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AWT6112

Cellular Dual Mode AMPS/CDMA 3.4V/28dBm Linear Power Amplifier Module

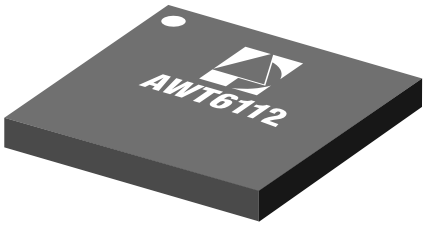
ADVANCED PRODUCT INFORMATION - Rev 0.1

FEATURES

- InGaP HBT Technology
- High Efficiency: 49% AMPS, 38% CDMA
- Low Quiescent Current: 50 mA
- Low Leakage Current in Shutdown Mode: <5 µA
- Optimized for a 50 Ω System
- Low Profile Miniature Surface Mount Package
- CDMA 1XRTT Compliant
- CDMA 1xEV-DO Compliant

APPLICATIONS

- Single Mode CDMA Wireless Handsets
- Dual Mode AMPS/CDMA Wireless Handsets



M7 Package
10 Pin 4mm x 4mm
Surface Mount Module

PRODUCT DESCRIPTION

The AWT6112 is a high power, high efficiency amplifier module for dual mode AMPS/CDMA wireless handset applications. 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, serve to increase handset talk and standby time. The self contained 4mm x 4mm surface mount package incorporates matching networks optimized for output power, efficiency and linearity in a 50 Ω system.

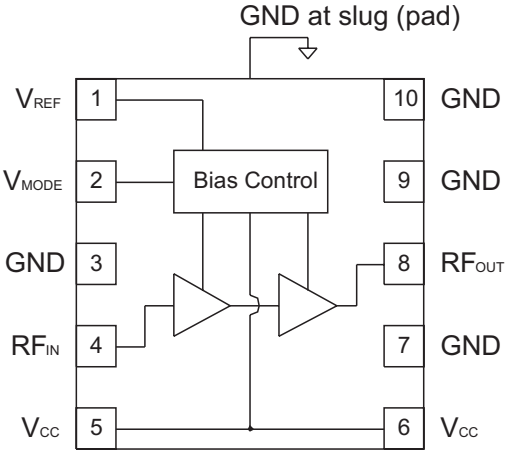


Figure 1: Block Diagram

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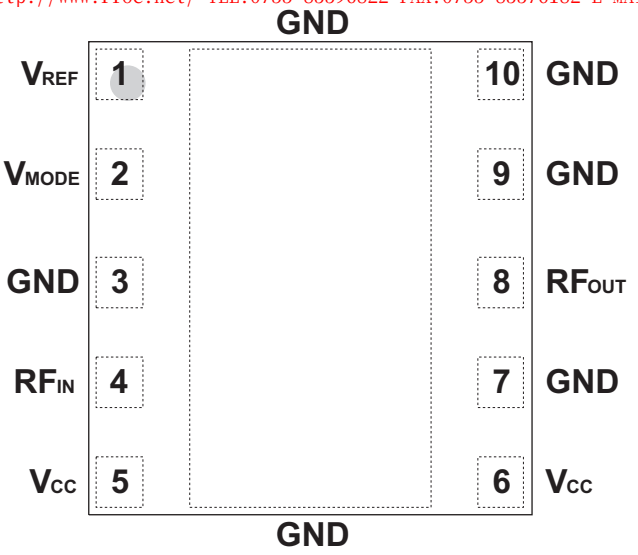

Figure 2: Pinout (X-ray Top View)

Table 1: Pin Description

PIN	NAME	DESCRIPTION
1	V_{REF}	Reference Voltage
2	V_{MODE}	Mode Control
3	GND	Ground
4	RF_{IN}	RF Input
5	V_{CC}	Supply Voltage
6	V_{CC}	Supply Voltage
7	GND	Ground
8	RF_{OUT}	RF Output
9	GND	Ground
10	GND	Ground

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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)	824	-	849	MHz	
Supply Voltage (V_{CC})	+3.0	+3.4	+4.2	V	
Reference Voltage (V_{REF})	+2.75 0	+3.0 -	+3.1 +0.5	V	PA "on" PA "shut down"
Mode Control Voltage (V_{MODE})	+2.5 0	+3.0 -	+3.1 +0.5	V	Low Bias Mode High Bias Mode
RF Output Power (P_{OUT})	- - -	+31.0 +29.0 +28.0	- - -	dBm	AMPS, V_{CC} = +3.4 V CDMA, V_{CC} = +3.7 V CDMA, V_{CC} = +3.4 V
Case Temperature (T_C)	-30	-	+110	°C	

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

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Table 4: Electrical Specifications - AMPS Operation

(T_C = +25 °C, V_{CC} = +3.4 V, V_{REF} = +3.0 V, V_{MODE} = +3.0 V, P_{OUT} = +31 dBm, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain	-	28.5	-	dB	
Gain Variation	-	0.5	1.0	dB	
Power-Added Efficiency	-	49	-	%	
Quiescent Current (Icq)	-	50	-	mA	
Reference Current	-	6.5	9.0	mA	through V_{REF} pin
Mode Control Current	-	0.35	0.7	mA	through V_{MODE} pin
Leakage Current	-	<5	-	µA	V_{CC} = +3.4 V, V_{REF} = 0 V, V_{MODE} = 0 V
Noise in Receive Band	-	-135	-	dBm/Hz	869 MHz to 894 MHz
Harmonics 2fo 3fo, 4fo	 - -	 -40 -55	 -30 -30	dBc	
Input Impedance	-	-	2:1	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-70	dBc	P_{OUT} ≤+31 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

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Table 5: Electrical Specifications - CDMA Operation
(T_C = +25 °C, V_{CC} = +3.4 V, V_{REF} = +3.0 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain	- -	29 26.5	- -	dB	P_{OUT} = +28 dBm, V_{MODE} = 0 V P_{OUT} = +16 dBm, V_{MODE} = +3.0 V
Adjacent Channel Power at ±885 kHz offset Primary Channel BW = 1.23 MHz Adjacent Channel BW = 30 kHz	- -	-49 -50	- -	dB	P_{OUT} = +28 dBm, V_{MODE} = 0 V P_{OUT} = +16 dBm, V_{MODE} = +3.0 V
Adjacent Channel Power at ±1.98 MHz offset Primary Channel BW = 1.23 MHz Adjacent Channel BW = 30 kHz	- -	-60 -68	- -	dB	P_{OUT} = +28 dBm, V_{MODE} = 0 V P_{OUT} = +16 dBm, V_{MODE} = +3.0 V
Power-Added Efficiency	- -	38 8	- -	%	P_{OUT} = +28 dBm, V_{MODE} = 0 V P_{OUT} = +16 dBm, V_{MODE} = +3.0 V
Quiescent Current (Icq)	-	50	-	mA	V_{MODE} = +3.0 V
Reference Current	-	6.5	9.0	mA	through V_{REF} pin
Mode Control Current	-	0.35	0.7	mA	through V_{MODE} pin
Leakage Current	-	<5	-	µA	V_{CC} = +3.4 V, V_{REF} = 0 V, V_{MODE} = 0 V
Noise in Receive Band	-	-135	-	dBm/Hz	869 MHz to 894 MHz
Harmonics 2fo 3fo, 4fo	- -	-40 -55	-30 -30	dBc	
Input Impedance	-	-	2:1	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-70	dBc	P_{OUT} ≤+29 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

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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 a 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 6: Bias Control

APPLICATION	P_{OUT} LEVELS	BIAS MODE	V_{REF}	V_{MODE}
AMPS	(all)	Low	+3.0 V	+3.0 V
CDMA - low power	≤+16 dBm	Low	+3.0 V	+3.0 V
CDMA - high power	>+16 dBm	High	+3.0 V	0 V
Shutdown	-	Shutdown	0 V	0 V

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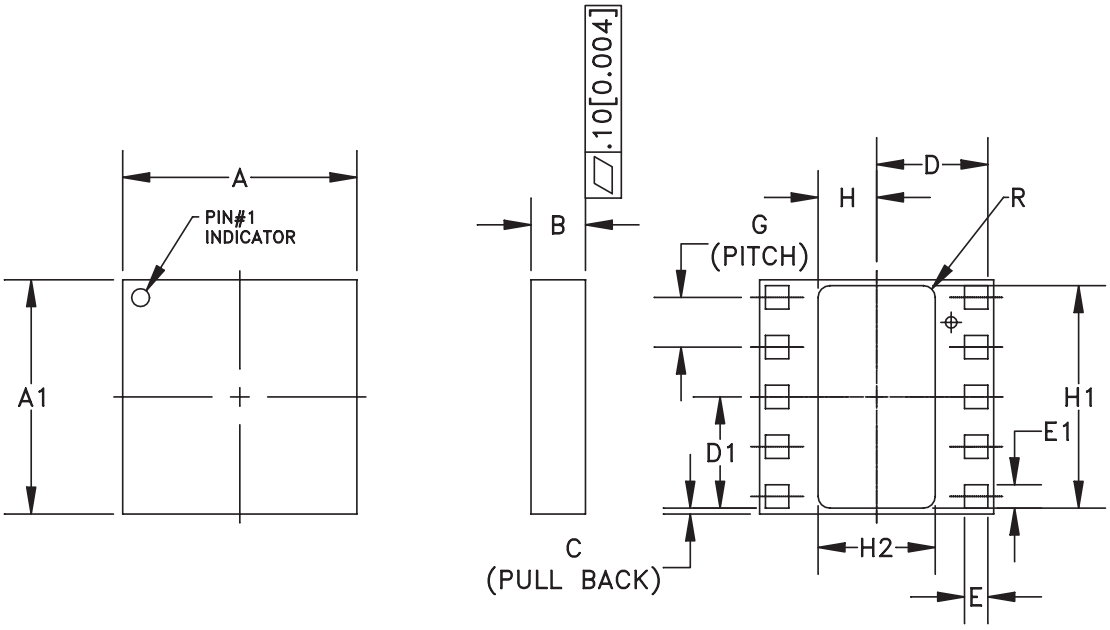
PACKAGE OUTLINE



SYMBOL	MILLIMETERS			INCHES			NOTE
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	
A	3.88	4.00	4.12	0.152	0.157	0.162	–
A1	3.88	4.00	4.12	0.152	0.157	0.162	–
B	1.30	1.55	1.70	0.051	0.061	0.067	3
C	–	0.10	–	–	0.004	–	–
D	–	1.90	–	–	0.075	–	–
D1	–	1.90	–	–	0.075	–	–
E	0.35	0.40	0.45	0.013	0.015	0.017	–
E1	0.35	0.40	0.45	0.013	0.015	0.017	–
G	0.85 BSC			0.033 BSC			–
H	–	1.00	–	–	0.039	–	–
H1	–	3.80	–	–	0.149	–	–
H2	–	2.00	–	–	0.078	–	–
R	–	0.20	–	–	0.007	–	–

NOTES:

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

Figure 3: M7 Package Outline - 10 Pin 4mm x 4mm Surface Mount Module

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ANADIGICS, Inc.
141 Mount Bethel Road
Warren, New Jersey 07059, U.S.A.
Tel: +1 (908) 668-5000
Fax: +1 (908) 668-5132

URL: http://www.anadigics.com
E-mail: Mktg@anadigics.com

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