HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD.

PRODUCT COMPLIANCE DIVISION
SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA
TEL : +82 31 639 8518 FAX : +82 31 639 8525 www.hct.co.kr

VERIFICATION

HYUNDAI CURITEL INC.
SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI,
KYOUNGKI-DO, 467-701,KOREA

FRN: 0006278469

Date of Issue: June 14, 2005
Test Report No.: HCT-SAR05-0611
Test Site: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD.
FRN: 0005866421

FCC ID : **PP4TX-215A**

MODEL : **TX-215A**

FCC Rule Part(s):	Part 15 & 2
Standard(s):	CISPR 22 CLASS B: 1998
FCC Classification:	Licensed Portable Transmitter Held to Ear (PCE)
Equipment (EUT) Type:	Tri-Mode Dual-Band Phone (AMPS/CDMA/ PCS CDMA)
Trade Name/Model(s):	HYUNDAI / TX-215A
Port/ Connector(s)	DC Input Port, Ear Phone Port

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003.(See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HYUNDAI C-Tech. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse of 1988,21 U.S.C.853(a).

Ki Soo Kim

Report prepared by : Ki-Soo Kim
Manager of Product Compliance Team

TABLE OF CONTENTS

PAGE

1. GENERAL INFORMATION

1.1 Product Description

The Hyundai Curitel TX-215A Tri-Mode Dual-Band (AMPS/ CDMA/ PCS CDMA) phone. Its basic purpose is used for communications. It transmits from AMPS (824.04~848.97), CDMA(824.70~848.31), PCS CDMA(1851.25~1908.75)MHz and receives from AMPS(869.04~893.97), CDMA(869.70~893.31), PCS CDMA(1931.25~1988.75)MHz. The RF power is rated at AMPS(0.436W), CDMA(0.328W), PCS CDMA(0.344W).

FCC ID	PP4TX-215A
EUT Type	Tri-Mode Dual-Band Phone (AMPS/CDMA/PCS CDMA) - Prototype
Model	HYUNDAI
TX Frequency	824.04 – 848.97 MHz (AMPS) 824.70 – 848.31 MHz (CDMA) 1851.25 – 1908.75 MHz (PCS CDMA)
RX Frequency	869.04 – 893.97 MHz (AMPS) 869.70 – 893.31 MHz (CDMA) 1931.25 – 1988.75 MHz (PCS CDMA)
FCC Classification	Licensed Portable Transmitter Held to Ear (PCE)
Max RF. Output Power	0.436W ERP AMPS (26.4dBm) / 0.328W ERP CDMA (25.2dBm) 0.344W EIRP PCS CDMA (25.4dBm)
Modulation	AMPS/ CDMA / PCS

1.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

1.3 Tested System Details

The Model names for all equipment, plus descriptions used in the tested system (including inserted cards) are:

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
Tri-Mode Dual-Band Phone (AMPS/CDMA/ PCS CDMA)	HYUNDAI CURITEL INC.	TX-215A	PP4TX-215A	CHARGER
CHARGER	PANTECH & CURITEL	CTA-20	-	EUT
Head-Set	HYUNDAI CURITEL INC.	-	-	EUT
P.C	Compaq	LDWZ	DoC	N/A
MONITOR	Cornea	CT1502	PL4CT1502	P.C
Adapter	Lishin international Enterprise Corp	LSE9901B1260	DoC	MONITOR
KEY BOARD	H.P	5181	DoC	P.C
MOUSE	H.P	M-S48a	DoC	P.C
PRINTER	H/P	C4569A	DoC	P.C

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to EUT distance of 10 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1,Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 23, 2003(Confirmation Number: EA90661)

2.SYSTEM TEST CONFIGURATION

2.1 Justification

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components and I/O cards inside the E.U.T were used.

DEVICE TYPE	MANUFACTURE	MODEL/PART NUMBER
MAIN BOARD	HYUNDAI CURITEL INC.	TX-215A

2.2 EUT exercise Software

The EUT was tested on the charging battery during the radiated and conducted emission testing.

