Technical Documentation

RF Transceiver Transmitter
CSxxxTRT-1-1

with Feedback Function

KH62400061.A, K500267 &
KH66983xxx61.A, K750172

Version	Datum	Name	Kommentar
1.00	25.03.2015	ORD	CS447 hinzugefügt; 04.5 und 09 nachgearbeitet
1.00	15.04.2015	ORD	10 Fertigung aktualisiert; CS335 hinzugefügt
1.00	05.05.2015	FRM	9:Firmwareversionen STD302N-R & 04.5.2 geändert
1.00	22.06.2015	FRM	9:Firmwareversionen STD302N-R (335, 429 &447) geändert
1.00	06.10.2015	FRM	04.5.x: FCC & IC Zulassungsnummern hinzugefügt 09.1: SW1 geändert
1.00	16.11.2015	FRM	04.5.3: Frequenz Kanal 20&21 getauscht.
1.00	17.11.2015	FRM	04.5.3: Frequenz & Kanäle 20 & 21 angepasst. 04.5.10: Gruppe 5-8 geändert.
1.00	21.01.2016	FRM	04.5.1: Frequenzliste geändert
1.00	19.05.2016	KÖM	Generelle Überarbeitung
1.00	04.11.2016	KÖM	Überarbeitung im Zug der Umstellung auf STD-302-S
1.00	15.03.2017	KÖM	10.1.1: Zusatzinfo für Verguss ergänzt
1.00	11.04.2017	KÖM	04.5 und 05.4: Zulassungen aktualisiert
1.00	25.07.2019	MK	04.5.11 CS456 hinzugefügt;
1.00	03.12.2019	KL	Integration Instructions

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01 Description

The CSxxxTRT-1-1 RF part is a transceiver with multiple functions:

1. Transmitting or Receiving (simplex or halfduplex)
2. “Feedback Master” or “-Slave” for 3 LED-Feedback (halfduplex).

The functions are selectable by SIP-Switch for frequency allocations and solder jumper to select Transmitter/Receiver, FB-Master or FB-Slave.

The TRT (CSxxxTRT-1-1) has four holes to be mounted on screw bosses or it is mounted in module slots in transmitter housings.

The counterpart of the TRT is the TRR (CSxxxTRR) module which is formed to be used in receivers.

The TRT has an ISP port (In System Programming) which makes it possible to download new firmware.

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

(2) NOTE: 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 and correct the interference by one or more of the following measures:

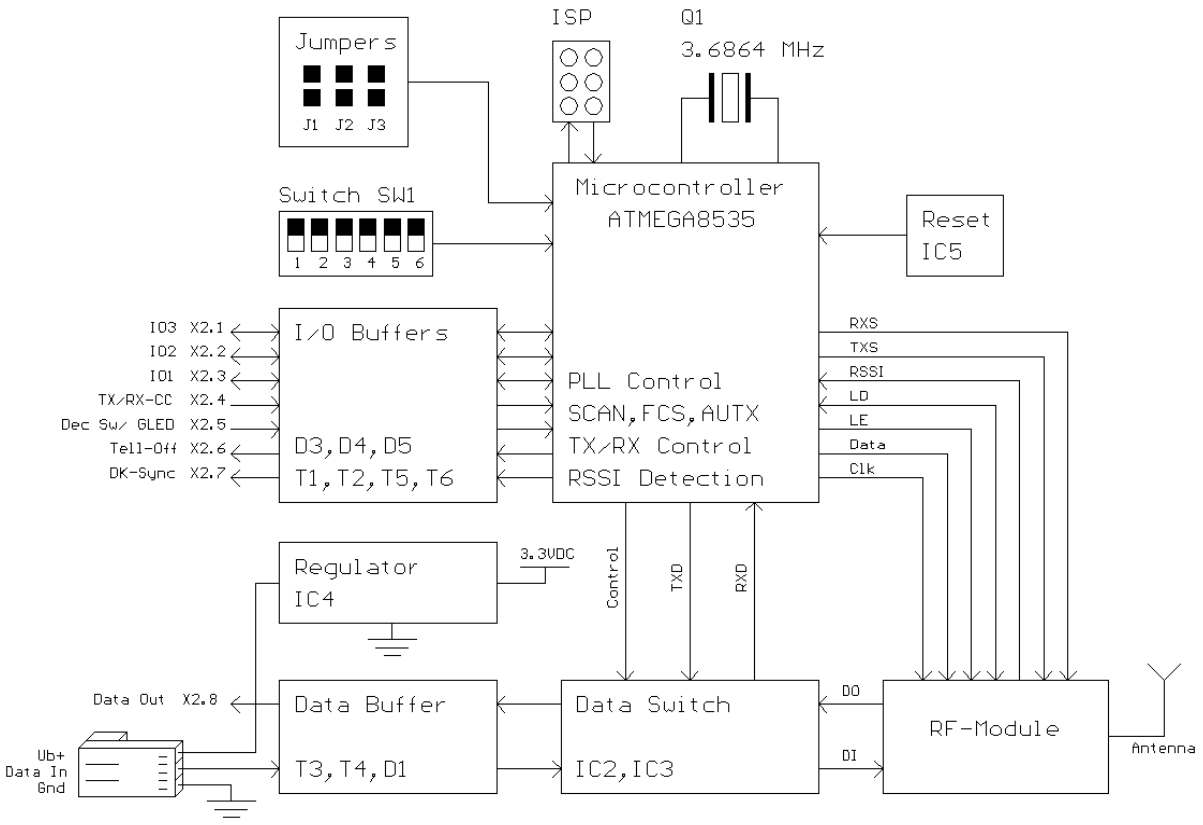
-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and the receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-RF Radiation Hazard Warning (products with activated transmit option only): To ensure compliance with FCC RF exposure requirements, this product should be positioned no less than 20 cm from your body or nearby persons during continuous use.

