

Measurement Report

FCC ID: M697310This report concerns (check one) : ☒ Original Grant ☐ Class II Change

Issued Date : Mar. 24, 2004
Project No. : 04E0124
Equipment : VGA Card
Model No. : SP7310; SP7310/128MB; SP7310/64MB
Applicant : SPARKLE COMPUTER CO., LTD.
13F, NO. 2, SEC. 1, FU HSING S. RD., TAIPEI, 104
TAIWAN, R.O.C.

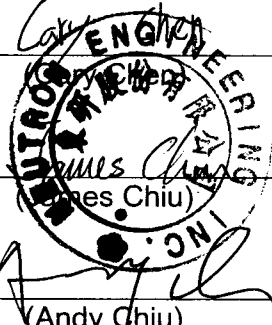
Tested by :
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Data of Test :
Feb. 26, 2004 ~ Mar. 22, 2004

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Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (NML) of **R.O.C.**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Assessment Authorities



Test Standard/Scope/Item Acceptance

FCC Part 15 Subpart B
IEC/CISPR22
AS/NZS CISPR 22
CNS 13438

FCC Part 15 Subpart B
CISPR 22/EN 55022
AS/NZS CISPR 22
VCCI -Technical Requirement
CNS 13438
SS IEC/CISPR 22
IEC/EN 61000-3-2 IEC/EN 61000-4-5
IEC/EN 61000-3-3 IEC/EN 61000-4-6
IEC/EN 61000-4-2 IEC/EN 61000-4-8
IEC/EN 61000-4-3 IEC/EN 61000-4-11
IEC/EN 61000-4-4

CISPR 22/EN 55022
IEC/EN 61000-3-2 IEC/EN 61000-4-5
IEC/EN 61000-3-3 IEC/EN 61000-4-6
IEC/EN 61000-4-2 IEC/EN 61000-4-8
IEC/EN 61000-4-3 IEC/EN 61000-4-11
IEC/EN 61000-4-4

VCCI -Technical Requirement

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1. General Information**1.1 Applicant**

Name SPARKLE COMPUTER CO., LTD.

Address 13F, NO. 2, SEC. 1, FU HSING S. RD., TAIPEI, 104 TAIWAN, R.O.C.

1.2 Manufacturer

Name N/A

Address N/A

1.3 Equipment Under Tested

Name: VGA Card

Trade Name: SPARKLE

Model No.: SP7310; SP7310/128MB; SP7310/64MB

1.4 OEM Brand/Model (if applicable)

OEM Brand(s)/Model(s) except the basic model in sub-clause 1.3 is(are) the follows:

OEM Brand: N/A

Model No.: N/A

1.5 Model Difference (Series, Versions, if any)

Except the basic model no. (model designation of the sample tested in this test report), additional model no. covered is(are) :

There are three models based on similar electrical circuit except the difference of list below:

| <u>Model No.</u> | <u>DDR</u> |
|---------------------|-----------------|
| <u>SP7310</u> | <u>16X16DDR</u> |
| <u>SP7310/128MB</u> | <u>16X16DDR</u> |
| <u>SP7310/64MB</u> | <u>8X16DDR</u> |

All the above models were tested, and the model: SP7310 was found to be the worst case during the pr-scanning test. This mode of the worst case was used for final testing and collecting test data included in this report.

1.6 Product Descriptions(Application/Features/Specification)

The EUT is a VGA Card.

Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual

1.7 Connecting I/O Port(s)

Please refer to the User's Manual

1.8 Power Supplied

Power Source: Supplied from AGP port.

Power Cord: N/A

Power Rating: N/A

1.9 Products Covered (if applicable)

The sample tested including the following sub-system/module/accessory :

| Sub-system/ Module/ Accessory | Model/Type No. | Int. Inst./ Ext. Cont. |
|-------------------------------|----------------|------------------------|
| N/A | N/A | N/A |

1.10 Description of Test Mode(s)

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Mode 1 1600*1200/106KHz/85Hz and S-Video (CRT & TV)

Mode 2 1024*768/99KHz/120Hz and S-Video (CRT & TV)

Mode 3 800*600/91KHz/140Hz and S-Video (CRT & TV)

The EUT system operated Mode 1, 2, and 3, mentioned above were found to be the worst case during the pre-scanning test.

