



AN_A9129M0F7_HW_U00

Preliminary

Application Note AN_A9129M0F7_HW_U00

General Information

AMICCOM CONFIDENTIAL



Document Title

Application Note AN9129M0F7_HW_U00

Revision History

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1. Crystal Selection Guide

To select an appropriate crystal for A9129M0F7 is important for good RF performance. If users are not familiar with how to choose the X'tal, we suggest them to use the one in BOM of MD9129M0F7 module spec. The X'tal spec. shown in table 1~5 are some suitable examples for different applications. Users can also get more information in “*FQA_0001_Xtal Selection*”. Users can adjust carrier frequency by INTXC [01C4] and XCL [01C8]. Please read A9129M0F7 datasheet or contact our FAE for detail.

- X'tal Type: 49S
- X'tal Load Capacitance: 20pF
- X'tal Shunt Capacitance: 7pF
- X'tal Drive Level: 100uW typ.
- X'tal Equivalent Series Resistor (ESR): $\leq 100\Omega$ *1

Annotation 1 :

A9129M0F7 can works well with an X'tal with ESR < 100 Ω . However, the X'tal settling time will get longer with higher ESR. The X'tal shown in BOM of MD9129M0F7 module spec. is fully tested. If users have problems with X'tal selection, please contact your X'tal supplier or AMICCOM's FAE.

Table 1 : 868 MHz Band

IFBW (KHz)	DR (Kbps)	Deviation (Kbps)	X'tal Frequency (MHz)	TRx are both in the same temperature		One of TRx is in room temperature		One of TRx is above room temperature and the other one is below room temperature	
				Tolerance (ppm)	Stability (ppm)	Tolerance (ppm)	Stability (ppm)	Tolerance (ppm)	Stability (ppm)
50	10	18.75	12.8	x	x	x	x	x	x
100	10	37.5	12.8	20	20	10	10	x	x
100	100	37.5	12.8	15	20	x	x	x	x
150	150	56.25	19.2	20	20	10	15	x	x
250	250	93.75	16	20	20	20	20	10	15

Annotation 2 : “x” means not suggestion.

2. Application Circuit and Layout Guide

2.1 Application Circuit

A9129M0F7 is AMICCOM's reference design for sub 1GHz application (please see module spec. for the last update). The schematic is as Fig. 2.1a and the layout is as Fig. 2.1b. This document mainly notifies some key points which should be paid attention while doing PCB layout.

