

FEATURES

- InGaP HBT Technology
- High Efficiency 37% CDMA
- Low Receive Band Noise (NRx) -132 dBm/Hz @ 10 MHz offset
- Low Leakage Current (<5 μ A)
- SMT Module Package
- 50 Ω Input and Output Matching
- Shut Down and Mode Control
- CDMA 2000 1XRTT Compliant
- RoHS Compliant Package 250 $^{\circ}$ C MSL-3

APPLICATIONS

- CDMA/EVDO 450 MHz Wireless Handsets and Data Devices



M5 Package
7 Pin 6 mm x 6 mm x 1.5 mm
Surface Mount Module

PRODUCT DESCRIPTION

The AWT6136 is a high power, high efficiency amplifier module for 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. A low power mode is available to reduce power drain on the

system battery. The 6 mm x 6 mm x 1.5 mm laminate package is self contained, incorporating 50 Ω input and output matching networks optimized for output power, linearity, and efficiency.

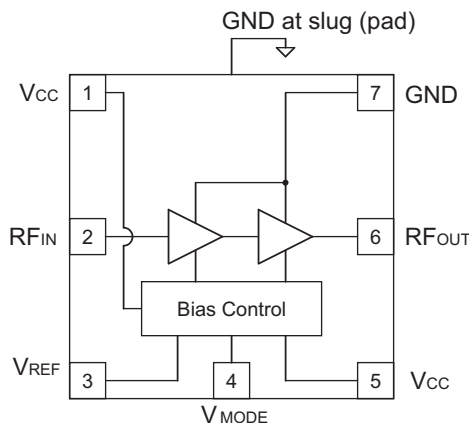


Figure 1: Block Diagram

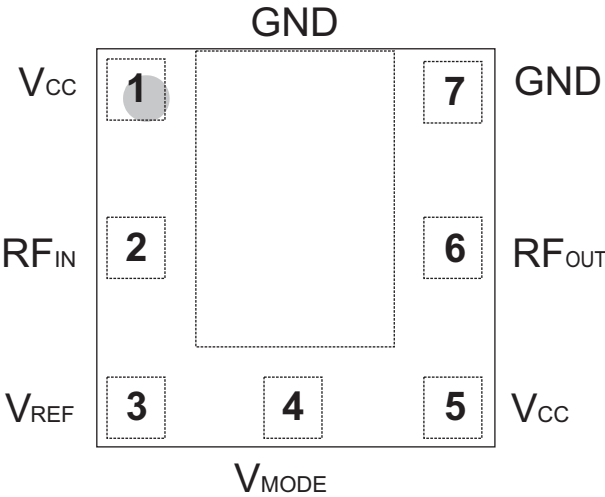


Figure 2: Pinout (X-ray Top View)

Table 1: Pin Description

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

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	+3.4	V
Reference Voltage (V_{REF})	0	+3.4	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)	450	-	460	MHz	
Supply Voltage (V_{CC})	+3.2	+3.4	+4.2	V	
Reference Voltage (V_{REF})	+2.80 0	+2.90 -	+3.1 +0.5	V	PA"on" PA"shut down"
Mode Control Voltage (V_{MODE})	+2.5 0	+2.90 -	+3.1 +0.5	V	Low Bias Mode High Bias Mode
RF Output Power (P_{OUT})	+29.0 ⁽¹⁾	+29.5	-	dBm	CDMA, V_{CC} =+3.4V
Case Temperature (T_C)	-10	-	+90	°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 V_{CC} = +3.2 V and T_C = +90 °C, P_{OUT} is derated by 0.5 dB.

