

RFIC Preliminary 2018.01 Rev3.0

DESCRIPTION

The AP1076 is a 2.4~ 2.5 GHz linear power amplifier MMIC (Microwave Monolithic Integrated Circuit) fabricated with InGaP HBT process. Input match and a power detector are incorporated on-chip for ease of use, while external output match is used to provide the flexibility the users with the flexibility in system optimization. The device is intended for use in WLAN IEEE802.11b/g/n/ac applications. It also serves as a general purpose PA solution for ISM band wireless systems requiring high power and/or high linearity.

The AP1076 is provided in a 3x3 mm, 16 pin QFN (Quad Flat No-leads) package.

KEY FEATURES

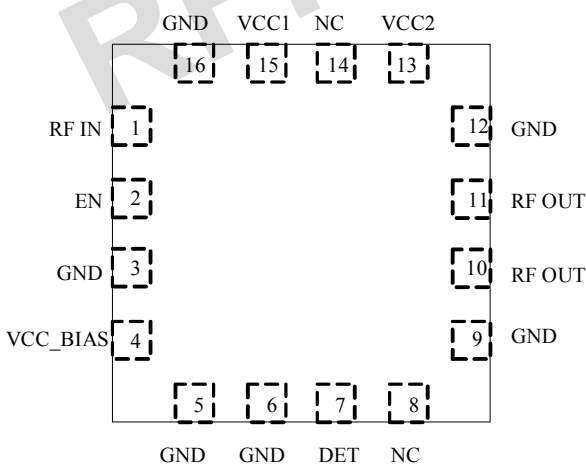
5V Condition Performance

- Quiescent Current
270mA
- High Linearity:
26dBm @ EVM = 3 %, with 64QAM OFDM
- High PAE:
17% @ 26dBm
- High Gain:
32dB Power Gain
- On Chip Detector

Major Applications

- IEEE 802.11b/g/n
- IEEE 802.11ac 256QAM
- 2.4 GHz ISM Band Application
- Suitable for high power WLAN applications
- High power WLAN AP Router applications
- Portable/ Embedded RF module

Pin Assignment



QFN-16pin, 3x3 (mm)

Pin Details

Pin Number	Name	Description
1	RF IN	RF input.
2	EN	Power Amplifier Enable
3	GND	Ground.
4	VCC_BIAS	Supply voltage for bias circuit.
5	GND	Ground.
6	GND	Ground.
7	DET	Detector output voltage.
8	NC	No connection
9	GND	Ground.
10	RF OUT	RF output
11	RF OUT	RF output
12	GND	Ground.
13	VCC2	PA 2 nd stage supply voltage.
14	NC	No connection
15	VCC1	PA 1 st stage supply voltage.
16	GND	Ground.
Pkg Base	Center Metal	The package ground provides circuit ground as well as heat dissipation path for the power amplifier.

AP1076

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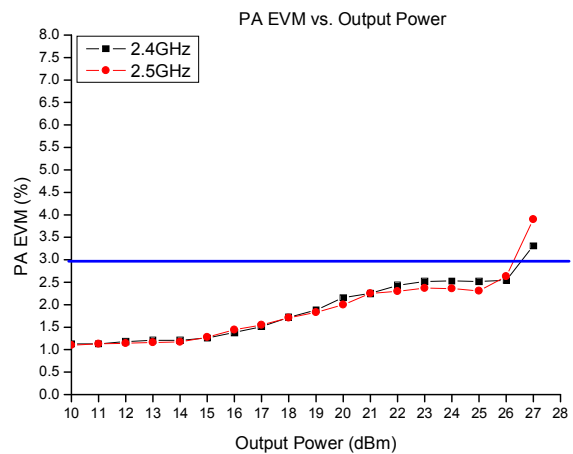
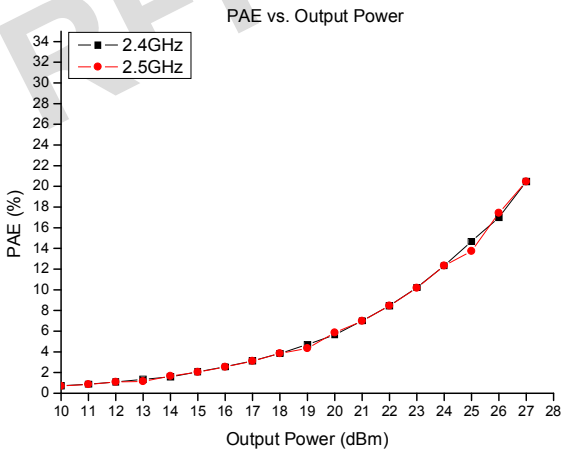
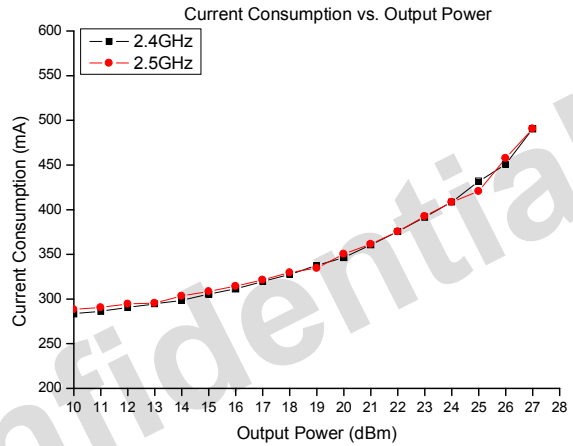
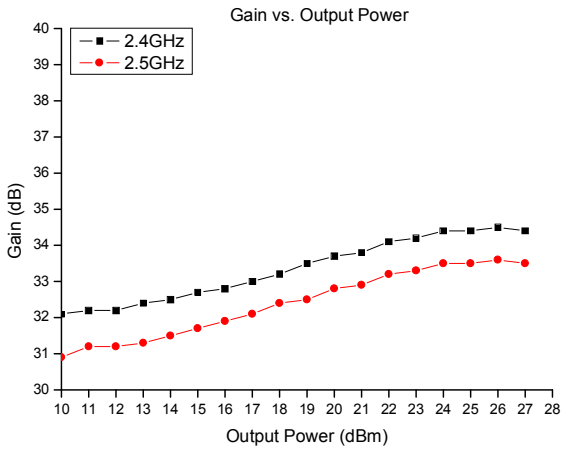
Electrical Characteristics

(VCC = 5V, Vref = 1.8V, TA = 25°C as Measured on the Evaluation Board , Unless Otherwise Noted)

