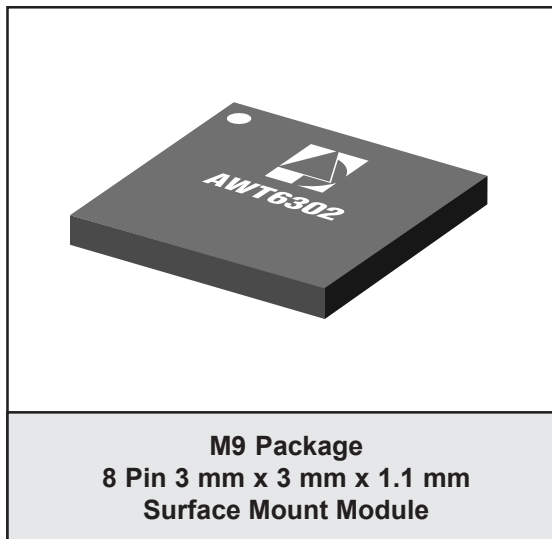


FEATURES

- InGaP HBT Technology
- High Efficiency: 39%
- Low Quiescent Current: 48 mA
- Low Leakage Current in Shutdown Mode: <math><1 \mu\text{A}</math>
- $V_{REF} = +2.85 \text{ V}$ (+2.75 V min over temp)
- Optimized for a 50 Ω System
- Low Profile Miniature Surface Mount Package: 1.1 mm
- CDMA 1XRTT, 1xEV-DO Compliant
- Pinout Enables Easy Phone Board Migration From 4 mm x 4 mm Package

APPLICATIONS

- PCS CDMA Wireless Handsets
- Dual Band CDMA Wireless Handsets



PRODUCT DESCRIPTION

The AWT6302 meets the increasing demands for higher efficiency and linearity in CDMA 1X handsets, while reducing pcb area by 44%. The package pinout was chosen to enable handset manufacturers to switch from a 4 mm x 4 mm PA module with very few layout changes to the phone board. The PA module is optimized for $V_{REF} = +2.85 \text{ V}$, a requirement for compatibility with the Qualcomm® 6000 chipset. The device is manufactured on an

advanced InGaP HBT MMIC technology offering state-of-the-art reliability, temperature stability, and ruggedness. Selectable bias modes that optimize efficiency for different output power levels, and a shutdown mode with low leakage current, increase handset talk and standby time. The self-contained 3 mm x 3 mm x 1.1 mm surface mount package incorporates matching networks optimized for output power, efficiency, and linearity in a 50 Ω system.

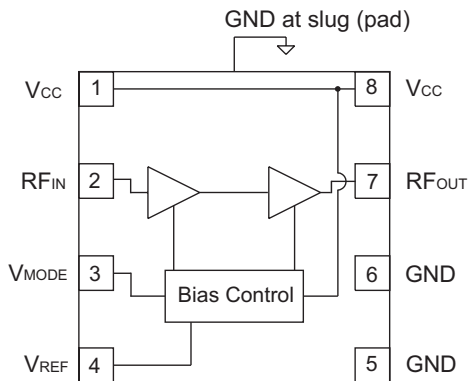


Figure 1: Block Diagram

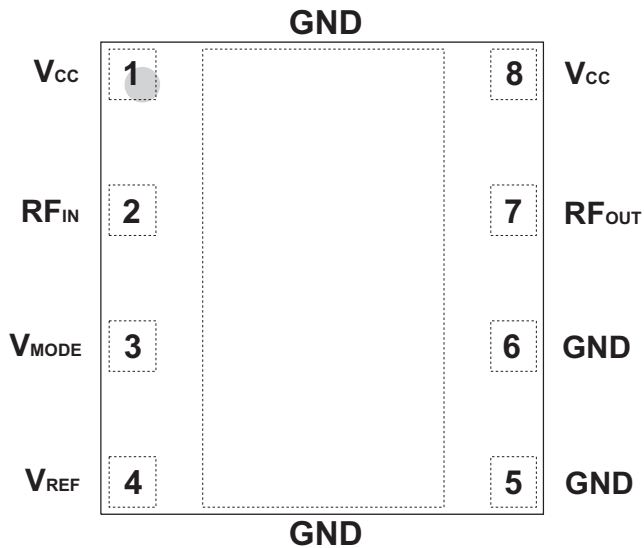


Figure 2: Pinout (X-ray Top View)

