

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)

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

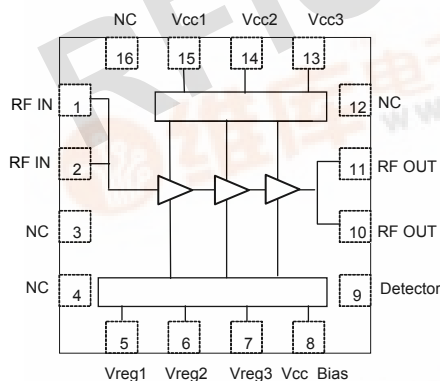
Major Applications

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

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 |

Functional Block Diagram



QFN- 16 pin, 3 x 3 (mm)

For more information, please contact us at:

© 2004 RF Integrated Corporation. All rights reserved.

Sales Dept.

Tel: +86-2-2698-1022

e-mail: sales@rfintc.com

RF integrated Corp. reserved the right to make any changes to the specifications without notice.



2004.08.06 Preliminary

Electrical Characteristics

• Under Vc=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 |

2004.08.06 Preliminary

Electrical Characteristics

- Under $V_c=5.0V$ (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.

For more information, please contact us at:

Sales Dept.

Tel: +886-2-2698-1022

e-mail: sales@rfintc.com

© 2004 RF Integrated Corporation. All rights reserved.

RF integrated Corp. reserved the right to make any changes to the specifications without notice.

