

FEATURES

- InGaP HBT Technology
- +25 dBm Linear Output Power, WiMAX
- +27 dBm, TD-LTE Uplink, B42
- 31 dB Gain
- 2.5 % EVM QPSK 1/2 CTC, 16 QAM OFDMA Modulation
- High Efficiency
- Integrated Voltage Regulator (eliminates need for external reference voltage)
- Integrated Output Power Detector
- Integrated Step Attenuator
- Low Leakage Current in Shutdown Mode: 20 μ A
- Optimized for a 50 Ω System
- Low Profile Miniature Surface Mount Package
- RoHS Compliant Package



APPLICATIONS

- Mobile WiMAX Data Cards and Terminals that Support the IEEE 802.16e (2005) Standard
- Band 42 TD-LTE Uplink

PRODUCT DESCRIPTION

The AWT6283R meets the stringent linearity and output power requirements of the Mobile WiMAX high speed data system. The device is manufactured on

an advanced InGaP HBT MMIC technology offering state-of-the-art reliability, temperature stability, and ruggedness. An integrated step attenuator enables gain control, and an integrated voltage regulator eliminates the need for an external reference voltage. 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.

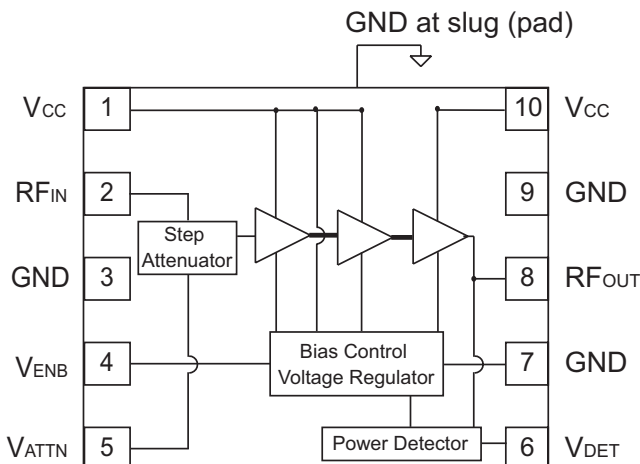


Figure 1: Block Diagram

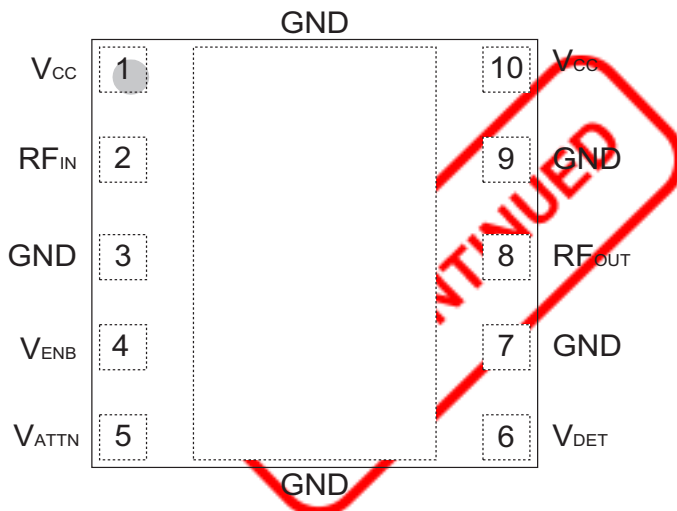


Table 1: Pin Description

PIN	NAME	DESCRIPTION
1	V _{CC}	Supply Voltage
2	RF _{IN}	RF Input
3	GND	Ground
4	V _{ENB}	PA Enable Voltage
5	V _{ATTN}	Attenuator Control Voltage
6	V _{DET}	Detector Output Voltage
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
Enable Voltage (V_{ENB})	0	+3.2	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
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)	3300	-	3800	MHz	
Supply Voltage (V_{CC})	+3.0	+3.3	+4.2	V	
Enable Voltage (V_{ENB})	+2.7 0	+2.9 -	+3.1 +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})	-	+25	-	dBm	
Case Temperature (T_C)	-40	-	+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 - QPSK 1/2 CTC, Zone = AMC 4:2
(T_C = +25 °C, V_{CC} = +3.3 V, V_{ENB} = +2.9 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain ⁽²⁾	28.5	31	37.5	dB	
Attenuation	17	20	25	dB	V _{ATTN} = 2.5 V
SEM ^{(1), (2)} @ Offset A @ Offset B @ Offset C @ Offset D	- - - -	- - - -	-51.37 -40.5 -50.5 -50.5	dBc	10 MHz Channel bandwidth WiMAX Forum Band Class 5C MRRT
