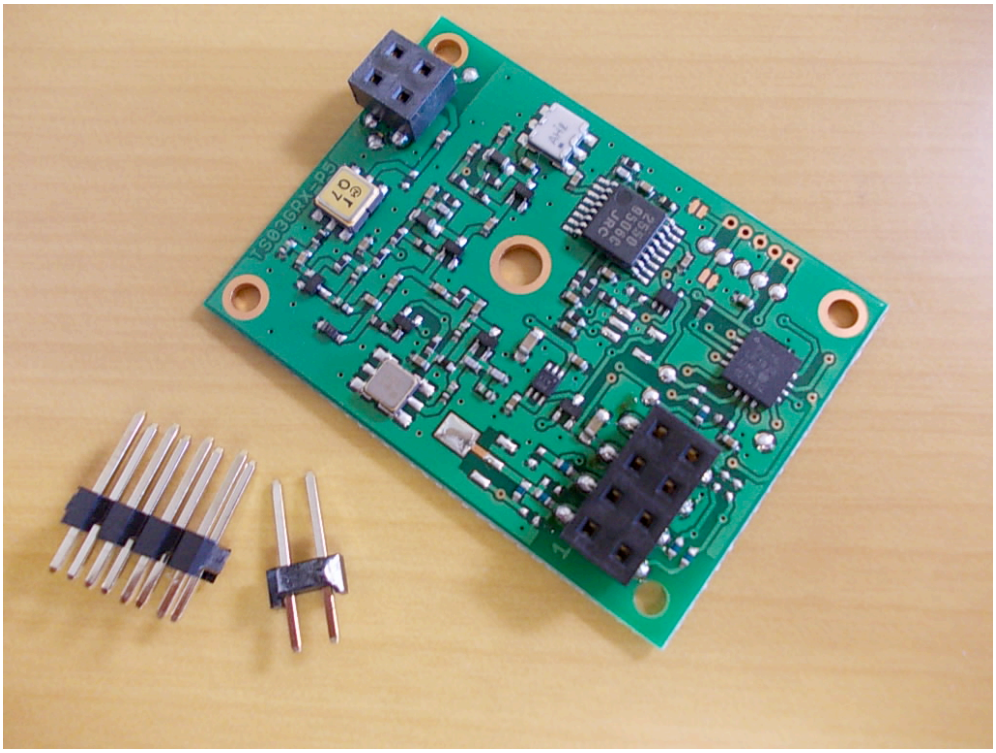
TS03GRX

315MHz Band Low Power Module
（TS03 Series Receiver）



野村エンジニアリング（有）
Nomura Engineering Co., Ltd.
Since 1997

Nomura Engineering Co. LTD http://www.nomura-e.co.jp e-mail:engineer@nomura-e.co.jp
〒242-0023 Kanagawa ken Yamato Shi Shibuya1-7-2 TEL:046-244-0041 FAX:046-244-3551

315MHz Band Low Power Module TS03GRX

1.Overview

- This module is a successor to A01DRX / TS03DRX module.
  However, this modules has no data communication reception function(it is a receiver for TS03DTX:used for maintenance).
- It can easily be combined with TS03 Transmitters(TS03NKHA remote control,TS03DTX)
  Combination can be used to realize a 4-switch ON/OFF remote control.
- Receiver output can be selected from 2 circuit toggle 4 independent output (2-output set latching operation)
- Transmitter ID can be registered / deleted with one external switch.
  Up to 30 items can be registered.
- In combination with TS03NKHA the communication range of
  50m or more can be achieved.

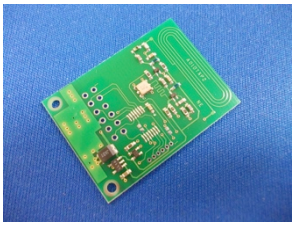
・The difference between A01DRX and TS03DRX

① Increased number of maximum registered ID 10⇒30.On ID registration IO1 provide status output.

