

FCC CFR47 PART 15 SUBPART C CLASS II PERMISSIVE CHANGE TEST REPORT

FOR

CLIENT BRIDGE 3000 SERIES

MODEL NUMBER: CB3000

FCC ID: H9PCB3000

REPORT NUMBER: 06U10509-1B

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Prepared for SYMBOL TECHNOLOGIES, INC. 6480 VIA DEL ORO DRIVE SAN JOSE, CA 95119, USA

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Revision History

| Rev. | Issue Date | Revisions | Revised By |
|------|---------------|---|------------|
| | 8/30/06 | Initial Issue | A. Ilarina |
| В | 9/1/2006 | Update description of EUT under section 5.1 and description of Class II Change in section 5.2 | A. Ilarina |

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1. ATTESTATION OF TEST RESULTS

| COMPANY NAME: | SYMBOL TECHNOLOG 6480 VIA DEL ORO DE SAN JOSE, CA 95119, V | GIES, INC. RIVE JSA |
|-------------------|--|---------------------------|
| EUT DESCRIPTION: | CLIENT BRIDGE 3000 S | SERIES |
| MODEL: | CB3000 | |
| SERIAL NUMBER: | 6146529900788 | |
| DATE TESTED: | AUGUST 21-22, 2006 | |
| | APPLICABLE STAN | NDARDS |
| STANDARD | | TEST RESULTS |
| FCC PART 15 SUBP. | ART C | NO NON-COMPLIANCE NOTED |

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

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Mautonpulp

THANH NGUYEN EMC ENGINEER COMPLIANCE CERTIFICATION SERVICES

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2 and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 561F Monterey Road, Morgan Hill, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <u>http://www.ccsemc.com</u>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER | UNCERTAINTY |
|-------------------------------------|----------------|
| Radiated Emission, 30 to 200 MHz | +/- 3.3 dB |
| Radiated Emission, 200 to 1000 MHz | +4.5 / -2.9 dB |
| Radiated Emission, 1000 to 2000 MHz | +4.5 / -2.9 dB |
| Power Line Conducted Emission | +/- 2.9 dB |

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an 802.11a/b/g transceiver.

The radio module is manufactured by Symbol Technologies, Inc.

5.2. DESCRIPTION OF CLASS II PERMISSIVE CHANGE

The change filed under this application is:

Change #1: Add a panel antenna, with 6.3 dBi gain for 2.4GHz band only

5.3. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was ART. The test utility software used during testing was ART.Exe

5.4. WORST-CASE CONFIGURATION AND MODE

The worst-case data rate for this channel is determined to be 11 Mb/s for the 802.11b mode and 6 Mb/s for the 802.11g mode.

Thus all emissions tests were made in the 802.11b mode at 11 Mb/s and 802.11g mode at 6Mb/s, using the 6.3 dBi Panel antenna set.

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5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

| PERIPHERAL SUPPORT EQUIPMENT LIST | | | | | | |
|---|------|----------|----------------|-----|--|--|
| Description Manufacturer Model Serial Number FCC ID | | | | | | |
| Laptop | DELL | Latitude | 48155-24T-4022 | DoC | | |

I/O CABLES

| I/O CABLE LIST | | | | | | | | |
|----------------|----------|----------------------------|-------------------|---------------|-----------------|---------|--|--|
| Cable No. | Port | # of Identical Ports | Connector Type | Cable Type | Cable Length | Remarks | | |
| 1 | AC | 1 | US 115V | Un-shielded | 2m | No | | |
| 2 | DC | 2 | DC Plug | Un-shielded | 1.5m | No | | |
| 3 | Ethernet | 1 | RJ45 | Un-shielded | 10m | Yes | | |
| 4 | Antenna | 1 | SMA | Shielded | 1m | Yes | | |

TEST SETUP

The EUT was tested with a remote host laptop computer connected via Ethernet Port. Test s/w exercised the EUT.

