



Accredited testing-laboratory

DAR registration number: DAT-P-176/94-D1

**Federal Motor Transport Authority (KBA)
DAR registration number: KBA-P 00070-97**

Recognized by the Federal Communications Commission

Anechoic chamber registration no.: 90462 (FCC)

Anechoic chamber registration no.: 3462C-1 (IC)

Certification ID: DE 0001

Accreditation ID: DE 0002

Accredited Bluetooth® Test Facility (BQTF)

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Test report no. : 1-1717-01-04/09
Type identification : HU Hyundai BH MY 10
Applicant : HARMAN/BECKER AUTOMOTIVE SYSTEMS GmbH
FCC ID : T8GBH10MYDIS
IC Certification No : 6434A-BH10MYDIS
Test standards : 47 CFR Part 15
RSS - 210 Issue 7

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1 General information

1.1 Notes

The test results of this test report relate exclusively to the test item specified in 3.1.1. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.

Test laboratory manager:

2009-10-30

Date

Meheza K. Walla

Name

Signature



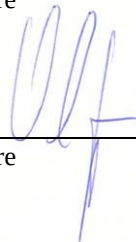
2009-10-30

Date

Joerg Warken

Name

Signature



Technical responsibility for area of testing:

2009-10-30

Date

Stefan Bös

Name

Signature



1.2 Testing laboratory

CETECOM ICT Services GmbH

Untertürkheimer Straße 6 - 10

66117 Saarbrücken

Germany

Phone: + 49 681 5 98 - 0

Fax: + 49 681 5 98 - 9075

e-mail: info@ICT.cetecom.de

Internet: <http://www.cetecom-ict.de>

State of accreditation: The test laboratory (area of testing) is accredited according to
DIN EN ISO/IEC 17025
DAR registration number: DAT-P-176/94-D1

Accredited by: Federal Motor Transport Authority (KBA)
DAR registration number: KBA-P 00070-97

Testing location, if different from CETECOM ICT Services GmbH:

Name :
Street :
Town :
Country :
Phone :
Fax :

1.3 Details of applicant

Name:	HARMAN/BECKER AUTOMOTIVE SYSTEMS GmbH
Street:	Söflinger Straße 100
Town:	89077 Ulm
Country:	Germany
Telephone:	+49 731 3994-101
Fax:	+49 731 3994-61 110
Contact:	Vincent Gabosch
E-mail:	vgabosch@harmanbecker.com
Telephone:	+49 731 3994-170

1.4 Application details

Date of receipt of order:	2009-09-28
Date of receipt of test item:	2009-10-05
Date of start test:	2009-10-07
Date of end test	2009-10-30
Persons(s) who have been present during the test:	-/-

2 Test standard/s

47 CFR Part 15	2008-07	Title 47 of the Code of Federal Regulations; Chapter I- Federal Communications Commission subchapter A - general, Part 15-Radio frequency devices
RSS - 210 Issue 7	2007-06	Spectrum Management and Telecommunications - Radio Standards Specification Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment

3 Technical tests

3.1 Details of manufacturer

Name:	HARMAN/BECKER AUTOMOTIVE SYSTEMS GmbH
Street:	Becker Göring Strasse 16
Town:	76307 Karlsbad
Country:	Germany

3.1.1 Test item

Kind of test item	:	Car radio Headunit
Type identification	:	HU Hyundai BH MY 10
S/N serial number	:	85001058
HW hardware status	:	D1-Sample
SW software status	:	BH10MY_HU_NA_06.001_09443AD1
Frequency Band [MHz]	:	ISM 2.400 - 2.483,5
Type of Modulation	:	FHSS
Number of channels	:	79
Antenna	:	Internal antenna
Power Supply	:	12 V DC from Power Supply
Temperature Range	:	-20 °C to +55 °C

Max. power radiated: 4.11 dBm (8DPSK)

Max. power conducted: not performed!

FCC ID: T8GBH10MYDIS

IC: 6434A-BH10MYDIS

3.1.2 Additional EUT information For IC Canada (appendix 2)

IC Registration Number:	6434A-BH10MYDIS
Model Name:	HU Hyundai BH MY 10
Manufacturer (complete Address):	HARMAN/BECKER AUTOMOTIVE SYSTEMS GmbH Becker Göring Strasse 16 76307 Karlsbad Germany
Tested to Radio Standards Specification (RSS) No.:	RSS-210 Issue 7
Open Area Test Site Industry Canada Number:	IC 3462C-1
Frequency Range (or fixed frequency) [MHz]:	2400 – 2483.5 MHz
RF: Power [W] (max):	GFSK: Rad. EIRP: 1.05 mW Conducted : Not performed! Pi/4 DQPSK: Rad. EIRP: 2.49 mW Conducted : Not performed! 8DPSK: Rad. EIRP: 2.58 mW Conducted : Not performed!
Antenna Type:	Internal antenna
Occupied Bandwidth (99% BW) [kHz]:	Not performed!
Type of Modulation:	GFSK, Pi/4 DQPSK, 8 DPSK
Emission Designator (TRC-43):	Not performed!
Transmitter Spurious (worst case) [dBμV/m in 3 m]:	48.65
Receiver Spurious (worst case) [dBμV/m in 3 m]:	49.61

ATTESTATION:

I attest that the testing was performed or supervised by me; that the test measurements were made in accordance with the above-mentioned departmental standard(s), and that the radio equipment identified in this application has been subject to all applicable test conditions specified in the departmental standards and all of the requirements of the standards have been met.

Signature:



Test engineer: Meheza K. Walla Date: 2009-10-30

3.1.3 RF Technical Brief Cover Sheet acc. To RSS-102

All Fields must be completed with the requested information or the following codes: N/A for Not Applicable, N/P for Not Performed or N/V for Not Available. Where applicable, check appropriate box.

1. COMPANY NUMBER: **6434A**
2. MODEL NUMBER: **HU Hyundai BH MY 10**
3. MANUFACTURER: **HARMAN/BECKER AUTOMOTIVE SYSTEMS GmbH**
4. TYPE OF EVALUATION: **N/A**

- Evaluated against exposure limits: General Public Use ☐ Controlled Use ☐
- Duty cycle used in evaluation: 100 %
- Standard used for evaluation: RSS-102 Issue 2 (2005-11)
- Measurement distance: 0.20 m
- RF value: -- V/m ☐ A/m ☐ W/m² ☐

Measured ☐ Computed ☐ Calculated ☐

Declaration of RF Exposure Compliance

ATTESTATION:

I attest that the information provided in this test report are correct; that a Technical Brief was prepared and the information it contains is correct; that the device evaluation was performed or supervised by me; that applicable measurement methods and evaluation methodologies have been followed and that the device meets the SAR and/or RF exposure limits of RSS-102.

Signature:



Name: Meheza K. Walla
Title: Dipl.-Ing (FH)
Company: Cetecom ICT Services GmbH

3.1.4 EUT operating modes

EUT operating mode no. *)	Description of operating modes	Additional information
Op. 0	Normal mode	Normal temperature and power source conditions
Op. 1		low temperature, low power source conditions
Op. 2		low temperature, high power source conditions
Op. 3		high temperature, low power source conditions
Op. 4		high temperature, high power source conditions

*) EUT operating mode no. is used to simplify the test plan

3.1.5 Extreme conditions testing values

Description	Shortcut	Unit	Value
Nominal Temperature	T _{nom}	°C	23
Nominal Humidity	H _{nom}	%	53
Nominal Power Source	V _{nom}	V	12

Type of power source: **12 V DC from Power Supply**

Deviations from these values are reported in chapter 2

4 Summary of Measurement Results and list of all performed test cases

- ☒ No deviations from the technical specifications were ascertained
- ☐ There were deviations from the technical specifications ascertained

TC identifier	Description	verdict	date	Remark
RF-Testing	FCC Part 15 §15.247 - CANADA RSS-210	PASS	2009-10-30	-/-

Test Specification Clause	Test Case	pass	fail	Not applicable	Not performed
§ 15.247 (b)(1)	Max. peak output power (radiated)	Yes			
§ 15.247 (d)	Spurious Emission - radiated (Transmitter) >30 MHz	Yes			
§ 15.109	Spurious Emissions - radiated (Receiver)	Yes			
§ 15.209	Spurious Emissions - radiated (Transmitter) <30 MHz	Yes			

5 RF measurement testing

5.1 Description of test set-up

5.1.1 Radiated measurements

The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 25 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber. The receiving antennas are confirmed with specifications ANSI C63.2-1996 clause 15 and ANSI C63.4-2003 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received. The wanted and unwanted emissions are received by spectrum analysers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-2003 clause 4.2.

Antennas are confirmed with ANSI C63.2-1996 item 15.

9 kHz - 150 kHz: Quasi Peak measurement, 200 Hz Bandwidth, passive loop antenna.
150 kHz - 30 MHz: Quasi Peak measurement, 9 kHz Bandwidth, passive loop antenna.
30 MHz - 200 MHz: Quasi Peak measurement, 120 kHz Bandwidth, biconical antenna
200MHz - 1GHz: Quasi Peak measurement, 120 kHz Bandwidth, log periodic antenna
>1GHz: Average, RBW 1MHz, VBW 10 Hz, waveguide horn

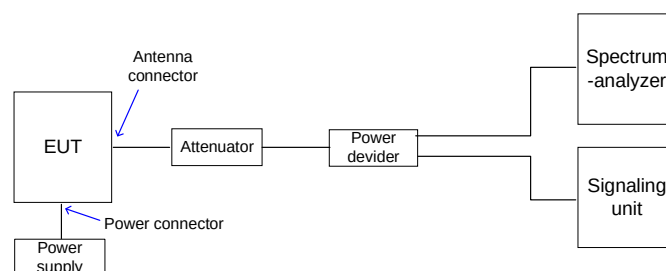
All measurements are done in accordance with the Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems DA 00-705 and Appendix A "BLUETOOTH APPROVALS"

The EUT is powered by an external power supply with nominal voltage. The signalling is performed from outside the chamber with a signalling unit (CMU200 or other) by air link using signalling antenna.

5.1.2 Conducted measurements

Not performed! **Only delta measurements radiated**

The EUT's RF signal is coupled out by the antenna connector which is supplied by the manufacturer. The signal is first 10dB attenuated before it is power divided (~6dB loss per branch). One of the signal paths is connected to the communication base Station (CMU200 or other), the other one is connected to the spectrum analyzer. The specific losses for both signal paths are first checked within a calibration. The measurement readings on the signalling unit/spectrum analyzer are corrected by the specific test set-up loss. The attenuator, power divider, signalling unit and the spectrum analyzer are impedance matched on 50 Ohm.



5.2 Referenced documents

None

5.3 Additional comments

Only delta-measurements performed. Refer to test report number: 1-1717-01-02_09 for the full tests.

