AWM6268

2.5-2.7 GHz Mobile WiMAX/LTE
Power Amplifier Module

PRELIMINARY DATA SHEET- Rev 1.1

FEATURES

- InGaP HBT Technology
- +26 dBm WiMAX Linear Output Power
- +28 dBm LTE Linear Output Power
- 31 dB Gain
- 2.5 % EVM QPSK 1/2 CTC, 16 QAM OFDMA Modulation
- High Efficiency
- Integrated Step Attenuator
- Low Leakage Current in Shutdown Mode
- Optimized for a 50 Ω System
- Low Profile Miniature Surface Mount Package; RoHS Compliant



10 Pin 4 mm x 4 mm x 1 mm Surface Mount Module

APPLICATIONS

- Mobile WiMAX Data Cards, Handsets and Terminals
- LTE Data Cards, Handsets and Terminals

PRODUCT DESCRIPTION

The AWM6268 meets the stringent linearity and output power requirements of Mobile WiMAX and LTE consumer products. The device is manufactured on an advanced InGaP HBT MMIC technology offering state-of-the-art reliability, temperature stability, and ruggedness. A shutdown mode with low leakage current increases talk and standby time, and an integrated step attenuator enables gain control. The self-contained 4 mm x 4 mm x 1 mm surface mount package incorporates matching networks optimized for output power, efficiency, and linearity in a 50 Ω system.

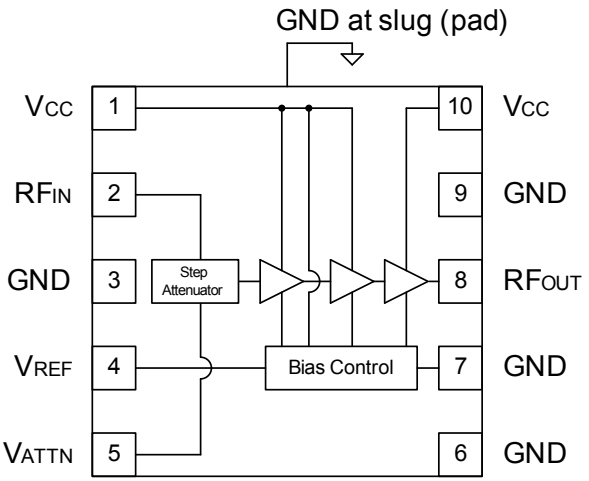


Figure 1: Block Diagram

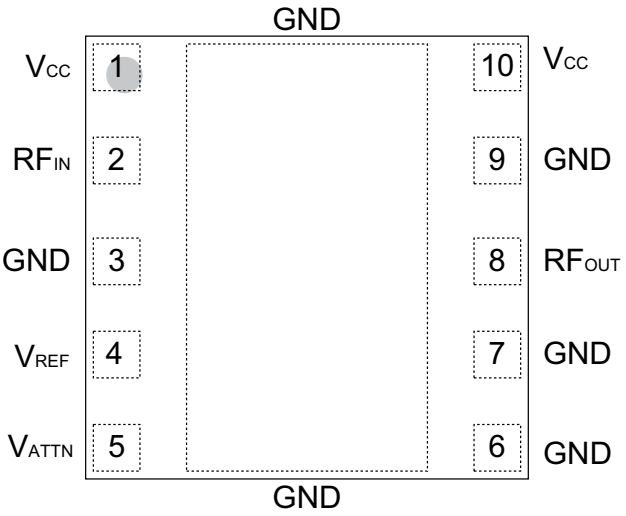


Figure 2: Pinout (X-ray Top View)

Table 1: Pin Description

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

ELECTRICAL CHARACTERISTICS

Table 2: Absolute Minimum and Maximum Ratings

PARAMETER	MIN	MAX	UNIT
Supply Voltage (V_{CC})	0	+5	V
Reference Voltage (V_{REF})	0	+3.0	V
Attenuator Control Voltage (V_{ATTN})	0	+3.7	V
RF Input Power (P_{IN})	-	0	dBm
ESD Rating Human Body Model[1] Charged Device Model[2]	 250 1000	 - -	 V V
MSL Rating[3]	3	-	
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.

Notes:
(1) JEDEC Class 1A.
(2) JEDEC Class IV.
(3) 260 °C Peak Reflow.