These operation modes were used for final testing and collecting test data included in this report.

1.11 EUT Modifications (if applicable)

Not any modification required for the EUT to comply with the standards.

Please refer to the Attachment – **A**.

1.12 Summary of Test Results

Test procedures according to the technical standards:

| EMC Emission | | | | |
|--|--------------------|---------|----------|--------|
| Standard | Test Item | Limit | Judgment | Remark |
| FCC Part15, Subpart B CISPR 22:1997+A1:2000 | Conducted Emission | Class B | PASS | |
| | Radiated Emission | Class B | PASS | |

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

2. RFI Emissions Measurement

2.1 Test Facility

The test facilities used to collect the test data in this report is SR01/OS01 at the location of No.132-1, Lane 329, Sec. 2, Palain Road, Shijr City, Taipei, Taiwan.

2.2 Standard Compliance

The test data contained in this report relate only to the item(s) listed below :

Limitation Class B

FCC Part15, Subpart B/CISPR 22:1997+A1:2000.

2.3 Test Methodology

Both conducted and radiated testing were performed during the max. EMI emission evaluation.

Antenna to EUT distance is 10 m.

Test procedures according to the technical standards:

FCC Part15, Subpart B / ANSI C63.4: 1992.

2.4 Deviations from Standard Test Method

N/A

2.5 Sample(s) Tested

The representative sample tested in this reports is(are): SP7310

Test results in this test report relate only to the sample(s) tested.

The EUT has been tested according to the following environmental condition:

| | |
|--------------------------|---------------------------------------|
| Input Power | 120Vac/60Hz |
| Environmental Conditions | Please refer to the measurement data. |

2.6 Measurement Instruments

Valid measurement instruments used in this report refer to **Table-1** enclosed.

2.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

A. Conducted Measurement :5.05dB

B. Radiated Measurement :

| Test Site | Method | Measurement Frequency Range | Ant. H / V | U , (dB) | NOTE |
|-----------|--------|-----------------------------|---------------|----------|----------------------|
| OS-01 | ANSI | 30MHz ~ 200MHz | H | 4.59 | |
| | | 30MHz ~ 200MHz | V | 4.80 | |
| | | 200MHz ~ 1,000MHz | H | 4.47 | |
| | | 200MHz ~ 1,000MHz | V | 5.03 | |
| OS-01 | VCCI | 30MHz ~ 200MHz | H | 4.59 | Only for VCCI Report |
| | | 30MHz ~ 200MHz | V | 4.48 | Only for VCCI Report |
| | | 200MHz ~ 1,000MHz | H | 4.47 | Only for VCCI Report |
| | | 200MHz ~ 1,000MHz | V | 4.73 | Only for VCCI Report |
| OS-02 | ANSI | 30MHz ~ 200MHz | H | 4.34 | |
| | | 30MHz ~ 200MHz | V | 5.15 | |
| | | 200MHz ~ 1,000MHz | H | 5.28 | |
| | | 200MHz ~ 1,000MHz | V | 4.53 | |
| OS-02 | VCCI | 30MHz ~ 200MHz | H | 4.34 | Only for VCCI Report |
| | | 30MHz ~ 200MHz | V | 4.77 | Only for VCCI Report |
| | | 200MHz ~ 1,000MHz | H | 4.91 | Only for VCCI Report |
| | | 200MHz ~ 1,000MHz | V | 4.53 | Only for VCCI Report |

2.8 Tested System Set-Up/Configuration Details

The system was configured for testing in a typical fashion (as a user would normally use) or in-accordance with the operating configuration specified in the user's manual. A Block Diagram(please refer to the Diagram - 1) and Photos(please refer to the attachment - **B**) showing the set-up/configuration of system tested. In addition, **Table-2** and **Table-3** provide a detail of all equipment items and cables information used in the system tested.

