Test Report:	3W06736
Applicant:	VTECH Engineering Canada Ltd. Suite 200 – 7671 Alderbridge Way Richmond, B.C., Canada V6X 1Z9
Equipment Under Test: (EUT)	VTECH 2651 And VTECH 2656, FHSS Cordless Phones With Speaker Phone And Answering Machine
FCC ID:	EW780-5269-00
In Accordance With:	**FCC Part 15, Subpart C** Frequency Hopping Transmitters 2400 - 2483.5 MHz
Tested By:	Nemko Canada Inc. 303 River Road, R.R. 5 Ottawa, Ontario K1V 1H2
Authorized By:	Glen Westwell, Wireless Technologist
Date:	31 January 2003
Total Number of Pages:	49

Table Of Contents

Section 1. Summary Of Test Results **3**

Section 2. General Equipment Specification **5**

Section 3. Powerline Conducted Emissions **6**

Section 4. Channel Seperation **12**

Section 4. Occupied Bandwidth **14**

Section 5. Peak Power Output **21**

Section 6. Spurious Emissions (Radiated) **27**

Section 7. Block Diagrams **48**

Section 8. Test Equipment List **49**

Section 1. Summary Of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C, Paragraph 15.247 for Frequency Hopping Spread Spectrum devices. Radiated tests were conducted is accordance with ANSI C63.4-1992. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE. The RF Circuitry in the VTECH 2651 and VTECH 2656 are identical, therefore only the VTECH 2651 was tested for radiated emissions associated with the fundamental frequency of transmission.
See " Summary of Test Data".

TESTED BY: _____ DATE: 31 January 2003
Kevin Carr, EMC Technologist

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This report applies only to the items tested.

Summary Of Test Data

Name Of Test	Para. No.	Result
Powerline Conducted Emissions	15.207 (a)	Complied
Occupied Bandwidth	15.247 (a)(2)	Complied
Peak Power Output	15.247 (b)	Complied
Spurious Emissions (Antenna Conducted)	15.247 (c)	N/A
Spurious Emissions (Radiated)	15.247 (c)	Complied
Transmitter Power Density	15.247 (d)	Complied

Footnotes For N/A's: **No Access Port**

Test Conditions:

Indoor Temperature: 20°C
Humidity: 20%

Outdoor

Ottawa: Temperature: -10°C
Humidity: 30%

Almonte: Temperature: 7°C
Humidity: 65%

Section 2. General Equipment Specification

Manufacturer:	VTech Engineering Canada Ltd. Xia Ling Bei Management Zone, Liaobu, Dongguan, guangdong, China 523411
Model/Serial No.:	
Base	M/N: 2651, S/N:PA 12/12 109
Base	M/N: 2656, S/N: PA 12/02 111
Handset	S/N: 12/02 111
Date Received In Laboratory:	9 Jan. 2003
Nemko Identification No.:	1, 2, 3
Frequency Range:	2401.056-2482.272MHz
Tunable Bands:	1
Number of Channels:	17
Min. Channel Spacing:	858kHz
Emissions Designator:	813k0F1D
User Frequency Adjustment:	None
Measured Output Power:	
Base	0.057 Watts, 17.6 dBm
Handset	0.0865 Watts, 19.3dBm
Rated Output Power:	
Base	+19.5dBm +/- 1 dB
Handset	+19.5dBm +/- 1 dB

Section 3. Powerline Conducted Emissions

Para. No.: 15.207(a)

Test Performed By: Kevin Carr	**Date of Test: 20 Jan. 2003**

Test Results: Complied

Measurement Data: See attached graph.

Conducted Disturbance at Mains Port Test Data:

Test Date: 20 Jan. 2003	
Engineer's Name: Kevin Carr	
Temperature (C°): 20	Humidity %: 20
Tested as per (Table Top/Floor Standing): Table Top	
Spectrum plots for each frequency band can be found at the back of this section. Any Emissions that were above or within 5 dB of the average limits were remeasured with a receiver and recorded. . *All plots were generated with a peak detector.	
Port under test: AC Mains	Test Voltage: 120VAC, 60Hz
Receiver Results (if applicable) :	

Conductor	Frequency (MHz)	Detector	Level dB(µV)	Limit dB(µV)	Margin dB
VTECH 2651					
Phase	0.45	Quasi-Peak	34.0	48.0	12.0
Neut.	0.45	Quasi-Peak	33.7	48.0	14.3
VTECH 2656					
Phase	0.54	Quasi-Peak	34.0	48.0	14.0
Neut.	0.54	Quasi-Peak	33.1	48.0	14.9

Notes:	

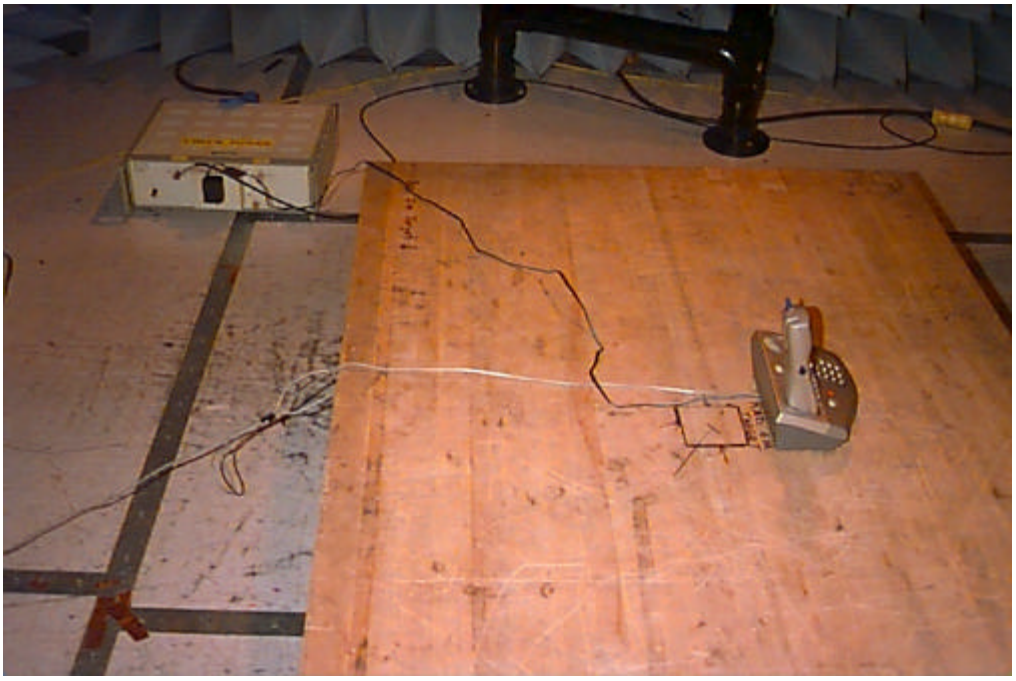
Conducted Disturbance at Mains Port Results:

Final Test Result (Please Check One):	☒ Pass	☐ Fail
Were their deviations from the standard test procedure?	☐ Yes	☒ No
If yes, document:		
Has rented equipment been used?	☐ Yes	☒ No
If yes, document:		
Exercise Program: The mode used to exercise the various system components in a manner similar to typical use.	S/W Ver. Not supplied by client	

