



Confidential Information

OEM-2013-319

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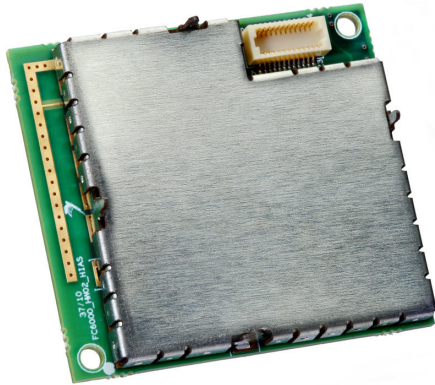
Parrot®

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FC6000T PRODUCT  
PRESENTATION

## Parrot FC6000T

All in one multimedia module  
 Dual mode Bluetooth 3.0 and 4.0 (nb: Bluetooth Low Energy 4.0: future implementation)



## FEATURES

- Bluetooth 3.0 qualified module
- Bluetooth 4.0: future implementation
- Wide band speech
- 3.3V & 1.8V power supply
- UART, I<sup>2</sup>S, I2C, GPIO
- Digital audio input and output
- Analog microphone input
- Analog output
- Up to 10 paired phones
- Small size module (32 x 36 mm)
- Automotive qualified

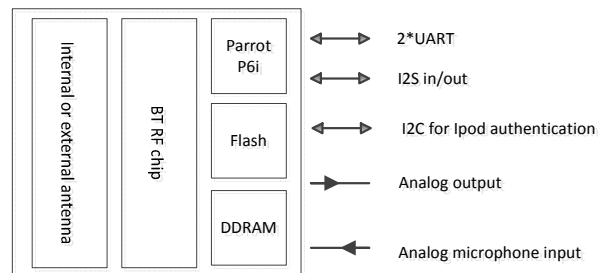
## Application:

- Telephony
- Internet access (through DUN or PAN)
- Audio Streaming
- Voice Recognition / Text To Speech

The FC6000T integrates the latest version of the Parrot Bluetooth stack (Blues). Blues gives to the customer a very high level of compatibility with most of the phones available on the market and provide phonebook and list synchronization. FC6000T offers the possibility to use a Speaker Independent Voice Recognition (SIVR) and a Text To Speech algorithm (TTS).

## Description:

Parrot FC6000T is a fully integrated Bluetooth phone connectivity solution powered by a Parrot P6i with 416 MIPS with an internal CODEC and NR/AEC signal processing. It integrates a large variety of interfaces for an easy integration in most of the applications.



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## 1. PRODUCT OVERVIEW

The FC6000T is a feature-rich Bluetooth platform dedicated for the integration of Bluetooth in car audios, car telematics systems or any systems requiring a complete embedded multimedia solution.



### FC6000T features are:

- **Bluetooth connectivity**
  - Bluetooth Power Class 2 Radio
  - Embedded Bluetooth .1, v1.2, v2.0+EDR, v2.1+EDR & v3.0 compliant
  - *Bluetooth v4.0 : future implementation*
  - Embedded profiles
  - Compatible with most of Bluetooth phones
  - Pairing and connection with all Bluetooth Devices: Phones, Smartphones, PDA ...
  - Multiple users support: Up to 10 paired phones depending on Flash memory size.
  - Multiple connections (up to 3 device connected at the same time)
  - Multiple profiles
  
- **Phone**
  - Pick-up, Hang-up, Redial
  - Automatic answer (from host via pickup command)
  - Send DTMF during calls
  - Private Mode
  - 3-way calling
  - Double HFP

