EiC Corp.

Excellence in Communications

PRELIMINARY DATA SHEET

ECP200

2.0 WATT POWER AMPLIFIER

Product Features

- 1800 - 2300MHz
- 33 dBm P1dB
- High Linearity: 49 dBm OIP3
- High Efficiency: PAE > 50%
- 11 dB Linear Gain
- Single 5V Supply
- High Reliabilty
- Class A or AB operation

Applications

- Basestations and Repeaters
- CDMA/GSM/TDMA/EDGE
- PCS/CDMA2000/IMT2000/UMTS
- Multi-carrier systems

Packages Available

- QFN-16 (4x4mm)
- SOIC-8

Product Description

The ECP200 is a single stage, 2.0W power amplifier that offers excellent linearity and efficiency. This device was developed using EiC's proprietary InGaP Heterojunction Bipolar Transistor (HBT) process. The devices have a 50 Ohms input impedance and pre-matched output. It is optimized for multicarriers applications and allows customers to use class A or class AB operations. The devices can be easily matched in output side to obtain the optimum power, linearity and efficiency. The product is targeted for use as driver amplifier for wireless infrastructure applications. It is available in two surface-mount plastic packages: QFN-16 (4x4mm) and SOIC-8.

Electrical Specifications

Test Conditions: Ta = 25°C, V_{CC} = +5 V Icq = 800 mA (class A operation)

SYMBOL	PARAMETER		LIMITS			UNIT	TEST CONDITION
			MIN.	TYP.	MAX.		
F	Frequency		1800		2300	MHz	
G	Gain (Small Signal)	f = 1960MHz		11.0		dB	
		f = 2140MHz		10.5			
P1dB	Output Power @ 1dB Compression	f = 1960MHz		33.0		dBm	
		f = 2140MHz		33.0			
OIP3	Output Third Order Intercept	f = 1960MHz		49.0		dBm	Note 1
		f = 2140MHz		48.0			
ACPR1	Pout = 24.5dBm (WCDMA)	f = 2140MHz		-45		dBc	Note 2
	Gain Flatness (120MHz Band)	f = 2140MHz		±0.5		dB	
RL in	Input Return Loss, 50 Ohm	f = 2000MHz		8.0		dB	
RL out	Output Return Loss, 50 Ohm	f = 2000MHz		10.0		dB	
Icop	Operational Current @ P1dB			950		mA	
Vde	Device Voltage			5.0		Vdc	
Note 1: OIP3 = Pout (by power meter, total 2-tone power) + (IM3(dB))/2) - 3dB							
Note 2: ACPR measured for 3GPP test model 1, 64 DPCH. Channel Bandwidth = 3.84MHz. Frequency offset: +/- 5MHz.							

CAUTION!
SENSITIVE ELECTRONIC DEVICE

Absolute Maximum Ratings

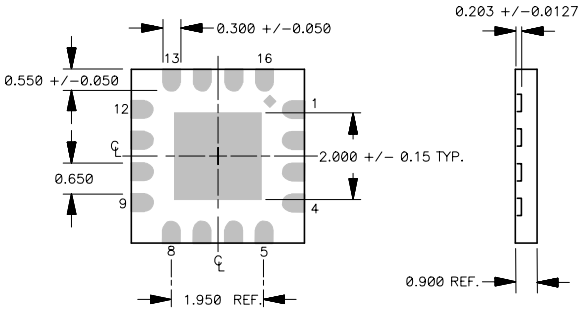
PARAMETER	RATING	UNIT
Supply Voltage	8	Volts
Supply Current	1400	mA
RF Power Input	+28	dBm
Storage Temperature	-65 to +150	°C
Ambient Operating Temperature	-40 to +85	°C
Absolute Maximum DC Power	4	Watts

Note: Exceeding any of the absolute maximum ratings may cause permanent damage to the device.
Note: Do not exceed more than one parameter at the same time.

