



CEM Solutions

research | development | manufacturing

TO WHOM SO EVER IT MAY CONCERN

This is to certify that our product NANO PBX, Model: CPX-002 is designed, developed and tested according to European telecommunication standard published by ETSI ES 203 021 (Old standard TBR21).

Rajneesh Verma

Mr. Rajneesh Verma, Director
Authorized Signatory





ELECTRONICS TEST AND DEVELOPMENT CENTRE

(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bangalore-560 058
(Tel: 2839 5992, 2839 4647. Fax: 080 - 2839 1804)
E-mail: centre@etdcbg.org



T-0044

Report No.: ETDC (Bg)/T-60331-1

TEST REPORT

Page 01 of 12

1. Scope

| | | |
|----|--|---|
| 1. | Service request number | 60331 |
| 2. | Requested by (Name & Address of the Organization) | M/s. CEM Solutions Pvt Ltd, Akarsh Eco Place ,Ground Floor, 176 EPIP, Industrial Area, Kundalahalli, Whitefield, Bangalore-560066. |
| 3. | Description of the equipment: | |
| | a) Nomenclature | Nano PBX |
| | b) Manufactured by | CEM Solutions Pvt Ltd |
| | c) Model / type no. | CPX-002 |
| | d) Serial no. | 001 (Prototype) |
| 4. | Date of submission of samples | 30-09-2009 |
| 5. | Condition of item on receipt | Good |
| 6. | Date of completion of tests | 01-10-2009 |
| 7. | Applicable test specification | CISPR22:2006 & IEC61000 series |
| 8. | Test category | Performance Test |
| 9. | Environment condition | Temp: 26 °C, RH: 65% |

2. Major equipments used

| Sl No | Nomenclature | Make | Model | Cal. Due |
|-------|-------------------------------|-----------------|------------|-----------|
| 1 | EMI Receiver | R&S | ESI26 | FEB 2010 |
| 2 | LISN | R&S | ESH3Z5 | FEB 2010 |
| 3 | ESD Gun & Simulator | EM Test | 30C/P30C | JUNE 2010 |
| 4 | Signal Generator | Marconi | 2030 | MAY 2010 |
| 5 | Biconicalog Antenna | Electro-metrics | EM-6917B-1 | AUG 2010 |
| 6 | E-field Sensor | DARE | RADISENSE | JAN 2010 |
| 7 | Continuous Wave Simulator | EM Test | CWS500C | NOV 2009 |
| 8 | Surge Generator | Keytek | 801-Plus | JUNE 2010 |
| 9 | Electric Field Strength Meter | Holaday | HI3604 | JUNE 2010 |

This report refers only to the item tested and shall not be reproduced except in full. Refer to Information contained on the cover.

EMC/FM-081-07





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Test Performed : 1) Mains terminal disturbance voltage measurement
2) Electromagnetic radiation disturbance measurement @ 3mts. distance
Specification : CISPR22:2006, class B
Detector : Quasi Peak (Qp) / Average (Avg)
Detector B/W:

| Frequency (MHz) | Detector B/W (kHz) |
|-----------------|--------------------|
| 0.15 - 30 | 9 |
| 30 - 1000 | 120 |

Limits:

| Mains terminal disturbance voltage measurement for class B equipment | | |
|---|-------------------------|------------------------|
| Frequency (MHz) | Qp Limit (dB μ V) | Avg Limit (dB μ V) |
| 0.15 - 0.5 | 66 - 56 | 56 - 46 |
| 0.5 - 5.0 | 56 | 46 |
| 5.0 - 30 | 60 | 50 |
| Electromagnetic radiation disturbance measurement for class B equipment | | |
| Frequency (MHz) | Qp Limit (dB μ V/m) | |
| 30 - 230 | 40 | |
| 230 - 1000 | 47 | |

EUT Configuration: Nano PBX (Internet Private Branch Exchange) was powered by 220V AC/12V DC power adaptor. It is used to make internal calls, outgoing calls, as well as IP calls. It has 6 FXS and 2 FXO ports. During the test, only one FXS and one FXO port was used for communication.

Summary of Test Results:

Mains terminal disturbance voltage measurement:

Meets the Class B Limits of CISPR 22.

Few significant emissions are reported in page no 03.

Refer annexure "A&B" for mains disturbance voltage graph (Peak measurement).

Electromagnetic radiation disturbance measurement:

Meets the Class B Limits of CISPR 22.

Few significant Emissions are reported in page no. 04

Refer annexure "C" to annexure "J" for radiated disturbance graphs (Peak measurement).

REMARK: - Equipment under test shown in annexure "K".

EMC/FM-082-07



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Results: (1) Mains terminal disturbance voltage measurement.

| Frequency (MHz) | Qp Reading (dB μ V) | Qp Limit (dB μ V) | Avg Reading (dB μ V) | Avg Limit (dB μ V) |
|-------------------------|----------------------------|--------------------------|-----------------------------|---------------------------|
| Phase - Ground | | | | |
| 0.342 | 34.32 | 61 | 27.21 | 51 |
| 0.438 | 34.06 | 58 | 25.61 | 48 |
| 0.478 | 38.50 | 57 | 27.77 | 47 |
| 0.498 | 36.38 | 56 | 23.59 | 46 |
| 1.134 | 31.74 | 56 | 14.29 | 46 |
| 29.818 | 22.35 | 60 | 16.09 | 50 |
| Neutral - Ground | | | | |
| 0.434 | 35.12 | 58 | 27.44 | 48 |
| 0.458 | 37.32 | 58 | 21.42 | 48 |
| 0.490 | 36.96 | 57 | 27.41 | 47 |
| 0.506 | 36.08 | 56 | 22.07 | 46 |
| 0.722 | 31.32 | 56 | 23.14 | 46 |
| 29.978 | 23.66 | 60 | 17.73 | 50 |





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2) Electromagnetic radiation disturbance measurement @ 3 mts.

| Frequency (MHz) | Emission level measured (dB μ V/m) | Angle (deg) | Polarisation (H/V) | Limit (dB μ V/m) |
|-----------------|--|-------------|--------------------|----------------------|
| 79.12 | 33.45 | 0 | V | 40 |
| 80.24 | 33.39 | 90 | V | 40 |
| 85.16 | 37.62 | 270 | H | 40 |
| 89.48 | 33.75 | 0 | H | 40 |
| 124.8 | 36.61 | 270 | H | 40 |
| 136.04 | 34.25 | 270 | V | 40 |
| 162.48 | 33.96 | 270 | V | 40 |
| 258.36 | 38.21 | 0 | V | 47 |
| 283.48 | 36.52 | 180 | H | 47 |
| 290.68 | 35.66 | 90 | H | 47 |
| 335.84 | 38.11 | 0 | H | 47 |
| 340.92 | 37.68 | 270 | H | 47 |
| 622.04 | 36.20 | 90 | V | 47 |
| 781.4 | 36.85 | 180 | H | 47 |
| 848.64 | 38.26 | 270 | V | 47 |
| 874.08 | 38.71 | 0 | H | 47 |





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Results:

Test : Electrostatic Discharge

Specification : IEC 61000-4-2:2001

EUT Configuration : Refer Page No.02

| Wave shape / severity | Requirements | Test results |
|---|--|--|
| <p>Energy storage Capacitance: 150pf Discharge Resistance: 330Ω</p> <p><u>Discharge type:</u></p> <p>a. <u>Contact:</u> Direct Indirect i. HCP ii. VCP</p> <p>Level : 2 Voltage : 4 kV Polarity: + Ve & -Ve</p> <p>b. <u>Air:</u></p> <p>Level : 3 Voltage : 8kV Polarity: + Ve & -Ve</p> <p>No of discharges: 10 discharges of each polarity at each point</p> | <p>Performance Criteria during the test:</p> <p>a. Normal performance within the specification limits.</p> <p>b. Temporary degradation or loss of function or performance which is self-recoverable.</p> <p>c. Temporary degradation or loss of function or performance which requires operator intervention or system reset.</p> <p>d. Degradation or loss of function which is not recoverable due to damage of equipment (Components) or software, or loss of data.</p> <p>- During & after the test equipment should work satisfactorily and communication should not disturb.</p> | <p>Meets the performance criteria (a).</p> <p>- During & after the test equipment was working satisfactorily without disturbing the communication.</p> |

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Results:

Test : Electrical Fast Transient / Burst

Specification : IEC 61000-4-4: 2004

EUT Configuration : Refer page 02.

| Wave shape / severity | Requirements | Test Results |
|---|--|--|
| <p>Pulse Rise time: 5nS Pulse Duration: 50nS Burst Duration: 15mS Burst period: 300mS Repetition rate of impulse: 5kHz</p> <p><u>Coupling on AC Power supply port</u> <u>Coupling type: Asymmetrical</u></p> <p>Level: 4 Voltage: 4 kV Peak Polarity: +ve & -ve Test duration: 1 minute in each polarity.</p> | <p>Performance criteria during the test:</p> <p>a. Normal performance within the specification limits.</p> <p>b. Temporary degradation or loss of function or performance which is self-recoverable.</p> <p>c. Temporary degradation or loss of function or performance which requires operator intervention or system reset.</p> <p>d. Degradation or loss of function which is not recoverable due to damage of equipment (Components) or software, or loss of data.</p> <p>- During & after the test equipment should work satisfactorily and communication should not disturb.</p> | <p>Meets the performance Criteria (a).</p> <p>- During & after the test equipment was working satisfactorily without disturbing the communication.</p> |



STQC
॥ गुणोत्कर्षे समृद्धिः ॥

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| | |
|-------------------|-----------------------|
| Test | : Surge Immunity |
| Specification | : IEC 61000-4-5: 2005 |
| IUT Configuration | : Refer page 02 |

| Wave shape / severity | Requirements | Test results |
|--|--|--|
| <p><u>Combination wave:</u></p> <p>Surge Voltage Front time: 1.2μS Duration: 50μS</p> <p>Surge current Front time: 8μS Duration: 20μS</p> <p><u>Coupling on Power supply port</u></p> <p><u>Coupling type: Symmetrical</u></p> <p>Level: 3 Voltage: 1 kV Peak Polarity: Positive & Negative No. of surges : 5 in each polarity</p> <p><u>Coupling type: Asymmetrical</u></p> <p>Level: 3 Voltage: 2 kV Peak Polarity: Positive & Negative No. of surges : 5 in each polarity</p> | <p>Performance criteria during the test:</p> <p>a. Normal performance within the specification limits.</p> <p>b. Temporary degradation or loss of function or performance which is self-recoverable.</p> <p>c. Temporary degradation or loss of function or performance which requires operator intervention or system reset.</p> <p>d. Degradation or loss of function which is not recoverable due to damage of equipment (Components) or software, or loss of data.</p> <p>- During & after the test equipment should work satisfactorily and communication should not disturb.</p> | <p>Meets the performance criteria (a).</p> <p>- During & after the test equipment was working satisfactorily without disturbing the communication.</p> |

EMC/FM-089-07





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Results:

Test : RF Conducted Immunity
Specification : IEC 61000 - 4 - 6:2006
EUT Configuration : Refer Page No.02

| Wave shape / severity | Requirements | Test results |
|---|--|--|
| <p>R.F Freq: 150kHz-80MHz Sweep rate: 1% Dwell time: 3Sec Mod Freq: 1kHz Mod depth: 80% AM</p> <p>Coupling on: Power Supply</p> <p><u>Coupling type: CDN</u></p> <p>Level: 3 Voltage: 10 Vrms</p> <p><u>Coupling on Signal and Control lines (Transmit & Receive)</u></p> <p><u>Coupling type: BCI</u></p> <p>Level: 3 Voltage: 10 Vrms</p> | <p>Performance Criteria during the test:</p> <p>a. Normal performance within the specification limits.</p> <p>b. Temporary degradation or loss of function or performance which is self-recoverable.</p> <p>c. Temporary degradation or loss of function or performance which requires operator intervention or system reset.</p> <p>d. Degradation or loss of function which is not recoverable due to damage of equipment (Components) or software, or loss of data.</p> <p>- During & after the test equipment should work satisfactorily and communication should not disturb.</p> | <p>Meets the performance criteria (a).</p> <p>- During & after the test equipment was working satisfactorily without disturbing the communication.</p> |





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Results:

Test Performed : Voltage Dips and Short Interruptions

Specification : IEC 61000-4-11:2004

EUT Configuration : Refer Page No.02

Performance criteria during the test:

- Normal performance within the specification limits.
- Temporary degradation or loss of function or performance which is self-recoverable.
- Temporary degradation or loss of function or performance which requires operator intervention or system reset.
- Degradation or loss of function which is not recoverable due to damage of equipment (Components) or software, or loss of data.