02 Block Diagram



03 Technical Data

Supply voltage:	3,4-12 VDC (recommended 3.4-5VDC)
Current consumption:	<50 mA
Outputs:	TTL Data (Open drain with 4.7K pull up)
	DK-Sync (Open drain with 4.7K pull up)
	Telegram-Off (Open drain with 10K pull up)
	3xIO, LEDs can be connected directly
	Antenna (use 50 Ohm antenna)
Inputs:	3xIO can be used as Inputs, Level 0 / 5V (higher values possible with additional series resistor).
	Frequency change („Dec“)-Input / Green LED (0-12V)
	TX/RX-Switch (0-12V)
	Antenna (use 50 Ohm antenna)
	TTL Data (0-5V level) 2400-9600 Baud
Temperature range:	-20° C to 70° C
Switching time:	TX to RX or RX to TX 10mS for temperature –10° to 50° C 20mS for temperature –20° to 70° C
Modulation:	FSK Narrow

The CSxxxTRT can work with the following baud rates (depending on frequency band):

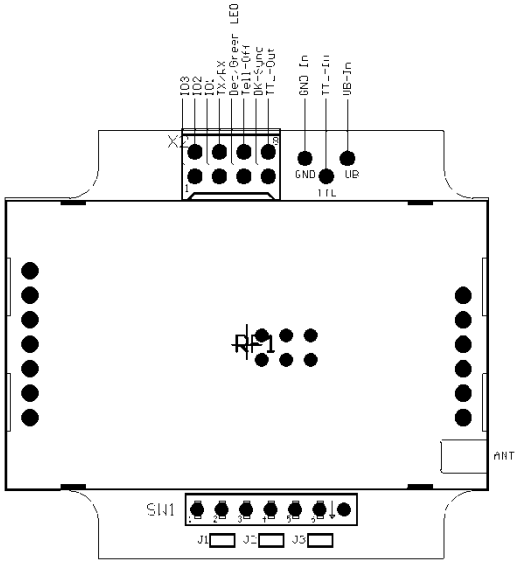
Notice:

It is recommended to use 3.4-5VDC power supply to reduce heat dissipation if available.

If module is used in automatic mode the decrement channel switch should be interlocked with the STOP switch so that it is not possible to change channel during normal operation. This way the channel change can only be done when the system is in STOP condition and an accidental channel change in normal conditions is prevented.

