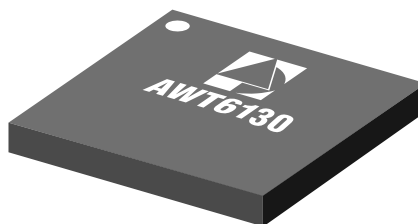


FEATURES

- InGaP HBT Technology
- High Efficiency: 48% AMPS, 37% CDMA
- Low Quiescent Current: 50 mA
- Low Leakage Current in Shutdown Mode: $<1 \mu\text{A}$
- Optimized for a 50Ω System
- Low Profile Miniature Surface Mount Package
- CDMA 1XRTT Compliant
- CDMA 1xEV-DO Compliant
- RoHS Compliant Package Option, 250 °C MSL-3

APPLICATIONS

- Single Mode CDMA Wireless Handsets
- Dual Mode AMPS/CDMA Wireless Handsets
- Tri Mode CDMA Handsets with GPS



M7 Package
10 Pin 4 mm x 4 mm x 1.5 mm
Surface Mount Module

PRODUCT DESCRIPTION

The AWT6130 provides the additional output power margin RF designers need to overcome additional post-PA insertion loss in tri-mode handset designs supporting E911 (GPS enabled). 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 4 mm x 4 mm x 1.5 mm surface mount package incorporates matching networks optimized for output power, efficiency, and linearity in a 50Ω system.

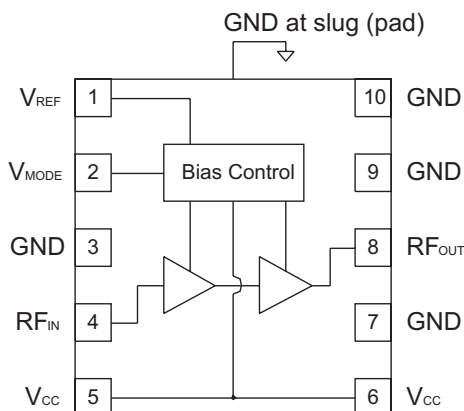


Figure 1: Block Diagram

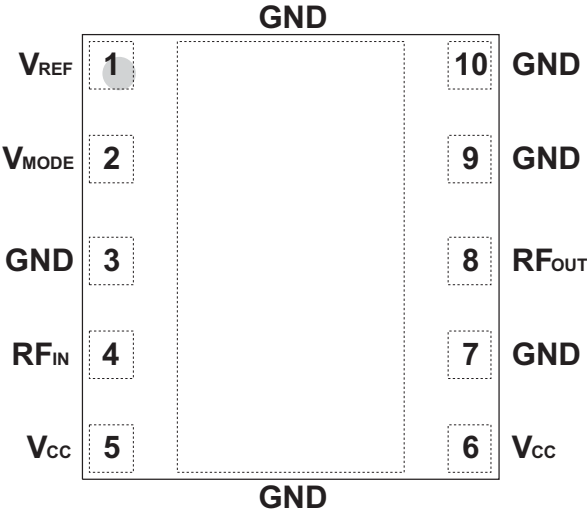


Figure 2: Pinout (X-ray Top View)

Table 1: Pin Description

PIN	NAME	DESCRIPTION
1	V _{REF}	Reference Voltage
2	V _{MODE}	Mode Control Voltage
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

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})	+3.2	+3.5	+4.2	V	
Reference Voltage (V_{REF})	+2.8 0	+2.9 -	+3.1 +0.5	V	PA "on" PA "shut down"
Mode Control Voltage (V_{MODE})	+2.5 0	+2.9 -	+3.1 +0.5	V	Low Bias Mode High Bias Mode
RF Output Power (P_{OUT})	+31.5 +29.0	- -	- -	dBm	AMPS, $V_{CC} = +3.5$ V CDMA, $V_{CC} = +3.5$ V
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 - AMPS Operation
(T_c = +25 °C, V_{CC} = +3.5 V, V_{REF} = +2.9 V, V_{MODE} = +2.9 V, P_{OUT} = +31.5 dBm, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain	25.5	28	30	dB	
Gain Variation	-	0.3	1.0	dB	
Power-Added Efficiency	44	48	-	%	
Quiescent Current (I _q)	-	50	65	mA	
Reference Current	-	3	5	mA	through V _{REF} pin
Mode Control Current	-	0.3	0.5	mA	through V _{MODE} pin
Leakage Current	-	<1	5	μA	V _{CC} = +4.2 V, V _{REF} = 0 V V _{MODE} = 0 V
Noise in Receive Band	-	-135	-133	dBm/Hz	869 MHz to 894 MHz
Harmonics 2fo 3fo, 4fo	- - -	-40 -50	-30 -30	dBc	
Input Impedance	-	-	2:1	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-70	dBc	P _{OUT} ≤ +31.5 dBm In-band load VSWR < 8:1 Out-of-band load VSWR < 10:1 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

Table 5: Electrical Specifications - CDMA Operation
(T_C = +25 °C, V_{CC} = +3.5 V, V_{REF} = +2.9 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain	25.5 -	28 26	30 -	dB	P _{OUT} = +29 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.9 V
Adjacent Channel Power at ±885 kHz offset Primary Channel BW = 1.23 MHz Adjacent Channel BW = 30 kHz	- -	-50 -50	-46.5 -46.5	dBc	P _{OUT} = +29 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.9 V
Adjacent Channel Power at ±1.98 MHz offset Primary Channel BW = 1.23 MHz Adjacent Channel BW = 30 kHz	- -	-59 -65	-56 -57	dBc	P _{OUT} = +29 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.9 V
Power-Added Efficiency	34 6.5	37.5 7.5	- -	%	P _{OUT} = +29 dBm, V _{MODE} = 0 V P _{OUT} = +16 dBm, V _{MODE} = +2.9 V
Quiescent Current (I _q)	-	50	65	mA	V _{MODE} = +2.9 V
Reference Current	-	3	5	mA	through V _{REF} pin
Mode Control Current	-	0.3	0.5	mA	through V _{MODE} pin
Leakage Current	-	<1	5	μA	V _{CC} = +4.2 V, V _{REF} = 0 V V _{MODE} = 0 V
Noise in Receive Band	-	-135	-133	dBm/Hz	869 MHz to 894 MHz
Harmonics 2fo 3fo, 4fo	- -	-40 -50	-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 < 10:1 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.