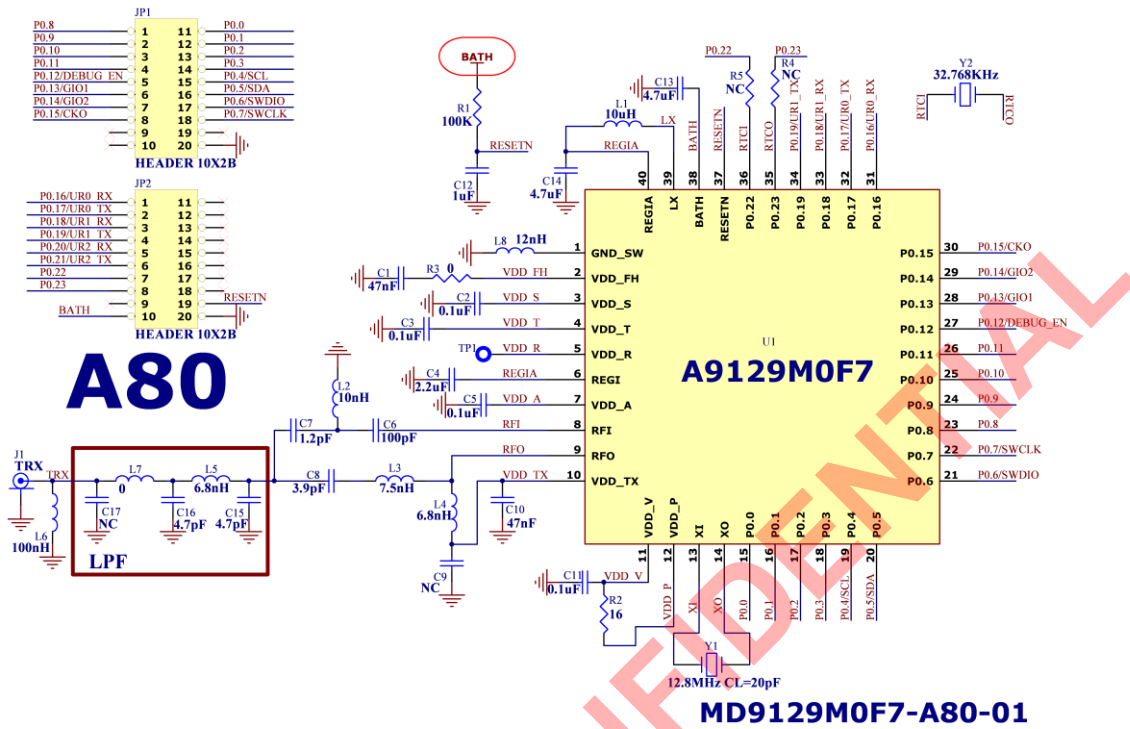


Fig. 2.1a Schematic of MD9129M0F7-A80

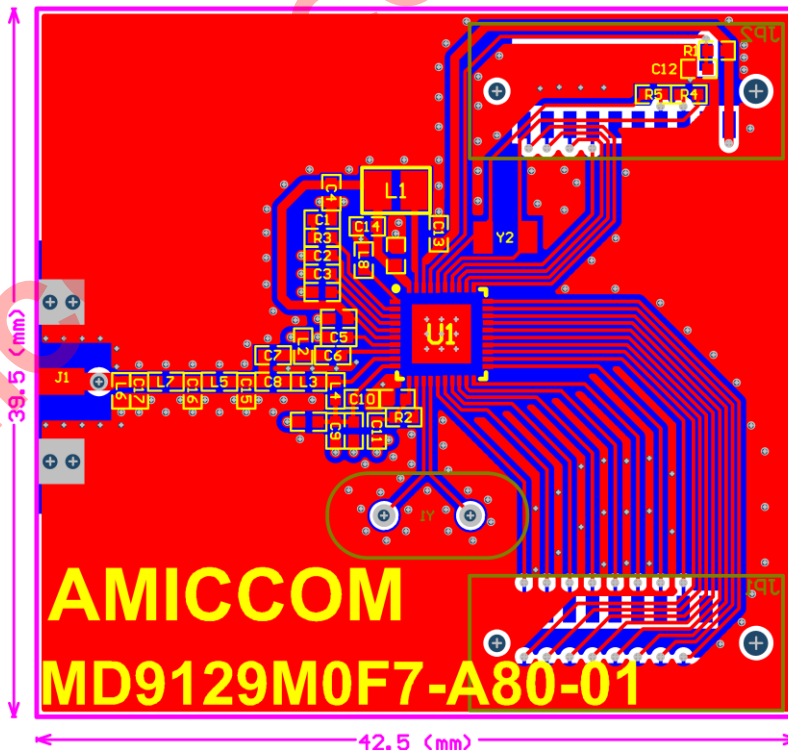


Fig. 2.1b Layout of MD9129M0F7-A80

2.2 Layout Guide

1. Bad ground plane always induce poor RF performance. Hence, a solid ground where it under the IC should be intact and not fragmentary can make the best RF performance of A9129M0F7. Please refer to Fig. 2.2a.

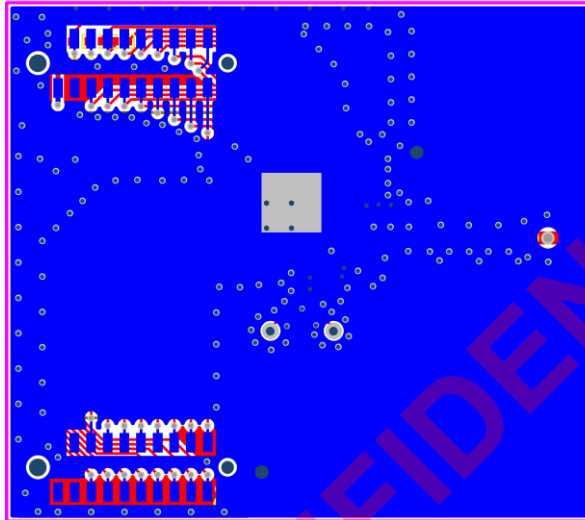


Fig. 2.2a solid ground for Bottom-layer (2L PCB)

2. The impedance of RF path should be as close to 50 ohm as possible, and the RF trace should also be as short as possible. The ground plane below all RF traces must be intact and not fragmentary. The matching network (L3, L2, C6, C7, L4, C8) and LPF (C15, L5, C16, L7 and C17) should be placed close to A9129M0F7 IC because the matching network affects RF performance (power, and current) heavily. Therefore, we strongly recommend user to follow components placement and layout where shown in Fig. 2.2b without any change.

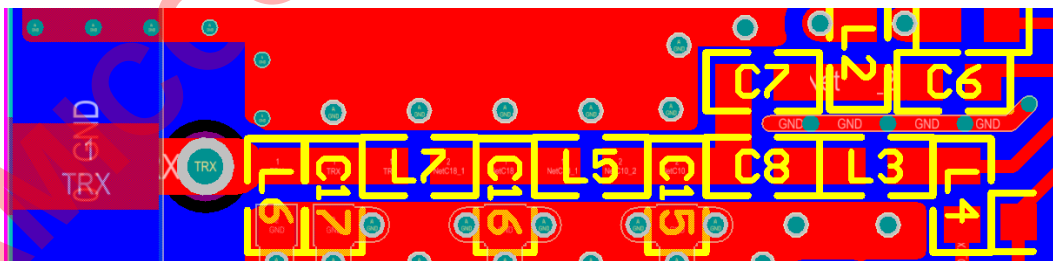


Fig. 2.2b RF matching

3. In addition to ground plane, the clean and stable VDD source is also a key factor to impact RF performance. The bypass capacitor (C5, C13, C14, C10, C11, C2, and C3) on this reference design is used for this purpose. To have the clean VDD source to A9129M0F7, those capacitors should be placed as close to the IC pins as possible and its ground via should be just nearby the components ground pad. Please refer to Fig. 2.1b.

