

6.9. TRANSMITTER ANTENNA POWER SPURIOUS/HARMONIC CONDUCTED EMISSIONS @ FCC 90.210

6.9.1. Limits @ 90.210

Emissions shall be attenuated below the mean output power of the transmitter as follows:

Frequency Band	Frequency Range	Attenuation Limit (dBc)
896-901MHz	10 MHz to Lowest frequency of the radio to 10 th harmonic of the highest frequency of the radio	50+10*log(P) or -20 dBm or 70 dBc whichever is less

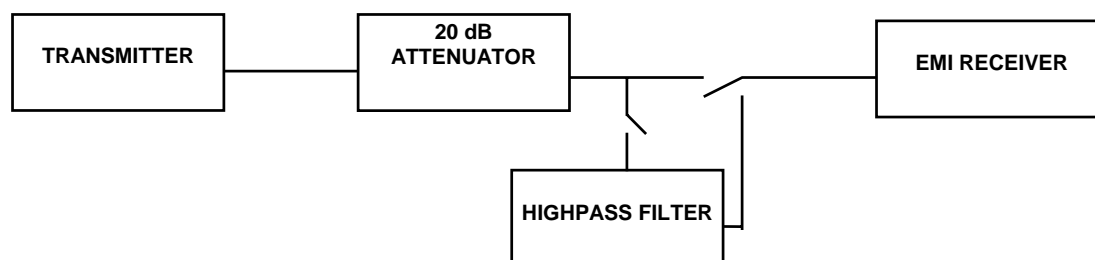
6.9.2. Method of Measurements

Refer to Exhibit 8 § 8.5 of this report for measurement details

6.9.3. Test Equipment List

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range
EMI Receiver/ EMI Receiver	Hewlett Packard	HP 8593EM	3412A00103	9 kHz – 26.5 GHz
Attenuator(s)	Bird	DC – 22 GHz
Audio Oscillator	Hewlett Packard	HP 204C	0989A08798	DC to 1.2 MHz
Highpass Filter, Microphase	Microphase	CR220HID	IIT111000AC	Cut-off Frequency at 600 MHz, 1.3 GHz or 4 GHz

6.9.4. Test Arrangement



6.9.5. Test Data

6.9.5.1. High Power Setting (2 Watts) at Lowest Frequency (896 MHz)

Fundamental Frequency:	896 MHz				
RF Output Power:	33.3 dBm (Conducted)				
Modulation:	2 level 8kbps GMSK				
FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS		LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
	(dBm)	(dBc)			
4480.9	-37.4	-70.7	-53.3	-17.4	PASS
5382.7	-27.8	-61.1	-53.3	-7.8	PASS
6266.5	-31.6	-64.9	-53.3	-11.6	PASS
<ul style="list-style-type: none"> ** The emissions were scanned from 10 MHz to 10 GHz and all emissions within 20 dB below the limits were recorded. Please refer to plots # 11 & 12 for details of measurement. 					

6.9.5.2. High Power Setting (2 Watts) at Middle Frequency (898.5 MHz)

Fundamental Frequency:	898.5 MHz				
RF Output Power:	33.3 dBm (Conducted)				
Modulation:	2 level 8kbps GMSK				
FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS		LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
	(dBm)	(dBc)			
4499.0	-37.4	-70.7	-53.3	-17.4	PASS
5382.7	-28.0	-61.3	-53.3	-8.0	PASS
6284.5	-31.5	-64.8	-53.3	-11.5	PASS
<ul style="list-style-type: none"> ** The emissions were scanned from 10 MHz to 10 GHz and all emissions within 20 dB below the limits were recorded. Please refer to plots # 13 & 14 for details of measurement. 					

6.9.5.3. High Power Setting (2 Watts) at Highest Frequency (901 MHz)

Fundamental Frequency:	901 MHz				
RF Output Power:	33.3 dBm (Conducted)				
Modulation:	2 level 8kbps GMSK				
FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS		LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
	(dBm)	(dBc)			
4499.0	-37.7	-71.0	-53.3	-17.7	PASS
5400.8	-27.6	-60.9	-53.3	-7.6	PASS
6302.6	-31.6	-64.9	-53.3	-11.6	PASS
<ul style="list-style-type: none"> ** The emissions were scanned from 10 MHz to 10 GHz and all emissions within 20 dB below the limits were recorded. Please refer to plots # 15 & 16 for details of measurement. 					

ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

6.9.5.4. Low Power Setting (0.033 Watts) at Lowest Frequency (896 MHz)

Fundamental Frequency:		896 MHz			
RF Output Power:		15.2 dBm (Conducted)			
Modulation:		2 level 8kbps GMSK			
FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS		LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
	(dBm)	(dBc)			
1793.6	-42.6	-57.8	-35.2	-22.6	PASS
6266.5	-38.1	-53.3	-35.2	-18.1	PASS
<ul style="list-style-type: none"> ** The emissions were scanned from 10 MHz to 10 GHz and all emissions within 20 dB below the limits were recorded. Please refer to plots # 17 & 18 for details of measurement. 					

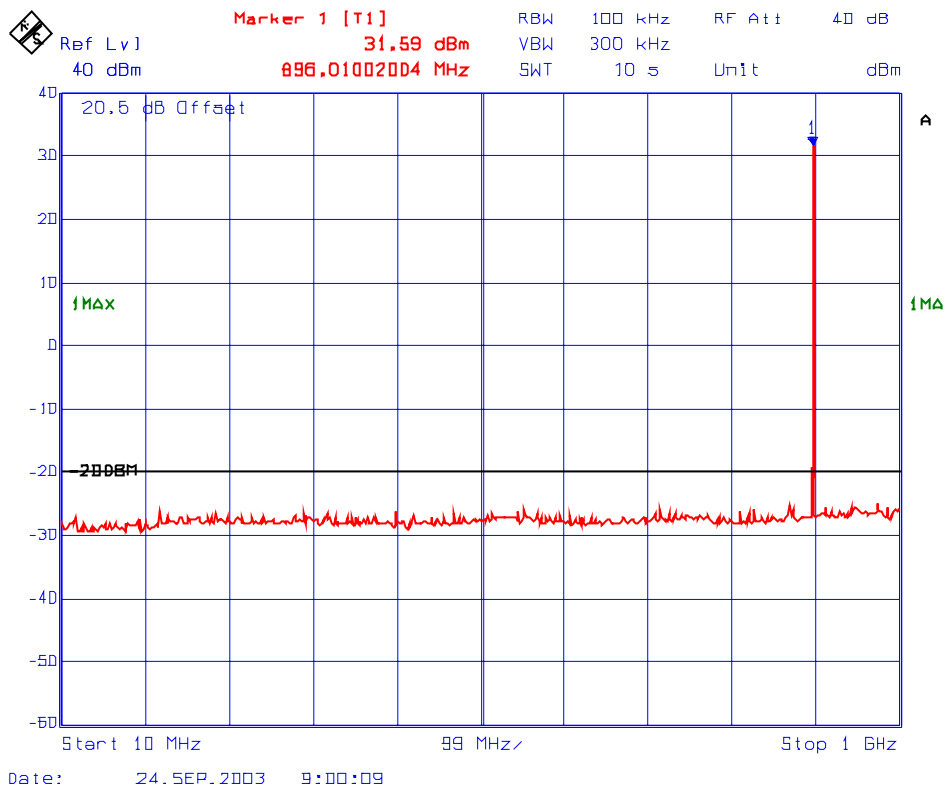
6.9.5.5. Low Power Setting (0.033 Watts) at Middle Frequency (898.5 MHz)

Fundamental Frequency:		898.5 MHz			
RF Output Power:		15.2 dBm (Conducted)			
Modulation:		2 level 8kbps GMSK			
FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS		LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
	(dBm)	(dBc)			
1793.6	-41.7	-56.9	-35.2	-21.7	PASS
6284.5	-38.3	-53.5	-35.2	-18.3	PASS
<ul style="list-style-type: none"> ** The emissions were scanned from 10 MHz to 10 GHz and all emissions within 20 dB below the limits were recorded. Please refer to plots # 19 & 20 for details of measurement. 					

6.9.5.6. Low Power Setting (0.033 Watts) at Highest Frequency (901 MHz)

Fundamental Frequency:		901 MHz			
RF Output Power:		15.2 dBm (Conducted)			
Modulation:		2 level 8kbps GMSK			
FREQUENCY (MHz)	TRANSMITTER CONDUCTED ANTENNA EMISSIONS		LIMIT (dBc)	MARGIN (dB)	PASS/ FAIL
	(dBm)	(dBc)			
1793.6	-40.5	-55.7	-35.2	-20.5	PASS
6302.6	-39.1	-54.3	-35.2	-19.1	PASS
<ul style="list-style-type: none"> ** The emissions were scanned from 10 MHz to 10 GHz and all emissions within 20 dB below the limits were recorded. Please refer to plots # 21 & 22 for details of measurement. 					