Table 3: Operating Ranges

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Operating Frequency (f)	2500	-	2700	MHz	
Supply Voltage (V_{CC})	+3.0	+3.4	+4.2	V	
Reference Voltage (V_{REF})	+2.80 0	+2.85 -	+2.90 +0.5	V	PA “on” PA “shut down”
Attenuator Control Voltage (V_{ATTN}) Logic High Logic Low	 +2.3 0	 - -	 +3.7 +0.7	 V	 Attenuator Enabled Attenuator Disabled
RF Output Power (P_{OUT})	- -	+26 -	- +28	dBm	WiMAX Operation LTE Operation
Case Temperature (T_C)	-10	-	+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 - WiMAX Operation = 16 QAM PUSC
(T_C = +25 °C, V_{CC} = +3.4 V, V_{REF} = +2.85 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain[2]	29	31	35	dB	
Attenuation	20	23	27	dB	V_{ATTN} = 2.5 V
SEM [1], [2] @ offset A @ offset B @ offset C @ offset D @ offset E @ offset F	 - - - - - -	 -21.5 -18.7 -20.7 -26.3 -32.0 -38.5	 -13.0 -13.0 -19.0 -25.0 -29.4 -37.0	dBm	10 MHz Channel Bandwidth WiMAX Forum Band Class 3A MRRT
Power-Added Efficiency [1], [2]	-	25	-	%	
Collector Current (I_{CC})[1], [2]	-	470	-	mA	
EVM[2]	-	2.5	-	%	
Quiescent Current (Icq)	-	106	-	mA	
V_{REF} Current	-	3.8	5	mA	through V_{REF} pin
Leakage Current	-	1	5	µA	V_{CC} = +4 V, V_{REF} = 0 V
Harmonics 2fo, 4fo 3fo	 - -	 -60 -55	 -45 -45	dBc	
Input Impedance	-	-	2:1	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-60	dBc	P_{OUT} < +26 dBm In-band load VSWR < 5:1 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} = +4 V, P_{IN} = 0 dBm Applies over full operating temperature range

Notes:
(1) Measured at 2600 MHz.
(2) P_{OUT} = +26 dBm

Table 5: Electrical Specifications - LTE Operation = 10 MHz QPSK 12 RB (Start = 0)
(T_C = +25 °C, V_{CC} = +3.3 V, V_{REF} = +2.85 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain (1)	-	31	-	dB	
UTRA ACLR1 (1), (2)	-	-38	-	dBc	
UTRA ACLR2 (1), (2)	-	-60	-	dBc	
Power-Added Efficiency (1), (2)	-	33	-	%	
Collector Current (1), (2)	-	580	-	mA	

Notes:
(1) Defined at +28 dBm output power.
(2) Defined at 2.6 GHz.

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 the V_{REF} voltage.

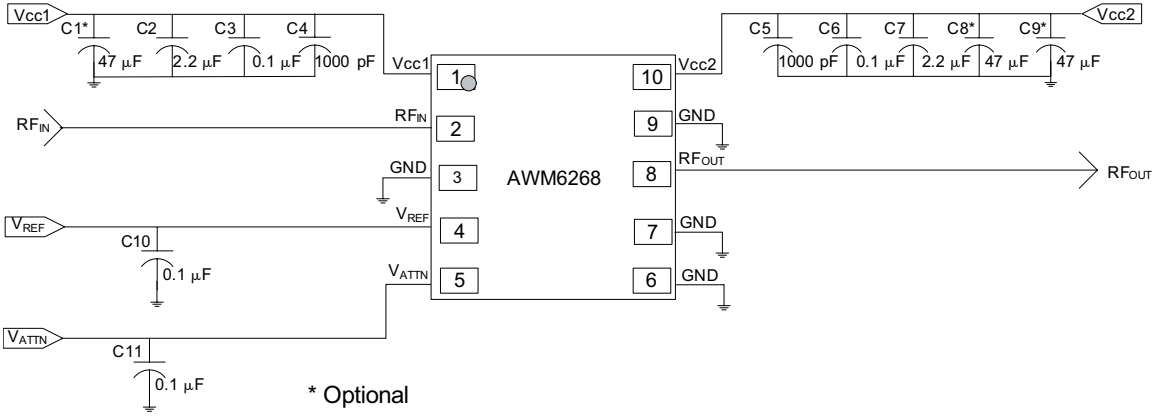
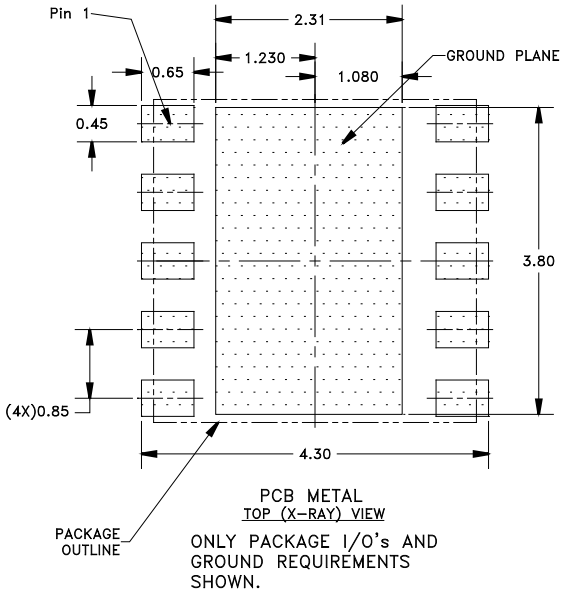


