A5133 module specification

MD5133-A02-01 (QFN4x4, 24pin)

Important Notice:

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Revision History

Rev. No.	History	Issue Date	Remark
0.0	Initial issue **MD5133-A02-01**	Jun., 2022	Preliminary

General Description

The MD5133-A02 module is designed for 5.8GHz ISM band with 15dBm out power wireless applications using AMICCOM A5133 FSK transceiver. This module features a fully programmable frequency synthesizer by SPI. The maximum data rate is 4Mbps.

Electrical specification

Item	Specification	Remark
Supply voltage	2.0V~3.6V	
Current consumption	4 uA @ Sleep mode (IRC on) 0.7 mA @ Idle mode 2.5 mA @ Stand-by mode 13.5 mA @ PLL mode 33 mA @ Rx mode 90 mA @ Tx mode (Pout = 15dBm)	Typical REGI=3.3V
Frequency	5725 – 5850 MHz	ISM band
Transmit output power	15 dBm (typical)	REGI=3.3V *1, *2
Rx sensitivity	-90 dBm (typical) @DR=4Mbps mode	BER≦1E-3
Modulation	FSK	
Interface	6 pin and 2 pin 2.0mm header	
Dimension	30.7mm(L) x 22.6mm(W) mm^2 with PCB antenna (PCB thickness is 0.8mm)	
Operating temperature	-40 ~ 85 ℃	

Annotation:

1. Typical setting:
   Register [21h] EXT2 (ATG[3:0]=8, page 8) value: 0x2C (TPA: 2)
   Register [21h] EXT5 (ATG[3:0]=11, page 11) value: 0x42 (CBBF: 2)
   Register [2Ah] DASP6 (ATG[3:0]=6, page 6) value: 0x03 (PA_HCS: 1, PAB_HCS: 1, TXLO_HC:0)
   Register [2Dh] TX Test value: 0xA7 (TBF: 7)
2. To pass CE/FCC and the setting as shown below.
   Transmit output power = 10dBm.
   Register [21h] EXT2 (ATG[3:0]=8, page 8) value: 0x6C (TPA: 6)
   Register [21h] EXT5 (ATG[3:0]=11, page 11) value: 0x40 (CBBF: 0)
   Register [2Ah] DASP6 (ATG[3:0]=6, page 6) value: 0x00 (PA_HCS: 0, PAB_HCS: 0, TXLO_HC:0)
   Register [2Dh] TX Test value: 0xA0 (TBF: 0)

Interface

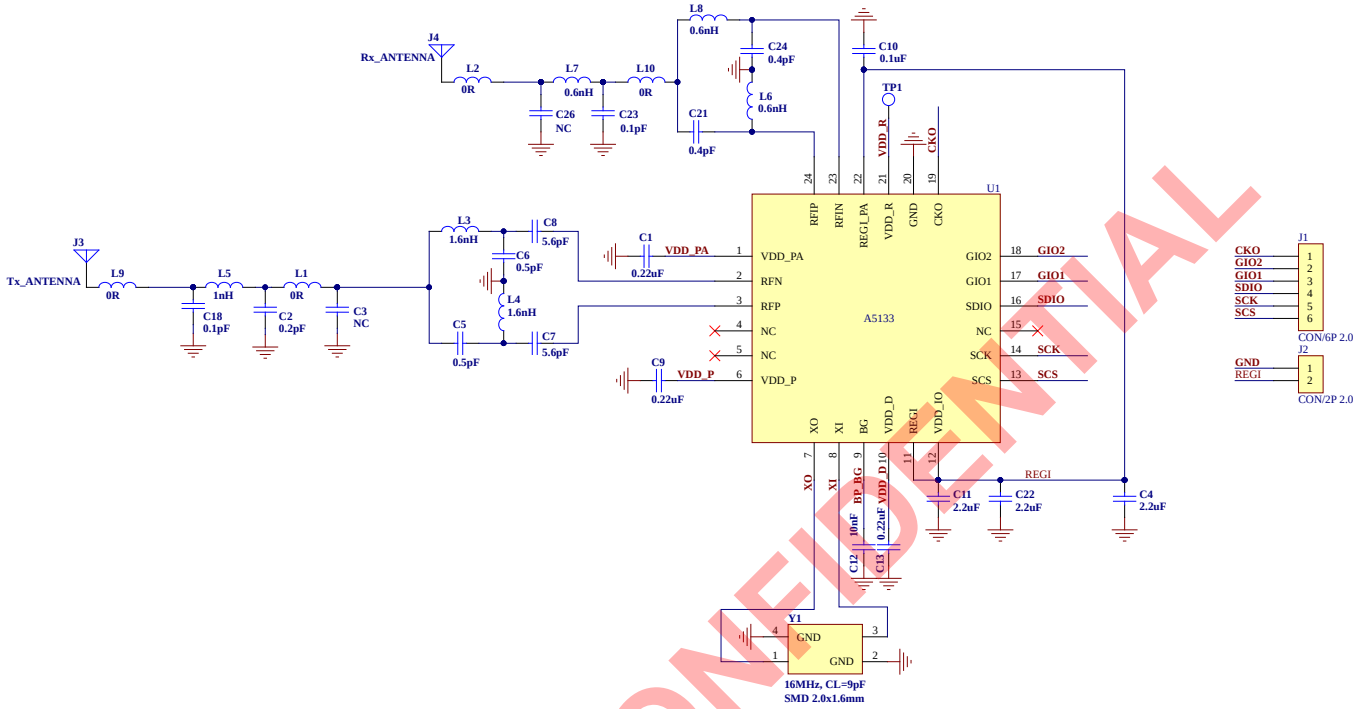
J1:

Pin No.	Symbol	Function Description	Remark
1	CKO	Multi-function Clock Output	
2	GIO2	General Purpose I/O 2	
3	GIO1	General Purpose I/O 1	
4	SDIO	SPI Data I/O	
5	SCK	SPI Clock	
6	SCS	SPI Chip Selection	

J2:

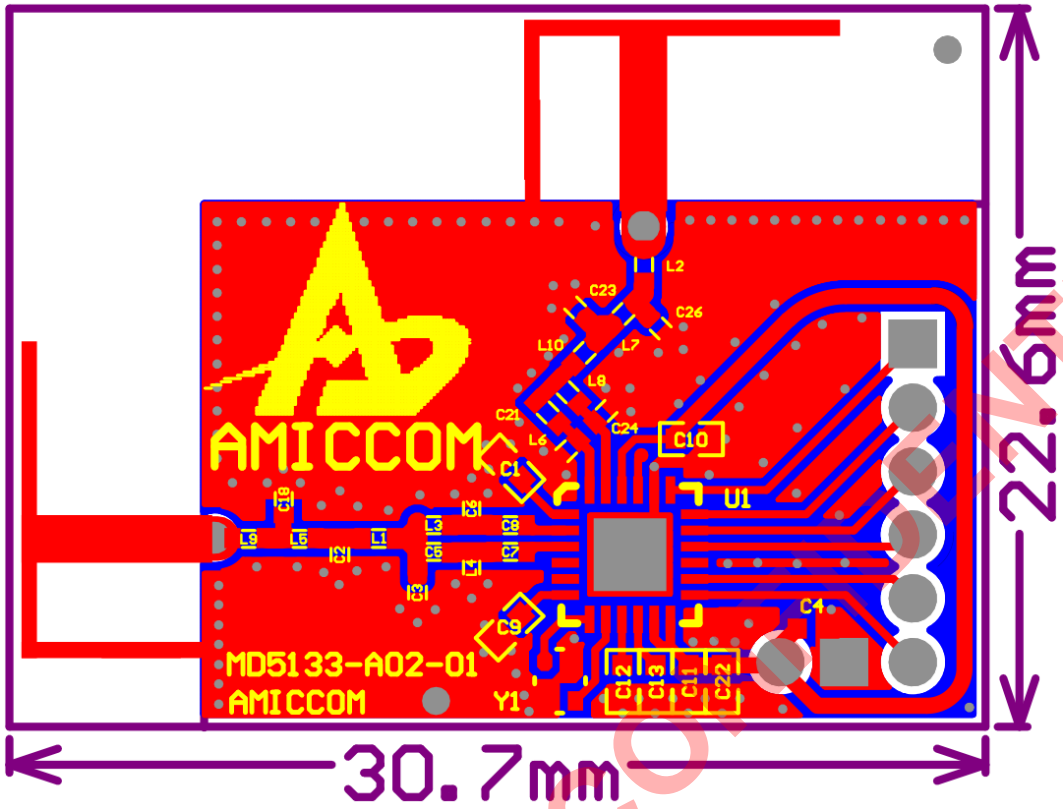
Pin No.	Symbol	Function Description	Remark
1	GND	Ground	
2	REGI	RF Module supply voltage supply input	Typical, 3.3V