Power-Added Efficiency ^{(1), (2)}	19.2	21.8	-	%	
Thermal Resistance (R _{JC})	-	24	-	°C/W	
Supply Current (I _{CC}) ⁽²⁾	-	440	500	mA	
EVM ⁽²⁾	-	2.5	4	%	
Power Detector Output @ 25 dBm	-	1.3	-	V	RL (Load Resistor) = 100K Ω
Quiescent Current (I _q)	90	145	170	mA	
PA Enable Current	0.6	3.5	5.0	mA	through V _{ENB} pin
Leakage Current	-	20	100	μA	V _{CC} = +3.3 V, V _{ENB} = 0 V
Harmonics ⁽²⁾ 2fo 3fo, 4fo	- - -	-42 -58 -	- - -	dBc	
Input Impedance	-	2:1	-	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-60	dBc	P _{OUT} < +25 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) Spectrum Mask and Efficiency measured at 3600 MHz.

(2) P_{OUT} = +25 dBm

Table 5: Electrical Specifications - 16 QAM PUSC Zone
(T_C = +25 °C, V_{CC} = +3.3 V, V_{ENB} = +2.9 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS
Gain ⁽²⁾	-	31	-	dB	
Attenuation	-	20	-	dB	V _{ATTN} = 2.5 V
SEM ^{(1), (2)} @ OFFSET A @ OFFSET B @ OFFSET C @ OFFSET D	- - - -	- - - -	-51.37 -40.5 -50.5 -50.5	dBc	10 MHz channel bandwidth WiMAX Forum Band Class 5C MRRT
Power-Added Efficiency ^{(1), (2)}	-	21.8	-	%	
Thermal Resistance (R _{JC})	-	24	-	°C/W	
Supply Current (I _{CC}) ⁽²⁾	-	440	-	mA	
EVM ⁽²⁾	-	2.5	-	%	
Power Detector Output @ 25 dBm	-	1.3	-	V	RL (Load Resistor) = 100K Ω
Quiescent Current (I _{cq})	-	145	-	mA	
PA Enable Current	-	3.5	-	mA	through V _{ENB} pin
Leakage Current	-	20	-	μA	V _{CC} = +3.3 V, V _{ENB} = 0 V
Harmonics ⁽²⁾ 2fo 3fo, 4fo	- - -	-42 -58	- -	dBc	
Input Impedance	-	2:1	-	VSWR	
Spurious Output Level (all spurious outputs)	-	-	-60	dBc	P _{OUT} < +25 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) Spectrum Mask and Efficiency measured at 3600 MHz.

(2) P_{OUT} = +25 dBm

Table 6: Electrical Specifications: LTE UL Operation (Band 42) = 10 MHz QPSK 12 RB (Start = 0)
(T_C = +25 °C, V_{BATT} = +3.8 V, V_{EN} = +2.9 V, 50 Ω system)

PARAMETER	MIN	TYP	MAX	UNIT	COMMENTS		
					P _{OUT}	V _{EN}	V _{CC}
Gain	-	31	-	dB	+27 dBm	2.9 V	3.8 V
LTE to LTE, E-UTRA	-	-38	-	dBc	+27 dBm	2.9 V	3.8 V
UTRA ACLR1	-	-40	-	dBc	+27 dBm	2.9 V	3.8 V
UTRA ACLR2	-	-48	-	dBc	+27 dBm	2.9 V	3.8 V
Efficiency	-	22	-	%	+27 dBm	2.9 V	3.8 V

DISCONTINUED

APPLICATION INFORMATION

To ensure proper performance, refer to all related Application Notes.

