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# EMC Test Report

# Application for Grant of Equipment Authorization

Industry Canada RSS-Gen Issue 3 / RSS 210 Issue 8 FCC Part 15 Subpart C

## Model: VAP2500

IC CERTIFICATION #: 109AS-VAP2500 FCC ID: ACQ-VAP2500

APPLICANT: Motorola Mobility

TEST SITE(S):

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July 7, 2012

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Fremont, CA. 94538-2435

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### **REVISION HISTORY**

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#### SCOPE

An electromagnetic emissions test has been performed on the Motorola Mobility model VAP2500, pursuant to the following rules:

Industry Canada RSS-Gen Issue 3

RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"

FCC Part 15 Subpart C

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in NTS Silicon Valley test procedures:

ANSI C63.4:2003 FCC DTS Measurement Procedure KDB558074

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

#### **OBJECTIVE**

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer's declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

#### STATEMENT OF COMPLIANCE

The tested sample of Motorola Mobility model VAP2500 complied with the requirements of the following regulations:

Industry Canada RSS-Gen Issue 3

RSS 210 Issue 8 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment" FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

The test results recorded herein are based on a single type test of Motorola Mobility model VAP2500 and therefore apply only to the tested sample. The sample was selected and prepared by Herman Huang of Motorola Mobility.

#### DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

### TEST RESULTS SUMMARY

DIGITAL TRANSMISSION SYSTEMS (5725 –5850 MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 210 A8.2	Digital Modulation	Systems uses OFDM techniques	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 210 A8.2 (1)	6dB Bandwidth	a: 16.26MHz n20: 17.53MHz n40: 36.27MHz	>500kHz	Complies
15.247 (b)	RSS 210 A8.2 (4)	Output Power (multipoint systems)	802.11a: $28.9  dBm$ (0.777 Watts) EIRP = 1.222 W <sup>Note 1</sup> 802.11n20: 28.8 dBm (0.766 Watts) EIRP = 1.214 W <sup>Note 1</sup> 802.11n40: 28.5 dBm (0.702 Watts) EIRP = 1.112 W <sup>Note 1</sup>	1 Watt, EIRP limited to 4 Watts.	Complies
15.247(d)	RSS 210 A8.2 (2)	Power Spectral Density	802.11a: -0.7 dBm / 3kHz 802.11n20 0 dBm / 3kHz 802.11n40 -1.5 dBm / 3kHz	Maximum permitted is 8dBm/3kHz	Complies
15.247(c)	RSS 210 A8.5	Antenna Port Spurious Emissions – 30MHz – 40 GHz	All spurious emissions < -20dBc	< -20dBc	Complies
15.247(c) / 15.209 Note 1: EIRP	RSS 210 A8.5 Table 2, 3	Radiated Spurious Emissions 30MHz – 40 GHz	53.5 dBµV/m @ 11572.1 MHz (-0.5 dB)	15.207 in restricted bands, all others < -20dBc	Complies

# GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Integral antennas	Unique or integral antenna required	Complies
15.207	RSS GEN Table 2	AC Conducted Emissions	35.4 dBµV @ 0.406MHz (-12.3 dB) 44.4dBuV @ 0.379MHz (-3.9 dB)	Refer to page 18	Complies
15.247 (b) (5) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in separate exhibit, RSS 102 declaration and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual	Refer to user manual	Statement required regarding non- interference	Complies
-	RSP 100 RSS GEN 7.1.5	User Manual	Integral antenna	Statement for products with detachable antenna	Complies
-	RSP 100 RSS GEN 4.4.1	99% Bandwidth	a: 18.96MHz n20: 20.03MHz n40: 37.01MHz	Information only	N/A

#### MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF power, conducted (power meter)	dBm	25 to 7000 MHz	$\pm 0.52 \text{ dB}$
RF power, conducted (Spectrum analyzer)	dBm	25 to 7000 MHz	$\pm 0.7 \text{ dB}$
Conducted emission of transmitter	dBm	25 to 26500 MHz	$\pm 0.7 \text{ dB}$
Conducted emission of receiver	dBm	25 to 26500 MHz	$\pm 0.7 \text{ dB}$
Radiated emission (substitution method)	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission (field strength)	dBµV/m	25 to 1000 MHz 1000 to 40000 MHz	$\frac{\pm 3.6 \text{ dB}}{\pm 6.0 \text{ dB}}$
Conducted Emissions (AC Power)	dBµV	0.15 to 30 MHz	± 2.4 dB

#### EQUIPMENT UNDER TEST (EUT) DETAILS

#### GENERAL

The Motorola Mobility model VAP2500 is a Video Access Point/Client that is designed to operate either as a wireless access point or wireless client in a network. Since the EUT would be placed on a table top during operation, the EUT was treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 120 Volts, 60 Hz, 12VDC/1Amp.

The sample was received on April 16, 2012 and tested on May 22 and 23 and June 18, 19 and 20, 2012. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Motorola	VAP2500	Video Access	M91215YA007	ACQ-VAP2500
		Point/Client	D	
Leader	MT12-	I.T.E Power	-	-
Electronics Inc	Y120100-A1	Supply		
Asian Power	WA-12M12FU-	Power supply	-	-
Device	AFAA			

#### OTHER EUT DETAILS

The EUT operates in the 5 GHz DTS and UNII bands using OFDM modulations (802.11a/n20/n40). It has four integral dipole antennas (2.0dBi).

#### ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 3.5 cm wide by 10 cm deep by 14.5 cm high.

#### **MODIFICATIONS**

No modifications were made to the EUT during the time the product was at NTS Silicon Valley.

#### SUPPORT EQUIPMENT

No local support equipment was used during testing.

The following equipment was used as remote support equipment for emissions testing:

Company	Model	Description	Serial Number	FCC ID
Hewlett Packard	EliteBook	Laptop	2CE940KDKY	-
	6930p			

#### EUT INTERFACE PORTS

The I/O cabling configuration during testing was as follows:

Dort	Connected		Cable(s)	
Port	То	Description	Shielded or Unshielded	Length(m)
Ethernet	PC Laptop	Cat 5	Unshielded	10
AC Power	AC Mains	2 Wire	Unshielded	2

#### EUT OPERATION

During emissions testing the EUT was set to continuously transmit on the desired channel at the selected power level.

### TEST SITE

#### GENERAL INFORMATION

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 3.3 of RSP-100, construction, calibration, and equipment data has been filed with the Commission and with industry Canada.

Site	Registratio	Location	
Site	FCC	Canada	Location
Chamber 3	769238	2845B-3	
Chamber 4	211948	2845B-4	41039 Boyce Road
Chamber 5	211948	2845B-5	Fremont,
Chamber 7	A2LA	2845B-7	CA 94538-2435
	accreditation	2043D-/	

ANSI C63.4:2003 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4:2003.

#### CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4:2003. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

#### RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4:2003 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4:2003.

#### MEASUREMENT INSTRUMENTATION

#### RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

#### INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

#### LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

#### FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

#### ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

#### ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a nonconductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.4:2003 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

#### INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

#### **TEST PROCEDURES**

#### EUT AND CABLE PLACEMENT

The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4:2003, and the worst-case orientation is used for final measurements.

#### CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

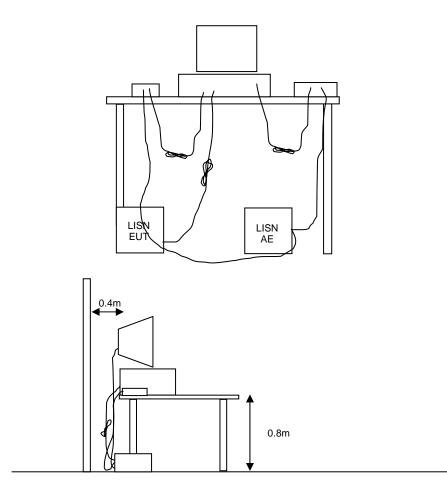


Figure 1 Typical Conducted Emissions Test Configuration

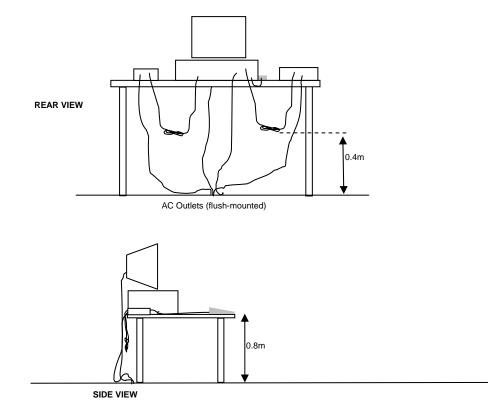
#### RADIATED EMISSIONS

A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

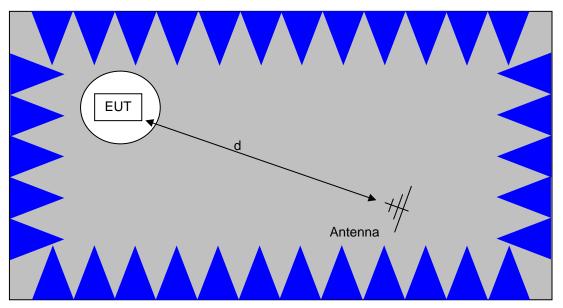
A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

When testing above 18 GHz, the receive antenna is located at 1 meter from the EUT and the antenna height is restricted to a maximum of 2.5 meters.

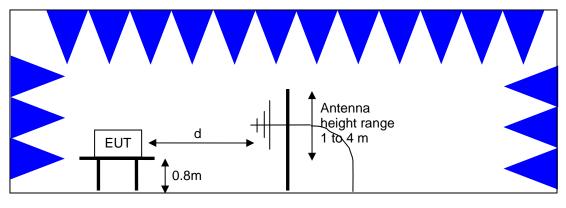


Typical Test Configuration for Radiated Field Strength Measurements



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

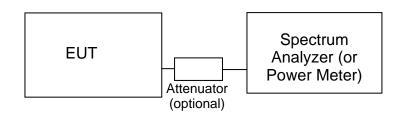
Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



<u>Test Configuration for Radiated Field Strength Measurements</u> <u>Semi-Anechoic Chamber, Plan and Side Views</u>

#### CONDUCTED EMISSIONS FROM ANTENNA PORT

Direct measurements of power, bandwidth and power spectral density are performed, where possible, with the antenna port of the EUT connected to either the power meter or spectrum analyzer via a suitable attenuator and/or filter. These are used to ensure that the front end of the measurement instrument is not overloaded by the fundamental transmission.



#### Test Configuration for Antenna Port Measurements

Measurement bandwidths (video and resolution) are set in accordance with the relevant standards and NTS Silicon Valley's test procedures for the type of radio being tested. When power measurements are made using a resolution bandwidth less than the signal bandwidth the power is calculated by summing the power across the signal bandwidth using either the analyzer channel power function or by capturing the trace data and calculating the power using software. In both cases the summed power is corrected to account for the equivalent noise bandwidth (ENBW) of the resolution bandwidth used.

If power averaging is used (typically for certain digital modulation techniques), the EUT is configured to transmit continuously. Power averaging is performed using either the built-in function of the analyzer or, if the analyzer does not feature power averaging, using external software. In both cases the average power is calculated over a number of sweeps (typically 100). When the EUT cannot be configured to continuously transmit then either the analyzer is configured to perform a gated sweep to ensure that the power is averaged over periods that the device is transmitting or power averaging is disabled and a max-hold feature is used.

If a power meter is used to make output power measurements the sensor head type (peak or average) is stated in the test data table.

#### BANDWIDTH MEASUREMENTS

The 6dB, 20dB and/or 26dB signal bandwidth is measured in using the bandwidths recommended by ANSI C63.4. When required, the 99% bandwidth is measured using the methods detailed in RSS GEN.

#### SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

#### CONDUCTED EMISSIONS SPECIFICATION LIMITS: FCC 15.207; FCC 15.107(a), RSS GEN

The table below shows the limits for the emissions on the AC power line from an intentional radiator and a receiver.

Frequency (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

#### GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands<sup>1</sup> (with the exception of transmitters operating under FCC Part 15 Subpart D and RSS 210 Annex 9), the limits for all emissions from a low power device operating under the general rules of RSS 310 (tables 3 and 4), RSS 210 (table 2) and FCC Part 15 Subpart C section 15.209.

Frequency Range (MHz)	Limit (uV/m)	Limit (dBuV/m @ 3m)
0.009-0.490	2400/F <sub>KHz</sub> @ 300m	67.6-20*log <sub>10</sub> (F <sub>KHz</sub> ) @ 300m
0.490-1.705	24000/F <sub>KHz</sub> @ 30m	87.6-20*log <sub>10</sub> (F <sub>KHz</sub> ) @ 30m
1.705 to 30	30 @ 30m	29.5 @ 30m
30 to 88	100 @ 3m	40 @ 3m
88 to 216	150 @ 3m	43.5 @ 3m
216 to 960	200 @ 3m	46.0 @ 3m
Above 960	500 @ 3m	54.0 @ 3m

#### RECEIVER RADIATED SPURIOUS EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from receivers as detailed in FCC Part 15.109, RSS 210 Table 2, RSS GEN Table 1 and RSS 310 Table 3. Note that receivers operating outside of the frequency range 30 MHz – 960 MHz are exempt from the requirements of 15.109.

Frequency Range (MHz)	Limit (uV/m @ 3m)	Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

<sup>&</sup>lt;sup>1</sup> The restricted bands are detailed in FCC 15.203, RSS 210 Table 1 and RSS 310 Table 2

#### OUTPUT POWER LIMITS - DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
902 - 928	1 Watt (30 dBm)	8 dBm/3kHz
2400 - 2483.5	1 Watt (30 dBm)	8 dBm/3kHz
5725 - 5850	1 Watt (30 dBm)	8 dBm/3kHz

The maximum permitted output power is reduced by 1dB for every dB the antenna gain exceeds 6dBi. Fixed point-to-point applications using the 5725 - 5850 MHz band are not subject to this restriction.

#### TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS 210. All other unwanted (spurious) emissions shall be at least 20dB below the level of the highest in-band signal level (30dB if the power is measured using the sample detector/power averaging method).

#### SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - S = M$$

where:

 $R_r = Receiver Reading in dBuV$ 

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

#### SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

 $F_d$  = Distance Factor in dB  $D_m$  = Measurement Distance in meters  $D_s$  = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40*LOG_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

 $M = R_c - L_s$ 

where:

 $R_r$  = Receiver Reading in dBuV/m

 $F_d$  = Distance Factor in dB

 $R_c$  = Corrected Reading in dBuV/m

 $L_S$  = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

#### SAMPLE CALCULATIONS - FIELD STRENGTH TO EIRP CONVERSION

Where the radiated electric field strength is expressed in terms of the equivalent isotropic radiated power (eirp), or where a field strength measurement of output power is made in lieu of a direct measurement, the following formula is used to convert between eirp and field strength at a distance of d (meters) from the equipment under test:

 $E = 1000000 \sqrt{30 P}$  microvolts per meter

d

where P is the eirp (Watts)

For a measurement at 3m the conversion from a logarithmic value for field strength (dBuV/m) to an eirp power (dBm) is -95.3dB.

# Appendix A Test Equipment Calibration Data

Radiated Emissions, 1	1000 - 6,500 MHz, 1-May-12			
Manufacturer	Description	Model	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)	3115	1142	8/2/2012
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	5/25/2012
Radiated Emissions. 3	30 - 1,000 MHz, 14-May-12			
Manufacturer	Description	Model	Asset #	Cal Due
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1657	5/28/2012
Com-Power Corp.	Preamplifier, 30-1000 MHz	PA-103A	2359	2/14/2013
Rohde & Schwarz	EMI Test Receiver, 20 Hz-40	ESIB40	2493	12/9/2012
	GHz	(1088.7490.40)		
<b>Conducted Emissions</b>	- AC Power Ports, 14-May-12			
Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz	Pulse Limiter	ESH3 Z2	1594	5/17/2012
Fischer Custom	LISN, 25A, 150kHz to 30MHz,	FCC-LISN-50-25-2-	2001	2/15/2013
Comm Rohde & Schwarz	25 Amp,	09 ESIB40	2493	12/9/2012
RUNUE & SCHWAIZ	EMI Test Receiver, 20 Hz-40 GHz	(1088.7490.40)	2493	12/9/2012
		(1000.1400.40)		
	1,000 - 10,000 MHz, 14-May-12			
Manufacturer	Description	<u>Model</u> 3115	<u>Asset #</u> 1142	<u>Cal Due</u> 8/2/2012
EMCO	Antenna, Horn, 1-18 GHz (SA40-Red)			
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB7	1756	5/25/2012
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	2199	2/23/2013
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	2239	10/4/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40)	8564E (84125C)	2415	7/28/2012
	Purple			
Radiated Emissions, 1	1000 - 40,000 MHz, 15-May-12			
Manufacturer	Description	Model	Asset #	Cal Due
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	263	3/29/2013
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/21/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	5/1/2013
Micro-Tronics	Band Reject Filter, 5150-5350	BRC50703-02	2239	10/4/2012
	MHz			
Radiated Emissions, 1	1000 - 26,500 MHz, 16-May-12			
Manufacturer	Description	Model	<u>Asset #</u>	<u>Cal Due</u>
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1681	9/8/2012
Hewlett Packard	Head (Inc W1-W4, 1946, 1947) Purple	84125C	1772	5/1/2013
A.H. Systems	Purple System Horn, 18-40GHz	SAS-574, p/n: 2581	2160	4/17/2013
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	2199	2/23/2013
Micro-Tronics	Band Reject Filter, 5150-5350	BRC50703-02	2251	10/11/2012
	MHz			

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Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	2415	7/28/2012
Radiated Emissions, <sup>2</sup> <u>Manufacturer</u> EMCO Rohde & Schwarz	1000 - 6,500 MHz, 16-May-12 <u>Description</u> Antenna, Horn, 1-18 GHz EMI Test Receiver, 20 Hz-7 GHz	<u>Model</u> 3115 ESIB7	<u>Asset #</u> 786 1630	<u>Cal Due</u> 12/19/2013 6/8/2012
Radiated Emissions, 7 <u>Manufacturer</u> EMCO Rohde & Schwarz	1000 - 6,500 MHz, 27-May-12 <u>Description</u> Antenna, Horn, 1-18 GHz EMI Test Receiver, 20 Hz-40 GHz	<u>Model</u> 3115 ESIB40 (1088.7490.40)	<u>Asset #</u> 1561 2493	<u>Cal Due</u> 6/22/2012 12/9/2012
Radiated Emissions.	1000 - 40,000 MHz, 21-May-12			
Manufacturer Hewlett Packard	<u>Description</u> Microwave Preamplifier, 1- 26.5GHz	Model 8449B	<u>Asset #</u> 263	<u>Cal Due</u> 3/29/2013
EMCO	Antenna, Horn, 1-18 GHz (SA40-Blu)	3115	1386	9/21/2012
Hewlett Packard	High Pass filter, 8.2 GHz (Blu System)	P/N 84300-80039 (84125C)	1392	5/18/2013
Hewlett Packard	SpecAn 9 kHz - 40 GHz, FT (SA40) Blue	8564E (84125C)	1393	5/1/2013
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	8/5/2012
Radiated Emissions, 7 <u>Manufacturer</u> Hewlett Packard	1 <b>000 - 40,000 MHz, 22-May-12</b> <u>Description</u> High Pass filter, 8.2 GHz (Blu System)	<u>Model</u> P/N 84300-80039 (84125C)	<u>Asset #</u> 1392	<u>Cal Due</u> 5/18/2013
EMCO Miero Tropico	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	8/5/2012
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	2199	2/23/2013
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	2415	7/28/2012
Radiated Emissions	1000 - 18,000 MHz, 23-May-12			
Manufacturer	<u>Description</u>	<u>Model</u>	Asset #	Cal Due
EMCO	Antenna, Horn, 1-18 GHz	3115	1561	6/22/2012
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1681	9/8/2012
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	2199	2/23/2013
Micro-Tronics	Band Reject Filter, 5725-5875 MHz	BRC50705-02	2241	10/4/2012
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	2415	7/28/2012
	18,000 - 40,000 MHz, 23-May-12			
<u>Manufacturer</u> Hewlett Packard	<u>Description</u> Head (Inc W1-W4, 1946, 1947) Purple	<u>Model</u> 84125C	<u>Asset #</u> 1772	<u>Cal Due</u> 5/1/2013
A.H. Systems Hewlett Packard	Purple System Horn, 18-40GHz SpecAn 9 kHz - 40 GHz, (SA40) Purple	SAS-574, p/n: 2581 8564E (84125C)	2160 2415	4/17/2013 7/28/2012

Radio Antenna Port (I <u>Manufacturer</u>	Power), 29-May-12 to 30-May-12 <u>Description</u>	Model	Asset #	<u>Cal Due</u>
Anritsu	Anritsu 68347C Signal Generator, 10MHz-20GHz	68347C	1785	11/16/2012
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	2/23/2013
	Power and Spurious Emissions), <sup>,</sup>		2	
<u>Manufacturer</u> Rohde & Schwarz	Description Power Meter, Single Channel	<u>Model</u> NRVS	<u>Asset #</u> 1290	<u>Cal Due</u> 12/5/2012
Rohde & Schwarz	Power Sensor 100 uW - 2 Watts use with 20dB attenuator sn:100059 only	NRV-Z32	1423	9/1/2012
Rohde & Schwarz	Pwr Sensor 300 uW - 30 Watts (+ 25dB pad)	NRV-Z54	1788	7/29/2012
Agilent	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1DS, B7J, HYX,	E4446A	2139	2/23/2013
Radiated Emissions,	1,000 - 40,000 MHz, 20-Jun-12			
Manufacturer EMCO	Description Antenna, Horn, 1-18 GHz (SA40-Blu)	<u>Model</u> 3115	<u>Asset #</u> 1386	<u>Cal Due</u> 9/21/2012
Hewlett Packard	Head (Inc flex cable, (1742,1743) Blue	84125C	1620	5/17/2013
Micro-Tronics	Band Reject Filter, 5150-5350 MHz	BRC50703-02	1729	8/5/2012
Micro-Tronics	Band Reject Filter, 5470-5725 MHz	BRC50704-02	1730	8/5/2012
Hewlett Packard	Microwave Preamplifier, 1- 26.5GHz	8449B	1780	11/22/2012
A.H. Systems	Spare System Horn, 18-40GHz	SAS-574, p/n: 2581	2162	5/8/2013
Hewlett Packard	SpecAn 9 kHz - 40 GHz, (SA40) Purple	8564E (84125C)	2415	7/28/2012
Radiated Emissions,	30 - 1,000 MHz & Conducted Emis	sions APD Supply, 25	-Jun-12	
Manufacturer	Description	Model	Asset #	Cal Due
Rohde & Schwarz Sunol Sciences	EMI Test Receiver, 20 Hz-7 GHz Biconilog, 30-3000 MHz	ESIB7 JB3	1538 1657	12/6/2012 6/4/2014
Fischer Custom	LISN, 25A, 150kHz to 30MHz,	FCC-LISN-50-25-2-	2001	2/15/2013
Comm Hewlett Packard	25 Amp, 9KHz-1300MHz pre-amp	09 8447F	2328	5/2/2013
HEWIELL FACKALU	and z-rootin iz pre-amp	0441 Г	2320	51212013

# Appendix B Test Data

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# EMC Test Data

Client:	Motorola	Job Number:	J87247
Model:	VAP2500	T-Log Number:	T87276
		Account Manager:	
Contact:	Rob Linebarger		
Emissions Standard(s):	FCC	Class:	В
Immunity Standard(s):	-	Environment:	-

# **EMC** Test Data

For The

# Motorola

Model

VAP2500

Date of Last Test: 6/25/2012



# EMC Test Data

r: J87247
r: T87276
: Christine Krebill
: B
t: -
ei ss

# Power vs. Data Rate

In normal operating modes the card uses power settings stored on EEPROM to set the output power. For a given nominal output power the actual transmit power is redcued as the data rate increases, therefore testing was performed at the lowest data rate in each mode as this data rate to determine compliance with the requirements at the highest power seting.

The following power measurements were made using an average power meter and the with the device configured in a continuous transmit mode on Chain A at the various data rates in each mode to verify this:

Date of Test: 5/31/2012 Test Engineer: Rafael Varelas Test Location: FT Lab #4 Config. Used: 1 Config Change: None Host Unit Voltage 120V/60Hz

Using Avg power meter

#### 802.11 DTS 5GHz Chain 1

Mode	Data Rate	Power (dBm)	Power setting	Data Rate Setting
	6	16.0		0
	9	15.8		1
	12	15.6		2
802.11a	18	15.6	17.0	3
002.118	24	15.4	17.0	4
	36	15.4		5
	48	15.4		6
	54	15.3		7
	6.5	15.9		0
	13	15.7		1
	19.5	15.7		2
802.11n 20MHz	26	15.7	17.0	3
002.11112010112	39	15.6	17.0	4
	52	15.5		5
	58.5	15.4		6
	65	15.3		7
	13.5	15.8		0
	27	15.7		1
	40.5	15.6		2
802.11n 40MHz	54	15.5	17.0	3
	81	15.4	17.0	4
	108	15.3		5
	121.5	14.7		6
	135	14.6		7

	NTS	SUCCESS			EM	C Test Data
Client:	Motorola	50002			Job Number:	J87247
					T-Log Number:	
Model:	VAP2500				Account Manager:	
Contact:	Rob Linebar	ger				
Standard:	FCC	- 			Class:	N/A
	F		and FCC 15.247 (DTS) MIMO and Smart A Power, PSD, Bandwidth ar	ntenna Syste	ms	S
Test Spec		The objectiv	e of this test session is to perform I listed above.	final qualification te	sting of the EUT with	respect to the
Те	Date of Test: est Engineer: est Location:	R. Varelas,	0/12 J. cadidal, J. Liu	Config. Used: 1 Config Change: No EUT Voltage: 12		
	<b>Cest Confi</b> as connected		rum analyzer or power meter via a	suitable attenuator	. All measurements w	vere made on a single
All measure	ments have b	een correcte	ed to allow for the external attenua	itors used.		
Ambient	Conditions	Т	emperature: 22.4 °C el. Humidity: 35 %			
Summary	of Result	S				
Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
802.11a						
1	-	-	Output Power	15.247(		28.9 dBm
2 802.11n20	-	-	Power spectral Density (PSD)	15.247(	d) Pass	-0.7 dBm/3kHz
3	-	-	Output Power	15.247(	b) Pass	28.8 dBm
4	-	-	Power spectral Density (PSD)			0 dBm/3kHz
802.11n40	· · · · · · · · · · · · · · · · · · ·					
5	-	-	Output Power	15.247(		28.5 dBm
6	-	-	Power spectral Density (PSD)	15.247(	d) Pass	-1.5 dBm/3kHz

		SUCCESS				EMO	C Test Data
Client:	Motorola				~	Job Number:	J87247
Model			T-l	og Number:	T87276		
Model: VAP2500 Account Manager: Christine Krel							
Contact:	Rob Linebar	ger					
Standard:	FCC					Class:	N/A
Run #	Pwr setting	Avg Pwr	Test Performed	Lir	nit	Pass / Fail	Result / Margin
All modes							
7	-	-	Minimum 6dB Bandwidth	15.24	47(a)	Pass	a: 16.26MHz n20: 17.53MHz n40: 36.27MHz
7	-	-	99% Bandwidth	RSS	GEN	Pass	a: 18.96MHz n20: 20.03MHz n40: 37.01MHz
8	-	-	Spurious emissions	15.24	47(b)	Pass	All emissions below the -20dBc limit

Modifications Made During Testing No modifications were made to the EUT during testing

## Deviations From The Standard

No deviations were made from the requirements of the standard.

