

Date: ESPOO 19.09.2005Page: 1 (40)Appendices -Number:
No. 1 / 1**51886**Date of handing in: 08.09.2005

Tested by:

**T017 (EN ISO/IEC 17025)**
Risto Hietanen, Test Engineer

Reviewed by:


Pekka Dahlgren, Director

SORT OF EQUIPMENT:

Radio Modem

MARKETING NAME:

SATEL

TYPE:

SATELLINE-3ASd VHF

MANUFACTURER:

SATEL OY

SERIAL NUMBER:

-

CLIENT:

Satel Oy

ADDRESS:

Meriniitynkatu 17, FIN-24100 Salo, Finland

TELEPHONE:

+358 2 777 7838 / Jaakko Ajanki

TEST SPECIFICATION

EN 300 113-2 V1.3.1 (2003-12)

REMARKS:

The test results are valid for the tested unit only. Without a written permission of Nemko Oy it is allowed to copy this report as a whole, but not partially.

Type:	SATELLINE-3ASd VHF	
Alignment range:	138,000 - 160,000 MHz	
Switching range:	138,000 - 160,000 MHz	Category: AR1

Measurement Frequencies Tx/Rx:	Equipment 1 Serial no. -	Equipment Serial no.	Equipment Serial no.
	1) 138,000 MHz 2) 160,000 MHz	3)	4)

Voltages: Temperatures: Humidity:	Normal	Minimum	Maximum
	12.0 VDC	9.0 VDC	30.0 VDC
	21,3 to 21,9 °C		
	33,3 to 46,1 %		

Rated carrier power:	1 W / 0,1 W	Antenna:	50 ohm (TNC-connector)
Class of emission:	12K5F1D	Production model:	Pre-production
Number of channels:	1761		
Channel separation:	12,5 kHz	Mode of data	Multilevel State FM, 9600 bps

The following measurements according to ETS EN 300 113-1 standard have been performed:

Eq. 3 Ch. 3)	Eq. 1 Channels 1) 2)	Eq. 4 Ch. 4)	
☐	☒ ☒	☐	5.1.1 Frequency error
☐	☒ ☒	☐	5.1.2 Carrier power (conducted)
☐	☒ ☒	☐	5.1.4 Adjacent channel power
☐	☒ ☒	☐	5.1.5 Spurious emissions (conducted)
☐	☒ ☒	☐	5.1.5 Spurious emissions (radiated)
☐	☒ ☒	☐	5.1.6 Intermodulation attenuation
☐	☒ ☒	☐	5.1.7 Transmitter attack time
☐	☒ ☒	☐	5.1.8 Transmitter release time
☐	☒ ☒	☐	5.1.9.1 Time domain analysis of power and frequency
☐	☒ ☒	☐	5.1.9.2 Adjacent channel power transient
☐	☐ ☐	☐	5.2.1 Maximum useable sensitivity
☐	☐ ☐	☐	5.2.3 Error behaviour at high input levels
☐	☐ ☐	☐	5.2.4 Co-channel rejection
☐	☐ ☐	☐	5.2.5 Adjacent channel selectivity
☐	☐ ☐	☐	5.2.6 Spurious response rejection
☐	☐ ☐	☐	5.2.7 Intermodulation response rejection
☐	☐ ☐	☐	5.2.8 Blocking or desensitisation
☐	☐ ☐	☐	5.2.9 Spurious radiations (conducted)
☐	☐ ☐	☐	5.2.9 Spurious radiations (radiated)
☐	☐ ☐	☐	Duplex operation
☐	☐ ☐	☐	5.3.1 Receiver desensitisation and maximum useable sensitivity
☐	☐ ☐	☐	5.3.2 Receiver spurious response rejection

na: no applicable

REMARKS:

The test results of the transmitter
(Set of the rated output power: 0,1W)

Ambient temperature: 21,8 °C Relative humidity: 45,6 % Date: 14.09.2005

TRANSMITTER FREQUENCY ERROR CLAUSE 8.1

Rated output power: 0,1 W.

TEST CONDITIONS		FREQUENCY ERROR (Hz)			
		Channel			
		1	2	3	4
Tnom	Vnom	+ 2 Hz	- 88 Hz		
Tmin	Vmin	- 300 Hz	- 309 Hz		
	Vmax	- 216 Hz	- 297 Hz		
Tmax	Vmin	+ 64 Hz	- 107 Hz		
	Vmax	+ 75 Hz	- 91 Hz		
Maximum freq. error. (Hz)		- 300 Hz	- 309 Hz		
Measurement uncertainty (U95)		6,1 x 10 ⁻⁸			

LIMITS CLAUSE 5.1.1

CHANNEL SPACING (kHz)	FREQUENCY RANGES				
	Below 47MHz	Above 47 to 137MHz	Above 137 to 300MHz	Above 300 to 500MHz	Above 500 to 1000MHz
	LIMITS kHz				
12,5	± 0,60	± 1,00	± 1,00 (B) ± 1,50 (M)	± 1,00 (B) ± 1,50 (M) (note)	No value specified
20,0 / 25,0	± 0,60	± 1,35	± 2,00	± 2,00 (note)	± 2,50 (note)

NOTE: For handportable stations having integral power supplies, these limits only apply to the reduced extreme temperature range 0 °C to + 30 °C.

However for the full extreme temperature conditions (subclause 6.4.1), exceeding the reduced extreme temperature range above, the following frequency error limits apply:

- ± 2.50 kHz between 300 MHz and 500 MHz;
- ± 3.50 kHz between 500 MHz and 1000 MHz.

B = BASE STATION

M = MOBILE STATION

TEST EQUIPMENT USED: 53, 328, 307, 563, 146, 302, 76, 404

Ambient temperature: 21,8 °C Relative humidity: 45,6 % Date: 14.09.2005

TRANSMITTER CARRIER OUTPUT POWER (CONDUCTED) CLAUSE 8.2

Rated output power: 0,1 W.

TEST CONDITIONS		TRANSMITTER POWER (Watts)			
		Channel			
		1	2	3	4
Tnom	Vnom	0,094	0,094		
Tmin	Vmin	0,100	0,106		
	Vmax	0,100	0,106		
Tmax	Vmin	0,078	0,084		
	Vmax	0,079	0,084		
Variation in output power under normal test conditions		- 0,27 dB	- 0,27 dB		
Variation in output power under extreme test conditions		- 1,08 to + 0,00 dB	- 0,76 to + 0,25 dB		
Measurement uncertainty		± 0.75 dB			

LIMITS CLAUSE 5.1.2

Under normal test conditions	± 1.5 (dB)
Under extreme test conditions	+ 2.0 (dB), - 3.0 (dB)

TEST EQUIPMENT USED: 59, 218, 328, 307, 563, 146, 302, 76, 404

Ambient temperature: 21,3 °C Relative humidity: 33,3 % Date: 13..09.2005

TRANSMITTER ADJACENT CHANNEL POWER CLAUSE 8.5

Modulation bit rate: 9600 bps

Channel separation 12,5 kHz

Rated output power: 0,1 W.

ADJACENT CHANNEL	BELOW CARRIER POWER (dBc)			
	Channel			
	1	2	3	4
+ 12,5 kHz	- 62,0	- 61,4		
- 12,5 kHz	- 62,0	- 61,4		
Measurement uncertainty (U95)	± 1.6 dB			

LIMIT CLAUSE 5.1.4	20.0 kHz & 25.0 kHz channel spacing: 70dB below carrier power 12.5 kHz channel spacing: 60dB below carrier power
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TEST EQUIPMENT USED: 337, 328, 314, 75, 404

Ambient temperature: 21,8 °C Relative humidity: 45,6 % Date: 14.09.2005

TRANSMITTER SPURIOUS EMISSIONS (CONDUCTED) CLAUSE 8.6

Rated output power: 0.1 W.

FREQUENCY (MHz)	CHANNEL 1	FREQUENCY (MHz)	CHANNEL 2	Remarks
Tx operating		Tx operating		
276,00	- 48,9 dBm	320,00	- 47,5 dBm	
414,00	- 63,5 dBm	others to 4.0 GHz	< - 65,0 dBm	
others to 4.0 GHz	< - 65,0 dBm			
Tx on standby		Tx on standby		
215,55	- 67,1 dBm	237,55	- 73,8 dBm	
others to 4.0 GHz	< - 80,0 dBm	others to 4.0 GHz	< - 80,0 dBm	
Measurement uncertainty	± 1.8 dB			

Limits CLAUSE 5.1.5 TABLE 2

Frequency range	9 kHz to 1 GHz	above 1 to 4 GHz or above 1 to 12.75 GHz, (clause 8.6.2)
Tx operating	0.25 µW (- 36.0 dBm)	1.00 µW (- 30.0 dBm)
Tx standby	2.0 nW (- 57.0 dBm)	20.0 nW (- 47.0 dBm)

TEST EQUIPMENT USED: 42, 146, 132, 142, 211, 212, 328, 75, 404

Ambient temperature: 21,9 °C Relative humidity: 46,1 % Date: 12.09.2005

TRANSMITTER SPURIOUS EMISSIONS (RADIATED) CLAUSE 8.6

Rated output power: 0,1 W.

FREQUENCY (MHz)	CHANNEL 1	FREQUENCY (MHz)	CHANNEL 2	REMARKS
Tx operating		Tx operating		
276,00	- 57,9 dBm	all 30 MHz - 1 GHz	< - 65,0 dBm	
others 30 MHz - 1 GHz	< - 65,0 dBm	all 1 GHz - 4 GHz	< - 55,0 dBm	
all 1 GHz - 4 GHz	< - 55,0 dBm			
Tx on standby		Tx on standby		
all 30 MHz - 1 GHz	< - 65,0 dBm	all 30 MHz - 1 GHz	< - 65,0 dBm	
all 1 GHz - 4 GHz	< - 55,0 dBm	all 1 GHz - 4 GHz	< - 55,0 dBm	
Measurement uncertainty	+ 3,4 dB - 4,4 dB			

LIMITS: CLAUSE 5.1.5 TABLE 3

Frequency range	30MHz to 1 GHz	above 1 to 4GHz
Tx operating	0.25 µW (-36,0 dBm)	1.00 µW (-30,0 dBm)
Tx standby	2.0 nW (-57,0 dBm)	20.0 nW (-47,0 dBm)

TEST EQUIPMENT USED: 42, 201, 205, 89, 176, 185, 417, 328, 301, 75, 404

Ambient temperature: 21,3 °C Relative humidity: 33,3 % Date: 13..09.2005

TRANSMITTER ATTACK TIME CLAUSE 8.8

Power level at which the measurement has been performed: 0,1 W

Measured the time after the carrier power exceeds – 50 dBc to the power – 1 dBc.

TIME CHARACTERISTIC	Channel		
	1	2	
Time relative to the power rise	—	—	
Time relative to the frequency behaviour	19,17 ms	19,72 ms	
Maximum of these times, i.e. attack time	19,17 ms	19,72 ms	
Measurement uncertainty	± 3.0 ms		

See clause 8.8.1 (ETS 300 113) for the definition and clause 8.10 (ETS 300 113), figures 12 and 13 for the graphs of transmitter attack time.

The plots of frequency and power versus time can be found in the test report sheets corresponding to clause 8.10.

See pages 13 and 15

LIMIT CLAUSE 5.1.7

The transmitter attack time shall not exceed: 25 ms

TEST EQUIPMENT USED: 42, 10, 62, 337, 314, 30, 328, 390, 100, 102, 301, 131, 75, 404

Ambient temperature: 21,3 °C Relative humidity: 33,3 % Date: 13..09.2005

TRANSMITTER RELEASE TIME CLAUSE 8.9

Power level at which the measurement has been performed: 0,1 W

The release time was measured between the power levels from - 3 dBc to - 50 dBc.

TIME CHARACTERISTIC	Channel		
	1	2	
Transmitter release time	1,64 ms	1,71 ms	
Measurement uncertainty	± 3.0		

See clause 8.9.1 (ETS 300 113) for the definition and clause 8.10 (ETS 300 113), figure 14 for the graph of the transmitter release time.

The plots of frequency and power versus time can be found in the test report sheets corresponding to Clause 8.10.

See pages 14 and 16

LIMIT CLAUSE 5.1.8

The transmitter release time shall not exceed: 20 ms

TEST EQUIPMENT USED: 42, 10, 62, 337, 314, 30, 328, 390, 100, 102, 301, 131, 75, 404

Ambient temperature: 21,3 °C Relative humidity: 33,3 % Date: 13..09.2005

TRANSIENT BEHAVIOUR OF THE TRANSMITTER CLAUSE 8.10

(TIME DOMAIN ANALYSIS OF POWER AND FREQUENCY)

Power level at which the measurement has been performed: 0,1 W

MEASUREMENT	Channel		
	1	2	
tp	0,25 ms	0,29 ms	
td	0,92 ms	0,80 ms	
Measurement uncertainty	± 3.0		

See pages 14 - 16

LIMIT CLAUSE 5.1.9.1

In case of equipment operating with channel separation of 12,5 kHz, the slopes of the plots “power as a function of time” corresponding to both attack and release times, shall be such that:

- tp: ≥ 0,10 ms, td: ≥ 0,10 ms, for attack and release time;
- between the Pc - 30 dB point and the Pc - 6 dB point, both in the case of attack and release time, the sign of the slope shall not change.

In case of equipment operating with channel separation of 20 kHz or 25 kHz, the slopes of the plots “power as a function of time” corresponding to both attack and release times, shall be such that:

- tp: ≥ 0,05 ms, td: ≥ 0,05 ms, for attack and release time;
- between the Pc - 30 dB point and the Pc - 6 dB point, both in the case of attack and release time, the sign of the slope shall not change.

TEST EQUIPMENT USED: 42, 10, 62, 337, 314, 30, 328, 390, 100, 102, 301, 131, 75, 404

Ambient temperature: 21,3 °C Relative humidity: 33,3 % Date: 13..09.2005

TRANSIENT BEHAVIOUR OF THE TRANSMITTER CLAUSE 8.10

(ADJACENT CHANNEL POWER TRANSIENT)

Power level at which the measurement has been performed: 0,1 W

Channel separation: 12,5 kHz

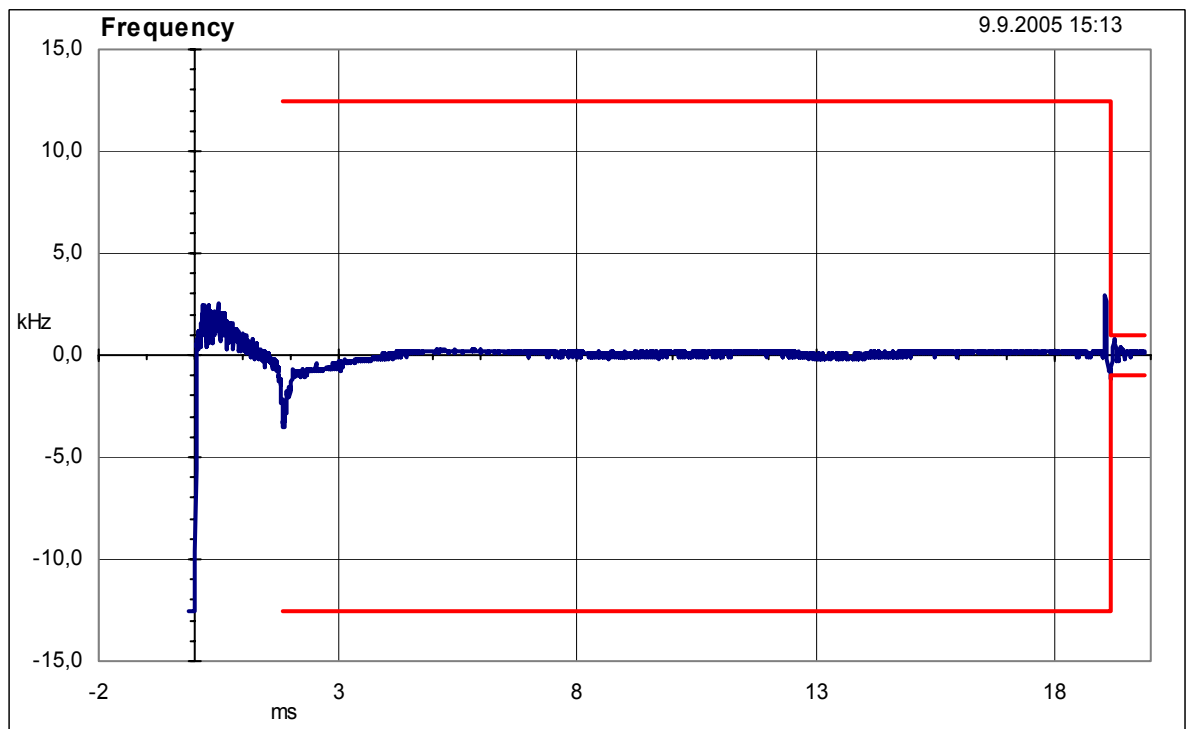
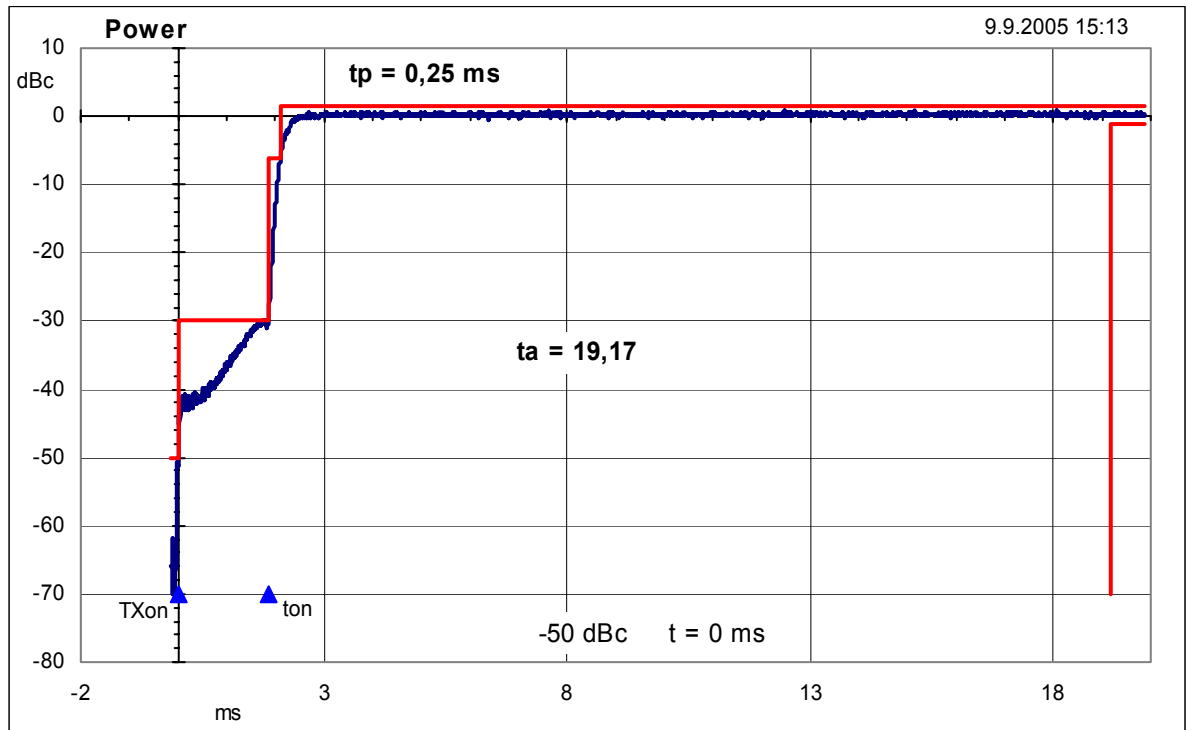
ADJACENT CHANNEL	BELOW CARRIER POWER (dBc)					
	Channel					
	1		2			
	TX on	TX off	TX on	TX off	TX on	TX off
+ 12,5 kHz	< - 53,5	< - 57,5	< - 52,5	< - 58,5		
- 12,5 kHz	< - 53,0	< - 59,5	< - 51,5	< - 61,0		
Measurement uncertainty (U95)	+ 1,4 dB, -1,6 dB					

LIMIT	CLAUSE 5.1.9.2	Ch. spacing 12.5 kHz: - 50 dBc (without the need to be below 2 µW) Ch. spacings 20.0/25.0 kHz: - 60 dBc (without the need to be below 2 µW)
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TEST EQUIPMENT USED: 42, 43, 10, 314, 328, 390, 146, 132, 335, 334, 218, 59, 75, 404

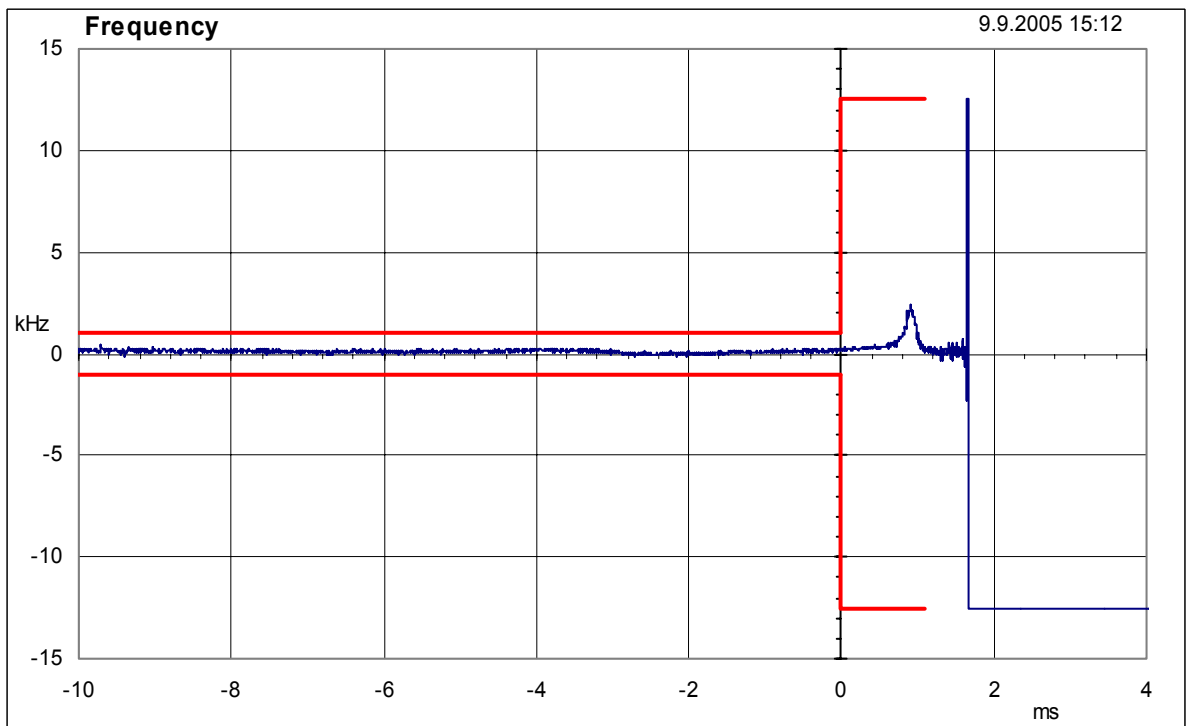
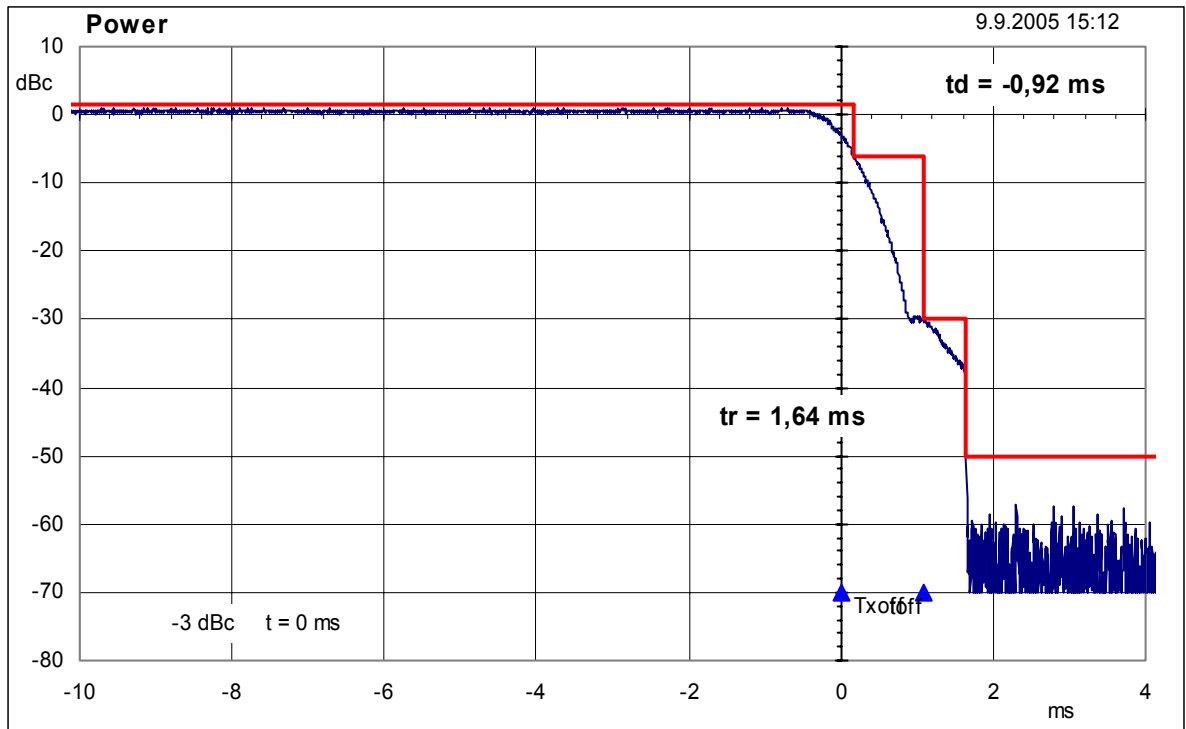
5.1.7 Transmitter attack time (138 MHz)
(Transient behaviour of the transmitter switch-on)

0,1 W



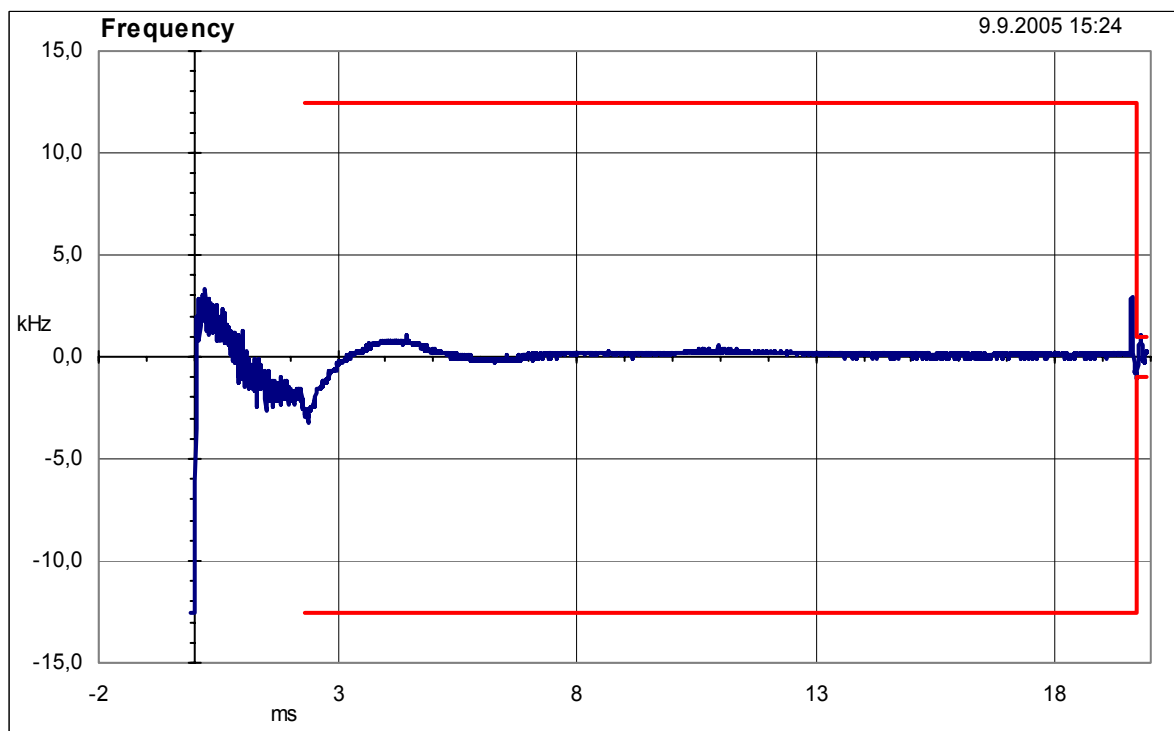
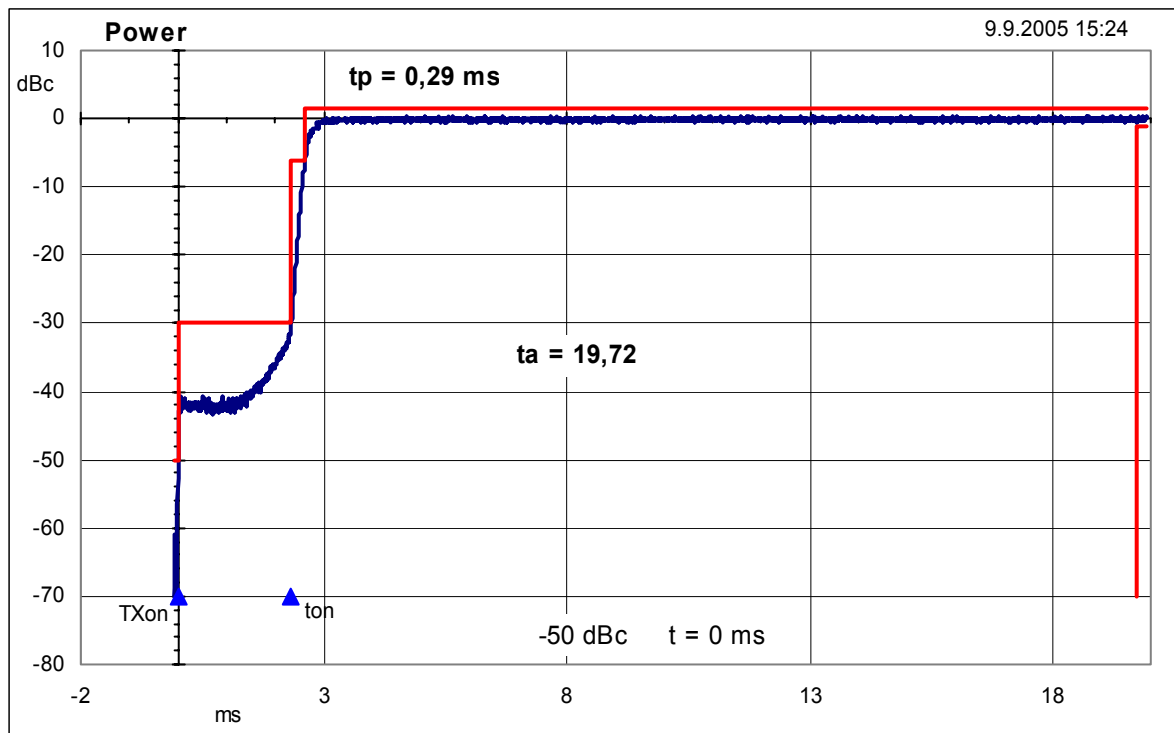
5.1.8 Transmitter release time (138 MHz)
(Transient behaviour of the transmitter switch-off)

0,1 W



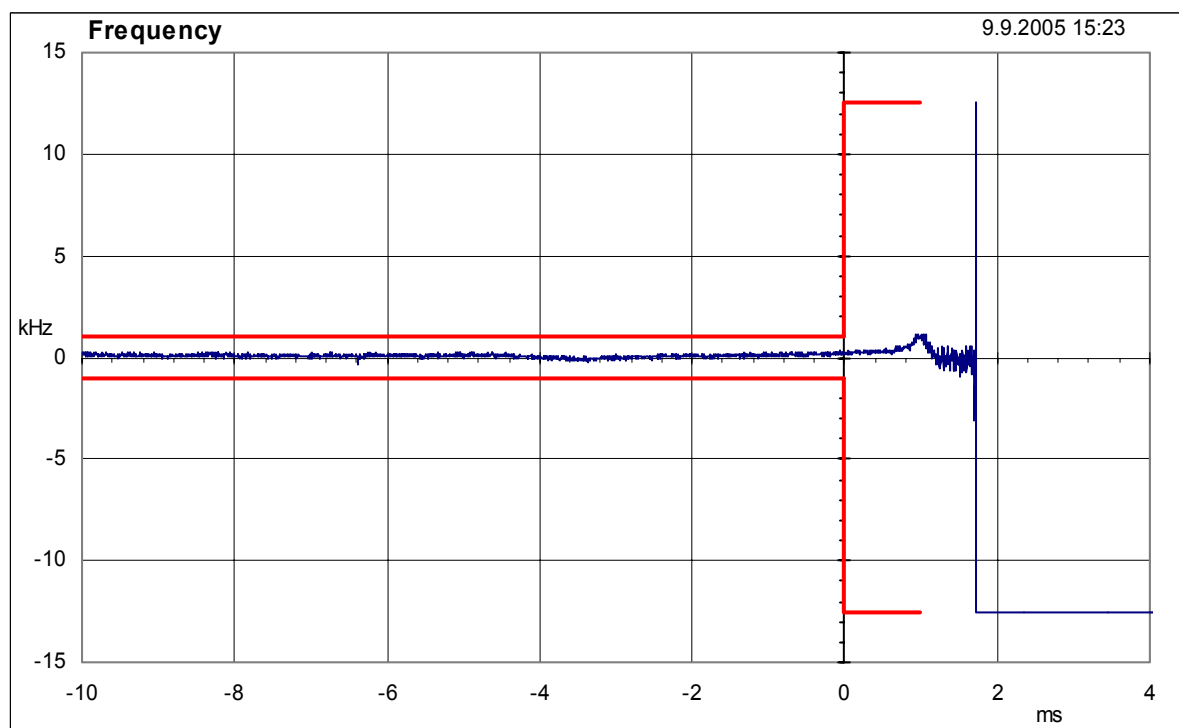
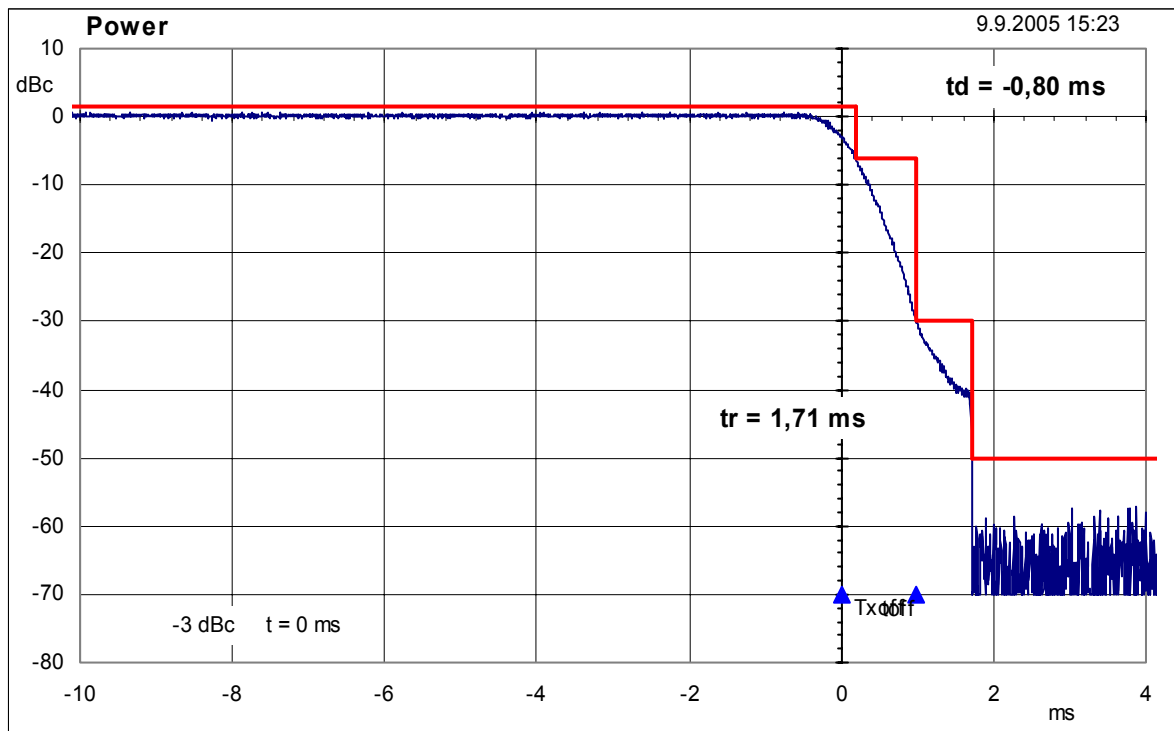
5.1.7 Transmitter attack time (160 MHz)
(Transient behaviour of the transmitter switch-on)

0,1 W



5.1.8 Transmitter release time (160 MHz) (Transient behaviour of the transmitter switch-off)

0,1 W



The test results of the transmitter
(Set of the rated output power: 1W)

Ambient temperature: 21,8 °C Relative humidity: 45,6 % Date: 14.09.2005

TRANSMITTER FREQUENCY ERROR CLAUSE 8.1

Rated output power: 1 W.

TEST CONDITIONS		FREQUENCY ERROR (Hz)			
		Channel			
		1	2	3	4
Tnom	Vnom	+ 4 Hz	- 96 Hz		
Tmin	Vmin	- 229 Hz	- 313 Hz		
	Vmax	- 214 Hz	- 309 Hz		
Tmax	Vmin	+ 43 Hz	- 78 Hz		
	Vmax	+ 56 Hz	- 60 Hz		
Maximum freq. error. (Hz)		- 229 Hz	- 313 Hz		
Measurement uncertainty (U95)		6,1 x 10 ⁻⁸			

LIMITS CLAUSE 5.1.1

CHANNEL SPACING (kHz)	FREQUENCY RANGES				
	Below 47MHz	Above 47 to 137MHz	Above 137 to 300MHz	Above 300 to 500MHz	Above 500 to 1000MHz
	LIMITS kHz				
12,5	± 0,60	± 1,00	± 1,00 (B) ± 1,50 (M)	± 1,00 (B) ± 1,50 (M) (note)	No value specified
20,0 / 25,0	± 0,60	± 1,35	± 2,00	± 2,00 (note)	± 2,50 (note)

NOTE: For handportable stations having integral power supplies, these limits only apply to the reduced extreme temperature range 0 °C to + 30 °C.

However for the full extreme temperature conditions (subclause 6.4.1), exceeding the reduced extreme temperature range above, the following frequency error limits apply:

- ± 2.50 kHz between 300 MHz and 500 MHz;
- ± 3.50 kHz between 500 MHz and 1000 MHz.

B = BASE STATION

M = MOBILE STATION

TEST EQUIPMENT USED: 53, 328, 307, 563, 146, 302, 76, 404

Ambient temperature: 21,8 °C Relative humidity: 45,6 % Date: 14.09.2005

TRANSMITTER CARRIER OUTPUT POWER (CONDUCTED) CLAUSE 8.2

Rated output power: 1 W.

TEST CONDITIONS		TRANSMITTER POWER (Watts)			
		Channel			
		1	2	3	4
Tnom	Vnom	0,92	0,95		
Tmin	Vmin	1,04	1,04		
	Vmax	1,04	1,04		
Tmax	Vmin	0,83	0,82		
	Vmax	0,81	0,81		
Variation in output power under normal test conditions		- 0,36 dB	- 0,22 dB		
Variation in output power under extreme test conditions		- 0,92 to + 0,17 dB	- 0,92 to + 0,17 dB		
Measurement uncertainty		± 0.75 dB			

LIMITS CLAUSE 5.1.2

Under normal test conditions	± 1.5 (dB)
Under extreme test conditions	+ 2.0 (dB), - 3.0 (dB)

TEST EQUIPMENT USED: 59, 218, 328, 307, 563, 146, 302, 76, 404

Ambient temperature: 21,3 °C Relative humidity: 33,3 % Date: 13..09.2005

TRANSMITTER ADJACENT CHANNEL POWER CLAUSE 8.5

Modulation bit rate: 9600 bps

Channel separation 12,5 kHz

Rated output power: 1 W.

ADJACENT CHANNEL	BELOW CARRIER POWER (dBc)			
	Channel			
	1	2	3	4
+ 12,5 kHz	- 69,6	- 69,1		
- 12,5 kHz	- 67,6	- 66,8		
Measurement uncertainty (U95)	± 1.6 dB			

LIMIT CLAUSE 5.1.4	20.0 kHz & 25.0 kHz channel spacing: 70dB below carrier power 12.5 kHz channel spacing: 60dB below carrier power
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TEST EQUIPMENT USED: 337, 328, 390, 314, 75, 404

Ambient temperature: 21,9 °C Relative humidity: 46,1 % Date: 12.09.2005

TRANSMITTER SPURIOUS EMISSIONS (RADIATED) CLAUSE 8.6

Rated output power: 1 W.

FREQUENCY (MHz)	CHANNEL 1	FREQUENCY (MHz)	CHANNEL 2	REMARKS
Tx operating		Tx operating		
276,00	- 58,6 dBm	320,00	- 61,5 dBm	
others 30 MHz - 1 GHz	< - 65,0 dBm	others 30 MHz - 1 GHz	< - 65,0 dBm	
all 1 GHz - 4 GHz	< - 55,0 dBm	all 1 GHz - 4 GHz	< - 55,0 dBm	
Tx on standby		Tx on standby		
all 30 MHz - 1 GHz	< - 65,0 dBm	all 30 MHz - 1 GHz	< - 65,0 dBm	
all 1 GHz - 4 GHz	< - 55,0 dBm	all 1 GHz - 4 GHz	< - 55,0 dBm	
Measurement uncertainty	+ 3,4 dB - 4,4 dB			

LIMITS: CLAUSE 5.1.5 TABLE 3

Frequency range	30MHz to 1 GHz	above 1 to 4GHz
Tx operating	0.25 µW (-36,0 dBm)	1.00 µW (-30,0 dBm)
Tx standby	2.0 nW (-57,0 dBm)	20.0 nW (-47,0 dBm)

TEST EQUIPMENT USED: 42, 201, 205, 89, 176, 185, 417, 328, 301, 75, 404

Ambient temperature: 21,3 °C Relative humidity: 33,3 % Date: 13..09.2005

TRANSMITTER ATTACK TIME CLAUSE 8.8

Power level at which the measurement has been performed: 1 W

Measured the time after the carrier power exceeds – 50 dBc to the power – 1 dBc.

TIME CHARACTERISTIC	Channel		
	1	2	
Time relative to the power rise	—	—	
Time relative to the frequency behaviour	19,06 ms	19,09 ms	
Maximum of these times, i.e. attack time	19,06 ms	19,09 ms	
Measurement uncertainty	± 3.0 ms		

See clause 8.8.1 (ETS 300 113) for the definition and clause 8.10 (ETS 300 113), figures 12 and 13 for the graphs of transmitter attack time.

The plots of frequency and power versus time can be found in the test report sheets corresponding to clause 8.10.

See pages 27 and 29

LIMIT CLAUSE 5.1.7

The transmitter attack time shall not exceed: 25 ms

TEST EQUIPMENT USED: 42, 10, 62, 337, 314, 30, 328, 390, 100, 102, 301, 131, 75, 404

Ambient temperature: 21,3 °C Relative humidity: 33,3 % Date: 13..09.2005

TRANSMITTER RELEASE TIME CLAUSE 8.9

Power level at which the measurement has been performed: 1 W

The release time was measured between the power levels from - 3 dBc to - 50 dBc.

TIME CHARACTERISTIC	Channel		
	1	2	
Transmitter release time	1,62 ms	1,70 ms	
Measurement uncertainty	± 3.0		

See clause 8.9.1 (ETS 300 113) for the definition and clause 8.10 (ETS 300 113), figure 14 for the graph of the transmitter release time.

The plots of frequency and power versus time can be found in the test report sheets corresponding to Clause 8.10.

See pages 28 and 30

LIMIT CLAUSE 5.1.8

The transmitter release time shall not exceed: 20 ms

TEST EQUIPMENT USED: 42, 10, 62, 337, 314, 30, 328, 390, 100, 102, 301, 131, 75, 404

Ambient temperature: 21,3 °C Relative humidity: 33,3 % Date: 13..09.2005

TRANSIENT BEHAVIOUR OF THE TRANSMITTER CLAUSE 8.10

(TIME DOMAIN ANALYSIS OF POWER AND FREQUENCY)

Power level at which the measurement has been performed: 1 W

MEASUREMENT	Channel		
	1	2	
tp	0,46 ms	0,41 ms	
td	0,67 ms	0,74 ms	
Measurement uncertainty	± 3.0		

See pages 13 - 16

LIMIT CLAUSE 5.1.9.1

In case of equipment operating with channel separation of 12,5 kHz, the slopes of the plots “power as a function of time” corresponding to both attack and release times, shall be such that:

- tp: ≥ 0,10 ms, td: ≥ 0,10 ms, for attack and release time;
- between the Pc - 30 dB point and the Pc - 6 dB point, both in the case of attack and release time, the sign of the slope shall not change.

In case of equipment operating with channel separation of 20 kHz or 25 kHz, the slopes of the plots “power as a function of time” corresponding to both attack and release times, shall be such that:

- tp: ≥ 0,05 ms, td: ≥ 0,05 ms, for attack and release time;
- between the Pc - 30 dB point and the Pc - 6 dB point, both in the case of attack and release time, the sign of the slope shall not change.

TEST EQUIPMENT USED: 42, 10, 62, 337, 314, 30, 328, 390, 100, 102, 301, 131, 75, 404

Ambient temperature: 21,3 °C Relative humidity: 33,3 % Date: 13..09.2005

TRANSIENT BEHAVIOUR OF THE TRANSMITTER CLAUSE 8.10

(ADJACENT CHANNEL POWER TRANSIENT)

Power level at which the measurement has been performed: 1 W

Channel separation: 12,5 kHz

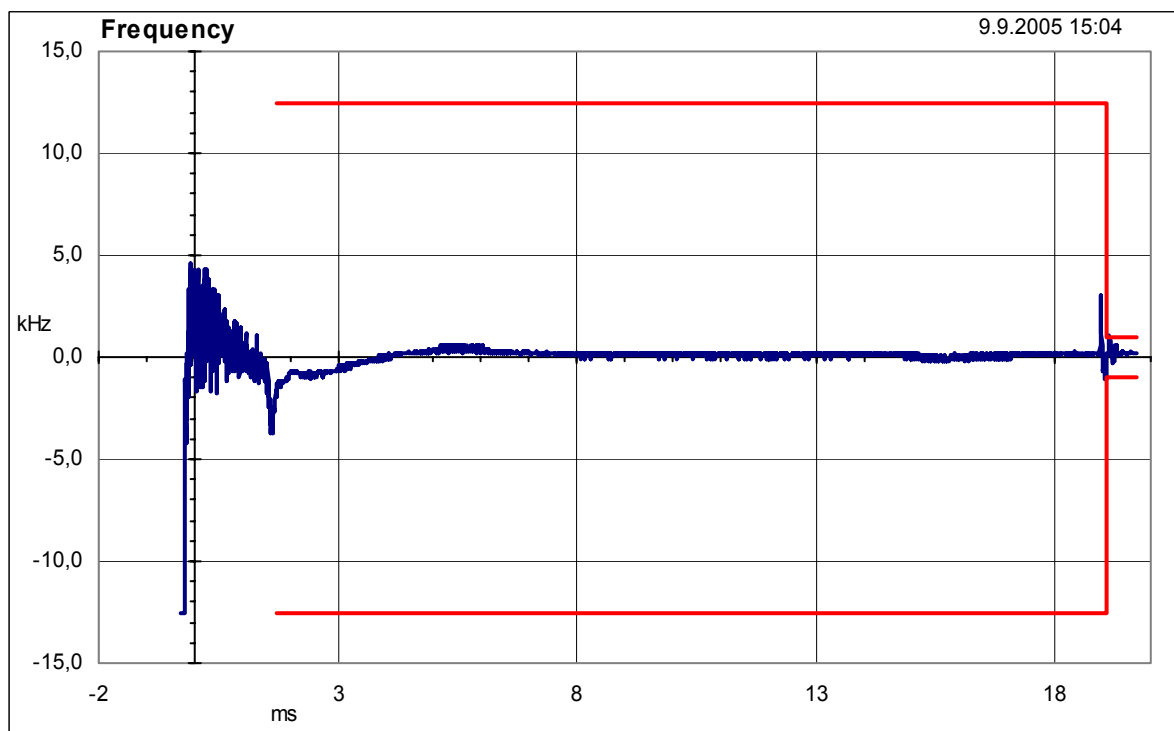
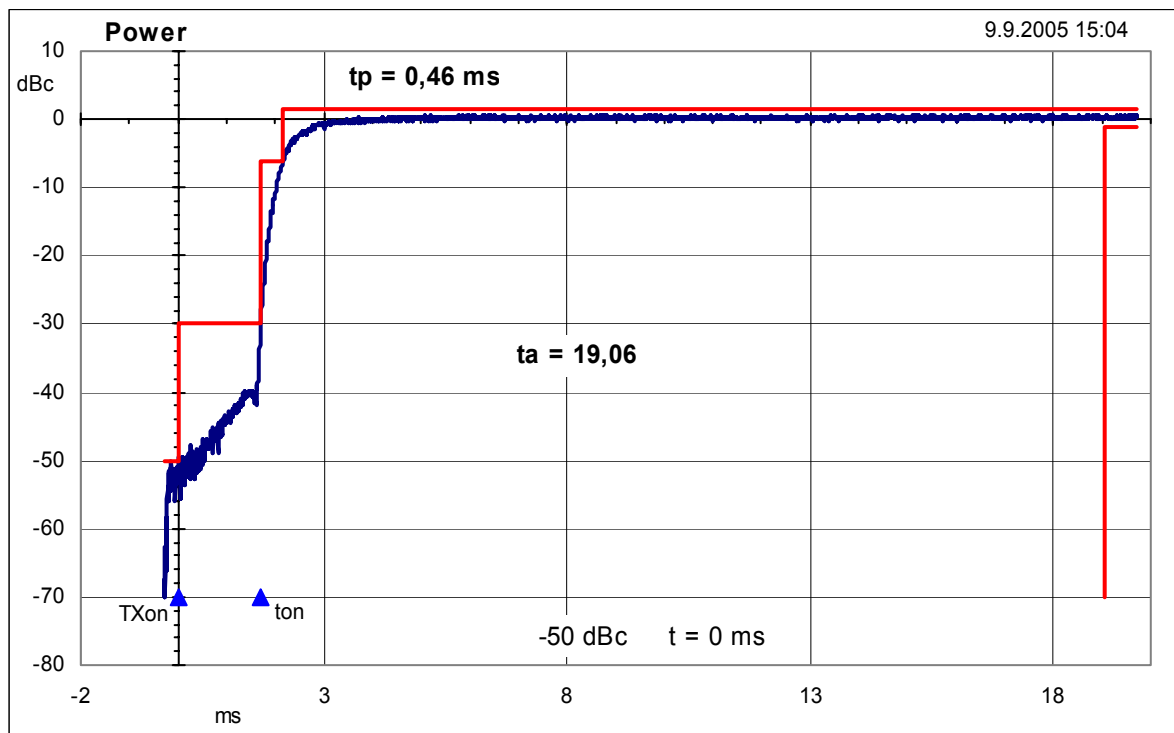
ADJACENT CHANNEL	BELOW CARRIER POWER (dBc)					
	Channel					
	1		2			
	TX on	TX off	TX on	TX off	TX on	TX off
+ 12,5 kHz	< - 60,5	< - 64,0	< - 60,0	< - 62,5		
- 12,5 kHz	< - 60,0	< - 64,0	< - 59,0	< - 62,5		
Measurement uncertainty (U95)	+ 1,4 dB, -1,6 dB					

LIMIT CLAUSE 5.1.9.2	Ch. spacing 12.5 kHz: - 50 dBc (without the need to be below 2 µW) Ch. spacings 20.0/25.0 kHz: - 60 dBc (without the need to be below 2 µW)
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TEST EQUIPMENT USED: 42, 43, 10, 314, 328, 390, 146, 132, 335, 334, 218, 59, 75, 404

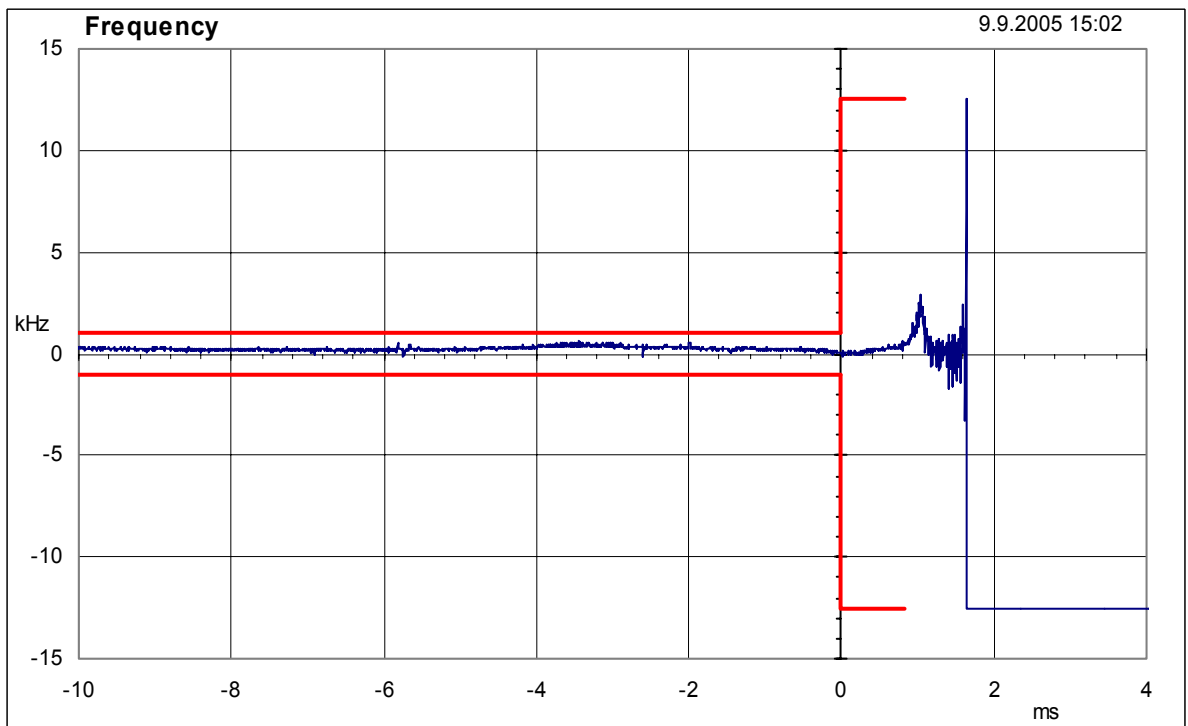
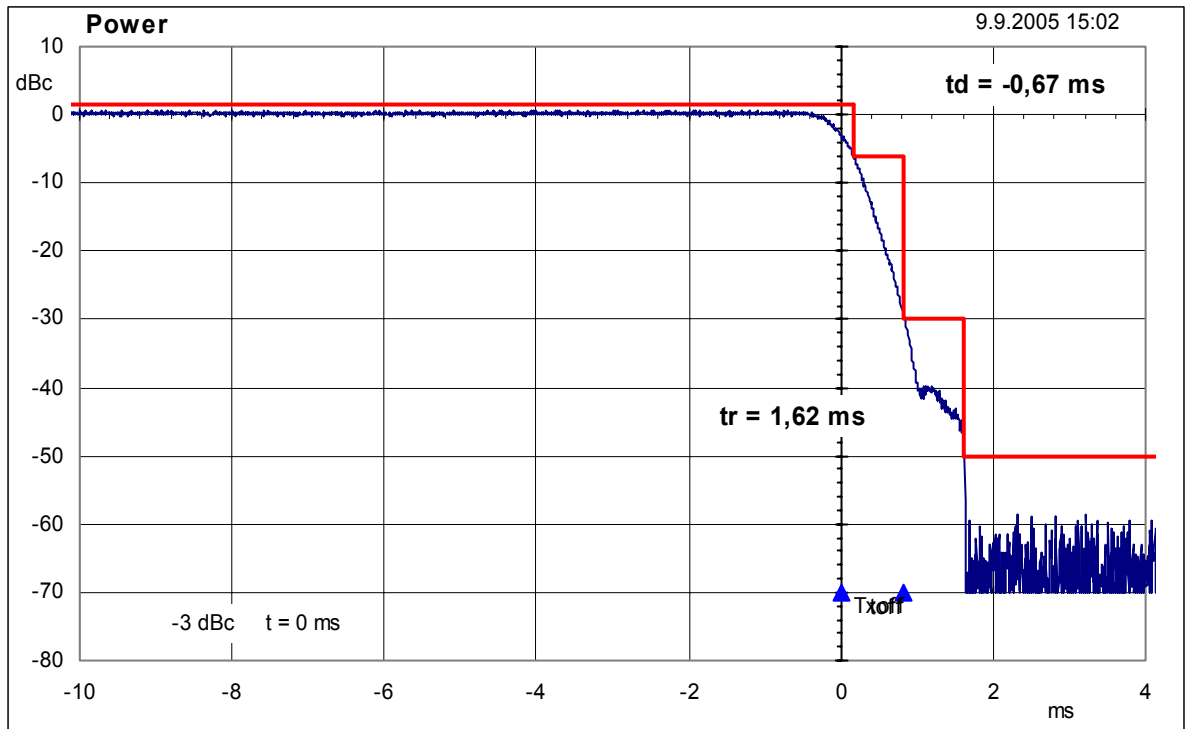
5.1.7 Transmitter attack time (138 MHz) (Transient behaviour of the transmitter switch-on)

1 W



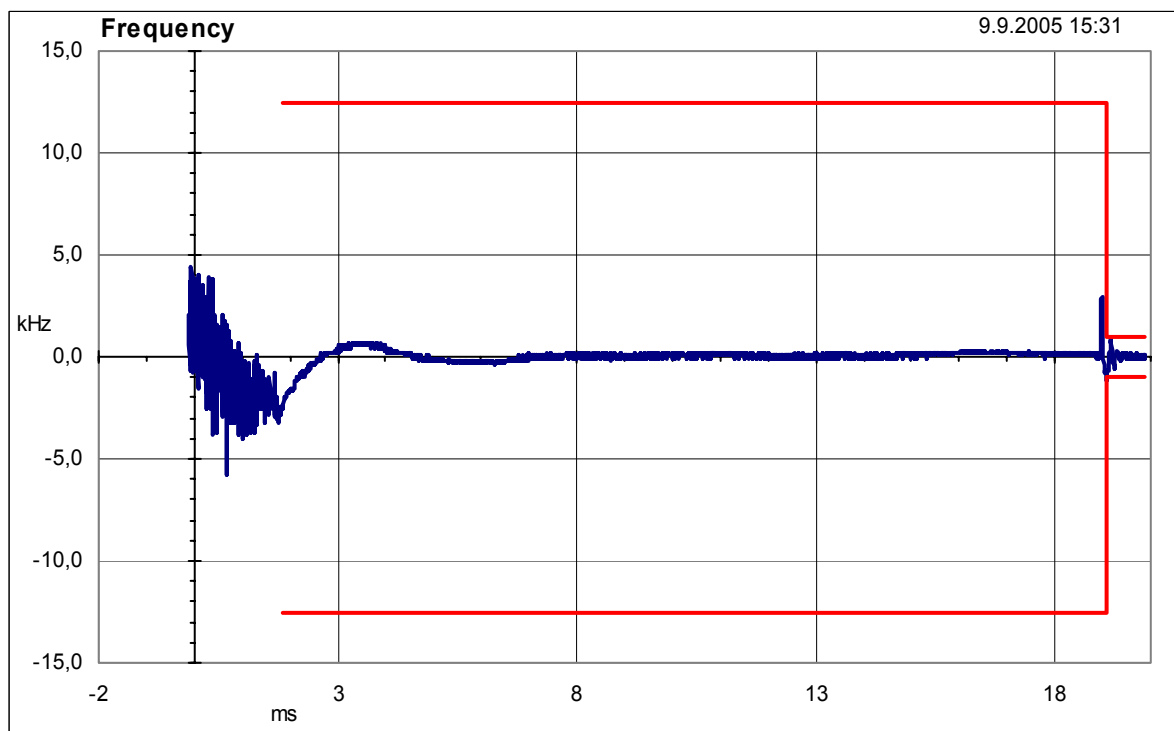
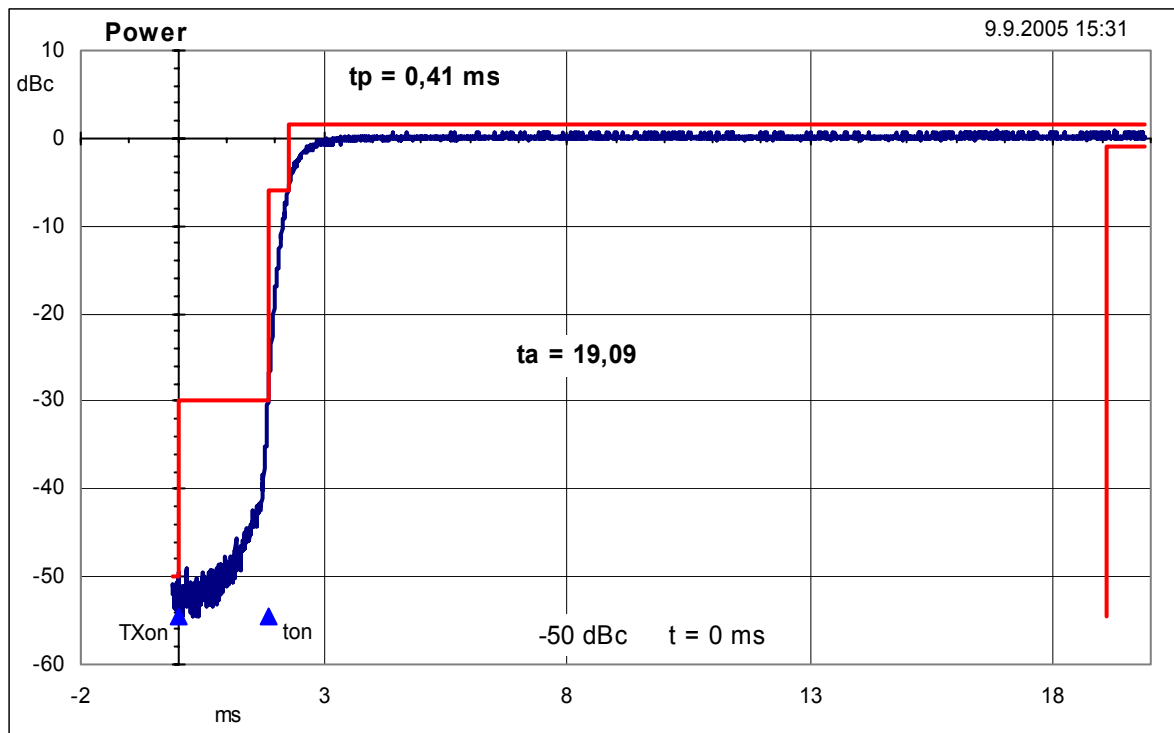
5.1.8 Transmitter release time (138 MHz)
(Transient behaviour of the transmitter switch-off)

1 W



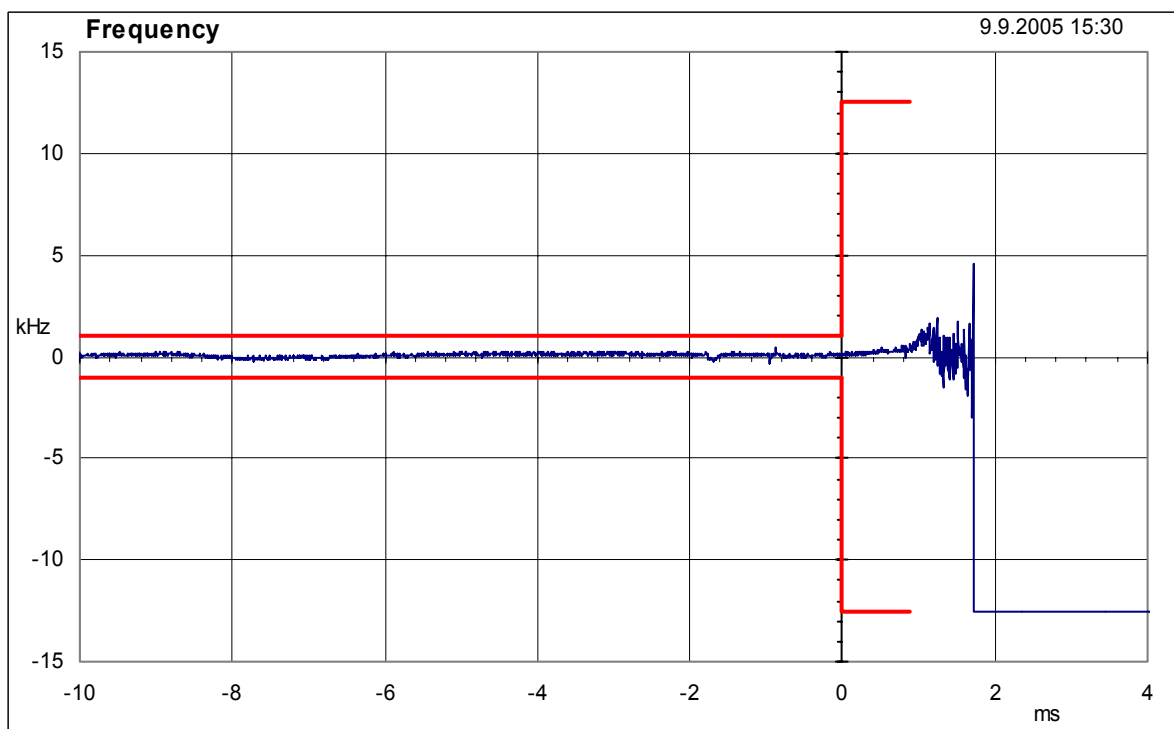
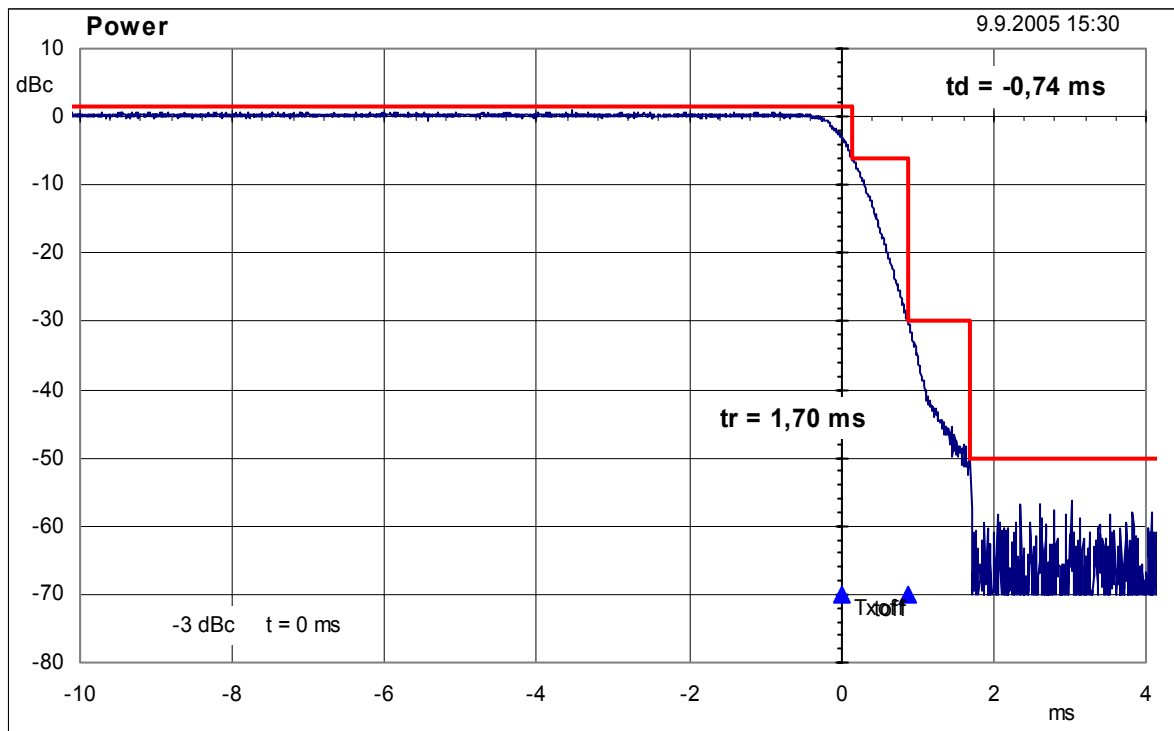
5.1.7 Transmitter attack time (160 MHz)
(Transient behaviour of the transmitter switch-on)

1 W



5.1.8 Transmitter release time (160 MHz) (Transient behaviour of the transmitter switch-off)

1 W









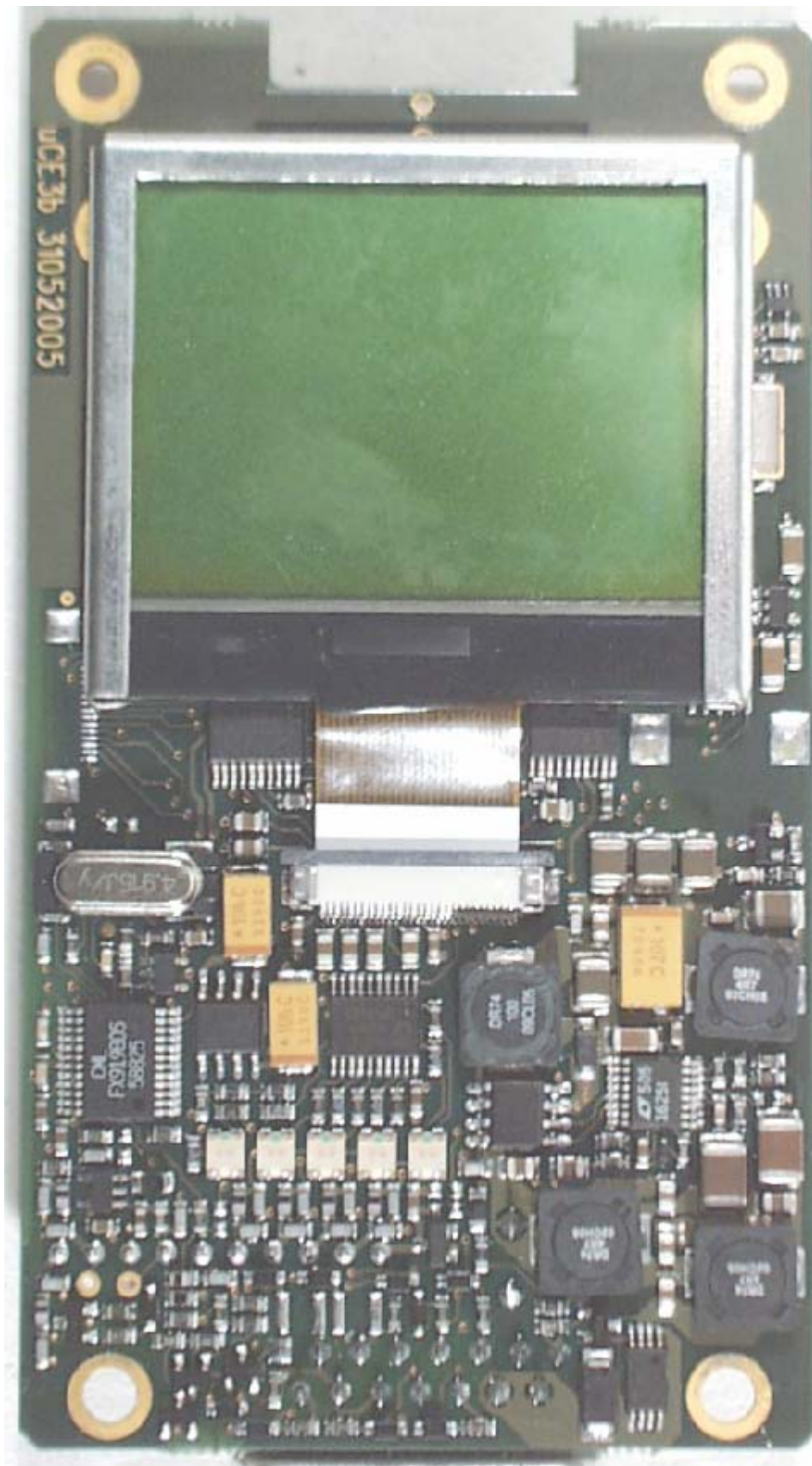












Nemko

51886

List of measuring equipment:

No.	Equipment	Type	Manufacturer	Serial Number
9	Modulation analyzer	8901B	Hewlett Packard	2718A01220
10	Oscilloscope	9400A	LeCroy	8878
33	RF generator	8642B	Hewlett Packard	2521A00232
41	Spectrum analyzer	8566B	Hewlett Packard	2005A01452
43	Spectrum analyzer	8568B	Hewlett Packard	2039A01256
45	Spectrum analyzer	FSBS	Rohde & Schwarz	862563/010
48	Counter	351DCCN150	EiP Incorporated	00369
53	Counter	1999	Racal-Dana	1321
59	Power meter	435A	Hewlett Packard	1430000505
62	Audio amplifier	PRL ?	Self made	
72	Power supply	PRL 722	Self made	
76	Power supply	B32-30R	Oltronix	537
89	Antenna	3147	EMCO	9202-1078
101	Hybrid	H 9	Anzac	
102	Hybrid	H 9	Anzac	
133	Termination 50□	370 BNM	Narda	
142	Notch Filter	TTR - 190 - 3EE	Telonic	00407 - 8
146	Dual directional coupler	778D	Hewlett Packard	1144A02333
157	Temp. test chamber	VMT 04/240	Vötsch	31884
176	Anechoic chamber	888 cm x 585 cm x 416 cm	length of absorber 66 cm	
185	Antenna	PRL LogPer	Self made	1A93
201	RF-Generator	2042	Marconi	119571/062
205	RF-Amplifier	ZHL-1042J	Mini-Circuits	012288-11
211	Bandpass Filter	TTF 1500-5-5EE	Telonic Berkeley Inc	93037-3
212	Bandpass Filter	TTF 3000-5-5EE	Telonic Berkeley Inc	93039-1
218	Power sensor	HP 8485A	Hewlett Packard	2942A08711
230	Thermometer	MT 120 KC	Eirelec Ltd.	0894/83
301	Termination	370 BNM	Narda	-
314	RF generator	HP 8642B	Hewlett Packard	2535A00464
327	Power attenuator	765-20	Narda	-
330	Power attenuator	BN 745394	Spinner	36009
334	IF-filter	10.7MHz/12.5kHz	Ultracom Oy	-
335	Mixer	ZFM-150	Mini-Circuits	-
341	Multimeter	Fluke 87	Fluke	593100386
393	RF attenuator PAD	1A (10dB)	Weinschel	
417	Antenna, bilog	CBL 6141	Chase	4028
489	RF attenuator PAD	757 C	Narda	-