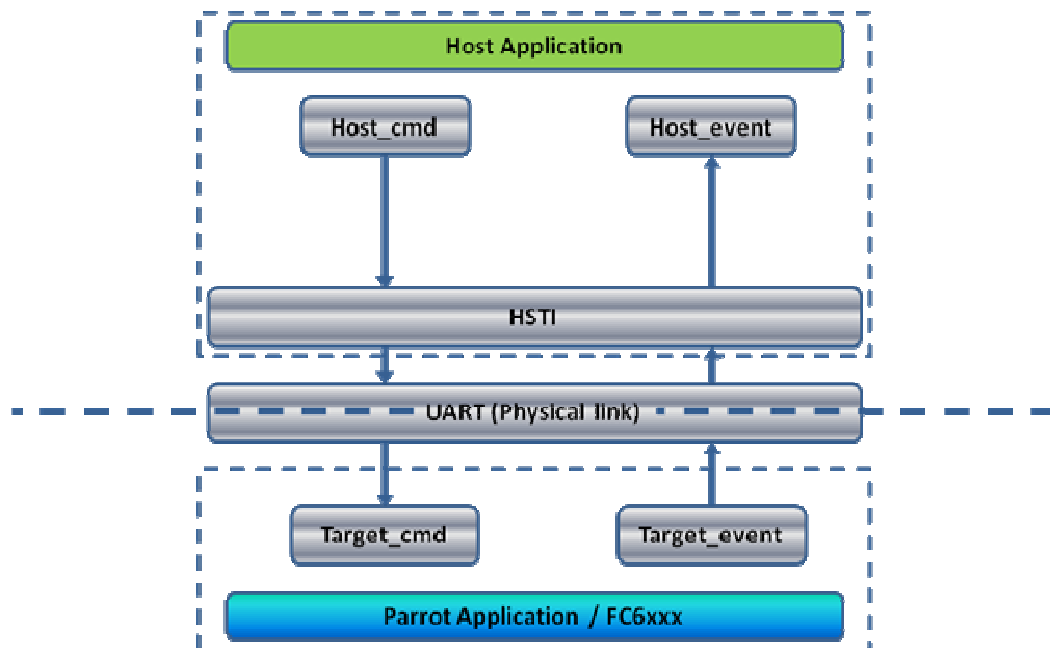
- **Phone Book**
  - Automatic Phone book synchronization over Bluetooth (up to 5000 contacts; depending on the Flash memory size)
  - Call history (dialed number, received calls, missed calls)
  - All Synchronization Methods
  - Full Unicode for compatibility with numerous characters sets (European, Russian, Chinese, Japanese...)
  
- **Digital Signal Processing**
  - Microphone(s): the module can manage two configurations:
    - Single microphone
    - Two microphones with AMS (Automatic Microphone Selection): 1 for the driver and 1 for the front seat passenger. The best microphone is automatically selected during the call.
  - Noise Reduction (NR)
    - Maximal NR is 25dB.
    - Typical NR is 15dB.
    - No musical noise
    - No fluctuation of the residual noise level
    - Automatic adaptation of the Noise Reduction to the Signal-to-noise ratio (SNR) to keep the best voice quality in idle and remove more noise in noisy conditions.
  - Acoustic Echo Cancellation (AEC)
    - The level of echo attenuation, called ERLE is 45dB (measured according to the VDA process).
    - Comfort Noise feature so that the background noise is adjusted after AEC algorithm, in order to keep it constant for enhanced communication experience.
    - Possibility to accept up to 100ms of delay in the speaker path for digital amplifiers.
    - Full duplex
  - Automatic Level Control (ALC)
    - Different phones can have different Speaker volumes (up to 20dB of difference). It adapts the signal level received from the phone to the target level, quickly and precisely.
  - Equalizer
    - 9 bands equalizer for microphones and speaker paths.
  - Tuning
    - Car independent tuning if the microphone position and specifications are the same.
    - Possibility to tune all parameters of the audio algorithms according to Customer preferences.
  - Wideband
    - All algorithms work @ 16 kHz.
  
- **Audio Streaming**
  - Embedded SBC decoder
  - Embedded MP3 decoder from Thomson Licensing (optional)
  - Stereo audio output
  
- **Speaker Independent Voice Recognition (Optional)**
  
- **Text To Speech (Optional)**

- **Miscellaneous**
  - Provide Phone Battery Level and Network Level, Carrier Name (depends on phones)
- **Software Update**
  - Full standard Software available (free upgrade from Parrot homepage)
  - Software update available through Bluetooth or UART
  - Very large compatibility with Phones, Smart phones, PDAs, Music players

- **External Bluetooth Antenna connection diagnostic**

- **HSTI**

In order to facilitate communication between the FC6000T and your product host microprocessor, Parrot has created and provides the HSTI Library. The HSTI library is the software application programming interface (API) to integrate the FC6000T command and control within the software of the host processor. HSTI is backward compatible with former AT commands. Few adaptations may be considered due to the improvements in the new modules generation. Application notes are available.



