Future
Communications
Integrated circuit Inc.

FC7214

Power Amplifier Module for KPCS CDMA

DESCRIPTION

FC7214 is a high-power, high–efficiency power amplifier module for K-PCS CDMA wireless handsets. It consists of a two-stage amplifier, 50-ohm input/output matching networks, and additional bias control circuitry. FC7214 provides excellent performance up to 28-dBm output power only with single-mode operation. This single-mode operation in FC7214 eliminates the need for mode change between low-power and high-power/high-gain modes. This advantage enables any handsets that use FC7214 to carry out one step calibration in any handsets with low idle current. FC7214 is assembled in a 3-mm x 3-mm leadless package without any passive components in it. This package provides excellent electrical stability and low thermal resistance. FC7214 is manufactured with an advanced InGaP HBT MMIC process.

APPLICATIONS

- K-PCS CDMA Wireless Handsets

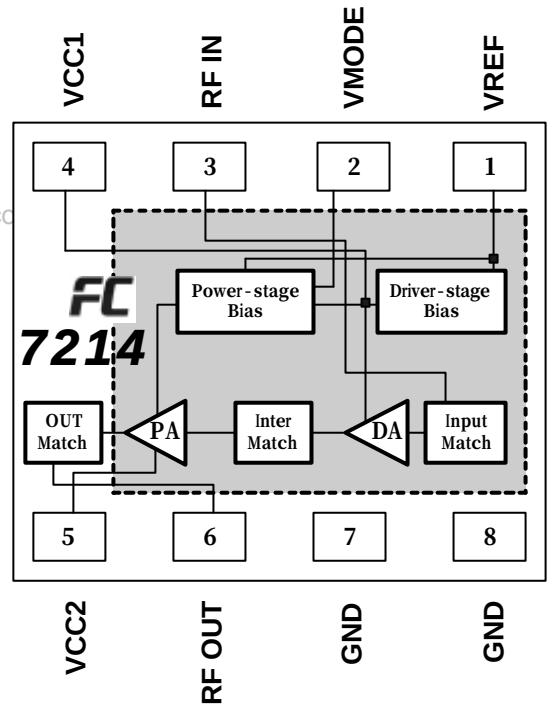
REVISION HISTORY

- **Preliminary** version datasheet release: October 5, 2004
- **Preliminary** version datasheet release: December 30, 2004
- **Preliminary** version datasheet release: February 28, 2005
- **Preliminary** version datasheet release: April 08, 2005

FEATURES

- Small surface mounting package (3x3x1.32mm)
- Operating frequency:1750~1780MHz
- Single-mode operation up to 28dBm
- Low quiescent current: 40mA
- Optimized for a 50-Ω system
- Lead-free package
- No passive component in package
- Low leakage current in shutdown mode: < 1uA

FUNCTIONAL BLOCK DIAGRAM



(TOP VIEW)

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

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ABSOLUTE MAXIMUM RATINGS

Parameter	Unit	Min	Max
Supply Voltage (Vcc)	V	-	+5
Mode Control Voltage (VMODE)	V	-	+3.2
Reference Voltage (VREF)	V	-	+3.2
RF Input Power (RF IN)	dBm	-	+7
Storage Temperature (Tstg)	°C	-55	+125

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	1750	1765	1780	
Supply Voltage(Vcc)	V	+3.2	+3.4	+4.2	
Reference Voltage (VREF)	V	+2.7 0	+2.85 0	+2.9 +0.5	PA "on" PA "shut down"
Mode Control Voltage(VMODE)	V	+2.6 0	+2.85 0	+3.0 0.5	Low Mode High Mode
RF Output Power (RF OUT)	dBm	- -	+28	- -	Vcc=+3.4V

The device may be operated safely over these conditions.

