TEST REPORT
FROM
RFI GLOBAL SERVICES LTD

Test of: Panasonic
VS85

To: FCC Part 24: 2008 (Subpart E)

Test Report Serial No:
RFI/RPT2/RP74290JD03A

Supersedes Test Report Serial No:
RFI/RPT1/RP74290JD03A

This Test Report Is Issued Under The Authority Of Steve Flooks, Service Leader: 	
Checked By: Steve Flooks 	**Report Copy No: PDF01**
Issue Date: 08 December 2008	**Test Dates: 10 November to 14 November 2008**

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Registered in England and Wales. Company number:2117901

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1. Customer Information

Company Name:	Panasonic Mobile Comms Dev of Europe Ltd
Address:	Panasonic House Willoughby Road Bracknell Berkshire RG12 8FP

2. Equipment Under Test (EUT)

2.1. Identification of Equipment Under Test (EUT)

Description:	Cellular Mobile Telephone incorporating Bluetooth and RFID
Brand Name:	Panasonic
Model Name or Number:	VS85
IMEI Numbers::	004401220651620 004401220651869
FCC ID Number:	UCE208011A

Description:	Micro-SD Memory Card
Brand Name:	Not marked
Model Name or Number:	2GB MicroSD
Connected to Port:	Dedicated micro-SD card port

Description:	AC adaptor
Brand Name:	SoftBank
Model Name or Number:	ZTDAA1
Cable Length & Type:	2.0m multicore
Connected to Port:	Charge/Data port

Description:	Personal Hands Free (stereo)
Brand Name:	SoftBank
Model Name or Number:	Stereo PHF#01
Cable Length & Type:	1.8m / multi-core
Connected to Port:	AV Out port

Identification of Equipment Under Test (EUT) (Continued)

Description:	USB cable
Model Name or Number:	None Stated
Serial Number:	C23
Cable Length:	1.1 metre / multicore
Connected to Port:	Charge/Data port

Description:	DC Charger
Brand Name:	SoftBank
Model Name or Number:	PMJAA1
Cable Length and Type:	2.0m approx / 2 core curl-cord
Connected to Port:	Charge/Data port

2.2. Description of EUT

The equipment under test was a dual mode (W-CDMA FDDI/GSM900/1800/1900MHz) cellular mobile telephone with Bluetooth & RFID.

2.3. Modifications Incorporated in EUT

One sample (IMEI: 004401220651869) has been modified by the customer. External SMA type RF connectors had been fitted to enable conducted tests to be performed this sample was used for frequency stability measurements.

The other unit (IMEI: 004401220651620) was unmodified and used for all other testing.

2.4. Support Equipment

The following support equipment was used to exercise the EUT during testing:

Description:	Dummy battery
Model Name or Number:	Panasonic
Serial Number:	Dummy battery No. VS85- 13
Cable Length and Type:	0.25 metre / 2 x single core
Connected to Port:	Battery

2.5. Additional Information Related to Testing

Power Supply Requirement:	Nominal 120 V, 60 Hz AC Mains supply (via AC charger) Internal battery supply 3.7 V (Nominal)		
Intended Operating Environment:	Within GSM network coverage		
Equipment Category:	GSM1900		
Type of Unit:	Portable Transceiver		
Transmit Frequency Range:	1850 to 1910 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	512	1850.2
	Middle	660	1879.8
	Top	810	1909.8
Receive Frequency Range:	1930 to 1990 MHz		
Receive Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	512	1930.2
	Middle	660	1959.8
	Top	810	1989.8

2.6. Port Identification

Port	Description
1	Charge/Data
2	Audio PHF
3	USIM
4	Micro-SD

3. Test Specification, Methods and Procedures

Reference:	FCC Part 24: 2008 Subpart E (Broadband PCS)
Title:	Code of Federal Regulations, Part 24 (47CFR24) Personal Communication Services.

3.1. Methods and Procedures

The methods and procedures used were as detailed in:

ANSI/TIA-603-B-2003
Land Mobile Communications Equipment, Measurements and performance Standards

ANSI C63.2 (1987)
Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (2003)
Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)
Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)
Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16-1: (1999)
Title: Specification For Radio Disturbance and Immunity Measuring Apparatus and Methods. Part 1: Radio Disturbance and Immunity Measuring Apparatus.

3.2. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures Section above. Appendix 1 contains a list of the test equipment used.

4. Deviations from the Test Specification

The equipment under test would not operate below a temperature of -20ºC consequently testing of frequency stability below this temperature could not be performed. The EUT showed compliance up to this point.

5. Operation of the EUT during Testing

5.1. Operating Modes

The EUT was tested in the following operating modes, unless otherwise stated:

- Connected to a GSM system simulator, operating in GSM transceiver mode.
- Receiver/Idle mode.
- Constantly transmitting at full power on bottom, centre and top channels as required.
- Bandwidth and power tests were initially performed with the EUT in GSM single timeslot circuit switched and GPRS Multislot Class 10 with the unit transmitting on two timeslots in the uplink. Both modes were found to be identical with regards bandwidth and amplitude.

5.2. Configuration and Peripherals

The EUT was tested in the following configuration:

- The Micro SD card and USIM were present in the EUT during all tests.
- Radiated emissions tests were performed with the Portable Hands Free (PHF) and mains charger connected as this was found to be the worst case compared with other supplied accessories during prescans.
- Mains charger and PHF were connected to the EUT during AC conducted emissions testing in idle/standby mode.

6. Summary of Test Results

Range of Measurements	Specification Reference	Port Type	Result
Receiver/Idle Mode AC Conducted Spurious Emissions (150 kHz to 30 MHz)	C.F.R. 47 FCC Part 15 Section 15.107	AC Mains Input	Complied
Receiver/Idle Mode Radiated Spurious Emissions	C.F.R. 47 FCC Part 15 Section 15.109	Enclosure	Complied
Transmitter Effective Isotropic Radiated Power (EIRP)	C.F.R. 47 FCC Part 24 Section 24.232	Antenna	Complied
Transmitter Frequency Stability (Temperature Variation)	C.F.R. 47 FCC Part 24 Section 24.235	*Antenna Terminals	Complied
Transmitter Frequency Stability (Voltage Variation)	C.F.R. 47 FCC Part 24 Section 24.235	*Antenna Terminals	Complied
Transmitter Occupied Bandwidth	C.F.R. 47 FCC Part 24 Section 24.238	Antenna	Complied
Transmitter Out of Band Radiated Emissions	C.F.R. 47 FCC Part 24 Section 2.1053/24.238(a)(b)	Antenna	Complied
Transmitter Band Edge Radiated Emissions	C.F.R. 47 FCC Part 2 Section 2.1053/24.238	Antenna	Complied

*Note. This is an access point on the EUT provided by the manufacturer for the purpose of this test.

6.1. Location of Tests

All the measurements described in this report were performed at the premises of RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.

6.2. Site Registration Numbers

209735

7. Measurements, Examinations and Derived Results

7.1. General Comments

This Section contains test results only.

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to Section 8 for details of measurement uncertainties.

7.2. Test Results

7.2.1. Receiver/Idle Mode AC Conducted Spurious Emissions: Section 15.107(a)

Ambient Temperature: 20ºC Relative Humidity: 48%

Tests were performed to identify the maximum emissions levels present on the ac mains line of the EUT.

Results:

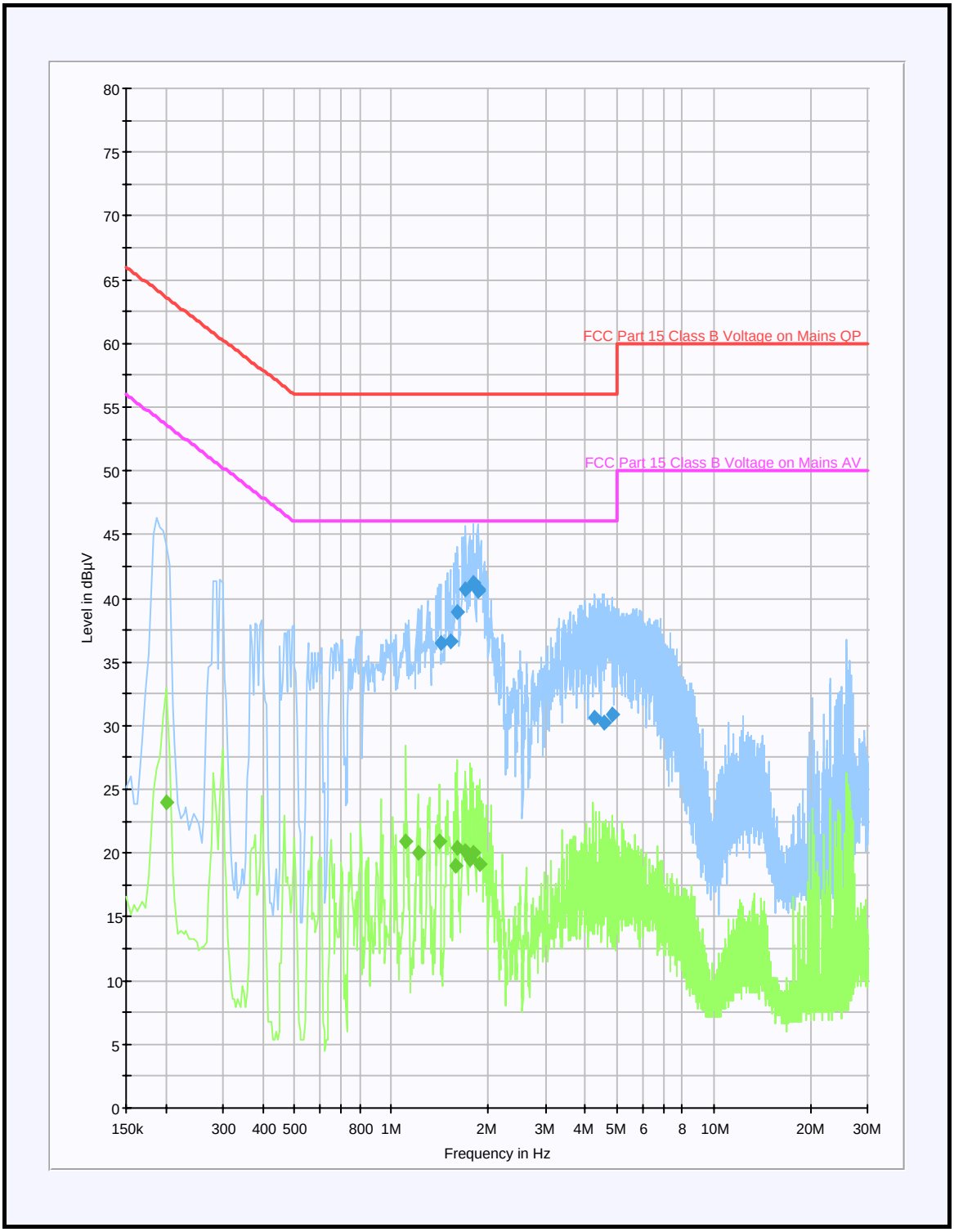
Quasi-Peak Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
1.419000	Live	36.5	56.0	19.5	Complied
1.518000	Live	36.7	56.0	19.3	Complied
1.603500	Live	39.0	56.0	17.0	Complied
1.702500	Live	40.8	56.0	15.2	Complied
1.792500	Live	41.2	56.0	14.8	Complied
1.851000	Live	40.5	56.0	15.5	Complied
1.864500	Live	40.7	56.0	15.3	Complied
4.263000	Live	30.6	56.0	25.4	Complied
4.546500	Live	30.2	56.0	25.8	Complied
4.830000	Live	30.8	56.0	25.2	Complied