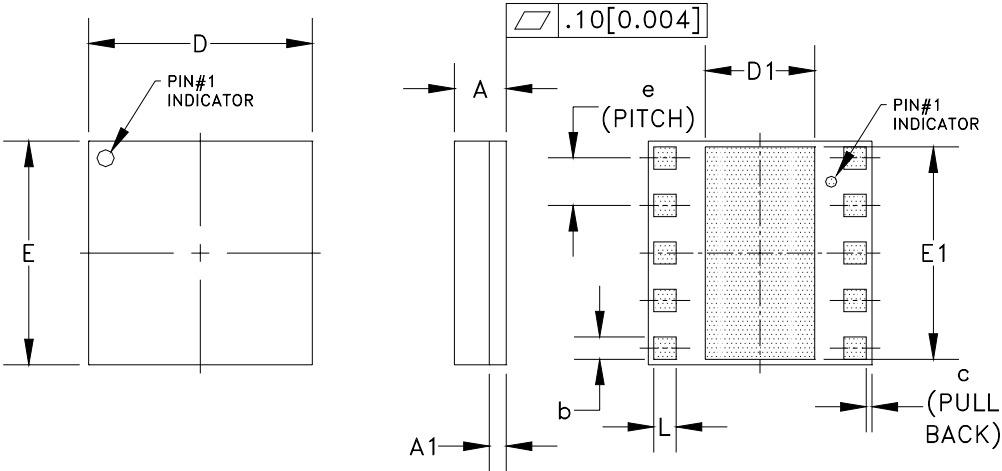
Bias Modes

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 6: Bias Control

APPLICATION	P_{OUT} LEVELS	BIAS MODE	V_{REF}	V_{MODE}
AMPS	(all)	Low	+2.9 V	+2.9 V
CDMA - low power	$\leq +16$ dBm	Low	+2.9 V	+2.9 V
CDMA - high power	$> +16$ dBm	High	+2.9 V	0 V
Shutdown	-	Shutdown	0 V	0 V

PACKAGE OUTLINE

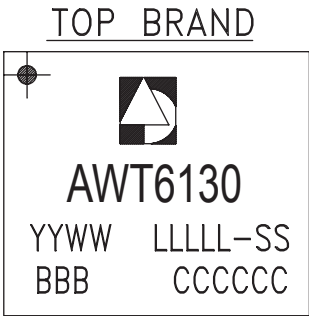


Symbol	MILLIMETERS			INCHES			NOTE
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	
A	1.31	1.46	1.61	0.051	0.057	0.063	—
A1	—	0.35	—	—	0.014	—	—
b	0.35	—	0.60	0.013	—	0.024	3
c	—	0.10	—	—	0.004	—	—
D	3.88	4.00	4.12	0.152	0.157	0.162	—
D1	1.90	—	2.20	0.075	—	0.086	—
E	3.88	4.00	4.12	0.152	0.157	0.162	—
E1	3.75	—	3.85	0.148	—	0.152	—
e	—	0.85	—	—	0.033	—	3
L	0.35	—	0.60	0.013	—	0.024	3

NOTES:

1. CONTROLLING DIMENSIONS: MILLIMETERS
2. UNLESS SPECIFIED TOLERANCE= $\pm 0.076 [0.003]$.
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.

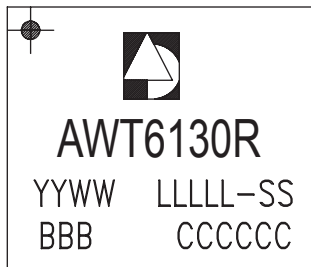
Figure 3: M7 Package Outline - 10 Pin 4 mm x 4 mm x 1.5 mm Surface Mount Module



NOTES:

1. ANADIGICS LOGO SIZE: $X=0.040 \pm 0.010$ $Y=0.048 \pm 0.010$
2. PART # AWT6130
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: CCCCCC
8. TYPE : ELITE
SIZE : AS LARGE AS POSSIBLE
LASER MARK

Figure 4: Branding Specification

TOP BRANDNOTES:

1. ANADIGICS LOGO SIZE: $X=0.040\pm0.010$ $Y=0.048\pm0.010$
2. PART # AWT6130R
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
LASER MARK

Figure 5: RoHS Branding Specification

NOTES

NOTES

AWT6130
ORDERING INFORMATION

ORDER NUMBER	TEMPERATURE RANGE	PACKAGE DESCRIPTION	COMPONENT PACKAGING
AWT6130M7P8	-30 °C to +85 °C	10 Pin 4 mm x 4 mm x 1.5 mm Surface Mount Module	Tape and Reel, 2500 pieces per Reel
AWT6130RM7P8	-30 °C to +85 °C	RoHS-Compliant 10 Pin 4 mm x 4 mm x 1.5 mm Surface Mount Module	Tape and Reel, 2500 pieces per Reel



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