
FCC Part 15.247 REPORT

Project AZ201382

for

Symbol Technologies Inc.

Snapper Module
FCC ID: H9PSNAPPER

BABT
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Note:

The following test results relate only to the devices specified in this document.
This report shall not be reproduced in parts without the written approval of the testing laboratory.

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	Name	Signature	Date
Prepared by	Erick Kurniawan		2002-04-26
Quality Manager	Charles Minx, Jr.		2002-04-26

1. Administrative Data

1.1 Testing Laboratory

Company Name: BABT
Address: 4855 Patrick Henry Drive, Building 6
Santa Clara, CA, 95054
USA

1.2 Project Data

Project Leader: Erick Kurniawan
Date of Test Report: 2002-04-26
Date of first Test: 2002-03-15
Date of last Test: 2002-03-21

1.3 Applicant Data

Company Name: Symbol Technologies, Inc.
Address: One Symbol Plaza
Holtsville, NY, 11742
Contact Person: Mr. Sandy Mazzola
Phone: (631) 738 5373
Fax: (631) 738 4618
Email: mazzolas@symbol.com

1.4 Manufacturer Data

Company Name: Manufacturer is Applicant

Address:

Contact Person:

2. Test Object Data

2.1 General EUT Description

Product Category:	Bluetooth Module
Equipment Under Test:	Snapper Module
HW Version:	0x0081
SW Version:	0x000A
Nominal Voltage:	3.3 V
Low Voltage:	3.1 V
High Voltage:	3.6 V
Power Class:	2
Max. Antenna Gain:	0 dBi
High Temperature:	60°C
Normal Temperature:	25°C
Low Temperature:	-30°C

Additional Information

Frequency:	2400.0 – 2483.5
Type of Modulation:	24M0FXD (FHSS)
Number of Channels:	79

3. Measurement Results

3.1 General

Summary of Test Results:

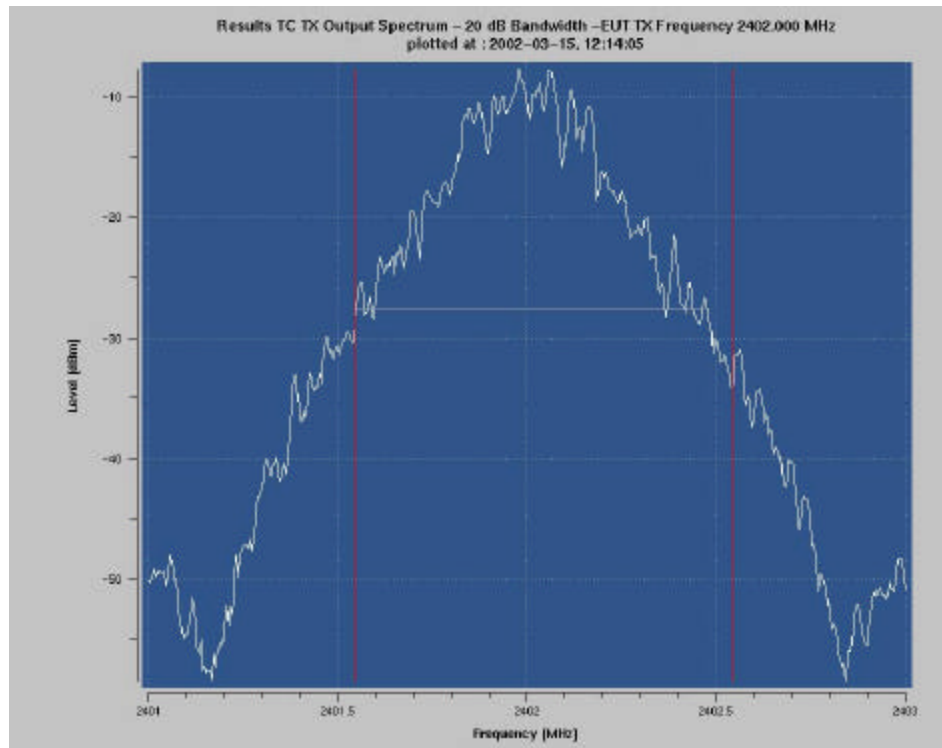
All relevant tests according to FCC CFR Part 15.247, 15.209 were performed and the results of these tests fulfill the requirements of the stated regulations.

