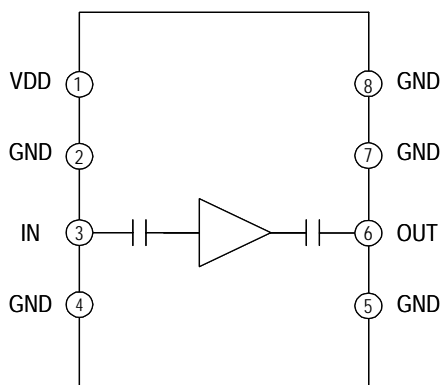


**Wide Band Power Amplifier Gain Block**

**Functional Block Diagram**



**Product Description**

The TQ9132 amplifier is a 500-2500 MHz amplifier capable of providing moderate output power (50 mW) for a wide variety of transmit and receive applications. The amplifier's input and output are matched to 50  $\Omega$  with internal circuitry, simplifying interfaces to 50  $\Omega$  systems. In addition, DC blocking capacitors are included on chip, permitting direct connections to the input and output. Its 8-pin surface mount package and low cost are well suited to many wireless communications applications.

**Electrical Characteristics<sup>1</sup>**

| Parameter                    | Typ  | Units |
|------------------------------|------|-------|
| Gain                         | 16   | dB    |
| Output 1 dB Gain Compression | 17.0 | dBm   |
| Input Return Loss            | 14   | dB    |
| Output Return Loss           | 12.5 | dB    |
| DC Supply Current            | 85   | mA    |

Note 1: Test Conditions:  $V_{DD} = 5.0 V$ ,  $Freq. = 2500 MHz$ ,  $T_A = 25^\circ C$ .

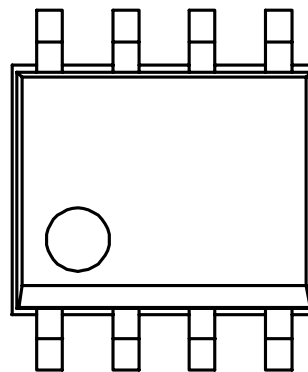
**Features**

- Single 3V-6V supply
- Wide frequency range
- +17 dBm output power
- Input and output matched to 50  $\Omega$
- SOIC-8 surface mount plastic package
- RoHS compliant, Pb-free

**Applications**

- Power Amplifier drivers
- PCN Medium-power amplifiers
- Medium-power WLAN's
- CDPD Modems
- Base Station receivers

**Package Style**



SOIC-8 5x6mm

**Wide Band Power Amplifier Gain Block**

*Absolute Maximum Ratings*

| Symbol            | Parameter                    | Absolute Maximum Value | Units |
|-------------------|------------------------------|------------------------|-------|
| V <sub>DD</sub>   | DC Power Supply              | 7.0                    | V     |
| P <sub>DISS</sub> | Power Dissipation            | 500                    | mW    |
| P <sub>IN</sub>   | Input Power                  | +10                    | dBm   |
| T <sub>STG</sub>  | Storage Temperature          | -55 to +150            | °C    |
| T <sub>OP</sub>   | Operating Temperature (case) | -40 to +85             | °C    |
|                   | Thermal Resistance           | 135.5                  | °C/W  |

Note: The part may not survive all maximums applied simultaneously.

