

MM610X-001 Reference Design Guide

IEEE 802.11 ah Wi-Fi HaLow

Power

1. VDD_FEM (Pin 1)
 - a. Connect to 3.3v supply via Ferrite Bead / 0 ohm jumper for noise filtering.
 - b. Provide large bulk capacitor (22uF) close to module pin.
 - c. Provide small bypass capacitor (0.01uF/0.1uF) for noise filtering.
2. VDD_VBAT (Pin 10)
 - a. Connect to 3.3v supply via Ferrite Bead / 0 ohm jumper for noise filtering.
 - b. Provide large bulk capacitor (22uF) close to module pin.
 - c. Provide small bypass capacitor (0.01uF/0.1uF) for noise filtering.
3. VDD_IO (Pin 19)
 - a. Connect to system IO (1.8v - 3.3v) supply.
 - b. Provide large bulk capacitor (4.7uF) close to module pin.
 - c. Provide small bypass capacitor (0.01uF/0.1uF) for noise filtering.
4. VDD_VBUCK (Pin 7)
 - a. NO CONNECT this pin.
 - b. Can be used as a DEBUG / TEST pin during manufacturing. Typical reading 1.65v.

PIN STRAPPING

1. RSSI (Pin 4)
 - a. Connect GND via 49.9 ohm resistor.
2. MM_WAKE (Pin 8)
 - a. Pull this pin HIGH to VDD_VBAT via 10K resistor
 - b. Optional - add small debounce capacitor (0.1uF) to GND.
3. MM_RESET (Pin 9)
 - a. Pull this pin HIGH to VDD_VBAT via 10K resistor
 - b. Add small debounce capacitor (0.1uF) to GND.
4. EXT_HOST_SEL (Pin 18)
 - a. Pull this pin HIGH to VDD_IO via 10K resistor

Version: 1.0

Release date: 2023-09-25

Page 1 of 8



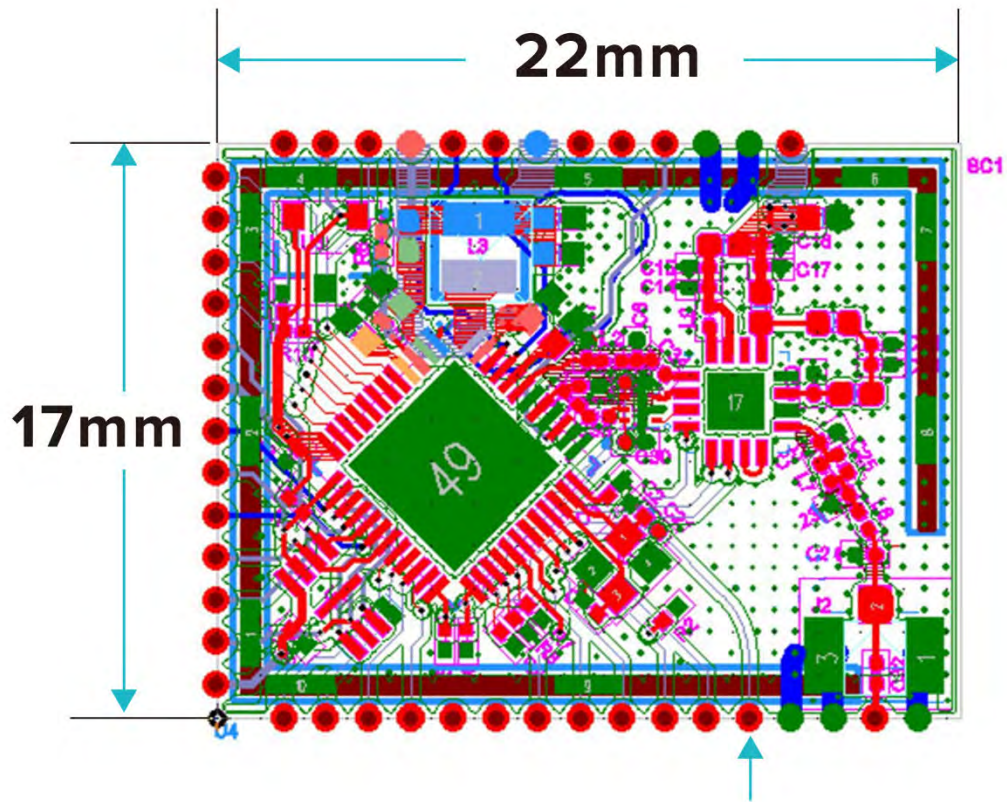
NO CONNECT

The following pins have no supported functionality or used internally to the module for FEM control and must be FLOATED in the implementation of the module.