Test Results

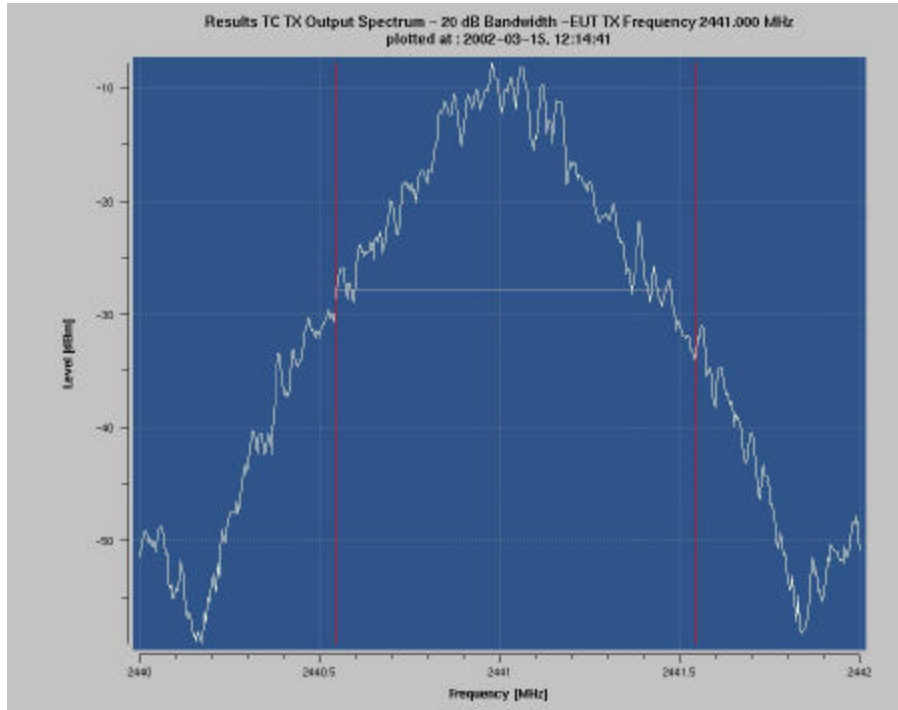
3.2.1 20 dB Bandwidth

Subclause §15.247 (a) (1) (ii)

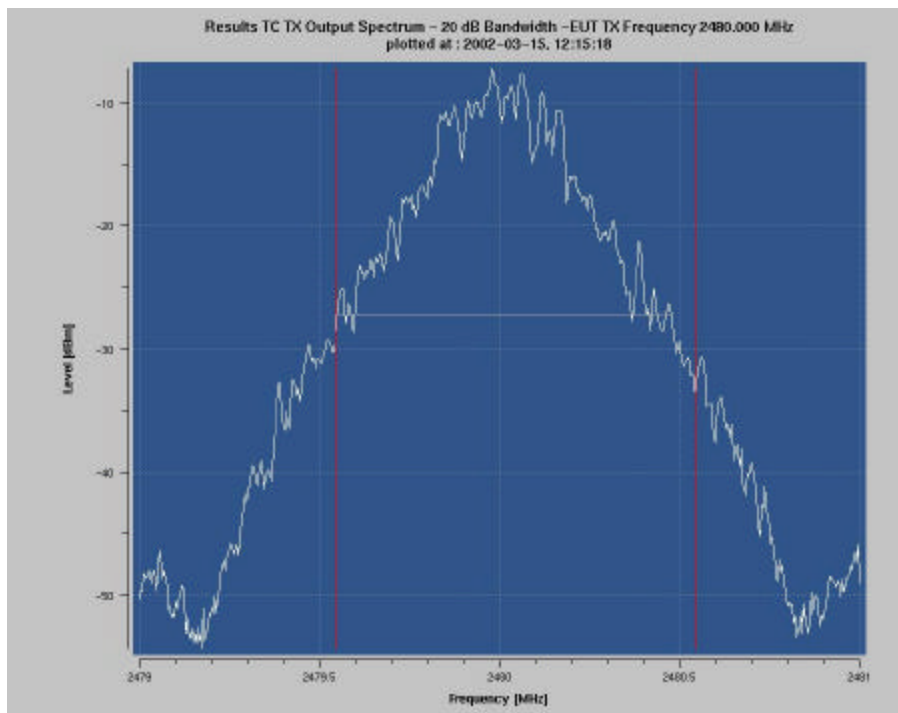
Test Conditions Freq. (MHz)	20 dB Bandwidth (kHz)		
	2402	2441	2480
Normal Temp. Normal Voltage	936	936	936