							EM	C Test	Data
Client:	Viotorola					J	ob Number:	J87247	
							og Number:	T87276	
Model: \	Model: VAP2500						Account Manager: Christine Kre		bill
Contact: F	Rob Linebarger								
Standard: F	8						Class:	N/A	
Run #1: Out Trans	•	rating Mode: s coherent ?							
	5745 MHz	Chain 1	Chain 2	Chain 3	Chain 4				
Power Setting	q	ondin 1		3.0	ondin	Total Acros	s All Chains	Lin	hit
Average pow	er <sup>Note 3</sup>	17.2	17.4	17.7	17.7			<u> </u>	
Output Power	r (dBm) <sup>Note 1</sup>	22.73	22.89	22.92	22.99	28.9 dBm	0.777 W	30.0 dBm	1.000 W
Antenna Gair	n (dBi) <sup>Note 2</sup>	2.0	2.0	2.0	2.0		2.0 dBi	Dev	
eirp (dBm) Not	te 2	24.73	24.89	24.92	24.99	30.9 dBm	1.231 W	Pas	22
				-					
	5785 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across	s All Chains	Lin	nit
Power Setting	g			3.0				LIII	III
Average pow	er <sup>Note 3</sup>	17.3	17.4	17.8	17.8			I T	
Output Power	r (dBm) <sup>Note 1</sup>	22.55	22.64	22.84	22.98	28.8 dBm	0.754 W	30.0 dBm	1.000 W
Antenna Gair	n (dBi) <sup>Note 2</sup>	2.0	2.0	2.0	2.0		2.0 dBi	Pas	22
eirp (dBm) <sup>Not</sup>	te 2	24.55	24.64	24.84	24.98	30.8 dBm	1.196 W	T U.	55
	5825 MHz	Chain 1	Chain 2	Chain 3	Chain 4	<b>T</b> 1 1 4			
Power Setting	q			3.0		Total Acros	s All Chains	Lin	lit
Average pow	er <sup>Note 3</sup>	17.4	17.6	17.7	17.7				
Output Power	r (dBm) Note 1	22.65	22.8	22.9	23.04	28.9 dBm	0.771 W	30.0 dBm	1.000 W
Antenna Gair	n (dBi) Note 2	2.0	2.0	2.0	2.0		2.0 dBi	Dev	
eirp (dBm) <sup>Not</sup>	te 2	24.65	24.8	24.9	25.04	30.9 dBm	1.222 W	Pas	55
Note 2: Note 3: F	Dutput power measured As there is no coherency he eirp divide by the sur Power setting and avera sensor. Power setting is	v between channed by bower areas a channed by bower and by bower areas a channed by bower and by bower a channed by bower and by bower a channed by bower and by bower a channed by bower and by bower a channed by bower	ains the total er on each cl for referenc	EIRP is the nain. e only. Aver	sum of the ir age power is	ndividual EIRF		-	•

Setting         Frequency (WH2)         Chain 1         Chain 2         Chain 3         Chain 4         Total         dBm/3kHz         Result           18         5745         -7.8         -8.7         -4.3         -7.6         -0.7         8.0         Pass           18         5785         -5.2         -9.3         -8.0         -8.2         -1.4         8.0         Pass           18         5825         -7.8         -8.4         -8.8         -9.5         -2.6         8.0         Pass           Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to	Onorm	Motorola						Job Number:	J87247
Account Manager:       Christine Krebill         Contact:       Rob Linebarger       Image:         Standard:       FCC       Class:         Im #2:       Power spectral Density       Image:         Power       Frequency (MHz)       PSD (dBm/3kHz)         Image:       Chain 1       Chain 2         Chain 1       Chain 2       Chain 3         Image:       Chain 1       Chain 2         Image:       Chain 1       Chain 2         Image:       Chain 1       Chain 2         Image:       Chain 3       Chain 4         Image:       Total       dBm/3kHz         Image:       Chain 1       Chain 2         Chain 3       Chain 4       Total         Image:       S745       -7.8         -8.7       -4.3       -7.6       -0.7         Image:       S825       -7.8       -8.4       -8.8         Image:       S825       -7.8       -8.4       -8.8       -9.5       -2.6       8.0       Pass         Image:       Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined fror <th>Model</th> <th>VAP2500</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	Model	VAP2500							
Standard:       FCC       Class:       N/A         In #2:       Power spectral Density       PSD (dBm/3kHz)       Note 1       Limit       Result         Setting       Frequency (MHz)       Chain 1       Chain 2       Chain 3       Chain 4       Total       dBm/3kHz       Result         18       5745       -7.8       -8.7       -4.3       -7.6       -0.7       8.0       Pass         18       5785       -5.2       -9.3       -8.0       -8.2       -1.4       8.0       Pass         18       5825       -7.8       -8.4       -8.8       -9.5       -2.6       8.0       Pass         18       5825       -7.8       -8.4       -8.8       ensure adwell time of at least 1 second per 3kHz.       VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from							Acco	unt Manager:	Christine Krebill
Power spectral Density         Power       Frequency (MHz)       PSD (dBm/3kHz)       Note 1       Limit dBm/3kHz       Result         18       5745       -7.8       -8.7       -4.3       -7.6       -0.7       8.0       Pass         18       5785       -5.2       -9.3       -8.0       -8.2       -1.4       8.0       Pass         18       5785       -5.2       -9.3       -8.0       -8.2       -1.4       8.0       Pass         18       5825       -7.8       -8.4       -8.8       -9.5       -2.6       8.0       Pass         18       5825       -7.8       -8.4       -8.8       result       -9.5       -2.6       8.0       Pass         18       5825       -7.8       -8.4       -8.8       result       -9.5       -2.6       8.0       Pass         Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from the sweep time set to ensure a dwell time of at least 1 second per 3kHz.								01	N1/A
Power Setting       Frequency (MHz)       PSD (dBm/3kHz)       Note 1       Limit dBm/3kHz       Result dBm/3kHz         18       5745       -7.8       -8.7       -4.3       -7.6       -0.7       8.0       Pass         18       5785       -5.2       -9.3       -8.0       -8.2       -1.4       8.0       Pass         18       5825       -7.8       -8.4       -8.8       -9.5       -2.6       8.0       Pass         18       5825       -7.8       -8.4       -8.8       result       -9.5       -2.6       8.0       Pass         Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from								Class:	N/A
Setting       Chain 1       Chain 2       Chain 3       Chain 4       Total       dBm/3kHz       Result         18       5745       -7.8       -8.7       -4.3       -7.6       -0.7       8.0       Pass         18       5785       -5.2       -9.3       -8.0       -8.2       -1.4       8.0       Pass         18       5825       -7.8       -8.4       -8.8       -9.5       -2.6       8.0       Pass         Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from	un #2: PC	wer spectral Density							
Setting       Chain 1       Chain 2       Chain 3       Chain 4       Total       dBm/3kHz       Result         18       5745       -7.8       -8.7       -4.3       -7.6       -0.7       8.0       Pass         18       5785       -5.2       -9.3       -8.0       -8.2       -1.4       8.0       Pass         18       5825       -7.8       -8.4       -8.8       -9.5       -2.6       8.0       Pass         Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from	Power			PSD	(dBm/3kHz)	Note 1		Limit	Docult
18       5785       -5.2       -9.3       -8.0       -8.2       -1.4       8.0       Pass         18       5825       -7.8       -8.4       -8.8       -9.5       -2.6       8.0       Pass         Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from the set of the s	Setting	Frequency (MITZ)	Chain 1				Total	dBm/3kHz	Result
18       5825       -7.8       -8.4       -8.8       -9.5       -2.6       8.0       Pass         Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from the frequency of PPSD determined from the second per 3kHz.	18	5745	-7.8	-8.7	-4.3	-7.6	-0.7	8.0	Pass
Power spectral density measured using RB=3 kHz, VB=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from			-5.2	-9.3	-8.0		-1.4	8.0	Pass
· · · · · · · · · · · · · · · · · · ·	18	5825	-7.8	-8.4	-8.8	-9.5	-2.6	8.0	Pass

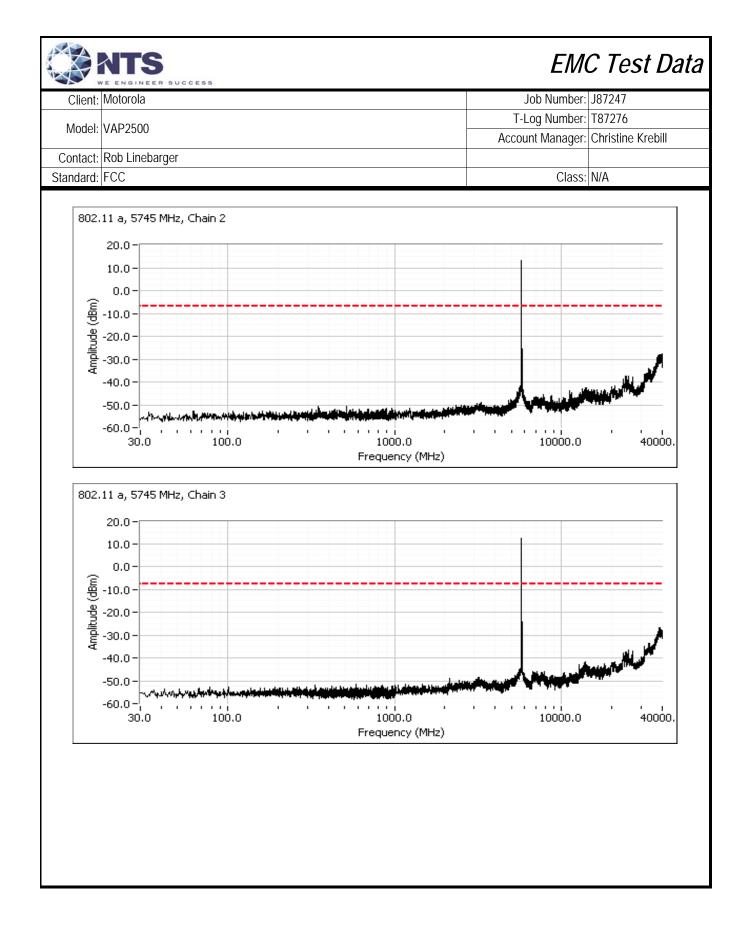
Client:	Motorola					J	ob Number:	J87247	
							og Number:		
Model: VAP2500							0	Christine Kre	bill
Contact:	Rob Linebarger						<u> </u>		
Standard:	°						Class:	N/A	
	Itput Power								
	-	erating Mode: is coherent ?							
	5745 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across	s All Chains	Lin	nit
Power Setti		47.0		3.0	47.0				
Averade por	Ner <sup>Note 3</sup>	17.3	17.5	17.8	17.8	28.8 dBm	0.757\\\/	20.0 40~	1 000 14
Output Pow		22.52 2.0	22.69 2.0	22.85 2.0	23 2.0	20.8 aRW	0.757 W 2.0 dBi	30.0 dBm	1.000 W
Antenna Ga	in (dBi) Note 2 lote 2	2.0	2.0	2.0	2.0	30.8 dBm	2.0 0Bi 1.199 W	Pa	SS
eirp (dBm) <sup>N</sup>		Z4.0Z	24.09	24.00	20	30.0 UDIII	1.177 VV	1	
	5785 MHz	Chain 1	Chain 2	Chain 3	Chain 4	<b>T</b>			
Power Setti				3.0		Total Across	s All Chains	Lin	nit
verade po	wer <sup>Note 3</sup>	17.3	17.4	17.8	18.0				
Dutput Pow	er (dBm) <sup>Note 1</sup>	22.6	22.6	22.86	22.98	28.8 dBm	0.756 W	30.0 dBm	1.000 V
Antenna Ga	in (dBi) <sup>Note 2</sup>	2.0	2.0	2.0	2.0		2.0 dBi	Pa	22
eirp (dBm) <sup>Ւ</sup>	lote 2	24.6	24.6	24.86	24.98	30.8 dBm	1.198 W	r u.	55
	5005 141					T		1	
Dowor Cotti	5825 MHz	Chain 1	Chain 2	Chain 3 3.0	Chain 4	Total Across	s All Chains	Lin	nit
Power Settin Average pov		17.3	17.5	18.0	18.0				
Output Pow	er (dBm) <sup>Note 1</sup>	22.65	22.68	22.97	22.97	28.8 dBm	0.766 W	30.0 dBm	1.000 V
Antenna Ga		2.0	2.0	2.0	2.0	2010 4211	2.0 dBi		
eirp (dBm) <sup>N</sup>	lote 2	24.65	24.68	24.97	24.97	30.8 dBm	1.214 W	Pa	SS
Note 1:	Output power measure	d using a peak	power mete	er, spurious li	mit is -20dB	C.			
Note 2:	As there is no coherend	5			sum of the ir	ndividual EIRF	Ps and effect	tive antenna g	jain equa
11010 21	the eirp divide by the su								
	Power setting and aver	age power are	for referenc	e only. Aver	age power is	s the power m	easured usi	ng an average	e power
Note 3:	sensor. Power setting		atting wood in						

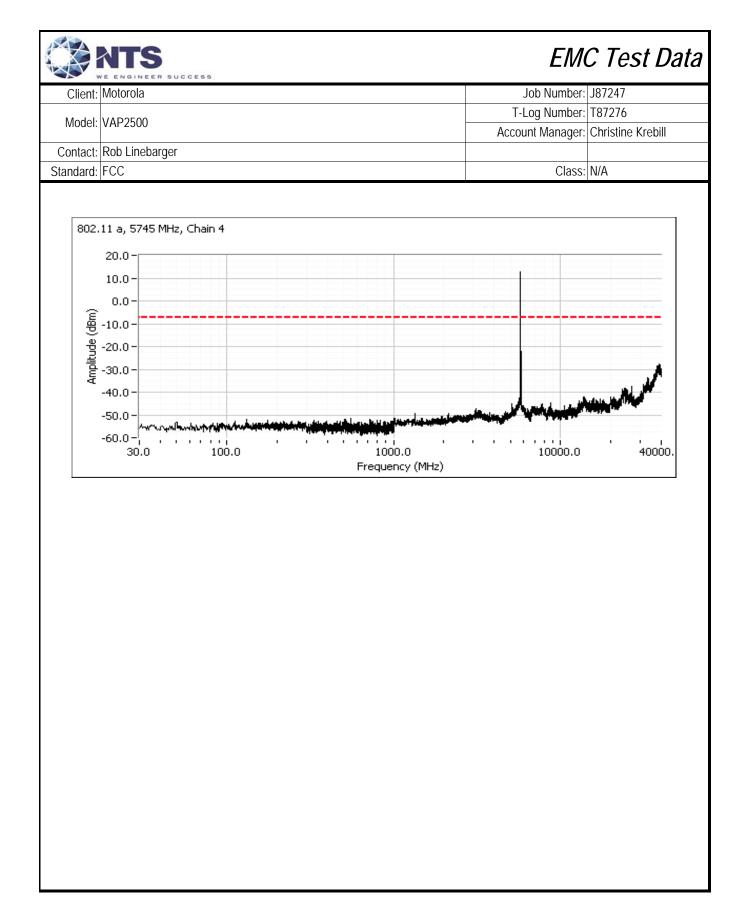
Model:VAP2500Contact:Rob LinebargerStandard:FCCRun #4:Power spectral DensityPowerFrequency (MHz)Setting18185745185785185825Note 1:Power spectral density ensure a dwell time of a preliminary scans using	at least 1 seco	Chain 2 -8.5 -7.8 -5.5 ng RB=3 kHz nd per 3kHz.	The measur	Chain 4 -7.9 -4.8 -8.5 , analyzer wit rement is made	Acco Total -0.3 0.0 0.5 h peak dete de at the free	Class: Limit dBm/3kHz 8.0 8.0 8.0 8.0 ector and with equency of PP	Christine Krebi N/A Result Pass Pass Pass a sweep time s 2SD determined
Contact:       Rob Linebarger         Standard:       FCC         Run #4:       Power spectral Density         Power       Frequency (MHz)         18       5745         18       5785         18       5785         18       5825         Power spectral density         Power spectral density         ensure a dwell time of a	-5.5 -4.4 -4.3 measured usin at least 1 seco	Chain 2 -8.5 -7.8 -5.5 ng RB=3 kHz nd per 3kHz.	Chain 3 -4.7 -8.8 -4.7 z, VB=10kHz, The measur	Chain 4 -7.9 -4.8 -8.5 , analyzer wit rement is made	Total -0.3 0.0 0.5 h peak dete de at the free	Class: Limit dBm/3kHz 8.0 8.0 8.0 8.0 ector and with equency of PP	N/A Result Pass Pass Pass a sweep time s 2SD determined
Standard:       FCC         Run #4:       Power spectral Density         Power       Frequency (MHz)         Setting       5745         18       5785         18       5785         18       5825         Power spectral density         Power 1:       ensure a dwell time of a	-5.5 -4.4 -4.3 measured usin at least 1 seco	Chain 2 -8.5 -7.8 -5.5 ng RB=3 kHz nd per 3kHz.	Chain 3 -4.7 -8.8 -4.7 z, VB=10kHz, The measur	Chain 4 -7.9 -4.8 -8.5 , analyzer wit rement is made	-0.3 0.0 0.5 h peak dete	Limit dBm/3kHz 8.0 8.0 8.0 ector and with equency of PP	Result Pass Pass Pass a sweep time s 2SD determined
Power       Frequency (MHz)         Setting       5745         18       5785         18       5785         18       5825         Power spectral density         ote 1:       Power a dwell time of a	-5.5 -4.4 -4.3 measured usin at least 1 seco	Chain 2 -8.5 -7.8 -5.5 ng RB=3 kHz nd per 3kHz.	Chain 3 -4.7 -8.8 -4.7 z, VB=10kHz, The measur	Chain 4 -7.9 -4.8 -8.5 , analyzer wit rement is made	-0.3 0.0 0.5 h peak dete	Limit dBm/3kHz 8.0 8.0 8.0 ector and with equency of PP	Result Pass Pass Pass a sweep time s 2SD determined
Power Setting     Frequency (MHz)       18     5745       18     5785       18     5825       Power spectral density ensure a dwell time of a	-5.5 -4.4 -4.3 measured usin at least 1 seco	Chain 2 -8.5 -7.8 -5.5 ng RB=3 kHz nd per 3kHz.	Chain 3 -4.7 -8.8 -4.7 z, VB=10kHz, The measur	Chain 4 -7.9 -4.8 -8.5 , analyzer wit rement is made	-0.3 0.0 0.5 h peak dete	dBm/3kHz 8.0 8.0 8.0 ector and with equency of PP	Pass Pass Pass a sweep time s 2SD determined
Setting     Frequency (MHZ)       18     5745       18     5785       18     5825       Power spectral density       Iote 1:	-5.5 -4.4 -4.3 measured usin at least 1 seco	Chain 2 -8.5 -7.8 -5.5 ng RB=3 kHz nd per 3kHz.	Chain 3 -4.7 -8.8 -4.7 z, VB=10kHz, The measur	Chain 4 -7.9 -4.8 -8.5 , analyzer wit rement is made	-0.3 0.0 0.5 h peak dete	dBm/3kHz 8.0 8.0 8.0 ector and with equency of PP	Pass Pass Pass a sweep time s 2SD determined
Setting     5745       18     5785       18     5785       18     5825       Power spectral density       ote 1:       ensure a dwell time of a	-5.5 -4.4 -4.3 measured usin at least 1 seco	Chain 2 -8.5 -7.8 -5.5 ng RB=3 kHz nd per 3kHz.	Chain 3 -4.7 -8.8 -4.7 z, VB=10kHz, The measur	Chain 4 -7.9 -4.8 -8.5 , analyzer wit rement is made	-0.3 0.0 0.5 h peak dete	8.0 8.0 8.0 ector and with equency of PP	Pass Pass Pass a sweep time s 2SD determined
18     5785       18     5825       Power spectral density       lote 1:	-4.4 -4.3 measured usin at least 1 seco	-7.8 -5.5 ng RB=3 kHz nd per 3kHz.	-8.8 -4.7 z, VB=10kHz, The measur	-4.8 -8.5 , analyzer wit rement is mad	0.0 0.5 h peak dete de at the fre	8.0 8.0 ector and with equency of PP	Pass Pass a sweep time s 2SD determined
18     5825       Power spectral density       ote 1:       ensure a dwell time of a	-4.3 measured usin at least 1 seco	-5.5 ng RB=3 kHz nd per 3kHz.	-4.7 z, VB=10kHz, The measur	-8.5 , analyzer wit rement is mad	0.5 h peak dete de at the fre	8.0 ector and with equency of PP	Pass a sweep time s 2SD determined
Power spectral density ote 1: ensure a dwell time of a	measured usin at least 1 seco	ng RB=3 kHz nd per 3kHz.	z, VB=10kHz, The measur	, analyzer wit ement is mad	h peak dete de at the fre	ector and with equency of PP	a sweep time s SD determined
ote 1: ensure a dwell time of a	at least 1 seco	nd per 3kHz.	The measur	rement is mad	de at the fre	equency of PP	SD determined

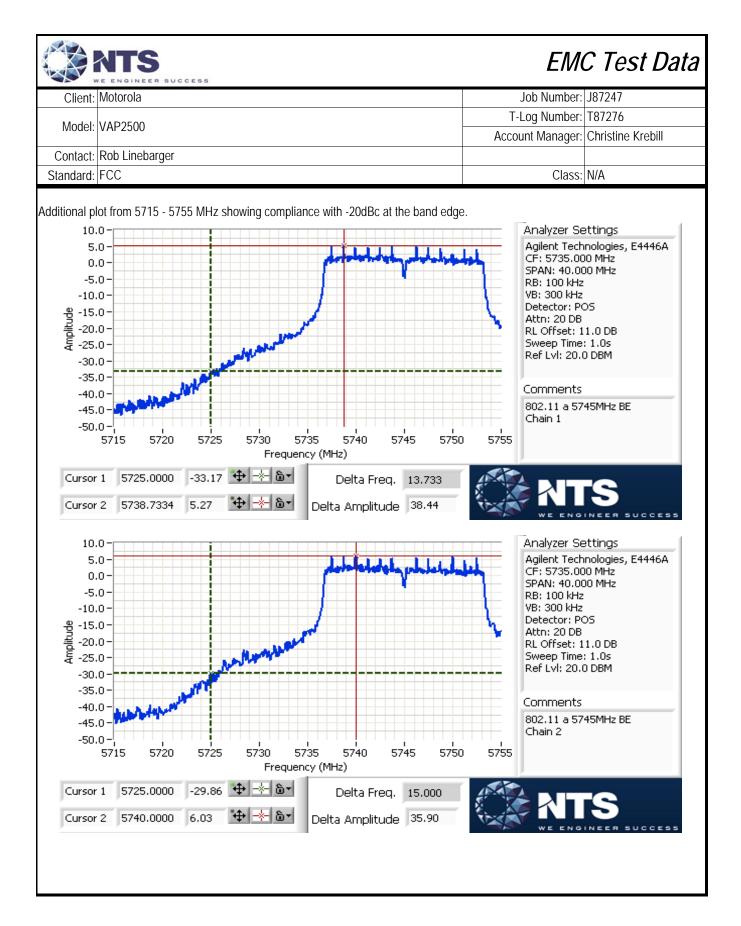
	Motorola						Job Number:	J87247	
Model:						T-Log Number:			
	Model: VAP2500						Account Manager: Christine Krebill		ebill
Contact: F	Rob Linebarger								
Standard: F	FCC					Class: N/A			
un #5: Out	•								
Trans	Ope smitted signal on chain i	rating Mode: is coherent ?							
	5755 MHz	Chain 1	Chain 2	Chain 3	Chain 4				
Power Setting				3.0	Undin 4	Total Acros	s All Chains	Limit	
verage powe	/er <sup>Note 3</sup>	16.9	17.2	17.5	17.2			1	
Dutput Power (dBm) Note 1		22.25	22.22	22.34	22.46	28.3 dBm	0.682 W	30.0 dBm	1.000 V
ntenna Gain (dBi) Note 2		2.0	2.0	2.0	2.0		2.0 dBi	Da	200
eirp (dBm) <sup>Not</sup>	ote 2	24.25	24.22	24.34	24.46	30.3 dBm	1.081 W	Pass	
						r			
	5795 MHz	Chain 1	Chain 2	Chain 3	Chain 4	Total Across All Chains		Limit	
ower Setting		16.9	17.2	3.0 17.5	17.5				
<u>Verage power<sup>Note 3</sup></u> Dutput Power (dBm) <sup>Note 1</sup>		22.3	22.4	22.42	22.64	28.5 dBm	0.702 W	30.0 dBm	1.000 V
ntenna Gain (dBi) <sup>Note 2</sup>		2.0	2.0	2.0	2.0	20.0 0011	2.0 dBi		
eirp (dBm) <sup>Note 2</sup>		24.3	24.4	24.42	24.64	30.5 dBm	1.112 W	Pa	ISS
	Output power measured								
	As there is no coherency				sum of the ir	ndividual EIR	Ps and effect	ive antenna	gain equa
ti	the eirp divide by the sur					the new or m			
	Power setting and avera sensor. Power setting is			s the power m	ieasured usi	ng an averag	je power		
3	Selisor. Fower setting is		etting used ii		ty.				
lun #6: Pow	wer spectral Density								
Power			PSD	(dBm/3kHz)	Note 1		Limit	Docult	1
Setting	Frequency (MHz)	Chain 1	Chain 2	Chain 3	Chain 4	Total	dBm/3kHz	Result	
18	5755	-7.8	-9.5	-9.1	-5.2	-1.5	8.0	Pass	
18	5795	-5.2	-8.9	-8.8	-9.3	-1.7	8.0	Pass	