| Test Conditions | : Standard Condition | No. of Dips | : 3 |
|-------------------------------------|--------------------------|------------------------------|---------------------------------------|
| | | Interval between Dips: | 10 sec |
| Test Frequency | : 50.00 Hz | Mode | : Synchronous |
| Test Volts (U_T) | : 230.00 V | Angle | : 0 or 180 deg |
| Waveform | : Sine | | |
| Voltage Dip (% U_T) | Test Level (% U_T) | Duration (Cycles) 50Hz | Test Result |
| 100 | 0 | 1 | Meets the performance criteria (a) |
| 80 | 20 | 10 | |
| 70 | 30 | 25 | |
| 40 | 60 | 250 | |
| Short interruption Test level (%UT) | | Duration (Cycles) | Test Result |
| 0 | | 250 | Meets the performance criteria (a) |





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Results:

Test Performed : Harmonic Current Emission

Specification : IEC 61000-3-2:2005

EUT Configuration : Refer Page No.02

Classification : CLASS - A

Test type : Steady State

Test time : 2.5 min

Test Volts : 230.00 V

Test Frequency: 50Hz

Waveform : Sine

| Harmonic No. | Amps | Limit | Results | Harmonic No. | Amps | Limit | Results |
|--------------|-------|-------|---------|--------------|-------|-------|---------|
| 1 | 0.057 | ----- | Pass | 21 | 0.026 | 0.107 | Pass |
| 2 | 0.001 | 1.080 | Pass | 22 | 0.001 | 0.084 | Pass |
| 3 | 0.050 | 2.300 | Pass | 23 | 0.022 | 0.098 | Pass |
| 4 | 0.001 | 0.430 | Pass | 24 | 0.001 | 0.077 | Pass |
| 5 | 0.049 | 1.140 | Pass | 25 | 0.019 | 0.090 | Pass |
| 6 | 0.001 | 0.300 | Pass | 26 | 0.001 | 0.071 | Pass |
| 7 | 0.047 | 0.770 | Pass | 27 | 0.015 | 0.083 | Pass |
| 8 | 0.001 | 0.230 | Pass | 28 | 0.000 | 0.066 | Pass |
| 9 | 0.045 | 0.400 | Pass | 29 | 0.012 | 0.078 | Pass |
| 10 | 0.001 | 0.184 | Pass | 30 | 0.000 | 0.061 | Pass |
| 11 | 0.043 | 0.330 | Pass | 31 | 0.009 | 0.073 | Pass |
| 12 | 0.001 | 0.153 | Pass | 32 | 0.000 | 0.058 | Pass |
| 13 | 0.040 | 0.210 | Pass | 33 | 0.007 | 0.068 | Pass |
| 14 | 0.001 | 0.131 | Pass | 34 | 0.000 | 0.054 | Pass |
| 15 | 0.037 | 0.150 | Pass | 35 | 0.005 | 0.064 | Pass |
| 16 | 0.001 | 0.115 | Pass | 36 | 0.000 | 0.051 | Pass |
| 17 | 0.033 | 0.132 | Pass | 37 | 0.003 | 0.061 | Pass |
| 18 | 0.001 | 0.102 | Pass | 38 | 0.000 | 0.048 | Pass |
| 19 | 0.030 | 0.118 | Pass | 39 | 0.002 | 0.058 | Pass |
| 20 | 0.001 | 0.092 | Pass | 40 | 0.000 | 0.046 | Pass |





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Results:

Test Performed : Voltage Fluctuation and Flicker

Specification : IEC 61000-3-3:2005

1) Test Volts : 230.00 V

Test Frequency : 50.00 Hz

Waveform : Sine

Test time : 120 min

T-shirt : 10 min

EUT Configuration : Refer page 02

| | EUT DATA | LIMIT | RESULT |
|----------|----------|-------|--------|
| Pst max | 0.008 | 1.00 | Pass |
| Plt max | 0.008 | 0.65 | Pass |
| dc% | 0.00 | 3.30 | Pass |
| d max% | 0.00 | 4.00 | Pass |
| d(t) sec | 0.00 | 0.50 | Pass |

Tested By
(Hemant Sahu)

(Scientist 'B')

Date:

EMC/FM-101-07

Approved By

Dr. N.C. JOSHI

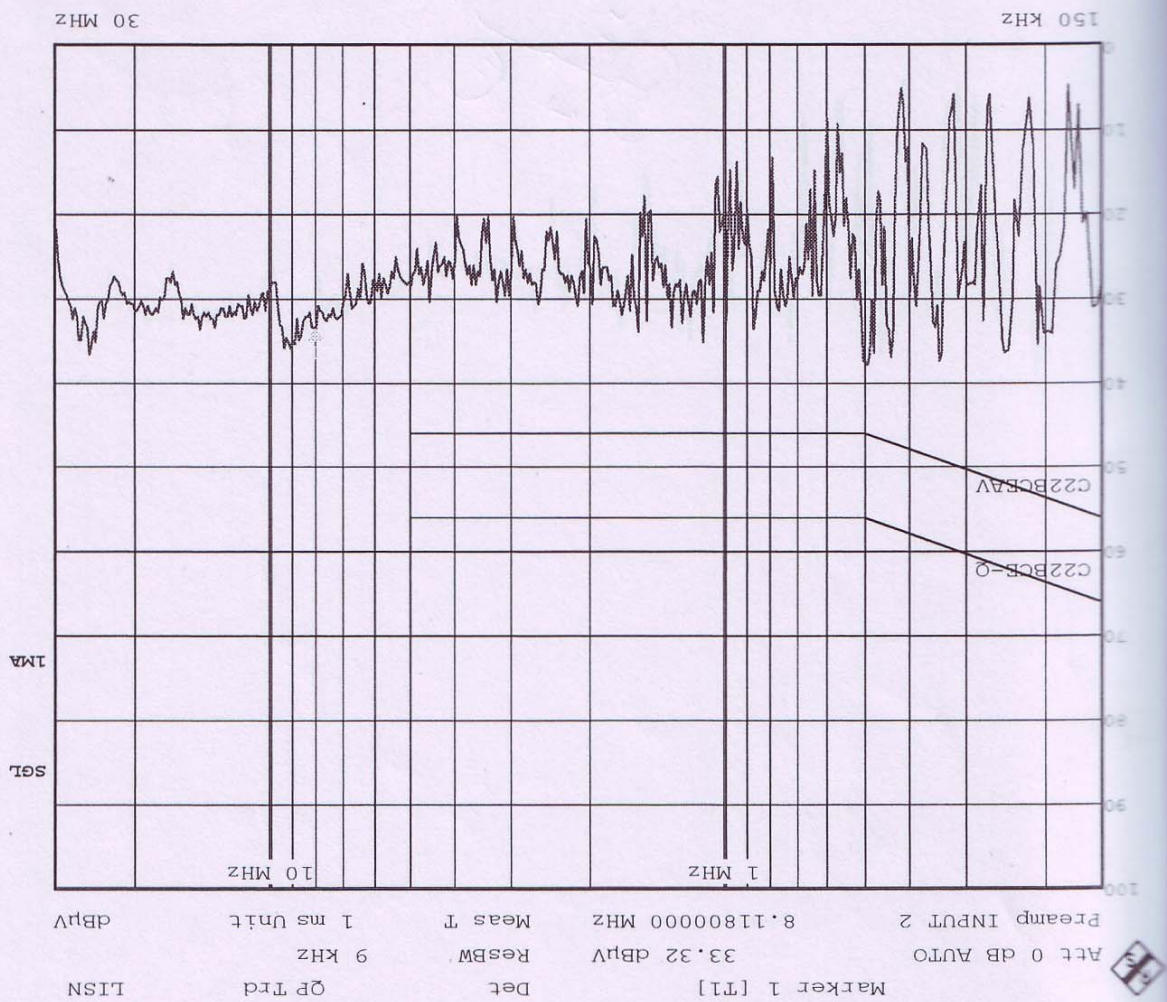
Scientist 'E'