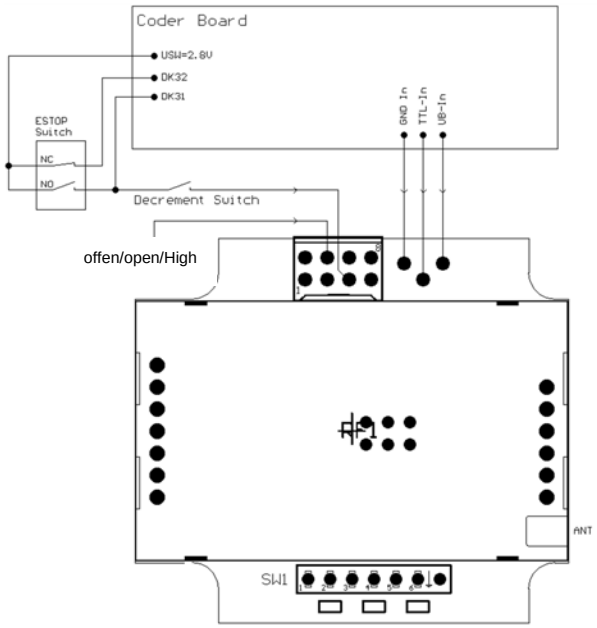
04 Connection

04.1 Standard Connection

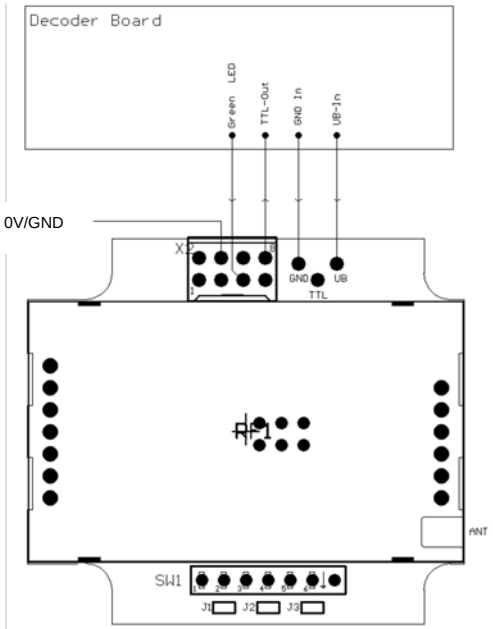


04.2 Modes

04.2.1 Connection as Transmitter or Receiver



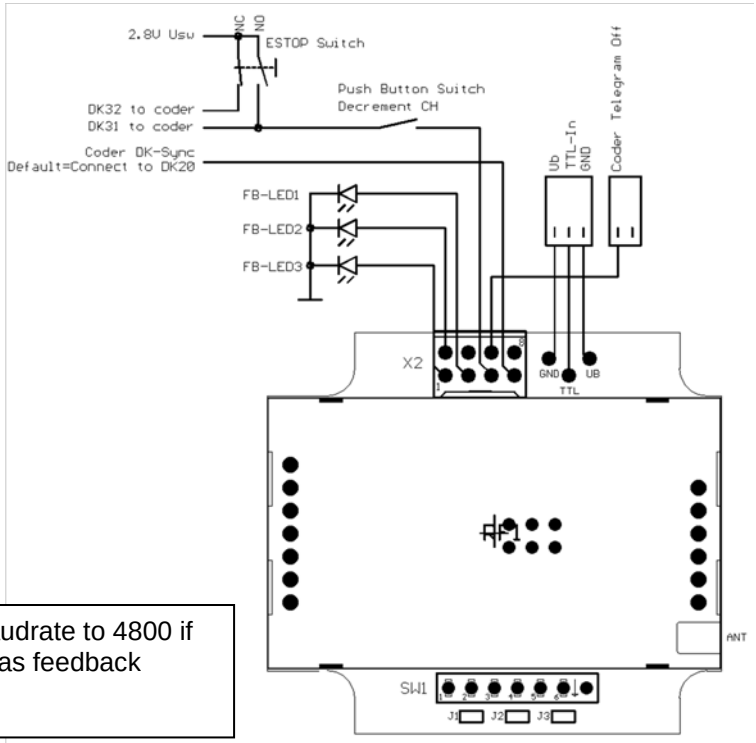
CSxxxTRT-1 as transmitter



CSxxxTRT-1 as Receiver

To change the frequency via a button connected to the decrement input of the TRT module, press this button for at least 2 seconds!