BIAS CONTROL

Power Mode		VREF	VMODE	Range
CDMA Mode	Low Mode	2.85V	2.6~3V	<-20dBm
	High Mode	2.85V	0~0.5V	-20 ~ 28dBm
Shut Down		0.0V	0.0V	-

ELECTRICAL CHARACTERISTICS

(Test Condition : Vcc = 3.4V, Vref = 2.85V, T = +25℃ and Frequency = 1765MHz)

Parameter		Unit	Specification			Note
			Min	Typ	Max	
High Mode (Vmode= 0V)	Gain	dB	- -	29.5 28.0	- -	Pout=28dBm Pout=16dBm
	Adjacent Channel Power at ±1.25MHz offset*	dBc	- -	-50 -50	- -	Pout=28dBm Pout=16dBm
	Adjacent Channel Power At ±2.25MHz offset*	dBc	- -	-58 -60	- -	Pout=28dBm Pout=16dBm
	Total Supply Current	mA	- -	480 125	- -	Pout=28dBm Pout=16dBm
	Power-Added Efficiency	%	- -	38.7 9.4	- -	Pout=28dBm Pout=16dBm
	Quiescent Current (Icq)	mA	-	40	-	
** Low Mode (Vmode=2.85V)	Gain	dB	-	18	-	Pout=<-20dBm
	Adjacent Channel Power at ±1.25MHz offset*	dBc	-	<-50	-	Pout=<-20dBm
	Adjacent Channel Power At ±2.25MHz offset*	dBc	-	<-60	-	Pout=<-20dBm
	Quiescent Current (Icq)	mA	-	20	-	
Reference Current		mA	-	1.5	-	Through Vref Pin(2.85V)
Mode Control Current		mA	-	0.2	-	Through Vmode Pin
Leakage Current		uA	-	1	-	Vcc=3.4V, Vref=0V, Vmode=0V
Noise in Receive Band		DBm/Hz	-	-136	-	1830MHz to 1860MHz
Harmonics 2fo Harmonics 3fo		dBc	- -	-30 -30	- -	Pout<28dBm
Input Impedance		VSWR	-	1.5:1	-	
Ruggedness-No damage		VSWR	-	10:1	-	Pout<28dBm, all phases

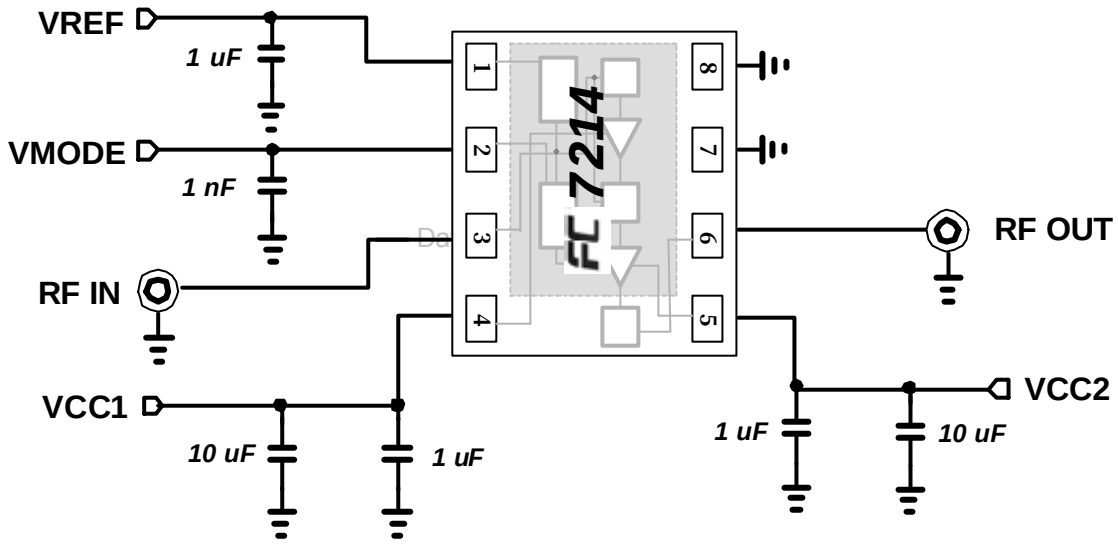
**Test Condition; Primary Channel BW=1.23 MHz, Adjacent Channel BW=30 kHz*

