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| | Reference OEM-2012-273 | Title FC6100 OEM MODULE PRODUCT PRESENTATION | |
| | Date 2012-12-17 | edition N° : 3.0 | |



Parrot®

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| <p>FC6100 OEM MODULE</p> <p>-</p> <p>PRODUCT PRESENTATION</p> |
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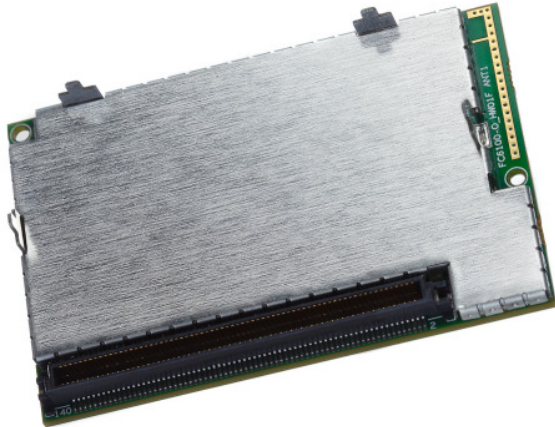
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Parrot FC6100

Full connectivity module with Android OS.
Bluetooth 3.0 +HS



Applications:

- Smartphone Android Apps platform
- Navigation
- Internet access (through 3G USB dongle, Bluetooth Dun, Pan, 3G+ module)
- MMI Display via LCD screen
- Telephony voice recognition
- Multimedia voice recognition
- USB & iPod management
- Rear-view camera video stream reception and decoding
- Telephony & Audio streaming
- Terminal mode

The FC6100 employs the ANDROID OS which embeds a WEB browser and a JAVA machine.

The FC6100 is designed as an open platform for any Android apps intended for a mobile phone such as Google Maps with Street view and POI search, Panoramio, and apps for weather and Yellow Page information.

The FC6100 embeds all of the automotive qualified Parrot Libraries:

- USB devices and iPod, iPhone, with database for metadata
- Voice recognition for telephony features or multimedia selection
- Bluetooth with a very high level of compatibility with most of the phones available on the market and phonebook synchronization.

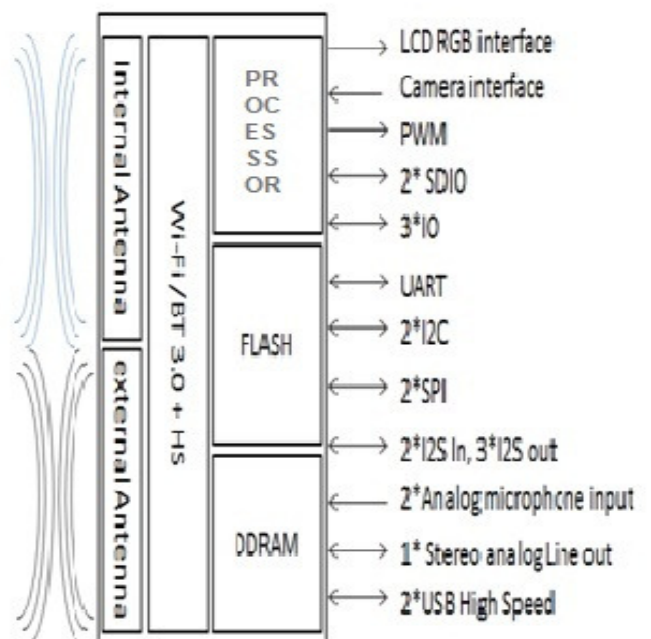
Technical Features:

- LCD Management-LCD RGB/LVDS
- Bluetooth 3.0+HS qualified module
- Piconet and scatternet support
- Standard single 3V3 supply
- UARTs, I²C
- 1*USB 2.0 High Speed
- Digital and analog audio in and out
- Analog Video output
- Module dimensions 72 x 44.3 x 4.60mm
- Automotive qualified
- iPod chip management (optional)
- 2nd USB 2.0 connection (optional)
- 2*SDcard support

The FC6100 platform provides a full API, to access Parrot Libraries and to enhance Android basic features.

Description:

Parrot FC6100 is a solution for Multimedia systems. It integrates a large variety of interfaces for easy integration of most multimedia applications.



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1 PRODUCT OVERVIEW AND FEATURES

Warning !: This product is to be sold only to OEM customers and not to the General Public.

The FC6100 is a connected Infotainment open platform, designed to ease the integration of connectivity applications in car audio / vidéo systems, car telematics systems or any system requiring a complete embedded connectivity solution.



FC6100 features:

1.1 Connectivity

- **Bluetooth**

- Bluetooth Power Class 2 Radio
- Embedded Bluetooth V3.0+HS
- Compatible with virtually all Bluetooth phones, best-in-class IOP
- Pairing and connection with all Bluetooth Devices: Phones, Smartphones, PDA...
- Multiple users support: Up to 10 paired phones
- Multiple connections (up to 3 devices connected at the same time)
- Multiple profiles active simultaneously
- Full Bluetooth Stack, all profiles supported



- **USB**

- Parrot FC6100 embeds a USB 2.0 OTG high speed transceiver
- Compliant with USB devices supporting Mass Storage Class
- Supports USB hub



- **SD Card**



- **iPod / iPhone connectivity**

- IAP (iPod Accessory Protocol)
- Album cover art download
- iPod Out



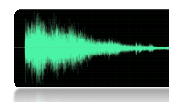
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- **iPod Out compatible**
 - Reference design available for Host motherboard
 - Support of iOS devices running iOS 4 and higher
 - Simplified iPod interface able to control music and show a UI on incoming call
- **Wi-Fi**
 - IEEE 802.11b/g compliant
 - Data rates up to 54 Mbps (802.11g)
 - Security support for WPS, WPA2, WPA station or Access Point mode
 - Up to 8 devices can simultaneously be connected in Access Point mode



1.2 Telephony

- **Hands-Free Telephony, Phonebook synchronization, SMS**
 - Automatic Phone book synchronization over Bluetooth
 - Up to 10 paired phones, 5000 contacts per phone, call history
 - Supports all of the various synchronization methods
 - Full Unicode; compatibility with many characters sets (EU, Russian, Chinese, Japanese...)
 - Message Access Profile (MAP)
- **Digital Signal Processing**
 - Single or dual microphones (Automatic Microphone Selection)
 - Noise Reduction (NR), Acoustic Echo Cancellation (AEC)
 - Automatic Level Control (ALC)
 - Equalizer
 - Car Independent Tuning
 - Wideband speech



1.3 Multimedia

- **Audio Player**
 - Multi Sources (Line-In, USB, SD, iPod, iPhone, BT/Wi-Fi)
 - Call artists and albums by voice recognition (see RAP)
 - Multiple codecs supported (External licences apply): MP3 / AAC / WMA / Ogg Vorbis / LC / AC3 (...)
- **CONCERTOS library**
 - Parrot Music library
 - Eases management of audio compressed files
- **RAP library**
 - Parrot Music library
 - Accurate search for artists, albums and genres using voice recognition (both CONCERTOS and Nuance VR required)
 - Operate player functionalities by voice commands on external sources
 - Voice recognition latency is typical ~ 1,8 s for a size of 20 000 Albums or Artists
- **Video Player**
 - Video multimedia player (H264, H263-MPEG4)
 - Dailymotion™, YouTube™ compatible, Streaming support over Wi-Fi
- **UPnP server Synchronization over Wi-Fi**



AAC



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- Personal files (music, pictures, etc.) can be downloaded personal server to the car

- **Graphical HMI**

- 3D accelerator up to 18 million triangles per seconds.
- 3D Graphics Industry standard API support Direct3D mobile OpenGL ES 1.1 and 2.0, OpenVG 1.0.1, OpenMax
- LCD management up to 2048 by 2048 pixels
- Wide range of graphical objects to facilitate user specific HMI design



1.4 Voice Recognition / Text to Speech

- **Speaker Independent voice recognition**

- Vocon 3200
- Recognizes a contact in the phonebook by speaking the contact name
- Initiates the phone call to that person
- Selects a music file from any media device (USB, SD Card, IPod) connected to the system
- 20 languages available (see TTS)



- **Text To Speech (TTS)**

- Based on SVOX (acquired by Nuance) Automotive Speech
- Tailored for noisy car environments
- Industry leading quality reputation
- Natural and clear sound quality
- Not limited in vocabulary: confirms the orders identified by a voice recognition process or for reading vehicle commands, songs titles or phonebook entries etc...
- 20 languages available.