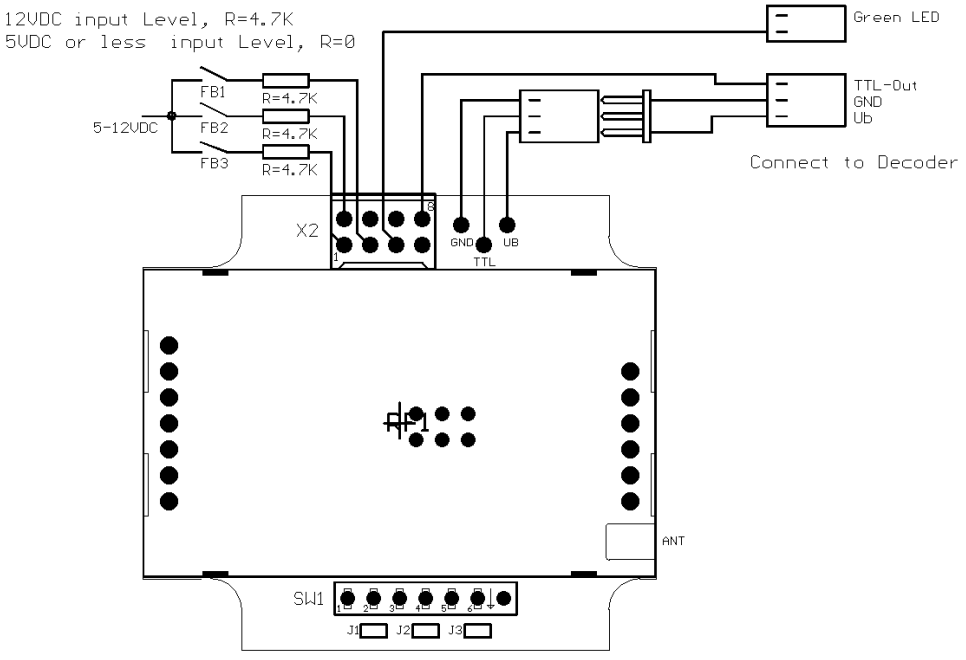
04.2.2 Connection as Feedback Master (Control Side)



Set the coder Baudrate to 4800 if the TRT is used as feedback master or slave!

J1 = closed
J2 & J3 = open

04.2.3 Connection as Feedback Slave (Machine Side)



J1 & J2 = closed
J3 = open

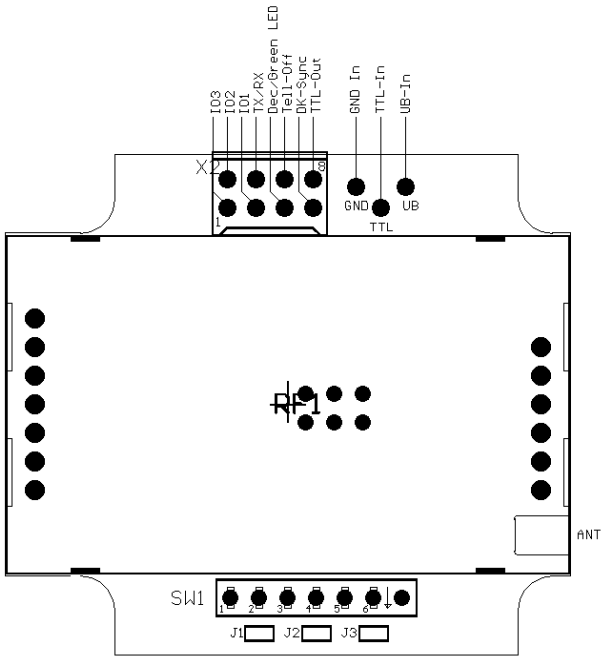
04.3 Jumper Setting

J1	J2	J3	Function
Open	Open	Open	Normal
Closed	Open	Open	FB-Master
Closed	Closed	Open	FB-Slave

Standard Setting = grey background

J3 = reserved

Close J1, J2 & J3 for Test mode.



04.4 Application Note

04.4.1 FCC/IC

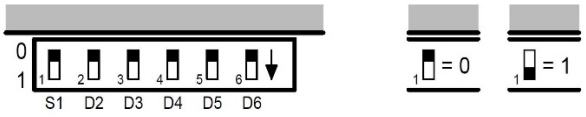
If the used RF part has a FCC/IC certification the certification number has to be written on the outside of the device.

Beware:

Any modification of the RF part can void the certification!

