

Electromagnetic Compatibility

Test of: Gas Fire remote controller

FCC ID: XO5RXT9400-5800E

Applicant: SMK (UK) LTD

Test Type: Compliance

Test Specification: FCC CFR47, parts 2.1049, 15.249

SGS Serial Number: EMC127535A\1\CL\09

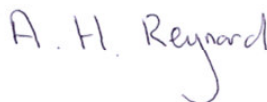
Date of Receipt: 25th June 2009

Date of Test(s): 26th August 2009 to 2nd October 2009

Date of Issue: 13th October 2009

Issue Number: 2

This document is issued by the Company under its General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. This report refers only to the sample submitted for test. This report shall not be reproduced except in full without the written approval of the testing laboratory.



Authorised Signatory

A. Reynard
Technical Manager

CONTENTS

Page Number

1. Client Information.....	3
2. Details Of Test Laboratory.....	3
3. Equipment Under Test (EUT)	4
3.1 Identification Of EUT.....	4
4. Test Specification, Methods and Procedures	4
4.1 Test Specification(s)	4
4.2 Purpose Of Test.....	4
4.3 Methods and Procedures.....	5
5. Deviations or Exclusions from the Test Specifications	6
6. Operation of the EUT During Testing / Configuration and Peripherals	7
6.1 Operation of EUT during testing.	7
6.2 Configuration and Peripherals	7
7. Test Results	7
7.1 General Comments.....	7
7.2 Modifications Made to the EUT.....	7
7.3 Summary of Test Results	8
7.4 Radiated Emissions Test Results 15.249	9
7.5 Occupied Bandwidth 2.1049	22
7.6 Frequency Stability 15.249.....	24

1. Client Information

Company Name: SMK (UK) LTD

Address: Northfield Way
Aycliffe Ind. Estate
Newton Aycliffe
Co. Durham
DL5 6UF

Contact Person: David Wishart

Telephone: 01325 300770

Facsimile: 01325 300556

2. Details Of Test Laboratory

Company Name: SGS UK Ltd.

UKAS Accreditation Number: 1116

Address: South Industrial Estate,
Bowburn,
Co. Durham,
DH6 5AD.

Contact Persons: Mr Stephen Thompson

Telephone: +44 191 377 2000

Facsimile: +44 191 377 2020

3. Equipment Under Test (EUT)

3.1 Identification Of EUT

FCC ID :	RXT9400-5800E
Unique Identifier:	Not Supplied
Description of EUT:	The equipment under test is a radio control unit for a Gas fire
Highest Internal Clock Frequencies:	2.475GHz
Supply Voltage:	3V (2xAA battery)
Ports present:	Enclosure
Accessories Supplied:	Receiver module Laptop and serial interface module

4. Test Specification, Methods and Procedures

4.1 Test Specification(s)

Specification(s)	Title
FCC CFR 47 : October 2008	Code Of Federal Regulations part 15
Parts 2.1049, 15.249	Telecommunication – Radio frequency devices

4.2 Purpose Of Test

To perform the relevant tests and assess the product for compliance with the above specification (s).

4.3 Methods and Procedures

The standards listed on the previous page refer to the following tests: -

CFR 47 Clause	Test
15.249	Radiated Emissions
15.249	Frequency Tolerance under extreme temperatures
15.249	Frequency Tolerance under extreme voltages
2.1049	Occupied Bandwidth

The tests were conducted in accordance with the following specification:

ANSI C63.4 – 2003 : American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range 9kHz to 40GHz

5. Deviations or Exclusions from the Test Specifications

There were no deviations from the test specifications.

6. Operation of the EUT During Testing / Configuration and Peripherals

6.1 Operation of EUT during testing.

- Mode 1. The equipment under test periodically handshakes with the transmitter. This occurs once every second and is the normal mode of operation for the EUT. In normal use i.e. by activating the buttons the EUT will only transmit once every second and hence the maximum transmission rate possible in normal operation is once every second.
- Mode 2. The equipment under test was connected to a laptop and was programmed to transmit continuously. This is a test mode for test purposes and in normal use the EUT can only transmit once every second.

6.2 Configuration and Peripherals

The receiver was placed nearby in order to verify the communication link. A serial interface module was connected to the EUT and connected to a laptop. Hyperlink was used to set the unit to continuously transmit and to change the frequency channel. Note these are not connected in normal use and were used for testing purposes only.

The equipment under test was pre-tested in three orientations. The worst case was lying horizontally with the LCD facing up. The compliance measurements reported were performed in this orientation.

7. Test Results

7.1 General Comments

The test methods used are referred to in the individual test results sections of this test report.

7.2 Modifications Made to the EUT

No modifications were made to the EUT during the testing.

7.3 Summary of Test Results

CFR 47 Clause	Test	Result
15.249	Radiated Emissions	Complied
15.249	Frequency Tolerance under extreme temperatures	Complied
15.249	Frequency Tolerance under extreme voltages	Complied
2.1049	Occupied Bandwidth	Complied

Result

In the configuration tested, the EUT complies with the requirements of Clauses of CFR 47: Part 15.

