

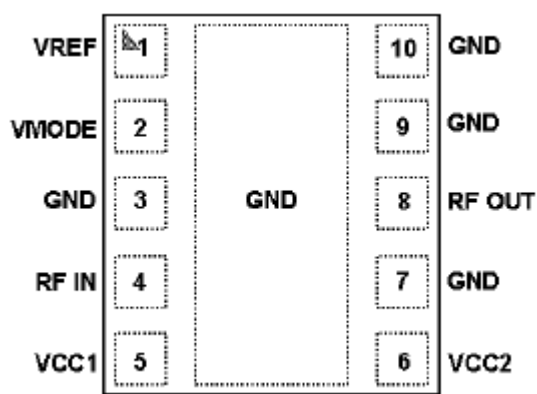
### DESCRIPTION

The FC7103 is a high power, high efficiency amplifier module for dual mode AMPS/CDMA wireless handset applications. The device is manufactured on an advanced InGaP HBT MMIC technology. Selectable bias modes that optimize efficiency for different output power levels, and a shutdown mode with low leakage current, serve to increase handset talk and standby time. The 10 Pin 4mm X 4mm surface mount package offers premium performance in a 50  $\Omega$  system.

### FEATURES

- Operating Frequency: 824~849MHz
- High Efficiency
  - 56% AMPS, 42.5% CDMA
- Very Low Quiescent Current: 32mA
- Low Leakage Current in Shutdown Mode: < 3uA
- Optimized for a 50  $\Omega$  System

### PIN CONFIGURATION

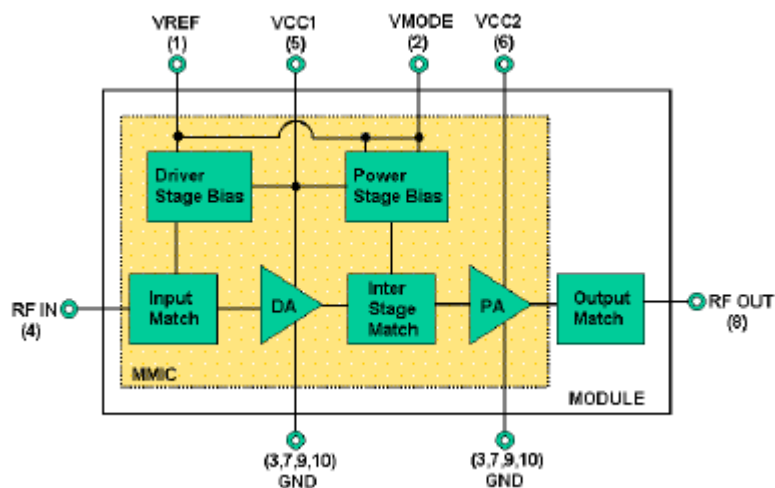


### APPLICATIONS

- Single Mode CDMA Wireless Handsets
- Dual Mode AMPS/CDMA Wireless Handsets

### FUNCTIONAL BLOCK DIAGRAM

(X-ray Transparency Top View)



For latest specifications, technical questions and additional product information, visit our website or e-mail us.

Web: <http://www.fci.co.kr>

E-mail : [info@fci.co.kr](mailto:info@fci.co.kr)

FCI Inc.

2nd Fl. Korea First Bank B/D, 6-8 Sunae-Dong Pundang-Gu,  
Sungham City, Kyunggi-do,  
463-020, KOREA

Tel : 82-31-711-6444

Fax: 82-31-714-6576

### ABSOLUTE MAXIMUM RATINGS

| Parameter                    | Unit | Min | Max  |
|------------------------------|------|-----|------|
| Supply Voltage (Vcc)         | V    | 0   | +5   |
| Mode Control Voltage (VMODE) | V    | 0   | +3.5 |
| Reference Voltage (VREF)     | V    | 0   | +3.5 |
| RF Input Power (RF IN)       | dBm  | -   | +7   |
| Storage Temperature (Tstg)   | °C   | -40 | +150 |