Table -1 Measurement Instruments List

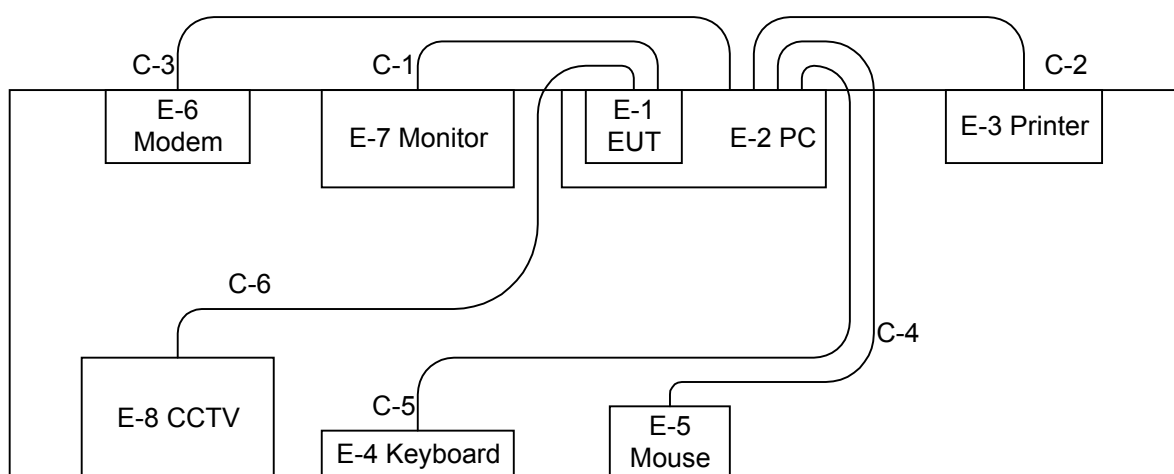
| Item | Instruments | Mfr/Brand | Model/Type No. | Serial No. | Calibrated Date | Next Cali. Date | Note |
|------|--------------------|-----------------|----------------|------------------------------------|-----------------|-----------------|------|
| 1 | LISN | EMCO | 3825/2 | 9605-2539 | 2003-06-10 | 2004-06-09 | ✓ |
| 2 | LISN | Rolf Heine | NNB-2/16Z | 98083 | 2003-11-01 | 2004-10-30 | |
| 3 | LISN | Rolf Heine | NNB-2/16Z | 98053 | 2003-11-14 | 2004-11-13 | ✓ |
| 4 | LISN | EMCO | 4825/2 | 00028234 | 2003-10-01 | 2004-09-30 | |
| 5 | Pulse Limiter | Electro-Metrics | EM-7600 | 112644 | 2003-12-08 | 2004-12-07 | ✓ |
| 6 | 50Ω Terminator | N/A | N/A | N/A | 2003-05-09 | 2004-05-08 | ✓ |
| 7 | Test Cable | N/A | C01 | N/A | 2003-12-09 | 2004-12-08 | ✓ |
| 8 | Log-Bicon Antenna | MESS-ELEKTRONIK | VULB 9160 | 3058 | 2003-10-21 | 2004-10-20 | ✓ |
| 9 | Log-Bicon Antenna | MESS-ELEKTRONIK | VULB 9160 | 3060 | 2003-10-21 | 2004-10-20 | |
| 10 | Log-Bicon Antenna | MESS-ELEKTRONIK | VULB 9160 | 3115 | 2003-04-17 | 2004-04-16 | |
| 11 | Log-Bicon Antenna | MESS-ELEKTRONIK | VULB 9161 | 4022 | 2003-07-14 | 2004-07-13 | |
| 12 | Test Cable | N/A | 10M_OS01 | N/A | 2003-12-09 | 2004-12-08 | ✓ |
| 13 | Test Cable | N/A | OS01-1/-2 | N/A | 2003-12-09 | 2004-12-08 | ✓ |
| 14 | Test Cable | N/A | 10M_OS02 | N/A | 2003-12-09 | 2004-12-08 | |
| 15 | Test Cable | N/A | OS02-1/-2/-3 | N/A | 2003-12-09 | 2004-12-08 | |
| 16 | RF Switch | Anritsu | MP59B | M65982 | 2003-12-08 | 2005-12-07 | ✓ |
| 17 | Quasi-Peak Adapter | HP | 85650A | 2521A00844 | 2003-10-20 | 2004-04-19 | |
| 18 | RF Pre-Selector | HP | 85685A | 2648A00417 | 2003-10-20 | 2004-04-19 | |
| 19 | Spectrum Analyzer | HP | 85680B | 2634A03025 | 2003-10-20 | 2004-04-19 | |
| 20 | Spectrum Monitor | HP | 85662B | 2648A13616 | 2003-10-20 | 2004-04-19 | |
| 21 | Pre-Amplifier | Anritsu | MH648A | M09961 | 2003-12-08 | 2004-12-07 | ✓ |
| 22 | Spectrum Analyzer | ADVAN TEST | R3261C | 81720298 | 2003-08-13 | 2004-08-12 | ✓ |
| 23 | Test Receiver | R&S | ESH3 | 860156/018 | 2003-10-21 | 2004-10-20 | |
| 24 | Test Receiver | R&S | ESVP | 860687/009 | 2003-12-05 | 2004-12-04 | |
| 25 | Test Receiver | MEB | SMV41 | 130 | 2003-12-05 | 2004-12-04 | ✓ |
| 26 | Test Receiver | PMM | PMM 9000 | 4310J01002 | 2003-10-03 | 2004-10-02 | |
| 27 | Horn Antenna | EMCO | 3115 | 9605-4803 | 2003-05-23 | 2004-05-22 | |
| 28 | Test Receiver | R&S | ESMI | 843977/005 | 2004-01-12 | 2005-01-11 | |
| 29 | Pre-Amplifier | R&S | ESMI-Z7 | 1045.5020.9801 (612.278 041 00) | 2003-05-19 | 2004-05-18 | |
| 30 | Absorbing Clamp | R&S | MDS-21 | 841077/011 | 2003-08-14 | 2004-08-13 | |
| 31 | Voltage Probe | R&S | ESH2-Z3 | 841.800/023 | 2003-08-26 | 2004-08-25 | |
| 32 | Signal Generator | HP | 8648A | 3426A01034 | 2002-10-11 | 2004-10-08 | |
| 33 | Antenna Mast | Chance Most | CMTB-1.5 | N/A | N/A | N/A | ✓ |
| 34 | Turn Table | Chance Most | CMTB-1.5 | N/A | N/A | N/A | ✓ |

