Specified low-power radio transceiver

429 MHz band

STD-602-429

Operation Guide

Version 1.0 (Aug. 2025)

- This product requires electrical and radio knowledge for setup and operation.
- To ensure proper and safe operation, please read this operation guide thoroughly prior to use.
- Please keep this operation guide for future reference.

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Contents

1. Outline

The specified low-power radio transceiver module STD-602 has the Type Certification of Construction Design (Giteki mark) and can be controlled with commands. Two serial ports are available for control and communication.
By using dedicated simple commands, it is possible to set RF parameters like frequency channel and check the received signal levels.
The transceiver uses a transparent input/output interface, enabling users to use their own protocols.
As required by the Japanese regulations, the carrier sensing function is also implemented and automatically executed.
Low power consumption enables battery operation.

2. Features and applications

Features

- Contains the Type Certification of Construction Design (Giteki mark)
- Small and thin 36 x 26 x 6.1
- Low consumption current: TX 27 mA typ. / RX 17 mA typ. at 3 V
- Operation temperature range: -20 to +65°C
- Communication parameter settings by simple commands

Applications

- Industrial telecontrol systems
- Industrial telemetry / monitoring systems

3. Specifications

General specifications

All values were measured with the antenna ports terminated into 50 ohm and at 25 degree C +/- 5 degree C unless otherwise noted.

Item	Specification	Remarks
Applicable standard	ARIB STD-T67	
Communication method	Simplex, Half-duplex	
Modulation method	FSK	
Antennas	Only to be used with the specified antennas	See '11. Antenna list'
Operation frequency range	429 MHz band	See '5. Frequency channel table'
Channel spacing	6.25 kHz	Bit rate 2400 bps
	12.5 kHz	Bit rate 4800 bps
Dimensions	36 × 26 × 6.1 (W x D x H) mm	Not including connector pins
Weight	13 g	
Soldering conditions	Hand soldering Temp.:350°C Time: 3 seconds max.	

Interface specifications

Item	Specification			Unit	Remarks
UART interface for command setting	Bit rate: 19.2			kbps	
	No parity Data length: 8 bits, Stop bit : 1 bit				
	Output	TXD	L = 0 to 0.55 H = 2.49 to Vcc	V	UART
	Input	RXD	L = 0 to 0.55 H = 2.03 to Vcc	V	UART
RX data output	DO		L = 0 to 0.55 H = 2.49 to Vcc	V	
TX data input	DI		L = 0 to 0.55 H = 2.03 to Vcc	V	
INT output	INT		L = 0 to 0.55 H = 2.49 to Vcc	V	Error output terminal
CSE output	CSE		L = 0 to 0.55 H = 2.49 to Vcc	V	Terminal for notifying carrier sensing status
TXS input	TXS		L = 0 to 0.55 H = 2.03 to Vcc	V	Low active TX select terminal
RXS input	RXS		L = 0 to 0.55 H = 2.03 to Vcc	V	Low active RX select terminal
Data polarity			L = 0 to 0.55 H = 2.03 to Vcc	V	DO output corresponding to DI input
Pulse width for input/output data	DO DI		416 us to 10 ms		RF bit rate 2400 bps
	DO DI		208 us to 10 ms		RF bit rate 4800 bps

* The input terminals should be driven with an open-drain or a CMOS output. .

Electrical specification

Common to transmitter and receiver

Item	Conditions	MIN	TYP	MAX	Unit	Remarks
Operating voltage		3.0		5.0	V	Absolute max. rating 5.5 V
Maximum input level				10	dBm	
Guaranteed operating temperature range		-20		65	°C	No dew condensation
Storage temperature range		-30		75	°C	No dew condensation
Frequency drift		-1		1	ppm / year	TX/RX Lo frequency
Initial frequency tolerance		-1.5		1.5	ppm	TX frequency
Oscillation type	PLL control (RFIC)					
Frequency stability	-20 to + 65°C	-3		3	ppm	
Carrier sensing level			-100	-97	dBm	
PLL reference freq.			25.6		MHz	TCXO

Transmitter part

Item	Conditions	MIN	TYP	MAX	Unit	Remarks
RF output power		5.0	9.0	12	mW	Conducted 50 Ω
Deviation Frequency stability	PN9 2400 bps	±0.9	±1.2	±1.5	kHz	@B24
	PN9 4800 bps	±2.1	±2.4	±2.7	kHz	@B48
Spurious emission			-50	-27	dBm	
Adjacent CH power	BW 4.0 KHz Ch 6.25 kHz PN9 2400 bps			40	dBc	@B24
	BW 8.5 KHz Ch 12.5 kHz PN9 4800 bps			40		@B48
Occupied bandwidth	99% PN9 2400 bps			5.8	kHz	@B24
	99% PN9 4800 bps			8.5		@B48
TX current consumption	Vcc=3.0 V		27	30	mA	RF output power :10 mW

Receiver part

Item	Conditions	MIN	TYP	MAX	Unit	Remarks
Receiver type	Single superheterodyne					
IF frequency			400		kHz	
Max. input level				10	dBm	
BER (0 error/2556 bits)	PN9 4800 bps	-108	-110		dBm	
BER (1% error)	PN9 4800 bps	-112	-114			
Spurious response	IF, 2-signal method, 1% error		40		dB	
Adjacent CH selectivity	±12.5 kHz, 2-signal method, 1% error		50		dB	
Blocking	±1 MHz, 2-signal method, 1% error		75		dB	
Intermodulation	3-signal method, 1% error		50		dB	
Spurious radiation				-54	dBm	Conducted 50Ω
RSSI dynamic range		-110		-20	dBm	
RSSI accuracy	With -100 dBm input	-3		3	dB	
	Other than above	-5		5	dB	
RX current consumption	Vcc=3.0 V		17	20	mA	

Notice

・Communication range depends on the operation environment and ambient surrounding.

・Specifications are subject to change to improve the characteristics and for other reasons without notice.

・The time required until a stable DO is established may get longer due to the possible frequency drift caused by operation environment changes, especially when switching from TX to RX, from RX to TX and changing channels. Please make sure to optimize the operation timing. A recommended preamble pattern is a repeated '1100' and the length is more than 20 ms.
When continuous 0 or 1 data exceeding 10 ms is used, demodulation may not be properly performed without a preamble.

・Antenna connection is designed as pin connection. RF output power, sensitivity, spurious emission and spurious radiation levels may vary with the pattern placed between the RF pin and the coaxial connector. Please make sure to verify those parameters before use.

