# EMI – TEST REPORT

**- Human Exposure -**

| | | |
|---|---|---|
| **Type / Model Name** | : | NXP2RX / NXP2RX-C |
| **Product Description** | : | Digital Wireless Audio Network |
| **Applicant** | : | Neutrik AG |
| Address | : | Im Alten Riet 143 |
| | | 9494 Schaan |
| | | LIECHTENSTEIN |
| **Manufacturer** | : | Neutrik AG |
| Address | : | Im Alten Riet 143 |
| | | 9494 Schaan |
| | | LIECHTENSTEIN |

| | |
|---|---|
| **Test Result** according to the standards listed in clause 1 test standards: | **POSITIVE** |

| | |
|---|---|
| **Test Report No. : T40632-00-05JP** | 15. March 2016<br>Date of issue |

Deutsche Akkreditierungsstelle
D-PL-12030-01-01
D-PL-12030-01-02



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# 1 TEST RESULT SUMMERY

This report replaces the report T40632-00-02JP.

| FCC Rule Part | RSS Rule Part | Description | Result |
|---|---|---|---|
| OET Bulletin 65 | RSS 102 | MPE | passed |

The mentioned RSS Rule Parts in the above table are related to:
RSS 102, Issue 5, March 2015

## 1.1 Final assessment

The equipment under test fulfills the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Calculation done : 15 March 2016

Checked by:

Klaus Gegenfurtner 2016.03.17 13:48:28 +01'00'

Klaus Gegenfurtner
Teamleader Radio

Calculated by:

Jürgen Pessinger 2016.03.17 11:10:24 +01'00'

Jürgen Pessinger

# 2 CALCULATION

## 2.1 EuT RF parameters

| technology | Frequency band | RF power (average) | Maximum antenna gain |
|---|---|---|---|
| WiFi | 2400 – 2483,5 MHz | 23.7dBm @ 2437MHz* | 2,15 dBi |
| Proprietary standard | 5150 – 5850 MHz | 29dBm @ 5745MHz** | 9 dBi |

* Value taken from Grant (module FCC-ID: R68XPICOW, IC-ID: 3867A-XPICOW)
** Value taken from document “Operational Description XIRIUM PRO”

Note: For calculation ±1.5dB tolerance was applied.

The minimum distance of radiating elements to persons has to be more than 20cm.

## 2.2 Calculation of MPE – FCC

### 2.2.1 Description of Caclculation

Following formula was used for calculation:

Friis transmission formula: $$P_d = \frac{P_{out} * G}{4 * \Pi * r^2}$$

Where:
$P_d$ =power density (mW/cm$^2$)
$P_{out}$ = output power to antenna (mW)
$G$ = gain of antenna (linear scale)
$r$ = distance between antenna and observation point (cm)

### 2.2.2 Limits for maximum permissible exposure (MPE):

Table 1B of 47 CFR 1.1310

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm$^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| **(B) Limits for General Population / Uncontrolled Exposure** | | | | |
| 0.3 – 3.0 | 614 | 1.63 | 100 | 30 |
| 3.0 – 30 | 824/*f* | 2.19/*f* | 180/ $f^2$ | 30 |
| 30 - 300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | --- | --- | *f*/1500 | 30 |
| 1500-100000 | --- | --- | 1.0 | 30 |

*f* = Frequency in MHz

### 2.2.3 Calculation of worst case

| technology: | WiFi | | proprietary | |
|---|---|---|---|---|
| applicable frequency | 2437 | MHz | 5745 | MHz |
| $P_{out}$ output power to antenna | 331,2 | mW | 446,7 | mW |
| G gain of antenna (factor) | 1,65 | -- | 7,95 | -- |
| r distance to observation point | 20 | cm | 20 | cm |
| $P_d$ power density | 0,11 | mW/cm² | 0,71 | mW/cm² |
| Limit | 1 | mW/cm² | 1 | mW/cm² |

### 2.2.4 Conclusion

The Limit according to Table 1B of 47 CFR 1.1310 is kept

## 2.1 Calculation of MPE – IC

### 2.1.1 Exemption Limits for Routine Evaluation – RF Exposure Evaluation:

RSS-102, Issue 5, 2.5.2
RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:
• below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f_{0.5}$W (adjusted for tune-up tolerance), where $f$ is in MHz;
• at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2}\ f_{0.6834}$ W (adjusted for tune-up tolerance), where $f$ is in MHz;
• at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

### 2.1.2 Calculation of worst case

| technology: | WiFi | | proprietary | |
|---|---|---|---|---|
| applicable frequency | 2437 | MHz | 5745 | MHz |
| $P_{out}$ output power to antenna | 331,2 | mW | 446,7 | mW |
| G gain of antenna (factor) | 1,65 | -- | 7,95 | -- |
| maximum e.i.r.p. | 0,546 | W | 3,551 | W |
| Exemption limit 300 MHz - 6 GHz | 2,703 | W | 4,857 | W |

### 2.1.3 Conclusion

The Exemption limits for routine Evaluation are kept.