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13-83

issue test report consist of

26 Pages

Page 1 (26)

Akkreditiertes Prüflaboratorium

DAR-Registriernummer:

TTI-P-066/94-40 vom 02.12.96

Test report no.: 523-13g/00024/98

FCC 47 Part 74.802

d.a.i.sy MSA VHF

1.2 Testing laboratory

Regulierungsbehörde für Telekommunikation und Post

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Deutschland

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Telefax : + 49 681 598 - 1600

E-mail : poststelle@regtp.de

Internet : http://www.regtp.de

Accredited testing laboratory

DAR-registration number : TTI-P-G-066/94-40 vom 02.12.96

1.3 Details of applicant

Name : mtc maintronic GmbH

Street : Carl-Zeiss-Str. 10

City : D-97424 Schweinfurt

Country : Germany

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Telefax : +49 9721 766518

Contact : Mr. G. Werner

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1.4 Application details

Date of receipt of application : 23.10.97

Date of receipt of test item : 27.11.98

Date of test : 02.02.98

1.5 Test item

Type of equipment : Wireless Transmitter

Type designation : d.a.i.sy MSA VHF

Manufacturer : applicant

Street :

City :

Country :

Serial number : -.-

Additional informations: :

Frequency : 185.750 MHz

Modulation : 100KF3E

Number of channels : 1

Antenna : integral antenna

Power supply : 9V D.C.

Type of equipment : not applicable

Unmodulated carrier : not applicable

1.6 Test standards

CFR 47, Part 74 Subpart H

TEST REPORT REFERENCE
LIST OF MEASUREMENTS

PARAMETER TO BE MEASURED		
Transmitter parameters		
Effective radiated power - Maximum	Frequency stability	7
	Temperature variation	8
	Characteristic of the audio modulation circuitry	9
	Occupied bandwidth	10
	Spurious emissions	12
Test equipment listing		15
Photographs of the equipment		16
		18

Equipment under test : d.a.i.sy MSA VHF

Ambient temperature : 23°C

Relative humidity : 36,0%

EFFECTIVE RADIATED POWER

FCC Rule Part 74.861

Polarisation of the measurements for the larger power level .: vertical

TEST CONDITIONS		TRANSMITTER POWER (mW)		
Frequency (MHz)		185.750		
T _{nom} (23)°C	V _{nom} (9.0)V	0,813		
Maximum deviation from output power under extreme test conditions (dBc)		0,8		
Measurement uncertainty		±3dB		

LIMIT

FCC Rule Part 74.861

Frequency range MHz	Power level radiated mW
54-72, 76-88, 174-216	50
470-608, 614-806	250

REFERENCE NUMBER(S) OF TEST EQUIPMENT USED
(for reference numbers see test equipment listing)

Equipment under test : d.a.i.sy MSA VHF

Ambient temperature : 23°C

Relative humidity : 36,0%

FREQUENCY STABILITY

TEST CONDITIONS		FREQUENCY (MHz)		
Theoretical Frequencies (MHz)		185.750		
T _{min} (23)°C	V _{min} (7.65)V	185.74946		
	V _{max} (10.35)V	185.75463		
Limit (MHz)		184.82125 to 186.67875		
Measurement uncertainty		< ± 10 ⁻⁷		

Equipment under test : d.a.i.sy MSA VHF

Ambient temperature : 23°C

Relative humidity : 36,0%

TEMPERATURE VARIATION :

TEST CONDITIONS	FREQUENCY (MHz)		
Theoretical Frequencies (MHz)	185.750		
Temperature(° Celsius)			
-30	185.76178		
-20	185.76066		
-10	185.75928		
0.0	185.75758		
+10	185.75564		
+20	185.75372		
+30	185.75176		
+40	185.74986		
+50	185.74864		
Limit (MHz)	184.82125 to 186.67875		
Measurement uncertainty	$< \pm 10^{-7}$		

Equipment under test : d.a.i.sy MSA VHF

Ambient temperature : 23°C

Relative humidity : 36,0%

CHARACTERISTICS OF THE AUDIO MODULATION CIRCUITRY

FCC Rule Part 74 Sec. 2.987

Frequency: 185.750 MHz

Modulation Frequency (Hz)	Carrier Deviation (kHz)	
	Modulation Input Level	
	50 mV _{rms}	100 mV _{rms}
100	23.1	28.0
200	24.0	27.4
300	25.1	27.9
400	25.3	28.5
500	26.0	28.3
600	26.3	28.3
700	26.4	28.3
800	26.6	28.6
900	26.6	28.2
1000	26.6	28.2
1500	27.0	27.8
2000	27.3	28.4
2500	27.8	27.9
3000	28.0	27.9
3500	27.6	28.0
4000	27.4	28.4
4500	27.4	28.5
5000	27.6	28.9
5500	27.5	28.6
6000	27.7	28.9
6500	27.5	29.0
7000	27.2	29.4
7500	26.7	28.7
8000	26.6	28.9

Modulation Frequency (Hz)	Carrier Deviation (kHz)	
	Modulation Input Level	
	50 mV _{rms}	100 mV _{rms}
8500	26.8	29.9
9000	27.0	29.5
9500	27.6	29.6
10000	28.5	28.8
10500	28.7	28.1
11000	29.0	27.5
11500	29.0	30.2
12000	28.9	31.4
12500	28.0	32.7
13000	28.0	33.1
13500	27.7	33.1
14000	27.5	33.1
14500	27.2	32.9
15000	26.8	32.5
15500	26.3	32.2
16000	26.0	31.8
16500	25.5	31.4
17000	25.3	31.1
17500	25.4	30.5
18000	25.8	29.7
18500	26.0	30.8
19000	25.9	31.1
19500	25.9	30.6
20000	26.6	30.0

Equipment under test : d.a.i.sy MSA VHF

Ambient temperature : 23°C

Relative humidity : 36,0%

CHARACTERISTICS OF THE AUDIO MODULATION CIRCUITRY

FCC Rule Part 74 Sec. 2.987(d)

Test: Low-Pass Filter Characterization

Frequency : 185.750 MHz

Modulation Input Level (mV)	Carrier Frequency Deviation (kHz)		
	Modulation Input Frequency		
	2500 Hz	5000 Hz	10000 Hz
1	19.0	18.4	19.2
2	19.0	19.1	20.3
3	19.0	19.6	20.9
4	20.2	20.5	21.9
5	20.8	21.0	22.6
6	20.9	21.7	23.2
7	20.9	22.2	24.3
8	21.5	22.9	25.2
9	21.5	23.6	25.6
10	22.3	23.9	25.7
20	24.7	25.3	29.0
30	26.1	26.5	28.6
40	26.5	27.9	28.6
50	27.5	27.8	28.6
60	27.8	27.8	29.8
70	27.6	28.0	27.7
80	27.9	28.4	27.6
90	27.8	28.7	28.2
100	27.7	28.7	29.0

Equipment under test : d.a.i.sy MSA VHF

Ambient temperature : 23°C

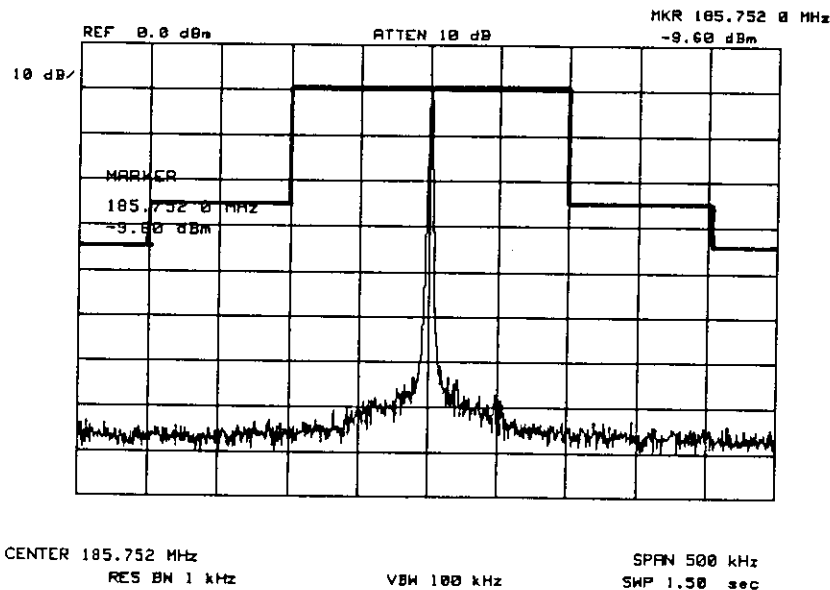
Relative humidity : 36,0%

OCCUPIED BANDWIDTH

FCC Rule Part 74 Sec. 2.989

Unmodulated Carrier

Frequency: 185.750 MHz



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

Equipment under test : d.a.i.sy MSA VHF

Ambient temperature : 23°C

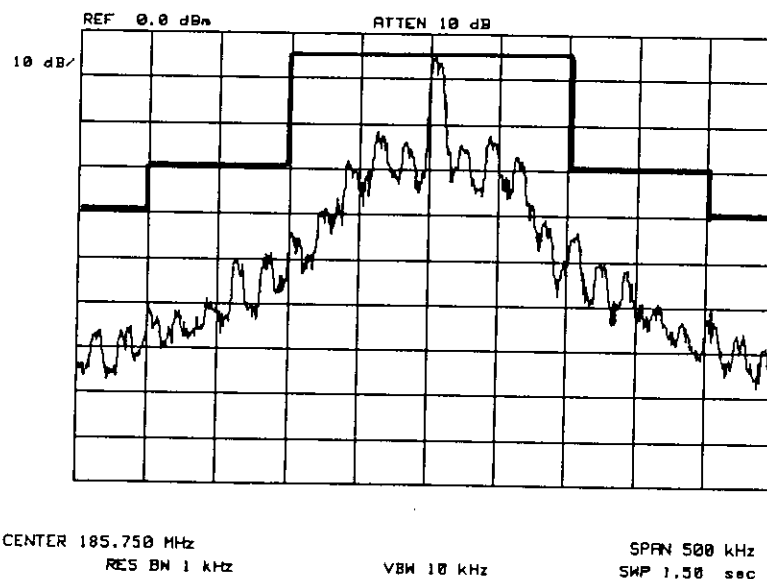
Relative humidity : 36,0%

OCCUPIED BANDWIDTH

FCC Rule Part 74 Sec. 2.989(c)(1)

50% Modulation

Frequency: 185.750 MHz



Equipment under test : d.a.i.sy MSA VHF

Ambient temperature : 23°C

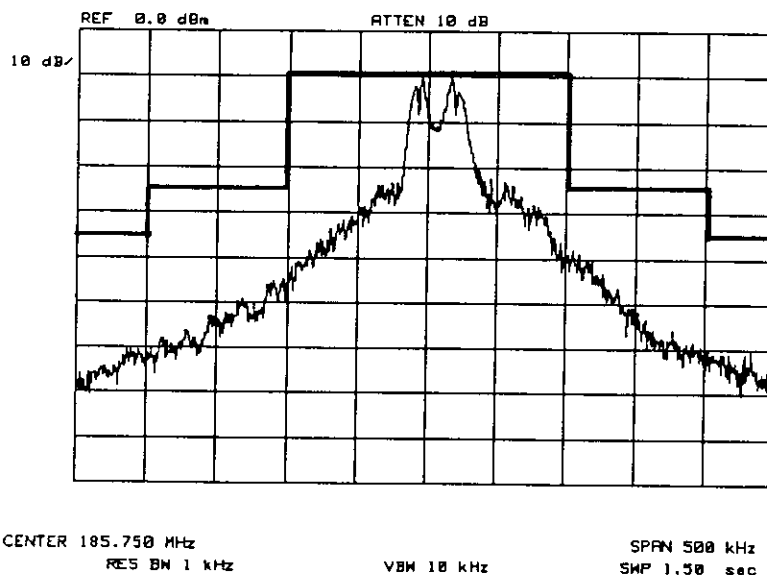
Relative humidity : 36,0%

OCCUPIED BANDWIDTH

FCC Rule Part 74 Sec. 2.989(E)(3) / (6)

85% Modulation

Frequency: 185.750 MHz



REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

01 ; 02 ; 05

Equipment under test : d.a.i.sy MSA VHF

Ambient temperature : 23°C

Relative humidity : 36,0%

RADIATED EMISSIONS**FCC Rule Part 74 subpart H**

Power level at which the measurement has been performed : -0,9 dBm / 0,813 mW

Transmitter operating

SPURIOUS EMISSIONS LEVEL (dBm)								
185.750 MHz								
f (MHz)	Band- width (kHz)	Level (dBm)	f (MHz)	Band- width (kHz)	Level (dBm)	f (MHz)	Band- width (kHz)	Level (dBm)
37.51	100	-66.2						
56.27	100	-65.8						
206.03	100	-66.0						
223.44	100	-66.7						
Measurement uncertainty			± 3dB					

Bandwidth (kHz); this refers to the bandwidth of the measurement receiver

Limits**FCC Rule Part 74.861(e)(6)**

f ± 100 kHz to f ± 200 kHz	f ± 200 kHz to f ± 500 kHz	f ± 500 kHz
25 dBc	35 dBc	-43 +10 log₁₀(mean output power in watts) dB

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
01	Spectrum Analyzer	8566 A	Hewlett-Packard	1925A00257
02	Analyzer Display	8566 A	Hewlett-Packard	1925A00860
03	Oscilloscope	7633	Tektronix	230054
04	Radio Analyzer	CMTA 54	Rohde & Schwarz	894 043/010
05	System Power Supply	6038 A	Hewlett-Packard	2848A07027
06	Signal Generator	8111 A	Hewlett-Packard	2215G00867
07	Signal Generator	8662 A	Hewlett-Packard	2224A01012
08	Funktionsgenerator	AFGU	Rohde & Schwarz	862 480/032
09	Regeltrenntrafo	MPL	Erfi	91350
10	Netznachbildung	NNLA 8120	Schwarzbeck	8120331
11	Relais-Matrix	PSU	Rohde & Schwarz	893 285/020
12	Power-Meter	436 A	Hewlett-Packard	2101A12378
13	Power-Sensor	8484 A	Hewlett-Packard	2237A10156
14	Power-Sensor	8482 A	Hewlett-Packard	2237A00616
15	Modulationsmeter	9008	Racal-Dana	2647
16	Frequenzzähler	5340 A	Hewlett-Packard	1532A03899
17	Absorber Schirmkabine	---	MWB	87400/002
18	Spectrum Analyzer	85660 B	Hewlett-Packard	2747A05306
19	Analyzer Display	85662 A	Hewlett-Packard	2816A16541
20	Quasi Peak Adapter	85650 A	Hewlett-Packard	2811A01131
21	RF-Preselector	85685 A	Hewlett-Packard	2833A00768
22	Biconical Antenne	3104	Emco	3758
23	Log. Per. Antenne	3146	Emco	2130
24	Double Ridge Horn	3115	Emco	3088
25	EMI-Testreceiver	ESAI	Rohde & Schwarz	863 180/013
26	EMI-Analyzer-Display	ESAI-D	Rohde & Schwarz	862 771/008
27	Biconical Antenne	HK 116	Rohde & Schwarz	888 945/013
28	Log. Per. Antenne	HL 223	Rohde & Schwarz	825 584/002
29	Relais-Switch-Unit	RSU	Rohde & Schwarz	375 339/002
30	Highpass	HM985955	FSY Microwave	001
31	Amplifier	P42-GA29	Tron-Tech	B 23602
32	Absorber Schirmkabine		Frankonia	
33	Steuerrechner	PSM 7	Rohde & Schwarz	834 621/004
34	EMI Test Reciever	ESMI	Rohde & Schwarz	827 063/010
35	EMI Test Receiver	Display	Rohde & Schwarz	829 808/010

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

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No	Instrument/Ancillary	Type	Manufacturer	Serial No.
36	Controler	HD 100	Deisel	100/322/93
37	Relais Matrix	PSN	Rohde & Schwarz	829 065/003
38	Control Unit	GB 016 A2	Rohde & Schwarz	344 122/008
39	Relais Switch Unit	RSU	Rohde & Schwarz	316 790/001
40	Power Supply	6032A	Hewlett Packard	2846A04063
41	Spektrum Monitor	EZM	Rohde & Schwarz	883 720/006
42	Meßempfänger	ESH 3	Rohde & Schwarz	890 174/002
43	Meßempfänger	ESVP	Rohde & Schwarz	891 752/005
44	Biconi Ant. 20-300MHz	HK 116	Rohde & Schwarz	833 162/011
45	Logper Ant. 0.3-1 GHz	HL 223	Rohde & Schwarz	832 914/010
46	Amplifier 0.1-4 GHz	AFS4	Miteq Inc.	206461
47	Logper Ant. 1-18 GHz	HL 024 A2	Rohde & Schwarz	342 662/002
48	Polarisationsnetzwerk	HL 024 Z1	Rohde & Schwarz	341 570/002
49	Double Ridge G Horn Antenne 1-26.5 GHz	3115	EMCO	9107-3696
50	Microw. Sys. Amplifier 0.5- 26.5 GHz	8317A	Hewlett Packard	3123A00105
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