20 dB Bandwidth Test Graph – 2402 MHz



20 dB Bandwidth Test Graph - 2441 MHz



20 dB Bandwidth Test Graph - 2480 MHz

Limit: Subclause §15.247 (a) (1) (ii)

Occupied bandwidth shall not exceed 1000 kHz

Test Equipment Used:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 & 15.

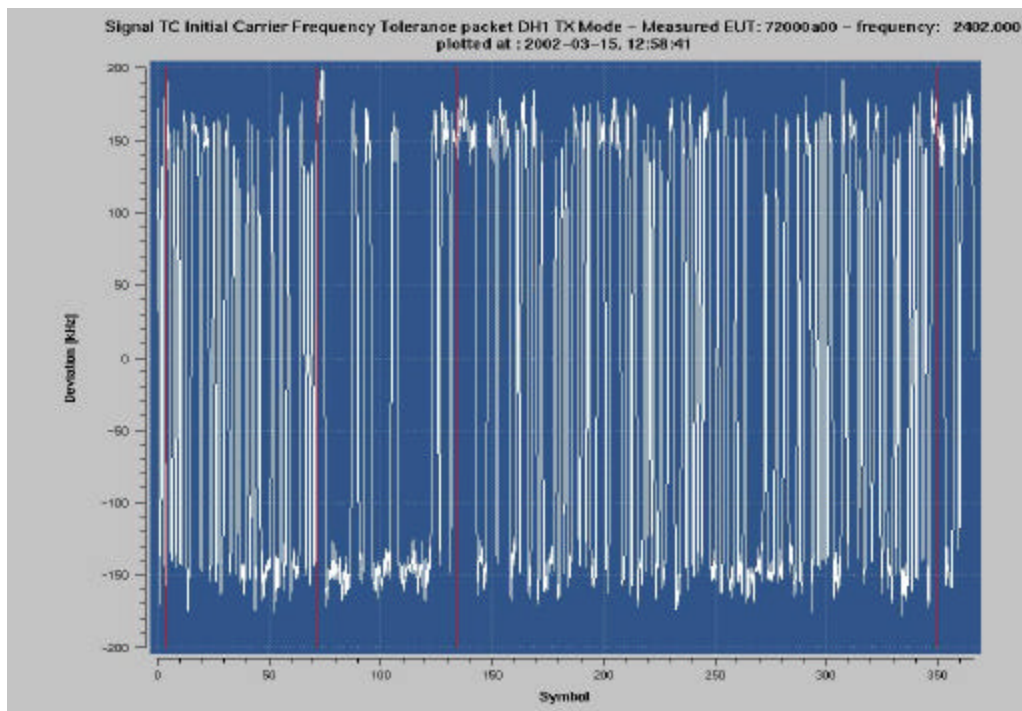
3.2.2 Number of Hopping Channels

Subclause §15.247 (a) (1) (ii)

79 hopping channels are supported.