QFN-16 (4x4mm) Package Outline

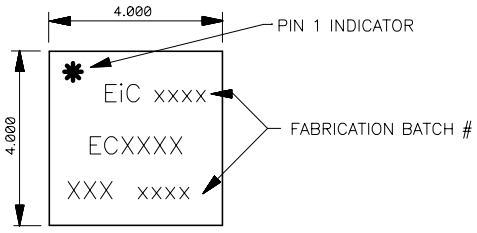
Package

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS



BOTTOM VIEW SIDE VIEW

DEVICE MARKING

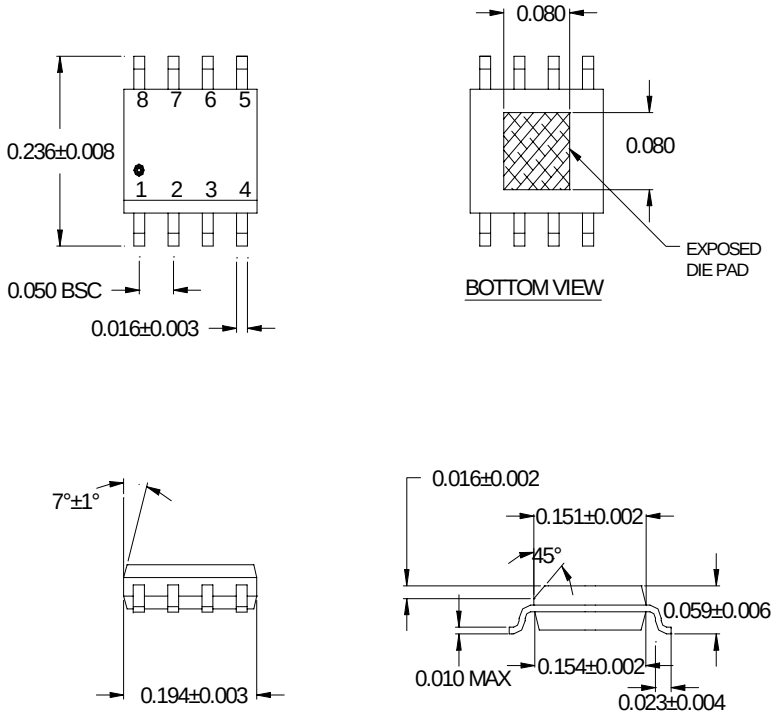


TOP VIEW

Pin Definitions

PIN	FUNCTION	DEFINITION
1	Vref/pd	This pin sets the reference / quiescient current.
2,4-5, 9, 12-15	GND	These pins provide ground as well as the slug which is required for heat sinking.
3	RF in	This pin connects to the input of the amplifier. It will have a dc voltage around 1.25 to 1.3 VDC. External circuit should provide DC blocking.
10,11	RF out	These are the output pins, which connects to the collector of the transistor. On the PCB, the two pins should also be tied together. Vcc connects to these through an inductor. A DC blocking capacitor is required.
16	Vbias	This pin provides current to the bias circuit , typically Vbias = Vcc. Bypass capacitors should be placed as close as practically possible to this pin.

SOIC-8 Package Outline



3. UNIT = INCH
2. MOLD FLASH, PROTRUSIONS AND GATE BURRS AT THE END OF THE PACKAGE BODY SHALL NOT EXCEED 0.006" PER SIDE.
1. EXPOSED DIE PAD AREA MAY VARY. DIE PAD SIZE IS BASED ON L/F PAD SIZE.

