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# Glassboard / WFM1MW Installation Manual r2

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FCC ID of this product is as follows:

FCC ID: **2AWBKWFM1MW**

IC No. of this product is as follows:

IC: **26068-WFM1MW**

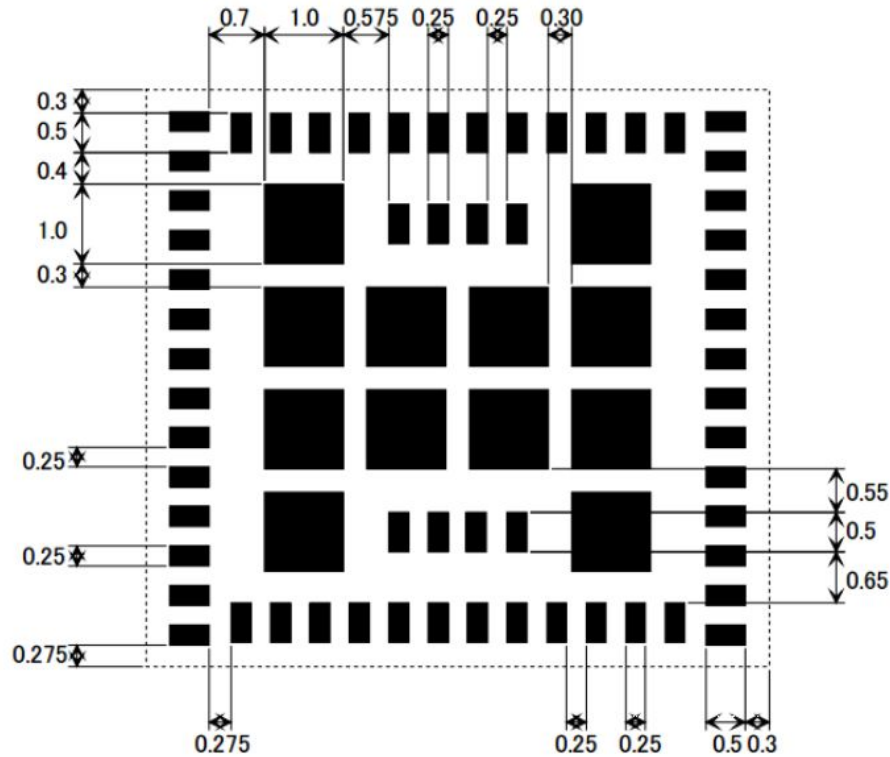
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# WFM1MW Installation Manual for FCC - Contents

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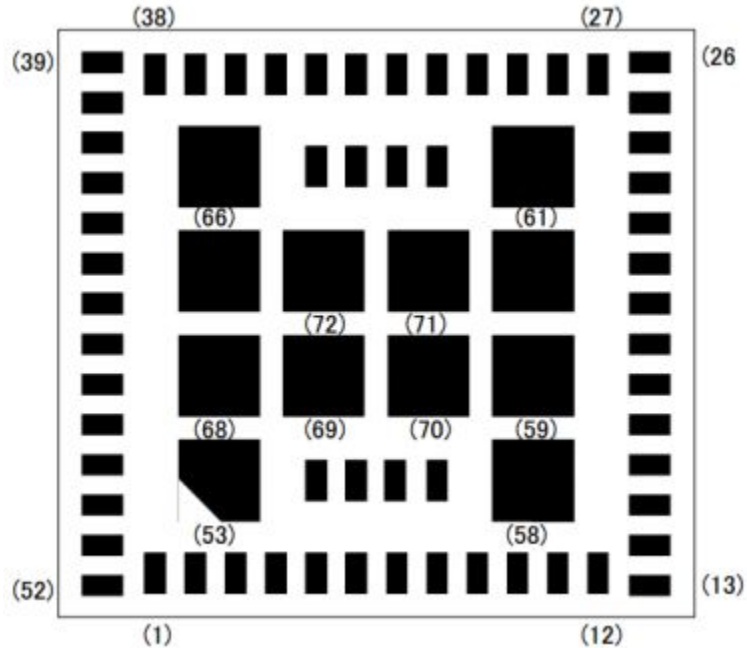
# Land Pattern Top View



To avoid the short-circuit between the side shielding and a solder on the module land after the reflow, please locate the module land at 0.2mm away from module outline as above figure.