*Stress 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.*

### RECOMMENDED OPERATING CONDITIONS

| Parameter                   | Unit | Min       | Typ        | Max          | Note                               |
|-----------------------------|------|-----------|------------|--------------|------------------------------------|
| Operating Frequency(f)      | MHz  | 824       | -          | 849          |                                    |
| Supply Voltage(Vcc)         | V    | +3.0      | +3.4       | +4.2         |                                    |
| Reference Voltage (VREF)    | V    | +2.8<br>0 | +2.85<br>- | +2.9<br>+0.5 | PA "on"<br>PA "shut down"          |
| Mode Control Voltage(VMODE) | V    | +2.5<br>0 | +3.0<br>-  | +3.1<br>+0.5 | Low Bias Mode<br>High Bias Mode    |
| RF Output Power<br>(RF OUT) | dBm  | -<br>-    | +31<br>+28 | -<br>-       | AMPS, Vcc=+3.4V<br>CDMA, Vcc=+3.4V |

*The device may be operated safely over these conditions.*

### BIAS CONTROL

| Power Mode           | VREF  | VMODE  | Range  |
|----------------------|-------|--------|--------|
| CDMA High Power Mode | 2.85V | 0~0.5V | <28dBm |
| CDMA Low Power Mode  | 2.85V | 2.5~3V | <28dBm |
| AMPS Mode            | 2.85V | 0~0.5V | <31dBm |
| Shut Down            | 0.0V  | 0.0V   | -      |



### ELECTRICAL CHARACTERISTICS

(Typical values are at T = +25°C and Vcc = 3.4V)

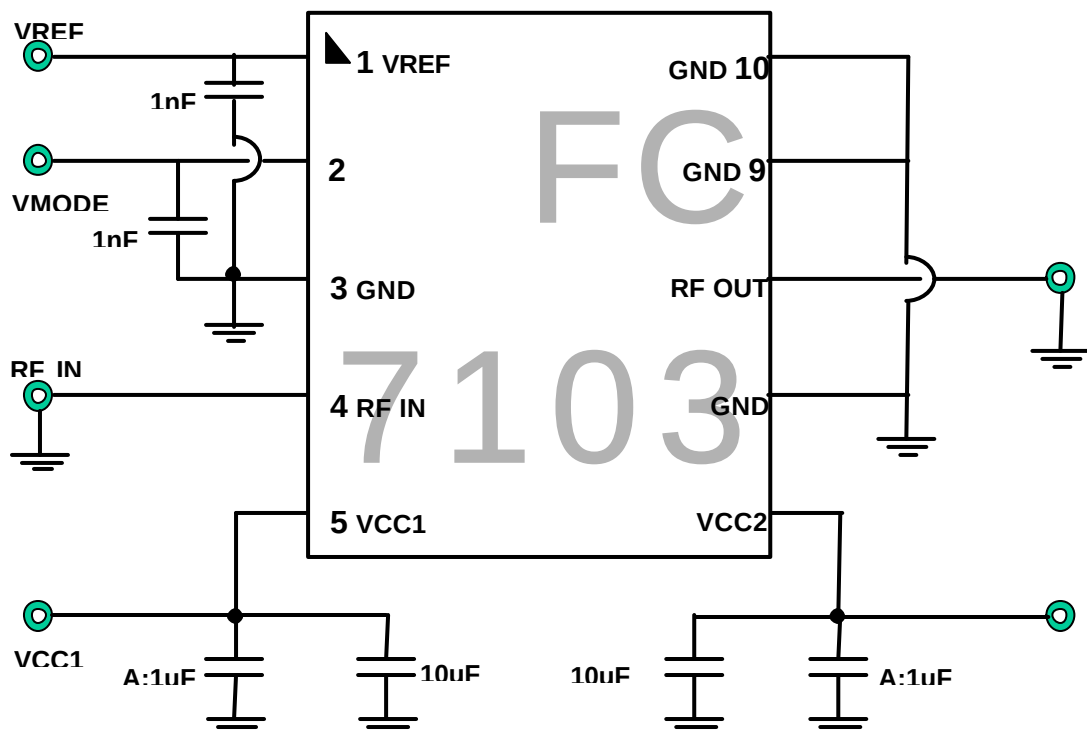
| Parameter                      |                                                        | Unit       | Specification |                      |             | Note                                   |
|--------------------------------|--------------------------------------------------------|------------|---------------|----------------------|-------------|----------------------------------------|
|                                |                                                        |            | Min           | Typ                  | Max         |                                        |
| High Mode<br>(Vmode=0V)        | Gain                                                   | dB         | -<br>-<br>-   | 27<br>27.5<br>26     | -<br>-<br>- | Pout=31dBm<br>Pout=28dBm<br>Pout=16dBm |
|                                | Adjacent Channel Power at $\pm 885\text{kHz}$ offset*  | dBc        | -<br>-        | -50<br>-59           | -<br>-      | Pout=28dBm<br>Pout=16dBm               |
|                                | Adjacent Channel Power At $\pm 1.98\text{MHz}$ offset* | dBc        | -<br>-        | -57<br>-77           | -<br>-      | Pout=28dBm<br>Pout=16dBm               |