2.3 Cable Description

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
EUT	N/A	Y	1.5(D)
Charger	N	N/A	1.5(P)
MONITOR	N	Y	1.8(P), 1.5(D)
Adaptor	N	N/A	1.8(P)
PC	N	N/A	1.8(P)
KEY BOARD	N/A	Y	1.8(D)
Head-Set	N/A	N	1.5(D)
MOUSE	N/A	Y	1.8(D)
PRINTER	N	Y	1.8(P),1.8(D)

2.4 Noise Suppression Parts on Cable.

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT	Y	P.C END	Y	PC END
Charger	N	N/A	N	EUT END
MONITOR	Y	P.C END	Y	P.C END
Adaptor	Y	Adaptor END	Y	MONITOR END
KEY BOARD	N	N/A	Y	P.C END
Head-Set	N	N/A	N	P.C END
MOUSE	N	N/A	Y	P.C END
PRINTER	N	N/A	Y	P.C END

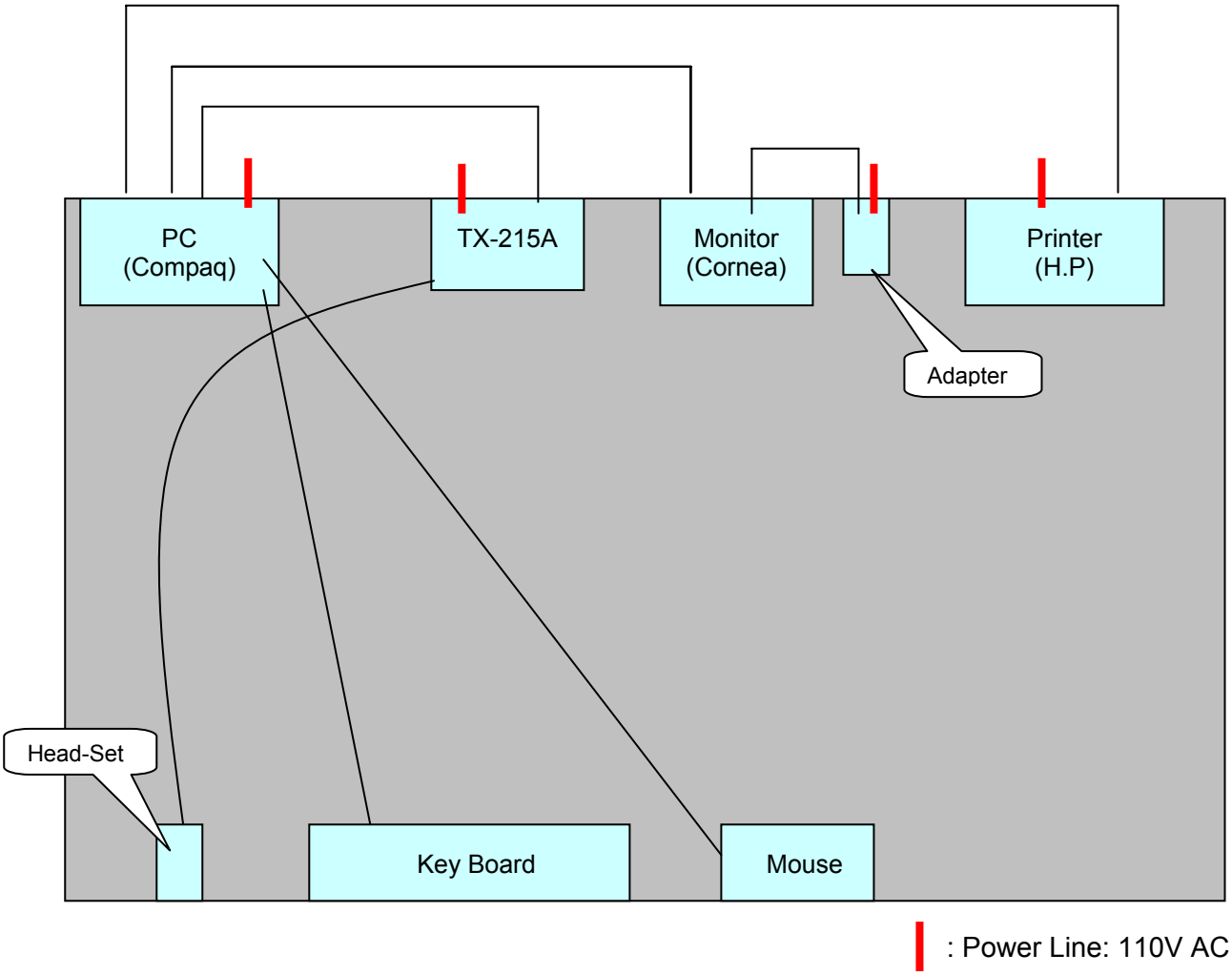
2.5 Equipment Modifications

N/A

2.6 Configuration of Test system

Line Conducted Test : EUT was connected to LISN, all other supporting equipment were Connected to another LISN. Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary Radiated Emissions tests were conducted using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worse perating condition. Final Radiated Emission tests were conducted at 10 meter open area test site.



[Configuration of Tested System]

3. PRELIMINARY TESTS

3.1 AC Power line Conducted Emission Tests

During Preliminary Tests, the following operating mode were investigated

Model	Operating Mode	The worst operating condition
