

**SK TECH CO., LTD.**

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Certificate of Compliance

Test Report No.:	SKTTRT-030709-003		
NVLAP CODE:	200220-0		
Applicant:	Jin Young Electronics Co., Ltd.		
Applicant Address:	321-34, Gongdan-Dong Gumi-City KyungBuk, Korea		
Device Under Test:	7" TFT LCD Color TV/Monitor		
FCC ID:	RAZJYT-7000	Model No.:	JYT-7000, PT-7TV JYT-7000M, LCD P7LX
Receipt No.:	SKTEU03-0398	Date of receipt:	June 30, 2003
Date of Issue:	July 09, 2003		
Location of Testing:	SK TECH CO., LTD. 820-2, Wolmoon-Ri, Wabu-Up, Namyangju-Si, Kyunggi-Do, Korea		
Test Procedure:	ANSI C63.4 / 2001		
Test Specification:	FCC Title 47, Part 15 Subpart C		
Equipment Class:	Part 15 Low Power Communication Device Transmitter		
Test Result:	The above-mentioned device has been tested and passed.		
Tested & Reported by: Jong-Soo, Yoon		Approved by: Jae-Kyung, Bae	
 2003. 07. 09 Signature Date		 2003. 07. 09 Signature Date	
Other Aspects:			
Abbreviations:	· OK, Pass = passed · Fail = failed · N/A = not applicable		



- This test report is not permitted to copy partly without our permission.
- This test result is dependent on only equipment to be used.
- This test result is based on a single evaluation of one sample of the above mentioned.
- This test report must not be used to claim product endorsement by NVLAP or any agency of the U.S Government.
- We certify that this test report has been based on the measurement standards that is traceable to the national or International standards.



NVLAP Lab. Code: 200220-0



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1. GENERAL

These tests were performed using the test procedure outlined in ANSI C63.4, 2001 for intentional radiators, and in accordance with the limits set forth in FCC Part 15.239 for Low Power Communication Device Transmitter. The EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards.

We attest to the accuracy of data. All measurements reported herein were performed by SK Tech Co., Ltd. and were made under Chief Engineer's supervision.

We assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

2. TEST SITE

SK TECH Co., Ltd.

2.1 Location

820-2, Wolmoon Ri, Wabu-Up, Namyangju-Si, Kyunggi-Do, Korea

This test site is in compliance with ISO/IEC 17025 for general requirements for the competence of testing and calibration laboratories.

This laboratory is accredited by NVLAP for NVLAP Lab. Code: 200220-0 and DATech for DAR-Registration No.: TTI-P-G155/97-10



2.2 List of Test and Measurement Instruments

Equipment Type	Manufacturer	Model No.	Serial No.	Cal. Due Date
EMI Test Receiver	Rohde&Schwarz	ESHS 10	862970/019	10, 2003
EMI Test Receiver	Rohde&Schwarz	ESHS 10	835871/002	10, 2003
Artificial Mains Network	Rohde&Schwarz	ESH2-Z5	834549/011	10, 2003
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	836679/018	10, 2003
EMI Test Receiver	Rohde&Schwarz	ESVS 10	825120/013	10, 2003
EMI Test Receiver	Rohde&Schwarz	ESVS 10	834468/008	10, 2003
Spectrum Analyzer	Advantest	R3361A	11730187	10, 2003
EMC Spectrum Analyzer	Agilent	E7405A	US40240203	12. 2003
Amplifier	H.P	8447F	3113A05153	10, 2003
Log Periodic Antenna	Schwarzbeck	UHALP9107	1819	10, 2003
Biconical Antenna	Schwarzbeck	BBA9106	91031626	10, 2003
Horn Antenna	Schwarzbeck	SAS-200/571	304	03, 2004
Antenna Mast	TOKIN	5907	N/A	N/A
Antenna & Turntable controller	TOKIN	5906	N/A	N/A
50Ω Switcher	Anritsu	MP59B	6100214538	N/A

2.3 Test Date

Date of Application : June 30, 2003

Date of Test : July 04, 2003 ~ July 07, 2003

2.4 Test Environment

See each test item's description.



3. DESCRIPTION OF THE EQUIPMENT UNDER TEST

The EUT is a 7-inch TFT LCD color TV/monitor, equipped with a FM transmitter to radiate audio signals to a FM broadcast receiver. The EUT has no digital interface used for supporting LCD display mode such as a VGA, SVGA, XGA, etc, being connected to personal computers. The product specification described herein was obtained from product data sheet or user's manual. The verification report for the TV Tuner in the EUT should be issued with other test report numbers.

3.1 Rating and Physical Characteristics

Type (Model No.)*	JYT-7000/ PT-7TV, JYT-7000M/LCD P7LX
Power source	AC/DC adapter or DC 12V supplied from a battery in the vehicle AC/DC adapter: Input AC 120V/60Hz, Output DC 14V
Local Oscillator or X-Tal	X-Tal: 7.6MHz, 3.579545MHz, 8MHz
Transmit Frequency	90.7MHz to 92.2MHz
Antenna Type	Internal, Integral
Type of Modulation	FM
RF Output power	10mW under
Interface Ports*	TV antenna input, A/V input, A/V output, Earphone output
Built-in TV Tuner*	VHF: 2ch to 13ch, UHF: 14ch to 69ch, CATV: 113ch (Option)

*:

The Model No. JYT-7000 is electronically identical to PT-7TV, and JYT-7000M is identical to LCD P7LX. JYT-7000M (LCD P7LX) has no the TV tuner used in JYT-7000 (PT-7TV) and substitutes A/V input for TV antenna input. The variants of the EUT were indicated in the internal photos in detail.

JYT-7000, PT-7TV : TV antenna input, A/V input, A/V output, Earphone output

JYT-7000M, LCD P7LX : A/V input1, A/V input2, A/V output, Earphone output

3.2 Equipment Modifications

None.

3.3 Submitted Documents

Block diagram

Schematic diagram

Part List

User manual



4. MEASUREMENT CONDITIONS

4.1 Description of test configuration

The EUT was configured for testing in a typical fashion (as a user would normally use it).

During the exploratory tests, the EUT was set to transmit the audio signals from either TV broadcast signals at each channel or video camera recorder to conduct Subpart C tests. The final conducted and radiated data were taken in the worst operating condition.

Operating Mode	The worst operating condition
TV receiving mode	
Composite Audio/Video input mode	O

O: Worst case investigated during the exploratory test

4.2 List of Peripherals

Equipment Type	FCC ID	Manufacture	Model	Serial Number
Video Camera Recorder	-	SONY	CCD-TRV408	985143
Speaker	-	Eastern	HF-341X	None
AC/DC adapter (supplied with EUT)	-	Hyosung Elect	KNU-1412	None

4.3 Type of Used Cables

Description	Length	Type of shield	Manufacturer	Remark
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None

4.4 Uncertainty

Radiated disturbance

Uc (Combined standard Uncertainty) = ± 2.37 dB

Expanded uncertainty U = KUc = ± 4.74 dB (K = 2)

Conducted disturbance

Uc (Combined standard Uncertainty) = ± 1.47 dB

Expanded uncertainty U = KUc = ± 2.94 dB (K = 2)



5. TEST AND MEASUREMENTS

Summary of Test Results

Requirement	CFR Section	Report Section	Test Result
Antenna Requirement	15.203	5.1	PASS
Conducted Emissions	15.207	5.2	PASS
Occupied bandwidth	15.239(a)	5.3	PASS
Field Strength (Fundamental)	15.239(b)	5.4	PASS
Radiated Spurious Emissions	15.239(c), 15.209	5.4	PASS

5.1 ANTENNA REQUIREMENT

5.1.1 Regulation

FCC section 15.203, An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of Part 15C. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31 (d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

5.1.2 Result: **PASS**

The transmitter has an integral antenna and meets the requirements of this section.



