



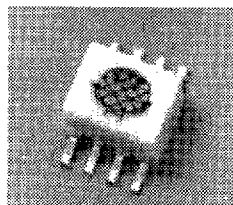
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## Features

**BANDWIDTH:** DC-9 GHz

**HIGH ISOLATION :** > 42 dB

**NON-REFLECTIVE DESIGN**

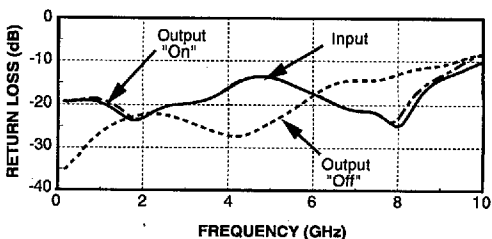
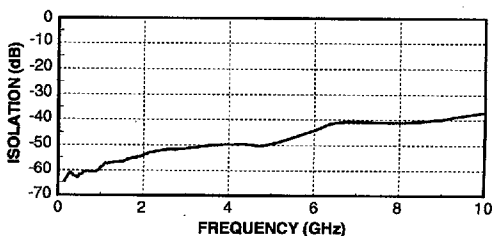
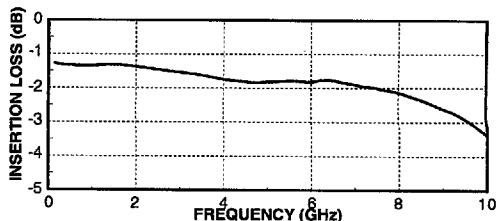


## General Description

The HMC132C8 is a surface mount, low cost, non-hermetic packaged version of the HMC132G7 MMIC SPDT switch. The device is a fast, broadband SPDT switch featuring high (> 42 dB) isolation over the entire band. The switch is non-reflective at both RF1 and RF2 ports. Applications for this device include T/R switching for 5.8 GHz ISM circuits, WLAN, and S, C and X-Band Telecom radios.

## Electrical Performance With 0/-5V control

### Typical Performance



| PARAMETER                                   | Frequency   | Min. | Typ. | Max. | Units |
|---------------------------------------------|-------------|------|------|------|-------|
| Insertion Loss                              | DC - 2 GHz  |      | 1.4  | 1.7  | dB    |
|                                             | DC - 6 GHz  |      | 1.8  | 2.2  | dB    |
|                                             | DC - 9 GHz  |      | 2.6  | 3.0  | dB    |
| Isolation                                   | DC - 2 GHz  | 50   | 54   |      | dB    |
|                                             | DC - 6 GHz  | 38   | 42   |      | dB    |
|                                             | DC - 9 GHz  | 36   | 40   |      | dB    |
| Return Loss                                 | DC - 2 GHz  | 15   | 19   |      | dB    |
|                                             | DC - 6 GHz  | 10   | 14   |      | dB    |
|                                             | DC - 9 GHz  | 9    | 13   |      | dB    |
| Input Power for 1dB Compression (0/-5V Ctl) | 0.5 - 6 GHz | +23  | +27  |      | dBm   |
| Input Third Order Intercept                 | 0.5 - 6 GHz | +38  | +42  |      | dBm   |
| Switching Characteristics                   | DC - 6 GHz  |      |      |      |       |
|                                             |             |      | 3    |      | ns    |
|                                             |             |      | 6    |      | ns    |



**HITTITE  
MICROWAVE  
CORPORATION**

**GaAs MMIC SMT  
High-Isolation  
SPDT Switch**

**HMC132C8**

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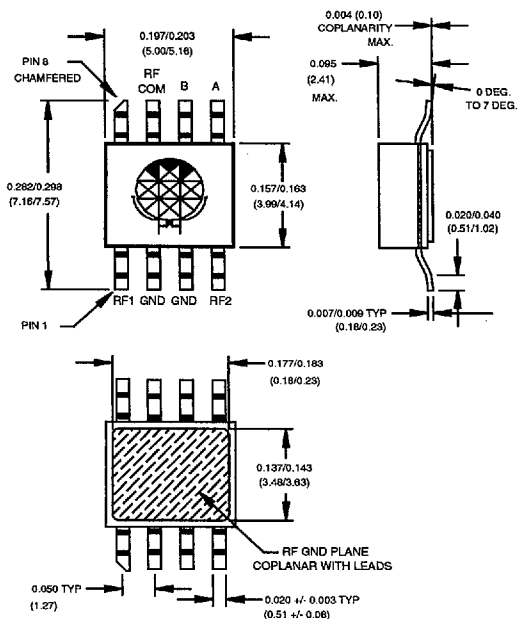
## Absolute Maximum Ratings