- **Gracenote® for the management of music collection**

- Advanced speech-based media databases (Media-Vocs)
- Multi-steps recognition to identify, to categorize, and to organize the digital music collection
- Unique tool to manage large music collections
- Improved voice recognition accuracy up to 7%
- 8 languages supported.



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1.5 Internet

- **Full Access (3G Dongle, Customer Phone, Modem)**

- Customer phone
 - Bluetooth (DUN, PAN)
 - USB tethering (cable)
 - Wifi tethering
- USB 3G Dongles
- Control of a built-in modem (embedded SIM, SAP)



Once an internet connection is established, the Android apps which require a connection become available. The following page shows some examples of Apps selected by Parrot. Other apps can also be added by the customer in collaboration with Parrot.

- **Internet Browser**

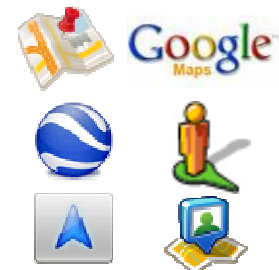
- Based on Webkit, integrated HTML5 and JAVA features
- Compatible with any web radio application available on Android
- Scores a 93/100 on the [Acid3](#) Test
- SSL support



1.6 Apps

- **Google Location Based Services Apps**

- Google Maps with Street View
- Location-based Google POI search
- Roadtrip
- Initiate a phone call with a Google POI in one click
- Google Earth
- Google Latitude
- Google NAV (Google certification required)



- **Google Productivity Apps**

- Google Search
- Gmail
- Google Calendar



- **Internet Music & Radios Apps**

- Pandora
- Tuneln



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- Spotify
- Deezer
- Orange Live Radio

- **Dangerous Aera Notification Apps**

- Coyote
- Wikango



- **Petrol / Fuel Apps**

- Whatgas petrol prices
- Station Essences



- **Weather Apps**



- **Traffic Information Apps**

- Inrix
- Michelin Traffic
- Any other Android compatible App...



- **Instant Messaging (using TTS and Voice Message)**

- Yahoo Messenger
- Google Talk



- **News / RSS Feeds Apps**

- CNN News
- BBC News
- Le Monde
- Many more...



- **Video streaming Apps (future development)**

- YouTube (Google)
- DailyMotion



1.7 Mirror Link (Real VNC library)

- Mirrors on head-unit's LCD the display of compatible smart-phone
- Controls any App located on your smart-phone using the vehicle's touch-screen or commands and controls



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1.8 Software Updates (IOP)

To ensure a maximum compatibility level with the latest consumer electronic devices (mobile phones, USB Stick, SD Card, iPod, iPhone), Parrot provides free firmware updates for all solutions on a regular basis (twice a year during mass production).

- Full standard software update made available twice per year
- Software can be updated via Bluetooth, USB, UART, DUN or PAN
- Regular updates ensure the best compatibility with Phones, Smartphones, PDA, Music players



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2 RATINGS AND MAIN SPECIFICATIONS

2.1 Environmental conditions

Our Design Validation test plan usually allows our customers to determine their own environmental conditions according to their experiences.

Therefore, the following chart is given for information purpose only:

| | |
|------------------------------------|-------------------------------|
| Storage conditions | Temperature: - 40°C to +125°C |
| Un-operating temperature range (*) | Humidity: 40 to 80% RH |
| Operating temperature range | - 40°C to + 85°C |

(*) This Temperature range relates to automotive customers requirements regarding the following phase of the product life cycle: Vehicle parked outdoor in very hot or cold countries, before shipment to car dealers.