Table 1: Pin Description

| PIN | NAME | DESCRIPTION |
|-----|-------------------|----------------------|
| 1 | V _{CC} | Supply Voltage |
| 2 | RF _{IN} | RF Input |
| 3 | V _{MODE} | Mode Control Voltage |
| 4 | V _{REF} | Reference Voltage |
| 5 | GND | Ground |
| 6 | GND | Ground |
| 7 | RF _{OUT} | RF Output |
| 8 | V _{CC} | Supply Voltage |

ELECTRICAL CHARACTERISTICS

Table 2: Absolute Minimum and Maximum Ratings

| PARAMETER | MIN | MAX | UNIT |
|-------------------------------------|-----|------|------|
| Supply Voltage (V_{CC}) | 0 | +5 | V |
| Mode Control Voltage (V_{MODE}) | 0 | +3.5 | V |
| Reference Voltage (V_{REF}) | 0 | +3.5 | V |
| RF Input Power (P_{IN}) | - | +10 | dBm |
| Storage Temperature (T_{STG}) | -40 | +150 | °C |

Stresses in excess of the absolute ratings may cause permanent damage. Functional operation is not implied under these conditions. Exposure to absolute ratings for extended periods of time may adversely affect reliability.

Table 3: Operating Ranges

| PARAMETER | MIN | TYP | MAX | UNIT | COMMENTS |
|-------------------------------------|---------------------|------------|--------------|------|---------------------------------|
| Operating Frequency (f) | 1850 | - | 1910 | MHz | |
| Supply Voltage (V_{CC}) | +3.2 | +3.4 | +4.2 | V | |
| Reference Voltage (V_{REF}) | +2.75 0 | +2.85 - | +3.1 +0.5 | V | PA "on" PA "shut down" |
| Mode Control Voltage (V_{MODE}) | +2.5 0 | +2.85 - | +3.1 +0.5 | V | Low Bias Mode High Bias Mode |
| RF Output Power (P_{OUT}) | 27.5 ⁽¹⁾ | +28.0 | - | dBm | |
| Case Temperature (T_C) | -30 | - | +85 | °C | |

The device may be operated safely over these conditions; however, parametric performance is guaranteed only over the conditions defined in the electrical specifications.

Notes:

(1) For operation at $T_C = +85\text{ }^\circ\text{C}$ and $V_{CC} = +3.2\text{ V}$, P_{OUT} is derated by 0.5 dB.

Table 4: Electrical Specifications
 (T_C = +25 °C, V_{CC} = +3.4 V, V_{REF} = +2.85 V, 50 Ω system)

| PARAMETER | MIN | TYP | MAX | UNIT | COMMENTS |
|--|-----------|------------|------------|--------|--|
| Gain | 25 22 | 27 24.5 | 29 27 | dB | P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.85 V |
| Adjacent Channel Power at ±1.25 MHz offset Primary Channel BW - 1.23 MHz Adjacent Channel BW = 30 kHz | - - | -50 -52 | -47 -47 | dBc | P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.85 V |
| Adjacent Channel Power at ±2.25 MHz offset Primary Channel BW - 1.23 MHz Adjacent Channel BW = 30 kHz | - - | -60 -69 | -57 -57 | dBc | P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.85 V |
| Power-Added Efficiency | 37 8.3 | 39 9 | - - | % | P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.85 V |
| Quiescent Current (I _q) | - | 48 | 62 | mA | V _{MODE} = +2.85 V |
| Reference Current | - | 4 | 5 | mA | through V _{REF} pin, PA "on" |
| Mode Control Current | - | 0.3 | 1.0 | mA | through V _{MODE} pin, V _{MODE} = +2.85 V |
| Leakage Current | - | <1 | 5 | μA | V _{CC} = +4.2 V, V _{REF} = 0 V, V _{MODE} = 0 V |
| Noise in Receive Band | - | -136 | -134 | dBm/Hz | 1930 MHz to 1990 MHz |
| Harmonics 2fo 3fo, 4fo | - - | -40 -55 | -30 -30 | dBc | |
| Input Impedance | - | - | 2:1 | VSWR | |
| Spurious Output Level (all spurious outputs) | - | - | -65 | dBc | P _{OUT} ≤ +28 dBm In-band load VSWR < 5:1 Out-of-band load VSWR < 10:1 Applies over all operating ranges |
| Load mismatch stress with no permanent degradation or failure | 8:1 | - | - | VSWR | Applies over full operating range |

Notes:

1. ACPRs and Efficiency Limits at mid-band only.

APPLICATION INFORMATION

To ensure proper performance, refer to all related Application Notes on the ANADIGICS web site: <http://www.anadigics.com>

Shutdown Mode

The power amplifier may be placed in a shutdown mode by applying logic low levels (see Operating Ranges table) to both the V_{REF} and V_{MODE} voltages.