Unit: mm

# Pin Layout



| Pin No. | Description | Pin No. | Description | Pin No. | Description   | Pin No. | Description |
|---------|-------------|---------|-------------|---------|---------------|---------|-------------|
| 1       | GPIO_6      | 19      | GND         | 37      | I2S_CLK       | 55      | GND         |
| 2       | GPIO_0      | 20      | SDIO_CLK    | 38      | I2S_WS        | 56      | GND         |
| 3       | GPIO_3      | 21      | GND         | 39      | GND           | 57      | JTAG_SEL    |
| 4       | GPIO_5      | 22      | VBAT_LDO    | 40      | BT_DEV_WAKE   | 58      | GND         |
| 5       | GPIO_1      | 23      | VBAT_SR     | 41      | BT_HOST_WAKE  | 59      | GND         |
| 6       | GPIO_4      | 24      | SR_PVSS     | 42      | I2S_DI        | 60      | GND         |
| 7       | GPIO_2      | 25      | VIN_LDO     | 43      | NC            | 61      | GND         |
| 8       | BT_REG_ON   | 26      | SR_PVSS     | 44      | GND           | 62      | BT_GPIO_4   |
| 9       | WL_REG_ON   | 27      | SR_PVSS     | 45      | BT_UART_RXD   | 63      | BT_GPIO_3   |
| 10      | GND         | 28      | SR_VLX      | 46      | BT_UART_TXD   | 64      | BT_GPIO_2   |
| 11      | VIO         | 29      | GND         | 47      | BT_UART_RTS_N | 65      | BT_GPIO_5   |
| 12      | GND         | 30      | LPO_IN      | 48      | BT_UART_CTS_N | 66      | GND         |
| 13      | GND         | 31      | GPIO_7      | 49      | GND           | 67      | GND         |
| 14      | SDIO_DATA0  | 32      | BT_PCM_IN   | 50      | ANT           | 68      | GND         |
| 15      | SDIO_CMD    | 33      | BT_PCM_SYNC | 51      | GND           | 69      | GND         |
| 16      | SDIO_DATA1  | 34      | BT_PCM_OUT  | 52      | GND           | 70      | GND         |
| 17      | SDIO_DATA2  | 35      | BT_PCM_CLK  | 53      | GND           | 71      | GND         |
| 18      | SDIO_DATA3  | 36      | I2S_DO      | 54      | NC            | 72      | GND         |

# Supply Voltage

| Parameter               |                | Min. | Typ. | Max. | Unit   |
|-------------------------|----------------|------|------|------|--------|
| Operating Temperature * |                | -30  | 25   | +85  | deg. C |
| Supply Voltage          | VBAT           | 3.2  | 3.3  | 4.8  | V      |
|                         | VIO# 1.8V/3.3V | 1.62 | -    | 3.63 | V      |

\*: Surface temperature of the shield case. Functionality is guaranteed but specifications require derating at extreme temperatures.

#: VIO don't influence the RF characteristic. Tolerance of 1.8V and 3.3V is  $\pm 10\%$ .

# Theory of Operation-Software Security and Channel List

| Frequency of operation |                    |                | Scan    | Ad-hoc mode |
|------------------------|--------------------|----------------|---------|-------------|
| 2.4GHz                 | 11b/g/n (HT20)     | 2412-2462MHz   | Active  | Yes         |
|                        | BT                 | 2402-2480MHz   | N/A     | N/A         |
|                        | BLE                | 2402-2480MHz   | N/A     | N/A         |
| W52                    | 11a/n/ac ((V)HT20) | 5180-5240MHz   | Active  | Yes         |
|                        | 11n/ac ((V)HT40)   | 5190-5230MHz   | Active  | Yes         |
|                        | 11ac (VHT80)       | 5210MHz        | Active  | Yes         |
| W53                    | 11a/n/ac ((V)HT20) | 5260-5320MHz   | Passive | No          |
|                        | 11n/ac ((V)HT40)   | 5270-5310MHz   | Passive | No          |
|                        | 11ac (VHT80)       | 5290MHz        | Passive | No          |
| W56                    | 11a/n/ac ((V)HT20) | 5500-5720MHz * | Passive | No          |
|                        | 11n/ac ((V)HT40)   | 5510-5710MHz * | Passive | No          |
|                        | 11ac (VHT80)       | 5530-5690MHz * | Passive | No          |
| W58                    | 11a/n/ac ((V)HT20) | 5745-5825MHz   | Active  | Yes         |
|                        | 11n/ac ((V)HT40)   | 5755-5795MHz   | Active  | Yes         |
|                        | 11ac (VHT80)       | 5775MHz        | Active  | Yes         |

The frequency band 5600MHz-5640MHz (11a/n/ac 20M band), 5590MHz-5630MHz (11n/ac 40M band) and 5610MHz (11ac 80M band) is restricted in ISCED.

Notes: End users can not modify the software because F/W & driver are installed in device.

# Antenna

- Please perform the antenna design that follow the specifications of the antenna.
- About the signal line between an antenna and a module
  - It is a 50-ohm line design.
  - Fine tuning of return loss etc. can be performed using a matching network.
  - However, it is required to check "Class1 change" and "Class2 change" which the authorities define then.
  - The concrete contents of a check are the following three points.
    - It is the same type as the antenna type of antenna specifications.
    - An antenna gain is lower than a gain given in antenna specifications.
    - The emission level is not getting worse.
- 50-ohm line(microstrip line length)

|                         | Antenna                                     |
|-------------------------|---|
| Antenna type            | Dipole pattern antenna chip or external PCB |
| 50-ohm feed line length | We test it at 0mm as a representative       |

## Antenna continued

- PCB Mounted Antenna Must Be: Ethertronics/AVX M830520
- All Ground Planes Must be Removed in an area of 8.75mm x 4.75mm with the farthest edge of the width being lined up with the edge of the PCB, and the length centered on the antenna.
- Antenna Trace should be .35mm Wide with a GND pullback of .15mm or greater. .2mm - .3mm recommended.
- GND must be poured under antenna trace and maintain a 50 ohm impedance with the antenna trace being plated to 1oz
- Antenna should not have right angles, and should use rounded corners for any turns in trace. A radius of .5mm or greater is recommended for trace turns





Thank You

