WGM110 Module Data Sheet

The WGM110 is an all-inclusive Wi-Fi® Module targeted for applications where good RF performance, low-power consumption, and easy application develop- ment, together with fast time to market, are key requirements. WGM110 has excellent RF performance and can provide long range with robust wireless connectivity.

The WGM110 Module integrates all of the necessary elements required for an IoT Wi-Fi application, including an 802.11b/g/n radio, integrated chip antenna (WGM110A) or an u.FL connector for an external antenna (WGM110E), certifications, a microcontroller, Wi-Fi and IP stacks, an HTTP server, and multiple protocols, such as TCP and UDP.

WGM110 can act as a Wi-Fi client or be used as a Wi-Fi access point, making the provisioning of the device as easy as surfing on the web. WGM110 can host BGScript™ end user applications, which means applications can be designed without relying on an external microcontroller. Alternatively, the Wi-Fi Module can run in Network Co-Processor (NCP) mode, leaving the complexity of TCP/IP networking to the Module so that the customer's own host controller can be fully dedicated to processing the customer application tasks. The WGM110 Module also has highly flexible hardware interfaces which allows connection to different peripherals and sensors.

KEY POINTS

- Module variants
  - WGM110A (chip antenna)
- 802.11b/g/n compliant
- TX power: +16 dBm
- RX sensitivity: -98 dBm
- Range: up to 450 m
- CPU core: 32-bit ARM® Cortex-M3
- Flash memory: 1 MB
- RAM: 128 kB
- Modular certification
  - FCC
  - IC
  - Japan
  - Korea
- CE compliant
- End-to-end security
- Can host applications
- Small size: 21.0 x 14.4 x 2.0 mm

WGM110 Module Block Diagram
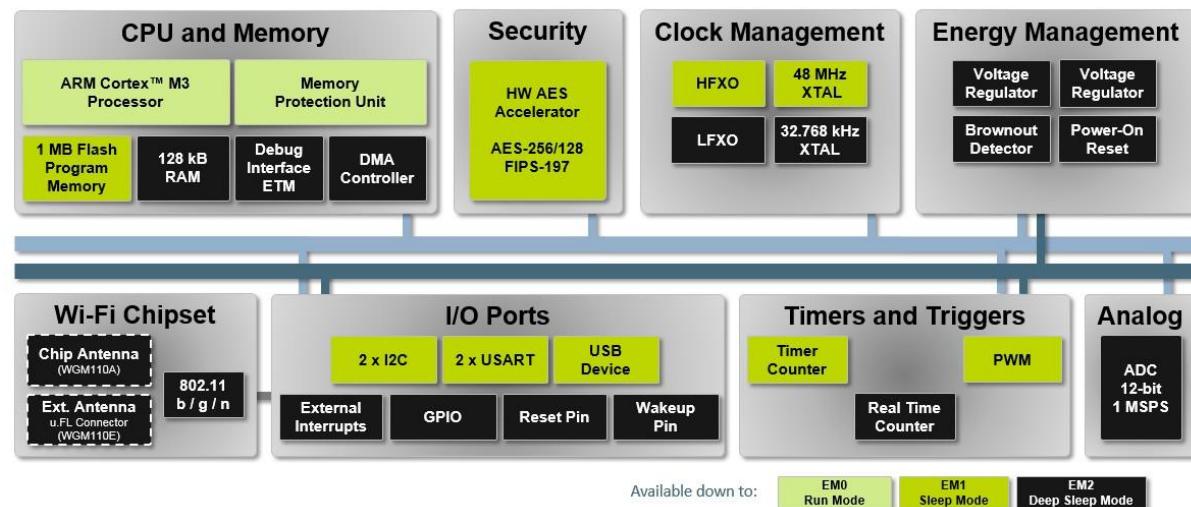
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1. Key Features

The key features of the WGM110 Module are listed below.

Radio Features

- Antenna
  - Chip Antenna: WGM110A
  - External Antenna: WGM110E (u.FL connector)
- TX Power: +16 dBm
- RX Sensitivity: -98 dBm
- Range: up to 450 m

Wi-Fi Features

- 802.11: b/g/n
- Bit rate: up to 72.2 Mbps
- 802.11 Security: WPA2/WPA Personal, WPA2/WPA Enterprise and WEP
- STA (Station Mode)
- SoftAP (Soft Access Point Mode): up to 5 clients
- Wi-Fi Direct
- WPS: 1.0 (push-button)

IP Stack

- IP version: IPv4
- IP multicast
- TCP: client/server
- UDP: client/server
- TCP sockets: 20+
- DHCP: client/server
- ARP
- DNS: client/server
- mDNS
- DNS-SD
- HTTP: server
- TLS/SSL: client

Software APIs

- BGAPI™ serial protocol API over UART/SPI/USB for modem usage
- BGLIB™ host API which implements BGAPI serial protocol
- BGScript™ scripting language for standalone usage

Software Development Tools

- Free SDK

MCU Features

- ARM® Cortex-M3
- 48 MHz
- 128 kB RAM
- 1 MB Flash

Hardware Interfaces

- Host interface: UART/SPI/USB
- Peripheral interfaces
  - 2 x USART (UART/SPI)
  - 1 x USB (2.0 Full speed)
  - 2 x I^2C peripheral interfaces
- Up to 32 x GPIO with interrupts
- 8-channel 12-bit ADC
- 2 x TIMER (3 PWM's each)
- Real-time counter

Electrical Characteristics

- Supply voltage: 2.7 V to 4.8 V for the radio block
- Supply voltage: 1.98 V to 3.8 V for the processor block

Power consumption

- 261 mA TX current at +16 dBm
- 81 mA RX current
- 2.4 mA associated idle consumption
- 18.8 µA deep sleep current

Environmental specifications

- Temperature range: -40°C to +85°C

Modular certification

- FCC
- IC
- Japan
- South-Korea

CE Compliant

Dimensions

- W x L x H: 21.0 mm x 14.4 mm x 2.0 mm

2. Pinout

This section describes the pinout of the WGM110 Module.