|                       |                   |
|-----------------------|-------------------|
| Control Voltage       | -7.5 Vdc          |
| Storage Temperature   | -65 to +175 deg C |
| Operating Temperature | -55 to +85 deg C  |

## Truth Table

| Control Input |      | Signal Path State |           |
|---------------|------|-------------------|-----------|
| A             | B    | RF to RF1         | RF to RF2 |
| High          | Low  | ON                | OFF       |
| Low           | High | OFF               | ON        |

## Outline: HMC132C8



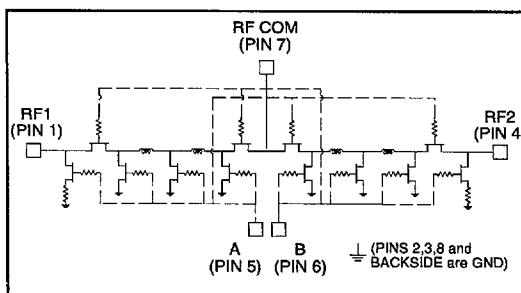
### NOTES:

- MATERIAL:  
A. PACKAGE BODY & COVER: WHITE ALUMINA (92%)  
B. LEADS & PACKAGE BOTTOM: COPPER
- PLATING: ELECTROLYTIC GOLD 100-200 MICROINCHES OVER ELECTROLYTIC NICKEL 100 TO 250 MICROINCHES.
- DIMENSIONS ARE IN INCHES (MILLIMETERS), UNLESS OTHERWISE SPECIFIED  
ALL TOLERANCES ARE +/- 0.005 (+/- 0.13).
- ALL UNLABELED LEADS ARE GROUND. THESE LEADS ARE CONNECTED INTERNALLY TO THE PACKAGE BOTTOM RF GROUND. THE PACKAGE BOTTOM RF GROUND MUST BE SOLDERED TO THE PCB RF GROUND.

## Control Voltages

| State | Bias Condition                    |
|-------|-----------------------------------|
| Low   | 0 to -0.2V @ 20uA Max.            |
| High  | -5V @ 50uA Typ to -7V @ 300uA Max |