2004.08.06 Preliminary

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

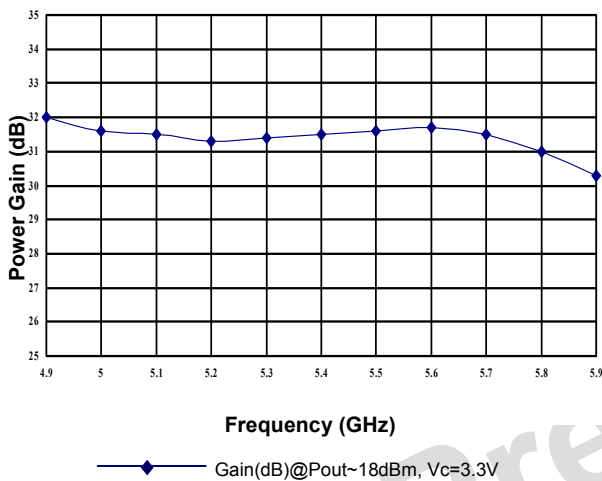


Fig. 2

Power Gain vs. Frequency at 5.0V

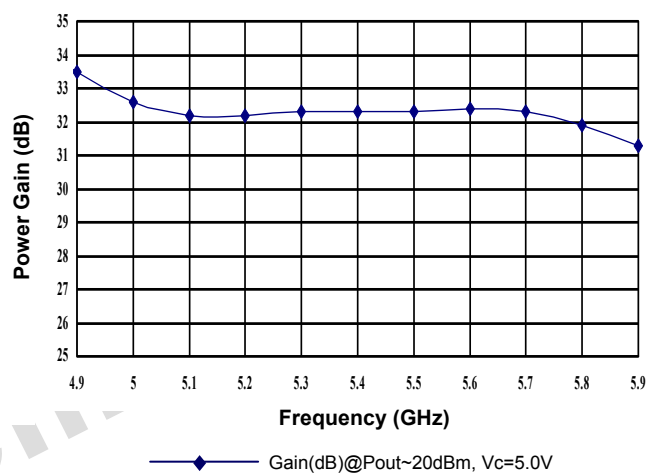


Fig. 3

P_{OUT} vs. Frequency at 3.3V

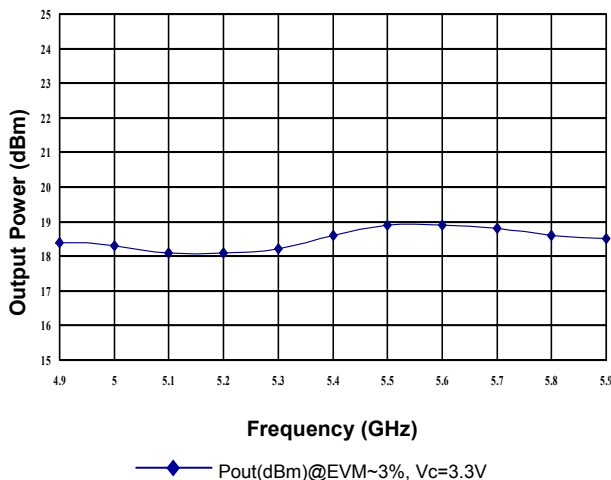
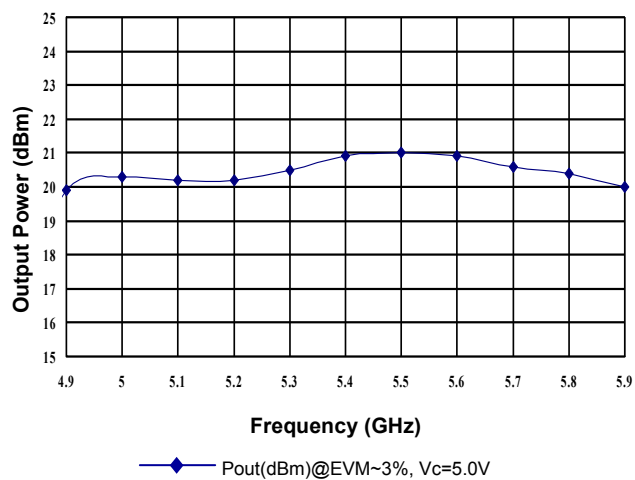


Fig. 4

P_{OUT} vs. Frequency at 5.0V



2004.08.06 Preliminary

Data Charts

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

Fig. 5

I_{TOTAL} vs. Frequency at 3.3V

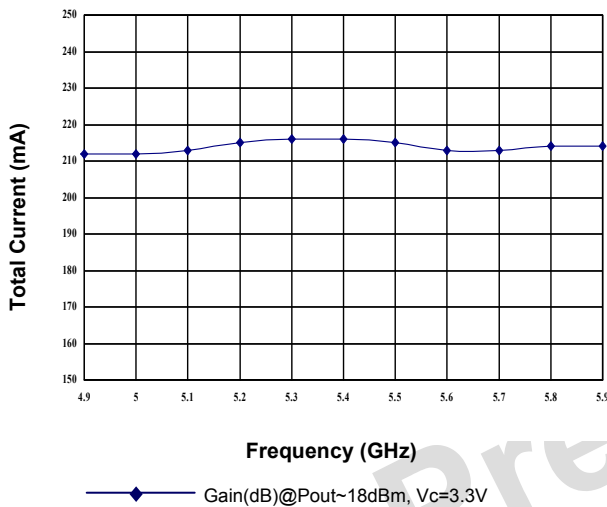


Fig. 6

I_{TOTAL} vs. Frequency at 5.0V

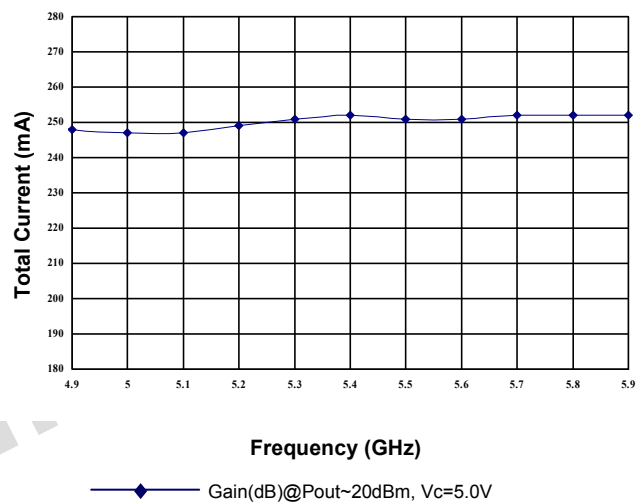


Fig. 7

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

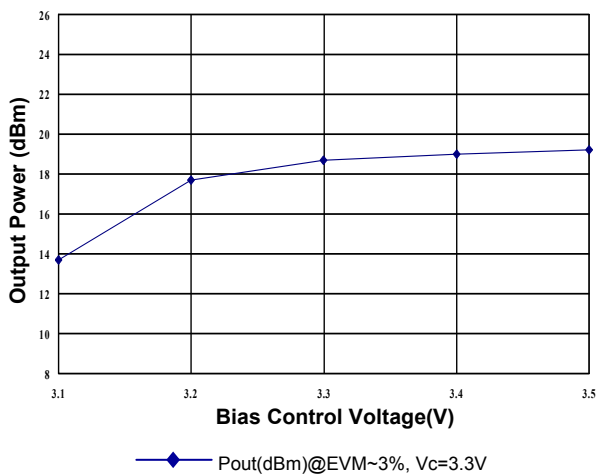
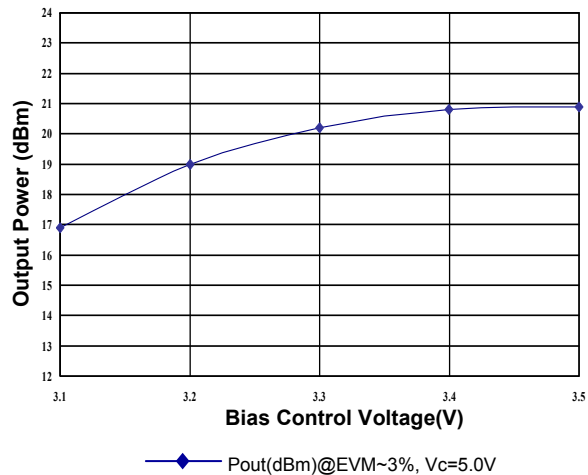


Fig. 8

