

Description

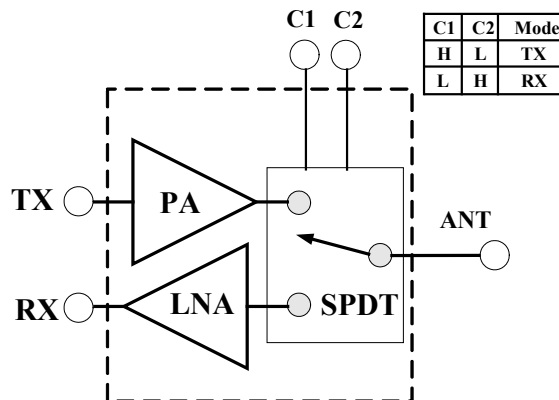
The MCP01 contains a power amplifier (PA), a low noise amplifier (LNA), and a SPDT switch. It is a 16-pins IC by 3×3mm²-QFN package. RF input and output impedance of MCP01 are 50Ω matched. Therefore, precious real estate of circuit board is saved when MCP01 is used. Besides, there is one more precious advantage of MCP01. MCP01 and MABT01 are pin-to-pin compatible. Compared with MABT01, MCP01's maximum output power is 5dB higher but consumes around 50mA more of current. When low consumption current is critical in a different wireless communication market, the MCP01 in the original circuit board can be replaced by MABT01 directly without modification of the original PCB. With the use of MCP01, it will offer convenience, flexibility and cost saving.

Features

- 19dBm P1dB and 22dB gain for transmitting RF signal
- 2.2dB NF and 12dB gain for receiving RF signal
- All PA, LNA and SPDT switch contained in a 16 pins 3×3mm²-QFN package
- Adjustable turn-on voltage levels

Applications

- Bluetooth
- 2.4 GHz ISM band application.
- Wireless phone



Absolute Maximum Ratings

DC Supply Voltage	6V
Total DC Supply Current	160 mA
RF Input Power	5 dBm
VSWR of Output Load	10:1
Operating Ambient Temperature	-40 °C to 85 °C
Storage Temperature	-60 °C to 150 °C
Maximum Junction Temperature (T _j max) °C	150 °C

Maxi-AMP INC (民瑞科技股份有限公司) Innovation Incubation Center, Rm.3A19, No.1, Sec. 1, Syuecheng Rd.,
 Dashu Township, Kaohsiung County, 840, Taiwan, R.O.C. . www.maxiamp.com

Maxi-AMP incorporation reserves the right of changing the specifications without any prior notice.

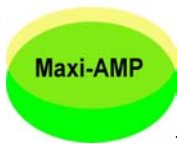
This device is ESD sensitive.

TEL : 0983001600, 0922305109, 0932698745, (07)343-1110,

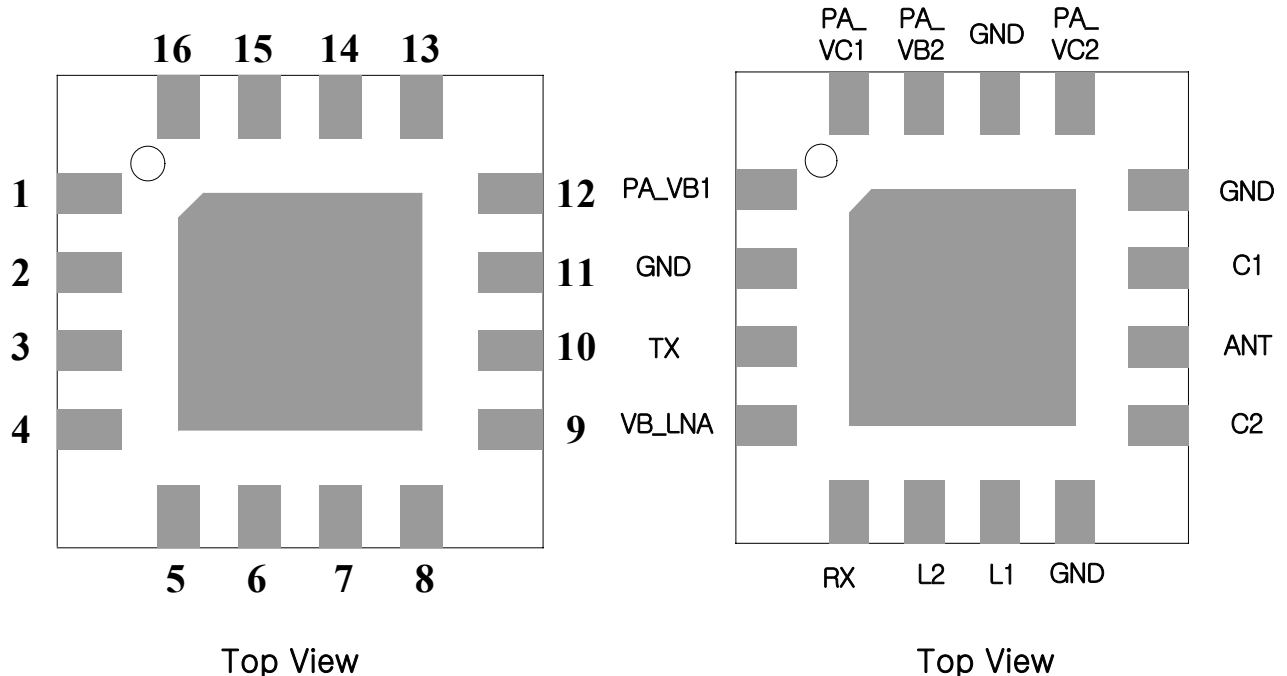
FAX : (07)657-9714 , Taiwan, R.O.C.

MCP01_r5. Preliminary data sheet, March/2011

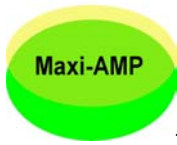
Page1/6



Pin Assignment



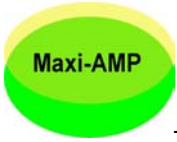
Pin No.	Name	Function
1	PA_VB1	Bias-voltage input for the 1 st -stage's base of PA
2	GND	Ground
3	TX	RF power input of PA
4	VB_LNA	Bias-voltage input for the base of LNA
5	RX	RF power output of LNA
6	L2	Connection pin for inductor
7	L1	Connection pin for inductor
8	GND	Ground
9	C2	Digital control voltage input of switch
10	ANT	Connection pin to antenna
11	C1	Digital control voltage input of switch
12	GND	Ground
13	PA_VC2	Bias-voltage input for the 2 nd -stage's collector of PA
14	GND	Ground
15	PA_VB2	Bias-voltage input for the 2 nd -stage's base of PA
16	PA_VC1	Bias-voltage input for the 1 st -stage's collector of PA



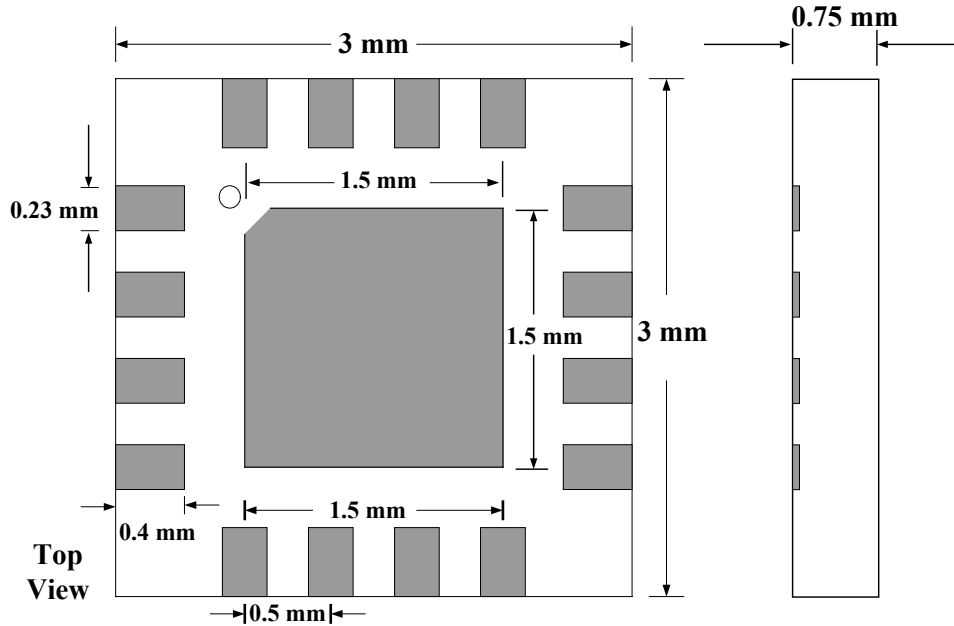
Electrical Characteristics (Temperature=25°C)