Notes about the specification values

・BER: RF level where no error per 2556 bits is confirmed with the signal of PN9 and 4800 bps.

・BER (1% error): RF level where 1% error per 2556 bits is confirmed with the signal of PN9 and 4800 bps.

・The unwanted signal is unmodulated in the measurements of spurious response, adjacent CH selectivity and blocking.

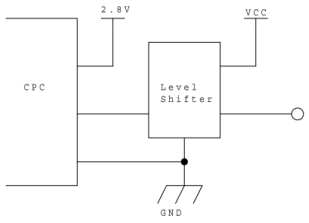
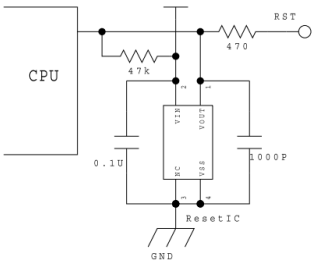
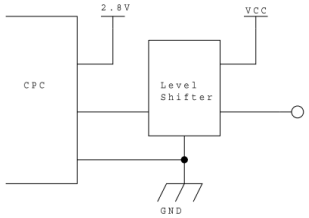
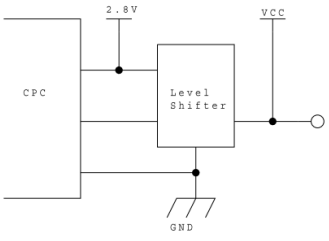
・Intermodulation: Ratio between the receiver input level with BER 1% and the signal level (PN9 4800 bps) added at the point of 'Receiving frequency -200 kHz' + 'Receiving frequency -100 kHz' with which BER 1 % is achieved.

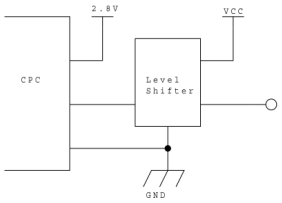
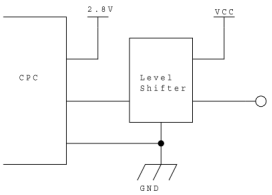
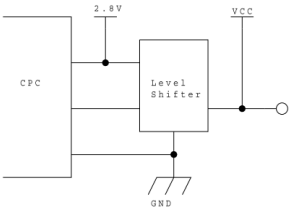
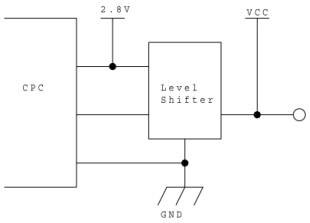
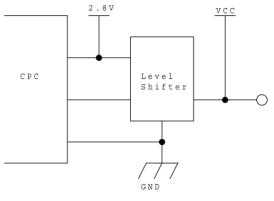
Actuation time

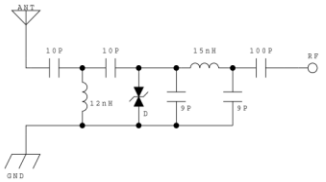
Item		MIN	TYP	MAX	Unit
Start-up with IR_CAL	Power on -> Transmission enabled		350	400	ms
	Power on -> Reception enabled		350	400	ms
Start-up without IR_CAL	Power on -> Transmission enabled		55	100	ms
	Power on -> Reception enabled		55	100	ms
TX/RX switching	Transmission -> Reception		20	25	ms
	Reception -> Transmission		30	35	ms
Preamble time			10	20	ms

* Above table shows the time required only for switching transmission and reception. The preamble duration needs to be added to estimate the time until stable data is output at the DO terminal.

4. Terminal specifications

Terminal No.	Terminal name	Input/ Output	Input/Output level (V)		Internal equivalent circuit
			Low	Hi	
1	VCC	Input	3.0	5.0	
		Power supply terminal. Connect to the regulated +3.0 to 5.0V DC.			
2	GND	-	-	-	
		GND terminal common to RF and VCC. The GND terminal should be connected to a wide GND plane.			
3	INT	Output	0 to 0.55	2.49 to Vcc	
		Error output terminal Outputs High at startup and then goes to Low once the initial setting is completed. When any of the module status bits become 1, this terminal outputs High. For details of the module status, refer to '8.11 @I Status check'.			
4	RST	Input	0 to 0.65	2.03 to Vcc	
		Reset terminal for MCU. Reset is enabled when connecting this terminal to Low. Normally, set this terminal to High or open.			
5	DO	Output	0 to 0.55	2.49 to Vcc	
		Received data output terminal Take out data corresponding to the RF bit rate set with the command.			
6	DI	Input	0 to 0.65	2.03 to Vcc	
		Transmission data input terminal Input data corresponding to the RF bit rate set with the command.			
7	NC	Do not connect.			

Terminal No.	Terminal name	Input/ Output	Input/Output level (V)		Internal equivalent circuit
			Low	Hi	
8	CSE	Output	0 to 0.55	2.49 to Vcc	
		Notification terminal for carrier sensing. Outputs High when the module is set to transmit and then goes to Low when carrier sensing finds transmission is allowed. Keep outputting High if transmission is not allowed by carrier sensing. Refer to '12. Carrier sensing' for details.			
9	TXD	Output	0 to 0.55	2.49 to Vcc	
		UART output terminal Make sure to perform communication with the following setting: Bit rate: 19.2 kbps Data length: 8 bits Parity: none Stop bits: 1 bit			
10	RXD	Input	0 to 0.65	2.03 to Vcc	
		UART input terminal Make sure to perform communication with the following setting: Bit rate: 19.2 kbps Data length: 8 bits Parity: none Stop bits: 1 bit			
11	TXS	Input	0 to 0.65	2.03 to Vcc	
		TX select terminal. Transmission is enabled when connecting this terminal to Low. When this terminal is active, set the RXS terminal to High or open.			
12	RXS	Input	0 to 0.65	2.03 to Vcc	
		RX select terminal. Reception is enabled when connecting this terminal to Low. When this terminal is active, set the TXS terminal to High or open.			

Terminal No.	Terminal name	Input/ Output	Input/Output level (V)		Internal equivalent circuit
			Low	Hi	
	RF	Input/Output	-	-	
		RF input/ output terminal. When in the TX mode, this terminal functions as an RF output and when in the RX mode, functions as an RF input. Nominal 50 Ω			
	GND	-	-	-	
		GND terminal. Both GND terminals should be connected to a wide GND plane.			