1. ID_0 (Pin 5)
2. ID_1 (Pin 6)
3. VDD_VBUCK (Pin 7)
4. N.C (Pin 26)
5. GPIO_11 (Pin 31)
6. GPIO_12 (Pin 32)
7. N.C (Pin 38)



Dimension (mil [mm])



Pinout & Pin Description

Pin	Name	Type	Primary Function	Alternate & Other Function(s)
1	VDD_FEM	Power	External PA/LNA power (3.3v)	
2	GND_1	Power	Ground	
3	GND_2	Power	Ground	
4	RSSI	O		
5	ID_0	O	Reserved	
6	ID_1	O	Reserved	
7	VDD_BUCK	Power	Reserved	
8	WAKE	I		
9	RESET_N	I		
10	VDD_VBAT	Power	Main module Power (3.3v)	
11	GPIO_0	I/O	General Purpose IO0	PWM1_0, SPI0_CS3
12	GPIO_1	I/O	General Purpose IO1	PWM1_1
13	GPIO_2	I/O	General Purpose IO2	UART0_RX, PWM1_2
14	GPIO_3	I/O	General Purpose IO3	UART0_TX, PWM1_3
15	GPIO_4	I/O	General Purpose IO4	I2C_SDA
16	GPIO_5	I/O	General Purpose IO5	I2C_SCL
17	GPIO_6	I/O	General Purpose IO6	UART1_RX
18	EXT_HOST_SEL	I	Mode selection	
19	VDD_IO	Power	3.3V VDD_IO Supply	
20	SDIO_D2	I/O	SDIO D2	
21	SDIO_D2	I/O	SDIO D3	
22	SDIO_CMD	I/O	SDIO CMD	
23	SDIO_CLK	I/O	SDIO CLK	
24	SDIO_D0	I/O	SDIO D0	
25	SDIO_D1	I/O	SDIO D1	
26	N.C.	Power	Reserved	
27	GPIO_7	I/O	General Purpose IO7	UART1_TX
28	GPIO_8	I/O	General Purpose IO8	SPI0_SCK
29	GPIO_9	I/O	General Purpose IO9	SPI0_CS0
30	GPIO_10	I/O	General Purpose IO10	SPI0_D0
31	GPIO_11	I/O	General Purpose IO11	