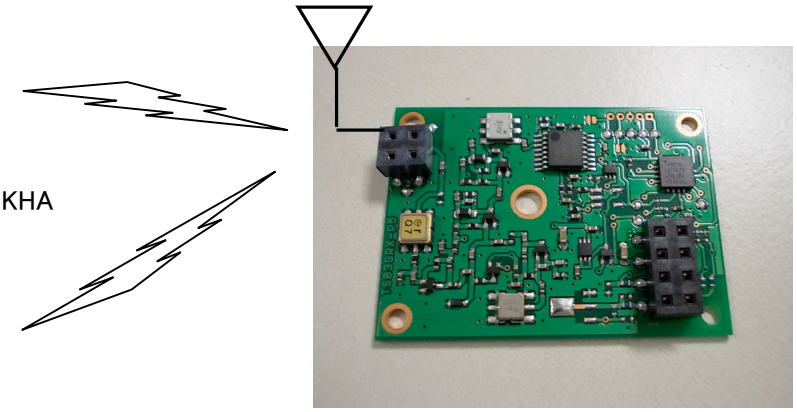
② Firmware can be selected using jumper(JP).

③ 2.54 mm pitch connector (socket) mounted on the module side

TS03NKHA



TS03DTX



315MHz Band Low Power Module TS03GRX

2.Components

Part number: TS03GRX - ＊ -#

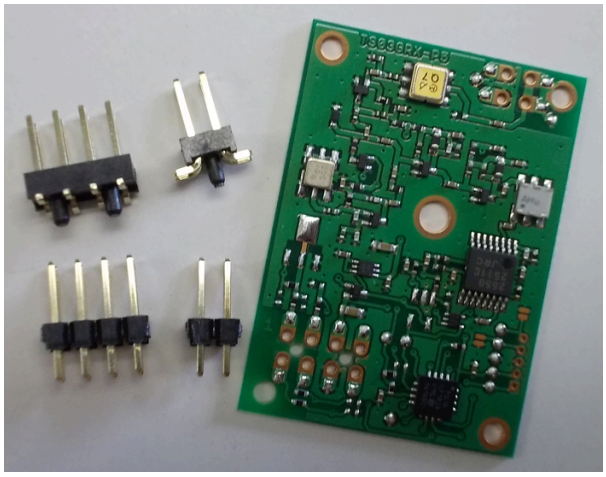
＊ : Antenna	Unspecified	・・・No Antenna
	PH	・・・Pattern Antenna
	ANT	・・・ANT-315LC-II
# : Housing	Unspecified	・・・No Socket
	CN	・・・Socket Implementation

Included Parts : 2.54 mm pin header – (SMT) 8 pins / 4 pins each 1pc

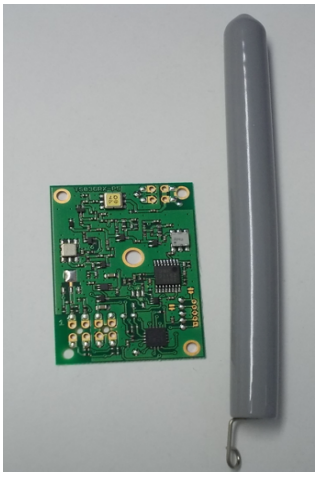
Or 2.54 mm pin header – (DIP) 8 pins / 2 pins each 1pc

Please specify SMT or DIP for attached pin header.

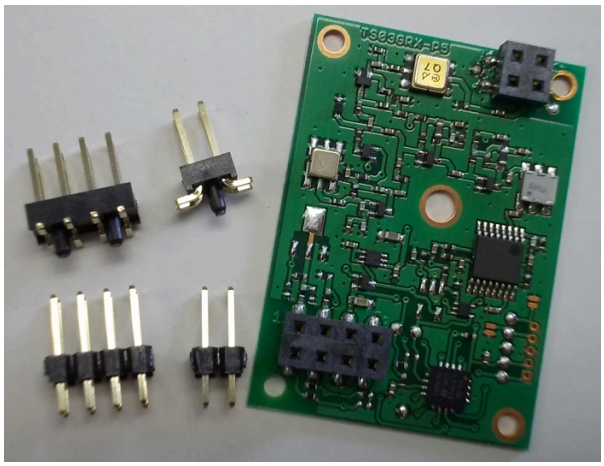
PH antenna board is TS 03 GRX-PH only. (Socket already installed)



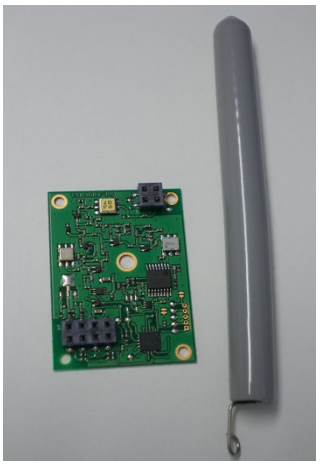
◆TS03GRx



◆TS03GRx-ANT



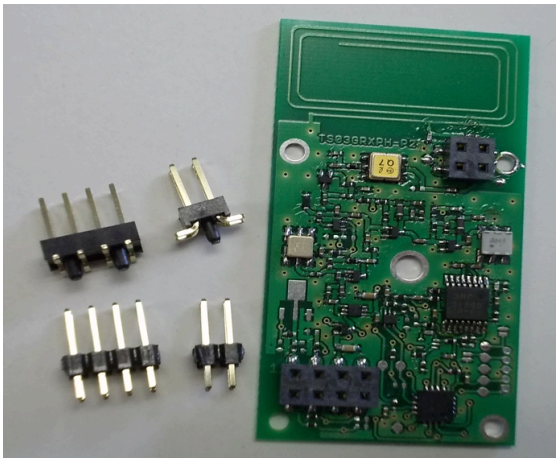
◆TS03GRx-CN



◆TS03GRx-ANT-CN

Nomura Engineering Co. LTD http://www.nomura-e.co.jp e-mail:engineer@nomura-e.co.jp
〒242-0023 Kanagawa ken Yamato Shi Shibuya1-7-2 TEL:046-244-0041 FAX:046-244-3551

315MHz Band Low Power Module TS03GRX



◆TS03GRx-PH

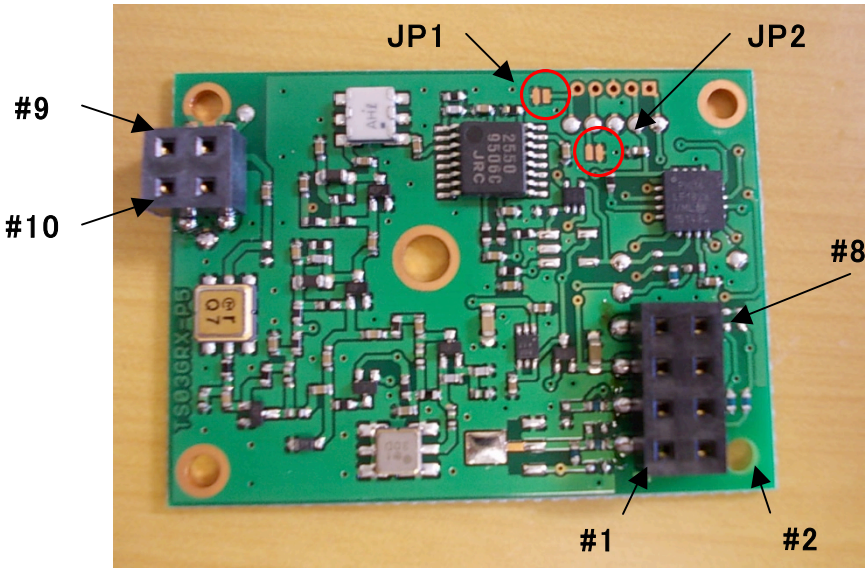
3.Specifications

No	Item	Specification	Remarks
1	Receive frequency	315MHz band	
2	Number of IO outputs	4 ports	
3	Response	ON: about 80msec/OFF:240msec or less	
4	Maximum ID registrations	30	
5	Power Supply	2.2V～3.5V	
6	Current Consumption	11mAtyp	Output port load not included
7	Temperature range	−10～60℃ 10～90% RH	No condensation
8	Board outline	29 x 40 mm	Contains no protrusions

4. Details for each part (interface)

Nomura Engineering Co. LTD http://www.nomura-e.co.jp e-mail:engineer@nomura-e.co.jp
〒242-0023 Kanagawa ken Yamato Shi Shibuya1−7−2 TEL:046-244-0041 FAX:046-244-3551

315MHz Band Low Power Module TS03GRX



No	Name	Function
#1	IO1	SW1 ON/OFF
#2	IO2	SW2 ON/OFF
#3	IO3	SW3 ON/OFF
#4	IO4	SW4 ON/OFF
#5	+B	Power Supply +V
#6	GND	Ground
#7	Audio OUT	**Disconnected**
#8	REG	Register/Erase

No	Name	Function
#9	ANT	Antenna
#10	GND	Antenna Ground

■ **C-MOS Input/Output** : #1～#4、#7,#8

High LVL = +B – 0.7V or more、Low LVL = 0.6Vor less

Each port 3mA or less、4 ports total 10mA or less。

■Firmware Selection

・JP1 : Output Logic Selection Open・・・Active High

・JP2 : Standard / 22 TGL selection Open・・・Standard (independent 4 outputs)

No.	JP1	JP2	Firmware Name	Remarks
1	Open	Open	Standard – P	Active High
2	**Short**	Open	Standard – N	Active Low
3	Open	**Short**	22TGL – P	Active High
4	**Short**	**Short**	22TGL – N	Active Low

Nomura Engineering Co. LTD http://www.nomura-e.co.jp e-mail:engineer@nomura-e.co.jp
〒242-0023 Kanagawa ken Yamato Shi Shibuya1-7-2 TEL:046-244-0041 FAX:046-244-3551

■Output of each firmware

①Independent 4-output ON / OFF : The receiver outputs only while the transmitter is ON (Active).

Send		Receive TS03GRX		
SW No	Operation	Port No	-P	-N
1	Active ON	1	Low ⇒ High	High ⇒ Low
2	Active ON	2	Low ⇒ High	High ⇒ Low
3	Active ON	3	Low ⇒ High	High ⇒ Low
4	Active ON	4	Low ⇒ High	High ⇒ Low

(Caution) · Multiple ON (active) transmission will result into multiple receive active.

② 22 TGL (2 circuit toggle): Latches output port 1, 2 or 3, 4 with inverted output.
(Switch output 1 circuit (2 ports) with 2 buttons of the transmitter)

Send		Receive 22TGL		Send		Receive 22TGL	
SW1 Operation	SW2 Operation	Port1 Output	Port 2 Output	SW3 Operation	SW4 Operation	Port 3 Output	Port 4 Output
OFF	OFF	Low	High	OFF	OFF	Low	High
ON	OFF	High	Low	ON	OFF	High	Low
OFF	ON	Low	High	OFF	ON	Low	High
ON	ON	Low	High	ON	ON	Low	High

(Attention) ・By default at startup the outputs of port 2 and port 4 are High.

・Simultaneously SW1 and SW2 of receiving side or SW3 and SW4 of transmitting side will be ON by default.

・TS03NKHA-3 (3 button) With the remote control, latch control is available only for receive outputs 1 and 2.

・22TGL-N, the logic High / Low of the above-P output is inverted.

■REG Port : ID Registration/Erase Setting Port

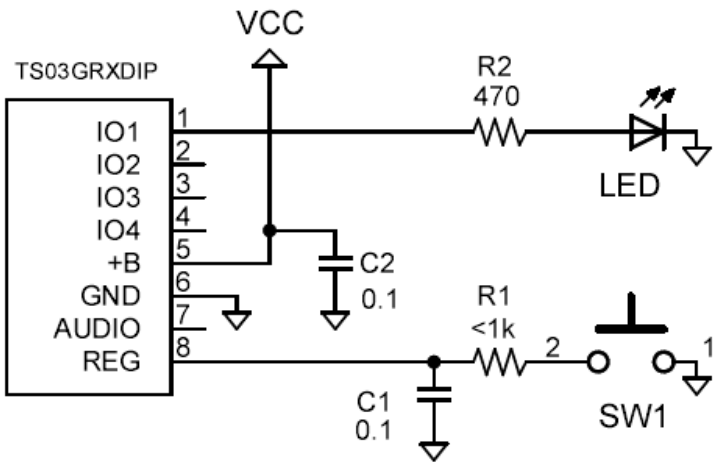
Port used to register or clear the transmitter ID in the receiver (TS 03 GRX).

If ID of the transmitter is not registered, the receiver will not operate,

Be sure to register at most 30 IDs.

When erasing all registered IDs will be deleted. Individual erase cannot be performed.