Plot # 11 : Spurious Emission Conducted at Antenna terminal, High power setting
Frequency: 896 MHz, Modulation: 2-Level 8kbps GMSK



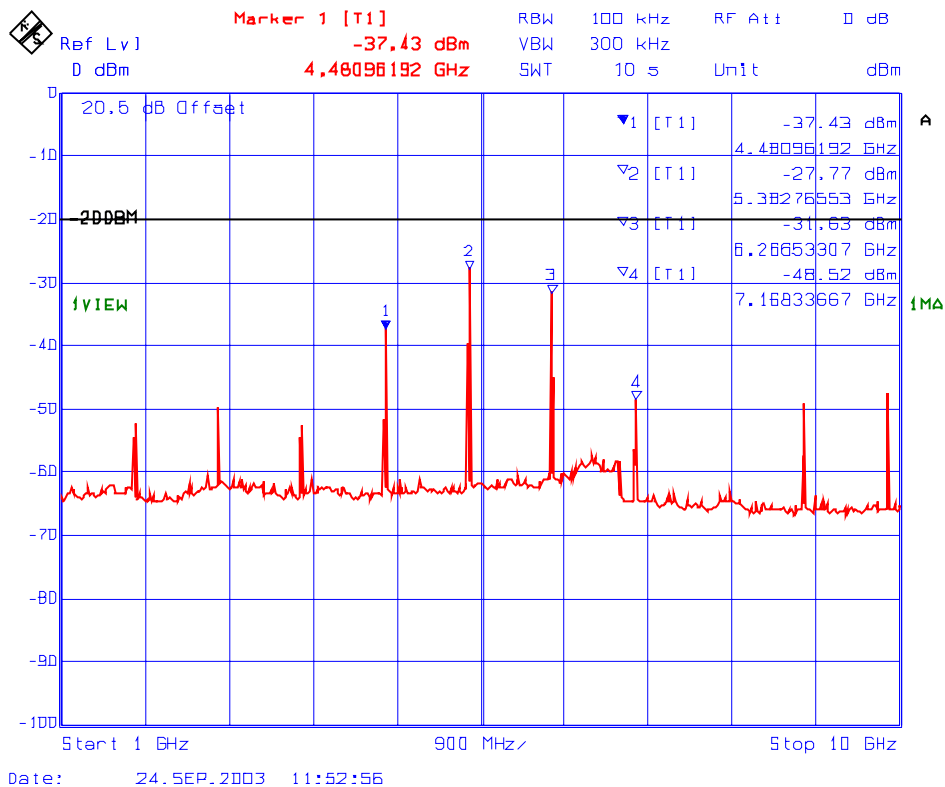
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot # 12 : Spurious Emission Conducted at Antenna terminal, High power setting
Frequency: 896 MHz, Modulation: 2-Level 8kbps GMSK



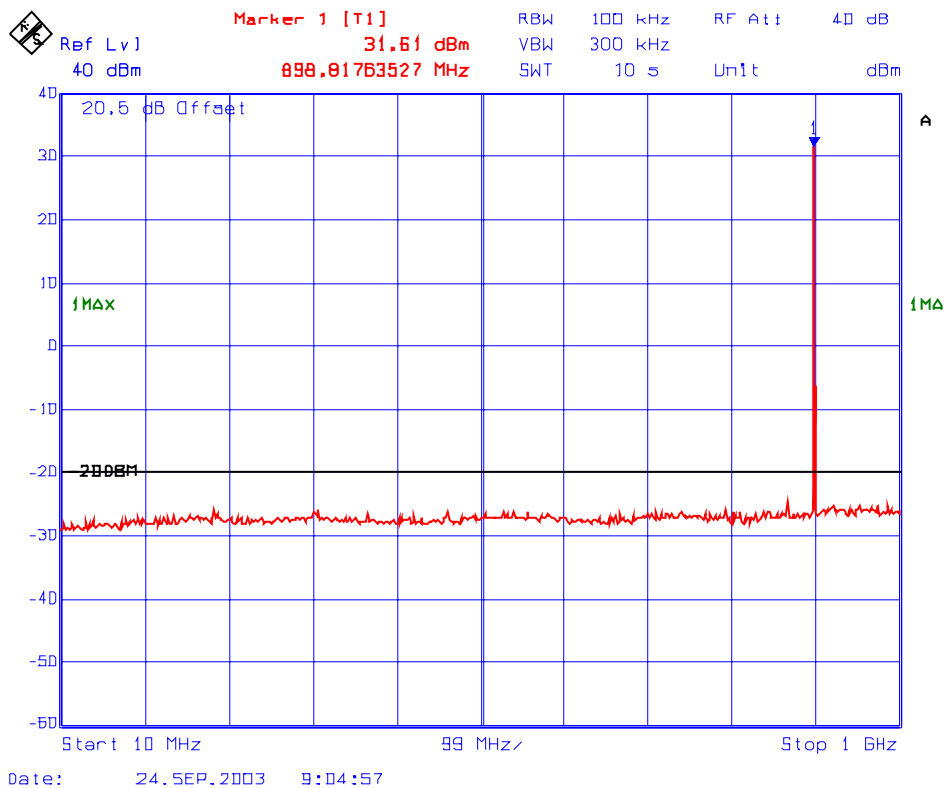
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot # 13 : Spurious Emission Conducted at Antenna terminal, High power setting
Frequency: 898.5 MHz, Modulation: 2-Level 8kbps GMSK