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



2004.08.06 Preliminary

Data Charts

Fig. 9

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

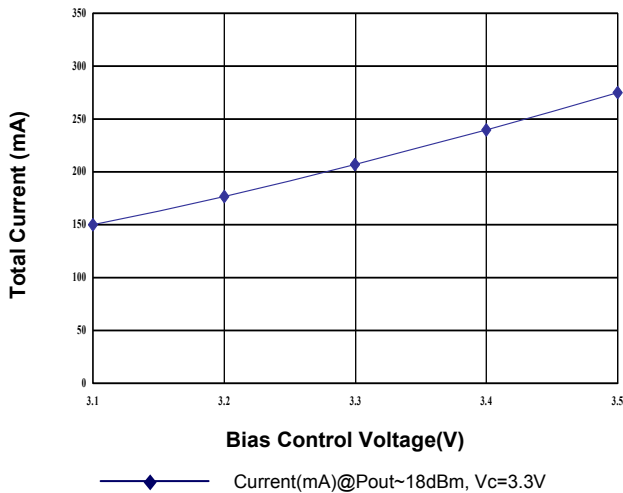


Fig. 10

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

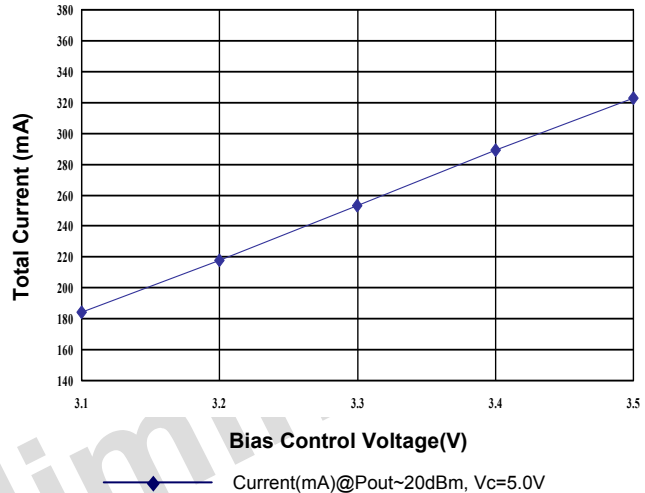


Fig. 11

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

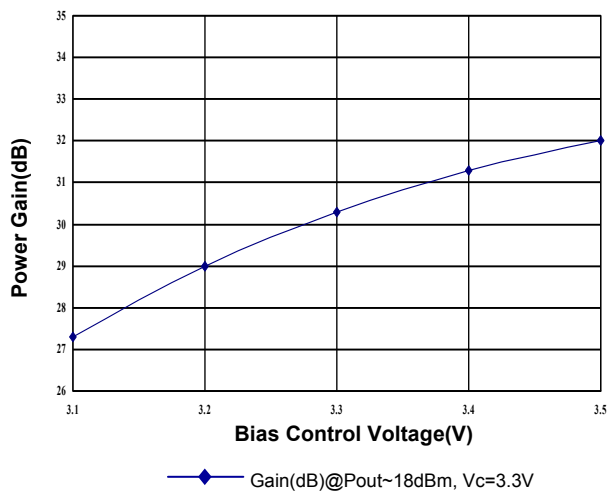
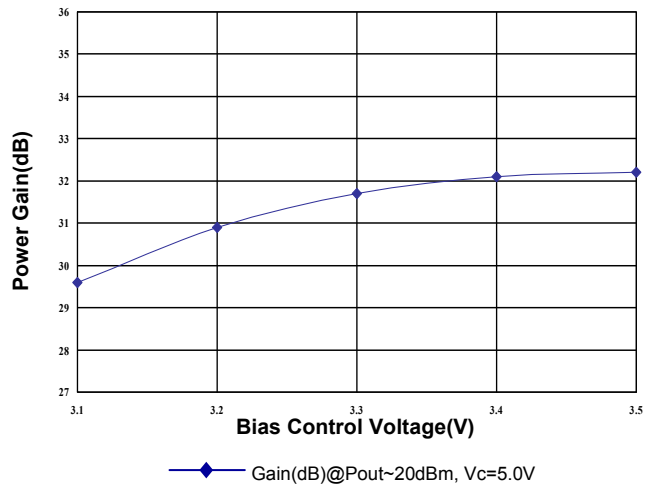