## 2. RATINGS-SPECIFICATIONS-CHARACTERIZATION

NB: ALL ELECTRICAL SPECIFICATIONS COULD BE UPDATED WITHOUT NOTIFICATION

### 2.1 Storage Period and Conditions

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

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

Storage condition	In original carton box
Storage temperature range	-20 °C / +50 °C
Humidity	40% - 80%
Duration	3 months
Un-operating temperature range (*)	-40 °C / +125 °C

(\*) This Temperature range relates to Automotive Customers requirement 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 Absolute Maximum ratings

Operating temperature range ..... -40 °C to +85 °C  
 Storage temperature range ..... -40 °C to +125 °C  
 Voltage on 3V3 power supply with respect to Vss ..... 3,1V to 3,6V  
 Voltage on 1V8 power supply with respect to Vss ..... 1,73V to 1,89V

The FC6000T module must be powered by a Limited Power Source (in the meaning of 2.5 of EN60950-1 safety standard).

### 2.3 Power Consumption

ON 3V3 Power Supply	Min	Typ	Max	Unit	Comment
Stop mode	-	-	6	mA	Reset pin low
Run/Standby mode (waiting for commands)	-	-	40	mA	
Hands Free and Audio streaming mode	-	-	120	mA	
Peak current at startup	-	-	200	mA	

ON 1V8 Power Supply	Min	Typ	Max	Unit	Comment
Stop mode	-	-	0	mA	Reset pin low
Run/Standby mode (waiting for commands)	-	-	120	mA	
Hands Free and Audio streaming mode	-	-	230	mA	
Peak current at startup	-	-	800	mA	

## 2.4 Bluetooth 3.0 main characteristics

Features	Description
Frequency Band	2.4000 – 2.4835 GHz (2.4 GHz ISM Band)
Number of channels	79 channels (f=2402+k MHz, k=0,...,78)
Modulation	FHSS (Frequency Hopping Spread Spectrum) system Modulations GFSK, $\pi/4$ DQPSK and 8DPSK
Supported rates	1, 2, 3 Mbps
Output Power	4dBm max
Antenna type	<ul style="list-style-type: none"> <li>• <b>PCB integrated antenna for FC6000T / internal antenna version</b></li> <li>• <b>External antenna (antenna connector) for FC6000T, external antenna version</b></li> </ul>
Antenna gain	Max 2,18 dBi
Permanent antenna connector (FC6000T, version 'external antenna' )	U.FL type coaxial subminiature connector

## 2.5 Bluetooth 4.0 main characteristics

*NB: This feature will be implemented as a second step.*



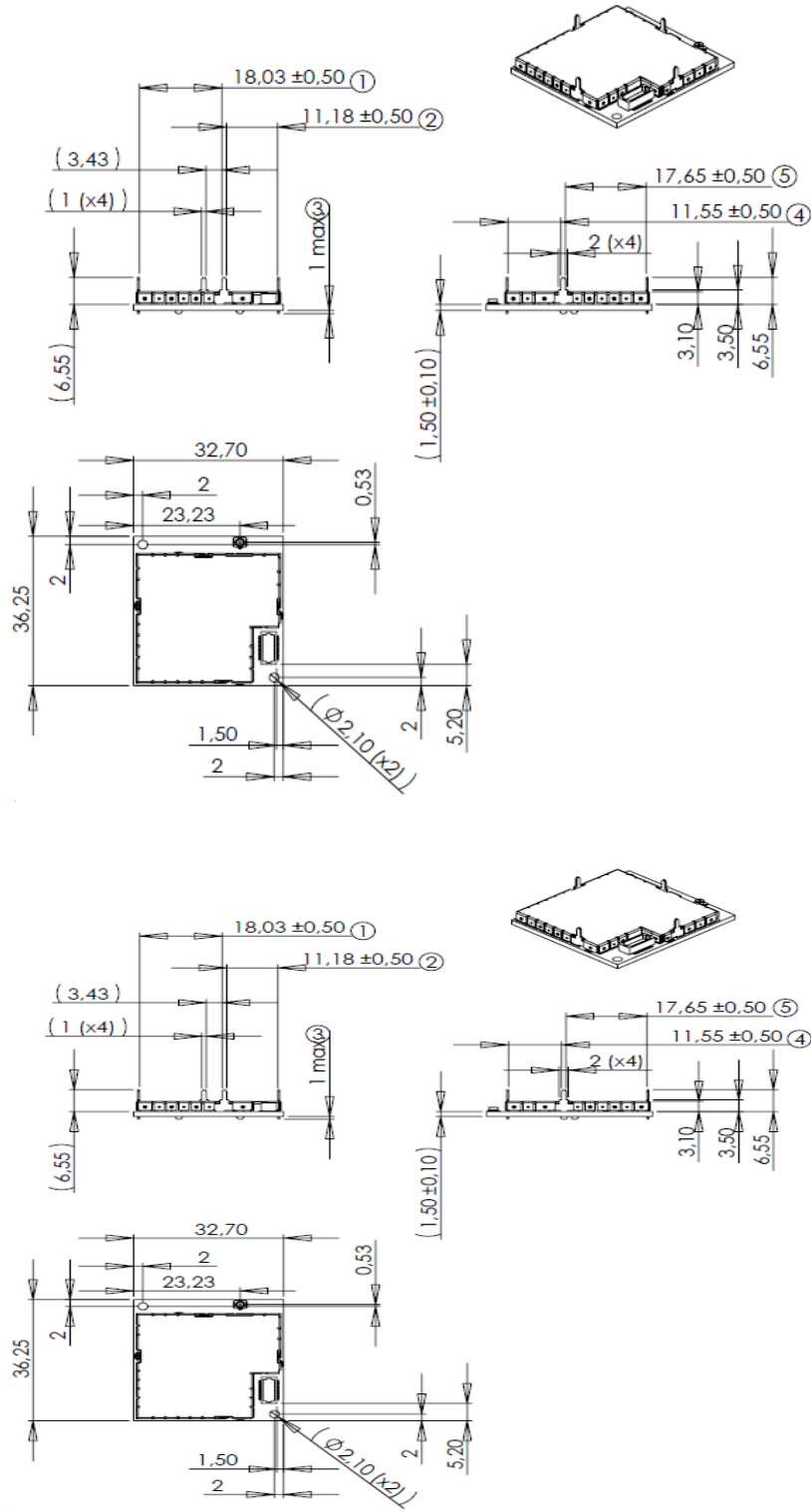
### 3. MECHANICAL SPECIFICATIONS

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The following chart describes the availability of the various versions of the FC6000T: For all versions, the legs of the shielding have to be soldered onto the host PCB in order to assure mechanical assembly and EMC performance.

Module version	Mounting	Bluetooth antenna	
		Internal	external
FC6000T	horizontal	Yes	Yes
	vertical	Yes	Yes

### 3.1 Horizontal module



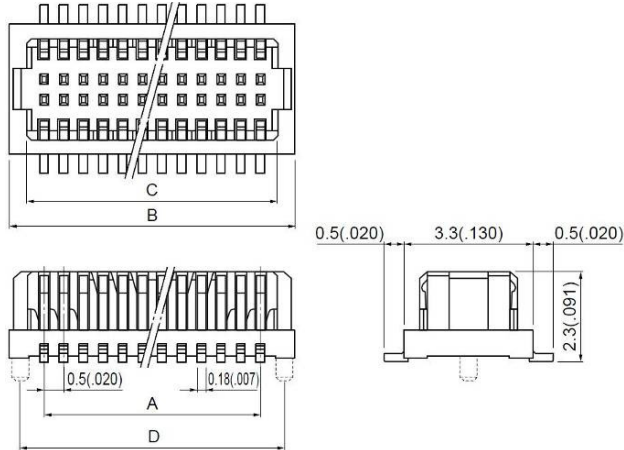


### 3.3 Module connectors

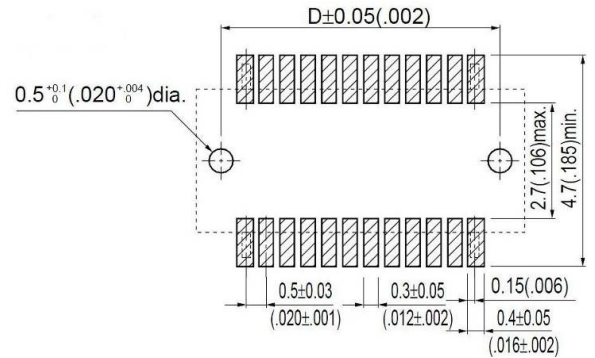
#### 3.3.1 Connector on mother board

**JST reference:** 24R-JMCS-G-(B)-TF

Mechanical overview:



Recommended PCB footprint:

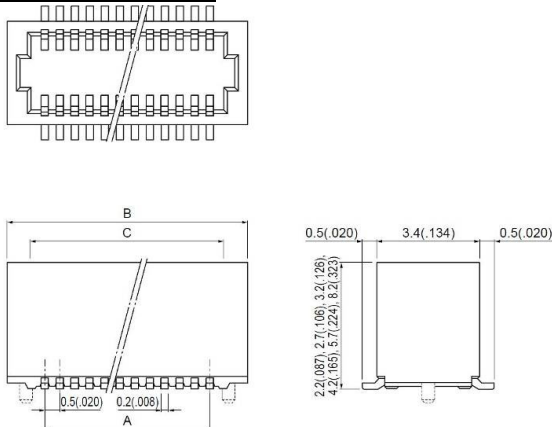


Cir- cuits	Model No.		Dimensions mm(in.)				Q'ty / reel
	Without bosses	With bosses	A	B	C	D	
24	<b>24R-JMCS-G-TF (S)</b>	<b>24R-JMCS-G-B-TF (S)</b>	5.5(.217)	7.3(.287)	6.4(.252)	6.7(.264)	2,500

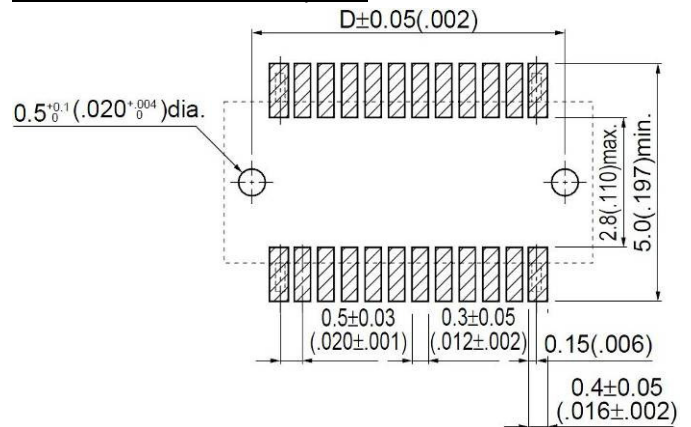
#### 3.3.2 Horizontal modules connector

**JST reference:** 24P3.5-JMCS-G-TF (Top entry type)

Mechanical overview:



Recommended PCB footprint:

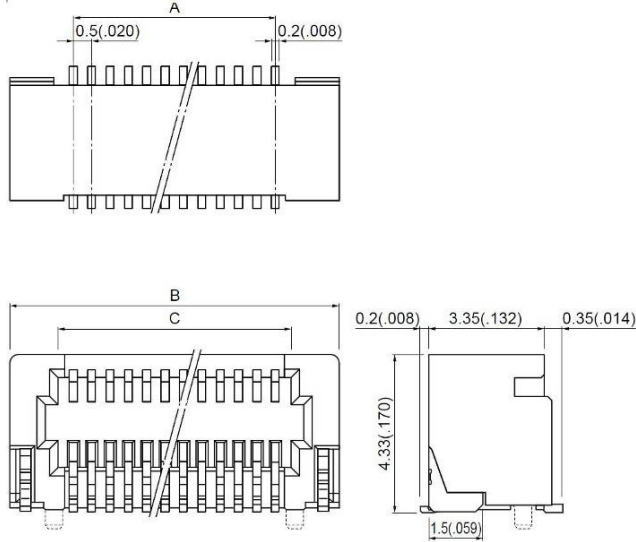


Circuits	Model No.				Dimensions (mm)			
	Stacking height (mm)				A	B	C	D
24	—	3.5	4.0	4.5	5.5	7.9	6.4	—
		<b>24P3.5-JMCS-G-TF</b>						