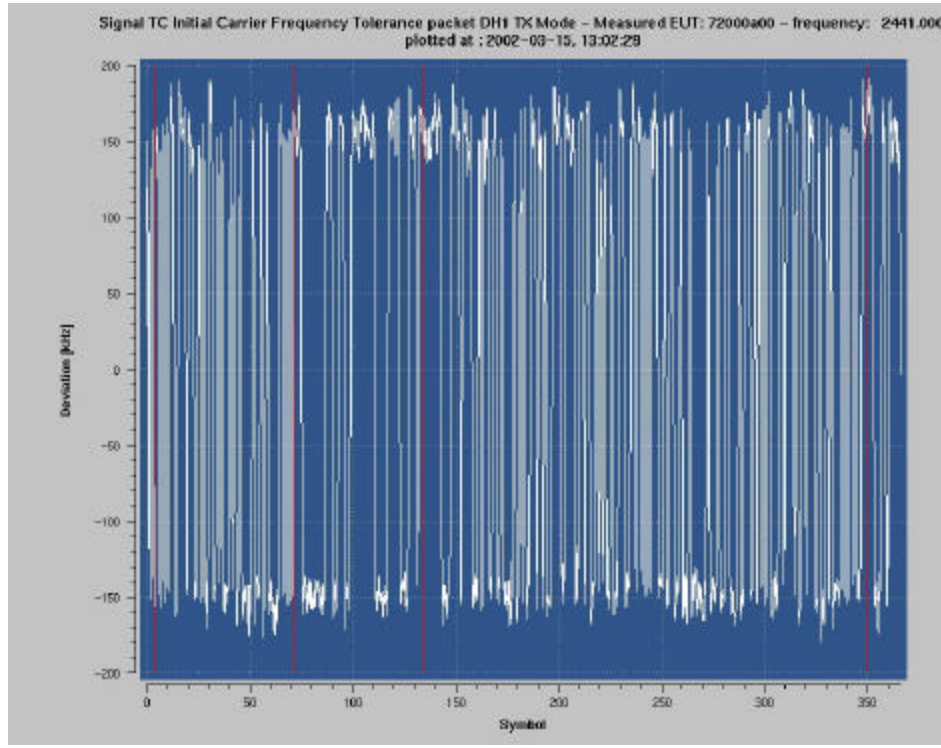
3.2.3 Average Time of Occupancy

Subclause §15.247 (a) (1) (ii)