Full details of all tests can be found in the test results section of this report.

7.4 Radiated Emissions Test Results 15.249

CFR Clause	15.249
Frequency Range	9 kHz – 25 GHz

Test Results

Frequency Range 0.009MHz – 30MHz

The Frequency Range was investigated and no emissions above the instrument noise floor could be attributed to the EUT. The investigation was performed with an EUT to loop distance of 1m. The test was performed in frequency channels 3, 9 & 15 (2.415GHz, 2.445GHz & 2.475GHz) and in mode 2 operation.

Frequency Range 30 - 1000MHz

The test was performed in mode 2

Frequency Channel 3 Results (2.415GHz)

Frequency	Measurement S.A Quasi-peak (dBuV)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-Amplifier Gain (dB)	Quasi-Peak Measurement (dBuV/m)	Quasi-Peak Limit (dBuV)	Antenna Polarity
47.800	32.50	1.4	10.7	29.9	14.7	40.0	Vertical
64.098	33.63	1.4	8.07	29.7	13.4	40.0	Vertical
79.975	30.09	2.4	8.91	29.7	11.7	40.0	Vertical
94.804	49.78	2.4	11.02	29.7	33.5	43.5	Vertical
127.975	32.62	3.3	15.38	29.7	21.6	43.5	Vertical
247.064	25.19	4.7	18.41	30.0	18.3	46.0	Vertical
47.785	29.10	1.4	10.7	29.9	11.3	40.0	Horizontal
63.959	36.73	1.4	8.07	29.7	16.5	40.0	Horizontal
79.963	30.99	2.4	8.91	29.7	12.6	40.0	Horizontal
94.801	43.68	2.4	11.02	29.7	27.4	43.5	Horizontal
127.985	38.82	3.3	15.38	29.7	27.8	43.5	Horizontal
246.934	24.79	4.7	18.41	30.0	17.9	46.0	Horizontal

Frequency Channel 9 Results (2.445GHz)

Frequency	Measurement S.A Quasi-peak (dBuV)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-Amplifier Gain (dB)	Quasi-Peak Measurement (dBuV/m)	Quasi-Peak Limit (dBuV)	Antenna Polarity
47.800	31.90	1.4	10.7	29.9	14.1	40.0	Vertical
63.929	33.43	1.4	8.07	29.7	13.2	40.0	Vertical
79.986	27.39	2.4	8.91	29.7	9.0	40.0	Vertical
94.802	50.58	2.4	11.02	29.7	34.3	43.5	Vertical
128.018	33.32	3.3	15.38	29.7	22.3	43.5	Vertical

247.342	23.89	4.7	18.41	30.0	17.0	46.0	Vertical
47.804	28.40	1.4	10.7	29.9	10.6	40.0	Horizontal
63.971	36.13	1.4	8.07	29.7	15.9	40.0	Horizontal
79.982	29.39	2.4	8.91	29.7	11.0	40.0	Horizontal
94.799	42.28	2.4	11.02	29.7	26.0	43.5	Horizontal
127.975	41.42	3.3	15.38	29.7	30.4	43.5	Horizontal
247.373	24.29	4.7	18.41	30.0	16.4	46.0	Horizontal

Frequency Channel 15 Results (2.475GHz)

Frequency	Measurement S.A Quasi-peak (dBuV)	Cable Loss (dB)	Antenna Factor (dB/m)	Pre-Amplifier Gain (dB)	Quasi-Peak Measurement (dBuV/m)	Quasi-Peak Limit (dBuV)	Antenna Polarity
47.759	32.10	1.4	10.7	29.9	14.3	40.0	Vertical
63.963	38.53	1.4	8.07	29.7	18.3	40.0	Vertical
79.927	31.09	2.4	8.91	29.7	12.7	40.0	Vertical
94.798	41.68	2.4	11.02	29.7	25.4	43.5	Vertical
127.980	33.52	3.3	15.38	29.7	22.5	43.5	Vertical
247.404	24.19	4.7	18.41	30.0	17.3	46.0	Vertical
47.759	29.10	1.4	10.7	29.9	11.3	40.0	Horizontal
63.951	38.23	1.4	8.07	29.7	18.0	40.0	Horizontal
79.971	29.39	2.4	8.91	29.7	11.0	40.0	Horizontal
94.798	41.68	2.4	11.02	29.7	25.4	43.5	Horizontal
127.968	41.62	3.3	15.38	29.7	30.6	43.5	Horizontal
247.349	23.89	4.7	18.41	30.0	17.0	46.0	Horizontal

The above measurements were made at 3m with a 120kHz resolution bandwidth.

Note: The limits given are the general radiated emission limits specified in 15.209.

15.249 d) *“Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.”*

Frequency Range 1000 – 25000MHz

Peak Measurements

Test performed in mode 2.