Shutdown Mode

The power amplifier may be placed in a shutdown mode by applying logic low levels (see Operating Ranges table) to the V_{ENB} voltage.

Table 7: Bias Control

APPLICATION	P _{OUT} LEVELS	BIAS MODE	V _{ENB}	V _{CC}
WiMAX - high power	All	High	+2.9 V	+3.3
Shutdown		Shutdown	0 V	-

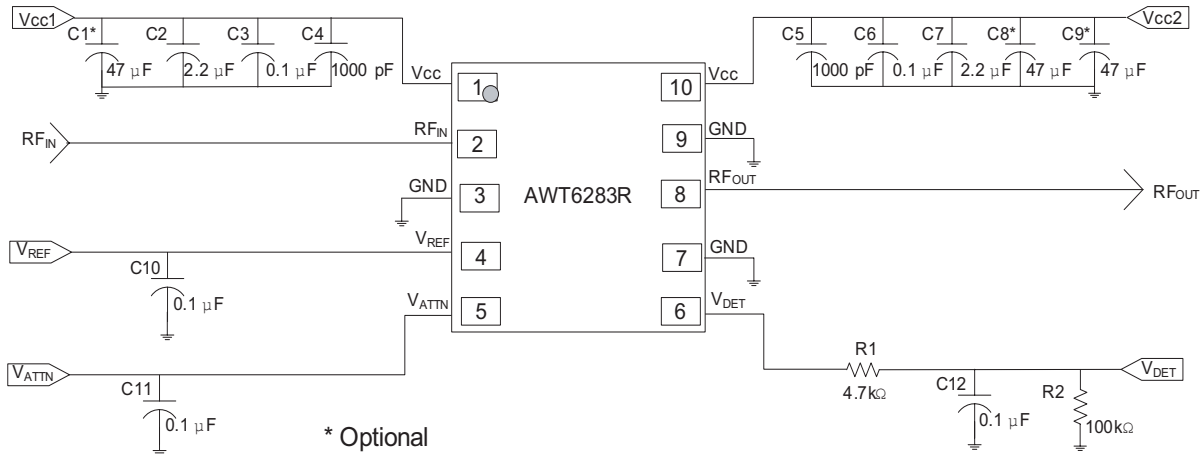
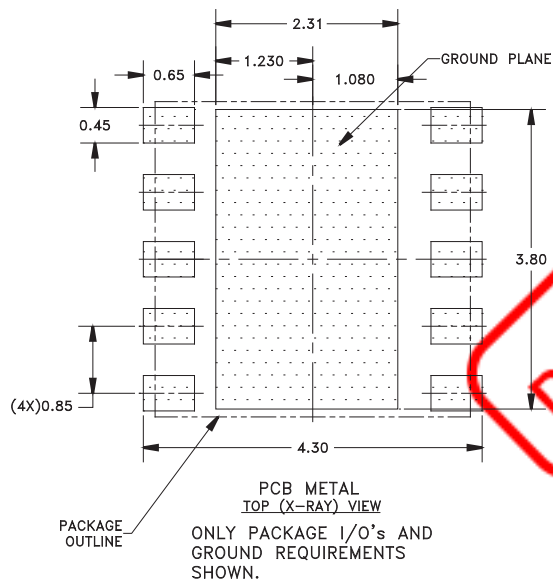


Figure 3: Application Circuit Schematic



NOTES:

- (1) UNLESS SPECIFIED DIMENSIONS ARE SYMMETRICAL ABOUT CENTER LINES SHOWN.
- (2) DIMENSIONS IN MILLIMETERS.