5.2 CONDUCTED EMISSIONS

5.2.1 Regulation

According to §15.207(a), For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50uH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency.

5.2.2 Test Procedure

The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 cm in which is located 40 cm away from the vertical wall and 1.5 m away from the side wall of the shielded room. Each current-carrying conductor of the EUT power cord was individually connected through a 50Ω/50uH LISN, which is an input transducer to a Spectrum Analyzer or an EMI/Field Intensity Meter, to the input power source.

Exploratory measurements were used to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.

The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 MHz to 30 MHz.

The measurements were made with the detector set to "peak" amplitude within a bandwidth of 10 kHz or to "quasi-peak and average" within a bandwidth of 9 kHz.



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5.2.3 Test Results:

PASS

Table 1: Measured values of the Conducted emissions

Frequency (MHz)	Reading (dBμV)		CF/CL (dB)	Actual (dBμV)		Limit (dBμV)		Margin (dB)	
	Qp	Av		Qp	Av	Qp	Av	Qp	Av
LINE – PE									
0.15	56.13	28.70	0.09/0.0	56.22	28.79	66.00	56.00	9.78	27.21
0.38	21.79	–	0.09/0.1	21.98	–	58.28	48.28	36.30	–
0.43	22.06	–	0.09/0.1	22.25	–	57.25	47.25	35.00	–
0.60	17.25	–	0.10/0.1	17.45	–	56.00	46.00	38.55	–
1.18	22.80	–	0.13/0.3	23.23	–	56.00	46.00	32.77	–
3.61	24.56	–	0.19/0.4	25.15	–	56.00	46.00	30.85	–
5.49	19.30	–	0.23/0.4	19.93	–	60.00	50.00	40.07	–
10.93	25.97	–	0.39/0.5	26.86	–	60.00	50.00	33.14	–
20.00	25.95	–	0.81/0.6	27.36	–	60.00	50.00	32.64	–
24.35	21.51	–	0.88/0.7	23.09	–	60.00	50.00	36.91	–
NEUTRAL – PE									
0.15	56.28	24.5	0.13/0.0	56.41	24.63	66.00	56.00	9.59	31.37
0.43	21.57	–	0.15/0.1	21.82	–	57.25	47.25	35.43	–
0.46	24.06	–	0.15/0.1	24.31	–	56.69	46.69	32.38	–
0.83	26.31	–	0.15/0.1	26.56	–	56.00	46.00	29.44	–
1.20	22.98	–	0.15/0.1	23.23	–	56.00	46.00	32.77	–
1.87	22.31	–	0.17/0.3	22.78	–	56.00	46.00	33.22	–
3.47	26.54	–	0.21/0.4	27.15	–	56.00	46.00	28.85	–
10.99	28.36	–	0.33/0.5	29.19	–	60.00	50.00	30.81	–
19.57	18.53	–	0.60/0.6	19.73	–	60.00	50.00	40.27	–
24.64	15.45	–	0.63/0.7	16.78	–	60.00	50.00	43.22	–

1. "–": Undetectable or the Qausi-peak value is lower than the limit of Average

2. Qp = Qausi-peak, Av = Average detector function

3. CF/CL = Correction Factor and Cable Loss

4. The frequency range was scanned from 150 kHz to 30 MHz. All emissions not reported were more than 20 dB below the specified limit.

$$\text{Margin (dB)} = \text{Limit} - \text{Actual}$$

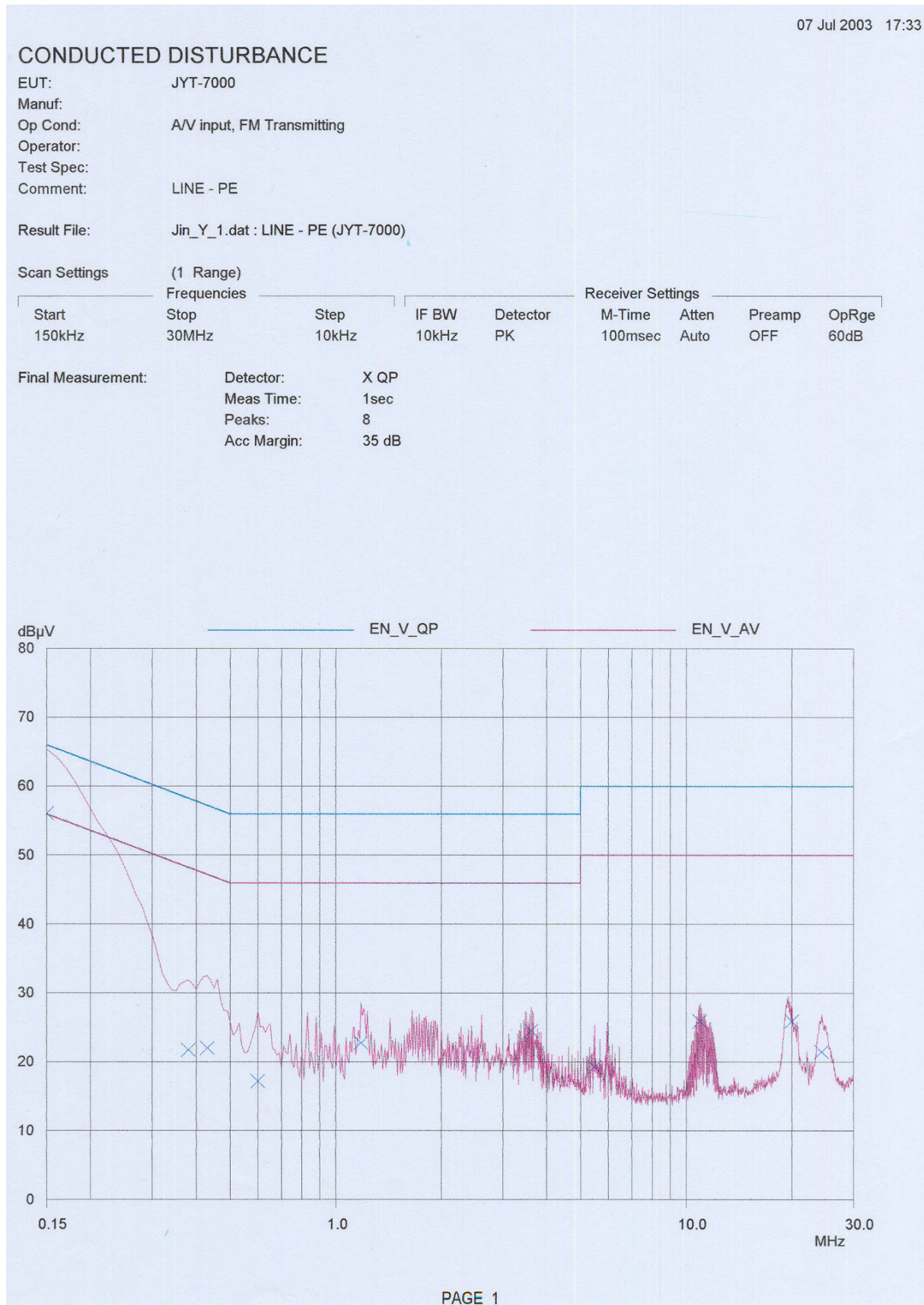
$$[\text{Actual} = \text{Reading} + \text{CF} + \text{CL}]$$

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Figure 1: Plot of the Conducted Emissions

Spectral Diagram: LINE – PE



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Figure 1: Plot of the Conducted Emissions (Continued)

Spectral Diagram: NETURAL – PE

07 Jul 2003 17:48

CONDUCTED DISTURBANCE

EUT: JYT-7000

Manuf:

Op Cond: A/V input, FM Transmitting

Operator:

Test Spec:

Comment: NEUTRAL - PE

Result File: Jin_Y_2.dat : NEUTRAL - PE (JYT-7000)

Scan Settings (1 Range)

Frequencies

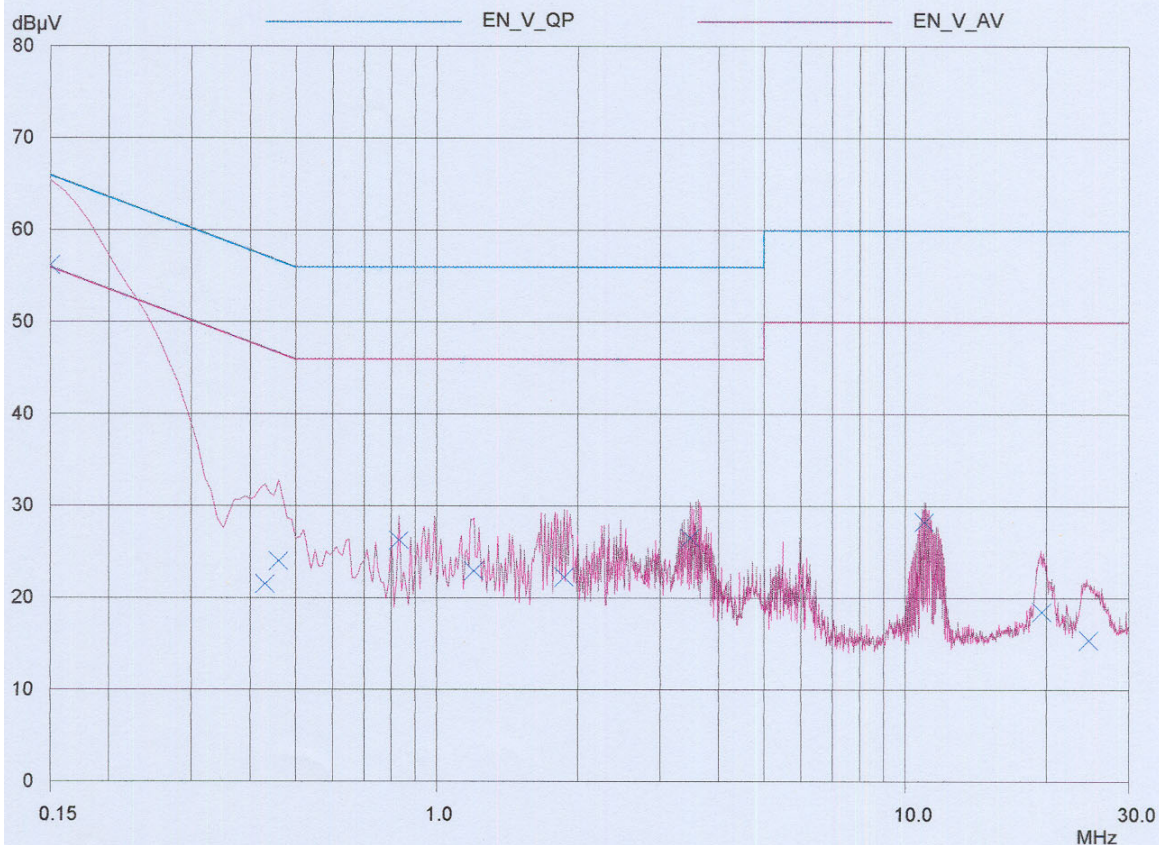
Start	Stop	Step
150kHz	30MHz	10kHz

IF BW	Detector
10kHz	PK

Receiver Settings

M-Time	Atten	Preamp	OpRge
100msec	Auto	OFF	60dB

Final Measurement:	Detector:	X QP
	Meas Time:	1sec
	Peaks:	8
	Acc Margin:	35 dB





5.3 OCCUPIED BANDWIDTH

5.3.1 Regulation

According to §15.239(a), Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

5.3.2 Test Procedure

ANSI C63.4-2001 Section 13.1.7, Occupied Bandwidth Measurements. The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at either the fundamental frequency or first-order modulation products in all typical modes of operation, including the unmodulated carrier, even if atypical. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce worst-case (i.e., the widest) bandwidth.

The measurements were performed at three channels, low (90.7 MHz), middle (91.5 MHz) and high (92.2 MHz). The spectrum trace data around fundamental frequency of the EUT was obtained with the spectrum analyzer in "Max Hold" mode. The bandwidth value was determined between the two points of 26dB down from the reference level.

5.3.3 Test Results:

PASS

Table 2: Measured values of the Occupied bandwidth

Center frequency (MHz)	Limit (kHz)	Measured occupied bandwidth (kHz)
90.7	200.0	111.0
91.5	200.0	124.7
92.2	200.0	129.7

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Figure 2: Plot of the Occupied bandwidth

Operating at 90.7 MHz

Agilent 21:42:27 Jul 7, 2003

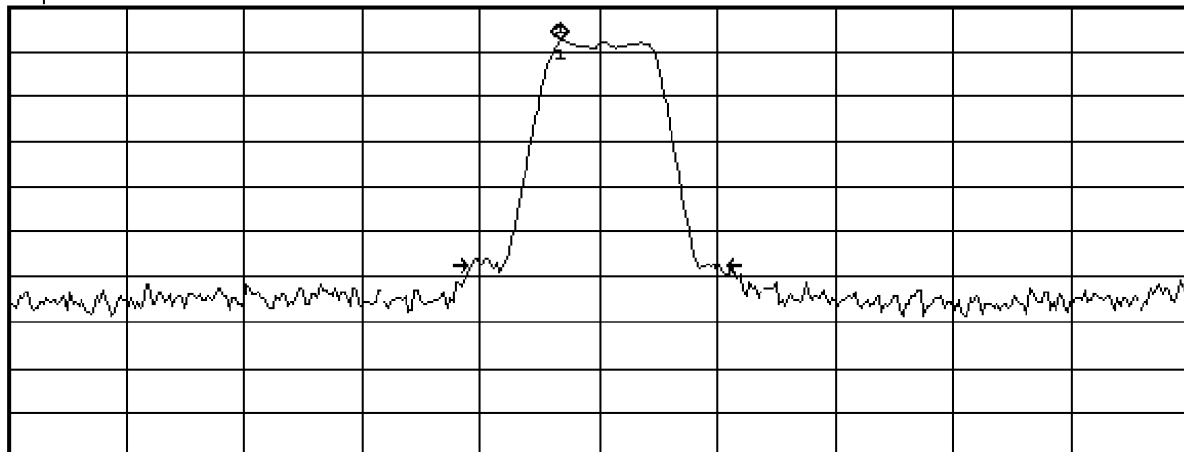
R T

Mkr1 90.684 MHz

N dB 111 kHz

Ref 45 dB μ V

Atten 5 dB

Peak
Log
5
dB/

Center 90.7 MHz

Span 500 kHz

#Res BW 10 kHz

VBW 10 kHz

Sweep 27.5 ms (401 pts)

Operating at 91.5 MHz

Agilent 21:39:56 Jul 7, 2003

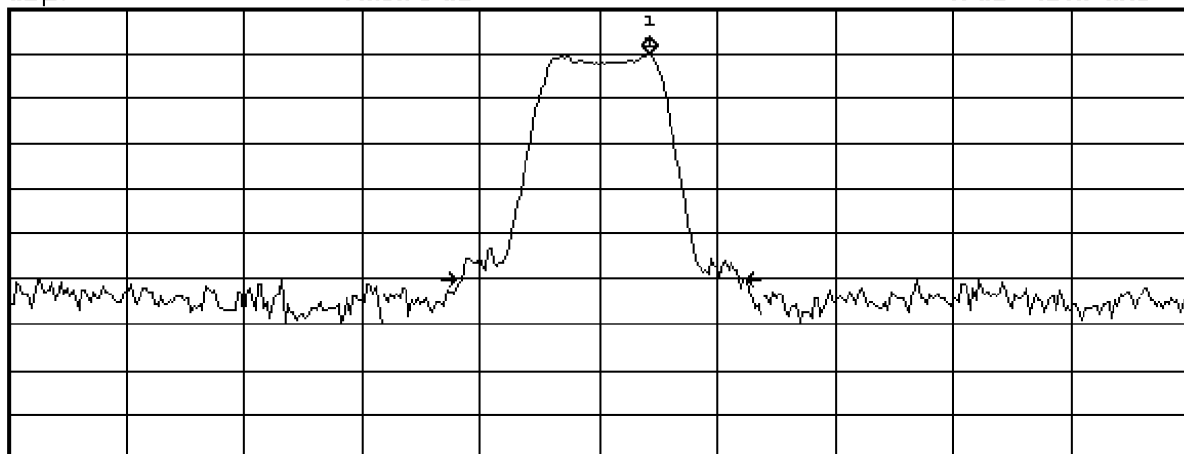
R T

Mkr1 91.521 MHz

N dB 124.7 kHz

Ref 45 dB μ V

Atten 5 dB

Peak
Log
5
dB/

Center 91.5 MHz

Span 500 kHz

#Res BW 10 kHz

VBW 10 kHz

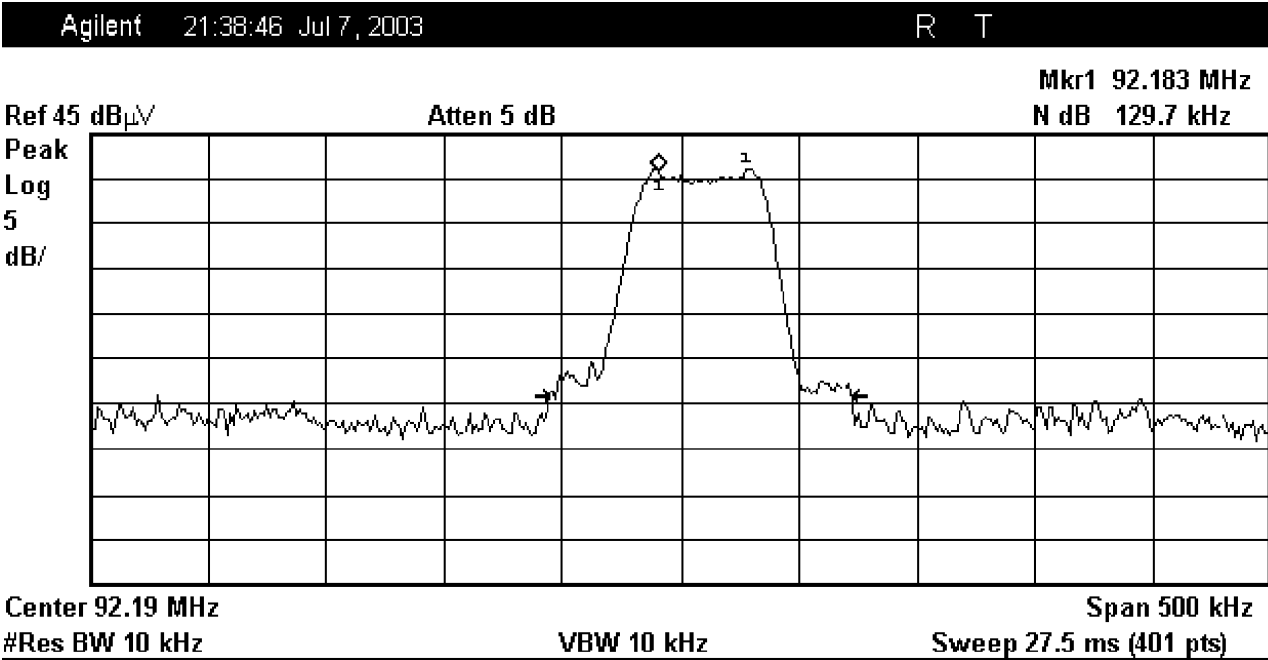
Sweep 27.5 ms (401 pts)



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Figure 2: Plot of the Occupied bandwidth (Continued)

Operating at 92.2 MHz





5.4 RADIATED EMISSIONS

5.4.1 Regulation

According to §15.239(b), The field strength of any emissions within the permitted 200kHz band shall not exceed the 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

Fundamental frequency (MHz)	Field strength of fundamental ($\mu\text{V}/\text{m}$ @ 3m)	Field strength of fundamental (dB $\mu\text{V}/\text{m}$ @ 3m)
88-108	250	48.0

According to §15.239(c), the field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in §15.209.

Frequency (MHz)	Field strength ($\mu\text{V}/\text{m}$ @ 3m)	Field strength (dB $\mu\text{V}/\text{m}$ @ 3m)
30–88	100	40.0
88–216	150	43.5
216–960	200	46.0
Above 960	500	54.0

5.4.2 Test Procedure

Preliminary radiated measurements were performed to determine the frequency producing the maximum emissions in an anechoic chamber at a distance of 3 meters. The EUT was placed on the top of the 0.8 meter high, 1 x 1.5 meter non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360°. The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 30 to 300 MHz using the biconical antenna and from 300 to 1000 MHz using the log-periodic antenna. Above 1 GHz, linearly polarized double ridge horn antenna was used. To obtain the final test data, the EUT was arranged on a turntable situated on a 4x4 meter at the Open Area Test Site. The EUT was tested at a 3-meter test distance. Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to quasi-peak or average and peak detector function with specified bandwidth. The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was



detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT.

The EUT was operated in transmitting mode. The measurements were performed at three modulated carrier frequencies: 90.7 MHz, 91.5 MHz and 92.2 MHz.

5.4.3 Test Results:**PASS****Table 3: Measured values of the Field strength**

Frequency [MHz]	Receiver Bandwidth [kHz]	Pol. (V/H)	Antenna Height [m]	Table Angle [°]	Reading [dB(μV)]	Amp Gain [dB]	AF / CL [dB(1/m)]	Actual [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
Emissions AVERAGE DATA 15.239(b) Bands										
90.7	120	V	3.83	149	54.6	27.8	8.5/1.2	36.5	48.0	11.5
91.5	120	V	1.86	156	53.7	27.8	8.7/1.2	35.8	48.0	12.2
92.2	120	V	1.86	329	54.1	27.8	8.7/1.2	36.2	48.0	11.8
Emissions PEAK DATA 15.239(b) Bands										
90.7	120	V	3.83	149	60.0	27.8	8.5/1.2	41.9	68.0	26.1
91.5	120	V	1.86	156	58.4	27.8	8.7/1.2	40.5	68.0	27.5
92.2	120	V	1.86	329	59.6	27.8	8.7/1.2	41.7	68.0	26.3
Emissions Quasi-peak DATA 15.209; general radiated emissions										

NO EMISSIONS FOUND

1. H = Horizontal, V = Vertical Polarization

2. AF/CL = Antenna Factor and Cable Loss

3. The frequency range was scanned from 30 MHz to 1 GHz. All emissions not reported were more than 20 dB below the specified limit or in the noise floor.

Margin (dB) = Limit - Actual

[Actual = Reading - Amp Gain + AF + CL]