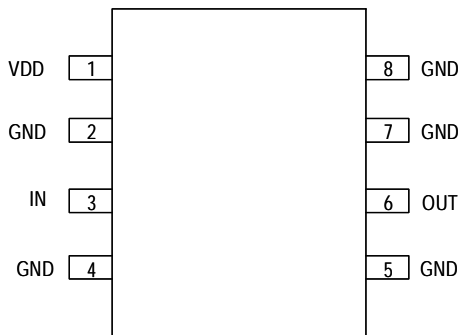
*Electrical Specifications<sup>1</sup>*

| Parameter                              | Conditions          | Min. | Typ  | Max. | Units |
|--|---------------------|------|------|------|-------|
| Frequency                              |                     | 500  |      | 2500 | MHz   |
| Supply Voltage (V <sub>DD</sub> )      |                     | 3.0  | 5.0  | 6.0  | V     |
| Gain                                   | f = 0.5 GHz         |      | 15.5 |      | dB    |
|  | f = 1.0 GHz         |      | 18.0 |      |       |
|  | f = 1.5 GHz         |      | 18.6 |      |       |
|  | f = 2.0 GHz         | 16.0 | 17.8 |      |       |
|  | f = 2.5 GHz         |      | 16.0 |      |       |
| Noise Figure                           | f = 0.5 to 2.5 GHz  |      | 5.0  |      | dB    |
| Output 1 dB Gain Compression           | f = 0.5 to 2.5 GHz  | 15.5 | 18.0 |      | dBm   |
| Output 3 <sup>rd</sup> Order Intercept | f = 0.5 to 2.5 GHz  |      | 29   |      | dBm   |
| Input Return Loss                      | f = 0.75 to 2.5 GHz |      | 14   |      | dB    |
| Output Return Loss                     | f = 0.75 to 2.5 GHz |      | 12.5 |      | dB    |
| DC Supply Current                      |                     |      | 85   | 100  | mA    |

*Note 1: Test Conditions: V<sub>DD</sub> = 5.0 V, T<sub>A</sub> = 25°C.*

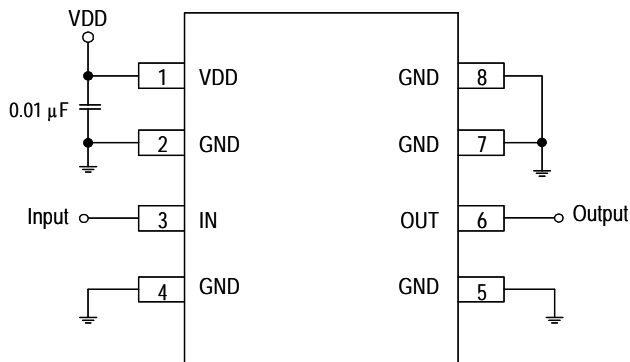
**Wide Band Power Amplifier Gain Block**

*Pin Out and Assignments*



| Pin       | Symbol          | Description   |
|-----------|-----------------|---|
| 1         | V <sub>DD</sub> | Voltage from desired power supply. Decoupling is required. Decouple with a 0.01 $\mu$ F capacitor within 5 mm of package.           |
| 3         | IN              | RF Input. Internally DC blocked and matched to 50 ohms. Connect directly to any 50 ohm source with 50 ohm printed microstrip line.  |
| 6         | OUT             | RF Output. Internally DC blocked and matched to 50 ohms. Connect directly to any 50 ohm source with 50 ohm printed microstrip line. |
| 2,4,5,7,8 | GND             | Ground connections. Connect immediately to ground plan for stability and performance. Pins are internally connected.                |

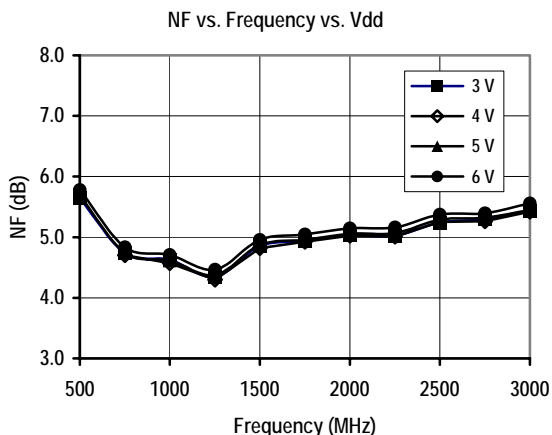
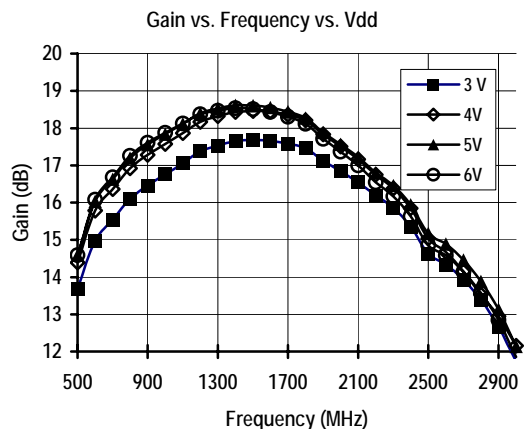
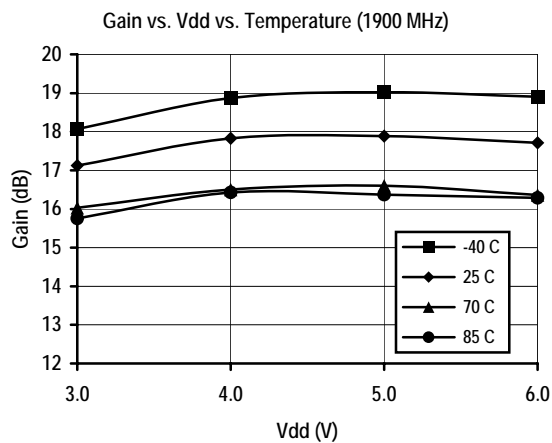
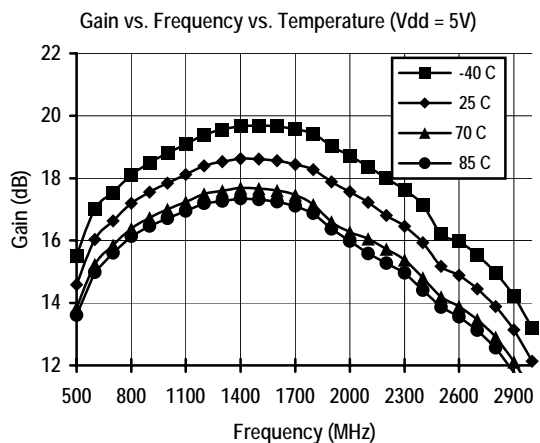
*Typical Test Circuit*



**Wide Band Power Amplifier Gain Block**

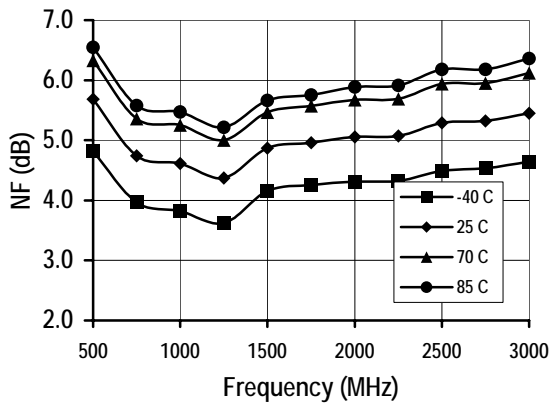
*Typical Performance*

Test Conditions (Unless Otherwise Specified): VDD = 5 V, Freq. = 2500 Mhz, TC = 25° C.