Remark :

(1)" ✓" indicates the instrument used in Test Report.

(2)" N/A" denotes No Model No. / Serial No. and No Calibration specified.

Diagram - 1
Block diagram showing the configuration of system tested



C-1 Video Cable
C-2 Centronic Cable
C-3 Interface Cable
C-4 Mouse Cable
C-5 Keyboard Cable
C-6 Video Cable

Table - 2 Equipments Used in Tested System

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Series No. | Note |
|------|--------------------|-----------|----------------|--------|--------------|------|
| E-1 | VGA Card | SPARKLE | SP7310 | DOC | N/A | EUT |
| E-2 | PC | IBM | 8196-I5V | DOC | 99M1136 | |
| E-3 | Printer | SII | DPU-414 | DOC | 1045105A | |
| E-4 | PS/2 K/B | HP | 5181 | DOC | N/A | |
| E-5 | PS/2 Mouse | HP | P8131 | DOC | 5185-1212 | |
| E-6 | Modem | ACEEX | DM-1414V | DOC | 8041708 | |
| E-7 | Monitor | HITACHI | CM753ET | DOC | T8L000003 | |
| E-8 | Color CCTV Monitor | TVS | CM-10DXA | N/A | BAXB8A507803 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Note:

- (1) Unless otherwise denoted as EUT in 『Remark』 column , device(s) used in tested system is a support equipment.
- (2) Unless otherwise marked as ※ in 『Remark』 column, Neutron consigns the support equipment to the tested system.
- (3) The support equipment was authorized by Declaration of Confirmation.

