

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

NEWGEN telecom CO., LTD.

5F HyeMyeong B/D 1082-13 Pungdeokcheon-dong
Yongin-city Gyeonggi-do, Korea 449-170
FRN: 0010936045

Date of Issue: October 7, 2004

Test Report No.: HCT-SAR04-1003

Test Site: HYUNDAI CALIBRATION & CERTIFICATION
TECHNOLOGIES CO., LTD.

FRN: 0005866421

MODEL

:

N541

Classification:	CLASS B
Standard(s):	CISPR 22 CLASS B
Equipment (EUT) Type:	Dual- Mode GSM Phone
Trade Name/Model(s):	NEWGEN telecom / N541
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 C63.4-1992.(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).

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



TABLE OF CONTENTS

PAGE

1. GENERAL INFORMATION.....	3
1.1 Product Description.....	3
1.2 Related submittal(s)/Grant(s).....	3
1.3 Tested System Details.....	4
1.4 Test Methodology.....	4
1.5 Test Facility.....	4
2. SYSTEM TEST CONFIGURATION.....	5
2.1 Cable Description.....	5
2.2 Noise Suppression Parts on Cable.....	5
2.3 EUT Exercise Software.....	6
2.4 Equipment Modifications.....	6
2.5 Configuration of Tested System.....	7
3. CONDUCTED AND RADIATED EMISSION TESTS SUMMARY.....	8
3.1 Conducted Emission Tests.....	8-10
3.2 Radiated Emission Tests.....	11
3.3 Test Setup Photos.....	12-14
4. FIELD STRENGTH CALCULATION.....	15
5. Test Equipment.....	16
6. Conclusion.....	17

1. GENERAL INFORMATION

1.1 Product Description

The NEWGEN Telecom CO., LTD. N541 Dual-Band GSM Phone.

Its basic purpose is used for communications. It transmits from (824.20 – 848.80MHz (GSM850) / 1850.20MHz – 1909.80MHz (GSM1900) and receives from (869.20 – 893.80MHz (GSM850) / 1930.20MHz – 1989.80MHz (GSM1900).

The RF power is rated at GSM850 (0.787W) and GSM1900 (0.505W).

FCC ID	R5WNGTN541T
EUT Type	Dual- Mode GSM Phone
Model	N541
TX Frequency	824.20 – 848.80MHz (GSM850) / 1850.20MHz – 1909.80MHz (GSM1900)
RX Frequency	869.20 – 893.80MHz (GSM850) / 1930.20MHz – 1989.80MHz (GSM1900)
FCC Classification	Licensed Portable Transmitter Held to Ear (PCE)
Max RF. Output Power	0.787 W ERP GSM850 (28.96 dBm) / 0.505 W EIRP GSM1900 (27.03 dBm)
Modulation	GSM850 / GSM1900
Power Voltage	Input AC: AC 100-240V/ 0.15A (AC 85-264V/ 0.25A)/ Output DC: DC 5.1V/620mA (DC 5.2V/ 600mA)

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
Dual- Mode GSM Phone	NEWGEN telecom CO., LTD.	N541	R5WNGTN541T	Adaptor/ P.C
Adaptor	Cell-line (Partsnic)	N541	N/A	GSM Phone

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at an antenna to EUT distance of 3 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(Registration Number: 90661)

2.SYSTEM TEST CONFIGURATION

2.1 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)
GSM PHONE	N/A	N/A	-
EAR PHONE	N/A	N	1.0(D)
Adapter	N	N/A	1.8(P)

2.2 Noise Suppression Parts on Cable.

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
GSM PHONE	N	N/A	N/A	Adapter END
EAR PHONE	N	N/A	Y	GSM PHONE
Adapter	N	N/A	Y	GSM PHONE