Channel 3 Results (2.415GHz)

Frequency (GHz)	Spectrum Analyser (dBuV)	Antenna factor (dB/m)	Atten. (dB)	Cable loss (dB)	Pre-amplifier Gain (dB)	Field Strength 1m (dBuV/m)	Field strength 3m* (dBuV/m)	Antenna Polarity	Limit** (dBuV/m) Average	Limit (dBuV/m) Peak
2.415 (Carrier)	87.49	28.75	6	4.96	37.51	86.69	79.69	Vertical	93.98	103.98
4.830	52.36	33.89	6	6.49	36.41	62.78	52.78	Vertical	53.98	73.98
7.245	45.21	37.27	6	8.75	36.25	60.98	50.98	Vertical	53.98	73.98
9.660	49.58	38.23	6	9.91	37.04	66.68	56.68	Vertical	53.98	73.98
12.075	45.36	38.95	6	11.74	35.97	66.08	56.08	Vertical	53.98	73.98
14.490	51.76	38.46	6	11.27	34.44	73.05	63.05	Vertical	53.98	73.98
16.905	52.59	45.59	0	12.82	34.61	76.39	66.39	Vertical	53.98	73.98
19.320	51.71	40.70	0	13.15	34.17	71.39	61.39	Vertical	53.98	73.98
21.735	52.62	40.90	0	12.54	34.25	71.81	61.81	Vertical	53.98	73.98
24.150	52.60	41.30	0	12.44	31.40	74.94	64.94	Vertical	53.98	73.98
2.415 (Carrier)	86.55	28.75	6	4.96	37.51	88.75	78.75	Horiz.	93.98	103.98
4.830	51.24	33.89	6	6.94	36.41	61.66	51.66	Horiz.	53.98	73.98
7.245	50.81	37.27	6	8.75	36.25	66.58	56.58	Horiz.	53.98	73.98
9.660	48.06	38.23	6	9.91	37.04	65.16	55.16	Horiz.	53.98	73.98
12.075	45.86	38.95	6	11.74	35.97	66.58	56.58	Horiz.	53.98	73.98
14.490	51.91	38.46	6	11.27	34.44	73.20	63.20	Horiz.	53.98	73.98
16.905	51.96	45.59	0	12.82	34.61	75.76	65.76	Horiz.	53.98	73.98
19.320	51.86	40.70	0	13.15	34.17	71.54	61.54	Horiz.	53.98	73.98
21.735	52.41	40.90	0	12.54	34.25	71.60	61.60	Horiz.	53.98	73.98
24.150	51.90	41.30	0	12.44	31.40	74.24	64.24	Horiz.	53.98	73.98

Channel 9 Results (2.445GHz)

Frequency (GHz)	Spectrum Analyser (dBuV)	Antenna factor (dB/m)	Atten. (dB)	Cable loss (dB)	Pre-amplifier Gain (dB)	Field Strength 1m (dBuV/m)	Field strength 3m* (dBuV/m)	Antenna Polarity	Limit** (dBuV/m) Average	Limit (dBuV/m) Peak
2.4445 (Carrier)	86.13	28.75	6	4.96	37.51	88.33	78.33	Vertical	93.98	103.98
4.8889	53.33	33.89	6	6.94	36.41	63.75	53.75	Vertical	53.98	73.98
7.3361	47.67	37.27	6	8.75	36.25	63.44	53.44	Vertical	53.98	73.98
9.7820	49.50	38.23	6	9.91	37.04	66.60	56.60	Vertical	53.98	73.98
12.2250	46.83	38.95	6	11.74	35.97	67.55	57.55	Vertical	53.98	73.98
14.6700	46.83	38.46	6	11.27	34.44	68.12	58.12	Vertical	53.98	73.98
17.1150	47.00	45.59	0	12.82	34.61	70.80	60.80	Vertical	53.98	73.98
19.5600	52.30	40.70	0	13.15	34.17	71.98	61.98	Vertical	53.98	73.98
22.0050	52.67	40.90	0	12.54	34.25	71.86	61.86	Vertical	53.98	73.98
24.4500	51.90	41.30	0	12.44	31.40	74.24	64.24	Vertical	53.98	73.98
2.4456 (Carrier)	88.40	28.75	6	4.96	37.51	90.60	80.60	Horiz.	93.98	103.98
4.8910	52.83	33.89	6	6.94	36.41	63.25	53.25	Horiz.	53.98	73.98
7.3335	47.50	37.27	6	8.75	36.25	63.27	53.27	Horiz.	53.98	73.98
9.7778	50.30	38.23	6	9.91	37.04	67.40	57.40	Horiz.	53.98	73.98
12.2250	46.67	38.95	6	11.74	35.97	67.39	57.39	Horiz.	53.98	73.98
14.6700	47.13	38.46	6	11.27	34.44	68.42	58.42	Horiz.	53.98	73.98
17.1150	46.43	45.59	0	12.82	34.61	70.23	60.23	Horiz.	53.98	73.98
19.5600	51.70	40.70	0	13.15	34.17	71.38	61.38	Horiz.	53.98	73.98
22.0050	52.60	40.90	0	12.54	34.25	71.79	61.79	Horiz.	53.98	73.98
24.4500	52.37	41.30	0	12.44	31.40	74.71	64.71	Horiz.	53.98	73.98