4. The X'tal traces should be as short as possible and are better to be isolated by ground via. In addition, to minimize cross talk issue, components placement shall be as far away to X'tal trace as possible. Please refer to the white traces in Fig. 2.2c.

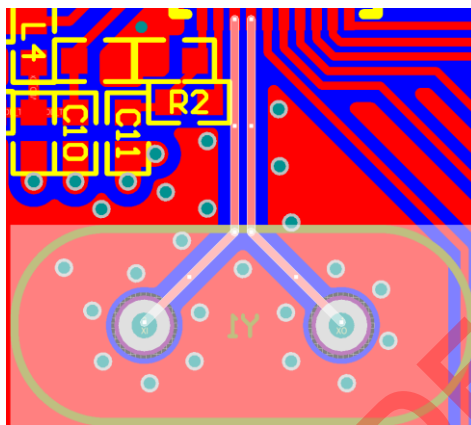


Fig. 2.2c X'tal trace

3. Tx Power Control Setting

Users can get different TX power by setting TDC (TX Current Select), and TBG (Tx Buffer Gain), PAC (PA Current Select) in register [0104] as the tables below. The default setting for A9129M0F7 is TBG=62, TCD=2, PAC=1). The power maybe change between different modules because the variation of components.

MD9129M0F7-A80 power control setting (868MHz)

A80 DCDC1.5V Avg.		PAC=0						
TDC	0		1		2		3	
TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)
0	-36.1	4.9	-36.1	4.9	-36.1	4.9	-36.1	4.9
1	-35.0	5.0	-31.3	5.9	-29.6	6.5	-28.5	7.0
2	-34.5	5.0	-30.8	5.9	-29.0	6.5	-27.9	7.0
3	-34.0	5.0	-30.2	5.9	-28.4	6.5	-27.3	7.0
4	-33.5	5.0	-29.7	5.9	-27.8	6.6	-26.7	7.0
5	-33.0	5.0	-29.1	5.9	-27.3	6.6	-26.1	7.0
6	-32.5	5.0	-28.6	5.9	-26.7	6.6	-25.5	7.0
7	-32.0	5.0	-28.0	5.9	-26.1	6.6	-25.0	7.0
8	-31.5	5.0	-27.5	5.9	-25.5	6.6	-24.3	7.1
9	-31.0	5.0	-26.9	5.9	-24.9	6.6	-23.7	7.1

MD9129M0F7-A80 power control setting (868MHz)(續)

A80 DCDC1.5V Avg.		PAC=0							
TDC	0		1		2		3		
TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	
10	-30.5	5.0	-26.4	6.0	-24.4	6.6	-23.2	7.1	
11	-30.0	5.0	-25.8	6.0	-23.8	6.6	-22.6	7.1	
12	-29.5	5.0	-25.2	6.0	-23.2	6.6	-22.0	7.1	
13	-29.0	5.0	-24.7	6.0	-22.6	6.7	-21.3	7.1	
14	-28.5	5.0	-24.1	6.0	-22.0	6.7	-20.8	7.1	
15	-28.0	5.0	-23.5	6.0	-21.4	6.7	-20.2	7.2	
16	-27.4	5.1	-22.9	6.0	-20.8	6.7	-19.5	7.2	
17	-26.9	5.1	-22.3	6.0	-20.2	6.7	-18.8	7.2	
18	-26.4	5.1	-21.7	6.1	-19.6	6.7	-18.3	7.2	
19	-25.9	5.1	-21.1	6.1	-19.0	6.8	-17.6	7.2	
20	-25.3	5.1	-20.5	6.1	-18.3	6.8	-17.0	7.3	
21	-24.8	5.1	-19.9	6.1	-17.7	6.8	-16.3	7.3	
22	-24.3	5.1	-19.3	6.1	-17.1	6.8	-15.7	7.3	
23	-23.7	5.1	-18.7	6.1	-16.5	6.9	-15.1	7.4	
24	-23.1	5.1	-18.1	6.2	-15.8	6.9	-14.4	7.4	
25	-22.6	5.2	-17.4	6.2	-15.1	6.9	-13.8	7.4	
26	-22.0	5.2	-16.8	6.2	-14.5	7.0	-13.2	7.5	
27	-21.5	5.2	-16.2	6.3	-13.9	7.0	-12.5	7.5	
28	-20.9	5.2	-15.5	6.3	-13.2	7.0	-11.9	7.6	
29	-20.3	5.2	-14.9	6.3	-12.6	7.1	-11.2	7.6	
30	-19.8	5.3	-14.3	6.4	-11.9	7.1	-10.6	7.7	
31	-19.2	5.3	-13.6	6.4	-11.3	7.2	-9.9	7.7	
32	-18.6	5.3	-13.0	6.5	-10.7	7.3	-9.3	7.8	
33	-18.0	5.3	-12.4	6.5	-10.0	7.3	-8.7	7.9	
34	-17.5	5.4	-11.7	6.6	-9.4	7.4	-8.1	7.9	
35	-16.9	5.4	-11.1	6.6	-8.7	7.4	-7.4	8.0	
36	-16.2	5.4	-10.4	6.7	-8.0	7.5	-6.7	8.1	
37	-15.6	5.5	-9.7	6.8	-7.4	7.6	-6.1	8.2	
38	-15.0	5.5	-9.0	6.8	-6.7	7.7	-5.4	8.3	
39	-14.4	5.5	-8.4	6.9	-6.1	7.8	-4.8	8.4	
40	-13.6	5.6	-7.6	7.0	-5.3	7.9	-4.0	8.6	