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SETUP DIAGRAM FOR TESTS



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6. TEST AND MEASUREMENT EQUIPMENT

| TEST EQUIPMENT LIST | | | | | | |
|---------------------------------|----------------|------------|---------------|------------|--|--|
| Description | Manufacturer | Model | Serial Number | Cal Due | | |
| Antenna, Horn 1 ~ 18 GHz | EMCO | 3115 | 6717 | 4/22/2007 | | |
| Preamplifier, 1 ~ 26 GHz | Miteq | NSP2600-SP | 924342 | 9/2/2006 | | |
| Spectrum Analyzer 3 Hz ~ 44 GHz | Agilent / HP | E4446A | MY45300064 | 12/19/2006 | | |
| EMI Receiver, 9 kHz ~ 2.9 GHz | Agilent / HP | 8542E | 3942A00286 | 2/4/2007 | | |
| RF Filter Section | Agilent / HP | 85420E | 3705A00256 | 2/4/2007 | | |
| Antenna, Bilog 30 MHz ~ 2 Ghz | Sunol Sciences | JB1 | A121003 | 9/3/2006 | | |

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7. LIMITS AND RESULTS

7.1. CHANNEL TESTS FOR THE 2400 TO 2483.5 MHz BAND

7.1.1. AVERAGE POWER

AVERAGE POWER LIMIT

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

802.11b Mode

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 2412 | 15.94 |
| Middle | 2437 | 15.80 |
| High | 2462 | 16.40 |

802.11g Mode

| Channel | Frequency | Power |
|---------|-----------|-------|
| | (MHz) | (dBm) |
| Low | 2412 | 13.55 |
| Middle | 2437 | 15.53 |
| High | 2462 | 14.05 |

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7.1.2. PEAK OUTPUT POWER

PEAK POWER LIMIT

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz , and 5725-5850 MHz bands: 1 watt.

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

§15.247 (b) (4) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

The transmitter output is connected to a power meter.

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RESULTS

No non-compliance noted:

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

The maximum antenna gain is 6.3 dBi for other than fixed, point-to-point operations, therefore the limit is 29.7 dBm.

802.11b Mode

| Channel | el Frequency Power Meter | | Limit | Margin |
|---------|--------------------------|---------------|-------|--------|
| | (MHz) | Reading (dBm) | (dBm) | (dB) |
| Low | 2412 | 19.15 | 29.7 | -10.55 |
| Middle | 2437 | 18.58 | 29.7 | -11.12 |
| High | 2462 | 18.96 | 29.7 | -10.74 |

802.11g Mode

| Channel | nnel Frequency Power Meter | | Limit | Margin |
|---------|----------------------------|---------------|-------|--------|
| | (MHz) | Reading (dBm) | (dBm) | (dB) |
| Low | 2412 | 17.39 | 29.7 | -12.31 |
| Middle | 2437 | 19.43 | 29.7 | -10.27 |
| High | 2462 | 16.71 | 29.7 | -12.99 |

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7.1.3. MAXIMUM PERMISSIBLE EXPOSURE

LIMITS

\$1.1310 The criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm²) | Averaging time (minutes) |
|---|-------------------------------------|-------------------------------------|--|-----------------------------|
| (A) Lim | its for Occupational | l/Controlled Exposu | res | |
| 0.3–3.0 3.0–30 30–300 300–1500 1500–100,000 | 614 1842/f 61.4 | 1.63 4.89/f 0.163 | *(100) *(900/f²) 1.0 f/300 5 | 6 6 6 6 6 |
| (B) Limits | for General Populati | ion/Uncontrolled Exp | posure | |
| 0.3–1.34 | 614 824 <i>/</i> f | 1.63 2.19/f | *(100) *(180/f²) | 30 30 |

TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

TABLE 1-LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)-Continued

| Frequency range (MHz) | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm²) | Averaging time (minutes) |
|------------------------------------|-------------------------------------|-------------------------------------|---------------------------|-----------------------------|
| 30–300 300–1500 1500–100,000 | 27.5 | 0.073 | 0.2 f/1500 1.0 | 30 30 30 |

f = frequency in MHz

* = Plane-wave equivalent power density NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occu-

pational/controlled limits apply provided he or she is made aware of the potential for exposure. NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be ex-posed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

