

Customer :

No. R040064

ALGE

Date : 10. May.2004

Attention :

Your ref. No. :

Your Part No. :

**S P E C I F I C A T I O N S**

ALPS':

MODEL : UGPZ1-603A

Sepec. No. :

Sample No.:

RECEIPT STATUS

APPROVED

By. Date \_\_\_\_\_

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## Bluetooth™ Module Board To Board Specification

Model number	Function	Specification revision	Remarks
UGPZ1-603A	Board To Board Built in antenna Built in RF connector Flash memory (256k bytes), Reference oscillator built in UART (RAW) interface	Rev 1.1.7	Ver2 rev. 1.3.2

Digit	Definition	Contents
Digit 0~3	Bluetooth™ Module Including Base Band	UGPZ (Board to board based on UGXZ Module)
Digit 4	Mechanical form Features	1: 32x15x2.6mm / Class1
Digit 5	Status of products	X: Engineering Sample -: Mass production
Digit 6	Interface dependent	6 : UART (RAW : 115.2 kbps, w/ANT, test RF connector)
Digit 7~8	Serial number	03 : for ALGE
Digit 9	Revision	Starting from A

**CONFIDENTIALITY NOTES:**

This specification contains confidential information, which shall not be provided to any third parties without agreement notice.

**CAUTION**

1.The BLUETOOTH trademarks are owned by Bluetooth SIG, Inc., U.S.A.

2.The Bluetooth™ Module contains capability to upgrade own firmware via USB or UART interface. This feature can be used for development purpose only. Firmware upgrade by end user in the market may be restricted by regulatory rule depending on each country. ALPS will not own any responsibilities of infringement of each country's regulatory law for firmware upgrade.

3. This product(or technology) is controlled item subject to the Japanese Foreign Exchange and Foreign Trade Law. It should not be exported from Japan without authorization from the appropriate governmental authorities.

4. ALPS guarantees performance only for the standard configuration (PS\_KEY settings). In case of any modifications on PS\_KEY settings by customer, the original guarantee will no longer be applied. If there is any objections on product quality, all analysis on the module performances will be done based only on ALPS standard configuration (PS\_KEY setting).

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## 1 GENERAL

### 1-1 Purpose and Scope of this document

This document contains the specifications pertinent to the module for Bluetooth™ system, which comply with BLUETOOTH™ Specifications Version 1.1.

This document specifies and describes General, Mechanical, Electrical, Software and Reliability specifications and aspects for ALPS Bluetooth™ Module.

### 1-2 Product Overview

ALPS Bluetooth™ Module contains CSR BC2-EXT(BC212013/BC212015), which has complete radio part and base band controller section (16bits RISC processor, RAM and Flash memory). Also, high accuracy reference oscillator and sub clock for extremely low power management are built in. Protocol software is already downloaded into integrated Flash memory and interfaces to HCI layer of upper layer protocol stack on an appropriate host system.

ALPS Bluetooth™ Module permits standard operating conditions according to the following table and will perform typical features described on the second table.

#### 1-2-1 Standard Operating Conditions

##### UGPZ1 / Class1

Items	Conditions
Operating Temperature	Nominal: +15 °C to +35 °C Extreme: -20°C to +75 °C
Storage Temperature	-40 °C to +85 °C
Supply Voltage ; VCC	Nominal: +5.0 V Extreme: +5.0± 0.2 V
Absolute Maximum Ratings Supply Voltage	VCC : -0.4V ~ +5.5V

#### 1-2-2 Features List

Features	Contents
Power level	UGPZ1: +20dBm Max.
Program memory	4M bits (256k bytes x 16 bits) Flash
RAM	32k bytes x 16 bits
Reference oscillator	Built in
Sub clock oscillator	Built in
Audio interface	PCM A-Law, $\mu$ -Law (CVSD)
Serial data interface	UART (RAW)
Physical connection	Board to board (Matsushita Electric Works AXK6F20345)

### 1-3 Radio part

Bluetooth™ Module has fully integrated 2.4GHz radio transceiver with Class1 power amplifier, receiver and frequency-hopping synthesizer. In order to facilitate power management, each section of the radio may be powered up and down separately. Various software controllable switches have been implemented to control power to the transmitter, the frequency synthesizer/VCO, the receiver and the LNA.

#### **1-4 Base band part**

Bluetooth™ Module contains link controller, which performs all the real-time functions of the Bluetooth™ baseband protocol layer, including data transfer and connection management. The device also controls states of operation enables sniff, park and hold modes of operation. Real-time functions such as frequency-hopping burst timing and clock synchronization are also implemented in this hardware. Further processing is required to format the data into the Bluetooth™ packet format before it may be applied to the GFSK modulator. On the receive side the controller performs error correction and de-scrambling before de-packetizing the incoming payload and storing it in RX buffers.

The link controller hardware also implements the basic, repetitive actions of paging, inquiry, page or inquiry scans and the general Bluetooth™ modes of park and sniff. This ensures that the processor used to implement the Link Manager and other lower layer protocol can be kept inactive. Also base band contains the following functionality.

##### **1-4-1 FEC – Forward Error Correction**

FEC provides the ability to correct any errors, which might have occurred during the transmission of the original data. FEC rate of 1/3, 2/3, and Automatic Repeat Request (ARQ) are implemented.

##### **1-4-2 Whiten / De-whiten – Scramble/Unscramble**

Whitening/Scramble refers to the addition of randomized data to avoid any undesirable DC bias effects in the transfer of data packets. De-whitening/Unscramble is the reversal of the original process where the original data can be extracted.