Pads in the middle of the Module are intended for ground connections and for RF test and production programming, while pads on the Module edges consist of general purpose input/output, power supply voltage input, ground, and reset signal connections.
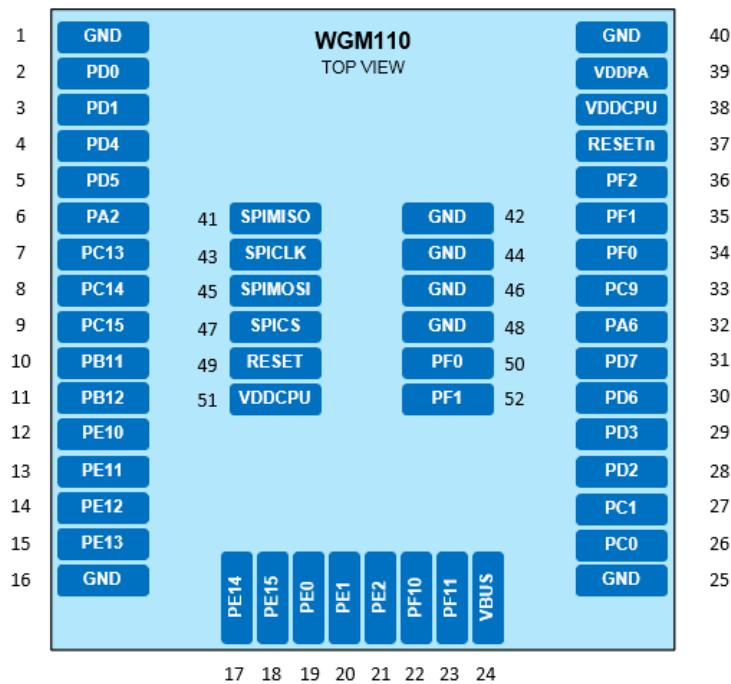
Figure 2.1. WGM110 Pinout (Top View)

2.1 Power, Ground and Reset Pads

The table below lists the power, ground, and reset pads of the WGM110 Module.

Table 2.1. WGM110 Power, Ground, and Reset Pads

Pad number	Function	Description
38, 51	VDDCPU	Processor core and peripheral interface power supply.
39	VDDPA	RF power amplifier and Wi-Fi core power supply
1, 16, 25, 40, 42, 44, 46, 48	GND	Ground. All ground pads are connected together internally. Connect ground pads directly to a solid ground plane with maximum number of vias in close proximity to pads especially at the antenna end. These ground pads also act as thermal paths which should be used to conduct heat from the module to the PCB. Do not use thermal reliefs on ground pads.
24	VBUS	USB VBUS detect input is used to detect the presence of an external USB port bus voltage. When USB is not used connect VBUS to VDDCPU.

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Pad number	Function	Description
37, 49	RESETn	Reset signal input. To reset the Module pull this line low. The reset signals resets both the MCU and the Wi-Fi radio. Connected to an internal pull-up, can be left floating if not needed.

2.2 Peripherals and GPIOs

The WGM110 has 32 GPIO pads which can be configured to various peripheral functions, like UART, I^{2}C, USB, etc., or alternatively they can be used as general purpose I/O pads.

These peripheral functions can be typically configured to multiple pad locations on the devices. Available peripherals, locations, and I/Os are described in the following sub-sections.

2.2.1 Peripheral and GPIO Pads

The table below maps out all supported peripheral functions and the GPIOs (pads) they can be routed to.

Table 2.2. Available Peripheral Functions and GPIO Pad Mapping

PERIPHERAL AND GPIO PAD MAPPING																																
Port Name	PA		PB		PC						PD								PE									PF				
Port Pin #	2	6	11	12	0	1	9	13	14	15	0	1	2	3	4	5	6	7	0	1	2	10	11	12	13	14	15	0	1	2	10	11
Pad #	6	32	10	11	26	27	33	7	8	9	2	3	28	29	4	5	30	31	19	20	21	12	13	14	15	17	18	34	35	36	22	23
Pad #																												50	52			
DEBUG																																
SWCLK																												•				
SWDIO																													•			
I2C0																																
SCL						•								•										•						•		
SDA					•								•										•					•				
I2C1																																
SCL				•												•																
SDA			•														•															
USART0																																
UART / SPI																																
CTS / CLK						•		•																•								
RTS / CS							•																		•							
RX / MISO						•																•	•									
TX / MOSI					•																•			•								
USART1																																
UART / SPI																																
CTS / CLK													•															•				
RTS / CS														•															•			

PERIPHERAL AND GPIO PAD MAPPING

Port Name / Pin	PA 2	PA 6	PB 11	PB 12	PC 0	PC 1	PC 9	PC 13	PC 14	PC 15	PD 0	PD 1	PD 2	PD 3	PD 4	PD 5	PD 6	PD 7	PE 0	PE 1	PE 2	PE 10	PE 11	PE 12	PE 13	PE 14	PE 15	PF 0	PF 1	PF 2	PF 10	PF 11
Pad #	6	32	10	11	26	27	33	7	8	9	2	3	28	29	4	5	30	31	19	20	21	12	13	14	15	17	18	34	35	36	22	23
Pad #																												50	52			
RX / MISO						•						•					•															
TX / MOSI					•						•							•														
TIMER0																																
CC0												•																•				
CC1					•									•															•			
CC2						•										•														•		
TIMER1																																
CCO								•									•					•										
CC1									•									•					•									
CC2		•								•														•								
ADC																																
CH0											•																					
CH1												•																				
CH2													•																			
CH3														•																		
CH4															•																	
CH5																•																
CH6																	•															
CH7																		•														
USB																																
DM																															•	
DP																																•

2.2.2 Peripheral Locations

Many of the peripheral functions can be configured into multiple locations on the GPIO pads. This allows a more flexible configuration of the Wi-Fi Modules GPIOs.

The following table shows the available locations and the corresponding GPIO pads.

Note: Peripheral function signals must always be grouped to a single location, combining signals from several locations to form a peripheral function is not allowed.

The configuration of the peripheral locations is defined in the hardware configuration file. See UG161: WGM110 Wi-Fi Module Configuration User's Guide for more details.