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CALCULATIONS

Given

 $E = \sqrt{(30 * P * G)} / d$

where

and

E = Field Strength in Volts/meter

P = Power in Watts

 $S = E^{2} / 3770$

G = Numeric antenna gain

d = Distance in meters

S = Power Density in milliwatts/square centimeter

Combining equations and rearranging the terms to express the distance as a function of the remaining variables yields:

 $d = \sqrt{((30 * P * G) / (3770 * S))}$

Changing to units of Power to mW and Distance to cm, using:

P(mW) = P(W) * 1000 and d(cm) = 100 * d(m)

yields

 $d = 100 * \sqrt{((30 * (P / 1000) * G) / (3770 * S))}$ $d = 0.282 * \sqrt{(P * G / S)}$

where

d = distance in cm P = Power in mW G = Numeric antenna gain S = Power Density in mW/cm^2

Substituting the logarithmic form of power and gain using:

 $P(mW) = 10^{(P(dBm) / 10)}$ and $G(numeric) = 10^{(G(dBi) / 10)}$

yields

 $d = 0.282 * 10^{(P+G)} / 20) / \sqrt{S}$

where

d = MPE distance in cm P = Power in dBm G = Antenna Gain in dBi S = Power Density Limit in mW/cm^2

Rearranging terms to calculate the power density at a specific distance yields

 $S = 0.0795 * 10^{(P+G)} / 10) / (d^2)$

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LIMITS

From 1.1310 Table 1 (B), the maximum value of S = 1.0 mW/cm²

RESULTS

No non-compliance noted:

| Mode | MPE | Output | Antenna | Power |
|---------|----------|--------|---------|-----------|
| | Distance | Power | Gain | Density |
| | (cm) | (dBm) | (dBi) | (mW/cm^2) |
| 802.11b | 20.0 | 19.15 | 6.30 | 0.07 |
| 802.11g | 20.0 | 19.43 | 6.30 | 0.07 |

NOTE: For mobile or fixed location transmitters, the minimum separation distance is 20 cm, even if calculations indicate that the MPE distance would be less.

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7.2. RADIATED EMISSIONS

7.2.1. TRANSMITTER RADIATED SPURIOUS EMISSIONS

LIMITS

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz | MHz | MHz | GHz |
|----------------------------|-----------------------|-----------------|---------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2655 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | $(^{2})$ |
| 13.36 - 13.41 | | | |

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

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\$15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|--------------------|--------------------------------------|-------------------------------|
| 30 - 88 | 100 ** | 3 |
| 88 - 216 | 150 ** | 3 |
| 216 - 960 | 200 ** | 3 |
| Above 960 | 500 | 3 |

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

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TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

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7.2.2. TRANSMITTER ABOVE 1 GHz FOR 2400 TO 2483.5 MHz BAND

RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, HORIZONTAL)



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| 🔆 Agilent | | L | Freq/Channel |
|--|---|---------------------------------|--|
| Restricted Band Ref 100 dB µ∨ #Peak | (Awg),b Mode Low Ch. # Atten 0 dB | Mkr1 2.390 00 GHz 44.52 dBµ∨ | Center Freq 2.3500000 GHz |
| - og 10 1B/ | | | Start Freq 2.3100000 GHz |
| 29.9 1B | | | Stop Freq 2.3900000 GHz |
| 54.0 1Βμ∨ _gAv | | | CF Step 8.0000000 MHz <u>Auto Ma</u> |
| /1 S2 S3 FC | | | Freq Offset 0.00000000 Hz |
| *(f): =Tun Swp | | | Signal Track On <u>Of</u> |
| Start 2.310 00 G | Hz (NEDIAL 40 LL | Stop 2.390 00 GHz | |

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RESTRICTED BANDEDGE (b MODE, LOW CHANNEL, VERTICAL)



