

FCC ID: RTD-G6RT



EMISSION -- TEST REPORT

Test Report File No. : **T 24275-04-02 XF** Date : April 26, 2004
of issue

Type Designation : e-Flame (Transmitter variant T)

Kind of Product : Electronic remote ignition and control system

Applicant : Mertik Maxitrol GmbH & Co. KG

Manufacturer : Mertik Maxitrol GmbH & Co. KG

Licence holder : Mertik Maxitrol GmbH & Co. KG

Address : Warnstedter Strasse 3

06502 Thale, Germany

Test result accdg. to the :
regulation(s) at page 3

Positive

This test report with attachment consists of **37** pages.
The test result only corresponds to the tested sample. It is not permitted
to copy this report, in part or in full, without the permission of the test laboratory.

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TEST REGULATIONS

The tests were performed according to following regulations :

- o - EN 50081-1 / 2.1991
- o - EN 50081-2 / 7.1993

o - EN 55011 / 3.1991

- o - Group 1
- o - class A
- o - Group 2
- o - class B

o - EN 55014 / 4.1993

- o - Household appliances and similar
- o - tools
- o - Semiconductor devices

o - EN 55014 / A2:1990

o - EN 55104 / 5.1995

Category:

o - EN 55015 / A1:1990

o - EN 55015 / 12.1993

o - EN 55022 / 5.1995

- o - class A
- o - class B

o - prEN 55103-1 / 3.1995

o - prEN 50121-3-2 / 3.1995

o - EN 60601-1-2 / 4.1994

o - VCCI

o - class 1

o - class 2

o - Part 15 Subpart C (15.209)

■ - Part 15 Subpart C (15.231)

MEASUREMENT PROTOCOL FOR FCC, VCCI AND AUSTEL

Test Methodology

Conducted and radiated emission testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1993), 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 (1993). 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 C63.4-1992 procedures and using the FCC limits or the CISPR 22 Limits.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of ± 4.5 dB. The equipment comprising the test systems are calibrated on an annual basis.

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 its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

General Standard Information

The test methods used comply with CISPR Publication 22 (1993), EN 55022 (1987) and AS 3548 (1992) - "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment" and with ANSI C63.4-1992 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

For detailed description of each measurement please refer to section test results.

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TEST RESULT

CONDUCTED EMISSIONS - 10/150 kHz - 30 MHz

■ - Test not applicable

Test location :

- o - Shielded room no. 1
- o - Shielded room no. 2
- o - Shielded room no. 3
- o - Shielded room no. 4
- o - Shielded room no. 5
- o - Shielded room no. 6
- o - Shielded room no. 7
- o - Anechoic chamber
- o - Full compact chamber

For test instruments and test accessories used please see attachment B A4

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.

Test result:

The requirements are	o - MET		o - NOT MET
Min. limit margin	_____	dB at	_____ MHz
Max. limit exceeding	_____	dB at	_____ MHz

Remarks: _____
The test is not applicable, because the EuT is battery powered.

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SPURIOUS EMISSION

Spurious emissions from the EuT are measured in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The antenna was positioned 3, 10 or 30 meters horizontally from the EuT. Measurements have been made in all three orthogonal axes and the shielded loop antenna was rotated to locate the maximum of the emissions.

Spurious emissions from the EuT are measured in the frequency range of 30 MHz to 10 times the highest used frequency 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 and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection, remeasurement of results which may be critical will be repeated in average mode. 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. 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.

SPURIOUS EMISSION (MAGNETIC FIELD) 9 kHz - 30 MHz

■ - Test not applicable

- o - in a shielded room
- o - at a non - reflecting open-site and
- o - in a test distance of 3 meters.
- o - in a test distance of 30 meters.

For test instruments and test accessories used please see attachment B SER1

Description of Measurement

The final level, expressed in dB μ V/m, is arrived at by taking the reading from the EMI receiver (Level dB μ V) and adding the antenna correction factor and cable loss factor (Factor dB) to it. This result then has to be compared with the relevant FCC limit.

The resolution bandwidth during the measurement is as follows:

9 kHz – 150 kHz: ResBW: 200 Hz
150 kHz – 30 MHz: ResBW: 10 kHz

Example:

Frequency (MHz)	Level (dB μ V)	+	Factor (dB)	=	Level (dB μ V/m)	Limit (dB μ V/m)	=	Delta (dB)
1.705	5	+	20	=	25	30	=	5

Testresult in detail:

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]

The requirements are

o - MET

o - NOT MET

Min. limit margin

_____ dB at _____ MHz

Max. limit exceeding

_____ dB at _____ MHz

Remarks: _____

SPURIOUS EMISSIONS (electric field) 30 MHz - 1000 MHz

- Test not applicable

Test location :

- Open-site 1
- Open-site 2
- 3 meters
- 10 meters
- 30 meters

For test instruments and test accessories used please see attachment B SER2

Description of Measurement

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) 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 below. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	Limit (dBµV/m)	=	Delta (dB)
719	75	+	32.6	=	107.6	110	=	-2.4

Testresult in detail:

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]

Test result:

The requirements are

- MET

- NOT MET

Min. limit margin

> 20 dB at 30-1000 MHz

Max. limit exceeding

_____ dB at _____ MHz

Remarks: The limits are met.

