

DELTA Test Report



**Measurement of radio frequency electromagnetic field from
transceiver system TT-3000C in the frequency range 1-2 GHz**

Performed for Thrane & Thrane A/S

DANAK-1910276

Project no.: A505614-2

Page 1 of 15

17 September 2008

DELTA

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| | |
|----------------|--|
| Title | Measurement of radio frequency electromagnetic field from transceiver system TT-3000C in frequency range 1-2 GHz |
| Test object | Transceiver system TT-3000C |
| Report no. | DANAK-1910276 |
| Project no. | A505614-2 |
| Test period | 4 August 2008 |
| Client | Thrane & Thrane A/S Lundtoftegårdsvej 93D 2800 Kongens Lyngby Denmark Tel.: +45 39 55 88 00 |
| Contact person | Morten Bondesen E-mail: mb@thrane.com |
| Manufacturer | Thrane & Thrane A/S |
| Specifications | IEC 60945:2002 |
| Results | The test object was found to be in compliance with the specification |
| Test personnel | Karsten Kruse Jensen |

Date 17 September 2008

Project Manager

Karsten Kruse Jensen
Technician, EMC
DELTA

Responsible

Michael Nielsen
Specialist, EMC
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1. Summary of tests

| Test | Test method | Result |
|--|----------------|----------------------|
| Measurement of radio frequency electromagnetic field | IEC 60945:2002 | Passed ¹⁾ |

1) Frequency range 1-2 GHz.

The given result is based on a shared risk principle with respect to the measurement uncertainty.

Conclusion

The test object mentioned in this report meets the requirements of the standard stated below.

- IEC 60945:2002.

The test results relate only to the object tested.

2. Test object and auxiliary equipment

2.1 Test object

Test object 2.1.1

| | |
|---------------------|---------------------|
| Name of test object | Transceiver |
| Model / type | TT-3020C |
| Part no. | - |
| Serial no. | 97203654 |
| FCC ID | - |
| Manufacturer | Thrane & Thrane A/S |
| Supply voltage | 24VDC |
| Comments | - |

Test object 2.1.2

| | |
|---------------------|---------------------|
| Name of test object | Power Supply |
| Model / type | TT-3680B |
| Part no. | - |
| Serial no. | - |
| FCC ID | - |
| Manufacturer | Thrane & Thrane A/S |
| Supply voltage | 230 VAC |
| Comments | - |

Test object 2.1.3

| | |
|---------------------|---------------------|
| Name of test object | Antenna |
| Model / type | TT-3005M |
| Part no. | - |
| Serial no. | 00836304 |
| FCC ID | - |
| Manufacturer | Thrane & Thrane A/S |
| Supply voltage | - |
| Comments | - |

Test object 2.1.4

| | |
|---------------------|---------------------|
| Name of test object | Message Terminal |
| Model / type | TT-3606E |
| Part no. | - |
| Serial no. | 03920371 |
| FCC ID | - |
| Manufacturer | Thrane & Thrane A/S |
| Supply voltage | Internal voltage |
| Comments | - |

Test object 2.1.5

| | |
|---------------------|---------------------|
| Name of test object | Keyboard |
| Model / type | TT-3601E |
| Part no. | - |
| Serial no. | - |
| FCC ID | - |
| Manufacturer | Thrane & Thrane A/S |
| Supply voltage | Internal voltage |
| Comments | - |

Test object 2.1.6

| | |
|---------------------|--|
| Name of test object | Transceiver system |
| Model / type | TT-3000C |
| Part no. | - |
| Serial no. | - |
| FCC ID | - |
| Manufacturer | Thrane & Thrane A/S |
| Supply voltage | 230 VAC |
| Comments | This system contains test object 2.1.1, 2.1.2, 2.1.3, 2.1.4, and 2.1.5 |

