



# WW-DL060

## 4G LTE Embedded Mini-Card Module Standard

Version 0.4

Document release	Date	Modification	Initials	Approved
Version 0.1	2013/06/10	Initial version	James Li	Daniel Lee
Version 0.2	2013/07/09	Spec update	Daniel	Daniel
Version 0.3	2013/07/09	Add packing SOP	Irene Lin	Irene Lin
Version 0.4	2013/07/29	Update packing SOP	Fiona Liang	Fiona Liang



## 1. General Description

### 1-1. Product Overview and Functional Description

**Billion Electric Co., Ltd.** introduces the embedded mini-card for 4G LTE data communication – WW-DL060. The demands of data communication everywhere becomes more due to the great development of 4G LTE system. WW-DL060 adopts GCT GDM7240 solution. It provides up to 50 Mbps Downlink, up to 25 Mbps Uplink and RX antenna diversity etc. WW-DL060 is fast, reliable and easy to operate. Therefore, by WW-DL060 mobile user can experience the new features and surf the internet everywhere.

#### **FCC Caution <15.21 >**

- Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

#### **FCC Statement**

Federal Communication Commission Interference Statement

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 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.



**RF exposure statements:**

Information to OEM integrator

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 manual of the end product.

The user manual which is provided by OEM integrators for end users must include the following information in a prominent location.

1. To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC multi-transmitter product procedures.
2. Only those antennas with same type and lesser gain filed under this FCC ID number can be used with this device.
3. The regulatory label on the final system must include the statement: "Contains FCC ID: xxxx or using electronic labeling method as documented in KDB 784748.
4. The final system integrator must ensure there is no instruction provided in the user manual or customer documentation indicating how to install or remove the transmitter module except such device has implemented two-ways authentication between module and the host system.

This module can't be used on radio system and operation Individually. Using others antenna must be re-testing and certification.



## 1-2. Antenna Description

Type: Dipole Antenna

A. Electrical Characteristics	
Frequency	700 ~ 960 MHz
S.W.R.	$\leq 3.5$ @ 700 ~ 960 MHz
Antenna Gain	1.37 dBi
Polarization	Linear
Impedance	50 Ohm
B. Material & Mechanical Characteristics	
Material of Radiator	Cu
Material of Plastic	TPE & ABS
Cable Type	RG-178
Connector Type	SMA Male
Pull Test	$\geq 5$ Kg
C. Environmental	
Operation Temperature	- 40 °C ~ + 65 °C
Storage Temperature	- 40 °C ~ + 80 °C



## 1-2. Key Features

### Supporting Following Standards

LTE : Long Term Evaluation (3GPP E-UTRA Release 8)

E-UTRA: Evolved Universal Terrestrial Radio Access

### Supporting Following Service

LTE packet data service

### Supporting Following Features

FDD: Frequency Division Duplex

RX diversity

Uplink data rate up to 25 Mbps

Downlink data rate up to 50 Mbps

Mini PCI Express form factor, USB interface

**\*Maximum data rate is subject to 4G services provided by network operators**

### Operating Systems Supported

Microsoft Windows XP ,Microsoft Vista , Microsoft Windows 7

Android: 2.3, 3.0, 4.0

Linux:



### 1-3. Specifications Table

<b>Model Name</b>	<b>WW-DL060</b>
<b>Product Description</b>	<b>4G LTE embedded mini card module</b>
<b>Technical Standard</b>	<ul style="list-style-type: none"><li>● LTE (3GPP R8)</li></ul>
<b>Host Interface</b>	USB (through mini-PCI Express interface)
<b>Operating Conditions</b>	
<b>Voltage</b>	3.3V
<b>Temperature</b>	Operating: -20~70 Storage: -40~85
<b>Humidity</b>	15% ~ 95%
<b>Dimension</b>	51mm X 30mm
<b>Form Factor</b>	Mini PCI Express Card
<b>Electrical Specifications</b>	
<b>Operating Frequency</b>	FDD 700 MHz (Band 12): <ul style="list-style-type: none"><li>● UP-Link:699~716 MHz</li><li>● DL-Link: 729~746 MHz</li></ul>
<b>Maximum Output Power</b>	<ul style="list-style-type: none"><li>● LTE 700 MHz: 23dBm (Class 3)</li></ul>
<b>Antenna</b>	Dual IPEX antenna port
<b>Receive Sensitivity</b>	<ul style="list-style-type: none"><li>● LTE 700 MHz: compliant with 3GPP TS 36.521-1</li></ul>



## 2. Electrical Characteristics

### 2-1. Recommended Operating Conditions

Power	Parameter	Tolerance	Units
3.3V	Module power supply	+9%	V

### 2-2. Power supply and Current Requirement:

The WW-DL060 complies with PCI express Mini CEM specifications v1.2.