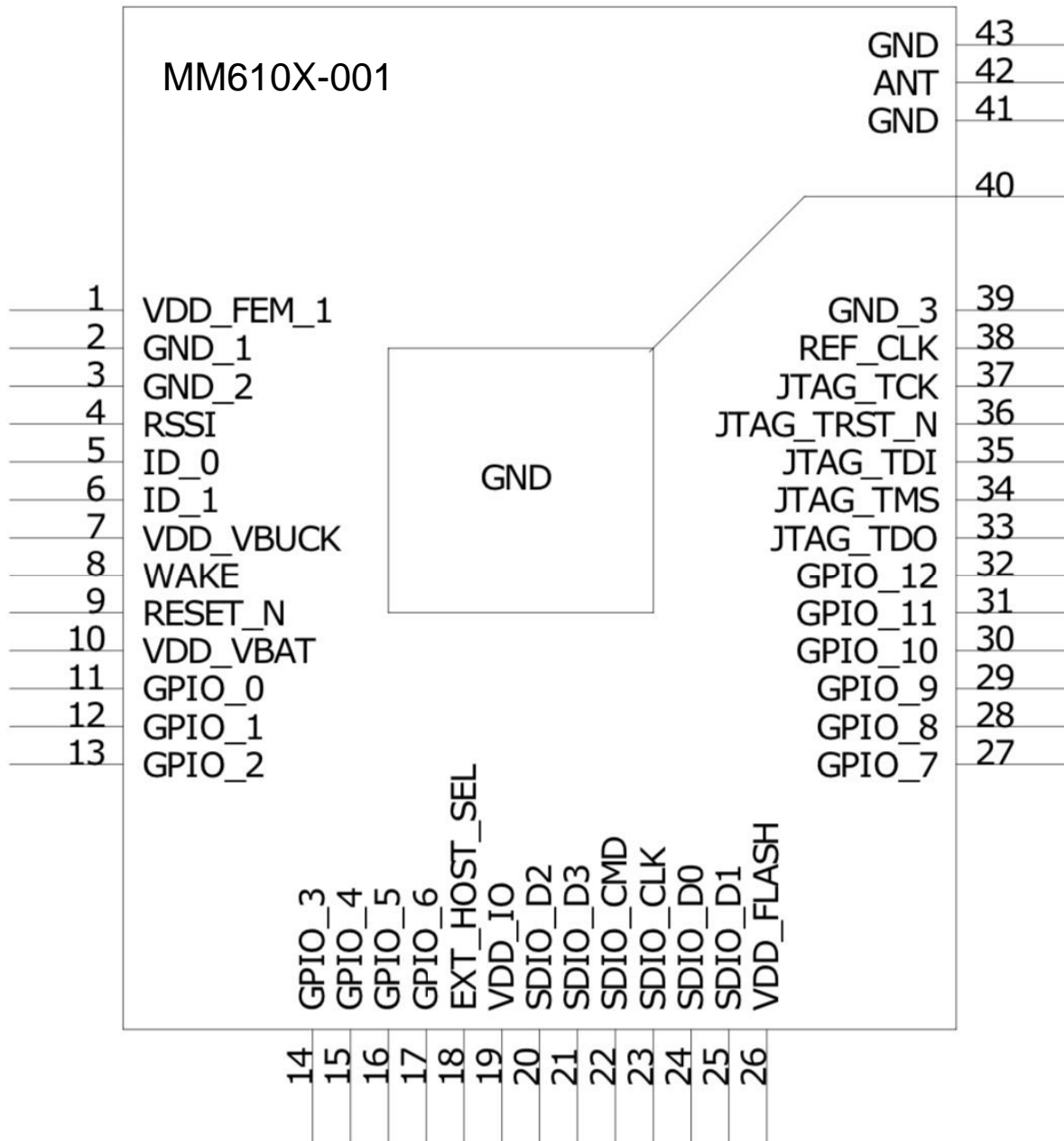


Pinout & Pin Description Cont.

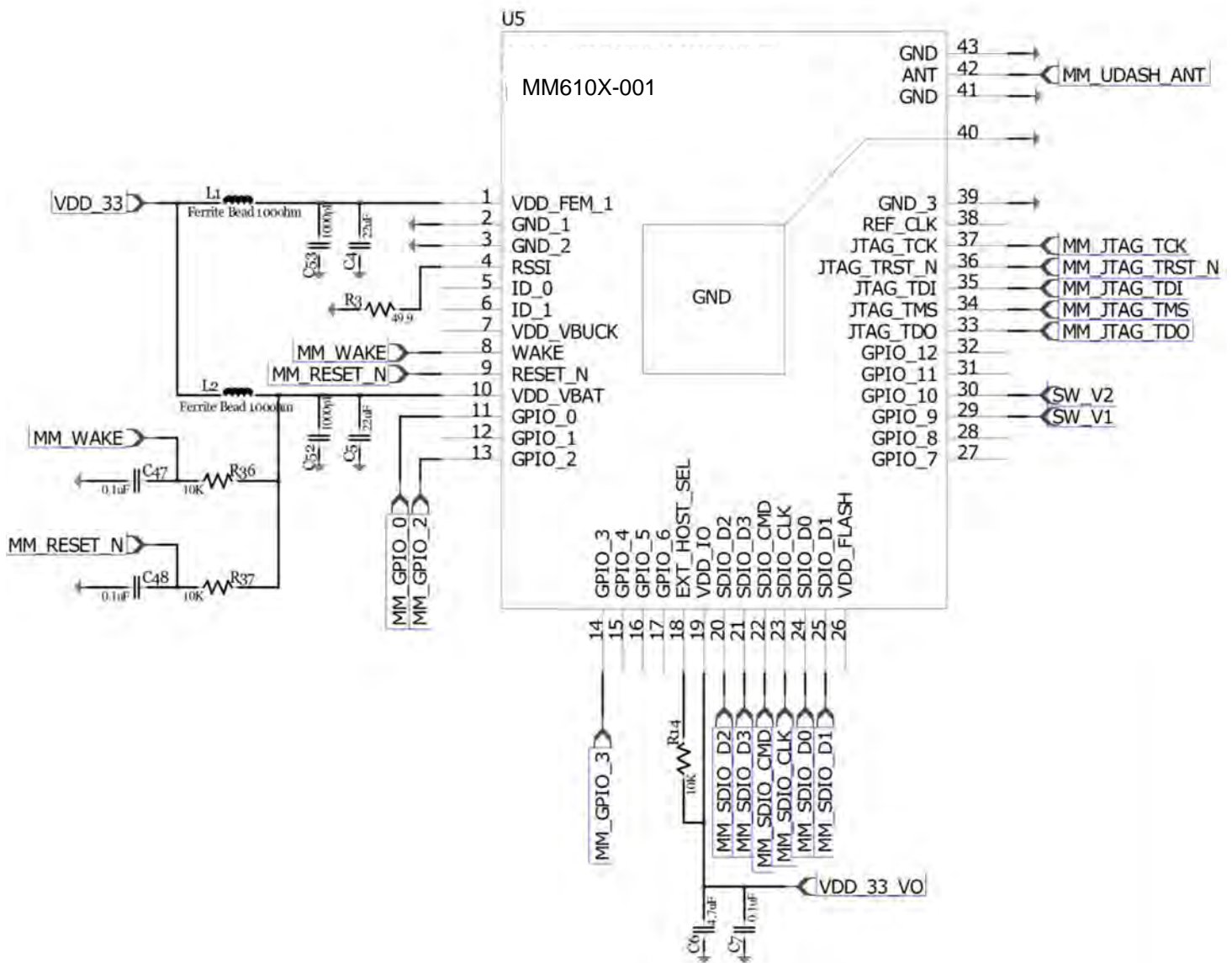
Pin	Name	Type	Function	Alternate & Other Function(s)
32	N.C.	I/O	Reserved	
33	JTAG_TDO	O	JTAG Data Out	
34	JTAG_TMS	I	JTAG Mode Select	
35	JTAG_TDI	I	JTAG Data In	
36	JTAG_TRST_N	I	JTAG Test Reset	
37	JTAG_TCK	I	JTAG Clock	
38	N.C.	I	Reserved	
39	GND_3	Power	Ground	
40	GND	Power	Ground	
41	GND	Power	RF Ground	
42	ANT	RF	RF signal launch pad	
43	GND	Power	RF Ground	



SCHEMATIC SYMBOL



Recommended Usage Schematic

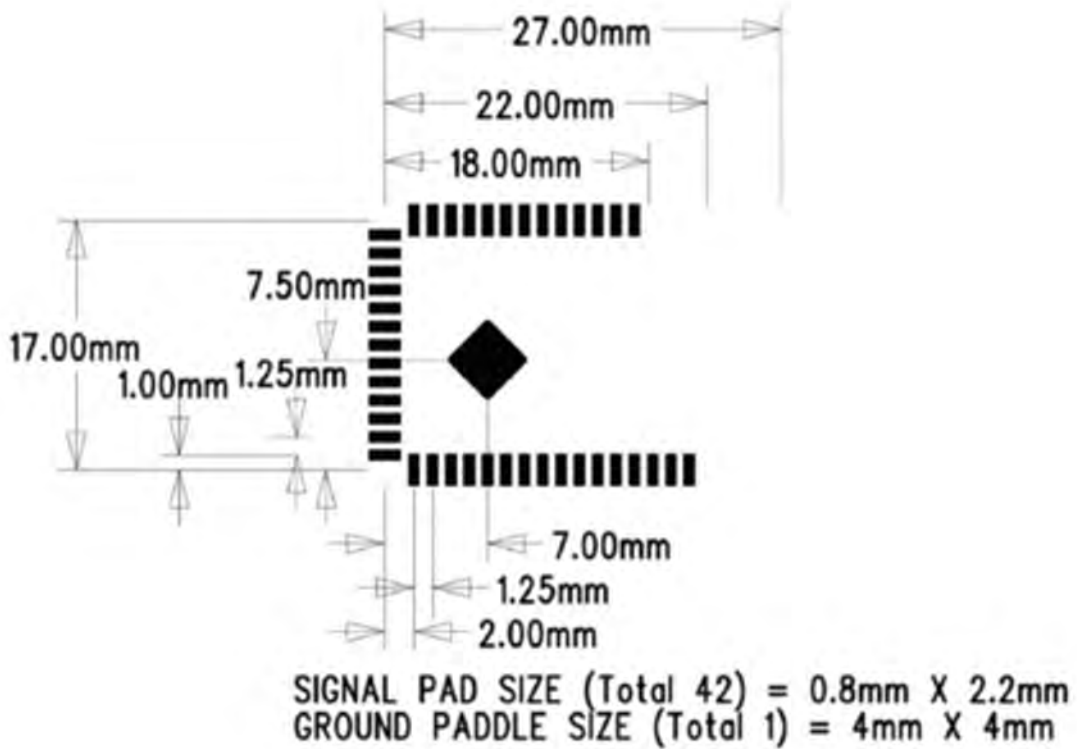


PS. RESET, GPIO0, MM_WAKE these three pins must be linked with CPU for different types. Like MT76x8, MCU, Raspberry Pi are different. After finished design, please share with us for confirmation.



PCB MOUNTING FOOTPRINT

PCB Footprint was updated to enlarge the pads from 0.8×1.1mm to 0.8×2.2mm



- Module WIDTH is fixed at 17mm
- Module LENGTH may vary with FEM vendor selection.
 - 18mm minimum length without ANTENNA pins and with u.FL option.
 - 22mm minimum length with ANTENNA launch pins. Current designs include LPV2 and LPV3
 - Length may exceed 27mm if onboard antenna is used.