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SPURIOUS EMISSION 1 GHz - 18 GHz

- Test not applicable

Testlocation :

- Open-site 1
 - Open-site 2
 - Anechoic chamber
 - Full compact chamber
-
- 1 meters
 - 3 meters
 - 10 meters

For test instruments and test accessories used please see attachment B SER3

Description of Measurement

The final level, expressed in dBµV/m, is arrived by taking the reading from the Spectrumalyzer in dBµV and adding the correction factors of the test setup incl. cables.

Example of the correction value at 1.8 GHz

Level reading at 1.8 GHz	Correction EMCO 3115	correction Amplifier AWT 4534 + cable	Correction factor (summarized)	corrected level
56 dBµV	+27.3 dB	-41.2 dB	-15.8 dB	42.1 dBµV/m

Testresult in detail:

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
1258,52	53,5			-14,6	38,9			55,6
1571,14	53,7			-13,6	40,1			55,6
1883,77	54,3			-12,4	41,9			55,6

Testresult

The requirements are

- MET

- NOT MET

Min. limit margin

13,7 dB at 1883,77 MHz

Max. limit exceeding

 dB at MHz

Remarks: The limits are met.

 The measurement was performed up to the 10th harmonic (3150 MHz).

FIELD STRENGTH OF THE FUNDAMENTAL WAVE

- Test not applicable

- Open-site 1
- Open-site 2
- 3 meters
- 10 meters
- 30 meters

For test instruments and test accessories used please see attachment B CPR2

Description of Measurement

The final level, expressed in dBµV/m, is arrived by taking the reading from the EMI receiver (Level dBµV) 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 24 - 25. The CISPR 22 limit is equivalent to the Australian AS 3548 limit.

Example:

Frequency (MHz)	Level (dBµV)	+	Factor (dB)	=	Level (dBµV/m)	-	Limit (dBµV/m)	=	Delta (dB)
315	45	+	22.5	=	67.5	-	74.3	=	-6.8

Testresult in detail:

Frequency [MHz]	L: PK [dBµV]	L: AV [dBµV]	L: QP [dBµV]	Correct. [dB]	L: PK [dBµV/m]	L: AV [dBµV/m]	L: QP [dBµV/m]	Limit [dBµV/m]
315,0	55,5	55,4	54,5	17,7	73,2	73,1	72,2	75,6

Testresult

The requirements are

- MET

- NOT MET

Min. limit margin

3,4 dB at 315,0 MHz

Max. limit exceeding

_____ dB at _____ MHz

Remarks:

The limits are kept.

CONDUCTED POWER OF THE FUNDAMENTAL WAVE MEASURED ON THE ANTENNA TERMINALS

- Test not applicable

Testlocation :

- o - Shielded room no. 1
- o - Shielded room no. 2
- o - Shielded room no. 3
- o - Shielded room no. 4
- o - Shielded room no. 5
- o - Shielded room no. 6
- o - Shielded room no. 7
- o - Anechoic chamber
- o - Full compact chamber
- o - Climatic test chamber VLK

For test instruments and test accessories used please see attachment B CPC2

Description of Measurement

The conducted power of the fundamental wave measured on the antenna terminals in a climatic test chamber. The antenna jack was connected to the input of a communication test receiver. The internal batteries have been removed also and a variable DC power supply was used instead. The measurements have been made with the EuT unmodulated. During the test the supply voltage and the temperature were varied and applied simultaneously. The lower supply voltage was given by the manufacturer. In case the equipment was switching off before, the switch off voltage was used instead.

Testresult

The requirements are

o - MET

o - NOT MET

Frequency range of equipment								
Temperature °C	DC supply voltage V	Power dBm	Power dBm	Power dBm	Power dBm	Power dBm	Power dBm	Power dBm
-30								
-20								
-10								
0								
+10								
+20								
+30								
+40								
+50								

Remarks: The test is not applicable.

Signal Deactivation
SUBPART 15.231(a)

- Test not applicable

Test location :

- - Test location 1
- o - Shielded room no. 3
- o - Shielded room no. 5

For test equipment used please refer to attachment B NBW

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released and a transmitter activated automatically shall cease transmission within 5 seconds after activation.

For the diagram see attachment A5.

Remarks: The limit is met. The EuT complies with the requirements described
under 15.231(a) regarding the signal deactivation of the transmitter.
The duration of the transmission is 44,89 milliseconds each time the button is
pushed which meets the requirement of ceasing transmission within
5 seconds of the button being released.