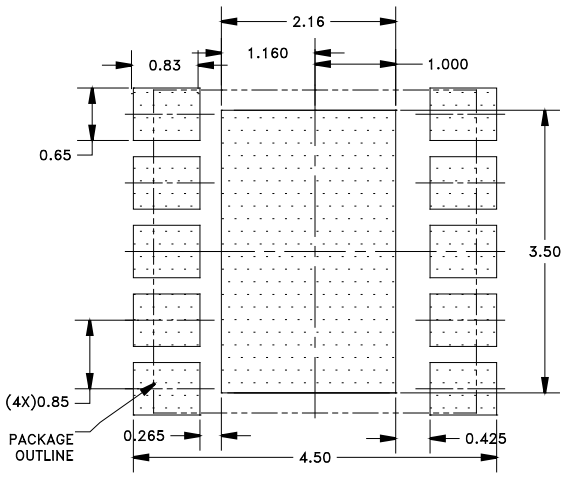
Figure 3: Application Circuit Schematic



NOTES:

(1) UNLESS SPECIFIED DIMENSIONS ARE SYMMETRICAL ABOUT CENTER LINES SHOWN.

(2) DIMENSIONS IN MILLIMETERS.



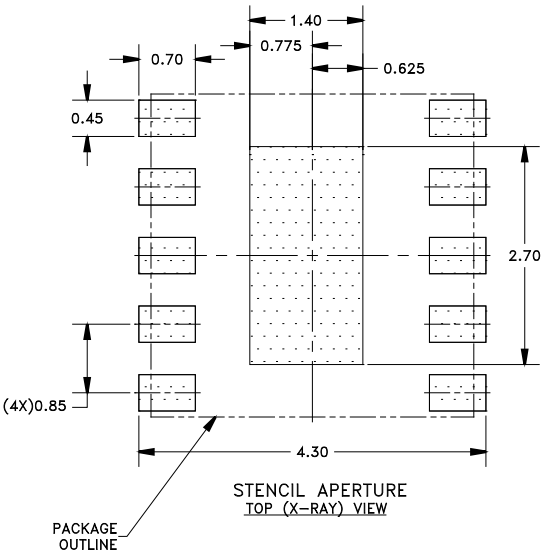
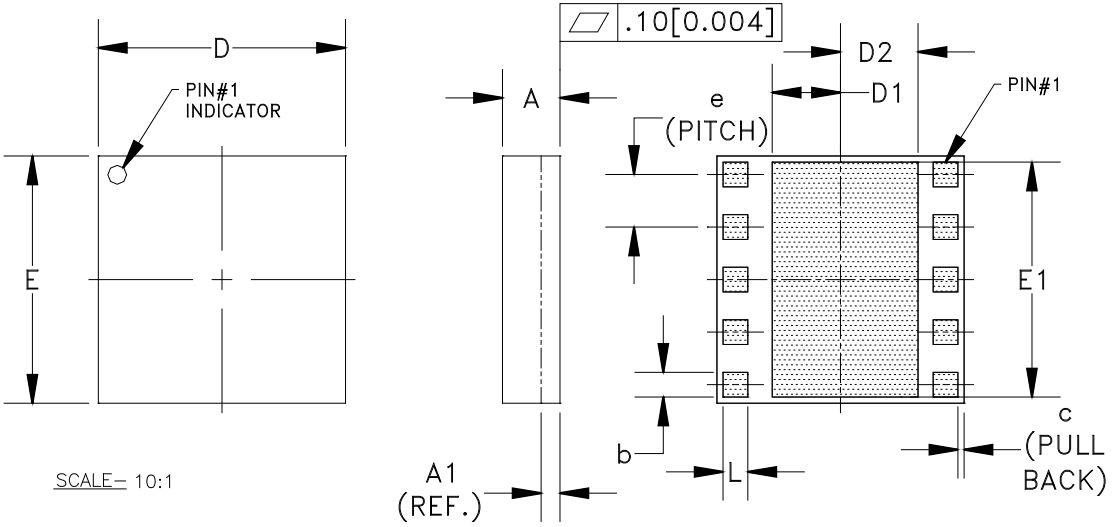


Figure 4: PCB Footprint

PACKAGE OUTLINE



SYMBOL	MILLIMETERS			INCHES			NOTE
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.	
A	0.85	0.93	1.01	0.033	0.037	0.040	–
A1	0.27 (REF.)			0.011(REF.)			–
b	0.35	0.40	0.45	0.014	0.016	0.018	3
c	–	0.10	–	–	0.004	–	–
D	3.88	4.00	4.12	0.152	0.157	0.162	–
D1	1.055	1.105	1.155	0.047	0.044	0.045	–
D2	1.205	1.255	1.305	0.049	0.049	0.051	–
E	3.88	4.00	4.12	0.152	0.157	0.162	–
E1	3.75	3.8	3.85	0.148	0.150	0.152	–
e		0.85			0.033		3
L	0.35	0.40	0.45	0.014	0.016	0.018	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.

Figure 5: Package Outline - 10 Pin 4 mm x 4 mm x 1 mm Surface Mount Module

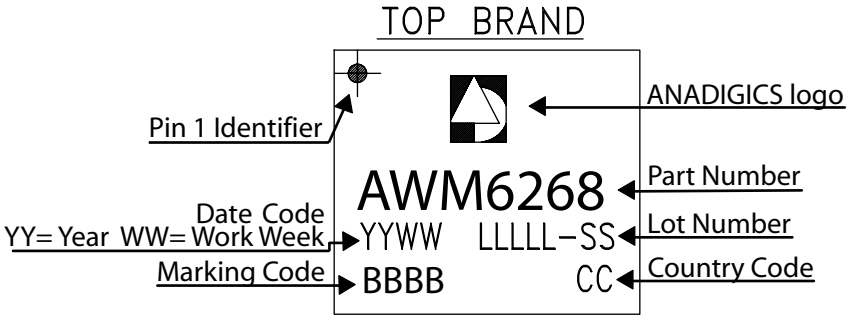


Figure 6: Branding Specification

COMPONENT PACKAGING

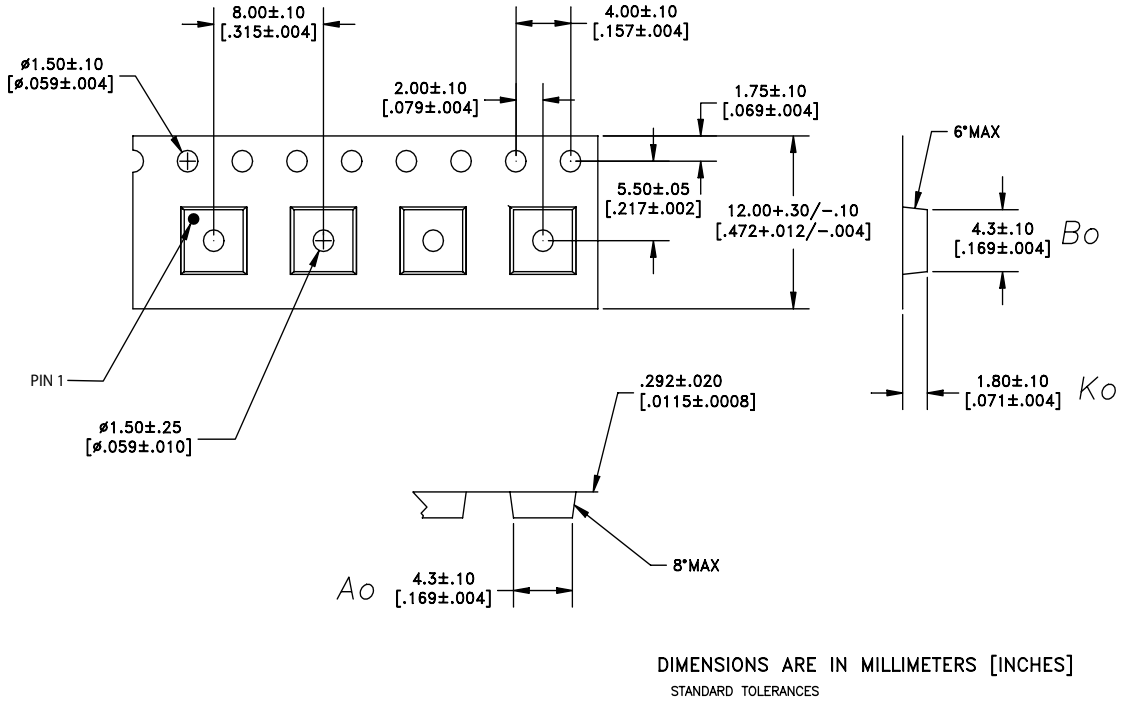


Figure 7: Tape & Reel Packaging

Table 6: Tape & Reel Dimensions

PACKAGE TYPE	TAPE WIDTH	POCKET PITCH	REEL CAPACITY	MAX REEL DIA
4 mm x 4 mm x 1 mm	12 mm	8 mm	2500	13"

ORDER NUMBER	TEMPERATURE RANGE	PACKAGE DESCRIPTION	COMPONENT PACKAGING
AWM6268P8	-10 °C to +85 °C	RoHS-compliant 10 Pin 4 mm x 4 mm x 1 mm Surface Mount Module	Tape and Reel, 2500 pieces per Reel

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