MD9129M0F7-A80 power control setting (868MHz)(續)

A80 DCDC1.5V Avg.		PAC=0							
TDC	0		1		2		3		
TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	
41	-13.0	5.7	-6.9	7.1	-4.6	8.1	-3.4	8.7	
42	-12.4	5.7	-6.3	7.2	-4.0	8.2	-2.7	8.8	
43	-11.7	5.8	-5.6	7.3	-3.3	8.3	-2.1	9.0	
44	-11.0	5.8	-4.8	7.5	-2.6	8.5	-1.4	9.2	
45	-10.3	5.9	-4.2	7.6	-1.9	8.6	-0.7	9.4	
46	-9.7	6.0	-3.5	7.7	-1.3	8.8	-0.1	9.6	
47	-9.0	6.1	-2.8	7.9	-0.6	9.0	0.6	9.8	
48	-8.1	6.2	-1.9	8.1	0.3	9.3	1.4	10.0	
49	-7.4	6.3	-1.2	8.3	1.0	9.5	2.1	10.3	
50	-6.8	6.4	-0.5	8.5	1.7	9.8	2.7	10.5	
51	-6.0	6.5	0.2	8.8	2.3	10.0	3.3	10.8	
52	-5.2	6.7	1.0	9.0	3.1	10.4	4.0	11.1	
53	-4.4	6.9	1.8	9.3	3.7	10.7	4.6	11.4	
54	-3.7	7.0	2.5	9.6	4.4	11.0	5.2	11.7	
55	-2.8	7.3	3.2	9.9	5.0	11.3	5.8	12.1	
56	-1.8	7.6	4.1	10.4	5.8	11.8	6.5	12.5	
57	-0.9	7.8	4.8	10.8	6.4	12.1	7.0	12.9	
58	0.1	8.2	5.5	11.2	7.0	12.5	7.5	13.2	
59	1.1	8.6	6.2	11.7	7.5	13.0	8.0	13.6	
60	2.3	9.1	6.9	12.2	8.1	13.5	8.5	14.1	
61	3.4	9.6	7.6	12.8	8.6	14.0	9.0	14.6	
62	4.4	10.2	8.2	13.4	9.1	14.5	9.4	15.1	
63	5.2	10.9	8.7	14.0	9.5	15.1	9.8	15.6	

A80 DCDC1.5V Avg.		PAC=1							
TDC	0		1		2		3		
TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	
0	-36.1	4.9	-36.1	4.9	-36.1	4.9	-35.5	4.9	
1	-26.5	5.3	-23.0	6.2	-21.5	6.9	-20.5	7.4	

MD9129M0F7-A80 power control setting (868MHz)(續)

A80 DCDC1.5V Avg.	PAC=1								
	TDC	0		1		2		3	
	TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)
2	-26.0	5.3	-22.5	6.2	-21.0	6.9	-20.0	7.4	
3	-25.5	5.3	-22.0	6.2	-20.5	6.9	-19.5	7.4	
4	-25.0	5.3	-21.5	6.3	-20.0	6.9	-19.0	7.4	
5	-24.6	5.3	-21.1	6.3	-19.5	6.9	-18.5	7.4	
6	-24.1	5.3	-20.6	6.3	-19.0	7.0	-18.0	7.5	
7	-23.7	5.3	-20.1	6.3	-18.5	7.0	-17.5	7.5	
8	-23.2	5.3	-19.6	6.3	-18.0	7.0	-17.0	7.5	
9	-22.7	5.4	-19.1	6.3	-17.5	7.0	-16.5	7.5	
10	-22.3	5.4	-18.7	6.4	-17.0	7.1	-16.0	7.5	
11	-21.8	5.4	-18.2	6.4	-16.5	7.1	-15.5	7.6	
12	-21.4	5.4	-17.7	6.4	-16.0	7.1	-15.0	7.6	
13	-20.9	5.4	-17.2	6.4	-15.5	7.1	-14.5	7.6	
14	-20.5	5.4	-16.8	6.4	-15.1	7.1	-14.0	7.6	
15	-20.0	5.4	-16.3	6.5	-14.6	7.2	-13.6	7.7	
16	-19.5	5.5	-15.7	6.5	-14.0	7.2	-13.0	7.7	
17	-19.1	5.5	-15.3	6.5	-13.5	7.2	-12.5	7.7	
18	-18.7	5.5	-14.8	6.5	-13.1	7.3	-12.0	7.8	
19	-18.2	5.5	-14.3	6.6	-12.6	7.3	-11.5	7.8	
20	-17.7	5.5	-13.8	6.6	-12.1	7.3	-11.0	7.9	
21	-17.3	5.6	-13.3	6.6	-11.6	7.4	-10.5	7.9	
22	-16.8	5.6	-12.9	6.7	-11.1	7.4	-10.0	8.0	
23	-16.4	5.6	-12.4	6.7	-10.6	7.5	-9.6	8.0	
24	-15.9	5.6	-11.9	6.8	-10.1	7.5	-9.0	8.1	
25	-15.4	5.7	-11.4	6.8	-9.6	7.6	-8.5	8.1	
26	-15.0	5.7	-10.9	6.8	-9.1	7.6	-8.0	8.2	
27	-14.5	5.7	-10.4	6.9	-8.6	7.7	-7.5	8.2	
28	-14.0	5.8	-9.9	6.9	-8.1	7.7	-7.0	8.3	
29	-13.6	5.8	-9.4	7.0	-7.5	7.8	-6.5	8.4	
30	-13.1	5.8	-8.9	7.1	-7.1	7.9	-6.0	8.5	
31	-12.6	5.9	-8.4	7.1	-6.5	8.0	-5.5	8.5	
32	-12.2	5.9	-7.9	7.2	-6.1	8.0	-5.0	8.6	