5. Frequency channel table

Bit rate 4800 bps (@B48) RF output power 10 mW

Channel No.		Frequency [MHz]	Channel No.		Frequency [MHz]
Dec	Hex		Dec	Hex	
07	07	429.2500	27	1B	429.5000
08	08	429.2625	28	1C	429.5125
09	09	429.2750	29	1D	429.5250
10	0A	429.2875	30	1E	429.5375
11	0B	429.3000	31	1F	429.5500
12	0C	429.3125	32	20	429.5625
13	0D	429.3250	33	21	429.5750
14	0E	429.3375	34	22	429.5875
15	0F	429.3500	35	23	429.6000
16	10	429.3625	36	24	429.6125
17	11	429.3750	37	25	429.6250
18	12	429.3875	38	26	429.6375
19	13	429.4000	39	27	429.6500
20	14	429.4125	40	28	429.6625
21	15	429.4250	41	29	429.6750
22	16	429.4375	42	2A	429.6875
23	17	429.4500	43	2B	429.7000
24	18	429.4625	44	2C	429.7125
25	19	429.4750	45	2D	429.7250
26	1A	429.4875	46	2E	429.7375

Bit rate 2400 bps (@B24) RF output power 10 mW

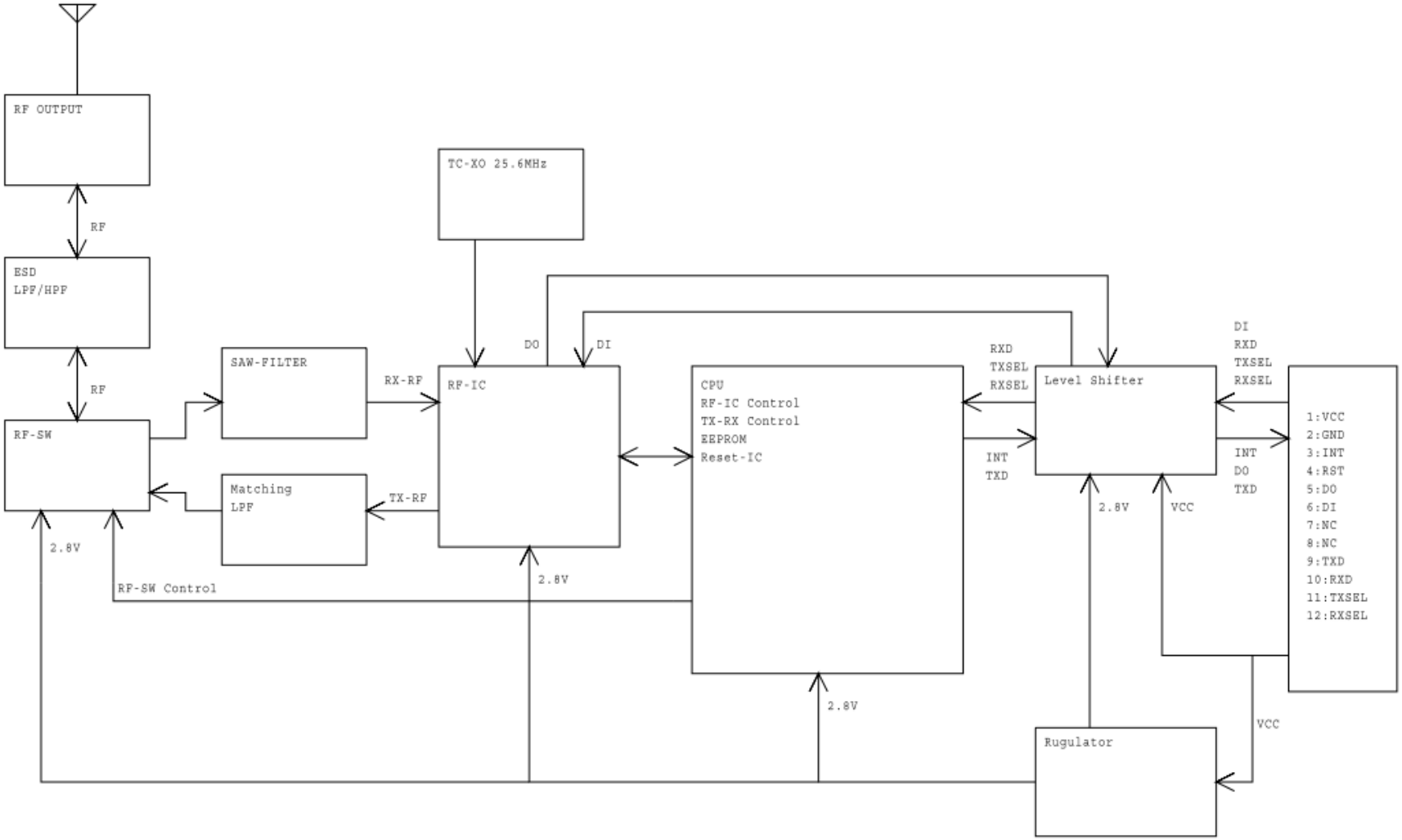
Channel No.		Frequency [MHz]	Channel No.		Frequency [MHz]
Dec	Hex		Dec	Hex	
12	0C	429.246875	51	33	429.490625
13	0D	429.253125	52	34	429.496875
14	0E	429.259375	53	35	429.503125
15	0F	429.265625	54	36	429.509375
16	10	429.271875	55	37	429.515625
17	11	429.278125	56	38	429.521875
18	12	429.284375	57	39	429.528125
19	13	429.290625	58	3A	429.534375
20	14	429.296875	59	3B	429.540625
21	15	429.303125	60	3C	429.546875
22	16	429.309375	61	3D	429.553125
23	17	429.315625	62	3E	429.559375
24	18	429.321875	63	3F	429.565625
25	19	429.328125	64	40	429.571875
26	1A	429.334375	65	41	429.578125
27	1B	429.340625	66	42	429.584375
28	1C	429.346875	67	43	429.590625
29	1D	429.353125	68	44	429.596875
30	1E	429.359375	69	45	429.603125
31	1F	429.365625	70	46	429.609375
32	20	429.371875	71	47	429.615625
33	21	429.378125	72	48	429.621875
34	22	429.384375	73	49	429.628125
35	23	429.390625	74	4A	429.634375