3. General test conditions

3.1 Test setup during test

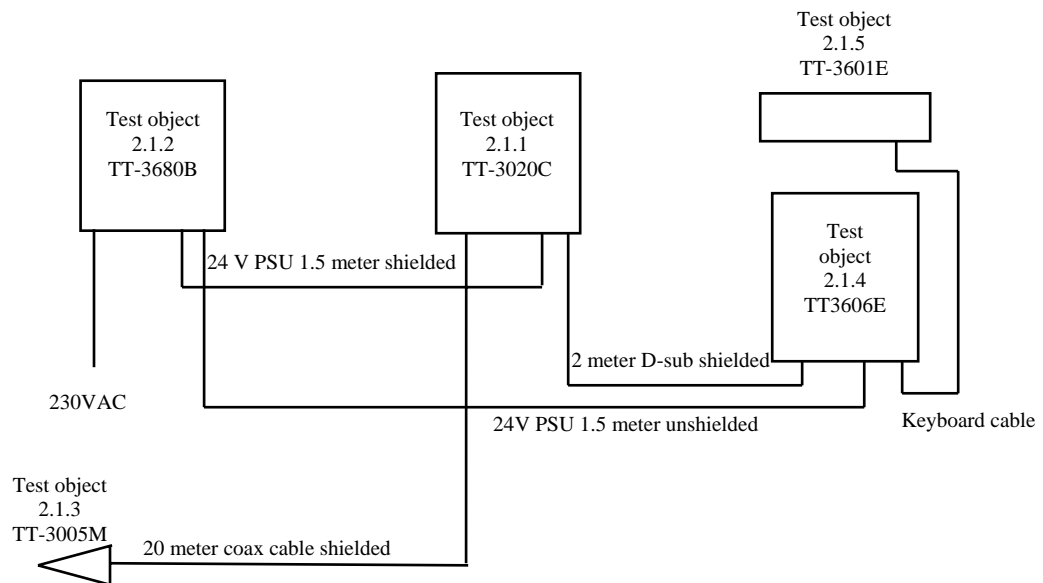


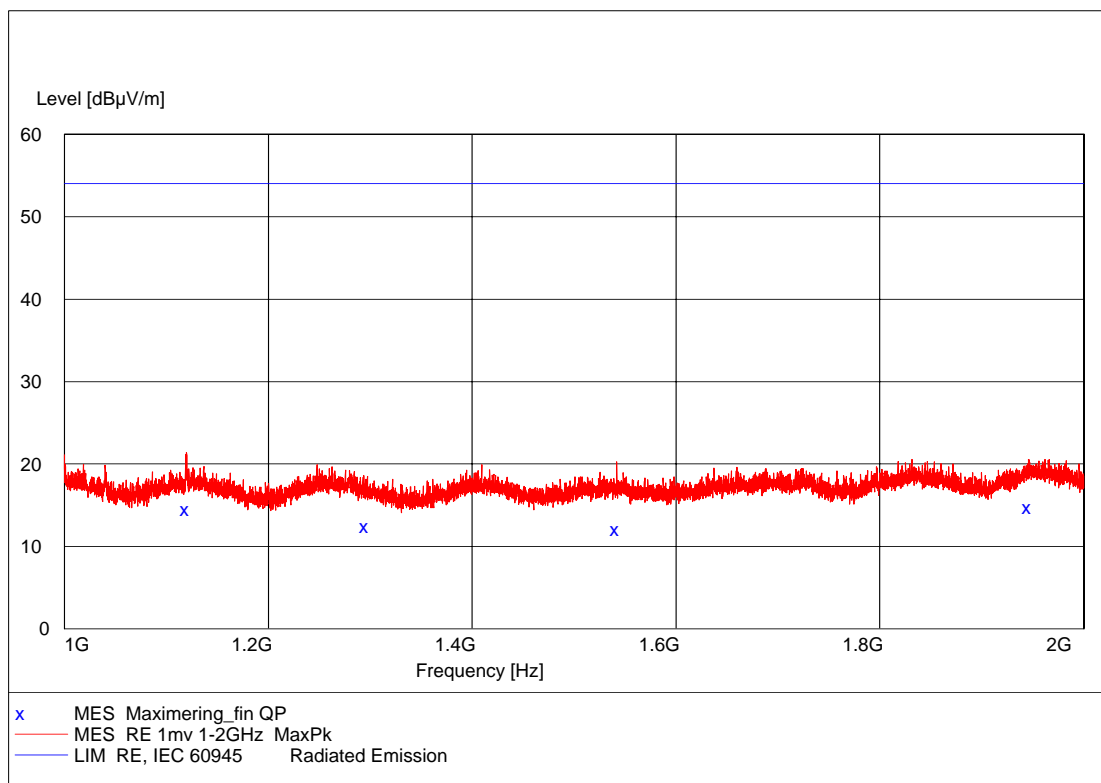
Figure 3.1.1 Block diagram of test object with cables and auxiliary equipment.