2.2 Power Supply

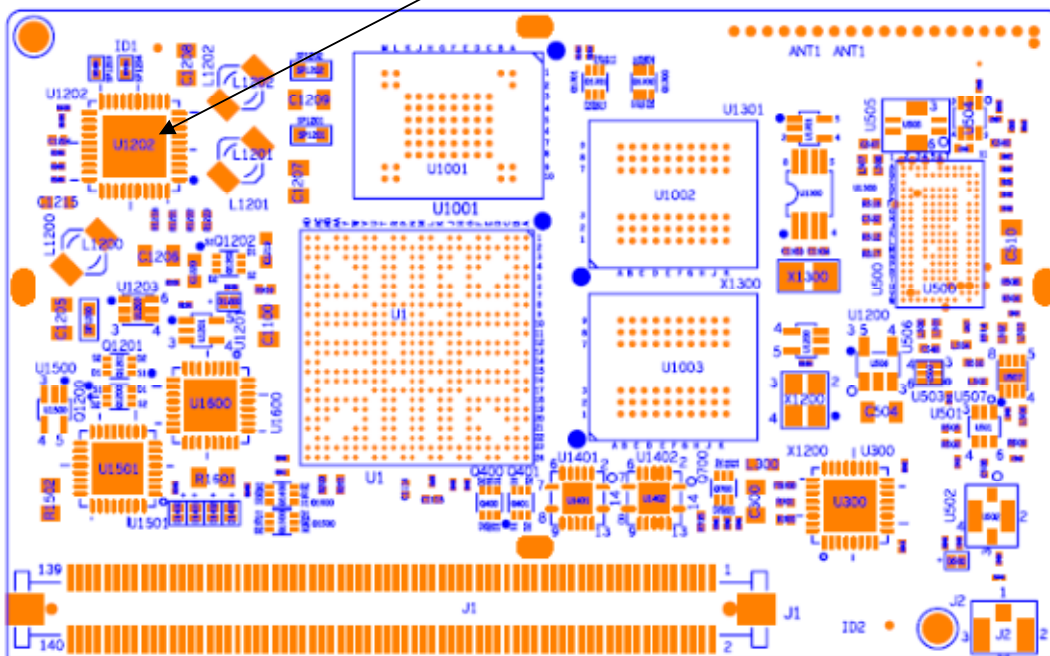
| | Value | Unit |
|--|------------|------|
| Typical Power Supply | 3.3 | Vdc |
| Operating voltage range | 3,2 to 3,6 | Vdc |
| Max voltage rating | 3.6 | Vdc |
| Max dc current drawn on 3,3 Vdc supply | 1 | A |

Warning !: This module is strictly limited to battery-operation. It can only be supplied by a DC mains / battery-type power system, and cannot be powered directly by mains.

The FC6100 module must be powered by a Limited Power Source (in the meaning of 2.5 of IEC / EN / UL 60950-1 safety standard).

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This module is supplied with a unique 3V3 voltage and integrate its own internal supplies regulations, performed by IC U1202 on schematic:



2.3 Bluetooth specifications

Two FC6100 versions may exist :

- PCB integrated BT antenna (“internal BT antenna”)
- External BT antenna

| Features | Description |
|--|---|
| Type | 3.0 + HS |
| Frequency Band | 2.4000 – 2.4835 GHz (2.4 GHz ISM Band) |
| Number of channels | 79 channels ($f=2402+k$ MHz, $k=0,\dots,78$) |
| Modulations | GFSK for basic rate $\pi/4$ DQPSK for EDR2 8 DPSK for EDR3 <i>FHSS (Frequency Hopping Spread Spectrum)</i> |
| Supported rates | 1, 2, 3 Mbps |
| Conducted output power | 4 dBm max |
| Antenna types | <ul style="list-style-type: none"> • PCB integrated antenna for FC6100 internal antenna version • External antenna (antenna connector) for FC6100 external BT antenna version |
| Antenna gain | 2,18 dBi max (internal or external versions) |
| Connector (FC6100 external BT antenna version) | U.FL type coaxial subminiature connector |

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2.4 WLAN / WiFi specifications

The FC6100 module only exists in version WLAN external antenna.

