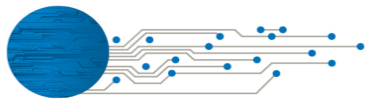


MiniPCle 802.11ac WiFi module

MTWM-0000T0

FCC ID: AU792U22L14872





General Descriptions:

MTWM-0000T0 is a highly integrated Wi-Fi single chip which supports 1266 Mbps PHY rate. It fully complies with IEEE 802.11ac and IEEE 802.11 a/b/g/n standards, offering feature-rich wireless connectivity at high standards, and delivering reliable, cost-effective throughput from an extended distance.

Optimized RF architecture and baseband algorithms provide superb performance and low power consumption. Intelligent MAC design deploys a high efficient offload engine and hardware data processing accelerators which completely offloads Wi-Fi task of the host processor. MTWM-0000T0 is designed to support standard based features in the areas of security, quality of service and international regulations, giving end users the greatest performance any time and in any circumstance.

MTWM-0000T0 supports concurrent dual-band operation at 5GHz and 2.4GHz band (DBDC, Dual-Band- Dual-Concurrent). It enables diversified applications that require one link at 2.4GHz band, and the other at less crowded 5GHz band simultaneously. With the advent of 802.11ac, multiuser MIMO (MU-MIMO) is defined.

MTWM-0000T0 supports MU-MIMO with different configurations. An AP is able to use its antenna arrays to transmit multiple frames to different clients at the same time and over the same frequency spectrum.

Baseband Supports The Following Features:

MTWM-0000T0 for 802.11ac WiFi 2x2 Dual-band Con-current (DBDC) Single chip solution 11ac wave2, MU-MIMO

2T2R(11ac) + 2T2R(11n) with support upto 1266MHz Phy rate

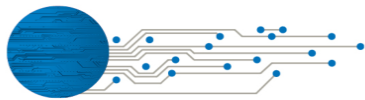
Configurable 2x2n + 2x2ac DBDC

Integrated high efficiency internal 2.4G/5G PAs

Intelligent Calibration (iCal) reduces the production time

Formfactor: mini-PCIe I/F, with 50mm PCB width

Add SAW filters for LTE coexistence design



WLAN Baseband:

MTWM-0000T0 baseband supports the following features:

- • Respective two spatial streams of 2.4G and 5G
- • 11ac wave-1/2 feature
 - 20, 40, 80MHz channels
 - ◦ MCS0-7 (BPSK, $r=1/2$ through 64QAM, $r=5/6$)
 - ◦ MCS8-9 (256QAM, $r=3/4$ and $r=5/6$)
 - ◦ VHT A-MPDU delimiter for RX and TX for single MPDU
 - ◦ Clear Channel Assessment (CCA) on secondary
 - ◦ Short Guard Interval
 - ◦ STBC
 - ◦ Low Density Parity check (LDPC) coding
 - ◦ SUBF
 - ◦ MU-MIMO
- • MU-MIMO configuration of 2 users: 2*1ss
 - 2 users: 2*1ss
- • DBDC
- • Digital pre-distortion to enhance PA performance
- • Smoothing (channel estimation) extension to MIMO case
- • Dynamic frequency selection (DFS) radar pulse detection
- • Proprietary Receiver MIMO power save scheme.

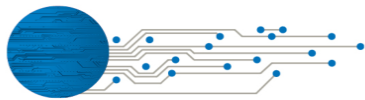
WLAN RF:

MTWM-0000T0 RF supports the following features:

- • Integrated 2T2R 2.4GHz and 5GHz PA and LNA
- • Integrated 5GHz Balun
- • 2.4GHz and 5GHz external PA and LNA
- • Improves the efficiency of RF PA with Digital Pre-Distortion (DPD)
- • Improves the power variation with TSSI compensated TX power control

Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may



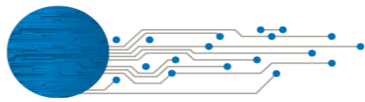
cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



FOR MOBILE DEVICE USAGE (>20cm/low power)

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:

2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures

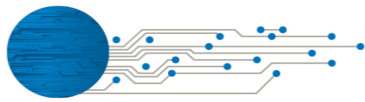
Not applicable.

2.5 Trace antenna designs

Not applicable.

2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.



2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

Antenna Type :Diople

Antenna connector :R-SMA

RF extender cable 10cm, loss<0.5 dB

Model name: RFA-25-F17M3-B-10069

Antenna Peak gain (Include Cable loss)

Frequency range	2400 –2500 MHz	5150 –5875 MHz
Peak gain	2.0 dBi	3.0 dBi

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: “Contains FCC ID: AU792U22L14872”. The grantee's FCC ID can be used only when all FCC compliance requirements are met.

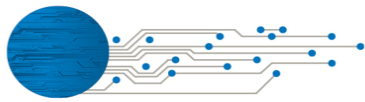
2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.

2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.



IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Manual Information To the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

OEM/Host manufacturer responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment