

TEST REPORT	
48859-2 TRF EMC	
<i>ITU Radio Regulations: Volume 2, Appendix 2 & 3, (WRC 2000).</i>	
Report Reference No.	48859-2 TRF EMC
Tested by (name+signature)	G. Curioni 
Witnessed by (name+signature)	Not applicable
Supervised by (name+signature)	Not applicable
Approved by (name+signature)	P. Barbieri 
Date of issue	2005-08-29
Testing Laboratory	Nemko Spa
Address	Via Trento e Trieste, 116 I-20046 Biassono MI (Italy)
Testing location/ procedure	Full application of Harmonised standards <input checked="" type="checkbox"/> Partial application of Harmonised standards <input type="checkbox"/> Other standard testing methods <input type="checkbox"/> Non-standard testing methods <input type="checkbox"/> SINAL accredited test report <input type="checkbox"/>
Testing location/ address	Nemko Spa - Via Trento e Trieste, 116 - I-20046 Biassono MI (Italy)
Applicant's name	Hurma Elektronik Sanayi ve Ticaret Koll. Sti.
Address	Eskoop Sanayi Sitesi C5 Blok No: 243 Organize sanayi Bölgesi İkitelli/İstanbul/Türkiye
Test specification:	
Standard	ITU Radio Regulations: Volume 2 ,appendix 2 & 3, (WRC 2000)
Test procedure	Nemko PT 177
Non-standard test method	N/A
Test Report Form No.	TRF EMC SpA
TRF Originator	Nemko Spa
Master TRF	2005-04
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Test item description	Analogue TV Broadcasting service transmitter
Trade Mark	HURMA
Manufacturer	Hurma Elektronik Sanayi ve Ticaret Koll. Sti
Model/Type reference	TVV 200
Ratings	180 – 240 Vac, 50 Hz, 5 A max. – 200 W Peak Sync.

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EMC -- TEST REPORT

Test Report No. : 48859-2 TRF EMC	2005-08-29 Date of issue
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Type / Model : TVV 200 s/n 400605

Equipment : The E.U.T. was composed by a single unit.(output filter included)

Applicant : Hurma Elektronik Sanayi ve Ticaret Koll. Sti.

Address : Eskoop Sanayi Sitesi C5 Blok No: 243
Organize sanayi Bölgesi İkitelli/İstanbul/Türkiye

Manufacturer : Hurma Elektronik Sanayi ve Ticaret Koll. Sti.

Address : Eskoop Sanayi Sitesi C5 Blok No: 243
Organize sanayi Bölgesi İkitelli/İstanbul/Türkiye

Test Result according to the standards on page 5:	Positive
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1 - EQUIPMENT UNDER TEST (E.U.T.)

1.1 - Product description:

- Model / (s/n) : TVV 200 / s.n. 400605

1.2 - E.U.T. specifications:

- E.U.T. use : base station for fixed use
- Antenna connector : 7/16, 50 Ω
- Antenna type : external antenna (not provided)

1.2.1 – Electric characteristics:

- Rated voltage : 230 V mono phase (180 to 240 Vac)
- Voltage supply source : AC mains
- Rated power : 1000 W (actual 1105 W)

1.2.2 – RF characteristics:

- RF rated power @ 50 Ω : 200 W peak sync.
- Transmission frequency : Ch 28 (527.250 MHz)
- Assigned band : IV – V
- Operating frequency range : 470 ÷ 860 MHz
- Channel step : 8 MHz
- Necessary bandwidth : 7.607 MHz
- Colour/system : PAL/ B,G
- ITU designation : VISION C3F / SOUND 1 F3E
- Video IF : 38.9 MHz
- Local osc. : higher

FREQUENCY IDENTIFICATION

Each equipment, whether one or more submitted for tests, shall carry clear identification (such as a serial number), together with the frequency identification displayed on the equipment.

Equipment identification, e.g. serial number	Channel No. (if applicable)	Transmit Nominal Freq. (MHz)	Audio TX Freq. (MHz)
TVV 200	28 anl	527.250	532.750
	-	-	-

Analog only F_v [MHz] = 471.25 + 8 k with k = any integral number 0 to 49 (B-IV, B-V)

REFERENCE DOCUMENTS

- Nemko PT 124:
General procedure to verify the technical characteristics of radio equipment.
- I T U Radio Regulations: Volume 2, Appendix 2 & 3, (WRC 2000).
- Rec. I T U-R SM.329-10
Unwanted emissions in the spurious domain

LIST OF MEASUREMENTS

I T U Radio Regulations: Appendix 2 & 3, (RR A2, RR A3).

Clause	Parameter	Test result
RR A2 Section II	Transmitter frequency tolerance	Passed
RR A3	Transmitter spurious emission (conducted)	Passed
RR A3 Section II	Transmitter spurious emission (radiated) Guidance: ITU-R SM.329	Passed

Remarks (Test result)

- Declared = the parameter is compliant according to the Manufacturer's declaration.
- Passed = the E.U.T. complied with the test specification limits.
- Failed = the E.U.T. did not comply with the test specification limits.
- N.A. = the test is not applicable to the E.U.T..

Ambient temperature: 20 °C Relative humidity: 40 %

TRANSMITTER FREQUENCY TOLLERANCE
(ITU RR A2)

Reference: local oscillator frequency at ambient temperature

<i>Test conditions</i>		<i>Frequency error (Hz)</i>		
		-	CH 28 (analog)	CH 28 (analog)*
T _{nom} (20) °C	V _{nom} (230V)	-	Passed	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
Maximum freq. error (Hz)		-		-
<i>Measurement uncertainty</i>		$\pm 1 \times 10^{-11}$		

* With connection to an external reference oscillator. NOT AVAILABLE.

LIMITS (ITU RR A2 table AP2-4)

Vision and sound carriers under normal and extreme test conditions:

<i>Rated power</i>	<i>Frequency error NORMAL OFFSET</i>	
	<i>Normal test conditions</i>	<i>Extreme test conditions</i>
Up to 100W	500 Hz	-
-	-	-

<i>Rated power</i>	<i>Frequency error PRECISION OFFSET</i>	
	<i>Normal test conditions</i>	<i>Extreme test conditions</i>
Up to 500W	± 1 Hz	± 1 Hz (AC Mains ± 10 %)
Above 500W	± 1 Hz	± 1 Hz (AC Mains ± 2 %)

Ambient temperature: 22 °C Relative humidity: 40 %

TRANSMITTER SPURIOUS EMISSION (CONDUCTED)

(ITU RR A3)

E.U.T.: SYSTEM

Power level at which the measurement has been performed: 200 W Peak sync.

According to RR A3 table II (P: mean power in W)

For digital: P in W RMS, for analog: P in W Peak sync. minus 2.5 dB

Frequency Range Of spurious emissions (MHz)	Measurement BANDWIDTH (kHz)	Spurious Emissions Measured Level (dBm)	Spurious Emissions Limit Level (dBm)
0.019 to 0.150	1	< -89	≤ -9.5 dBm
0.150 to 30 5.47	10	-34	≤ -9.5 dBm
30 to Out of B. E.	100	< - 95	≤ -9.5 dBm
Out of Band Emission	-	-	-
Out of B, E. to 1000	100	< - 93	≤ -9.5 dBm
> 1000	1000	< - 14	≤ -9.5 dBm
-	-	-	-
<i>Measurement uncertainty: ± 1.5 dB</i>			

Bandwidth (kHz); this refers to the bandwidth of the measurement receiver.
See ITU RR A3 AP3-4 par. 10.

RBW [kHz]	Frequency range [MHz]
1	0.009 ÷ 0.150
10	0.150 ÷ 30
100	30 ÷ 1000
1000	> 1000

LIMITS (RR A3 section II, par. 10, table II)

<i>Broadcast TV Spurious emission limit 9 kHz ≤ out of band ≤ 110 GHz</i>
46+10log(P), or 60 dBc whichever is less stringent
Without exceeding the absolute mean power level of 1mW for VHF stations or 12 mW for UHF stations. However, greater attention may be necessary on a case by case basis.

Note:

According to RR A3 table II (P: mean power in W)
For digital: P in W RMS, for analog: P in W Peak sync. minus 2.5 dB

Out of band emission: $F_c \pm 250\%$ of necessary bandwidth
According to ITU RR A3 AP3-4 par. 11.

TRANSMITTER SPURIOUS EMISSION (RADIATED)

Power level at which the measurement has been performed: 200 W Peak sync.

According to ITU vol. II RR A3 table II & ITU-R SM.329-10 table 2 (P: mean power in W)
 For digital: P in W RMS, for analog: P in W Peak sync. minus 2.5 dB

Frequency Range of spurious emissions (MHz)	Measurement BANDWIDTH (kHz)	Spurious Emissions Measured Level (dBm)	Spurious Emissions Limit Level (dBm)
30 to out of B. E.	100	Ground noise	≤ -9.5 dBm
out of Band Emission	-	-	-
out of B. E. to 1000	100		≤ -9.5 dBm
566.15		-80	
571.6		-62	
Above 1000	1000	-	≤ -9.5 dBm
1049	1000	-57	≤ -9.5 dBm
1054	1000	-44	≤ -9.5 dBm
1060	1000	-48	≤ -9.5 dBm
1576	1000	-50	≤ -9.5 dBm
1582	1000	-39	≤ -9.5 dBm
1587	1000	-38	≤ -9.5 dBm
1592	1000	-48	≤ -9.5 dBm
2103	1000	-47	≤ -9.5 dBm
2109	1000	-46	≤ -9.5 dBm
2114	1000	-44	≤ -9.5 dBm
2120	1000	-48	≤ -9.5 dBm

Measurement uncertainty: ± 1.5 dB

Bandwidth (kHz); this refers to the bandwidth of the measurement receiver.
See ITU-R SM.329-10 par 4.1.

RBW [kHz]	Frequency range [MHz]
1	0.009 ÷ 0.150
10	0.150 ÷ 30
100	30 ÷ 1000
1000	> 1000

LIMITS (ITU-R SM.329-10 table 2 Category A)

<i>Broadcast TV Spurious emission limit lower limit ≤ Out of band ≤ upper limit</i>
46+10log(P), or 60 dBc whichever is less stringent
Without exceeding the absolute mean power level of 1mW for VHF stations or 12 mW for UHF stations. However, greater attention may be necessary on a case by case basis.

Note:

According to RR A3 table II (P: mean power in W)

For digital: P in W RMS, for analog: P in W Peak sync. minus 2.5 dB

Frequency range for measurement of unwanted emissions:

According to ITU-R SM.329-10 table 1.

Fundamental frequency range Fc	Frequency range of measurements	
	Lower limit	Upper limit
9 kHz – 100 MHz	9 kHz	1 GHz
100 MHz – 300 MHz	9kHz	10 th harmonic
300 MHz – 600 Mhz	30 MHz	3 GHz
600 MHz – 5.2 GHz	30 MHz	5 th harmonic
5.2 GHz – 13 GHz	30 MHz	26 GHz
13 GHz – 150 GHz	30 MHz	2 nd harmonic
150 GHz – 300 GHz	30 MHz	300 GHz

Out of Band emission:

Definition: ITU RR 1. No. 1.144

**TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS
(provided by the manufacturer)**

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory.

<i>Ref. No.</i>	<i>Equipment</i>	<i>Model / type</i>	<i>Manufact.</i>	<i>Serial No.</i>
1	Signal generator	SFF	R&S	177
2	TV Demodulator	AMFS	R&S	155
3	Video Analyzer	UAF	R&S	156
4	Video Measurement	1781 R	Tektronix	392
5	Spectrum Analyzer	4122 B	Takeda	4826
6	Level Meter	8992A	H.P.	2745
7	Counter	53181	H.P.	4282
8	TV Network Analyzer	SWKF	R&S	4247
9	MPEG 2 player	DVG	R&S	4821
10	TV test receiver	EFA	R&S	4828
11	MPEG 2 player	DVMD	R&S	4798
12	Spectrum Analyzer	8560E	H.P.	4804
13	Power Meter	E4419B	AGILENT	4816
14	Power Sensor	8482A	H.P.	4810
15	Dummy Load	Ref.17-0067	Diconex	02/2002
16	Log Periodic Antenna 200 ÷ 1000 MHz (property of Nemko)	HUF-Z3	Rohde & Schwarz	893 232/005
17	Log Periodic Antenna 1 ÷ 18 GHz (property of Nemko)	HL-025	Rohde & Schwarz	351 387/002

ADDITIONAL INFORMATION SUPPLEMENTARY TO THE TEST REPORT

Page No.

Remarks

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PHOTOS