MD9129M0F7-A80 power control setting (868MHz)(續)

A80 DCDC1.5V Avg.	PAC=1								
	TDC	0		1		2		3	
	TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)
33	-11.7	6.0	-7.4	7.3	-5.5	8.1	-4.5	8.7	
34	-11.3	6.0	-6.9	7.3	-5.0	8.2	-4.0	8.8	
35	-10.8	6.1	-6.4	7.4	-4.5	8.3	-3.5	8.9	
36	-10.2	6.1	-5.8	7.5	-3.9	8.4	-2.9	9.1	
37	-9.7	6.2	-5.3	7.6	-3.4	8.6	-2.4	9.2	
38	-9.3	6.2	-4.7	7.7	-2.9	8.7	-1.8	9.3	
39	-8.8	6.3	-4.2	7.8	-2.4	8.8	-1.3	9.5	
40	-8.2	6.4	-3.6	8.0	-1.7	9.0	-0.7	9.7	
41	-7.7	6.5	-3.0	8.1	-1.2	9.1	-0.1	9.8	
42	-7.2	6.6	-2.5	8.2	-0.7	9.3	0.4	10.0	
43	-6.7	6.6	-1.9	8.4	-0.1	9.5	0.9	10.2	
44	-6.1	6.7	-1.3	8.6	0.5	9.7	1.6	10.4	
45	-5.6	6.9	-0.8	8.7	1.1	9.9	2.1	10.7	
46	-5.0	7.0	-0.2	8.9	1.7	10.1	2.6	10.9	
47	-4.5	7.1	0.4	9.1	2.2	10.4	3.2	11.2	
48	-3.8	7.3	1.2	9.4	3.0	10.7	3.9	11.5	
49	-3.2	7.4	1.8	9.7	3.5	11.0	4.5	11.8	
50	-2.6	7.6	2.4	9.9	4.1	11.3	5.0	12.1	
51	-2.0	7.8	2.9	10.2	4.7	11.6	5.5	12.4	
52	-1.4	8.0	3.6	10.6	5.3	12.0	6.1	12.8	
53	-0.7	8.2	4.3	10.9	5.9	12.4	6.6	13.1	
54	0.0	8.5	4.9	11.3	6.5	12.7	7.1	13.5	
55	0.7	8.8	5.5	11.7	7.0	13.1	7.6	13.9	
56	1.6	9.2	6.3	12.2	7.6	13.6	8.2	14.3	
57	2.4	9.6	6.9	12.7	8.1	14.0	8.6	14.7	
58	3.2	10.1	7.5	13.2	8.6	14.5	9.0	15.1	
59	4.1	10.6	8.1	13.8	9.1	15.0	9.4	15.5	
60	5.2	11.3	8.8	14.4	9.5	15.5	9.8	16.0	
61	6.2	12.2	9.3	15.1	10.0	16.1	10.2	16.6	
62	7.1	13.2	9.8	15.9	10.3	16.8	10.5	17.2	
63	7.8	14.7	10.2	16.9	10.7	17.6	10.8	17.9	

MD9129M0F7-A80 power control setting (868MHz)(續)