Table - 3 Information of Interface Cable

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|------|
| C-1 | YES | NO | 1.8M | |
| C-2 | YES | NO | 1.8M | |
| C-3 | YES | NO | 1.5M | |
| C-4 | YES | NO | 1.5M | |
| C-5 | YES | NO | 1.5M | |
| C-6 | YES | NO | 1.5M | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Note:

- (1) Unless otherwise marked as ※ in 『Remark』 column, Neutron consigns the support equipment to the tested system.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.9 EUT Operating Conditions

- (a) Both conducted and radiated testing were performed during the max. EMI emission evaluation.
- (b) The system was configured for testing in a typical fashion (as a customer would normally use it). The EUT was connected to support equipment-personal computer. Peripherals of PC, such as monitor, keyboard, modem and printer were contained in this system in order to comply with the CISPR22 Rules requirement. This operating condition was tested and used to collect the included data.
- (c) The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The program contained on a PC hard disk and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:
 - 1. Read (write) from (to) mass storage device (Disk).
 - 2. Send "H" pattern to video port device (EUT-Monitor & TV)
 - 3. Send " H " pattern to parallel port device (Printer).
 - 4. Send " H " pattern to serial port device (Modem).
 - 5. Repeated from 2 to 4 continuously.As the keyboard and mouse are strictly input devices, no data is transmitted to (from) them during test. They are, however, continuously scanned for data input activity.

3. Justification

3.1 Limitations

3.1.1 Power Line Conducted Emission (Frequency Range 150KHz-30MHz)

| Measurement Frequency Range (MHz) | Mains Terminal Class A Limits (dBuV) | | Mains Terminals Class B Limits (dBuV) | | Note CISPR FCC Std. |
|--|--|---------|---|-----------|------------------------------|
| | QP Mode | AV Mode | QP Mode | AV Mode | |
| | | | | | |
| 0.15 - 0.50 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * | CISPR |
| 0.50 - 5.00 | 73.00 | 60.00 | 56.00 | 46.00 | CISPR |
| 5.00 - 30.0 | 73.00 | 60.00 | 60.00 | 50.00 | CISPR |
| 0.45-1.705 | 60.00 | N/A | 48.00 | N/A | FCC |
| 1.705-30.0 | 69.50 | N/A | 48.00 | N/A | FCC |

Notes:

- (1). The tighter limit applies at the band edges.
- (2). The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.1.2 Radiated Emission Limits (Frequency Range 30MHz-1000MHz)

| Measurement Frequency Range (MHz) | Quasi-Peak Mode Class A Limits (dBuV/m) | | Quasi-Peak Mode Class B Limits (dBuV/m) | | Note CISPR FCC Std. |
|--|---|-------|---|-------|------------------------------|
| | 10m | 30m | 10m | 3m | |
| | | | | | |
| 30.00 -230.00 | 40.00 | 30.00 | 30.00 | 40.00 | CISPR |
| 230.0 -1000.0 | 47.00 | 37.00 | 37.00 | 47.00 | CISPR |
| 30.00 - 88.00 | 39.00 | N/A | 30.00 | 40.00 | FCC |
| 88.00 - 216.0 | 43.50 | N/A | 33.50 | 43.50 | FCC |
| 216.0 -960.0 | 46.00 | N/A | 36.00 | 46.00 | FCC |
| above 960.0 | 49.50 | N/A | 46.00 | 54.00 | FCC |

Notes:

- (1). The tighter limit applies at the band edges.
- (2). Emission level (dBuV/m)=20log Emission level (uV/m).
- (3). A measuring distance of 10m is a primary used. However, either 3m or 10m (instead of 10m) distance may be allowed. If the distance is 3m, add 10dB to the QP-limit above. If the distance is 10m, subtract 10dB from the QP-limit above.

3.2 Measurement Justification

3.2.1 Conducted Emission

The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and these signals are then Quasi Peak detector mode and Average detector mode re-measured.

Data of **Table - 4.** lists the significant emission frequencies, measured levels, limits and safe margins. All readings are Peak Mode measured unless otherwise stated as QP or AV in column of " Remark ".

If the Peak Mode measured value lower than both QP Mode and AV Mode Limit, EUT shall be deemed to compliance with both QP & AV Limits and then no additional QP Mode or AV Mode measurement performed.