![TEREX CORPORATION logo]

Table 2.3. GPIO Peripheral Locations

Peripheral		Signal name	LOC 0	LOC 1	LOC 2	LOC 3	LOC 4	LOC 5	LOC 6	NOTE
USART0	*SPI*	MOSI	PE10			PE13		PC0		
		MISO	PE11			PE12		PC1		
		CLK	PE12		PC9	PC15				
		CS	PE13			PC14				
	UART	TX	PE10			PE13		PC0		1
		RX	PE11			PE12		PC1		1
		CTS	PE12			PC15				
		RTS	PE13			PC14				
USART1	*SPI*	MOSI	PC0	PD0	PD7					
		MISO	PC1	PD1	PD6					
		CLK		PD2	PF0					
		CS		PD3	PF1					
	UART	TX	PC0	PD0	PD7					2
		RX	PC1	PD1	PD6					2
		CTS		PD2	PF0					
		RTS		PD3	PF1					
I2C0		SCL		PD7			PC1	PF1	PE13	
		SDA		PD6			PC0	PF0	PE12	
I2C1		SCL		PB12	PE1					
		SDA		PB11	PE0					
USB		DM	PF10							
		DP	PF11							
TIMER0		CC0				PD1		PF0		
		CC1				PD2	PC0	PF1		
		CC2	PA2	PA2		PD3	PC1	PF2		
TIMER1		CC0	PC13	PE10			PD6			
		CC1	PC14	PE11			PD7			
		CC2	PC15	PE12		PB11	PC13			
DEBUG		SWCLK	PF0	PF0	PF0	PF0				
		SWDIO	PF1	PF1	PF1	PF1				

Note: The following notes apply to UART Locations:

- **1:** USART0 as UART: LOC 5 can be used as an UART without handshake.
- **2:** USART1 as UART: LOC 0 can be used as an UART without handshake.

2.2.3 GPIO Port Pins

The table below lists available Ports and corresponding Port pins in the WGM110 Module and the pads they can be routed to.

Table 2.4. Available GPIO Ports and Pins and Related Pads on the WGM110 Module

Pin →	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Port ↓																
Port A										PA6				PA2		
Port B				PB12	PB11											
Port C	PC15	PC14	PC13				PC9								PC1	PC0
Port D									PD7	PD6	PD5	PD4	PD3	PD2	PD1	PD0
Port E	PE15	PE14	PE13	PE12	PE11	PE10								PE2	PE1	PE0
Port F					PF11	PF10								PF2	PF1	PF0

2.2.4 GPIO Input and Output Modes

The GPIO pins on the WGM110 Module can be configured as inputs (options are normal input with pull-up or pull-down or with pull-up with filter or pull-down with filter), outputs (maximum output current 6 mA) or disabled (tristate). The default state of the GPIO pins after reset is "disabled".

For more information on how to configure the GPIO pins and modes, see WGM110 API Reference Manual.

2.2.5 Interrupt Pins

All GPIO pins may be used as interrupts. WGM110 supports up to 14 asynchronous external pin interrupts with the following limitations:
- All pins with the same number are grouped together and multiplexed to trigger one interrupt.
- **Pin 0** from any port cannot be used as an interrupt, because it is reserved for the Module's internal operation.
- **Pin 8** of **Port A - F** is not available for external use.

Example:
- If **PB11** is used as an interrupt pin, then the use of **Pin 11** of any other available port as an interrupt is not allowed (**PE11** and **PF11** cannot be used as an interrupt).

2.3 Debug and RF Test Pads

The table below indicates the pads available for debug and RF test connections.

Table 2.5. Debug and RF Test Pads

Debug and RF Test pads						
Port Name	RFPORT				PF	
Pad #	41	43	45	47	34	35
Pad #					50	52
Pad Name	SPIMISO	SPICLK	SPIMOSI	SPICS	PF0	PF1
DEBUG						
SWCLK					•	
SWDIO						•
RF TEST						
SPIMISO	•					
SPIMOSI			•			
SPICLK		•				
SPICS				•		

3. Hardware Design Guidelines

WGM110 is an easy-to use Module with regard to hardware application design, but certain guidelines must be followed to guarantee optimal performance. These guidelines are listed in the next sub-sections.

3.1 Power Supply Requirements

WGM110 Module consists of two separate internal blocks, the microcontroller and the Wi-Fi radio block. Individual power supplies are needed for both the MCU and the Wi-Fi radio blocks.

The WGM110 Module is designed to operate with a 3.3 V nominal input voltage supplied to the two supply inputs as follows:
- The **VDDCPU** powers the MCU and can be fed with a voltage between 2.0 V and 3.8 V. The regulator supplying VDDCPU should be able to supply at least 30 mA.
- The **VDDPA** pad can be supplied with a voltage between 2.7 V and 4.8 V and supplies the RF power amplifier and the internal switch-mode converter powering the Wi-Fi digital core. VDDPA may draw short peaks up to 350 mA.

In lithium battery powered applications, VDDPA can be connected directly to the battery, while a regulator is needed to supply the VDDCPU with a lower voltage, as needed by the design. Care should be taken that the supply source is capable of supplying enough current for the heavy load peaks of the power amplifier.

External high frequency bypass capacitors are not needed because the module contains the required supply filter capacitors. However, care should be taken to prevent strong switching noise from being superimposed on the supply lines. Such noise can be generated, for example, by on-board charge pump converters used in RS232 level shifters. Note that there is a total of about 20 µF of low ESR ceramic capacitors on the VDDPA line and approximately 2 µF on the VDDCPU line inside the module. When using external regulators to generate regulated supplies for the module, the stability of the regulator with the low ESR provided by these capacitors should be checked. Many low-drop linear regulators and some switched mode regulators are not stable when using ceramic output capacitors. The datasheet of the regulator typically lists recommendations concerning suitable capacitors, including data on ESR range and/or stability curves. A regulator with a statement *"stable with ceramic capacitors"* is recommended.

3.2 PCB Design Guidelines

For optimal performance of the WGM110 Module, please follow these guidelines:
- Place the Module at the edge of the PCB (does not apply to WGM110E), as shown in the figure below.
- Do not place any metal (traces, components, battery, etc.) within the clearance area of the antenna, shown in the figure below as a white rectangle between the pad rows (does not apply to WGM110E).
- Connect all ground pads directly to a solid ground plane.
- Place the ground vias as close to the ground pads as possible.
- Do not place plastic or any other dielectric material in touch with the antenna.
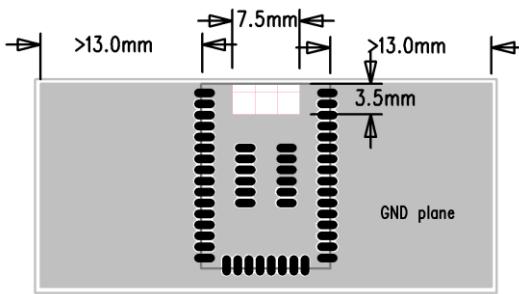
Figure 3.1. Recommended Application PCB Layout for WGM110A Module