36	24	429.396875	75	4B	429.640625
37	25	429.403125	76	4C	429.646875
38	26	429.409375	77	4D	429.653125
39	27	429.415625	78	4E	429.659375
40	28	429.421875	79	4F	429.665625
41	29	429.428125	80	50	429.671875
42	2A	429.434375	81	51	429.678125
43	2B	429.440625	82	52	429.684375
44	2C	429.446875	83	53	429.690625
45	2D	429.453125	84	54	429.696875
46	2E	429.459375	85	55	429.703125
47	2F	429.465625	86	56	429.709375
48	30	429.471875	87	57	429.715625
49	31	429.478125	88	58	429.721875
50	32	429.484375	89	59	429.728125
			90	5A	429.734375

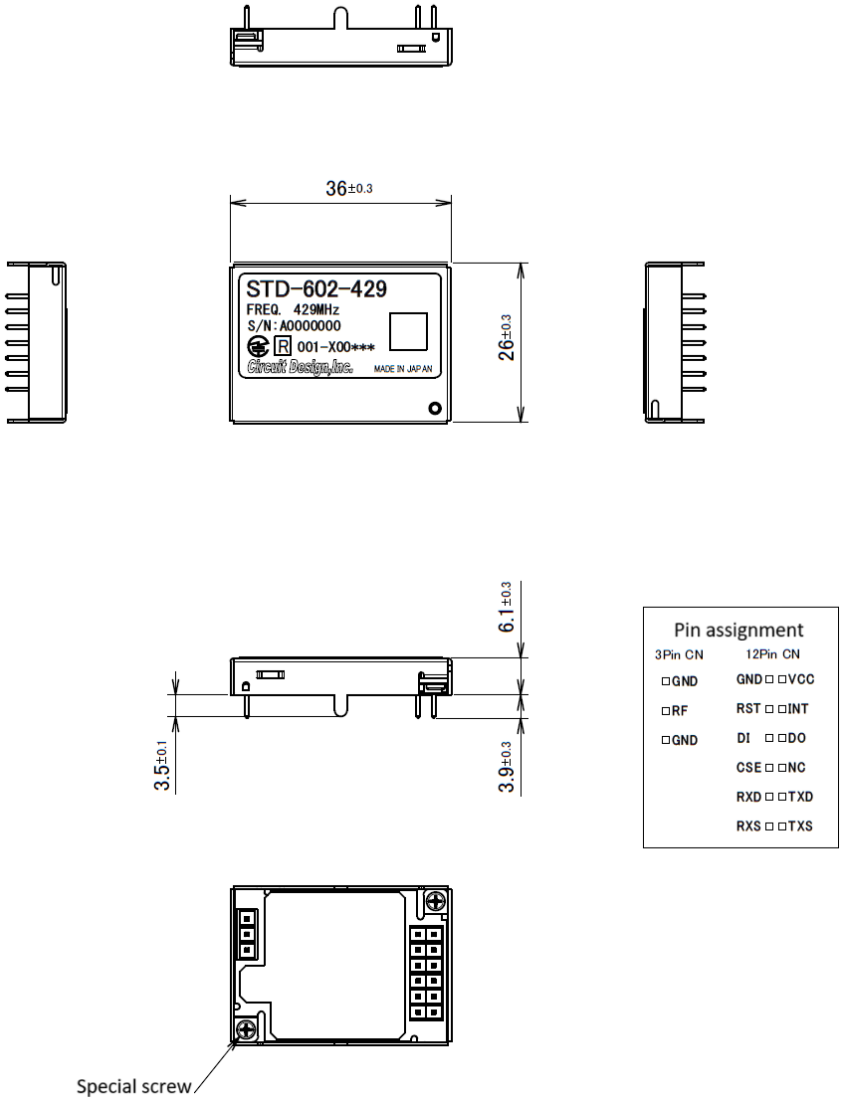
Bit rate 2400 bps (@B24) RF output power 1 mW

Channel No.		Frequency [MHz]	Channel No.		Frequency [MHz]
Dec	Hex		Dec	Hex	
103	67	429.815625	112	70	429.871875
104	68	429.821875	113	71	429.878125
105	69	429.828125	114	72	429.884375
106	6A	429.834375	115	73	429.890625
107	6B	429.840625	116	74	429.896875
108	6C	429.846875	117	75	429.903125
109	6D	429.853125	118	76	429.909375
110	6E	429.859375	119	77	429.915625
111	6F	429.865625			

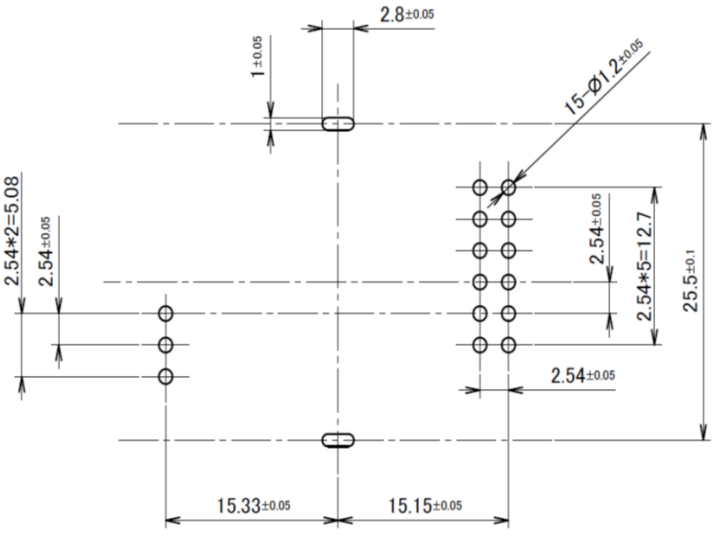
6. Block diagram



7. External dimensions



Reference hole position for PCB mounting (Top view)



8. Commands and responses

8.1 Control commands & responses

Control command basic format

Prefix + command name + value + terminator (Cr)

Prefix: '@'=40h, a code that indicates the start of the command string.
Command name: 2ASCII characters. Specified with upper case or lower case characters.
Value: Value of two characters corresponding to each command.

Example
Command string: @C0ACr
Value: 40,43,30,41,0D……

Control response basic format

Prefix + command name + value + terminator (CrLf)

Prefix: '*' = 2Ah, a code that indicates the start of the response string.
Command name: 2 ASCII characters for the received command.
Value: Result value corresponding to the relevant command.

Example
Response character string: *C0ACrLf
Value: 2A,42,30,46,0D,0A…..

* When issuing commands, unless otherwise stated, make sure that neither TXS nor RXS is selected.

*When issuing the default setting commands, confirm that the power supply is stable. Turning off the power during the command issue may damage the data to be stored.

* The maximum number of flash memory conversions is 10,000.

8.2 "@C" Frequency channel setting

Sets the channel to be used.
Specify the channel following **'@C'** with the ASCII code of two characters.

Default
2400 bps : 34h (429.496875 MHz)
4800 bps: 1Bh (429.5000 MHz)

Value
2400 bps: 0ch-5Ah, 67h-77h
4800 bps: 07h-2Eh, 34h-3Ch

Example: Change the channel to 09 (09h) CH.

Control command: @C09Cr
Control response: *C09CrLf

8.3 "@D" Default frequency channel setting (fix in flash memory)

Changes the current and default frequency channel.
Specify the channel following **'@D'** with the ASCII code of two characters.

The default settings are as follows:

Default
2400 bps : 34h (429.496875 MHz)
4800 bps: 1Bh (429.5000 MHz)

Value
2400 bps: 0ch-5Ah, 67h-77h
4800 bps: 07h-2Eh, 34h-3Ch

Example: Change to 09 (09h) CH and fix in the FLASH MEMORY.

Control command: @D09Cr
Control response: *D09CrLf

8.4 "@B" Default RF bit rate setting (fix in flash memory)

Sets the RF bit rate.
Specify the RF bit rate following **'@B'** with the ASCII code of two characters.
When changing the RF bit rate with this command, the frequency channel is set to the default channel in the frequency table for the set bit rate (See 5. Frequency channel table).

Default: 48h (4800 bps)

Value
24h: FSK 2400 bps
48h: FSK 4800 bps

Example: Change the RF bit rate to 2400 bps.

Control command: @B24Cr
Control response: *B24CrLf

8.5 “@P" RF transmit power setting

Sets the RF transmit power.
The RF power is set to 1 mW at the frequencies where it is legally limited to 1 mW regardless of the setting value.
Specify the RF bit rate following **'@P'** with the ASCII code of two characters.

Default: 10h (10 mW).

Value
10h: 10 mW
05h: 5 mW
01h: 1 mW

Example: Change the RF transmit power to 5 mW. .

Control command: @P05Cr
Control response: *P05CrL

8.6 "@H" Default RF transmit power setting (fix in flash memory)

Changes the current and default RF transmit power.
Specify the RF transmit power following **'@H'** with the ASCII code of two characters.

Default : 10h (10 mW).

Value
10h: 10 mW
05h: 5 mW
01h: 1 mW

Example: Change to 5 mW and fix in the FLASH MEMORY.

Control command: @H05Cr
Control response: *H05CrLf

8.7 "@R" RSSI acquisition

Reads out the RSSI level in the receive mode. The absolute value of the RSSI level is returned in hexadecimal.
The RSSI level can be obtained by decimalizing the value part of the control response and adding "-(minus)" . *R64 and *R50h are -100 dBm, -80 dBm, respectively.

Example: Reads out the RSSI level.

Control command: @RCr
Control response: *R64CrLf (when the RSSI level is -100 dBm)

8.8 "@J" Enable/disable of Image rejection calibration (IR_CAL) at startup (fix in Flash memory)

Sets whether to execute image rejection calibration (IR_CAL) at startup. The setting is stored as default and enabled when the power is turned on again.

Specify whether IR_CAL to be enabled or disabled following **'@J'** with the ASCII code of two characters.

Default : 00h (IR_CAL disabled)

Value
00h (IR_CAL disabled)
01h (IR_CAL enabled)

Example: Enable IR_CAL at startup.

Control command: @J01Cr
Control response: *J01CrLf

After performing image rejection calibration (IR_CAL), the blocking characteristics will be improved from approx. 30 dB to approx. 50 dB at the frequency 800kHz lower than the receiving frequency. The startup time is approx. 350 ms with IR_CAL and approx. 55 ms without IR_CAL.
When IR_CAL at startup is disabled, temperature monitoring is not performed.

8.9 "@K" Image rejection calibration (IR_CAL)

Performs receiver image rejection calibration (IR_CAL). If the temperature changes more than 20 degrees after performing IR_CAL, IR_CAL needs to be performed again as the calibrated frequency deviates and the blocking characteristics may be degraded. If there is a temperature change of more than 20 degrees after the last calibration, the high level output at the INT terminal and the module status bit (see 8.11 @I Status check) warn of the need for recalibration. Once re-calibration is executed, the warning is cancelled and INT terminal goes to Low.

It takes approx. 250 ms for the first IR_CAL, and approx. 140 ms from the second time. While performing IR_CAL, both transmission and reception does not operate.

Example: Performs image rejection calibration

Control command: @KCr
Control response: *KCrLf

* Even if the IR_CAL at startup is disabled, temperature monitoring starts after performing IR_CAL with @K command.
* The temperature accuracy is +/- 2 degrees.
* Even if @K command is not performed after the warning for re-calibration, the receiver sensitivity is maintained.

8.10 ”@T” Enable/disable of ID transmission for connecting to telecommunications circuit facilities (fix in Flash memory)

Sets whether to transmit a 48-bit ID that is required to connect to telecommunications circuit facilities. The setting is still effective when the power is turned on again.

Default: 00h (ID transmission disabled)

Value
00h: ID transmission disabled
01h: ID transmission enabled

Example: Enable ID transmission.

Control command: @T01Cr
Control response: *T01CrLf

8.11 “@I” Status check

Checks the module status.
High is output at the INT terminal when any of the status bits becomes 1.
Once the status is checked by issuing @I command or all status bits become 0, the INT terminal goes to Low.
The bit allocation and details are as follows:

Bit	7 to 5	4	3	2	1	0
Name	-	Internal comm.	IR_CAL request	Carrier sensing	Flash comm.	Initialization

Internal comm.: The communication between RFIC and CPU fails.

IR_CAL: The temperature changes more than 20C after the last calibration

Carrier sensing: Transmission is not allowed as a result of carrier sensing. The bit is cleared to 0 when the TXS terminal is set to High.

Flash comm.: The Flash memory is not read out correctly.

Initialization: Initialization fails.