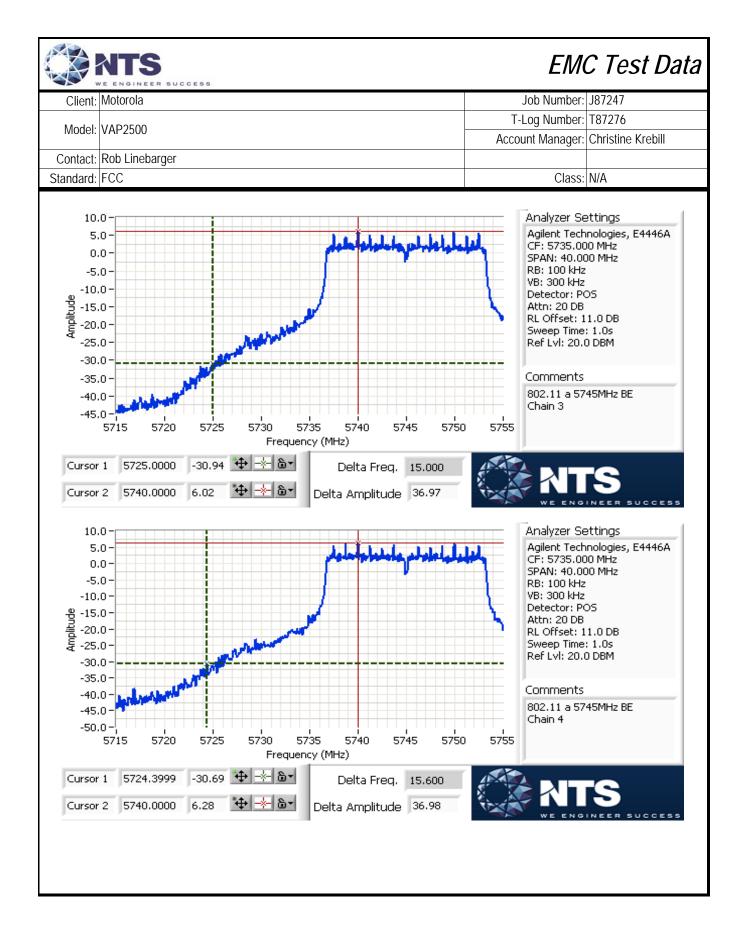
		SUCCESS				EM	C Test Data
Client:	Motorola					Job Number:	J87247
						T-Log Number:	T87276
wodel:	VAP2500				-	Account Manager:	Christine Krebill
Contact:	Rob Linebar	ger					
Standard:	FCC	*				Class:	N/A
Run #7: Sig	gnal Bandwi	dth			L. L		
	-						
Mode:	802.11a		Desclution	Danahuia			
	Power	Frequency (MHz)	Resolution Bandwidth	6dB	th (MHz) 99%		
	Setting 18	5745	100k/1M	16.33	18.96		
	18	5785	100k/1M	16.40	19.30		
	18	5825	100k/1M	16.26	19.43		
Mode:	802.11n20						
	Power	Frequency (MHz)	Resolution		lth (MHz)		
	Setting		Bandwidth	6dB	99%		
	18	5745 5785	100k/1M 100k/1M	17.53	20.10		
	18 18	5825	100k/1M 100k/1M	17.60 17.53	20.16 20.03		
	10	5025	TUUN/ TIVI	17.00	20.03		
Mode:	802.11n40						
	Power	Frequency (MHz)	Resolution	Bandwic	lth (MHz)		
	Setting		Bandwidth	6dB	99%		
	18	5755	100k/1M	36.27	37.01		
	18	5795	100k/1M	36.27	37.14		
lote 1:	Measured or	n a single chain					
		dth measured in accord	ance with RSS	GEN, with	RB > 1% of th	e span and VB > 3xRB	
1010 2.	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						

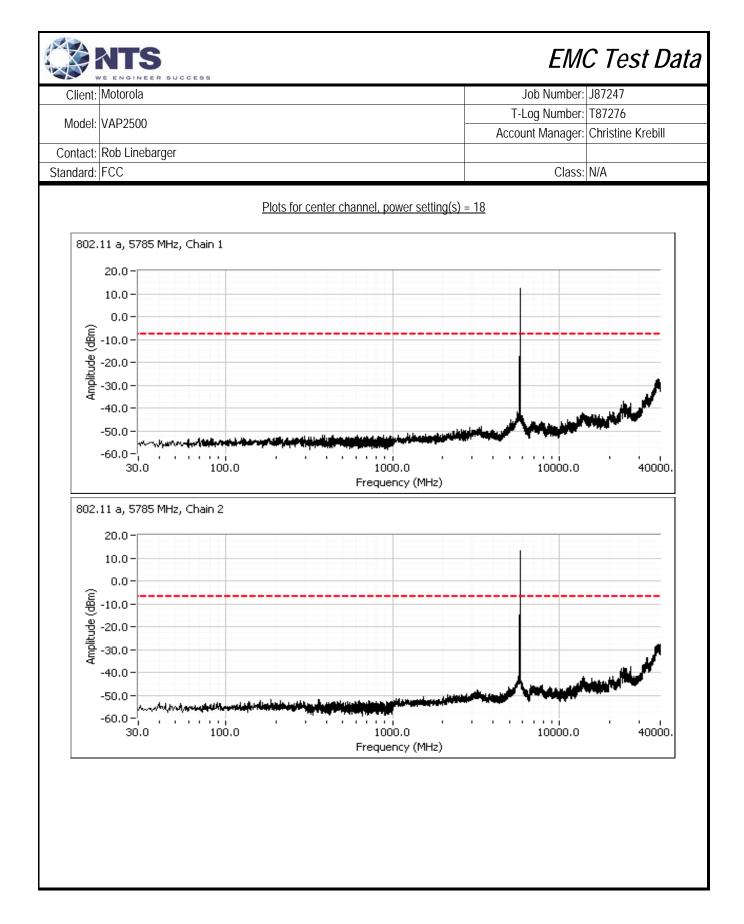
	Motorola					Job Number:	J87247	
Madal					T-Log Number: T87276			
woder	: VAP2500				Account Manager: Christine Krebil			
Contact	Rob Lineba	rger						
andard	FCC					Class:	N/A	
ı #8:  O	ut of Band S	purious Emi	ssions					
Mada	000 11-							
wode	802.11a Power Setti	ng Per Chain						
#1	#2	#3	#4	Frequency (MHz)	Limit	Re	sult	
18	18	18	18	5745	-20dBc	Pa	ISS	
18	18	18	18	5785	-20dBc		ISS	
18	18	18	18	5825	-20dBc	Pa	iS	
Mode	802.11n20							
moue.		ng Per Chain			11.1	-		
#1	#2	#3	#4	Frequency (MHz)	Limit	Re	sult	
18	18	18	18	5745	-20dBc		ISS	
18	18	18	18	5785	-20dBc		ISS	
18	18	18	18	5825	-20dBc	Pa	ISS	
Mode:	802.11n40							
		ng Per Chain		Frequency (MHz)	Limit	Do	sult	
#1	#2	#3	#4					
18	18	18	18	5755	-20dBc		ISS	
18	18	18	18	5795	-20dBc	Pa	ISS	
e 1:	Measured o	n each chain	individually					
	in out our our o		indiriddaily					
.11 a			D		- II' (-) 10			
				lots for low channel, power se	etting(s) = 18			
802	.11 a, 5745	MHz, Chain 1						
	20.0-							
	10.0-							
	0.0-							
1 2								
Ð	-10.0-							
9	-20.0-							
1 3	30.0 -							
mplituc							a M	
Amolitude (dBm)								
Amplituc	-40.0-				L.	العادير ويستحر		

