# A5133 15dBm module specification

## MD5133-A01 (-02)

## Revision History

| Rev. No. | History | Issue Date | Remark |
|---|---|---|---|
| 0.0 | Initial issue<br>**MD5133-A01-01** | Oct, 2019 | Preliminary |
| 0.1 | PCB added fixture hole at RF.<br>**MD5133-A01-02** | Nov, 2019 | |

## General Description

The MD5133-A01 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<br>0.7 mA @ Idle mode<br>2.5 mA @ Stand-by mode<br>13.5 mA @ PLL mode<br>33 mA @ Rx mode<br>88 mA @ Tx mode (Pout = 15dBm) | Typical<br>REGI=3.3V |
| Frequency | 5725 – 5850 MHz | ISM band |
| Transmit output power | 15 dBm @ room temperature | Typical, REGI=3.3V<br>Annotation 1 |
| Rx sensitivity | -91 dBm (typical) @ 4Mbps mode, Dev = 1 MHz | BER≦1E-3 |
| Modulation | FSK | |
| Interface | 10 pin 2mm header | |
| Dimension | 39.7mm(L) x 25.33mm(W) $mm^2$ without PCB antenna (PCB thickness is 0.8mm) | |
| Operating temperature | -40 ~ 85 ℃<br>(Depend on crystal Spec., example: Fork type_-10 ~ 60 ℃) | |



Annotation:

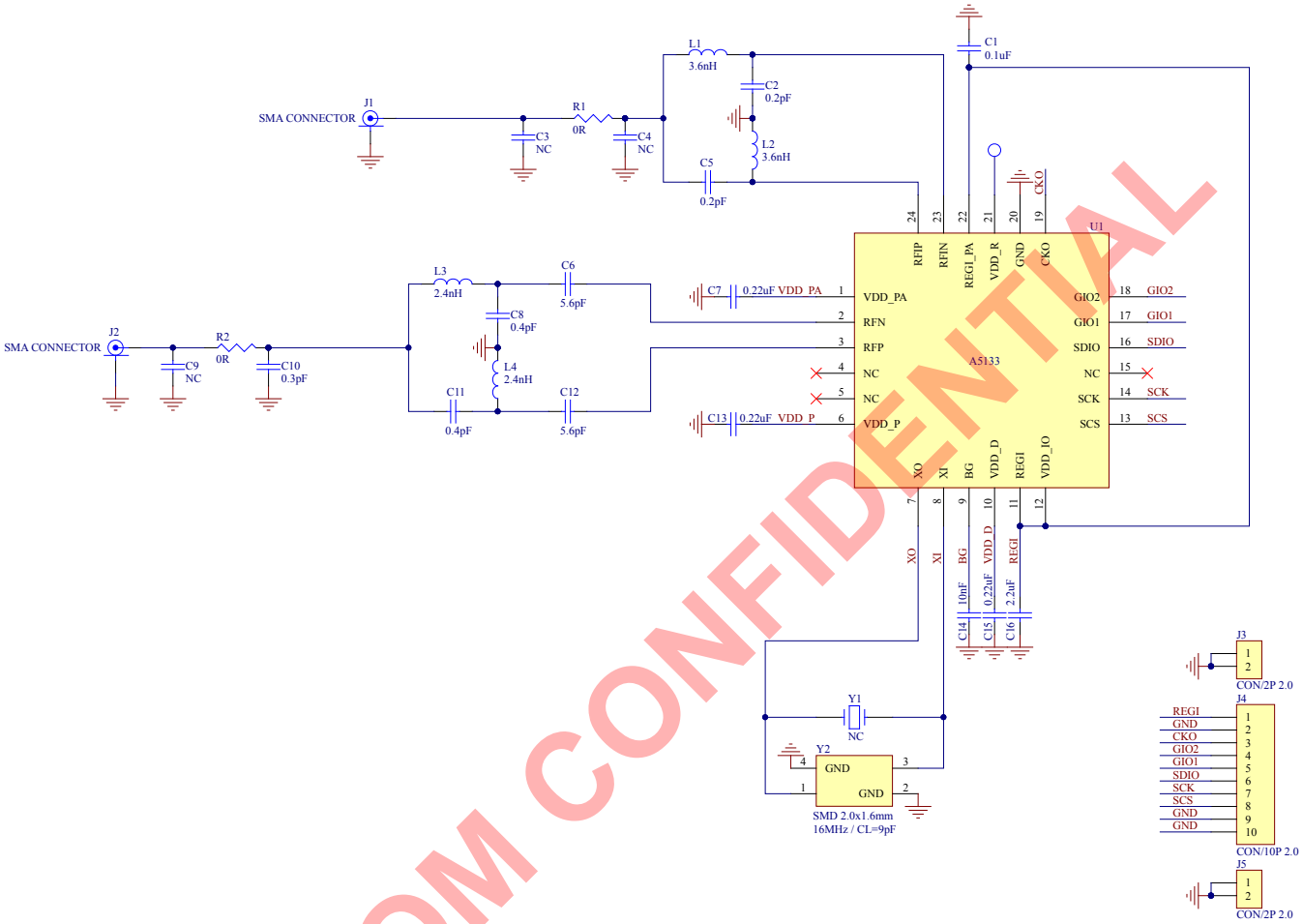
1. Tx output power = 15dBm,

   [22] Page1：TXLPN=1,TXHP=0
   [21] Page8：TPA=2；Page11：CBBF=2
   [2A] Page6：PA_HCS=1,PAB_HCS=1,TXLO_HC=0
   [2D] TBF=7

## Interface

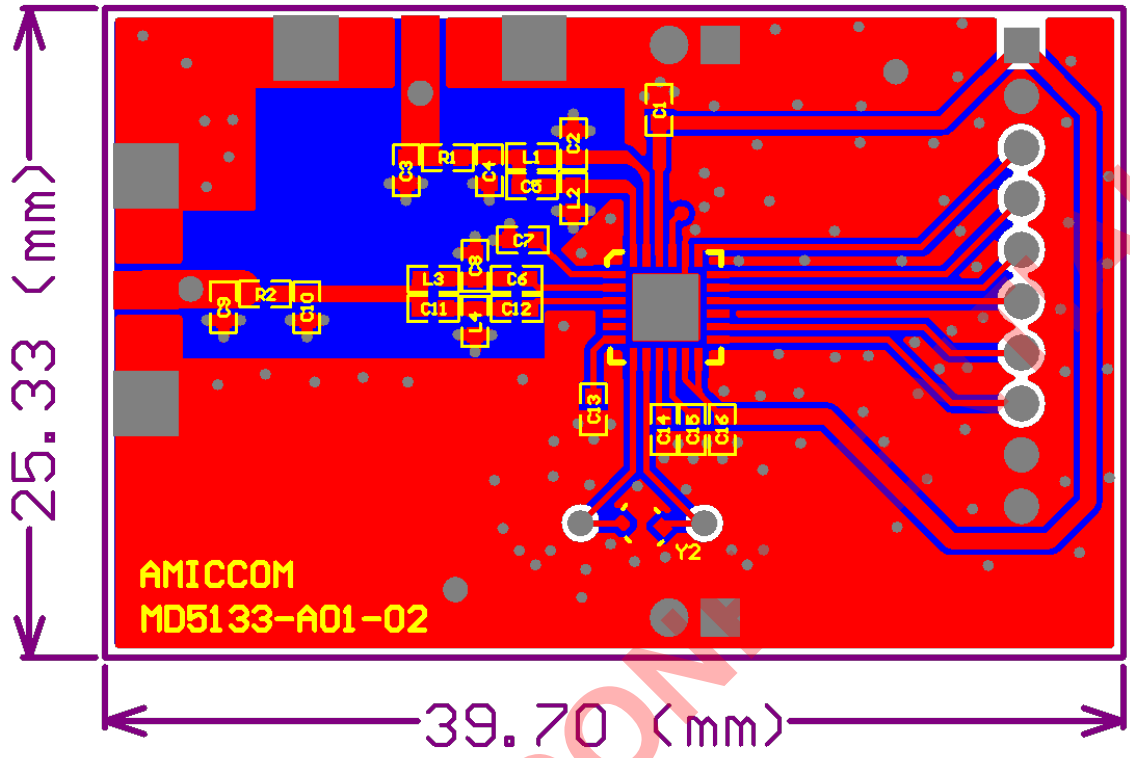
| Pin No. | Symbol | Function Description | Remark |
|---|---|---|---|
| 1 | REGI | RF Module supply voltage supply input | 3.3V |
| 2 | GND | Ground | |
| 3 | CKO | Multi-function Clock Output | |
| 4 | GIO2 | General Purpose I/O 2 | |
| 5 | GIO1 | General Purpose I/O 1 | |
| 6 | SDIO | SPI Data I/O | |
| 7 | SCK | SPI Clock | |
| 8 | SCS | SPI Chip Selection | |
| 9 | GND | Ground | |
| 10 | GND | Ground | |

## Application Circuit

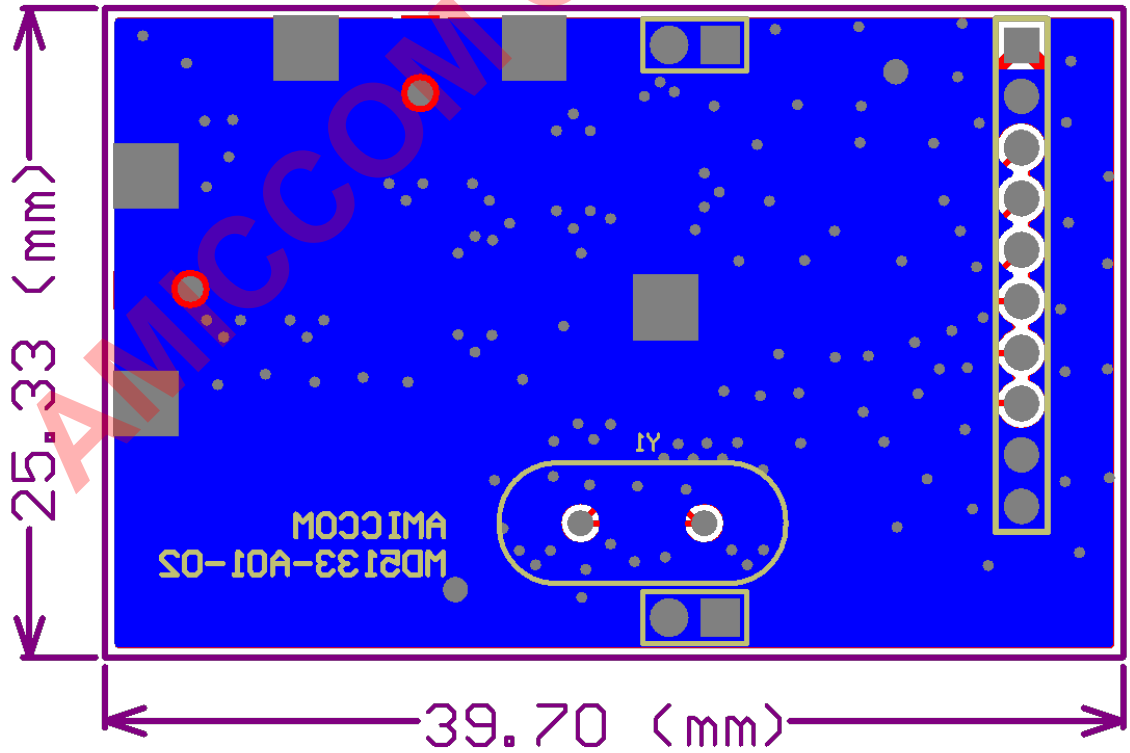



**The back plate of the IC should connect to GND**

## Module dimension drawing (Top view)




## Module dimension drawing (Bottom view)



## Bill of Material

| Item | Component | Description | Size | Value | Tol. | Manufacturer | Manufacturer Number |
|---|---|---|---|---|---|---|---|
| 1 | C1 | X7R ceramic capacitor | 0402 | 0.1uF | ±10% | Murata | GRM155R71C104K |
| 2 | C2 | C0G ceramic capacitor | 0402 | 0.2pF | ±0.05pF | Murata | GRM1555C1HR20W |
| 3 | C5 | C0G ceramic capacitor | 0402 | 0.2pF | ±0.05pF | Murata | GRM1555C1HR20W |
| 4 | C6 | C0G ceramic capacitor | 0402 | 5.6pF | ±0.25pF | Murata | GRM1555C1H5R6C |
| 5 | C7 | X5R ceramic capacitor | 0402 | 0.22uF | ±10% | Murata | GRM155R61A224K |
| 6 | C8 | C0G ceramic capacitor | 0402 | 0.4pF | ±0.05pF | Murata | GRM1555C1HR40W |
| 7 | C10 | C0G ceramic capacitor | 0402 | 0.3pF | ±0.05pF | Murata | GRM1555C1HR30W |
| 8 | C11 | C0G ceramic capacitor | 0402 | 0.4pF | ±0.05pF | Murata | GRM1555C1HR40W |
| 9 | C12 | C0G ceramic capacitor | 0402 | 5.6pF | ±0.25pF | Murata | GRM1555C1H5R6C |
| 10 | C13 | X5R ceramic capacitor | 0402 | 0.22uF | ±10% | Murata | GRM155R61A224K |
| 11 | C14 | X7R ceramic capacitor | 0402 | 10nF | ±10% | Murata | GRM155R71H103K |
| 12 | C15 | X5R ceramic capacitor | 0402 | 0.22uF | ±10% | Murata | GRM155R61A224K |
| 13 | C16 | X5R ceramic capacitor | 0402 | 2.2uF | ±10% | Murata | GRM155R61A225K |
| 14 | L1 | Chip inductor | 0402 | 3.6nH | ±0.3nH | Murata | LQG15HS3N6S |
| 15 | L2 | Chip inductor | 0402 | 3.6nH | ±0.3nH | Murata | LQG15HS3N6S |
| 16 | L3 | Chip inductor | 0402 | 2.4nH | ±0.3nH | Murata | LQG15HS2N4S |
| 17 | L4 | Chip inductor | 0402 | 2.4nH | ±0.3nH | Murata | LQG15HS2N4S |
| 18 | R1 | Chip resistor | 0402 | 0R | | | |
| 19 | R2 | Chip resistor | 0402 | 0R | | | |
| 20 | U1 | Transceiver IC | QFN 4x4 24pin | | | AMICCOM | A51U33AQCI |
| 21 | Y2 | SMD Crystal Oscillator | SMD 2.0x1.6mm | 16MHz CL=9pF | ±20ppm | TST | TZ23157 |

Annotation：

1. C3, C4, C9 are NC
2. Y1 is NC