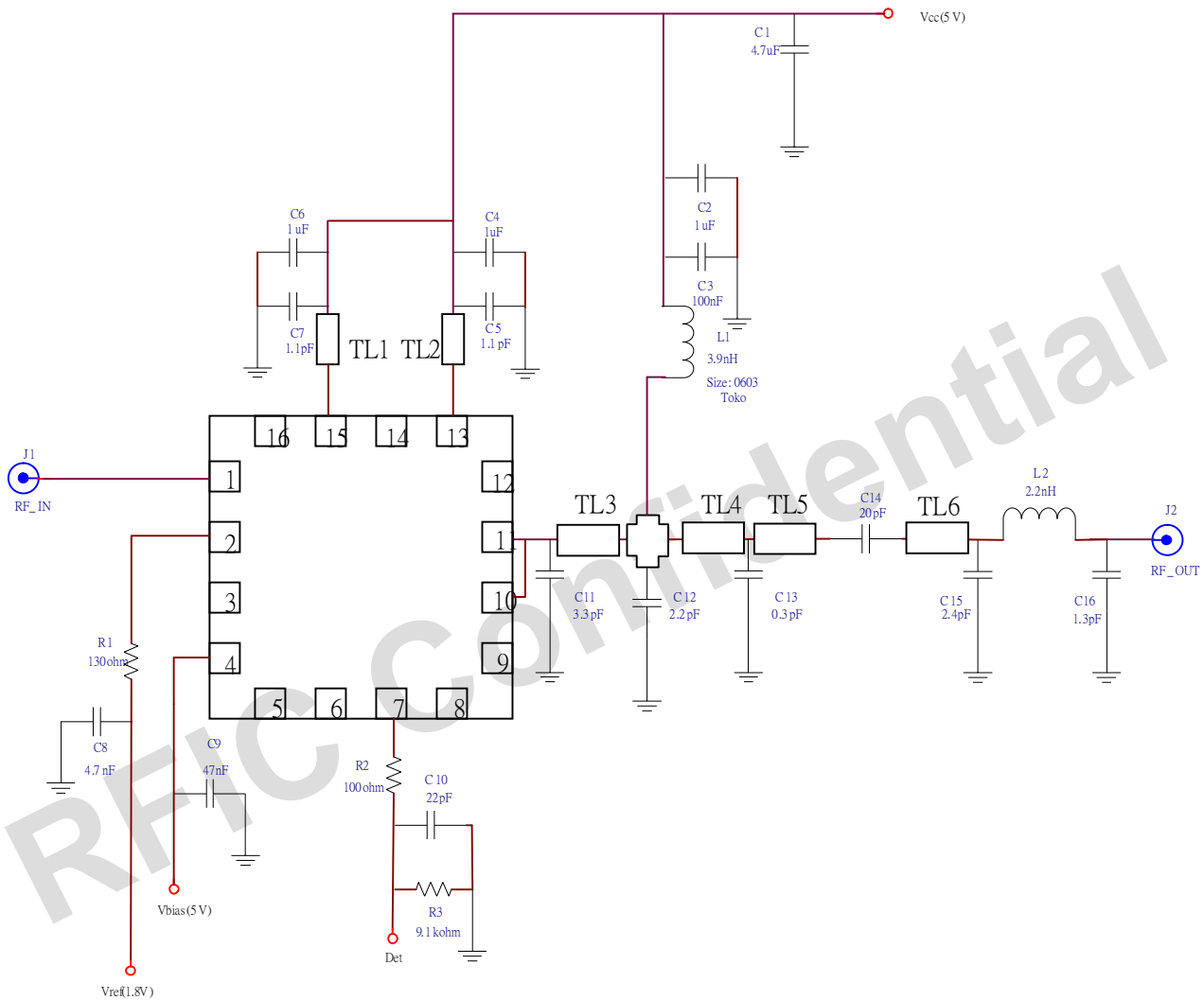
Parameter	Specification			Units	Notes
	Min	Typ.	Max		
Frequency	2.4		2.5	GHz	
Input return loss	15		20	dB	S11
Output return loss	10		15	dB	S22
OP1dB		33		dBm	CW signal
Power Gain	30	32	34	dB	
Linear Power	23	23.5 18	24	dBm	MCS8, HT40, 1.8% EVM MCS8, HT40, 1.25% EVM MCS7, HT20, 3% EVM MCS0, HT20, mask MCS0, HT40, mask
Harmonics	-55 -50	-50 -47	-42 -42	dBm/ MHz	2fo @ 29dBm, CCK signal, BT = 0.045 3fo @ 29dBm, CCK signal, BT = 0.045
Iref		1		mA	@ Idle current
Idle current	260		280	mA	
Current Consumption	360 300 450		400 360 510	mA	@ 23.5 dBm, MCS8, HT40, 1.8% EVM @ 18 dBm, MCS8, HT40, 1.25% EVM @ 26 dBm, MCS7, HT20, 3% EVM
Gain flatness		1		dB	100MHz bandwidth
PAE	11.2 15.6		12.4 17.7	%	@ 23.5 dBm, MCS8, HT40, 1.8% EVM @ 26 dBm, MCS7, HT20, 3% EVM
Detector output		1.5		V	@ 26dBm, OFDM signal, MCS7, HT20 mode

Note 1: Performance is guaranteed only under the conditions listed in this Table.

Electrical Characteristics Charts $V_{cc} = 5V$



AP1076 Evaluation Board Schematic Diagram for 5V Application



Transmission Line (50Ω)	Physical Length (mm)	Length Measurement
TL1	0.78	IC edge to C7 center
TL2	0.78	IC edge to C5 center
TL3	1.35	C11 center to C12 center
TL4	1.76	C12 center to C13 center
TL5	0.86	C13 center to C14 center
TL6	0.8	C14 center to C15 center

For more information, please contact us at:

Sales Dept.