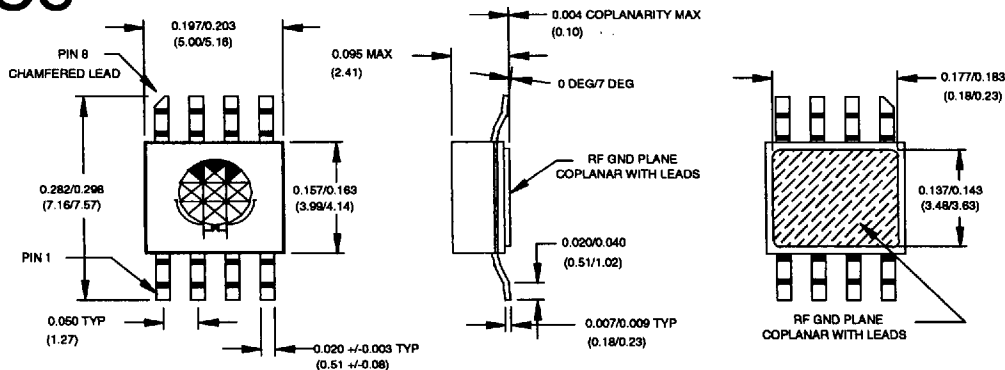
## Schematic





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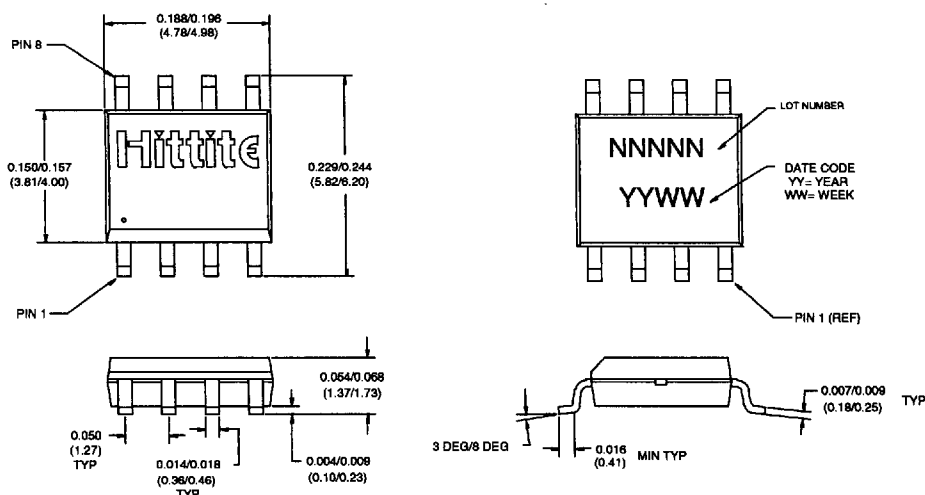
# C8



## NOTES: FOR 8 LEAD CERAMIC PACKAGE

1. MATERIAL:  
A. PACKAGE BODY & COVER: WHITE ALUMINA (92%)  
B. LEADS & PACKAGE BOTTOM: COPPER
2. PLATING: ELECTROLYTIC GOLD 100-200 MICRONS OVER  
ELECTROLYTIC NICKEL 100 TO 250 MICRONS OVER
3. DIMENSIONS ARE IN INCHES (MILLIMETERS). UNLESS OTHERWISE SPECIFIED  
ALL TOLERANCES ARE +/- 0.005 (+/- 0.13).
4. THE PACKAGE BOTTOM, RF GROUND, MUST BE SOLDERED  
OR CONDUCTIVE EPOXIED TO THE PCB RF GROUND.
5. NON-HERMETIC EPOXY SEALED COVER
6. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE  
C8 PACKAGED PRODUCTS.

# S8



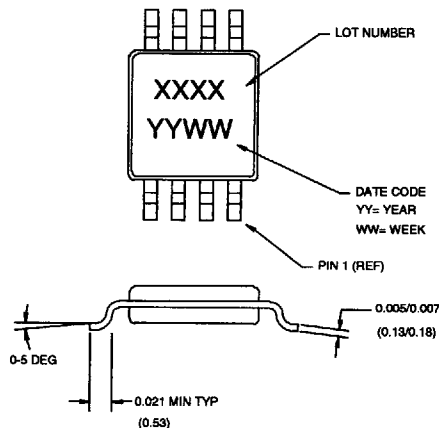
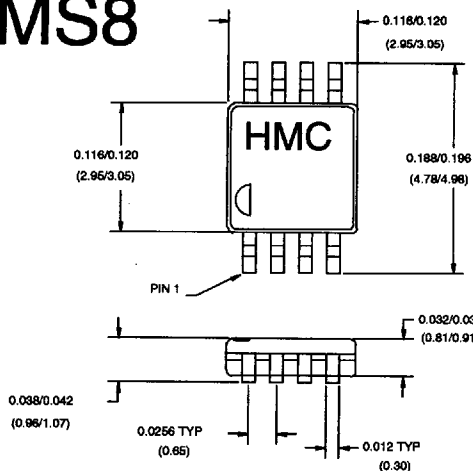
## NOTES: FOR 8 LEAD SOIC PACKAGE

1. MATERIAL:  
A. PACKAGE BODY: LOW STRESS INJECTION-MOLDED PLASTIC,  
SILICA & SILICONE IMPREGNATED.  
B. LEADFRAME MATERIAL: COPPER ALLOY
2. PLATING: LEAD-TIN SOLDER PLATE
3. DIMENSIONS ARE IN INCHES (MILLIMETERS).  
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE +/- 0.005 (+/- 0.13)
4. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE  
S8 PACKAGED PRODUCTS.



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# MS8



## NOTES: FOR 8 LEAD MSOP

### 1. MATERIAL:

A. PACKAGE BODY: LOW STRESS INJECTION-MOLDED PLASTIC, SILICA & SILICONE IMPREGNATED.

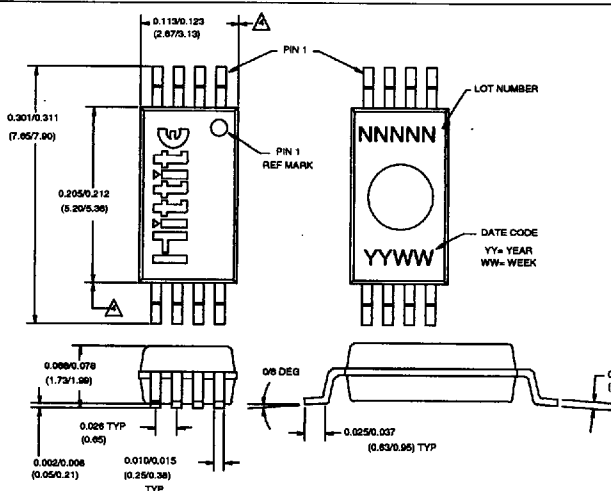
B. LEADFRAME MATERIAL: COPPER ALLOY

### 2. PLATING: LEAD-TIN SOLDER PLATE

3. DIMENSIONS ARE IN INCHES (MILLIMETERS), UNLESS OTHERWISE SPECIFIED TOLERANCES ARE  $\pm 0.005$  ( $\pm 0.13$ )

4. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE MS8 PACKAGED PRODUCTS.

# SS8



## NOTES: FOR 8 LEAD SSOP

### 1. MATERIAL:

A. PACKAGE BODY: LOW STRESS INJECTION-MOLDED PLASTIC, SILICA & SILICONE IMPREGNATED.

B. LEADFRAME MATERIAL: COPPER ALLOY

### 2. PLATING: LEAD-TIN SOLDER PLATE

3. DIMENSIONS ARE IN INCHES (MILLIMETERS), UNLESS OTHERWISE SPECIFIED TOLERANCES ARE  $\pm 0.005$  ( $\pm 0.13$ )

△ THESE ARE REFERENCE DIMENSIONS AND DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS, BUT DO INCLUDE MOLD MISMATCH AT THE PARTING LINE. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.006 (0.16) PER SIDE.

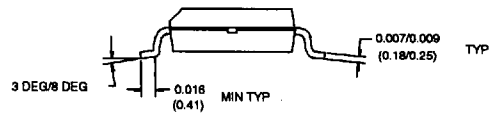
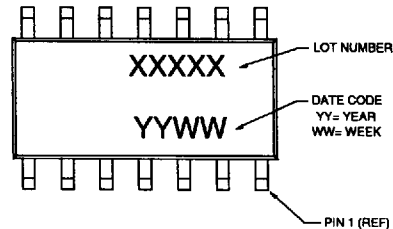
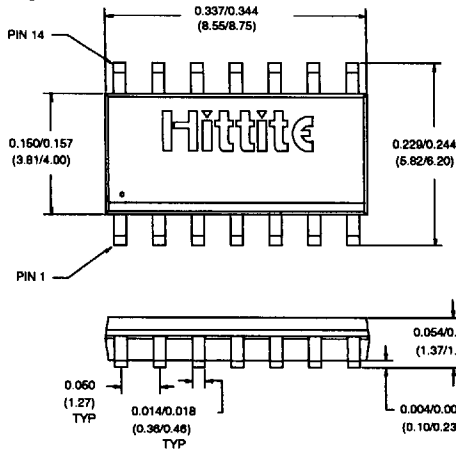
5. COPLANARITY: LEADS SHALL BE PLANAR WITH RESPECT TO ONE ANOTHER WITHIN 0.003 (0.08) AT SEATING PLANE.

6. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE SS8 PACKAGED PRODUCTS.



