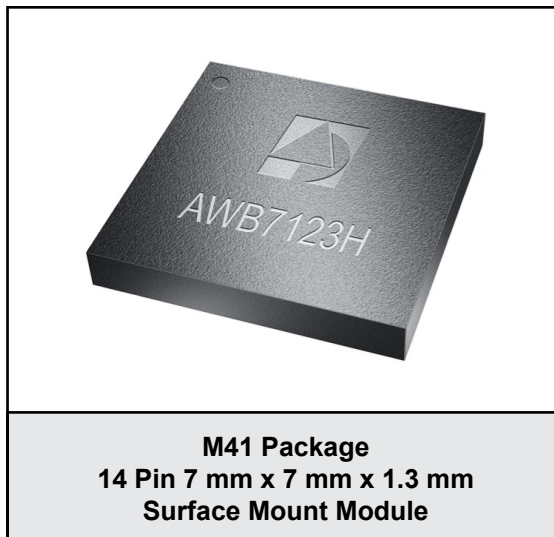


FEATURES

- InGaP HBT Technology
- -50 dBc ACPR @ ± 5 MHz, +24.5 dBm
- 32 dB Gain
- High Efficiency
- Low Transistor Junction Temperature
- Internally Matched for a 50 Ω System
- Low Profile Miniature Surface Mount Package; Halogen Free and RoHS Compliant
- Multi-Carrier Capability

APPLICATIONS

- WCDMA, HSDPA and LTE Air Interfaces
- Picocell, Femtocell, Home Nodes
- Customer Premises Equipment (CPE)
- Data Cards and Terminals



PRODUCT DESCRIPTION

The AWB7123 is a highly linear, fully matched, power amplifier module designed for picocell, femtocell, and customer premises equipment (CPE) applications. Its high power efficiency and low adjacent channel power levels meet the extremely demanding needs of small cell infrastructure architectures. Designed for WCDMA, HSDPA, and LTE air interfaces operating in the 1.93 GHz to 1.99 GHz band, the AWB7123 delivers up to +24.5 dBm of WCDMA (64 DPCH)

power with an ACPR of -50 dBc. It operates from a convenient +4.2 V supply and provides 32 dB of gain. The device is manufactured using an advanced InGaP HBT MMIC technology offering state-of-the-art reliability, temperature stability, and ruggedness. The self-contained 7 mm x 7 mm x 1.3 mm surface mount package incorporates RF matching networks optimized for output power, efficiency, and linearity in a 50 Ω system.