Nomura Engineering Co. LTD http://www.nomura-e.co.jp e-mail:engineer@nomura-e.co.jp
〒242-0023 Kanagawa ken Yamato Shi Shibuya1-7-2 TEL:046-244-0041 FAX:046-244-3551



Example of registration / erasing connection circuit

- Connect switch to # 8 (REG) port. (To prevent chattering, we recommend filtering with a resistance of 1 kΩ or less and with a capacitor of 0.1 μF)
- By connecting the LED to port #1(IO1), you can check the status of the receiver (TS 03 GRX). (# 1: IO1 port in registration mode is the status output of the receiver)

Nomura Engineering Co. LTD http://www.nomura-e.co.jp e-mail:engineer@nomura-e.co.jp
〒242-0023 Kanagawa ken Yamato Shi Shibuya1-7-2 TEL:046-244-0041 FAX:046-244-3551

■ID registration operation(explanation based on the circuit example above)

①Turn on the power while pressing SW1 (ON). (Set to registration mode)

・・・LED will flash twice.

②Release SW1(OFF).

・・・LED will remain on.

③Send radio waves from transmitter to register (Turn on one of SW1-SW4)

・・・LED repeatedly blinks 5 times slowly (about 200 nsec cycle).

(If the transmitter is turned on continuously, the LED is 5 times faster (about 50 msec cycle)・・・ When the transmitter is turned off, the LED turns off. (Completion of registration)

④ If you wish to register another transmitter in succession, repeat operation③ above

⑤When you turn off the power of the receiver, you cancel the registration mode.

(Caution)・In case of registered ID,LED blinks 5 times fast(about 50msec) then will be ignored

・In case the registered ID have reached maximum(30) then on the 31st registration the LED blink fast 5 times(about 50msec) then registration will be invalid and overwriting will not be done.

・In order to register after exceeding maximum(30),please erase ID(delete all) then re-register.

■Erase/Delete ID

①Perform the operation in ① and ② as in ID registration

②Press SW1 again with LED on.

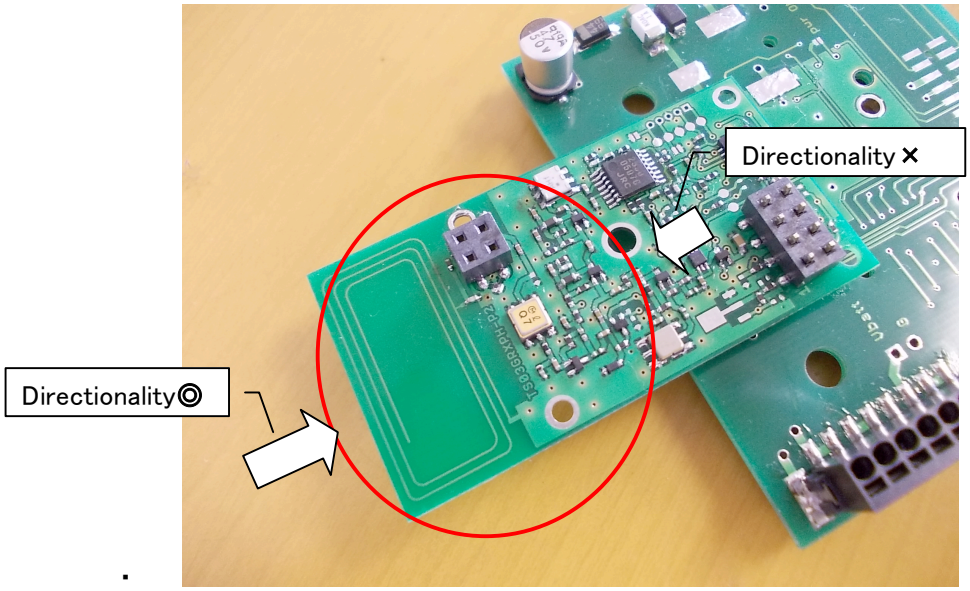
・・・LED flashes 10 times fast, erasing is completed.

③Turn off the power of the receiver

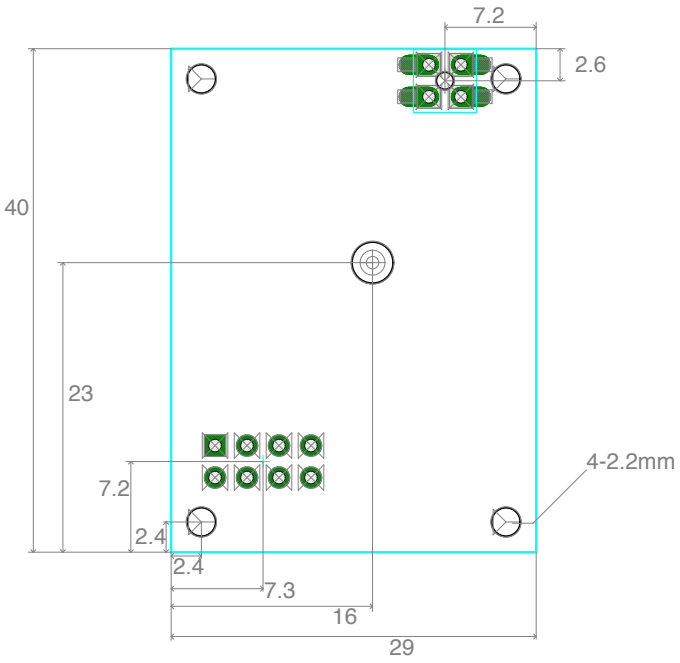
Nomura Engineering Co. LTD http://www.nomura-e.co.jp e-mail:engineer@nomura-e.co.jp
〒242-0023 Kanagawa ken Yamato Shi Shibuya1-7-2 TEL:046-244-0041 FAX:046-244-3551

5.Notes

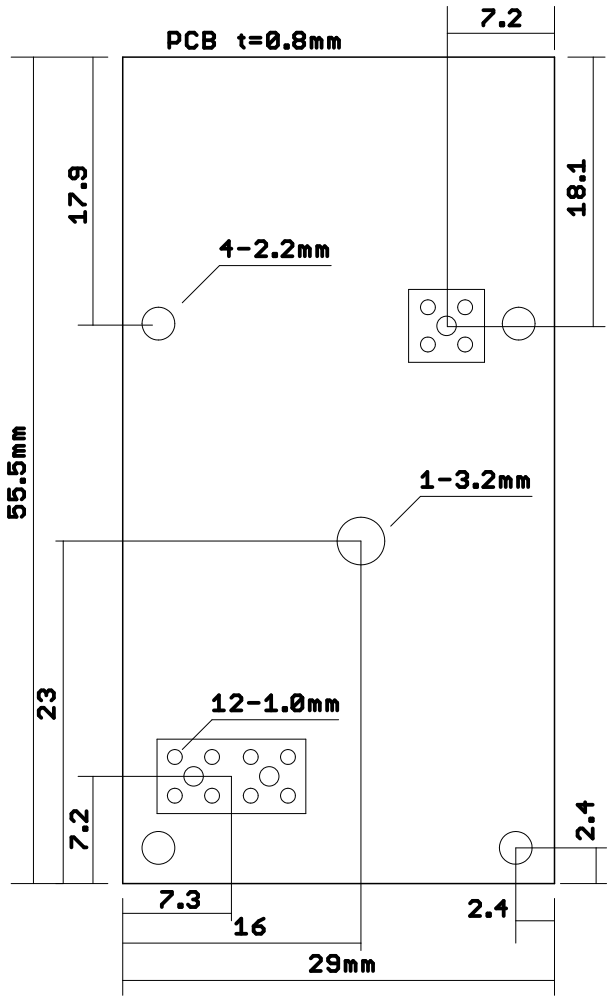
- Reception sensitivity suppression occurs due to high-frequency noise radiated from a high-speed logic circuit or brush motor, and communication
- The communication distance may become extremely short. In that case please try to keep the receiver away from the noise source.
- In radio wave propagation, the strength of radio waves occurs in multipath, causing a dead point (null point), and it may not be able to receive signal just by tilting the transmitter.
- Never use a malfunctioned product or in a way that it may endanger human life.
- Never reverse the power supply, because the reverse of the power supply may cause the equipment malfunction.
- Never dip the equipment into water or other solutions, doing that may cause strong shocks and damage the equipment.
- Please do not pull the antenna strongly, do not disassemble or/and modify the main body.
- When using TS03GRx-PH, please mount design avoiding the ground pattern/electronic component / metal casing, etc. Which will be a shielding around the pattern antenna shown in the figure below