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# S14



## NOTES: FOR 14 LEAD SOIC PACKAGE

### 1. MATERIAL:

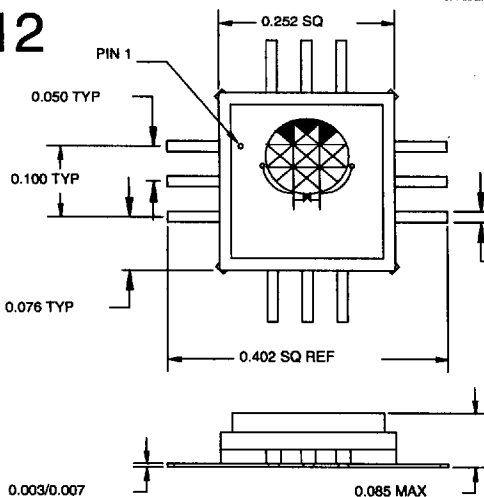
- A. PACKAGE BODY: LOW STRESS INJECTION-MOLDED PLASTIC, SILICA & SILICONE IMPREGNATED.
- B. LEADFRAME MATERIAL: COPPER ALLOY

### 2. PLATING: LEAD-TIN SOLDER PLATE

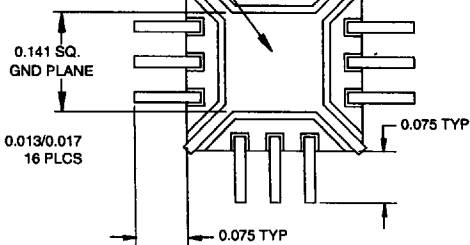
3. DIMENSIONS ARE IN INCHES (MILLIMETERS);  
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE  
+/-0.005 (+/-0.13)

4. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE  
S14 PACKAGED PRODUCTS.

# C12



RF GND PLANE  
SEE NOTE 5



## NOTES: FOR 12 LEAD CERAMIC PACKAGE

### 1. MATERIAL:

- A. PACKAGE BODY & COVER: WHITE ALUMINA (99%)
- B. LEAD: KOVAR (or) ASTM F15 (ALLOY 42) EQUIVALENT
2. PLATING (LEADS): ELECTROLYTIC GOLD 25 MICROINCHES MINIMUM OVER ELECTROLYTIC NICKEL 100 TO 250 MICROINCHES
3. DIMENSIONS ARE IN INCHES. UNLESS OTHERWISE SPECIFIED ALL TOLERANCES ARE ±0.005.

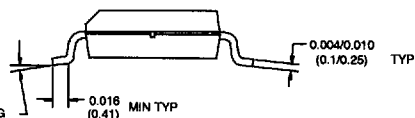
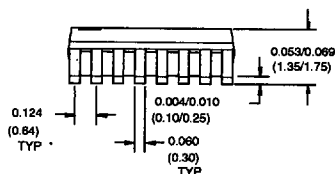
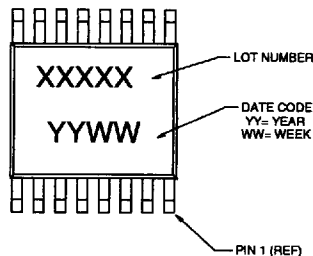
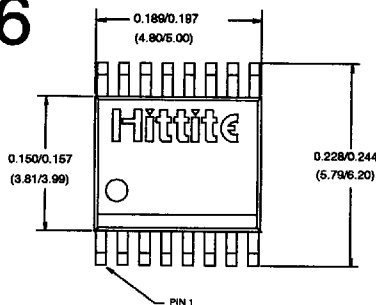
### 4. NON-HERMETIC EPOXY SEALED COVER.

5. THE PACKAGE BOTTOM, RF GROUND, MUST BE SOLDERED OR CONDUCTIVE EPOXIED TO THE RF PCB GROUND
6. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE C12 PACKAGED PRODUCTS.