Parameter	Symbol	Description	Min.	Typical	Max.	Units
Frequency Range	Freq		2.4	2.45	2.5	GHz
DC Supply Voltage	V _{CC}			3.3		V
Collector's Supply Current (PA)	I _{PA_C}	Total collector currents		65		mA
Collector's DC Supply Current (LNA)	I _{LNA_C}			7		mA
Base's DC Supply Current (PA)	I _{PA_B}				1	mA
Base's DC Supply Current (LNA)	I _{LNB_B}				0.1	mA
Input Voltage of C1	V _{C1}	'1' ranges from 2.2V to V _{CC} '0' ranges 0V to 0.2V.	0		V _{CC}	V
Input Voltage of C2	V _{C2}	'1' ranges from 2.2V to V _{CC} '0' ranges 0V to 0.2V.	0		V _{CC}	V
PA's Small-Signal Power Gain	G _{PA}	V _{C1} ='1', V _{C2} ='0' Including 0.5dB loss by switch		22		dB
LNA's Small-Signal Power Gain	G _{LNA}	V _{C1} ='0', V _{C2} ='1' Including 0.5dB loss by switch		12		dB
Gain Flatness (PA)				1		dB
Gain Flatness (LNA)				0.3		dB
Noise Figure of LNA	NF	Including 0.5dB loss by switch		2.2		dB
P1dB (PA)	P1dB_P	Including 0.5dB loss by switch		19		dBm
P1dB (LNA)	P1dB_L			2.3		dBm
2 nd Harmonics (PA)	2fo	18dBm RF power at pin ANT		-27		dBc
3 rd Harmonics (PA)	3fo	18dBm RF power at pin ANT		-45		dBc
Input Return Loss of PA	S11 _{PA_IN}	Small-signal, V _{C1} ='1', V _{C2} ='0'		-8		dB
Input Return Loss of LNA	S11 _{ANT}	Small-signal, V _{C1} ='0', V _{C2} ='1'		-9		dB
Output Return Loss of LNA	S22 _{LNA_OUT}	Small-signal, V _{C1} ='0', V _{C2} ='1'		-10		dB
Isolation		18dBm RF power at pin ANT V _{C1} ='1', V _{C2} ='0', from pin ANT to pin RX		-31		dB

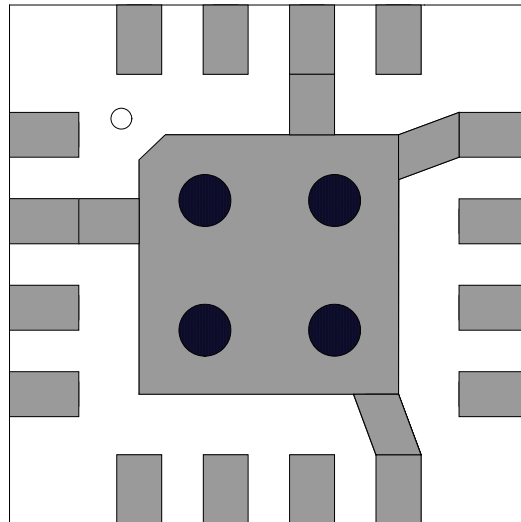
* If not specified, all data are measured at 2.45 GHz.