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| 🔄 Agilent | | | L Freq/Channel |
|--|---|------------------------------------|---|
| Restricted Band (Av Ref 100 dB µ∨ ∕Peak | /g),b Mode Low Ch. # Atten 0 dB | Mkr1 2.389 8 51.61 | 7 GHz dBμ√ 2.35000000 GHz |
| .og 0 IB/ | | | Start Freq 2.31000000 GHz |
| 9.9 B | | | Stop Freq 2.39000000 GHz |
| 4.0 IBμ√ gAv | | ^ | CF Step 8.00000000 MHz <u>Auto Ma</u> |
| /1 S2 33 FC | | | Freq Offset 0.00000000 Hz |
| (f): Tun Wvp | | | Signal Track On <u>Of</u> |
| Start 2.310 00 GHz Res BW 1 MHz | #VBW 10 H | Stop 2.390 0 Sweep 6.238 s /601 | 0 GHz |

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RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, HORIZONTAL)



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| e Agilent | | L | - Freq/Channel |
|---|------------------------------------|---------------------------------|---|
| lestricted Band (A l ef 100 dB µ∨ Peak | wg),b Mode High Ch. #Atten 0 dB | Mkr1 2.483 88 GHz 44.05 dBµ∨ | Center Freq 2.49175000 GHz |
| og 0 B/ | | | Start Freq 2.48350000 GHz |
| 0 B II | | | Stop Freq 2.5000000 GHz |
| 4.0 Βμ√ gAv δ | | | CF Step 1.65000000 MHz <u>Auto Ma</u> |
| /1 S2 3 FC | | | Freq Offset 0.00000000 Hz |
| (f): 'Tun Swp | | | Signal Track On <u>Ot</u> |
| Start 2.483 50 GH | z #VBW 10 H | Stop 2.500 00 GHz | â |

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RESTRICTED BANDEDGE (b MODE, HIGH CHANNEL, VERTICAL)



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| Agilent | | L | Freq/Channel |
|---|--|--|---|
| lestricted Band (A t ef 100 dB µ∨ Peak | wg),b Mode High Ch. # Atten 0 dB | Mkr1 2.483 94 GHz 48.17 dBμ∨ | Center Freq 2.49175000 GHz |
| og 0 B/ | | | Start Freq 2.48350000 GHz |
| B | | | Stop Freq 2.5000000 GHz |
| 4.0 Βμ√ ¹ gAv | | | CF Ste 1.65000000 MHz <u>Auto M</u> a |
| 1 S2 3 FC | | | Freq Offset 0.00000000 Hz |
| (f): Tun /wp | | | Signal Track On <u>O</u> |
| itart 2.483 50 GH Res BW 1 MHz | z #VB <u>W 10 H</u> | Stop 2.500 00 GHz z Sweep 1.287 s (601 pts) | ^ |

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HARMONICS AND SPURIOUS EMISSIONS (b MODE)

