

**ANT™ + *Bluetooth*® Smart Module**  
**Bluetooth® 4.2 Low Energy**

**SWAN-2**

Data Report

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

# SWAN-2

Confidential

Control No. HD-AG-A140402	(1/6)	Control name General Items
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## Scope

This specification ("Specification") applies to the hybrid IC "SWAN-2", a ANT<sup>TM</sup>+ **Bluetooth**<sup>®</sup> 4.2 Low Energy module ("Product"). .

1. Type: SWAN-2

2. Function:

Radio frequency module. ANT<sup>TM</sup>+**Bluetooth**<sup>®</sup> standard Ver 4.2 Low Energy conformity

3. Application: Health & Fitness Equipment, Sensor, Cycle computer

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: SHIMANO INC.
- Equipment name/ Model name: Wireless Module / SWAN-2
- Manufacturing date: traceable from "lot number" shown on device
- Country of origin: JAPAN
- Countries: Canada, Japan, U.S.A., EU countries regulated under R&TTE directive, Andorra, Brazil, Chile, Costa Rica, Panama, Russia, South Korea (only for RF scheme), Taiwan and Venezuela,

-  
To maintain the compliance, please install SWAN-2 into your final product within the scope of the specification and regulation of each country.

### ■ **Canada: Regulatory information**

a) SWAN-2 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: 8117A-SWAN2

*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: 8117A-SWAN2

b) 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.*

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

-Contains Transmitter module IC : 8117A-SWAN2

-Contains IC : 8117A-SWAN2

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

-Contains Transmitter module IC : 8117A-SWAN2

-Contains IC : 8117A-SWAN2

■ **Japan: Regulatory Information**

a) SWAN-2 is approved with the specific antenna on this module.



b) Please ensure that the sentence below is clearly stated on your product or product manual.

- *This product has a radio system which was approved as a radio station in a low power data communication system based on the Radio Law and the Telecommunication Business Law.  
Name of the radio system: 001-A06159*

■ **U.S.A.: Regulatory Information**

a) SWAN-2 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: WY7-SWAN2

b) 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.

c) Please ensure that one of the following is clearly stated on your product.

-Contains Transmitter Module FCC ID: WY7-SWAN2

-Contains FCC ID: WY7-SWAN2

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

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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■ **EU: Regulatory information**

- a) Hereby, *SHIMANO INC.*, declares that this SWAN-2 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

# CE 0560

Българин[Bulgarian]	<i>С настоящето [SHIMANO INC.] декларира, че [SWAN-2] отговаря на съществените изисквания и другите приложими изисквания на Директива 1999/5/EC.</i>
Česky [Czech]	<i>[SHIMANO INC.] tímto prohlašuje, že tento [SWAN-2] je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.</i>
Dansk [Danish]	<i>Undertegnede [SHIMANO INC.] erklærer herved, at følgende udstyr [SWAN-2] overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.</i>
Deutsch [German]	<i>Hiermit erkläre [SHIMANO INC.], dass sich das Gerät [SWAN-2] in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.</i>
Eesti [Estonian]	<i>Käesolevaga kinnitab [SHIMANO INC.] seadme [SWAN-2] vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.</i>
Español [Spanish]	<i>Por medio de la presente [SHIMANO INC.] declara que el [SWAN-2] cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.</i>
Ελληνική [Greek]	<i>ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ [SHIMANO INC.] ΔΗΛΩΝΕΙ ΟΤΙ [SWAN-2] ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.</i>
Français [French]	<i>Par la présente [SHIMANO INC.] déclare que l'appareil [SWAN-2] est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.</i>
Italiano [Italian]	<i>Con la presente [SHIMANO INC.] dichiara che questo [SWAN-2] è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.</i>
Latviski [Latvian]	<i>Ar šo [SHIMANO INC.] deklarē, ka [SWAN-2] atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.</i>
Lietuvių [Lithuanian]	<i>Šiuo [SHIMANO INC.] deklaruojama, kad šis [SWAN-2] atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.</i>

