

CUSTOMER :

DATE : 2025.03.17

SPECIFICATIONS FOR APPROVAL

PRODUCT : Sub 1GHz FHSS Transceiver Module

MODEL NAME : DGT12-01DC0

CUSTOMER P/N :

APPROVAL	REMARK

Revision
1.0 (25/03/17) - Initial release.

RoHS

Designed	Checked	Approved	DeviceDesign Co., Ltd.	
			DOCUMENT No.	DGT12-01DC0 SA
HA M.H	Hwang K.R	Choi Y.L	PAGE	REV 1.0 (1 / 9)

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1. Introduction

DeviceDesign would like to announce a low-cost and low-power consumption module which has Sub 1GHz FHSS Transceiver Functionality.

2. Purpose

This module is used for communication between sensor devices and gateways, utilizing Frequency Hopping Spread Spectrum (FHSS)

3. Quality

Quality should meet each condition which mentioned on this specification.

However, the items which are not mentioned on this specification follow the inspection agreements and standards which are agree with both companies.

4. Appearance and Characteristics

1) Appearance

The appearance should not be contaminated by harmful materials and should not have cracks etc.

Mechanical dimensions should comply with the contents of Clause 9.

2) Characteristics

Electrical characteristics should meet the contents of Clause 11.

5. Application

DGT12-01DC0 is a Sub 1GHz FHSS Transceiver Module.

But this module is not designed for Life Support Application.

This Module applications include :

- Sensor Devices
- Gateways

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6. Absolute Maximum Rating

Parameter	Min.	Max.	Unit	
Storage Temperature	-40	85	°C	
Supply Voltage	VCC	-0.3	3.	V

7. Test

Electrical characteristics are tested for every products. However, if there are any objection in judgment, it should be treated with agreements of both companies.

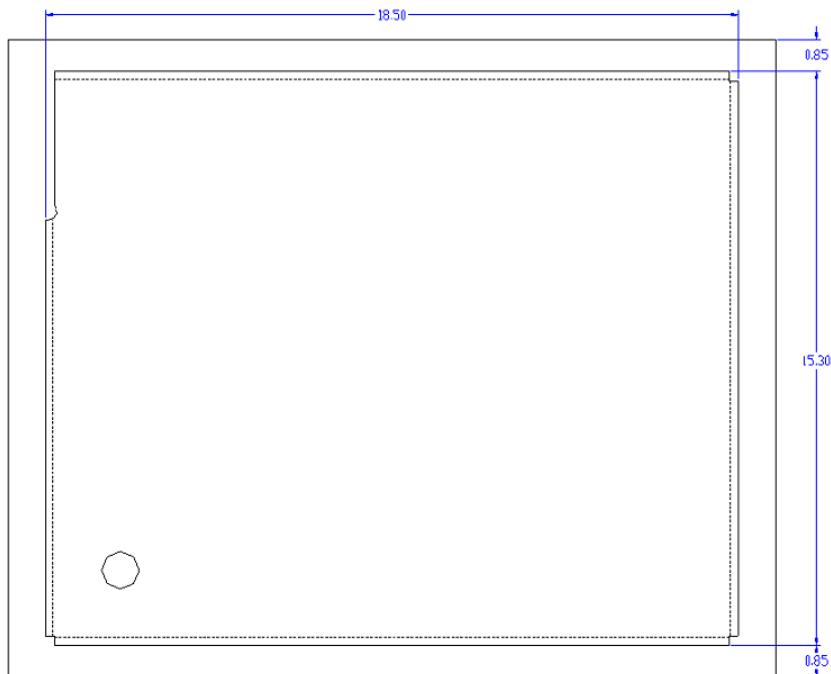
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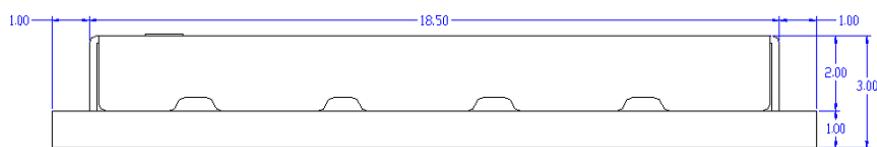
8. Mechanical Dimensions #1

Dimension	18.50mm × 15.30mm × 3.0mm(Typ.)
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<Top View>

