designed to provide a stable 2.5V reference over a wide current range.

These devices are designed to maintain stability over the full military temperature range and over time. The 0.2% reference tolerance is achieved by on-chip trimming.

An adjustment terminal is provided to allow for the calibration of system errors. The use of this terminal to adjust the reference voltage does not effect the temperature coefficient.

Constructed with the Intersil dielectrically isolated EBHF process, these devices are immune to single event latch-up and have been specifically designed to provide highly reliable performance in harsh radiation environments.

The IS-1009EH replaces the obsoleted IS-1009RH.

**Specifications for Rad Hard QML devices are controlled by the Defense Logistics Agency Land and Maritime (DLA). The SMD numbers listed here must be used when ordering.**

Detailed Electrical Specifications for these devices are contained in SMD [5962-00523](#).

**Features**

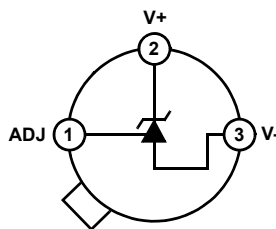
- Electrically screened to SMD #[5962-00523](#)
- QML qualified per MIL-PRF-38535 requirements
- EH version acceptance tested to 50krad(Si) (LDR)
- Radiation environment
  - High dose rate (50-300rad(Si)/s) . . . . . 300 krad(Si)
  - Low dose rate (0.01rad(Si)/s) . . . . . 50krad(Si)
  - Latch-up immune . . . . . dielectrically isolated
- Reverse breakdown voltage ( $V_Z$ ) . . . . . 2.5V
- Change in  $V_Z$  vs current (400 $\mu$ A to 10mA) . . . . . 6mV
- Change in  $V_Z$  vs temperature (-55 $^{\circ}$ C to +125 $^{\circ}$ C) . . . . . 15mV
- Maximum reverse breakdown current . . . . . 20mA
- Device is tested with 10 $\mu$ F shunt capacitance connected from V+ to V-, which provides optimum stability
- Interchangeable with 1009 and 136 industry types

**Applications**

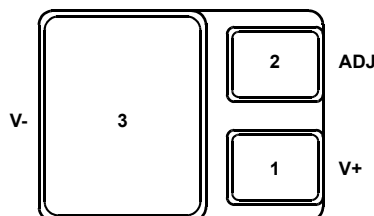
- Power supply monitoring
- Reference for 5V systems
- A/D and D/A reference

**Pin Configurations**

IS2-1009RH, IS2-1009EH  
(TO-206AB CAN)  
BOTTOM VIEW



ISYE-1009RH, ISYE-1009EH  
(SMD.5)  
BOTTOM VIEW



## Ordering Information

ORDERING SMD NUMBER (Note 2)	INTERNAL MKT. NUMBER (Note 1)	PART MARKING (RoHS Compliant)	TEMP. RANGE (°C)
5962F0052302VXC	IS2-1009EH-Q	F00523V2	-55 to +125
5962F0052302VYC	ISYE-1009EH-Q	Q 5962F00 52302VYC	-55 to +125
5962F0052302V9A	ISO-1009EH-Q		-55 to +125
IS2-1009EH/PROTO	IS2-1009EH/PROTO	IS2- 1009EH /PROTO	-55 to +125
ISYE-1009EH/PROTO	ISYE-1009EH/PROTO	ISYE- 1009EH /PROTO	-55 to +125
ISO-1009EH/SAMPLE	ISO-1009EH/SAMPLE		-55 to +125
5962F0052301VXC	IS2-1009RH-Q <b>No longer available or supported</b>	F00523V	-55 to +125
5962F0052301QXC	IS2-1009RH-8 <b>No longer available or supported</b>	F00523 01QXC Q	-55 to +125
5962F0052301VYC	ISYE-1009RH-Q <b>No longer available or supported</b>	Q 5962F00 52301VYC	-55 to +125
5962F0052301QYC	ISYE-1009RH-8 <b>No longer available or supported</b>	Q 5962F00 52301QYC	-55 to +125
IS2-1009RH/PROTO	IS2-1009RH/PROTO <b>No longer available or supported</b>	IS2-1009RH/PROTO	-55 to +125
ISYE-1009RH/PROTO	ISYE-1009RH/PROTO <b>No longer available or supported</b>	ISYE-1009RH/PROTO	-55 to +125
5962F0052301V9A	ISO-1009RH-Q <b>No longer available or supported</b>		-55 to +125
ISO-1009RH/SAMPLE	ISO-1009RH/SAMPLE <b>No longer available or supported</b>		-55 to +125

## NOTES:

1. 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.
2. Specifications for Rad Hard QML devices are controlled by the Defense Logistics Agency Land and Maritime (DLA). The SMD numbers listed in the "Ordering Information" table must be used when ordering.

## Die Characteristics

### DIE DIMENSIONS

1270 $\mu$ m x 1778 $\mu$ m (50 mils x 70 mils)  
Thickness: 356 $\mu$ m  $\pm$  25.4 $\mu$ m (14 mils  $\pm$  1 mil)

### INTERFACE MATERIALS

#### Glassivation

Type: Nitride (Si<sub>3</sub>N<sub>4</sub>)  
Nitride Thickness: 4.0k $\text{Å}$   $\pm$  1.0k $\text{Å}$

#### Top Metallization

Type: AlSiCu  
Thickness: 16.0k $\text{Å}$   $\pm$  2k $\text{Å}$

#### Substrate

EBHF, Dielectric Isolation

### Backside Finish

Silicon

### ASSEMBLY RELATED INFORMATION

#### Substrate Potential

Unbiased (DI)

### ADDITIONAL INFORMATION

#### Worst Case Current Density

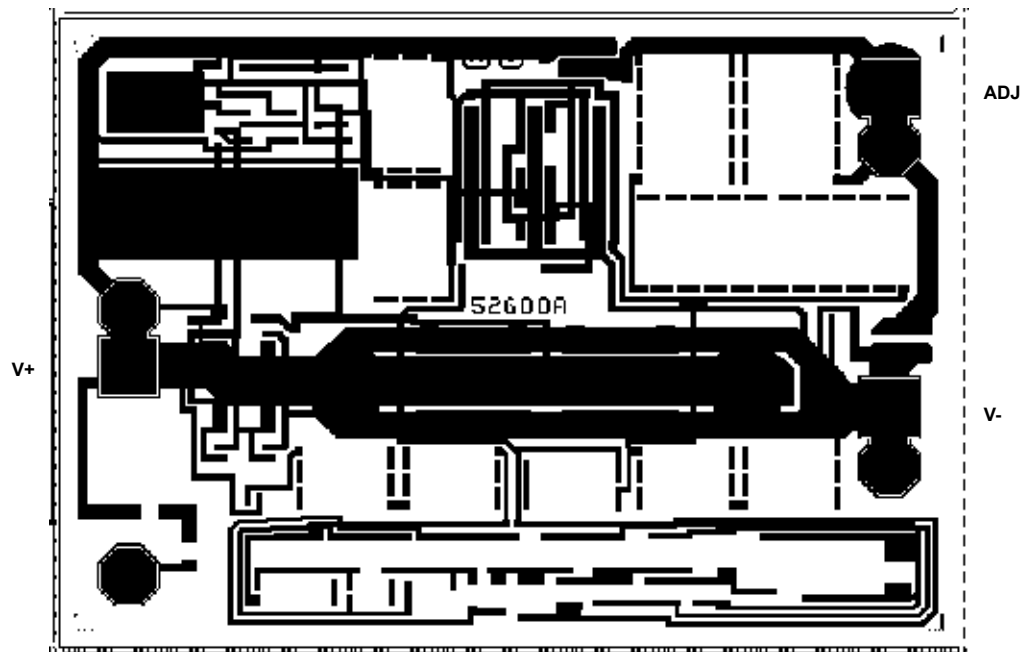
$< 1.0 \times 10^5$  A/cm<sup>2</sup>

#### Transistor Count

26

## Metallization Mask Layout

IS-1009RH, IS-1009EH



## Revision History

The revision history provided is for informational purposes only and is believed to be accurate, but not warranted. Please go to the web to make sure that you have the latest revision.

DATE	REVISION	CHANGE
November 19, 2015	FN4780.7	Added Rev History and About Intersil verbiage. Added to page 1 introduction "The IS-1009EH replaces the obsoleted IS-1009RH." Updated Ordering Information on page 2 as follows: Marked RH obsolete parts "No longer available or supported" Added EH Proto and Sample parts.

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