A80 DCDC1.5V Avg.	PAC=2							
	TDC	0		1		2		3
TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)
0	-36.1	4.9	-36.1	4.9	-36.1	4.9	-36.1	4.9
1	-23.9	5.5	-20.6	6.5	-19.1	7.2	-18.2	7.6
2	-23.4	5.5	-20.1	6.5	-18.6	7.2	-17.7	7.7
3	-22.9	5.5	-19.6	6.5	-18.1	7.2	-17.2	7.7
4	-22.5	5.5	-19.1	6.5	-17.6	7.2	-16.7	7.7
5	-22.0	5.5	-18.6	6.5	-17.1	7.2	-16.2	7.7
6	-21.6	5.6	-18.2	6.6	-16.7	7.3	-15.7	7.7
7	-21.1	5.6	-17.7	6.6	-16.2	7.3	-15.3	7.8
8	-20.7	5.6	-17.2	6.6	-15.7	7.3	-14.8	7.8
9	-20.3	5.6	-16.8	6.6	-15.2	7.3	-14.3	7.8
10	-19.8	5.6	-16.3	6.6	-14.8	7.3	-13.9	7.8
11	-19.4	5.6	-15.9	6.7	-14.3	7.4	-13.4	7.9
12	-18.9	5.7	-15.4	6.7	-13.9	7.4	-12.9	7.9
13	-18.5	5.7	-15.0	6.7	-13.4	7.4	-12.4	7.9
14	-18.1	5.7	-14.5	6.7	-13.0	7.5	-12.0	8.0
15	-17.7	5.7	-14.1	6.8	-12.5	7.5	-11.5	8.0
16	-17.2	5.8	-13.6	6.8	-12.0	7.5	-11.0	8.0
17	-16.8	5.8	-13.1	6.8	-11.5	7.6	-10.5	8.1
18	-16.3	5.8	-12.7	6.9	-11.1	7.6	-10.1	8.1
19	-15.9	5.8	-12.2	6.9	-10.6	7.6	-9.7	8.2
20	-15.5	5.9	-11.8	6.9	-10.1	7.7	-9.2	8.2
21	-15.0	5.9	-11.3	7.0	-9.7	7.7	-8.7	8.3
22	-14.6	5.9	-10.9	7.0	-9.2	7.8	-8.3	8.3
23	-14.2	5.9	-10.4	7.1	-8.8	7.8	-7.8	8.4
24	-13.7	6.0	-9.9	7.1	-8.3	7.9	-7.3	8.5
25	-13.3	6.0	-9.5	7.2	-7.8	8.0	-6.8	8.5
26	-12.9	6.1	-9.0	7.2	-7.4	8.0	-6.4	8.6
27	-12.4	6.1	-8.6	7.3	-6.9	8.1	-5.9	8.7
28	-12.0	6.1	-8.1	7.3	-6.4	8.2	-5.4	8.7
29	-11.5	6.2	-7.6	7.4	-5.9	8.2	-4.9	8.8
30	-11.1	6.2	-7.1	7.5	-5.5	8.3	-4.5	8.9

MD9129M0F7-A80 power control setting (868MHz)(續)

A80 DCDC1.5V Avg.	PAC=2								
	TDC	0		1		2		3	
	TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)
31	-10.6	6.3	-6.7	7.5	-5.0	8.4	-4.0	9.0	
32	-10.2	6.3	-6.2	7.6	-4.5	8.5	-3.6	9.1	
33	-9.8	6.4	-5.8	7.7	-4.1	8.6	-3.1	9.2	
34	-9.3	6.4	-5.3	7.8	-3.6	8.7	-2.6	9.3	
35	-8.9	6.5	-4.8	7.9	-3.1	8.8	-2.1	9.4	
36	-8.4	6.6	-4.3	8.0	-2.6	8.9	-1.6	9.6	
37	-7.9	6.6	-3.8	8.1	-2.1	9.1	-1.1	9.7	
38	-7.5	6.7	-3.3	8.2	-1.6	9.2	-0.6	9.9	
39	-7.0	6.8	-2.8	8.3	-1.1	9.3	-0.1	10.0	
40	-6.5	6.9	-2.2	8.5	-0.5	9.5	0.5	10.2	
41	-6.0	7.0	-1.7	8.6	0.0	9.7	1.0	10.4	
42	-5.5	7.1	-1.2	8.8	0.5	9.9	1.5	10.6	
43	-5.0	7.2	-0.7	9.0	1.1	10.1	2.0	10.8	
44	-4.5	7.3	-0.1	9.2	1.6	10.3	2.6	11.1	
45	-4.0	7.4	0.5	9.4	2.2	10.5	3.1	11.3	
46	-3.5	7.6	1.0	9.6	2.7	10.8	3.6	11.6	
47	-3.0	7.7	1.5	9.8	3.2	11.1	4.1	11.9	
48	-2.3	7.9	2.2	10.1	3.9	11.4	4.8	12.2	
49	-1.8	8.1	2.8	10.4	4.5	11.7	5.3	12.6	
50	-1.2	8.3	3.3	10.7	5.0	12.1	5.8	12.9	
51	-0.7	8.5	3.9	11.0	5.5	12.4	6.3	13.2	
52	0.0	8.8	4.6	11.4	6.1	12.8	6.9	13.6	
53	0.6	9.0	5.1	11.8	6.7	13.2	7.4	14.0	
54	1.2	9.3	5.7	12.2	7.2	13.6	7.8	14.3	
55	1.9	9.7	6.3	12.6	7.7	14.0	8.3	14.7	
56	2.7	10.2	7.1	13.2	8.3	14.5	8.8	15.2	
57	3.5	10.7	7.7	13.7	8.8	15.0	9.2	15.6	
58	4.3	11.2	8.3	14.3	9.2	15.4	9.5	16.0	
59	5.1	11.9	8.8	14.9	9.6	15.9	9.9	16.4	
60	6.1	12.8	9.4	15.6	10.0	16.5	10.3	16.9	
61	7.0	14.0	9.9	16.4	10.4	17.2	10.6	17.5	