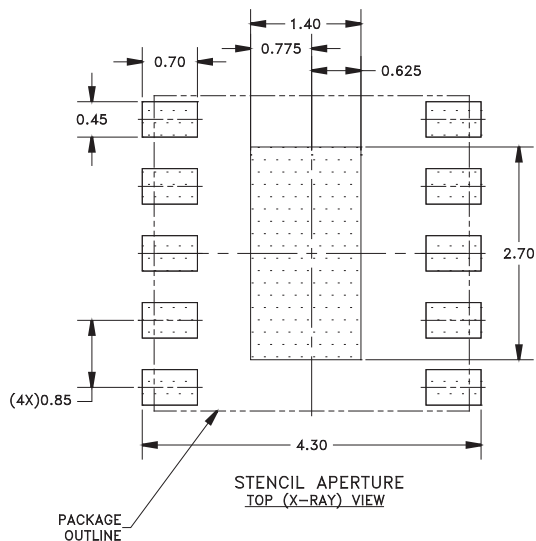
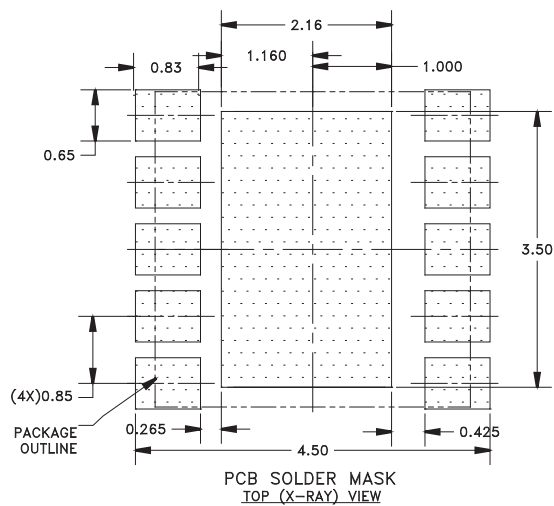
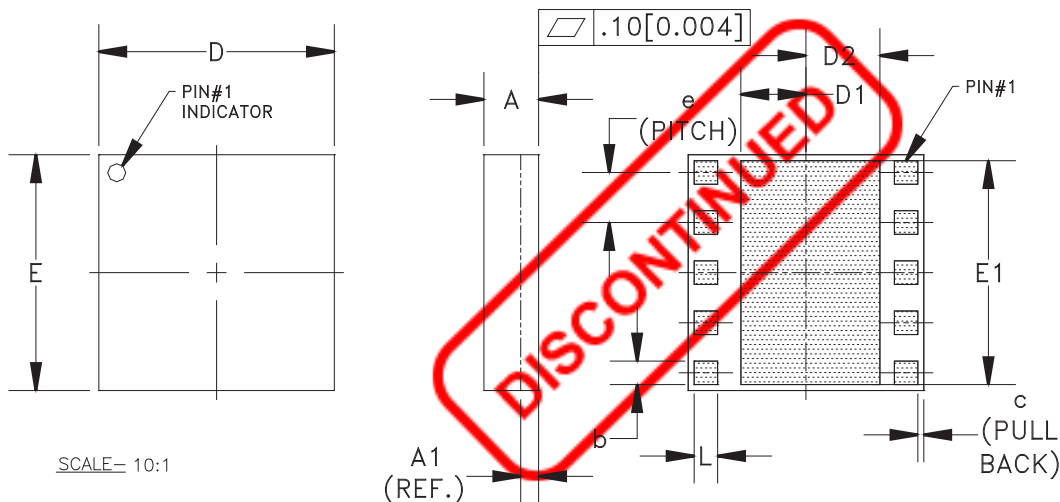


Figure 4: PCB Footprint

PACKAGE OUTLINE



	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: M49 Package Outline - 10 Pin 4 mm x 4 mm x 1 mm Surface Mount Module

