

TOSHIBA RF Power Amplifier

TG2014CS

1700/1900 MHz Band Amplifier Applications (US/K-PCS (CDMA))

- GaAs HBT MMIC (Include Bias circuit type)
- Output Power: $P_o = 28.0$ dBmW (min)
- Gain: $G_p = 24$ dB (min)
- Drain Efficiency: 37% (typ.)
- Include bias circuit with power control

Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Supply voltage	V_{CC}	4.5	V
Collector current	I_{CC}	1.5	A
Input power	P_i	6	dBmW
Power dissipation	P_D (Note 1)	4	W
Channel temperature	T_{ch}	150	°C
Operating temperature	T_{ope}	-30~85	°C
Storage temperature range	T_{stg}	-40~150	°C

Note 1: Ta = 25°C

Electrical Characteristics (Ta = 25°C)

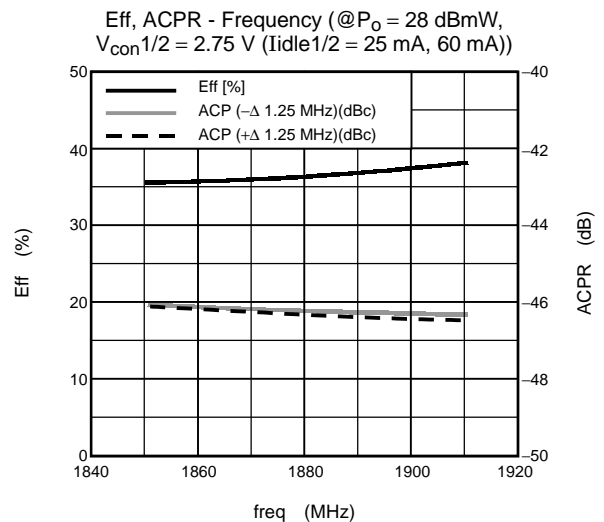
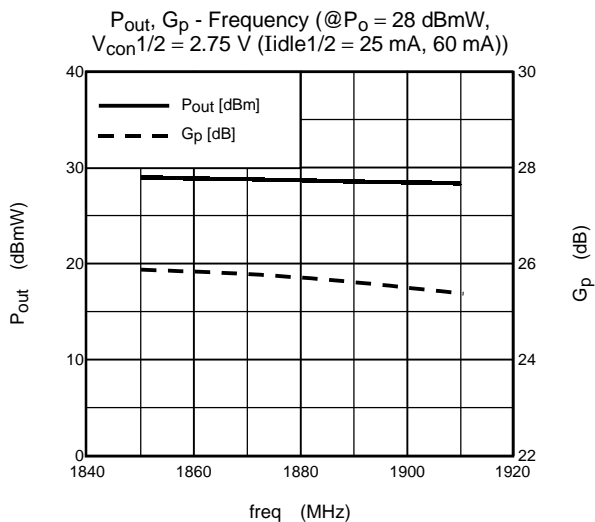
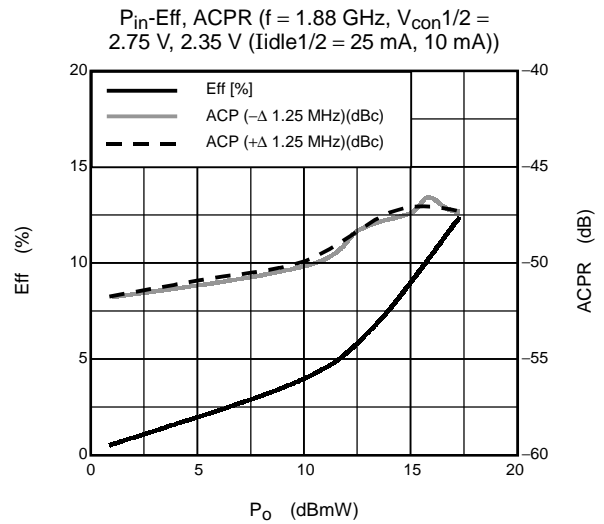
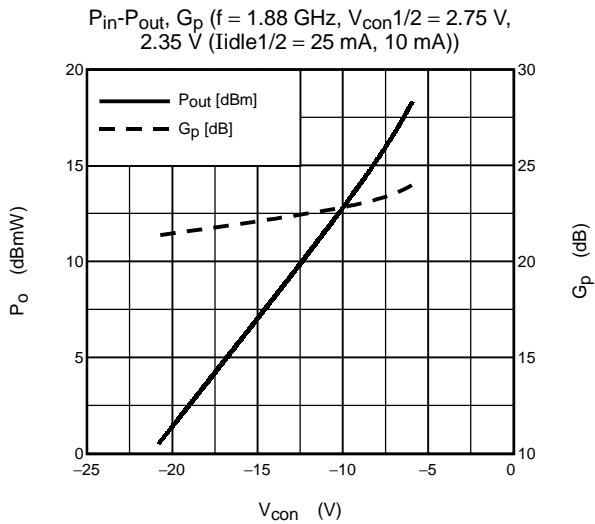
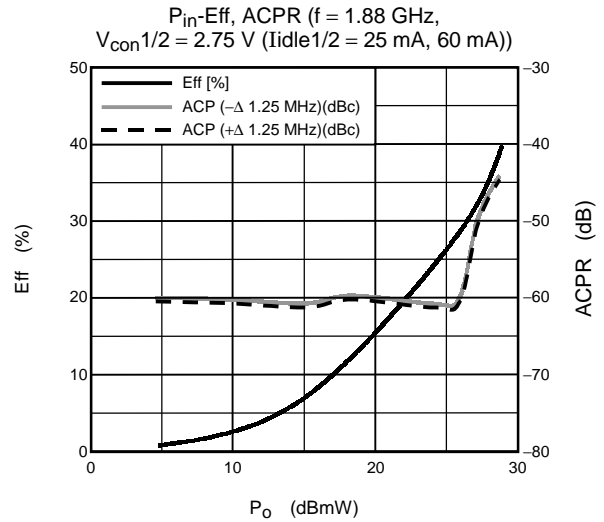
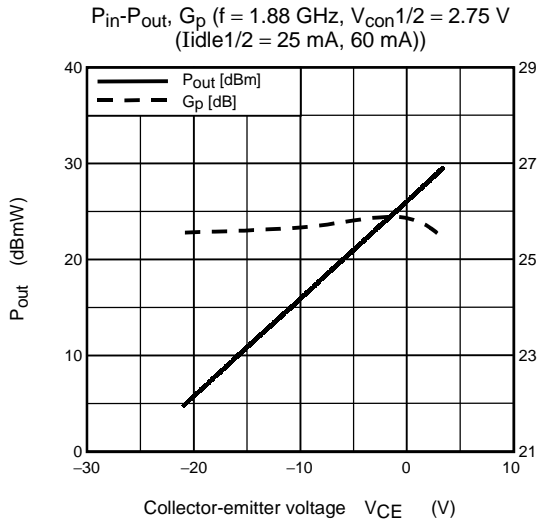
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Usable frequency range	—	—	1750		1910	
Typical frequency range	—		1750 1850		1780 1910	