Channel 15 Results (2.475GHz)

Frequency (GHz)	Spectrum Analyser (dBuV)	Antenna factor (dB/m)	Atten. (dB)	Cable loss (dB)	Pre-amplifier Gain (dB)	Field Strength 1m (dBuV/m)	Field strength 3m* (dBuV/m)	Antenna Polarity	Limit** (dBuV/m) Average	Limit (dBuV/m) Peak
2.4745 (Carrier)	85.07	28.75	6	4.96	37.51	87.27	77.27	Vertical	93.98	103.98
4.9511	52.87	33.89	6	6.94	36.41	63.29	53.29	Vertical	53.98	73.98
7.4233	47.30	37.27	6	8.75	36.25	63.07	53.07	Vertical	53.98	73.98
9.8982	49.97	38.23	6	9.91	37.04	67.07	57.07	Vertical	53.98	73.98
12.3750	45.97	38.95	6	11.74	35.97	66.69	56.69	Vertical	53.98	73.98
14.8500	46.80	38.46	6	11.27	34.44	68.09	58.09	Vertical	53.98	73.98
17.3250	46.80	45.59	0	12.82	34.61	70.60	60.60	Vertical	53.98	73.98
19.8000	51.77	40.70	0	13.15	34.17	71.45	61.45	Vertical	53.98	73.98
22.2750	52.83	40.90	0	12.54	34.25	72.02	62.02	Vertical	53.98	73.98
24.7500	53.10	41.30	0	12.44	31.4	75.44	65.44	Vertical	53.98	73.98
2.4745 (Carrier)	88.73	28.75	6	4.96	37.51	90.93	80.93	Horiz.	93.98	103.98
4.9490	52.83	33.89	6	6.94	36.41	63.25	53.25	Horiz.	53.98	73.98
7.4235	46.83	37.27	6	8.75	36.25	62.60	52.60	Horiz.	53.98	73.98
9.9019	52.17	38.23	6	9.91	37.04	69.27	59.27	Horiz.	53.98	73.98
12.3750	46.33	38.95	6	11.74	35.97	67.05	57.05	Horiz.	53.98	73.98
14.8500	46.63	38.46	6	11.27	34.44	67.92	57.92	Horiz.	53.98	73.98
17.3250	46.13	45.59	0	12.82	34.61	69.93	59.93	Horiz.	53.98	73.98
19.8000	51.50	40.70	0	13.15	34.17	71.18	61.18	Horiz.	53.98	73.98
22.2750	52.67	40.90	0	12.54	34.25	71.86	61.86	Horiz.	53.98	73.98
24.7500	52.21	41.30	0	12.44	31.40	74.55	64.55	Horiz.	53.98	73.98

* The above measurements were made at 1m. The Measurement was corrected using the square of an inverse linear distance extrapolation factor (20dB/decade). See 15.31 f) 2); this results in an extrapolation factor of 10dB between 1 and 3m.

** 2400-2483.5MHz Fundamental 50mV/meter (93.98dBuV/m), Harmonics 500uV/m (53.98dBuV/m).

15. 249 e) "The peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation."

The above measurements were made with a 1MHz resolution bandwidth.

Average Measurements

Test performed in mode 1.

Channel 3 Results (2.415GHz)

Frequency (GHz)	Spectrum Analyser (dBuV)	Antenna factor (dB/m)	Atten. (dB)	Cable loss (dB)	Pre-amplifier Gain (dB)	Field Strength 1m (dBuV/m)	Field strength 3m* (dBuV/m)	Antenna Polarity	Limit** (dBuV/m) Average
2.415 (Carrier)	33.72	28.75	6	4.96	37.51	35.92	25.92	Vertical	93.98
4.830	32.23	33.89	6	6.49	36.41	42.65	32.65	Vertical	53.98
7.245	32.18	37.27	6	8.75	36.25	47.95	37.95	Vertical	53.98
9.660	33.44	38.23	6	9.91	37.04	50.54	40.54	Vertical	53.98
12.075	32.53	38.95	6	11.74	35.97	53.25	43.25	Vertical	53.98
14.490	39.11	38.46	6	11.27	34.44	60.40	50.40	Vertical	53.98
16.905	38.36	45.59	0	12.82	34.61	62.16	52.16	Vertical	53.98
19.320	38.58	40.70	0	13.15	34.17	58.26	48.26	Vertical	53.98
21.735	40.15	40.90	0	12.54	34.25	59.34	49.34	Vertical	53.98
24.150	40.02	41.30	0	12.44	31.40	61.12	51.12	Vertical	53.98
2.415 (Carrier)	33.47	28.75	6	4.96	37.51	35.67	25.67	Horiz.	93.98
4.83	32.30	33.89	6	6.94	36.41	42.72	32.72	Horiz.	53.98
7.245	32.15	37.27	6	8.75	36.25	47.92	37.92	Horiz.	53.98
9.660	33.24	38.23	6	9.91	37.04	50.34	40.34	Horiz.	53.98
12.075	33.12	38.95	6	11.74	35.97	53.84	43.84	Horiz.	53.98
14.490	38.90	38.46	6	11.27	34.44	60.19	50.19	Horiz.	53.98
16.905	38.30	45.59	0	12.82	34.61	62.10	52.10	Horiz.	53.98
19.320	38.32	40.70	0	13.15	34.17	58.00	48.00	Horiz.	53.98
21.735	40.02	40.90	0	12.54	34.25	59.21	49.21	Horiz.	53.98
24.150	39.92	41.30	0	12.44	31.40	61.02	51.02	Horiz.	53.98