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# **QS16**



## **NOTES: FOR 16 LEAD QSOP PACKAGE**

### **1. MATERIAL:**

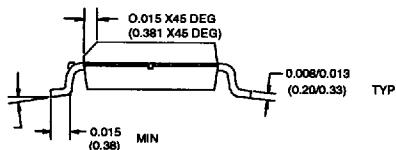
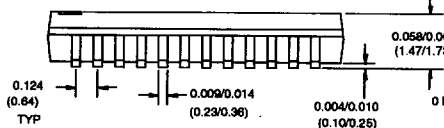
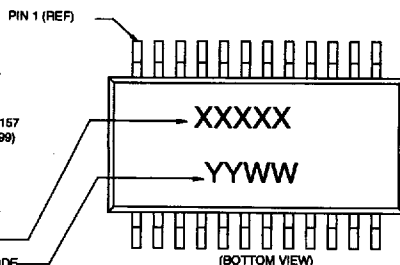
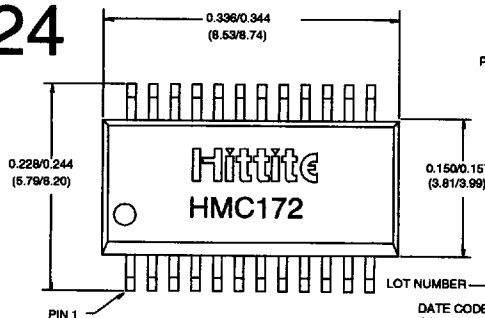
- A. PACKAGE BODY: LOW STRESS INJECTION-MOLDED PLASTIC, SILICA & SILICONE IMPREGNATED.
- B. LEADFRAME MATERIAL: COPPER ALLOY

### **2. PLATING: LEAD-TIN SOLDER PLATE**

- 3. DIMENSIONS ARE IN INCHES (MILLIMETERS), UNLESS OTHERWISE SPECIFIED TOLERANCES ARE  $\pm 0.005$  ( $\pm 0.13$ )

- 4. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE QS16 PACKAGED PRODUCTS.

# **QS24**



## **NOTES: FOR 24 LEAD QSOP PACKAGE**

### **1. MATERIAL:**

- A. PACKAGE BODY: LOW STRESS INJECTION-MOLDED PLASTIC, SILICA & SILICONE IMPREGNATED.
- B. LEADFRAME MATERIAL: COPPER ALLOY

### **2. PLATING: LEAD-TIN SOLDER PLATE**

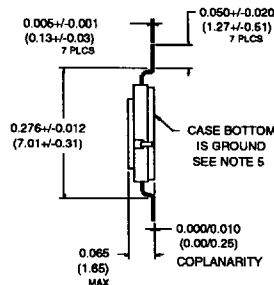
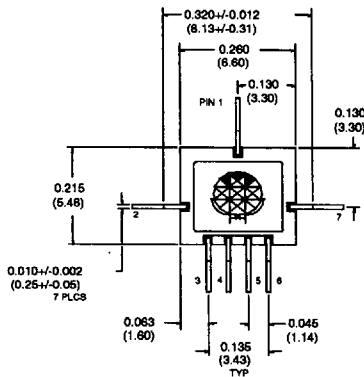
- 3. DIMENSIONS ARE IN INCHES (MILLIMETERS), UNLESS OTHERWISE SPECIFIED TOLERANCES ARE  $\pm 0.005$  ( $\pm 0.13$ )

- 4. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE QS24 PACKAGED PRODUCTS.



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**G7**



**NOTES: FOR 7 LEAD CERAMIC PACKAGE**

**1. MATERIAL:**

**1.1 G7 PACKAGE:**

- A. PACKAGE BODY: WHITE ALUMINA (92%)
- B. LEADS, BASE, & COVER - ASTM F-15 ALLOY
- C. CONDUCTOR TRACES: TUNGSTEN

**2. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MINIMUM, OVER ELECTROLYTIC NICKEL 50 MICROINCHES MINIMUM.**

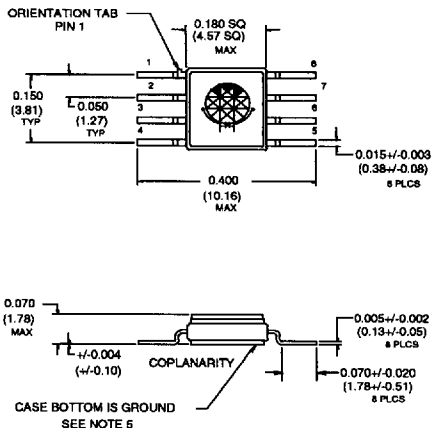
**3. DIMENSIONS ARE IN INCHES (MILLIMETERS), UNLESS OTHERWISE SPECIFIED TOLERANCES ARE +/- 0.005 (+/- 0.13)**