PCI express Mini CEM specifications define as the below Table:

Power	Tolerance	Max. Current	Idle Current
3.3V	+9%	700 mA	TBD mA

**Note.** The idle current is generally less than 100mA, depending on the FW version.



### 3. Pin Definition

#### 3-1. Pin Assignment

Pin No	Definition	Basic Description	Type	
1	NC	No connect		
2	3.3V	3.3V DC supply	Input	
3	NC	No connect		
4	GND	Ground		
5	NC	No connect		
6	NC	No connect		
7	NC	No connect		
8	UIM_PWR	Power source for external UIM/SIM	Output	
9	GND	Ground		
10	UIM_DATA	External UIM/SIM data signal	Input/output	
11	NC	No connect		
12	UIM_CLK	External UIM/SIM clock signal	Output	
13	NC	No connect		
14	UIM_RESET	External UIM/SIM reset signal	Output	
15	GND	Ground		
16	NC	No connect		
17	NC	No connect		
18	GND	Ground		
19	NC	No connect		
20	NC	No connect		
21	GND	Ground		
22	*NC	No connect		Note 1
23	NC	No connect		
24	3.3Vaux	3.3V_FMC DC supply		
25	NC	No connect		
26	GND	Ground		
27	GND	Ground		
28	NC	No connect		
29	GND	Ground		
30	NC	No connect		



Pin No	Definition	Basic Description	Type
31	NC	No connect	
32	NC	No connect	
33	NC	No connect	
34	GND	Ground	
35	GND	Ground	
36	USB_D-	USB signal D-	Input/Output
37	GND	Ground	
38	USB_D+	USB signal D+	Input/Output
39	3.3Vaux	3.3V_FMC DC supply	Input
40	GND	Ground	
41	3.3Vaux	3.3V_FMC DC supply	Input
42	LED_WWAN_1	Active Low LED signal for indicating the state of the module open drain structure If no use this pin, connect to GND	Output
43	GND	Ground	
44	NC	No connect	
45	NC	No connect	
46	NC	No connect	
47	NC	No connect	
48	NC	No connect	
49	NC	No connect	
50	GND	Ground	
51	NC	No connect	
52	3.3V	3.3V DC power supply	Input

**Note:**

Please don't series NC pin to ground or bias voltage.

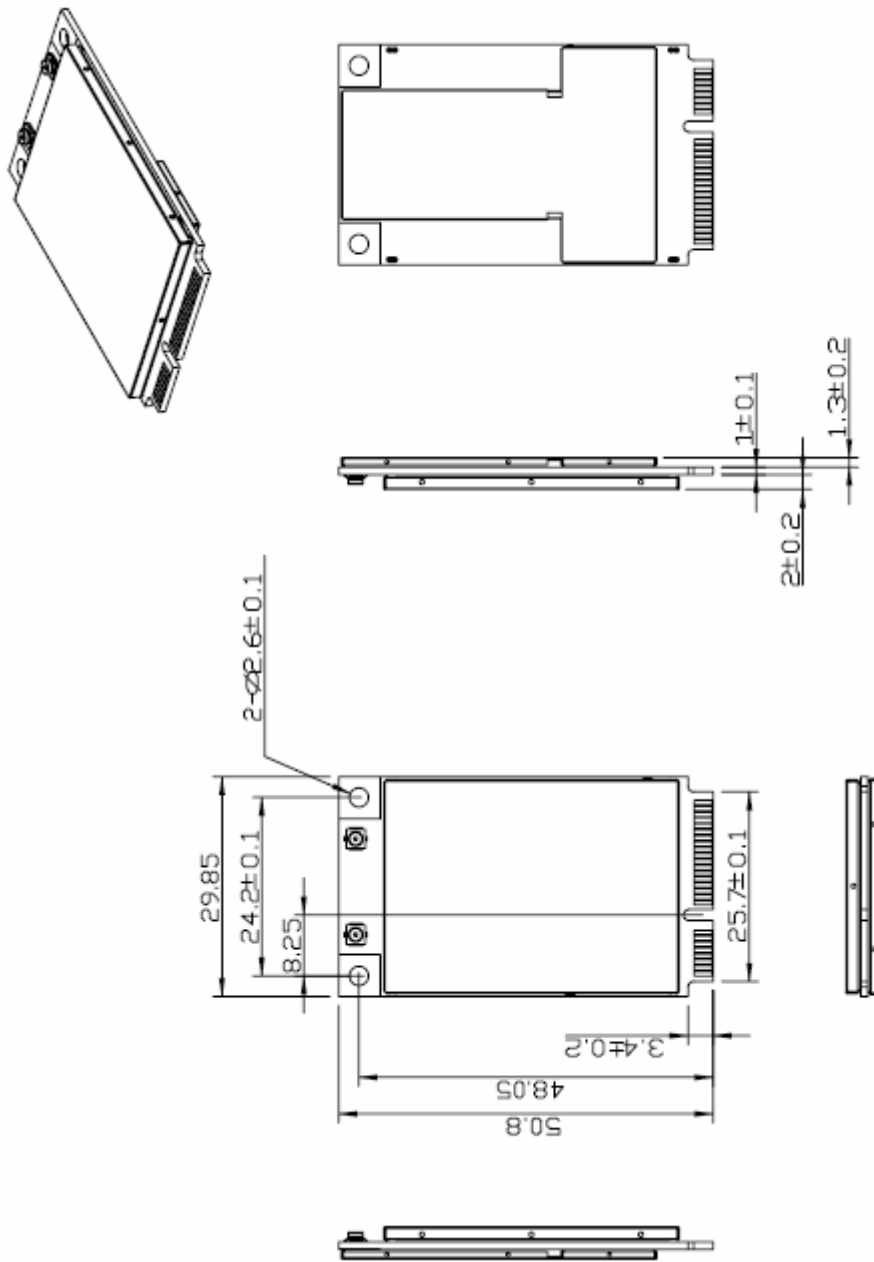
**Note1:**

Please keep pin 22 NC

If want to preset module

Recommend to add a switch to turn off and turn on 3.3V DC power

## 4. Mechanical drawing



Tolerances unless otherwise specified :  $\pm 0.15\text{mm}$