TX-215A	Charging	X
	Camera operating	
	Camera download	

3.2 Radiated Emission Tests

During Preliminary Tests, Charging battery mode were investigated.

Model	Operating Mode	The worst operating condition
TX-215A	Charging	
	Camera operating	X
	Camera download	

4. FINAL CONDUCETD AND RADIATED EMISSION TESTS SUMMARY

4.1 Conducted Emissions Tests

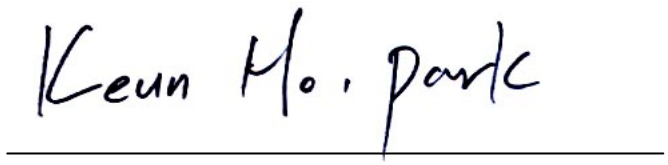
The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

==========

Humidity Level : 28 % Temperature: 25.2°C
Type of Tests : CISPR 22 CLASS B
Result : PASSED BY -14.7 dB
EUT : TX-215A
Operating Condition: CHARGING BATTERY
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 KHz)

Power Line Conducted Emissions				CISPR 22 CLASS B	
Frequency (MHz)	Amplitude (dBuV)	Conductor	Result	Limit (dBuv)	Margin (dB)
3.45	33.80	NEUTRAL	Quasi-Peak	56	-22.2
3.45	20.50	NEUTRAL	Average	46	-25.5
3.515	41.30	HOT	Quasi-Peak	56	-14.7
3.505	29.50	HOT	Average	46	-16.5

Line Conducted Emissions Tabulated Data



Measured by: Keun-Ho Park / Engineer Date : June 12, 2005

HCT

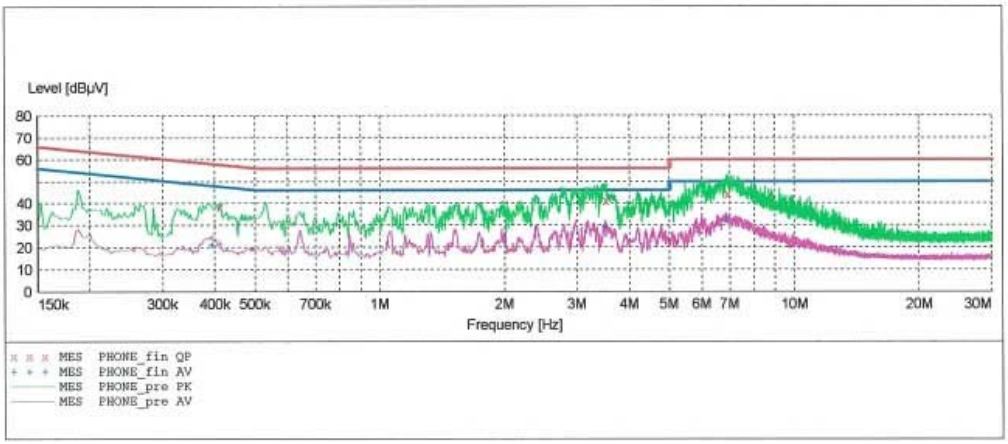
EMC TEST LAB

EUT: TX-215A
Manufacturer: HYUNDAI CURITEL INC.
Operating Condition: NORMAL
Test Site: SHIELD ROOM
Operator: KEUN-HO PARK
Test Specification: CISPR 22 CLASS B
Comment: H 110