04.5.11 CS456TRT-1

Firmware-Version: *CS456TRT-1K2_190723*



Manual Setting

S1=0

D2	D3	D4	D5	D6	Freq. (MHz)	Ch. -No.
0	0	0	0	0	456,300	00
0	0	0	0	1	456,325	01
0	0	0	1	0	456,350	02
0	0	0	1	1	456,400	03
0	0	1	0	0	456,450	04
0	0	1	0	1	456,500	05
0	0	1	1	0	456,725	06
0	0	1	1	1	456,775	07
0	1	0	0	0	456,850	08
0	1	0	0	1	456,875	09
0	1	0	1	0	456,900	10
0	1	0	1	1	456,925	11
0	1	1	0	0	456,950	12
0	1	1	0	1	457,000	13
0	1	1	1	0	457,050	14
0	1	1	1	1	457,075	15
1	0	0	0	0	457,100	16
1	0	0	0	1	457,150	17
1	0	0	1	0	457,175	18
1	0	0	1	1	457,200	19
1	0	1	0	0	457,250	20
1	0	1	0	1	457,275	21
1	0	1	1	0	457,300	22
1	0	1	1	1	457,350	23
1	1	0	0	0	457,400	24
1	1	0	0	1	457,450	25
1	1	0	1	0	457,500	26
1	1	0	1	1	457,625	27
1	1	1	0	0	457,675	28
1	1	1	0	1	457,700	29
1	1	1	1	0	457,750	30
1	1	1	1	1	457,800	31

Automatic Setting

S1=1

D2	D3	Mode
0	0	Invalid – don´t use
0	1	TX: AUTX („Auto Channel Change“) RX: Scan-Mode
1	0	TX: FCS („Free Channel Search“) RX: Scan-Mode
1	1	Invalid – don´t use **

D4	D5	D6	Channels	Gr.No.
0	0	0	0, 5, 10, 16, 22, 26, 31	1
0	0	1	3, 7, 13, 19, 24, 28	2
0	1	0	2, 6, 12, 17, 23, 27	3
0	1	1	4, 8, 14, 20, 25, 30	4
1	0	0	0, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13, 14, 16, 17, 19, 20, 22, 23, 24, 25, 26, 27, 28, 30, 31	5
1	0	1	1, 9, 11, 15, 18, 21, 29	6
1	1	0	n.u.	7
1	1	1	n.u.	8

** if used as onboard RF-Part: if all switches (S1, D2, D3, D4, D5 and D6) are set to “1” -> frequency setting is done by the software of the mainboard.

Certification Number			Channels
USA	FCC-ID:	2AC8P-456TR1	all

05 Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01

2.2 List of applicable FCC rules
Part 90

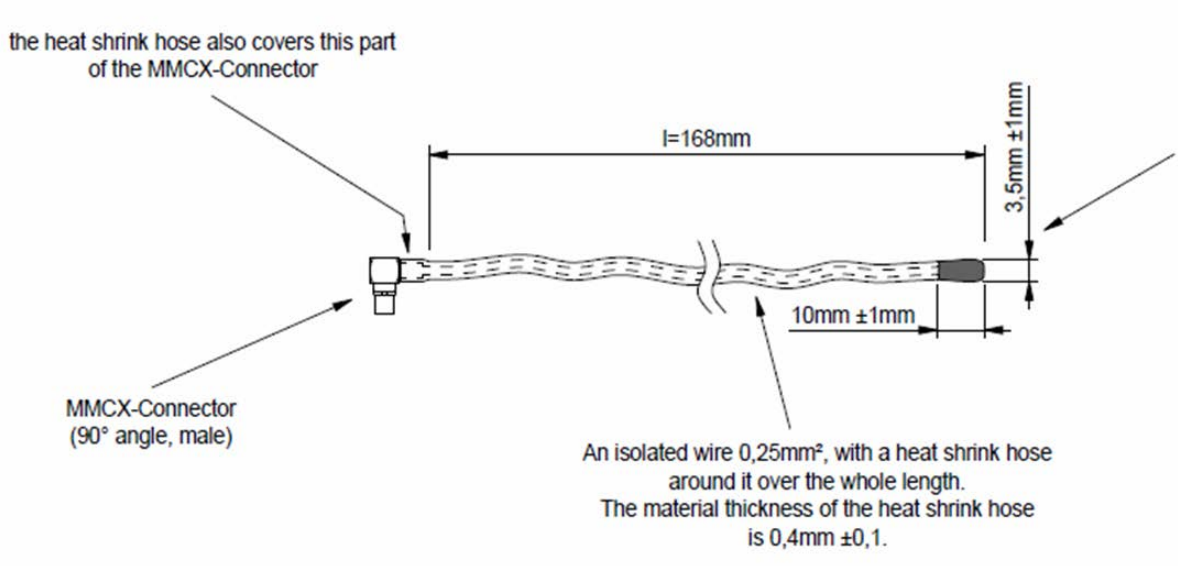
2.3 Specific operational use conditions
This module is approved for use in portable and mobile applications. Integrators must supply operating instructions for end users and installers to satisfy RF exposure compliance requirements are met. Integrators and installers must also make sure that compliance with Part 15B are ensured.