Electronics Test & Development Centre
Ministry of Comm. & IT., STQC Directorate,
Govt. of India, Bangalore - 560 058.

Issued By

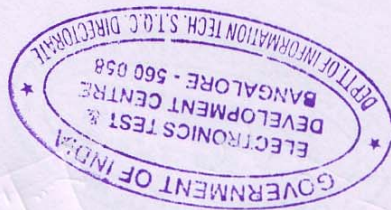
**CO-ORDINATOR
TESTING SERVICES,
E.T.D.C., BANGALORE**





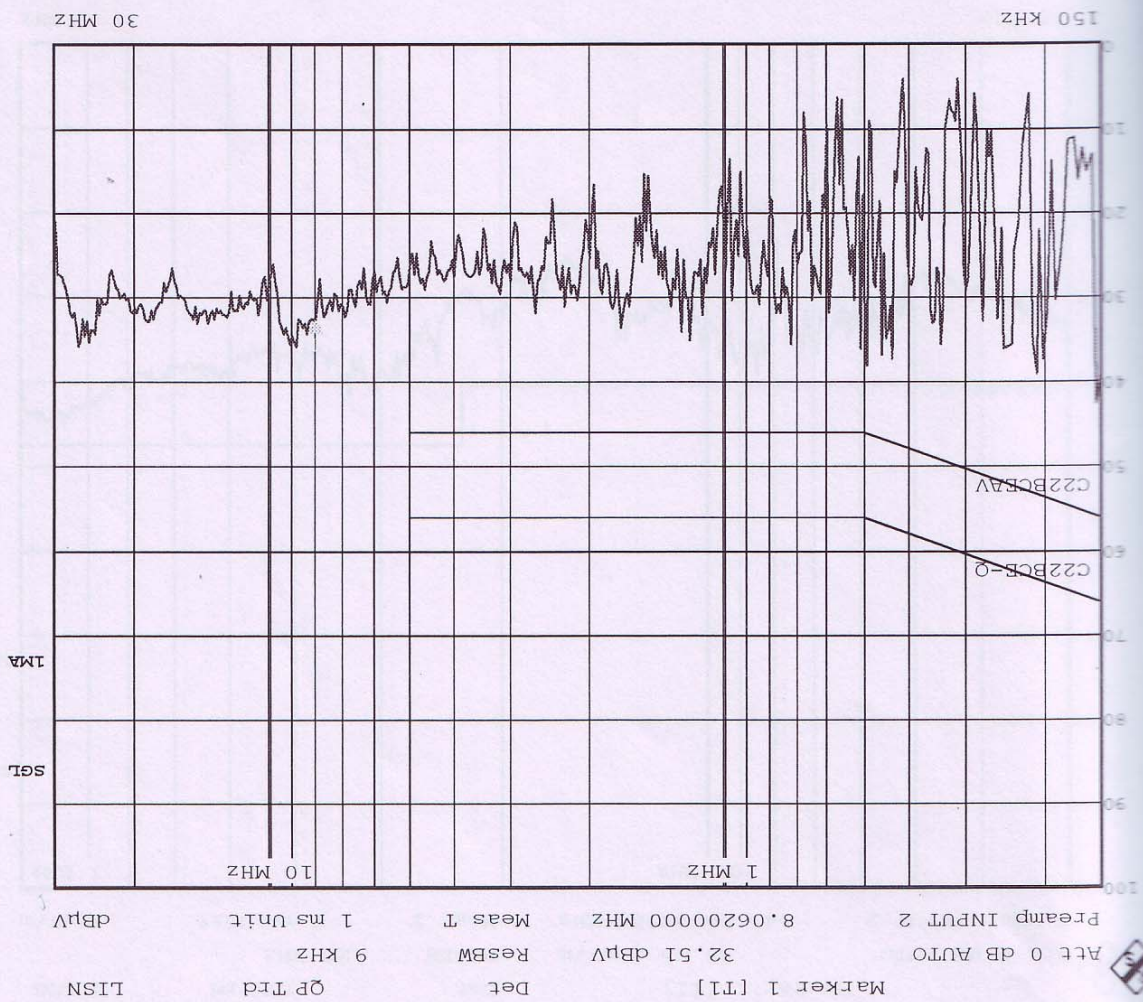
Title: conducted disturbance at mains ports, class B (L-G)

Date: 30.SEP.2009 15:14:26

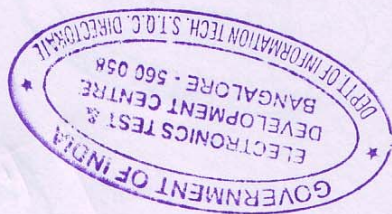


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Handwritten number 14.