SCAN TABLE: "CISPR 22 Voltage"

Short Description: CISPR 22 Voltage

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	2.5 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.412500	38.50	10.1	58	19.1	---	---
3.515000	41.30	10.2	56	14.7	---	---
6.900000	44.40	10.3	60	15.6	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.395000	21.10	10.1	48	26.8	---	---
3.505000	29.50	10.2	46	16.5	---	---
6.875000	32.10	10.3	50	17.9	---	---

HCT

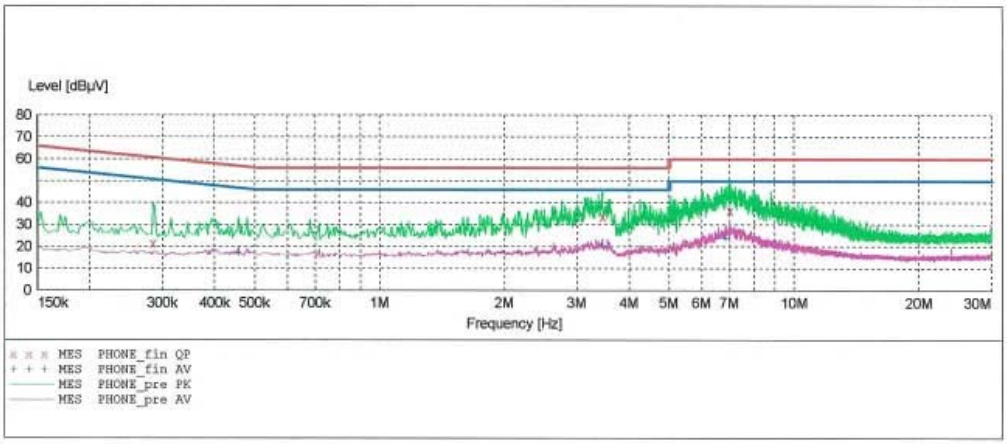
EMC TEST LAB

EUT: TX-215A
Manufacturer: HYUNDAI CURITEL INC.
Operating Condition: NORMAL
Test Site: SHIELD ROOM
Operator: KEUN-HO PARK
Test Specification: CISPR 22 CLASS B
Comment: N 110

SCAN TABLE: "CISPR 22 Voltage"

Short Description: CISPR 22 Voltage

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	2.5 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.285000	21.70	10.1	61	38.9	---	---
3.450000	33.80	10.2	56	22.2	---	---
7.025000	36.70	10.3	60	23.3	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.457500	17.00	10.1	47	29.8	---	---
3.450000	20.50	10.2	46	25.5	---	---
6.850000	24.00	10.3	50	26.0	---	---

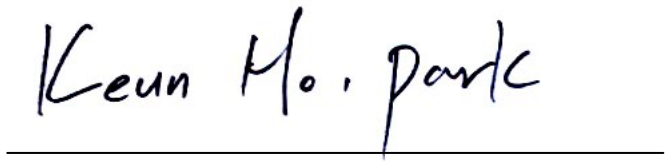
4.2 Radiated Emissions Tests

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

==========

Humidity Level : 28 % Temperature: 25.2°C
Type of Tests : CISPR 22 CLASS B
Result : PASSED BY -5.4 dB
EUT : TX-215A
Operating Condition: CHARGING BATTERY
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 KHz)

MHz	dBuV	dB	dB	(H/V)	dBuV/m	dBuV/m	dB
74.1	14.92	6.50	1.9	V	23.3	30	-6.7
154.8	6.66	15.16	2.8	V	24.6	30	**-5.4**
263.5	7.03	17.77	3.7	V	28.5	37	-8.5
364.5	8.63	16.58	4.4	V	29.6	37	-7.4
403.5	6.75	17.04	4.6	V	28.4	37	-8.6
476.5	5.84	18.78	5.0	V	29.6	37	-7.4
282.2	4.98	18.56	3.9	H	27.4	37	-9.6
362.2	7.57	16.56	4.4	H	28.5	37	-8.5
447.7	5.73	18.33	4.8	H	28.9	37	-8.1
435.6	6.75	17.98	4.8	H	29.5	37	-7.5
468.7	3.79	18.67	4.9	H	27.4	37	-9.6
512.7	3.56	19.38	5.2	H	28.1	37	-8.9