Conducted Disturbance at Mains Detailed Setup Photos:
VTECH 2651

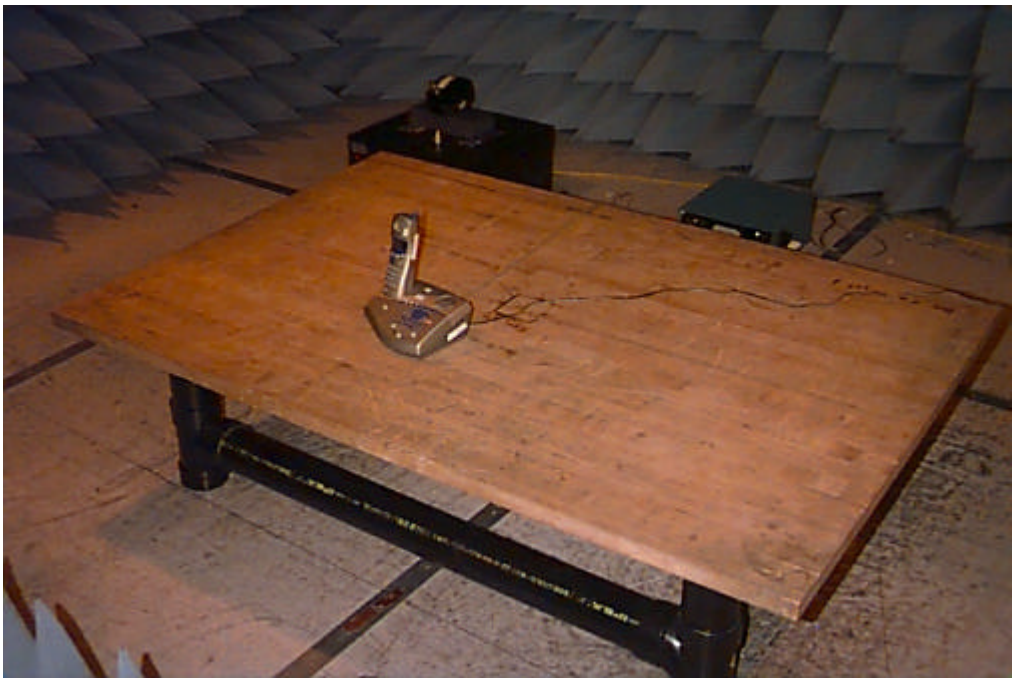
Front

Side

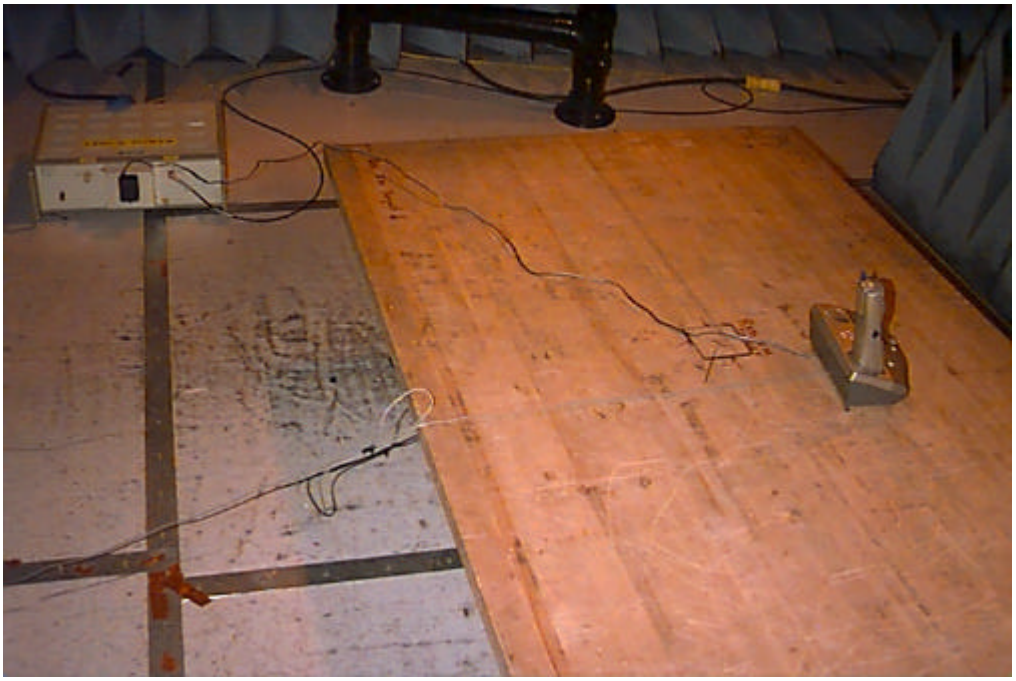


VTECH 2656

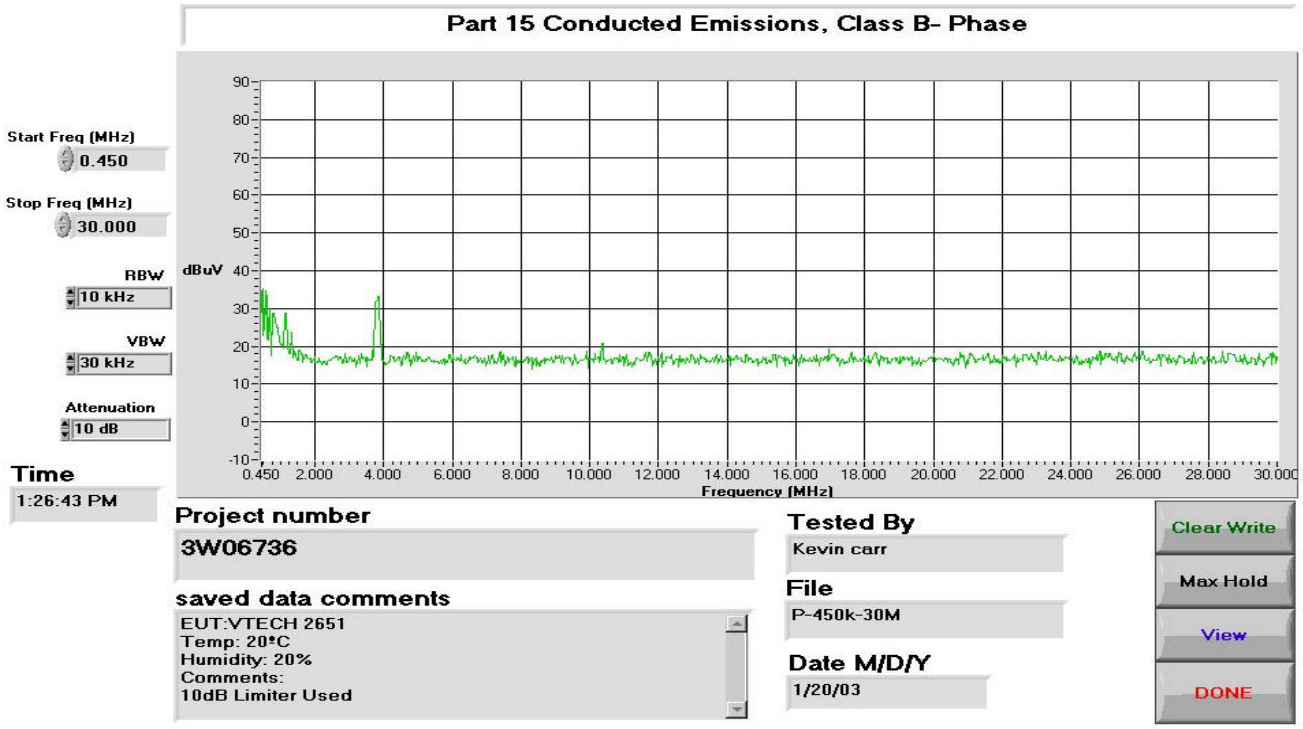