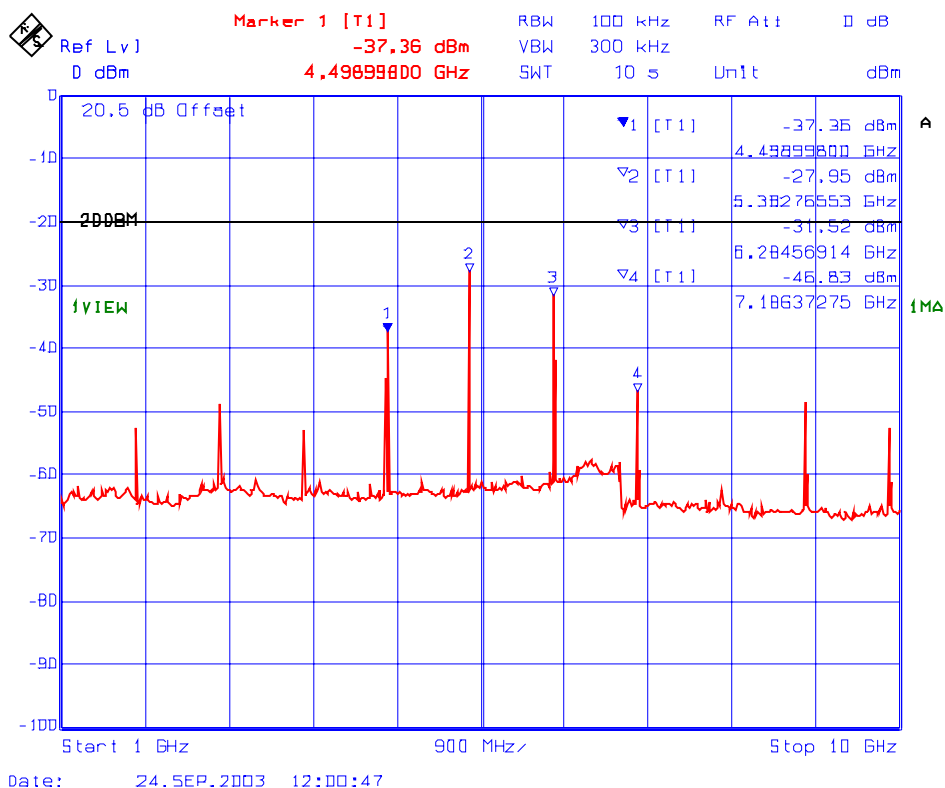
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

**Plot # 14 : Spurious Emission Conducted at Antenna terminal, High power setting
 Frequency: 898.5 MHz, Modulation: 2-Level 8kbps GMSK**



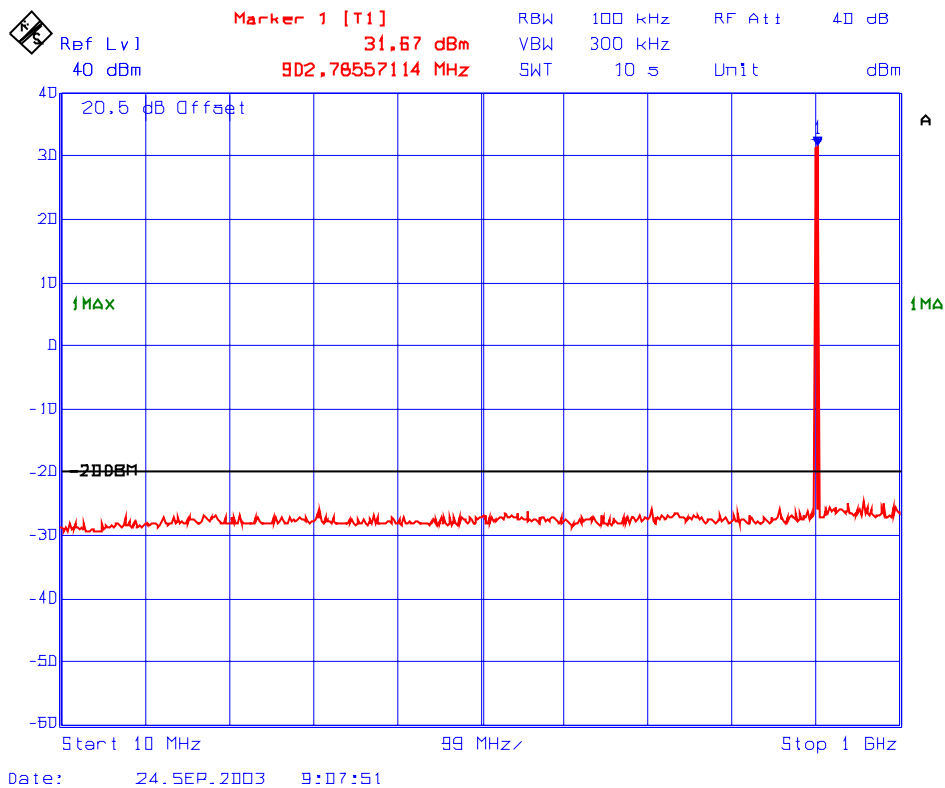
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
 Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
 October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot # 15 : Spurious Emission Conducted at Antenna terminal, High power setting
Frequency: 901 MHz, Modulation: 2-Level 8kbps GMSK



