

2004.08.06 Preliminary

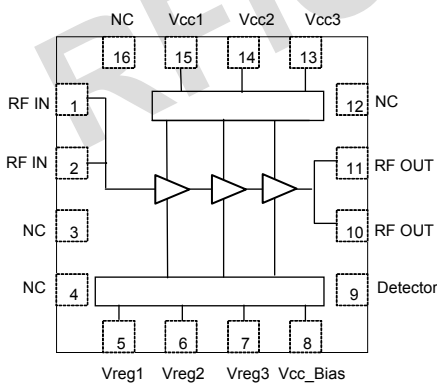
DESCRIPTION

AP2085 is a linear, three-stage power amplifier MMIC in the 5GHz band utilizing InGaP/GaAs HBT process. With the excellent linearity performance, the device delivers ~18dBm linear output power for EVM<3%, and 30dB gain under 54Mbps OFDM (IEEE802.11a) modulation at 3.3V. AP2085 can also deliver ~20dBm linear output power for EVM<3%, and 31dB gain at 5.0 V. The AP2085 is housed in a 3 x 3 (mm), 16 pin, QFN package. This power amplifier is suitable for the high gain applications in the full 802.11a 5GHz band.(4.9~5.85GHz)

Major Applications

- Wireless LAN IEEE 802.11a
- FCC-U-NII Wireless
- HiperLAN2

Functional Block Diagram



QFN- 16 pin, 3 x 3 (mm)

KEY FEATURES

- Full 11a frequency range: 4.9~5.85GHz (Gain and Power Flatness for the full 11a band)

Under Vc = 3.3V (For bias condition, please see Application Note)

- High Gain: ~30dB at Pout=18dBm
- Pout @ EVM<3%: ~18dBm
- Total Current at Pout @ EVM<3%: ~210mA

Under Vc = 5V (For bias condition, please see Application Note)

- High Gain: ~31dB at Pout=20dBm
- Pout @ EVM<3%: ~20dBm
- Total Current at Pout @ EVM<3%: ~260mA

Pin Details

Pin Number	Name	Description
1	RF_IN	RF Input
2	RF_IN	RF Input
3	NC	No Contact
4	NC	No Contact
5	Vreg1	First Stage Bias
6	Vreg2	Second Stage Bias
7	Vreg3	Third Stage Bias
8	Vcc_Bias	Bias Circuit Supply
9	Detector	Detector
10	RF_OUT	RF Output
11	RF_OUT	RF Output
12	NC	No Contact
13	Vcc3	Supply voltage for third stage
14	Vcc2	Supply voltage for second stage
15	Vcc1	Supply voltage for first stage
16	NC	No Contact
Pkg Base	GND	Ground

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Electrical Characteristics

• Under $V_c=3.3V$ (For bias condition, please see Application Note)

PARAMETER	CONDITION	SYMBOL	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	UNIT
Frequency Range		f	4.9		5.35	5.7		5.85	GHz
P1dB		P1dB		23.5			24		dBm
Power Gain	Pout=18dBm	Gp		30			29.5		dB
Linear Output Power	EVM<3%, 64QAM/54Mbps			17.5			18		dBm
Total Current	Pout=18dBm	Ic_total		210			210		mA
Quiescent Current		Icq		180			180		mA
Input VSWR				2:1			2:1		
Output VSWR				2.5:1			2.5:1		
Second Harmonics	Pout=18dBm			-40			-40		dBc
Third Harmonics	Pout=18dBm			-40			-40		dBc
Detector Response	Pout=18dBm	Vdet		0.6			0.5		V

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Electrical Characteristics

• Under Vc=5.0V (For bias condition, please see Application Note)

PARAMETER	CONDITION	SYMBOL	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	UNIT
Frequency Range		f	4.9		5.35	5.7		5.85	GHz
P1dB		Pout		25.5			26		dBm
Power Gain	Pout=20dBm	Gp		31.5			31		dB
Linear Output Power	EVM<3%, 64QAM/54Mbps			19.5			20		dBm
Total Current	Pout=20dBm	Ic_total		260			260		mA
Quiescent Current		Icq		230			230		mA
Input VSWR				2.5:1			2.5:1		
Output VSWR				2.5:1			2.5:1		
Second Harmonics	Pout=20dBm			-40			-40		dBc
Third Harmonics	Pout=20dBm			-40			-40		dBc
Detector Response	Pout=20dBm	Vdet		0.6			0.5		V

Absolute Maximum Ratings

Parameter	Rating	Unit
DC Power Supply For Collector	+5.5	V
DC Supply Current For Collector	600	mA
RF Input Power	+5	dBm
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

Important Notice:

The information provided in this datasheet is deemed to be accurate and reliable only at present time. RF Integrated Corp. reserves the right to make any changes to the specifications in this datasheet without prior notice.