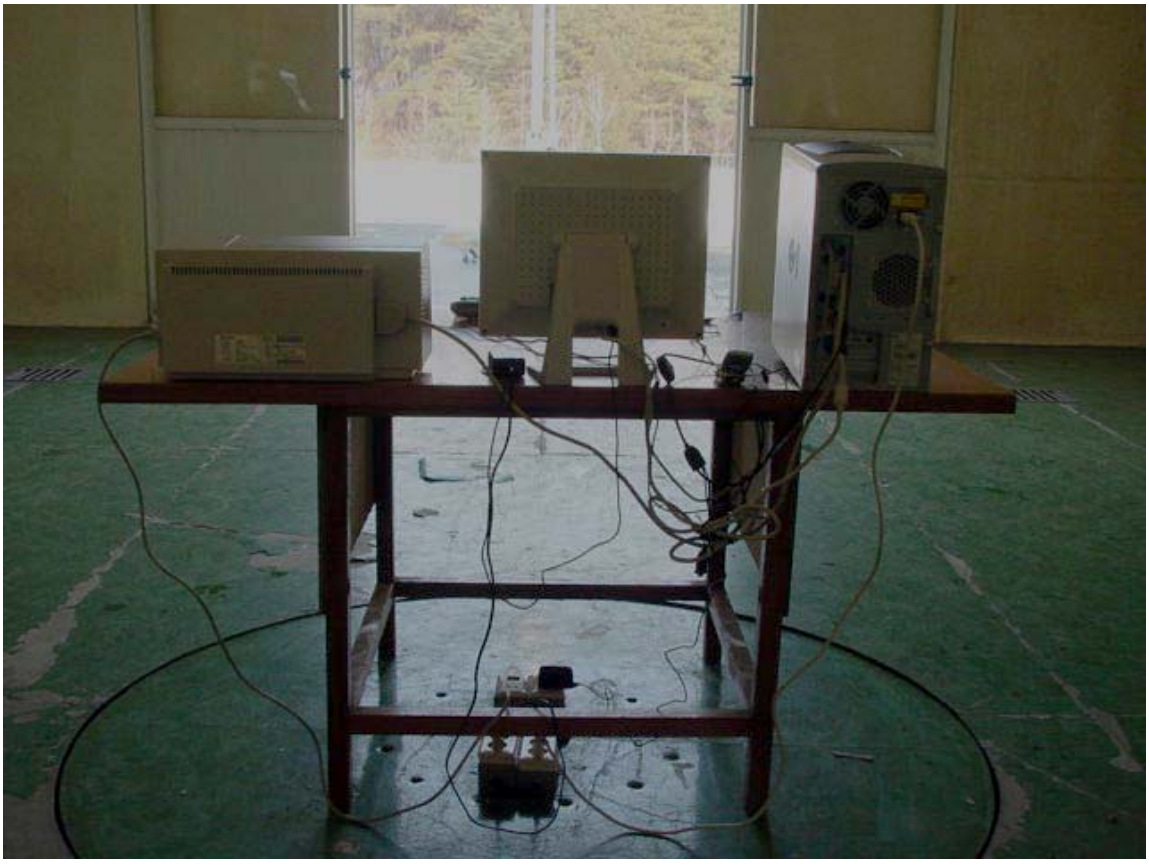


Measured by: Keun-Ho Park / Engineer Date : June 12, 2005

4.3 Test Setup Photos

4.3.1 Conducted Radiated Emission

4.3.2 Radiated Emission



5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.
The basic equation with a sample calculation is as follows:

FS = RA + AF + CF

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBuV is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The 30 dBuV/m value was mathematically converted to its corresponding level in uV/m.

FS = 21.5 + 7.4 + 1.1 = 30 dBuV/m

Level in uV/m = Common Antilogarithm [(30 dBuV/m)/20] = 31.6 uV/m