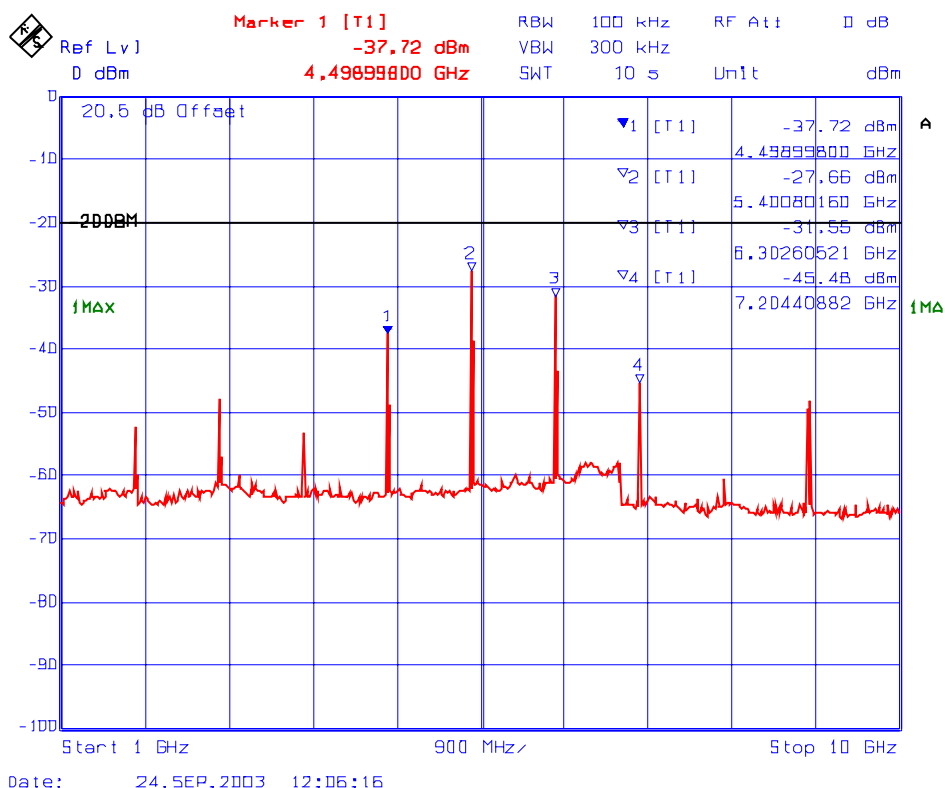
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot # 16 : Spurious Emission Conducted at Antenna terminal, High power setting
Frequency: 901 MHz, Modulation: 2-Level 8kbps GMSK



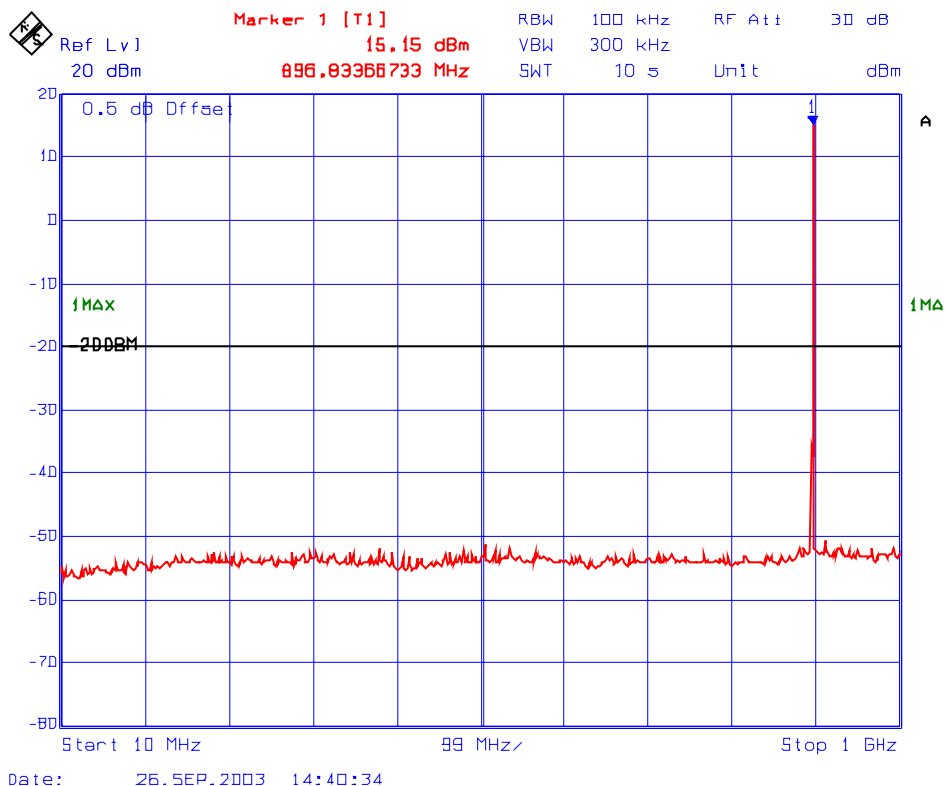
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
 Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
 October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot # 17 : Spurious Emission Conducted at Antenna terminal, Low power setting
Frequency: 896 MHz, Modulation: 2-Level 8kbps GMSK