The layouts shown in the figure below will result in severely degraded RF-performance.
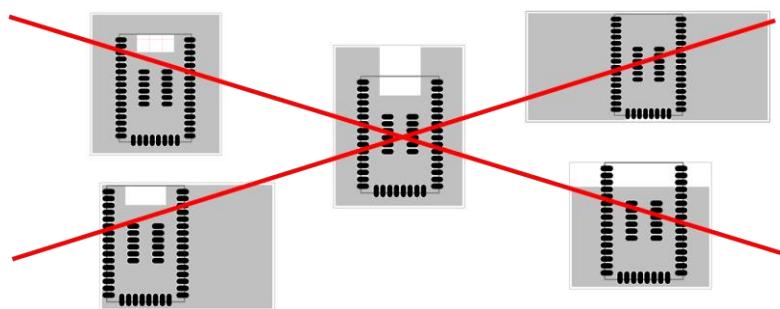
Figure 3.2. Non-optimal Application PCB Layouts for WGM110A Module

The impact of the size of the ground plane on the achievable range of the maximum range available for the WGM110A Module is shown below. As can be seen from the image, the curve indicates that the maximum range is achieved with an approximately 35 - 40 mm wide ground plane. Narrower ground planes can be used but will result in compromised RF performance.
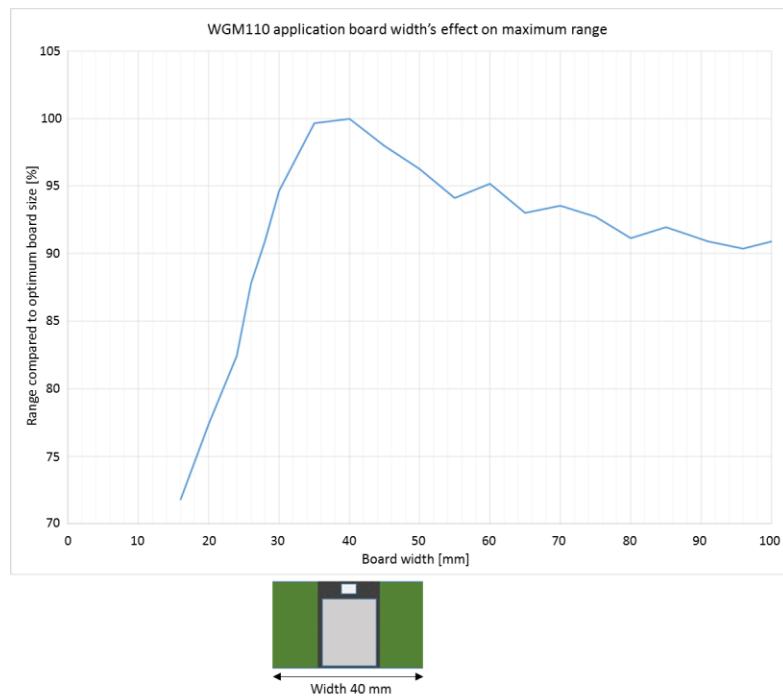

Figure 3.3. Guideline For the Achievable Range vs. Ground Plane Width for WGM110A

3.3 Antenna Design Guidelines

This section contains information regarding the optimal functioning of the antenna when using the WGM110A version. When using the WGM110E version with an external antenna follow the antenna manufacturers design related information typically available from the antenna data sheet.

3.3.1 Effect of Plastic and Metal Materials

Do not place plastic or any other dielectric material in touch with the antenna.

Any metallic objects in close proximity to the antenna will prevent the antenna from radiating freely. The minimum recommended distance of metallic and/or conductive objects is 10 mm in any direction from the antenna except in the directions of the application PCB ground planes.

4. Physical Dimensions and PCB Land Pattern

This section contains dimensional drawings of the WGM110 Module and the recommended application PCB land pattern dimensions. The indicated dimensions apply for both WGM110A and WGM110E versions, the only difference physically being the u.Fl connector on the WGM110E version.

4.1 Module Top View Dimensions
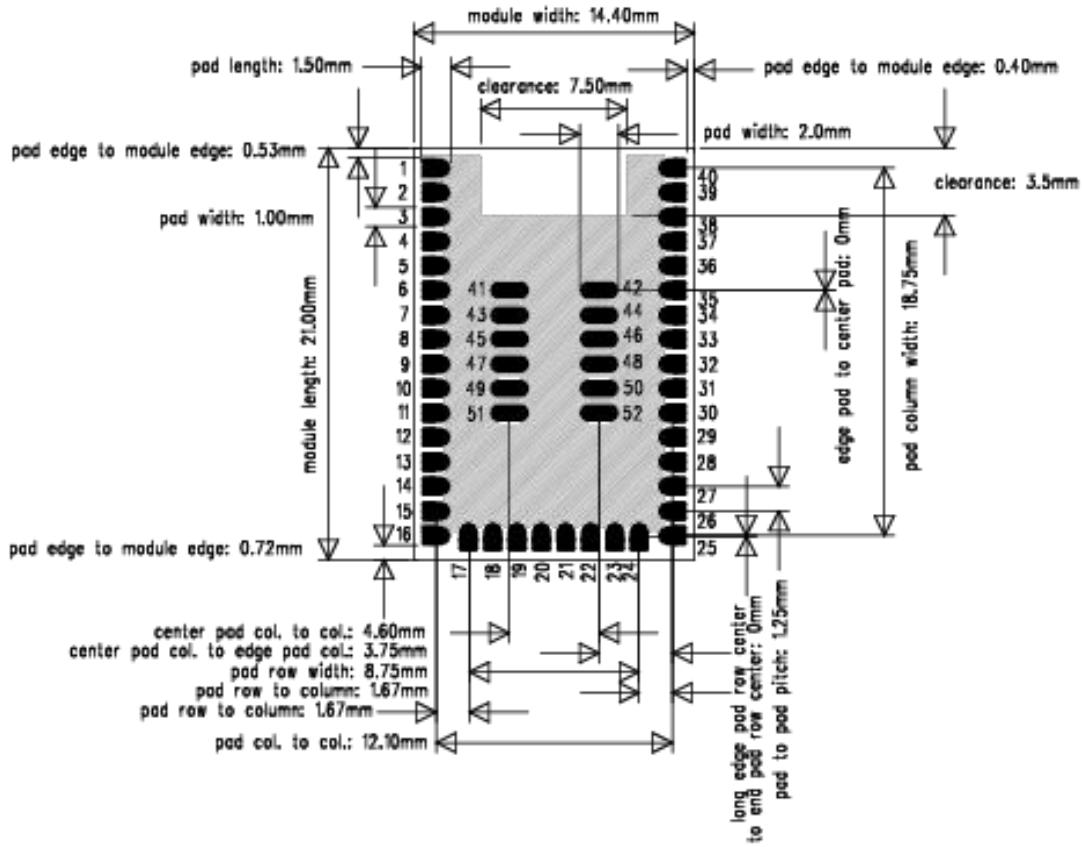
Figure 4.1. Top View Dimensions

Note: The clearance area indicated in the figure above is required only for WGM110A.