Front

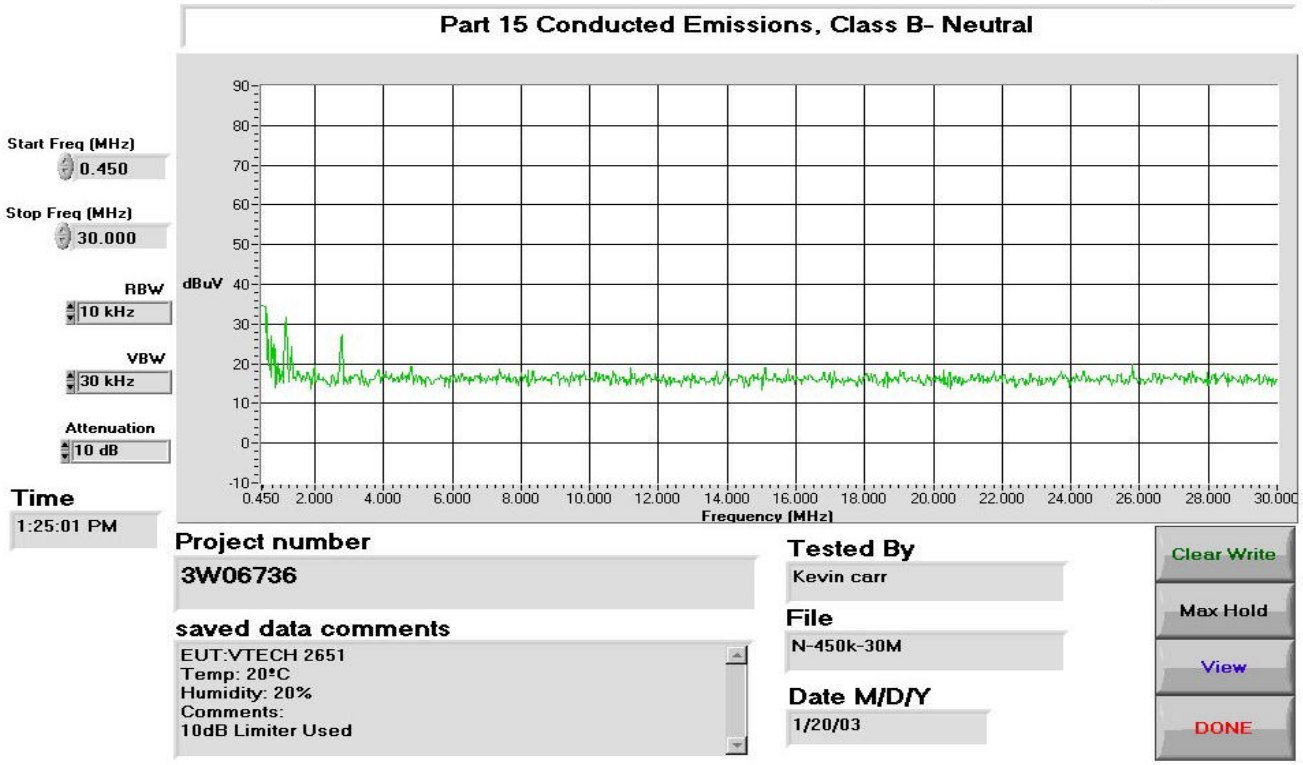


Side

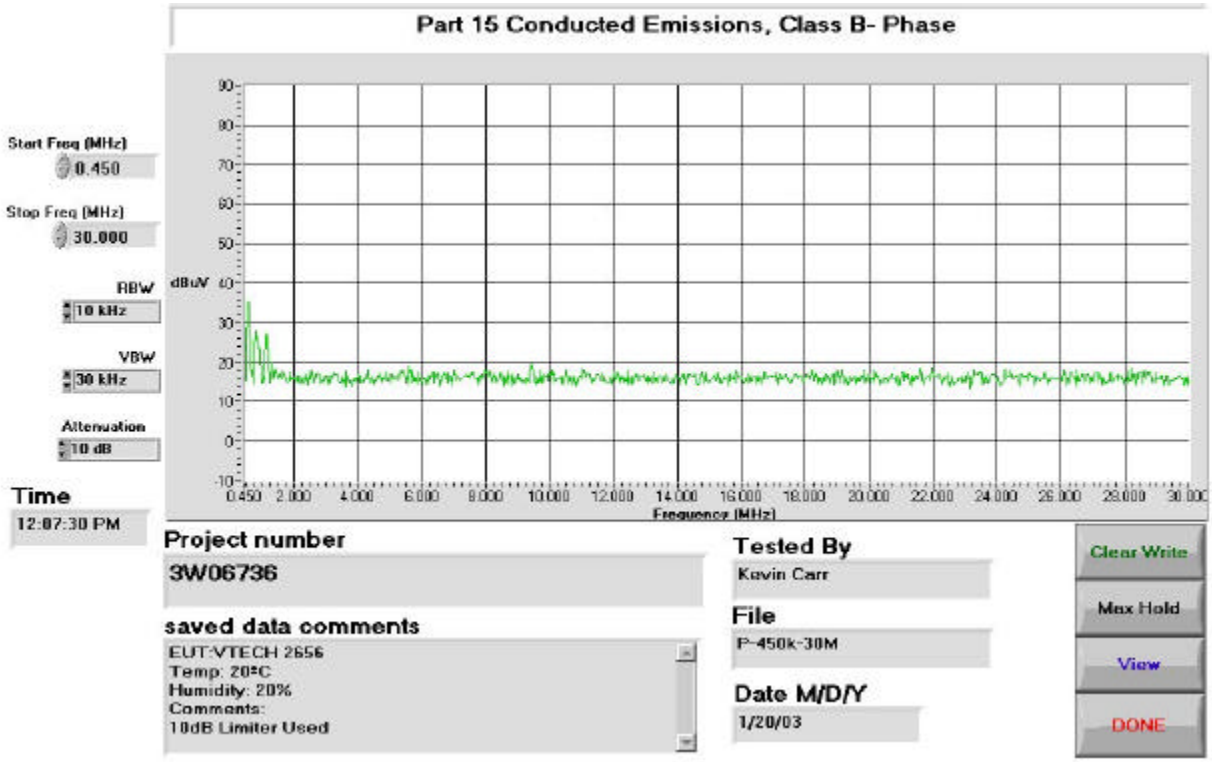


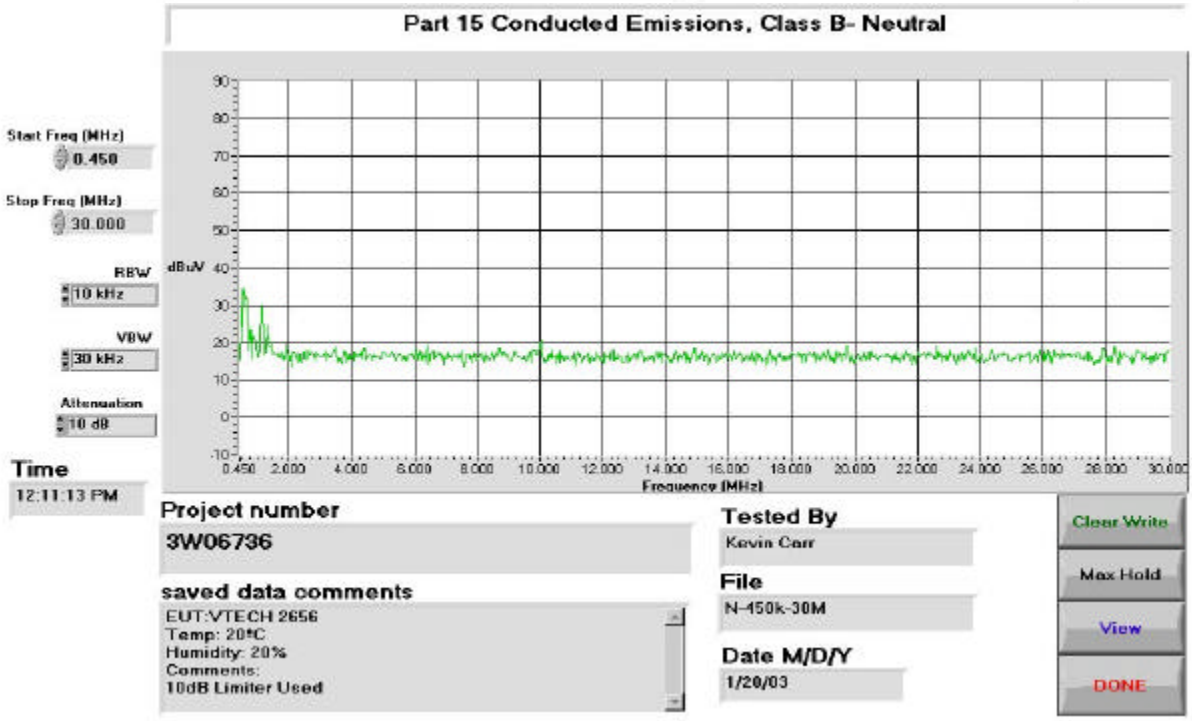
Conducted Disturbance at Mains Plots:
VTECH 2651