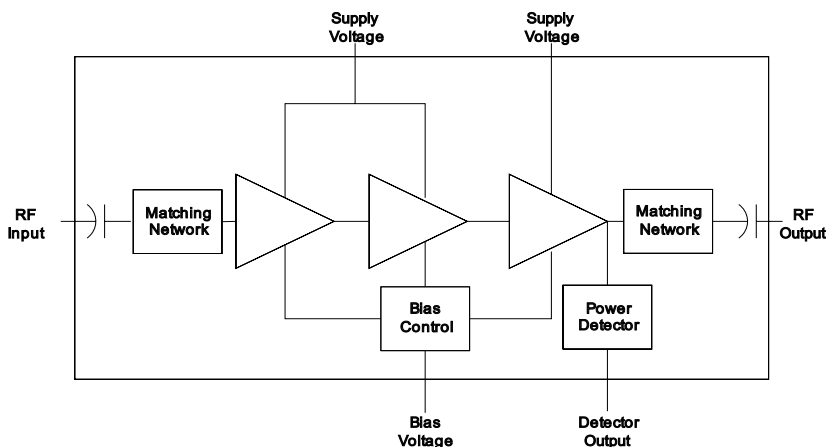


Figure 1: Block Diagram

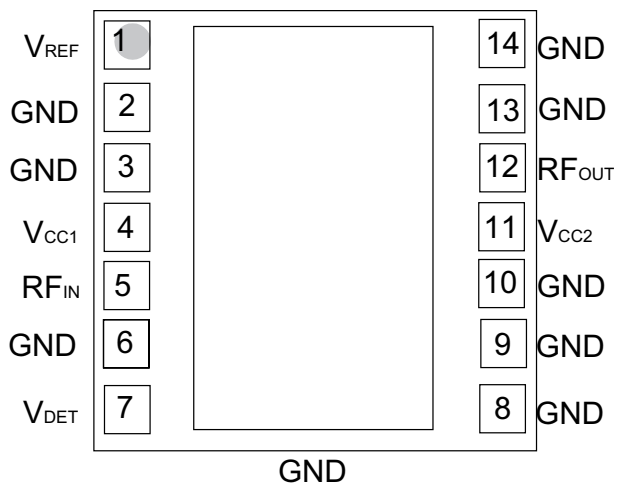


Figure 2: Pinout (X-ray Top View)

Table 1: Pin Description

| PIN | NAME | DESCRIPTION |
|-----|-------------------|-------------------|
| 1 | V _{REF} | Reference Voltage |
| 2 | GND | Ground |
| 3 | GND | Ground |
| 4 | V _{CC1} | Supply Voltage |
| 5 | RF _{IN} | RF Input |
| 6 | GND | Ground |
| 7 | V _{DET} | Detector Voltage |
| 8 | GND | Ground |
| 9 | GND | Ground |
| 10 | GND | Ground |
| 11 | V _{CC2} | Supply Voltage |
| 12 | RF _{OUT} | RF Output |
| 13 | GND | Ground |
| 14 | GND | Ground |

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 | +3.5 | V |
| ESD Rating Human Body Model ⁽¹⁾ Charged Device Model ⁽²⁾ | Class 1C Class IV | - - | |
| MSL Rating ⁽³⁾ | 4 | - | - |
| RF Output Power (P_{OUT}) | - | +28 | 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.

Notes:

(1) JEDEC JS-001-2010

(2) JEDEC JESD22-C101D

(3) 260 °C peak reflow

Table 3: Operating Ranges

| PARAMETER | MIN | TYP | MAX | UNIT | COMMENTS |
|---------------------------------|------------|------------|---------------|------|---------------------------|
| Operating Frequency (f) | 1930 | - | 1990 | MHz | |
| Supply Voltage (V_{CC}) | +3.2 | +4.2 | +4.5 | V | |
| Reference Voltage (V_{REF}) | +2.80 0 | +2.85 - | +2.90 +0.5 | V | PA "on" PA "shut down" |
| RF Output Power (P_{OUT}) | - | +24.5 | - | 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
(T_C = +25 °C, V_{CC} = +4.2 V, V_{REF} = +2.85 V, 50 Ω system)

| PARAMETER | MIN | TYP | MAX | UNIT | COMMENTS |
|---|--------|------------|------------|------|--|
| Gain ⁽²⁾ | 30 | 32 | 37 | dB | |
| ACPR ^{(1), (2), (3)} @ 10 MHz @ 20 MHz | - - | -50 -62 | -48 -60 | dBc | |
| Power-Added Efficiency ^{(1), (2), (3)} | 14.5 | 17 | - | % | |
| Thermal Resistance | - | 21 | - | °C/W | Junction to Case |
| Supply Current ^{(1), (2), (3)} | - | 395 | 463 | mA | Total through V _{CC} pins |
| Quiescent Current (I _{cq}) | - | 120 | 160 | mA | |
| Reference Current | - | 6.5 | 10 | mA | through V _{REF} pin |
| Leakage Current | - | 1.5 | 5 | μA | V _{CC} = +5 V, V _{REF} = 0 V |
| Harmonics 2fo 3fo, 4fo | - - | -54 -62 | -46 -56 | dBc | |
| Input Return Loss | 10 | 14 | - | dB | |
| P1dB | - | +32 | - | dBm | CW Tone |
| Spurious Output Level (all spurious outputs) | - | - | -60 | dBc | P _{OUT} ≤ +24.5 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} = +4.2 V, P _{IN} = 0 dBm Applies over full operating temperature range |

Notes:

(1) Measured at 1960 MHz.

(2) P_{OUT} = +24.5 dBm.

