



AWT6302

PCS/CDMA 3.4V/28dBm

Linear Power Amplifier Module

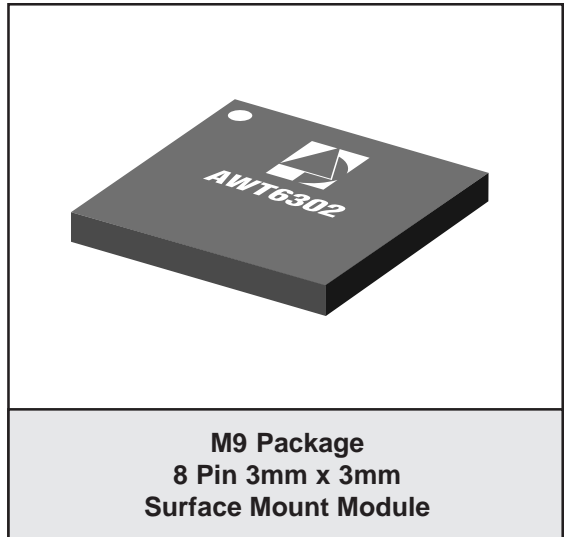
ADVANCED PRODUCT INFORMATION - Rev 0.1

FEATURES

- InGaP HBT Technology
- High Efficiency: 40%
- Low Quiescent Current: 50 mA
- Low Leakage Current in Shutdown Mode: $<1 \mu\text{A}$
- $V_{\text{REF}} = +2.8 \text{ V}$ (+2.7 V min over temp)
- Optimized for a 50Ω System
- Low Profile Miniature Surface Mount Package: 1.1mm
- CDMA 1XRTT, 1xEV-DO Compliant
- Pinout Enables Easy Phone Board Migration From 4mm x 4mm 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 4mm x 4mm PA module with very few layout changes to the phone board. The PA module is optimized for $V_{\text{REF}} = +2.8 \text{ V}$, 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 3mm x 3mm surface mount package incorporates matching networks optimized for output power, efficiency, and linearity in a 50Ω system.

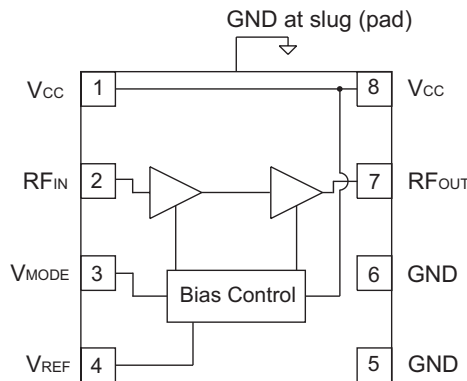


Figure 1: Block Diagram

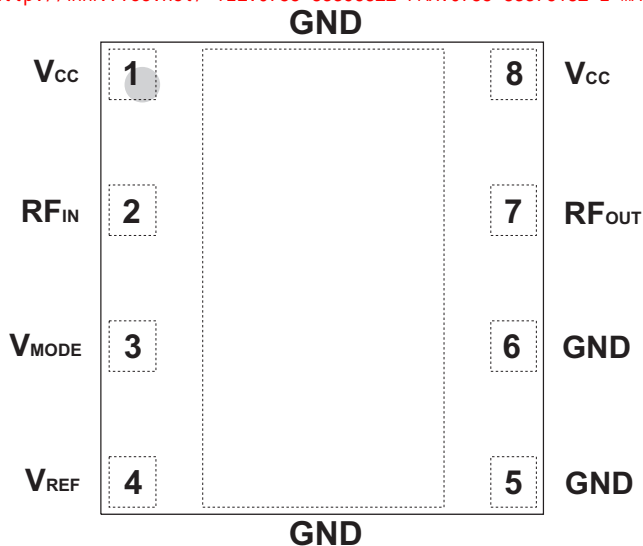


Figure 2: Pinout (X-ray Top View)

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})	+2.7 0	+2.8 -	+3.1 +0.5	V	PA "on" PA "shut down"
Mode Control Voltage (V_{MODE})	+2.3 0	+2.8 -	+3.1 +0.5	V	Low Bias Mode High Bias Mode
RF Output Power (P_{OUT})	-	+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.