Example: IR_CAL request occurs

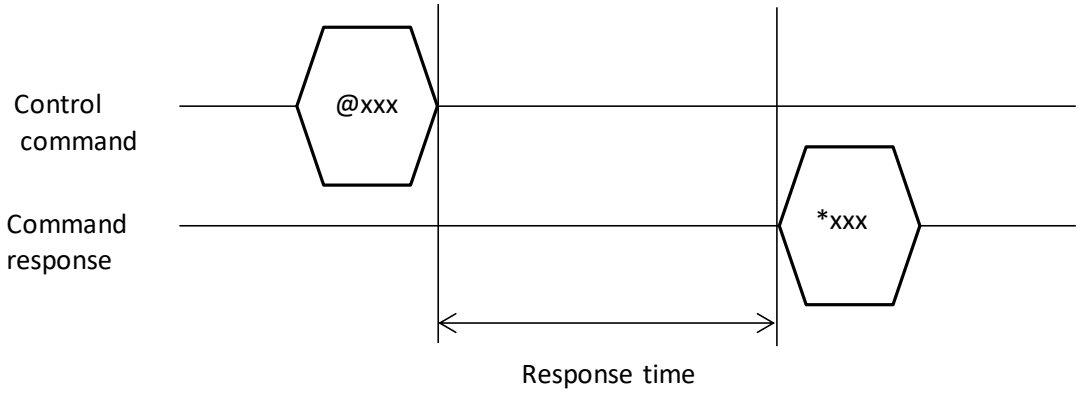
Control command: @ICr
Control response: *I008CrLf

8.12 Error responses

When errors occur, the following responses are returned via UART.

Code	Response name	Description
*E01	Command format error	The issued command format is wrong.
‘*E02	Out of parameter setting range	The specified parameter is outside the setting range. (@C and @D)

9. Command response time



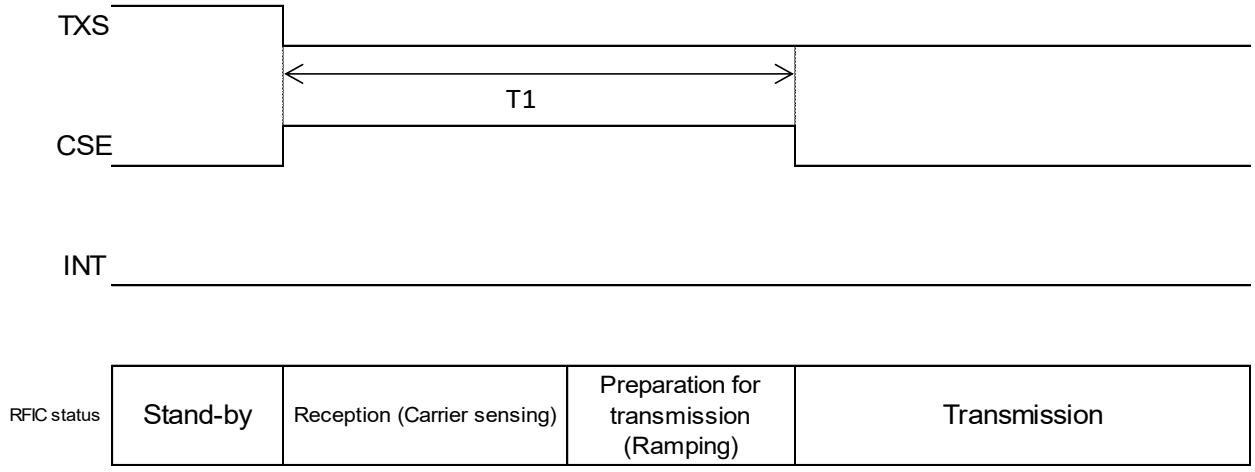
Command	TYP	MAX	Unit
@Cxx	0.5	1.2	ms
@Dxx *	3.3	4	ms
@Bxx *	4.9	5.8	ms
@Pxx	0.5	1.2	ms
@Hxx *	3.4	4.2	ms
@R	2	2	ms
@Jxx *	3.4	3.4	ms
@K (first time)	250	280	ms
@K(from the second time on)	140	170	ms
@T *	3.4	3.4	ms
@I	0.5	0.5	ms

* With those commands that write settings into the Flash memory, the response time may get longer (approx. 60 ms) in the timing of internal block displacement in the flash memory. Cautions are required when using those commands.

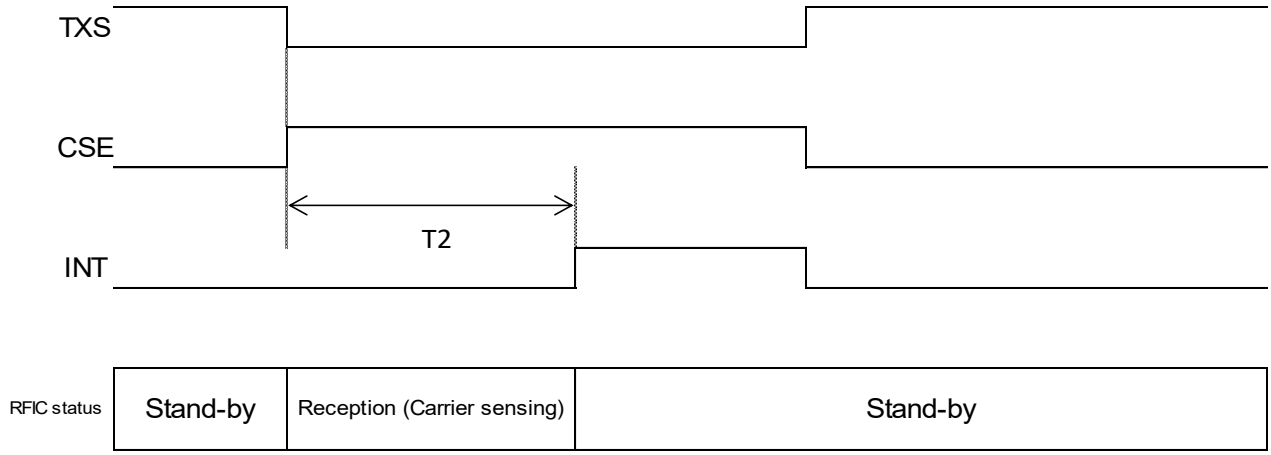
10. Carrier sensing

Carrier sensing is performed before starting transmission. If a signal exceeding -97 dBm is detected at the transmission channel, the module does not start transmission. The result of carrier sensing is notified by the CSE and INT terminals. Please refer to '8.11 @I Status check' for the operation of INT terminal.

- When Carrier sensing finds transmission is allowed.



- When Carrier sensing finds transmission is not allowed.



	MIN [ms]	MAX [ms]
T1	17.8	28
T2	-	13.7

11. Antenna list

The antennas listed below are registered to be used with the STD-602.

Using any other antennas may violate Japanese Radio law.

To use the STD-602 within the range of STD-T67 certification, carefully read ‘12. Recommended stripline for antenna connection’.