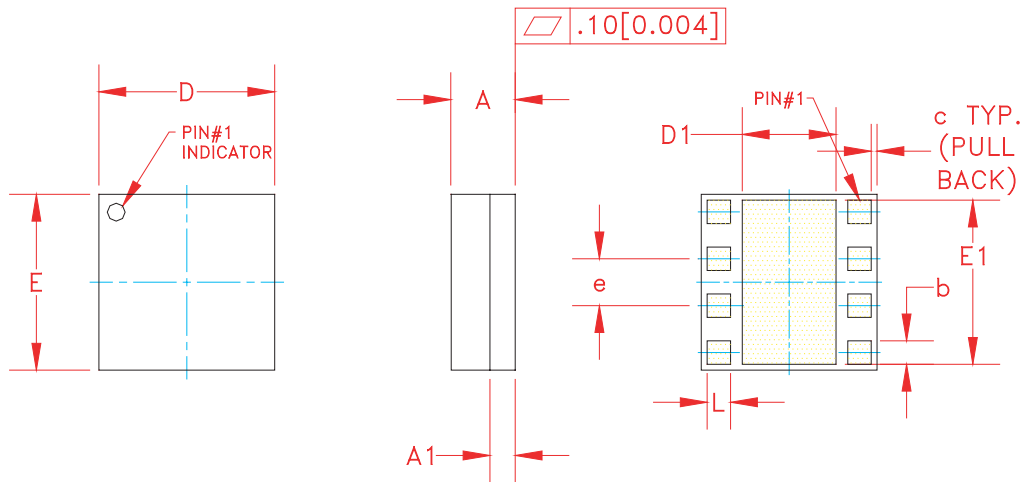
Bias Modes

The power amplifier may be placed in either a Low Bias mode or a High Bias mode by applying the appropriate logic level (see Operating Ranges table) to the V_{MODE} voltage. The Bias Control table lists the recommended modes of operation for various applications.

Table 5: Bias Control

| APPLICATION | P_{OUT} LEVELS | BIAS MODE | V_{REF} | V_{MODE} |
|-------------------|----------------------|--------------|-----------|------------|
| CDMA - low power | $\leq +16\text{dBm}$ | Low | +2.85 V | +2.85 V |
| CDMA - high power | $> +16\text{ dBm}$ | High | +2.85 V | 0 V |
| Shutdown | - | Shutdown | 0 V | 0 V |

PACKAGE OUTLINE



| S.M. P.O.L. | MILLIMETERS | | | INCHES | | | NOTE |
|-------------|-------------|------|------|------------|-------|-------|------|
| | MIN. | NOM. | MAX. | MIN. | NOM. | MAX. | |
| A | 1.07 | 1.17 | 1.27 | 0.042 | 0.046 | 0.05 | — |
| A1 | — | 0.51 | — | — | 0.020 | — | — |
| b | 0.35 | — | 0.60 | 0.013 | — | 0.024 | 3 |
| c | — | 0.10 | — | — | 0.004 | — | — |
| D | 2.88 | 3.00 | 3.12 | 0.113 | 0.118 | 0.123 | — |
| D1 | 1.20 | — | 1.50 | 0.047 | — | 0.060 | 3 |
| E | 2.88 | 3.00 | 3.12 | 0.113 | 0.118 | 0.123 | — |
| E1 | 2.75 | — | 2.85 | 0.108 | — | 0.112 | 3 |
| e | 0.80 BSC | | | 0.0315 BSC | | | — |
| L | 0.35 | — | 0.60 | 0.013 | — | 0.024 | 3 |

NOTES:

1. CONTROLLING DIMENSIONS: MILLIMETERS
2. UNLESS SPECIFIED TOLERANCE=±0.076[0.003].
3. PADS (INCLUDING CENTER) SHOWN UNIFORM SIZE FOR REFERENCE ONLY. ACTUAL PAD SIZE AND LOCATION WILL VARY WITHIN MIN. AND MAX. DIMENSIONS ACCORDING TO SPECIFIC LAMINATE DESIGN.
4. UNLESS SPECIFIED DIMENSIONS ARE SYMMETRICAL ABOUT CENTER LINES SHOWN.

Figure 3: M9 Package Outline - 8 Pin 3 mm x 3 mm x 1.1 mm Surface Mount Module

NOTES



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