4. Test results

4.1 Measurement of radio frequency electromagnetic field, 1-2 GHz

| | | | |
|---------------|---------------------|-------------|--------------|
| Test object | Transceiver system | Sheet | RE-1 |
| Type | TT-3000C | Project no. | A505614-2 |
| Serial no. | - | Date | 04 Aug. 2008 |
| Client | Thrane & Thrane A/S | Initials | KKJ |
| Specification | IEC 60945:2002 | Frequency | 1 – 2 GHz |

| | | | |
|-----------------|--|-------------|---------|
| Test method | IEC 60945:2002 | Temperature | 23 °C |
| Characteristics | Pre-scan, Antenna at 3 m, 1 m height, vert. pol. | Humidity | 35 % RH |
| Detector | Peak | Bandwidth | 120 kHz |
| Test equipm. | EMI room Hørsholm 29916 29861 29876 29301 | Uncertainty | 4 dB |

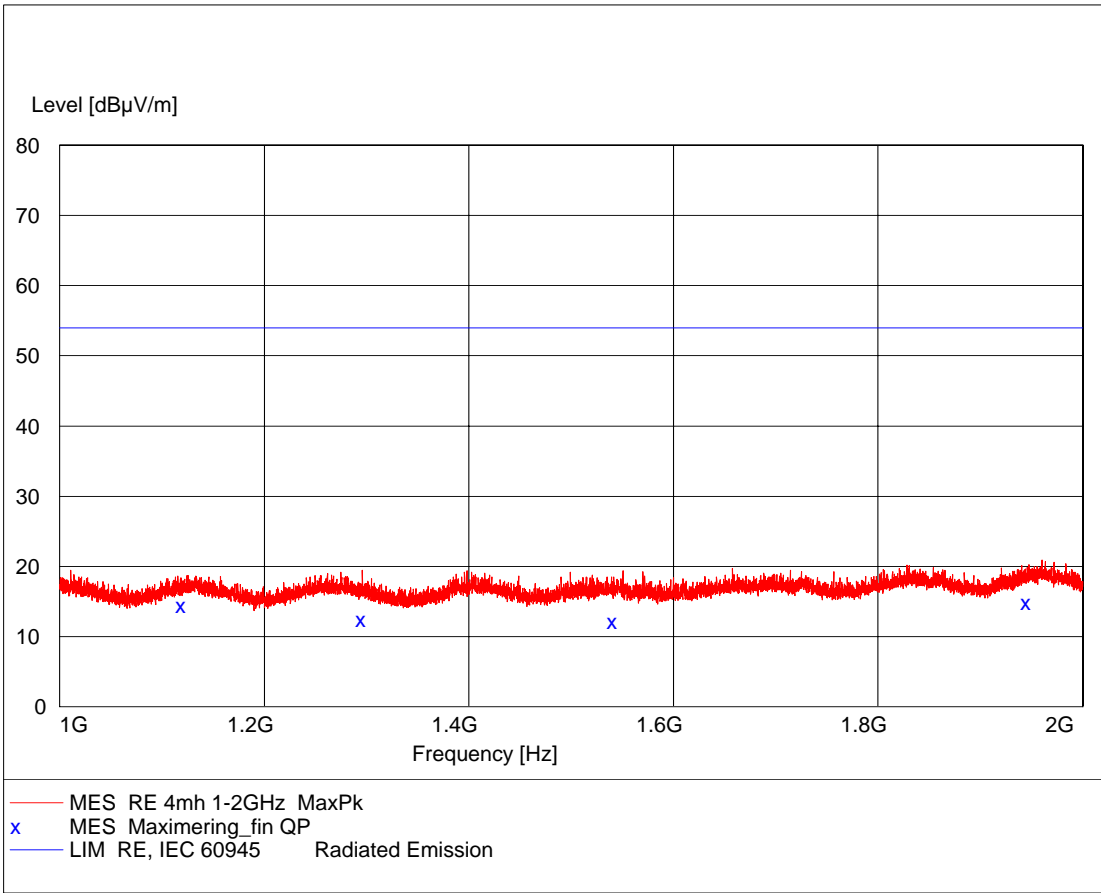


Comments

None

| | | | |
|---------------|---------------------|-------------|--------------|
| Test object | Transceiver system | Sheet | RE-2 |
| Type | TT-3000C | Project no. | A505614-2 |
| Serial no. | - | Date | 04 Aug. 2008 |
| Client | Thrane & Thrane A/S | Initials | KKJ |
| Specification | IEC 60945:2002 | Frequency | 1 – 2 GHz |

| | | | |
|-----------------|---|-------------|---------|
| Test method | IEC 60945:2002 | Temperature | 23 °C |
| Characteristics | Pre-scan, Antenna at 3 m, 4 m height, hor. pol. | Humidity | 35 % RH |
| Detector | Peak and quasi peak | Bandwidth | 120 kHz |
| Test equipm. | EMI room Hørsholm 29916 29861 29876 29301 | Uncertainty | 4 dB |



Comments None

| | | | |
|---------------|---------------------|-------------|--------------|
| Test object | Transceiver system | Sheet | RE-3 |
| Type | TT-3000C | Project no. | A505614-2 |
| Serial no. | - | Date | 04 Aug. 2008 |
| Client | Thrane & Thrane A/S | Initials | KKJ |
| Specification | IEC 60945:2002 | Frequency | 1 – 2 GHz |

| | | | |
|-----------------|--|-------------|---------|
| Test method | IEC 60945:2002 | Temperature | 23 °C |
| Characteristics | Peak search ant. at 3 m, height: 1-4 m, v/h pol. | Humidity | 35 % RH |
| Detector | Quasi peak | Bandwidth | 120 kHz |
| Test equipm. | EMI room Hørsholm 29916 29861 29876 29301 | Uncertainty | 4 dB |

| Frequency MHz | Level dBµV/m | Transd dB | Limit dB | Margin dB | Height dB | Azimuth cm | Polarisation deg |
|------------------|-----------------|--------------|-------------|--------------|--------------|---------------|---------------------|
| 1119.600000 | 14.50 | -18.4 | 54.0 | 39.5 | 101.0 | 1.00 | VERTICAL |
| 1295.600000 | 12.40 | -17.6 | 54.0 | 41.6 | 101.0 | 176.00 | VERTICAL |
| 1541.500000 | 12.10 | -16.4 | 54.0 | 41.9 | 176.0 | 197.00 | VERTICAL |
| 1946.000000 | 14.80 | -14.0 | 54.0 | 39.2 | 213.0 | 72.00 | VERTICAL |

Test result The measured field strengths are below the limit

Compliant Yes

Comments Final maximal measurements by variation of turntable azimuth, antenna height, and antenna polarisation

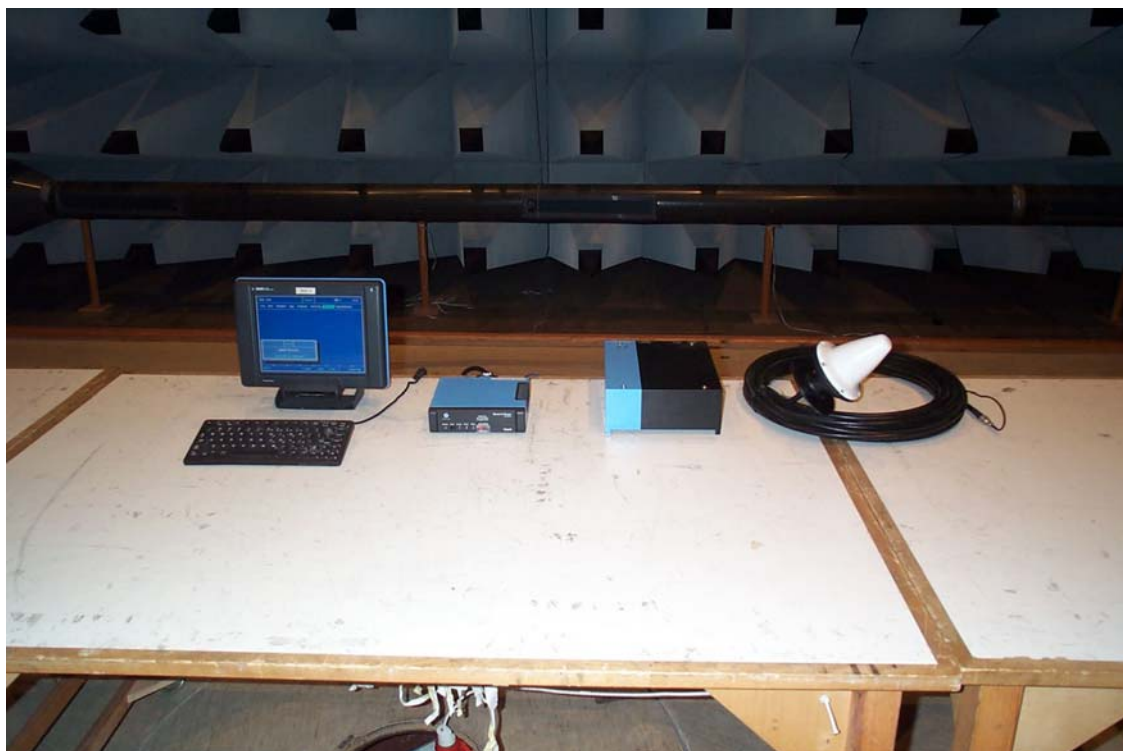


Photo 4.1.1 Test setup regarding measurement of radio frequency electromagnetic field.



Photo 4.1.2 Test setup regarding measurement of radio frequency electromagnetic field.

5. National registrations and accreditations

5.1 FCC Registrations

Organization: Federal Communications Commission, USA

Registration Number: 90529

Facilities: OATS Hørsholm (EMC-0)
EMC room 2 Hørsholm (EMC-2)
EMC room 3 Hørsholm (EMC-3)
EMC room 4 Hørsholm (EMC-4)
EMI room Hørsholm (EMC-5)

5.2 VCCI Registrations

Organization: Voluntary Control Council for Interference by Information Technology, Japan

Member Number: 910

Facilities: OATS Hørsholm (EMC-0): R-691
EMC room 2 Hørsholm (EMC-2): C-707 and T-246
EMC room 3 Hørsholm (EMC-3): C-2532 and T-247
EMC room 4 Hørsholm (EMC-4): C-2533 and T-248
EMI room Hørsholm (EMC-5): R-1180, C-706 and T-249

5.3 IC Registrations

Organization: Industry Canada, Certification and Engineering Bureau

Registration Number: IC4187-5

Facilities: EMI room Hørsholm (EMC-5)

5.4 DANAK Accreditation

Organization: Danish Accreditation and Metrology Fund - DANAK, see www.danak.dk and www.ilac.org

Registration Number: 19C

DANAK is part of ILAC (International Laboratory Accreditation Cooperation) including its MRA (Mutual Recognition Arrangement). The MRA includes the Australian NATA and Canadian SCC.

CISPR 22 is equivalent to AS/NZS CISPR 22, and therefore this report can be used for applying the **Australian C-Tick mark** for IT equipment, when this test has been passed.

CISPR 22:2002 is equivalent to ICES-003:2004, and therefore this report can be used for approval in Canada for IT equipment, when this test has been passed.

6. List of instruments

| NO. | DESCRIPTION | MANUFACTURER | TYPE NO. |
|-------|---|-----------------|--------------------------------------|
| 29301 | ARTIFICIAL MAINS NETWORK | ROHDE & SCHWARZ | ESH2-Z5 |
| 29861 | EMI-SOFTWARE Ver. 1.60 | ROHDE & SCHWARZ | ES-K1, PART: 1026.6790.02 3115 |
| 29876 | RIDGED GUIDE HORN ANTENNA, 1-12.75 (18) GHz | EMCO | |
| 29916 | AUTOMATIC TEST RECEIVER, 9 kHz - 2.75 GHz | ROHDE & SCHWARZ | ESCS 30 1102.4500.30 |
| 49037 | BROADBAND MICROWAVE PRE- AMPLIFIER, 1-12.8 GHz | MITEQ / DELTA | AMF-5D-001128- 35-11P |