Title: conducted disturbance at mains ports, class B (N-G)
Date: 30.SEP.2009 15:20:18



TR



Marker 1 [T1]

Det

QP Trd

BILOG

Att 0 dB AUTO

38.05 dBμV/m

ResBW

120 kHz

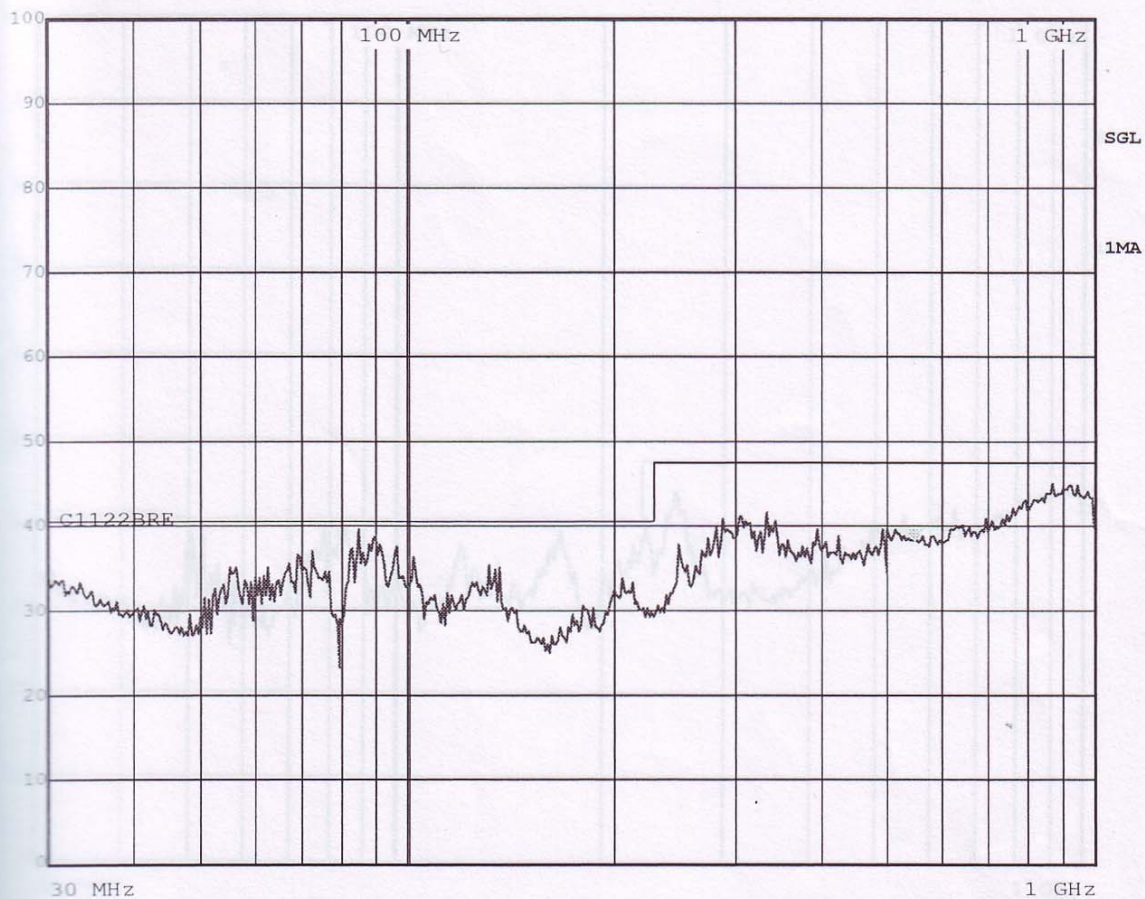
Preamp INPUT 2

549.40000000 MHz

Meas T

1 ms Unit

dBμV/m

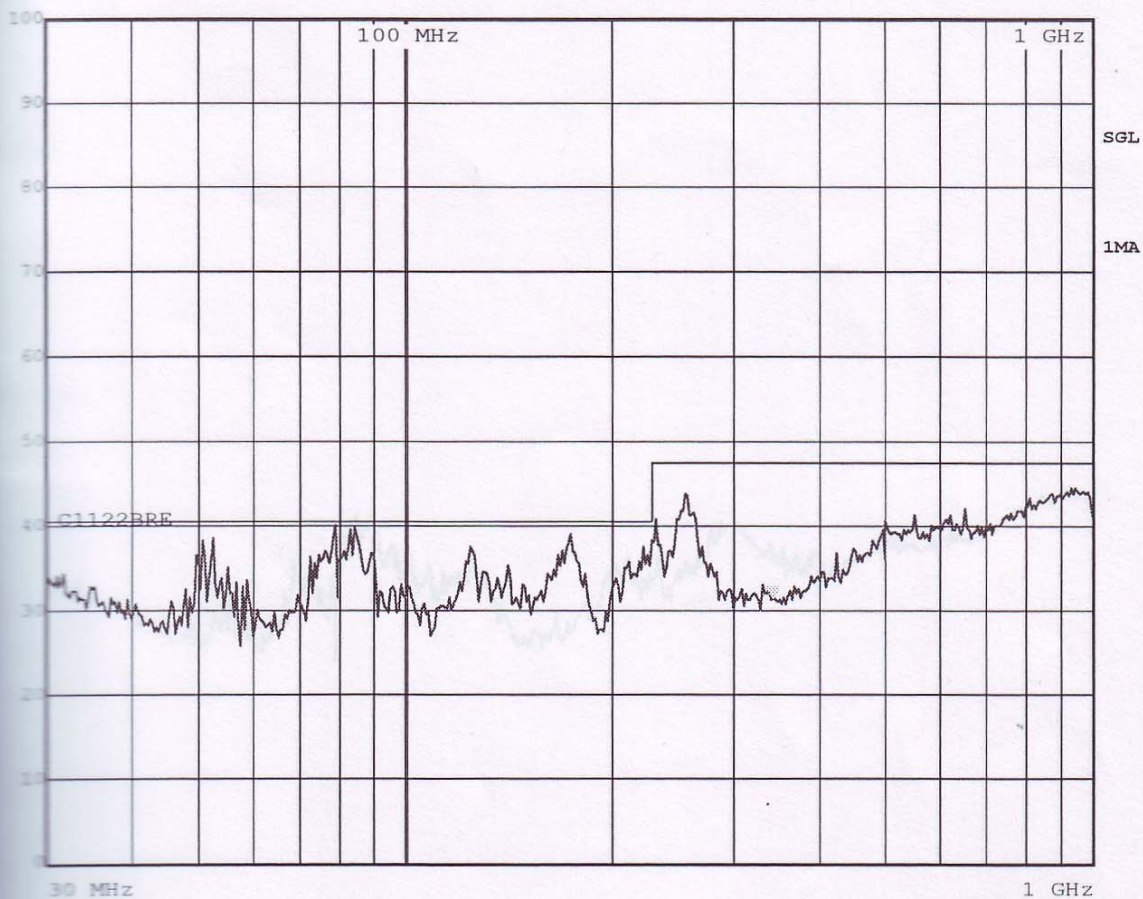


Title: Radiated disturbance, class B (H,O)
 Date: 30.SEP.2009 11:42:55





Marker 1 [T1] Det QP Trd BILOG
Att 0 dB AUTO 31.26 dB μ V/m ResBW 120 kHz
Preamp INPUT 2 344.36000000 MHz Meas T 1 ms Unit dB μ V/m