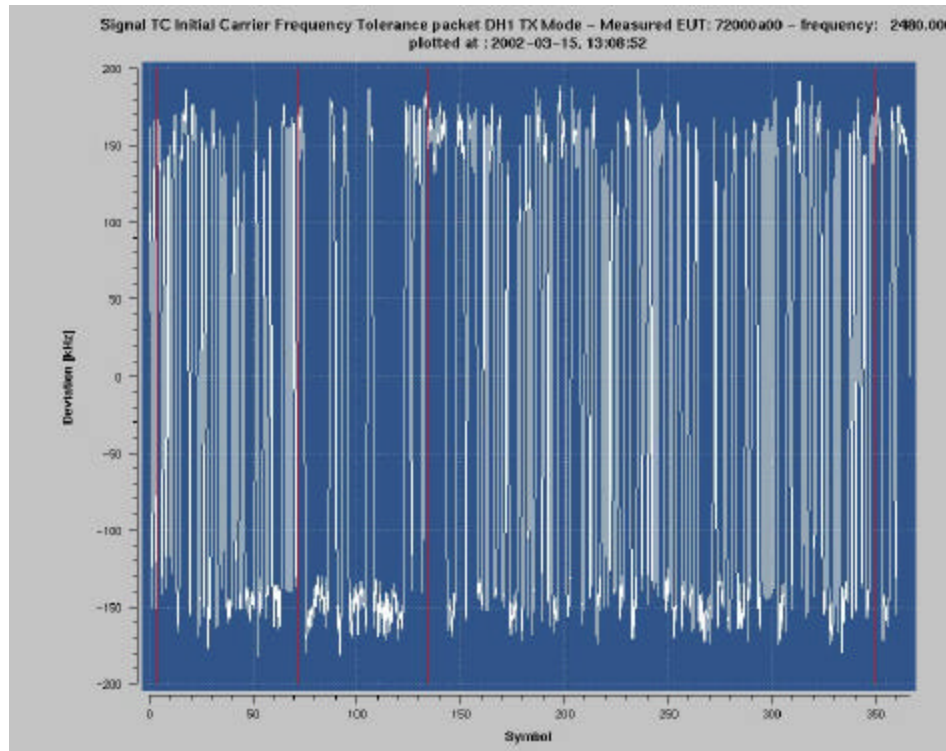


Average Time of Occupancy – 2402 MHz

A



Average Time of Occupancy – 2441 MHz



Average Time of Occupancy – 2480 MHz

The Average time of Occupancy shall not exceed 400mS

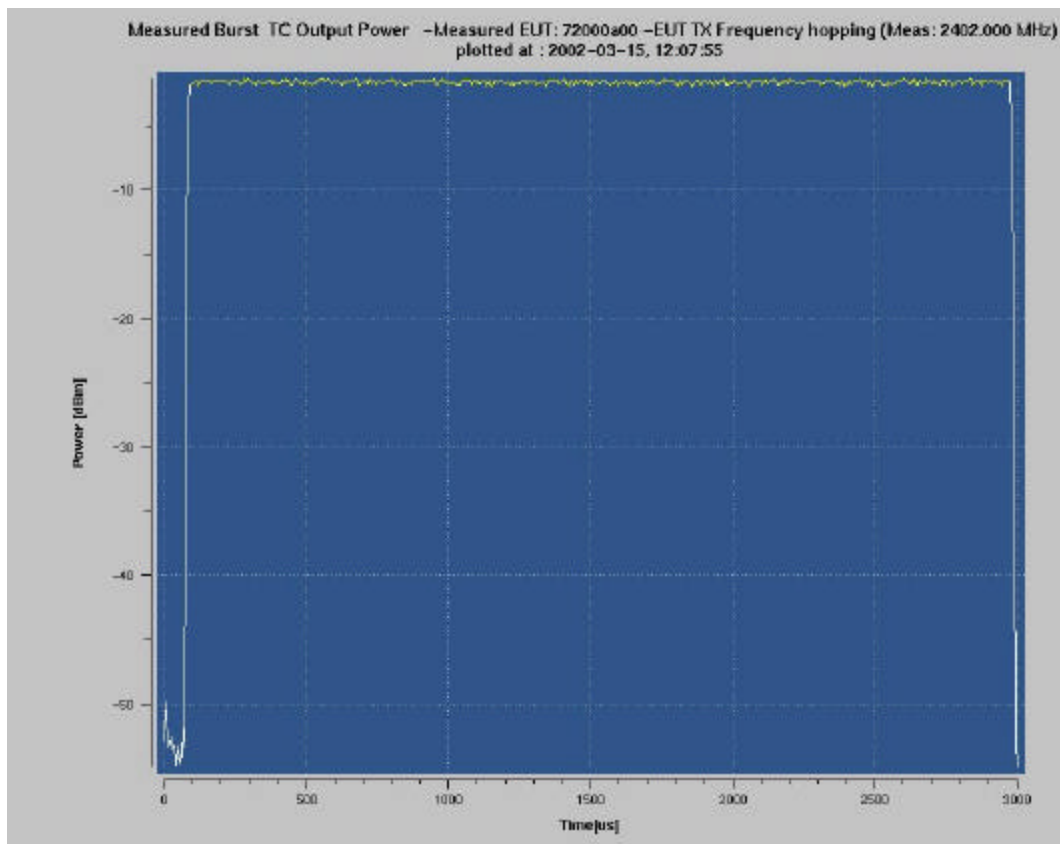
Test Equipment Used:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 & 15.