Average Detector Measurements on Live and Neutral Lines

Frequency (MHz)	Line	Level (dBµV)	Limit (dBµV)	Margin (dB)	Result
0.199500	Live	24.0	53.6	29.6	Complied
1.108500	Live	20.9	46.0	25.1	Complied
1.207500	Live	20.0	46.0	26.0	Complied
1.405500	Live	20.9	46.0	25.1	Complied
1.576500	Live	19.0	46.0	27.0	Complied
1.590000	Live	20.4	46.0	25.6	Complied
1.684500	Live	20.2	46.0	25.8	Complied
1.761000	Live	19.5	46.0	26.5	Complied
1.792500	Live	20.1	46.0	25.9	Complied
1.878000	Live	19.2	46.0	26.8	Complied

Receiver/Idle Mode AC Conducted Spurious Emissions (Continued)



7.2.2.Receiver/Idle Radiated Spurious Emissions: Section 15.109(a)

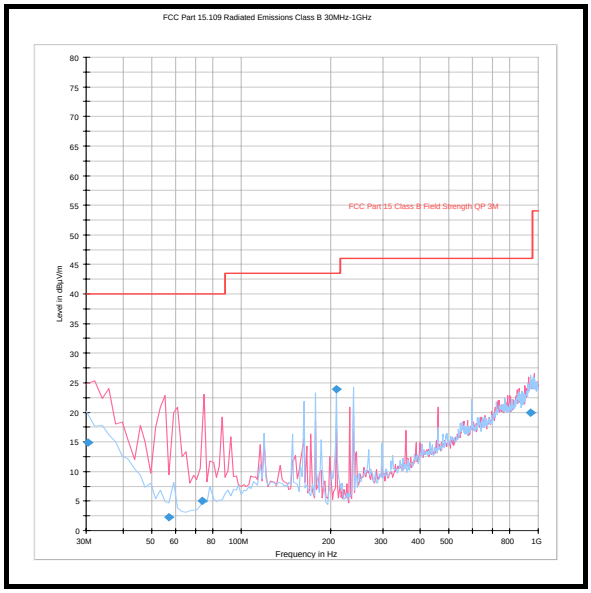
Ambient Temperature: 21ºC Relative Humidity: 39%

Tests were performed to identify the maximum receiver or standby radiated emission levels.

Results: Frequency Range 30 to 1000 MHz

Frequency (MHz)	Antenna Polarity	Quasi Peak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
208.678958	Horizontal	23.9	43.5	19.6	Complied

Receiver/Idle Radiated Spurious Emissions (Continued)



7.2.3. Receiver/Idle Radiated Spurious Emissions (Continued)

Results: Frequency Range 1 to 12.75 GHz

Tests were performed to identify the maximum receiver/idle mode radiated emission levels.

Highest Peak Level:

Frequency (GHz)	Antenna Polarity	Detector Level (dBμV)	Transducer Factor (dB)	Actual Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
11.902	Horizontal	33.9	2.4	36.3	54.0	17.7	Complied

Note(s):