Application Circuit

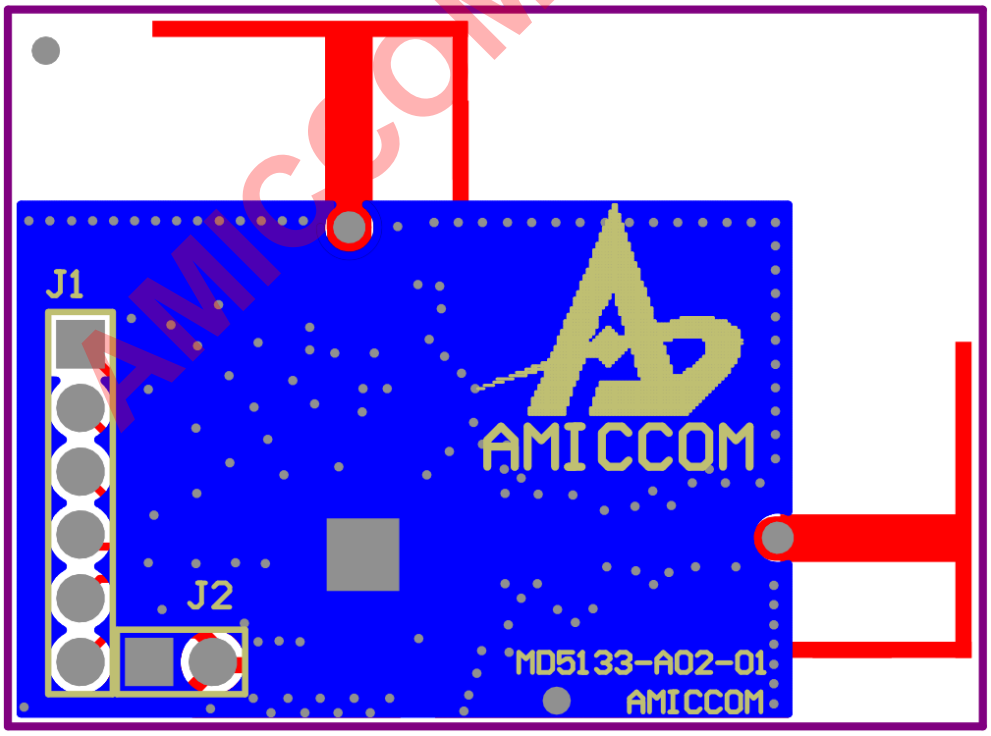


The back plate of the IC should connect to GND

Module dimension drawing (Top view)



Module dimension drawing (Bottom view)



J1: CON/6P 2.0mm

J2: CON/2P 2.0mm

Bill of Material

Item	Component	Description	Size	Value	Tol.	Manufacturer	Manufacturer Number
1	C1	X5R ceramic capacitor	0402	0.22uF	±10%	Murata	GRM155R61A224K
2	C2	C0G ceramic capacitor	0402	0.2pF	±0.05pF	Murata	GRM1555C1HR20W
3	C4	X5R ceramic capacitor	0402	2.2uF	±10%	Murata	GRM155R61A225K
4	C5	C0G ceramic capacitor	0402	0.5pF	±0.1pF	Murata	GRM1555C1HR50B
5	C6	C0G ceramic capacitor	0402	0.5pF	±0.1pF	Murata	GRM1555C1HR50B
6	C7	C0G ceramic capacitor	0402	5.6pF	±0.25pF	Murata	GRM1555C1H5R6C
7	C8	C0G ceramic capacitor	0402	5.6pF	±0.25pF	Murata	GRM1555C1H5R6C
8	C9	X5R ceramic capacitor	0402	0.22uF	±10%	Murata	GRM155R61A224K
9	C10	X7R ceramic capacitor	0402	0.1uF	±10%	Murata	GRM155R71C104K
10	C11	X5R ceramic capacitor	0402	2.2uF	±10%	Murata	GRM155R61A225K
11	C12	X7R ceramic capacitor	0402	10nF	±10%	Murata	GRM155R71H103K
12	C13	X5R ceramic capacitor	0402	0.22uF	±10%	Murata	GRM155R61A224K
13	C18	C0G ceramic capacitor	0402	0.1pF	±0.05pF	Murata	GRM1555C1HR10W
14	C21	C0G ceramic capacitor	0402	0.4pF	±0.05pF	Murata	GRM1555C1HR40W
15	C22	X5R ceramic capacitor	0402	2.2uF	±10%	Murata	GRM155R61A225K
16	C23	C0G ceramic capacitor	0402	0.1pF	±0.05pF	Murata	GRM1555C1HR10W
17	C24	C0G ceramic capacitor	0402	0.4pF	±0.05pF	Murata	GRM1555C1HR40W
18	L1	Chip resistor	0402	0 ohm			
19	L2	Chip resistor	0402	0 ohm			
20	L3	Chip inductor	0402	1.6nH	±0.3nH	Murata	LQG15HS1N6S
21	L4	Chip inductor	0402	1.6nH	±0.3nH	Murata	LQG15HS1N6S
22	L5	Chip inductor	0402	1nH	±0.3nH	Murata	LQG15HS1N0S
23	L6	Chip inductor	0402	0.6nH	±0.1nH	WLCM	0603TGB0N5TB
24	L7	Chip inductor	0402	0.6nH	±0.1nH	WLCM	0603TGB0N5TB
25	L8	Chip inductor	0402	0.6nH	±0.1nH	WLCM	0603TGB0N5TB
26	L9	Chip resistor	0402	0 ohm			
27	L10	Chip resistor	0402	0 ohm			
28	U1	Transceiver IC	QFN 4x4 24pin			AMICCOM	A51U33AQCI
29	Y2	SMD Crystal Oscillator	SMD 2.0x1.6mm	16MHz CL=9pF	±20ppm	TST	TZ23157

Annotation：

1. C3, C26 are NC