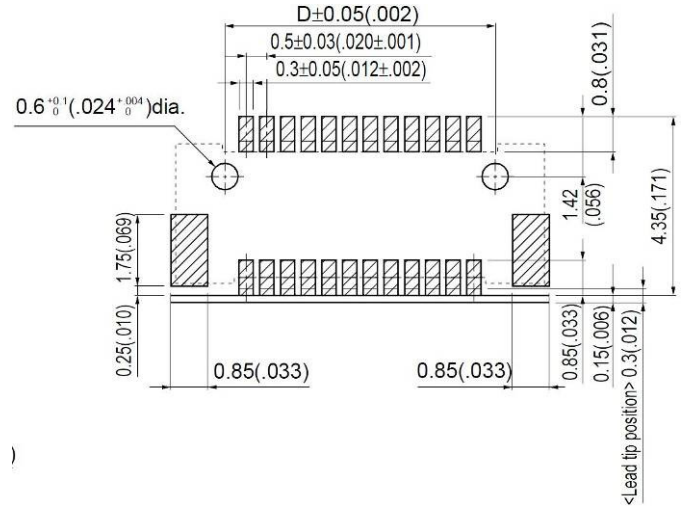
### 3.3.3 Vertical modules connector

**JST reference:** 24PS-JMCS-G-1B-TF (Side entry type)

**Mechanical overview:**



**Recommended PCB footprint:**

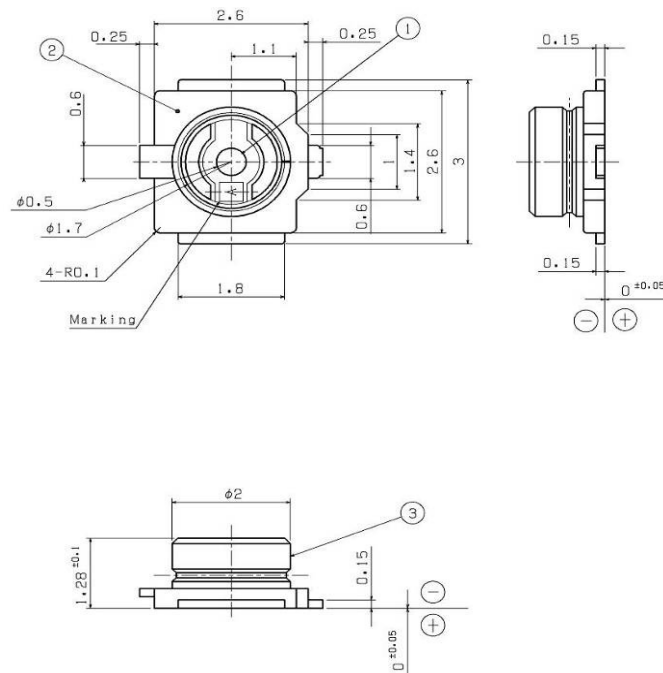


Circuits	Model No.	Dimensions (mm)				Qty / reel
		A	B	C	D	
24	24PS-JMCS-G-1B-TF	5.5	8.9	6.4	6.55	1,500

### 3.3.4 Antenna connector

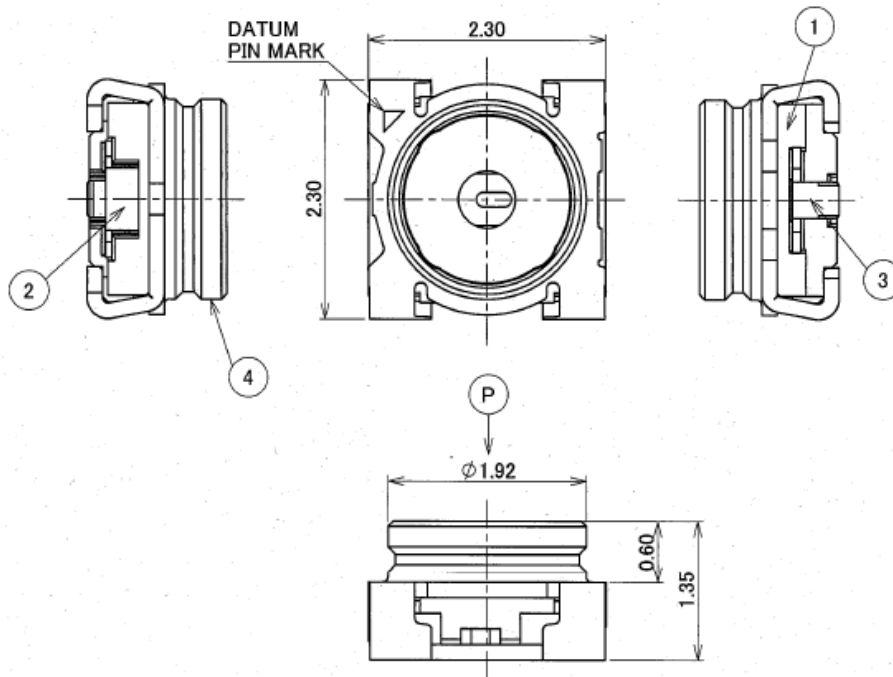
**Only on external antenna products: JST reference:** AYU1-1P-02676-120

This connector must be connected to a radio antenna.