Effect of Supply Voltage Variation
SUBPART 15.31(e)

- Test not applicable

Test location :

- - Test location 1
- o - Shielded room no. 3
- o - Shielded room no. 5

For test equipment used please refer to attachment B NBW

The EuT has been designed to be powered by 9,0 V DC battery. For this test, the battery was replaced by a laboratory variable power supply. Relative power radiated was measured at the fundamental as the voltage was varied from 7,5 to 10,5 volts.

For the diagram see attachment A4.

Remarks: The limit are met.

EQUIPMENT UNDER TEST

Operation - mode of the EuT.:

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

- Standby
- Test program (H - Pattern)
- Test program (colour bar)
- Test program (customer specific)

The transmitter was during all test activated once with modulation and once without

 modulation.

Configuration of the equipment under test: see attachment D
Following periphery devices and interface cables were connected during the measurement:

- _____ Type : _____
- _____ Type : _____
- _____ Type : _____
- _____ Type : _____
- _____ Type : _____
- _____ Type : _____

- unshielded power cable
- unshielded cables
- shielded cables
- customer specific cables

MBPS.No.:

- _____
- _____

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S U M M A R Y

GENERAL REMARKS:

The EuT has been tested on the following frequency:

TX-Mode: 315 MHz

The RF-Part is technical identical to the model Remote control (variant D). Only small differences between the layout designs and additional functions are existing.

FINAL JUDGEMENT:

The requirements according to the technical regulations and tested operation modes are

■ - met.

o - **not** met.

The Equipment Under Test

■ - **Fulfils** the general approval requirements according to page 3.

o - **Does not** fulfil the general approval requirements according to page 3.

Date of receipt of test sample : accdg. to storage record of MBPS

Testing Start Date : April 19, 2004

Testing End Date : April 26, 2004

Checked by:

i. A.


Günter Mikes
Dipl.Ing.(FH)

Tested by:


Xaver Fischer

Attachment A: Test data

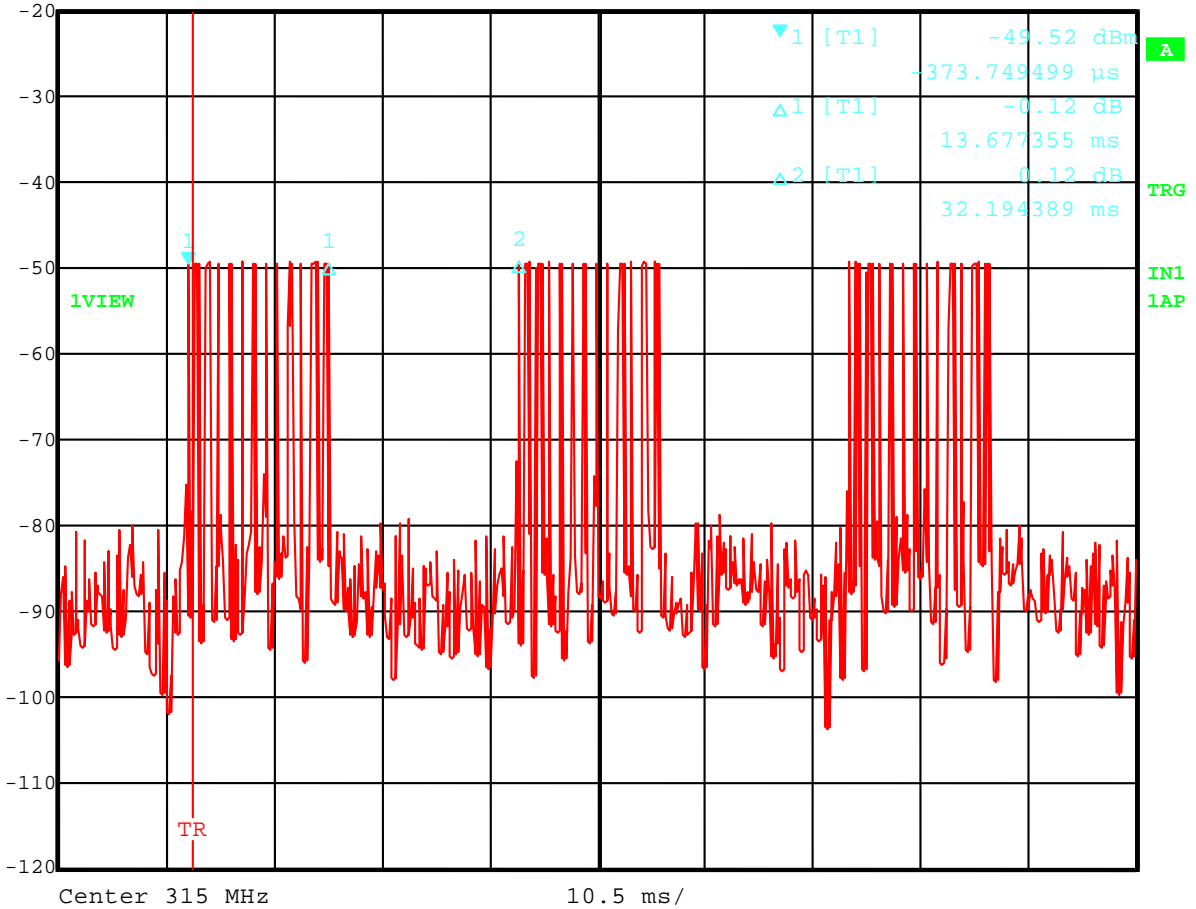
Correction for Pulse Operation (Duty Cycle)

FCC Part 15 Subpart 15.35(c)

(Duration of the complete dataword)



Ref Lvl	Marker 1 [T1]	RBW	1 MHz	RF Att	10 dB
-20 dBm	-49.52 dBm	VBW	1 MHz		
	-373.749499 μ s	SWT	105 ms	Unit	dBm



Date: 20.APR.2004 08:58:51

Attachment A: Test data

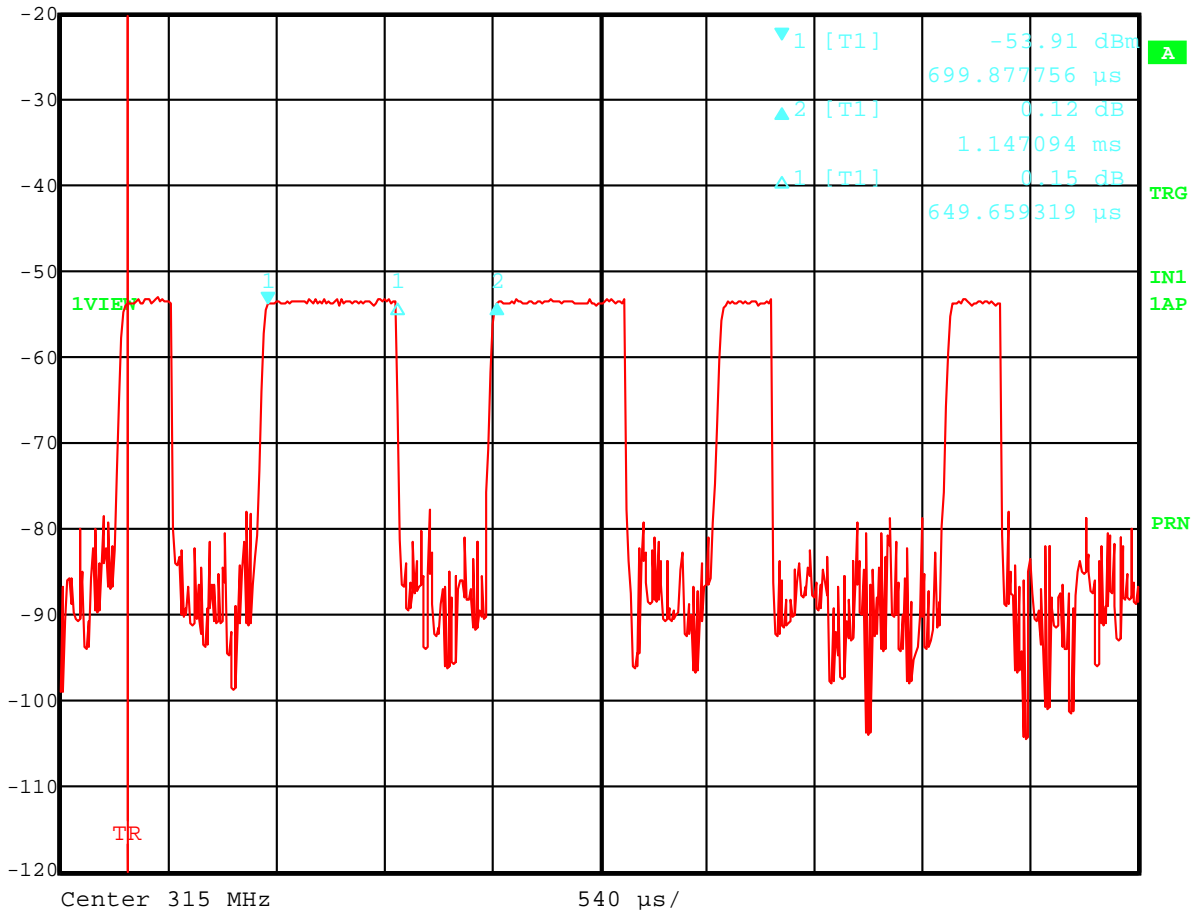
Correction for Pulse Operation (Duty Cycle)

FCC Part 15 Subpart 15.35(c)

(Duration of one bit)



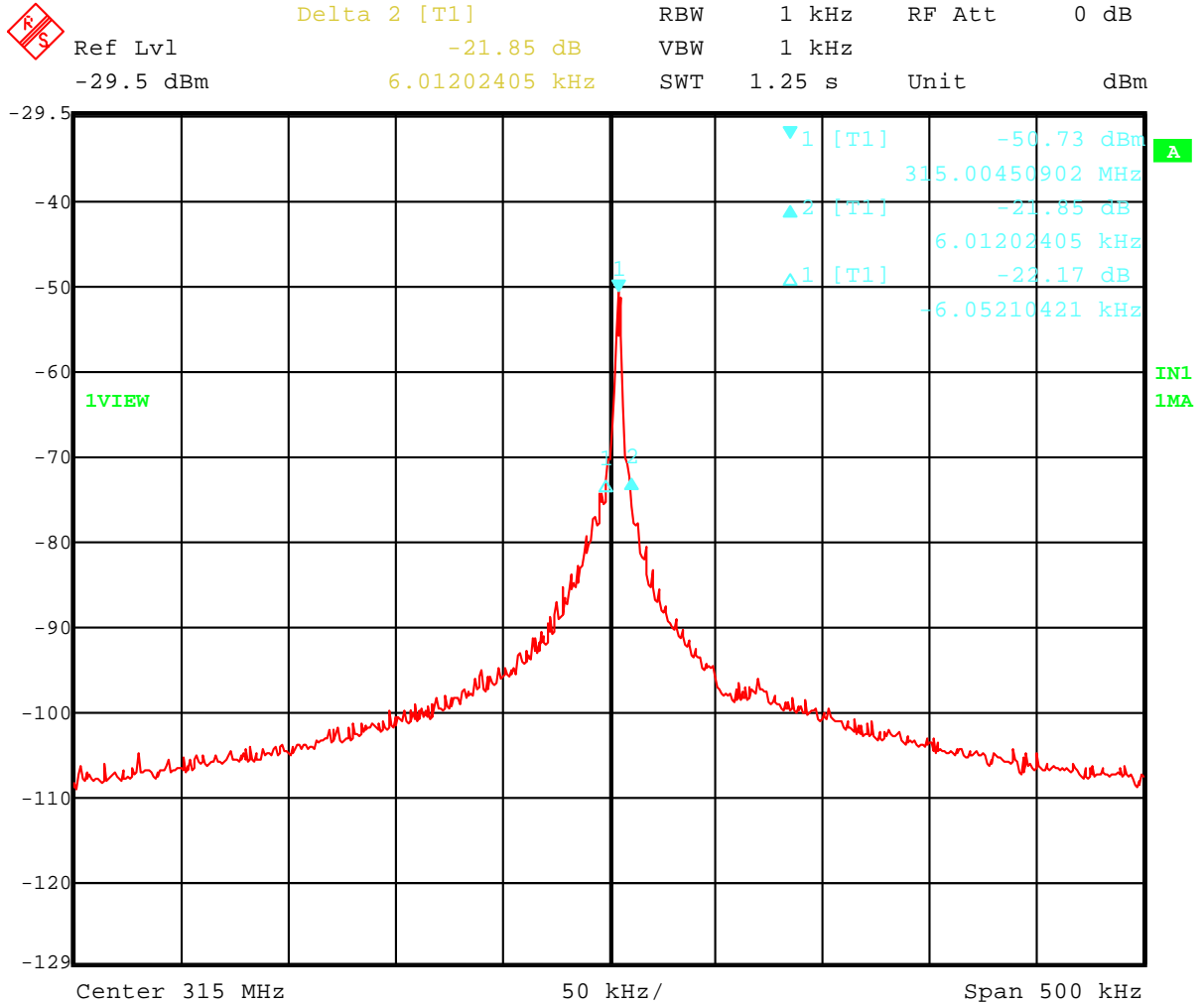
Ref Lvl	Delta 2 [T1]	RBW	1 MHz	RF Att	10 dB
-20 dBm	0.12 dB	VBW	1 MHz		
	1.147094 ms	SWT	5.4 ms	Unit	dBm



Date: 20.APR.2004 09:18:58

Attachment A: Test data

Emission Bandwidth
FCC Part 15 Subpart 15.231(c)

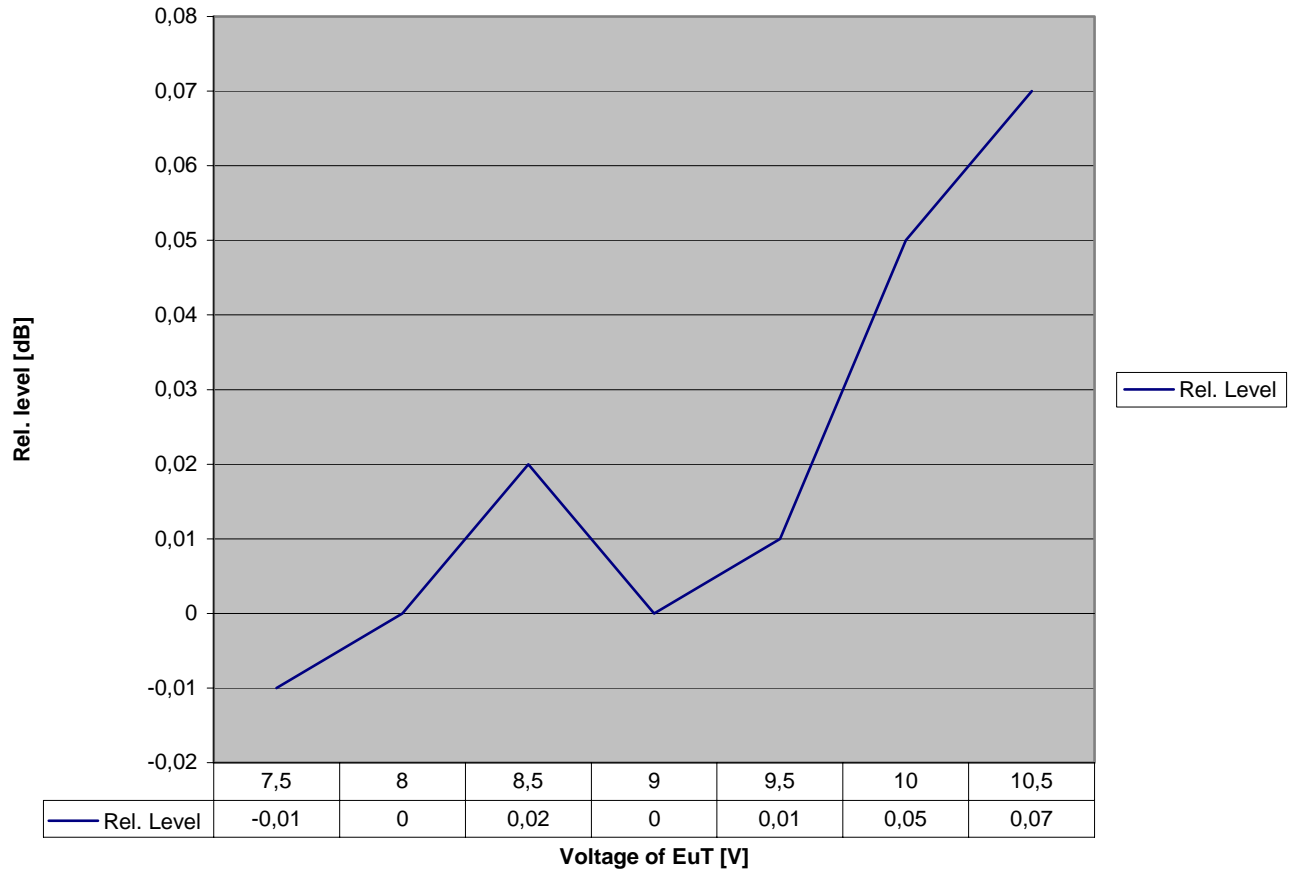


Date: 20.APR.2004 10:13:15

Attachment A: Test data

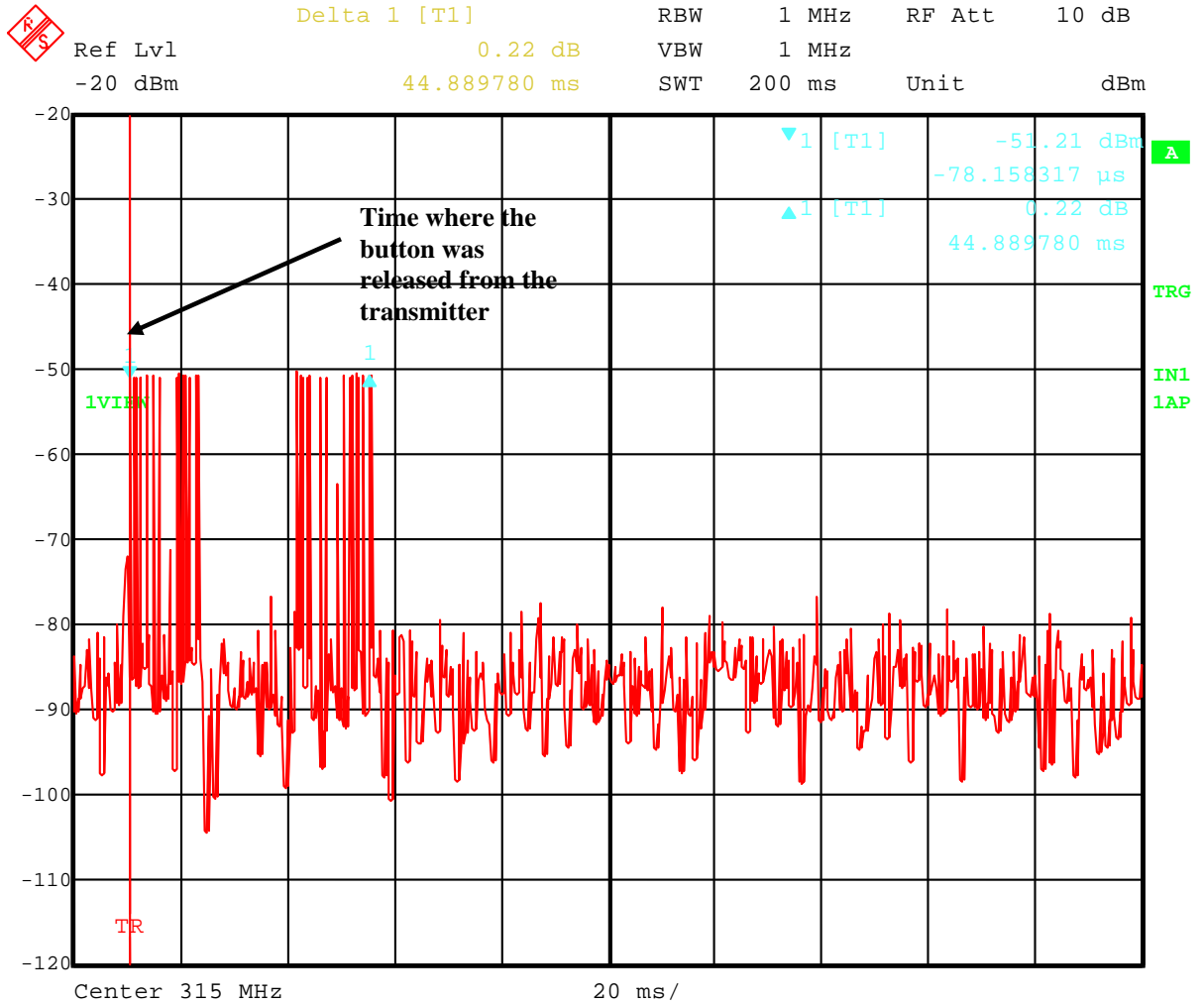
Effect of Supply Voltage Variation

FCC Part 15 Subpart 15.31(e)



Attachment A: Test data

Signal Deactivation
FCC Part 15 Subpart 15.231(a)



Date: 20.APR.2004 09:13:41

FCC ID: RTD-G6RT

Attachment B: List of test equipment

Test ID	Model Type	Kind of Equipment	Manufacturer	Equipment No.
CPR2	Sucofeed 7/8	RF Cable	Huber+Suhner	04-07/60-04-089
	NW-2000-NB	RF Cable	MBPS GmbH	04-07/60-04-205
	NB-15000-NB	RF Cable	MBPS GmbH	04-07/60-04-207
	VULB 9165	Super Broadband Antenn	Schwarzbeck Mess-Elektronik	04-07/62-00-001
	ESVS 30	Test Receiver	Rohde & Schwarz München	04-07/63-04-001
DC	ESIB 40	Test Receiver	Rohde & Schwarz München	04-07/63-03-002
NBW	Tektronix THS 730A	Handheld Scope	Tektronix GmbH	04-07/38-02-001
	HM-8142	Power Supply	Conrad Electronic GmbH	04-07/49-99-002
	ESIB 40	Test Receiver	Rohde & Schwarz München	04-07/63-03-002
SER2	Sucofeed 7/8	RF Cable	Huber+Suhner	04-07/60-04-089