NOTES: UNLESS OTHERWISE SPECIFIED

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PIN	FUNCTION	DEFINITION
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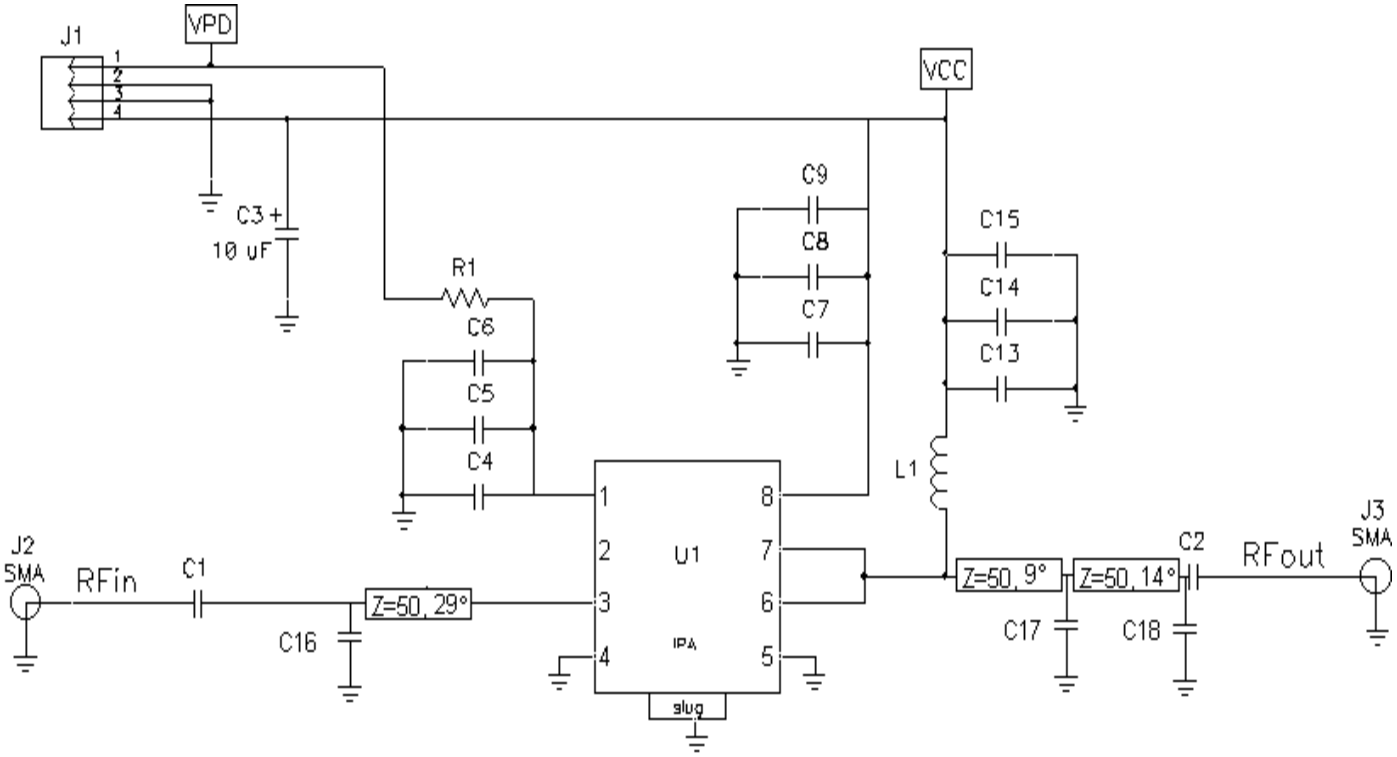
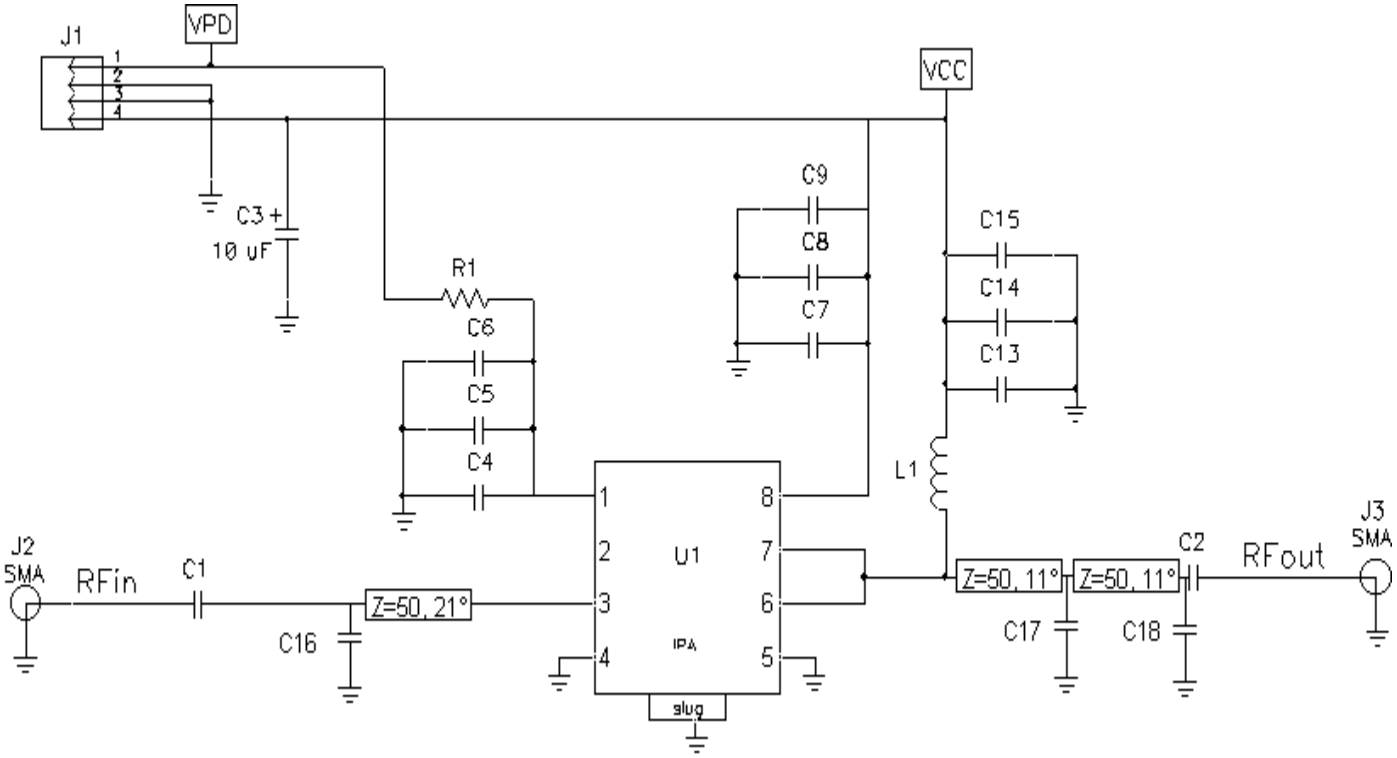
2,4,5	GND	These pins provide ground as well as the slug which is required for heat sinking.
3	RF in	This pin connects to the input of the amplifier. It will have a dc voltage around 1.25 to 1.3 VDC. External circuit should provide DC blocking.
6,7	RF out	These are the output pins, which connects to the collector of the transistor. On the PCB, the two pins should also be tied together. Vcc connects to these through an inductor. A DC blocking capacitor is required.
8	Vbias	This pin provides current to the bias circuit , typically Vbias = Vcc. Bypass capacitors should be placed as close as practically possible to this pin.