***In the case that the transmitter has a wide dynamic range, it will be enough to use high mode only without switching operation.*

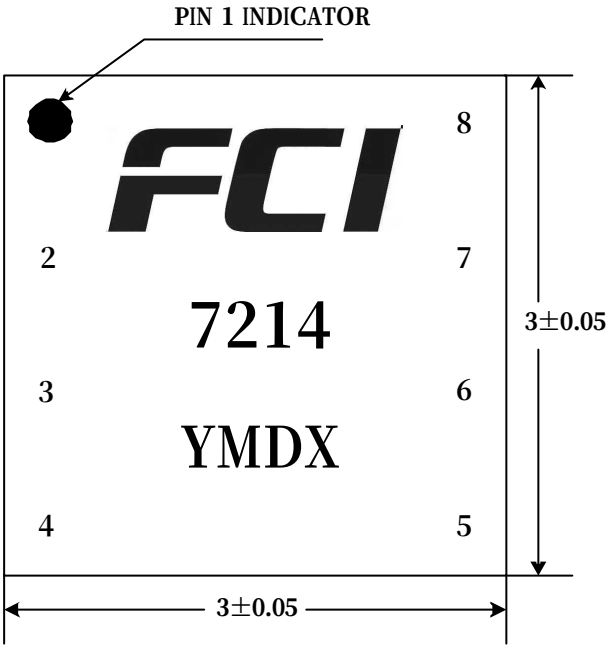
PIN DESCRIPTION

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

EVALUATION BOARD SCHEMATIC (TOP VIEW)

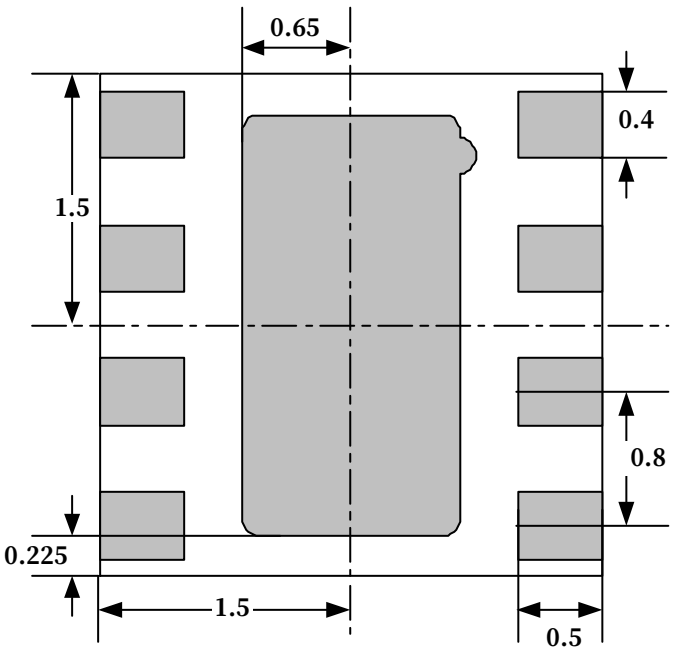


PACKAGE OUTLINE AND DIMENSIONS

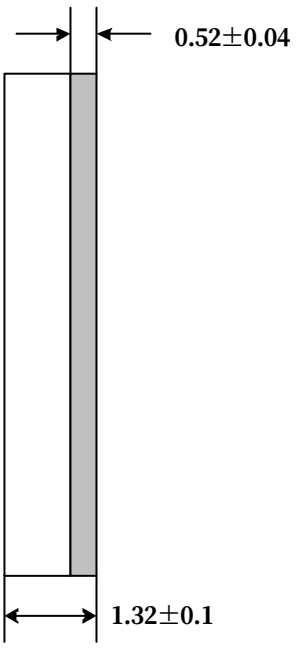


TOP VIEW

Line	Device Marking Description
1	FCI's Company Name
2	7214 = Product Name
3	YMDX LOT Code Y = Year code M = Month code D = Day code X = Manufacture code
●	Pin 1 Identifier



BOTTOM VIEW



SIDE VIEW

All dimensions are in millimeters