	NW-2000-NB	RF Cable	MBPS GmbH	04-07/60-04-205
	NB-15000-NB	RF Cable	MBPS GmbH	04-07/60-04-207
	VULB 9165	Super Broadband Antenn	Schwarzbeck Mess-Elektronik	04-07/62-00-001
	ESVS 30	Test Receiver	Rohde & Schwarz München	04-07/63-04-001
SER3	N-1600-N	Microwave Cable	Huber+Suhner	04-07/60-04-202
	N-1600-SMA	Microwave Cable	Huber+Suhner	04-07/60-04-203
	Model 3115	Horn Antenna	EMCO Elektronik GmbH	04-07/62-03-003
	ESIB 40	Test Receiver	Rohde & Schwarz München	04-07/63-03-002
	AF S4-01000400-10-10P-4	RF Amplifier 1-4 GHz	PARZICH GMBH	04-07/66-03-001

Attachment D: Constructional dataform for testing of radio equipment

US/Canada

Licence holder:	Mertik Maxitrol GmbH & Co. KG		
Address:	Warnstedter Strasse 3 06502 Thale, Germany		
Manufacturer:	Mertik Maxitrol GmbH & Co. KG		
Address:	Warnstedter Strasse 3 06502 Thale, Germany		
Type:	Remote control (Transmitter variant D/T)		
Model:	e –FLAME (Europa)		
Serial-No.:	G6R	Protection class:	

Additional informations to the above named model:

Antenna: transmitter:	Type: Wire antenna		
	Length/size: 100mm		
receiver:	Type: Marconi Antenna ($\lambda/4$)		
	Length/size: 170mm		
Power supply of the transmitter: Type:	9 V battery	nominal voltage:	9 V
		lowest voltage:	3,5 V
		highest voltage:	9,5 V
		current consumption	1,2 mA
Power supply of the receiver: Type:	a) 4xAA or C batteries	nominal voltage:	6 V
	b) regulated transformer	current consumption	< 100µA

Ancillary equipment:

Description:	<u>Gas control</u>	Type:	<u>GV6</u>	Serial-no.:	<u> </u>
Description:	<u>Electronic ignition</u>	Type:	<u> </u>	Serial-no.:	<u> </u>
Description:	<u> </u>	Type:	<u> </u>	Serial-no.:	<u> </u>

Extreme temperature range in which the approval test should be performed:

- Category I: General (-20°C to +55°C)
- Category II: Portable (-10°C to +55°C)
- Category III: Equipment for normal indoor use (0°C to +55°C)

Connectable cables (receiver):

Name of the cable	Digital	Length/m	shielded
Thermo current cable 1	<input type="radio"/> yes <input checked="" type="radio"/> no	0,35...0,8	<input type="radio"/> yes <input checked="" type="radio"/> no
Thermo current cable 2	<input type="radio"/> yes <input checked="" type="radio"/> no	0,35...0,8	<input type="radio"/> yes <input checked="" type="radio"/> no
Connection receiver –gas valve (8 wires)	<input type="radio"/> yes <input checked="" type="radio"/> no	0,35...0,8	<input type="radio"/> yes <input checked="" type="radio"/> no
Ignition cable	<input type="radio"/> yes <input checked="" type="radio"/> no	0,35...0,9	<input type="radio"/> yes <input checked="" type="radio"/> no
Cable for switch panel (5 wires)	<input checked="" type="radio"/> yes <input type="radio"/> no	0,35...0,8	<input type="radio"/> yes <input checked="" type="radio"/> no

Attachment D: Constructional dataform for testing of radio equipment

US/Canada


Type designation: Manuel and automatic temperature regulator transmitter			
Name and type designation of individual units comprising the radio equipment:			
Type of equipment:			
<input type="checkbox"/> Radiotelephone equipment	<input checked="" type="checkbox"/> Remote-control equipment	<input type="checkbox"/> Radiomaritime equipment	<input type="checkbox"/> LPD
<input type="checkbox"/> One-way radiotelephone equipment	<input type="checkbox"/> Inductive loop system	<input type="checkbox"/> Inland waterways equipment	<input type="checkbox"/> RLAN
<input type="checkbox"/> Personal paging system	<input type="checkbox"/> Radio-relay system	<input type="checkbox"/> Radionavigation equipm.	<input type="checkbox"/>
<input type="checkbox"/> Satellite earth station	<input type="checkbox"/> CB radiotelephone equipment	<input type="checkbox"/> Antenna	<input type="checkbox"/>
<input type="checkbox"/> Data transmission equipment	<input type="checkbox"/> Movement detector	<input type="checkbox"/> Aeronautical equipment	<input type="checkbox"/>
Technical characteristics:			
	Transmitter-receiver	Transmitter	Receiver
Frequency range		315,00 ± 0,1MHz	315,00 ± 0,3MHz
Maximum no. of channels		1	1
Channel spacing		-	-
Class of emission (type of modulation)		AM	-
Maximum RF output power		smaller then 10mW	
Maximum effective radiated power (ERP)			
Output power variable		no	
Channel switching frequency range		no	
Method of frequency generation	<input type="checkbox"/> Synthesizer <input type="checkbox"/> Crystal <input checked="" type="checkbox"/> Other		
Frequency generation TX	1 Port SAW Resonator 315,00MHz		
Frequency generation RX	VFO C-trim, thermal stable		
IF	1st IF -	2nd IF -	3rd IF -
Integral selective calling			
Audio-frequency interface level at external data socket			
Modes of operation	<input type="checkbox"/> Duplex mode <input type="checkbox"/> Semi-duplex mode <input checked="" type="checkbox"/> Simplex mode		
Power source	<input type="checkbox"/> Mains <input type="checkbox"/> Vehicle-regulated <input checked="" type="checkbox"/> Integral Transmitter		
Antenna socket	<input type="checkbox"/> BNC <input type="checkbox"/> TNC <input type="checkbox"/> N <input type="checkbox"/> M <input type="checkbox"/> UHF <input type="checkbox"/> Adapter <input checked="" type="checkbox"/> None <input type="checkbox"/>		
Test specifications:			


Attachment D: Constructional dataform for testing of radio equipment

Declarations:

- We declare that the above information are correct and the named model was supplied with the maximum configuration to the accredited test laboratory.

e-Flame G6R (US/Canada)


Bernd Mönning
Vice President Engineering/Production


Barbara Happe
Group leader development gas controls

Thale, 2004-04-22