
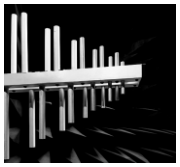
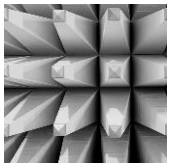

CTC advanced
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Test Report-No.: 1-4111/17-01-14

FCC ID:	**2ACK7SNT114**
IC:	**12204A-SNT114**
PMN:	**Sigfox Network Tester**
HVIN:	**SNT1.1-4**
FVIN	**-/-**

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.

(1) Standalone SAR test exclusion for 100 MHz to 6 GHz at test separation distances ≤ 50mm

$$(\text{Threshold}_{1\text{-g};10\text{-g}}) \times d_{\text{seperation}} / f^{0.5}$$

where

$\text{Threshold}_{1\text{-g};10\text{-g}}$ is 3 for 1-g; 7.5 for 10-g
$d_{\text{seperation}}$ is the min. test separation distance; 5mm is used if the distance is less
f is the RF channel transmit frequency

The table below gives the calculated maximal power that could be used for source based time averaged conducted or radiated power, adjusted for tune up tolerance. If this is below the calculated value the DUT is exempted from SAR evaluation.

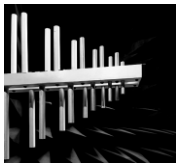
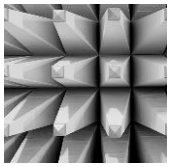
f in [MHz]	$d_{\text{separation}}$ [mm]	$\text{Threshold}_{1\text{-g}}$	Powerlimit [mW]	$P_{\text{max-declared}}$ [mW]	Exclusion
902.00	**5**	7.5	39.48	20.26	yes

SAR test exclusion according to RSS-102 Issue 5 Section 2.5.1/Table 1

The table below gives the calculated maximal power that could be used for source based time averaged conducted or radiated power, adjusted for tune up tolerance. If this is below the calculated value the DUT is exempted from SAR evaluation.

f in [MHz]	$d_{\text{separation}}$ [mm]	tissue volume	Powerlimit [mW]	$P_{\text{max-declared}}$ [mW]	Exclusion
902.00	**5**	1 g	41.00	20.26	yes

Note: factor 2.5 for handheld use included

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Justification for SAR test exclusion

The Conducted Power of the device is **20.9** dBm, which corresponds to **123.0** mW.

The worst case duty cycle as declared by the manufacturer is as follows:

Short message:

- 1 frame =208bits
- Transmission speed = 600bps
- Length: 208/600
- Sent 3 times: 0.35 * 3 = 1.04 seconds
- 2 interframes of 490ms = 980ms
- And 20s between each emission = 20.98 seconds
- Duty cycle = 1.04/20.98*100=**4.95**%

Long message (max size):

- 1 frame =208bits
- Transmission speed = 600bps
- Length: 208/600
- Sent 3 times: 0.35 * 3*255 (max size) = 20.98 seconds
- 254 interframes of 490ms = 124.46 seconds
- And 20s between each emission = 144.46 seconds
- Duty cycle = 20.98/144.46*100=**61.78**%

Worst case of Duty cycle = 90*4.95+10*61.78 =**10.63%**

Antenna gain according to CTC advanced FCC Part 15.247 test report 1-4111/17-01-03: **1.9** dBi

The maximum conducted timebased-averaged output power is: **13.08 mW**
The maximum radiated timebased-averaged output power is: **20.26 mW**

Verdict:
The DUT is exempted from SAR evaluation for any hand-held or standalone use, when operating at worst case conditions.

Thomas Vogler

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