Federal Communications Commission

CFR 47, FCC, Part 22, Part 2, Part 15 Class A
Digital Cellular Systems (DCS)

CERTIFICATION

CERTIFICATION COMPLIANCE REPORT
ON

HD-PIC800 DCS Base Station...

FCC ID: CKLPIC800

PREPARED FOR:

Hyundai Electronics

3103 NORTH FIRST STREET
SAN JOSE, CA-95134

TESTING PERFORMED BY:

Electronic Compliance Laboratories, Inc.

Testing date	Report Number
JAN.-FEB., 2000	2K0110401

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1.0 VERIFICATION OF COMPLIANCE

DIGITAL CELLULAR SYSTEM *Certification*

EUT Description: The HD-PIC800 Digital Cellular System (DCS) Base Station operates at three different bends, providing communication links for a variety of cellular communication services.

Model Number: HD-PIC800
Serial Number: Prototype

Applicant: Hyundai Electronics America

Type of Test: FCC Part 22, Digital Cellular Services (DCS) &Part 15 Class A Radiated and Conducted Emissions (ITE)

Registration: NVLAP Code: 200089

Date of Test: Jan.-Feb. 2000

Tested By: Suresh Kondapalli, Jook Lee

The above equipment was tested by Electronic Compliance Laboratories, Inc. and found to be in compliance with the requirements set forth in the Federal Communications Commission for Interference by Digital Cellular Services (DCS). The equipment, in the configuration described in this report, shows that the maximum emission levels emanating from this equipment are within the FCC Part 15 Class A compliance requirements. Measurements investigating spectrum for all three blocks provided favorable results and were found to meet all the applicable requirements set forth per CFR 47 FCC Part 22 pertaining to DCS telecommunication Base Stations operating in the 835 – 890MHz band.

Chip Matheny
Technical Officer

Date: 2/23/00

Date: 2/23/00

Dr. Sang Kyoon Hyun
Director of Hardware Engineering

2.0 GENERAL INFORMATION

Applicant: Hyundai Electronics America
3103, North First Street
San Jose, CA -95134

Contact Name: Kweon Na
Contact Telephone: (408) 894-0437
Contact Fax: (408) 894-0588

EUT Description: The Digital Cellularl Services (DCS) System Base Station operates at three different bends, providing communication links for a variety of cellular communication services.
Model Number: HD-PIC800
Serial Number: Prototype
Report Number: 2K0110401A

Date of Test: Jan.-Feb. 2000

Manufacturer: Hyundai Electronics America

Type of Test: FCC Part 22 Digital Cellular Services (DCS), Part 15, Class A Radiated and Conducted Emissions
Frequency Range: Radiated Emissions 30 MHz to 1000MHz , Line Conducted Emissions 450kHz to 30 MHz - Radiated Emissions 1865 MHz to 19.9GHz Part 24

SUMMARY

Pass/Fail: PASSED

2.1 RADIATED EMISSION TEST:

The ***HD-PIC800*** was placed on a 3-meter open field test site. All emissions observed were below the applicable limit. All emissions observed were below the FCC Class A limit. Test results are in ***Appendix A.***

2.2 AC LINE CONDUCTED TEST:

The ***HD-PIC800*** was placed in a screen room and connected to AC power through a LISN. All other associated peripherals and support equipment were connected to a separate power source. All emissions observed were below the FCC Class A limit. Test results are in ***Appendix B.***

2.3 PART22 DIGITAL CELLULAR SYSTEM (DCS) WITHIN 835 MHz–890MHz BAND:

The ***HD-PIC800*** met all the requirements. See data and plots in Appendices contained at the end of this document. Spectrum Plots and Data available in ***Appendix C.***

3.0 TEST FACILITY

Name: *ELECTRONIC COMPLIANCE LABORATORIES, INC.*

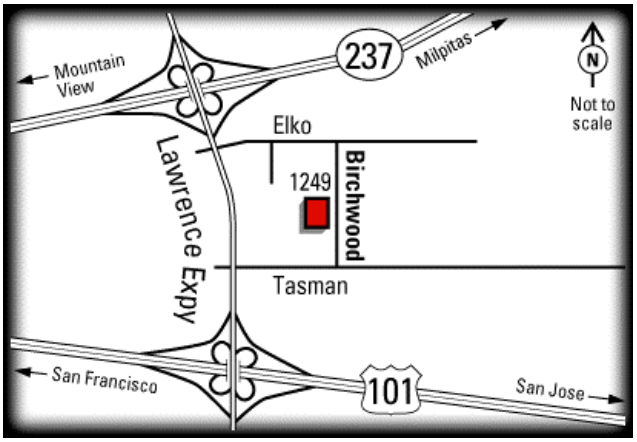
Location: 1249 Birchwood Drive
Sunnyvale, CA 94089

Site Filing: A site description is on file at the;
Federal Communications Commission
P.O. Box 429
Columbia, MD 21045

Types of Sites: Open Field Radiated and Indoor (Screen Room). Line Conducted: All sites are constructed and calibrated to meet ANSI C63.4-1994 requirements. Test facility is recognized by the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations.

NVLAP Code: 20089 effective through: March 31, 2000

LOCATION OF THE SUNNYVALE TEST FACILITY



www.eclabs.com

800/707-LABS

4.0 TEST EQUIPMENT SETTINGS

4.1 TEST EQUIPMENT SETTINGS

Parameter	Line Conducted Emissions	Radiated Emissions
Bandwidth	9 kHz	120kHz
*Detector Mode	Peak	Peak

*Unless otherwise specified

Units of Measurement

Measurements of radiated emissions are reported in terms of microvolts per meter or in dBuV/m at a specified distance. The indicated readings on the spectrum analyzer are converted to microvolts per meter or to dBuV/m by the use of appropriate conversion factors. Measurements of conducted interference are reported in units of microvolts or dBuV.

5.0 ANTENNAS

5.1 ANTENNA TABLE

Antenna Type	Frequency Range
Biconical	25 to 300 MHz
Log Periodic	300 to 1000MHz
Horn Double Ridge	1 to 24GHz
Horn Parabolic	4.9 to 10GHz
Horn Polarad	4.7 to 7.74GHz
Horn Polarad	8.3 to 10GHz

Correction Factors: Programmed into the software
Antenna Height: Varied from 1 to 4 meters above the ground plane
Polarization: Vertical/Horizontal

Note: The antenna used at the time that the data was taken is indicated on each data page in the appendixes. The correction factors and antenna polarization are also noted on each data page.

6.0 TEST EQUIPMENT

The following list contains equipment used at EC Laboratories, Inc. for compliance testing. The equipment conforms to the American National Standard Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1000 MHz.

6.1 TEST EQUIPMENT TABLE

Description	Manufacturer	Serial No.	Model No.
EMI Receiver	HP	3325A00137	8456A
Power Meter	HP	3125U13399	437B
Power Sensor	HP	3318A16275	8481
Spectrum Analyzer	HP	3137A01183	8563A
Pre-amp	HP	3113A05849	8447F
Pre-amp	HP	3008A00527	8449B
LISN	EM	2532	ANS-25/2
Biconical Antenna	EM	677	EM-6912
Log-Periodic Antenna	EM	858	EM-6950
Double Ridge Horn	EM	6231	EM 6961
Filter BP 1.2-4 GHz	FSY	001	HM1160-11SS
Filter BP 4-10 GHz	FSY	001	HM2950-15SS
Filter BP 10-18 GHz	FSY	001	HP8601-7SS

HP = Hewlett Packard
EM = Electro Metrics
FSY = FSY Microwave

Antennas used at the time the data was taken is indicated on each data page. Antenna height and polarization are also noted on the data pages.

Calibration of the measuring instruments, including any accessories that may effect such calibration, are checked frequently to assure their accuracy. Adjustments are made and correction factors applied in accordance with instructions contained in the manual for the measuring instrument. All equipment is calibrated per EC Labs' Test Equipment Calibration Schedule as required per EN 45001 and NVLAP Accreditations.

7.0 DATA REPORTING FORMAT

The measurement results are expressed in accordance with FCC Part 15 Subpart B Class B limits, where applicable, are presented in tabular or graphical form.

7.1 Operating Conditions

The EUT was operated at the specified load conditions (mechanical and/or electrical) for which it was designed.

7.2 Conditions of the EUT

The EUT was operated for a sufficient period of time to approximate normal operating conditions.

7.3 Test Configuration

The equipment under test was configured and operated in a manner that tends to maximize its emission characteristics in a typical application. Power and signal distribution, ground, interconnecting cabling and physical placement of equipment were simulating the typical application and usage in so far as practicable. The EUT was furnished with rated voltage as specified by the manufacturer in the individual equipment's power requirements.

7.4 Test Platform

The EUT was placed on a non-conductive table having a height of 1 meter above the test site ground.

7.5 Maximization of Emissions

The test platform was rotated 360 degrees along with the moving of cabling and/or equipment in order to determine the maximum level of emissions.

7.6 Temperature

The ambient temperature of the testing location was within the range of 10 to 40 degrees Centigrade (50 to 104 Degrees Fahrenheit).

8.0 DETECTOR FUNCTIONS

On any frequency or frequencies below or equal to 1000 MHz, the limits shown below are based on measuring equipment employing a CISPR quasi-peak detector function and related measurement bandwidths.

On any frequency or frequencies above 1000 MHz, the radiated limits shown below are based on the use of measuring equipment employing an average detector function.

EC Laboratories uses the Peak detection mode for normal testing and initial screening of the EUT. The Peak detection mode will produce a measurement value that is always greater than, or equal to, the quasi-peak or average detection mode. Whenever the measurement value is 6 dB below the applicable limit or greater, the appropriate detector function will be employed and recorded.

8.1 FREQUENCY RANGE OF INVESTIGATION

The spectrum was investigated up to the frequency specified in the following table according to the highest clock frequency generated in the device.

Highest Frequency Used (Clock)	Upper Limit of Range Measured
Below 1.705 MHz	30 MHz
1.705 to 108 MHz	1000 MHz
108 to 500 MHz	2000 MHz
500 to 1000 MHz	5000 MHz
Above 1000 MHz	5th Harmonic or 40 GHz (Whichever is Lower)

9.0 FCC CLASS TYPES

9.1 CLASS A DIGITAL DEVICE

A digital device that is marketed for use in a commercial, industrial or business environment, exclusive of a device which is marketed for use by the general public or is intended to be used in the home.

9.2 CLASS B DIGITAL DEVICE

A digital device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments. Examples of such devices include, but are not limited to, personal computers, calculators, and similar electronic devices that are marketed for use by the general public.

Note: The responsible party may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B device, and in fact is encouraged to do so, provided that the device complies with the technical specifications for a Class B digital device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B digital device, regardless of its intended use.

(Code of Federal Regulations, Part 15, Subpart A, Sect. H&I)
(CFR 47, Parts 0 to 19, Revised as of October 1, 1990)

10.0 FCC LIMITS

10.1 RADIATED EMISSION LIMITS

The field strength of radiated emissions for a Class A Digital Device, when measured at a distance of 10 meters, shall not exceed the limits given in the table below. The lower limit applies at the band edge.

The field strength of radiated emissions for a Class B Digital Device, when measured at a distance of 3 meters, shall not exceed the limits given in the table below. The lower limit applies at the band edge.

Frequency (MHz)	Class A (3m) Limit (µV/m)	Class A (3m) Limit (dBµV/m)	Class A (10m) Limit (µV/m)	Class A (10m) Limit (dBµV/m)	Class B (3m) Limit (µV/m)	Class B (3m) Limit (dBµV/m)
30-88	300	49.6	90	39.1	100	40.0
88-216	500	54.0	150	43.5	150	43.5
216-960	700	56.0	210	46.4	200	46.0
Above 960	1000	60.0	300	49.5	500	54.0

10.2 CONDUCTED EMISSION LIMITS

For a digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back into the AC power line on any frequency or frequencies within the band 450kHz to 30MHz shall not exceed the limits in the following table for the appropriate class. Compliance shall be based on the measurement of the Radio Frequency voltage between each power line and ground at the power terminals. The lower limit applies at the band edges.

Frequency (MHz)	Class A Limit (µV)	Class A Limit (dBµV)	Class B Limit (µV)	Class B Limit (dBµV)
0.45 to 1.705	1000	60.0	250	48.0
1.705 to 30.0	3000	69.5	250	48.0

11.0 TEST METHODS

11.1 RADIATED EMISSIONS TEST PROCEDURE

(1) EUT and any other equipment and cables used with the EUT are placed on a non-conductive table 1-meter above a ground plane.
(2) The EUT receives the normal AC Power at the base of the table.
(3) All equipment and cables are placed in a manner, which tends to maximize their emission characteristics in a typical application.
(4) The table is rotated 360 degrees to determine the maximum radial emissions.
(5) The antenna height is varied between 1 meter and 4 meters above the ground plane to determine the maximum emissions. Appropriate antennas are used during the test in both the vertical and horizontal polarization.
(6) The Spectrum Analyzer is scanned from 30 MHz to 1000 MHz for emissions. The applicable spectrum analyzer settings are:
a). Resolution Bandwidth = 100 kHz,
b). Normal Detector Mode = Peak (The Quasi-Peak is used when the emissions are near, or over the limit).
(7) When an emission is found and maximized, the following actions are performed:
a). The emission frequency is entered into the computer.
b). The emission level is read from the spectrum analyzer in dBm and entered into the computer.
c). The antenna polarization is entered into the computer.
d). The computer converts the level in dBm to dBµV and uses lookup tables to determine the coax cable loss, antenna factor, and pre-amp gain. A site correction factor is calculated for that particular frequency, and the data is printed out in tabular form.

11.2 RADIATED EMISSIONS TEST EXAMPLE

FREQ	SITE			FCC Limit		EUT Level (L1)	
MHz	Raw (dBm)	CF (dB)	Corr'd (dBµV)	Class A (dBµV)	Class B (dBµV)	A (dB)	B (dB)
65.4	-58	-14.5	34.5	39.1	40.0	-4.6	-5.5

Frequency = Frequency of emission in MHz
Raw dBm = Reading at Spectrum Analyzer (uncorrected)
Site CF = Correction Factor for coax/antenna/preamp for that frequency. Note that a negative CF is the result of the gain of the preamp.
Corr'd dBuV = Corrected emission level in dBuV
FCC Limit A / B = Limit as stated in Part-15, Subpart B
EUT Level A* = Emission relative to the FCC Class A Limit.
EUT Level B* = Emission relative to the FCC Class B Limit.

Note: V/H is the antenna polarization (Vertical or Horizontal)
QP indicates the Quasi-Peak value.

*A negative value indicates that the emission is below (or meets) the limit and a positive value indicates that the emission is above (or exceeds) the limit.

11.3 LINE CONDUCTED EMISSIONS TEST PROCEDURE

1. EUT and any other equipment and cables were placed on a non-conductive table one meter above a ground screen.
2. The EUT's Input Power line cord was connected to a Line Impedance Stabilization Network (LISN).
3. All other (Non-EUT) equipment received power from a separate AC Power Source. The LISN assembly has two monitoring points: Line 1 (AC-Hot) and Line 2 (AC-Neutral). Each monitoring point was scanned by the measuring equipment (the other point was terminated in 50 ohms) over the frequency range of 450kHz to 30MHz for conducted emissions.
4. When an emission is found, the following takes place:
   a. The emission levels are maximized by equipment/cable placement.
   b. Frequency and emission level data are entered into computer in dBm.
   c. The monitoring point (Line 1 or 2) is entered into the computer.
   d. The computer converts dBm to micro volts and uses a look-up table to find cable losses (in dB) at that frequency, calculates a corrected emission level, and compares the corrected emission level to the appropriate limit. The data is then printed out in tabular form.

An example of the printout and definitions follows:

11.4 LINE CONDUCTED EMISSIONS TEST EXAMPLE

FREQ	SITE			FCC Limit		EUT Level (L1)	
MHz	Raw (dBm)	CF (dB)	Corr'd (dBµV)	Class A (dBµV)	Class B (dBµV)	A (dB)	B (dB)
1.85	-57	15.0	65.0	69.5	48.0	-4.5	+17

Frequency = Frequency of emission in MHz
Raw dBm = Reading at Spectrum Analyzer (uncorrected)
Site CF = Correction Factor for cable loss
Corr'd dBuV = Corrected emission level in dBuV
FCC Limit A / B = Conducted Emission level limit in dBµV
EUT Level 1* = Emission relative to the FCC Class A Limit
EUT Level 2* = Emission relative to the FCC Class B Limit

Note: L1 is AC-Hot, L2 is AC-Neutral
QP is a Quasi-Peak value
AV is an Average value

*A negative value indicates that the emission is below (or meets) the limit and a positive value indicates that the emission is above (or exceeds) the limit.

12.0 EUT

Explanation of the operation of the product with Model and Serial Number information is at **APPENDIX J**.

13.0 SUPPORT EQUIPMENT

*The **HD-PIC800** Unit is a self contained unit and requires no additional support equipment.*

14.0 EQUIPMENT CONFIGURATION

All of the equipment and cables were placed in worstcase positions to maximize emissions.
Interconnecting cables were of the type and length specified in the individual equipment requirements.
Grounding was in accordance with the manufacturer requirements and conditions for intended use.

15.0 SUMMARY OF TESTS

The ***HD-PIC800*** is a Digital Cellularl Communication System operating in the 835-890 MHz band. Tests were performed on the ***HD-PIC800*** with one standard antenna. Test firmware resident in the EUT and software provided by Hyundai was used to do the test. Refer to file ***"Summary Of Measurements"*** for the actual Test results and findings. Please refer to ***Appendix C*** for all the Spectrum Plots and measurements.

15.1 PART 22 – DIGITAL CELLULAR SYSTEM (DCS)

The HD-PIC800 uses CDMA, which will be referenced in this report. Please refer to ***"Theory of operation"*** in the confidentiality package attached to this submission for more details.
This information can be found in ***Appendix J.***

15.1.1 PART 22 FREQUENCIES OF OPERATION

The HD-PIC800 radio operates utilizing the B Block frequency Range. Measurements were performed at three channels the results can be seen in ***Appendix C.***

Block B: 835-845 MHz Paired with 880- 890 MHz

15.1.2 PART 22 POWER AND ANTENNA HEIGHT LIMITS

(a) The Maximum output Power of ***HD-PIC800*** Base Station is +39.5dBm (8.91Watts). The peak output power and the Antenna height of the ***HD-PIC800*** are within the limits specified.

(b) The Peak Transmit Power was measured using calibrated Power meter. The EUT was made to transmit uninterrupted random data on each of the channels. The output of Antenna port was connected directly via a cable to the Power Meter.The Output Power measured for each channel, is listed below

BAND B

At Channel 356, Pout = 39.4 dBm / 8.71 Watts
At Channel 500, Pout = 39.4 dBm / 8.71 Watts
At Channel 644, Pout = 38.6 dBm / 7.24 Watts

15.1.3 PART 22 FREQUENCY STABILITY

The ***HD-PIC800*** Transmitter frequency stability was measured and recorded over the temperature –30 degrees Celsius to 50 degree Celsius

The fundamental emission of ***HD-PIC800*** Transmitter was stable to be within authorized frequency block. The results recorded are at ***Appendix F.***

15.1.4 PART 22 EMISSION LIMITS

The spectrum analyzer plots, in ***Appendix C***, titled "**OUT OF BAND Lower Band Edge**"; "**OUT OF BAND Upper Band Edge**" shows the output spectrum of the EUT at its highest and lowest operating frequencies. The plots show the output of the EUT to be at least 20dB down at the band edges.

The spectrum analyzer plots labeled "**OUT OF BAND Emissions 30 MHz - 1 GHz** ", "**OUT OF BAND Emissions 1 - 2.75 GHz** ", "**OUT OF BAND Emissions 2.75 - 26.5 GHz** "show that emissions are more than 20 dB below the highest level of the desired power outside of the 1930 -1990 MHz band.

Spectrum analyzers MAX HOLD plots labeled " **26 dB BANDWIDTH**" show the 26-dB bandwidth of transmit Channel. Plots are in ***Appendix C*.**

15.2 15.203 ANTENNA REQUIREMENT

This product is intended for professional installation by trained personnel and is therefore exempt from the requirements of 15.203.

15.3 15.205 RESTRICTED BAND EMISSION LIMITS

The EUT was placed on a wooden table resting on a turntable. The wooden table was approximately 1 meter above the groundplane of the 3 meter test-site. The search antenna was moved in to 1 meter when necessary to improve the noise floor, and the appropriate range factor was applied. While the EUT was transmitting uninterrupted random data on each of the low/mid/high channels and with the spectrum analyzer on MAX HOLD, the turntable was rotated, and the search antenna raised and lowered in an attempt to maximize the received radiated emission level. Test results are attached in tabular form showing that no spurious signals were detected above the 74dBuV/m peak 54dBuV/m average limits. Peak measurements were taken with an RBW and VBW = 1MHz. Average readings were taken with an RBW = 1MHz and a VBW = 10 Hz. Test data is in ***Appendix D*****.**

15.4 15.209 RADIATED EMISSIONS

The data sheets in ***Appendix A*** show that the Class B radiated limits from 30 - 1000 MHz are not exceeded by the EUT. The EUT was operating normally with a combination of transmission and reception and hopping using a pseudorandom sequence during this test. The EUT was placed near one edge of a wooden table resting on a turntable. The wooden table was approximately 1 meter above the groundplane. The search antennas were located at 3 meters. Measurements were made in accordance with ANSI C63.4-1994.

15.5 15.207 AC LINE CONDUCTED EMISSIONS

The RF line conducted levels for emissions in the 0.45 - 30 MHz band must not exceed 250 µV when measured with a LISN. Attached graphs and tabular data show that emissions are below the 250 µV (48 dBµV) maximum allowed level. The test data sheets are in ***Appendix B*****.**

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Please Refer to file: **appendixA.pdf**

APPENDIX A

RADIATED EMISSIONS

CONTENTS:

Radiated Emissions

INFORMATION

* CLIENT:	HYUNDAI ELECTRONICS AMERICA 3103 NORTH FIRST STREET, SAN JOSE, CALIFORNIA, 95134	
* CONTACT:	DR. SANG KYOON HYUN 408/894-0437	408/894-0588 FAX
* PRODUCT:	*PICO_BTS, DIGITAL CELLULAR SYSTEM*	
* REPORT FILE:	2K0110401A	
* FILE NAME:	APPENDIX A	
* DATE:	1/12/2000	
* SUBMITTED BY:	ELECTRONIC COMPLIANCE LABORATORIES, INC. 1249 BIRCHWOOD DRIVE, SUNNYVALE, CALIFORNIA 94089	
* CONTACT:	CHIP MATHENY	408/747-1490 CHIP@ECLABS.COM

Please Refer to file: **appendixB.pdf**

APPENDIX B

CONDUCTED EMISSIONS

CONTENTS:

Conducted Emissions

INFORMATION

* CLIENT:	HYUNDAI ELECTRONICS AMERICA 3103 NORTH FIRST STREET, SAN JOSE, CALIFORNIA, 95134		
* CONTACT:	DR. SANG KYOON HYUN 408/894-0437		408/894-0588 FAX
* PRODUCT:	*PICO_BTS, DIGITAL CELLULAR SYSTEM*		
* REPORT FILE:	2K0110401A		
* FILE NAME:	APPENDIX B		
* DATE:	1/12/2000		
* SUBMITTED BY:	ELECTRONIC COMPLIANCE LABORATORIES, INC. 1249 BIRCHWOOD DRIVE, SUNNYVALE, CALIFORNIA 94089		
* CONTACT:	CHIP MATHENY	408/747-1490	CHIP@ECLABS.COM

Please Refer to file: **appendixC.pdf**

APPENDIX C

DCS SPECTRUM PLOTS

CONTENTS:

Spectrum Plots and Data

INFORMATION

* CLIENT:	HYUNDAI ELECTRONICS AMERICA 3103 NORTH FIRST STREET, SAN JOSE, CALIFORNIA, 95134	
* CONTACT:	DR. SANG KYOON HYUN 408/894-0437	408/894-0588 FAX
* PRODUCT:	*PICO_BTS, DIGITAL CELLULAR SYSTEM*	
* REPORT FILE:	2K0110401A	
* FILE NAME:	APPENDIX C	
* DATE:	1/12/2000	
* SUBMITTED BY:	ELECTRONIC COMPLIANCE LABORATORIES, INC. 1249 BIRCHWOOD DRIVE, SUNNYVALE, CALIFORNIA 94089	
* CONTACT:	CHIP MATHENY 408/747-1490	CHIP@ECLABS.COM

Please Refer to file: **appendixD.pdf**

APPENDIX D

RESTRICTED BANDS

CONTENTS:

Restricted Band Measurements

INFORMATION

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* CONTACT:	DR. SANG KYOON HYUN 408/894-0437		408/894-0588 FAX
* PRODUCT:	*PICO_BTS, DIGITAL CELLULAR SYSTEM*		
* REPORT FILE:	2K0110401A		
* FILE NAME:	APPENDIX A		
* DATE:	1/12/2000		
* SUBMITTED BY:	ELECTRONIC COMPLIANCE LABORATORIES, INC. 1249 BIRCHWOOD DRIVE, SUNNYVALE, CALIFORNIA 94089		
* CONTACT:	CHIP MATHENY	408/747-1490	CHIP@ECLABS.COM

Please Refer to file: **appendixE.pdf**

APPENDIX E

ANTENNA SPECIFICATIONS

CONTENTS:

Antenna Data Sheets

INFORMATION

* CLIENT:	HYUNDAI ELECTRONICS AMERICA 3103 NORTH FIRST STREET, SAN JOSE, CALIFORNIA, 95134
* CONTACT:	DR. SANG KYOON HYUN 408/894-0437 408/894-0588 FAX
* PRODUCT:	*PICO_BTS, DIGITAL CELLULAR SYSTEM*
* REPORT FILE:	2K0110401A
* FILE NAME:	APPENDIX E
* DATE:	1/12/2000
* SUBMITTED BY:	ELECTRONIC COMPLIANCE LABORATORIES, INC. 1249 BIRCHWOOD DRIVE, SUNNYVALE, CALIFORNIA 94089
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Please Refer to file: **appendixF.pdf**

APPENDIX F

FREQUENCY STABILITY

CONTENTS:

Measurements over Temperature

INFORMATION

* CLIENT:	HYUNDAI ELECTRONICS AMERICA 3103 NORTH FIRST STREET, SAN JOSE, CALIFORNIA, 95134
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* PRODUCT:	*PICO_BTS, DIGITAL CELLULAR SYSTEM*
* REPORT FILE:	2K0110401A
* FILE NAME:	APPENDIX A
* DATE:	1/12/2000
* SUBMITTED BY:	ELECTRONIC COMPLIANCE LABORATORIES, INC. 1249 BIRCHWOOD DRIVE, SUNNYVALE, CALIFORNIA 94089
* CONTACT:	CHIP MATHENY 408/747-1490 CHIP@ECLABS.COM

Please Refer to file: **appendixG.pdf**

APPENDIX G

TEST SET-UP CONFIGURATION

CONTENTS:

Configuration Photographs

INFORMATION

* CLIENT:	HYUNDAI ELECTRONICS AMERICA 3103 NORTH FIRST STREET, SAN JOSE, CALIFORNIA, 95134
* CONTACT:	DR. SANG KYOON HYUN 408/894-0437 408/894-0588 FAX
* PRODUCT:	*PICO_BTS, DIGITAL CELLULAR SYSTEM*
* REPORT FILE:	2K0110401A
* FILE NAME:	APPENDIX G
* DATE:	1/12/2000
* SUBMITTED BY:	ELECTRONIC COMPLIANCE LABORATORIES, INC. 1249 BIRCHWOOD DRIVE, SUNNYVALE, CALIFORNIA 94089
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Please Refer to file: **appendixH.pdf**

APPENDIX H

LABELING REQUIREMENTS

CONTENTS:

Labeling Information

INFORMATION

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* REPORT FILE:	2K0110401A	
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* DATE:	1/12/2000	
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Please Refer to file: **appendixA.pdf**

APPENDIX I

EUT PHOTOGRAPHS

CONTENTS:

HD-PIC800 Pictures

INFORMATION

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* REPORT FILE:	2K0110401A	
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Please Refer to file: **appendixJ.pdf**

APPENDIX J

CONFIDENTIAL INFORMATION

CONTENTS:

Theory of Operation
Schematics
Block Diagram
Users Manual

INFORMATION

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EUT SCHEMATICS, THEORY OF OPERATION AND OTHER RELEVANT AND *CONFIDENTIAL* INFORMATION WILL BE ADDED AS AN ATTACHMENT.