1. *No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.*

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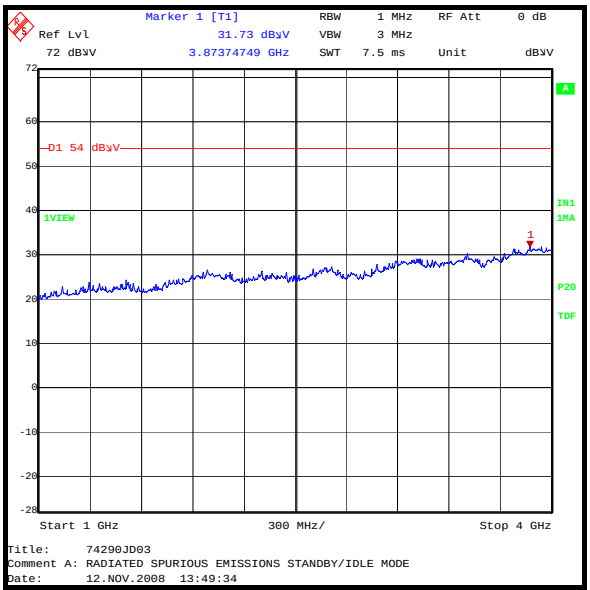
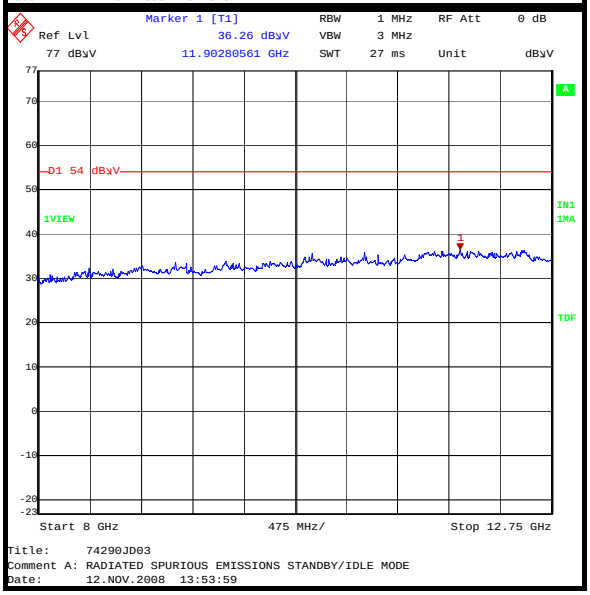
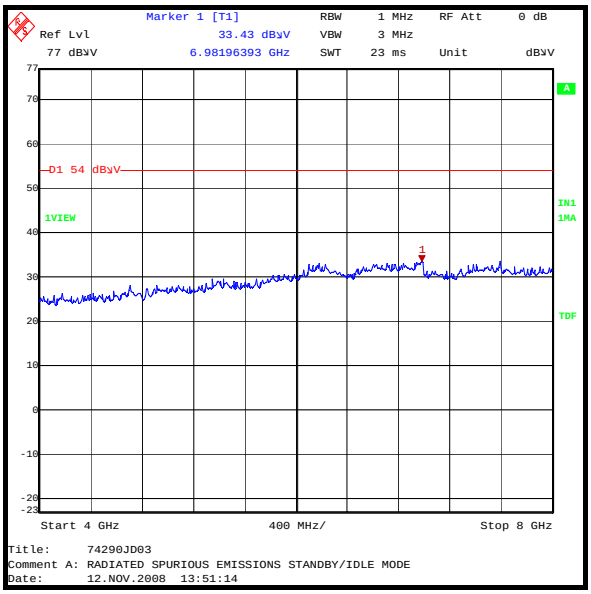
Receiver/Idle Radiated Spurious Emissions (Continued)







7.2.4. Transmitter Effective Isotropic Radiated Power (EIRP): Section 24.232

Ambient Temperature: 21ºC to 22 ºC Relative Humidity: 38% to 32%

Tests were performed to identify the maximum effective isotropic radiated power (EIRP).

Results: GSM/GPRS

Channel	Measured Frequency (MHz)	Antenna Polarity	Maximum Transmitter EIRP (dBm)	Limit EIRP (dBm)	Margin (dB)	Result
Bottom	1850.2	Horizontal	28.6	33.0	4.4	Complied
Middle	1879.8	Horizontal	29.5	33.0	3.5	Complied
Top	1909.8	Horizontal	29.5	33.0	3.5	Complied

7.2.5. Transmitter Frequency Stability (Temperature Variation): Section 24.235

Ambient Temperature: 20ºC Relative Humidity: 43%

Tests were performed to identify the maximum frequency error of the EUT with variations in nominal operating voltage.

Results: Bottom Channel (1850.2 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
-20	-19	1850.199981	1850.0	0. 199981	Complied
-10	-23	1850.199977	1850.0	0.199977	Complied
0	-19	1850.199981	1850.0	0. 199981	Complied
10	-15	1850.199985	1850.0	0.199985	Complied
20	-9	1850.199991	1850.0	0. 199991	Complied
30	-12	1850.199988	1850.0	0.199988	Complied
40	18	1850.200018	1850.0	0.200018	Complied
50	15	1850.200015	1850.0	0.200015	Complied

Transmitter Frequency Stability (Temperature Variation): Section 24.235 (Continued)

Results: Top Channel (1909.8 MHz)

Temperature (ºC)	Frequency Error (Hz)	Measured Frequency (MHz)	Upper Band Edge Limit (MHz)	Margin (MHz)	Result
-20	-23	1909.799977	1910.0	0.200023	Complied
-10	-25	1909.799975	1910.0	0.200025	Complied
0	-16	1909.799984	1910.0	0.200016	Complied
10	-12	1909.799988	1910.0	0.200012	Complied
20	-16	1909.799984	1910.0	0.200016	Complied
30	-19	1909.799981	1910.0	0.200019	Complied
40	-21	1909.799979	1910.0	0.200021	Complied
50	16	1909.800016	1910.0	0.199984	Complied

Note(s):

1. *The equipment under test would not operate below a temperature of -20ºC consequently testing of frequency stability below this temperature could not be performed. The EUT showed compliance up to this point.*

7.2.6. Transmitter Frequency Stability (Voltage Variation): Section 24.235

Ambient Temperature: 20ºC Relative Humidity: 43%

Results: Bottom Channel (1850.2 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.4	-16	1850.199984	1850	0.199984	Complied
4.2	-11	1850.199989	1850	0.199989	Complied

Results: Bottom Channel (1909.8 MHz)

Supply Voltage (V)	Frequency Error (Hz)	Measured Frequency (MHz)	Lower Band Edge Limit (MHz)	Margin (MHz)	Result
3.4	-18	1909.799982	1910.0	0.200018	Complied
4.2	-25	1909.799975	1910.0	0.200025	Complied

7.2.7. Transmitter Occupied Bandwidth: Section 24.238

Ambient Temperature: 22ºC Relative Humidity: 32%

The occupied bandwidth was measured using the occupied bandwidth function on a spectrum analyser.