MD9129M0F7-A80 power control setting (868MHz)(續)

A80 DCDC1.5V Avg.	PAC=2								
	TDC	0		1		2		3	
	TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)
	62	7.8	15.5	10.3	17.5	10.7	18.0	10.9	18.3
	63	8.2	17.7	10.6	18.7	11.0	19.0	11.1	19.2

A80 DCDC1.5V Avg.	PAC=3								
	TDC	0		1		2		3	
	TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)
	0	-36.1	4.9	-36.1	4.9	-36.1	4.9	-36.1	4.9
	1	-21.8	5.8	-18.5	6.8	-17.1	7.5	-16.2	8.0
	2	-21.3	5.8	-18.0	6.8	-16.6	7.5	-15.7	8.0
	3	-20.9	5.8	-17.6	6.8	-16.1	7.5	-15.2	8.0
	4	-20.4	5.9	-17.1	6.9	-15.6	7.6	-14.7	8.1
	5	-20.0	5.9	-16.6	6.9	-15.2	7.6	-14.3	8.1
	6	-19.5	5.9	-16.2	6.9	-14.7	7.6	-13.8	8.1
	7	-19.1	5.9	-15.8	6.9	-14.3	7.6	-13.4	8.1
	8	-18.7	5.9	-15.3	7.0	-13.8	7.7	-12.9	8.2
	9	-18.2	6.0	-14.9	7.0	-13.4	7.7	-12.5	8.2
	10	-17.8	6.0	-14.4	7.0	-12.9	7.7	-12.0	8.2
	11	-17.4	6.0	-14.0	7.0	-12.5	7.8	-11.6	8.3
	12	-17.0	6.0	-13.5	7.1	-12.0	7.8	-11.1	8.3
	13	-16.5	6.1	-13.1	7.1	-11.6	7.8	-10.7	8.3
	14	-16.1	6.1	-12.7	7.1	-11.2	7.9	-10.3	8.4
	15	-15.7	6.1	-12.3	7.2	-10.7	7.9	-9.8	8.4
	16	-15.3	6.1	-11.8	7.2	-10.2	8.0	-9.3	8.5
	17	-14.8	6.2	-11.3	7.3	-9.8	8.0	-8.9	8.5
	18	-14.4	6.2	-10.9	7.3	-9.4	8.0	-8.5	8.6
	19	-14.0	6.2	-10.5	7.3	-9.0	8.1	-8.0	8.6
	20	-13.6	6.3	-10.0	7.4	-8.5	8.1	-7.6	8.7
	21	-13.2	6.3	-9.6	7.4	-8.1	8.2	-7.1	8.7
	22	-12.8	6.3	-9.2	7.5	-7.6	8.3	-6.7	8.8

MD9129M0F7-A80 power control setting (868MHz)(續)

A80 DCDC1.5V Avg.	PAC=3								
	TDC	0		1		2		3	
	TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)
23	-12.4	6.4	-8.8	7.5	-7.2	8.3	-6.3	8.9	
24	-11.9	6.4	-8.3	7.6	-6.7	8.4	-5.8	9.0	
25	-11.5	6.5	-7.8	7.6	-6.3	8.5	-5.4	9.0	
26	-11.1	6.5	-7.4	7.7	-5.9	8.5	-4.9	9.1	
27	-10.7	6.6	-7.0	7.8	-5.4	8.6	-4.5	9.2	
28	-10.2	6.6	-6.5	7.8	-4.9	8.7	-4.0	9.3	
29	-9.8	6.7	-6.1	7.9	-4.5	8.8	-3.6	9.4	
30	-9.4	6.7	-5.7	8.0	-4.1	8.9	-3.2	9.5	
31	-9.0	6.8	-5.2	8.1	-3.6	9.0	-2.7	9.6	
32	-8.6	6.9	-4.8	8.2	-3.2	9.0	-2.3	9.7	
33	-8.1	6.9	-4.3	8.3	-2.7	9.2	-1.8	9.8	
34	-7.7	7.0	-3.9	8.4	-2.3	9.3	-1.4	9.9	
35	-7.3	7.1	-3.4	8.5	-1.8	9.4	-0.9	10.0	
36	-6.8	7.2	-2.9	8.6	-1.3	9.5	-0.4	10.2	
37	-6.4	7.2	-2.5	8.7	-0.9	9.7	0.1	10.3	
38	-6.0	7.3	-2.0	8.8	-0.4	9.8	0.5	10.5	
39	-5.5	7.4	-1.5	9.0	0.1	10.0	1.0	10.7	
40	-5.0	7.6	-1.0	9.2	0.6	10.2	1.6	10.9	
41	-4.6	7.7	-0.5	9.3	1.1	10.4	2.0	11.1	
42	-4.1	7.8	0.0	9.5	1.6	10.6	2.5	11.3	
43	-3.6	7.9	0.5	9.7	2.1	10.8	3.0	11.6	
44	-3.1	8.1	1.0	9.9	2.6	11.1	3.5	11.8	
45	-2.7	8.2	1.5	10.1	3.1	11.3	4.0	12.1	
46	-2.2	8.4	2.0	10.3	3.6	11.6	4.5	12.4	
47	-1.7	8.5	2.6	10.6	4.1	11.9	5.0	12.7	
48	-1.1	8.8	3.2	10.9	4.8	12.2	5.6	13.1	
49	-0.6	9.0	3.8	11.2	5.3	12.6	6.1	13.4	
50	0.0	9.2	4.3	11.6	5.8	12.9	6.6	13.7	
51	0.5	9.5	4.8	11.9	6.3	13.3	7.0	14.1	
52	1.1	9.8	5.4	12.3	6.9	13.7	7.6	14.5	
53	1.7	10.1	6.0	12.7	7.4	14.1	8.0	14.9	