Channel 9 Results (2.445GHz)

Frequency (GHz)	Spectrum Analyser (dBuV)	Antenna factor (dB/m)	Atten. (dB)	Cable loss (dB)	Pre-amplifier Gain (dB)	Field Strength 1m (dBuV/m)	Field strength 3m* (dBuV/m)	Antenna Polarity	Limit** (dBuV/m) Average
2.4445 (Carrier)	32.36	28.75	6	4.96	37.51	34.56	24.56	Vertical	93.98
4.8889	31.13	33.89	6	6.49	36.41	41.55	31.55	Vertical	53.98
7.3361	30.97	37.27	6	8.75	36.25	46.74	36.74	Vertical	53.98
9.7820	32.84	38.23	6	9.91	37.04	49.94	39.94	Vertical	53.98
12.2250	29.43	38.95	6	11.74	35.97	50.15	40.15	Vertical	53.98
14.6700	38.79	38.46	6	11.27	34.44	60.08	50.08	Vertical	53.98
17.1150	38.88	45.59	0	12.82	34.61	62.68	52.68	Vertical	53.98
19.5600	39.02	40.70	0	13.15	34.17	58.70	48.70	Vertical	53.98
22.0050	40.01	40.90	0	12.54	34.25	59.20	49.20	Vertical	53.98
24.4500	39.55	41.30	0	12.44	31.40	60.65	50.65	Vertical	53.98
2.4456 (Carrier)	32.42	28.75	6	4.96	37.51	34.62	24.62	Horiz.	93.98
4.8910	31.26	33.89	6	6.94	36.41	41.68	31.68	Horiz.	53.98
7.3335	31.00	37.27	6	8.75	36.25	46.77	36.77	Horiz.	53.98
9.7778	32.90	38.23	6	9.91	37.04	50.00	40.00	Horiz.	53.98
12.2250	29.52	38.95	6	11.74	35.97	50.24	40.24	Horiz.	53.98
14.6700	38.83	38.46	6	11.27	34.44	60.12	50.12	Horiz.	53.98
17.1150	38.90	45.59	0	12.82	34.61	62.70	52.70	Horiz.	53.98
19.5600	39.10	40.70	0	13.15	34.17	58.78	48.78	Horiz.	53.98
22.0050	39.98	40.90	0	12.54	34.25	59.17	49.17	Horiz.	53.98
24.4500	39.38	41.30	0	12.44	31.40	60.48	50.48	Horiz.	53.98

Channel 15 Results (2.475GHz)

Frequency (GHz)	Spectrum Analyser (dBuV)	Antenna factor (dB/m)	Atten. (dB)	Cable loss (dB)	Pre-amplifier Gain (dB)	Field Strength 1m (dBuV/m)	Field strength 3m* (dBuV/m)	Antenna Polarity	Limit** (dBuV/m) Average
2.4745 (Carrier)	32.47	28.75	6	4.96	37.51	34.67	24.67	Vertical	93.98
4.9511	31.22	33.89	6	6.94	36.41	41.64	31.64	Vertical	53.98
7.4233	30.86	37.27	6	8.75	36.25	46.63	36.63	Vertical	53.98
9.8982	32.82	38.23	6	9.91	37.04	49.92	39.92	Vertical	53.98
12.3750	29.39	38.95	6	11.74	35.97	50.11	40.11	Vertical	53.98
14.8500	38.65	38.46	6	11.27	34.44	59.94	49.94	Vertical	53.98
17.3250	38.72	45.59	0	12.82	34.61	62.52	52.52	Vertical	53.98
19.8000	39.01	40.70	0	13.15	34.17	58.69	48.69	Vertical	53.98
22.2750	39.98	40.90	0	12.54	34.25	59.17	49.17	Vertical	53.98
24.7500	39.50	41.30	0	12.44	31.40	60.60	50.60	Vertical	53.98
2.4745 (Carrier)	32.72	28.75	6	4.96	37.51	34.92	24.92	Horiz.	93.98
4.9490	31.46	33.89	6	6.94	36.41	41.88	31.88	Horiz.	53.98
7.4235	31.11	37.27	6	8.75	36.25	46.88	36.88	Horiz.	53.98
9.9019	32.89	38.23	6	9.91	37.04	49.99	39.99	Horiz.	53.98
12.3750	29.44	38.95	6	11.74	35.97	50.16	40.16	Horiz.	53.98
14.8500	38.69	38.46	6	11.27	34.44	59.98	49.98	Horiz.	53.98
17.3250	38.93	45.59	0	12.82	34.61	62.73	52.73	Horiz.	53.98
19.8000	39.06	40.70	0	13.15	34.17	58.74	48.74	Horiz.	53.98
22.2750	39.96	40.90	0	12.54	34.25	59.15	49.15	Horiz.	53.98
24.7500	39.51	41.30	0	12.44	31.40	60.61	50.61	Horiz.	53.98

* The above measurements were made at 1m. The Measurement was corrected using the square of an inverse linear distance extrapolation factor (20dB/decade). See 15.31 f) 2); this results in an extrapolation factor of 10dB between 1 and 3m.

** 2400-2483.5MHz Fundamental 50mV/meter (93.98dBuV/m), Harmonics 500uV/m (53.98dBuV/m).

15. 249 e) "The peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation."

The above measurements were made with a 1MHz resolution bandwidth.

Frequency Band Edges – Peak Measurements

Test performed in mode 2.

EUT Transmitting on Channel 3 (2.415GHz)

Freq (GHz)	Spect Analys Meas-ment dBuV	Rx Att (dB)	Rx ant Factor (dB)	Rx Cable Loss (dB)	Pre-amp Gain (dB)	Field Strength dBuV at 1m	Field Strength dBuV at 3m	Antenna Polarity	Limit** (dBuV/m) Average	Peak Limit dBuV/m
2.4	35.51	6	28.75	4.96	37.51	37.71	27.71	Vert	53.98	73.98
2.4	35.82	6	28.75	4.96	37.51	38.02	28.02	Horiz	53.98	73.98

EUT Transmitting on Channel 15 (2.475GHz)

Freq (GHz)	Spect Analys Meas-ment dBuV	Rx Att (dB)	Rx ant Factor (dB)	Rx Cable Loss (dB)	Pre-amp Gain (dB)	Field Strength dBuV at 1m	Field Strength dBuV at 3m	Antenna Polarity	Limit** (dBuV/m) Average	Peak Limit dBuV/m
2.4835	35.08	6	28.75	4.96	37.51	37.28	27.28	Vert	53.98	73.98
2.4835	35.15	6	28.75	4.96	37.51	37.35	27.35	Horiz	53.98	73.98

* The above measurements were made at 1m using a peak detector. The Measurement was corrected using the square of an inverse linear distance extrapolation factor (20dB/decade). See 15.31 f) 2); this results in an extrapolation factor of 10dB between 1 and 3m.

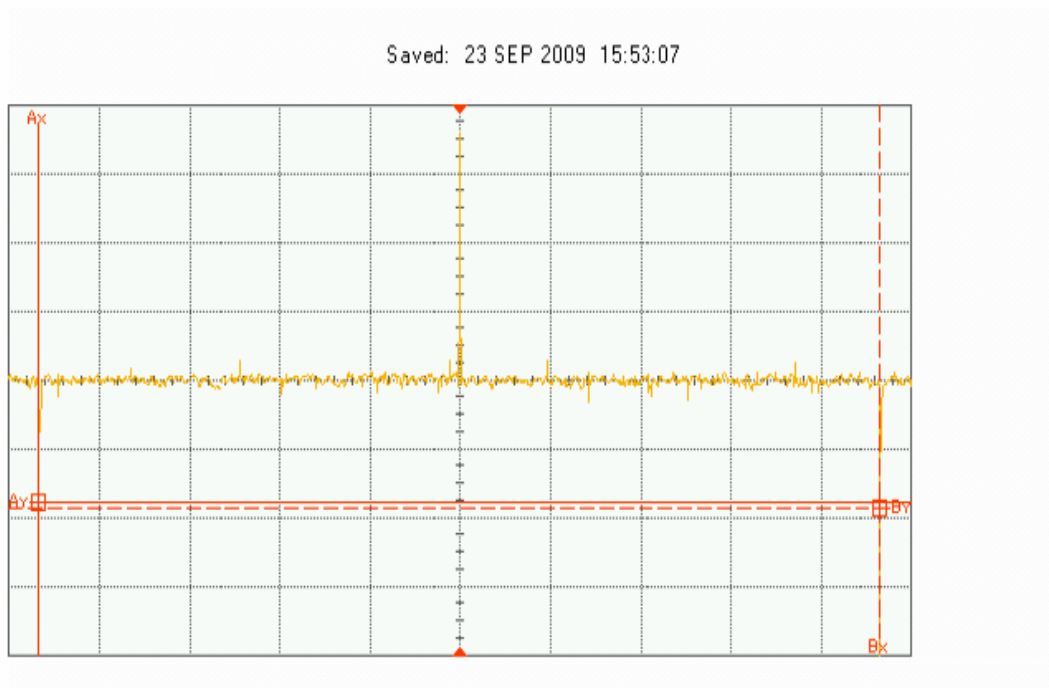
** 2400-2483.5MHz Fundamental 50mV/meter (93.98dBuV/m), Harmonics 500uV/m (53.98dBuV/m).

15. 249 e) “The peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.”

The above measurements were made with a 1MHz resolution bandwidth.

Plot Showing pulse repetition rate exceeds 20Hz

The below plot shows 3 pulses with the markers on the first and third pulses hence the repetition frequency is twice that of 21.4425 Hz i.e. 42.885 Hz.



Acquisition Sampling mode real time
Memory depth automatic Memory depth 1255pts
Sampling rate automatic Sampling rate 25.0 kSa/s
Averaging off
9-bit BW Filter off Interpolation on

Channel 1 Scale 2 mV/div Offset 0.0 V
BW limit off Coupling DC Impedance 1M Ohm
Attenuation 1.000 : 1 Atten units ratio Skew 0.0 s
Ext adaptor None
Ext gain 1.00 V Ext offset 0.0 V

Time base Scale 5.00 ms/div Position 0.0 s Reference center

Trigger Mode edge Sweep triggered
Hysteresis normal Holdoff time 60 ns Coupling DC
Source channel 1 Trigger level 2.20 mV Slope falling

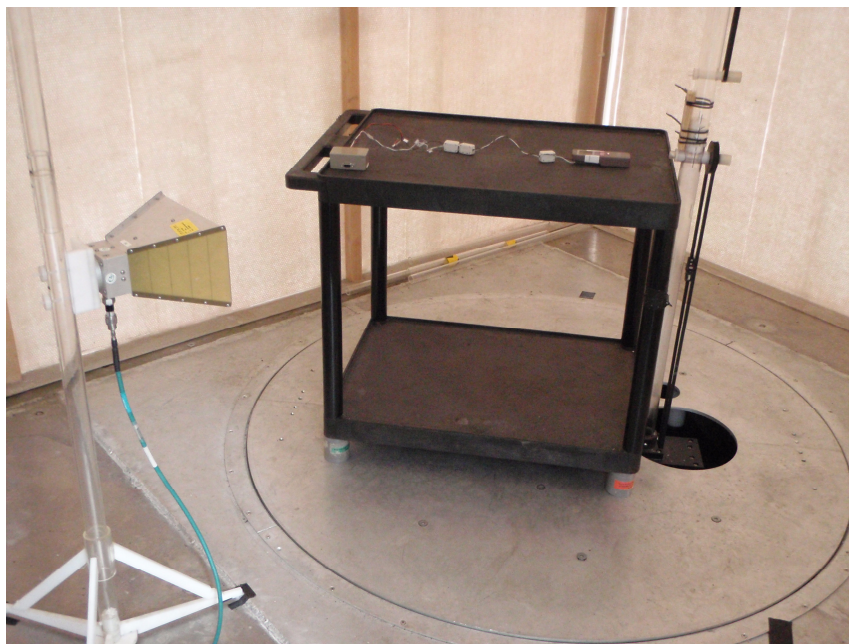
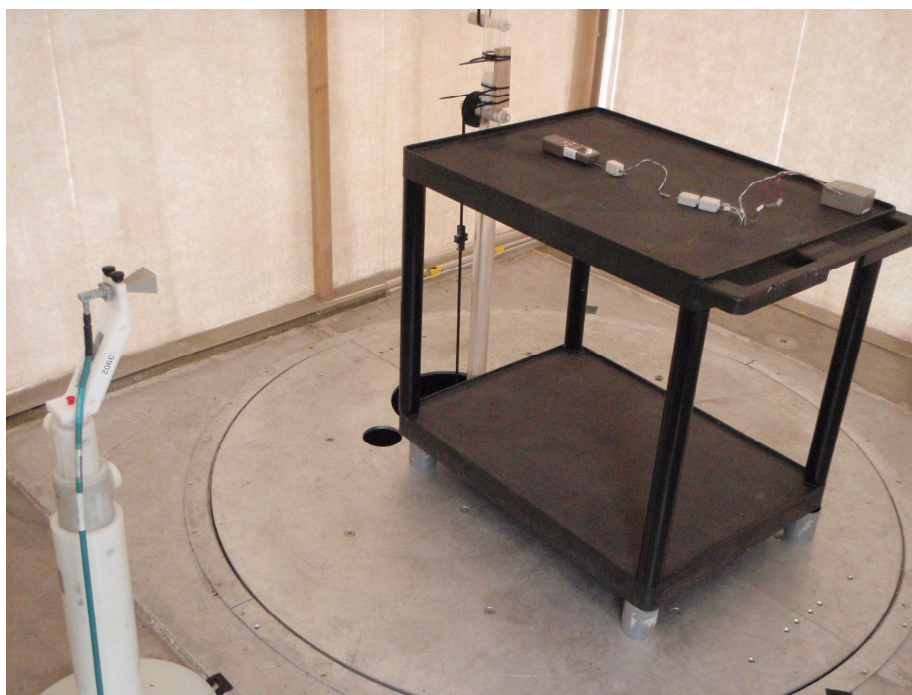
Marker	X	Y
A—(1)	-23.364 ms	-3.53 mV
B---(1)	23.273 ms	-3.71 mV
Δ	46.636 ms	-180 μV
1/ΔX	21.4425 Hz	

Radiated Emissions Test Configuration 30MHz - 1000MHz



Radiated Emissions Test Configuration 9 kHz – 30MHz



Radiated Emissions Test Configuration 1GHz - 18GHz**Radiated Emissions Test Configuration 18GHz – 25GHz**

Radiated Emissions Environmental Conditions

Power Supply	3V
Temperature	20°C
Relative Humidity	48.5%
Barometric Pressure	988mb

Radiated Emissions Measurement Uncertainties

Frequency	± 200kHz
Amplitude	± 4.6dB

The uncertainties stated are calculated in accordance with the requirements of UKAS with a confidence level of 95%.