TOP BRAND

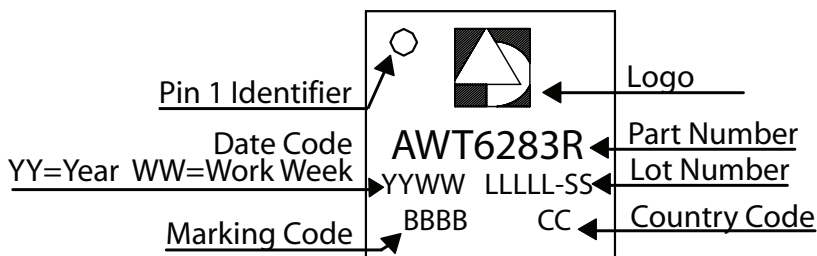


Figure 6: Branding Specification

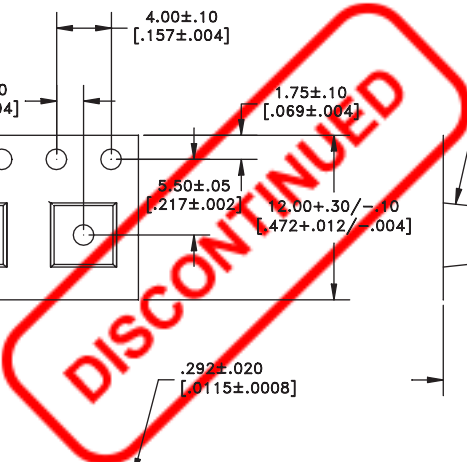


Figure 7: Tape & Reel Packaging

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"

ORDERING INFORMATION

ORDER NUMBER	TEMPERATURE RANGE	PACKAGE DESCRIPTION	COMPONENT PACKAGING
AWT6283RM49P8	-40 °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

Copyright © 2016, 2018 Skyworks Solutions, Inc. All Rights Reserved.

Information in this document is provided in connection with Skyworks Solutions, Inc. ("Skyworks") products or services. These materials, including the information contained herein, are provided by Skyworks as a service to its customers and may be used for informational purposes only by the customer. Skyworks assumes no responsibility for errors or omissions in these materials or the information contained herein. Skyworks may change its documentation, products, services, specifications or product descriptions at any time, without notice. Skyworks makes no commitment to update the materials or information and shall have no responsibility whatsoever for conflicts, incompatibilities, or other difficulties arising from any future changes.

No license, whether express, implied, by estoppel or otherwise, is granted to any intellectual property rights by this document. Skyworks assumes no liability for any materials, products or information provided hereunder, including the sale, distribution, reproduction or use of Skyworks products, information or materials, except as may be provided in Skyworks Terms and Conditions of Sale.

THE MATERIALS, PRODUCTS AND INFORMATION ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, INCLUDING FITNESS FOR A PARTICULAR PURPOSE OR USE, MERCHANTABILITY, PERFORMANCE, QUALITY OR NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT; ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED. SKYWORKS DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. SKYWORKS SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY SPECIAL, INDIRECT, INCIDENTAL, STATUTORY, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS THAT MAY RESULT FROM THE USE OF THE MATERIALS OR INFORMATION, WHETHER OR NOT THE RECIPIENT OF MATERIALS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Skyworks products are not intended for use in medical, lifesaving or life-sustaining applications, or other equipment in which the failure of the Skyworks products could lead to personal injury, death, physical or environmental damage. Skyworks customers using or selling Skyworks products for use in such applications do so at their own risk and agree to fully indemnify Skyworks for any damages resulting from such improper use or sale.

Customers are responsible for their products and applications using Skyworks products, which may deviate from published specifications as a result of design defects, errors, or operation of products outside of published parameters or design specifications.

Customers should include design and operating safeguards to minimize these and other risks. Skyworks assumes no liability for applications assistance, customer product design, or damage to any equipment resulting from the use of Skyworks products outside of stated published specifications or parameters.

Skyworks and the Skyworks symbol are trademarks or registered trademarks of Skyworks Solutions, Inc., in the United States and other countries. Third-party brands and names are for identification purposes only, and are the property of their respective owners. Additional information, including relevant terms and conditions, posted at www.skyworksinc.com, are incorporated by reference.

Skyworks Solutions, Inc.

Phone [781] 376-3000 • Fax [781] 376-3100 • sales@skyworksinc.com • www.skyworksinc.com

Skyworks Proprietary and Confidential information • Products and Product Information are Subject to Change Without Notice