|                                | Power-Added Efficiency                                 | %          | -<br>-<br>-   | 56<br>40.5<br>8.5    | -<br>-<br>- | Pout=31dBm<br>Pout=28dBm<br>Pout=16dBm |
|                                | Quiescent Current (Icq)                                | mA         | -<br>-        | 85                   | -<br>-      |                                        |
| Low Mode<br>(Vmode=3V)         | Gain                                                   | dB         | -<br>-<br>-   | 24.5<br>25.5<br>24.5 | -<br>-<br>- | Pout=31dBm<br>Pout=28dBm<br>Pout=16dBm |
|                                | Adjacent Channel Power at $\pm 885\text{kHz}$ offset*  | dBc        | -<br>-        | -49<br>-52           | -<br>-      | Pout=28dBm<br>Pout=16dBm               |
|                                | Adjacent Channel Power At $\pm 1.98\text{MHz}$ offset* | dBc        | -<br>-        | -55<br>-68           | -<br>-      | Pout=28dBm<br>Pout=16dBm               |
|                                | Power-Added Efficiency                                 | %          | -<br>-<br>-   | 58<br>42.5<br>10.0   | -<br>-<br>- | Pout=31dBm<br>Pout=28dBm<br>Pout=16dBm |
|                                | Quiescent Current (Icq)                                | mA         | -<br>-        | 32                   | -<br>-      |                                        |
| Reference Current              |                                                        | mA         | -             | 3                    | -           | Through Vref Pin                       |
| Mode Control Current           |                                                        | mA         | -             | 1                    | -           | Through Vmode Pin                      |
| Leakage Current                |                                                        | uA         | -             | 3                    | -           | Vcc=3.4V, Vref=0V, Vmode=0V            |
| Noise in Receive Band          |                                                        | DBm/H<br>z | -             | -138                 | -           | 869MHz to 894MHz                       |
| Harmonics 2fo<br>Harmonics 3fo |                                                        | dBc        | -<br>-        | -50<br>-50           | -           | Pout<31dBm                             |
| Input Impedance                |                                                        | VSWR       | -             | 1.5:1                | -           |                                        |
| Ruggedness-No damage           |                                                        | VSWR       | -             | 10:1                 | -           | Pout<28dBm, all phases                 |

\*Test Condition; Primary Channel BW=1.23 MHz, Adjacent Channel BW=30 kHz

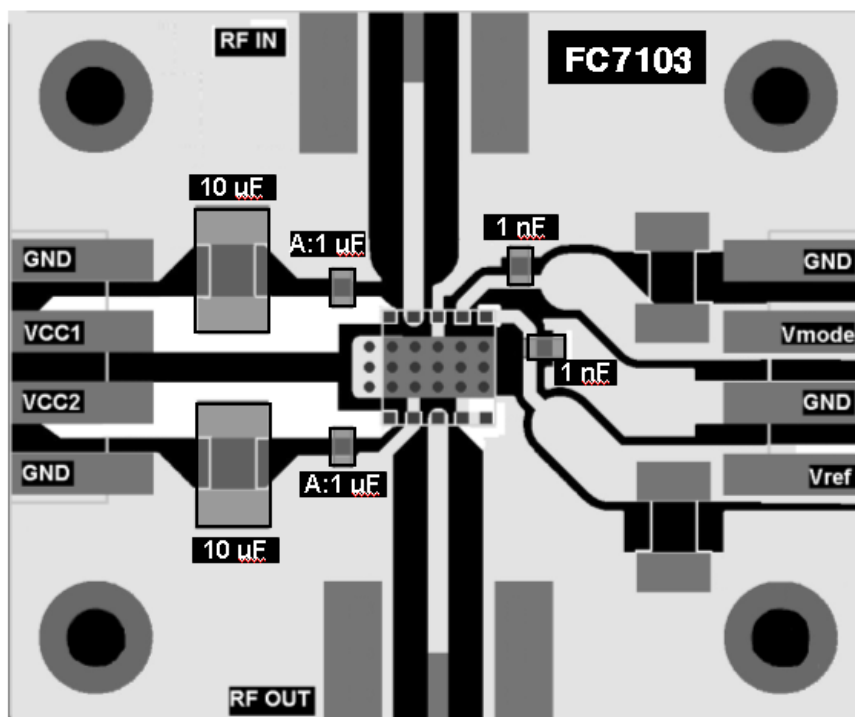
## PIN DESCRIPTION

| Pin | Name  | Description          | Pin | Name  | Description    |
|-----|-------|----------------------|-----|-------|----------------|
| 1   | VREF  | Reference Voltage    | 6   | VCC2  | Supply Voltage |
| 2   | VMODE | Mode Control Voltage | 7   | GND   | Ground         |
| 3   | GND   | Ground               | 8   | RFOUT | RF Output      |
| 4   | RF IN | RF Input             | 9   | GND   | Ground         |
| 5   | VCC1  | Supply Voltage       | 10  | GND   | Ground         |

## EVALUATION BOARD SCHEMATIC



## EVALUATION BOARD ASSEMBLY DIAGRAM



**'A' Place Caps at closest to PAM with the capacitor grounds directly connected to the PAM grounds.**

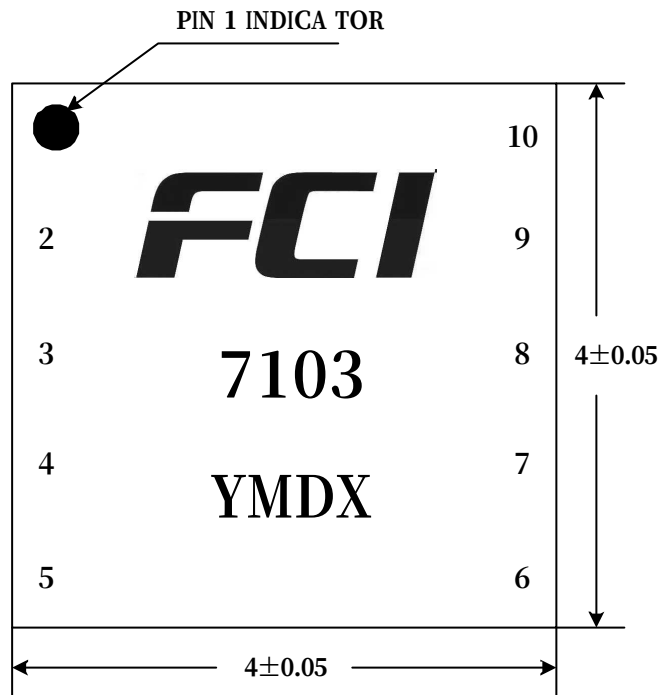
### TURN ON SEQUENCE

1. Connect the amplifier to 50Ω RF input and output cables.
2. Set the VCC1 and VCC2 supplies to +3.4V, and observed a current of 0mA.
3. Set the VREF supply to +2.85V. Observe a current draw of approximately 85mA from the VCC supplies. (VMODE=0V, so the amplifier is in High Bias Mode)
4. Apply an RF signal and measure the RF performance.

### TURN OFF SEQUENCE

1. Turn off the RF signal. Do not disconnect the PA from the RF SMAs before first turn off the DC connections.
2. Turn off the VREF and VMODE first and then turn off the VCC1 and VCC2.
3. Disconnect the PAM from the test set up.

### PACKAGE OUTLINE AND DIMENSIONS



| Line | Device Marking Description                                                               |
|------|------------------------------------------------------------------------------------------|
| 1    | FCI's Company Name                                                                       |
| 2    | 7103 = Product Name                                                                      |
| 3    | YMDX LOT Code<br>Y = Year code<br>M = Month code<br>D = Day code<br>X = Manufacture code |
|      | Pin 1 Identifier                                                                         |