2.4 Limited module procedures
N/A, this module is not compliant with Chapter (b) from §15.212.

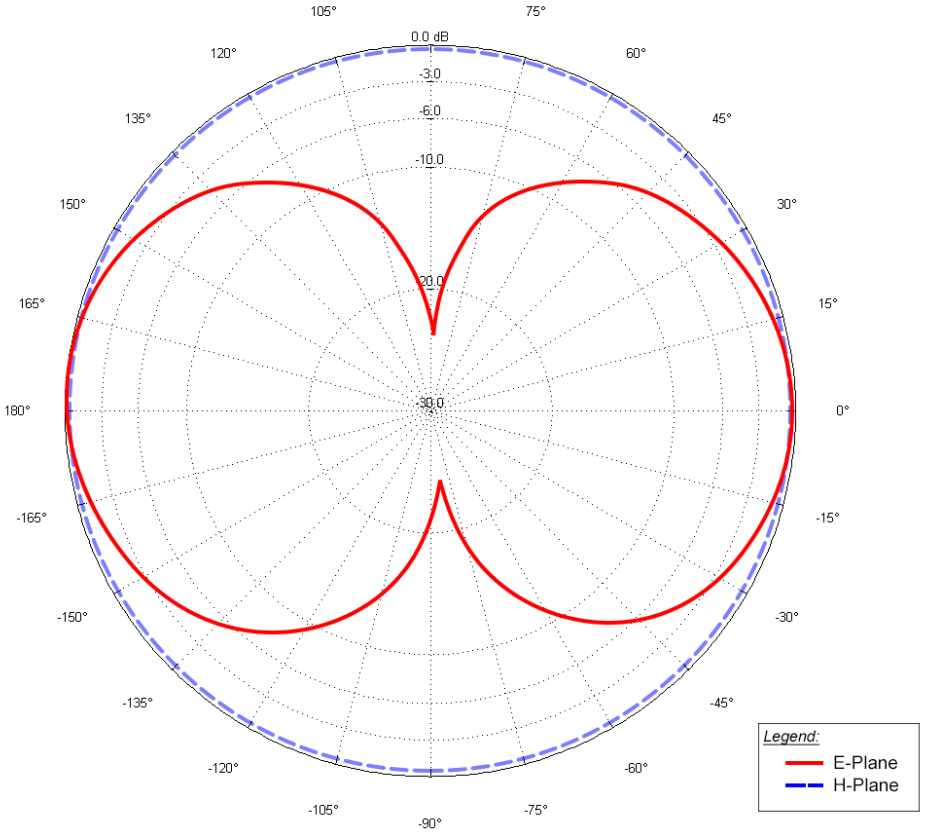
2.5 Trace antenna designs
N/A, the module does not use a trace antenna, it uses an external dipole antenna.

2.6 RF exposure considerations
WARNING: The 456TR1 device radiates radio frequency energy at a level below the United States FCC radio frequency exposure limits. Nevertheless, this device should be used in such a manner that the potential for human contact during normal operation is minimized. 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.).

2.7 Antennas
Antenna is named with IANT419458. It´s a168mm long wire antenna with a MMCX-Connector and connected to the RF-part CS456 TRT-1



1	FREQUENCY :	6	IMPEDANCE : 50 Ω
2	GAIN :	7	
3	V.S.W.R : <= 2.0 : 1	8	
4	LENGTH :	9	
5	CONNECTOR : MMCX PLUG R/A	10	



2.8 Label and compliance information

The 456TR1 module is labelled with its own FCC ID. If the FCC ID is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a physical label or eLabel referring to the enclosed module. In that case the end product must be labelled in a visible area with the following: Contains
FCC ID: 2AC8P-456TR1.