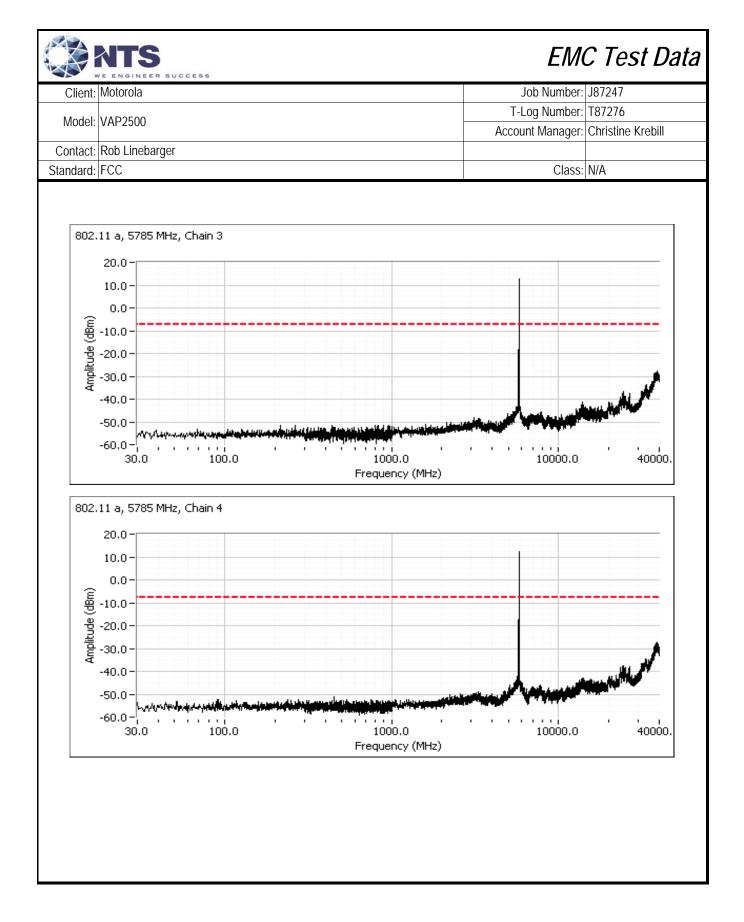


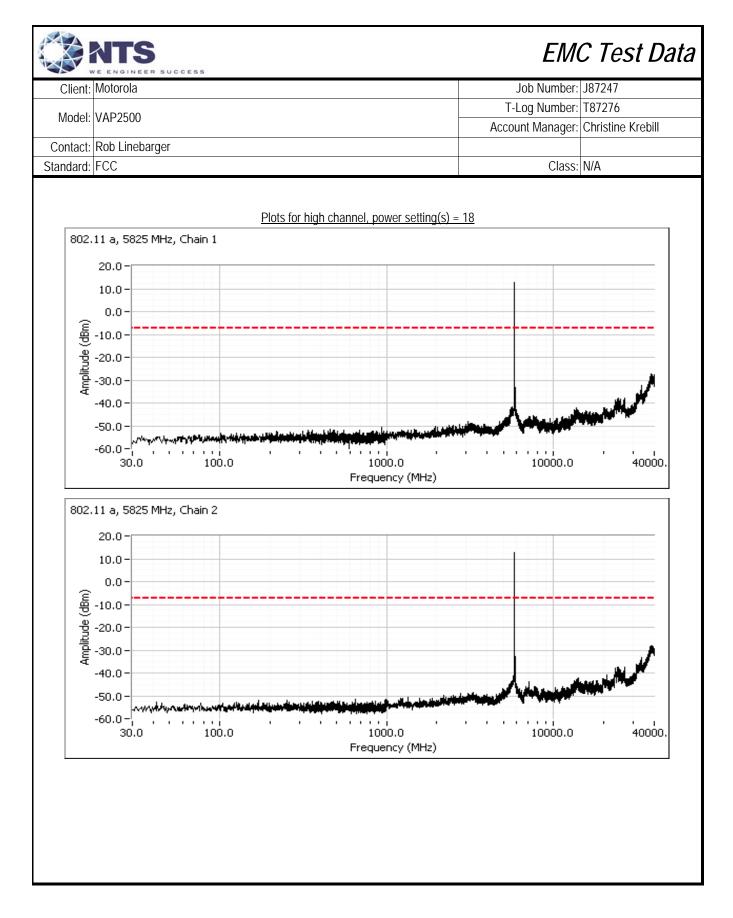


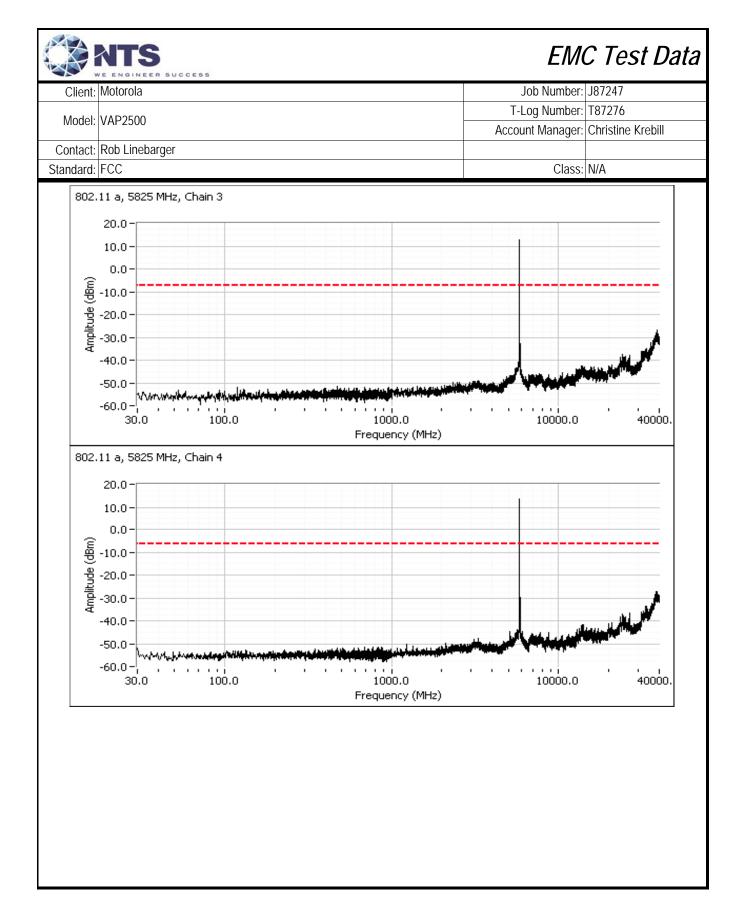


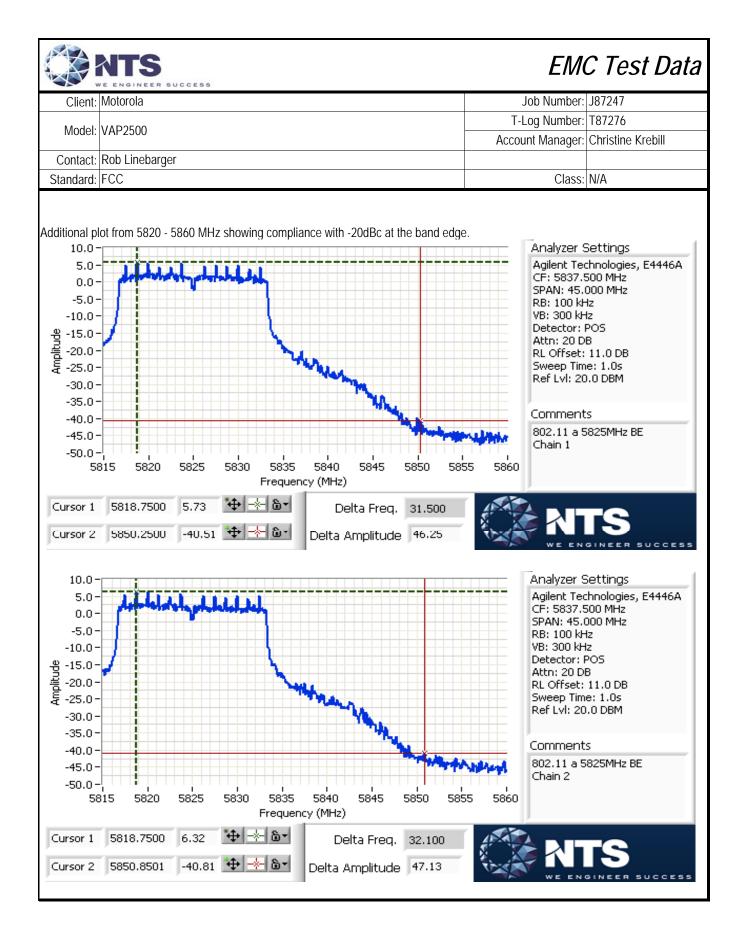


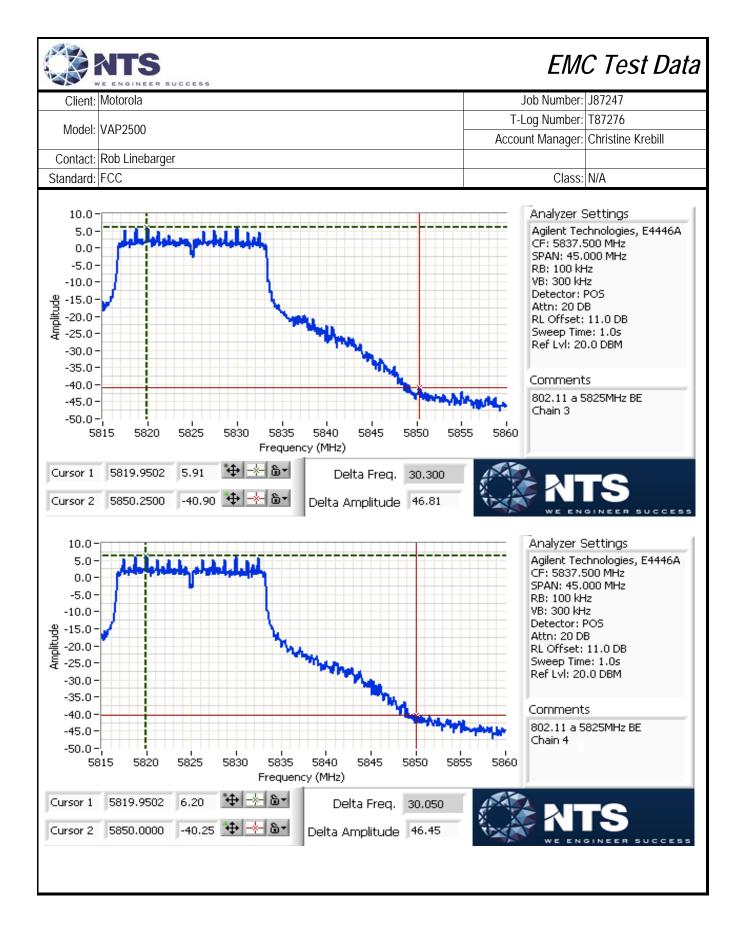


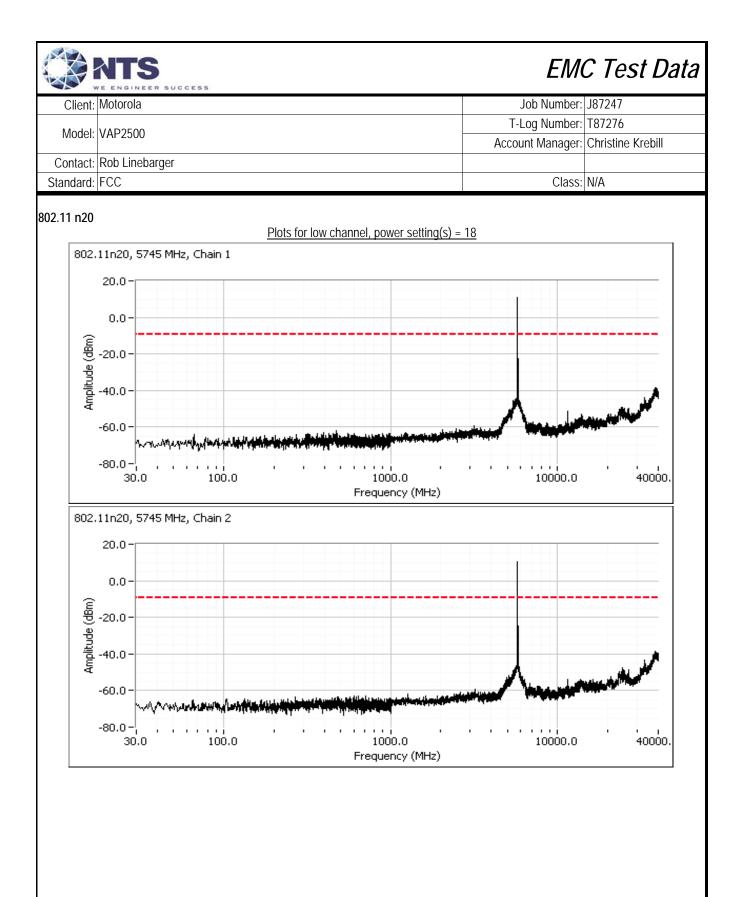


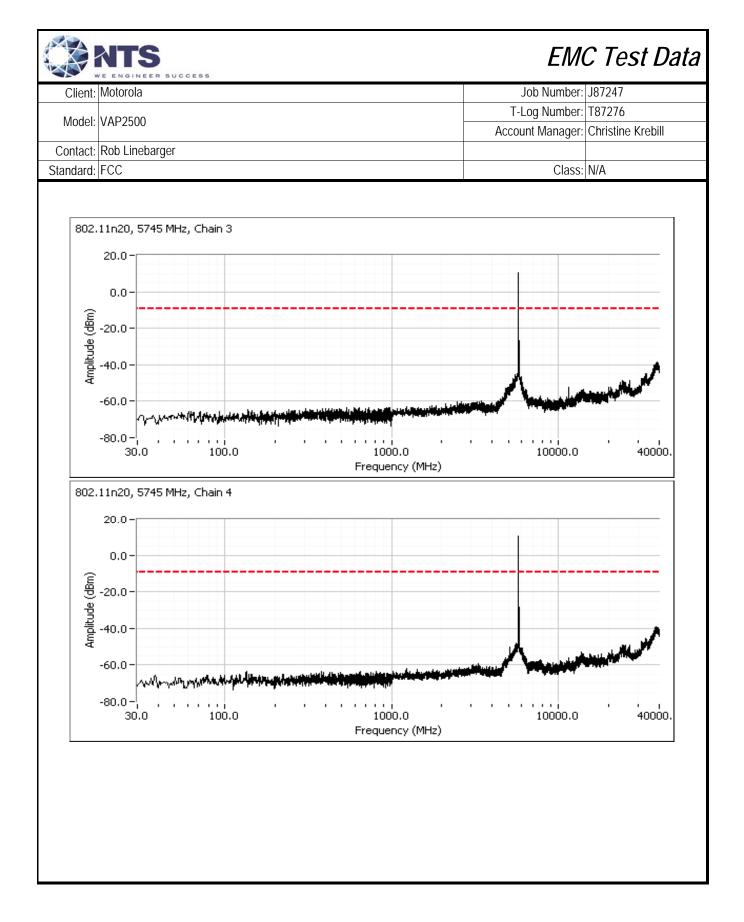


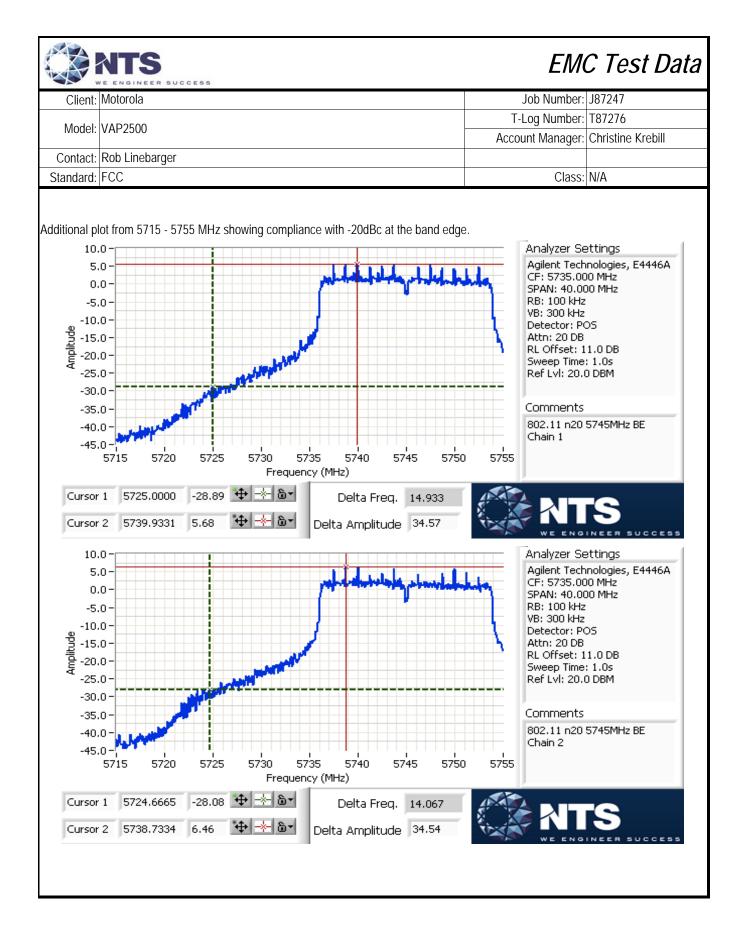


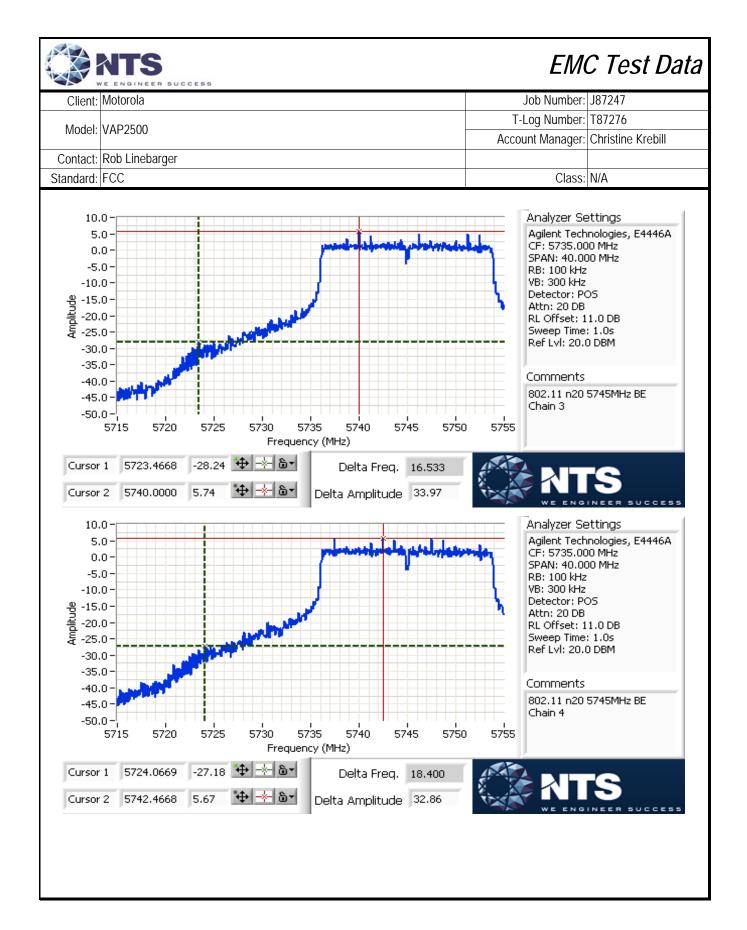


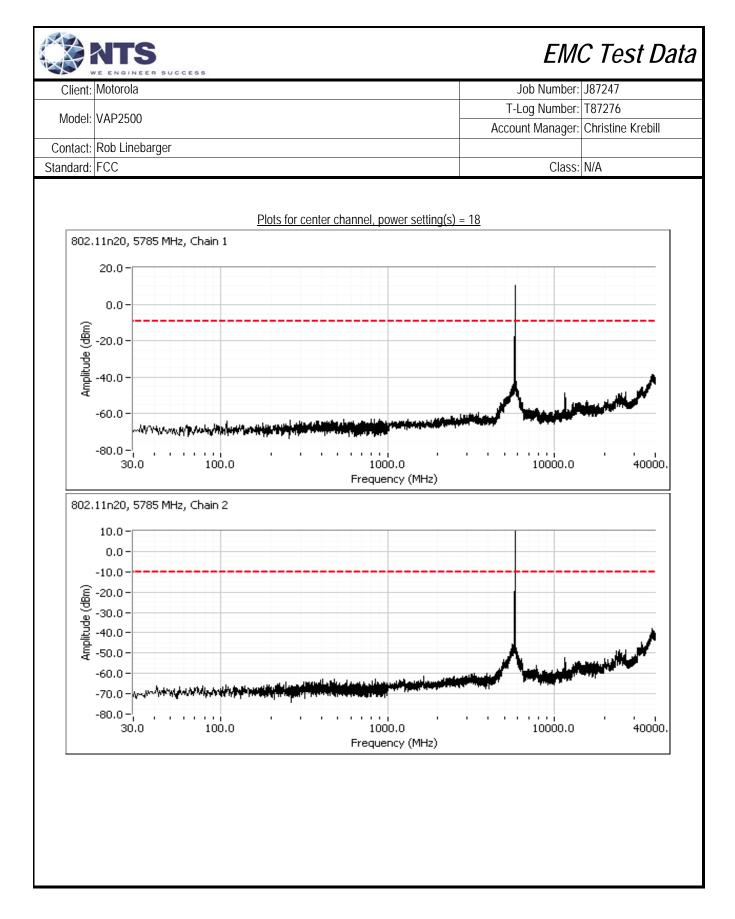


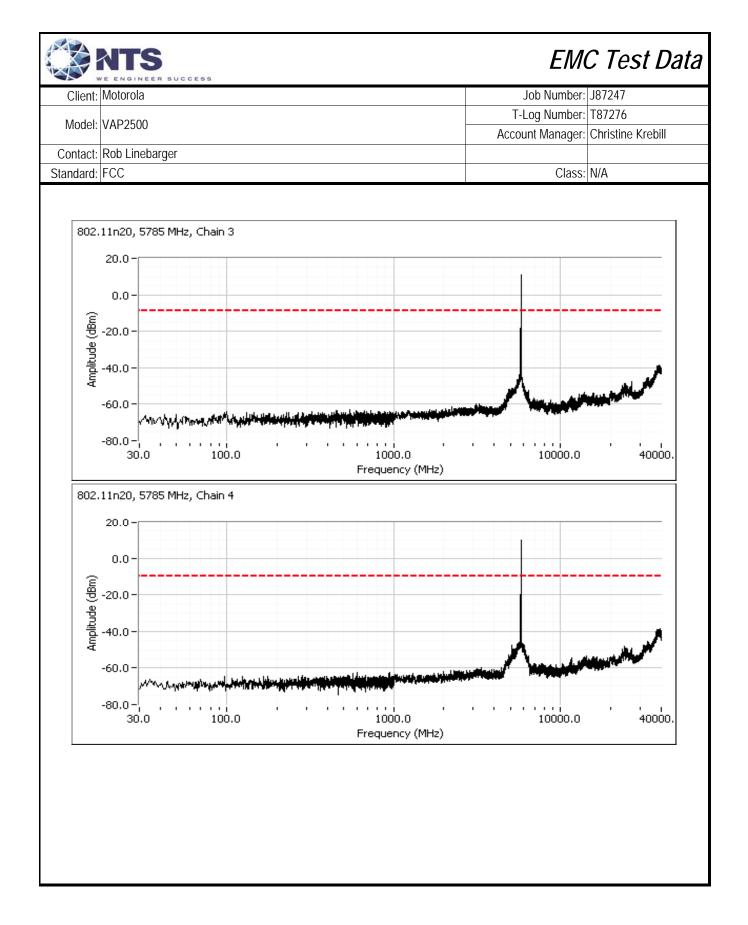


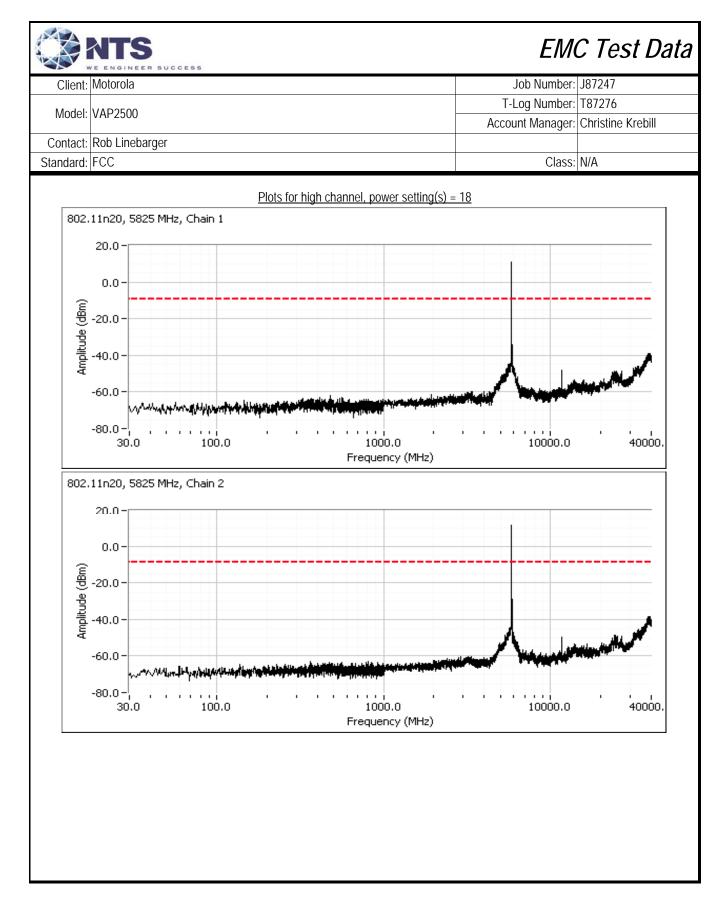


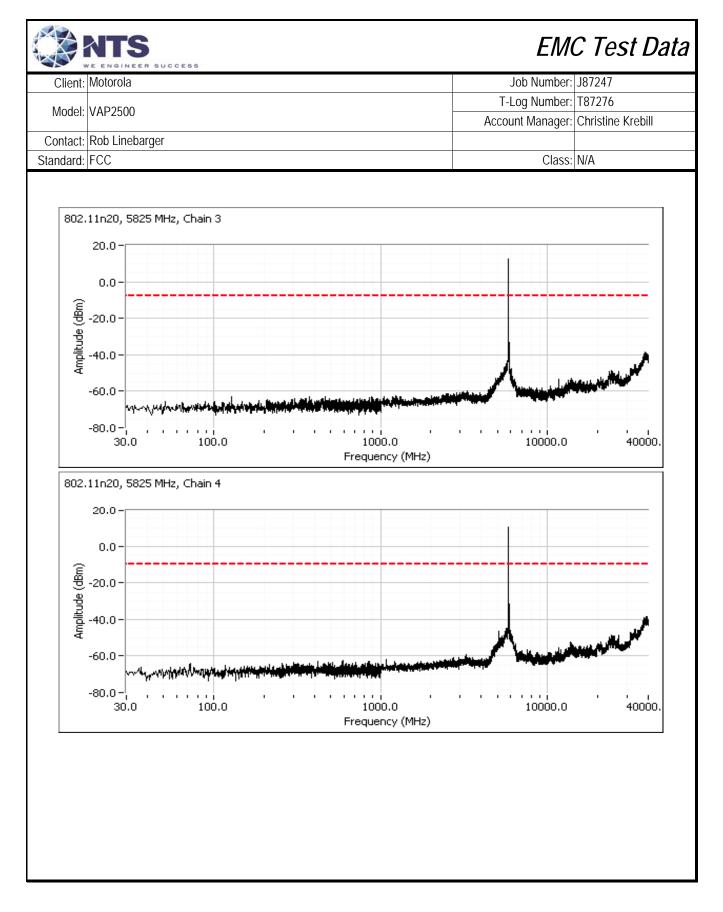


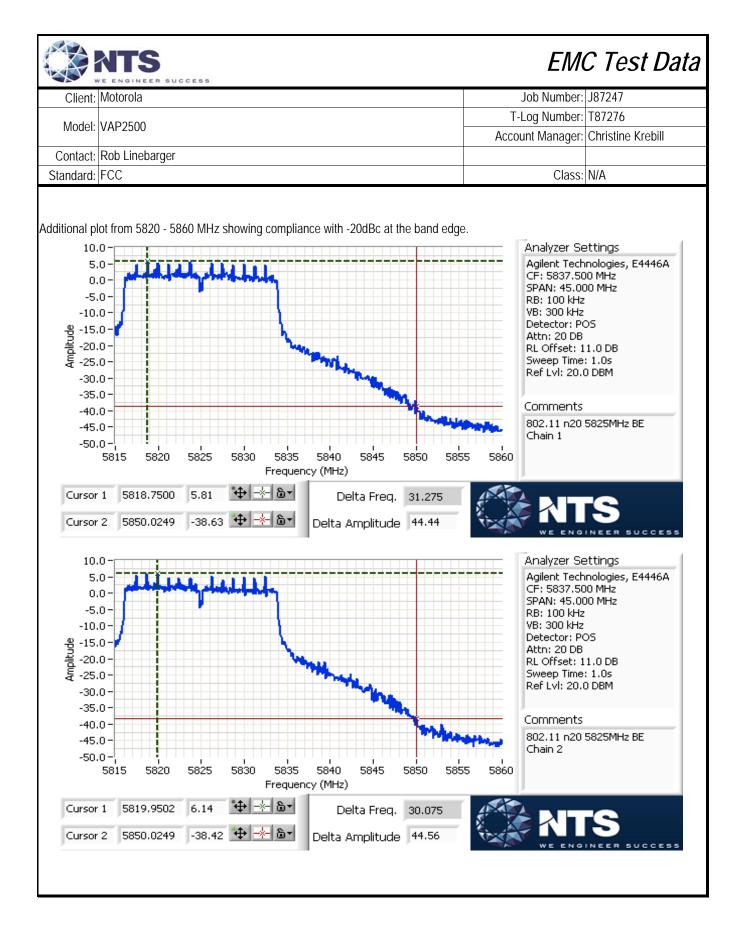


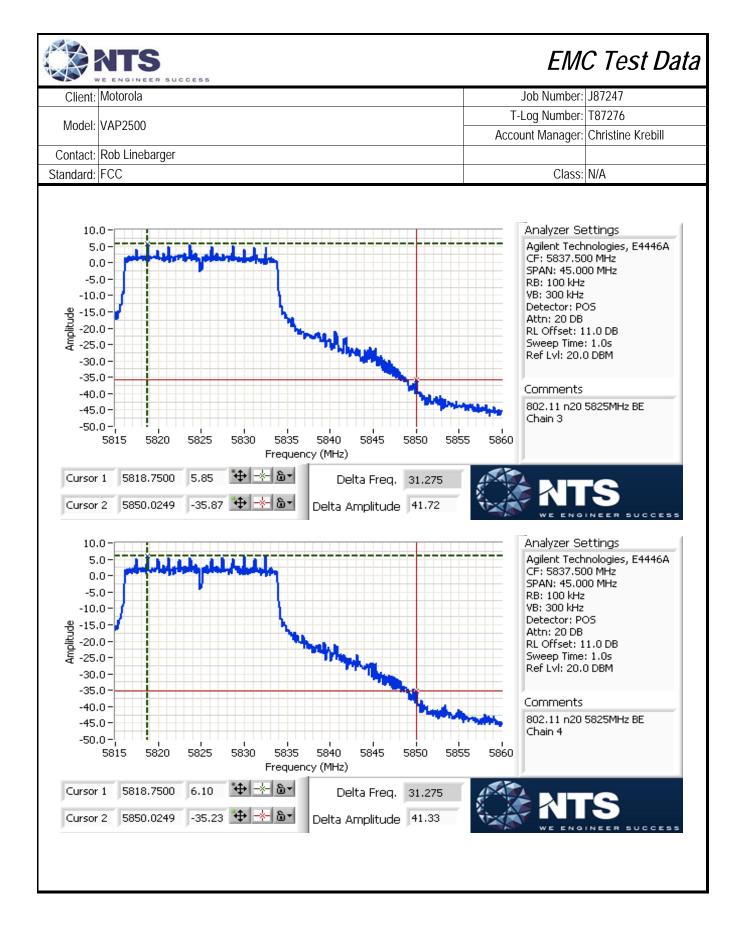


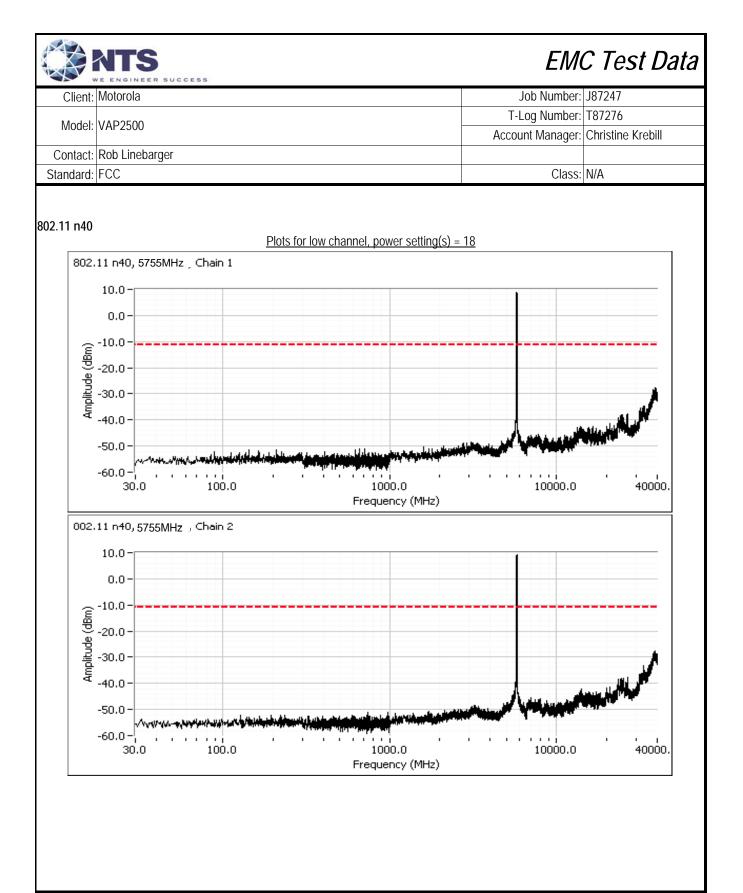


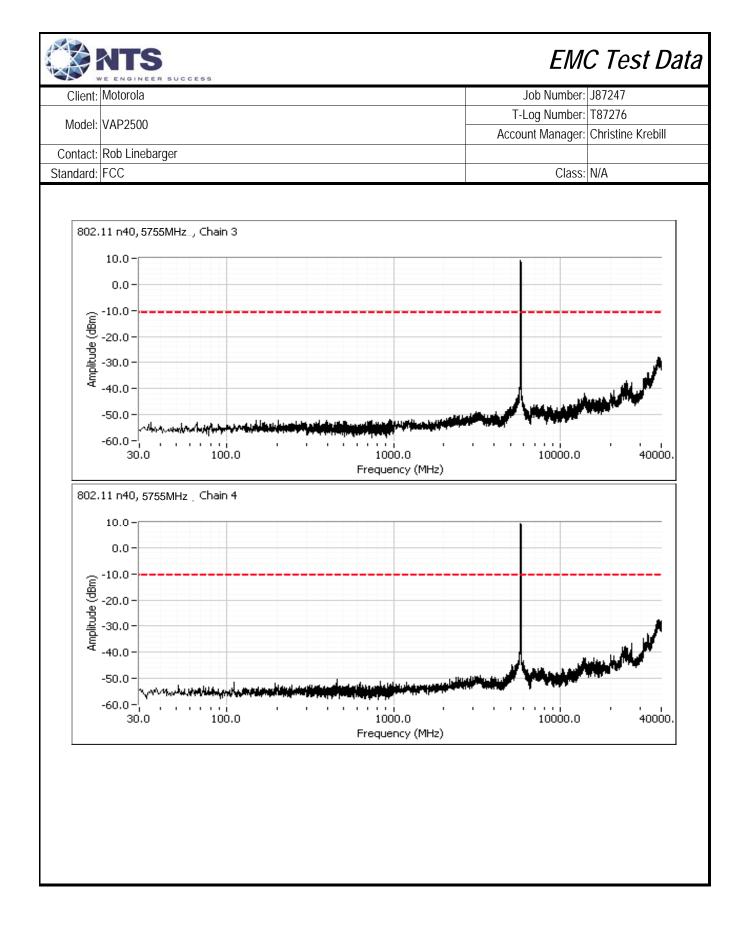


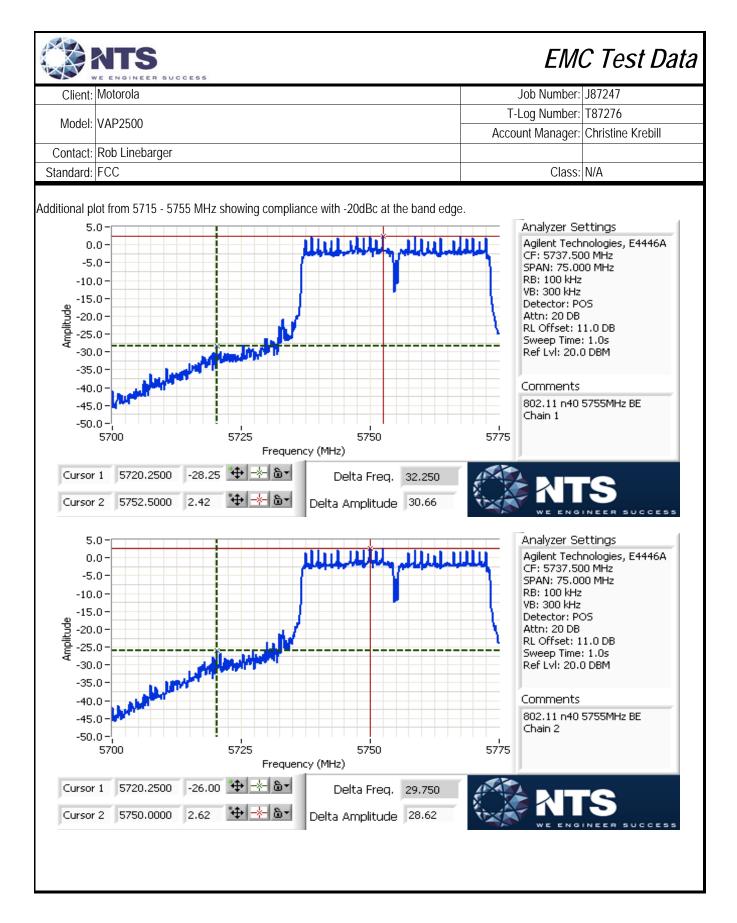


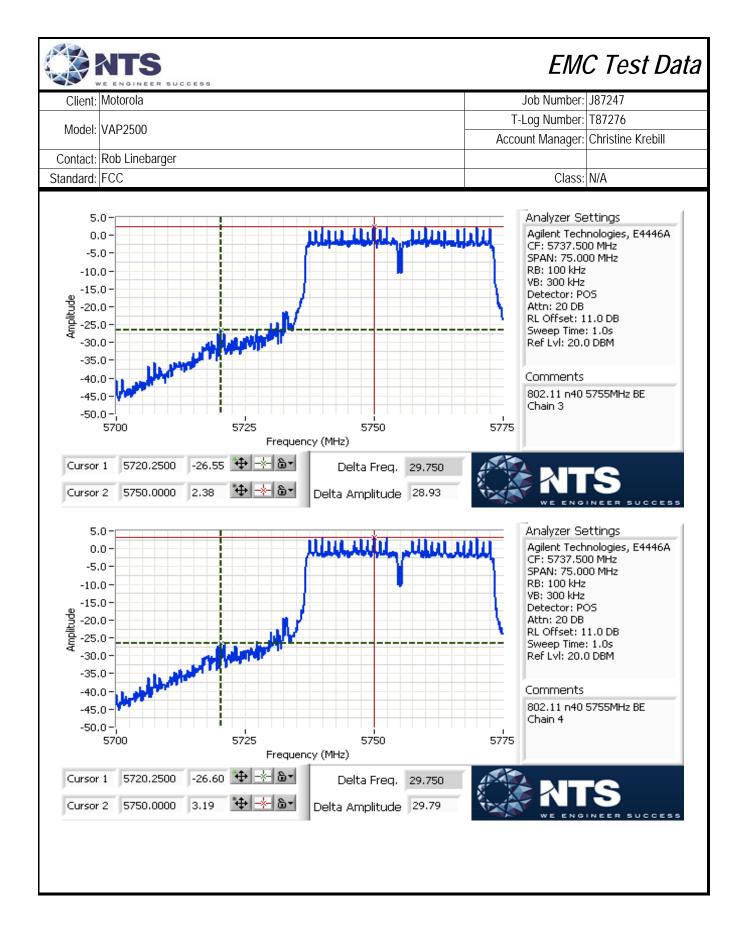


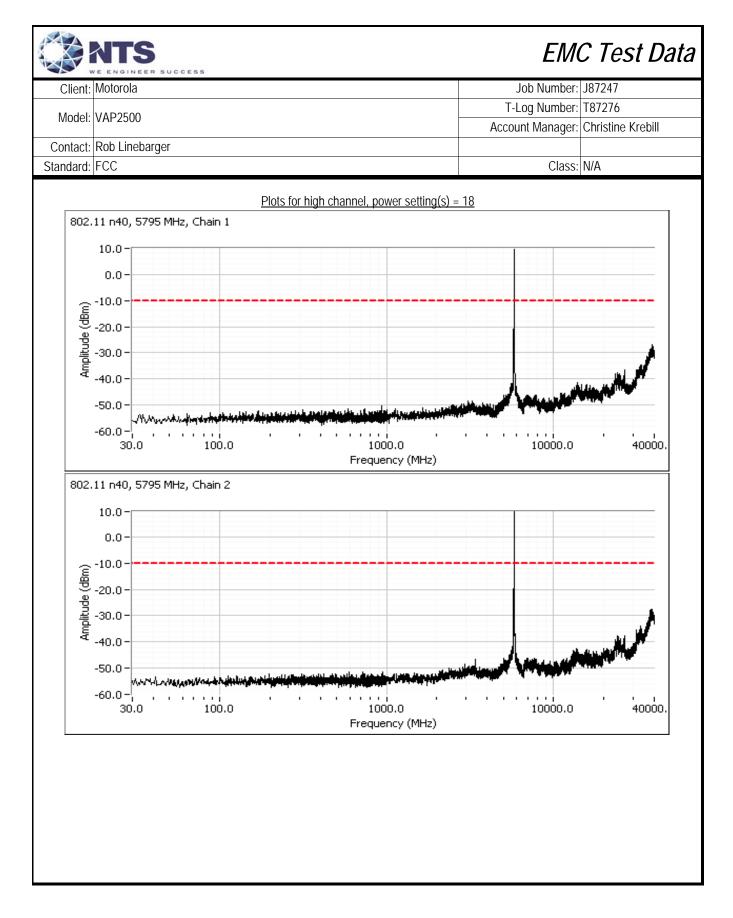


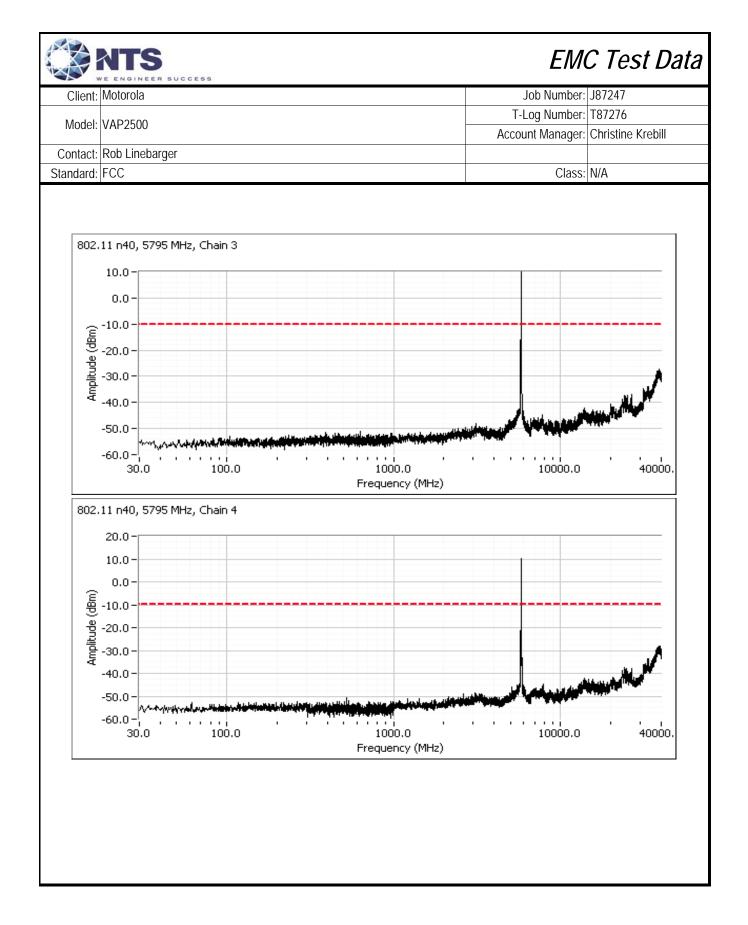


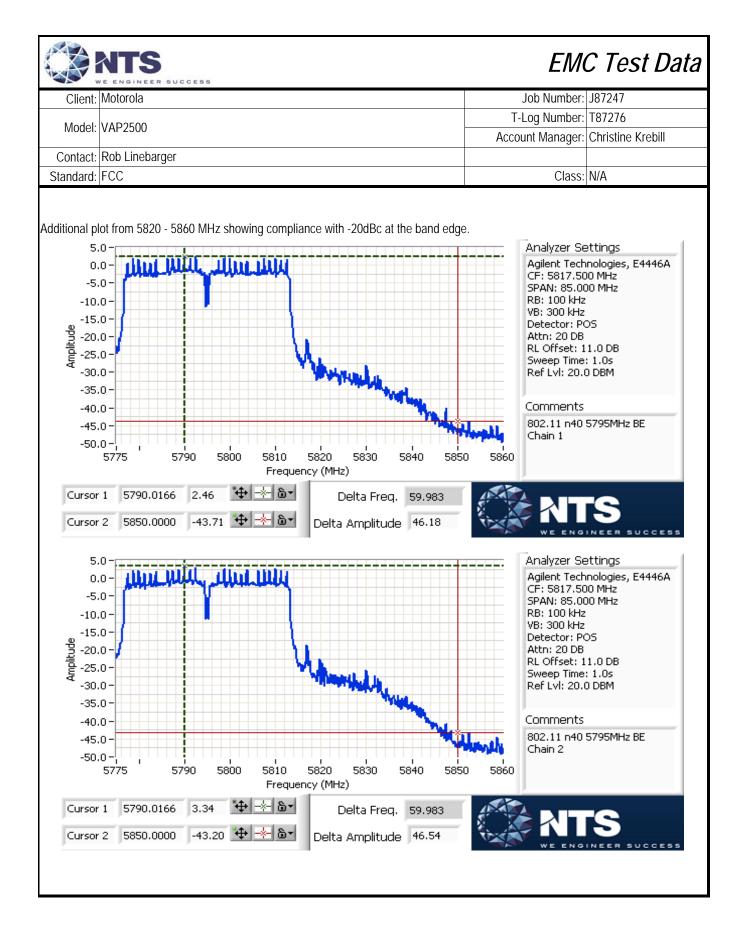


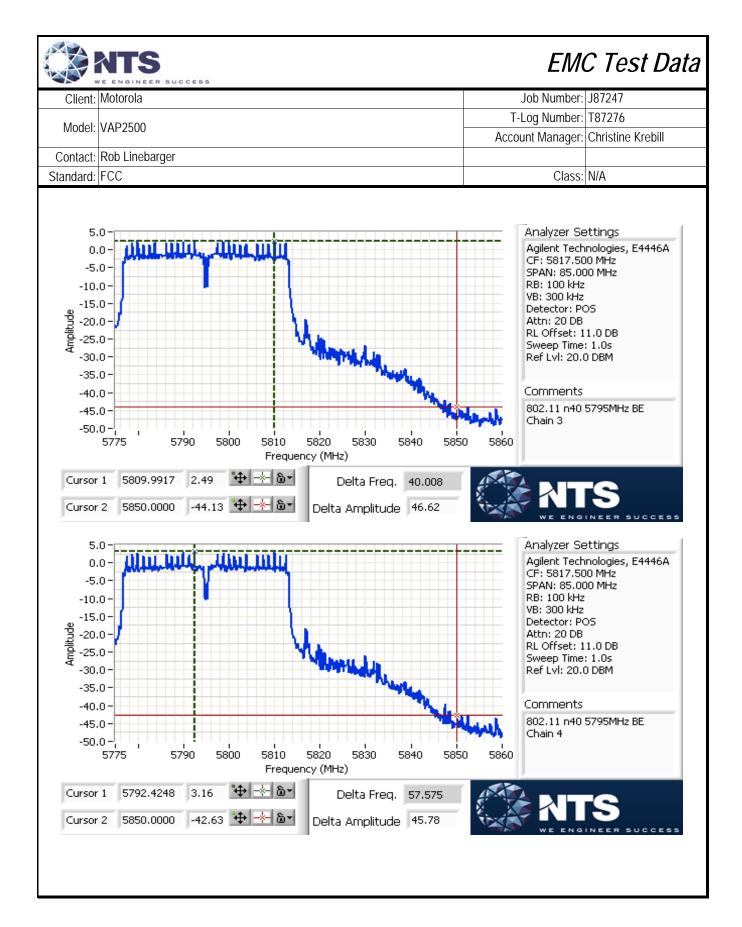








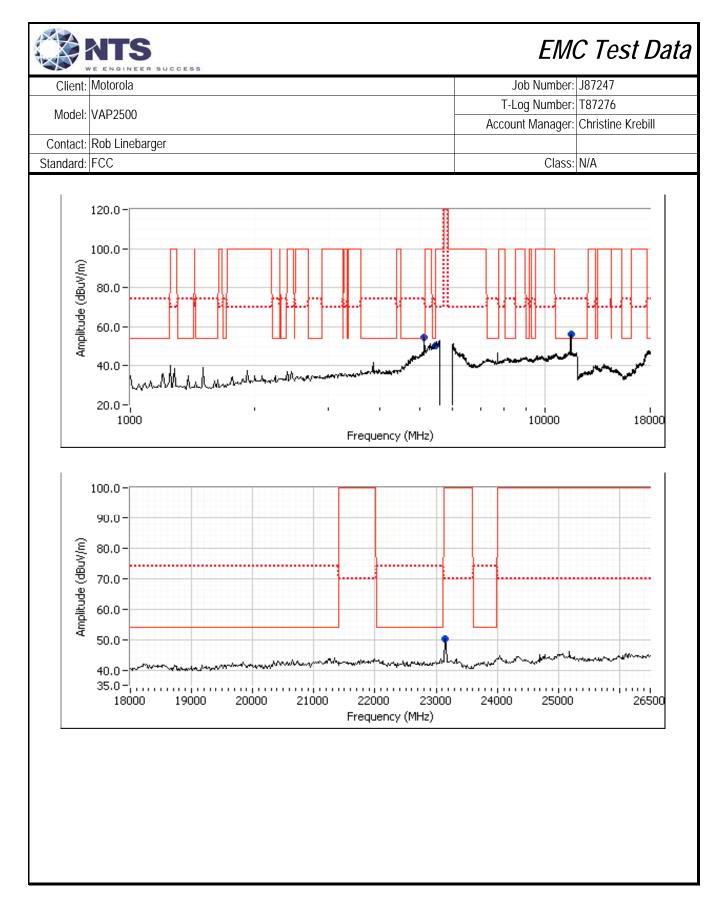


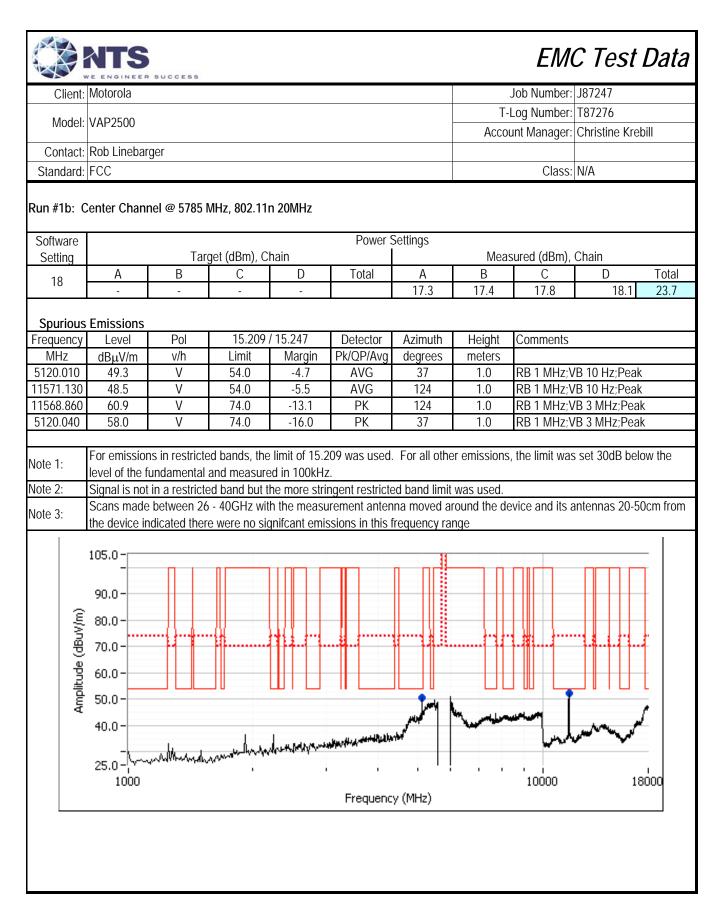


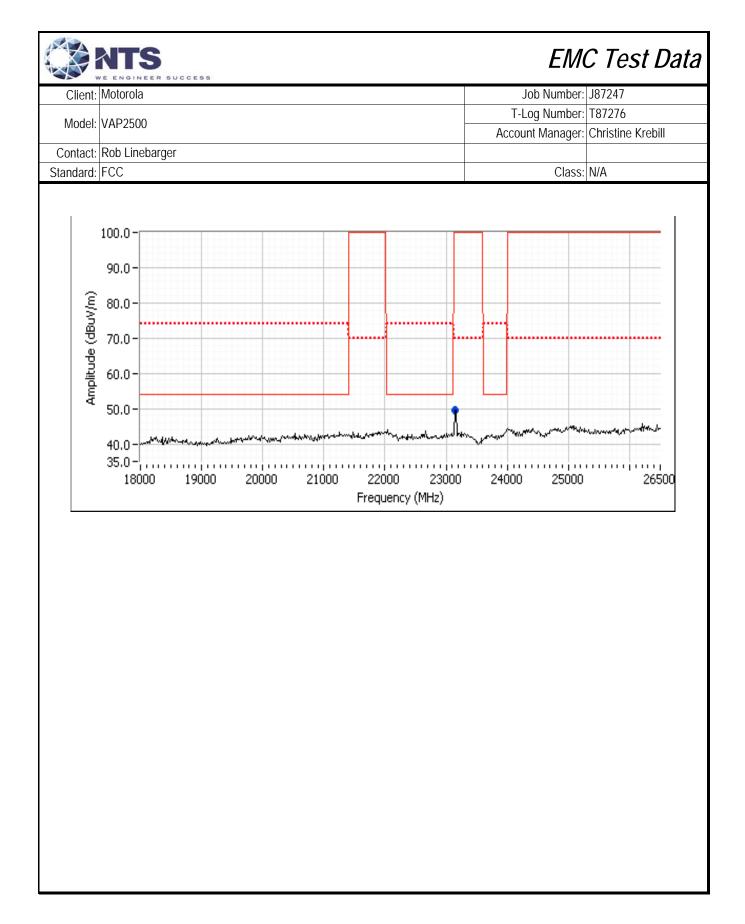
	: Motorola	SUCCESS				Job Number:	J87247
			T-Log Number:				
Model	: VAP2500		Account Manager:				
	: Rob Linebar	ger					
Standard	FCC					Class:	N/A
	R	SS 210 a	ind FCC	15.247 (I	DTS) Radiated Sp	ourious Emissior	IS
est Spe	cific Detail	S					
	Objective:	The objective specification			perform final qualification	n testing of the EUT with i	respect to the
The EUT	Test Config and all local nt was located	support equip		located on the	e turntable for radiated sp	purious emissions testing.	All remote support
For radia	ted emissions	s testing the r	neasuremer	nt antenna wa	as located 3 meters from t	he EUT.	
mbient	Condition	S:		emperature: el. Humidity:			
Summar	y of Result	s - Device	Operatin	g in the 57	25 - 5850 MHz Band	ł	
Run #	Mode	Channel	Power Setting	Measured Power	Test Performed	Limit	Result / Margin
	i center chanr		e OFDM mo	des in each o	peratintg band were used	to determine the worst c	
		#157	18.0	23.7			53.5 dBµV/m @ 11572.1 MHz (-0.5 d
	802.11a	5785MHz					
Scans or	802.11a 802.11n20	#157	18.0	23.7	Radiated Emissions	FCC 15.209 / 15 E	
Scans or		#157 5785MHz #159	18.0 18.0	23.7 23.4	Radiated Emissions 1 - 40 GHz	FCC 15.209 / 15 E	MHz (-4.7 dB) 48.2 dBµV/m @ 512