Results: GSM Mode.

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	242.886
Middle	1879.8	239.279
Top	1909.8	242.886

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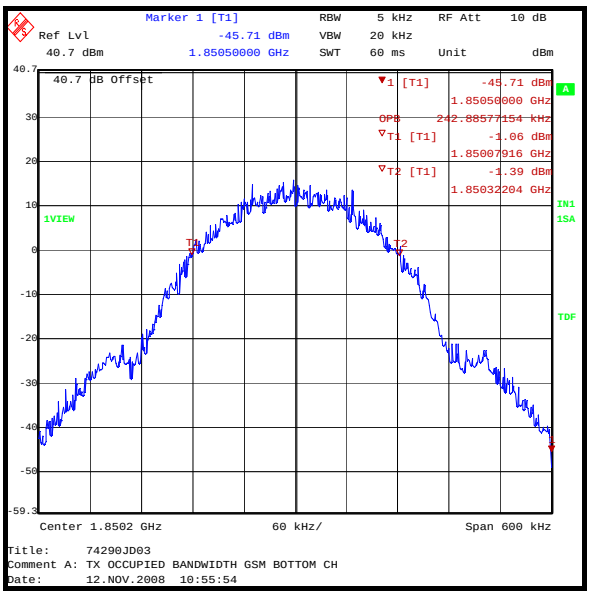
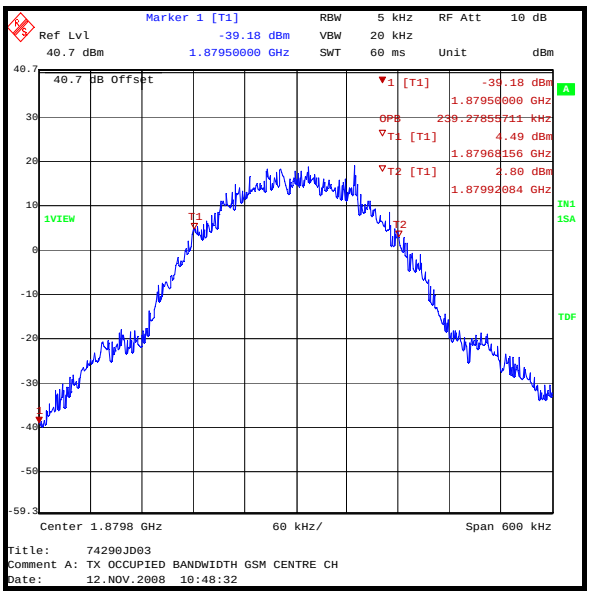
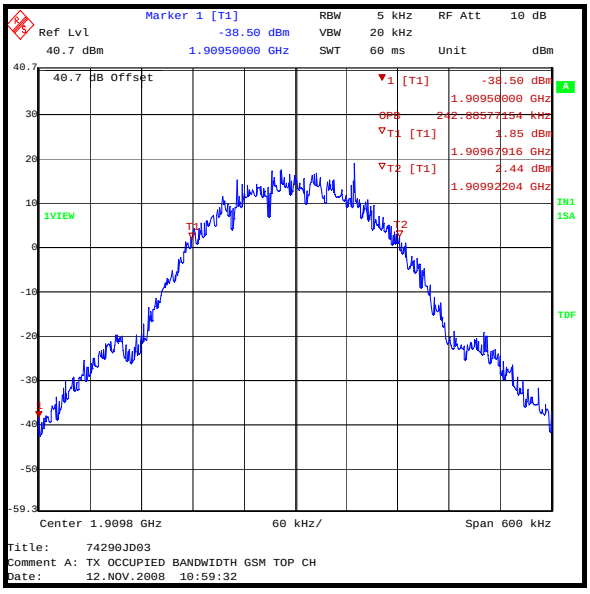
Transmitter Occupied Bandwidth (Continued)







7.2.8. Transmitter Occupied Bandwidth: Section 24.238

Ambient Temperature: 22ºC Relative Humidity: 32%

The occupied bandwidth was measured using the occupied bandwidth function on a spectrum analyser.

Results: GPRS Mode.

Channel	Frequency (MHz)	Occupied Bandwidth (kHz)
Bottom	1850.2	242.886
Middle	1879.8	239.279
Top	1909.8	239.279