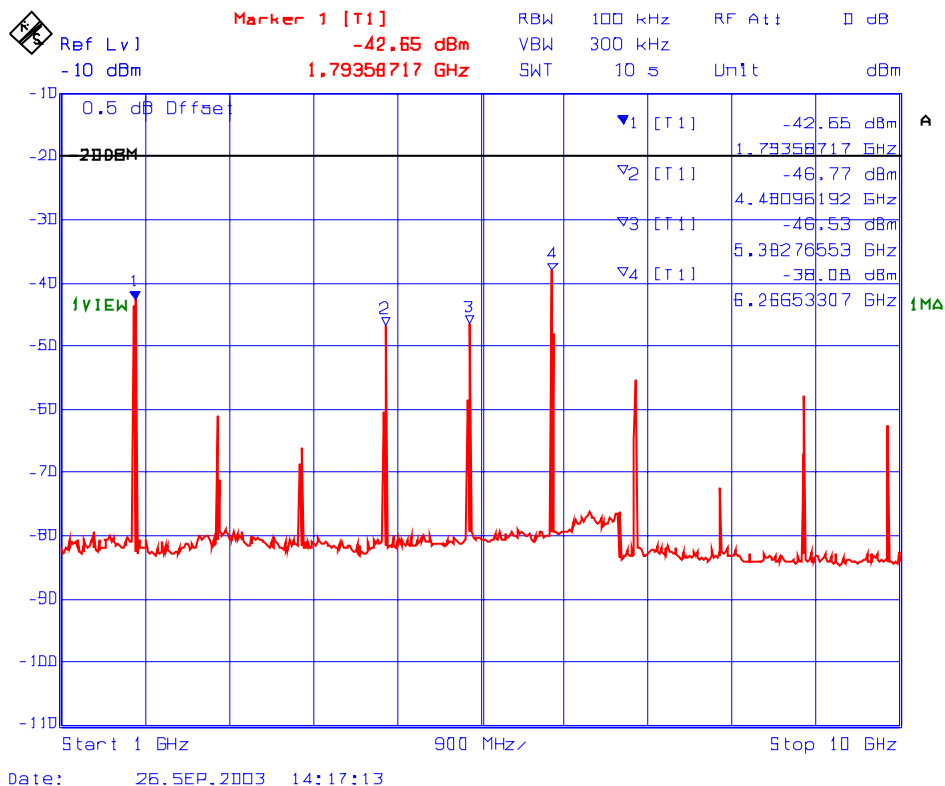
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot # 18 : Spurious Emission Conducted at Antenna terminal, Low power setting
Frequency: 896 MHz, Modulation: 2-Level 8kbps GMSK



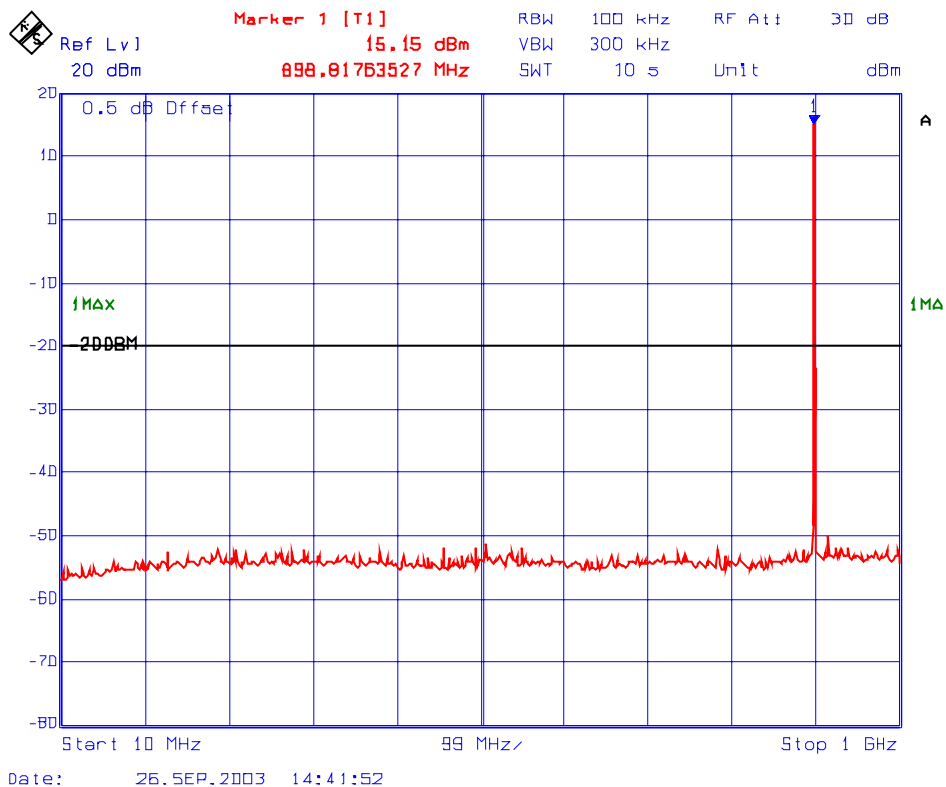
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
 Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
 October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot # 19 : Spurious Emission Conducted at Antenna terminal, Low power setting
Frequency: 898.5 MHz, Modulation: 2-Level 8kbps GMSK