If additional QP or AV Mode measurement needed, and if the QP Mode measured value compliance with the QP Mode Limit and lower than AV Mode Limit, the EUT shall be deemed to meet both QP & AV Limits and then only QP Mode was measured, but AV Mode was not performed °

3.2.2 Radiated Emission

The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

Data of **Table - 5.** lists the significant emission frequencies, measured levels, limits and safe margins. All readings are Peak Mode measured unless otherwise stated as QP in column of " Remark ".

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

3.3 Measurement Data

Table - 4. Conducted Emission Data

Table - 5. Radiated Emission Data

Table 4 Conducted Emission Data

EUT : VGA Card Model/Type No. : SP7310Temperature : 20 °C Relative Humidity : 66 % Pressure : 1015.1 hPa

Special Notes : (EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 1

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Safe Margins (dBuV) | |
|----------------|-----------------|----------------|---------|--------------|--------------|------------------------|-------------|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | Note |
| 0.15 | Line | 43.16 | * | 66.00 | 56.00 | -22.84 | (QP) |
| 0.17 | Line | 42.58 | * | 64.77 | 54.77 | -22.19 | (QP) |
| 0.43 | Line | 38.21 | * | 57.23 | 47.23 | -19.02 | (QP) |
| 0.74 | Line | 38.61 | * | 56.00 | 46.00 | -17.39 | (QP) |
| 0.83 | Line | 42.21 | * | 56.00 | 46.00 | -13.79 | (QP) |
| 1.20 | Line | 39.98 | * | 56.00 | 46.00 | -16.02 | (QP) |
| 0.16 | Neutral | 42.97 | * | 65.67 | 55.67 | -22.70 | (QP) |
| 0.43 | Neutral | 38.01 | * | 57.23 | 47.23 | -19.22 | (QP) |
| 0.73 | Neutral | 38.41 | * | 56.00 | 46.00 | -17.59 | (QP) |
| 0.83 | Neutral | 42.21 | * | 56.00 | 46.00 | -13.79 | (QP) |
| 1.09 | Neutral | 38.79 | * | 56.00 | 46.00 | -17.21 | (QP) |
| 1.20 | Neutral | 39.98 | * | 56.00 | 46.00 | -16.02 | (QP) |

Remark :

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz .
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz .
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』 . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform . In this case, a “ * ” marked in AVG Mode column of Interference Voltage Measured .
- (3) Measuring frequency range from 150KHz to 30MHz .

Table 4 Conducted Emission Data

EUT : VGA Card Model/Type No. : SP7310Temperature : 20 °C Relative Humidity : 66 % Pressure : 1015.1 hPa

Special Notes : (EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Safe Margins (dBuV) | |
|----------------|-----------------|----------------|---------|--------------|--------------|------------------------|-------------|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | Note |
| 0.15 | Line | 48.16 | * | 66.00 | 56.00 | -17.84 | (QP) |
| 0.43 | Line | 38.21 | * | 57.23 | 47.23 | -19.02 | (QP) |
| 0.74 | Line | 38.81 | * | 56.00 | 46.00 | -17.19 | (QP) |
| 0.84 | Line | 42.41 | * | 56.00 | 46.00 | -13.59 | (QP) |
| 1.09 | Line | 36.79 | * | 56.00 | 46.00 | -19.21 | (QP) |
| 1.20 | Line | 40.38 | * | 56.00 | 46.00 | -15.62 | (QP) |
| 0.16 | Neutral | 43.97 | * | 65.57 | 55.57 | -21.60 | (QP) |
| 0.43 | Neutral | 38.01 | * | 57.23 | 47.23 | -19.22 | (QP) |
| 0.53 | Neutral | 36.01 | * | 56.00 | 46.00 | -19.99 | (QP) |
| 0.74 | Neutral | 38.41 | * | 56.00 | 46.00 | -17.59 | (QP) |
| 0.84 | Neutral | 42.61 | * | 56.00 | 46.00 | -13.39 | (QP) |
| 1.20 | Neutral | 39.78 | * | 56.00 | 46.00 | -16.22 | (QP) |

Remark :

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz .
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz .
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』 . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform . In this case, a “ * ” marked in AVG Mode column of Interference Voltage Measured .
- (3) Measuring frequency range from 150KHz to 30MHz .

