

RUITZ0004MPZZ

***Bluetooth*[®] low energy Module**

Bluetooth[®] 4.2 low energy

RUITZ0004MPZZ

Data Report

Please note that this manual should not be provided to end-users.

SHARP CORPORATION

RUITZ0004MPZZ

Control No. HD-AG-A150049	(1/5)	Control name General Items
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Scope

This specification ("Specification") applies to the hybrid IC "RUITZ0004MPZZ", a **Bluetooth**[®] 4.2 low energy module ("Product").

1. Type: RUITZ0004MPZZ
2. Function:
Radio frequency module. **Bluetooth**[®] standard Ver 4.2 low energy conformity
3. Application: Health & Fitness Equipment, Sensor, Toys
4. Note:
 - a. Regulatory information:
Compliance with each radio law and/or regulation in below listed countries has been confirmed under the conditions follows:
 - Company name of Manufacturer: SHARP CORPORATION
 - Equipment name/ Model name: Wireless Module / RUITZ0004MPZZ
 - Manufacturing date: traceable from "lot number" shown on device
 - Country of origin: JAPAN
 - Countries: Canada, Japan, U.S.A.

To maintain the compliance, please install RUITZ0004MPZZ into your final product within the scope of the specification and regulation of each country.

Japan Regulatory Information

This module is approved with the specific antenna on this module.

- a) Please ensure that your product can bear a label with the following information. If the product is so small that it is not practicable to place the label, please place it in the instruction manual and package. The mark diameter shall be equal or greater than 3mm.

This product installs a radio system which has been approved as a radio station in a low power data communication system based on the Radio Law.

RUITZ0004MPZZ : 001-A05676



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Control No. HD-AG-A150049	(2/5)	Control name General Items
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Canada Regulatory Information

- a) This device complies with Industry Canada 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.

L'utilisation de ce dispositif est autorisée seulement aux conditions suivantes: (1) il ne doit pas produire de brouillage et (2) l'utilisateur du dispositif doit être prêt à accepter tout brouillage radioélectrique reçu, même si ce brouillage est susceptible de compromettre le fonctionnement du dispositif.

- b) This product is certified as type of the portable device with Industry Canada Rules. To maintain compliance with RF Exposure requirement, please use within specification of this product.

- IC: **548B-RUITZ0004MP**

Ce produit est certifié comme type de l'appareil portable avec Industrie Règles de Canada. Pour maintenir l'acquiescement avec exigence Exposition de RF, veuillez utiliser dans spécification de ce produit.

- IC: **548B-RUITZ0004MP**

- c) Please notify certified ID by either one of the following method on your product. Specifiez ID certifiée dans votre produit par une de méthode suivante.

-Contains Transmitter module IC : **548B-RUITZ0004MP**

-Contains IC : **548B-RUITZ0004MP**

Pecifiez ID certifiée dans votre produit par une de méthode suivante.

-Contains Transmitter module IC : **548B-RUITZ0004MP**

-Contains IC : **548B-RUITZ0004MP**

FCC Regulatory Information

- a) 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.

- b) Please notify certified ID by either one of the following method on your product.

-Contains Transmitter Module FCC ID: **APYBSC0001**

-Contains FCC ID: **APYBSC0001**

- c) CAUTION: changes or modifications not expressly approved by the party responsible for compliance could void the use's authority to operate the equipment.

- d) This product is certified as type of the portable device with FCC Rules. To maintain compliance with RF Exposure requirement, please use within specification of this product.

- FCC ID: **APYBSC0001**

- e) The antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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Control No. HD-AM-A150049	(1/1)	Control name Absolute maximum ratings
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Absolute maximum ratings

Symbol	Parameter	Min.	Max.	Units
VCC_NRF		-0.3	+3.6	V
GND			0	V
VIO		-0.3	VCC_NRF+ 0.3	V
Storage temperature		-40	+85	Deg-C
MSL	Moisture Sensitivity Level	3		
ESD HBM	Human Body Model		1	kV
ESD MM	Machine Model		100	V
Endurance	Flash Memory Endurance	20000		write/erase cycles
Retention	Flash Memory Retention	10 years		At 40 deg-C
Number of times an address can be written between erase cycles			2	times