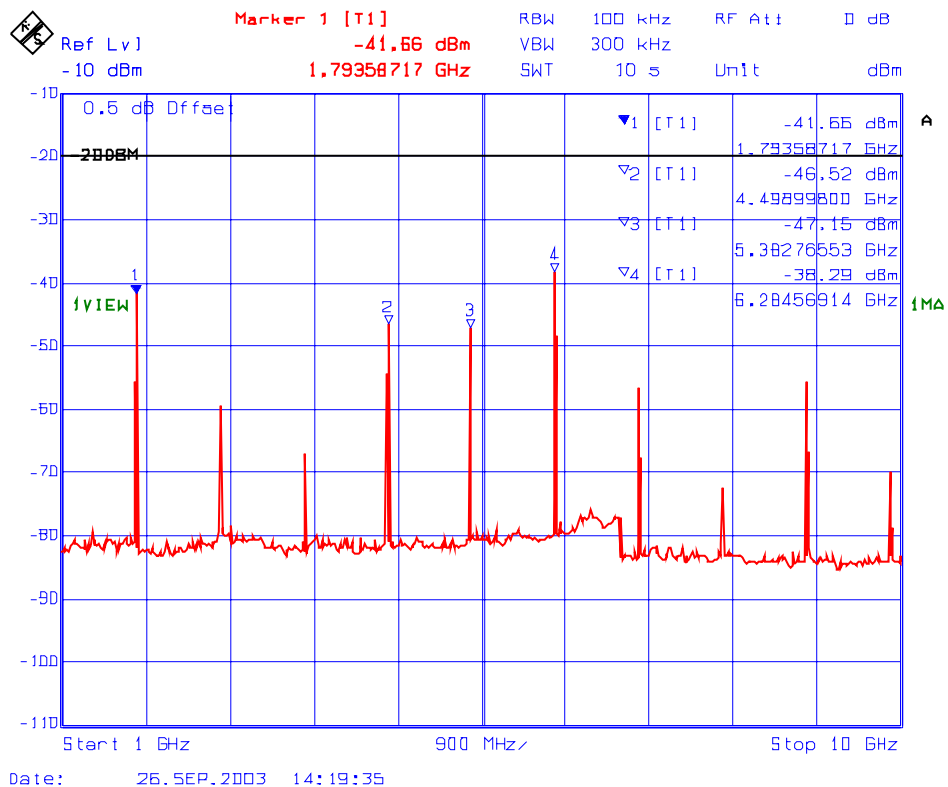
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot # 20 : Spurious Emission Conducted at Antenna terminal, Low power setting
Frequency: 898.5 MHz, Modulation: 2-Level 8kbps GMSK



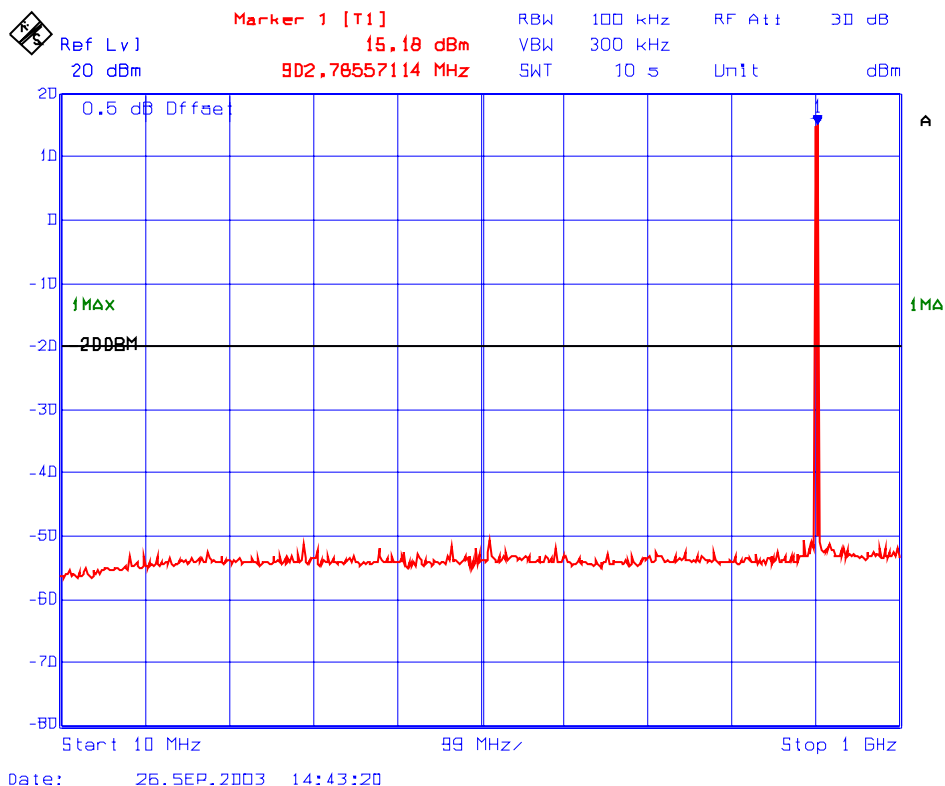
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot # 21 : Spurious Emission Conducted at Antenna terminal, Low power setting
Frequency: 901 MHz, Modulation: 2-Level 8kbps GMSK



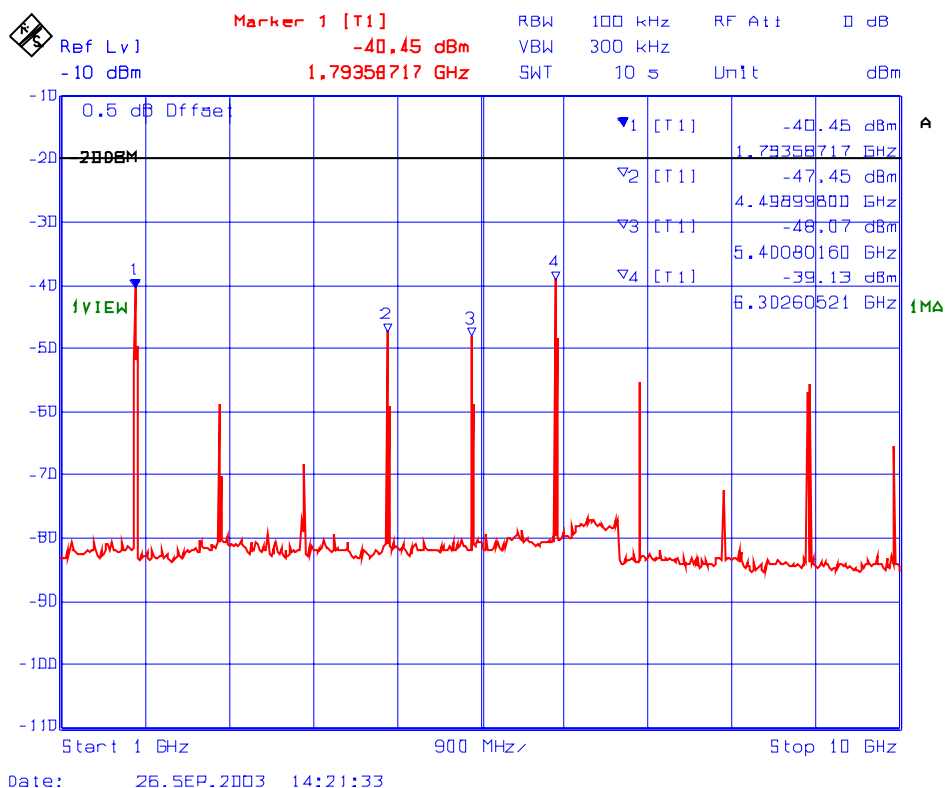
ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)

Plot # 22 : Spurious Emission Conducted at Antenna terminal, Low power setting
Frequency: 901 MHz, Modulation: 2-Level 8kbps GMSK



ULTRATECH GROUP OF LABS

3000 Bristol Circle, Oakville, Ontario, Canada L6H 6G4
Tel. #: 905-829-1570, Fax. #: 905-829-8050, Email: vic@ultratech-labs.com, Website: <http://www.ultratech-labs.com>

File #: WTP015QFCC90
October 01, 2003

- All test results contained in this engineering test report are traceable to National Institute of Standards and Technology (NIST)