Table 4: Electrical Specifications – CDMA Operation
(T_C = +25 °C, V_{CC} = +3.4 V, V_{REF} = +2.90 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain	26 25	28.5 27.5	30 29	dB	P _{OUT} = +29.5 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.90 V
Gain Variation	-	0.4	1.0	dB	
Adjacent Channel Power at ± 885 kHz offset ⁽¹⁾ Primary Channel BW = 1.23 MHz Adjacent Channel BW = 30 kHz	- -	-50 -58	-47 -47	dB	P _{OUT} = +29.5 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.90 V
Adjacent Channel Power at ± 1.98 MHz offset ⁽¹⁾ Primary Channel BW = 1.23 MHz Adjacent Channel BW = 30 kHz	- -	-62 -68	-59 -59	dB	P _{OUT} = +29.5 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.90 V
Power-Added Efficiency ^{(1), (2)}	33 6	37 7	- -	%	P _{OUT} = +29.5 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.90 V
Quiescent Current (I _{cq})	-	60	75	mA	through V _{CC} pins, V _{MODE} = +2.90 V
Reference Current	-	6.5	9	mA	through V _{REF} pin, PA "on"
Mode Control Current	-	0.8	1.0	mA	through V _{MODE} pin, V _{MODE} = +2.90 V
Leakage Current	-	<1	5	μA	V _{CC} = +4.2 V, V _{REF} = 0 V, V _{MODE} = 0 V
Noise in Receive Band	-	-132	-130	dBm/Hz	f _o +10 MHz, P _{OUT} ≤ +29.5 dBm
Harmonics 2f _o 3f _o , 4f _o	- -	-36 -44	-30 -35	dBc	P _{OUT} ≤ +29.5 dBm
Input Impedance	-	-	2:1	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-70	dBc	P _{OUT} ≤ +29.5 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	10:1	-	-	VSWR	Applies over all operating ranges

Notes:

(1) P_{OUT} is derated by 0.5 dB for IS-98 / CDMA 2000 operation.

(2) Efficiency spec applies at 455 MHz.

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.

High Bias Mode

The power amplifier may be placed in a high bias mode by applying a logic low level (see Operating Ranges table) to the V_{MODE} voltage.

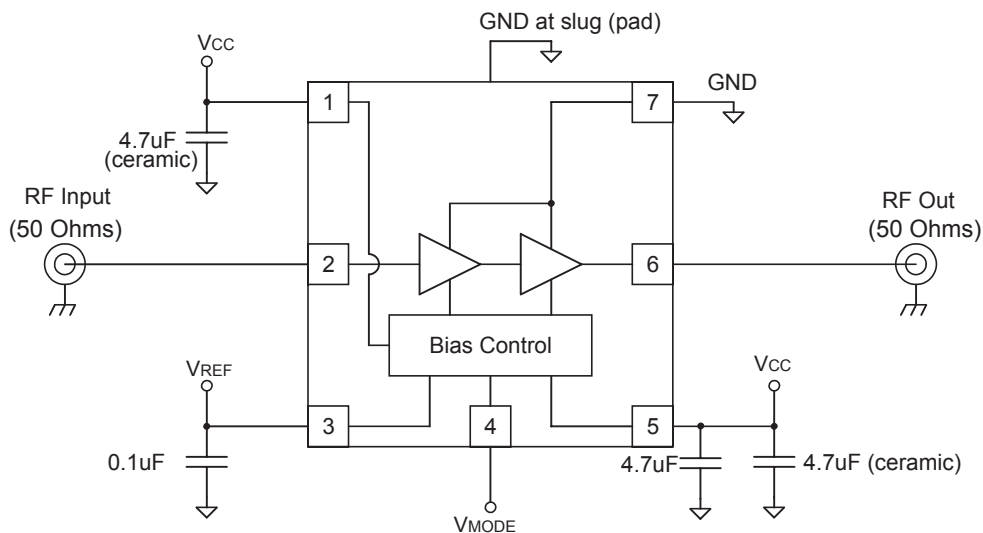
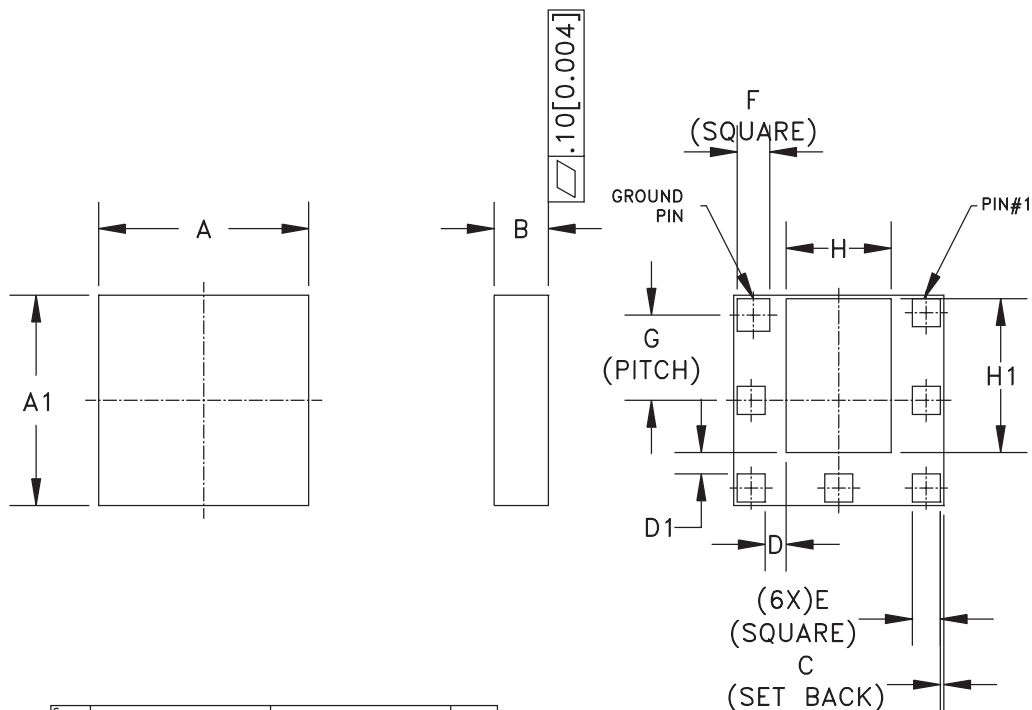