| Features | Description |
|---------------------------------|--|
| Type | 802.11b / 802.11g |
| Frequency Band | 2.4000 – 2.4835 GHz (2.4 GHz ISM Band) |
| Number of channels (USA-Canada) | 11 channels (2412 to 2462 MHz) |
| Number of channels (Europe) | 13 channels (2412 to 2472 MHz) |
| Modulations | DBPSK; OFDM: BPSK; OFDM:64-QAM |
| Supported rates | Up to 11 Mbps (802.11b) Up to 54 Mbps (802.11g) |
| Conducted output power | 20 dBm max |
| Antenna type | External antenna |
| Antenna gain | 2,18 dBi max |
| Antenna connector type | U.FL type coaxial subminiature connector |

2.5 FC6100 Module integration into the Host System

Communication with host:

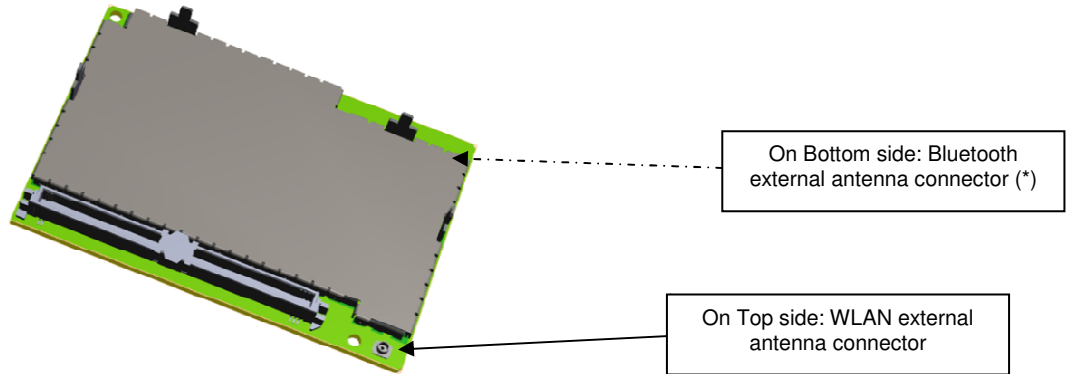
The FC6100 Module communicates with its Host system via a set of AT commands.

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3 MECHANICAL CHARACTERISTICS

3.1 General appearance

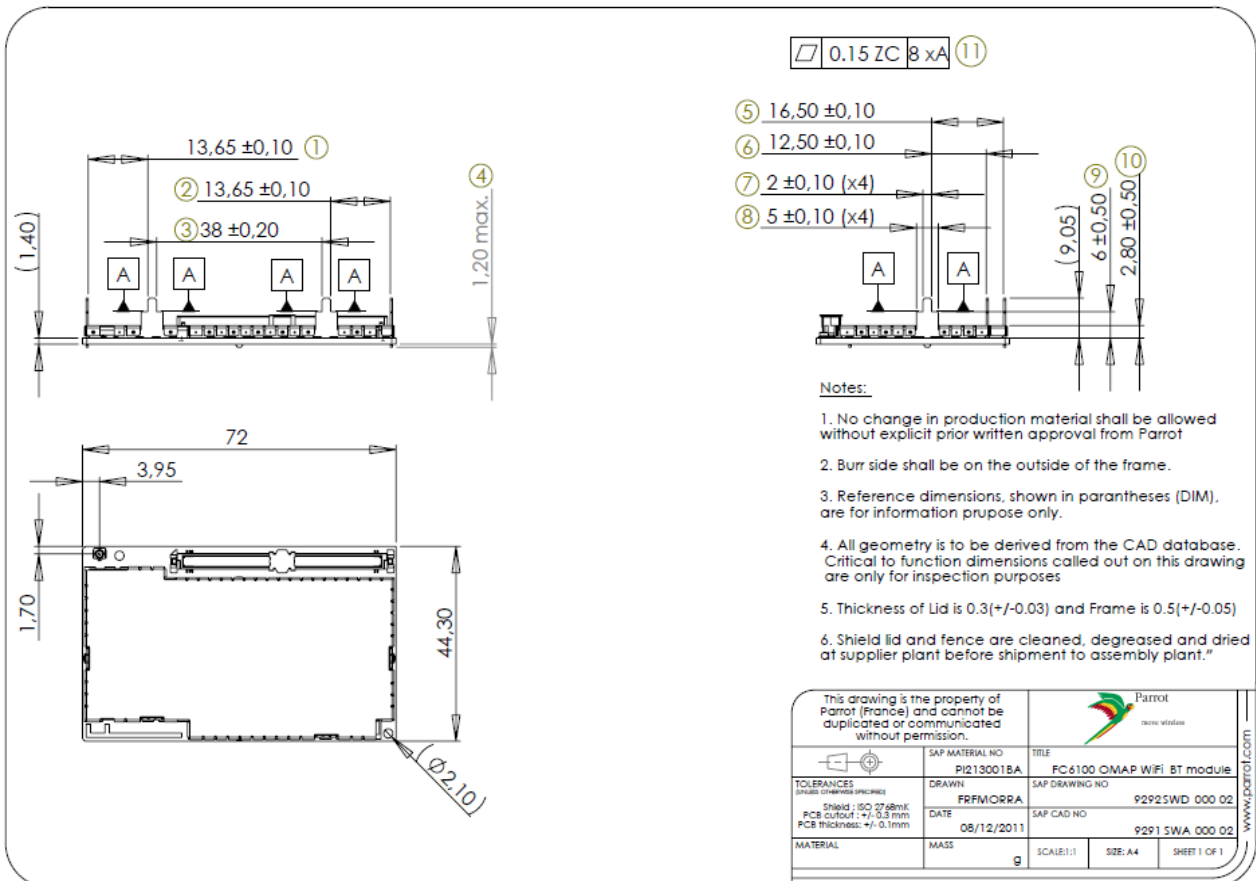
Picture below is given for information only :



(*) This connector exists also on internal BT antenna version of the module, but only for manufacturing purpose.

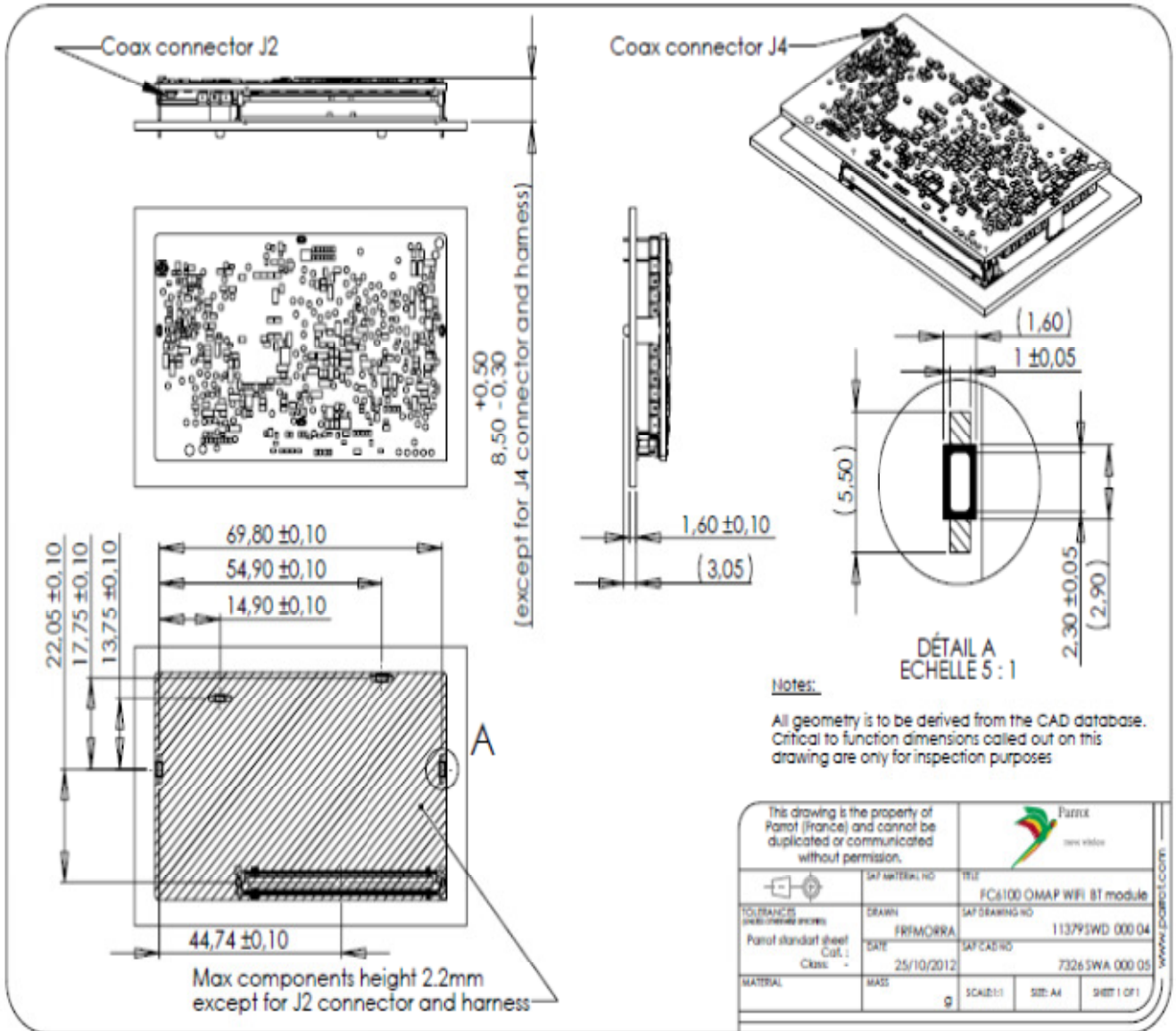
3.2 Dimensions

Main dimensions for FC6100 module (in mm) :



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3.3 PCB Footprints



(Dimensions in mm)

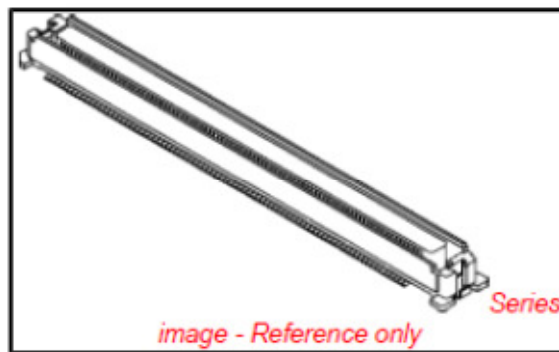
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3.4 Connectors

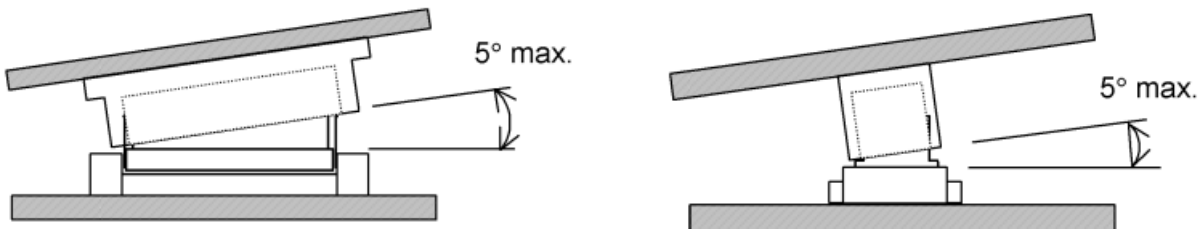
3.4.1 FC6100 Main connector

The module's interface with host systems is made through a 140-pin board to board connector with a 0.635mm pitch.

Module connector reference: MOLEX / 52885-1474



Maximum mating angle :



Maximum insertion force : 50N

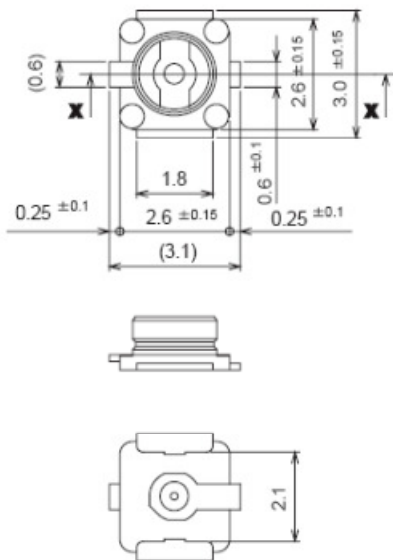
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3.4.2 BT antenna connector and WLAN external antenna connector

BT connector: For manufacturing purpose (internal antenna version) or connection of an external antenna (BT external antenna version).

WLAN: connection of external antenna.

Theses RF connectors are of ultra-small coaxial type :



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4 MARKING

4.1 Module Marking

4.1.1 Label



The TELEC / Japan certification number is not the relevant one. It is just an example for placement on the label. It will be printed and updated when final number is available. **Until that time, neither the logo nor the number will be printed.**

4.1.2 Position and Orientation on module



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5 CAUTION FOR USE

5.1 ESD Compliance

Operator must use ESD protection gloves for Module Manipulation. In case of electrical discharge, Module must be scrapped.

5.2 Safety

Mechanical shield is made of metal and have several draft angle which can cause Human injuries. Operator must be trained on how to manipulate it.

5.3 Assembly

Key mechanical dimensions are tested before shipment.

In case of manual handling or operation, to avoid any issue with mechanical distance between legs and ensure a good insertion in the host side, packaging has been designed to ensure that operator will pick up the part by the most adequate area of the module. Operator should be trained and alerted about this specific behavior.

5.4 Drop

In case the part drop to the floor, Parrot doesn't warrant the part. Part has to be scrapped. Same process applies in our manufacturing site.

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6 APPROVAL / CERTIFICATIONS

6.1 Normative informations

FC6100 module certifications identifications :

| CERTIFICATION | ID |
|---------------|---------------------------------|
| Bluetooth | QD ID: B019632 (FC6100) |
| WLAN / WiFi | Marvell Semiconductors WFA10013 |
| CE | CE 0700 |
| FCC | RKXFCC6100 |
| IC | 5119A-FC6100 |
| TELEC | Not yet available |

6.2 FCC and IC requirements for module application

Identifications :

FCC ID: RKXFCC6100

IC : 5119A-FC6100

In accordance with FCC Part 15, the FC6100 is listed as a limited Modular Transmitter device.

USA – User information

This intends to inform how to specify the FCC ID of our module “FC6100” on the final product:

Based on the Public Notice from FCC, the host device should have a label which indicates that it contains our module.

The label should use wording such as: “Contains FCC ID: RKXFCC6100”. Any similar wording that expresses the same meaning may be used.

The label of the host device should also include the below FCC statements When it is not possible, this information should be included in the User Manual of the host device :

“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

(2) This device must accept any interference received, including interference that may cause undesired operation.

Caution: Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment..

The antenna(s) used for this transmitter must be installed and operated to provide a separation distance of at least 20 cm from all persons, and must not be co-located or operated in conjunction with any other antenna or transmitter. Installers / integrators must ensure that a separation distance of at least 20 cm exists between the device and its antenna and users.”

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CANADA – User information

This intends to inform how to specify the Industry Canada (IC) ID of our module “FC6100” on the final product:

According to Canadian standards “RSS-210” and “RSS-Gen”, the host device should have a label which indicates that it contains our module. The label should use wording such as: “Contains IC ID: 5119A-FC6100”. Any similar wording that expresses the same meaning may be used.

The label of the host device should also include the below IC statements. When it is not possible, this information should be included in the User Manual of the host device:

[English]

“This device complies with Industry Canada licence-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.*

This equipment complies with IC RF radiation exposure limits set forth for an uncontrolled environment.. The antenna(s) used for this transmitter must be installed and operated to provide a separation distance of at least 20 cm from all persons, and must not be co-located or operated in conjunction with any other antenna or transmitter. Installers / integrators must ensure that a separation distance of at least 20 cm exists between the device and its antenna and users.

[French]

« 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, et*
- (2) L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement »*

Cet appareil est conforme aux limites d'exposition aux rayonnements RF stipulées par IC pour une utilisation dans un environnement non contrôlé. Les antennes utilisées pour cet émetteur doivent être installées et doivent fonctionner à au moins 20 cm de distance des utilisateurs, et ne doivent pas être placées près d'autres antennes ou émetteurs, ou fonctionner en conjonction avec ceux-ci. Les installateurs / intégrateurs doivent s'assurer qu'une distance de 20 cm au moins sépare l'appareil et ses antennes des utilisateurs. »