Scans or (5725-5850	802.11n20 802.11n40	#157 5785MHz #159 5795MHz	18.0	23.4	1 - 40 GHz		MHz (-4.7 dB) 48.2 dBµV/m @ 512 MHz (-5.8 dB)
Scans or Rur (5725-5850	802.11n20 802.11n40 Worst cas	#157 5785MHz #159 5795MHz e mode - top	18.0 and bottom	23.4 channels. As		is 802.11a evaluated at c	MHz (-4.7 dB) 48.2 dBµV/m @ 512 MHz (-5.8 dB) enter channel
Scans or Ru (5725-5850	802.11n20 802.11n40 Worst cas (5785MHz	#157 5785MHz #159 5795MHz e mode - top z); therefore, #149	18.0 and bottom	23.4 channels. As	1 - 40 GHz s the worst case mode wa and high channel (5825M	is 802.11a evaluated at c Hz) were tested in 802.11	MHz (-4.7 dB) 48.2 dBμV/m @ 512 MHz (-5.8 dB) enter channel a mode. 50.4 dBμV/m @ 512
Scans or Rur (5725-5850	802.11n20 802.11n40 Worst cas	#157 5785MHz #159 5795MHz e mode - top z); therefore,	18.0 and bottom low channel	23.4 channels. As (5745MHz) a	1 - 40 GHz	is 802.11a evaluated at c	48.2 dBµV/m @ 5120 MHz (-5.8 dB) enter channel

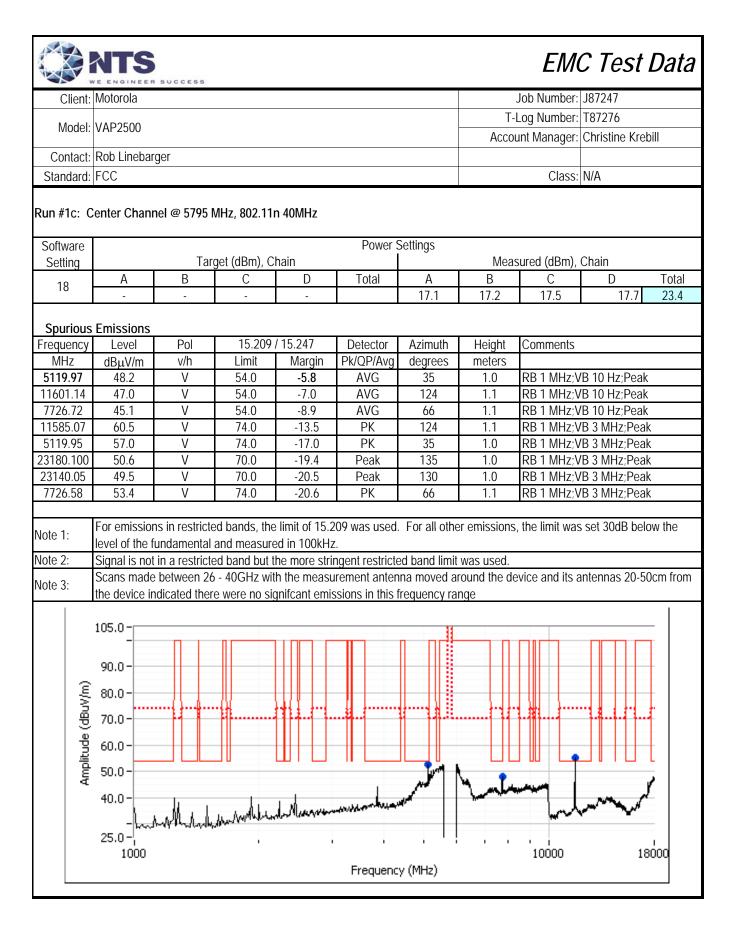
Antenna: antenna(s) connected Duty Cycle: 98.4%

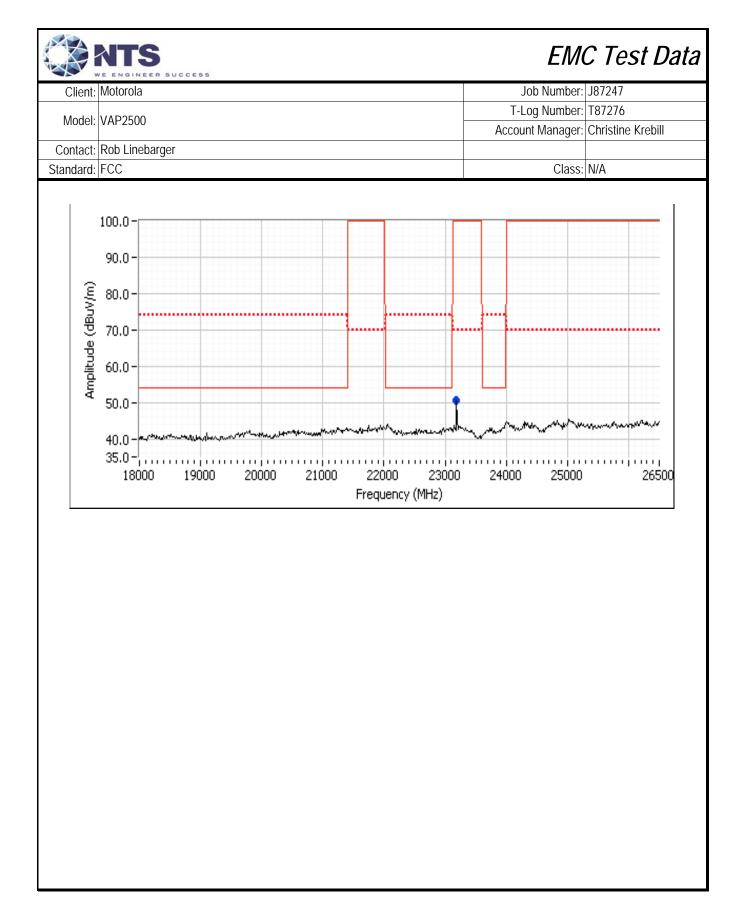
	Motorola			Job Number:		J87247					
Model:					T-Log Number: T87276		T87276				
	VAP2500			-	Account Manager: Christine Krebil			ill			
Contact	Rob Linebarg	nor									
Standard:		jei			Class:	NI/A					
Stariuaru. I								Class.	IN/A		
D	diated Spuri ate of Test: ! st Engineer:	5/22/2012	i <b>ons, 1,000 -</b> las	40,000 MHz		est Location:	FT5				
Software					Power S	Settings					
Setting		Target (dBm), Chain Measured (dBm), Chain						Chain			
18 -	А	В	С	D	Total	А	В	С	D	Total	
10	-	-	-	-		17.4	17.5	17.8	18.0	23.7	
1571.900 457.880 453.910 120.010 5119.95 23142.50	65.0 47.1 58.3 50.3 55.9 50.1 For emissio	V V V V V V ons in restric	74.0 54.0 74.0 54.0 74.0 70.0 cted bands, t	-9.0 -6.9 -15.7 -3.7 -18.1 -19.9 he limit of 15	PK AVG PK AVG PK Peak 5.209 was use	103 195 195 215 215 138 ed. For all ot	1.3 1.2 1.2 1.0 1.0 1.0 her emission	RB 1 MHz;V RB 1 MHz;V RB 1 MHz;V RB 1 MHz;V RB 1 MHz;V	1 MHz;VB 3 MHz;Peak 1 MHz;VB 10 Hz;Peak 1 MHz;VB 3 MHz;Peak 1 MHz;VB 10 Hz;Peak 1 MHz;VB 3 MHz;Peak 1 MHz;VB 3 MHz;Peak me limit was set 30dB below the		
ote 1:	level of the	e fundamenta	al and measu	ured in 100k	Hz.						
ote 2:					stringent restrie						
DIA 3.								evice and its a	intennas 20-50	icm fror	
				Inicant emis	ssions in this f	requency rai	ige				