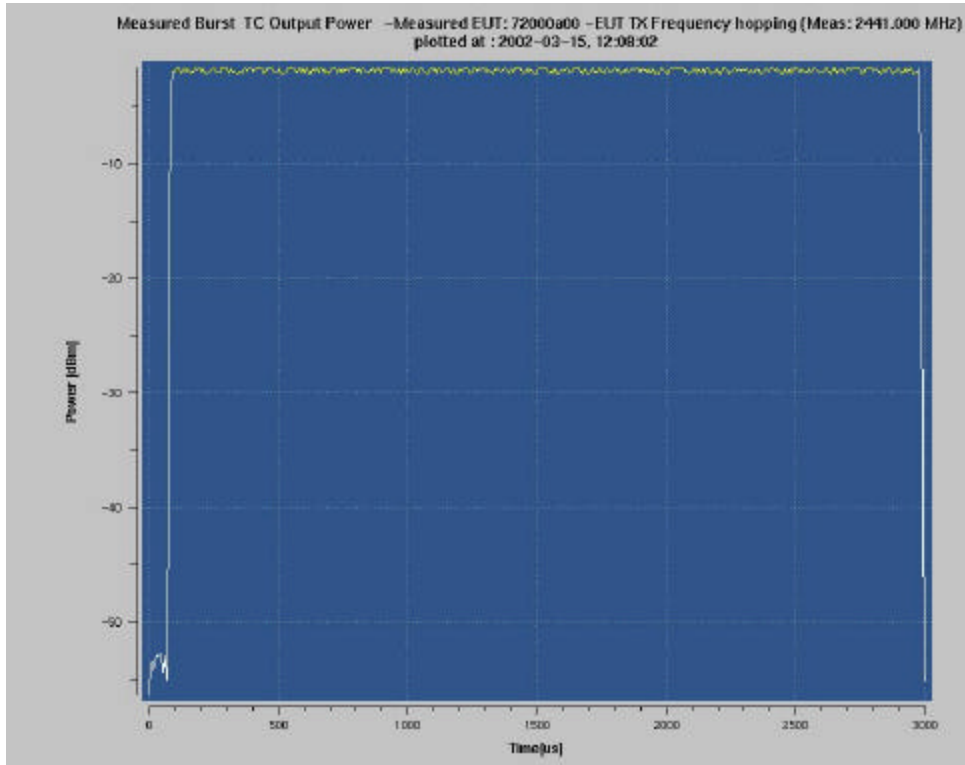
3.2.4 Maximum Peak Output Power

Subclause §15.247 (b) (1)

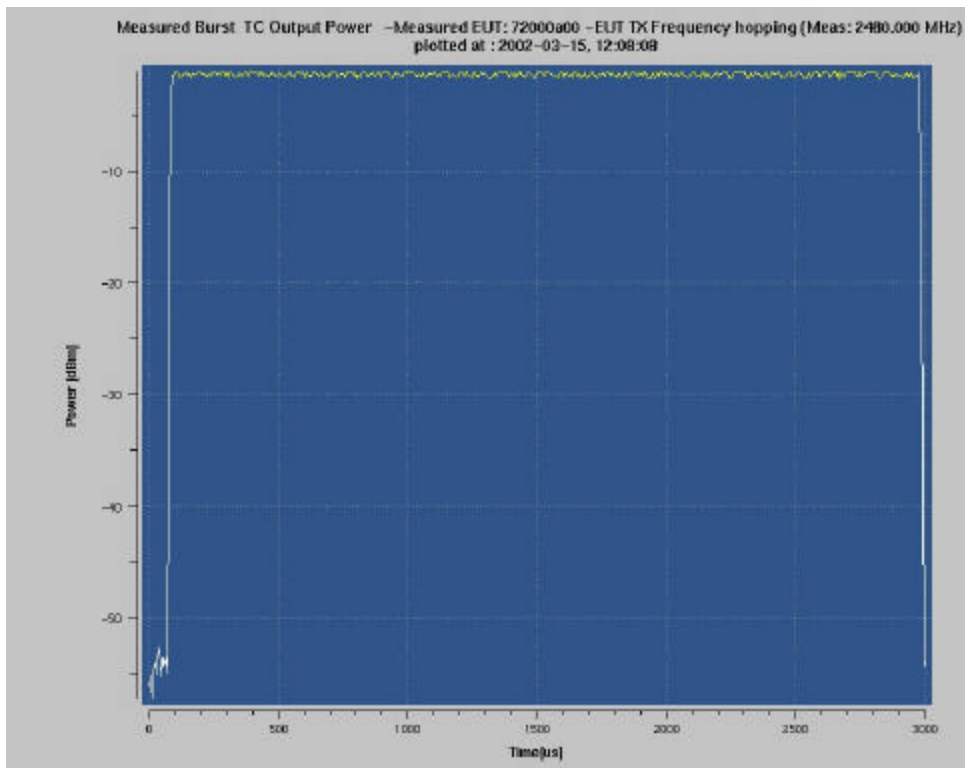
Test Conditions Freq. (MHz)	Maximum Peak Output Power (mW)		
	2402	2441	2480
Normal Temp. Normal Voltage	0.724	0.676	0.776



Maximum Peak Output Power Graph – 2402 MHz



Maximum Peak Output Power Graph – 2441 MHz



Maximum Peak Output Power Graph – 2480 MHz



Limit: Subclause §15.247 (b) (1)

Frequency Range	RF Power Output
2400-2483.5 MHz	1.0 Watt

Test Equipment Used:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 & 15.

3.2.5 Emissions

Subclause §15.247 (c) (1), 15.205

f (MHz)	Emission Amplitude (dBm)	Limit	Actual Attenuation below freq. Of Operation (dB)	Results
2402	-1.4	30.0 dBm		Operation Freq.
4804	-47.0	-20 dBc	45.6	Compliant
7206	-40.0	-20 dBc	38.6	Compliant
2441	-1.7	30.0 dBm		Operation Freq.
4882	-46.0	-20 dBc	44.3	Compliant
7323	-41.2	-20 dBc	39.5	Compliant
2480	-1.1	30.0 dBm		Operation Freq.
4960	-47.5	-20 dBc	46.4	Compliant
7440	-40.2	-20 dBc	39.1	Compliant

Limit: Subclause §15.247 (c)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement. Attenuation below the general limits specified in §15.209 (a) is not required. 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)).

Remarks

No other emissions were detected at a level greater than 20dB below the limits specified in 15.205.

Test Equipment Used:

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 & 15.

3.2.6 Receiver Spurious Radiation

Subclause §15.209

Spurious Emissions Level ($\mu\text{V/m}$)		
f (MHz)	Detector	Level ($\mu\text{V/m}$)
1213	Average	84
1053	Average	74
1278	Average	70

Limit: Subclause §15.209

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 – 0.490	2400	300
0.490 – 1.705	24000	30
1.705 – 30.0	30	30
30.0 – 88.0	100	3
88.0 – 216.0	150	3
216.0 – 960.0	200	3
> 960.0	500	3

Test Equipment Used:

16, 17, 18, 19 & 20.

4. Test Equipment

	Manufacturer	Model	Serial Number	Description	Cal Due
1	Rohde&Schwarz	SMIQ03	835742/002	RF Generator (B1 Signal)	11/13/2004
2	Rohde&Schwarz	SMIQ03	835742/003	RF Generator (B2 Signal)	6/14/2003
3	Rohde&Schwarz	SMP02	835133/012	RF Generator (B3 Signal)	6/16/2003
4	Rohde&Schwarz	NRVD	835430/046	Power Meter	6/13/2004
5	Rohde&Schwarz	FSIQ26	835540/016	Spectrum Analyzer	6/13/2004
6	Rohde&Schwarz	SSCU	338864/001	Switching and Signal Conditioning Unit	N/A
7	Rohde&Schwarz	RSP	834500/009	RF Step Attenuator	3/1/2003
8	Rohde&Schwarz	PTW60	100001	Signaling Unit	N/A
9	Rohde&Schwarz	PSM12	83529/006	System Controller	N/A
10	Datum	RUB	MSP 001	Rubidium Standard RUB	2/28/2003
11	Huber+Suhner	RF Cable		TS8960 EUTCable 3	N/A
12	Huber+Suhner	RF Cable		TS8960 SSCU Cable 1	N/A
13	Rohde&Schwarz	NRV-Z1	832279/011	Probe	2/1/2003
14	Rohde&Schwarz	NRV-Z1	832279/009	Probe	6/13/2003
15	Hewlett Packard	6263B	2438A-15767	Power Supply	N/A
16	Hewlett Packard	6286A	2763A-10556	Power Supply	N/A
17	Chase	CBL6112 A	2180	Bilog Antenna	2/11/2003
18	Hewlett Packard	HP8566B	2421A00443	Spectrum Analyser	5/14/2003
19	Mitec	AMF-SD-010180-35	682514	Amplifier	4/10/2002
20	EMCO	3115	6524	DRG Horn Antenna	4/27/2002