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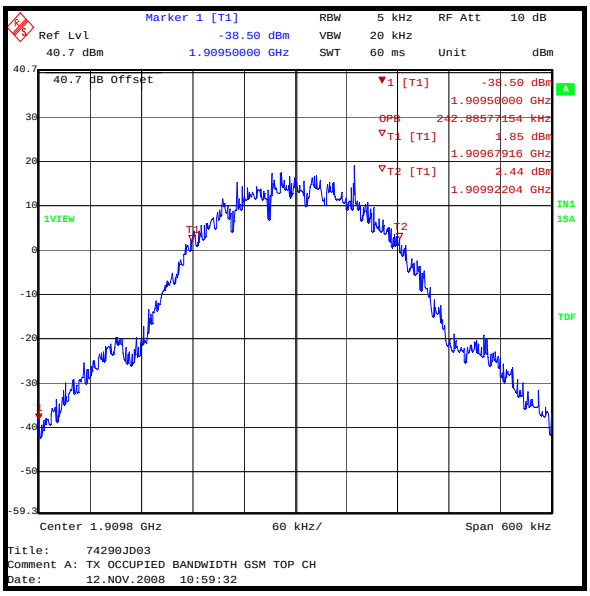
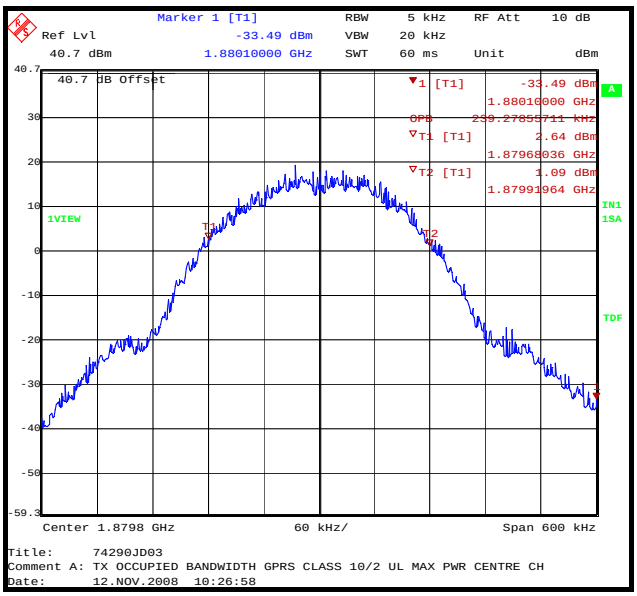
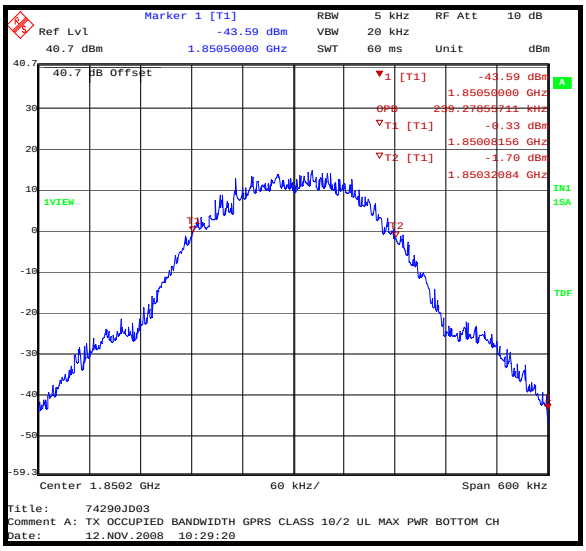
Transmitter Occupied Bandwidth (Continued)







7.2.9. Transmitter Out of Band Radiated Emissions: Section 2.1053/24.238

Ambient Temperature: 21ºC Relative Humidity: 33%

Tests were performed to identify the maximum transmitter radiated emission levels.

Results: Top Channel

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
976.673	-37.2	-13.0	24.2	Complied

Note(s):

1. **Note: No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above.*

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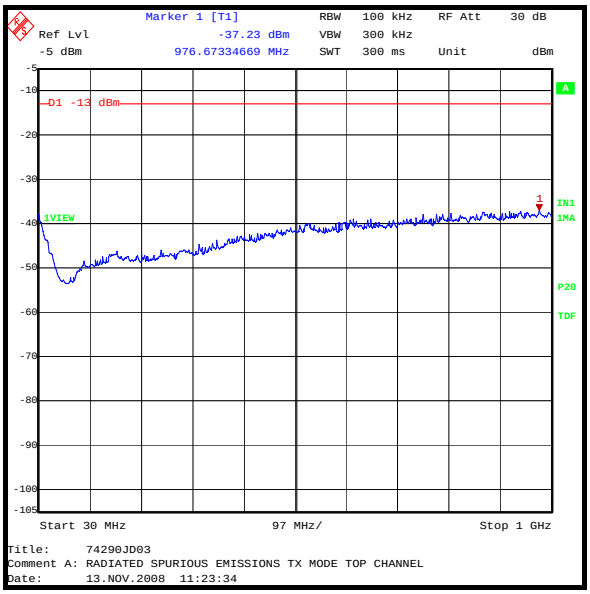
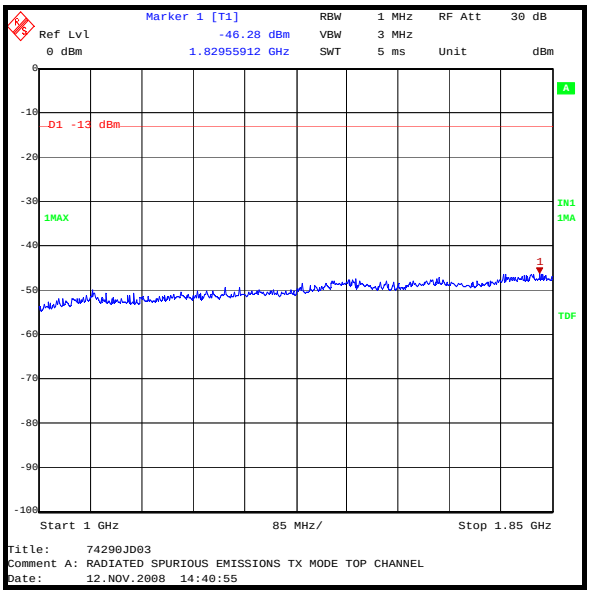
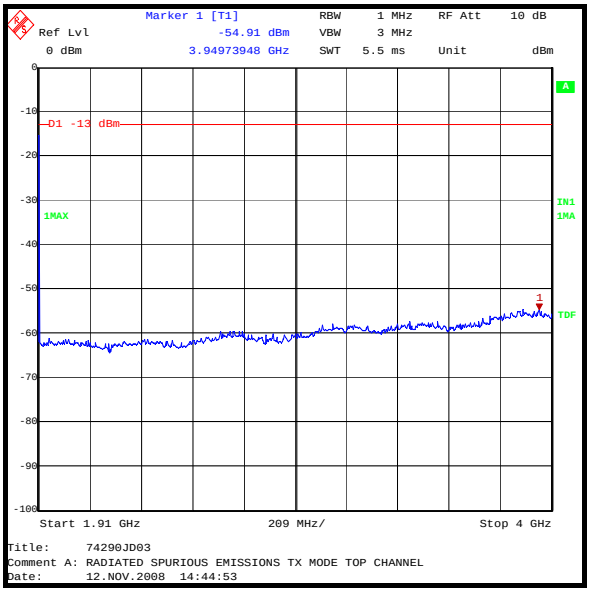
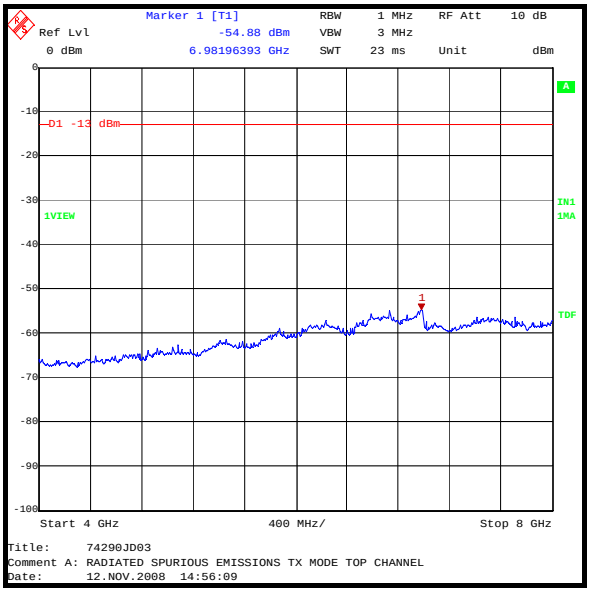
Transmitter Out of Band Radiated Emissions: Section 2.1053/24.238 (Continued)