Figure 3: Application Circuit Schematic

PACKAGE OUTLINE



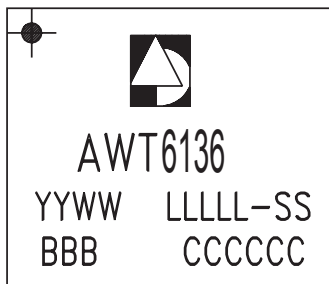
SYMBOL	MILLIMETERS			INCHES			NOTE
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	
A	5.88	6.00	6.12	0.231	0.236	0.241	—
A1	5.88	6.00	6.12	0.231	0.236	0.241	—
B	1.30	1.55	1.70	0.051	0.061	0.067	—
C	—	0.10	—	—	0.004	—	—
D	—	0.60	—	—	0.024	—	—
D1	—	0.60	—	—	0.024	—	—
E	—	0.81	—	—	0.032	—	—
F	—	0.89	—	—	0.035	—	—
G	2.50 BSC			0.098 BSC			3
H	—	3.00	—	—	0.118	—	—
H1	—	4.39	—	—	0.173	—	—

NOTES:

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

Figure 4: M5 Package Outline - 7 Pin 6 mm x 6 mm x 1.5 mm Surface Mount Module (Low Band)

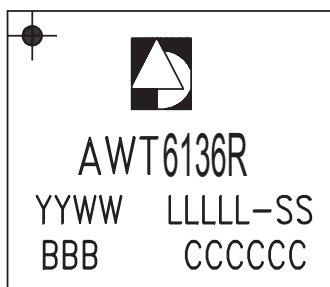
TOP BRAND



NOTES:

1. ANADIGICS LOGO SIZE: X=0.080±0.010 Y=0.095±0.010
2. PART #: AWT6136
3. YEAR AND WORK WEEK: YYWW: YY = YEAR, WW = WORK WEEK
4. LOT - Wafer I.D.: LLLLL-SS = Wafer/Lot I.D.
5. PIN 1 INDICATOR: MOLD NOTCH -or- INK DOT
6. BOM #: BBB
7. COUNTRY CODE: CCCCC
8. TYPE : ELITE
SIZE : AS LARGE AS POSSIBLE
COLOR : WHITE or SILVER INK MARKED

Figure 5: Branding Specification

TOP BRANDNOTES:

- | | |
|-------------------------|---------------------------------|
| 1. ANADIGICS LOGO SIZE: | X=0.080±0.010 Y=0.095±0.010 |
| 2. PART #: | AWT6136R |
| 3. YEAR AND WORK WEEK: | YYWW; YY = YEAR, WW = WORK WEEK |
| 4. LOT - Wafer I.D.: | LLLLL-SS = Wafer/Lot I.D. |
| 5. PIN 1 INDICATOR: | MOLD NOTCH -or- INK DOT |
| 6. BOM #: | BBB |
| 7. COUNTRY CODE: | CCCCC |
| 8. TYPE : | ELITE |
| SIZE : | AS LARGE AS POSSIBLE |
| COLOR : | WHITE or SILVER INK MARKED |

Figure 6: RoHS Compliant Branding Specification

COMPONENT PACKAGING

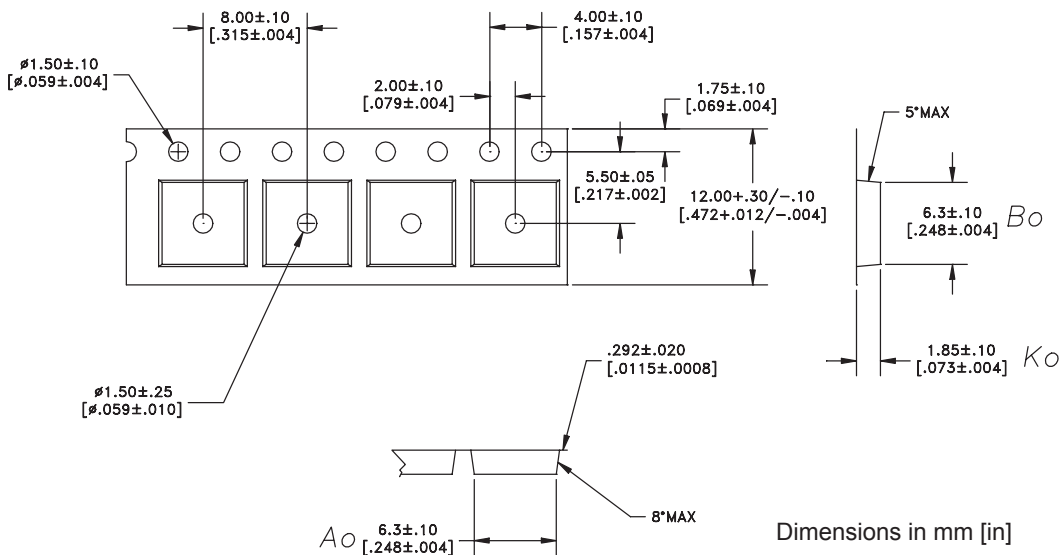


Figure 6: Tape & Reel Packaging

Table 5: Tape & Reel Dimensions

PACKAGE TYPE	TAPE WIDTH	POCKET PITCH	REEL CAPACITY	MAX REEL DIA
6 x 6 x 1.5 mm	12mm	8mm	2500	13"

ORDERING INFORMATION

ORDER NUMBER	TEMPERATURE RANGE	PACKAGE DESCRIPTION	COMPONENT PACKAGING
AWT6136RM5P8	-10 °C to +90 °C	RoHS Compliant 7 Pin 6 x 6 x 1.5 mm Surface Mount Module	Tape and Reel, 2500 pieces per Reel
AWT6136RM5P9	-10 °C to +90 °C	RoHS Compliant 7 Pin 6 mm x 6 mm x 1.5 mm Surface Mount Module	Partial Tape and Reel

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