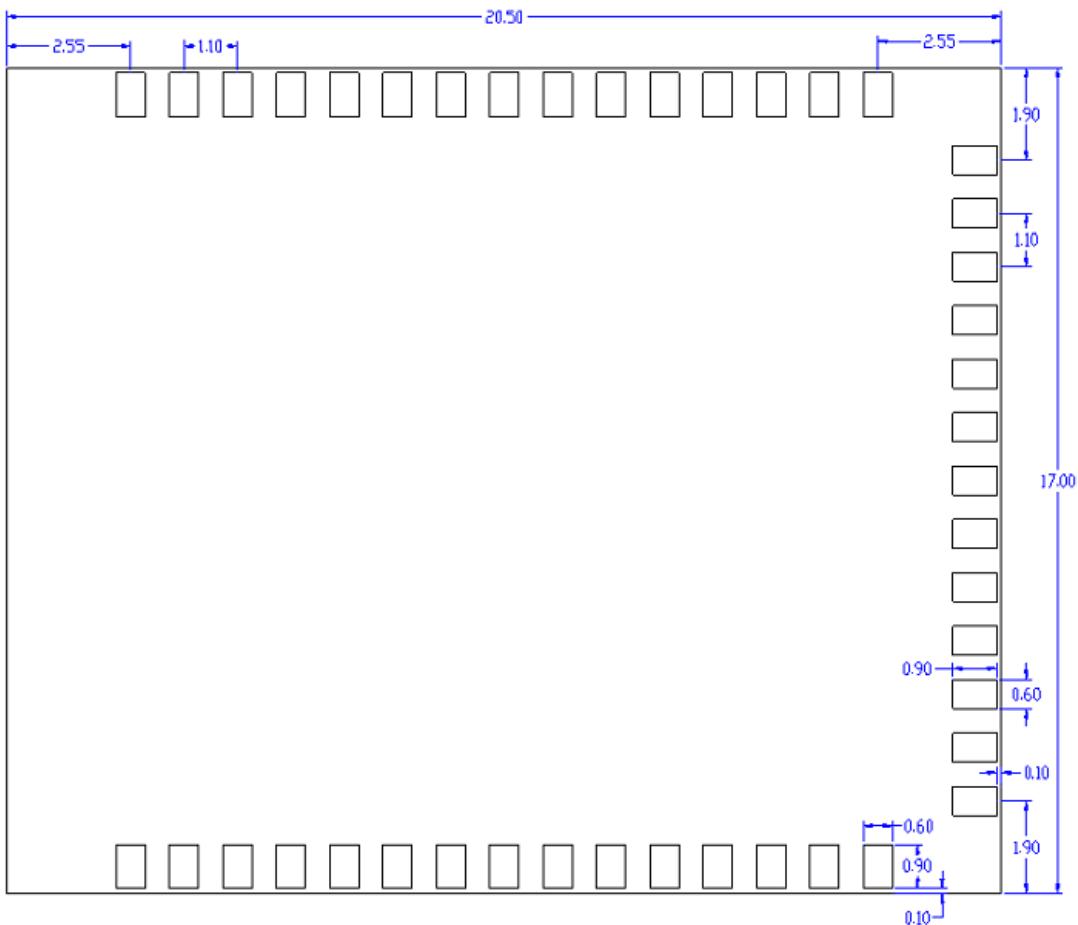


<Side View>



Unit : mm

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9. Mechanical Dimensions #2**<Bottom View>**

Unit : mm

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10. General Description

- Main IC : Texas Instrument CC1312R1
- 48MHz and 32.768KHz crystal embedded
- 352kB/256kB of Flash/ROM memory
- Size : 18.5 mm x 15.3 mm x 3.0mm
- 43 Pins of LGA Type Pad

11. Electrical Characteristics

1) Recommended Operating Rating

Parameter		Min.	Typ.	Max.	Unit
Operating Temperature		-30	20	85	°C
Supply Voltage	VCC	2.0	3.3	3.6	V

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2) Operating Parameter

Unless otherwise indicated, typical conditions are: VCC = 3.3 V.