Fig. 12

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



For more information, please contact us at:

Sales Dept.

Tel: +886-2-2698-1022

e-mail: sales@rfintc.com

© 2004 RF Integrated Corporation. All rights reserved.

RF integrated Corp. reserved the right to make any changes to the specifications without notice.

2004.08.06 Preliminary

Data Charts

Fig. 13

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

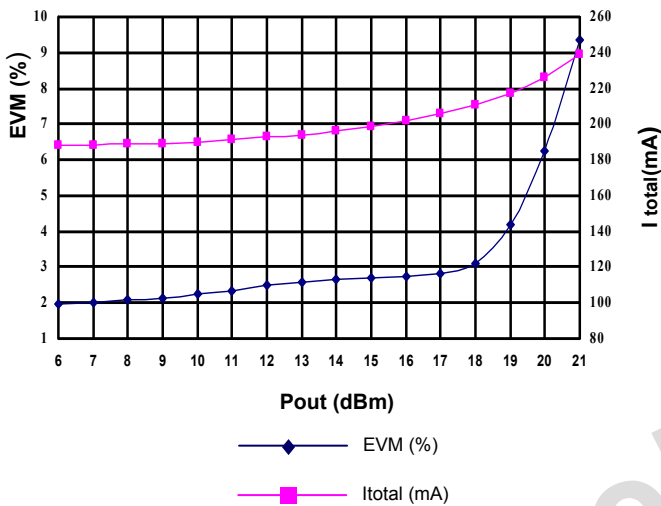


Fig. 14

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

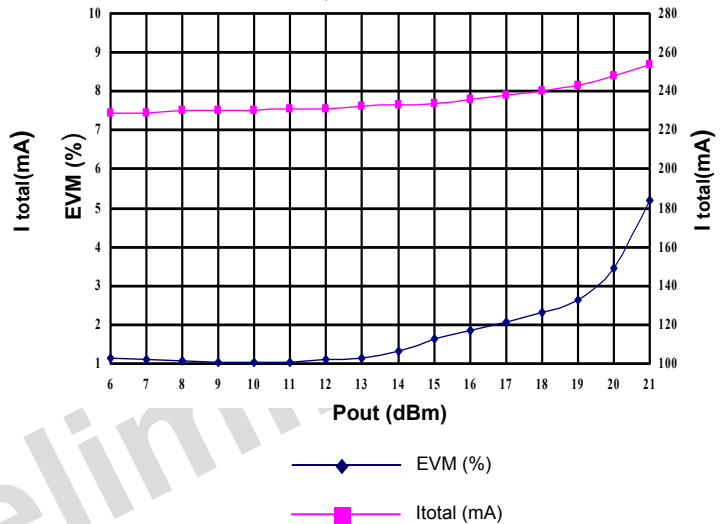


Fig. 15

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

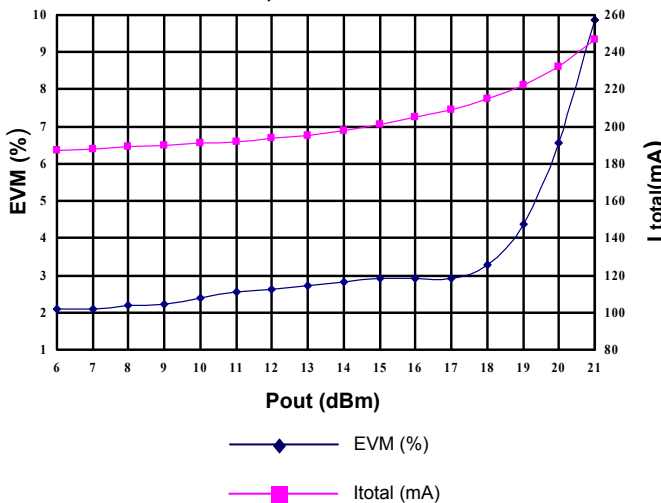
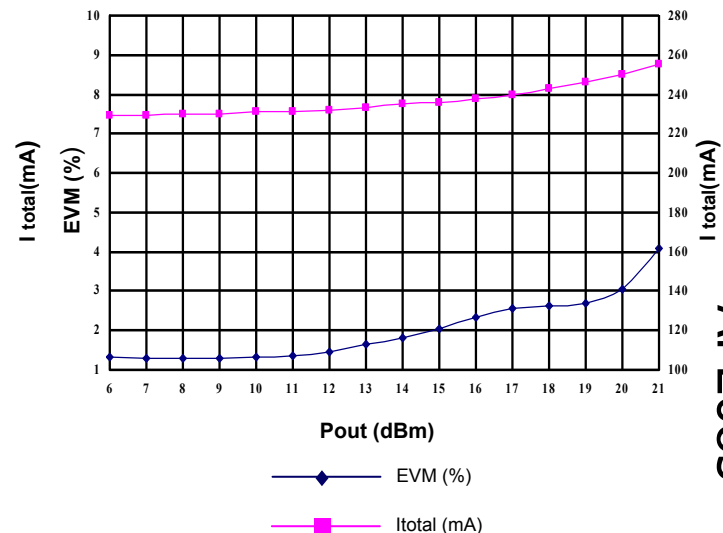


Fig. 16

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



For more information, please contact us at:

Sales Dept.

Tel: +886-2-2698-1022

e-mail: sales@rfintc.com

© 2004 RF Integrated Corporation. All rights reserved.

RF integrated Corp. reserved the right to make any changes to the specifications without notice.

2004.08.06 Preliminary

Data Charts

Fig. 17

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

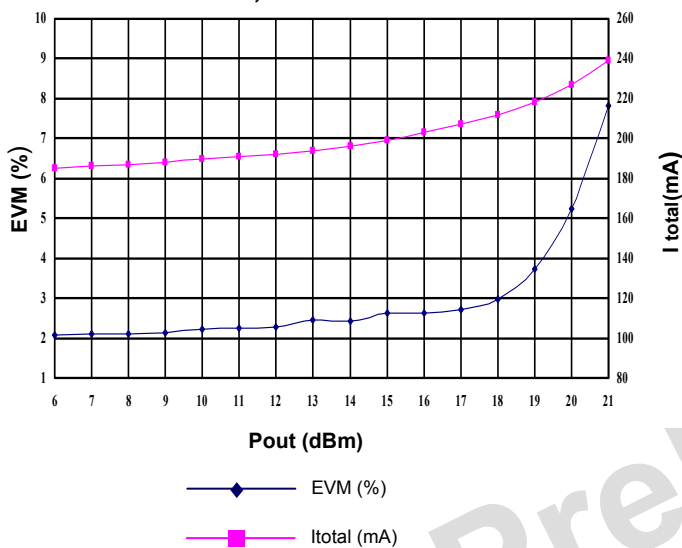


Fig. 18

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

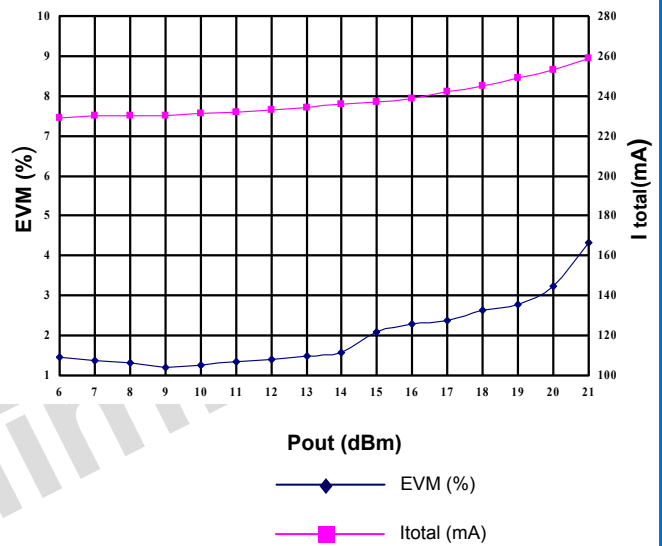


Fig. 19

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

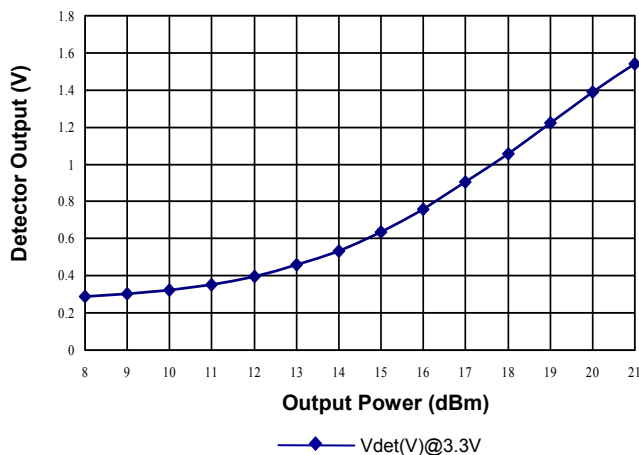
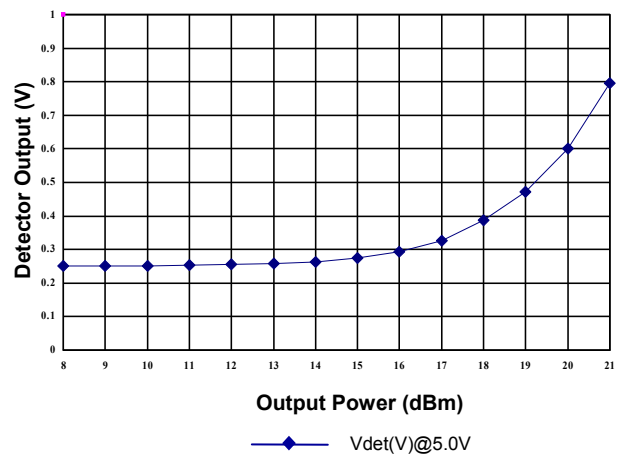


Fig. 20

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



For more information, please contact us at:

Sales Dept.

Tel: +886-2-2698-1022

e-mail: sales@rfintc.com

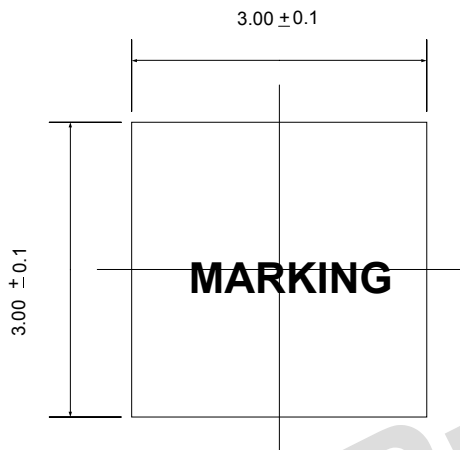
© 2004 RF Integrated Corporation. All rights reserved.

RF integrated Corp. reserved the right to make any changes to the specifications without notice.

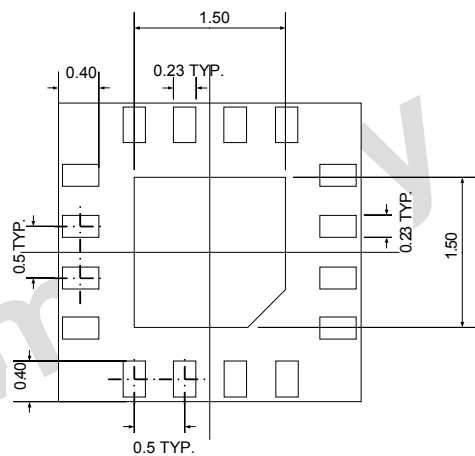
2004.08.06 Preliminary

Package Outline

Top View

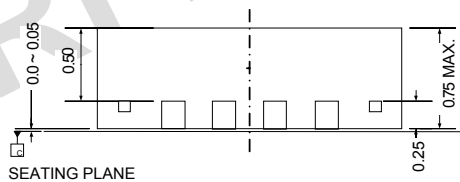


Bottom View



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.

For more information, please contact us at:

Sales Dept.

Tel: +886-2-2698-1022

e-mail: sales@rfintc.com

© 2004 RF Integrated Corporation. All rights reserved.

RF integrated Corp. reserved the right to make any changes to the specifications without notice.