2.3 EUT exercise Software

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

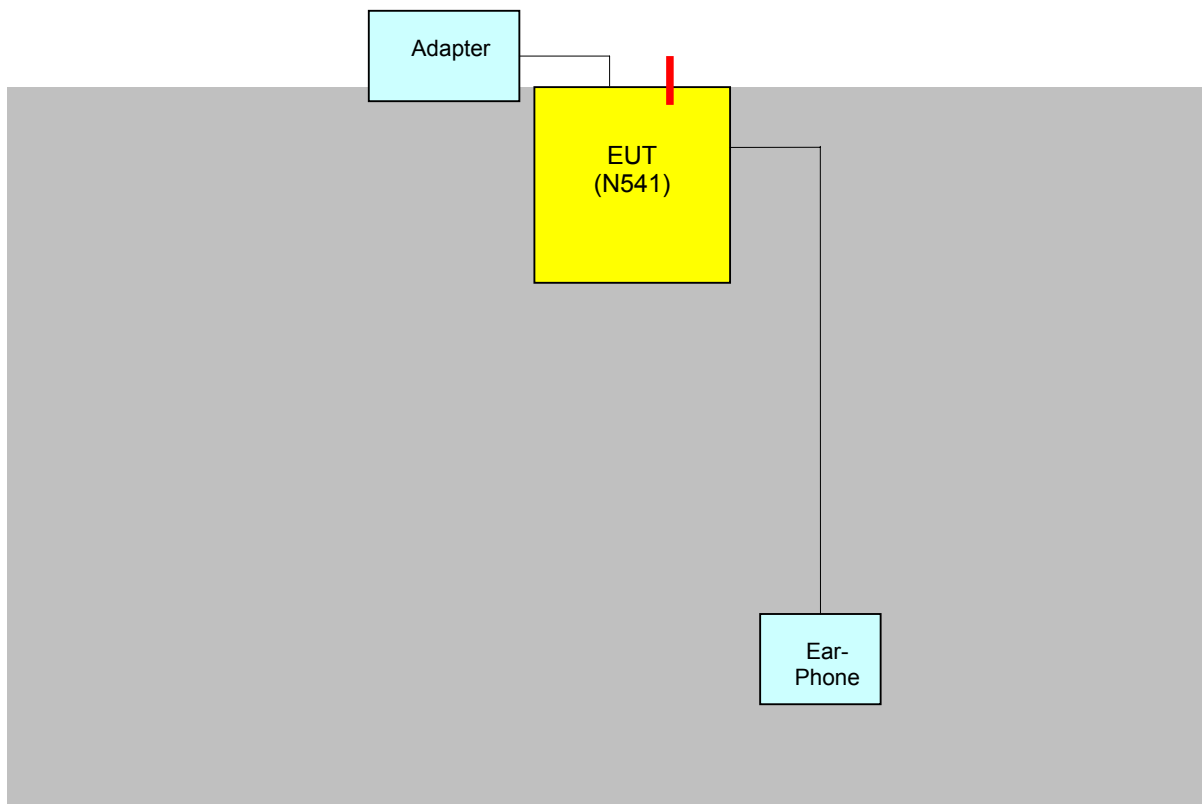
2.4 Equipment Modifications

N/A

2.5 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 C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary Radiated Emissions tests were conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse pirating condition. Final Radiated Emission tests were conducted at 3 meter open area test site.



[Configuration of Tested System]

3. CONDUCTED AND RADIATED EMISSION TESTS SUMMARY

3.1 Conducted Emissions Tests

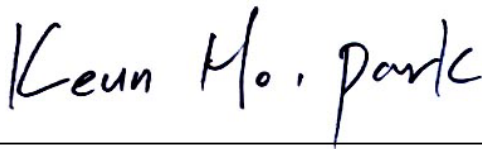
The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

=====

Humidity Level	: 39 %	Temperature	: 25.7 °C
Limit apply to	: CISPR 22		
Type of Tests	: CLASS B		
Result	: PASSED BY -15.2 dB		
Operating Condition	: CHARGING BATTERY		
Detector	: CISPR Quasi-Peak (6 dB Bandwidth: 9 KHz)		

Power Line Conducted Emissions				FCC Class B	
Frequency (MHz)	Amplitude (dBuV)	Conductor	Result	Limit (dBuV)	Margin (dB)
0.470	38.2	HOT	Quasi-Peak	57	-18.3
0.465	30.6	HOT	Average	47	-16.0
0.465	41.4	NEUTRAL	Quasi-Peak	57	-15.2
0.385	28.7	NEUTRAL	Average	48	-19.5

Line Conducted Emissions Tabulated Data



Measured by : Keun-Ho Park / Engineer

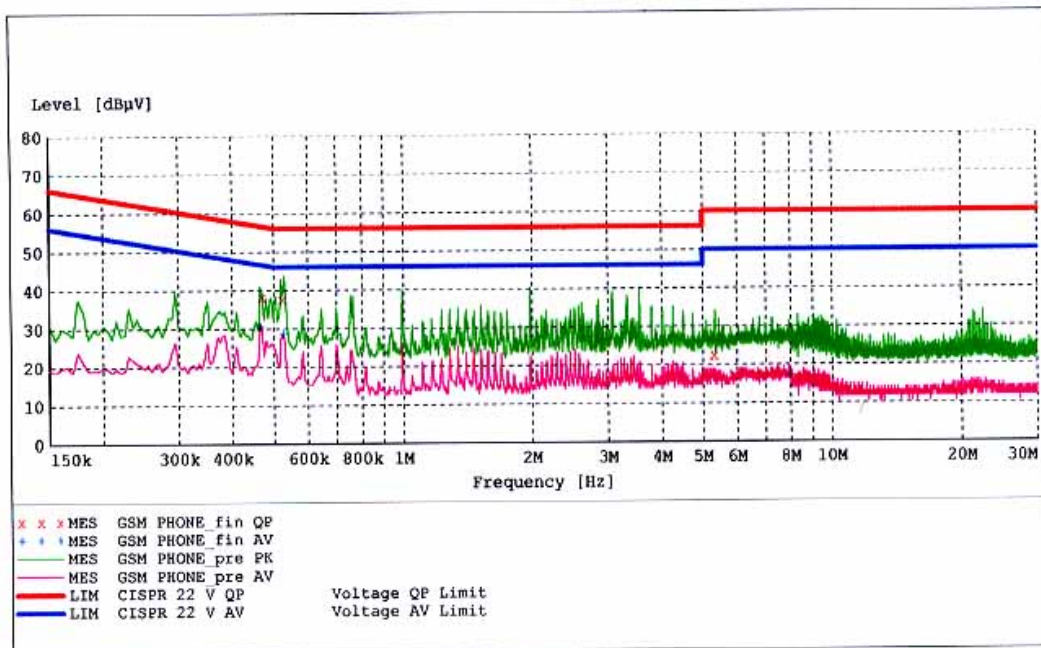
Date : October 5, 2004

HCT
EMC TESTING Laboratory

EUT: N541
Manufacturer: NEWGEN TELECOM
Operating Condition: CHARGING MODE
Test Site: SHIELD ROOM
Operator: KEUN HO PARK
Test Specification: CISPR 22 CLASS B
Comment: H

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	5.0 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: "GSM PHONE_fin QP"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.470000	38.20	10.1	57	18.3	1	---
0.525000	37.70	10.1	56	18.3	1	---
5.310000	22.30	10.3	60	37.7	1	---

MEASUREMENT RESULT: "GSM PHONE_fin AV"

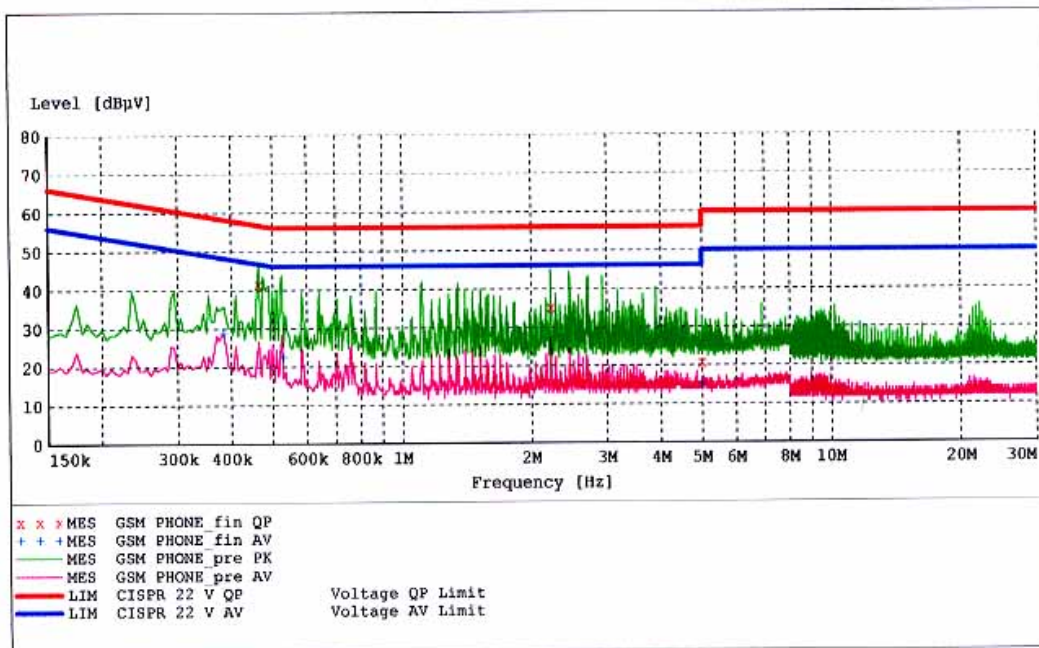
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.465000	30.60	10.1	47	16.0	1	---
0.525000	28.70	10.1	46	17.3	1	---
7.980000	17.10	10.4	50	32.9	1	---