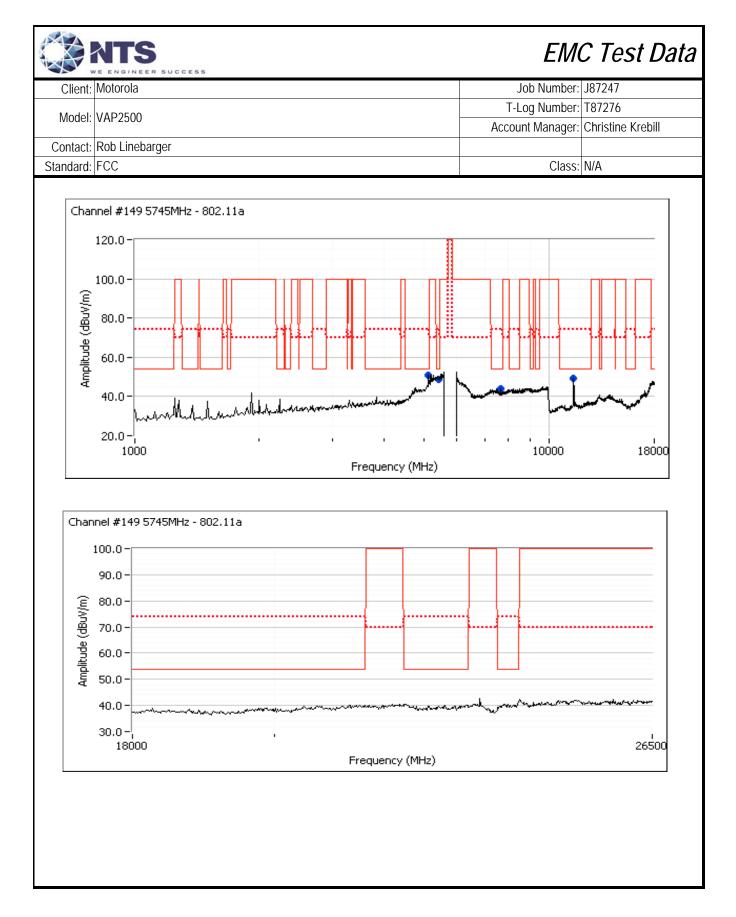


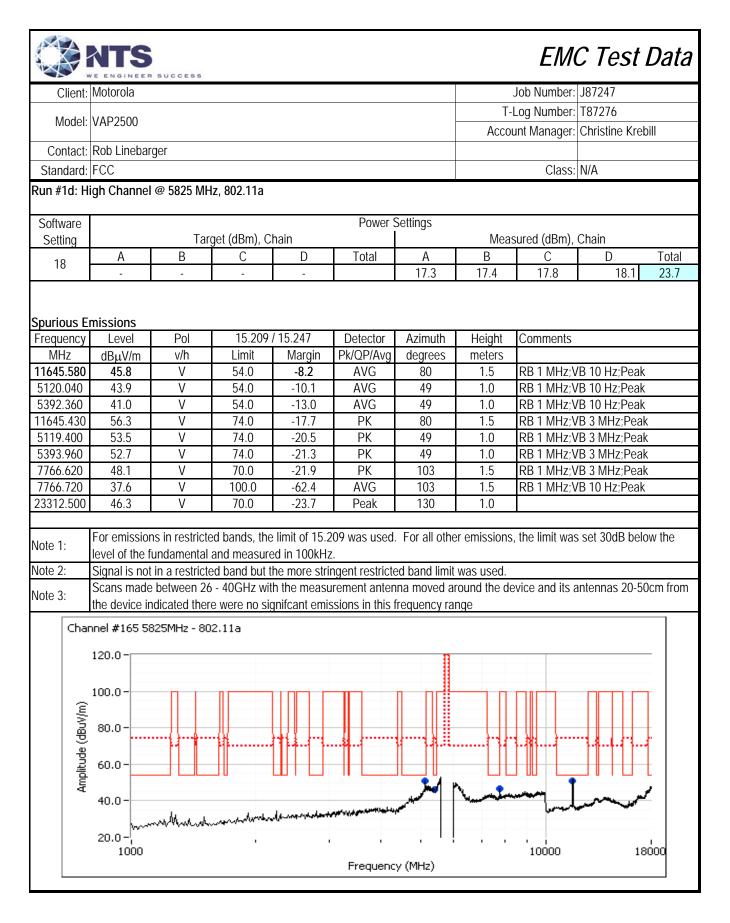


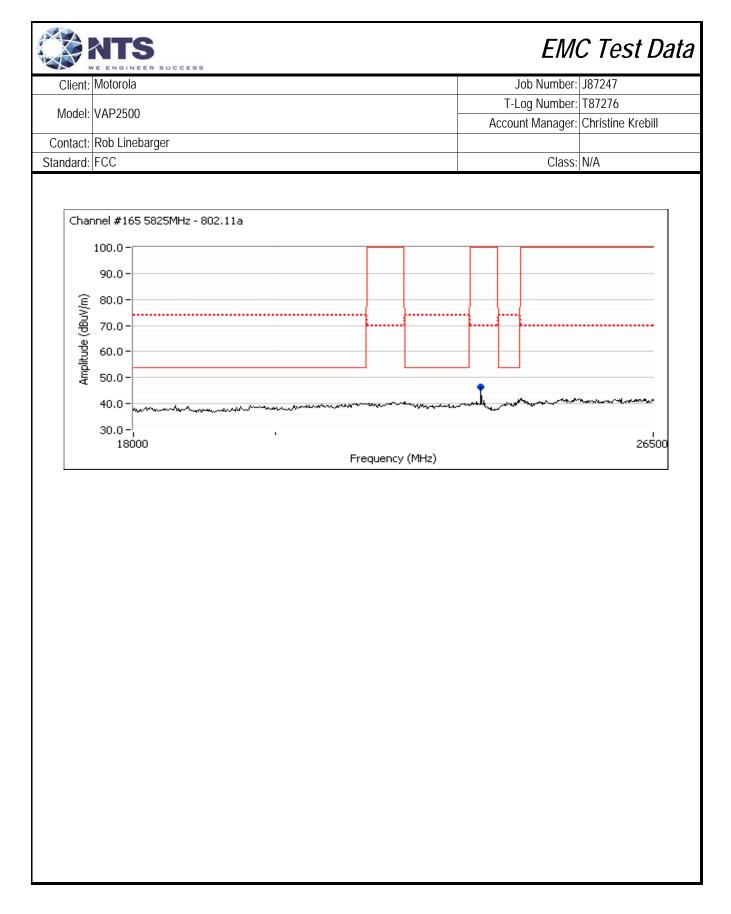




	Model:         VAP2500           Contact:         Rob Linebarger           Standard:         FCC           Run #1c: Low Channel @ 574 Date of Test: 5/23/2 Test Engineer: Josep           Software Setting         A           18         -           18         -           Spurious Emissions         P           Frequency         Level         P           MHz         dBµV/m         V           5119.990         50.4         V           5419.280         45.7         V           11480.070         42.9         V           5120.250         56.9         V           5120.250         56.9         V           Note 1:         For emissions in relevel of the fundan           Note 2:         Signal is not in a relevel of the fundan	2012 oh Cadigal Target (dBm), B C				T- Accoi	Log Number: unt Manager:	T87276 Christine Kreb	)ill
Model:         VAP2500         Account Manager:         Christine Krebill           Contact:         Rob Linebarger         Image:         Christine Krebill           Standard:         FCC         Class:         N/A           Run #1c: Low Channel @ 5745 MHz, 802.11a Date of Test: 5/23/2012         Test Location:         FT5           Test Engineer:         Joseph Cadigal         Target (dBm), Chain         Measured (dBm), Chain           18         A         B         C         D         Total           18         A         B         C         D         Total           MHz         Agu/Vm         Vh         Limit         Margin         Pk/OP/Avg         degrees         meters           5119.990         50.4         V         54.0         -3.6         AVG         10.0         RB 1 MHz/VB 10 Hz:Peak           5419.280         45.7         V         54.0         -1.1         AVG         102         1.0         RB 1 MHz:VB 10 Hz:Peak           5419.280         45.7         V         54.0         -1.1         AVG         102         1.0         RB 1 MHz:VB 10 Hz:Peak           5418.880         57.3         V         74.0         -16.7         PK         166 <t< th=""><th>Contact:         Rob Linebarger           Standard:         FCC           Run #1c: Low Channel @ 574 Date of Test: 5/23/2 Test Engineer: Josep           Software Setting        </th><th>2012 oh Cadigal Target (dBm), B C</th><th></th><th></th><th></th><th>Ассо</th><th>unt Manager:</th><th>Christine Kreb</th><th>bill</th></t<>	Contact:         Rob Linebarger           Standard:         FCC           Run #1c: Low Channel @ 574 Date of Test: 5/23/2 Test Engineer: Josep           Software Setting	2012 oh Cadigal Target (dBm), B C				Ассо	unt Manager:	Christine Kreb	bill
Contact:         Rob Linebarger         Class:         N/A           Standard:         FCC         Class:         N/A           Run #1c:         Low Channel @ 5745 MHz, 802.11a Date of Test:         5/23/2012         Test Location:         FT5           Test Engineer:         Joseph Cadigal         Test Location:         FT5           Software Setting         Target (dBm), Chain         Measured (dBm), Chain         Measured (dBm), Chain           18         A         B         C         D         Total         A         B         C         D         Total           18         A         B         C         D         Total         A         B         C         D         Total           18         A         B         C         D         Total         A         B         C         D         Total           18         A         B         C         D         Total         A         B         C         D         Total           18         Hz, vB         Pol         15.209 / 15.247         Detector         Azimuth         Height         Comments           5119.990         50.4         V         54.0         -3.6         AVG <td< td=""><td>Standard:         FCC           Run #1c:         Low Channel @ 574           Date of Test:         5/23/2           Test Engineer:         Josep           Software         A         I           Setting         -         -           18         -         -           Spurious Emissions         Frequency         Level         P           MHz         dBμV/m         v/           5119.990         50.4         -           5419.280         45.7         -           5418.880         57.3         -           5120.250         56.9         -           5120.250         56.9         -           11480.600         53.6         -           7660.120         47.7         -           Jote 1:         For emissions in relevel of the fundant level of thevel of the fundant level of the fundant level of th</td><td>2012 oh Cadigal Target (dBm), B C</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Standard:         FCC           Run #1c:         Low Channel @ 574           Date of Test:         5/23/2           Test Engineer:         Josep           Software         A         I           Setting         -         -           18         -         -           Spurious Emissions         Frequency         Level         P           MHz         dBμV/m         v/           5119.990         50.4         -           5419.280         45.7         -           5418.880         57.3         -           5120.250         56.9         -           5120.250         56.9         -           11480.600         53.6         -           7660.120         47.7         -           Jote 1:         For emissions in relevel of the fundant level of thevel of the fundant level of the fundant level of th	2012 oh Cadigal Target (dBm), B C							
Standard:       FCC       Class:       N/A         Class:       N/A         tun #1c: Low Channel @ 5745 MHz, 802.11a Date of Test:       5/23/2012       Test Location:       FT5         Test Engineer:       Joseph Cadigal         Software Setting       Target (dBm), Chain       Measured (dBm), Chain         18       A       B       C       D       Total       A       B       C       D       Tota         A       B       C       D       Total       A       B       C       D       Tota         17.2       17.4       17.6       17.9       23.6         Stings         Settings	Standard:         FCC           Run #1c:         Low Channel @ 574           Date of Test:         5/23/2           Test Engineer:         Josep           Software         A         I           Setting         -         -           18         -         -           Spurious Emissions         -         -           Frequency         Level         P           MHz         dBμV/m         v/           5419.280         45.7         V           5418.880         57.3         V           5418.880         57.3         V           7659.980         36.9         V           5120.250         56.9         V           11480.600         53.6         V           7660.120         47.7         V           Iote 1:         For emissions in relevel of the fundantion in a relevel of the fundantin a relevel of the fundantin a relevel of the fundantion	2012 oh Cadigal Target (dBm), B C				FT5	Class:	N/A	
Date of Test:         5/23/2012 Test Engineer:         Test Location:         FT5           Software Setting         Target (dBm), Chain         Measured (dBm), Chain           18         A         B         C         D         Total         A         B         C         D         Total           18         A         B         C         D         Total         A         B         C         D         Total           purious Emissions         -         -         -         17.2         17.4         17.6         17.9         23.6           purious Emissions         -	Date of Test: 5/23/2           Test Engineer: Josep           Software           Setting           18         A           18         -           Spurious Emissions           Frequency         Level           MHz         dBµV/m           5419.280         45.7           5419.280         45.7           5418.880         57.3           7659.980         36.9           5120.250         56.9           51480.600         53.6           7660.120         47.7           Iote 1:         For emissions in relevel of the fundantion in a relevel of	2012 oh Cadigal Target (dBm), B C				FT5			
Date of Test:         5/23/2012 Test Engineer:         Test Location:         FT5           Software Setting         Target (dBm), Chain         Measured (dBm), Chain           18         A         B         C         D         Total         A         B         C         D         Total           18         A         B         C         D         Total         A         B         C         D         Total           purious Emissions           Trequency         Level         Pol         15.209 / 15.247         Detector         Azimuth         Height         Comments           MHz         dBµU/m         v/h         Limit         Margin         Pk/OP/Avg         degrees         meters           5119.990         50.4         V         54.0         -3.6         AVG         70         1.0         RB 1 MHz;VB 10 Hz;Peak           5419.280         45.7         V         54.0         -10.1         AVG         102         1.0         RB 1 MHz;VB 10 Hz;Peak           5418.880         57.3         V         74.0         -16.7         PK         166         1.0         RB 1 MHz;VB 3 MHz;Peak           5120.250         56.9         V         74.0	Date of Test: 5/23/2           Test Engineer: Josep           Software           Setting           18         A           18         -           purious Emissions           Frequency         Level           MHz         dBµV/m           5419.280         45.7           5419.280         45.7           5418.880         57.3           55120.250         56.9           51480.600         53.6           7660.120         47.7           For emissions in relevel of the fundant level of the fundant l	2012 oh Cadigal Target (dBm), B C				FT5			
Setting         Target (dBm), Chain         Measured (dBm), Chain           18         A         B         C         D         Total         A         B         C         D         Total           18         -         -         -         -         17.2         17.4         17.6         17.9         23.6           Spurious Emissions           "requency         Level         Pol         15.209 / 15.247         Detector         Azimuth         Height         Comments           MHz         dBµU/m         v/h         Limit         Margin         Pk/QP/Avg         degrees         meters           5119.990         50.4         V         54.0         -3.6         AVG         70         1.0         RB 1 MHz;VB 10 Hz;Peak           5419.280         45.7         V         54.0         -8.3         AVG         166         1.0         RB 1 MHz;VB 10 Hz;Peak           5418.880         57.3         V         74.0         -16.7         PK         166         1.0         RB 1 MHz;VB 3 MHz;Peak           5120.250         56.9         V         54.0         -17.1         AVG         234         1.5         RB 1 MHz;VB 3 MHz;Peak           1480.00 <td>Setting         A         I           18         -         -           5purious Emissions         -         -           Frequency         Level         P           MHz         dBµV/m         v/v           5119.990         50.4         v/v           5419.280         45.7         v/v           5418.880         57.3         v/v           5418.880         57.3         v/v           5120.250         56.9         v/v           5120.250         56.9         v/v           11480.600         53.6         v/v           7660.120         47.7         v           Iote 1:         For emissions in reilevel of the fundantion reint and reint</td> <td>B C</td> <td></td> <td>Power S</td> <td></td> <td></td> <td></td> <td></td> <td></td>	Setting         A         I           18         -         -           5purious Emissions         -         -           Frequency         Level         P           MHz         dBµV/m         v/v           5119.990         50.4         v/v           5419.280         45.7         v/v           5418.880         57.3         v/v           5418.880         57.3         v/v           5120.250         56.9         v/v           5120.250         56.9         v/v           11480.600         53.6         v/v           7660.120         47.7         v           Iote 1:         For emissions in reilevel of the fundantion reint and reint	B C		Power S					
18         A         B         C         D         Total         A         B         C         D         Total           18         -         -         -         -         17.2         17.4         17.6         17.9         23.6           purious Emissions         requency         Level         Pol         15.209 / 15.247         Detector         Azimuth         Height         Comments           MHz         dBµV/m         v/h         Limit         Margin         Pk/QP/Avg         degrees         meters         5119.990         50.4         V         54.0         -3.6         AVG         70         1.0         RB 1 MHz; VB 10 Hz; Peak           5419.280         45.7         V         54.0         -8.3         AVG         166         1.0         RB 1 MHz; VB 10 Hz; Peak           5418.280         57.3         V         74.0         -11.1         AVG         102         1.0         RB 1 MHz; VB 3 MHz; Peak           7659.980         36.9         V         54.0         -17.1         AVG         234         1.5         RB 1 MHz; VB 3 MHz; Peak           7660.120         47.7         V         74.0         -20.4         PK         102         1.0 <td< td=""><td>A         I           18         -           purious Emissions           Frequency         Level         P           MHz         dBμV/m         v/v           5119.990         50.4         v           5419.280         45.7         v           1480.070         42.9         v           5418.880         57.3         v           5418.000         53.6         v           7659.980         36.9         v           5120.250         56.9         v           1480.600         53.6         v           rote 1:         For emissions in relevel of the fundant of the fundat of the fundat of the fundant</td><td>B C</td><td></td><td></td><td>Settings</td><td></td><td></td><td></td><td></td></td<>	A         I           18         -           purious Emissions           Frequency         Level         P           MHz         dBμV/m         v/v           5119.990         50.4         v           5419.280         45.7         v           1480.070         42.9         v           5418.880         57.3         v           5418.000         53.6         v           7659.980         36.9         v           5120.250         56.9         v           1480.600         53.6         v           rote 1:         For emissions in relevel of the fundant of the fundat of the fundat of the fundant	B C			Settings				
18         -         -         17.2         17.4         17.6         17.9         23.6           ipurious Emissions         Frequency         Level         Pol         15.209 / 15.247         Detector         Azimuth         Height         Comments           MHz         dBµV/m         v/h         Limit         Margin         PK/QP/Avg         degrees         meters           5119.990         50.4         V         54.0         -3.6         AVG         70         1.0         RB 1 MHz;VB 10 Hz;Peak           5419.280         45.7         V         54.0         -8.3         AVG         166         1.0         RB 1 MHz;VB 10 Hz;Peak           5418.880         57.3         V         74.0         -16.7         PK         166         1.0         RB 1 MHz;VB 3 MHz;Peak           5120.250         56.9         V         54.0         -17.1         AVG         234         1.5         RB 1 MHz;VB 3 MHz;Peak           5120.250         56.9         V         74.0         -16.7         PK         102         1.0         RB 1 MHz;VB 3 MHz;Peak           5120.250         56.9         V         74.0         -20.4         PK         102         1.0         RB 1 MHz;VB 3 MHz;Peak	Image: regulation of the system		П	_				1	
interpretation         interp	Spurious Emissions           Frequency         Level         P           MHz         dBμV/m         v/v           5119.990         50.4         v           5419.280         45.7         v           5418.880         57.3         v           5418.880         57.3         v           5418.000         56.9         v           5120.250         56.9         v           5120.250         56.9         v           11480.600         53.6         v           7660.120         47.7         v           Iote 1:         For emissions in relevel of the fundant           Iote 2:         Signal is not in a relevel of the fundant           Iote 2:         Scans made between the second	<u>-                                     </u>	D	Total			-	_	Total
Frequency         Level         Pol         15.209 / 15.247         Detector         Azimuth         Height         Comments           MHz         dBμV/m         v/h         Limit         Margin         Pk/QP/Avg         degrees         meters           5119.990         50.4         V         54.0         -3.6         AVG         70         1.0         RB 1 MHz;VB 10 Hz;Peak           5419.280         45.7         V         54.0         -8.3         AVG         166         1.0         RB 1 MHz;VB 10 Hz;Peak           11480.070         42.9         V         54.0         -11.1         AVG         102         1.0         RB 1 MHz;VB 10 Hz;Peak           5419.280         57.3         V         74.0         -16.7         PK         166         1.0         RB 1 MHz;VB 3 MHz;Peak           5418.880         57.3         V         74.0         -17.1         AVG         234         1.5         RB 1 MHz;VB 10 Hz;Peak           5120.250         56.9         V         74.0         -17.1         PK         70         1.0         RB 1 MHz;VB 3 MHz;Peak           11480.600         53.6         V         74.0         -20.4         PK         102         1.0         RB 1 MHz;VB 3 MH	Frequency         Level         P           MHz         dBμV/m         v           5119.990         50.4         v           5419.280         45.7         v           11480.070         42.9         v           5418.880         57.3         v           5418.880         57.3         v           5120.250         56.9         v           11480.600         53.6         v           7660.120         47.7         v           Iote 1:         For emissions in relevel of the fundantion in a rel		-		17.2	17.4	17.6	17.9	23.6
5419.280       45.7       V       54.0       -8.3       AVG       166       1.0       RB 1 MHz;VB 10 Hz;Peak         1480.070       42.9       V       54.0       -11.1       AVG       102       1.0       RB 1 MHz;VB 10 Hz;Peak         5418.880       57.3       V       74.0       -16.7       PK       166       1.0       RB 1 MHz;VB 3 MHz;Peak         7659.980       36.9       V       54.0       -17.1       AVG       234       1.5       RB 1 MHz;VB 10 Hz;Peak         5120.250       56.9       V       74.0       -17.1       AVG       234       1.5       RB 1 MHz;VB 3 MHz;Peak         5120.250       56.9       V       74.0       -17.1       PK       70       1.0       RB 1 MHz;VB 3 MHz;Peak         1480.600       53.6       V       74.0       -20.4       PK       102       1.0       RB 1 MHz;VB 3 MHz;Peak         7660.120       47.7       V       74.0       -26.3       PK       234       1.5       RB 1 MHz;VB 3 MHz;Peak         ote 1:       For emissions in restricted bands, the limit of 15.209 was used.       For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.       Scans made between 26 - 40GHz with the measurement antenna moved arou	5419.280       45.7         1480.070       42.9         5418.880       57.3         7659.980       36.9         5120.250       56.9         1480.600       53.6         7660.120       47.7         ote 1:       For emissions in relevel of the fundant of the funda	r/h Limit	Margin	Pk/QP/Avg	degrees	meters			
11480.070         42.9         V         54.0         -11.1         AVG         102         1.0         RB 1 MHz;VB 10 Hz;Peak           5418.880         57.3         V         74.0         -16.7         PK         166         1.0         RB 1 MHz;VB 3 MHz;Peak           7659.980         36.9         V         54.0         -17.1         AVG         234         1.5         RB 1 MHz;VB 3 MHz;Peak           5120.250         56.9         V         74.0         -17.1         PK         70         1.0         RB 1 MHz;VB 3 MHz;Peak           5120.250         56.9         V         74.0         -17.1         PK         70         1.0         RB 1 MHz;VB 3 MHz;Peak           11480.600         53.6         V         74.0         -20.4         PK         102         1.0         RB 1 MHz;VB 3 MHz;Peak           7660.120         47.7         V         74.0         -26.3         PK         234         1.5         RB 1 MHz;VB 3 MHz;Peak           Iote 1:         For emissions in restricted bands, the limit of 15.209 was used.         For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.         Iote 2:         Signal is not in a restricted band but the more stringent restricted band limit was used.         Scans made between 26 - 40G	11480.070       42.9         5418.880       57.3         7659.980       36.9         5120.250       56.9         11480.600       53.6         7660.120       47.7         Iote 1:       For emissions in relevel of the fundant lote 2:         Signal is not in a relevel of the fundant lote 3:       Scans made between the lote state sta		v v	J	Ŭ		RB 1 MHz;V	/B 10 Hz;Peak	
5418.88057.3V74.0-16.7PK1661.0RB 1 MHz;VB 3 MHz;Peak7659.98036.9V54.0-17.1AVG2341.5RB 1 MHz;VB 3 MHz;Peak5120.25056.9V74.0-17.1PK701.0RB 1 MHz;VB 3 MHz;Peak1480.60053.6V74.0-20.4PK1021.0RB 1 MHz;VB 3 MHz;Peak7660.12047.7V74.0-26.3PK2341.5RB 1 MHz;VB 3 MHz;Peakote 1:For emissions in restricted bands, the limit of 15.209 was used.For all other emissions, the limit was set 30dB below thelevel of the fundamental and measured in 100kHz.ote 2:Signal is not in a restricted band but the more stringent restricted band limit was used.Scans made between 26 - 40GHz with the measurement antenna moved around the device and its antennas 20-50cm from	5418.880         57.3         1           7659.980         36.9         1           5120.250         56.9         1           1480.600         53.6         1           7660.120         47.7         1           ote 1:         For emissions in relevel of the fundant ote 2:         Signal is not in a relevel of the fundant ote 3:	V 54.0	-8.3	AVG	166	1.0	RB 1 MHz;V	/B 10 Hz;Peak	
7659.980       36.9       V       54.0       -17.1       AVG       234       1.5       RB 1 MHz;VB 10 Hz;Peak         5120.250       56.9       V       74.0       -17.1       PK       70       1.0       RB 1 MHz;VB 3 MHz;Peak         1480.600       53.6       V       74.0       -20.4       PK       102       1.0       RB 1 MHz;VB 3 MHz;Peak         7660.120       47.7       V       74.0       -26.3       PK       234       1.5       RB 1 MHz;VB 3 MHz;Peak         7660.120       47.7       V       74.0       -26.3       PK       234       1.5       RB 1 MHz;VB 3 MHz;Peak         ote 1:       For emissions in restricted bands, the limit of 15.209 was used.       For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.       Scans made between 26 - 40GHz with the measurement antenna moved around the device and its antennas 20-50cm from the device and its antennas 2	7659.980         36.9           5120.250         56.9           1480.600         53.6           7660.120         47.7           ote 1:         For emissions in relevel of the fundant ote 2:           ote 2:         Signal is not in a relevel of the fundant ote 3:		-11.1			1.0	RB 1 MHz;V	/B 10 Hz;Peak	
5120.250       56.9       V       74.0       -17.1       PK       70       1.0       RB 1 MHz;VB 3 MHz;Peak         11480.600       53.6       V       74.0       -20.4       PK       102       1.0       RB 1 MHz;VB 3 MHz;Peak         7660.120       47.7       V       74.0       -26.3       PK       234       1.5       RB 1 MHz;VB 3 MHz;Peak         Interstricted bands, the limit of 15.209 was used.         For emissions in restricted bands, the limit of 15.209 was used.         For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.         Interstricted band but the more stringent restricted band limit was used.         Scans made between 26 - 40GHz with the measurement antenna moved around the device and its antennas 20-50cm from the stringent restricted band limit was used.	5120.250         56.9         1480.600           11480.600         53.6         1           7660.120         47.7         1           Iote 1:         For emissions in relevel of the fundantiantiantiantiantiantiantiantiantianti		-16.7						
11480.600       53.6       V       74.0       -20.4       PK       102       1.0       RB 1 MHz;VB 3 MHz;Peak         7660.120       47.7       V       74.0       -26.3       PK       234       1.5       RB 1 MHz;VB 3 MHz;Peak         Interstand         Interstand <tr< td=""><td>11480.600     53.6       7660.120     47.7       Iote 1:     For emissions in relevel of the fundant level of the fundant level of the fundant structure for a relevel of the fundant level of the</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr<>	11480.600     53.6       7660.120     47.7       Iote 1:     For emissions in relevel of the fundant level of the fundant level of the fundant structure for a relevel of the fundant level of the								
7660.120       47.7       V       74.0       -26.3       PK       234       1.5       RB 1 MHz;VB 3 MHz;Peak         Iote 1:         For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.         Iote 2:       Signal is not in a restricted band but the more stringent restricted band limit was used.         Scans made between 26 - 40GHz with the measurement antenna moved around the device and its antennas 20-50cm from the device antennas 20-50cm from the device and its antennas 20-50cm from the d	7660.120     47.7       Iote 1:     For emissions in relevel of the fundant lote 2:       Signal is not in a relevel of the state 3:								
Iote 1:       For emissions in restricted bands, the limit of 15.209 was used. For all other emissions, the limit was set 30dB below the level of the fundamental and measured in 100kHz.         Iote 2:       Signal is not in a restricted band but the more stringent restricted band limit was used.         Iote 3:       Scans made between 26 - 40GHz with the measurement antenna moved around the device and its antennas 20-50cm from the stringent restricted band but the measurement antenna moved around the device and its antennas 20-50cm from the stringent restricted band band bar the measurement antenna moved around the device and its antennas 20-50cm from the stringent restricted band bar the measurement antenna moved around the device and its antennas 20-50cm from the stringent restricted bar and the device and its antennas 20-50cm from the device and the device and its antennas 20-50cm from the device and the device and its antennas 20-50cm from the device and t	Iote 1:     For emissions in relevel of the fundan       Iote 2:     Signal is not in a relevel       Iote 3:     Scans made between								
ote 1:       level of the fundamental and measured in 100kHz.         ote 2:       Signal is not in a restricted band but the more stringent restricted band limit was used.         ote 3:       Scans made between 26 - 40GHz with the measurement antenna moved around the device and its antennas 20-50cm from the device and the device and its antennas 20-50cm from the device and the device antend the device and the device antend the device antend	ote 1: level of the fundan ote 2: Signal is not in a ro ote 3: Scans made betwo	V /4.0	-26.3	PK	234	1.5	RB 1 MHZ;V	/B 3 MHZ;Peak	
lote 2: Signal is not in a restricted band but the more stringent restricted band limit was used. Scans made between 26 - 40GHz with the measurement antenna moved around the device and its antennas 20-50cm fro	lote 2: Signal is not in a re Scans made between				For all othe	er emissions	, the limit was	s set 30dB belo	w the
Scans made between 26 - 40GHz with the measurement antenna moved around the device and its antennas 20-50cm fro	Scans made betwe				d band limit	was usod			
							wice and its a	antonnas 20 50	)cm fror
							evice and its a	antennas 20-50	
				5510115 111 (1115 1	requency rai	lige			







# EMC Test Data

×	VE ENGINEER SUCCESS		
Client:	Motorola	Job Number:	J87247
Madal	VAP2500	T-Log Number:	T87276
wouer.	VAP2300	Account Manager:	Christine Krebill
Contact:	Rob Linebarger		
Standard:	FCC	Class:	N/A

### Radiated Emissions 30-1000 MHz, (FCC 15.247/RSS 210)

(NTS Silicon Valley Fremont Facility, Semi-Anechoic Chamber)

#### Test Specific Details

NTS

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 5/14/2012 Test Engineer: Jack Liu Test Location: FT5 Config. Used: 1 Config Change: None EUT Voltage: 120v/60Hz

#### General Test Configuration

The EUT and any local support equipment were located on the turntable for radiated emissions testing.

The test distance and extrapolation factor (if applicable) are detailed under each run description.