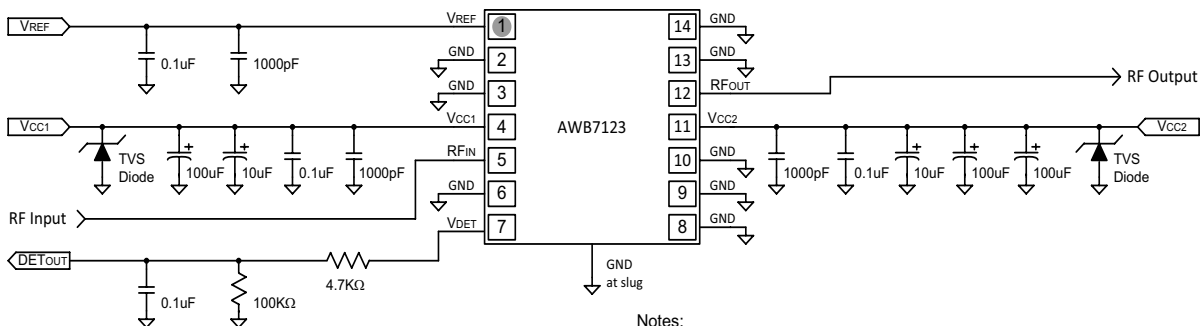
(3) TM1 WCDMA 64DPCH

APPLICATION INFORMATION

To ensure proper performance, refer to all related Application Notes on the ANADIGICS web site:
<http://www.anadigics.com>

Shutdown Mode

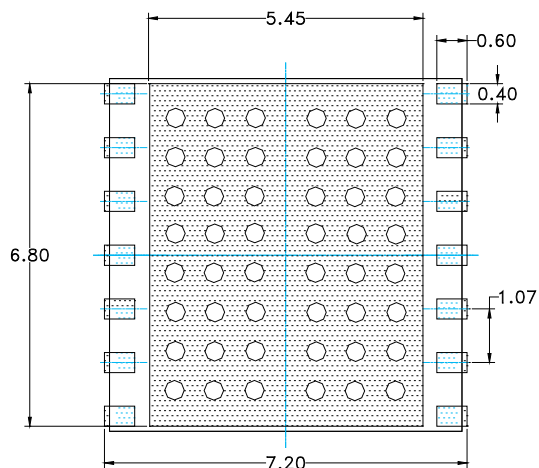
The power amplifier may be placed in a shutdown mode by applying logic low levels (see Operating Ranges table) to the V_{REF} voltage.



Notes:

1. 10uF and 100uF capacitors are optional.
2. Applications that have large supply voltage transients may benefit from the use of TVS diodes. For such applications, recommended TVS diodes are SM05T1G or SMJ5.0A.

Figure 3: Application Circuit Schematic

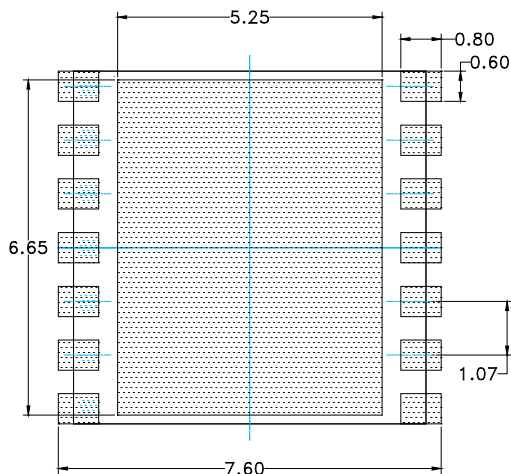


PCB METAL
TOP (X-RAY) VIEW

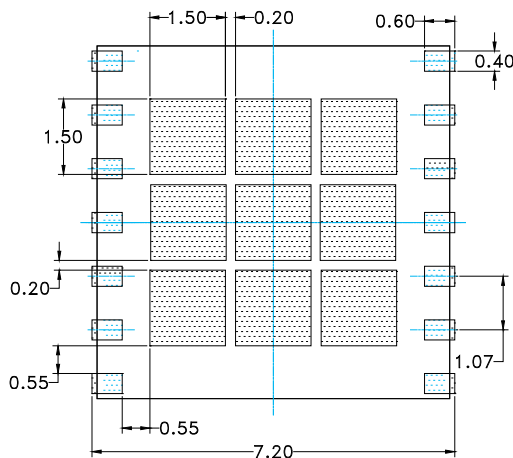
ONLY PACKAGE I/O's AND
GROUND REQUIREMENTS
SHOWN.