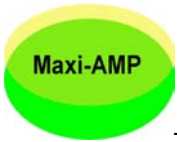
Dimensions of Package



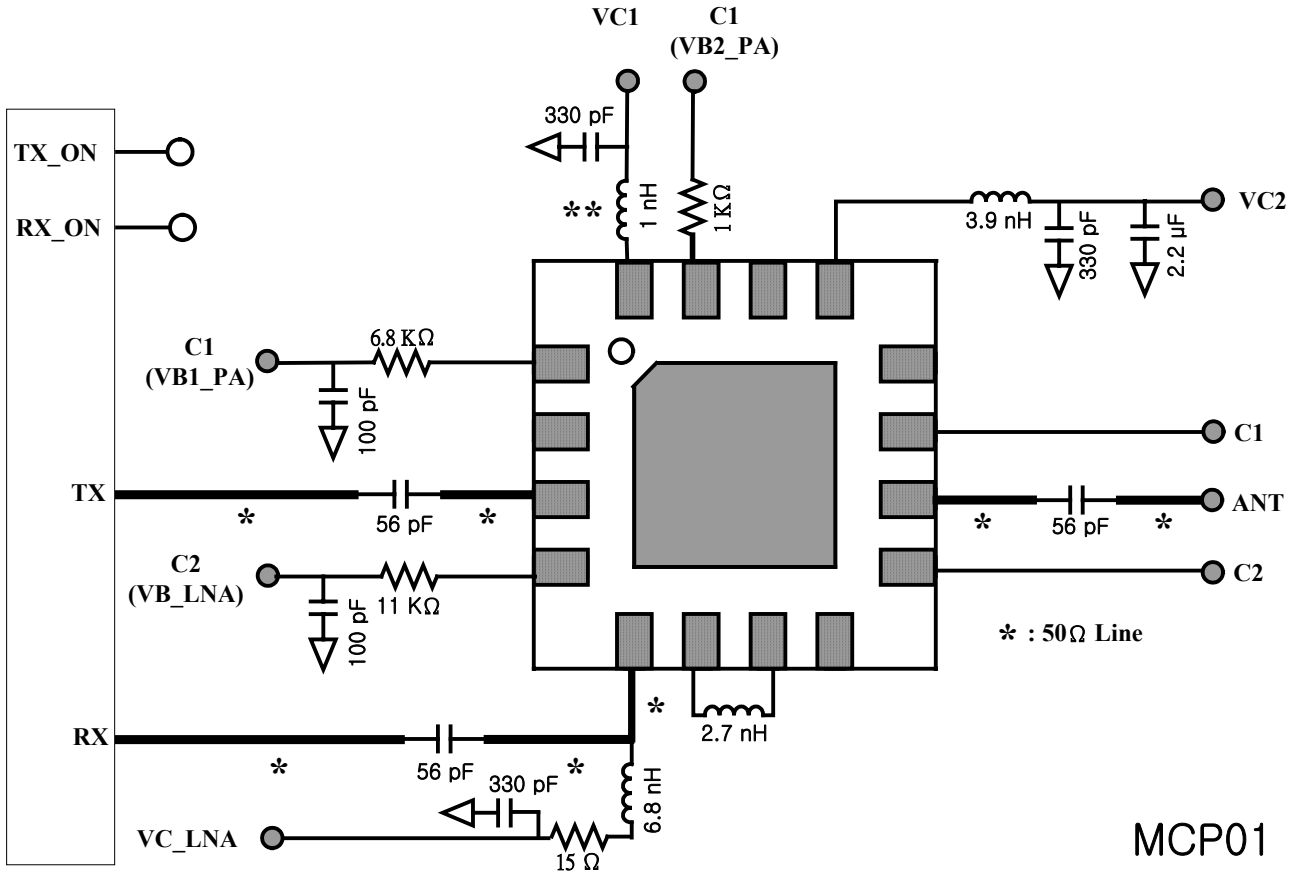
Land Pattern



Top View

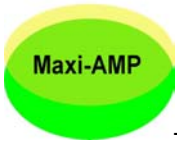


Application Circuit

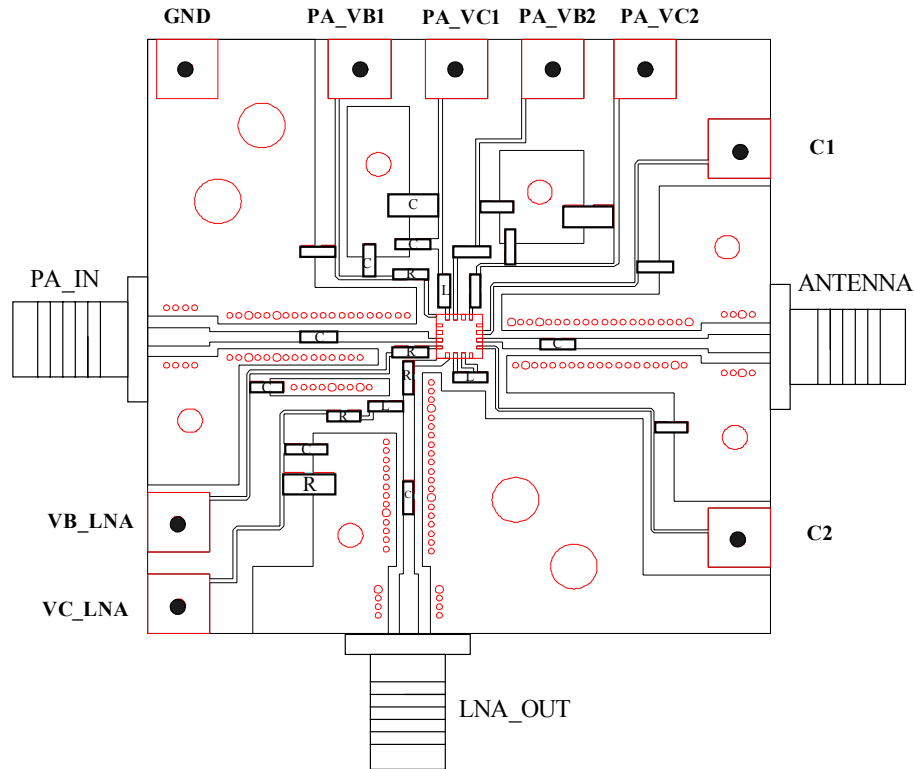


** The connection length from the edge of 330 pF to the edge of pin-16 must be less than 150mil.

On the above application circuit, ports VC1, VC2, and VC_LNA are connected to fixed bias, such as 3.3V. Ports C1, C2, VB_LNA, VB1_PA and VB2_PA are used as on/off control as well as bias control for PA and LNA. Usually, C1, VB1_PA, and VB2_PA are connected to TX_ON, C2 and VB_LNA are connected to RX_ON. Both TX_ON and RX_ON are digital control signals that are provided by transceiver or base-band chip. When TX_ON outputs “high”, it indicates the system is in the transmitting mode. When RX_ON outputs “high”, it indicates the system is in the receiving mode. Resistors 1KΩ, 6.8KΩ and 11KΩ are for TX_ON and RX_ON that are operated at 3.3V. Their values need to be changed if different voltage level of TX_ON and RX_ON (such as 2.7V) are used. You may contact us for proper resistor’s values.



Evaluation Board



Name	Function
GND	Ground
PA_VB1	Bias-voltage input for the 1 st -stage's base of PA
PA_VC1	Bias-voltage input for the 1 st -stage's collector of PA
PA_VB2	Bias-voltage input for the 2 nd -stage's base of PA
PA_VC2	Bias-voltage input for the 2 nd -stage's collector of PA
C1	Digital control voltage input of switch
C2	Digital control voltage input of switch
VC_LNA	Bias-voltage input for the collector of LNA
VB_LNA	Bias-voltage input for the base of LNA

No liability is assumed by Maxi-AMP Incorporation for use any information contained in this document, or for infringement of any patent rights of a third party, which may result from such use.

Maxi-AMP INC (民瑞科技股份有限公司) Innovation Incubation Center, Rm.3A19, No.1, Sec. 1, Syuecheng Rd., Dashu Township, Kaohsiung County, 840, Taiwan, R.O.C. www.maxiamp.com

Maxi-AMP incorporation reserves the right of changing the specifications without any prior notice.

This device is ESD sensitive.

TEL : 0983001600, 0922305109, 0932698745, (07)343-1110,

FAX : (07)657-9714 , Taiwan, R.O.C.

MCP01_r5. Preliminary data sheet, March/2011

Page6/6