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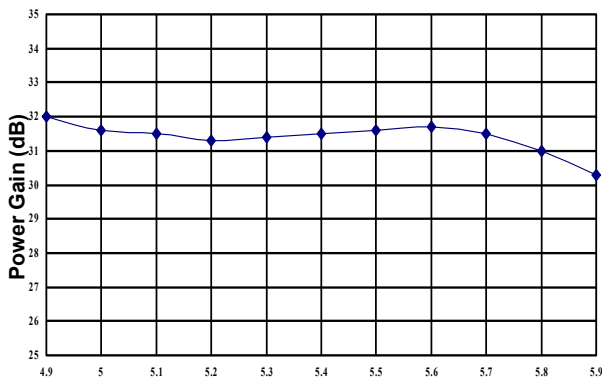
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Data Charts

(AP2085 Evaluation Kit, RF Signal = With IEEE 802.11a Modulation (54Mbps),
TA = 25°C, unless otherwise noted.)

Fig. 1

Power Gain vs. Frequency at 3.3V

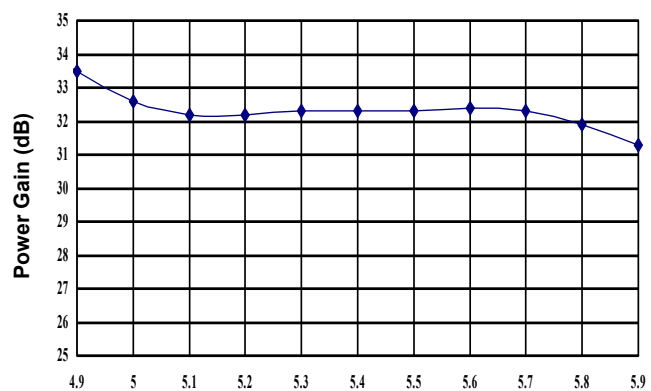


Frequency (GHz)

Gain(dB)@Pout~18dBm, Vc=3.3V

Fig. 2

Power Gain vs. Frequency at 5.0V

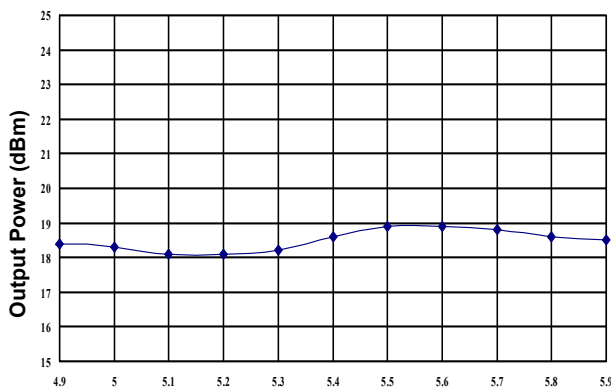


Frequency (GHz)

Gain(dB)@Pout~20dBm, Vc=5.0V

Fig. 3

P_{OUT} vs. Frequency at 3.3V

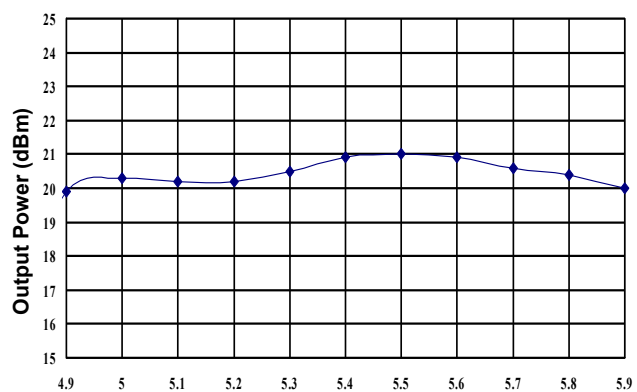


Frequency (GHz)

Pout(dBm)@EVM~3%, Vc=3.3V

Fig. 4

P_{OUT} vs. Frequency at 5.0V



Frequency (GHz)

Pout(dBm)@EVM~3%, Vc=5.0V

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Fig. 5

I TOTAL vs. Frequency at 3.3V

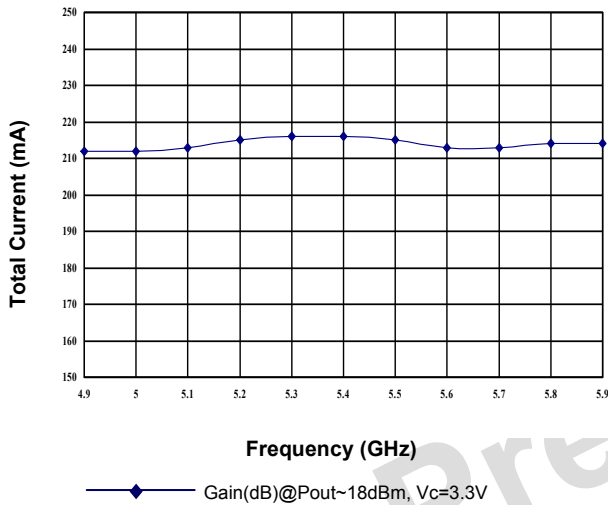


Fig. 6

I TOTAL vs. Frequency at 5.0V

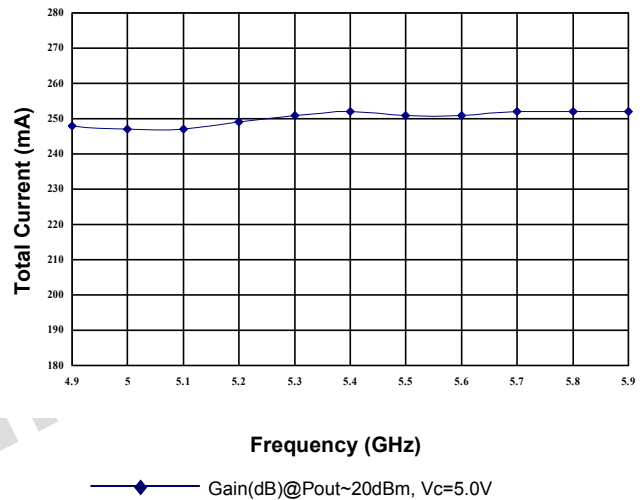


Fig. 7

Output Power vs Bias Control Voltage at 5.85GHz at 3.3V

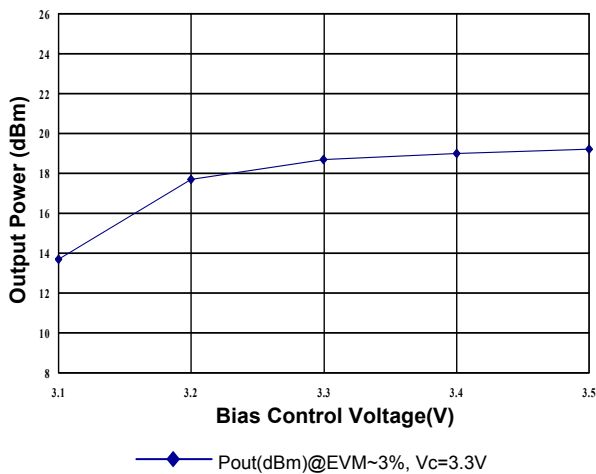
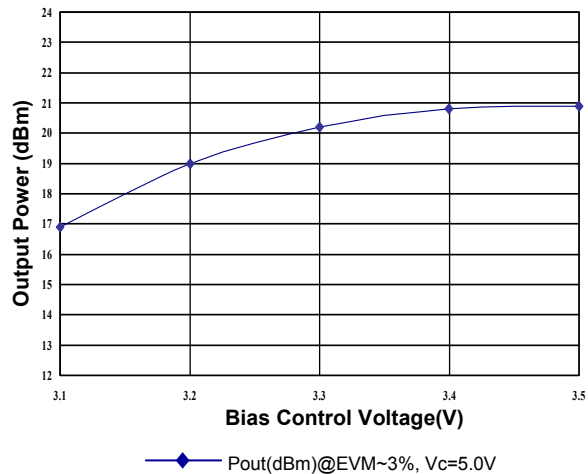


Fig. 8

Output Power vs Bias Control Voltage at 5.85GHz at 5.0V



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Fig. 9

Total Current vs Bias Control Voltage at 5.85GHz at 3.3V

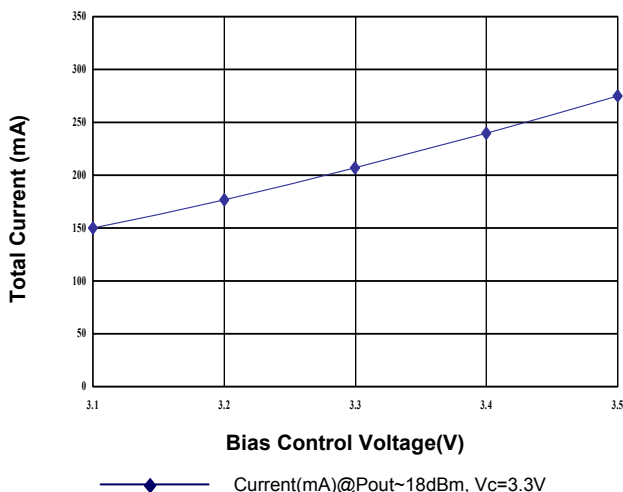


Fig. 10

Total Current vs Bias Control Voltage at 5.85GHz at 5.0V

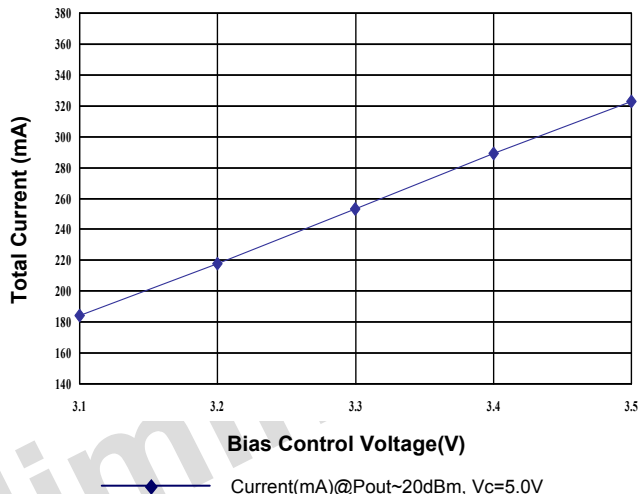


Fig. 11

Power Gain vs Bias Control Voltage at 5.85GHz at 3.3V

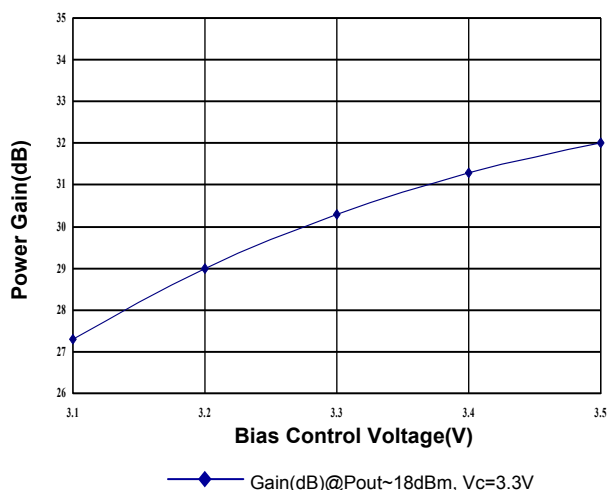
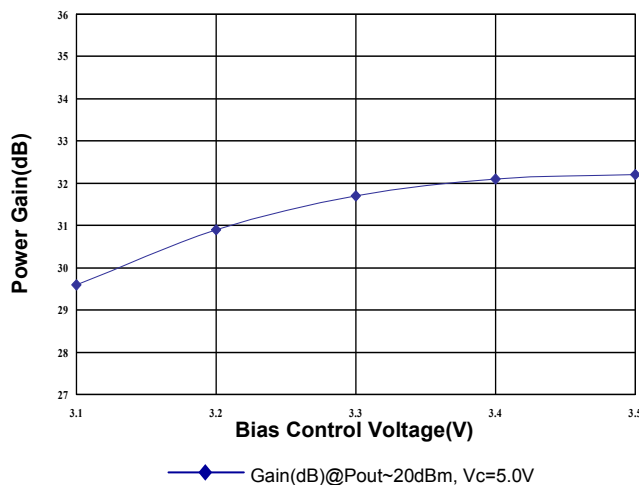


Fig. 12

Power Gain vs Bias Control Voltage at 5.85GHz at 5.0V



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Data Charts

Fig. 13

EVM(4.9GHz) vs. Pout(dBm) vs. Icc (mA),
Vc=3.3V, Source EVM =1.9%

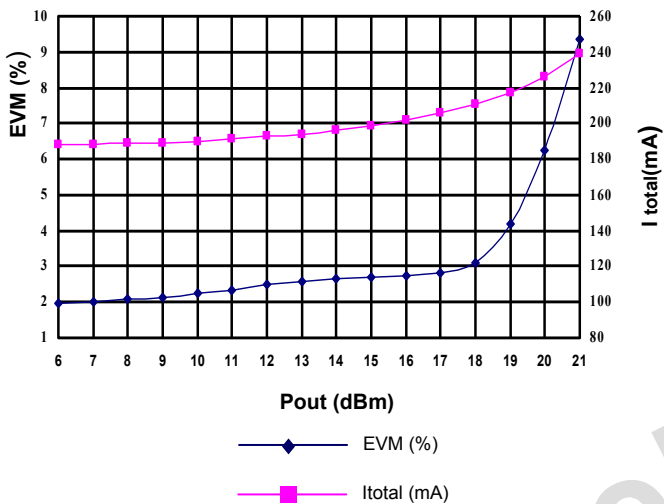


Fig. 14

EVM(4.9GHz) vs. Pout(dBm) vs. Icc (mA),
Vc=5.0V, Source EVM =1.0%

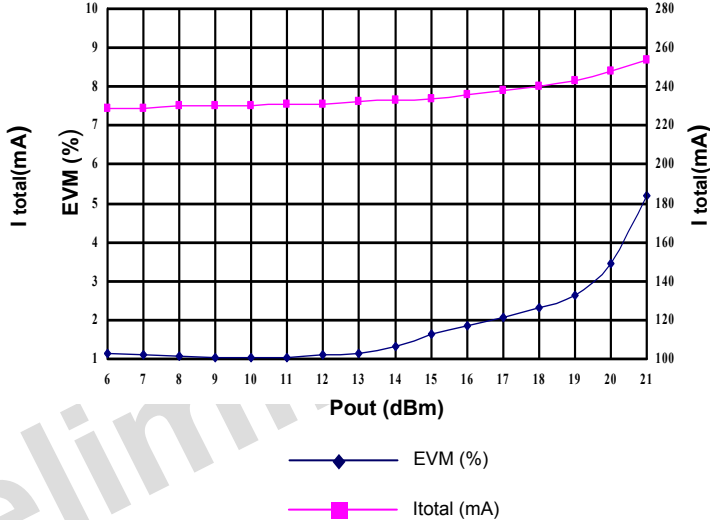


Fig. 15

EVM(5.25GHz) vs. Pout(dBm) vs. Icc (mA),
Vc=3.3V, Source EVM =1.9%

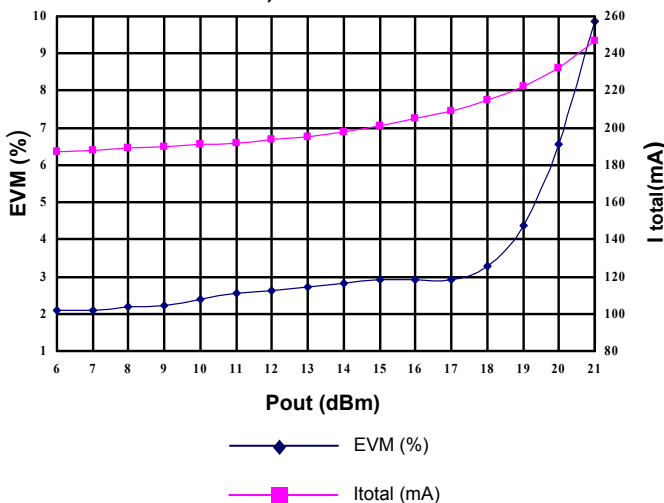
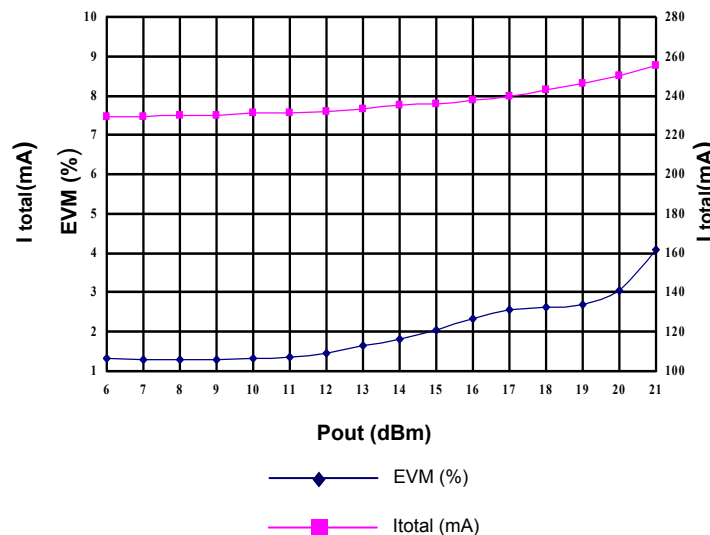


Fig. 16

EVM(5.25GHz) vs. Pout(dBm) vs. Icc (mA),
Vc=5.0V, Source EVM =1.0%



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Fig. 17

EVM(5.85GHz) vs. Pout(dBm) vs. Icc (mA),
Vc=3.3 V, Source EVM =1.9%

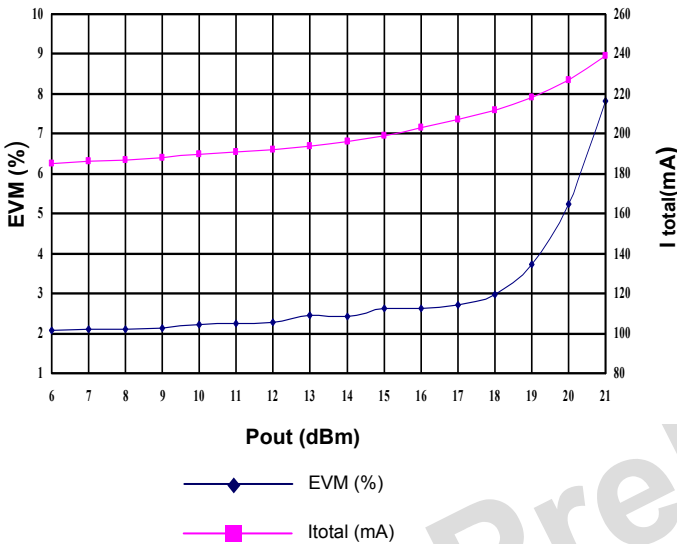


Fig. 18

EVM(5.85GHz) vs. Pout(dBm) vs. Icc (mA),
Vc=5.0 V, Source EVM =1.0%

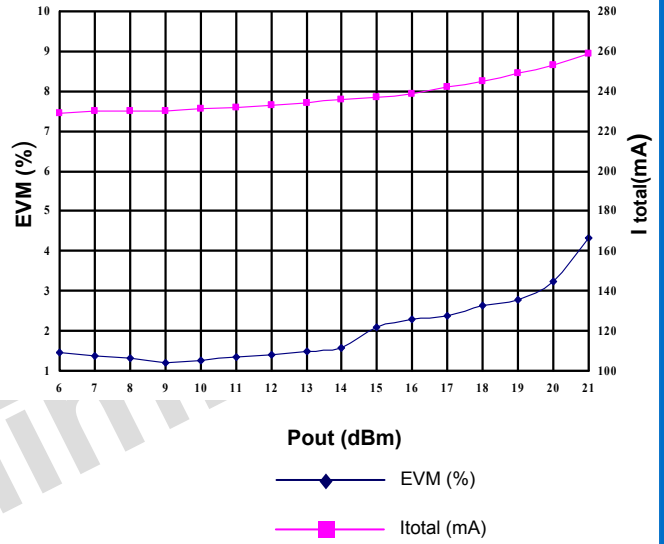


Fig. 19

Detector Output vs. Output Power
(With 54Mb/s, OFDM Modulation)
at 5.25GHz at 3.3V