NOTES:

- (1) UNLESS SPECIFIED DIMENSIONS ARE SYMMETRICAL ABOUT CENTER LINES SHOWN.
- (2) DIMENSIONS IN MILLIMETERS.
- (3) VIAS SHOWN IN PCB METAL VIEW ARE FOR REFERENCE ONLY. NUMBER & SIZE OF THERMAL VIAS REQUIRED DEPENDENT ON HEAT DISSIPATION REQUIREMENT AND THE PCB PROCESS CAPABILITY.



PCB SOLDER MASK
TOP (X-RAY) VIEW



STENCIL APERTURE
TOP (X-RAY) VIEW

Figure 4: PCB Footprint

PACKAGE OUTLINE

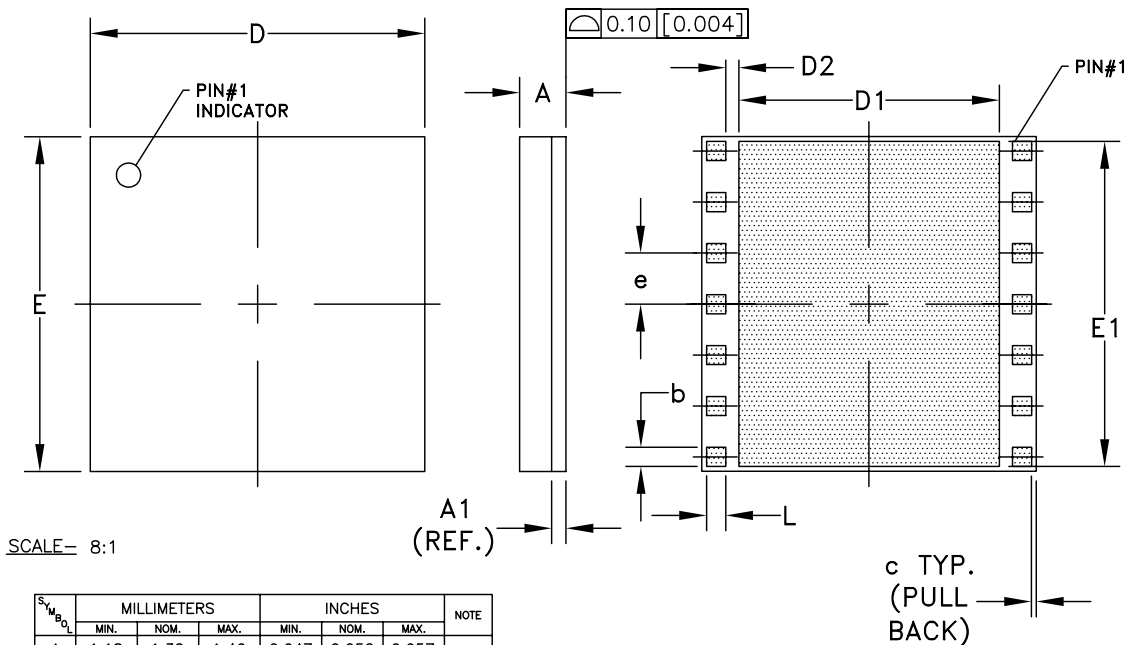


Figure 5: M41 Package Outline - 14 Pin 7 mm x 7 mm x 1.3 mm Surface Mount Module

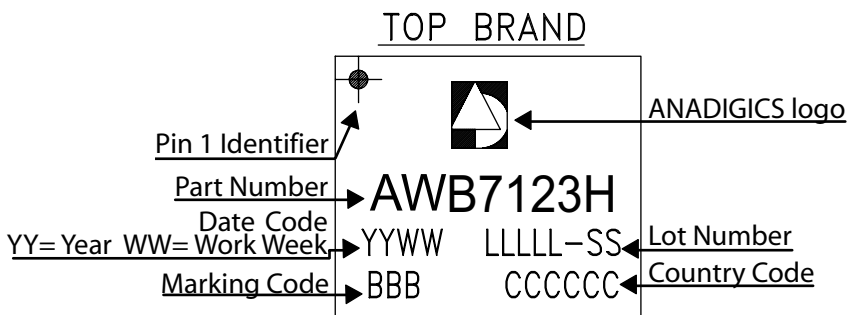


Figure 6: Branding Specification

COMPONENT PACKAGING

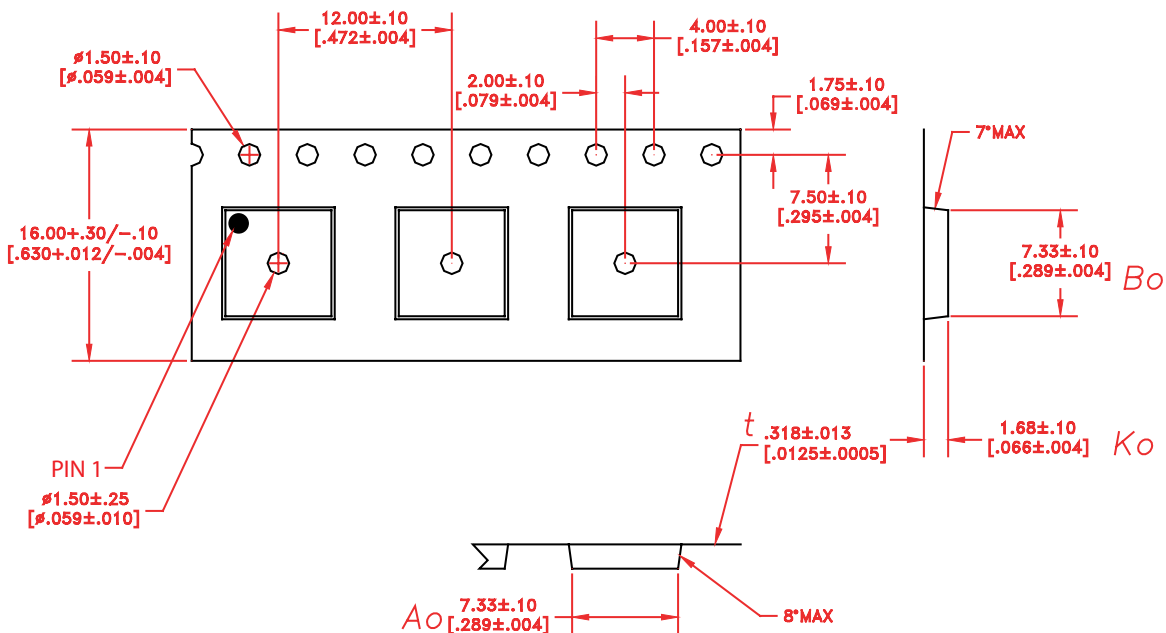


Figure 7: Tape & Reel Packaging

Table 5: Tape & Reel Dimensions

| PACKAGE TYPE | TAPE WIDTH | POCKET PITCH | REEL CAPACITY | MAX REEL DIA |
|----------------------|------------|--------------|---------------|--------------|
| 7 mm x 7 mm x 1.3 mm | 16 mm | 12 mm | 2500 | 13" |

ORDERING INFORMATION

| ORDER NUMBER | TEMPERATURE RANGE | PACKAGE DESCRIPTION | COMPONENT PACKAGING |
|-----------------|----------------------|---|-------------------------------------|
| AWB7123HM41P8 | -40 °C to +85 °C | Halogen Free RoHS-compliant 14 Pin 7 mm x 7 mm x 1.3 mm Surface Mount Module | Tape and Reel, 2500 pieces per Reel |

**ANADIGICS**

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>

IMPORTANT NOTICE

ANADIGICS, Inc. reserves the right to make changes to its products or to discontinue any product at any time without notice. The product specifications contained in Advanced Product Information sheets and Preliminary Data Sheets are subject to change prior to a product's formal introduction. Information in Data Sheets have been carefully checked and are assumed to be reliable; however, ANADIGICS assumes no responsibilities for inaccuracies. ANADIGICS strongly urges customers to verify that the information they are using is current before placing orders.

WARNING

ANADIGICS products are not intended for use in life support appliances, devices or systems. Use of an ANADIGICS product in any such application without written consent is prohibited.