Product name	Gain	Manufacturer	Connector
ANT-400	1.7 dBi	Circuit Design, Inc.	SMA-J
ANT-400-SW	2.14 dBi	Circuit Design, Inc.	SMA-P
ANT-400-SFW	0.8 dBi	Circuit Design, Inc.	RPSMA-P
ANT-400-SWW	2.0 dBi	Circuit Design, Inc.	RPSMA-P
ANT-400-AR	0.59 dBi	Circuit Design, Inc.	SMA-P
ANT-400-DX-5	2.14 dBi	Circuit Design, Inc.	SMA-P
ANT-400-DX-10	2.14dBi	Circuit Design, Inc.	SMA-P
Wired antenna (170 mm)	-5.68 dBi	-	Soldering
SRFI028	-3.04 dBi	antenova	MHF
ANT-433-HETH	-4 dBi	LinX Technologies	Soldering
OnBoard SMD 434MHz	-6 dBi	ProAnt	Soldering

12. Recommended stripline for antenna connection

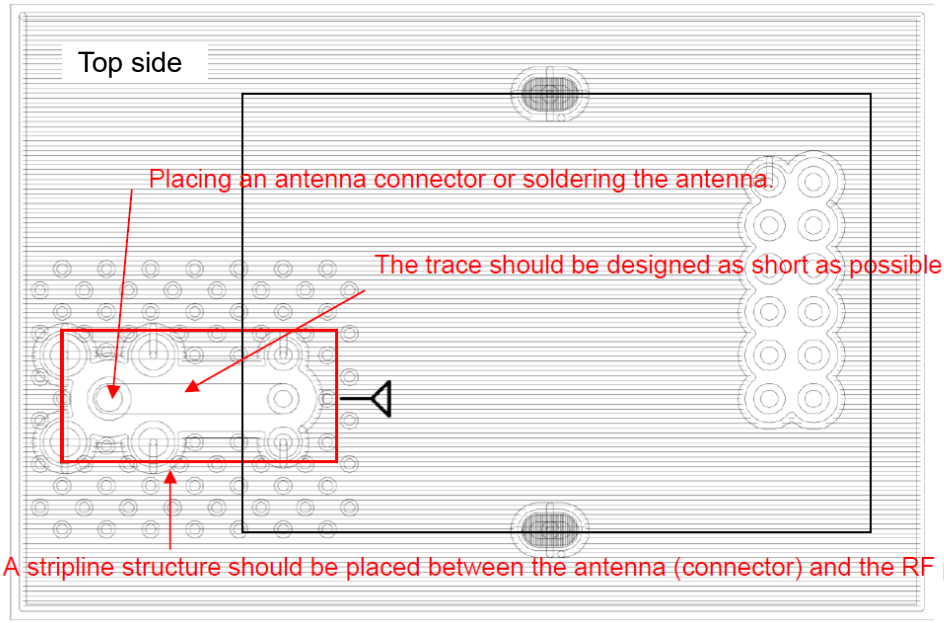
To use the STD-602 within the range of STD-T67 certification, the PCB pattern between the RF pin of the STD-602 and user's antenna connector should be designed as shown below.

Antennas with SMA connector

- A stripline structure should be placed between the antenna connector and the STD-602 as shown in Fig.1.
- Use 50 Ω SMA connectors.
- When extending the distance between the connector and the antenna, make sure to use 50Ω conversion connector and high-frequency coaxial cable.

Wired antenna

Place a stripline structure as shown in Fig.1 before soldering the wire antenna.