HCT
EMC TESTING Laboratory

EUT: N541
Manufacturer: NEWGEN TELECOM
Operating Condition: CHARGING MODE
Test Site: SHIELD ROOM
Operator: KEUN HO PARK
Test Specification: CISPR 22 CLASS B
Comment: N

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	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	5.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "GSM PHONE_fin QP"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.465000	41.40	10.1	57	15.2	1	---
2.225000	35.10	10.3	56	20.9	1	---
5.000000	20.70	10.3	56	35.3	1	---

MEASUREMENT RESULT: "GSM PHONE_fin AV"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.385000	28.70	10.1	48	19.5	1	---
0.530000	22.60	10.1	46	23.4	1	---
5.000000	15.00	10.3	46	31.0	1	---

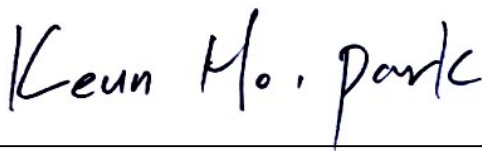
3.2 Radiated Emissions Tests

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

=====

Humidity Level	: 35 %	Temperature: 25.4 °C
Limit apply to	: CISPR 22	
Type of Tests	: CLASS B	
Date	: October 5, 2004	
Result	: PASSED BY -3.2 dB	
EUT	: N541	
Operating Condition:	Charging Battery	
Detector	: CISPR Quasi-Peak (6 dB Bandwidth: 120 KHz)	

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dBuV/m	Margin dB
76.40	26.9	6.7	1.9	V	35.5	40	-4.5
115.90	23.3	12.3	2.4	V	37.9	43.5	-5.6
132.80	23.9	13.8	2.6	V	40.3	43.5	-3.2
168.90	19.0	15.6	3.0	V	37.6	43.5	-5.9
196.80	17.9	16.2	3.2	V	37.2	43.5	-6.3
299.20	12.8	19.7	4.0	V	36.4	46	-9.6
585.50	11.4	20.8	5.5	V	37.8	46	-8.2
718.70	7.4	22.6	6.2	V	36.1	46	-9.9
132.00	18.8	13.8	2.6	H	35.2	43.5	-8.3
168.90	17.5	15.6	3.0	H	36.1	43.5	-7.4
528.10	12.8	19.7	5.2	H	37.8	46	-8.2
585.50	12.0	20.8	5.5	H	38.4	46	-7.6



Measured by : Keun-Ho Park / Engineer

Date : October 5, 2004

3.3.1 Conducted Radiated Emission



3.3.2 Radiated Emission





4.1 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.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dBuV/m}$$

$$\text{Level in uV/m} = \text{Common Antilogarithm} [(30 \text{ dBuV/m})/20] = 31.6 \text{ uV/m}$$

5.1 Test Equipment

Type	Manufacture	Model Number	CAL Date
EMI Test Receiver	Rohde & Schwarz	ESI40	2003.11.16
EMI Test Receiver	Rohde & Schwarz	ESVS30	2004.07.16
LISN	Rohde & Schwarz	ESH2-Z5	2004.07.28
LISN	EMCO	ESH3-Z5	2004.07.28
Attenuator	Rohde & Schwarz	ESH3-Z2	2003.11.16
Amplifier	Hewlett-Packard	8447E	2004.08.23
TRILOG Antenna	Schwarzbeck	9160	2004.04.06
Antenna Position Tower	EMCO	1051-12	N/A
Turn Table	EMCO	1060-06	N/A
Power Analyzer	Voltech	PM 3300	2004.02.15
Reference Network Impedance	Voltech	IEC 555	N/A
AC Power Source	PACIFIC	Magnetic Module	N/A
AC Power Source	PACIFIC	360-AMX	2003.11.25
Controller	HD GmbH	HD 100	N/A
SlideBar	HD GmbH	KMS 560	N/A

6.1 Conclusion

The data collected shows that the NEWGEN Telecom CO., LTD. Dual- Mode GSM Phone. FCC ID: FCC ID: R5WNGTN541T. Complies with §15.107 and §15.109 of the FCC Rules.