4.2 Module Side View Dimensions

MODULE SIDE VIEW
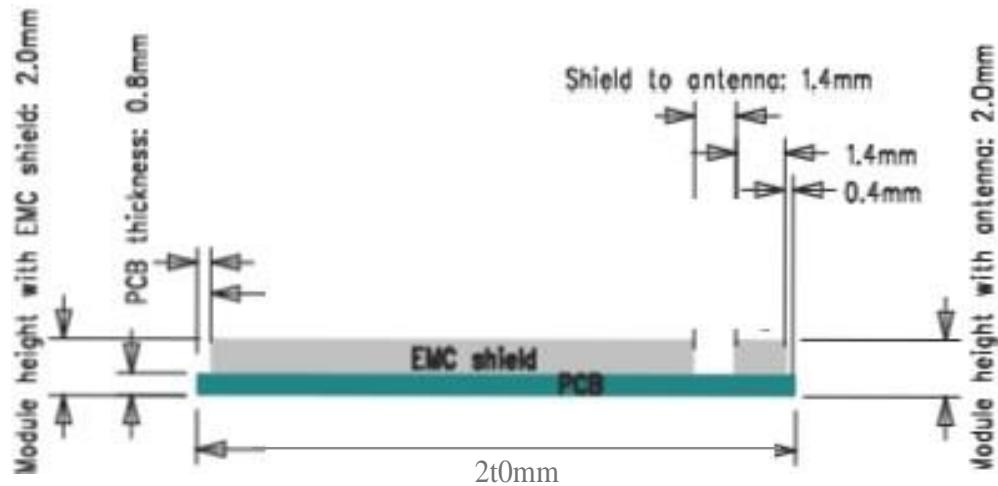
MODULE END VIEW
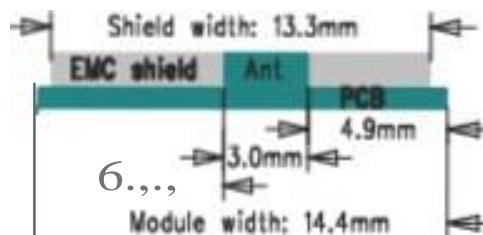
Figure *42.* Module Side View (Antenna)

Side view

Module height with EMC shield: 2.0mm

PCB thickness: 0.8mm

Shield to module edge: 0.5mm

Shield length: 17.0mm

Connector

EMC shield

PCB

Module length: 21.0mm

End view

Shield width: 13.3mm

PCB

Module width: 14.4mm
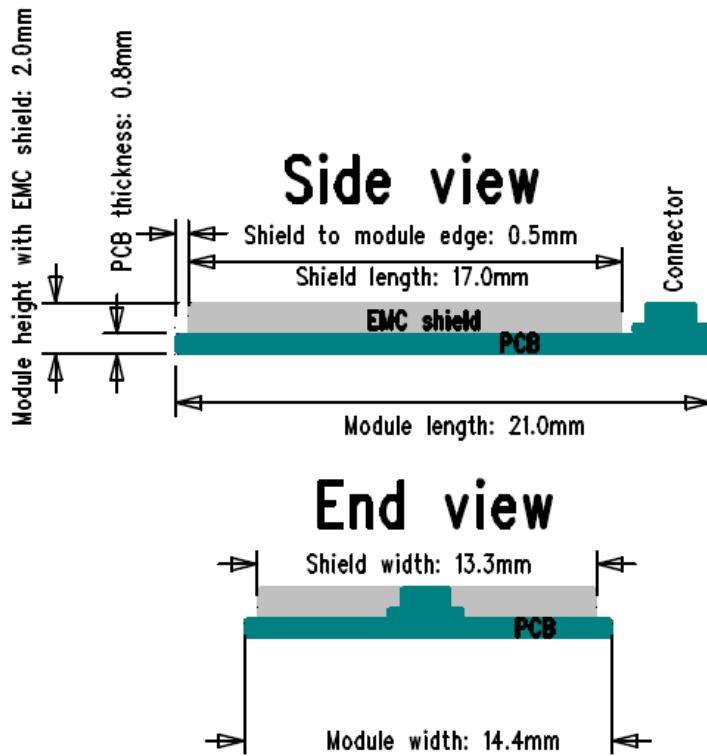
Tolerance +/-0.1mm for all measurements

Figure 8.3. Side and Antenna View Dimensions (WGM110E)

4.3 u.FL Connector Placement (WGM110E)

The WGM110E type has an u.FL connector for attaching an external antenna. The location of the u.FL connector in relation to the Module package is shown in the figure below.

Connector center pin to module edge:

7.2mm   7.2mm

Connector center pin to module end: 1.55mm
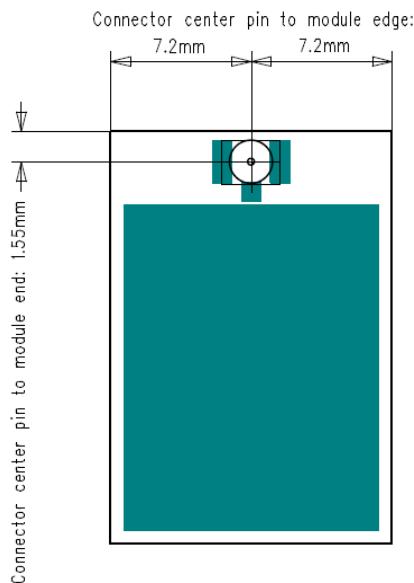
Figure 4.4. u.FL Connector Placement on the WGM110E Module