VTECH 2656


Part 15 Conducted Emissions, Class B- Phase
Start Freq (MHz)
0.450
Stop Freq (MHz)
30.000
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Time
12:07:30 PM
dBuV
Frequency (MHz)
Project number
3W06736
Tested By
Kevin Carr
File
P-450k-30M
Date M/D/Y
1/20/03
saved data comments
EUT:VTECH 2656
Temp: 20°C
Humidity: 20%
Comments:
10dB Limiter Used
Clear Write
Max Hold
View
DONE


Part 15 Conducted Emissions, Class B- Neutral
Start Freq (MHz)
0.450
Stop Freq (MHz)
30.000
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Time
12:11:13 PM
dBuV
Frequency (MHz)
Project number
3W06736
Tested By
Kevin Carr
File
N-450k-30M
Date M/D/Y
1/20/03
saved data comments
EUT:VTECH 2656
Temp: 20°C
Humidity: 20%
Comments:
10dB Limiter Used
Clear Write
Max Hold
View
DONE

Section 4. Channel Seperation

Para. No.: 15.247(a)(1)

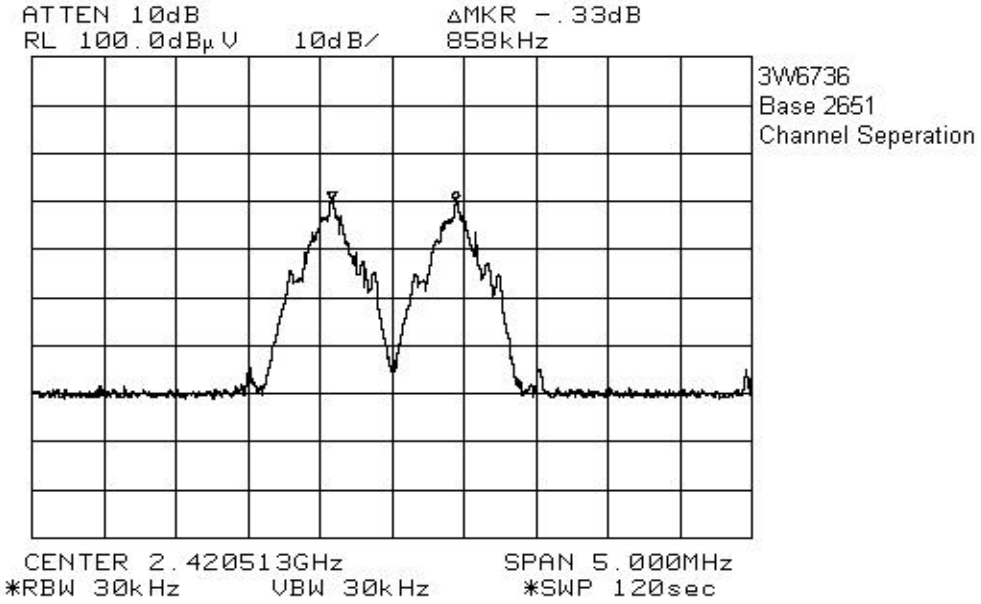
Test Performed By:Kevin Carr	**Date of Test: 28 Jan. 2003**

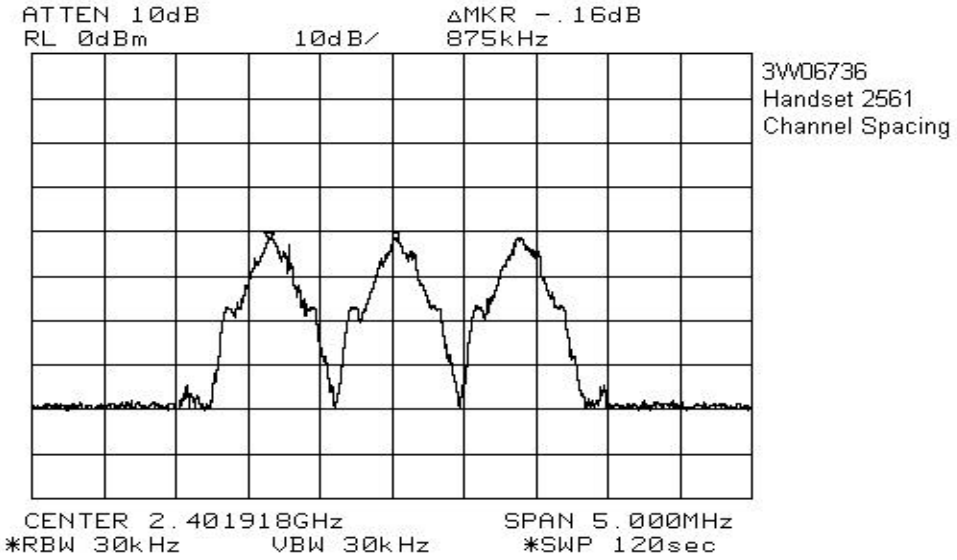
Test Results: Complied

Measurement Data:

Channel Separation:	VTECH 2651	
	Base:	858kHz
	Handset:	875kHz

VTECH 2651


ATTEN 10dB
RL 100.0dBμV 10dB/
ΔMKR -.33dB
858kHz
3W6736
Base 2651
Channel Seperation
CENTER 2.420513GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
*SWP 120sec


ATTEN 10dB
RL 0dBm 10dB/
ΔMKR -.16dB
875kHz
3W06736
Handset 2561
Channel Spacing
CENTER 2.401918GHz
SPAN 5.000MHz
*RBW 30kHz
VBW 30kHz
*SWP 120sec

Section 4. Occupied Bandwidth

Para. No.: 15.247(a)(2)

Test Performed By: Kevin Carr	**Date of Test: 29 Jan 2003**

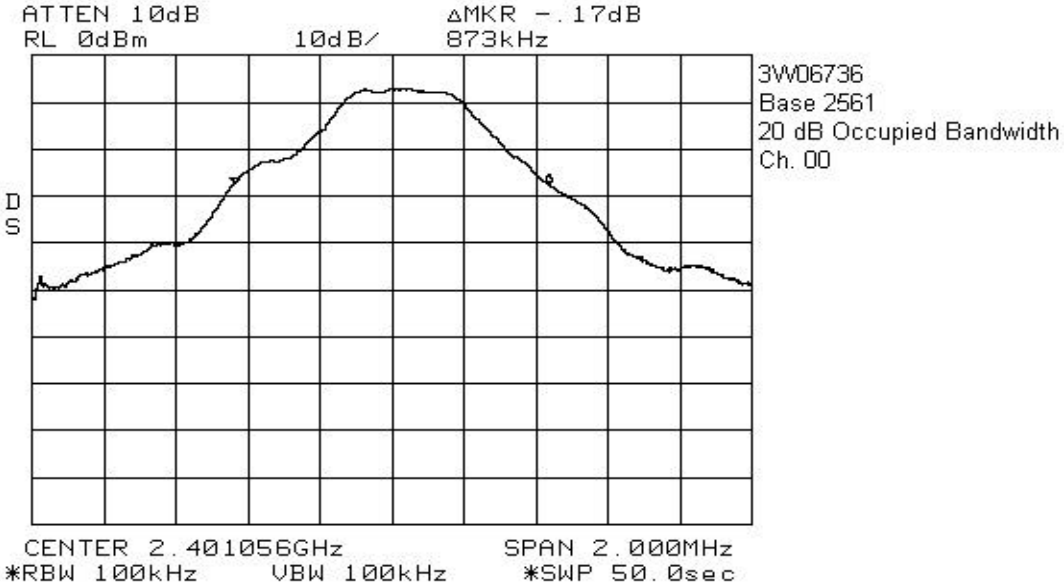
Test Results: Complied.

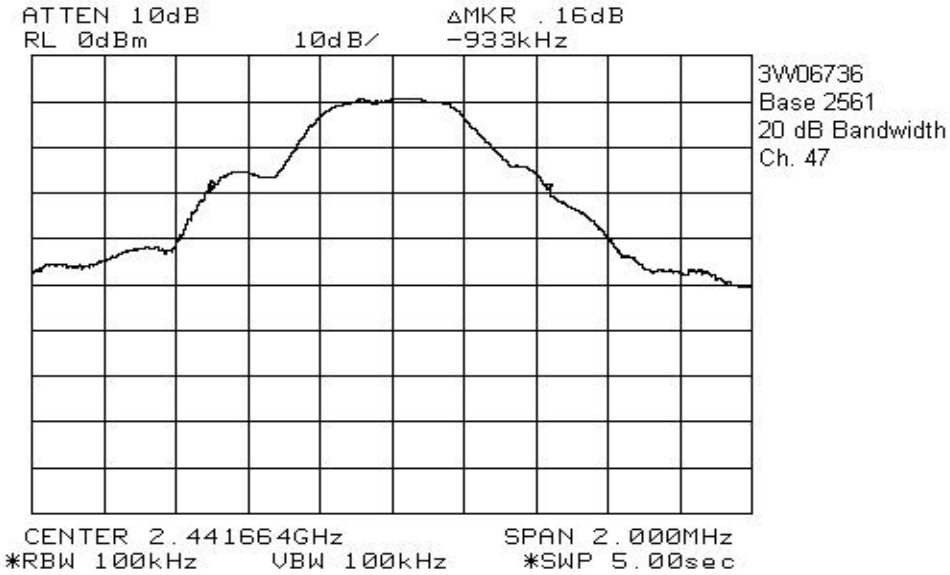
Worst Case 20 dB Bandwidth
Base: 933kHz
Handset: 773kHz

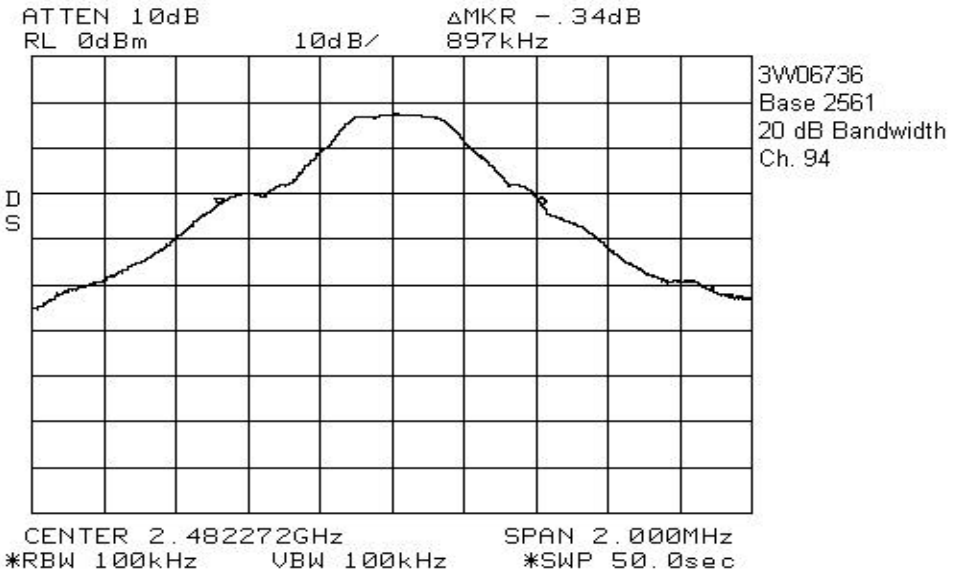
Worst Case 99% Occupied Bandwidth
Base: 813kHz
Handset: 653kHz

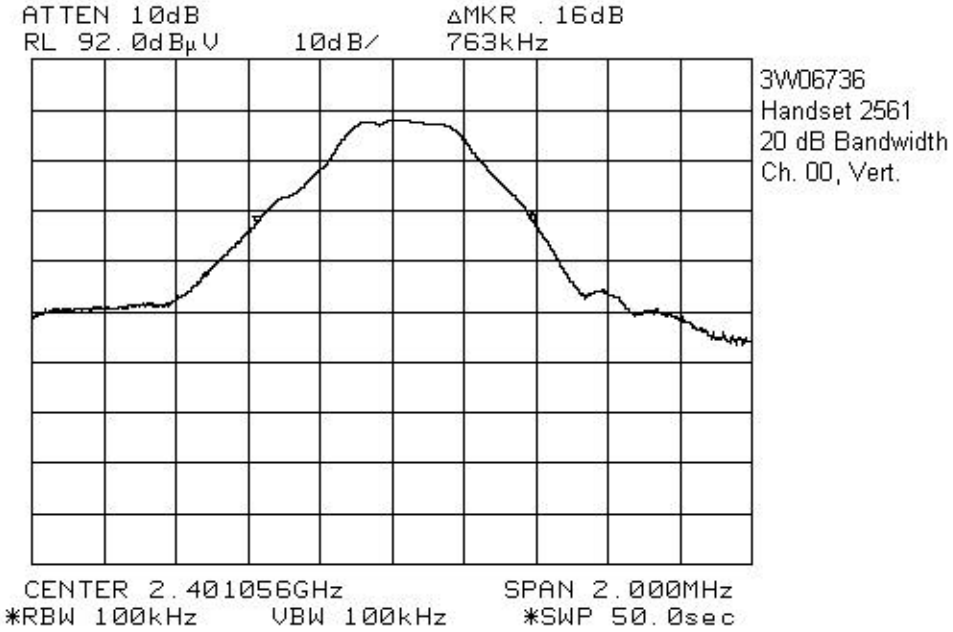
Measurement Data: See attached graph.

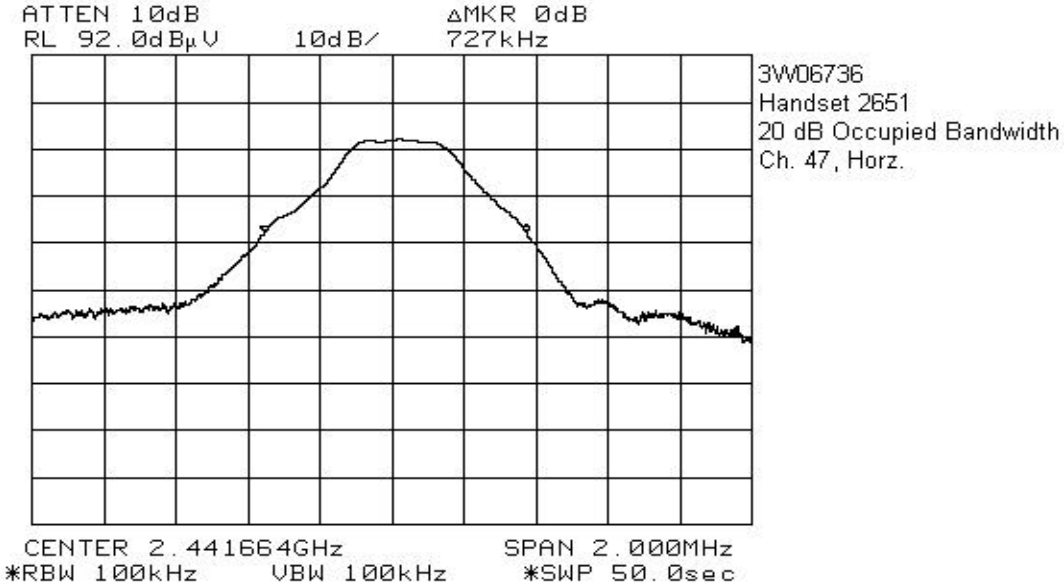
VTECH 2651
20 dB Bandwidth

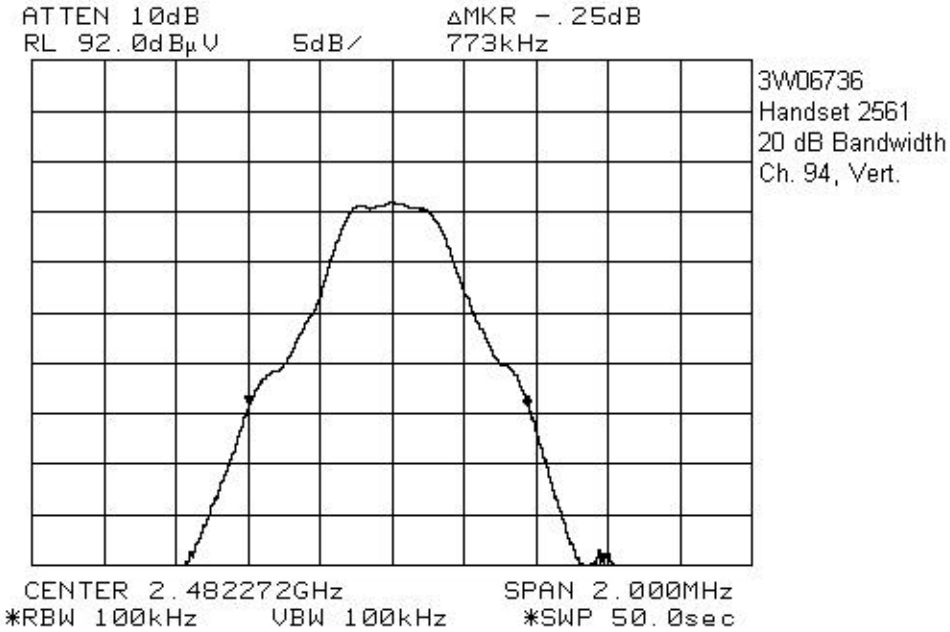




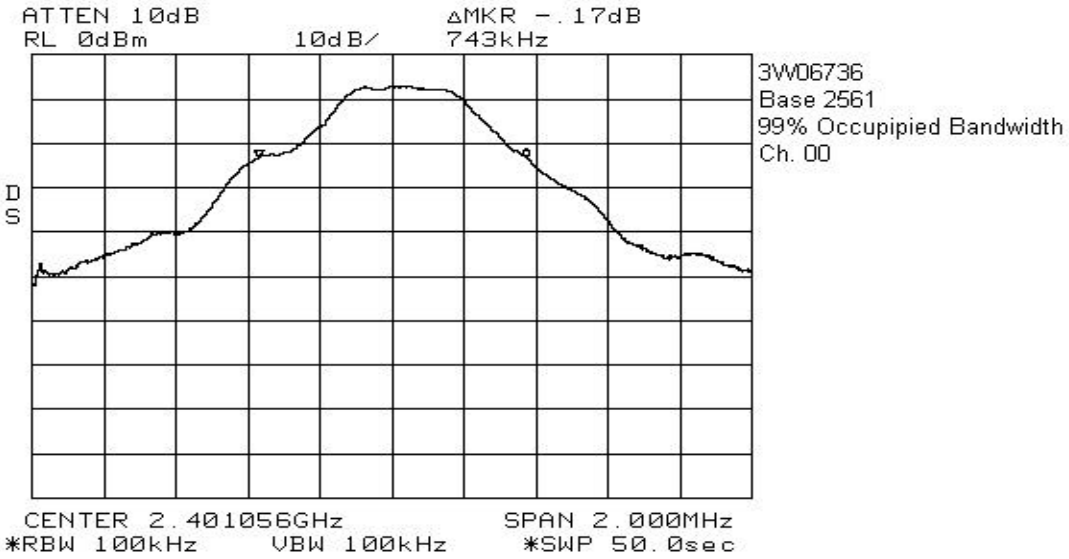

ATTEN 10dB
RL 0dBm
10dB/
ΔMKR -.34dB
897kHz
3W06736
Base 2561
20 dB Bandwidth
Ch. 94
D
S
CENTER 2.482272GHz
SPAN 2.000MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec

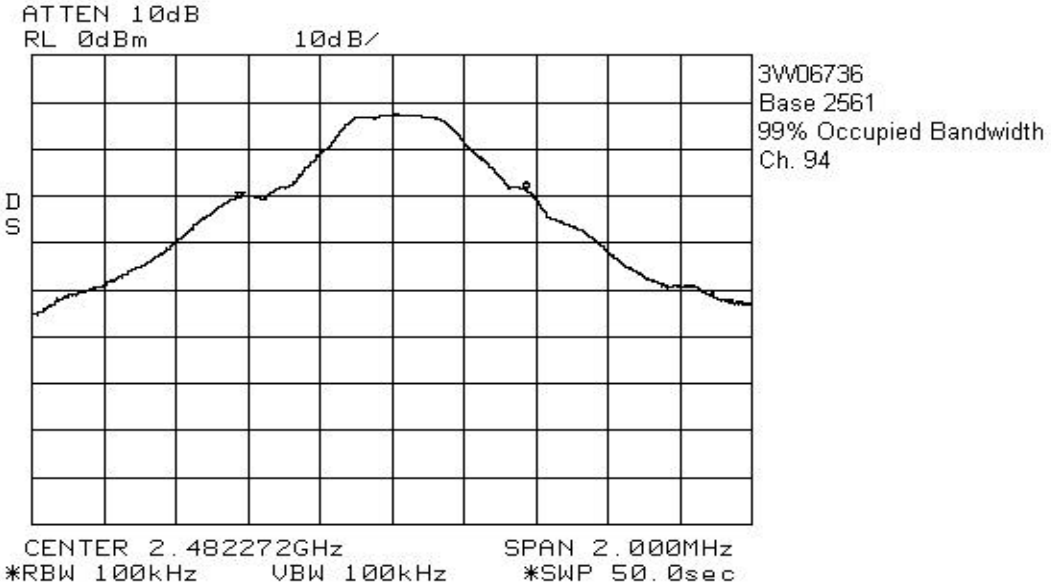

ATTEN 10dB
RL 92.0dBμV
10dB/
ΔMKR .16dB
763kHz
3W06736
Handset 2561
20 dB Bandwidth
Ch. 00, Vert.
CENTER 2.401056GHz
SPAN 2.000MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec

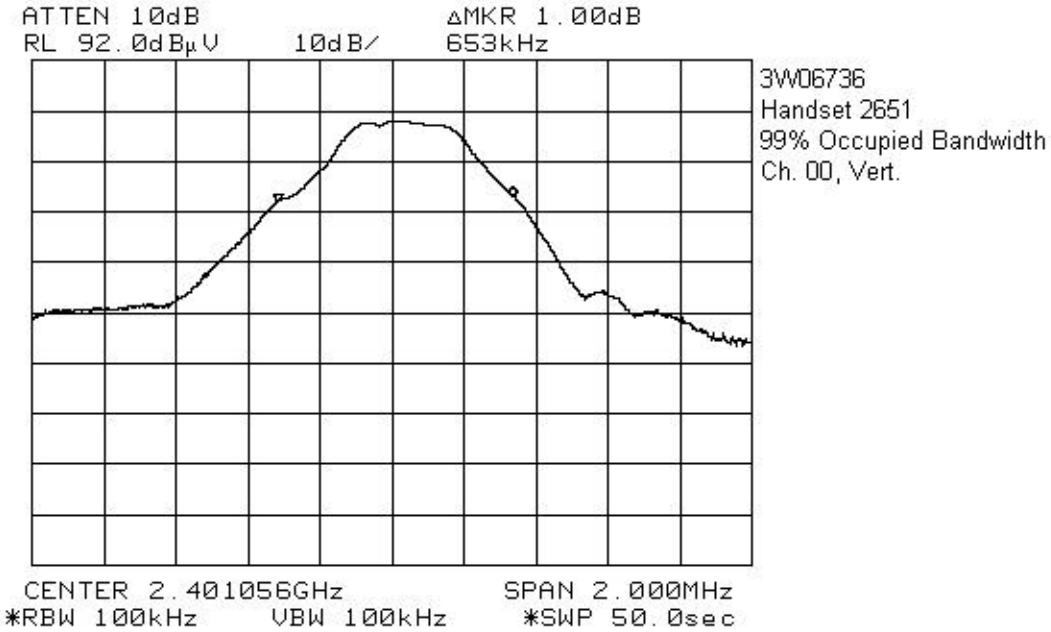

ATTEN 10dB
RL 92.0dBμV
10dB/
ΔMKR 0dB
727kHz
3W06736
Handset 2651
20 dB Occupied Bandwidth
Ch. 47, Horz.
CENTER 2.441664GHz
SPAN 2.000MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec

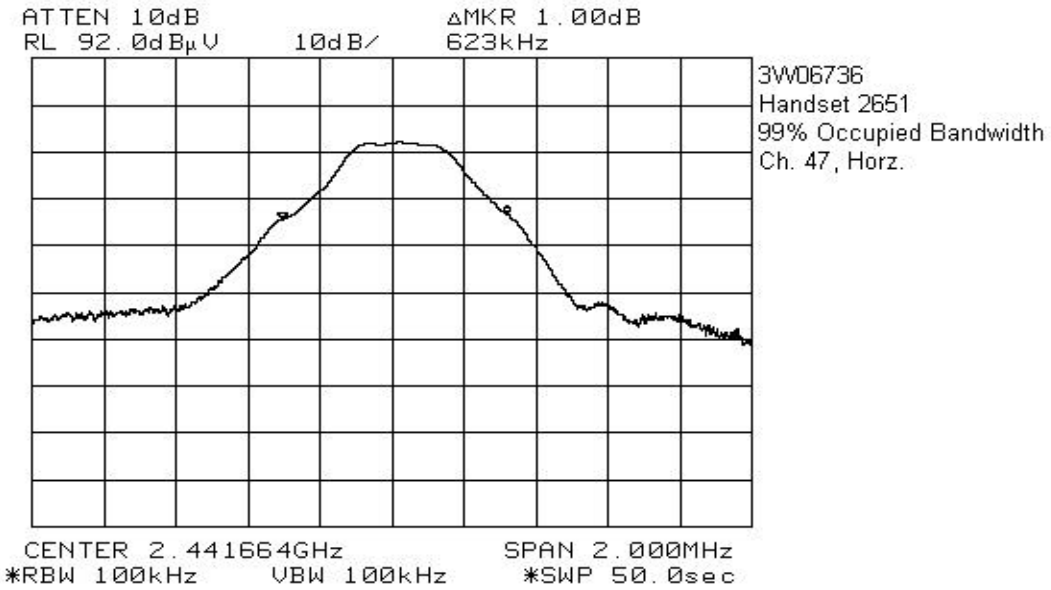

ATTEN 10dB
RL 92.0dBμV
5dB/
ΔMKR -.25dB
773kHz
3W06736
Handset 2561
20 dB Bandwidth
Ch. 94, Vert.
CENTER 2.482272GHz
SPAN 2.000MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec

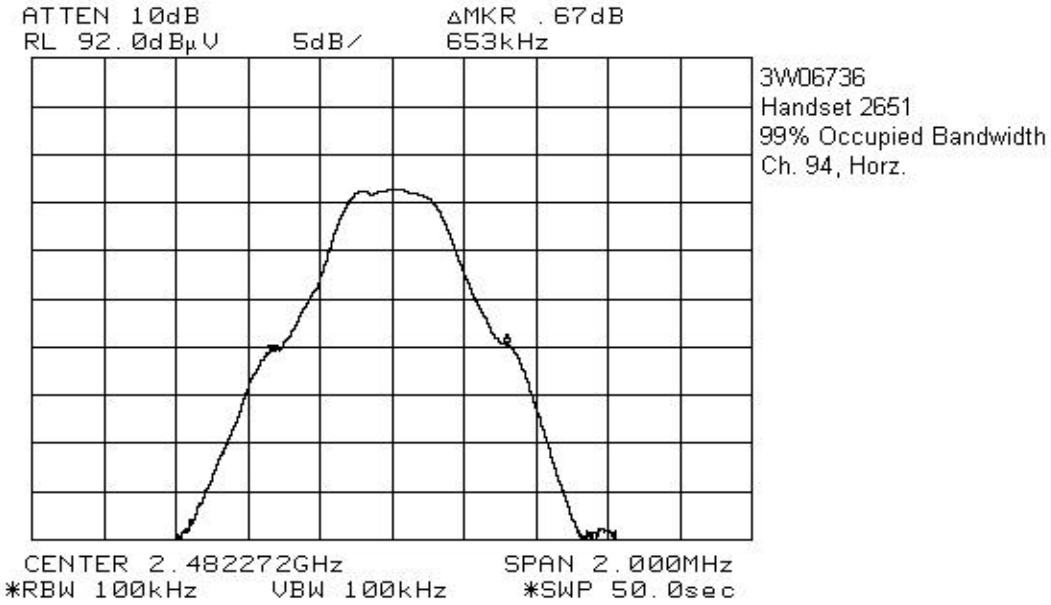
99% Occupied Bandwidth




ATTEN 10dB
RL 0dBm
10dB/
3W06736
Base 2561
99% Occupied Bandwidth
Ch. 94
D
S
CENTER 2.482272GHz
SPAN 2.000MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec


ATTEN 10dB
RL 92.0dBμV
10dB/
ΔMKR 1.00dB
653kHz
3W06736
Handset 2651
99% Occupied Bandwidth
Ch. 00, Vert.
CENTER 2.401056GHz
SPAN 2.000MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec


ATTEN 10dB
RL 92.0dBμV
10dB/
ΔMKR 1.00dB
623kHz
3W06736
Handset 2651
99% Occupied Bandwidth
Ch. 47, Horz.
CENTER 2.441664GHz
SPAN 2.000MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec


ATTEN 10dB
RL 92.0dBμV
5dB/
ΔMKR .67dB
653kHz
3W06736
Handset 2651
99% Occupied Bandwidth
Ch. 94, Horz.
CENTER 2.482272GHz
SPAN 2.000MHz
*RBW 100kHz
VBW 100kHz
*SWP 50.0sec

Section 5. Peak Power Output

Para. No.: 15.247(b)

Test Performed By: Kevin Carr	**Date of Test: 28 Jan. 2003**

Test Results: Complied

The maximum peak power output of the transmitter is 0.0865 watts. The base station RF Power did not vary with +/- 10% AC rail variations.

Measurement Data: Detachable antenna? ☐ Yes ☒ No

If yes, state the type of non-standard connector used at the antenna port:

Handset
Directional Gain of Antenna: 0 dBi or 1.0 Numeric
Peak Power Output: 0.0865 watts, 19.3 dBm
Field Strength: 114.6 dBμV/m @ 3m or 0.537V/m @ 3m.

Base Station
Directional Gain of Antenna: -1.0 dBi or 0.794 Numeric
Peak Power Output: 0.057 watts, 17.6 dBm
Field Strength: 111.8 dBμV/m @ 3m or 0.389 V/m @ 3m.

See Attached radiated measurements.

Radiated Disturbance Test Data: VTECH 2651 Base Station Fundamentals

Test Date: 22 Jan 2003	
Engineer's Name: Kevin Carr	
Temperature (C°): -10	Humidity %: 30
Tested as per (Table Top/Floor Standing): Table Top	
Test Distance (meters): 3	Range: Ottawa, Range 1
Emissions within 20 dB of the limit have been recorded. Pre-scan data can be found at the back of this section	

Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor (dB)	Cable Loss (dB)	Field Strength (dBµV/m)
Ch. 00						
2401.060	Horn 1	V	77.9	29.2	4.7	111.8
2401.070	Horn 1	H	76.5	29.2	4.7	110.4
Ch. 47						
2441.63	Horn 1	V	76.4	29.2	5.2	110.8
2441.63	Horn 1	H	75.2	29.2	5.2	109.6
Ch. 94						
2482.27	Horn 1	V	71.0	29.2	5.6	105.8
2482.27	Horn 1	H	73.7	29.2	5.6	108.5
Handset						
Ch 47						
2442	Horn 1	V	80.2	29.2	5.2	114.6
2442	Horn 1	H	77.3	29.2	5.2	111.7

Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW

Notes:	The RF Circuitry in the VTECH 2651 and VTECH 2656 are identical, therefore only the VTECH 2651 was tested

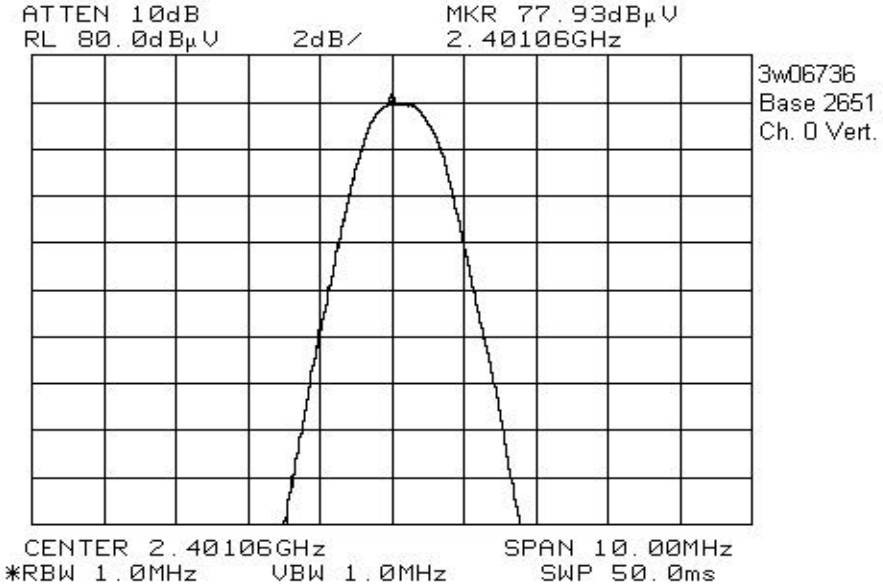
Radiated Disturbance Test Data: VTECH 2651 Handset Fundamentals

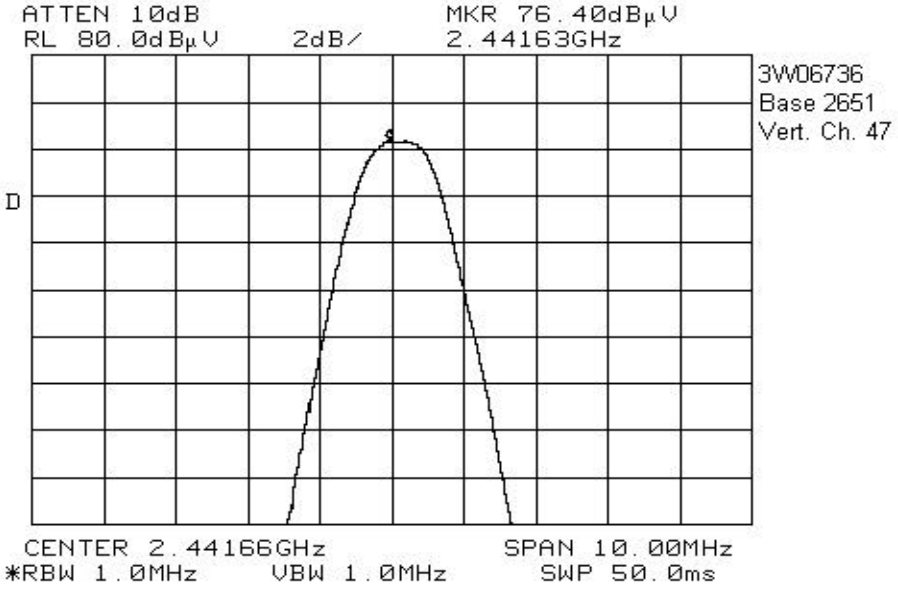
Test Date: 28 Jan 2003	
Engineer's Name: Kevin Carr	
Temperature (C°): 7	Humidity %: 65
Tested as per (Table Top/Floor Standing): Table Top	
Test Distance (meters): 3	Range:Almonte, Range
Emissions within 20 dB of the limit have been recorded. Pre-scan data can be found at the back of this section	

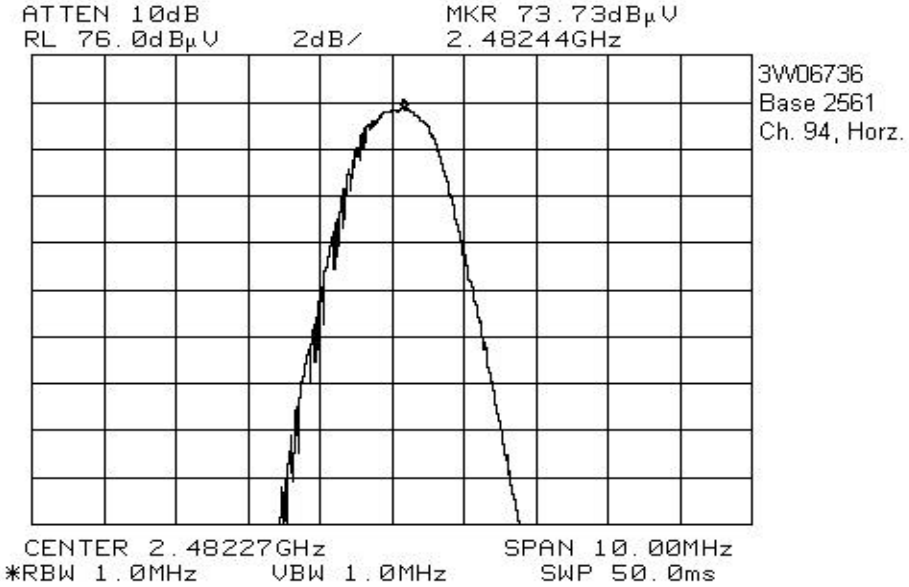
Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBµV)	Ant. Factor + Cable Loss (dB)	Field Strength (dBµV/m)
Ch. 00					
2400.97	Horn 3	V	80.2	37.7	117.9
2441.75	Horn 3	H	74.0	38.0	112.0
Ch. 94					
2482.26	Horn 3	V	78.2	38.1	116.3
2482.27	Horn 3	H	78.4	38.1	116.5

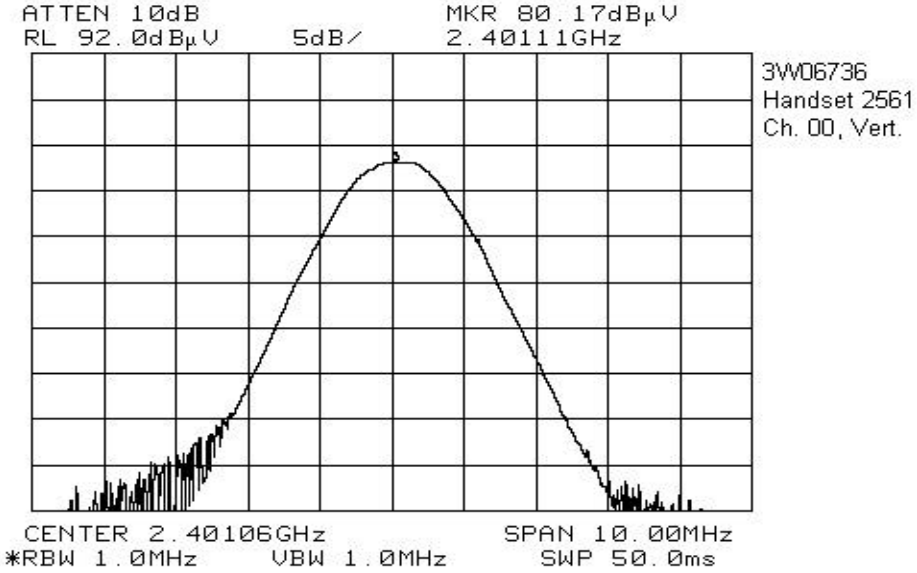
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Average = 1.0 MHz RBW

Notes:	The RF Circuitry in the VTECH 2651 and VTECH 2656 are identical, therefore only the VTECH 2651 was tested


ATTEN 10dB
RL 80.0dBμV
2dB/
MKR 77.93dBμV
2.40106GHz
3w06736
Base 2651
Ch. 0 Vert.
CENTER 2.40106GHz
SPAN 10.00MHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms


ATTEN 10dB
RL 80.0dBμV
2dB/
MKR 76.40dBμV
2.44163GHz
3W06736
Base 2651
Vert. Ch. 47
D
CENTER 2.44166GHz
SPAN 10.00MHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms


ATTEN 10dB
RL 76.0dBμV
2dB/
MKR 73.73dBμV
2.48244GHz
3W06736
Base 2561
Ch. 94, Horz.
CENTER 2.48227GHz
SPAN 10.00MHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms


ATTEN 10dB
RL 92.0dBμV
5dB/
MKR 80.17dBμV
2.40111GHz
3W06736
Handset 2561
Ch. 00, Vert.
CENTER 2.40106GHz
SPAN 10.00MHz
*RBW 1.0MHz
VBW 1.0MHz
SWP 50.0ms