5.4 Max. peak output power (radiated) § 15.247 (b)(1)

Modulation: GFSK

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2402	2442	2480
T _{nom}	V _{nom}	0.20	-0.25	-0.58
Measurement uncertainty		±3dB		

RBW / VBW: 3 MHz

Measured at a distance of 3m

Modulation: Pi/4 DQPSK

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2402	2442	2480
T _{nom}	V _{nom}	3.96	3.38	2.73
Measurement uncertainty		±3dB		

RBW / VBW: 3 MHz

Measured at a distance of 3m

Modulation: 8DPSK

Test conditions		Max. peak output power EIRP [dBm]		
Frequency [MHz]		2402	2442	2480
T _{nom}	V _{nom}	4.11	3.54	2.92
Measurement uncertainty		±3dB		

RBW / VBW: 3 MHz

Measured at a distance of 3m

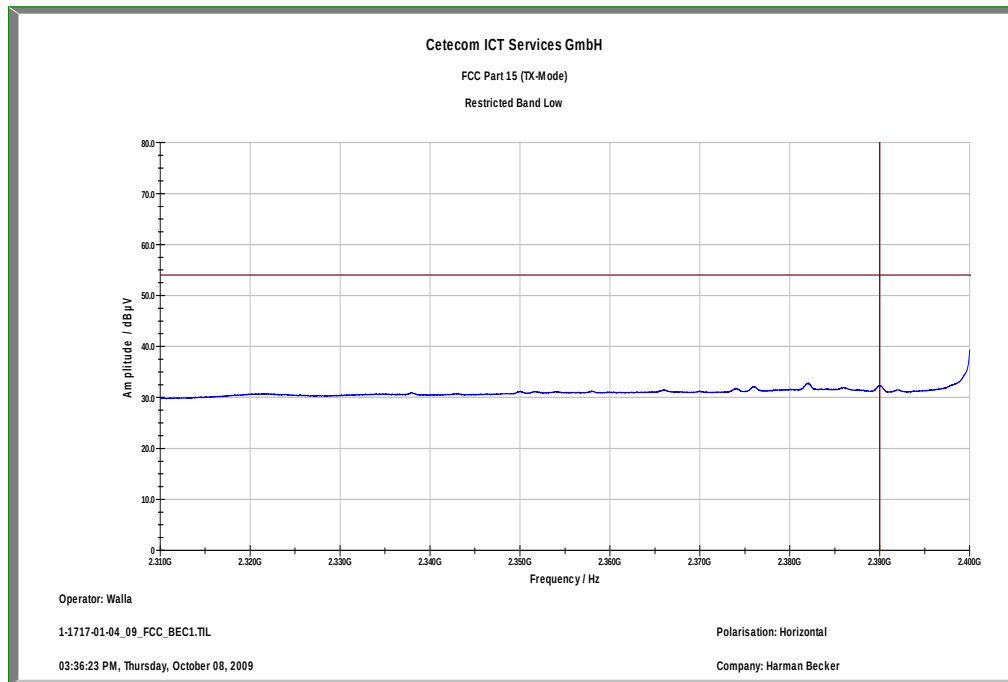
Limits:

Under normal test conditions only, for frequency range 2400-2483.5 MHz	Max. 1.0 Watt
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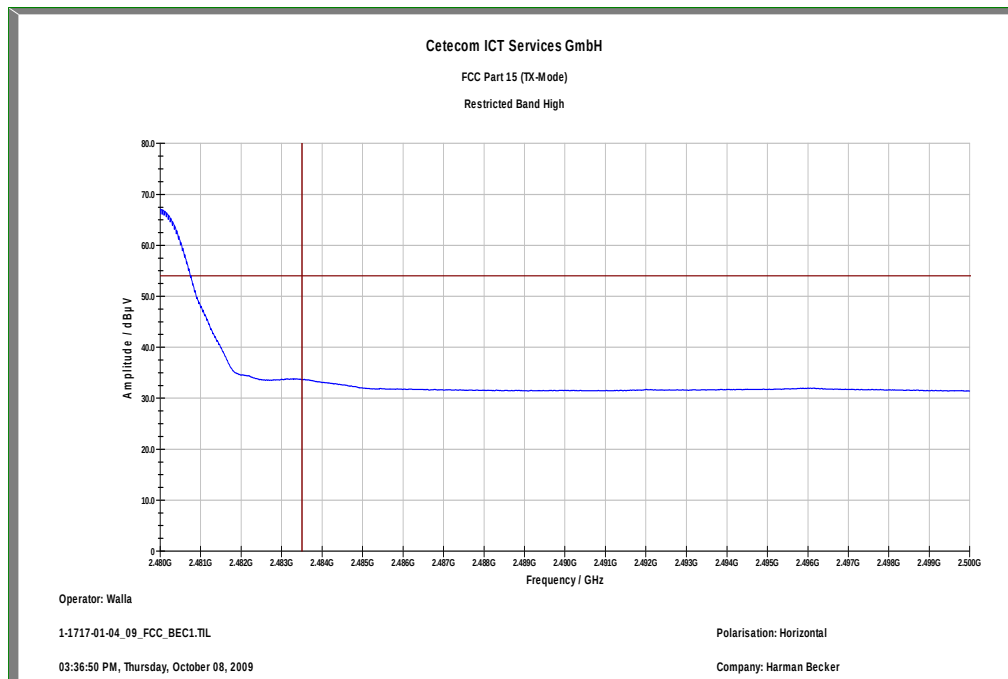
5.5 Band-edge compliance of radiated emissions §15.205