Evaluation Board Application Schematics (4X4)

1.96GHz



2.14GHz



Evaluation Board Bill of Material (4X4)

1.9GHz Qty.	2.14GHz Qty.	Location (See eval brd. Layout)	DESIG.	VALUE	DESCRIPTION	MANUFACTURER & P/N	
2	2		C1, C2	100pF	CAPACITOR, 0603	ROHM MCH185A101JK	NOTE1
1	1		C3	10.0uF	CAPACITOR, 2512	PANASONIC ECS-H1CC106R	NOTE1
3	3		C4, C7, C13	18pF	CAPACITOR, 0603	ROHM MCH185A180JK	NOTE1
3	3		C5, C8, C14	1000pF	CAPACITOR, 0603	ROHM MCH185C102KK	NOTE1
3	3		C9, C6, C15	1.0uF	CAPACITOR, 0603	PANASONIC ECJ-1VF1A105Z	NOTE1
--	1	INPUT 4|5	C16	3pF	CAPACITOR, 0603	ROHM MCH185A020CK	NOTE1
1	--	INPUT 6	C16	2.7pF	CAPACITOR, 0603	ROHM MCH185A2R7CK	NOTE1
--	1	OUTPUT 2	C17	3.9pF	CAPACITOR, 0603	ROHM MCH185A3R9CK	NOTE1
1	--	OUTPUT 1|2	C17	3.9pF	CAPACITOR, 0603	ROHM MCH185A3R9CK	NOTE1
	1	OUTPUT 4	C18	1.5pF	CAPACITOR, 0603	ROHM MCH185A1R5CK	NOTE1
1	--	OUTPUT 5	C18	1.5pF	CAPACITOR, 0603	ROHM MCH185A1R5CK	NOTE1
1	1		R1	0 Ω	RESISTOR, 0603	ROHM MCR03EZHJ000	NOTE1
1	1		L1	15 nH	INDUCTOR, 0805	CTLL 2012-15N	NOTE1
2	2		J2, J3	---	SMA CONNECTOR	EF JOHNSON 142-0701-881	NOTE1
1	1		J1	---	RT ANG. CONN.	SULLINS ELEC PZC04SGAN	
1	1			---	IC, ECP200D (4X4)	EiC Corp	
1	1			---	PCB (4X4)	EiC Corp 60-000523-000B	

Evaluation Board Layout