Item	Specification			Note
	Min.	Typ.	Max.	
Frequency (MHz)	900	-	930	
Power Consumption	Tx (mA)	25		Instant Power Consumption
	Rx (mA)	6.5		
	Sleep (uA)	2		Shut down mode
Max Tx Power (dBm)	12	-	14.5	
Sensitivity (dBm)	-115	-120	-122	Data rate 5kbps

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12. Pin Assignment (Bottom Layout, Top Through View)

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13. Pin Description

PIN NO	PIN NAME	IC Pin	Pin Type	Description	Reference Assign
1	GND	GND	Ground	Reference ground	-
2	VCC	VDDS	Power	2.0 V ~ 3.6 V, recommended to 3.3 V	-
3	P01	DIO_1	Digital I/O	GPIO	-
4	P02	DIO_2	Digital I/O	GPIO	UART RXD
5	P03	DIO_3	Digital I/O	GPIO	UART TXD
6	P04	DIO_4	Digital I/O	GPIO	I2C SCL
7	P05	DIO_5	Digital I/O	GPIO, high-drive capability	I2C SDA
8	P06	DIO_6	Digital I/O	GPIO, high-drive capability	LED#1 Source
9	P07	DIO_7	Digital I/O	GPIO, high-drive capability	LED#2 Source
10	P08	DIO_8	Digital I/O	GPIO	External Flash MISO
11	P09	DIO_9	Digital I/O	GPIO	External Flash MOSI
12	P10	DIO_10	Digital I/O	GPIO	External Flash SCLK
13	P11	DIO_11	Digital I/O	GPIO	-
14	P12	DIO_12	Digital I/O	GPIO	-
15	GND	GND	Ground	Reference ground	-
16	P13	DIO_13	Digital I/O	GPIO	Button#1, active low
17	P14	DIO_14	Digital I/O	GPIO	Button#2, active low
18	P15	DIO_15	Digital I/O	GPIO	-
19	TMS	JTAG_TMSC	JTAG	JTAG TMSC, high-drive capability	JTAG TMS
20	TCK	JTAG_TCKC	JTAG	JTAG TCK	JTAG TCK
21	P16	DIO_16	Digital I/O or JTAG	GPIO, JTAG_TDO, high-drive capability	JTAG TDO
22	P17	DIO_17	Digital I/O or JTAG	GPIO, JTAG_TDI, high-drive capability	JTAG TDI
23	P18	DIO_18	Digital I/O	GPIO	UART RTS or SWO
24	P19	DIO_19	Digital I/O	GPIO	UART CTS
25	P20	DIO_20	Digital I/O	GPIO	External Flash CS#
26	P21	DIO_21	Digital I/O	GPIO	-
27	P22	DIO_22	Digital I/O	GPIO	-
28	RESET	RESET_N	Reset_N	Reset, active low	Reset
29	GND	GND	Ground	Reference ground	-
30	P23	DIO_23	Digital or Analog I/O	GPIO, analog capability	-
31	P24	DIO_24	Digital or Analog I/O	GPIO, analog capability	-
32	P25	DIO_25	Digital or Analog I/O	GPIO, analog capability	-
33	P26	DIO_26	Digital or Analog I/O	GPIO, analog capability	-
34	P27	DIO_27	Digital or Analog I/O	GPIO, analog capability	-
35	P28	DIO_28	Digital or Analog I/O	GPIO, analog capability	-
36	P29	DIO_29	Digital or Analog I/O	GPIO, analog capability	-
37	P30	DIO_30	Digital or Analog I/O	GPIO, analog capability	-
38	GND	GND	Ground	Reference ground	-
39	GND	GND	Ground	Reference ground	-
40	GND	GND	Ground	Reference ground	-
41	GND	GND	Ground	Reference ground	-
42	RF	-	RF I/O	External antenna pin	-
43	GND	GND	Ground	Reference ground	-

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14. FCC Information to User

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 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.

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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

FCC RF Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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OEM INTEGRATION INSTRUCTIONS:

This device is intended only for OEM integrators under the following conditions:

The module must be installed in the host equipment such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the internal on-board antenna that has been originally tested and certified with this module.

External antennas are not supported. As long as these 3 conditions above are 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.). The end-product may need Verification testing, Declaration of Conformity testing, a Permissive Class II Change or new Certification. Please involve a FCC certification specialist in order to determine what will be exactly applicable for the end-product.

Validity of using the module certification:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot 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. In such cases, please involve a FCC certification specialist in order to determine if a Permissive Class II Change or new Certification is required.

Upgrade Firmware:

The software provided for firmware upgrade will not be capable to affect any RF parameters as certified for the FCC for this module, in order to prevent compliance issues.

End product labeling:

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following:

- ▶ Contains FCC ID: DGT12-01DC0

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- This Module has been tested and should be used with below antennas:

Antenna Type	Peak Gain (dBi)	Part Name
Dipole	2.707	HW-LORA-N-RSMA

Information that must be placed in the end user manual:

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.

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