Tel: +886-2-2698-1022

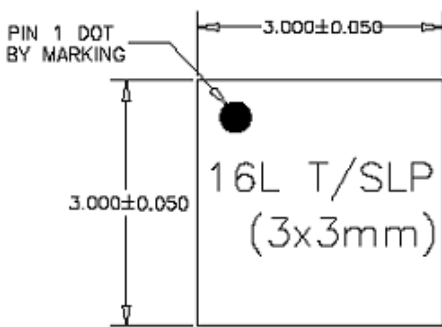
e-mail: sales@rfintc.com

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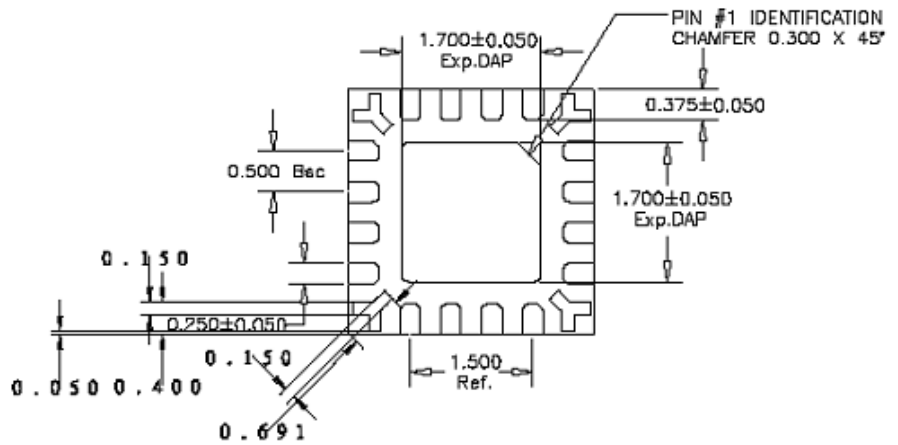
RFIC Technology Corp. reserved the right to make any changes to the specifications without notice.

Package Outline

Top View



Bottom View



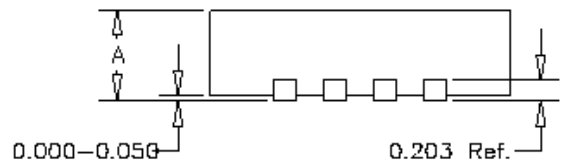
Side View

Unit: mm

NOTE:

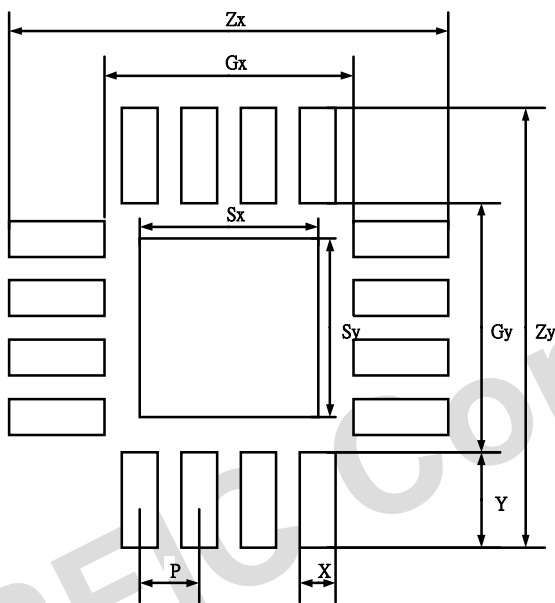
- 1) TSLP AND SLP SHARE THE SAME EXPOSE OUTLINE BUT WITH DIFFERENT THICKNESS:

A		TSLP	SLP
	MAX.	0.800	0.900
NOM.	0.750	0.850	
MIN.	0.700	0.800	

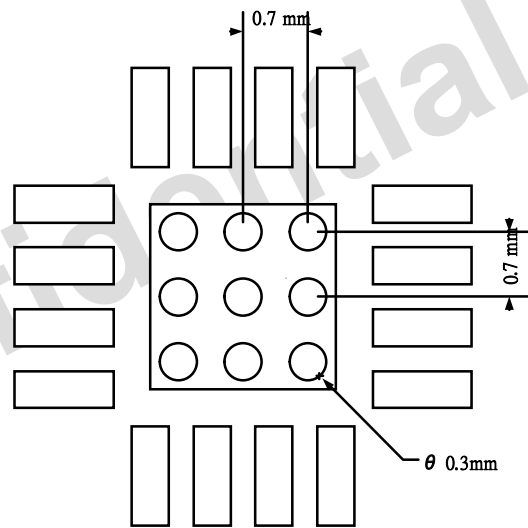


Suggested PCB Layout

I/O Pin, Central PAD Layout



Thermal PAD Via Design



PCB Footprint Dimension (mm)

P	X	Y	Sx	Sy	Gx	Gy	Zx	Zy
0.5	0.3	0.85	1.5	1.5	2.1	2.1	3.8	3.8



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The product is designed and manufactured for consumer application only and is not intended for any application listed below which requires especially high reliability for the prevention of such defect which could lead to personal injury, death, physical or environmental damage.

- Aircraft equipment.
- Aerospace equipment.
- Undersea equipment.
- Medical equipment.
- Life-saving or life-sustaining applications
- Transportation equipment (vehicles, trains, ships, etc.).
- Traffic signal equipment.
- Disaster prevention / crime prevention equipment.
- Application of similar complexity and/ or reliability requirements to the applications listed in the above.

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