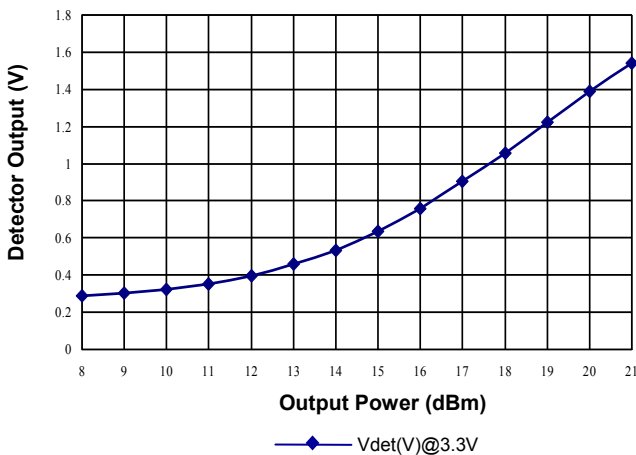
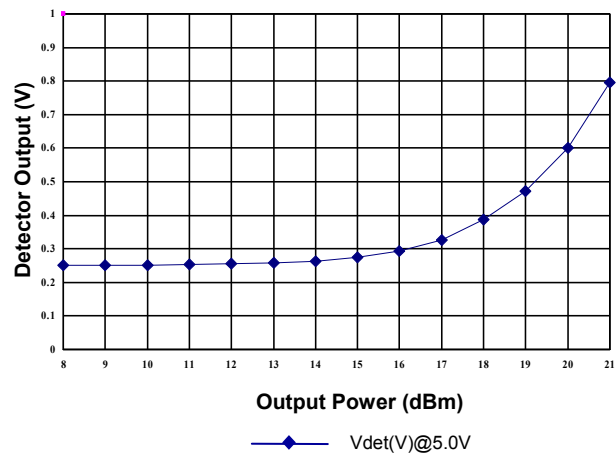


Fig. 20

Detector Output vs. Output Power
(With 54Mb/s, OFDM Modulation)
at 5.25GHz at 5.0V



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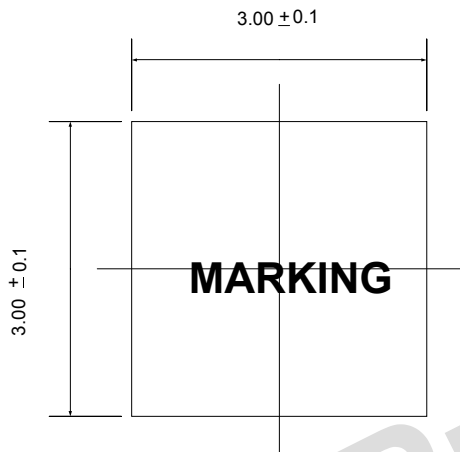
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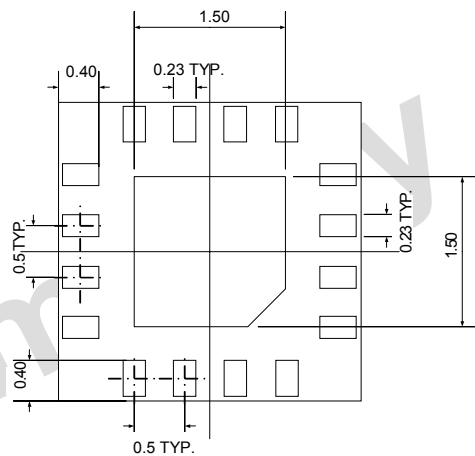
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Package Outline

Top View

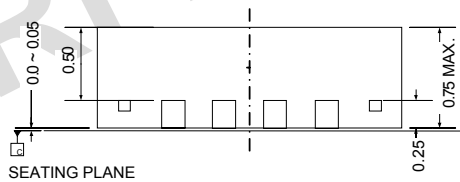


Bottom View



Unit: mm

Side View



Note :

1. Dimension and tolerance conform to ASME Y14.5M-1994.
2. Refer to JEDEC STD. MO-220 WEED-2 ISSUE B

© For more detailed information, please refer to the AP2085 Application Note.

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