Table 4: Electrical Specifications

(T_C = +25 °C, V_{CC} = +3.4 V, V_{REF} = +2.8 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain	-	27 25	-	dB	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.8 V
Adjacent Channel Power at ±1.25 kHz offset Primary Channel BW = 1.23 MHz Adjacent Channel BW = 30 kHz	-	-49 -52	-	dB	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.8 V
Adjacent Channel Power at ±2.25 MHz offset Primary Channel BW = 1.23 MHz Adjacent Channel BW = 30 kHz	-	-60 -70	-	dB	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.8 V
Power-Added Efficiency	-	40 9	-	%	P _{OUT} = +28 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.8 V
Quiescent Current (I _q)	-	48	-	mA	V _{MODE} = +2.8 V
Reference Current	-	3.5	5	mA	through V _{REF} pin, PA "on"
Mode Control Current	-	0.3	-	mA	through V _{MODE} pin, V _{MODE} = +2.8 V
Leakage Current	-	<1	5	μA	V _{CC} = +4.2 V, V _{REF} = 0 V V _{MODE} = 0 V
Noise in Receive Band	-	-137	-	dBm/Hz	1930 MHz to 1990 MHz
Harmonics 2fo 3fo, 4fo	-	-40 -55	-	dBc	
Input Impedance	-	-	2:1	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-65	dBc	P _{OUT} ≤ +28 dBm In-band load VSWR < 8:1 Out-of-band load VSWR < 8:1 Applies over all voltage and temperature operating ranges
Load mismatch stress with no permanent degradation or failure	8:1	-	-	VSWR	V _{CC} = +5.0 V, P _{IN} = +5 dBm Applies over full operating temperature range

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.

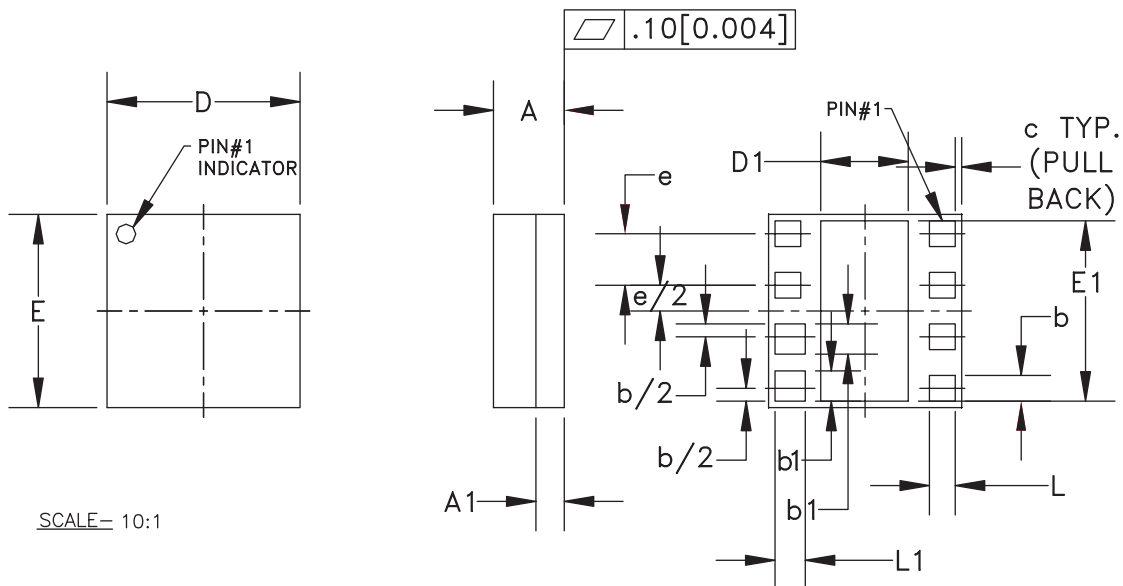
Bias Modes

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	+2.8 V	+2.8 V
CDMA - high power	$> +16\text{ dBm}$	High	+2.8 V	0 V
Shutdown	-	Shutdown	0 V	0 V

PACKAGE OUTLINE



SCALE= 10:1

SYMBOL	MILLIMETERS			INCHES			NOTE
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	
A	1.01	1.10	1.19	0.039	0.043	0.047	-
A1	-	0.44	-	-	0.017	-	-
b	-	0.40	-	-	0.015	-	6X
b1	-	0.47	-	-	0.018	-	2X
c	-	0.10	-	-	0.004	-	-
D	2.88	3.00	3.12	0.113	0.118	0.123	-
D1	-	1.35	-	-	0.053	-	-
E	2.88	3.00	3.12	0.113	0.118	0.123	-
E1	-	2.80	-	-	0.110	-	-
e	0.80 BSC			0.0315 BSC			-
L	-	0.40	-	-	0.015	-	6X
L1	-	0.47	-	-	0.018	-	2X

NOTES:

1. CONTROLLING DIMENSIONS: MILLIMETERS
2. UNLESS SPECIFIED TOLERANCE=±0.076[0.003].

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

NOTES



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