6.Dimensions（TS03GRX）

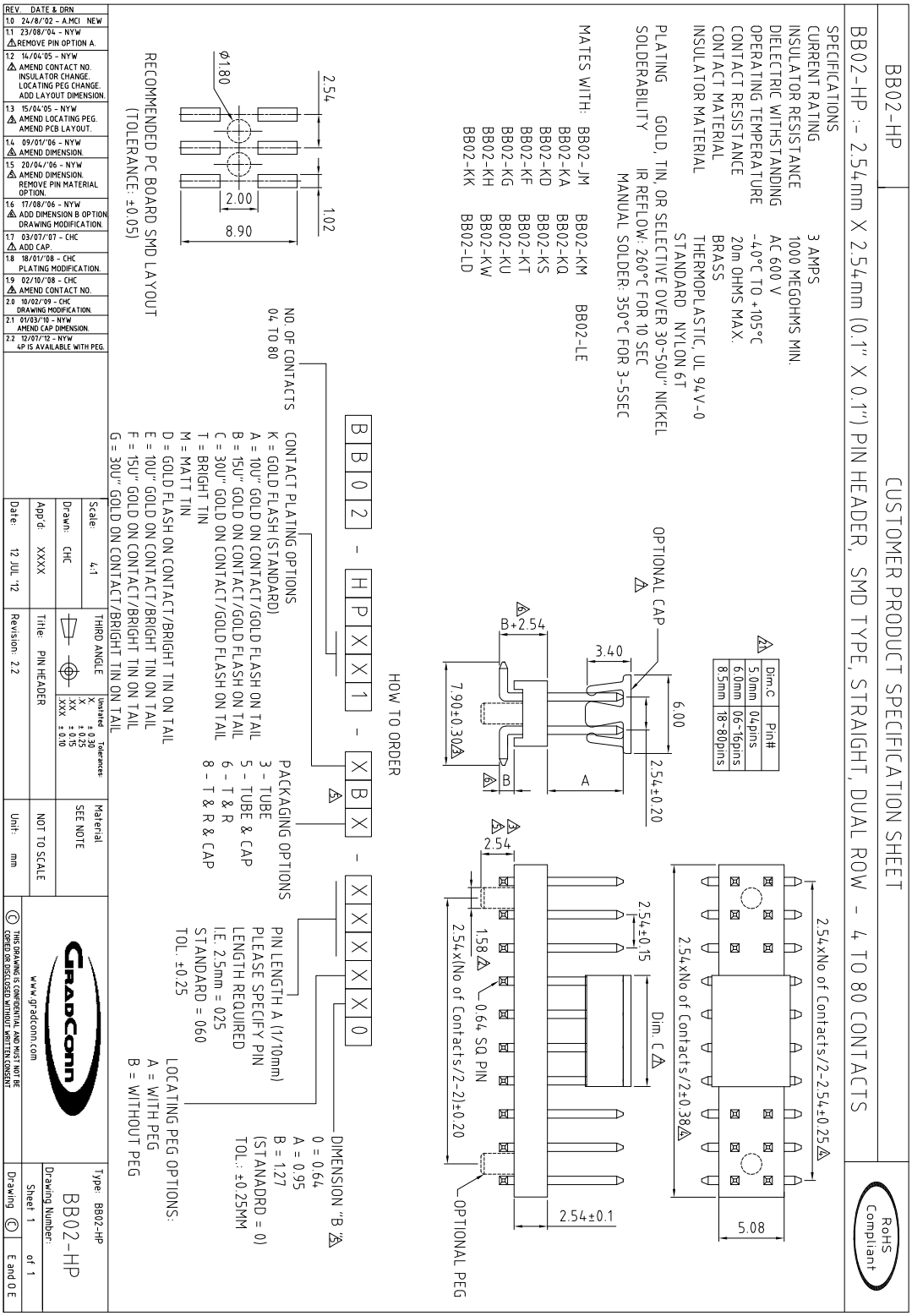


7.Dimensions(TS03GRX-PH)



315MHz Band Low Power Module TS03GRX

8. Attached pin header



9.Change History

Ver.0.0: First edition

Ver 01: Added socket mounting product / PH antenna integrated product 2013.5.10

Ver0.2: Overview A01DRx and TS03GRx ID registration status difference added 2014.6.23

Ver.0.3: TS03 GRX outline drawing is added 2015.5.18

Ver.0.4: Revised 2 circuit toggle table 2015.7.2

Ver0.5: TS03GRX-PH Package outline · Attached pin header material added 2015.11.5

Nomura Engineering Co. LTD http://www.nomura-e.co.jp e-mail:engineer@nomura-e.co.jp
〒242-0023 Kanagawa ken Yamato Shi Shibuya1-7-2 TEL:046-244-0041 FAX:046-244-3551