**4. G8 PACKAGE IS AVAILABLE WITH STRAIGHT LEADS, SPECIFY "P7".**

**5. THE PACKAGE BOTTOM, RF GROUND, MUST BE SOLDERED OR CONDUCTIVE EPOXIED TO THE PCB RF GROUND.**

**6. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE G7 PACKAGED PRODUCTS.**

**G8**



**NOTES: FOR 8 LEAD GLASS/METAL PACKAGE**

**1. MATERIAL:**

**1.1 G8 PACKAGE:**

- A. PACKAGE BODY: ALUMINA LOADED BOROSILICATE GLASS (#7052 CORNING)
- B. LEADS, BASE, & COVER - ASTM F-16 ALLOY

**2. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MINIMUM, OVER ELECTROLYTIC NICKEL 50 MICROINCHES MINIMUM.**

**3. DIMENSIONS ARE IN INCHES (MILLIMETERS), UNLESS OTHERWISE SPECIFIED TOLERANCES ARE +/- 0.005 (+/- 0.13)**

**4. G8 PACKAGE IS AVAILABLE WITH STRAIGHT LEADS, SPECIFY "P8".**

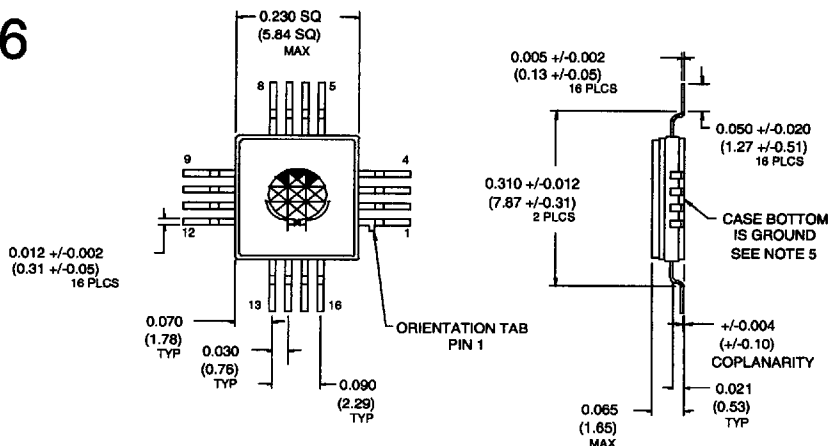
**5. THE PACKAGE BOTTOM, RF GROUND, MUST BE SOLDERED OR CONDUCTIVE EPOXIED TO THE PCB RF GROUND.**

**6. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE G8 PACKAGED PRODUCTS.**



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**G16**



**NOTES: FOR 16 LEAD GLASS METAL PACKAGE**

**1. MATERIAL:**

**1.1 G16 PACKAGE:**

A. PACKAGE BODY: ALUMINA LOADED BOROSILICATE GLASS (77052 CORNING)

B. LEADS, BASE, & COVER: ASTM F-15 ALLOY

2. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MINIMUM, OVER ELECTROLYTIC NICKEL 50 MICROINCHES MINIMUM.

3. DIMENSIONS ARE IN INCHES (MILLIMETERS), UNLESS OTHERWISE SPECIFIED TOLERANCES ARE  $\pm 0.005$  ( $\pm 0.13$ )

4. G8 PACKAGE IS AVAILABLE WITH STRAIGHT LEADS, SPECIFY "P16".

5. THE PACKAGE BOTTOM, RF GROUND, MUST BE SOLDERED OR CONDUCTIVE EPOXIED TO THE PCB RF GROUND.

6. CONSULT FACTORY FOR PIN DESIGNATION OF AVAILABLE G16 PACKAGED PRODUCTS.