MD9129M0F7-A80 power control setting (868MHz)(續)

A80 DCDC1.5V Avg.		PAC=3							
TDC	0		1		2		3		
TBG	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	Power (dBm)	Current (mA)	
54	2.3	10.5	6.5	13.2	7.9	14.6	8.4	15.3	
55	2.9	10.9	7.1	13.7	8.4	15.0	8.8	15.7	
56	3.7	11.5	7.8	14.3	8.9	15.5	9.3	16.1	
57	4.4	12.2	8.3	14.9	9.3	16.0	9.7	16.5	
58	5.2	12.9	8.9	15.5	9.7	16.5	10.0	17.0	
59	5.9	13.8	9.4	16.2	10.1	17.1	10.3	17.5	
60	6.8	15.1	9.9	17.1	10.5	17.7	10.6	18.0	
61	7.5	16.8	10.3	18.2	10.8	18.6	10.9	18.8	
62	7.9	19.1	10.6	19.6	11.0	19.7	11.1	19.8	
63	7.9	21.6	10.7	21.3	11.1	20.9	11.3	20.9	

4. RSSI

A9129M0F7 has a built-in digital RSSI (Received Signal Strength Indicator) which measures the strength of the incoming RF signal. The digital RSSI can be read from **ADC Control** and its range is from 0 to 511 (9 bits). Typical RSSI characteristic is shown in Figure 4a.

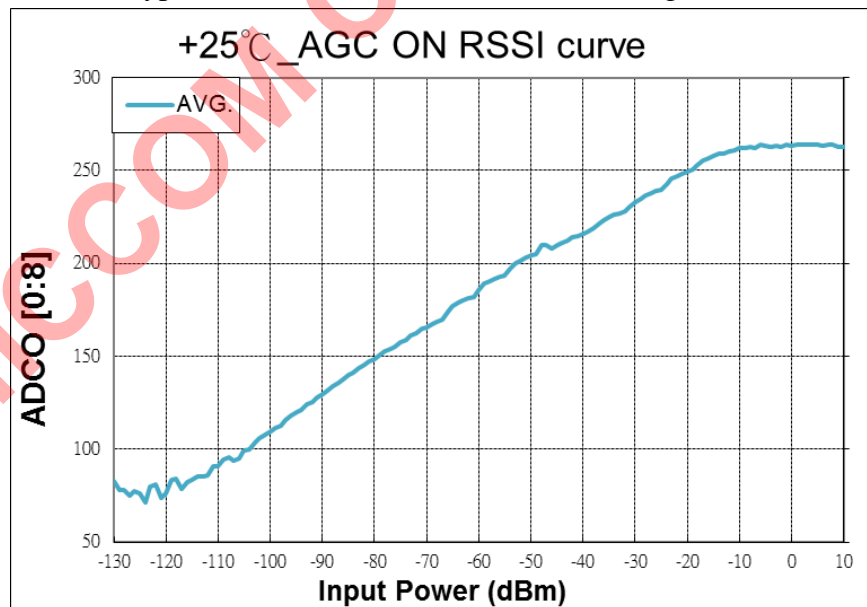


Fig. 4a Typical RSSI characteristic

Linear range = -115dBm ~ -30dBm

A80 : Input power = -30dBm+[(0.5537*ADCO[8:0])-131]

5. Frequency Setting Rule

Set the frequency to the third decimal place, and the third bit is set to 1. For example, if operation frequency is 868.3MHz, the frequency should be set at 868.301MHz.

6. The restriction of VCO Band Range when RF module is tested in Pilot Run or Mass Production

In Pilot Run or Mass Production, the VCO Band Range should be between Band 1 and Band 6 when customer tests RF module at room temperature. Band 0 and Band 7 should not be used. It is a very important rule for Pilot Run or Mass Production.

However, for the application software in product, the VCO Band Range can be between Band 0 and Band 7.

Customers can refer to Amiccom's document "FQA_0003_VCO Application Note V0.0" for detail.

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