4.4 Recommended Application PCB Land Pattern
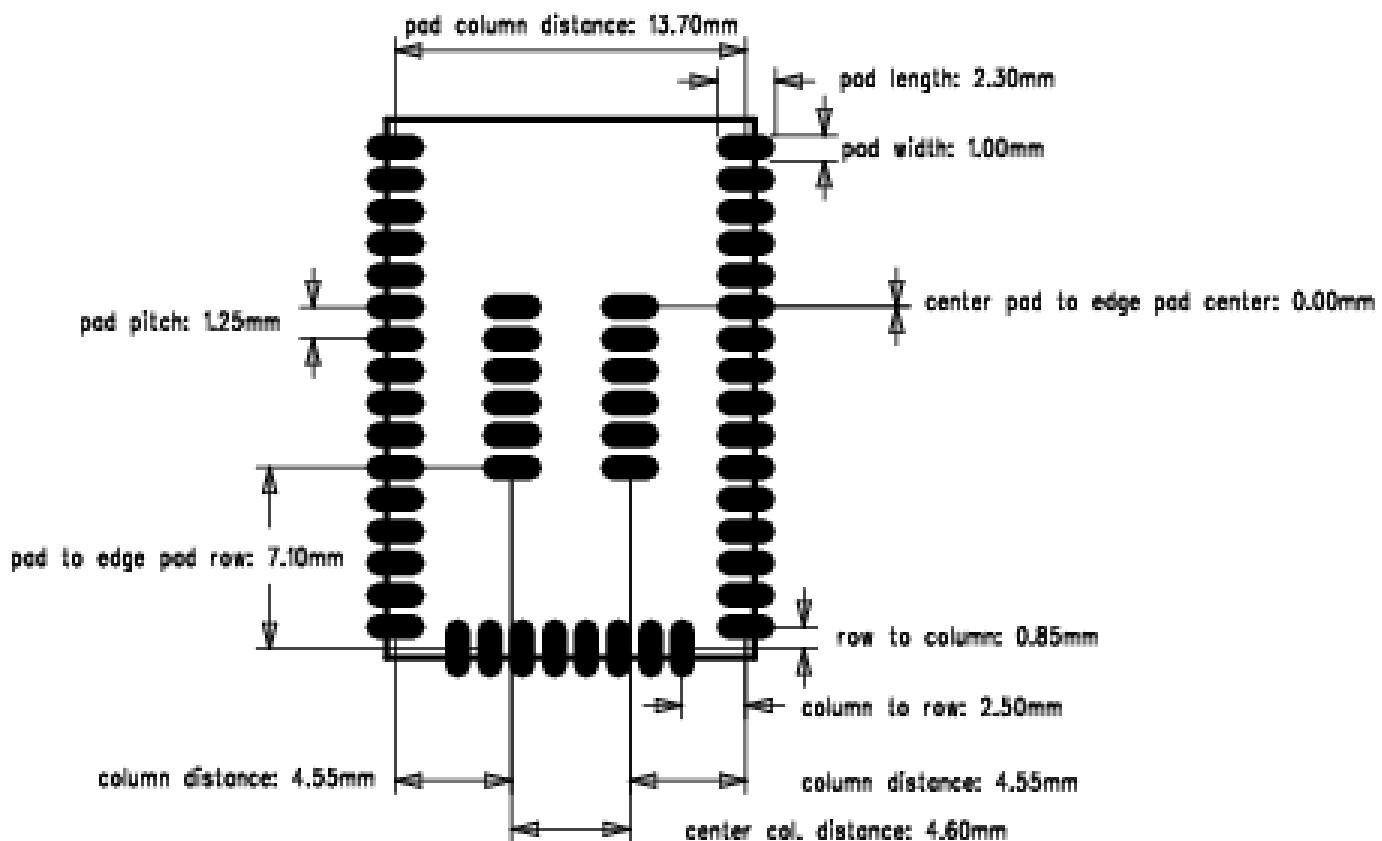
Figure 4.5. Recommended Application PCB Land Pattern

5. Soldering Recommendations

This section describes the soldering recommendations regarding WGM110 Module.

WGM110 is compatible with industrial standard reflow profile for Pb-free solders. The reflow profile used is dependent on the thermal mass of the entire populated PCB, heat transfer efficiency of the oven, and particular type of solder paste used

- Refer to technical documentations of particular solder paste for profile configurations.
- Avoid using more than two reflow cycles.
- Aperture size of the stencil should be 1:1 with the pad size.
- A no-clean, type-3 solder paste is recommended.
- For further recommendation, please refer to the JEDEC/IPC J-STD-020, IPC-SM-782 and IPC 7351 guidelines..

6. Tape and Reel Packaging

This section contains information regarding the tape and reel packaging for the Wizard Gecko WGM110 Wi-Fi Module including shipment packaging information.

6.1 Tape Material and Dimensions

- Tape material: Polystyrene (PS)
- Tape length/reel: 53.4 m
- Tape surface resistivity: 10^4 ... 10^9 Ω/sq.
- Curvature of the tape / 100 mm of tape: Complies with EIA-481 standard
- Maximum radius of unmarked round corners: 0.2 mm
- Cumulative tolerance of any 10 consecutive sprocket holes: ± 0.2 mm
- Cover tape peel strength: The peeling force required to tear the cover tape from the carrier tape will fall within tthe range of 0.1 Newton to 1.3 Newton (10 to 130 grams) at peeling speed to 300 mm per minute. This complies with the EIA standard.
- Cover tape adhesion method: pressure sensitive
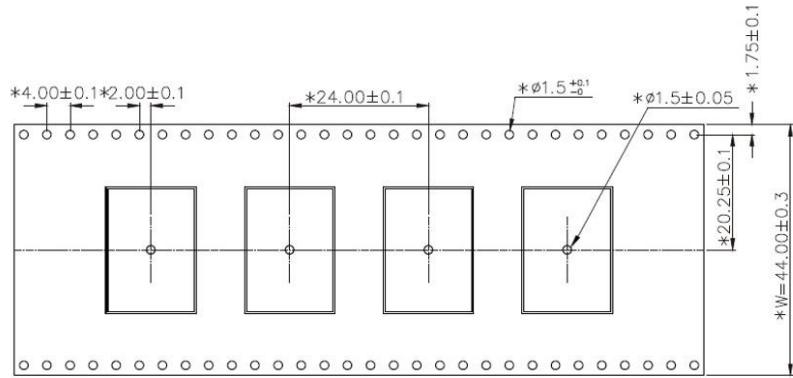
Figure 10.1. Tape Dimensions - Top View
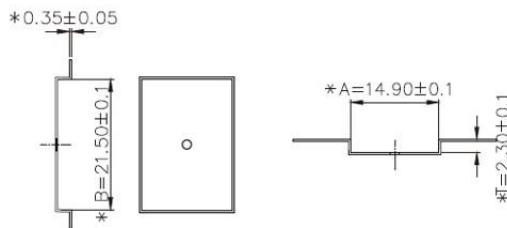
Figure 6.2. Dimensions of the Module Slot on Tape
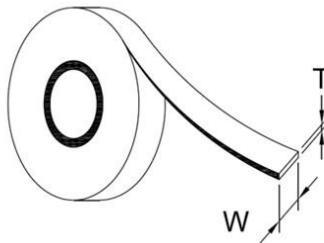
Figure 6.3. Dimensions of the Cover Tape

