PEGATRON- Wireless Module MD100-Q62

Contents

1 Foreword

1.1 Introduction

The document describes the electrical characteristics, RF performance, dimensions and application environment, etc. of MD100-Q62 With the assistance of the document and other instructions, the developers can quickly understand the hardware functions of MD100-Q62 modules and develop products.

2 Overview

2.1 Introduction

The MD100-Q62 series module is a 5G module which supports NSA and SA network architectures. The MD100-Q62 integrates core devices such as Baseband, Memory, PMU, Transceiver, and PA. It supports 5G NR Sub6, FDD-LTE, TDD-LTE, long-distance communication modes. Supports uplink 2×2 MIMO and downlink 4×4 MIMO multi-antenna configuration in SA mode. It also reserved GNSS wireless positioning technology. The MD100-Q62 is designed in M.2 form factor interface, and is suitable for a variety of eMBB scenarios, such as CPE, VR/AR, gateway, TV box, and intelligent monitoring.

2.1.1Key Features

Table 2-1 Key features

Performance	Description
Operating Band	LTE FDD: Band 2/4/5/12/13/29/30/66/71
	LTE TDD: Band 41/48/46（LAA）
	NR: n2/5/12/14/25/30/41/48/66/70/71/77
NR	3GPP Release 16
LTE	3GPP Release 16
Feature	NR: DL 4×4 MIMO: n2/5/25/30/41/66/71/77 UL 2×2MIMO: n41/77 LTE: DL 4×4MIMO: Band B2/4/5/12/13/30/41/48/66

	NSA and SA supported	
	SRS: n41, n77 Support: 1T2R, 1T4R, 2T4R	
	HPUE: B41, n41, n77	
Data Transmission	SA 5G/NR Sub-6 Peak	DL 2.47Gbps/UL 900Mbps
	NSA Peak	DL 3.47Gbps/UL 555Mbps
	LTE	DL 1.6Gbps (CAT19)/UL 211Mbps (CAT18)
	UMTS/HSPA+	NA
		NA
Power Supply	DC: 3.135~4.4V, typical voltage: 3.8V	
Antenna Type:	External	
Antenna Gain:	<4dBi	
Temperature	Normal operating temperature: -30~75℃[1] Extended operating temperature: -40~85℃[2] Storage temperature: -40~85℃	
Physical characteristics	Dimension: 30 mm×52mm×2.3 mm Package: M.2 Weight: about 7.8 g	
CPU	ARM Cortex-A7, quad core, up to 1.5 GHz	
Memory	4Gb LPDDR4X+4Gb NAND Flash	
Interface		
USB Interface	USB 3.0，rate up to 10Gbps	
PCIe Interface	PCIe interface：PCIe Gen 3 1-lane or PCIe Gen 4 1-lane(RC only)	
SIM Interface	Dual SIM: 1.8V/3V SIM1: USIM SIM2: ESIM/USIM	
I2C	One set of I2C interface, data transmission rate up to 400Kbit/s	
ADCs	A/D conversion channel, Voltage Range: 0~1.45V	
Software		
Firmware update	USB/PCIe/FOTA	
Operating System	Linux/Android/Windows	

1. When temperature keeps in the range of -30~75°C, the module can work normally. Module performance meets the 3GPP specifications.
2. When temperature keeps in the range of -40~85°C, module performance may be slightly out of 3GPP specifications.

2.2 Application Framework

The application framework below shows the main hardware functions of the MD100-Q62 module:

- Baseband
- RF transceiver
- PMU
- Memory
- Peripheral interface

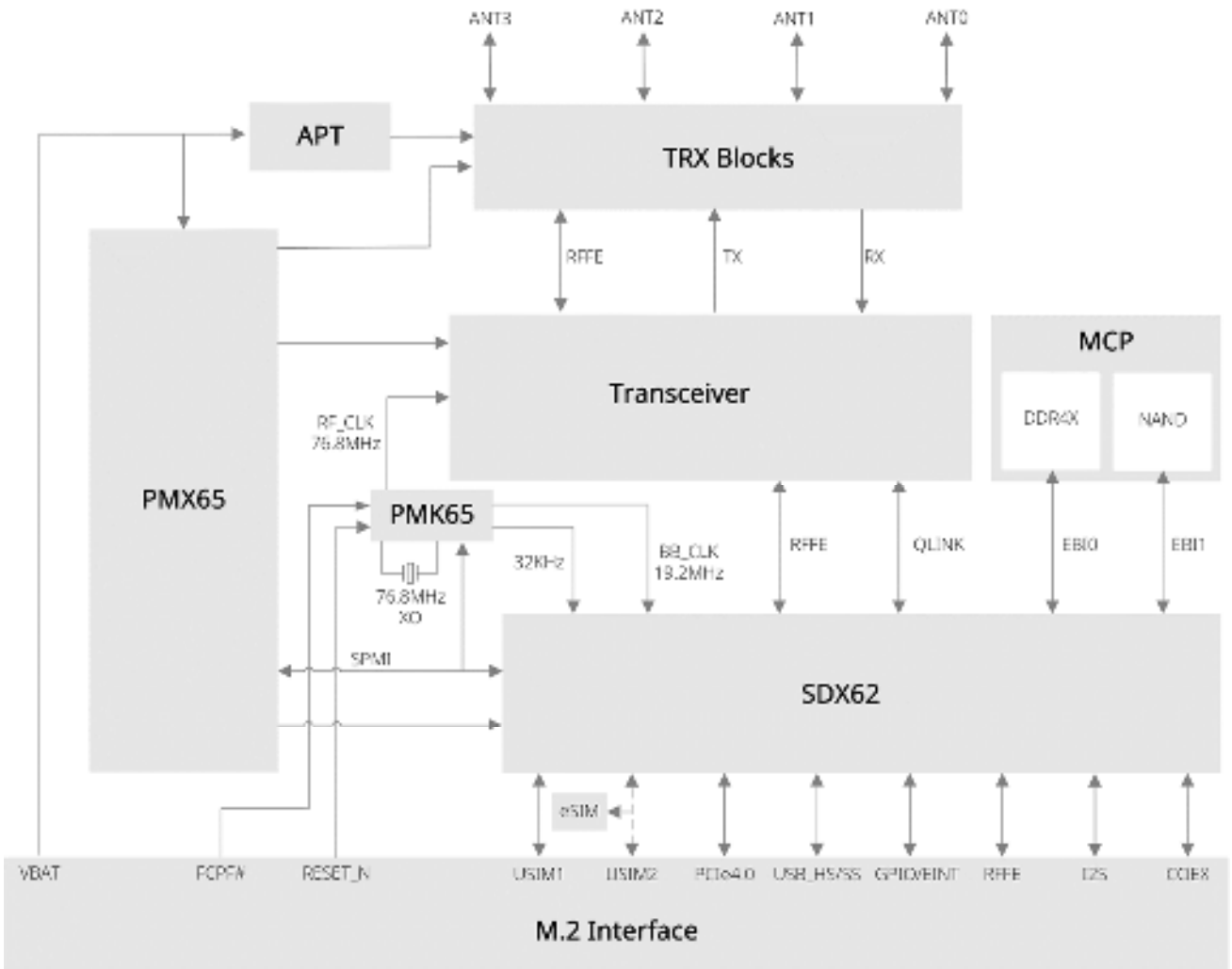

Figure 2-1 Hardware block diagram

2.3 Antenna Configuration

MD100-Q62 module supports four antennas and the configuration is as below

Antenna Connector	Function	Band Description	Frequency Range (MHz)
ANT0	PRX (Main TX)	LTE: B2/4/30/66/41/48 NR: n2/25/30/41/48/66/70/77	617-960 1427-2690 3300-4200
	MIMO PRX	LTE:B5/12/13/71 NR:n5/12/14/71	
	Secondary TX	LTE: B5 NR: n5	
ANT1	PRX	LTE: B46 (LAA)	617-2690 3300-4200 5150-5925
	DRX	LTE: B2/4/5/12/13/29(SDL)/30/41/66/71 NR: n2/5/12/14/25//30/41/66/70/71	
	MIMO PRX	LTE : B48 NR : n48/77	
	GNSS	L1	
ANT2	DRX	LTE: B46 (LAA)	617-2690 3300-4200 5150-5925
	MIMO DRX	LTE: B2/4/5/12/13/30/41/48/66/71 NR: n2/5/12/14/25/30/41/48/66/70/71/77	
ANT3	PRX (Main TX)	LTE: B5/12/13/29(SDL)/71 NR: n5/12/14/71	617-960 1427-2690 3300-4200
	DRX	LTE : 48 NR : n48/77	
	MIMO PRX	LTE : B2/4/30/41/66 NR : n2/25/30/41/66/70	

	Secondary TX	LTE: B2/4/41/48/66 NR: n2/25/41/48/66/77

2.4 Waring

2.4.1 Important Notice to OEM integrators

1. This module is limited to OEM installation ONLY.
2. This module is limited to installation in fixed applications, according to Part 2.1091(b).
3. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations
4. For FCC Part 15.31 (h) and (k): The host manufacturer is responsible for additional testing to verify compliance as a composite system. When testing the host device for compliance with Part 12 Subpart B, the host manufacturer is required to show compliance with Part 15 Subpart B while the transmitter module(s) are installed and operating. The modules should be transmitting and the evaluation should confirm that the module's intentional emissions are compliant (i.e. fundamental and out of band emissions). The host manufacturer must verify that there are no additional unintentional emissions other than what is permitted in Part 15 Subpart B or emissions are complaint with the transmitter(s) rule(s). The Grantee will provide guidance to the host manufacturer for Part 15 B requirements if needed.

Important Note

notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify to PEGATRON that they wish to change
the antenna trace design. In this case, a Class II permissive change application is required to be filed by the USI, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

End Product Labeling

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text:
“Contains FCC ID: VUIMD100”
The FCC ID can be used only when all FCC compliance requirements are met.

Antenna Installation

(1) The antenna must be installed such that **20** cm is maintained between the antenna and users,

(2) The transmitter module may not be co-located with any other transmitter or antenna.

(3) Only antennas of the same type and with equal or less gains as shown below may be used with this module. Other types of antennas and/or higher gain antennas may require additional authorization for operation.

(4)The max allowed antenna gain is 3.76dBi for external monopole antenna.

In the event that these conditions cannot 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 ID cannot 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.

2.4.2 FCC Statement

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.

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.

This device is intended only for OEM integrators under the following conditions: (For module device use)

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
2) The transmitter module may not be co-located with any other transmitter or antenna.
As long as 2 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.

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 **20** cm between the radiator & your body.