Leak current	Ileack	V _{CC} 1/2 = V _{ref} = 3.6 V, V _{con} 1/2 = 0.4 V			1	μA
Output power (1)	P _o (1)	V _{CC} 1/2 = 3.6 V, I _{idle} 1 = 25 mA, I _{idle} 2 = 60 mA (V _{con} 1/2 = adjust), V _{ref} = 3.6 V, P _i ≤ 4dBmW, Z _G = Z _L = 50 Ω	28.0	29.0	—	dBmW
Power gain (1)	G _p (1)		24.0	26.0	—	dB
Collector efficiency (2)	Eff. (2)	V _{CC} 1/2 = 3.6 V, P _o = 28.0dBmW (V _{con} 1/2 = adjust at P _o (1)), V _{ref} 1/2 = 3.6 V, P _i = adjust	—	37.0	—	%
ACPR (1)	P _{acp} (1)	V _{CC} 1/2 = 3.6 V, P _o = 28dBm (V _{con} 1/2 = adjust at P _o (1)), V _{ref} = 3.6 V, P _i = adjust, f = ±1.25 MHz*	—	-47	-45	dB
Stability	SPR	V _{CC} 1/2 = V _{ref} = 3.2~4.3 V, V _{con} = adjust at P _o (1), P _i = 6dBmW, Load VSWR = 3:1			-60	dB
Load mismatch	—	V _{CC} 1/2 = 4.3 V, I _{idle} 1 = 12 mA, I _{idle} 2 = 120 mA (V _{con} 1/2 = adjust), V _{ref} = 4.3 V, P _o = 28dBmW, VSWR LOAD 3:1 all phase	No degradation			—

Caution: This MMIC is the electrostatic sensitive device. Please handle with caution.

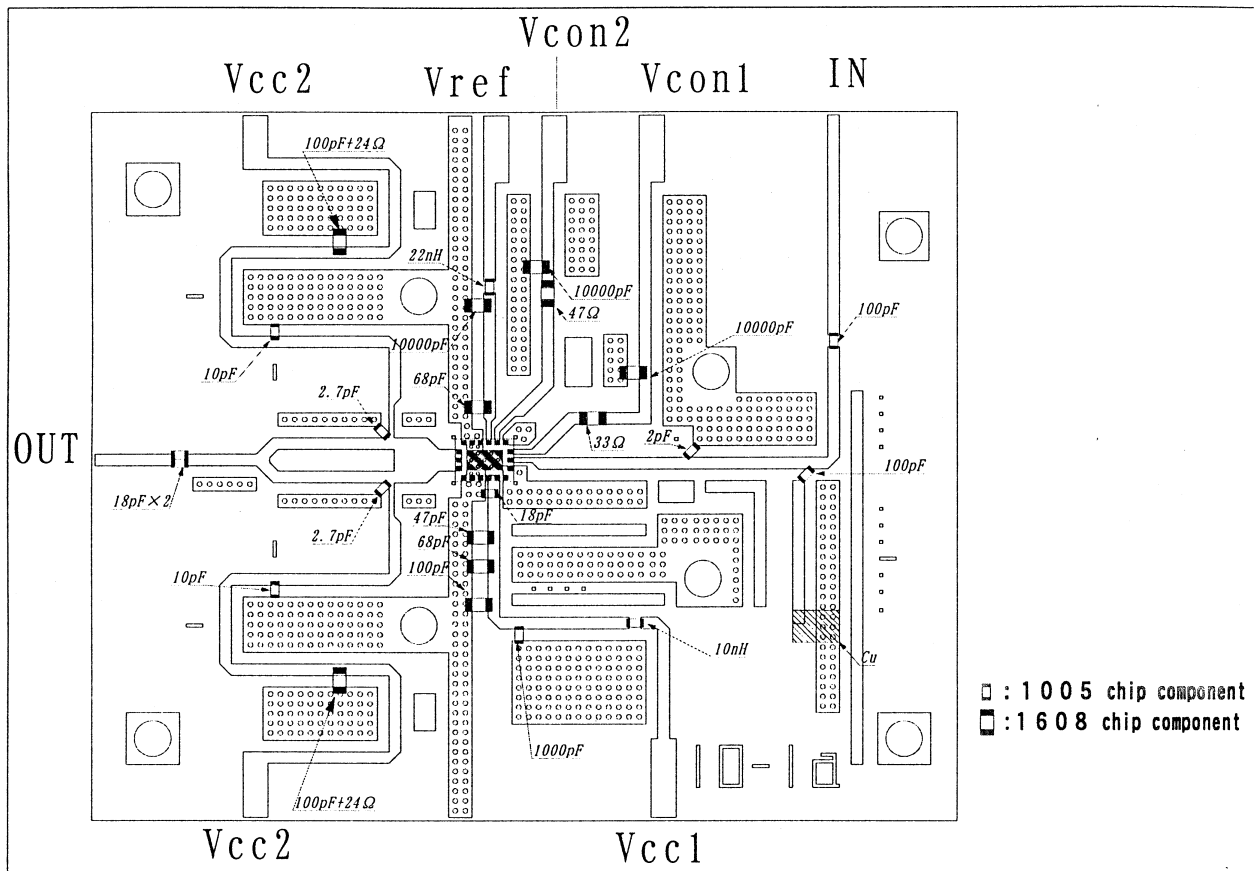
Note 2: ACPR

- a) Measure the average power in the 30 kHz bandwidth CDMA signal, and then determine the average power in a 30 kHz bandwidth, P_c (30 kHz).
- b) Measure power at 1.25 MHz offset. P (30 kHz), in a 30 kHz bandwidth.
- c) ACPR (1) = P (30 kHz) – P_c (30 kHz)

Typical Characteristic Curve



Test Board



Note for biasing procedure: Please follow this sequence when you measure a device bias sequence.

- a) VCC1, VCC2 On 0 V to Supply Voltage
- b) Vref On 0 V to Supply Voltage
- c) Vcon1 On adjust idle current to 25 mA
- d) Vcon2 On adjust idle current to 50 mA
- e) RF on

Notice

The circuit and measured data contained herein are presented only as a example for the applications of this product, and do not specify or recommend any circuit and parameters.

Besides, it is not aimed at the design for mass production of an application system. Because high frequency characteristics (AC characteristics) is changed by the external attached parts that a customer uses, circuit pattern and other conditions.

It is the responsibility of the customer to design external circuit for achieving the request from application system, and to confirm the characteristics of designed circuit.

No responsibility is assumed by TOSHIBA for the circuit design or application of a customer.

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