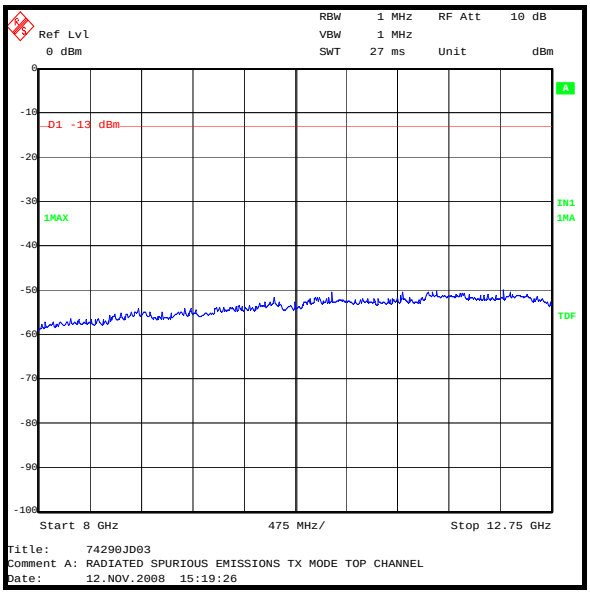


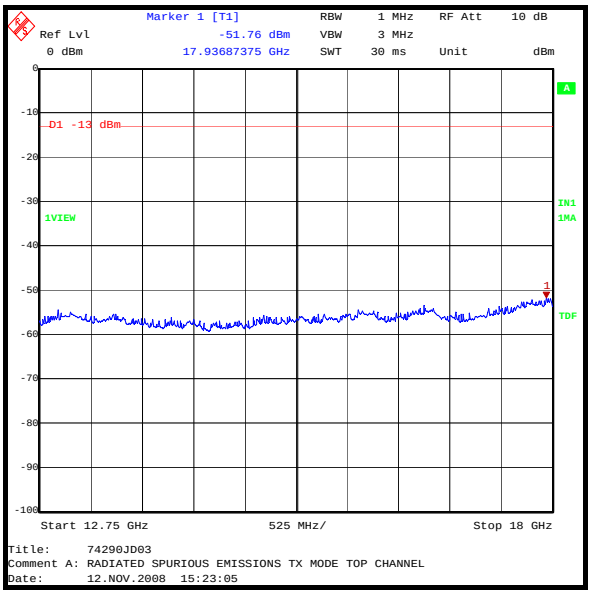


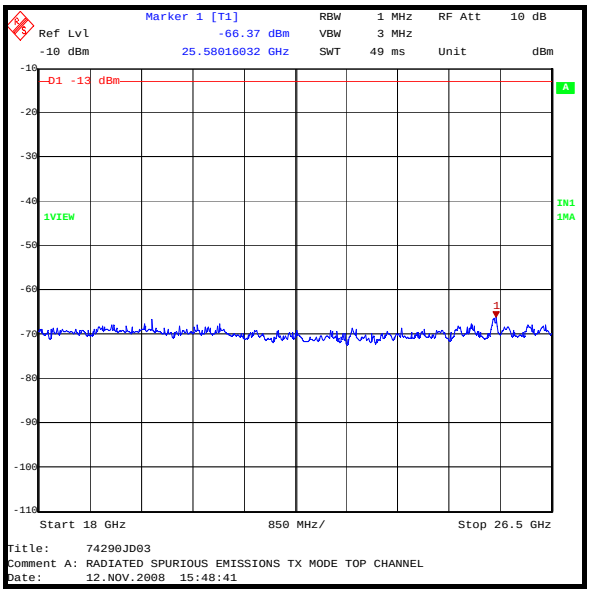




Transmitter Out of Band Radiated Emissions: Section 2.1053/24.238 (continued)