| - | v Symb | ol Technol | ogios | | | | | | | | | | | | |
|------------------|----------------------|------------------------|---------------------|------------|-------|--------|-----------|---------|--------------|--------|----------|------------|---------------|----------------------|-----------------------------------|
| roject i | 9.89110 #:06U1 | 0509 | ogies | | | | | | | | | | | | |
| ate:08 | /21/200 | б | | | | | | | | | | | | | |
| əst En onfiom | gineer: ration: F | Thanh Ngu UT, sunno | yen et lanton. P | anel ant | enna | | | | | | | | | | |
| lode: 1 | fx b mo | de | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| est Eq | uipmen | <u>t:</u> | | | | | | | | | | | | | |
| н | orn 1. | 18GH7 | Pre-a | mplifer | 1-260 | 3Hz | Pre-am | plifer | 26-40GH | 7 | н | lorn > 18(| GH7 | | Limit |
| 172.6 | -/N. 674 | 7 @2m | T97 M | lito a 024 | 242 | | | | | - | | | | | ECC 15 209 |
| 115; 5 | 07 NG 107 1 | i @əili | 10/ W | nteq 524 | J4Z | • | | | | | | | | • | T GG 13.203 |
| Hi Freq | uency Cal | bles | 1 | | | | | | | | | | | | |
| | 2 foot | cable | ; | 3 foot o | able | | 12 | foot c | able | | HPF | Re | ject Filte | r <u>Peak</u> RBV | <u>Measurements</u> V=VBW=1MHz |
| Tha | nh 1770 | 79008 | | | | - | Thanh | 208946 | 5003 🖕 | HP | F_4.0GHz | | | Averag | ge Measurements |
| | | | | | | | | | | | | | | RBW=1 | MHz ; VBW=10Hz |
| f | Dist | Read Pk | Read Avg | AF | CL | Amp | D Corr | Fltr | Peak | Avg | Pk Lim | Avg Lim | Pk Mar | Avg Mar | Notes |
| GHz | (m) | dBuV | dBuV | dB/m | dB | dB | dB | dB | dBuV/m | dBuV/m | dBuV/m | dBuV/m | dB | dB | (V/H) |
| 324 | 3.0 | 44.68 | 32.17 | 33.3 | 2.8 | -45.3 | 0.0 | 0.0 | 36.1 | 23.6 | 74 | 54 | - 37.9 | -30.4 | Noise Floor |
| 236 a Ch | 3.0 | 44.75 | 31.50 | 34.9 | 33 | -43.3 | 0.0 | 0.6 | 40.3 | 27.0 | 74 | 54 | -33.7 | -27.0 | Noise Floor |
| 349 | 3.0 | 43.10 | 31.25 | 33.3 | 2.8 | -45.3 | 0.0 | 0.6 | 34.5 | 22.7 | 74 | 54 | -39.5 | -31.3 | Noise Floor |
| 261 ơh Ch | 3.0 | 44.86 | 31.45 | 35.0 | 33 | -43.3 | 0.0 | 6.0 | 40.5 | 27.1 | 74 | 54 | -33.5 | -26.9 | Noise Floor |
| 24 | 3.0 | 43.86 | 30.70 | 33.4 | 2.8 | -45.4 | 0.0 | 0.0 | 35.3 | 22.2 | 74 | 54 | -38.7 | -31.8 | Noise Floor |
| 186 | 3.0 | 44.56 | 31.04 | 35.0 | 33 | -43.1 | 0.0 | 0.0 | 40.5 | 26.9 | 74 | 54 | -33.5 | -27.1 | Noise Floor |
| | | | | | | | | | | | | | | | |
| v. 5.1.6 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | f | Measurem | ent Frequenc | y | | Amp | Preamp (| Gain | | | | Avg Lim | Average H | Field Strength | Limit |
| | Dist | Distance to | Antenna | | | D Corr | Distance | Corre | ct to 3 mete | ers | | Pk Lim | Peak Fiel | d Strength Lir | nit |
| | Read | Analyzer R | eading | | | Avg | Average | Field S | Strength @ | 3 m | | Avg Mar | Margin vs | . Average Lir | nit |
| | A T. | <u>öntenna</u> Ha | actor | | | Peak | Calculate | ed Peal | k Field Stre | ngth | | PK Mar | Margin vs | . Peak Limit | |

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RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, HORIZONTAL)



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| K Agilent | | RL | Freq/Channel |
|--|------------------------------------|---------------------------------|---|
| lestricted Band (k ef 100 dB µ∨ Peak | Avg),g Mode Low Ch. #Atten 0 dB | Mkr1 2.390 00 GHz 44.82 dBµ√ | Center Freq 2.35000000 GHz |
| og D B/ | | | Start Freq 2.31000000 GHz |
| 9.9 B | | | Stop Freq 2.3900000 GHz |
| 4.0 Βμ√ gAv | | | CF Step 8.0000000 MHz <u>Auto M</u> a |
| 1 S2 3 FC | | | Freq Offset 0.00000000 Hz |
| (f): Tun wp | | | Signal Track On <u>Or</u> |
| itart 2.310 00 Gl | | Stop 2.390 00 GHz | |

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RESTRICTED BANDEDGE (g MODE, LOW CHANNEL, VERTICAL)



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| 🔆 Agilent | | RL | Freq/Channel |
|---|-----------------------------------|--|---|
| Restricted Band (A Ref 100 dB µ∨ #Peak | wg),g Mode Low Ch. #Atten 0 dB | Mkr1 2.389 87 GHz 52.08 dBμ∨ | Center Freq 2.35000000 GHz |
| -og 0 B/ | | | Start Freq 2.31000000 GHz |
| 19.9 IB | | | Stop Freq 2.39000000 GHz |
| 4.0 IBμ√ gAv | | | CF Step 8.00000000 MHz <u>Auto Ma</u> |
| /1 S2 33 FC | | | Freq Offset 0.00000000 Hz |
| (f): :Tun Swp | | | Signal Track On <u>Of</u> |
| Start 2.310 00 GH | z #VBW 10 Hz | Stop 2.390 00 GHz Sweep 6.238 s (601 pts) | |

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RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, HORIZONTAL)



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| 🤄 Agilent | | L | Freq/Channel |
|---|---|---------------------------------|---|
| Restricted Band (. Ref 100 dB µ∨ ÆPeak | Avg),g Mode High Ch. # Atten 0 dB | Mkr1 2.483 61 GHz 44.58 dBµ∨ | Center Freq 2.49175000 GHz |
| .og 0 IB/ | | | Start Freq 2.48350000 GHz |
| 0 B II | | | Stop Freq 2.5000000 GHz |
| 4.0 Βμ∨ gAv δ | | | CF Step 1.65000000 MHz <u>Auto Ma</u> |
| /1 S2 3 FC | | | Freq Offset 0.00000000 Hz |
| (f): Tun Swp | | | Signal Track On <u>Ot</u> |
| Start 2.483 50 Gl | 1z #\/RW/10 | Stop 2.500 00 GHz | |

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RESTRICTED BANDEDGE (g MODE, HIGH CHANNEL, VERTICAL)



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| 🤄 Agilent | | L | Freq/Channel |
|--|--|--|--|
| lestricted Band (A lef 100 dB µ∨ Peak | wg),g Mode High Ch. # Atten 0 dB | Mkr1 2.483 50 GHz 49.10 dBµ∨ | Center Freq 2.49175000 GHz |
| og | | | Start Freq 2.48350000 GHz |
| nist 0 B 11 | | | Stop Freq 2.5000000 GHz |
| 4.0 ⅠΒμ√ → gAv | | Image: | CF Ste 1.6500000 MHz <u>Auto M</u> i |
| /1 S2 3 FC | | | Freq Offset 0.00000000 Hz |
| (f): Tun Swp | | | Signal Track On <u>O</u> |
| Start 2.483 50 GH | z #VBW 10 H | Stop 2.500 00 GHz | |

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HARMONICS AND SPURIOUS EMISSIONS (g MODE)

| T73; | | 100112 | Pre- | ampiiter | 1-260 | GHZ | Fre-am | piller | 20-40GH | z | H | orn > 18(| GHZ | | |
|-----------------------------------|------------|----------------|----------------|--------------|------------|----------------|------------|------------|--------------|----------------|--|----------------|----------------|----------------|----------------------------|
| | S/N: 671 | 7 @3m | • T87 | Miteq 924 | 342 | • | | | | • | | | | • | FCC 15.209 |
| Hi Fre | quency Ca | bles — | | | | _ | , | | | | | | | | |
| | 2 foot | cable | | 3 foot o | able | | 12 | foot d | able | | HPF | Re | iect Filte | r <u>Peak</u> | <u>a Measurements</u> |
| | 21000 | CUDIC | | | | | | | | | | Ke | jectrite | RB' | W=VBW=1MHz |
| Tha | anh 177(| 79008 | • | | | | Thanh | 208946 | 5003 🖕 | HPI | F_4.0GHz | • | | Avera | ge Measurements |
| | | | | | | | | | | | | | | RBW= | 1MHz; VBW=10Hz |
| f | Dist | Read Pk | Read Av | z. AF | CL | Amp | D Corr | Fltr | Peak | Avg | Pk Lim | Avg Lim | Pk Mar | Avg Mar | Notes |
| GHz | (m) | dBuV | dBuV | dB/m | dB | dB | dB | dB | dBuV/m | dBuV/m | dBuV/m | dBuV/m | dB | dB | (V/H) |
| ~ ~ ~ ~ ~ ~ | (111) | a de la c | | sub/m | | | | | abama | and the second | direction of the second | and the second | | | (111) |
| w Ch | | | | | | | | | | | | | | | |
| w Ch | 3.0 | 45.26 | 33.25 | 33.3 | 2.8 | -45.3 | 0.0 | 0.6 | 36.6 | 24.6 | 74 | 54 | -37.4 | -29.4 | Noise Floor |
| w Ch 124 d Ch | 3.0 | 45.26 | 33.25 | 33.3 | 2.8 | -45.3 | 0.0 | 0.6 | 36.6 | 24.6 | 74 | 54 | -37,4 | -29.4 | Noise Floor |
| w Ch 124 d Ch 149 | 3.0 3.0 | 45.26 44.47 | 33.25 32.86 | 33.3 33.3 | 2.8 2.8 | -45.3 -45.3 | 0.0 0.0 | 6.0 6.0 | 36.6 35.9 | 24.6 24.3 | 74 74 | 54 54 | -37.4 -38.1 | -29.4 -29.7 | Noise Floor Noise Floor |
| w Ch 24 d Ch 49 çh Ch | 3.0 3.0 | 45.26 44.47 | 33.25 32.86 | 33.3 33.3 | 2.8 2.8 | -453 -453 | 0.0 0.0 | 0.0 0.6 | 36.6 35.9 | 24.6 24.3 | 74 74 | 54 54 | -37.4 -38.1 | -29,4 -29,7 | Noise Floor Noise Floor |

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7.2.3. WORST-CASE RADIATED EMISSIONS BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION Graph, HORIZONTAL)



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SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION Data, HORIZONTAL)

HORIZONTAL DATA

| | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
|--------|--------------------|----------------|------------------|----------------|----------------|------------------|--------------|
| | MHz | dBuV | dB | <u>d</u> BuV/m | dBuV/m | dB | |
| 1 | 85.290 | 24.42 | 8.25 | 32.67 | 40.00 | -7.33 | Peak |
| 2 3 | 111.480 252.130 | 17.09 16.27 | $13.82 \\ 13.96$ | 30.91 30.23 | 43.50 46.00 | -12.59 -15.77 | Peak Peak |
| 4 5 | 361.740 502.390 | 12.71 12.07 | 17.20 | 29.91 32.31 | 46.00 46.00 | -16.09 -13.69 | Peak Peak |
| 6 | 751.680 | 10.72 | 23.83 | 34.55 | 46.00 | -11.45 | Peak |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

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SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)



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SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION, VERTICAL)

| VERTICA | AL DATA | | | | | | |
|----------------------------|---|--|---|--|--|---|--------------------------------------|
| | Freq | Read Level | Factor | Level | Limit Line | Over Limit | Remark |
| | MHZ | dBuV | dB | $\overline{d}\overline{BuV/m}$ | dBuV/m | dB | |
| 1 2 3 4 5 6 | MHZ 39.700 85.290 110.510 502.390 625.580 751.680 | dBuV 21.43 29.97 21.59 12.05 10.03 12.04 | dB 15.51 8.25 13.67 20.24 21.95 23.83 | dBuV/m 36.95 38.22 35.25 32.29 31.98 35.87 | dBuV/m 40.00 40.00 43.50 46.00 46.00 46.00 | dB -3.05 -1.78 -8.25 -13.71 -14.02 -10.13 | Peak Peak Peak Peak Peak |
| | | | | | | | |

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8. SETUP PHOTOS

RADIATED RF MEASUREMENT SETUP



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END OF REPORT

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