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<p style="text-align: center;"><b>User Manual</b> <b>Bluetooth Module</b></p>
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<b>Part Name</b>	<b>Bluetooth Module</b>
<b>Doc. Rev.</b>	<b>0.0</b>
<b>Foxconn P/N.</b>	<b>T77H114</b>

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## **1. Introduction**

**Project Name: Bluetooth Module**

**Project Number: T77H114**

This document provides information for designing and using the Broadcom Bluetooth module with BCM2070 solution. It is a confidential document of Foxconn.

The Broadcom BCM2070 Bluetooth module is compatible with Bluetooth Core Specification, Version 2.1, available in the 2.4GHz (ISM) band, and support Enhanced Data Rate (EDR) and Adaptive Frequency Hopping (AFH) schemes. The chipset is a single-chip Bluetooth transceiver and baseband processor, with highest level of integration and eliminating most of critical external components, and thus minimizing the module size and its cost.

### **1.1 Major Components**

- Broadcom BCM2070 (50 pin BGA, single-chip Bluetooth transceiver and base-band processor)
- Serial Flash Memory

### **1.2 Features**

- Bluetooth 2.1 compliant
- Point-to-multipoint operation
- External USB interface for data
- Coexistence support

### **1.3 Application**

- Laptop and desktop computers
- Handheld devices
- Embedded systems



## 2. Product Specification

### 2.1 Chipset

50 pin BGA BCM2070PB0KWFBG

### 2.2 Interfaces

Bluetooth RF interface

Zo = 50 ohm

USB compliant 2.0 Interface

Multi-Function GPIO Interface

### 2.3 Hardware Design Considerations

#### 2.3.1 Power

The module requires either a 3.3V or 5V supply voltage. There are 2 integrated on-chip LDOs; VREG and VREGHV. The BCM2070 I/O port is 3.3V tolerant. The core and RF run at VREG (1.2V). VDDTF is tied to VREGHV which can be programmed to operate as either a class 1 or a class 2 device.

#### 2.3.2 Clock Sources

A high-accuracy crystal with  $\pm 10$ ppm tolerance is connected to the BCM2070 clock input pins.

#### 2.3.3 Serial Flash and Firmware Version

Firmware is stored on an onboard serial flash module.

#### 2.3.4 Radio Characteristics

Bluetooth v2.1 + EDR

Frequency Band: 2402 - 2480 GHz

Number of Channels: 79 1MHz channels

### 3. Pin Assignment

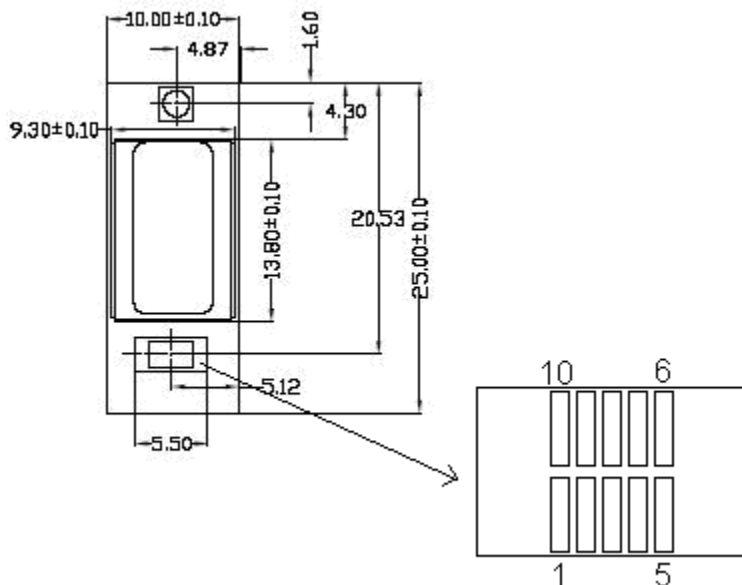
Connector: 10pin Matsushita AXK6F10347YG

Pin	Pin Name	I/O	Description
1	GND	GND	GND
2	BT_PRI	Output	INTEL_CH_CLK
3	Pairing	In/Out	GPIO_ANY_USE
4	Open	Not Used	NC
5	GND	GND	GND
6	LED	Output	BT_LED
7	USB D+	In/Out	USB D+
8	USB D-	In/Out	USB D-
9	WLAN_ACT	Input	INTEL_CH_DATA
10	3.3V Power	Power	Vcc

10-pin Connector Description

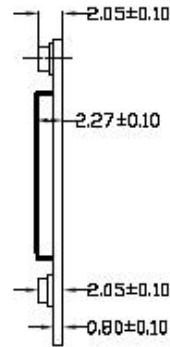
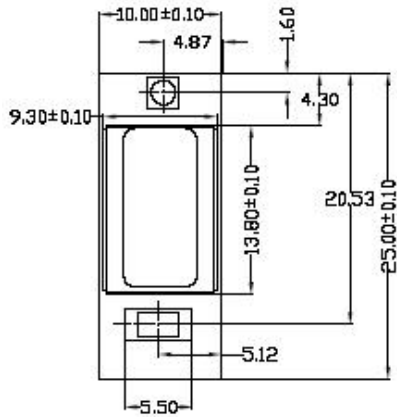
**Output** indicates that the signal is driven by Bluetooth device and transmitted to other devices.

**Input** indicates that the signal is driven by other devices and transmitted to Bluetooth device.

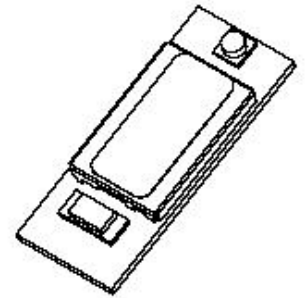


## 4. 2D Dimension

### 4.1 Module



Solder Pad: 0.10+/-0.02mm

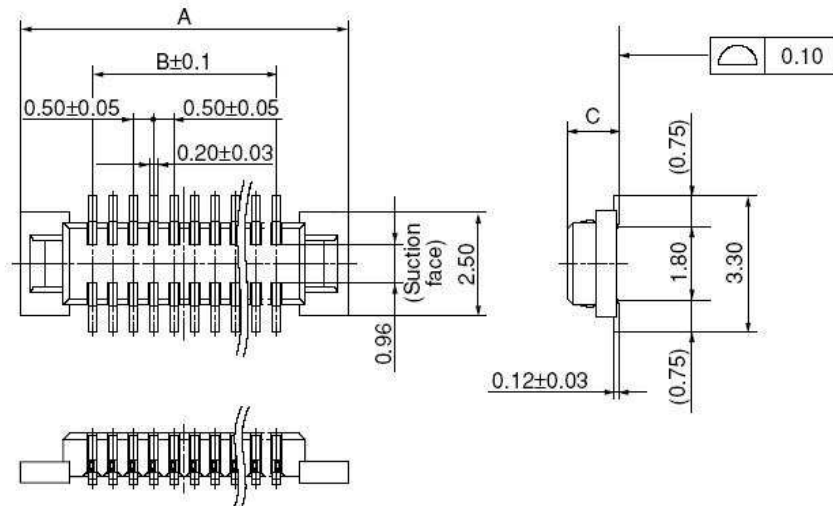


### 4.2 10pin Board-to-Board Connector (Header)

Manufacturer: MATSUSHITA

Manufacturer P/N: AXK6F10347YG

Dimensions: (Unit: mm)



For AXK6F10347YG, A=5.50 mm, B=2.00 mm, C=1.25 mm.

### 5.3 RF connector

Manufacturer: Hirose /Foxconn

Manufacturer P/N: U.FL-R-SMT (10) / (HD96017)

#### 5.3.1 Specification

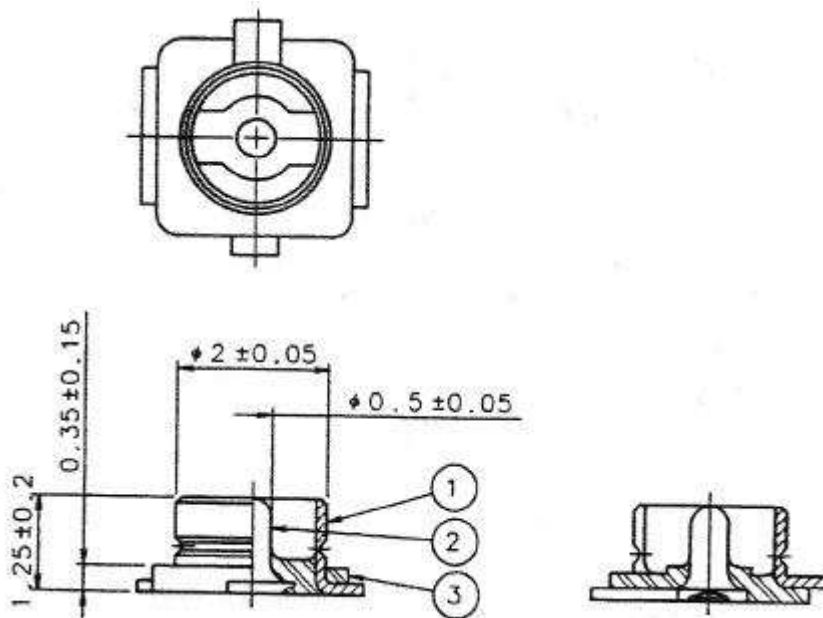
Operating temperature range: 0°C~70°C

Storage temperature range: 0°C~70°C

Characteristic impedance: 50Ω (0~3GHz)

Voltage standing wave ratio: VSWR<=1.3 (0.045~3GHz)

#### 5.3.2 Dimensions





### **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.

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.

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 is intended only for OEM integrators under the following conditions:**

The transmitter module may not be co-located with any other transmitter or antenna, As long as the condition above is 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 (for example, digital device emissions, PC peripheral requirements, etc.).

**IMPORTANT NOTE:** In the event that the condition can not 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 can not 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 final end product must be labeled in a visible area with the following: "Contains FCC ID: MCLT77H114".





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### 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.

### **Industry Canada Statement**

This device complies with RSS-210 of the Industry Canada Rules. 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

### **IC Radiation Exposure Statement:**

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. To maintain compliance with IC RF exposure compliance requirements, please follow operation instruction as documented in this manual.

### **This device is intended only for OEM integrators**

#### **under the following conditions:**

The transmitter module may not be co-located with any other transmitter or antenna. As long as conduction above is 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 (for example, digital device emissions, PC peripheral requirements, etc.).

**IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the IC authorization is no longer considered valid and the IC ID can not be used on the final product. In these circumstances, the OEM



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integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate IC authorization.

### **End Product Labeling**

The final end product must be labeled in a visible area with the following: “Contains TX IC : 2878D-T77H114”.

### **Manual Information That Must be Included**

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 user's manual for OEM Integrators must include the following information in a prominent location “IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements. The antenna must not be co-located or operating in conjunction with any other antenna or transmitter”.

### **NCC 警語：**

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

本模組於取得認證後將依規定於模組本體標示審合格籤，並要求平台上標示「本產品內含射頻模組：ID 編號」