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Control No. HD-AE-A150049	(1/7)	Control name Electrical characteristics
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Electrical characteristics

Recommendation operating range

Symbol	Parameter	Min.	Typ.	Max.	Units
VCC_NRF	Supply voltage, normal mode	1.8	3.0	3.6	V
VCC_NRF	Supply voltage, normal mode, DC/DC converter output voltage 1.9 V	2.1	3.0	3.6	V
tR_VCC_NRF	Supply rise time (0V to 1.8V)*1			100	ms
TA	Operation temperature	-25	25	75	Deg-C

*1 The on-chip power-on reset circuitry may not function properly for rise times outside the specified interval. Also after power off, please start up from below 0.3V.

RF Specifications

Symbol	Description	Min.	Typ.	Max.	Units
Fop	Operating frequencies	2402		2480	MHz
PLLres	PLL programming resolution		1		MHz
Df	Frequency deviation	+/-225	+/-250	+/-275	kHz
PRF	Maximum output power		4		dBm
PRFC	RF power control range	20	24		dB
PRFCR	RF power accuracy			+/-4	dB
PWHISP	RF power whisper mode		-30		dBm
PBW	20 dB bandwidth for modulated carrier		950	1100	kHz
PRF1	1st Adjacent Channel Transmit Power 1 MHz			-20	dBc
PRF2	2nd Adjacent Channel Transmit Power 2 MHz			-45	dBc
PRXMAX	Maximum received signal strength at < 0.1% PER		0		dBm
PSENS IT	Receiver sensitivity (0.1% BER) Ideal transmitter		-93		dBm
PSENS DT	Receiver sensitivity (0.1% BER) dirty transmitter		-91		dBm

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Control No. HD-BA-A150049	(1/2)	Control name Pin Layout
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Pin Descriptions

Pin	Pin name	Pin function	Description
1	GND	Ground	Ground (0 V)
2	P0.27 AIN1 XL1	Digital I/O Analog input Analog input	General purpose I/O pin ADC input 1 Crystal connection for 32.768kHz crystal oscillator or external 32.768kHz crystal reference
3	P0.26 AIN0 XL2	Digital I/O Analog input Analog output	General purpose I/O pin ADC input 0 Crystal connection for 32.768kHz crystal oscillator
4	P0.21	Digital I/O	General purpose I/O pin
5	VCC_NRF	Power	Power supply
6	AVDD	Power	Analog Power supply
7	P0.23	Digital I/O	General purpose I/O pin
8	P0.17	Digital I/O	General purpose I/O pin
9	GND	Ground	Ground (0 V)
10	DEC2	Power	Power supply for low voltage mode
11	P0.19	Digital I/O	General purpose I/O pin
12	GND	Ground	Ground (0 V)
13	OUT_ANT	Antenna In/Out	Internal antenna. It should be connected to Pin 14 OUT_MOD for normal operation.
14	OUT_MOD	RF In/Out	RF I/O pin. It should be connected to Pin 13 OUT_ANT for normal operation.
15	GND	Ground	Ground (0 V)
16	SWDIO	Digital I/O	System reset (active low). Also HW debug and flash programming I/O
17	SWDCLK	Digital input	HW debug and flash programming I/O
18	P0.25	Digital I/O	General purpose I/O pin
19	P0.03 AIN4	Digital I/O Analog input	General purpose I/O pin ADC input 4
20	GND	Ground	Ground (0 V)
21	P0.01 AIN2	Digital I/O Analog input	General purpose I/O pin ADC input 2
22	P0.02 AIN3	Digital I/O Analog input	General purpose I/O pin ADC input 3

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Control No. HD-BA-A150049	(2/2)	Control name Pin Layout
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Pin	Pin name	Pin function	Description
23	P0.00 AREF0	Digital I/O Analog input	General purpose I/O pin ADC Reference voltage
24	DCC	Power	DC/DC output
25	P0.05 AIN6	Digital I/O Analog input	General purpose I/O pin ADC input 6
26	P0.06 AIN7 AREF1	Digital I/O Analog input Analog input	General purpose I/O pin ADC input 7 ADC Reference voltage
27	P0.04 AIN5	Digital I/O Analog input	General purpose I/O pin ADC input 5
28	GND	Ground	Ground (0 V)