Modulation: GFSK

Plot 1: Restricted Bands low



Plot 2: Restricted Bands high

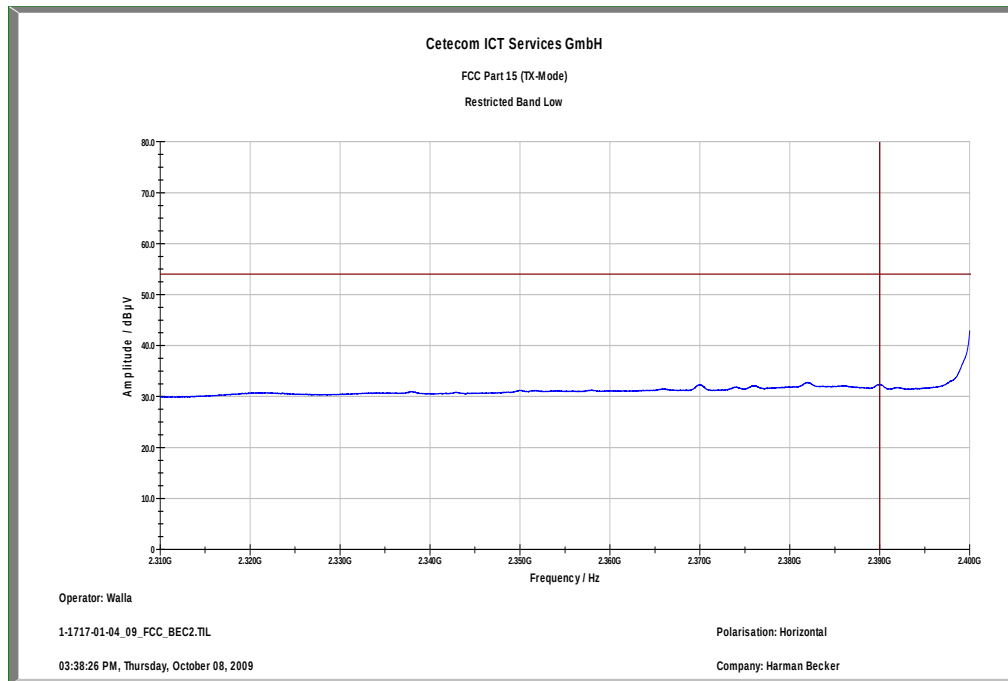


Limit: 54 dBµV/m

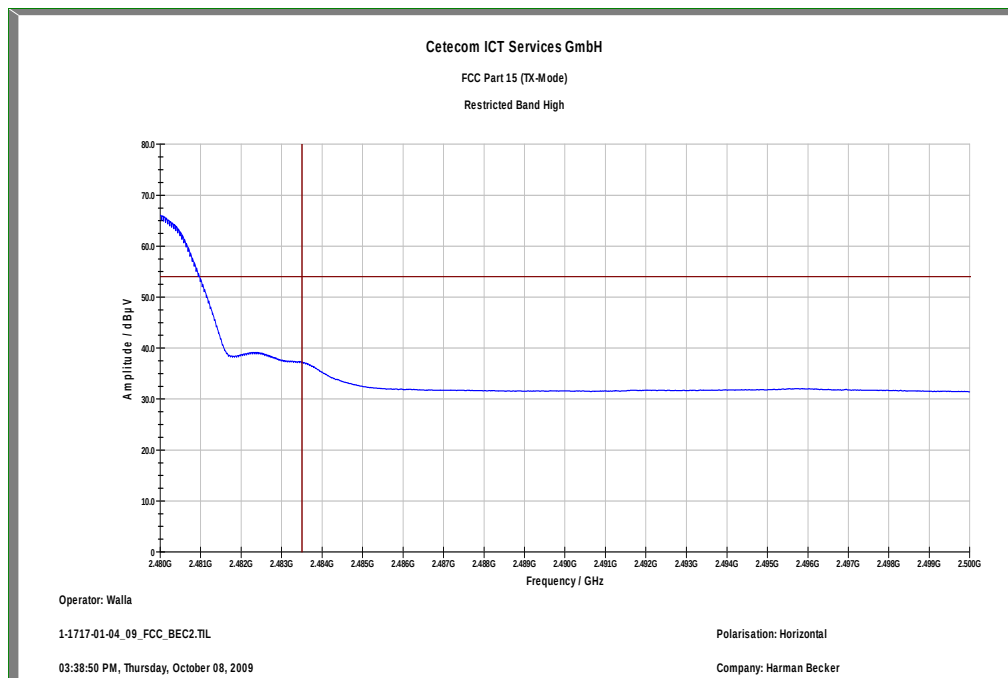
Complies

Modulation: Pi/4 DQPSK

Plot 3: Restricted Bands low



Plot 4: Restricted Bands high

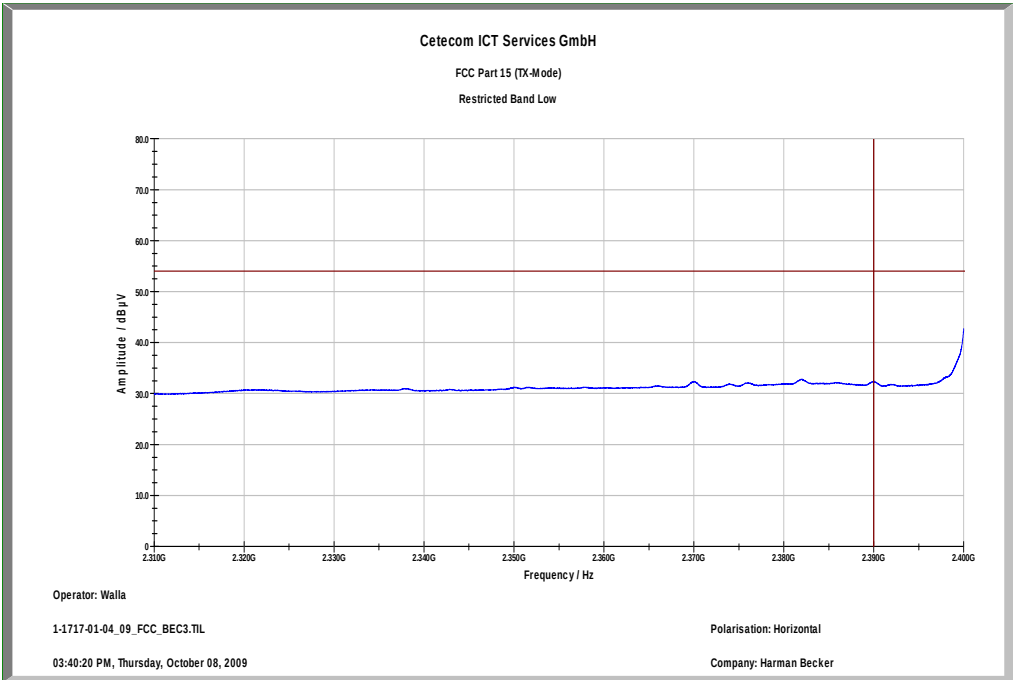


Limit: 54 dBµV/m

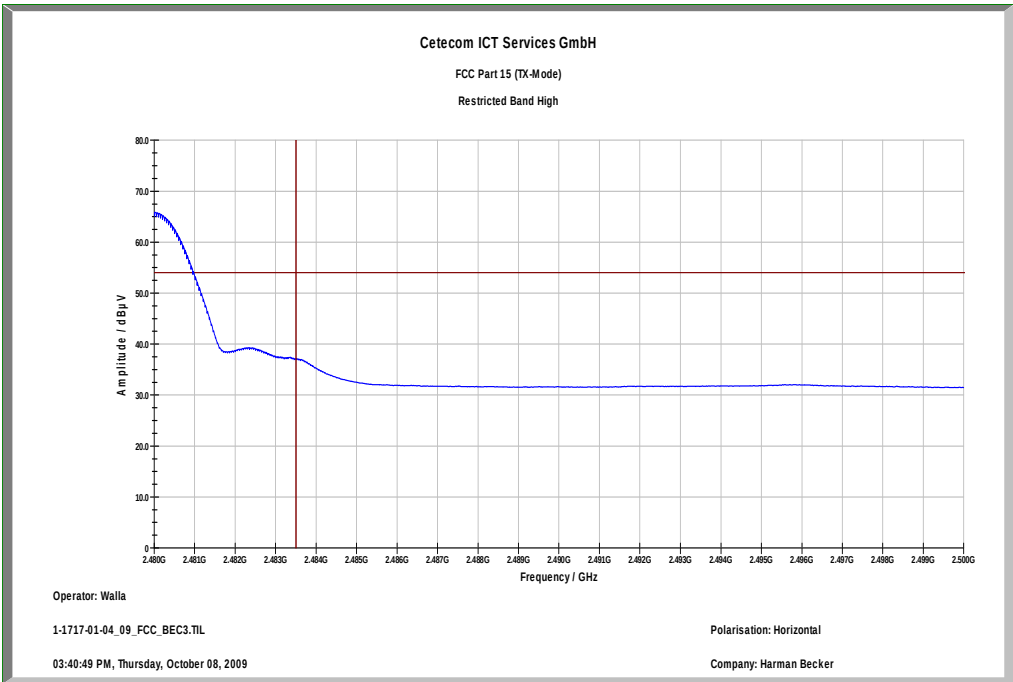
Complies

Modulation: 8DPSK

Plot 5: Restricted Bands low



Plot 6: Restricted Bands high



Limit: 54 dBµV/m		Complies
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5.6 Spurious Emissions > 30 MHz- radiated (Transmitter) § 15.247 (c)(1)

Modulation: 8DPSK

Plot 1: 0.03 - 1 GHz vertical/horizontal (lowest channel) @ 10 m

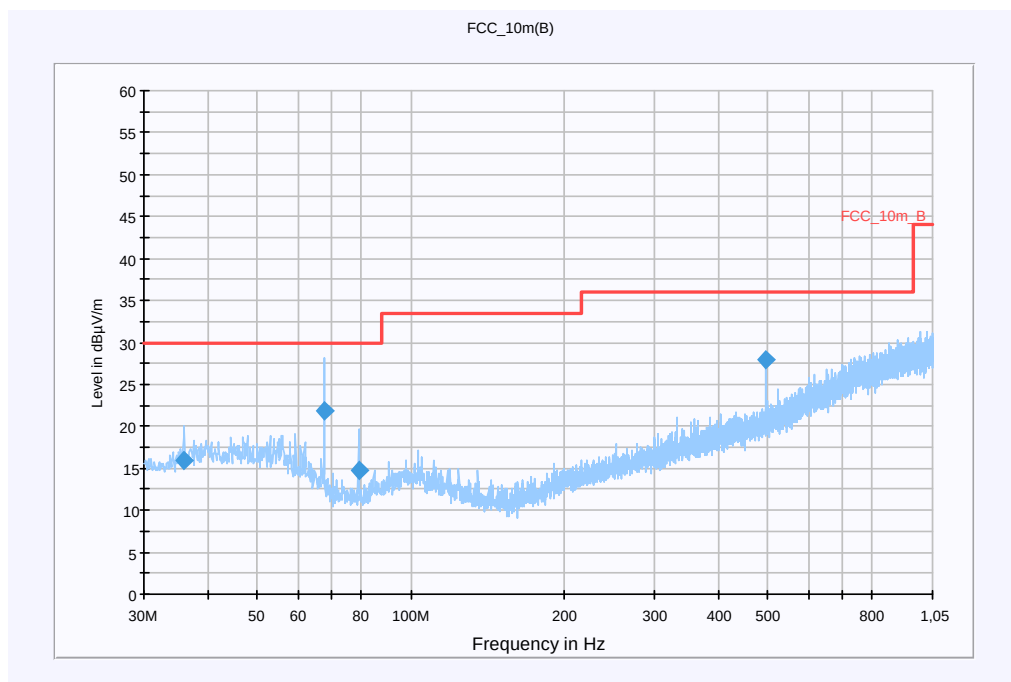
Information

EUT:	HU Hyundai BH MY 10
Serial Number:	85001058
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	TX-Mode, Low Channel
Operator Name:	Hennemann
Comment:	DC: 12 V

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver

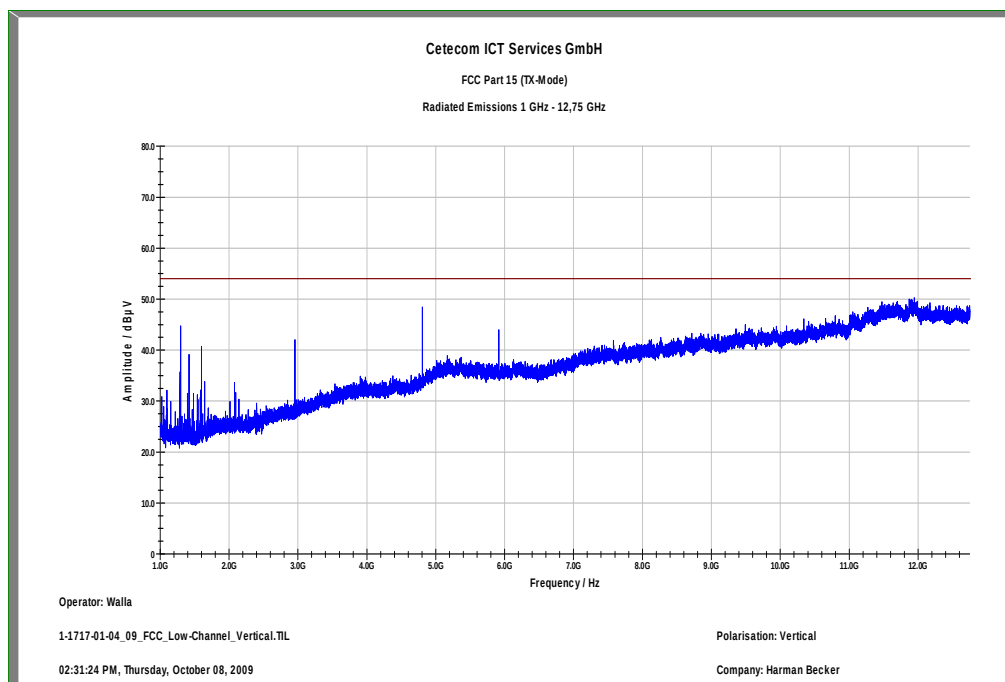


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
35.994450	16.0	15000.000	120.000	100.0	V	51.0	13.2	14.0	30.0
67.728300	21.8	15000.000	120.000	200.0	V	49.0	10.0	8.2	30.0
79.013850	14.7	15000.000	120.000	200.0	V	98.0	9.4	15.3	30.0
494.991600	28.0	15000.000	120.000	100.0	V	19.0	19.0	8.0	36.0

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

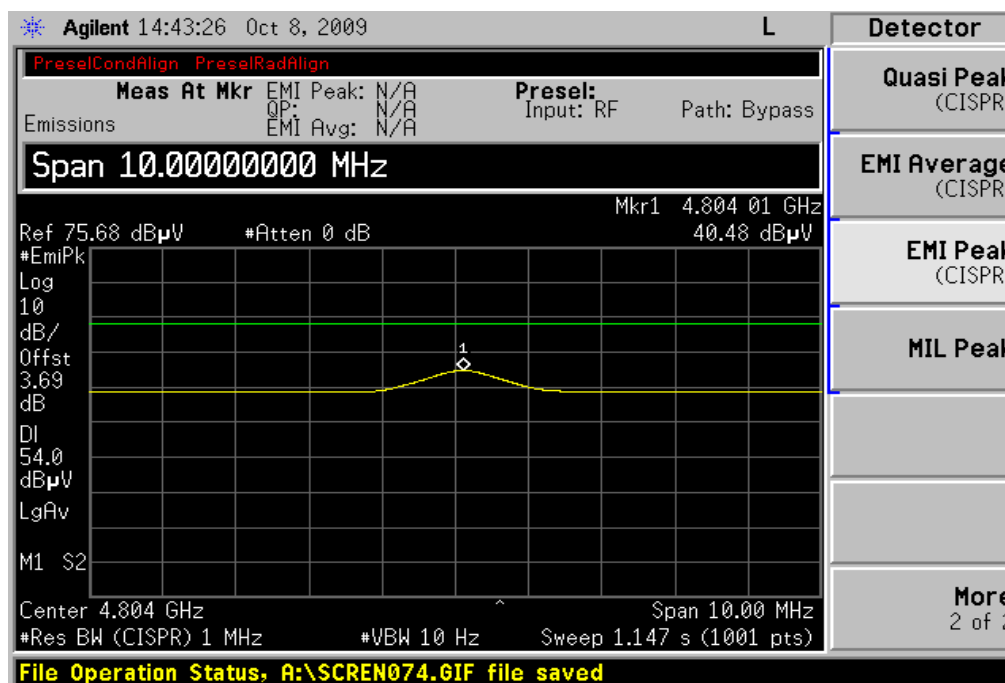
Subrange 1		
	Frequency Range:	30 MHz - 2 GHz
	Receiver:	Receiver [ESCI 3]
		@ GPIB0 (ADR 20), SN 100083/003, FW 4.32
	Signal Path:	without Notch
		FW 1.0
	Antenna:	VULB 9163
		SN 9163-295, FW ---
		Correction Table (vertical): VULP6113
		Correction Table (horizontal): VULP6113
		Correction Table: Cable_EN_1GHz (0909)
	Antenna Tower:	Tower [EMCO 2090 Antenna Tower]
		@ GPIB0 (ADR 8), FW REV 3.12
	Turntable:	Turntable [EMCO Turntable]
		@ GPIB0 (ADR 9), FW REV 3.12
	EMC 32 Version 8.10.00	

Plot 2: 1 - 12 GHz vertical (lowest channel) @ 3 m



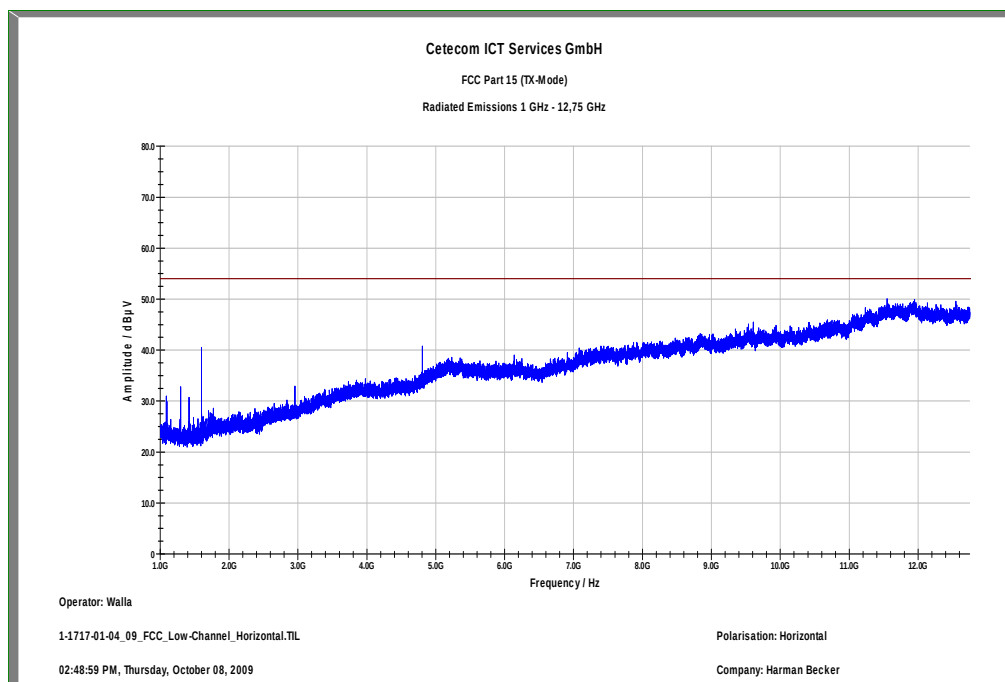
Carrier rejected with 2.4 GHz notch filter.

Plot 3: Remeasurement of the critical emission identified during the scan (@ 3 m)



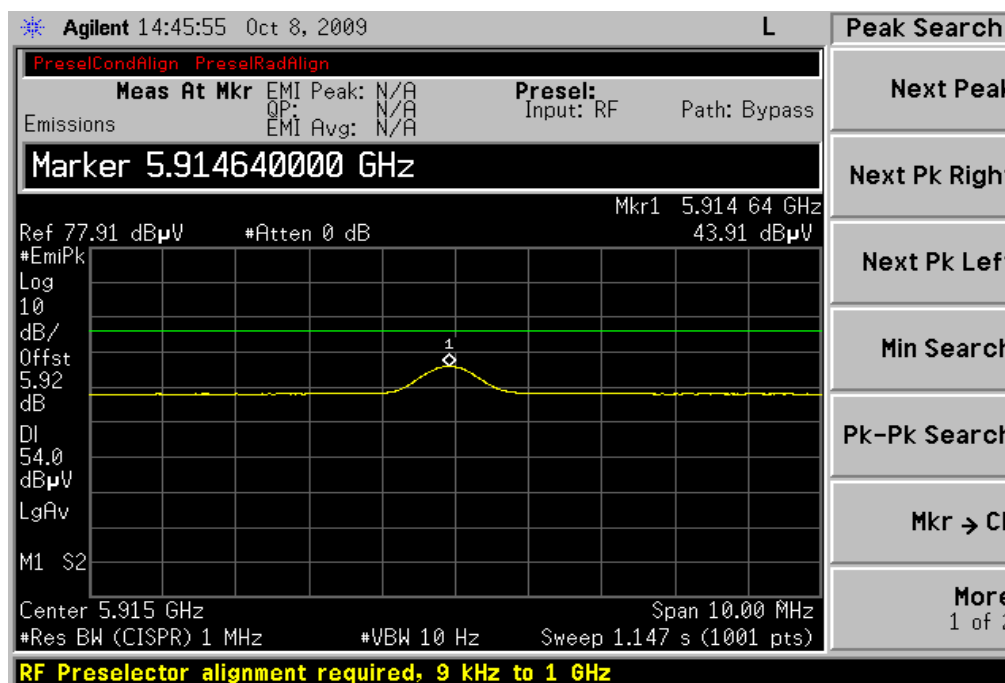
Applies to harmonics/spurious that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A Pre-amp (and possibly a high-pass filter) is necessary for this measurement. For measurement above 1 GHz, set RBW = 1 MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation, use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See 15.35(b) and (c).

Plot 4: 1 - 12 GHz horizontal (lowest channel) @ 3 m



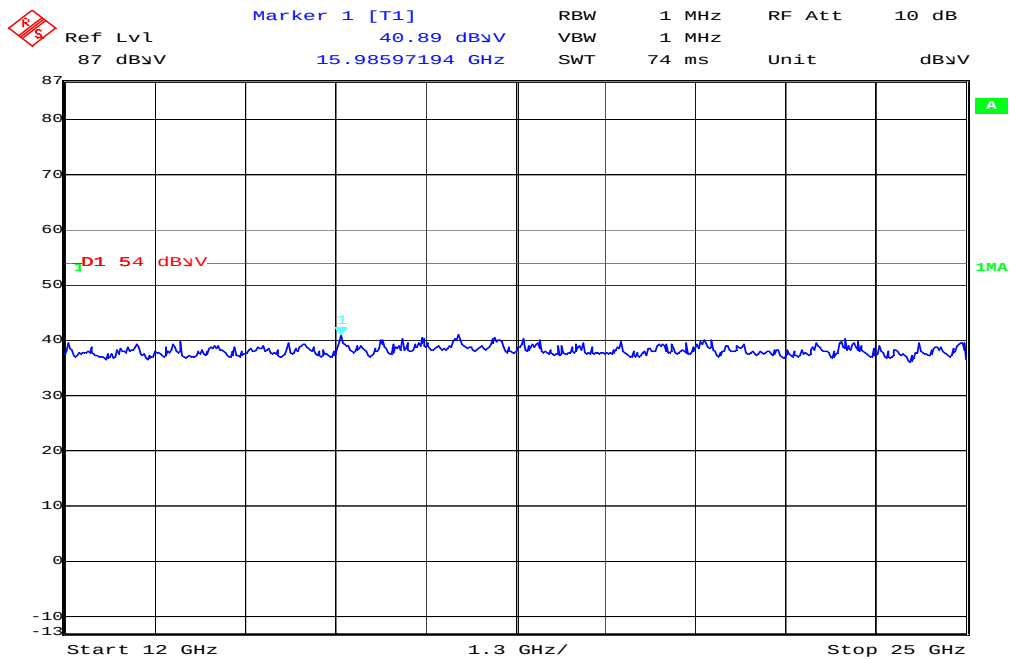
Carrier rejected with 2.4 GHz notch filter.

Plot 5: Remeasurement of the critical emission identified during the scan (@ 3 m)



Applies to harmonics/spurious that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A Pre-amp (and possibly a high-pass filter) is necessary for this measurement. For measurement above 1 GHz, set RBW = 1 MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation, use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See 15.35(b) and (c).

Plot 6: 12 - 25 GHz vertical/horizontal (valid for all channels)



Plot 7: 0.03 - 1 GHz vertical/horizontal (middle channel) @ 10 m

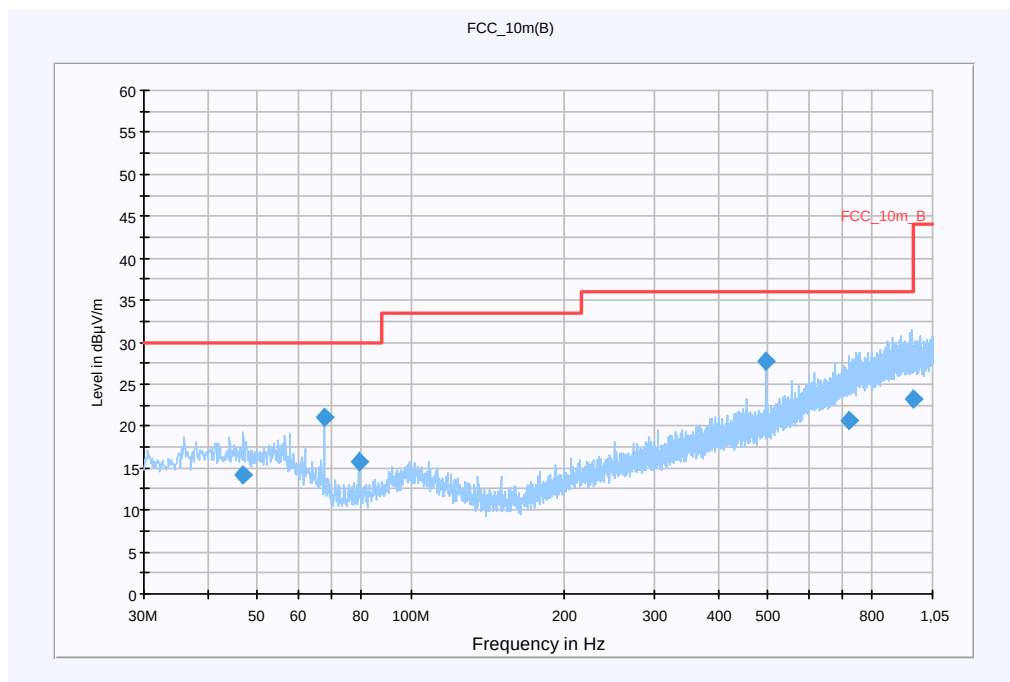
Information

EUT:	HU Hyundai BH MY 10
Serial Number:	85001058
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	TX-Mode, Middle Channel
Operator Name:	Hennemann
Comment:	DC: 12 V

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dB μ V/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver

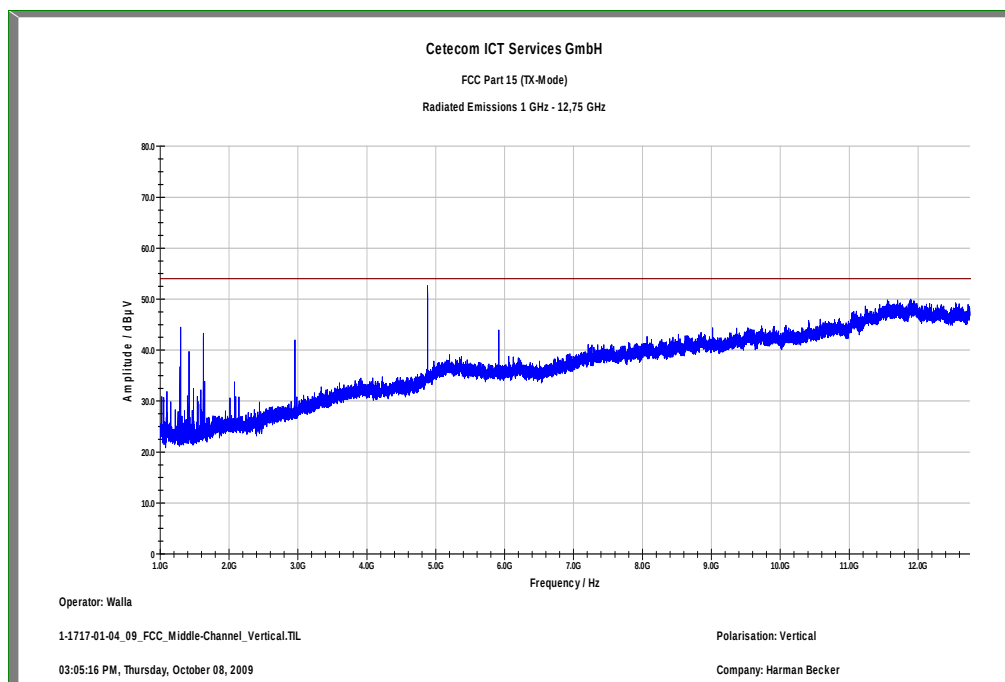


Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
46.960950	14.2	15000.000	120.000	210.0	V	128.0	13.5	15.8	30.0
67.750650	21.0	15000.000	120.000	200.0	V	113.0	10.0	9.0	30.0
79.019850	15.7	15000.000	120.000	322.0	V	5.0	9.4	14.3	30.0
494.998050	27.7	15000.000	120.000	100.0	V	18.0	19.0	8.3	36.0
720.272700	20.6	15000.000	120.000	340.0	H	302.0	23.5	15.4	36.0
959.756400	23.1	15000.000	120.000	400.0	V	195.0	25.9	12.9	36.0

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

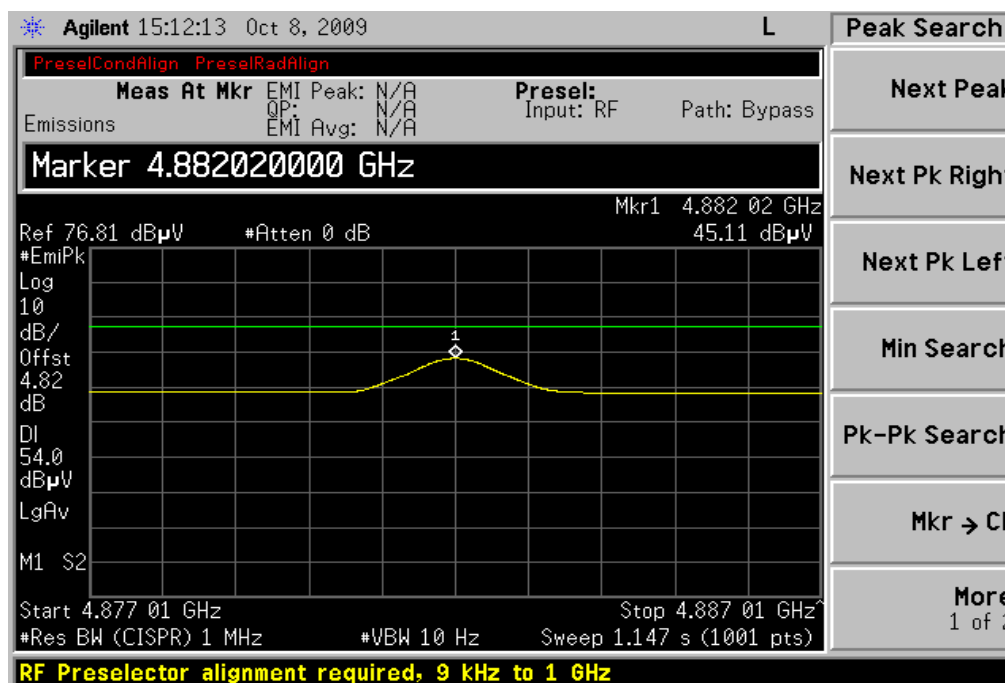
Subrange 1		
	Frequency Range:	30 MHz - 2 GHz
	Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
	Signal Path:	without Notch FW 1.0
	Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
	Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
	Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12
	EMC 32 Version 8.10.00	

Plot 8: 1 - 12 GHz vertical (middle channel) @ 3 m



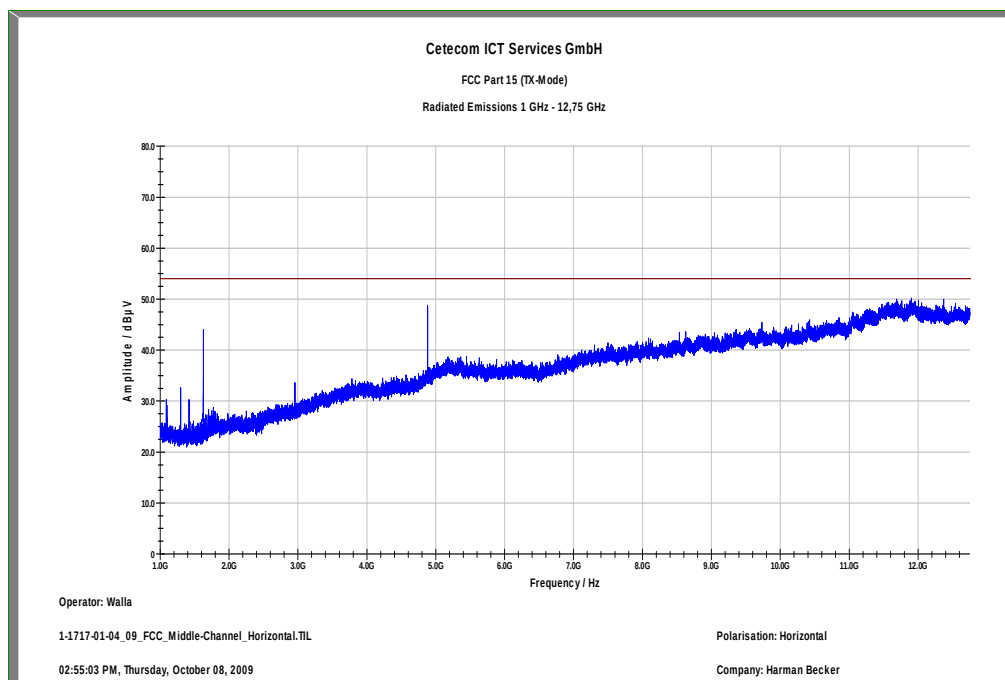
Carrier rejected with 2.4 GHz notch filter.

Plot 9: Remeasurement of the critical emission identified during the scan (@ 3 m)



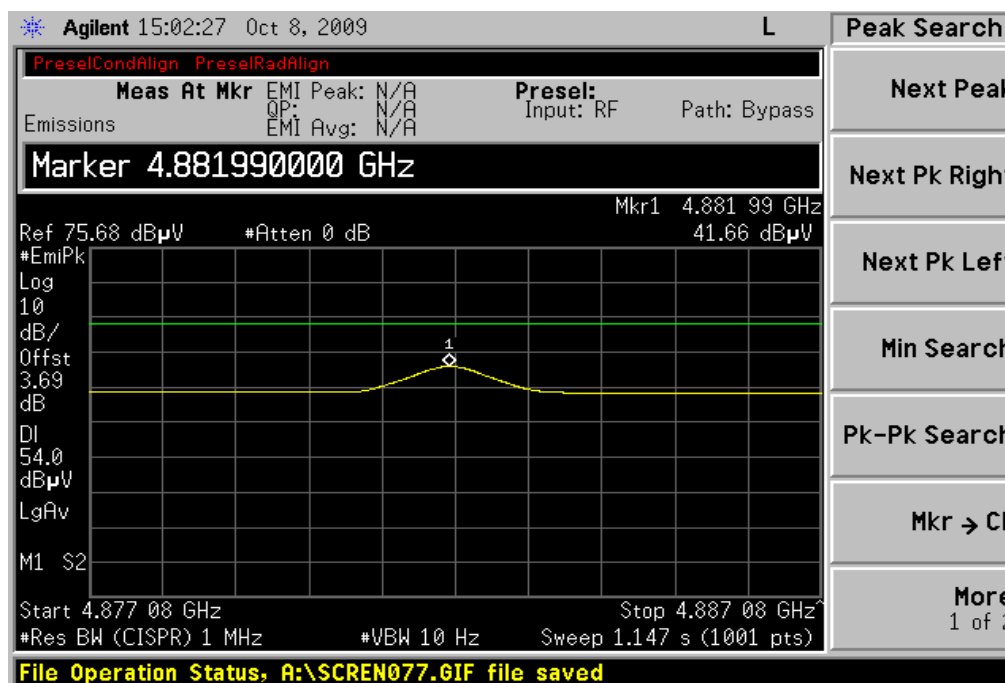
Applies to harmonics/spurious that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A Pre-amp (and possibly a high-pass filter) is necessary for this measurement. For measurement above 1 GHz, set RBW = 1 MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation, use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See 15.35(b) and (c).

Plot 10: 1 - 12 GHz horizontal (middle channel) @ 3 m



Carrier rejected with 2.4 GHz notch filter.

Plot 11: Remeasurement of the critical emission identified during the scan (@ 3 m)



Applies to harmonics/spurious that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A Pre-amp (and possibly a high-pass filter) is necessary for this measurement. For measurement above 1 GHz, set RBW = 1 MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation, use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See 15.35(b) and (c).

Plot 12: 0.03 - 1 GHz vertical/horizontal (highest channel) @ 10 m

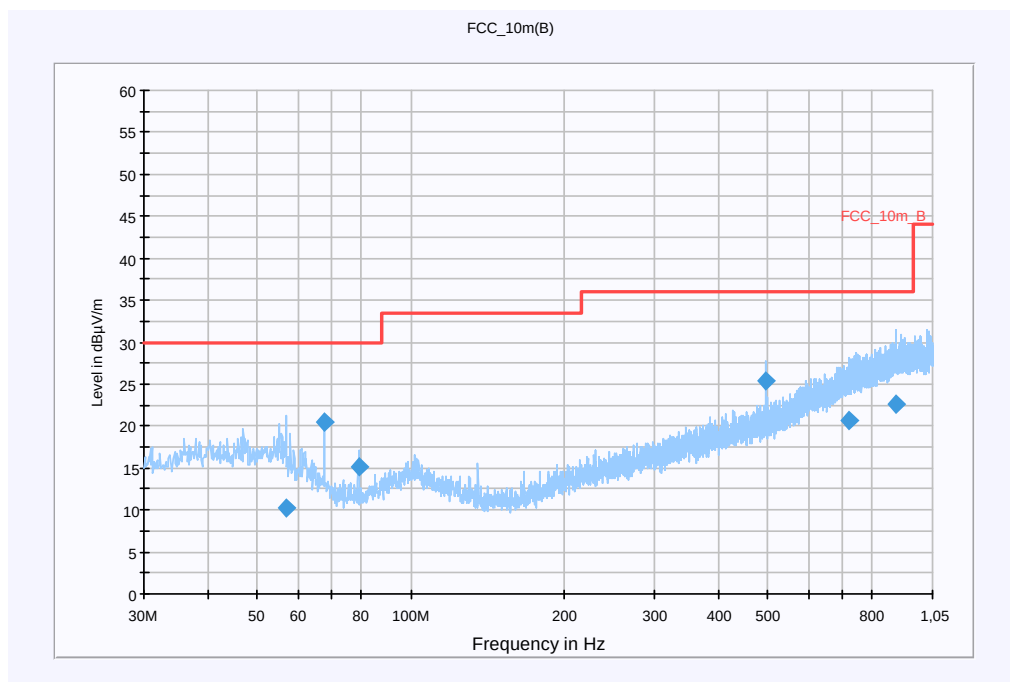
Information

EUT:	HU Hyundai BH MY 10
Serial Number:	85001058
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	TX-Mode, High Channel
Operator Name:	Hennemann
Comment:	DC: 12 V

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dB μ V/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver

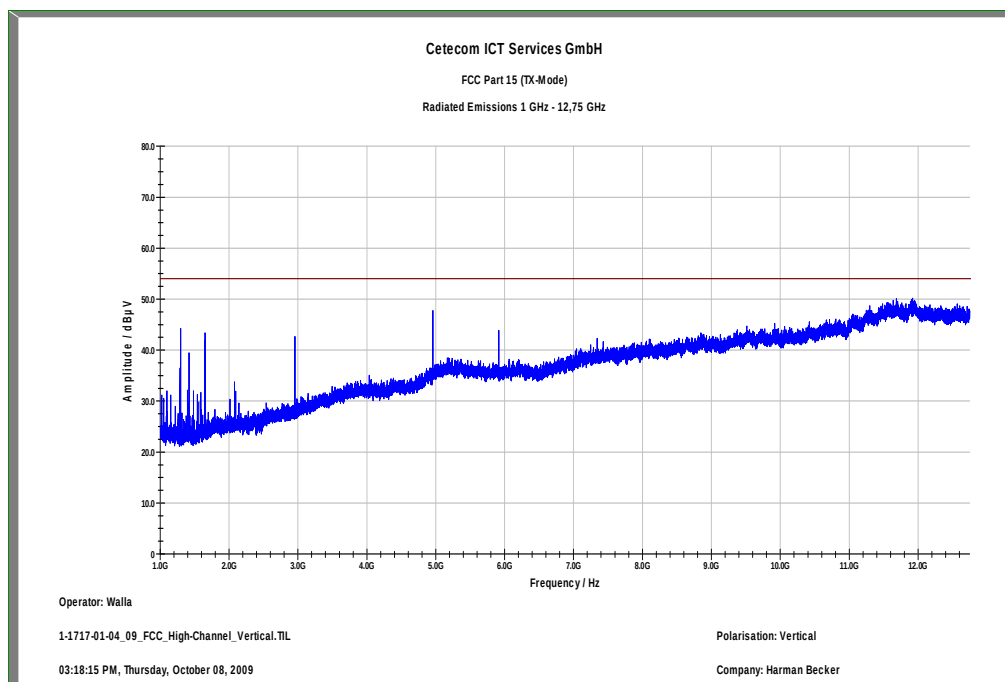


Frequency (MHz)	QuasiPeak (dB μ V/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
57.166350	10.3	15000.000	120.000	148.0	V	12.0	12.5	19.7	30.0
67.738650	20.5	15000.000	120.000	326.0	V	148.0	10.0	9.5	30.0
79.035300	15.1	15000.000	120.000	345.0	V	278.0	9.4	14.9	30.0
494.987250	25.4	15000.000	120.000	338.0	V	23.0	19.0	10.6	36.0
723.086250	20.7	15000.000	120.000	142.0	V	59.0	23.5	15.3	36.0
890.023200	22.7	15000.000	120.000	276.0	V	257.0	25.6	13.3	36.0

Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

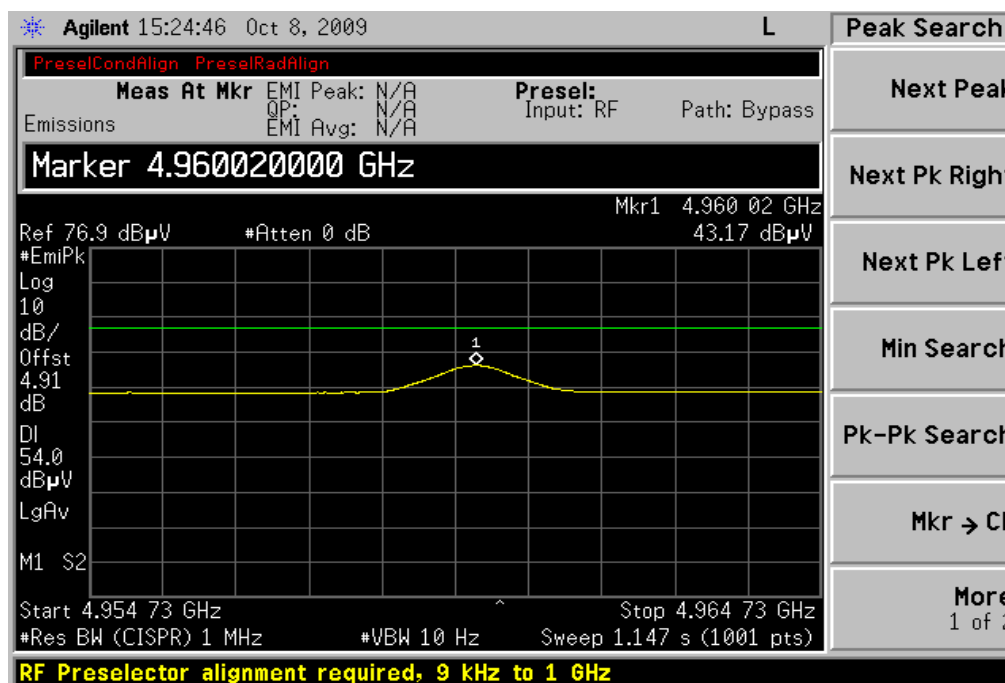
Subrange 1		
	Frequency Range:	30 MHz - 2 GHz
	Receiver:	Receiver [ESCI 3]
		@ GPIB0 (ADR 20), SN 100083/003, FW 4.32
	Signal Path:	without Notch
		FW 1.0
	Antenna:	VULB 9163
		SN 9163-295, FW ---
		Correction Table (vertical): VULP6113
		Correction Table (horizontal): VULP6113
		Correction Table: Cable_EN_1GHz (0909)
	Antenna Tower:	Tower [EMCO 2090 Antenna Tower]
		@ GPIB0 (ADR 8), FW REV 3.12
	Turntable:	Turntable [EMCO Turntable]
		@ GPIB0 (ADR 9), FW REV 3.12
	EMC 32 Version 8.10.00	

Plot 13: 1 - 12 GHz vertical (highest channel) @ 3 m



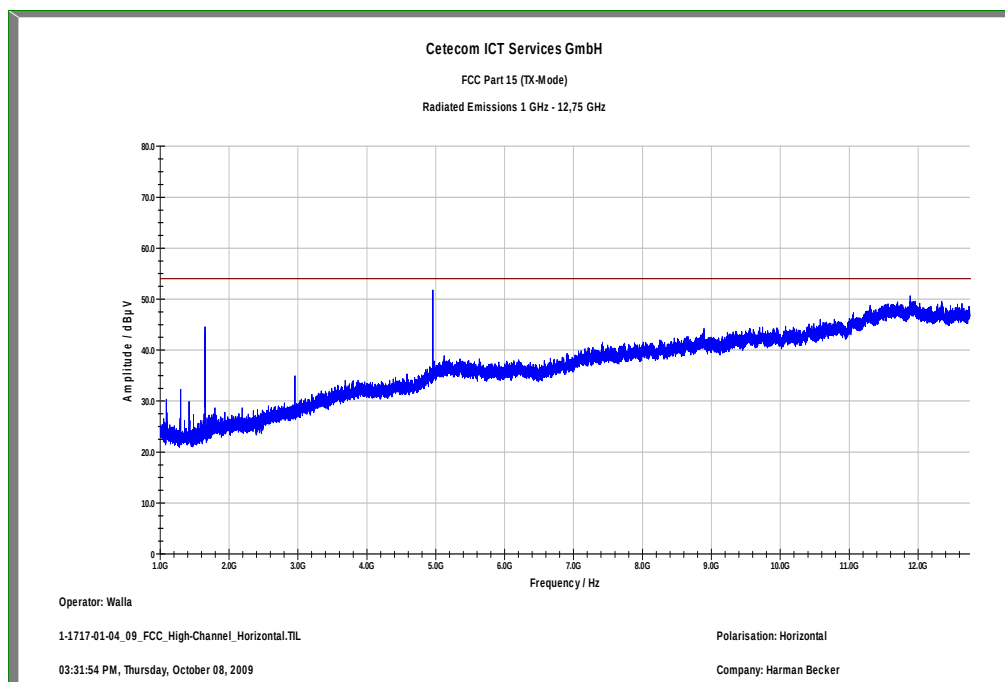
Carrier rejected with 2.4 GHz notch filter.

Plot 14: Remeasurement of the critical emission identified during the scan (@ 3 m)



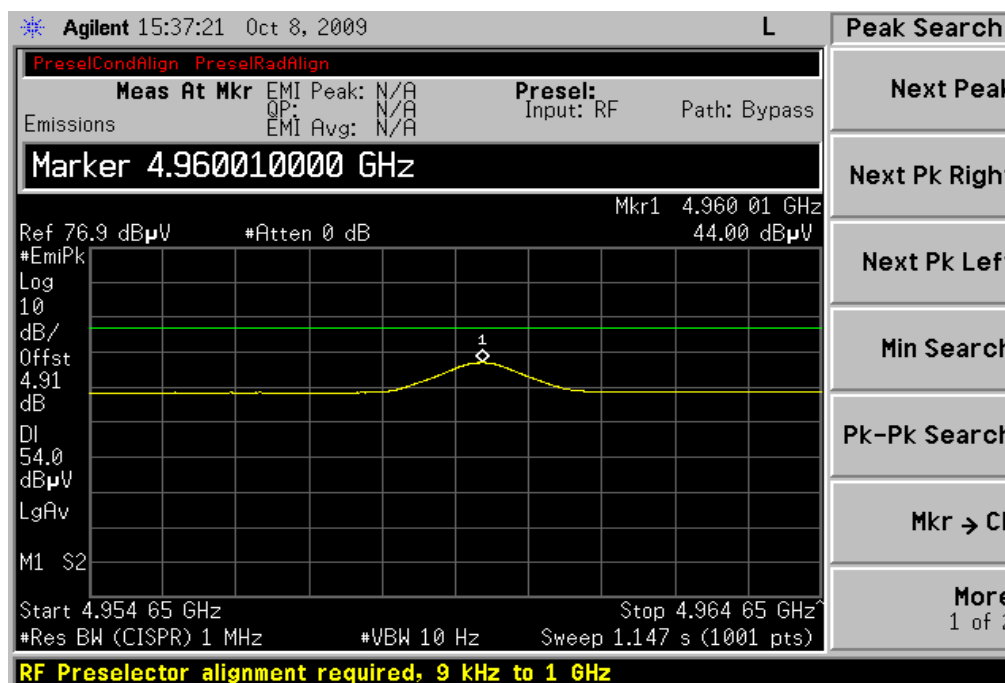
Applies to harmonics/spurious that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A Pre-amp (and possibly a high-pass filter) is necessary for this measurement. For measurement above 1 GHz, set RBW = 1 MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation, use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See 15.35(b) and (c).

Plot 14: 1 - 12 GHz horizontal (highest channel) @ 3 m



Carrier rejected with 2.4 GHz notch filter.

Plot 14: Remeasurement of the critical emission identified during the scan (@ 3 m)



Applies to harmonics/spurious that fall in the restricted bands listed in Section 15.205. The maximum permitted average field strength is listed in Section 15.209. A Pre-amp (and possibly a high-pass filter) is necessary for this measurement. For measurement above 1 GHz, set RBW = 1 MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation, use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See 15.35(b) and (c).

Results:

SPURIOUS EMISSIONS LEVEL [dB μ V/m]								
2402 MHz			2441 MHz			2480 MHz		
Frequency [MHz]	Detector	Level [dB μ V/m]	Frequency [MHz]	Detector	Level [dB μ V/m]	Frequency [MHz]	Detector	Level [dB μ V/m]
1298	Peak	48.31	1298	Peak	48.03	1298	Peak	48.17
1628	Peak	42.81	1628	Peak	47.95	1628	Peak	48.56
2957	Peak	41.98	2957	Peak	44.48	2957	Peak	48.65
4804	Average	40.48	4882	Average	45.11	4960	Average	44.00
5914	Average	43.91	5914	Peak	47.02	5914	Peak	45.30
Measurement uncertainty			± 3 dB					

f < 1 GHz : RBW/VBW: 100 kHz

f $\geq$ 1GHz : RBW/VBW: 1 MHz

Limits:

§ 15.247 (c)

In any 100 kHz bandwidth outside the frequency band at least 20dB below the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Limits:

§ 15.209

Frequency [MHz]	Field strength [μ V/m]	Measurement distance (m)
30 - 88	100 (40 dB μ V/m)	3
88 - 216	150 (43.5 dB μ V/m)	3
216 - 960	200 (46 dB μ V/m)	3
above 960	500 (54 dB μ V/m)	3

5.7 Spurious Emissions - radiated (Receiver) § 15.109

Modulation: GFSK

Plot 1: 0.03 - 1 GHz vertical/horizontal (receiver) @ 10 m

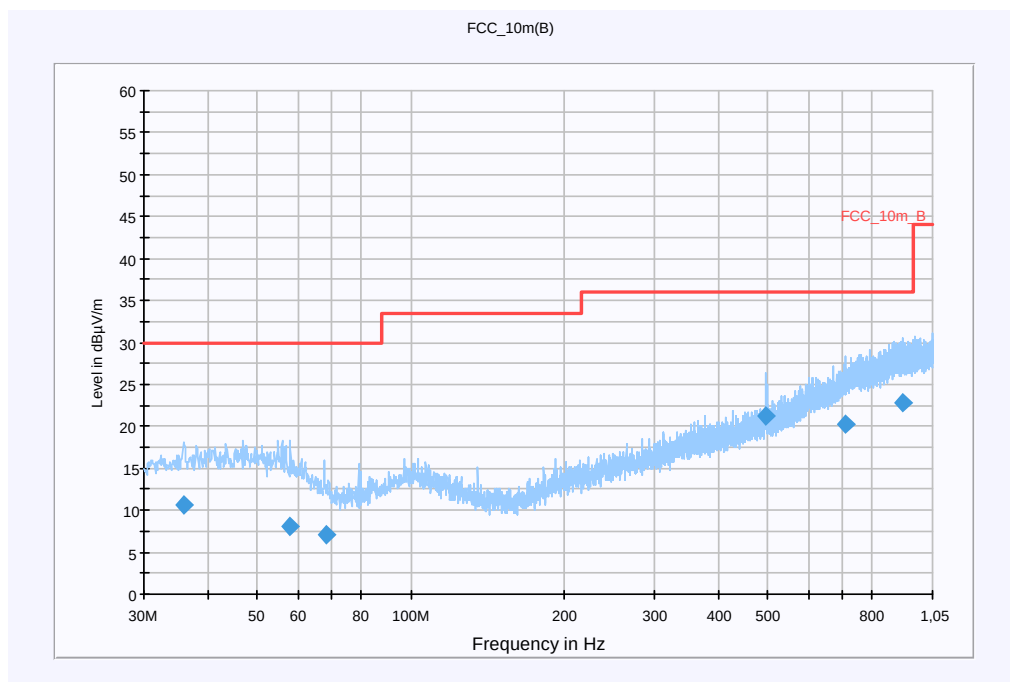
Information

EUT:	HU Hyundai BH MY 10
Serial Number:	85001058
Test Description:	FCC part 15 class B @ 10 m
Operating Conditions:	RX-Mode
Operator Name:	Hennemann
Comment:	DC: 12 V

Scan Setup: STAN_Fin [EMI radiated]

Hardware Setup:	Electric Field (NOS)
Level Unit:	dBµV/m

Subrange	Detectors	IF Bandwidth	Meas. Time	Receiver
30 MHz - 1,05 GHz	QuasiPeak	120 kHz	15 s	Receiver

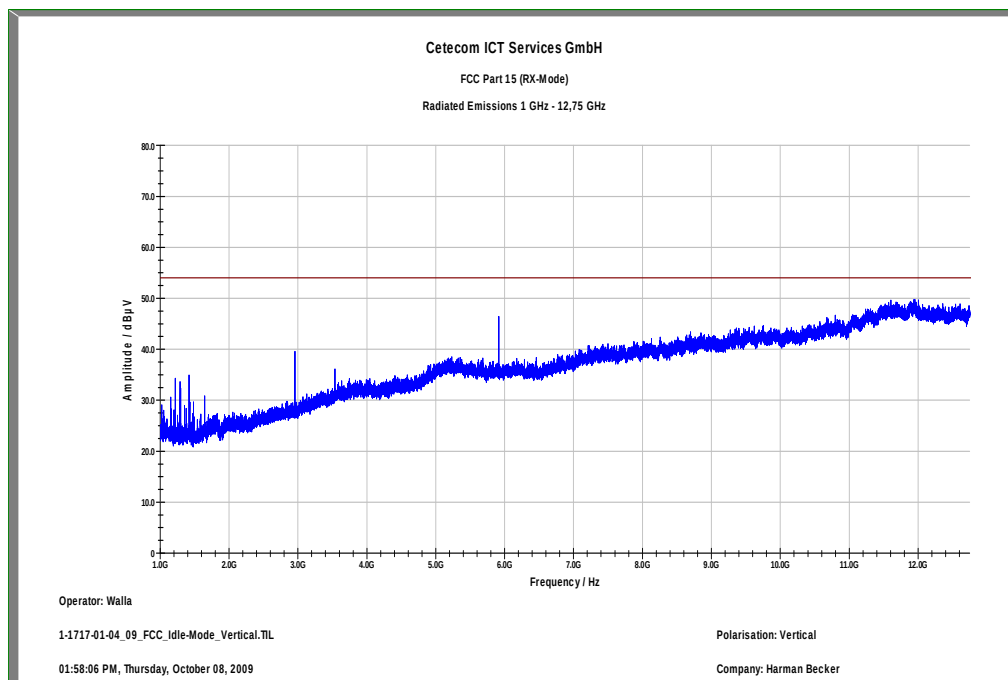


Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
35.859300	10.5	15000.000	120.000	200.0	V	-6.0	13.2	19.5	30.0
57.951300	8.2	15000.000	120.000	200.0	V	277.0	12.3	21.8	30.0
68.254350	7.1	15000.000	120.000	171.0	V	5.0	9.9	23.0	30.0
495.011100	21.3	15000.000	120.000	100.0	V	13.0	19.0	14.7	36.0
711.655950	20.4	15000.000	120.000	400.0	H	-1.0	23.3	15.6	36.0
920.684400	22.9	15000.000	120.000	229.0	V	95.0	25.8	13.1	36.0

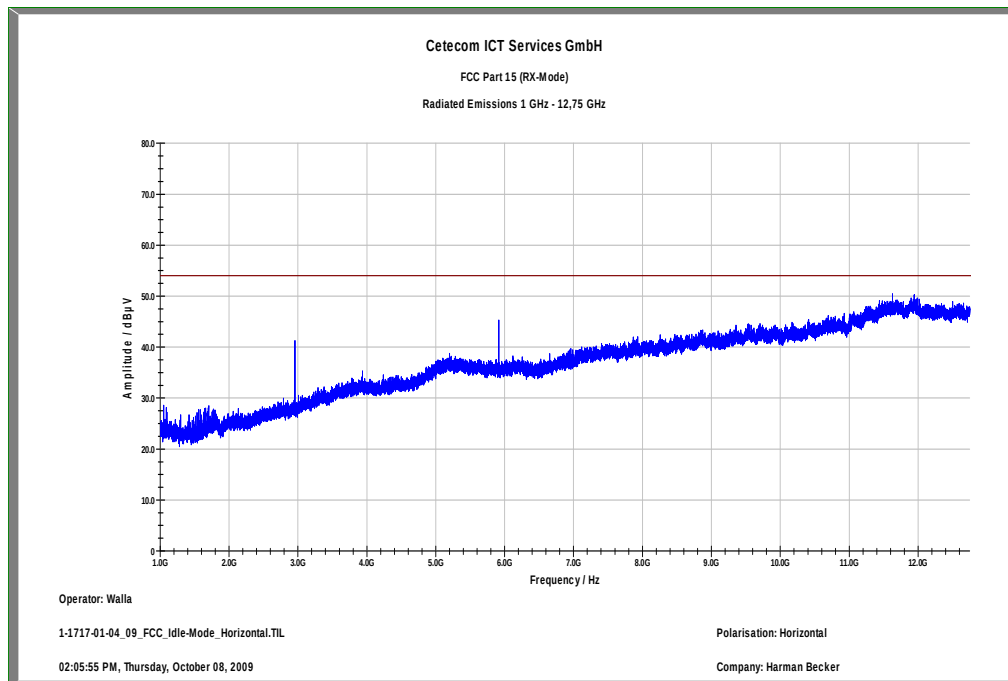
Hardware Setup: EMI radiated\Electric Field (NOS) - [EMI radiated]

Subrange 1	
Frequency Range:	30 MHz - 2 GHz
Receiver:	Receiver [ESCI 3] @ GPIB0 (ADR 20), SN 100083/003, FW 4.32
Signal Path:	without Notch FW 1.0
Antenna:	VULB 9163 SN 9163-295, FW --- Correction Table (vertical): VULP6113 Correction Table (horizontal): VULP6113 Correction Table: Cable_EN_1GHz (0909)
Antenna Tower:	Tower [EMCO 2090 Antenna Tower] @ GPIB0 (ADR 8), FW REV 3.12
Turntable:	Turntable [EMCO Turntable] @ GPIB0 (ADR 9), FW REV 3.12
EMC 32 Version 8.10.00	

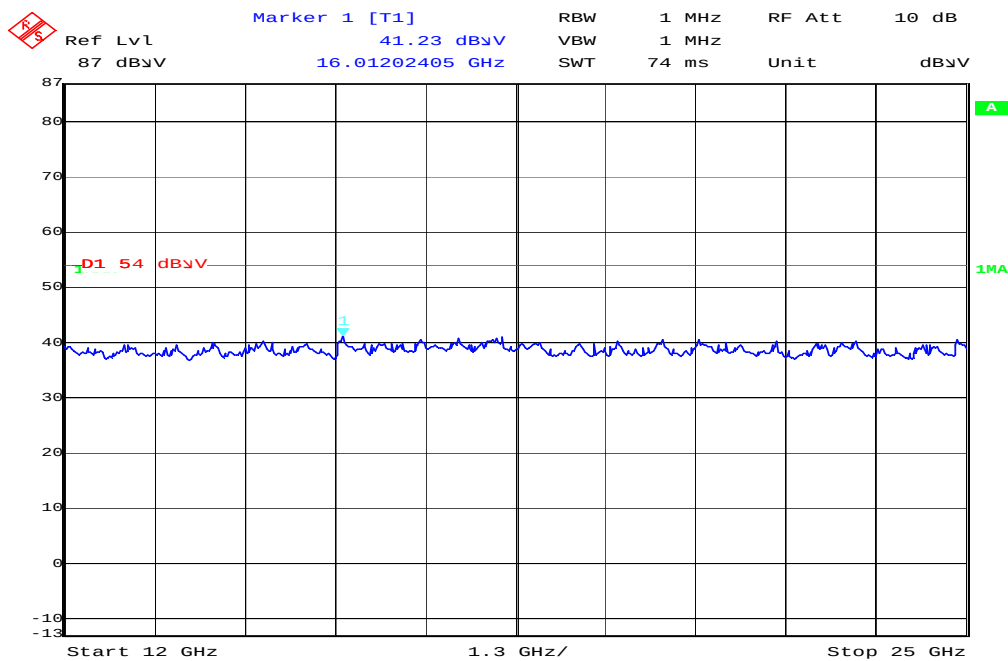
Plot 2: 1 - 12 GHz vertical (receiver) @ 3 m



Plot 3: 1 - 12 GHz horizontal (receiver) @ 3 m



Plot 4: 12 - 25 GHz vertical/horizontal (receiver)



Results:

Spurious Emissions level [dB μ V/m]		
Frequency [MHz]	Detector	Level [dB μ V/m]
5914	Peak	44.92
2957	Peak	49.61
Measurement uncertainty		± 3 dB

$f < 1$ GHz: RBW/VBW: 100 kHz

$f \geq 1$ GHz : RBW/VBW: 1 MHz

See above plots

Measurement distance see table

Limits:

§ 15.109

Frequency (MHz)	Field strength (μ V/m)	Measurement distance (m)
30 - 88	100 (40 dB μ V/m)	3
88 - 216	150 (43.5 dB μ V/m)	3
216 - 960	200 (46 dB μ V/m)	3
above 960	500 (54 dB μ V/m)	3

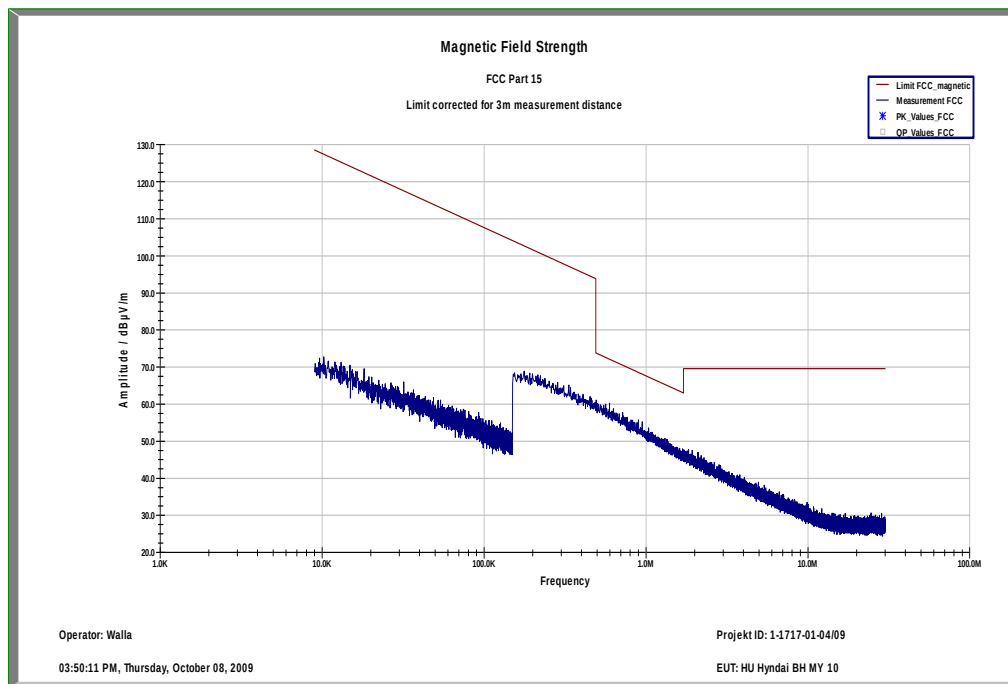
5.8 Spurious Emissions < 30 MHz – Transmitter and Receiver radiated § 15.209

Modulation: 8DPSK

Measured at 3 m distance.

Values recalculated with 40 dB/decade according to FCC rules.

Plot 1:



Limits:

Frequency (MHz)	Field strength (µV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30 / 29.5 dBµV/m	30

6 Test equipment and ancillaries used for tests

To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.

All reported calibration intervals are calibrations according to the EN/ISO/IEC 17025 standard. These calibrations were performed from an accredited external calibration laboratory.

Additional to these calibrations the laboratory performed comparison measurements with other calibrated systems and performed a weekly chamber inspection.

All used devices are connected with a 10 MHz external reference.

According to the manufacturers' instruction is it possible to establish a calibration interval for the FSP unit of 24 month, if the device has an external 10 MHz reference.

Anechoic chamber C:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Anechoic chamber	MWB	87400/02	300000996	Monthly verification		
2	System-Rack 85900	HP I.V.	*	300000222	n.a.		
3	Measurement System 1						
4	PSA-Spektrumanalysator 3 Hz - 26.5 GHz (E4440A)	Agilent	MY48250080	300003812	05.08.2008	24	05.08.2010
5	EMI Preselector 9 kHz - 1 GHz (N9039A)	Agilent	MY48260003	300003825	19.08.2008	24	19.08.2010
6	Microwave Analog Signal Generator (N5183A)	Agilent	MY47420220	300003813	06.08.2008	24	06.08.2010
7	PC	F+W			n.a.		
8	TILE	TILE			n.a.		
9	TRILOG Super Broadband Antenna (VULB9163)	Schwarzbeck	371	300003854	Monthly verification (System cal.)		
10	Double Ridged Antenna 3115	EMCO	3088	300001032	Monthly verification (System cal.)		
11	Active Loop Antenna 6502	EMCO	2210	300001015	Monthly verification (System cal.)		
12	Switch / Control Unit 3488A	HP	2719A15013	300001156	n.a.		
13	Power Supply 6032A	HP	2818A03450	300001040	08.01.2009	36	08.01.2012
14	Busisolator	Kontron		300001056	n.a.		
15	Leitungsteiler 11850C	HP		300000997	Monthly verification (System cal.)		
16	Power attenuator 8325	Byrd	1530	300001595	Monthly verification (System cal.)		
17	Band reject filter WRCG1855/1910	Wainwright	7	300003350	Monthly verification (System cal.)		
18	Band reject filter WRCG2400/2483	Wainwright	11	300003351	Monthly verification (System cal.)		
19	Hochpassfilter WHK1.1/15G-10SS	Wainwright	3	300003255	Monthly verification (System cal.)		
20	Hochpassfilter WHKX2.9/18G-12SS	Wainwright	1	300003492	Monthly verification (System cal.)		
21	Hochpassfilter WHKX7.0/18G-8SS	Wainwright	18	300003789	Monthly verification (System cal.)		
22	Switch / Control Unit 3488A	HP	2605e08770	300001443	n.a.		
23	Trenntrafo RT5A	Grundig	9242	300001263	n.a.		
24	Relais Matrix PSU	R&S	890167/024	300001168	n.a.		
25	Netznachbildung ESH3-Z5	R&S	828576/020	300001210	n.a.		

Signalling Units:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	CBT	R&S	100313	300003516	03.09.2008	24	03.09.2010
2	CBT	R&S	100185	300003416	27.08.2008	24	27.08.2010
3	CMU-200	R&S	103992	300003231	04.06.2008	24	04.06.2010
4	CMU-200	R&S	106240	300003321	27.08.2008	24	27.08.2010
5	CMU-200	R&S	832221/0055	300002862	20.03.2008	24	20.03.2010

SRD Laboratory Room 002:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	System Controller PSM 12	R&S	835259/007	300002681-00xx	n.a.		
2	Memory Extension PSM-K10	R&S	To 1	300002681	n.a.		
3	Operating Software PSM-B2	R&S	To 1	300002681	n.a.		
4	19'' Monitor		22759020-ED	300002681	n.a.		
5	Mouse		LZE 0095/6639	300002681	n.a.		
6	Keyboard		G00013834L461	300002681	n.a.		
7	Spectrum Analyser FSIQ 26	R&S	835540/018	300002681-0005	10.01.2008	24	10.01.2010
8	Tracking Generator FSIQ-B10	R&S	835107/015	300002681	s.No.7		
10	RF-Generator SMIQ03 (B1 Signal)	R&S	835541/056	300002681-0002	26.08.2008	36	26.08.2011
11	Modulation Coder SMIQ-B20	R&S	To 10	300002681	s.No.10		
12	Data Generator SMIQ-B11	R&S	To 10	300002681	s.No.10		
13	RF Rear Connection SMIQ-B19	R&S	To 10	300002681	s.No.10		
14	Broadband horn antenna (1-18 GHz)	EMCO	9107-3696	300001604	16.04.2008	24	16.04.2010
15	Broadband horn antenna (1-18 GHz)	EMCO	9107-3697	300001605	21.08.2008	24	21.08.2010
16	Std gain horn antenna (18- 26.5 GHz)	Narda	Model no. 638	300000486	n.a.		
17	Std gain horn antenna (18- 26.5 GHz)	Narda	Model no. 638	300000487	n.a.		
18	Sleeve dipole antenna Model 3126-880	ETS-Lindgren	00040887	30000000	n.a.		
19	Fast CPU SM-B50	R&S	To 10	300002681	s.No.10		
20	FM Modulator SM-B5	R&S	835676/033	300002681	s.No.10		
21	RF-Generator SMIQ03 (B2 Signal)	R&S	835541/055	300002681-0001	25.08.2008	36	25.08.2011
22	Modulation Coder SMIQ-B20	R&S	To 21	300002681	s.No.21		
23	Data Generator SMIQ-B11	R&S	To 21	300002681	s.No.21		
24	RF Rear Connection SMIQ-B19	R&S	To 21	300002681	s.No.21		
25	Fast CPU SM-B50	R&S	To 21	300002681	s.No.21		
26	FM Modulator SM-B5	R&S	836061/022	300002681	s.No.21		
27	RF-Generator SMP03 (B3 Signal)	R&S	835133/011	300002681-0003	26.08.2008	36	26.08.2011
28	Attenuator SMP-B15	R&S	835136/014	300002681	S.No.27		
29	RF Rear Connection SMP-B19	R&S	834745/007	300002681	S.No.27		
30	Power Meter NRVD	R&S	835430/044	300002681-0004	26.08.2008	24	26.08.2010
31	Power Sensor NRVD-Z1	R&S	833894/012	300002681-0013	26.08.2008	24	26.08.2010
32	Power Sensor NRVD-Z1	R&S	833894/011	300002681-0010	26.08.2008	24	26.08.2010
33	Rubidium Standard RUB	R&S		300002681-0009	27.08.2008	24	27.08.2010
34	Switching and Signal Conditioning Unit SSCU	R&S	338864/003	300002681-0006	Verified with path compensation		
35	Laser Printer HP Deskjet 2100	HP	N/A	300002681-0011	n.a.		
36	19'' Rack	R&S	11138363000004	300002681	n.a.		
37	RF-cable set	R&S	N/A	300002681	n.a.		
39	IEEE-cables	R&S	N/A	300002681	n.a.		
40	Sampling System FSIQ-B70	R&S	835355/009	300002681	s.No.7		
41	RSP programmable attenuator	R&S	834500/010	300002681-0007	26.08.2008	24	26.08.2010

42	Signalling Unit	R&S	838312/011	300002681	n.a.		
43	NGPE programmable Power Supply for EUT	R&S	192.033.41	300002681			
44	Power Splitter 6005-3	Inmet Corp.	none	300002841	n.a.		
45	SMA Cables SPS-1151-985-SPS	Insulated Wire	different	different	n.a.		
46	CBT32 with EDR Signaling Unit	R&S					
47	Coupling unit	Narda	N/A	--	n.a.		
48	2xSwitch Matrix PSU	R&S	872584/021	300001329	n.a.		
49	RF-cable set	R&S	N/A	different	n.a.		
50	IEEE-cables	R&S	N/A	--	n.a.		

Note: 3000002681-00xx inventoried as a system

Anechoic chamber F:

No	Equipment/Type	Manuf.	Serial Nr.	Inv. No. Cetecom	Last Calibration	Frequency (months)	Next Calibration
1	Control Computer	F+W	FW0502032	300003303	-/-	-/-	-/-
2	Trilog Antenna VULB 9163	Schwarzbeck	295	300003787	01.04.2008	24	01.04.2010
3	Amplifier - 0518C-138	Veritech Micro- wave Inc.	-/-	-/-	-/-	-/-	-/-
4	Switch - 3488A	HP		300000368	-/-	-/-	-/-
5	EMI Test receiver - ESCI	R&S	100083	300003312	01.06.2009	24	01.06.2011
6	Turntable Controller - 1061 3M	EMCO	1218	300000661	-/-	-/-	-/-
7	Tower Controller 1051 Controller	EMCO	1262	300000625	-/-	-/-	-/-
8	Tower - 1051	EMCO	1262	300000625	-/-	-/-	-/-
10	Ultra Notch-Filter Rejected band Ch. 62	WRCD	9	-/-	-/-	-/-	-/-