##### **1-4-3 Encrypt/Decrypt – Apply/Remove Encryption**

Encryption is the security feature where keys are used to prevent the access of data to unauthorized sources. This functional block is responsible for the processing of authentication and key management functions required by Bluetooth™

##### **1-4-4 CRC – Cyclic Redundancy Check**

This is the error detection function implemented to process the CRC field within the payload section of a Bluetooth™ transfer packet. On the receiver side, the CRC is checked with the expected value based on algorithms. On the transmitter side, proper CRC is generated to and appended to the payload.

##### **1-4-5 HEC – Header Error Correction**

This is the error correction function implemented dealing with the 8-bit HEC field of the Bluetooth™ packet header as specified in Version 1.1 spec.

#### **1-5 Attention for FAA (Federal Aviation Association) compliance**

FAA proposal is to restrict use of any wireless devices during entire flight. This restriction is applied for also Bluetooth™ as well. Customer must implements disable switch of Bluetooth™ functionality by hardware or software. Module contains disable and enable radio over extended HCI commands, which shall be implemented into application software for any products, which might be carried out to airplane.

#### **1-6 LIFE SUPPORT APPLICATIONS**

This product is not designed for use in life support appliances, devices or systems where malfunction of this product can reasonably be expected to result in personal injury. ALPS customers using or selling this product for use in such applications do so at their own risk and agree to fully indemnify ALPS for any damages resulting from such improper use or sale.

**2 RADIO PART (RF) SPECIFICATIONS**

All RF specification items below are specified in accordance with Bluetooth™ RF Test Specification Revision 0.91 dated on 2001-Jul-02 and corresponding with Critical Erratum.

**2-1 Common Physical Layer Specifications**

Operating Frequency	2402 MHz to 2480 MHz
Carrier Spacing	1.0 MHz
Channel	79
Duplexing	TDD
Symbol Rate	1 Mbps
Modulation Method	GFSK BbT = 0.5
Reference Oscillator	16MHz (built in)
RF input and output impedance	Nominal 50 ohm

## 2-2 TX Specifications (UGPZ1 Class1)

Items	Spec. limits			Unit	Conditions	
	Min	Typ	Max		Temp.	Volt.
Normal Transmit Power	0	12.0	20.0	dBm	Extreme	Extreme
Maximum controlled level	9.0	12.0	15.0	dBm	Nominal	Nominal
Minimum controlled level			4.0	dBm	Nominal	Nominal
Power control step size	2		8	dB	Nominal	Nominal
Radio Frequency Tolerance	-75		+75	kHz	Extreme	Extreme
Radio Frequency drift						
One slot	-25		+25	kHz	Extreme	Extreme
Three slot	-40		+40	kHz		
Five slot	-40		+40	kHz		
Drift Rate	-20		+20	kHz/50 $\mu$ s		
Peak Deviation						
00001111(df1 <sub>avg</sub> )	$\pm$ 140		$\pm$ 175	kHz	Extreme	Extreme
01010101(df2 <sub>min</sub> )	$\pm$ 115			kHz		
01010101(df2 <sub>avg</sub> /df1 <sub>avg</sub> )	80			%		
Spurious Emission(In Band) *1)						
$\pm$ 500 kHz	-20			dBc	Extreme	Extreme
M-N  = 2			-20	dBm		
*2)  M-N  $\geq$ 3			-40	dBm		
Spurious Emission(out of Band) *3)						
30 MHz ~ 1 GHz			-36	dBm	Extreme	Extreme
1 GHz ~ 12.75 GHz			-30	dBm		
1.8 GHz ~ 1.9 GHz			-47	dBm		
5.15 GHz ~ 5.3 GHz			-47	dBm		
TX current consumption *4)		230	250	mA	Nominal	Nominal

## Notes:

\*1) The transmit power shall be measured in the following conditions.

Frequency offset	Test Condition
$\pm$ 500 kHz	RBW: 10 kHz, VBW: 30 kHz
M-N  = 2	RBW: 100 kHz, VBW: 300 kHz
M-N  $\geq$ 3	RBW: 100 kHz, VBW: 300 kHz

M : Transmit channel, N : Measured channel

\*2) Exceptions are allowed in up to three bands of 1MHz width centered on a frequency which is an integer multiple of 1MHz. They must, however, comply with an absolute value of -20dBm.

\*3) The transmit power shall be measured in a 100 kHz bandwidth.

\*4) Based on Normal Transmit Power specified on the above table.

## 2-3 RX Specifications

Items	Spec limits			Unit	Conditions	
	Min	Typ	Max		Temp.	Volt.
Reference Sensitivity Level (BER=0.001)		-78	-70 TBD	dBm	Extreme Nominal	Extreme Nominal
Reference Interference Level *1) BER<=0.1%						
Co-ch interference C/I <sub>co</sub>	11			dB	Nominal	Nominal
Adj. (1 MHz) interference C/I <sub>1MHz</sub>	0			dB		
Adj. (2 MHz) interference C/I <sub>2MHz</sub>	-30			dB		
Adj. (≥3 MHz) interference C/I <sub>3MHz</sub>	-40			dB		
Image Ch interference C/I <sub>Image</sub>	-9			dB		
Image Ch interference C/I <sub>Image±1MHz</sub>	-20			dB		
Out of Band Blocking *2) BER ≤0.1 %					Nominal	Nominal
30 MHz ~ 2 GHz	-10			dBm		
2 GHz ~ 2.4 GHz	-27			dBm		
2.5 GHz ~ 3 GHz	-27			dBm		
3 GHz ~ 12.75 GHz	-10			dBm		
Intermodulation Characteristics *3) BER ≤ 0.1% Carrier Level: -64 dBm	-39			dBm	Nominal	Nominal
Maximum Usable Level	-20			dBm	Nominal	Nominal
Spurious Emission					Nominal	Nominal
30 MHz ~ 1 GHz			-57	dBm		
1 GHz ~ 12.75 GHz			-47	dBm		
RX current consumption		65	80	mA	Nominal	Nominal

Note \*1) Carrier Signal Level: -67 dBm (Adj.( ≥3 MHz), Image)  
Carrier Signal Level: -60 dBm (Co-chi, Adj.(1 MHz), Adj.(2 MHz)) Frequencies where the requirements are not met are called spurious response frequencies. Five spurious response frequencies with a distance of ≥2 MHz from the wanted signals are allowed. On these spurious response frequencies a relaxed interference requirement C/I = -17 dB must be met.

Note \*2) Carrier Signal level: -67 dBm  
24 exceptions are permitted which are dependent upon the given receive channel frequency and are centered at a frequency which is an integer multiple of 1 MHz. At 19 of those spurious response frequencies a relaxed power level -50 dBm of the interfere may used to achieve a BER of 0.1 % and at the remaining 5 spurious response frequencies the power level is arbitrary.

Note \*3) Carrier signal level: -64 dBm  
A static sine wave signal at f1 with a power level of -39 dBm. A Bluetooth™ module signal at f2 with a power level of -39 dBm. Such that f0 = 2f1 -f2 and f2 -f1 = n\*1 MHz, where n can be 3, 4 or 5. The system must fulfill one of there alternatives.

**REFERENCE INTERFERENCE SIGNAL DEFINITION**

A modulated Interfering signal is defined as:

Modulation = GFSK  
Modulation index = 0.32 ±1 %  
BT = 0.5 ±1 %  
Bit rate 1Mbps ±1 ppm  
Modulating data = PRBS15  
Frequency Accuracy better than ±1 ppm

### 3 BASE BAND SPECIFICATIONS

#### 3-1 Program memory

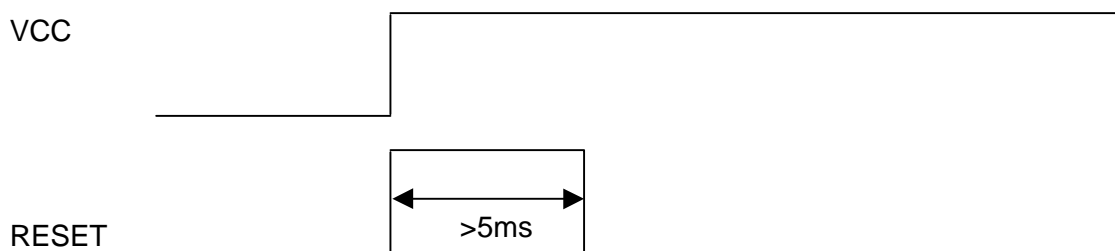
Module contains on chip flash memory (256k bytes x 16 bits) which includes Bluetooth™ protocol up to RFCOMM and the Serial Port Profile.

#### 3-2 Hardware RESET sequence

When RESET is asserted to module, microprocessor will be initialized.

The reset is positive level triggered based on schmitt-trigger input and needs a worst case 5ms or wider pulse. Once reset is begun, all I/O ports will be instantly tri-state and stop the clock. The fall-time decay of reset signal can be arbitrarily long. Removal of reset will initiate the system boot, which takes typically several 100ms to reach a state where USB enumeration or UART link establishment can occur.

If the host does not capable to create such reset signal at beginning of cold start-up (VCC ramp-up), a 0.22uF capacitor between VCC and RESET is required to maintain module functionality.



**3-3 UART (Universal Asynchronous Receiver Transmitter)**

Base band processor contains individual transmitter and receiver blocks thus user can use full bi-directional communication. And possible to receive and transmit in continuous by double buffer structure.

Host controller can re-configure data format using a private communications logical channel running over the UART. Data bit will be transmitted from LSB as default setting.

UART\_TxD, UART\_RxD, UART\_RTS, UART\_CTS form a conventional asynchronous data serial port. The interface is designed to operate correctly when connected to other UART devices such as the NS16550A. The signaling levels are 0V and VCC. The interface is programmable over a variety of bit rates; no, even or odd parity; one or two stop bits and hardware flow control on or off. The default condition on power-up is pre-assigned in the (external) Flash memory.

The maximum UART data rate is 1.3824Mbps. Two-way hardware flow control is implemented by UART\_RTS and UART\_CTS. UART\_RTS is an output and is active low. UART\_CTS is an input and is active low. These signals operate according to normal industry convention.

**3-3-1 Default Data format**

User can set desired data format (software setting should be determined) by the following selection However, Host shall communicate with default setting UART connection initiated at first time.

Baudrate:	115.2k bps
Data bit length:	8 bit
Stop bit length:	1
Parity:	None
Flow control:	Yes

**3-3-2 HOST Command timing after cold start-up**

AT Commands that are used to control / configure the module may be issued when the "READY" result code has been received.

### 3-4 PCM

#### 3-4-1 Features

Bluetooth™ Module implements an audio transcoder to translate between A-law,  $\mu$ -law and linear voice data from the host and A-l w,  $\mu$ -law and CVSD voice data over the air. Voice interpolation for lost packets is also included. PCM\_OUT, PCM\_IN, PCM\_CLK and PCM\_SYNC carry up to three bi-directional channels of voice data, each at 8ks/s. The format of the PCM samples can be 8-bit A-law, 8-bit  $\mu$ -law, 13-bit linear or 16-bit linear. The PCM\_CLK and PCM\_SYNC pins can be configured as inputs or outputs, depending on whether Bluetooth™ Module is the master or slave of the PCM interface.

PCM\_SYNC operates at a fixed clock frequency of 8kHz. When PCM\_SYNC is operated as an output (master mode) a clock frequency of 8kHz is generated from this pin. When operated as an input (slave mode) 8kHz must be input on this pin.

PCM\_CLK operates at a fixed clock frequency of 256kHz. When PCM\_CLK is operated as an output (master mode) a clock frequency of 256kHz is generated from this pin. When operated as an input (slave mode) 256kHz must be input on this pin.

When used with the Motorola MC145483 PCM or compatible devices, bits 1 to 13 of the PCM\_OUT data carry the current output sample value. Bits 14 to 16 carry a three-bit signal level value and these 'level bits' allow to vary the level of the audio signal output from the PCM device.

#### 3-4-2 Recommended codec IC

Bluetooth™ Module can be interfaced directly to appropriate PCM audio chips as below listed.

- OKI MSM7705 four channel  $\mu$ /A-law codec
- Motorola MC145481 8-bit  $\mu$ /A-law codec
- Motorola MC145483SD 13-bit linear codec
- Mitel MT93LI6 Echo canceling codec

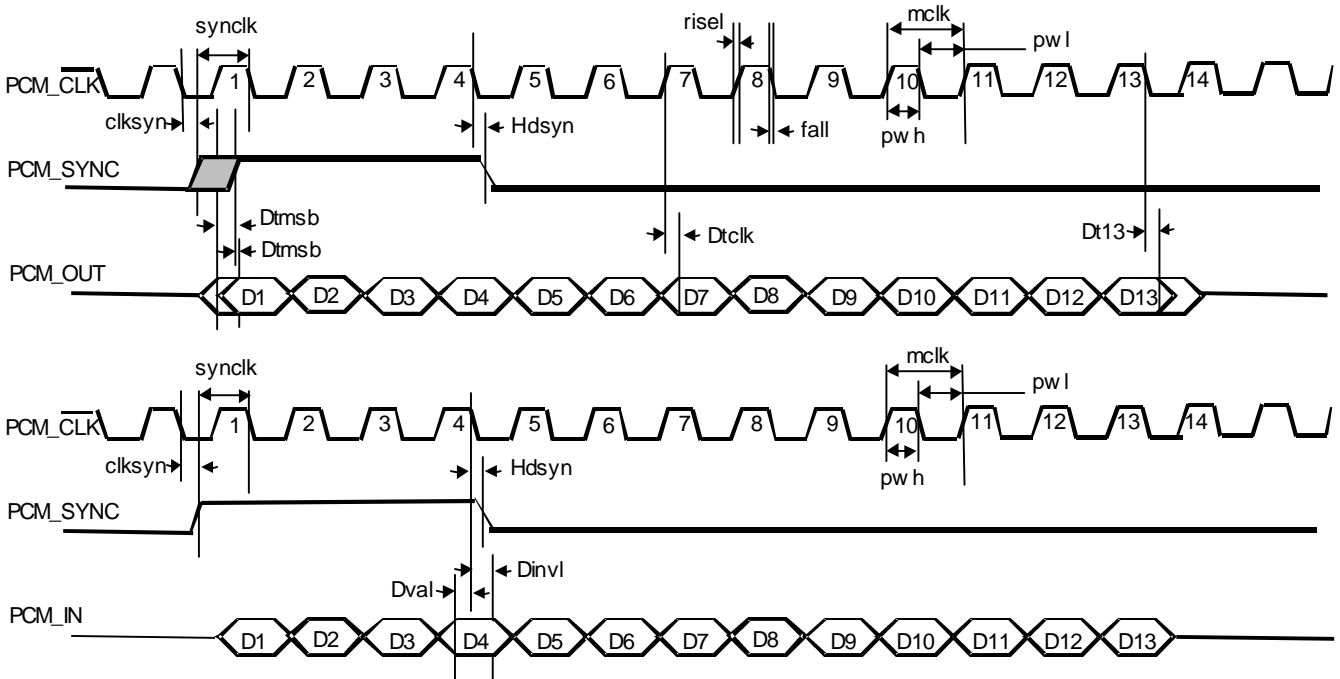
#### 3-4-3 PCM\_OUT and PCM\_IN 13 bit data format (based on Motorola MC145483SD)

PCM data stream is output from MSB in a sequential order, the following complement data format should be used for maximum positive code and negative zero and full scale.

Input / Output level	Sign bit	MSB											
+ Full scale	0	1	1	1	1	1	1	1	1	1	1	1	1
+One step	0	0	0	0	0	0	0	0	0	0	0	0	1
+0	0	0	0	0	0	0	0	0	0	0	0	0	0
-One step	1	1	1	1	1	1	1	1	1	1	1	1	1
-Full scale	1	0	0	0	0	0	0	0	0	0	0	1	1

3-4-4 Operating Condition Example (based on Motorola MC145483SD)

Symbol	Parameter	Conditions	MIN	TYP	MAX	Unit
V <sub>IH</sub>	Input High Voltage (PCM_CLK, SYNC, IN, PWRDWN)		VCC-0.5		VCC	V
V <sub>IL</sub>	Input Low Voltage (PCM_CLK, SYNC, IN, PWRDWN)		0		0.6	V
V <sub>OH</sub>	Output high voltage (PCM_CLK, SYNC, OUT)		2.2		VCC	V
V <sub>OL</sub>	Output low voltage (PCM_CLK, SYNC, OUT)		0		0.4	V
Mclk	Shift clock output (PCM_CLK)	at room temp	-20	256kHz	20	ppm
Sync	8khz sync clock (PCM_SYNC)	at room temp	-20	8kHz	20	ppm
Dc	Clock duty cycle ratio	at room temp	45	50	55	%
Pwh	Min pulse(High) width of PCM_CLK	See Fig	50			ns
Pwl	Min pulse width(Low) of PCM_CLK	See Fig	50			ns
Rise	Rising time for PCM signals	See Fig			50	ns
Fall	Falling time of PCM signals	See Fig			50	ns
Clksyn	Hold time form PCM_CLK(low) to PCM_SYNC(High)	See Fig	20			ns
Syncclk	Setup time form PCM_SYNC(High) to PCM_CLK(Low)	See Fig	80			ns
Hdsyn	Hold time from 4 <sup>th</sup> Period of PCM_CLK(Low) to PCM_SYNC(Low)	See Fig	50			ns
Dtmsb	Delay time from PCM_SYNC or PCM_CLK, whichever later, to PCM_OUT for valid MSB data	See Fig			60	ns
Dtclk	Delay time from PCM_CLK Hi to PCM_OUT for valid data	See Fig			60	ns
Dt13	Delay time from later of 13 <sup>th</sup> PCM_CLK falling edge, or falling edge of PCM_SYNC to PCM_OUT to be High Z	See Fig			60	ns
Dval	Setup time PCM_IN valid to PCM_CLK(Low)	See Fig	0			ns
Dinv	Hold time PCM_CLK(Low) to PCM_IN invalid	See Fig	50			ns



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## 4 PIN DESCRIPTION (refer to mechanical drawing for pin location)

## UGPZ1 / Class 1

Name	No	I/O	Description	Active state	Usage	Typical External Connection
						UART / PCM
GND	1	---	Ground		GND	GROUND
PCM_OUT	2	O	PCM data stream output (No use for USB mode)	Hi:1 Lo: 0	PCM	PCM input (DR <sup>*4</sup> ) Or N.C. <sup>*3</sup>
PCM_IN	3	I	PCM data stream input (No use for USB mode)	Hi:1 Lo: 0	PCM	PCM output(DT <sup>*4</sup> ) or N.C. <sup>*3</sup>
HUM (Host UART Mode) <sup>*5</sup>	4	I	Determines if information from host is command (logic 0) or data (logic 1).	Command : 0 Data : 1	GPIO	Host CPU port
NC	5	I/O	No connection	---	NC	N.C.
UART_RxD	6	I	UART / RxD from DTE (No use for USB mode)	Hi:0 Lo:1	UART	TxD
UART_TxD	7	O	UART / TxD to DTE (No use for USB mode)	Hi:0 Lo:1	UART	RxD
RESET	8	I	System Reset.	Hi: Active (Reset) Lo: Inactive	RESET	Host CPU port or VCC via capacitor
NC	9	I/O	No connection	---	NC	N.C.
ON/OFF_CTRL	10	I/O	General purpose I/O Shut down all block	Hi: Power Active Lo: Power Off	Power	To be connected port to control Power ON/OFF
GND	11	---	Ground		GND	GROUND
UART_RTS	12	O	UART / Ready To Send to DTE (No use for USB mode)	Hi: De-assert Lo: Assert	UART	CTS
NC	13	I/O	No connection	---	NC	N.C.
UART_CTS	14	I	UART / Clear To Send from DTE (No use for USB mode)	Hi: De-assert Lo: Assert	UART	RTS
PCM_SYNC	15	I/O	Connection to PCM frame sync Input/output of 8Khz (No use for USB mode)	Hi: Active Lo: Inactive	PCM	Frame Sync I/O (FST, FSR <sup>*4</sup> ) or N.C. <sup>*3</sup>
NC	16	I/O	No connection	---	NC	N.C.
NC	17	I/O	No connection	---	NC	N.C.
PCM_CLK	18	I/O	Connection to PCM reference Clock input/output of 256kHz (No use for USB mode)	Hi: 1 Lo: 0	PCM	PCM Clock I/O (BCLKR,BCLKT,MCLK <sup>*4</sup> ) or N.C. <sup>*3</sup>
MUM (Module UART Mode) <sup>*5</sup>	19	O	Determines if information from module is result code (logic 0) or data (logic 1).	Result code : 0 Data : 1	GPIO	Host CPU port
VCC	20	I	DC Power Supply Input	5.0V+/-0.2V	VCC	DC power source
RF IN/OUT or Antenna	---	I/O	RF input/output	---	RF IN/OUT	

## Notes :

\*1. In order to stabilize module performances, the below de-coupling capacitors would be required on application platform.

VCC : 2.2μ~5.6μF Tantalum capacitor and 1000pF ~ 1μF ceramic capacitor

VDD : 2.2μ~5.6μF Tantalum capacitor and 1000pF ~ 1μF ceramic capacitor

\*2. Due to limited capacity of integrated voltage regulator, any load except de-coupling capacitors shall not be tied to this pin.

\*3. Termination method if this pin is not used.

\*4. Pin name is based on Motorola 13bit Linear PCM codec IC MC145483.

\*5. Please refer to UGPZ1-603A software specification for detail.

**5 DC CHARACTERISTIC (VCC = 5.0 V)**

Mode	Symbol	MIN	MAX	UNIT	PIN	CONDITION
Input HIGH level	V <sub>IH</sub>	3.3x0.8	3.3	V		
Input LOW level	V <sub>IL</sub>	-0.4	+0.7	V		
Output HIGH level	V <sub>OH</sub>	3.3-0.3	-----	V		I <sub>OH</sub> =-200μA
Output LOW level	V <sub>OL</sub>	-----	+0.3	V		I <sub>OL</sub> =200μA

Note :

- \*1. UART\_RTS, UART\_CTS, UART\_TXD, UART\_RXD, PCM\_IN, PCM\_SYNC, PCM\_OUT, PCM\_CLK, USB\_DETACH, USB\_WAKE, PORT 1, PORT 2, PORT 3 and RESET pins are relevant.