Table 4 Conducted Emission Data

EUT : VGA Card Model/Type No. : SP7310Temperature : 20 °C Relative Humidity : 66 % Pressure : 1015.1 hPa

Special Notes : (EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 3

| Freq. (MHz) | Terminal L/N | Measured(dBuV) | | Limits(dBuV) | | Safe Margins (dBuV) | |
|----------------|-----------------|----------------|---------|--------------|--------------|------------------------|-------------|
| | | QP-Mode | AV-Mode | QP-Mode | AV-Mode | | Note |
| 0.15 | Line | 43.96 | * | 65.78 | 55.78 | -21.82 | (QP) |
| 0.43 | Line | 38.01 | * | 57.23 | 47.23 | -19.22 | (QP) |
| 0.74 | Line | 38.41 | * | 56.00 | 46.00 | -17.59 | (QP) |
| 0.84 | Line | 42.61 | * | 56.00 | 46.00 | -13.39 | (QP) |
| 1.09 | Line | 38.19 | * | 56.00 | 46.00 | -17.81 | (QP) |
| 1.20 | Line | 39.98 | * | 56.00 | 46.00 | -16.02 | (QP) |
| 0.15 | Neutral | 43.76 | * | 65.84 | 55.84 | -22.08 | (QP) |
| 0.43 | Neutral | 37.81 | * | 57.23 | 47.23 | -19.42 | (QP) |
| 0.58 | Neutral | 37.21 | * | 56.00 | 46.00 | -18.79 | (QP) |
| 0.74 | Neutral | 38.21 | * | 56.00 | 46.00 | -17.79 | (QP) |
| 0.83 | Neutral | 42.01 | * | 56.00 | 46.00 | -13.99 | (QP) |
| 1.20 | Neutral | 40.38 | * | 56.00 | 46.00 | -15.62 | (QP) |

Remark :

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz . Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz .
- (2) All readings are QP Mode value unless otherwise stated AVG in column of 『Note』 . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform . In this case, a “ * ” marked in AVG Mode column of Interference Voltage Measured .
- (3) Measuring frequency range from 150KHz to 30MHz .

Table 5 Radiated Emission Data

EUT : VGA Card Model/Type No. : SP7310

Temperature : 21 °C Relative Humidity : 65 % Pressure : 1021.1 hPa

Special Notes : (EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 1

| Freq. (MHz) | Ant. H/V | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Safe Margins (dBuV/m) | Note |
|----------------|-------------|-----------------------|-------------------------|--------------------------|------------------------|--------------------------|-------------|
| 45.90 | V | 41.00 | - 15.57 | 25.43 | 30.00 | - 4.57 | (QP) |
| 114.75 | H | 37.35 | - 15.56 | 21.79 | 30.00 | - 8.21 | |
| 137.71 | H | 36.42 | - 13.33 | 23.09 | 30.00 | - 6.91 | |
| 160.66 | V | 38.37 | - 12.75 | 25.62 | 30.00 | - 4.38 | |
| 160.67 | H | 36.00 | - 12.75 | 23.25 | 30.00 | - 6.75 | |
| 196.64 | V | 39.07 | - 15.52 | 23.55 | 30.00 | - 6.45 | |
| 206.56 | H | 41.30 | - 15.50 | 25.80 | 30.00 | - 4.20 | |
| 206.58 | V | 42.15 | - 15.50 | 26.65 | 30.00 | - 3.35 | (QP) |
| 436.07 | V | 38.57 | - 7.22 | 31.35 | 37.00 | - 5.65 | |
| 573.77 | H | 36.92 | - 3.30 | 33.62 | 37.00 | - 3.38 | |
| 661.52 | H | 34.50 | - 1.31 | 33.19 | 37.00 | - 3.81 | (QP) |
| 661.54 | V | 32.17 | - 1.31 | 30.86 | 37.00 | - 6.14 | (QP) |