7.2.10. Transmitter Radiated Emissions at Band Edges: Section 2.1053/24.238(a)(b)

Ambient Temperature: 22ºC Relative Humidity: 32%

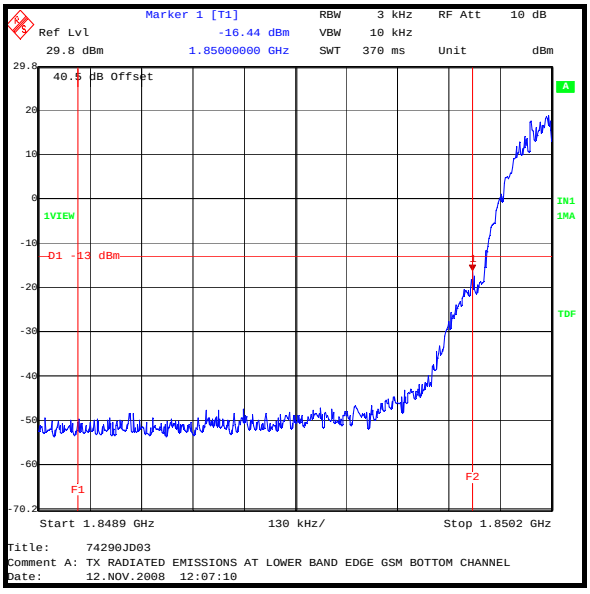
Tests were performed to identify the maximum emissions level at the band edges of the frequency block that the EUT will operate over.

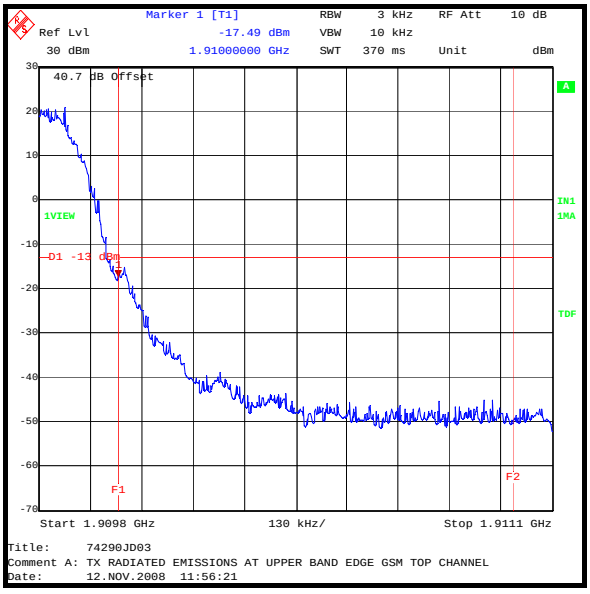
Bottom Band Edge GSM/GPRS Mode

Frequency (MHz)	Spurious Emission (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-16.4	-13.0	3.4	Complied

Top Band Edge

Frequency (MHz)	Peak Emission Level (dBm)	Limit (dBm)	Margin (dB)	Result
1910	-17.5	-13.0	4.5	Complied





8. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.72 dB
Transmitter Effective Isotropic Radiated Power (EIRP)	Not applicable	95%	±2.94 dB
Transmitter Frequency Stability	Not applicable	95%	±11.4 ppm
Transmitter Occupied Bandwidth	824 to 849 MHz	95%	±11.4 ppm
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±4.64 dB
Radiated Spurious Emissions	1 GHz to 26 GHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A004	Line Impedance Stabilization Network	Rohde & Schwarz	ESH3-Z5	890 604/027	19 May 2008	12
A1793	Pre Amplifier	A.H. Systems Inc.	PAM-0118	183	03 Jul 2008	12
A1818	Antenna	EMCO	3115	00075692	25 Oct 2008	12
A1830	Pulse Limiter	Rhode & Schwarz	ESH3-Z2	100668	16 Jan 2008	12
A259	Antenna	Chase	CBL6111	1513	25 Jul 2008	12
A436	Antenna	Flann	20240-20	330	24 Apr 2006	36
E013	Environmental Chamber	Sanyo	ATMOS chamber	None	Calibration not required	-
K0001	Site Reference 4420	Rainford EMC	N/A	N/A	13 Aug 2008	12
K0002	Site Reference 4421	Rainford EMC	N/A	N/A	26 Aug 2008	12
L0983	R&S CMU	R&S	CMU200	101376	16 Sep 2008	12
M1068	Thermometer	Iso-Tech	RS55	93102884	09 Jul 2008	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	19 Feb 2008	12
M1229	Digital Multimeter	Fluke	179	87640015	09 May 2008	12
M1253	Spectrum Analyser	HP	8564E	3442A00262	21 Oct 2008	12
M1273	Test Receiver	Rhode & Schwarz	ESIB 26	100275	26 Feb 2008	12

NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule.