

FCC ID: NXIE86NB

EMI -- TEST REPORT

Test Report No. :	T30555-00-00AA	14. February 2006 Date of issue
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Type / Model Name : E86N (Base station)

Product Description : Transceiver

Applicant : Marposs S.p.A.

Address : Via Saliceto 13
40010 Bentivoglio Bo, Italia

Manufacturer : Marposs S.p.A.

Address : Via Saliceto 13
40010 Bentivoglio Bo, Italia

Licence holder : Marposs S.p.A.

Address : Via Saliceto 13
40010 Bentivoglio Bo, Italia

Test Result according to the standards listed in clause 1 test standards:	POSITIVE
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15 Subpart C - Intentional Radiators (October 01, 2004)

Part 15, Subpart C, Section 15.249	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz
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Part 15, Subpart C, Section 15.35(c)	Correction for Pulse Operation (Duty Cycle)
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Part 15, Subpart C, Section 15.209(a)	Radiated emissions, general requirements
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ANSI C63.4-2003, Section 13.1.7	Occupied bandwidth measurements
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FCC Rules and Regulations Part 15 Subpart B - Unintentional Radiators (October 01, 2004)

Part 15, Subpart B, Section 15.109(a)	Radiated emissions, general requirements
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2 SUMMARY

GENERAL REMARKS:

The frequency range was scanned from 1 MHz to 10 GHz.

All emissions not reported in this test report are at least 10 dB below the specified limits.

The EuT is working in transmit mode at 915 MHz.

The receive mode is divided into 99 channels in the frequency band from 912.4 MHz to 917.55 MHz.

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

Testing commenced on : 01. February 2006

Testing concluded on : 03. February 2006

Checked by:

 Klaus Gegenfurtner
Ich bestätige die
Richtigkeit und Integrität
dieses Dokuments
2006.02.22 11:01:39
+01'00'

Klaus Gegenfurtner
Dipl.-Ing.(FH)
Manager: Radio Group

Tested by:

 Anton Altmann
Ich bin der Verfasser
dieses Dokuments
2006.02.22 09:55:23
+01'00'

Anton Altmann
Dipl.-Ing.(FH)

3 EQUIPMENT UNDER TEST

3.1 Photo documentation of the EuT



FCC ID: NXIE86NB



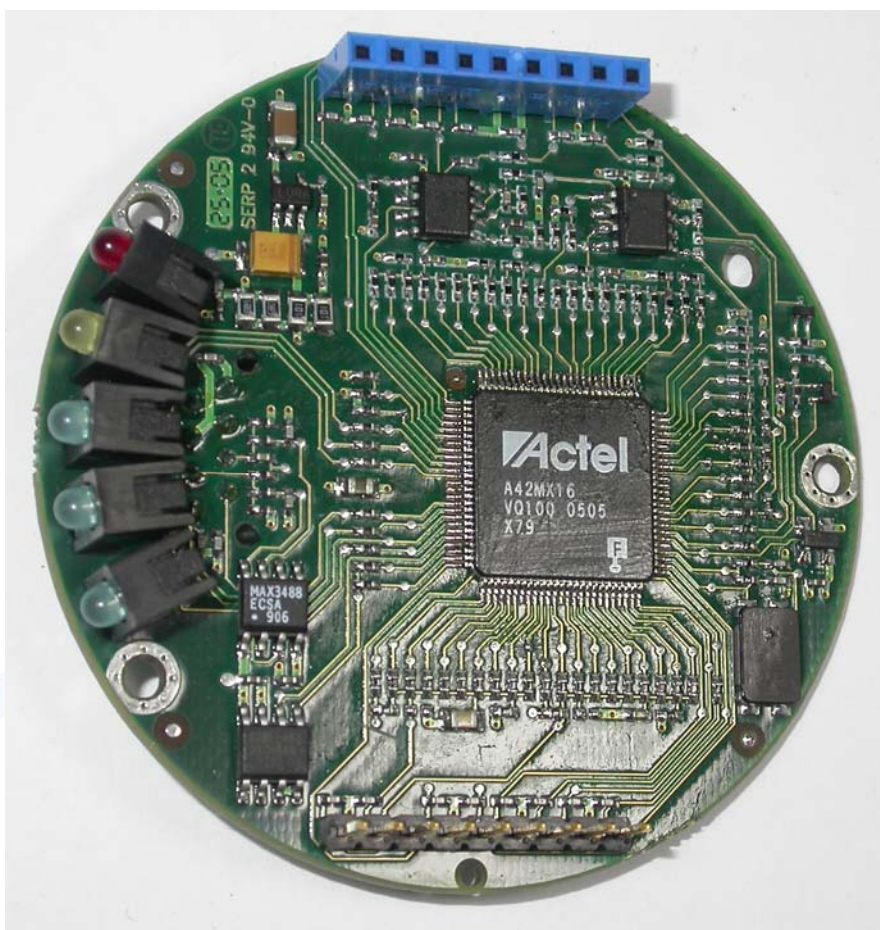
FCC ID: NXIE86NB



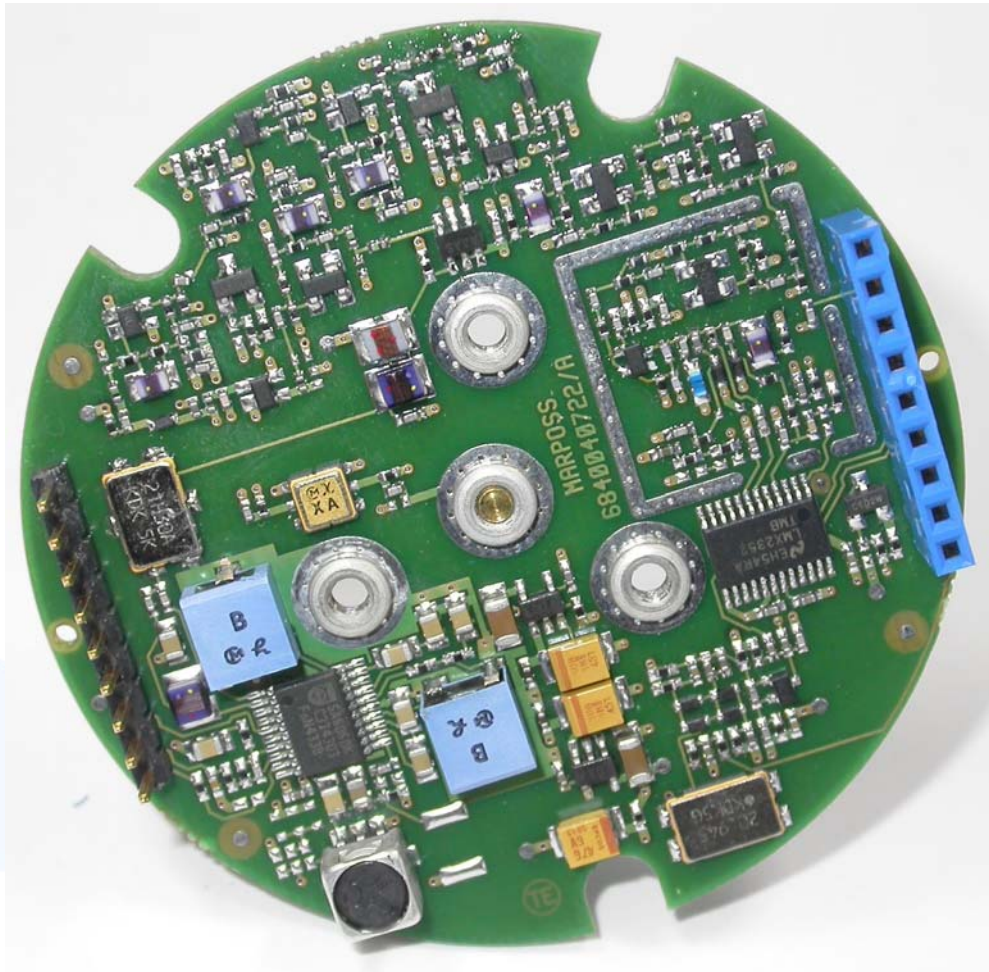
FCC ID: NXIE86NB



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3.2 Power supply system utilised

Power supply voltage : 24 VDC

3.3 Short description of the Equipment under Test (EuT)

The complete system consists of three single units: Base station, Probe station and Interface.
The system is used when there is the need to measure the workpiece after or during its machining. The main function of the system is the transmission of the touch probe status (contact open or contact close), that is mounted on the probe station, to the machine numeric control.

Number of tested samples: 2
Serial number: 6871980100 (radial)
6871980150 (axial)

EuT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- continuous wave, modulated

- receive mode

EuT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurements:

- Interface (by extension cabel)	Model : E86N interface module (8304870000)
- Switch box (by IO extension cable)	Model :
-	Model :
-	Model :
-	Model :
-	Model :

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

mikes-testingpartners gmbh
Ohmstrasse 2-4
94342 Strasskirchen
Germany

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 /11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.4 Measurement Protocol for FCC, VCCI and AUSTEL

4.4.1 GENERAL INFORMATION

4.4.1.1 Test Methodology

Conducted and radiated disturbance testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1997), European Standard EN 55022 and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1997). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-2003 procedures and using the CISPR 22 Limits.

4.4.1.2 Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into it's characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum disturbances from the unit.

4.4.2 DETAILS OF TEST PROCEDURES

4.4.2.1 General Standard Information

The test methods used comply with CISPR Publication 22 (1997), EN 55022 (2001) and AS 3548 (1992) - "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment" and with ANSI C63.4-2003 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

4.5 Discovery of worst case measurement conditions

The fundamental of two units (radial and axial) have been measured. The unit with radial connection showed the highest power output and has been declared as the worst case. All measurements have been carried out with the radial unit.

5 TEST CONDITIONS AND RESULTS

5.1 Conducted emissions

For test instruments and accessories used see section 6 Part A 4.

5.1.1 Description of the test location

Test location:

5.1.2 Photo documentation of the test set-up

5.1.3 Description of Measurement

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC Limit or to the CISPR limit, which is equivalent to the Australian AS 3548 limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EuT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeter's above the floor and is positioned 40 centimeter's from the vertical ground plane (wall) of the screen room. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

5.1.4 Test result

Frequency range:

Min. limit margin

The requirements are

Remarks: The measurement is not applicable. The EuT has no AC mains connections.

5.2 Radiated power of the fundamental wave

For test instruments and accessories used see section 6 Part CPR 2.

5.2.1 Description of the test location

Test location: OATS1

Test distance: 3 metres

5.2.2 Photo documentation of the test set-up



5.2.3 Description of Measurement

The radiated power of the fundamental wave from the EUT is measured in the frequency range of 30 to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003.

The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization's and the EuT are rotated 360 degrees.

The final level, expressed in dB μ V/m, is arrived by taking the reading from the EMI receiver (Level dB μ V) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

The radiated power of the fundamental wave from the EUT is measured in the frequency range above 1 GHz using a tuned receiver (Spectrum Analyser) and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003.

The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3 horizontally from the EuT.

Measurement are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwidth set to 1 MHz. All tests are performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration procedure the highest emission relative the limit and therefore shall be used for final testing. During the tests the EUT is rotated all around to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions. When the EuT is larger than the beamwidth of the measuring antenna, the measurement antenna will be moved over the surfaces for the four sides or the test distance will be reduced to demonstrate that emissions were at maximum at the limit distance.

The resolution bandwidth during the measurement is as follows:

30 MHz – 1000 MHz:	ResBW: 120 kHz
1000 MHz – 40 GHz	ResBW: 1 MHz

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5.2.4 Test result

Frequency [MHz]	Reading Level Qp [dBμV]	Band-width [kHz]	Correct. Factor [dB]	Corrected Level Qp [dBμV/m]	Limit Qp [dBμV/m]	Delta [dB]
915.0	58.0	120	27.5	85.5	94.0	-8.5

Quasipeak-Limit according to FCC Subpart 15.249(a) for fundamental and harmonics

Frequency (MHz)	Fieldstrength of fundamental		Fieldstrength of harmonics	
	(mV/m)	dB (μV/m)	(μV/m)	dB (μV/m)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54

The requirements are **FULFILLED**.

Remarks:

5.3 Radiated emissions (electric field) 9 kHz – 40 GHz

For test instruments and accessories used see section 6 Part SER1, SER 2, SER 3.

5.3.1 Description of the test location

Test location: OATS1
Test location: Anechoic Chamber A2

Test distance: 3 metres

5.3.2 Photo documentation of the test set-up

OATS1



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Anechoic chamber A2



5.3.3 Description of Measurement

Radiated spurious emissions from the EuT are measured in the frequency range of 9 kHz to 1000 MHz using a tuned receiver and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003. The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarization's and the EuT are rotated 360 degrees.

The final level, expressed in dB μ V/m, is arrived by taking the reading from the EMI receiver (Level dB μ V) and adding the correction factors and cable loss factor (Factor dB) to it. This is done automatically in the EMI receiver, where the correction factors are stored. This result then has the FCC or CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets at page.

The radiated emissions from the EuT are measured in the frequency range of 1 GHz to maximum frequency as specified in section 15.33, using a tuned receiver (Spectrum Analyser) and appropriate linearly polarized antennas. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimetres above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. The set up of the Equipment under test will be in accordance to ANSI C63.4-2003.

The Interface cables that are closer than 40 centimetres to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimetres from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna was positioned 3 horizontally from the EuT.

Measurement are made in both the horizontal and vertical planes of polarization in a fully anechoic room using a spectrum analyzer with the detector function set to peak and resolution as well as video bandwidth set to 1 MHz. All tests are performed at a test-distance of 3 meters. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration procedure the highest emission relative the limit and therefore shall be used for final testing. During the tests the EUT is rotated all around to find the maximum levels of emissions. The cables and equipment were placed and moved within the range of position likely to find their maximum emissions. When the EuT is larger than the beamwidth of the measuring antenna, the measurement antenna will be moved over the surfaces for the four sides or the test distance will be reduced to demonstrate that emissions were at maximum at the limit distance.

The resolution bandwidth during the measurement is as follows:

30 MHz – 1000 MHz:	ResBW: 120 kHz
1000 MHz – 40000 MHz	ResBW: 1 MHz

5.3.4 Test result

No emissions found between the lowest internal frequency (8 MHz) and 30 MHz.

Testresult in detail: (<1GHz)

Frequency [MHz]	Reading Level QP [dBμV]	Reading Level AV [dBμV]	Bandwidth [kHz]	Correct. factor [dB]	Corrected Level QP [dBμV/m]	Corrected Level AV [dBμV/m]	Limit [dBμV/m]	Delta [dB]
30-1000	---	---	120	---	---	---	54	---

Remarks: No emissions could be measured!

Quasipeak-Limit according to FCC Subpart 15.249(a) for fundamental and harmonics

Frequency (MHz)	Fieldstrength of fundamental		Fieldstrength of harmonics	
	(mV/m)	dB (μV/m)	(μV/m)	dB (μV/m)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54

Testresult in detail: (>1GHz)

Frequency [GHz]	Reading Level PK [dBμV]	Corr. Duty Cycle [dB]	Level AV [dBμV ^{*)}	Bandwidth [kHz]	Correct. Factor [dB]	Corrected Level PK [dBμV/m]	Corrected Level AV [dBμV/m]	Limit PK [dBμV/m]	Limit AV [dBμV/m]	Delta [dB]
1-10	---	---	---	1000	---	---	---	---	---	---

Remarks: No emissions could be measured!

Average-Limit according to FCC Subpart 15.249(a)

Frequency (MHz)	Fieldstrength of fundamental		Fieldstrength of harmonics	
	(mV/m)	dB (μV/m)	(μV/m)	dB (μV/m)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54

Peak-Limit according to FCC Subpart 15.249(a), Subpart 15.249(e)

Frequency (MHz)	Fieldstrength of fundamental		Fieldstrength of harmonics	
	(mV/m)	dB (μV/m)	(μV/m)	dB (μV/m)
902-928	500	114	5000	74
2400-2483.5	500	114	5000	74
5725-5875	500	114	5000	74

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Average-Limit according to FCC Subpart 15.249(d) for spurious emissions outside of the specified frequency band:

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

Frequency [MHz]	50dB below of the fundamental [dB μ V/m]	15.209 Limits [dB μ V/m]	General Radiated Limits [dB μ V/m]
30-88	35.5	40	44
88-216	35.5	43,5	44
216-960	35.5	46	46
Above 960	35.5	54	54

Restricted bands of operation:

The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209

MHz	MHz	GHz
25.5 – 25.67	960 – 1240	4.5 – 5.15
37.5 – 38.25	1300 – 1427	5.35 – 5.46
73 – 74.6	1435 – 1626.5	7.25 – 7.75
74.8 – 75.2	1645.5 – 1646.5	8.025 – 8.5
108 – 121.94	1660 – 1710	9.0 – 9.2
123 – 138	1718.8 – 1722.2	9.3 – 9.5
149.9 – 150.05	2200 – 2300	10.6 – 12.7
156.52475 – 156.52525	2310 – 2390	13.25 – 13.4
156.7 – 156.9	2483.5 – 2500	14.47 – 14.5
162.0125 – 167.17	2655 – 2900	15.35 – 16.2
167.72 – 173.2	3260 – 3267	17.7 – 21.4
240 – 285	3332 – 3339	22.01 – 23.12
322 – 335.4	3345.8 – 3358	23.6 – 24.0
399.9 – 410	3600 – 4400	31.2 – 31.8
608 – 614		36.43 – 36.5

The requirements are **FULFILLED**.

Remarks: During the test, the EuT was set into continuous transmitting mode with modulation.

The measurement was performed up to the 10th harmonic (9150 MHz).

5.4 Emission Bandwidth

For test instruments and accessories used see section 6 Part MB.

5.4.1 Description of the test location

Test location: AREA4

5.4.2 Description of Measurement

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio of -20 dB. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or the first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical.

The resolution bandwidth of measuring instrument was set to a value as shown in the following table below according to ANSI C63.4-2003.

Fundamental frequency	Minimum resolution bandwidth
9 kHz to 30 MHz	1kHz
30 to 1000 MHz	10 kHz
1000 MHz to 40 GHz	100 kHz

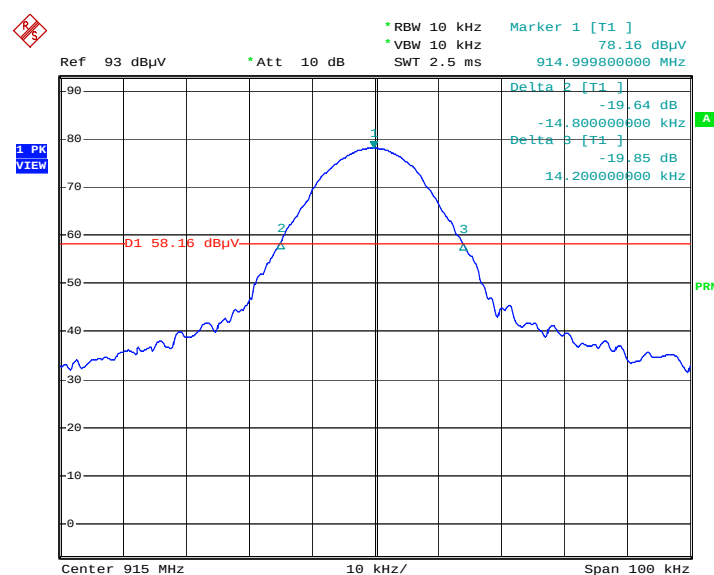
5.4.3 Test result

Channel Frequency [MHz]	20 dB Bandwidth [kHz]
915.0	29.0

Remarks: For the bandwidth there is no limit defined in Part 15.249. This measurement is informative only.

For detailed test result refer to following test protocol.

5.4.4 Test protocol



Date: 2.FEB.2006 14:49:18

5.5 Band edge test

For test instruments and accessories used see section 6 Part MB.

5.5.1 Description of the test location

Test location: AREA4

5.5.2 Description of Measurement

The spectrum analyzer receives the signal from the EuT by a connected antenna. The span of the spectrum analyzer is set wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation. The highest amplitude appearing on spectral display is measured and it is set as the reference level for the emission mask. It is allowed the trace to stabilize and after then it is set the emission mask on the reference level to show the compliance with the bandedge requirements.

Further settings on the spectrum analyzer:

RBW: $\geq 1\%$ of the span

VBW: $\geq$ RBW

Sweep: Auto

Detector function: Peak

5.5.3 Test result

Frequency [MHz]	Peak Power Output [dB μ V/m]	Spurious emission read value [dB μ V/m]	Result of Band edge [dBc]	Band edge LIMIT [dBc]
< 902	78.0	15 (noise)	63	>50
> 928	78.0	15 (noise)	63	>50

Peak-Limit according to FCC Subpart 15.249(d)

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

The requirements are **FULFILLED**.

Remarks: For detailed test result please refer to following test protocol.

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5.5.4 Test protocol



*RBW 10 kHz Marker 1 [T1]
*VBW 10 kHz 77.98 dBμV
SWT 260 ms 915.000000000 MHz

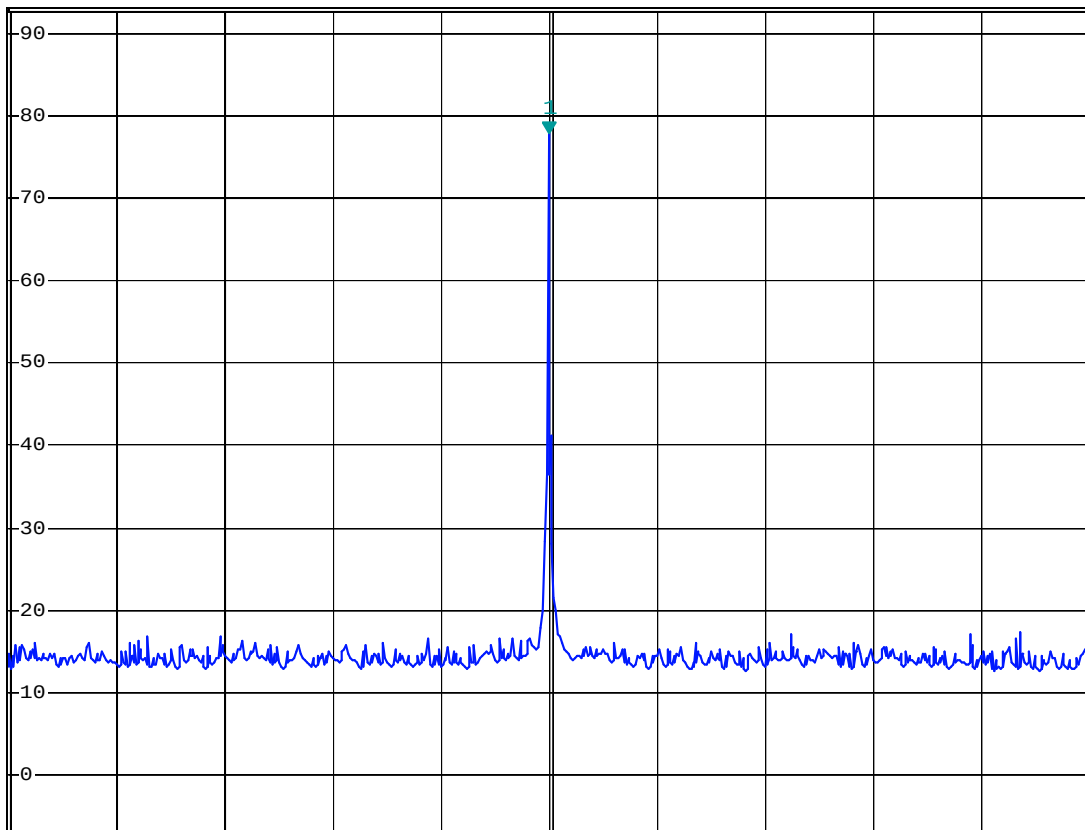
Ref 93 dBμV

*Att 10 dB

SWT 260 ms

915.000000000 MHz

1 PK
VIEW



Start 902 MHz

2.6 MHz/

Stop 928 MHz

Date: 2.FEB.2006 14:51:48

5.6 Correction for Pulse Operation (Duty Cycle)

For test instruments and accessories used see section 6 Part DC.

5.6.1 Description of the test location

Test location: Manufacturer site

5.6.2 Description of Measurement

The Duty cycle factor, expressed in dB, is arrived by taking the following formula:

$$KE = 20 \log [(t_{IB} \cdot p) / T_w]$$

KE: pulse operation correction factor [dB]
 t_{IW} : pulse duration for one complete pulse track [msec]
 t_{IB} : pulse duration for one pulse [µsec]
 T_w : a period of the pulse track [msec]
 p : number of pulses in one train

5.6.3 Test result

t_{IW} [µsec]	T_w [msec]	t_{IB} [µsec]	p	KE [dB / %]
100	100	10	1	-20 / 10

Remarks: For detailed results, please see the test protocol below.

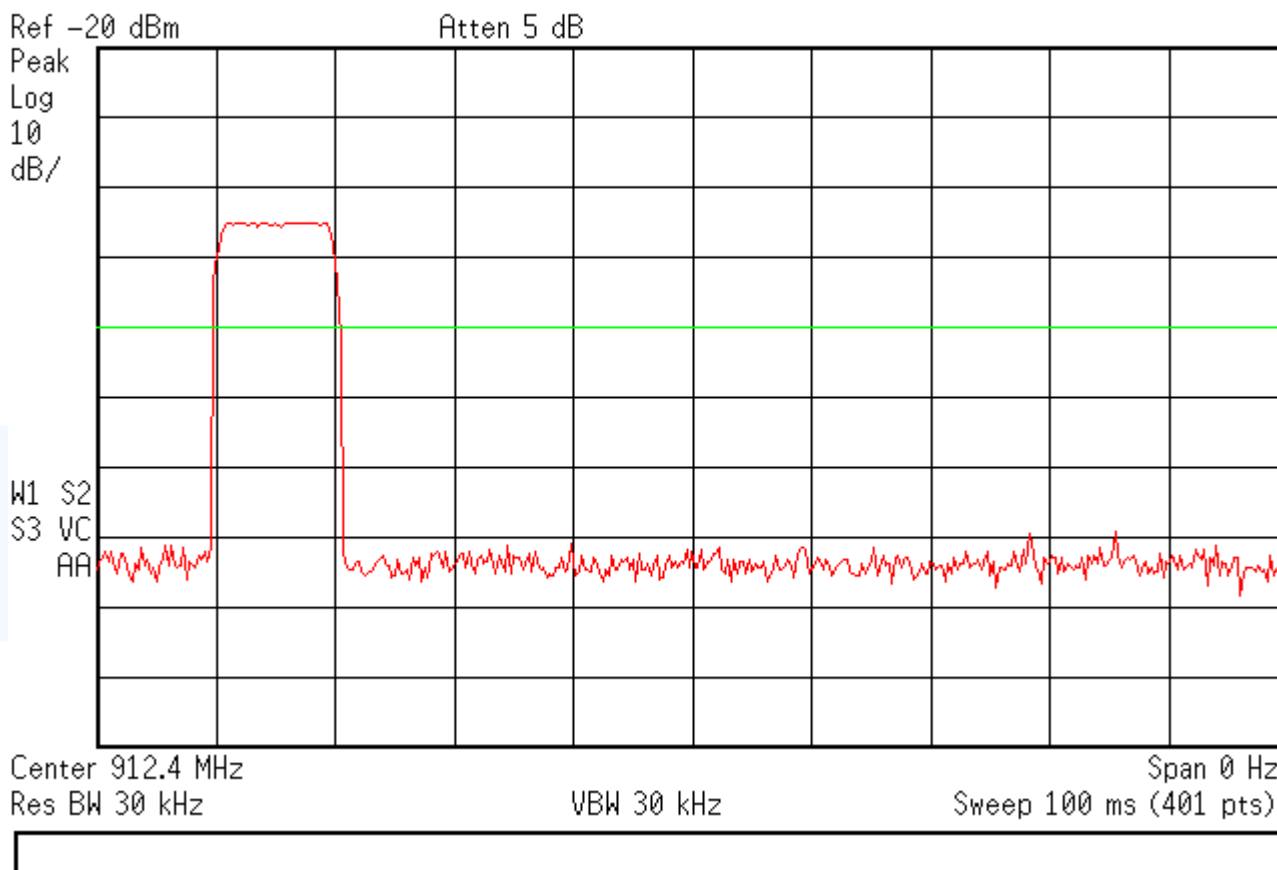
The duty cycle has been recorded by the manufacturer.

There is no need for any correction with duty cycle.

5.6.4 Test protocol

Record of Duty Cycle FCC Part 15 Subpart 15.35(c)

✱ Agilent 16:17:06 3 Feb 2006



5.7 Antenna application

5.7.1 Antenna requirements

The EUT's antenna is met the requirement of FCC Part 15 C section 15.203 and 15.204

5.7.2 Result

The antenna is mounted inside the case. There is no possibility to connect other antennas by the user.

5.8 Receiver conducted disturbances 0.15 - 30 MHz

For test instruments and accessories used see section 6 Part A 4.

5.8.1 Description of the test location

Test location:

5.8.2 Photo documentation of the test set-up

5.8.3 Description of Measurement

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC Limit or to the CISPR limit, which is equivalent to the Australian AS 3548 limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EuT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeter's above the floor and is positioned 40 centimeter's from the vertical ground plane (wall) of the screen room. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

5.8.4 Test result

Frequency range:

Min. limit margin

The requirements are

Remarks: The measurement is not applicable. The EuT has no AC mains connections.

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5.9 Receiver radiated emissions (electric field) 30 MHz - 40 GHz

For test instruments and accessories used see section 6 Part SER2 and SER3.

5.9.1 Description of the test location

Test location: OATS1
Test location: Anechoic Chamber A2

Test distance: 3 metres

5.9.2 Photo documentation of the test set-up



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5.9.3 Test result

Receive frequency from 912.4 to 917.55 MHz

Testresult in detail: (<1GHz)

Frequency [MHz]	Reading Level QP [dBµV]	Reading Level AV [dBµV]	Bandwidth [kHz]	Correct. factor [dB]	Corrected Level QP [dBµV/m]	Corrected Level AV [dBµV/m]	Limit [dBµV/m]	Delta [dB]
30-1000	---	---	120	---	---	---	---	---

Remarks: No emissions could be measured!

Test result >1GHz

Frequency [GHz]	Reading Level PK [dBµV]	Bandwidth [kHz]	Correct. factor [dB]	Corrected Level PK [dBµV/m]	Limit [dBµV/m]	Delta [dB]
1-5	---	1000	---	---	---	---

Remarks: No emissions could be measured!

Limit according to FCC Subpart 15.109(a)

Frequency of emission [MHz]	Field strength Limits [µV/m]	Field strength Limits [dBµV/m]
30-88	100	40
88-216	150	44
216-960	200	46
Above 960	500	54

The requirements are **FULFILLED**.

Remarks: The measurement was performed up to the 5th harmonic (4575 MHz).

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used, in addition to the test accessories, are calibrated and verified regularly.

The calibration intervals and the calibration history will be given out on request.

Test ID	Model / Type	Kind of Equipment	Manufacturer	Equipment No.
CPR 2	ESVS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-006
	VULB 9168	Trilog-Broadband Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-005
	S10162-B / +11N-50-10-5 / +	RF Cable 33m	Huber + Suhner	02-02/50-05-031
	KK-EF393-21N-16	RF Cable 20m	Huber + Suhner	02-02/50-05-033
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113
MB	FSP 30	Spectrum Analyzer	Rohde & Schwarz München	02-02/11-05-001
SER 2	ESVS 30	EMI Test Receiver	Rohde & Schwarz München	02-02/03-05-006
	VULB 9168	Trilog-Broadband Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-005
	S10162-B / +11N-50-10-5 / +	RF Cable 33m	Huber + Suhner	02-02/50-05-031
	KK-EF393-21N-16	RF Cable 20m	Huber + Suhner	02-02/50-05-033
	NW-2000-NB	RF Cable	Huber + Suhner	02-02/50-05-113
SER 3	FSP 30	Spectrum Analyzer	Rohde & Schwarz München	02-02/11-05-001
	AFS4-01000400-10-10P-4	RF Amplifier 1-4 GHz	PARZICH GMBH	02-02/17-05-003
	AMF-4F-04001200-15-10P	RF Amplifier 4-12 GHz	PARZICH GMBH	02-02/17-05-004
	BBHA 9120 E 251	Broad-Band Horn Antenna	Schwarzbeck Mess-Elektronik	02-02/24-05-006
	WBH218H N	Horn Antenna 2-18 GHz	Q-par Angus Ltd	02-02/24-05-007
	Sucoflex N-2000-SMA	RF Cable	novotronik Signalverarbeitung	02-02/50-05-075
	Sucoflex N-2000-SMA	RF Cable	novotronik Signalverarbeitung	02-02/50-05-083
	Sucoflex N-2000-SMA	RF Cable	novotronik Signalverarbeitung	02-02/50-05-088