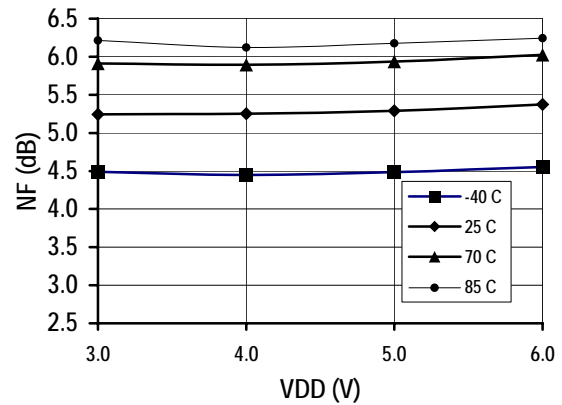


**Wide Band Power Amplifier Gain Block**

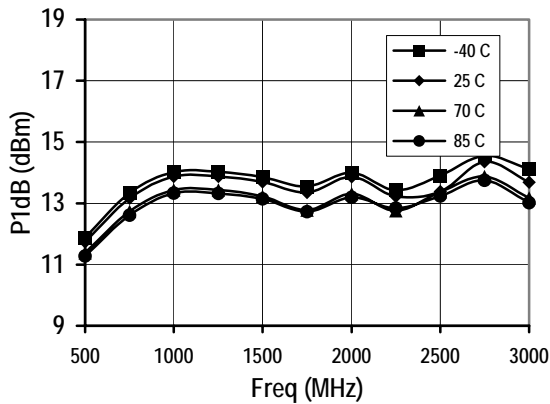
NF vs. Frequency vs. Temperature



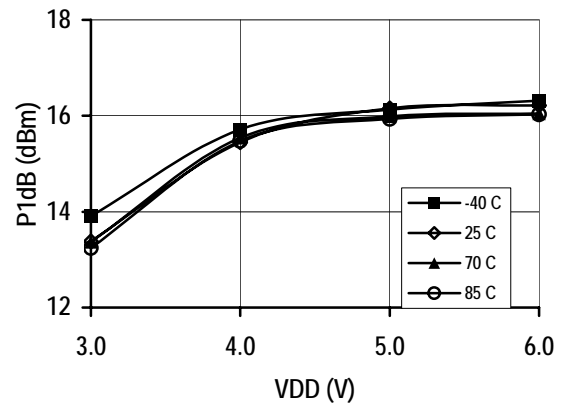
NF vs. VDD vs. Temperature



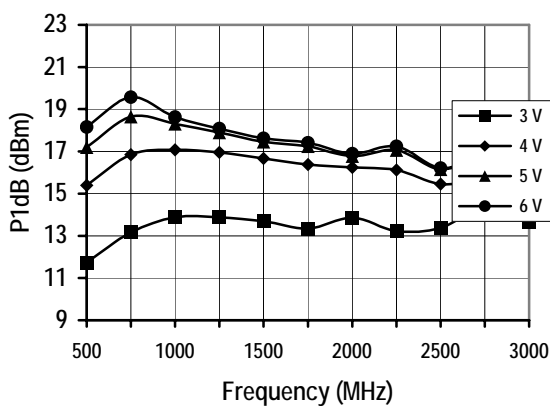
P1dB vs. Frequency vs. Temperature (Vdd = 3V)



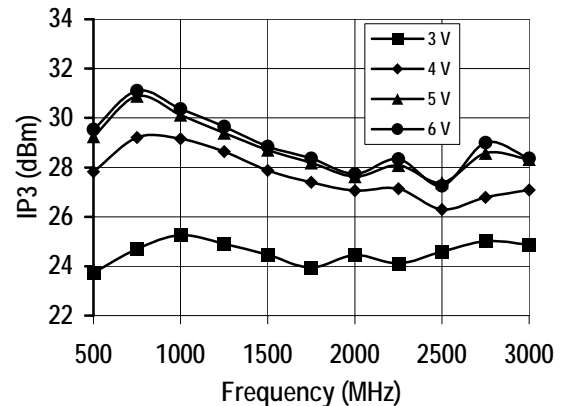
P1dB vs. VDD vs. Temperature



P1dB vs. Frequency vs. Vdd

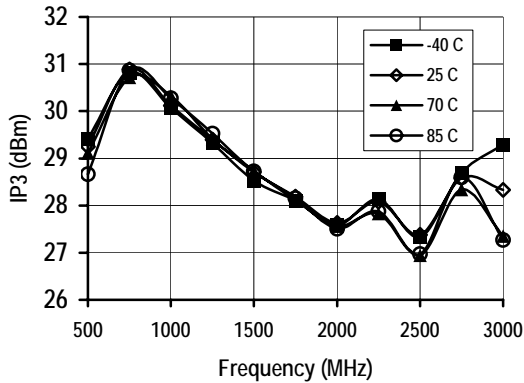


IP3 vs. Frequency vs. VDD

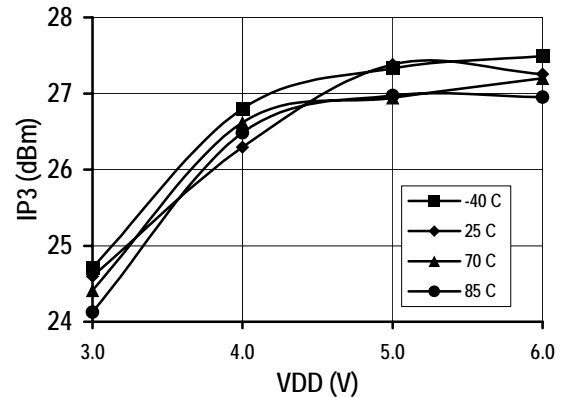


**Wide Band Power Amplifier Gain Block**

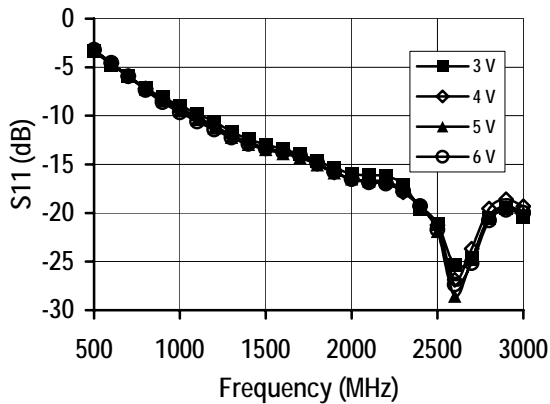
IP3 vs. Frequency v.s Temperature



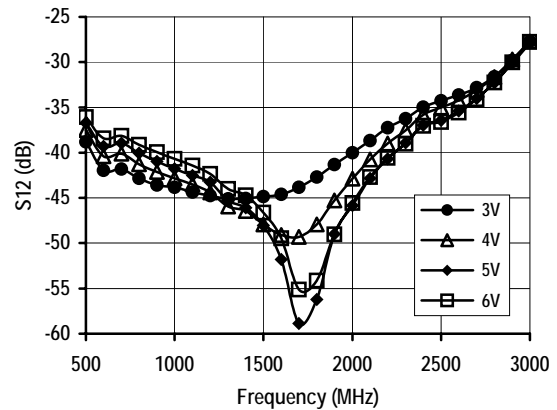
IP3 vs. VDD vs. Temperature



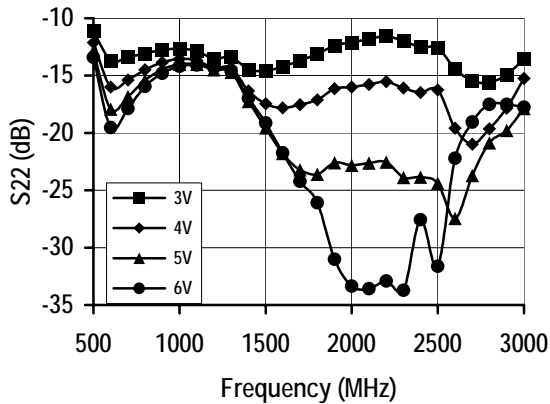
S11 vs. Frequency vs. VDD



S12 vs. Frequency vs. VDD



S22 vs. Frequency vs. VDD



**Wide Band Power Amplifier Gain Block**

*S-Parameters (typical)<sup>1</sup>*

| <i>Freq (MHz)</i> | <i> S11 </i> | <i>∠S11</i> | <i> S21 </i> | <i>∠S21</i> | <i> S12 </i> | <i>∠S12</i> | <i> S22 </i> | <i>∠S22</i> |
|-------------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| 500               | 0.769        | -110        | 5.2          | 22          | 0.012        | 83          | 0.157        | 12          |
| 600               | 0.644        | -127        | 5.9          | -15         | 0.010        | 17          | 0.159        | -44         |
| 700               | 0.543        | -144        | 6.5          | -48         | 0.011        | -17         | 0.185        | -77         |
| 800               | 0.450        | -159        | 7.0          | -78         | 0.010        | -38         | 0.206        | -103        |
| 900               | 0.382        | -172        | 7.4          | -106        | 0.010        | -56         | 0.216        | -126        |
| 1000              | 0.326        | 92          | 7.7          | -132        | 0.010        | -72         | 0.219        | -150        |
| 1100              | 0.281        | 166         | 7.9          | -158        | 0.010        | -85         | 0.221        | -125        |
| 1200              | 0.247        | 157         | 8.2          | 152         | 0.010        | -98         | 0.214        | -164        |
| 1300              | 0.220        | 147         | 8.4          | 151         | 0.010        | -109        | 0.204        | 140         |
| 1400              | 0.199        | 137         | 8.5          | 126         | 0.009        | -120        | 0.194        | 118         |
| 1500              | 0.177        | 126         | 8.6          | 102         | 0.009        | -130        | 0.185        | 92          |
| 1600              | 0.154        | 113         | 8.6          | 78          | 0.009        | -137        | 0.175        | 64          |
| 1700              | 0.131        | 99          | 8.5          | 53          | 0.009        | -133        | 0.165        | 36          |
| 1800              | 0.102        | 85          | 8.4          | 30          | 0.010        | -141        | 0.165        | 7           |
| 1900              | 0.072        | 62          | 8.1          | 6           | 0.011        | -158        | 0.165        | -24         |
| 2000              | 0.053        | -2          | 7.8          | -17         | 0.012        | -155        | 0.171        | -54         |
| 2100              | 0.050        | -49         | 7.5          | -39         | 0.013        | -127        | 0.18         | -82         |
| 2200              | 0.063        | -105        | 7.2          | -62         | 0.015        | 137         | 0.188        | -107        |
| 2300              | 0.085        | -84         | 6.7          | -84         | 0.016        | 159         | 0.194        | -128        |
| 2400              | 0.119        | 58          | 6.4          | -105        | 0.017        | 147         | 0.199        | -148        |
| 2500              | 0.153        | 149         | 6.0          | -127        | 0.019        | 134         | 0.201        | -107        |
| 2600              | 0.182        | 146         | 5.6          | -147        | 0.020        | 120         | 0.199        | -8          |
| 2700              | 0.210        | 131         | 5.3          | -132        | 0.021        | 107         | 0.198        | 160         |
| 2800              | 0.234        | 117         | 5.0          | 135         | 0.023        | 93          | 0.196        | 145         |
| 2900              | 0.258        | 103         | 4.7          | 151         | 0.024        | 76          | 0.191        | 128         |
| 3000              | 0.285        | 86          | 4.4          | 131         | 0.025        | 63          | 0.178        | 112         |

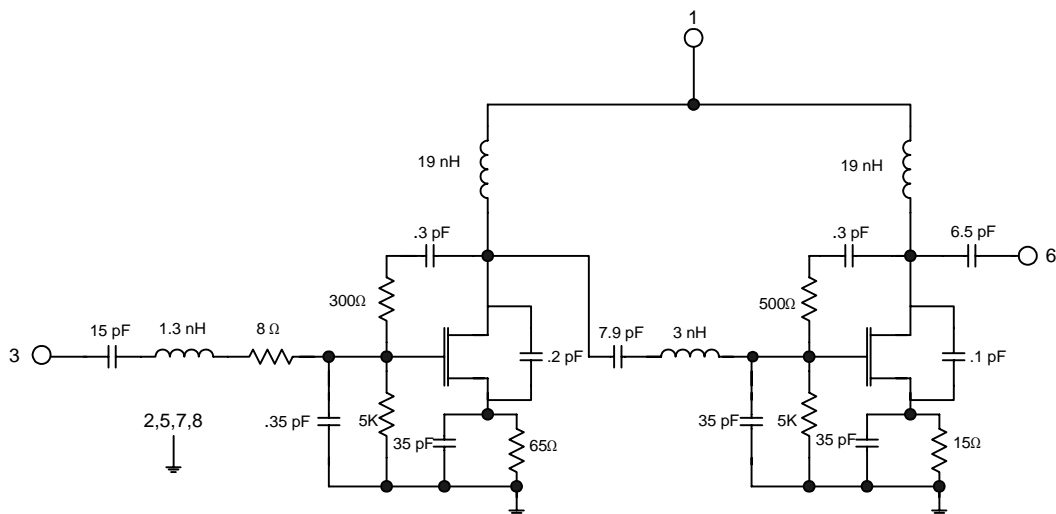
*Note 1: Test Conditions:  $V_{DD} = 5.0\text{ V}$ ,  $Freq. = 2500\text{ MHz}$ ,  $T_A = 25^\circ\text{ C}$ . Reference plane at package leads.*

For additional information and latest specifications, see our website: [www.triquint.com](http://www.triquint.com)

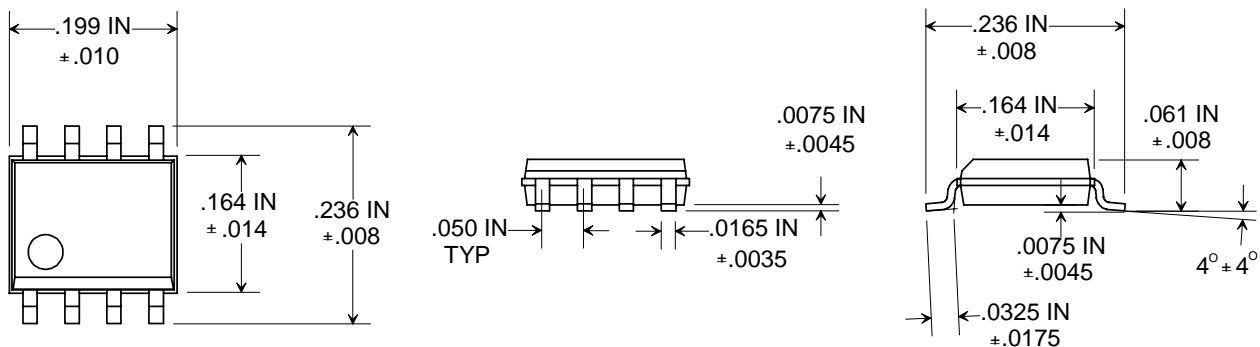


**Wide Band Power Amplifier Gain Block**

*Simplified Schematic*



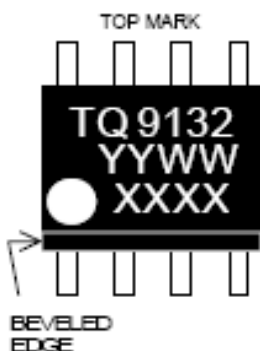
*Package Type: SOIC-8 Plastic Package*





**Wide Band Power Amplifier Gain Block**

*Package Marking*



Line 1- TriQuint Part number (TQ9132)

Line 2 – YYWW=Year/Week

Line 3 – XXXX (TriQuint lot number)

**Additional Information**<sup>1</sup>

This part is compliant with RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

The part is rated Moisture Sensitivity Level 1 at 260°C per JEDEC standard IPC/JEDEC J-STD-020.

<sup>1</sup> For latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

Web: [www.triquint.com](http://www.triquint.com)

Tel: (503) 615-9000

Email: [info\\_wireless@tqs.com](mailto:info_wireless@tqs.com)

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Email: [info\\_wireless@tqs.com](mailto:info_wireless@tqs.com)

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