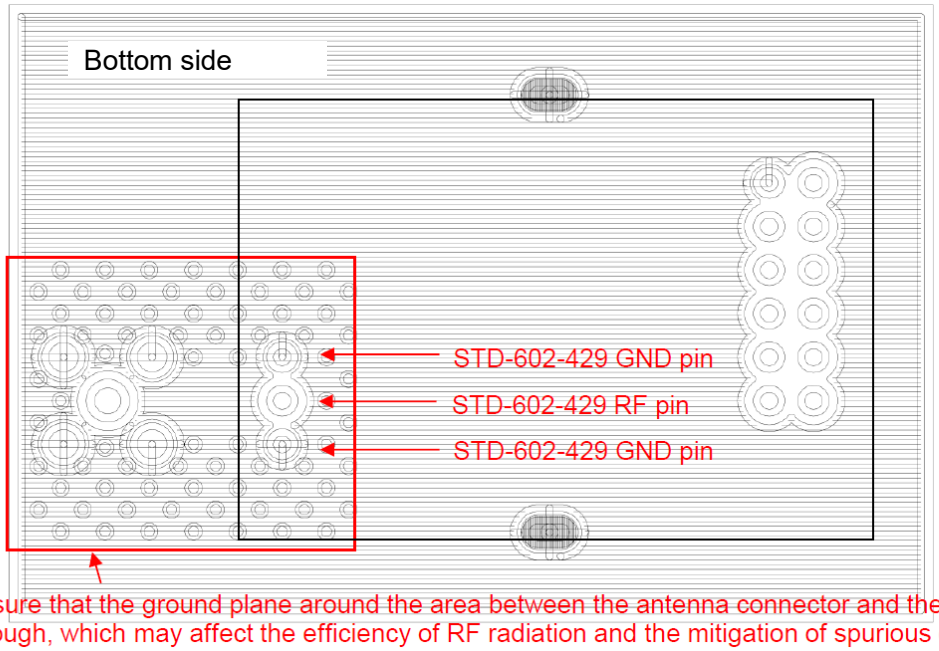
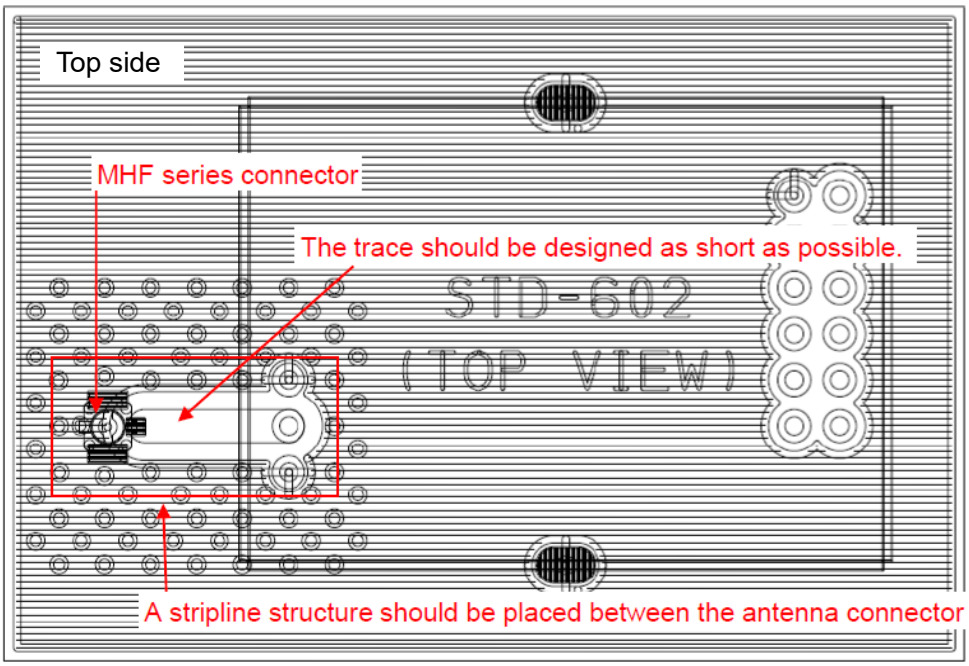
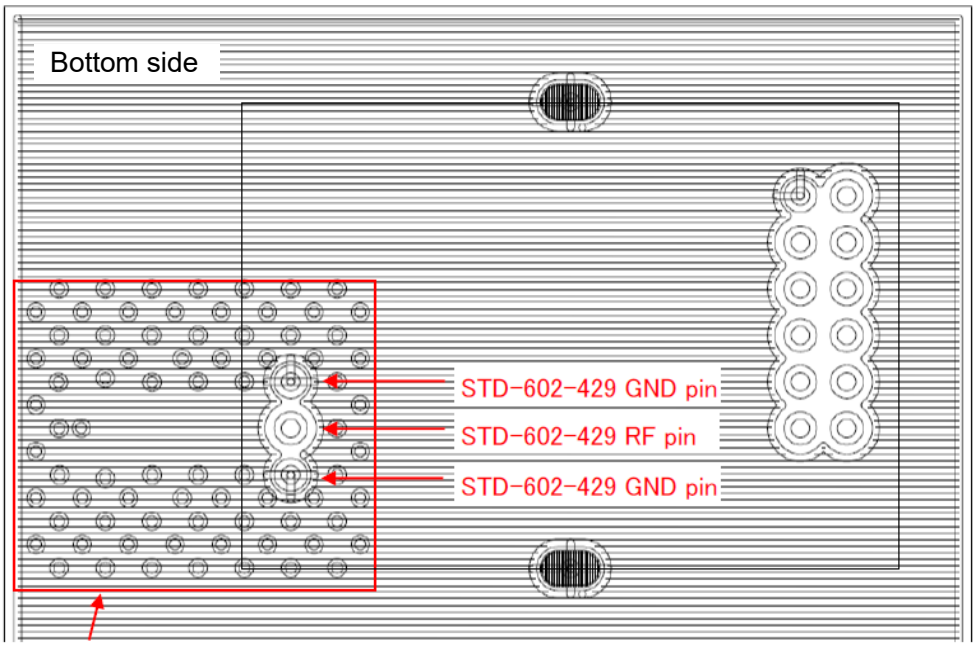


Fig. 1

antenova SRFI028

A stripline structure should be placed between the antenna connector and the STD-602 as shown in Fig.2. Use I-PEX MHS series connectors (50 Ω) for antenna connection.





Ensure that the ground plane around the area between the antenna connector and the STD-602 is large enough, which may affect the efficiency of RF radiation and the mitigation of spurious emissions.

Fig. 2

LinX Technologies ANT-433-HETH

Follow the instructions provided in the data sheet from to design pattern wiring.

ProAnt OnBoard SMD 434MHz

Follow the instructions provided in the application note from ProAnt to design pattern wiring and make matches.

Important notice

- Customers are advised to consult with Circuit Design sales representatives before ordering. Circuit Design believes the provided information is accurate and reliable. However, Circuit Design reserves the right to make changes to this product without notice.
- Circuit Design products are neither designed nor intended for use in life support applications where malfunction can reasonably be expected to result in significant personal injury to the user. Any use of Circuit Design products in such safety-critical applications is understood to be fully at the risk of the customer and the customer must fully indemnify Circuit Design, Inc for any damages resulting from any improper use.
- As the radio module communicates using electronic radio waves, there are cases where transmission will be temporarily cut off due to the surrounding environment and method of usage. The manufacturer is exempt from all responsibility relating to resulting harm to personnel or equipment and other secondary damage.
- The manufacturer is exempt from all responsibility relating to secondary damage resulting from the operation, performance and reliability of equipment connected to the radio module.

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Cautions

- Do not use the equipment within the vicinity of devices that may malfunction as a result of electronic radio waves from the radio module.
- Communication performance will be affected by the surrounding environment, so communication tests should be carried out before actual use.
- Ensure that the power supply for the radio module is within the specified rating. Short circuits and reverse connections may result in overheating and damage and must be avoided at all costs.
- Ensure that the power supply has been switched off before attempting any wiring work.
- The case is connected to the GND terminal of the internal circuit, so do not make contact between the '+' side of the power supply terminal and the case.
- When batteries are used as the power source, avoid short circuits, recharging, dismantling, and pressure. Failure to observe this caution may result in the outbreak of fire, overheating and damage to the equipment. Remove the batteries when the equipment is not to be used for a long period of time. Failure to observe this caution may result in battery leaks and damage to the equipment.
- Do not use this equipment in vehicles with the windows closed, in locations where it is subject to direct sunlight, or in locations with extremely high humidity.
- The radio module is neither waterproof nor splash proof. Ensure that it is not splashed with soot or water. Do not use the equipment if water or other foreign matter has entered the case.
- Do not drop the radio module or otherwise subject it to strong shocks.
- Do not subject the equipment to condensation (including moving it from cold locations to locations with a significant increase in temperature.)
- Do not use the equipment in locations where it is likely to be affected by acid, alkalis, organic agents or corrosive gas.
- Do not bend or break the antenna. Metallic objects placed in the vicinity of the antenna will have a great effect on communication performance. As far as possible, ensure that the equipment is placed well away from metallic objects.
- The GND for the radio module will also affect communication performance. If possible, ensure that the case GND and the circuit GND are connected to a large GND pattern.

Warnings

- Do not take apart or modify the equipment.
- Do not remove the product label (the label attached to the upper surface of the module.) Using a module from which the label has been removed is prohibited.

Revision History

Version	Date	Description
1.0	Aug. 2025	