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Nederlands [Dutch]	<i>Hierbij verklaart [SHIMANO INC.] dat het toestel [SWAN-2] in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.</i>
Malti [Maltese]	<i>Hawnhekk, [SHIMANO INC.], jiddikjara li dan [SWAN-2] jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn rilevanti li hemm fid-Dirrettiva 1999/5/EC.</i>
Magyar [Hungarian]	<i>Alulírott, [SHIMANO INC.] nyilatkozom, hogy a [SWAN-2] megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.</i>
Polski [Polish]	<i>Niniejszym [SHIMANO INC.] oświadczam, że [SWAN-2] jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.</i>
Português [Portuguese]	<i>[SHIMANO INC.] declara que este [SWAN-2] está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.</i>
Român [Romanian]	<i>Prin prezenta, [SHIMANO INC.], declară că aparatul [SWAN-2] este în conformitate cu cerințele esențiale și cu alte prevederi pertinente ale Directivei 1999/5/CE.</i>
Slovensko [Slovenian]	<i>[SHIMANO INC.] izjavlja, da je ta [SWAN-2] v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.</i>
Slovensky [Slovak]	<i>[SHIMANO INC.] týmto vyhlasuje, že [SWAN-2] spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.</i>
Suomi [Finnish]	<i>[SHIMANO INC.] vakuuttaa täten että [SWAN-2] tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.</i>
Svenska [Swedish]	<i>Härmed intygar [SHIMANO INC.] att denna [SWAN-2] står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.</i>

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■ **Brazil: Regulatory information**

a) SWAN-2 is certified under below certification information:

- ANATEL approval number: **HHHH-AA-FFFF(TBD)**



\*ID barcode in accordance with UCC/EAN-128 and ANATEL approval Number shown in above label format will be replaced after assignment accordingly.

b) This device works in a secondary level, this means that this kind of device doesn't have harmful protection against device of the same type, and they can't be interfered with first class equipments. *Este equipamento opera em caráter secundário, isto é, não tem direito a proteção contra interferência prejudicial, mesmo de estações do mesmo tipo, e não pode causar interferência a sistemas operando em caráter primário.*

c) Anatel information:

This product is approved by ANATEL, in accordance with the procedures regulated by Resolution 242/2000, and meets the applicable technical requirements.

For more information, please visit the ANATEL: <http://www.anatel.gov.br>

*Informações Anatel:*

*Este produto está homologado pela ANATEL, de acordo com os procedimentos regulamentados pela Resolução 242/2000, e atende aos requisitos técnicos aplicados.*

*Para maiores informações, consulte o site da ANATEL: <http://www.anatel.gov.br>*

■ **South Korea: Regulatory information**

a) SWAN-2 is certified under below certification information:

- Company name of Applicant: SHIMANO INC.
- Conformity assessment number: **MSIP-CRM-WY7-XXXXXXXXXXXXXXXX(TBD)**



b) This radio equipment has the possibility of radio interference.

*해당 무선 설비는 운용 중 전파 혼신 가능성이 있음.*

c) As this radio equipment has the possibility of radio interference, this equipment cannot be used for any services related to human life safety.

*해당 무선설비는 운용 중 전파혼신 가능성이 있으므로, 인명 안전과 관련된 서비스는 할 수 없습니다.*

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■ **Taiwan: Regulatory information**

a) SWAN-2 is certified under below certification information:

- Company name of Applicant: SHIMANO INC.
- NCC certification ID: CCXXxxYYyyyZzW(TBD)



b) Any changes or modifications are not allowed. The product is subject to not cause harmful interference to radio communications and air flight safety. If this equipment does cause interference, which can be determined stop shipping till the product is improved. This device may not cause harmful interference, and this device must accept any interference received, including interference that may cause undesired operation.

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。

c) Caution: SWAN-2 is certified as full modular approval. You can install SWAN-2 into multifunction device only. For other type of devices, host approval is required. Details and/or definition of multifunction device should be confirmed authority.

d) Note:

1. The NCC ID should be showed on product casing.(\*)
2. If a system contains NCC approved module, please show "This device contains NCC ID:
  1. 本模組於取得認證後將依規定於模組本體標示審驗合格標籤
  2. 系統廠商應於平台上標示「本產品內含射頻模組: XXXyyyLPDzzzz-x(TBD)」字樣

(\* ) SWAN-2 is too small to affix NCC ID on product case, allowance of alternatives method will be asked to and obtained from NCC.

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Control No. HD-AM-A140402	(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	2		
ESD HBM	Human Body Model		1	kV
ESD CDM	Charged Device 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-A140402	(1/1)	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)			100	ms
TA	Operation temperature	-25	25	75	Deg-C

The on-chip power-on reset circuitry may not function properly for rise times outside the specified interval.

**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-A140402	(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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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)