Note, preliminary testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. Maximized testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

#### Ambient Conditions:

Temperature:	24 °C
Rel. Humidity:	35 %

#### Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	Radiated Emissions	FCC 15.209 / RSS 210	Pass	33.5 dBµV/m @ 54.15 MHz
I.	30 - 1000 MHz	1 00 13.2077 1035 210	r ass	(-6.5 dB)
2	Radiated Emissions	FCC 15.209 / RSS 210	Pass	32.8 dBµV/m @ 53.55 MHz
Z	30 - 1000 MHz	1 00 15.2077 1055 210	Pass	(-7.2 dB)

#### Modifications Made During Testing

No modifications were made to the EUT during testing

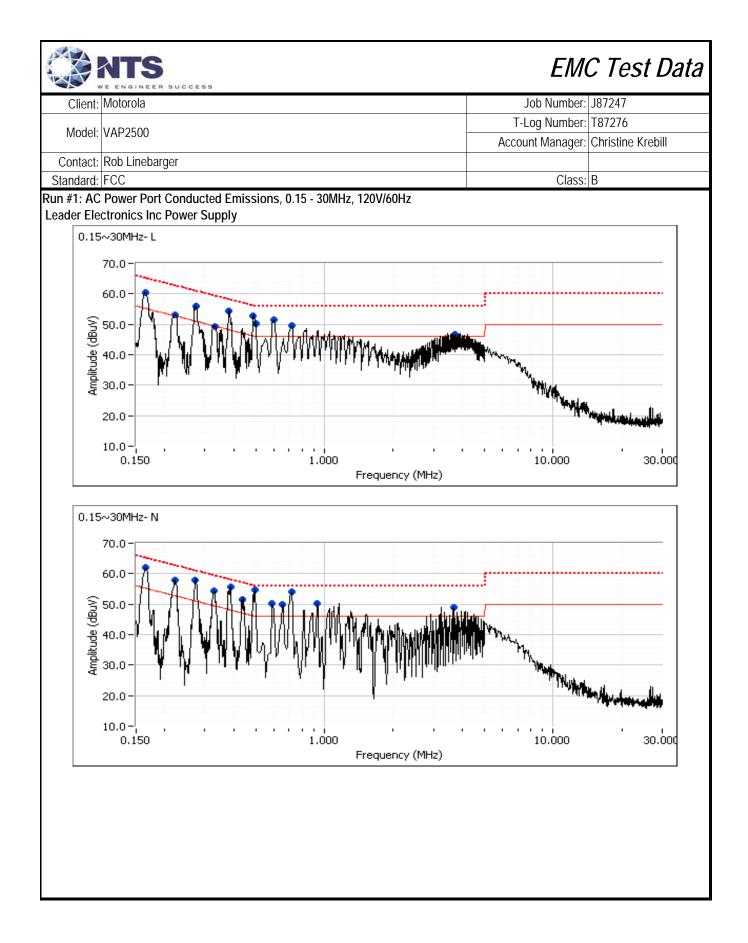
#### Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Motorola							Job Number:	: J87247
							T-Log Number: T87276		
Model:	VAP2500							0	Christine Kreb
Contact:	Rob Linebar	aer						<u> </u>	
Standard:		3						Class:	: N/A
	eliminary Ra	diated En	nissions, 30	- 1000 MHz					1
						hannel 36, L	eader Elect	ronics Inc Po	wer Supply
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	50.0-								
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reliminary requency	20.0 - 10.0 - 30.0 7 peak readir Level	Pol	FCC 15.20	ore-scan 9 / RSS 210	Detector	Azimuth	Height	Comments	
eliminary requency MHz	20.0 - 10.0 - 30.0 7 peak readir Level dBµV/m	Pol v/h	FCC 15.20 Limit	<b>re-scan</b> 9 / RSS 210 Margin	Detector Pk/QP/Avg	Azimuth degrees	meters	Comments	
reliminary requency MHz 54.153	20.0 - 10.0 - 30.0 7 peak readin Level dBµV/m 36.2	Pol v/h V	FCC 15.20 Limit 40.0	9 / RSS 210 Margin -3.8	Detector Pk/QP/Avg Peak	Azimuth degrees 0	meters 1.0	Comments	
eliminary requency MHz 54.153 95.769	20.0 - 10.0 - 30.0 7 peak readin Level dBµV/m 36.2 34.2	Pol v/h	FCC 15.20 Limit 40.0 43.5	9 / RSS 210 Margin -3.8 -9.3	Detector Pk/QP/Avg Peak Peak	Azimuth degrees 0 257	meters	Comments	
eliminary equency MHz 54.153 95.769 105.684	20.0 - 10.0 - 30.0 7 peak readin Level dBµV/m 36.2	Pol v/h V V	FCC 15.20 Limit 40.0	9 / RSS 210 Margin -3.8	Detector Pk/QP/Avg Peak	Azimuth degrees 0	meters 1.0 1.0	Comments	
reliminary requency MHz 54.153 95.769 105.684 499.998	20.0 - 10.0 - 30.0 7 peak readin Level dBμV/m 36.2 34.2 31.8	Pol v/h V V V	FCC 15.20 Limit 40.0 43.5 43.5	9 / RSS 210 Margin -3.8 -9.3 -11.7	Detector Pk/QP/Avg Peak Peak Peak	Azimuth degrees 0 257 173	meters 1.0 1.0 1.0		
reliminary requency MHz 54.153 95.769 105.684 499.998 624.988	20.0 - 10.0 - 30.0 7 peak readin Level dBµV/m 36.2 34.2 31.8 34.1	Pol v/h V V V V V	FCC 15.20 Limit 40.0 43.5 43.5 46.0	ore-scan 9 / RSS 210 Margin -3.8 -9.3 -11.7 -11.9	Detector Pk/QP/Avg Peak Peak Peak Peak	Azimuth degrees 0 257 173 161	meters 1.0 1.0 1.0 1.0		
eliminary requency MHz 54.153 95.769 105.684 499.998 524.988 524.988 540.009	20.0 - 10.0 - 30.0 7 peak readin Level dBµV/m 36.2 34.2 31.8 34.1 31.5 38.1	Pol v/h V V V V V V V	FCC 15.20 Limit 40.0 43.5 43.5 43.5 46.0 46.0 46.0 46.0	ore-scan 9 / RSS 210 -3.8 -9.3 -11.7 -11.9 -14.5 -7.9	Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak	Azimuth degrees 0 257 173 161 44 254	meters 1.0 1.0 1.0 1.0 1.0 1.0		
eliminary requency MHz 54.153 95.769 105.684 499.998 624.988 640.009 aximized	20.0 - 10.0 - 30.0 7 peak readin Level dBµV/m 36.2 34.2 31.8 34.1 31.5 38.1 quasi-peak r	Pol v/h V V V V V V	FCC 15.20 Limit 40.0 43.5 43.5 46.0 46.0 46.0 46.0 (includes matrix)	9 / RSS 210 Margin -3.8 -9.3 -11.7 -11.9 -14.5 -7.9 anipulation o	Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak Peak	Azimuth degrees 0 257 173 161 44 254 ace cables)	meters           1.0           1.0           1.0           1.0           1.0           1.0           1.0           1.0           1.0           1.0		
eliminary requency MHz 54.153 95.769 105.684 499.998 624.988 640.009 aximized requency	20.0 - 10.0 - 30.0 7 peak readir Level dBµV/m 36.2 34.2 31.8 34.1 31.5 38.1 quasi-peak r Level	Pol v/h V V V V V v readings (	FCC 15.20 Limit 40.0 43.5 43.5 46.0 46.0 46.0 46.0 46.0 5CC 15.20	ore-scan 9 / RSS 210 Margin -3.8 -9.3 -11.7 -11.9 -14.5 -7.9 anipulation of 9 / RSS 210	Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak of EUT interf Detector	Azimuth degrees 0 257 173 161 44 254 ace cables) Azimuth	meters 1.0 1.0 1.0 1.0 1.0 1.0 Height	Comments Comments	
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eliminary requency MHz 54.153 95.769 105.684 199.998 524.988 540.009 aximized requency MHz 54.153 540.009	20.0 - 10.0 - 30.0 7 peak readin Level dBµV/m 36.2 34.2 31.8 34.1 31.5 38.1 quasi-peak r Level dBµV/m 33.5 37.6	Pol           v/h           V/h           V           V           V	FCC 15.20 Limit 40.0 43.5 43.5 46.0 46.0 46.0 46.0 (includes ma FCC 15.20 Limit 40.0 46.0	re-scan 9 / RSS 210 Margin -3.8 -9.3 -11.7 -11.9 -14.5 -7.9 anipulation of 9 / RSS 210 Margin -6.5 -8.4	Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak of EUT interf Detector Pk/QP/Avg QP QP	Azimuth degrees 0 257 173 161 44 254 ace cables) Azimuth degrees 259 255	meters           1.0	Comments QP (1.00s) QP (1.00s)	
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Client:	Motorola							Job Number:	
Model	VAP2500							Log Number:	
woudt.							Acco	unt Manager:	Christine Krebill
	Rob Linebar	ger							
Standard:								Class:	N/A
	eliminary Ra								
Shiigurea		quency Ra			ettings 16) on istance		istance	Extranolat	tion Factor
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Preliminary Frequency MHz 53.547 95.770	20.0 - 30.0 20.0 - 30.0 2 peak readin Level dBµV/m 35.4 35.5	Pol v/h V V	FCC 15.209 Limit 40.0 43.5	re-scan 2 / RSS 210 Margin -4.6 -8.0	Detector Pk/QP/Avg Peak Peak	Azimuth degrees 30 250	meters 1.0 1.0		ioo'o.
reliminary Frequency MHz 53.547 95.770 105.699	20.0 - 30.0 20.0 - 30.0 20.0 20.0 30.0 20.0 30.0 20.0 30.0 20.0 2	Pol v/h V V V	FCC 15.209 Limit 40.0 43.5 43.5	re-scan 0 / RSS 210 Margin -4.6 -8.0 -12.0	Detector Pk/QP/Avg Peak Peak Peak	Azimuth degrees 30 250 203	meters 1.0 1.0 1.5	Comments	ioo'o.
reliminary Frequency MHz 53.547 95.770 105.699 500.003	20.0 - 30.0 7 peak readin Level $dB\mu V/m$ 35.4 35.5 31.5 34.2	Pol v/h V V V V	FCC 15.209 Limit 40.0 43.5 43.5 46.0	re-scan 9 / RSS 210 Margin -4.6 -8.0 -12.0 -11.8	Detector Pk/QP/Avg Peak Peak Peak Peak	Azimuth degrees 30 250 203 137	meters 1.0 1.0 1.5 1.0	Comments	ioo'o.
reliminary Frequency MHz 53.547 95.770 105.699	20.0 - 30.0 20.0 - 30.0 20.0 20.0 30.0 20.0 30.0 20.0 30.0 20.0 2	Pol v/h V V V	FCC 15.209 Limit 40.0 43.5 43.5	re-scan 0 / RSS 210 Margin -4.6 -8.0 -12.0	Detector Pk/QP/Avg Peak Peak Peak Peak Peak	Azimuth degrees 30 250 203	meters 1.0 1.0 1.5		iooo.
reliminary requency MHz 53.547 95.770 105.699 500.003 624.999	20.0 - 30.0 <b>peak readin</b> Level dB $\mu$ V/m 35.4 35.5 31.5 34.2 32.1	Pol v/h V V V V V V	FCC 15.209 Limit 40.0 43.5 43.5 43.5 46.0 46.0	re-scan 9 / RSS 210 Margin -4.6 -8.0 -12.0 -11.8 -13.9	Detector Pk/QP/Avg Peak Peak Peak Peak	Azimuth degrees 30 250 203 137 30	meters 1.0 1.0 1.5 1.0 1.0	Comments	· · · iooo.
reliminary Frequency MHz 53.547 95.770 105.699 500.003 624.999 640.009	20.0 - 30.0 20.0 - 30.0 20.0 20.0 20.0 20.0 30.0 20.0 20.0	Pol v/h V V V V V V v v v	FCC 15.209 Limit 40.0 43.5 43.5 46.0 46.0 46.0 46.0	re-scan 9 / RSS 210 Margin -4.6 -8.0 -12.0 -11.8 -13.9 -7.7 mipulation (	Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak Peak	Azimuth degrees 30 250 203 137 30 252 ace cables)	meters 1.0 1.0 1.5 1.0 1.0 1.0 1.0		i oo'o.
reliminary requency MHz 53.547 95.770 105.699 500.003 624.999 640.009 laximized requency	20.0 - 30.0 20.0 - 30.0 2 peak readin Level dBµV/m 35.4 35.5 31.5 34.2 32.1 38.3 quasi-peak r Level	Pol v/h V V V V V V v v readings (	FCC 15.209 Limit 40.0 43.5 43.5 46.0 46.0 46.0 46.0 46.0 46.0	re-scan 9 / RSS 210 Margin -4.6 -8.0 -12.0 -11.8 -13.9 -7.7 mipulation ( 9 / RSS 210	Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak Peak	Azimuth degrees 30 250 203 137 30 252 ace cables) Azimuth	meters 1.0 1.0 1.5 1.0 1.0 1.0 Height	Comments Comments	iooo.
reliminary requency MHz 53.547 95.770 105.699 500.003 624.999 640.009 laximized requency MHz	20.0 - 30.0 7 peak readin Level $dB\mu V/m$ 35.4 35.5 31.5 34.2 32.1 38.3 quasi-peak r Level $dB\mu V/m$	Pol v/h V V V V V V v readings ( Pol v/h	FCC 15.209 Limit 40.0 43.5 43.5 46.0 46.0 46.0 46.0 (includes ma FCC 15.209 Limit	re-scan 9 / RSS 210 Margin -4.6 -8.0 -12.0 -11.8 -13.9 -7.7 mipulation ( 9 / RSS 210 Margin	Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak Detector Pk/QP/Avg	Azimuth degrees 30 250 203 137 30 252 ace cables) Azimuth degrees	meters           1.0           1.0           1.5           1.0           1.0           1.0           Height           meters		· · · iooo.
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reliminary requency MHz 53.547 95.770 105.699 500.003 624.999 640.009 MHz 53.547 640.009 95.770	20.0 - 30.0 20.0 - 30.0 2 peak readin Level dBµV/m 35.4 35.5 31.5 34.2 32.1 38.3 quasi-peak r Level dBµV/m 32.8	Pol           v/h           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           V           Pol           v/h           V	FCC 15.209 Limit 40.0 43.5 43.5 46.0 46.0 46.0 46.0 (includes ma FCC 15.209 Limit 40.0	re-scan 9 / RSS 210 Margin -4.6 -8.0 -12.0 -11.8 -13.9 -7.7 mipulation ( 9 / RSS 210 Margin -7.2	Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak Detector Pk/QP/Avg QP	Azimuth degrees 30 250 203 137 30 252 ace cables) Azimuth degrees 29	meters           1.0           1.0           1.5           1.0           1.0           1.0           1.0           1.0           1.0           1.0           1.0           1.0           1.0           1.0           1.0		
reliminary requency MHz 53.547 95.770 105.699 500.003 624.999 640.009 laximized requency MHz 53.547 640.009	20.0 - 30.0 20.0 - 30.0 20.0 - 30.0 20.0 - 30.0 20.0 - 30.0 20.0 - 20.0 -	Pol v/h V V V V V V v readings ( Pol v/h V V V V V V V V V V V V V	FCC 15.209           Limit           40.0           43.5           43.5           46.0           46.0           46.0           46.0           Limit           40.0           46.0           46.0           46.0           46.0           46.0           46.0           40.0           40.0           43.5	re-scan 9 / RSS 210 Margin -4.6 -8.0 -12.0 -11.8 -13.9 -7.7 mipulation ( 9 / RSS 210 Margin -7.2 -8.4 -11.9	Detector Pk/QP/Avg Peak Peak Peak Peak Peak Peak Peak Of EUT interf Detector Pk/QP/Avg QP QP QP	Azimuth degrees 30 250 203 137 30 252 ace cables) Azimuth degrees 29 257 211	meters           1.0           1.0           1.5           1.0		

<b>NTS</b>	R SUCCESS			EM	C Test Data
Client: Motorola	R 0000E00			Job Number:	J87247
			T-	Log Number:	Т87276
Model: VAP2500			Acco	unt Manager:	Christine Krebill
Contact: Rob Lineba	irger				
Standard: FCC				Class:	В
	Conducted Emiss (NTS Silicon Valley Fremo	•		•	
Test Specific Detai	ils				
Objective	: The objective of this test session is to specification listed above.	perform final qualification	n testing of t	he EUT with r	respect to the
Date of Test	: 5/14/2012	Config. Used:	1		
Test Engineer		Config Change:	None		
Test Location	: FT5	EUT Voltage:	120v/60Hz		
	Temperature: Rel. Humidity:				
Run #	Test Performed	Limit	Result	Margin	
1	CE, AC Power,120V/60Hz	RSS 210 / 15.207	Pass		@ 0.379 MHz (-3.9 dB)
Deviations From T	nade to the EUT during testing	d.			



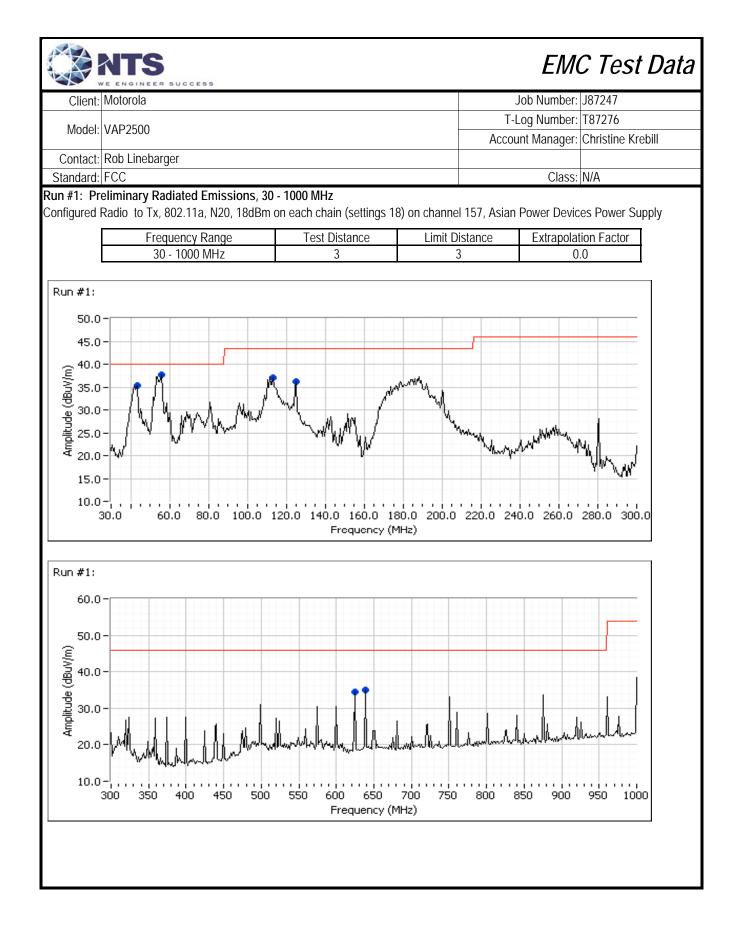
Model:	Motorola						Job Number:	J87247			
wodel:							T-Log Number: T87276				
	VAP2500						Account Manager:	Account Manager: Christine Krebill			
Contact:	Rob Lineba	rger									
Standard:	FCC	-					Class:	В			
						s. average lim	iit)				
Frequency	Level	AC		) / 15.207	Detector	Comments					
MHz	dBµV	Line	Limit	Margin	QP/Ave						
0.163	60.4	Line	55.2	5.2	Peak						
0.218 0.272	53.1 55.8	Line Line	52.7 51.0	0.4 4.8	Peak Peak						
0.272	49.3	Line	49.4	4.8 -0.1	Peak						
0.332	54.3	Line	49.4	6.1	Peak						
0.490	52.8	Line	46.2	6.6	Peak						
3.700	46.8	Line	46.0	0.8	Peak	1					
0.611	51.6	Line	46.0	5.6	Peak						
0.498	50.1	Line	46.0	4.1	Peak						
0.721	49.7	Line	46.0	3.7	Peak						
0.163	61.9	Neutral	55.2	6.7	Peak						
0.219	57.9	Neutral	52.8	5.1	Peak						
0.272	58.0	Neutral	51.0	7.0	Peak						
0.326	54.3	Neutral	49.5	4.8	Peak	-					
0.386	55.6	Neutral	48.1	7.5	Peak						
0.440	51.5	Neutral	47.1	4.4	Peak						
0.496	54.6	Neutral	46.1	8.5	Peak						
0.708	54.0 50.0	Neutral Neutral	46.0 46.0	8.0 4.0	Peak Peak						
0.607	50.0	Neutral	46.0	4.0	Peak						
0.936	50.2	Neutral	46.0	4.1	Peak						
3.685	48.8	Neutral	46.0	2.8	Peak						

equency MHz 0.379 0.496 0.271 0.219 0.607 0.162 0.272 0.608 0.490 0.490 0.379 0.219 0.386 0.163 0.272 0.498 0.326 0.326 0.326 0.326 0.271 0.218 0.707 0.163	AP2500 Rob Linebar CC	ger /erage reading AC Line Line Neutral Neutral Neutral Neutral Line Line Line Line Line Line Line Line Line Line Line Line		0 / 15.207 Margin -3.9 -4.1 -4.4 -4.6 -4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6 -5.6 -5.7	Detector QP/Ave AVG QP QP AVG QP QP AVG QP QP AVG	Comments AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s) QP (1.00s)	T-Log Number: Account Manager: Class:	Christine Krebill
Contact: Ro Standard: FC al quasi-pe equency MHz 0.379 0.496 0.271 0.219 0.607 0.162 0.272 0.608 0.490 0.490 0.379 0.219 0.386 0.163 0.272 0.386 0.163 0.272 0.498 0.326 0.326 0.326 0.271 0.318 0.271 0.218 0.707 0.163	Bob Linebar           CC           eak and avenue           Level           dBμV           44.4           52.0           56.7           48.3           51.4           60.6           46.0           50.7           40.6           52.7           57.2           52.3           59.2	verage readi AC Line Line Neutral Neutral Neutral Neutral Line Line Line Line Line Line Neutral	RSS 210 Limit 48.3 56.1 61.1 52.9 56.0 65.4 51.1 56.0 56.2 46.2 58.3 62.9	Margin -3.9 -4.1 -4.4 -4.6 -4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6 -5.6	QP/Ave AVG QP AVG QP QP QP AVG QP AVG	AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)	Account Manager:	Christine Krebill
Standard:         FC           al quasi-pe           equency           MHz           0.379           0.496           0.271           0.219           0.607           0.162           0.272           0.608           0.490           0.379           0.219           0.3608           0.490           0.379           0.219           0.386           0.163           0.272           0.498           0.326           0.271           0.218           0.707           0.163	CC eak and av Level dBµV 44.4 52.0 56.7 48.3 51.4 60.6 46.0 50.8 50.7 40.6 52.7 57.2 52.3 59.2	verage readi AC Line Line Neutral Neutral Neutral Neutral Line Line Line Line Line Line Neutral	RSS 210 Limit 48.3 56.1 61.1 52.9 56.0 65.4 51.1 56.0 56.2 46.2 58.3 62.9	Margin -3.9 -4.1 -4.4 -4.6 -4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6 -5.6	QP/Ave AVG QP AVG QP QP QP AVG QP AVG	AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)	<u> </u>	
al quasi-pe         equency         MHz         0.379         0.496         0.271         0.607         0.162         0.272         0.608         0.490         0.490         0.379         0.490         0.379         0.219         0.608         0.490         0.379         0.219         0.386         0.163         0.272         0.498         0.326         0.271         0.218         0.707         0.163	eak and av Level dBµV 44.4 52.0 56.7 48.3 51.4 60.6 46.0 50.8 50.7 40.6 52.7 57.2 57.2 52.3 59.2	AC Line Neutral Neutral Neutral Neutral Line Line Line Line Line Neutral	RSS 210 Limit 48.3 56.1 61.1 52.9 56.0 65.4 51.1 56.0 56.2 46.2 58.3 62.9	Margin -3.9 -4.1 -4.4 -4.6 -4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6 -5.6	QP/Ave AVG QP AVG QP QP QP AVG QP AVG	AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)	Class:	B
equency MHz 0.379 0.496 0.271 0.219 0.607 0.162 0.272 0.608 0.490 0.490 0.379 0.219 0.386 0.163 0.272 0.498 0.326 0.326 0.326 0.326 0.271 0.218 0.707 0.163	Level dBµV 44.4 52.0 56.7 48.3 51.4 60.6 46.0 50.8 50.7 40.6 52.7 57.2 52.3 59.2	AC Line Neutral Neutral Neutral Neutral Line Line Line Line Line Neutral	RSS 210 Limit 48.3 56.1 61.1 52.9 56.0 65.4 51.1 56.0 56.2 46.2 58.3 62.9	Margin -3.9 -4.1 -4.4 -4.6 -4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6 -5.6	QP/Ave AVG QP AVG QP QP QP AVG QP AVG	AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)		
MHz           0.379           0.496           0.271           0.219           0.607           0.162           0.272           0.608           0.490           0.379           0.219           0.608           0.490           0.379           0.219           0.386           0.163           0.272           0.498           0.326           0.271           0.218           0.707           0.163	dBμV           44.4           52.0           56.7           48.3           51.4           60.6           46.0           50.7           40.6           52.7           57.2           52.3           59.2	Line Line Neutral Neutral Neutral Line Line Line Line Line Neutral Neutral	Limit 48.3 56.1 61.1 52.9 56.0 65.4 51.1 56.0 56.2 46.2 58.3 62.9	Margin -3.9 -4.1 -4.4 -4.6 -4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6 -5.6	QP/Ave AVG QP AVG QP QP QP AVG QP AVG	AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)		
0.379           0.496           0.271           0.219           0.607           0.162           0.272           0.608           0.490           0.490           0.379           0.219           0.386           0.163           0.272           0.386           0.326           0.326           0.271           0.218           0.707           0.163	44.4         52.0         56.7         48.3         51.4         60.6         46.0         50.8         50.7         40.6         52.7         57.2         52.3         59.2	Line Neutral Neutral Neutral Line Line Line Line Line Neutral Neutral	48.3 56.1 61.1 52.9 56.0 65.4 51.1 56.0 56.2 46.2 58.3 62.9	-3.9 -4.1 -4.4 -4.6 -4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6	AVG QP AVG QP QP AVG QP QP QP AVG	QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)		
0.496           0.271           0.219           0.607           0.162           0.272           0.608           0.490           0.490           0.379           0.219           0.386           0.163           0.272           0.386           0.163           0.272           0.498           0.326           0.271           0.218           0.707           0.163	52.0           56.7           48.3           51.4           60.6           46.0           50.8           50.7           40.6           52.7           57.2           52.3           59.2	Neutral Neutral Neutral Neutral Line Line Line Line Line Neutral Neutral	56.1 61.1 52.9 56.0 65.4 51.1 56.0 56.2 46.2 58.3 62.9	-4.1 -4.4 -4.6 -4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6	QP QP AVG QP QP AVG QP QP AVG	QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)		
0.271         0.219         0.607         0.162         0.272         0.608         0.490         0.379         0.219         0.386         0.163         0.272         0.498         0.326         0.326         0.271         0.218         0.707         0.163	56.7           48.3           51.4           60.6           46.0           50.8           50.7           40.6           52.7           57.2           52.3           59.2	Neutral Neutral Neutral Line Line Line Line Line Neutral Neutral	61.1 52.9 56.0 65.4 51.1 56.0 56.2 46.2 58.3 62.9	-4.4 -4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6	QP AVG QP QP AVG QP QP AVG	QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)		
0.219         0.607         0.162         0.272         0.608         0.490         0.379         0.219         0.386         0.163         0.272         0.498         0.326         0.326         0.211         0.218         0.707         0.163	48.3         51.4         60.6         46.0         50.8         50.7         40.6         52.7         57.2         52.3         59.2	Neutral Neutral Line Neutral Line Line Line Neutral Neutral	52.9 56.0 65.4 51.1 56.0 56.2 46.2 58.3 62.9	-4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6	AVG QP QP AVG QP QP AVG	AVG (0.10s) QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)		
0.607           0.162           0.272           0.608           0.490           0.379           0.219           0.386           0.163           0.272           0.498           0.326           0.271           0.218           0.707           0.163	51.4           60.6           46.0           50.8           50.7           40.6           52.7           57.2           52.3           59.2	Neutral Neutral Line Line Line Line Neutral Neutral	56.0 65.4 51.1 56.0 56.2 46.2 58.3 62.9	-4.6 -4.8 -5.1 -5.2 -5.5 -5.6 -5.6	QP QP AVG QP QP AVG	QP (1.00s) QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)		
0.162         0.272         0.608         0.490         0.379         0.219         0.386         0.163         0.272         0.498         0.326         0.326         0.271         0.218         0.707         0.163	60.6 46.0 50.8 50.7 40.6 52.7 57.2 52.3 59.2	Neutral Line Line Line Line Line Neutral Neutral	65.4 51.1 56.0 56.2 46.2 58.3 62.9	-4.8 -5.1 -5.2 -5.5 -5.6 -5.6	QP AVG QP QP AVG	QP (1.00s) AVG (0.10s) QP (1.00s) QP (1.00s)		
0.272         0.608         0.490         0.379         0.219         0.386         0.163         0.272         0.498         0.326         0.326         0.271         0.218         0.707         0.163	46.0 50.8 50.7 40.6 52.7 57.2 52.3 59.2	Line Neutral Line Line Line Neutral Neutral	51.1 56.0 56.2 46.2 58.3 62.9	-5.1 -5.2 -5.5 -5.6 -5.6	AVG QP QP AVG	AVG (0.10s) QP (1.00s) QP (1.00s)		
0.608           0.490           0.490           0.379           0.219           0.386           0.163           0.272           0.498           0.326           0.271           0.218           0.707           0.163	50.8           50.7           40.6           52.7           57.2           52.3           59.2	Neutral Line Line Line Neutral Neutral	56.0 56.2 46.2 58.3 62.9	-5.2 -5.5 -5.6 -5.6	QP QP AVG	QP (1.00s) QP (1.00s)		
0.490         0.490         0.379         0.219         0.386         0.163         0.272         0.498         0.326         0.326         0.271         0.218         0.707         0.163	50.7 40.6 52.7 57.2 52.3 59.2	Line Line Line Neutral Neutral	56.2 46.2 58.3 62.9	-5.5 -5.6 -5.6	QP AVG	QP (1.00s)		
0.490         0.379         0.219         0.386         0.163         0.272         0.498         0.326         0.326         0.271         0.218         0.707         0.163	40.6 52.7 57.2 52.3 59.2	Line Line Neutral Neutral	46.2 58.3 62.9	-5.6 -5.6	AVG			
0.379         0.219         0.386         0.163         0.272         0.498         0.326         0.326         0.271         0.218         0.707         0.163	52.7 57.2 52.3 59.2	Line Neutral Neutral	58.3 62.9	-5.6				
0.219       0.386       0.163       0.272       0.498       0.326       0.326       0.271       0.218       0.707       0.163	57.2 52.3 59.2	Neutral Neutral	62.9			AVG (0.10s)		
0.386         0.163         0.272         0.498         0.326         0.326         0.271         0.218         0.707         0.163	52.3 59.2	Neutral		F 7	QP	QP (1.00s)		
0.163 0.272 0.498 0.326 0.326 0.271 0.218 0.707 0.163	59.2		58 1		QP	QP (1.00s)		
0.272 0.498 0.326 0.326 0.271 0.218 0.707 0.163		Line		-5.8	QP	QP (1.00s)		
0.498       0.326       0.3271       0.271       0.218       0.707       0.163	54.8		65.3	-6.1	QP	QP (1.00s)		
0.326 0.326 0.271 0.218 0.707 0.163		Line	61.1	-6.3	QP	QP (1.00s)		
0.326 0.271 0.218 0.707 0.163	49.7	Line	56.0	-6.3	QP	QP (1.00s)		
0.271 0.218 0.707 0.163	43.2	Neutral	49.6	-6.4	AVG	AVG (0.10s)		
0.218 0.707 0.163	53.2	Neutral	59.6	-6.4	QP	QP (1.00s)		
0.707 0.163	44.6	Neutral	51.1	-6.5	AVG	AVG (0.10s)		
0.163	46.3	Line	52.9	-6.6	AVG	AVG (0.10s)		
	49.2	Neutral	56.0	-6.8	QP	QP (1.00s)		
0.007	48.3	Line	55.3	-7.0	AVG	AVG (0.10s)		
0.936	48.6	Neutral	56.0	-7.4	QP	QP (1.00s)		
0.707	38.4	Neutral	46.0	-7.6	AVG	AVG (0.10s)		
0.162	47.6	Neutral	55.4	-7.8	AVG	AVG (0.10s)		
0.721	47.6	Line	56.0	-8.4	QP	QP (1.00s)		
0.611	47.4	Line	56.0	-8.6	QP	QP (1.00s)		
0.440	48.5	Neutral	57.1	-8.6	QP	QP (1.00s)		
0.386	37.9	Neutral	48.1	-10.2	AVG	AVG (0.10s)		
0.496	35.9	Neutral	46.1	-10.2	AVG	AVG (0.10s)		
0.332	48.8	Line	59.4	-10.6	QP	QP (1.00s)		
3.685	45.2	Neutral	56.0	-10.8	QP	QP (1.00s)		
0.218	51.9	Line	62.9	-11.0	QP	QP (1.00s)		
0.607	33.4	Neutral	46.0	-12.6	AVG	AVG (0.10s)		
0.440	34.3	Neutral	47.1	-12.8	AVG	AVG (0.10s)		
0.608	32.6	Neutral	46.0	-13.4	AVG	AVG (0.10s)		
0.498	32.1	Line	46.0	-13.9	AVG	AVG (0.10s)		
0.332	35.1	Line	49.4	-14.3	AVG	AVG (0.10s)		

Image: Standard         Job Number:         J87247           Clent:         Modet:         VAP2500         T-Log Number:         T87276           Contact:         Rob Linebarger         Christine Krebill         Christine Krebill           Standard:         FCC         Class:         B           equency         Level         AC         RSS 210 / 15.207         Detector         Comments           MHz         dByL         Line         Linit         Margin         OP/Ave         OP/Ave           0.936         29.5         Neutral         46.0         -17.6         AVG         AVG (0.10s)		NTS					EMO	C Test Dat
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Client:	Motorola	SUCCESS				Job Number:	J87247
Model:VAP2500Account Manager:Christine KrebillContact:Rob LinebargerChristine KrebillStandard:FCCClass:BrequencyLevelACRSS 210 / 15.207DetectorCommentsMHzdB $\mu$ VLineLinitMarginQP/AveComments0.93629.5Neutral46.0-16.5AVGAVG (0.10s)0.61128.4Line46.0-17.6AVGAVG (0.10s)0.72128.0Line46.0-18.0AVGAVG (0.10s)3.70037.1Line56.0-18.9QPQP (1.00s)								
Contact:         Rob Linebarger         Class:         B           Standard:         FCC         Class:         B           requency         Level         AC         RSS 210 / 15.207         Detector         Comments           MHz         dBµV         Line         Linit         Margin         QP/Ave         Comments           0.936         29.5         Neutral         46.0         -16.5         AVG         AVG (0.10s)           0.611         28.4         Line         46.0         -17.6         AVG         AVG (0.10s)           0.721         28.0         Line         46.0         -18.0         AVG         AVG (0.10s)           3.700         37.1         Line         56.0         -18.9         QP         QP (1.00s)	Model:	VAP2500						
Standard:         FCC         Class:         B           requency         Level         AC         RSS 210 / 15.207         Detector         Comments         Comments	Contact:	Rob Linebar	ger					
MHz         dBμV         Line         Limit         Margin         QP/Ave           0.936         29.5         Neutral         46.0         -16.5         AVG         AVG (0.10s)           0.611         28.4         Line         46.0         -17.6         AVG         AVG (0.10s)           0.721         28.0         Line         46.0         -18.0         AVG         AVG (0.10s)           3.700         37.1         Line         56.0         -18.9         QP         QP (1.00s)							Class:	В
MHz         dBμV         Line         Limit         Margin         QP/Ave           0.936         29.5         Neutral         46.0         -16.5         AVG         AVG (0.10s)           0.611         28.4         Line         46.0         -17.6         AVG         AVG (0.10s)           0.721         28.0         Line         46.0         -18.0         AVG         AVG (0.10s)           3.700         37.1         Line         56.0         -18.9         QP         QP (1.00s)				 	<u> </u>			
0.936         29.5         Neutral         46.0         -16.5         AVG         AVG (0.10s)           0.611         28.4         Line         46.0         -17.6         AVG         AVG (0.10s)           0.721         28.0         Line         46.0         -18.0         AVG         AVG (0.10s)           3.700         37.1         Line         56.0         -18.9         QP         QP (1.00s)						Comments		
0.611         28.4         Line         46.0         -17.6         AVG         AVG (0.10s)           0.721         28.0         Line         46.0         -18.0         AVG         AVG (0.10s)           3.700         37.1         Line         56.0         -18.9         QP         QP (1.00s)						$\Lambda V C (0.10s)$		
0.721         28.0         Line         46.0         -18.0         AVG         AVG (0.10s)           3.700         37.1         Line         56.0         -18.9         QP         QP (1.00s)								
3.700 37.1 Line 56.0 -18.9 QP QP (1.00s)								
						QP (1.00s)		

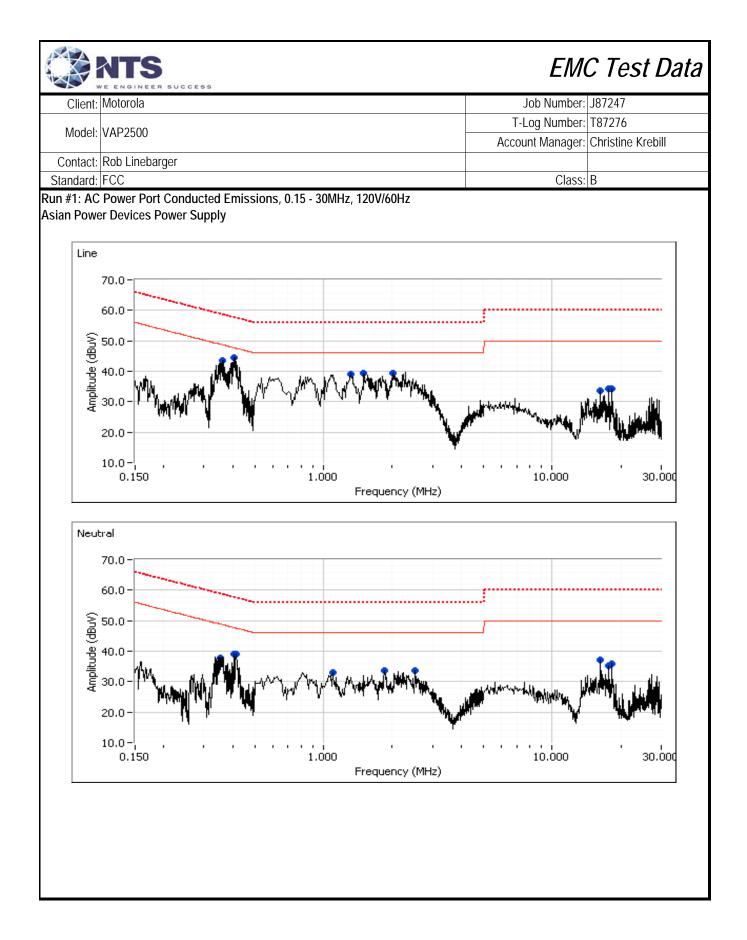
EMO	C Test Data
Job Number:	J87247

		R SUCCESS			EM	C Test Data	
Client:	Motorola			-	Job Number:	J87247	
Model	VAP2500			T-l	Log Number:	Т87276	
				Αссоυ	Int Manager:	Christine Krebill	
	Rob Linebar	ger					
Standard:	FCC				Class:	N/A	
		Radiated Emissions 30 (NTS Silicon Valley Fren	)-1000 MHz, (FCC mont Facility, Semi-Anect		-		
Test Spe	cific Detail Objective:	Is The objective of this test session is specification listed above.	s to perform final qualificati	ion testing of	the EUT with	n respect to the	
Date of Test: 6/25/2012Config. Used: 1Test Engineer: Michael FindleyConfig Change: NoneTest Location: FT4EUT Voltage: 120v/60Hz							
	Test Config nd any local s	guration support equipment were located on t	the turntable for radiated e	emissions tes	sting.		
The test dis	tance and ex	trapolation factor (if applicable) are	detailed under each run d	escription.			
antenna. M	laximized test	indicates that the emissions were m ting indicated that the emissions we	5				
Amplent	Conditions		4 °C				
			5 %				
Summary	y of Result	5					
Rı	un #	Test Performed	Limit	Result	Margin		
	1	Radiated Emissions 30 - 1000 MHz	FCC 15.209 / RSS 210	Pass	33.5 dBµ\	//m @ 55.90 MHz (-6.5 dB)	
No modifi Deviation	ications were	e During Testing made to the EUT during testing he Standard ade from the requirements of the sta	andard.		_		



	Motorola							Job Number:	
Nodel	VAP2500 -						T-Log Number:		
							Acco	unt Manager:	Christine Krebill
	Rob Linebarger								
tandard:								Class:	N/A
	v peak readir				Detector	۸ <u> </u>	Llainht	Commente	
equency MHz	Level	Pol	FCC 15.209 Limit		Detector	Azimuth	Height	Comments	
25.006	dBµV/m 36.2	v/h V	43.5	Margin -7.3	Pk/QP/Avg Peak	degrees 340	meters 1.0		
2.985	35.3	V	40.0	-4.7	Peak	340	1.0		
12.194	37.0	V	43.5	-6.5	Peak	303	1.0		
40.009	35.1	V	46.0	-10.9	Peak	276	1.0		
5.897	37.6	V	40.0	-2.4	Peak	107	1.0		
25.005	34.5	V	46.0	-11.5	Peak	57	1.0		
					of EUT interf		Llaight	Commonto	
equency MHz	Level	Pol v/h	Limit	9 / RSS 210 Margin	Detector Pk/QP/Avg	Azimuth degrees	Height	Comments	
5.897	dBμV/m 33.5	V	40.0	-6.5	QP QP	uegrees 0	meters 1.0	QP (1.00s)	
2.985	31.4	V	40.0	-8.6	QP	360	1.0	QP (1.003)	
25.006	34.6	V	43.5	-8.9	QP	341	1.0	QP (1.00s)	
12.194	31.1	V	43.5	-12.4	QP	290	1.0	QP (1.00s)	
40.009	33.0	V	46.0	-13.0	QP	277	1.0	QP (1.00s)	
25.005	32.3	V	46.0	-13.7	QP	64	1.0	QP (1.00s)	

<b>NTS</b>	SUCCESS			EM	C Test Data	
Client: Motorola		Job Number: J87247				
Model: VAP2500		T-Log Number: T87276 Account Manager: Christine Krebill				
Contact: Rob Linebar Standard: FCC	ger	Class: B				
	Conducted Emiss (NTS Silicon Valley Fremo	•		•		
Test Specific Detai Objective:	S The objective of this test session is to specification listed above.	perform final qualificatior	n testing of t	the EUT with i	respect to the	
Date of Test: Test Engineer: Test Location:	Michael Findley	1 None 120v/60Hz				
	guration the EUT was located on a wooden tab A second LISN was used for all loc					
Ambient Condition	Rel. Humidity:	24 °C 35 %				
Summary of Result	S					
Run #	Test Performed	Limit	Result	Margin		
1	CE, AC Power,120V/60Hz	RSS 210 / 15.207	Pass	35.4 dBµV (-12.3 dB)	@ 0.406 MHz	
Modifications Made No modifications were m Deviations From Th	ade to the EUT during testing					
No deviations were made	e from the requirements of the standar	d.				



Client:         Motorola         Job Number:         J87247           Model:         VAP2500         T-Log Number:         T87276           Account Manager:         Christine Kreet         Christine Kreet         Christine Kreet           Standard:         FCC         Class:         B           Preliminary peak readings captured during pre-scan (peak readings vs. average limit)         Class:         B           Preliminary peak readings captured during pre-scan (peak readings vs. average limit)         Class:         B           Preliminary peak readings captured during pre-scan (peak readings vs. average limit)         Class:         B           Preliminary peak readings and the time transformer
Model:VAP2500Account Manager:Christine KreeContact:Rob LinebargerStandard:FCCClass:Breliminary peak readings captured during pre-scan (peak readings vs. average limit)requencyLevelACRSS 210 / 15.207DetectorCommentsMHzdB $\mu$ VLineLinitMarginQP/AveCommentsComments0.40644.6Line 147.7-3.1PeakCommentsComments1.51639.4Line 146.0-6.6PeakCommentsComments1.30839.1Line 146.0-6.7PeakCommentsComments1.622933.6Line 150.0-16.4PeakCommentsComments16.16833.6Line 150.0-16.4PeakCommentsComments16.16833.6Line 150.0-16.4PeakCommentsComments16.16833.6Line 150.0-16.4PeakCommentsComments16.16833.6Line 150.0-16.4PeakCommentsComments16.16815.0CommentsCommentsCommentsCommentsComments16.16816.16816.164PeakCommentsCommentsComments16.16816.16816.164PeakCommentsCommentsComments16.16816.16816.164PeakCommentsCommentsComments16.168
Standard: FCCClass: Breliminary peak readings captured during pre-scan (peak readings vs. average limit)requencyLevelACRSS 210 / 15.207DetectorCommentsMHzdB $\mu$ VLineLimitMarginQP/AveComments
eliminary peak readings captured during pre-scan (peak readings vs. average limit)         equency       Level       AC       RSS 210 / 15.207       Detector       Comments         MHz       dB $\mu$ V       Line       Linei       Margin       QP/Ave       Comments         0.406       44.6       Line 1       47.7       -3.1       Peak       Peak         0.357       43.4       Line 1       48.7       -5.3       Peak       Peak         1.516       39.4       Line 1       46.0       -6.6       Peak       Peak         2.029       39.3       Line 1       46.0       -6.7       Peak       Peak         16.229       33.6       Line 1       50.0       -16.4       Peak       Peak
$\begin{array}{c c c c c c c c c c c c c c c c c c c $
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $
MHz         dBµV         Line         Limit         Margin         QP/Ave           0.406         44.6         Line 1         47.7         -3.1         Peak           0.357         43.4         Line 1         48.7         -5.3         Peak           1.516         39.4         Line 1         46.0         -6.6         Peak           1.308         39.1         Line 1         46.0         -6.7         Peak           2.029         39.3         Line 1         46.0         -6.7         Peak           6.229         33.6         Line 1         50.0         -16.4         Peak           6.168         33.6         Line 1         50.0         -16.4         Peak
0.406       44.6       Line 1       47.7       -3.1       Peak         0.357       43.4       Line 1       48.7       -5.3       Peak         1.516       39.4       Line 1       46.0       -6.6       Peak         1.308       39.1       Line 1       46.0       -6.9       Peak         2.029       39.3       Line 1       46.0       -6.7       Peak         16.229       33.6       Line 1       50.0       -16.4       Peak         16.168       33.6       Line 1       50.0       -16.4       Peak
0.357       43.4       Line 1       48.7       -5.3       Peak         1.516       39.4       Line 1       46.0       -6.6       Peak         1.308       39.1       Line 1       46.0       -6.9       Peak         2.029       39.3       Line 1       46.0       -6.7       Peak         16.229       33.6       Line 1       50.0       -16.4       Peak         16.168       33.6       Line 1       50.0       -16.4       Peak
1.516       39.4       Line 1       46.0       -6.6       Peak         1.308       39.1       Line 1       46.0       -6.9       Peak         2.029       39.3       Line 1       46.0       -6.7       Peak         6.229       33.6       Line 1       50.0       -16.4       Peak         6.168       33.6       Line 1       50.0       -16.4       Peak
1.308       39.1       Line 1       46.0       -6.9       Peak         2.029       39.3       Line 1       46.0       -6.7       Peak         6.229       33.6       Line 1       50.0       -16.4       Peak         6.168       33.6       Line 1       50.0       -16.4       Peak
2.029         39.3         Line 1         46.0         -6.7         Peak           6.229         33.6         Line 1         50.0         -16.4         Peak           6.168         33.6         Line 1         50.0         -16.4         Peak
6.229         33.6         Line 1         50.0         -16.4         Peak           6.168         33.6         Line 1         50.0         -16.4         Peak
6.168 33.6 Line 1 50.0 -16.4 Peak
18.244 34.3 Line 1 50.0 -15.7 Peak
8.304 34.3 Line 1 50.0 -15.7 Peak
0.357 37.8 Neutral 48.8 -11.0 Peak
0.353 37.8 Neutral 48.8 -11.0 Peak
0.403 39.2 Neutral 47.7 -8.5 Peak
0.410 38.9 Neutral 47.6 -8.7 Peak
2.549 33.5 Neutral 46.0 -12.5 Peak
1.856 33.5 Neutral 46.0 -12.5 Peak
1.109 33.1 Neutral 46.0 -12.9 Peak

Client:	Motorola						Job Number:	J87247
							T-Log Number:	T87276
Model:	VAP2500						Account Manager:	
Contact:	Rob Lineba	rger					Ĵ	
Standard:	FCC	0					Class:	В
inal quasi	-peak and a	verage readi	ngs					
requency	Level	AC	RSS 210	/ 15.207	Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.406	35.4	Line 1	47.7	-12.3	AVG	AVG (0.10s)		
0.357	35.6	Line 1	48.8	-13.2	AVG	AVG (0.10s)		
0.406	42.6	Line 1	57.7	-15.1	QP	QP (1.00s)		
0.357	42.6	Line 1	58.8	-16.2	QP	QP (1.00s)		
1.308	28.2	Line 1	46.0	-17.8	AVG	AVG (0.10s)		
0.403	30.0	Neutral	47.8	-17.8	AVG	AVG (0.10s)		
0.357	30.0	Neutral	48.8	-18.8	AVG	AVG (0.10s)		
0.410	28.8	Neutral	47.6	-18.8	AVG	AVG (0.10s)		
0.353	29.8	Neutral	48.9	-19.1	AVG	AVG (0.10s)		
2.029	26.4	Line 1	46.0	-19.6	AVG	AVG (0.10s)		
0.403	37.8	Neutral	57.8	-20.0	QP	QP (1.00s)		
1.308	35.8	Line 1	56.0	-20.2	QP	QP (1.00s)		
1.516	25.4	Line 1	46.0	-20.6	AVG	AVG (0.10s)		
16.229	29.0	Line 1	50.0	-21.0	AVG	AVG (0.10s)		
1.516	35.0	Line 1	56.0	-21.0	QP	QP (1.00s)		
0.357	37.8	Neutral	58.8	-21.0	QP	QP (1.00s)		
0.410	36.6	Neutral	57.6	-21.0	QP	QP (1.00s)		
2.029	34.9	Line 1	56.0	-21.1	QP	QP (1.00s)		
0.353	37.6	Neutral	58.9	-21.3	QP	QP (1.00s)		
16.168	27.8	Line 1	50.0	-22.2	AVG	AVG (0.10s)		
17.694	27.5	Line 1	50.0	-22.5	AVG	AVG (0.10s)		
18.244	26.7	Line 1	50.0	-23.3	AVG	AVG (0.10s)		
1.109	22.1	Neutral	46.0	-23.9	AVG	AVG (0.10s)		
18.304	25.1	Line 1	50.0	-24.9	AVG	AVG (0.10s)		
1.856	21.1	Neutral	46.0	-24.9	AVG	AVG (0.10s)		
16.229	34.5	Line 1	60.0	-25.5	QP	QP (1.00s)		
2.549	19.9	Neutral	46.0	-26.1	AVG	AVG (0.10s)		
1.109	29.6	Neutral	56.0	-26.4	QP	QP (1.00s)		
16.168	33.4	Line 1	60.0	-26.6	QP	QP (1.00s)		
1.856	28.4	Neutral	56.0	-27.6	QP	QP (1.00s)		
17.694	32.2	Line 1	60.0	-27.8	QP	QP (1.00s)		
18.244	31.4	Line 1	60.0	-28.6	QP	QP (1.00s)		
2.549 18.304	27.4 29.7	Neutral Line 1	56.0 60.0	-28.6 -30.3	QP QP	QP (1.00s) QP (1.00s)		

## End of Report

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