Radiated Emissions Test Equipment Used

Equipment Type	Model Number	Calibration Date	Calibration Cycle
Spectrum Analyser	Rohde and Schwarz FSP 64.4391K40	4 th September 2008	2 Years
Receiver System	HP EMC Set (85733)	4 th September 2008	2 Years
Spectrum Analyser	HP8563E	13 th March 2008	2 Years
Antenna 0.009 – 30MHz	EMCO 6152	30 th June 2008	3 Years
Antenna 30-300MHz	Chase VBA 606	21 st November 2008	3 Years
Antenna 300-1000MHz	EMCO 3146	8 th September 2009	3 Years
Antenna 1-18GHz	EMCO 3115	18 th April 2008	2 Years
Antenna 18-24GHz	EMCO 3160-09	9 th November 2009	2 Years

7.5 Occupied Bandwidth 2.1049

Operating mode

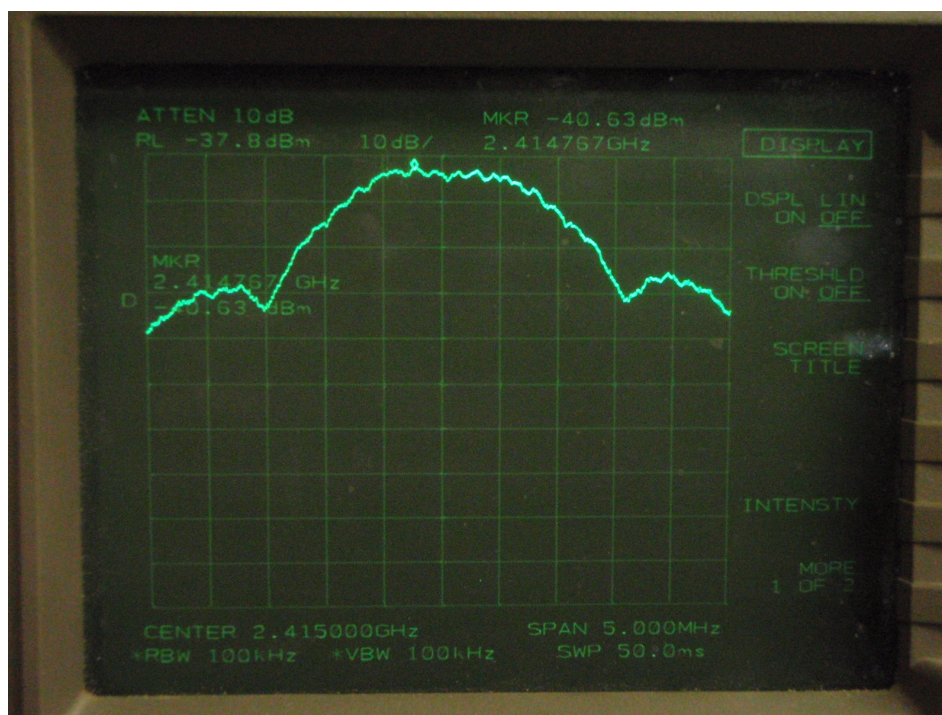
The compliance test was performed in mode 1.

Test Results

Test performed at 3V, 20°C.

Measurement Resolution BW set to 100kHz.

Bandwidth	Lower Frequency	Upper Frequency
26 dB	2.413600GHz	2.416525



Occupied Bandwidth Environmental Condition

Power Supply	3V
Temperature	21.5°C
Relative Humidity	50%
Barometric Pressure	993mb

Test Equipment Used

Equipment Type	Model Number
Spectrum Analyser	HP 8563E
Environmental Chamber	VCS 4100

7.6 Frequency Stability 15.249

Operating mode

The compliance test was performed in mode 1

Voltage	-20°C	20°C	50°C
	Frequency	Frequency	Frequency
3V (nominal)	2.414775GHz	2.414808GHz Nominal	2.415308GHz
2.55V (0.85%)	-	2.414800GHz	-
3.45V (115%)	-	2.414758GHz	-

Limits are the nominal carrier frequency +/- 0.001% = 2.412452133GHz - 2.417281867GHz.

Frequency Stability Environmental Condition

Power Supply	3V
Temperature	21.5 °C
Relative Humidity	50%
Barometric Pressure	993mb

Test Equipment Used

Equipment Type	Model Number
Spectrum Analyser	HP 8563E
Environmental Chamber	VCS 4100