

## Radiation Hardened Ultra High Frequency NPN Transistor Array

The HS-6254RH is a Radiation Hardened array of five NPN transistors on a common substrate. One of our bonded wafer, dielectrically isolated fabrication processes provides an immunity to Single Event Latch-up and the capability of highly reliable performance in any radiation environment.

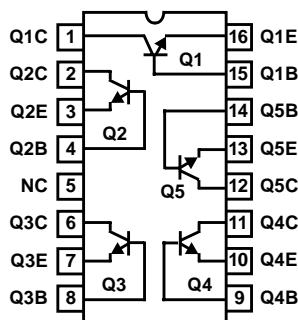
The high  $F_T$  (8GHz) and low noise figure (3.5dB) of these transistors make them ideal for use in high frequency amplifier and mixer applications. Monolithic construction of the five transistors provides the closest electrical and thermal matching possible. Access is provided to each terminal of the transistors for maximum application flexibility.

**Specifications for Rad Hard QML devices are controlled by the Defense Supply Center in Columbus (DSCC). The SMD numbers listed here must be used when ordering.**

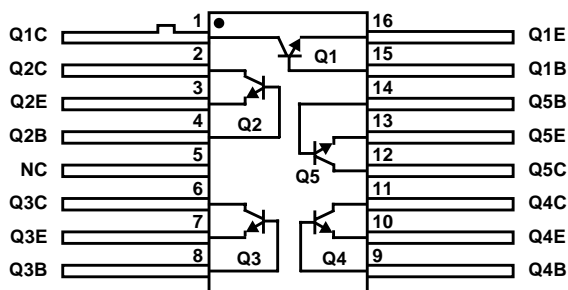
Detailed Electrical Specifications for these devices are contained in SMD 5962-97641. A "hot-link" is provided on our homepage for downloading.  
[www.intersil.com/spacedefense/space.asp](http://www.intersil.com/spacedefense/space.asp)

## Pinouts

**HS1-6254RH (CERDIP) GDIP1-T16 OR  
 HS1-6254RH (SBDIP) CDIP2-T16  
 TOP VIEW**



**HS9-6254RH (FLATPACK) CDFP4-F16  
 TOP VIEW**



## Features

- Electrically Screened to SMD # 5962-97641
- QML Qualified per MIL-PRF-38535 Requirements
- Radiation Environment
  - Gamma Dose ( $\gamma$ ) . . . . .  $3 \times 10^5$  RAD(Si)
  - SEL Immune . . . . . Bonded Wafer Dielectric Isolation
- Gain Bandwidth Product ( $F_T$ ) . . . . . 8GHz (Typ)
- Current Gain ( $h_{FE}$ ) . . . . . 70 (Typ)
- Early Voltage ( $V_A$ ) . . . . . 50V (Typ)
- Noise Figure (50 $\Omega$ ) at 1GHz. . . . . 3.5dB (Typ)
- Collector-to-Collector Leakage . . . . . <1pA (Typ)

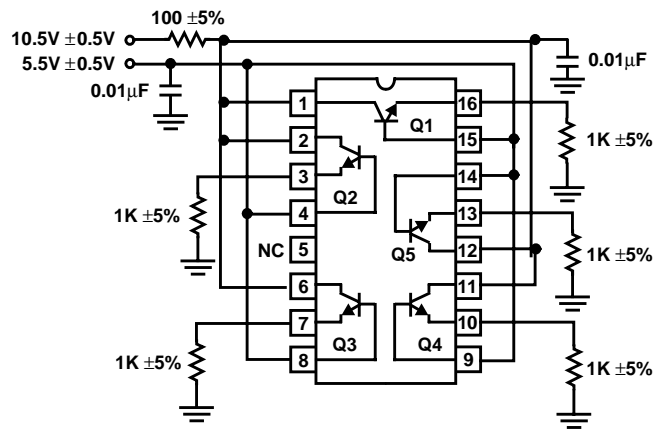
## Applications

- High Frequency Amplifiers and Mixers
  - Refer to Application Note 9315
- High Frequency Converters
- Synchronous Detectors

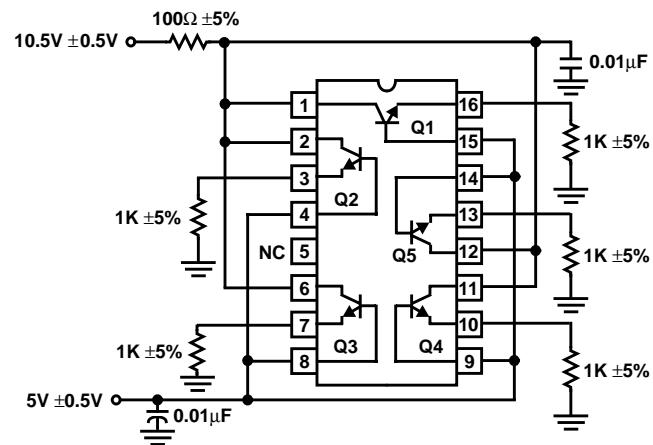
## Ordering Information

ORDERING NUMBER	INTERNAL MKT. NUMBER	TEMP. RANGE (°C)
HS0-6254RH-Q	HS0-6254RH-Q	25
5962F9764101VEA	HS1-6254RH-Q	-55 to 125
5962F9764101VEC	HS1B-6254RH-Q	-55 to 125
5962F9764101VXC	HS9-6254RH-Q	-55 to 125
HS1-6254RH/SAMPLE	HS1-6254RH/SAMPLE	-55 to 125

## Burn-In Circuit



## Irradiation Circuit



## Die Characteristics

### DIE DIMENSIONS:

52 mils x 52.8 mils x 15 mils  $\pm 1$  mil  
 1320 $\mu$ m x 1340 $\mu$ m x 381 $\mu$ m  $\pm 25.4\mu$ m

### INTERFACE MATERIALS:

#### Glassivation:

Type: Nitride  
 Thickness: 4k $\text{\AA}$   $\pm 0.5\text{k}\text{\AA}$

#### Top Metallization:

Type: Metal 1: AlCu (2%)/TiW  
 Thickness: Metal 1: 8k $\text{\AA}$   $\pm 0.5\text{k}\text{\AA}$   
 Type: Metal 2: AlCu (2%)  
 Thickness: Metal 2: 16k $\text{\AA}$   $\pm 0.8\text{k}\text{\AA}$

#### Substrate:

UHF-1X Bonded Wafer, DI

#### Backside Finish:

Silicon

### ASSEMBLY RELATED INFORMATION:

#### Substrate Potential:

Floating

### ADDITIONAL INFORMATION:

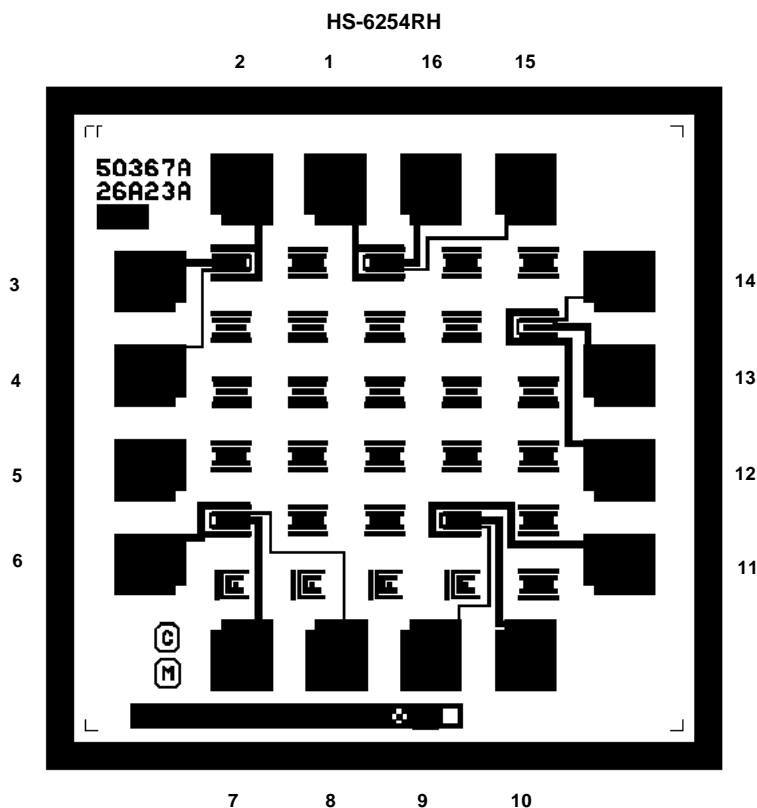
#### Worst Case Current Density:

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

#### Transistor Count:

5

## Metallization Mask Layout



NOTE: Pad numbers correspond to the 16 lead pinout.

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