## **6. SOFTWARE SPECIFICATIONS**

For the detail description of the implemented firmware, please refer to “Alps Embedded Audio Gateway Beta3 Firmware Release Note Document Version 1.0”.

(Please see the file “UGPZ1-603A\_FAS\_R040059.pdf”.)

### **6-1. Limitation of Liability**

The built in firmware on this module shall be tested and verified by customer in combination with appropriate Bluetooth™ compliant upper layer protocol software on the actual application platform. Customer needs to verify the firmware functionality with the software as ALPS is only able to test the firmware in accordance with the Bluetooth™ Test Specification (Part C) and its internal testing procedures. After ALPS receives customer's final agrees that ALPS shall not be liable or responsible for any damages or losses to module and/or customer's application platform to the extent caused by the Verified Firmware. Customer assumes any and all risks associated with the use of the Verified Firmware and shall indemnify, defend, and hold ALPS harmless from third party claims arising from such use.

## 7. MECHANICAL SPECIFICATIONS

### 7-1 General Mechanical Characteristics

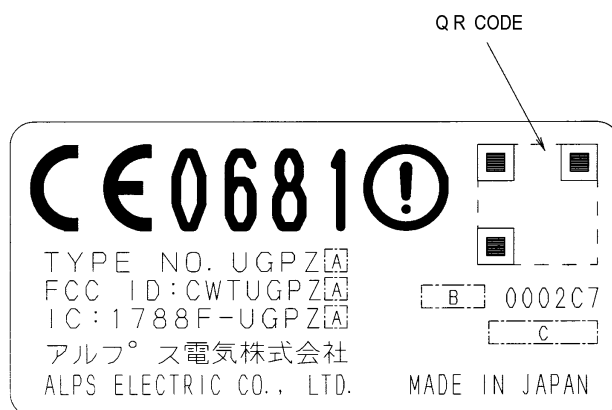
	UGPZ1	UGPZ2
Aspect	No contamination No scratches No strains	No contamination No scratches No strains
Dimensions	32.0 x 15.0 x 2.6mm typ. (Refer to assembly drawing)	32.0 x 15.0 x 2.6mm typ. (Refer to assembly drawing)
Mass	1.5g (Typ.)	1.3g (Typ.)

### 7-2 Mechanical Drawing

Please see mechanical drawing on page 20.

### 7-3 Marking Specifications on label

Marking on the label of module contains the below contents. ( Refer to assembly drawing)



note: [A] (Bluetooth class)  
 [B] (ALPS model No.)  
 0002C7 + [C] (Bluetooth Address)

## 8. Eligibility requirements for regulatory approval:

As a part of regulatory certification, ALPS will provide an approval for certain countries in the form of modular approval (MA) .

The regulatory approval is required for each country throughout world where the end-user wishes to use ALPS UGPZ series into entire end product, if no certification program for the modular approval exists in the country.

The countries that can accept MA include the USA, Canada, and certain European countries.

The conditions for approval of ALPS UGPZ series and related information for each country are described below.

ALPS wishes that our customer for end product would contact with us about what module of UGPZ series has been certified for each country.

### 8-1. USA

The following provisions for end product will be required on the FCC regulation, part 15.

(1) Antenna

ALPS wishes that our customer use the UGPZ module without any modifications including antenna. If customer use a unique antenna, the FCC certification is required for the end product.

(2) RF exposure compliance

This module may be installed into any end product both mobile and portable applications.

Because the module only radiates very low power levels, it complies with RF exposure requirements.

According to Supplement C, Edition 01-01 to OET Bulletin 65, Edition 97-01 spread spectrum transmitters are categorically excluded from routine environmental evaluation because of the low power level, where there is a high likelihood of compliance with RF exposure standards.

(3) Markings

To satisfy FCC exterior labeling requirements, the following text must be placed on the exterior of the end product.

1) UGPZ1

<b>Contains Transmitter Module FCC ID: CWTUGPZ1</b>
---

2) UGPZ2

<b>Contains Transmitter Module FCC ID: CWTUGPZ2</b>
---

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

### 8-2. Canada

In general, I.C (Industry Canada) follows the FCC in terms of emission levels and other regulatory requirements.

(1) Antenna

ALPS wishes that our customer use the UGPZ module without any modifications including antenna. If customer use a unique antenna, the I.C certification is required for the end product.

(2) RF exposure compliance

The UGPZ module is intended to use into any end product of **mobile applications**, only.

Because the module only radiates very low power levels and operates in band of 2.4GHz, it complies with the exemption of the clause 4.3 of RSS-102.

To comply with RF exposure requirements for mobile application, this module should be installed and operated with minimum distance 20cm between the radiator and body (excluding extremities: hands, wrists and feet) and must not be co-located or operated with any antenna or transmitter.

(3) Markings

1) The marking of "IC:1788F-UGPZ#" on the UGPZ module means: "1788F-UGPZ#" is the certification number, and the term "IC' before the equipment certification number only signifies that Industry Canada technical specifications were met.

2) To satisfy Industry Canada exterior labeling requirements, the following text must be placed on the exterior of the end product.

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1) UGPZ1

**Contains Transmitter Module IC: 1788F-UGPZ1**

2) UGPZ2

**Contains Transmitter Module IC: 1788F-UGPZ2**

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

### 8-3. Europe

The UGPZ module with CE marking will assist our customer into advance.

The end product containing UGPZ module with CE marking does not require further involvement of R&TTE directive Notified Body, where the end product installs UGPZ module **with no modification of the antenna** in conformance with ALPS's installation instructions.

In all other cases, or if our customer of the end product is in doubt then the end product integrating the UGPZ module must be assessed against Article 3.2 of the R&TTE Directive.

Since ALPS UGPZ modules are only intended to use for the end product, our customer shall take an action to submit a **"Notification"** to each country of EU.

