

## SAR Test exclusion documentation according to FCC KDB 447498, RSS-102

Report identification number: 1-2150/21-01-05 Exclusion (FCC)

<b>contains the module with the following certification numbers</b>	
FCC ID	YUH-Q152

This test report is electronically signed and valid without handwritten signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

### Document authorised:

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**EUT technologies:**

Technologies:	Max. declared cond. AVG Power	Max. measured EIRP @ 10m <sup>1)</sup>	Antenna gain
NFC 13.56 MHz	23.52 dBm (225mW)	54.5 dBµV (Peak) = -30.27 dBm	< 0 dBi

**NOTE:**

Max. power according Technical Documentation metraTec QR15. The relevant extract is added as Annex B of this document.

1) Test setup from 10m EIRP measurement is attached in Annex A of this document.

**SAR test exclusion according to KDB447498 (General RF Exposure Guidance v06)**

Equation from Chapter 4.3.1: Standalone SAR test exclusion considerations page 11 and ff and tables in Annex C.

(c) (2) Standalone SAR test exclusion below 100 MHz < 50mm

$$0.5 \times (\text{Threshold}_{100\text{MHz}}) \times (1 + \log(100/f))$$

where

Threshold<sub>1-g;10-g</sub> is 3 for 1-g; 7.5 for 10-g

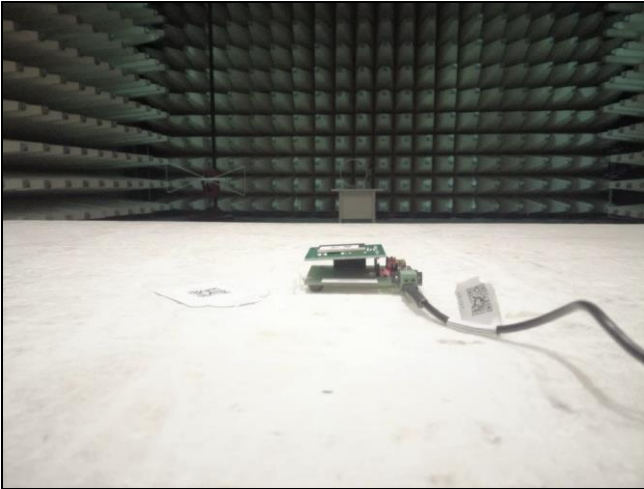
f is the RF channel transmit frequency

Threshold<sub>100MHz,50mm</sub> is Threshold<sub>1-g;10-g</sub> × d / f<sup>0.5</sup>; with f = 100MHz and d=50mm

The table below gives the calculated maximal power that could be used for source based time averaged conducted power, adjusted for tune up tolerance. If this is below the calculated value SAR testing is excluded.

frequency [MHz]	Threshold <sub>1-g;10-g</sub>	Threshold <sub>100MHz,50mm</sub>	Powerlimit [mW]	P <sub>max-declared</sub>		Exclusion
				[dBm]	[mW]	
13.56	3	474.34	442.97	23.52	224.9	yes

**Annex A: Pictures of the EIRP measurement for 13.56MHz with 10m distance**



**Loop-Antenna: EMCO 6502A (Correction factor @ 13.56MHz +9.5 dB)**



## Annex B: Technical Documentation metraTec QR15 (Extract) – Max. Power:

### 2.2 Intended Use

The QR15 HF RFID Module reads RFID tags that comply to the ISO 15693 standard on a short range of 30-80 mm. Custom tag commands can be used without firmware changes if the tags follow the ISO 15693 standard with regard to the air interface. For transponders that use the ISO 14443A or a protocol with MIFARE® technology, please use our QR14 RFID Module.

### 2.3 Technical Specification

	Min.	Typ.	Max.
Supply voltage	4.7 V	5.0 V	5.5 V
Supply Current Standby		20mA	
Supply Current RF on 200mW	135	150mA	160mA
Supply Current RF on 100mW	95	110mA	120mA
RF output power 200mW	150mW	200mW	225mW
V_In_low (UART+GPIO)	-0.3 V	0	0.9 V
V_In_high (UART+GPIO)	2.3 V	3.3 V	3.45 V
V_out_low (UART+GPIO)	-	0	0.4 V
V_out_high (UART+GPIO)	2.9 V	3.3 V	3.45 V
Operating Temperature <sup>(1)</sup>	-25°C	20°C	+85°C
Antenna port impedance		Internal antenna, 2250 mm <sup>2</sup>	
Carrier frequency <sup>(2)</sup>		13.56 MHz	
Supported RFID Protocol		ISO 15693	
Dimensions		50,08 x 50,08 mm	
Antenna Connector		n.a.	
Communication Interface <sup>(3)</sup>		3V3 UART	