**Only on internal antenna products: I-PEX reference:** 20549-001E

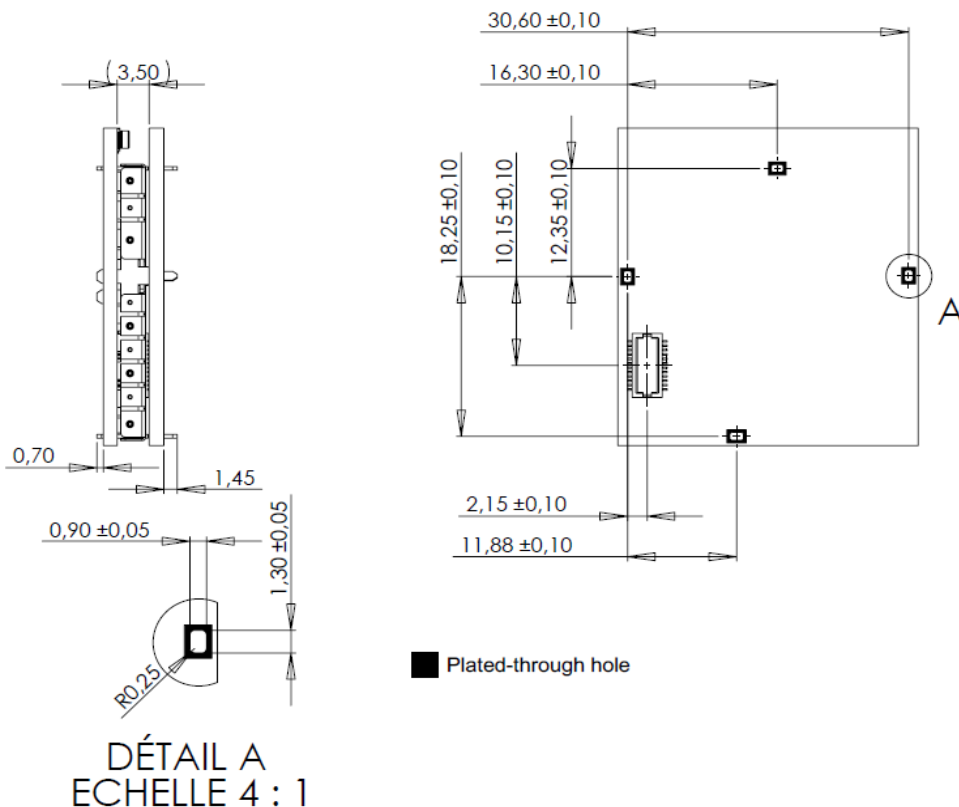
This switch is only used in production for testing purpose.



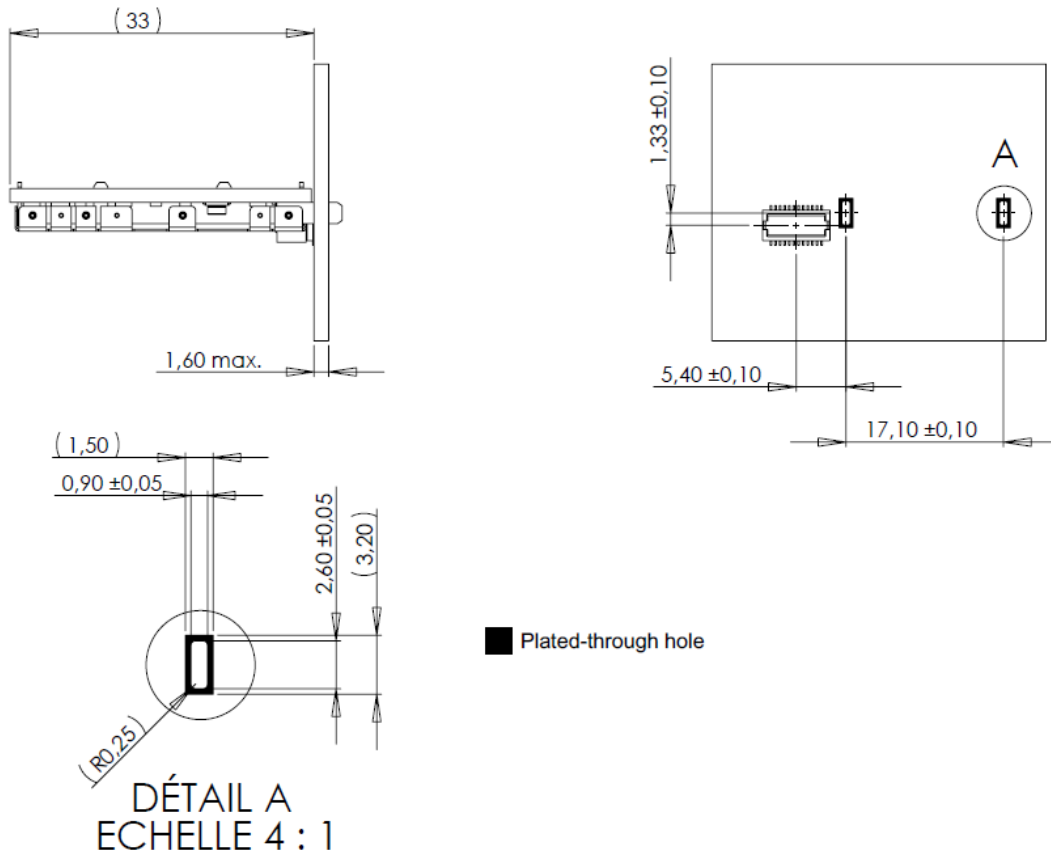
### 3.4 Motherboard Mechanical Integration