In the case where a Notified Body/Bodies has/have assessed the end product, this will be the Notified Body number(s) given on the notification to the Spectrum Management Agencies.

In the case where a Notified Body has not assessed the end product, the Notification can be made to Spectrum Management Agencies using the Notified Body number(s) on the UGPZ module.

Please note that the notification shall be given no less than four weeks in advance of the start of placing on the market

Note: The our customer for the end product containing UGPZ module without CE marking shall be required further application to R&TTE directive.

**9 RELIABILITY TEST  
TEST METHOD**

ITEM	Condition	Specification
High Temperature Test (No power applied)	<p>85°C 96H</p>	Table 1
Temperature Test	<p>-40°C 96H</p>	Table 1
Temperature Shock		Table 1
Humidity Test	<p>40°C 90% 96H</p>	Table 1
Vibration Test	<p>Vibration Frequency: 10 Hz, 55 Hz, 10 Hz (1 cycle / 1 minutes) Total Amplitude : 1 mm Direction : X, Y, Z (Each direction 40 minutes)</p>	Table 1
Drop Test	<p>Drop Point (Height): 1 m Receiving board: Wooden board (20 x 20 x 3 cm.) Drop times: 1 times Direction: Any direction without the part of connector</p>	Table 1

TABLE-1

TX Frequency Accuracy	±75 kHz MAX.
Normal Transmitter Power	+20dBm MAX. (UGPZ1 /Class1) +4dBm MAX. (UGPZ2 /Class2)
Input Sensitivity	-70 dBm MAX.

1 2 3 4 5 6

A

B

C

D

A

B

C

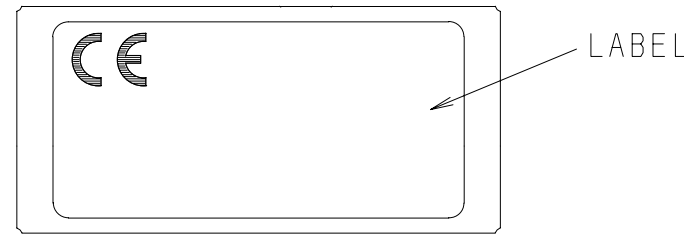
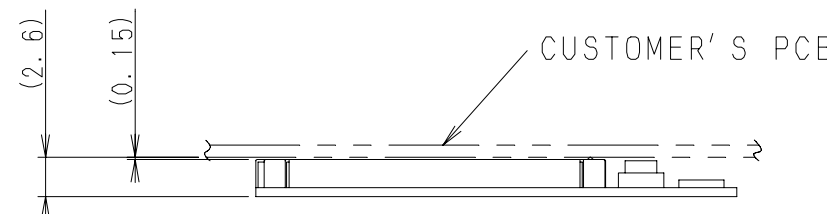
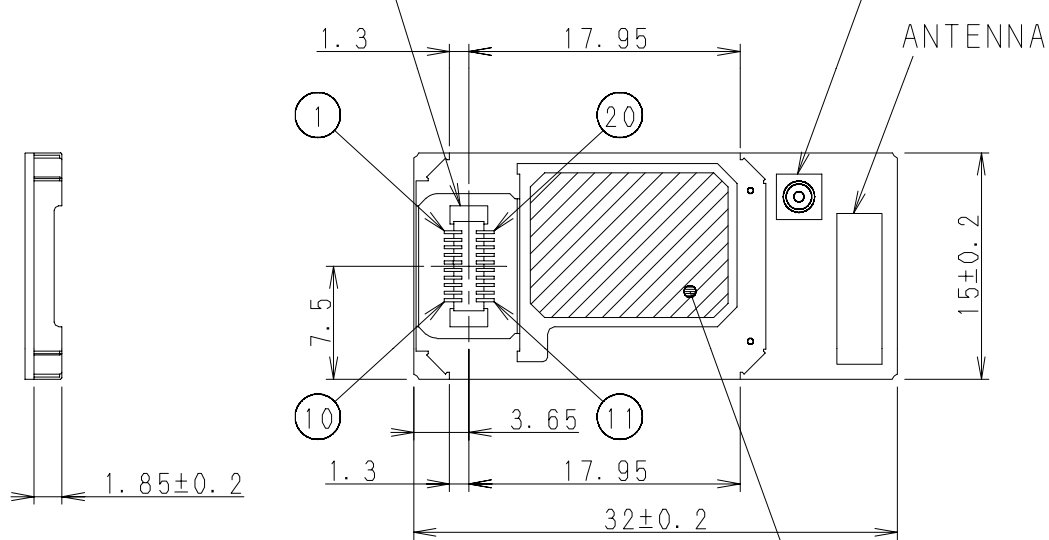
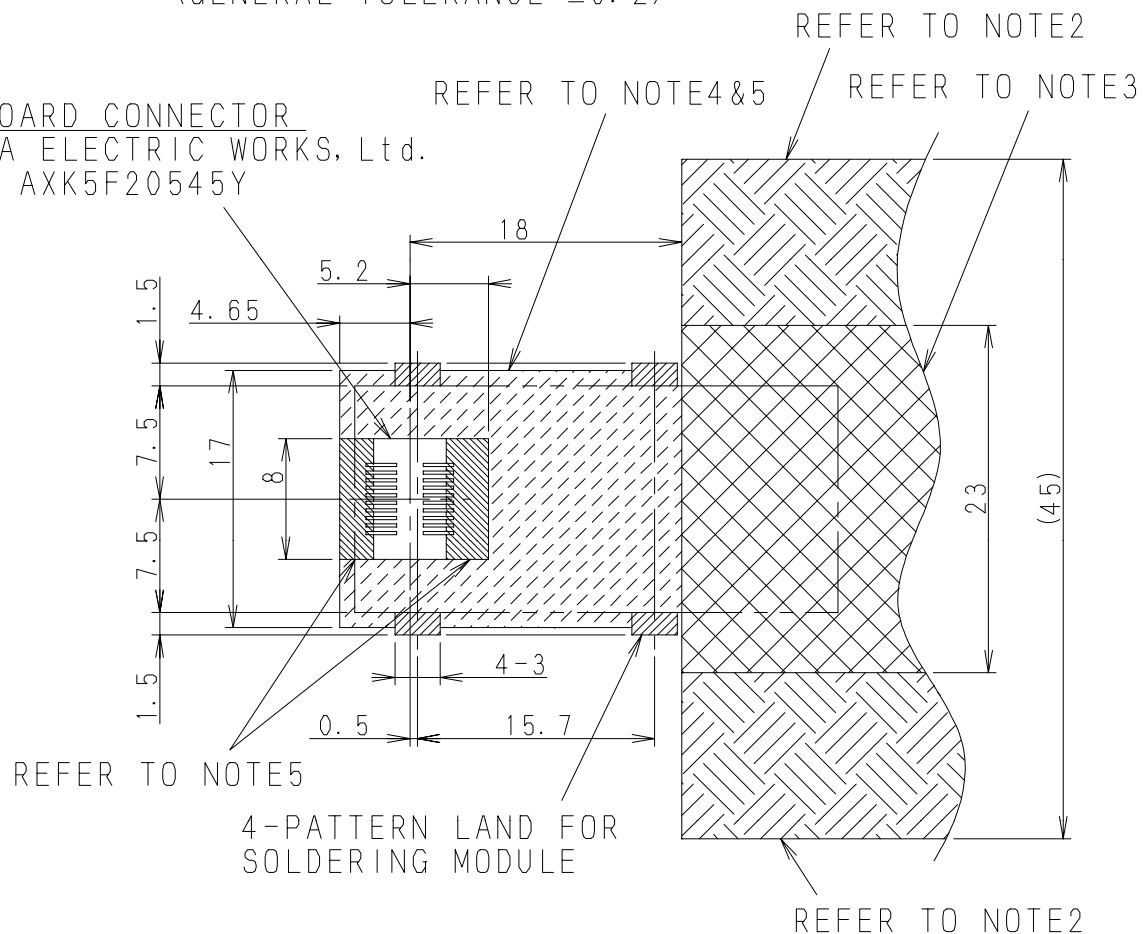
D