Symbol	Dimensions [mm]
Thickness (T)	0.061
Width (W)	37.5 +/- 0.2

6.2 Reel Material and Dimensions

- Reel material: Polystyrene (PS)
- Reel diameter: 13 inches (330 mm)
- Number of modules per reel: 500 pcs
- Environmental standard of reel materials: Delta Management Standard for Environnment related substances
- Disk deformation, folding whitening and mold imperfections: Not allowed
- Disk set: consists of two 13 inch (330 mm) rotary round disks and one central axis (100 mm)
- Antistatic treatment: Required
- Surface resistivity: 10^8 - 10^{11} Ω/cm^2
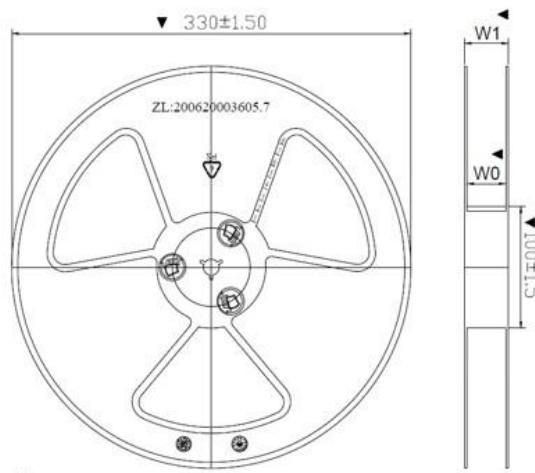
Figure 6.4. Reel Dimensions - Side View

Symbol	Dimensions [mm]
W0	45.0 ± 0.5
W1	50.0 ± 1.0
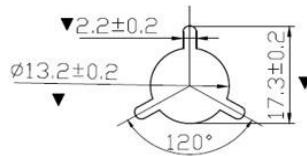
Figure 6.5. Central Axis Dimensions

6.3 Module Orientation in Tape
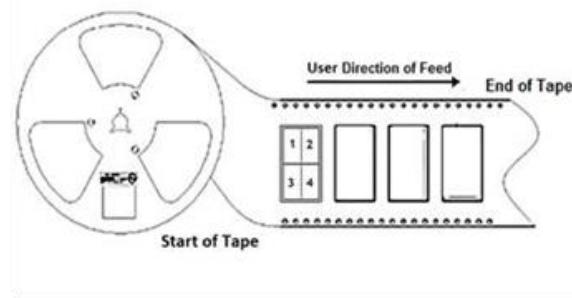
Figure 6.6. Module Orientation in Tape

6.4 Moisture Sensitivity Level

WGM110 Module reels are delivered in packing which conforms to MSL3 (Moisture Sensitivity Level 3) requirements.

6.5 Tape and Reel Box Dimensions
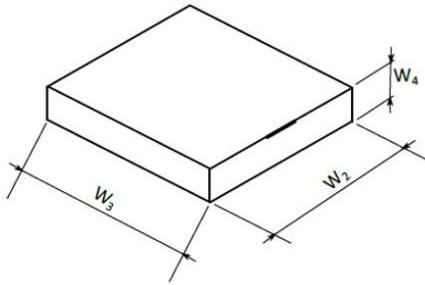
Figure 6.7. Tape and Reel Box Dimensions

Symbol	Dimensions [mm]
W_2	368
W_3	338
W_4	72

7. Installation

This section provides installation instructions for the module.

7.1 General Installation

The WGM110 is soldered directly to the main PCBA in the Genie Tech Pro Link, and as such, cannot be added or removed with out unsoldering it from the PCBA. It is considered a permanent placement. The module itself is placed near the circuit board edge (as per section 3 and Figure 3.1 above) and soldered as per the soldering profile and recommendations above.

7.2 Circuit board installation

The module is installed into the enclosure of the Genie Tech Pro Link as illustrated in the Figure below
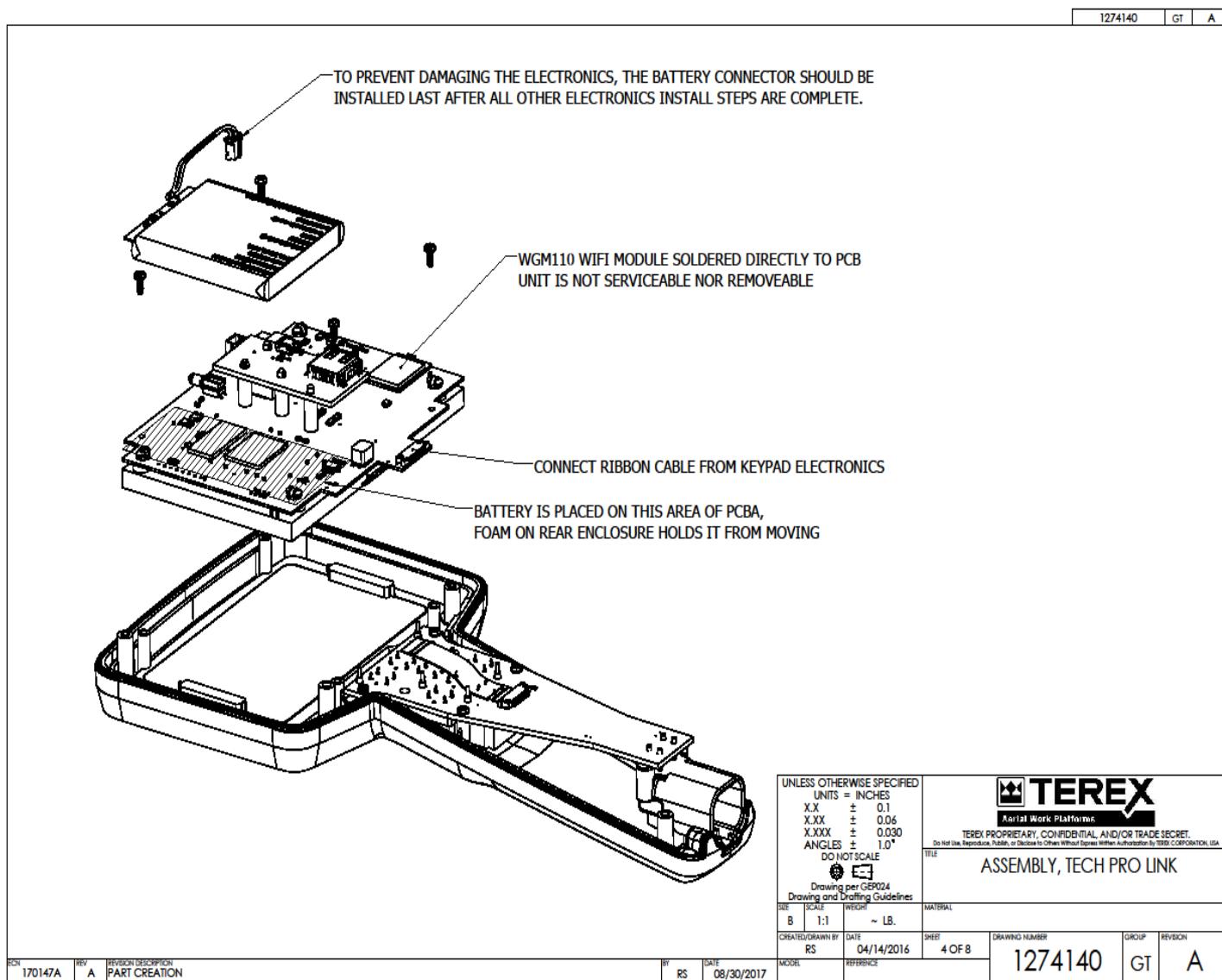
Figure 7.1 LCD PCBA Installation showing WGM110 placement