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW=120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦

Table 5 Radiated Emission Data

EUT : VGA Card Model/Type No. : SP7310

Temperature : 21 °C Relative Humidity : 65 % Pressure : 1021.1 hPa

Special Notes : (EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 2

| Freq. (MHz) | Ant. H/V | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Safe Margins (dBuV/m) | Note |
|----------------|-------------|-----------------------|-------------------------|--------------------------|------------------------|--------------------------|------|
| 111.22 | H | 37.77 | - 15.96 | 21.81 | 30.00 | - 8.19 | |
| 111.25 | V | 39.25 | - 15.96 | 23.29 | 30.00 | - 6.71 | |
| 127.68 | H | 35.10 | - 14.19 | 20.91 | 30.00 | - 9.09 | |
| 166.93 | V | 36.30 | - 13.32 | 22.98 | 30.00 | - 7.02 | |
| 196.61 | H | 36.20 | - 15.52 | 20.68 | 30.00 | - 9.32 | |
| 196.63 | V | 38.12 | - 15.52 | 22.60 | 30.00 | - 7.40 | |
| 206.51 | V | 36.62 | - 15.50 | 21.12 | 30.00 | - 8.88 | |
| 295.71 | H | 32.05 | - 11.46 | 20.59 | 37.00 | - 16.41 | |
| 332.00 | H | 32.45 | - 10.72 | 21.73 | 37.00 | - 15.27 | |
| 509.09 | V | 36.00 | - 5.44 | 30.56 | 37.00 | - 6.44 | |
| 509.09 | H | 33.77 | - 5.44 | 28.33 | 37.00 | - 8.67 | |
| 661.53 | V | 31.57 | - 1.31 | 30.26 | 37.00 | - 6.74 | |

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW=120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦

Table 5 Radiated Emission DataEUT : VGA Card Model/Type No. : SP7310Temperature : 21 °C Relative Humidity : 65 % Pressure : 1021.1 hPa

Special Notes : (EUT Operation Mode or Test Configuration Mode, if applicable)

Mode 3

| Freq. (MHz) | Ant. H/V | Reading(RA) (dBuV) | Corr.Factor(CF) (dB) | Measured(FS) (dBuV/m) | Limits(QP) (dBuV/m) | Safe Margins (dBuV/m) | Note |
|----------------|-------------|-----------------------|-------------------------|--------------------------|------------------------|--------------------------|------|
| 119.03 | V | 39.65 | - 15.01 | 24.64 | 30.00 | - 5.36 | |
| 127.43 | V | 38.32 | - 14.21 | 24.11 | 30.00 | - 5.89 | |
| 143.06 | H | 35.75 | - 13.05 | 22.70 | 30.00 | - 7.30 | |
| 145.89 | V | 37.20 | - 12.90 | 24.30 | 30.00 | - 5.70 | |
| 147.43 | H | 35.47 | - 12.84 | 22.63 | 30.00 | - 7.37 | |
| 196.20 | H | 36.37 | - 15.50 | 20.87 | 30.00 | - 9.13 | |
| 209.00 | H | 38.60 | - 15.49 | 23.11 | 30.00 | - 6.89 | |
| 210.71 | V | 41.35 | - 15.46 | 25.89 | 30.00 | - 4.11 | |
| 216.43 | V | 35.97 | - 15.17 | 20.80 | 30.00 | - 9.20 | |
| 222.21 | V | 34.00 | - 14.80 | 19.20 | 30.00 | - 10.80 | |
| 600.93 | H | 32.30 | - 2.28 | 30.02 | 37.00 | - 6.98 | |
| 637.81 | H | 31.57 | - 1.63 | 29.94 | 37.00 | - 7.06 | |

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz ◦
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform ◦
- (3) Measuring frequency range from 30MHz to 1000MHz ◦
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table ◦

Attachment

Table Contents

- A. EUT Modification Description
- B. EUT Test Photos

Attachment - A.

EUT Modification Description

No any modification required for the EUT to comply with the standards.

Attachment - B.

EUT Test Photos

- 1. Conducted Measurement Photos**
- 2. Radiated Measurement Photos**