RECOMENDED PAD DIMENSIONS FOR MOUNTING MODULE  
(GENERAL TOLERANCE:±0.2)

BOARD TO BOARD CONNECTOR  
MATSUSHITA ELECTRIC WORKS, Ltd.  
PART NO. : AXK5F20545Y

COAXIAL CONNECTOR  
WITH SWITCH (For Test)  
MURATA MANUFACTURING CO., LTD.  
PARTNO. MM8430

BOARD TO BOARD CONNECTOR  
MATSUSHITA ELECTRIC WORKS, LTD.  
PART NO. : AXK6F20345 OR AXK6F20345Y



- NOTE 1. TOLERANCES ARE ±0.5 UNLESS OTHERWISE SPECIFIED.
2. ANY COMPONENTS MOUNTED IN THIS AREA WILL INFLUENCE ANTENNA PERFORMANCE.
3. PCB ARTWORK (WIRING, THROUGH HOLES ETC.) MUST NOT BE PLACED IN THIS AREA ON ANY LAYER.
4. PCB PATTERN ON TOP LAYER IN THIS AREA MUST BE COVERED WITH SOLDER STOP RESIST.
5. COMPONENTS MUST NOT BE MOUNTED IN THIS AREA.
6. THIS AREA SHALL NOT BE USED FOR MOUNTING THIS MODULE ONTO CUSTOMER'S APPLICATION PLATFORM.

PIN NO.	CONTENTS
1	GND
2	PCM_OUT*
3	PCM_IN*
4	HUM
5	NC
6	RXD*
7	TXD*
8	RESET
9	NC
10	ON/OFF_CTL
11	GND
12	RTS*
13	NC
14	CTS*
15	PCM_SYNC*
16	NC
17	NC
18	PCM_CLK*
19	MUM
20	VCC (5.0V±0.2V)

\*No Use for USB

CUSTOMER'S MODEL NO.	UGPZ1-603A
ALPS MODEL NO.	

PART NO.	NAME	MATERIAL	SPEC.	FINISH
		<b>ALPS ALPS ELECTRIC CO., LTD.</b>		
		DSGD.	SCALE	
		Apr. 19, '04 Y. Watanabe	2 : 1	
		CHKD.	TITLE UGPZ1 ASSEMBLY DRAWING	
		APPD.	UNIT	
		Apr. 19, '04 Y. Watanabe	mm	

## RECORD OF REVISIONS

UGPZ1-603

DATE	PRESENT CONTENTS	NEW CONTENTS / REASON	DSGN BY
16.April.'04 (R040056)	NEW		T. Sato
10. May, '04 (R040064)	<p>Specification revision</p> <p>Contents</p> <p>Storage temperature</p> <p>Operable temperature</p> <p>Normal Transmit Power</p>	<p>Changed specification revision to 1.1.7 / the specification was changed.</p> <p>Deleted chapter 6-1, 6-2, 6-3, 6-4, and change chapter 6-5 to 6-1 in contents / mistake</p> <p>Changed storage temperature range to “-40°C to + 85°C” in chapter 2-2 / Specification change</p> <p>Deleted operable temperature in chapter 2-2 / Specification change</p> <p>Changed specification limit of Normal Transmit Power in chapter 2-2</p>	T. Sato