Mechanical constraints for the integration on the mother board are detailed below.

Mechanical integration – Horizontal version:



Mechanical integration – Vertical version:



## 4. MARKING

### 4.1 Label FC6000TN / FC6000TS



The label is done here for the FC6000TN. For the FC6000TS, all designations 'FC6000TN' are replaced by 'FC6000TS'.

NB: The TELEC / Japan certification reference 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

## 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.



## 6. Approval and certification

### 6.1 FC6000TS

#### 6.1.1 Normative certificates

FC6000TS module certifications / identifications numbers:

CE : CE0700  
 FCC ID : RKXFC6000TS  
 IC : 5119A-FC6000TS  
 BT : QD-ID B020794

#### 6.1.2 CE declaration



**DECLARATION OF "CE" CONFORMITY**  
**"PARROT FC6000T"**

We, PARROT SA, 174 quai de Jemmapes - 75010 PARIS, FRANCE, declare under our sole responsibility that our product Parrot FC6000T complies with the essentials requirements and other relevant provisions of the "Directive 1999/5/CE of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity", and complies with the "Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment".

This product complies with the following standards listed below:

1999/5/CE R&TTE Directive essential requirements:	Standards:
3.1-a) Electrical Safety User health / EMF	EN 60950-1:2006 / A11:2009 / A1:2010 / A12:2011 EN 62479:2010
3.1-b) EMC	EN 301 489-1 v1.9.2 EN 301 489-17 v2.1.1
3.2 Radio	EN 300 328 v1.7.1
2011/65/EU RoHS Directive:	Standard:
	EN 62321:2009

Paris, 2013, June 20<sup>th</sup>

Arezki Guerrab  
 Qualification Manager




PARROT RCS Paris B 394 149 496 - S.A. au capital de 1 968 527,52 € - NAF : 2630Z  
 174, quai de Jemmapes - 75010 PARIS - France - Tel : +33 1 48 03 60 60 - Fax : +33 1 48 03 06 66  
 Internet : www.parrot.com  
 N° ID-TVA : FR 70 394 149 496 000 25

### 6.1.3 FCC and IC requirements for module application

**FCC ID: RKXFC6000TS**

**IC: 5119A-FC6000TS**

In accordance with FCC Part 15, the FC6000TS is listed as a Modular Transmitter device.

#### **USA – User information**

This intends to inform how to specify the FCC ID of our module “FC6000TS” on the 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: RKXFC6000TS”

Any similar wording that expresses the same meaning may be used.

The label of the host device should also include the below FCC Statement. 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.”*

#### **Canada – User information**

This intends to inform how to specify contain IC of our module “FC6000TS” on the 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: 5119A-FC6000TS

Any similar wording that expresses the same meaning may be used.

The label of the host device should also include the below IC Statement.

When it is not possible, this information should be included in the User Manual of the host device.

*“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.”*

*« 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. »*

## 6.2 FC6000TN

### 6.2.1 Normative certificates

FC6000TN module certifications / identifications numbers:

CE : CE0700  
FCC ID : RKXFC6000TN  
IC : 5119A-FC6000TN  
BT : QD-ID B020794

### 6.2.2 CE declaration

Identical to CE declaration shown on 6.1.2.

### 6.2.3 FCC and IC requirements for module application

**FCC ID: RKXFC6000TN**

**IC: 5119A-FC6000TN**

In accordance with FCC Part 15, the FC6000TN is listed as a Modular Transmitter device.

#### **USA – User information**

This intends to inform how to specify the FCC ID of our module “FC6000TN” on the 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: RKXFC6000TN”

Any similar wording that expresses the same meaning may be used.

The label of the host device should also include the below FCC Statement. 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.*

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