Intel® Radio Control Module 2.4 GHz Model: RCM24G

Manual (US/CAN)

Revision 1.0

Revision History

Revision	Description	Date
1.0	RCM24G Modular Approval US/Canada	01.04.2017

Overview

The RCM24G is a data transceiving module for wireless communication between two or more nodes of this kind.

Instruction

Do only use

- with specified antennas
- within specified supply voltage range
- interfacing via UART/CAN-Bus

Specification:

Module output (Frequencies)	70 Hopping channels from 2402.5 MHz (Channel 0) to 2471.5MHz (Channel 69), 1MHz channel spacing, ADFSS
Modulation	MSK modulation
Receiver Bandwidth	232kHz, 540kHz, 812.5kHz
Datarate	50kbit/s, 100kbit/s, 250kbit/s and 500kbit/s
Dwell Time	10ms (500kbit/s) to 28ms (50kbit/s). Fixed amount of useable data per hop (128 bytes TX and 128 byte RX)
CCA	Inactive
Supply Input range	3.6 VDCV ± 5% / 1A
Testing Antennas	1x Intel® FA5 antenna (HW-Version: Antenna-002) with 5 ports 1x Prestta WLAN Embedded Antenna P/N: 1000418 50 Ohm unbalanced
Antenna connection	µUFL Connector type: 50 Ohm nominal
Permissive antenna type/gain	Type: (Circularly polarized) patch antenna Max. antenna gain: 4.86 dBi Type: Dipole Max. antenna gain: 2.5 dBi
Antenna configuration	1 antenna/module

Transmitter Output Power

Channel	Max. power
0-3	10.19 dBm
4-7	10.72 dBm
8-10	12.84 dBm
11-14	14.71 dBm
15-17	16.37 dBm
18-21	17.92 dBm
22-24	19.05 dBm
25-39	19.93 dBm
40-43	18.81 dBm
44-48	17.79 dBm
49-52	16.19 Bm
53-57	14.51 dBm
58-61	12.49 dBm
62-66	10.36 dBm
67-69	9.32 dBm

Table 1 Max. Power Settings

Operational Characteristics

Hopping mode

A user serial number is used to generate a 70 hop long pseudo random hopping sequence which is contains each channel exactly once and is repeated every 70 hops.

Diversity Mode

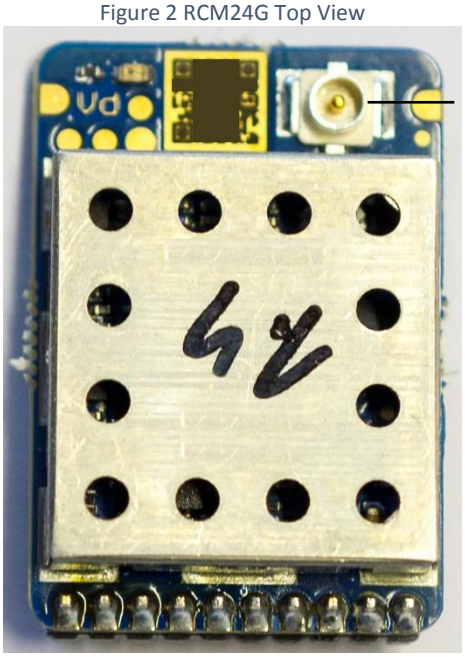
The RCM24G module is designed to work in the following diversity mode: Two adjacent modules transmit parallel with full power. The pseudo random hopping frequency along with dissimilar seeding ensures that both modules never occupy the same channel at a time. CCA is not performed.

Connection

Figure 1 RCM24G Bottom View

THC (Transmitter Host Connector)

Figure 2 RCM24G Top View



Pin	Signal	Designation	Pin	Signal	Designation
1	V_sup	3.3V	2	GND	GND
3	UART2	TX	4	UART2	RX
5	I/O	General I/O	6	I/O	General I/O
7	UART 3	TX	8	UART 3	RX
9	CAN	RX	10	CAN	TX

Table 2: Transmitter Host Connector

FCC and ISED Statement

This device complies with Part 15 of the FCC Rules and with Industry Canada's licence-exempt RSSs. 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.

Cet appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence.
L'autorisation d'exploitation est soumise aux deux conditions suivantes:
(1) l'appareil ne doit pas produire de d'interférences radioélectriques, et
(2) l'appareil doit accepter toute interference radioélectrique subi, même si le brouillage est susceptible d'en compromettre le bon fonctionnement.

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 in-stalled 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 or more 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.

ICES-003 Statement (Canada)

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Canadian Department of Communications.	Cet appareil numérique respecte les limites bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme relatives aux interferences causée par du matériel: "Appareils Numériques", NMB-003 édictée par le Ministre Canadian des Communications.
i. the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;	i. Le dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques d'interférence préjudiciable aux systèmes de téléphonie satellitaire utilisant les mêmes canaux;
ii. high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350	ii. De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux

MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.	(c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer des interférenceset/ou des dommages aux dispositifs LAN-EL.
iii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;	iii. Pour les dispositifs dotés d'antenne (s) amovible (s), le gain d'antenne maximal autorisé pour les dispositifs dans les bandes 5250-5350 MHz et 5470-5725 MHz doit être tel que l'équipement soit toujours conforme aux normes e.i.r.p. limite;
iv. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725- 5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point- to-point and non-point-to-point operation as appropriate	iv. Pour les dispositifs dotés d'antenne (s) amovible (s), le gain d'antenne maximal autorisé pour les dispositifs de la bande 5725- 5850 MHz doit être tel que l'équipement soit toujours conforme aux normes e.i.r.p. Limites spécifiées pour les opérations point à point et non point-à-point selon le cas

Important Note

Changes or modifications made to this equipment not expressly approved by Intel Corporation may void the FCC authorization to operate this equipment.

The product is provided with an approved antenna. Use only supplied or approved antenna by Intel Corporation. Any changes or modifications to the Antenna may void the FCC regulatory approvals obtained for the product.

End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons. RF exposure compliance must be ensured by integrator.

Contact

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