The module itself is located on the LCD PCBA and is placed near the edge of the PCB (as shown above in Figure 7.1). The PCB is held inside the enclosure using 4 screws that affix the LCD PCBA to the enclosure. The back half of the enclosure is screwed to the front half after the battery and connectors. When the unit is screwed together it is not field serviceable, and the WGM110 cannot be removed or added at a later time.

8. Certifications

The certifications for the WGM110 Wi-Fi Module are listed in this section.

8.1 CE

The WGM110 Module is in conformity with the essential requirements and other relevant requirements of the R&TTE Directive (1999/5/EC). This device is compliant with the following standards:

- **Safety**: EN 60950
- **EMC**: EN 301 489
- **Spectrum**: EN 300 328

A formal DoC is available from Terex

8.2 FCC

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 undesirable operation.

Any changes or modifications not expressly approved by Terex USA LLC could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmittermeets both portable and mobile limits as demonstrated in the RF Exposure Analysis. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures. As long as the condition above is met, further transmitter testing 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 (for example, digital device emissions, PC peripheral requirements, etc.).

OEM Responsibilities to comply with FCC Regulations

The WGM110 Module has been certified for integration into products only by OEM integrators under the following condition:

- The transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

As long as the conditions above are met, further transmitter testing 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 (for example, digital device emissions, PC peripheral requirements, etc.).

Note: In the event that this condition cannot be met (for certain configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC 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.

End Product Labeling

The WGM110 Module is labeled with its own FCC ID. If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

"Contains Transmitter Module FCC ID: 2AISP-1274140

or

"Contains FCC ID: 2AISP-1274140"

8.3 IC

IC (English)

This radio transmitter has been approved by Industry Canada to operate with the embedded chip antenna. Other antenna types are strictly prohibited for use with this device.

This device complies with Industry Canada's license-exempt RSS standards. Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

RF Exposure Statement

Reported SAR value **0.11W/kg**, next to body. 0mm

OEM Responsibilities to comply with IC Regulations

The WGM110 Module has been certified for integration into products only by OEM integrators under the following conditions:

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

As long as the condition above is met, further transmitter testing will not be required. However, the OEM integrator is still respon- sible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Note: In the event that these conditions cannot be met (for certain configurations or co-location with another transmitter), then the IC authorization is no longer considered valid and the IC Certification cannot be used on the final product. In these circumstances, the OEM integra- tor will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate IC authorization.

End Product Labeling

The WGM110 Module is labeled with its own IC Certification. If the IC Certification is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

"Contains Transmitter Module IC: 22906-1274140"

or

"Contains IC: 22906-1274140"

IC (Francais)

Cet émetteur radio a reçu l'approbation d'Industrie Canada pour une exploitation avec l'antenne puce incorpo- rée. Il est strictement interdit d'utiliser d'autres types d'antenne avec cet appareil.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. L'appareil ne doit pas produire de brouillage;
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Déclaration RF Exposure

Valeur SAR déclarée 0.11w/Kg, à côté du corps 0mm

ResponsabilitésduFEOayanttraitàlaconformitéaveclesrèglementsIC

Le Module WGM110 a été certifié pour une intégration dans des produits uniquement par les intégrateurs FEO dans les conditions suivantes:

- La ou les antennes doivent être installées de telle façon qu'une distance de séparation minimum de 25 mm (WGM110A) / 30 mm (WGM110E) (soit maintenue entre le radiateur (antenne) et toute personne à tout moment.
- Le module émetteur ne doit pas être installé au même endroit ou fonctionner conjointement avec toute autre antenne ou émetteur.

Dès lors que les deux conditions ci-dessus sont respectées, d'autres tests de l'émetteur ne sont pas obligatoires. Cependant, il incombe toujours à l'intégrateur FEO de tester la conformité de son produit final vis-à-vis de toute exigence supplémentaire avec ce module installé (par exemple, émissions de dispositifs numériques, exigences relatives aux matériels périphériques PC, etc).

Note: S'il s'avère que ces conditions ne peuvent être respectées (pour certaines configurations ou la colocation avec un autre émetteur), alors l'autorisation IC n'est plus considérée comme valide et l'identifiant IC ne peut plus être employé sur le produit final. Dans ces circonstances, l'intégrateur FEO aura la responsabilité de réévaluer le produit final (y compris l'émetteur) et d'obtenir une autorisation IC distincte.

Étiquetage du produit final

L'étiquette du Module WGM110 porte son propre identifiant IC. Si l'identifiant IC n'est pas visible quand le module est installé à l'intérieur d'un autre appareil, l'extérieur de l'appareil dans lequel le module est installé doit aussi porter une étiquette faisant référence au module qu'il contient. Dans ce cas, une étiquette comportant les informations suivantes doit être collée sur une partie visible du produit final.

"Contient le module émetteur IC: 22906-1274140"

or

"Contient IC : 22906-1274140"

L'intégrateur FEO doit être conscient de ne pas fournir d'informations à l'utilisateur final permettant d'installer ou de retirer ce module RF ou de changer les paramètres liés aux RF dans le mode d'emploi du produit final.