Title: Radiated disturbance, class B(V,0)
Date: 30.SEP.2009 12:06:54





Marker 1 [T1]

Det

QP Trd

BILOG

Att 0 dB AUTO

40.28 dB μ V/m

ResBW

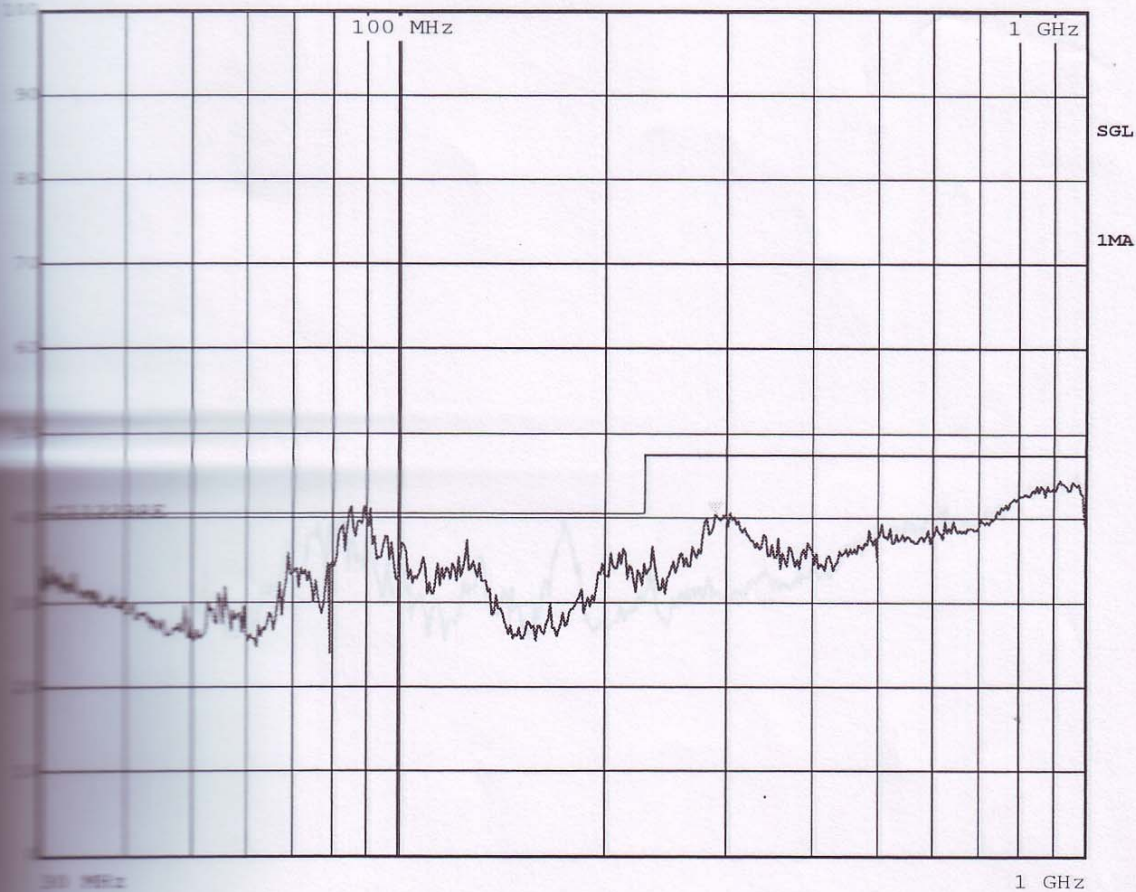
120 kHz

Preamp INPUT 2

290.68000000 MHz

Meas T

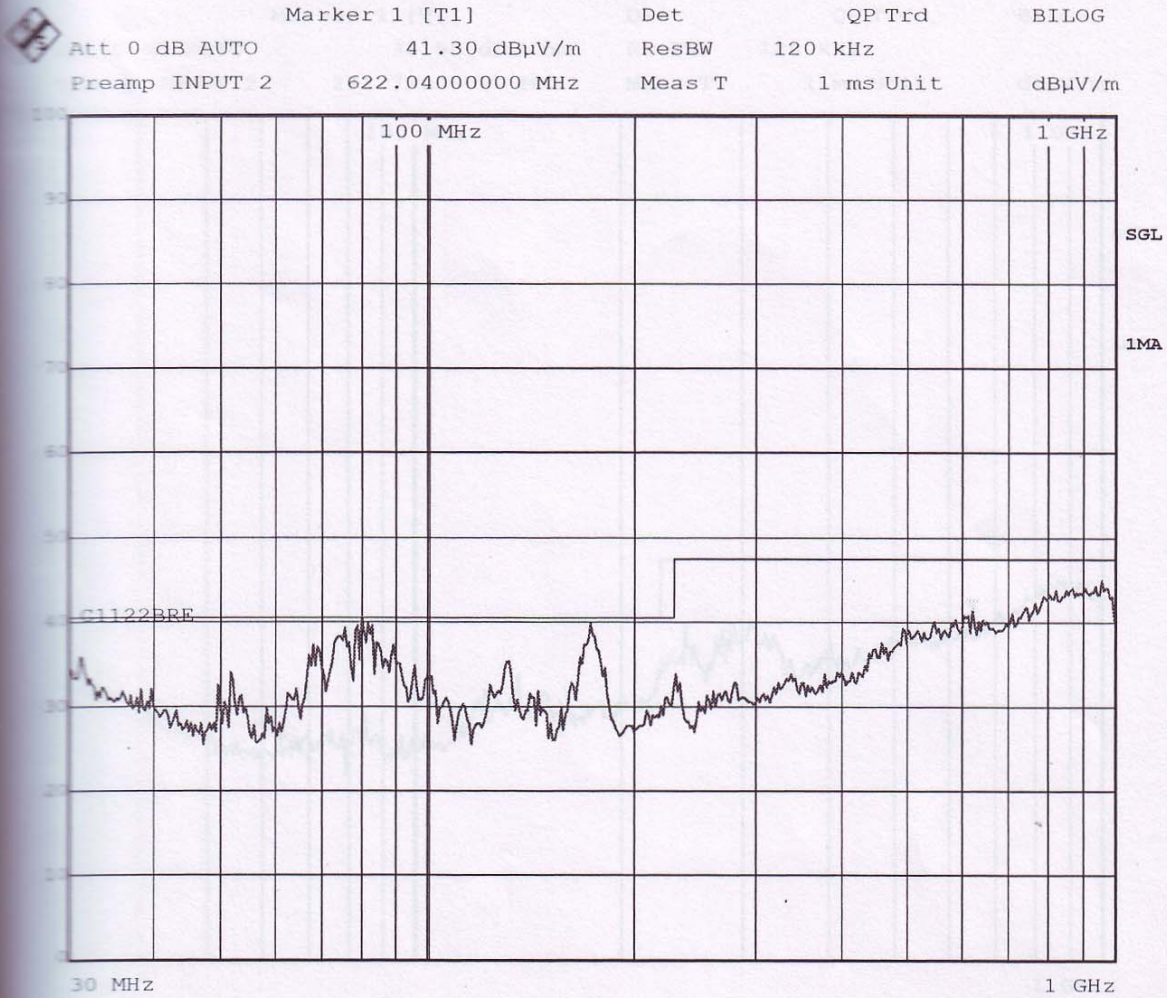
1 ms Unit

dB μ V/m

Radiated disturbance, class B(H,90)

30.SEP.2009 12:28:47



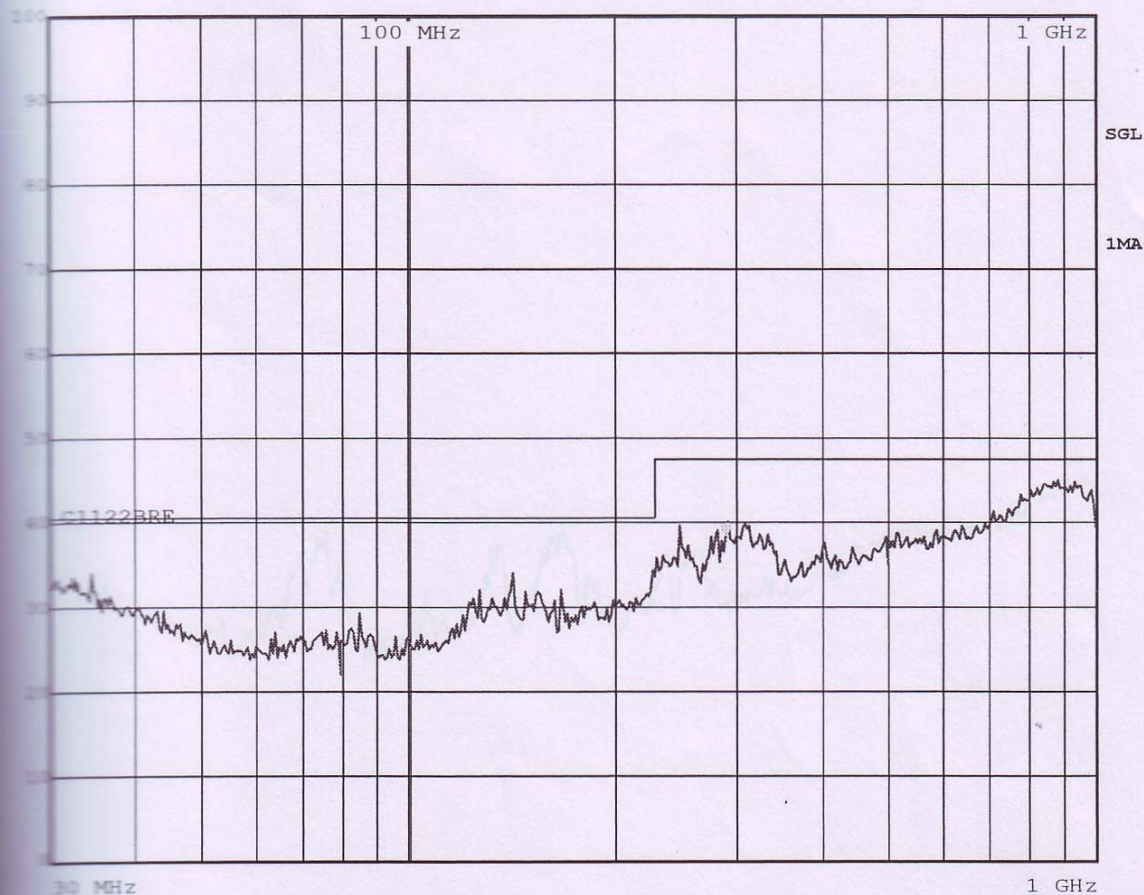


Title: Radiated disturbance, class B(V,90)
Date: 30.SEP.2009 12:19:29





Marker 1 [T1] Det QP Trd BILOG
Att 0 dB AUTO 38.50 dB μ V/m ResBW 120 kHz
Preamp INPUT 2 291.7200000 MHz Meas T 1 ms Unit dB μ V/m

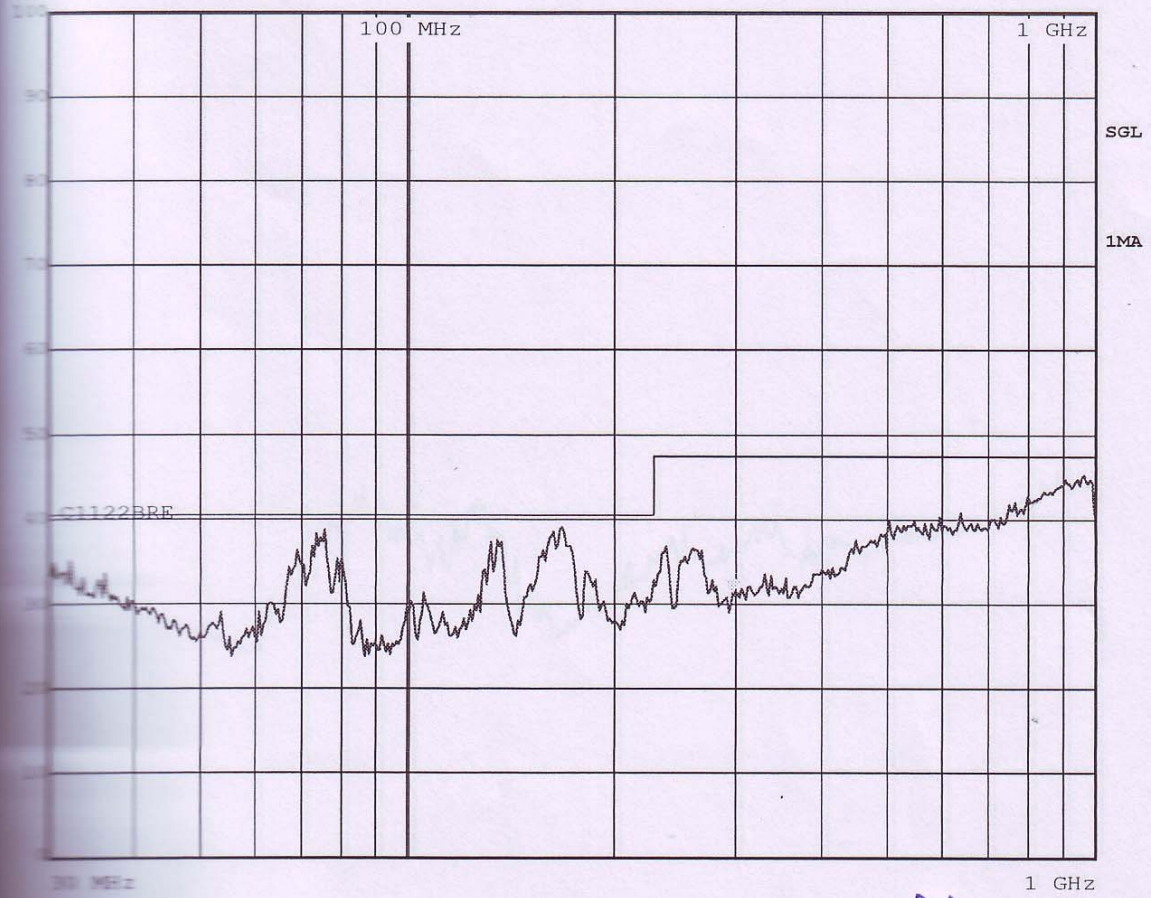


Title: Radiated disturbance, class B(H,180)
Date: 30.SEP.2009 12:36:57

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Marker 1 [T1] Det QP Trd BILOG
 Att 0 dB AUTO 31.30 dBuV/m ResBW 120 kHz
 Preamp INPUT 2 300.32000000 MHz Meas T 1 ms Unit dBuV/m



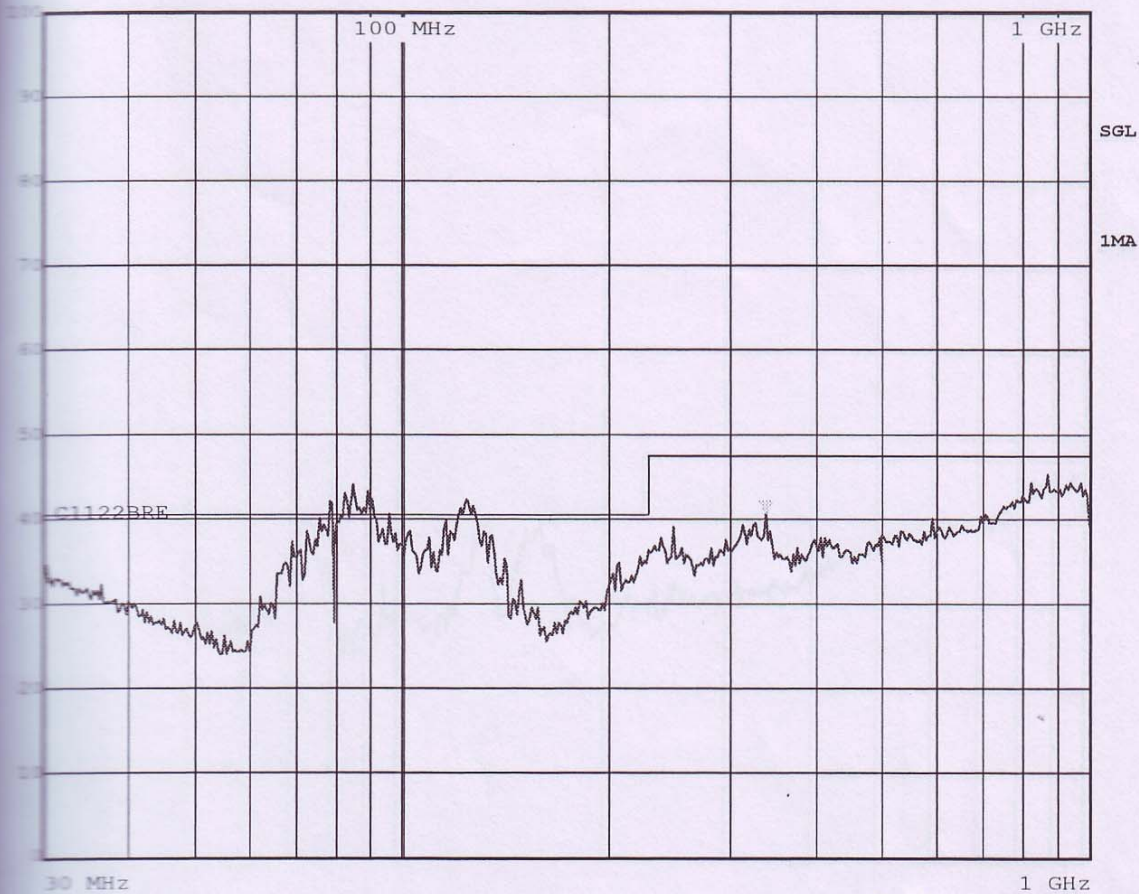
Radiated disturbance, class B(V,180)
 30.SEP.2009 12:49:03

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Marker 1 [T1] Det QP Trd BILOG
 Att 0 dB AUTO 40.67 dB μ V/m ResBW 120 kHz
 Preamp INPUT 2 340.92000000 MHz Meas T 1 ms Unit dB μ V/m

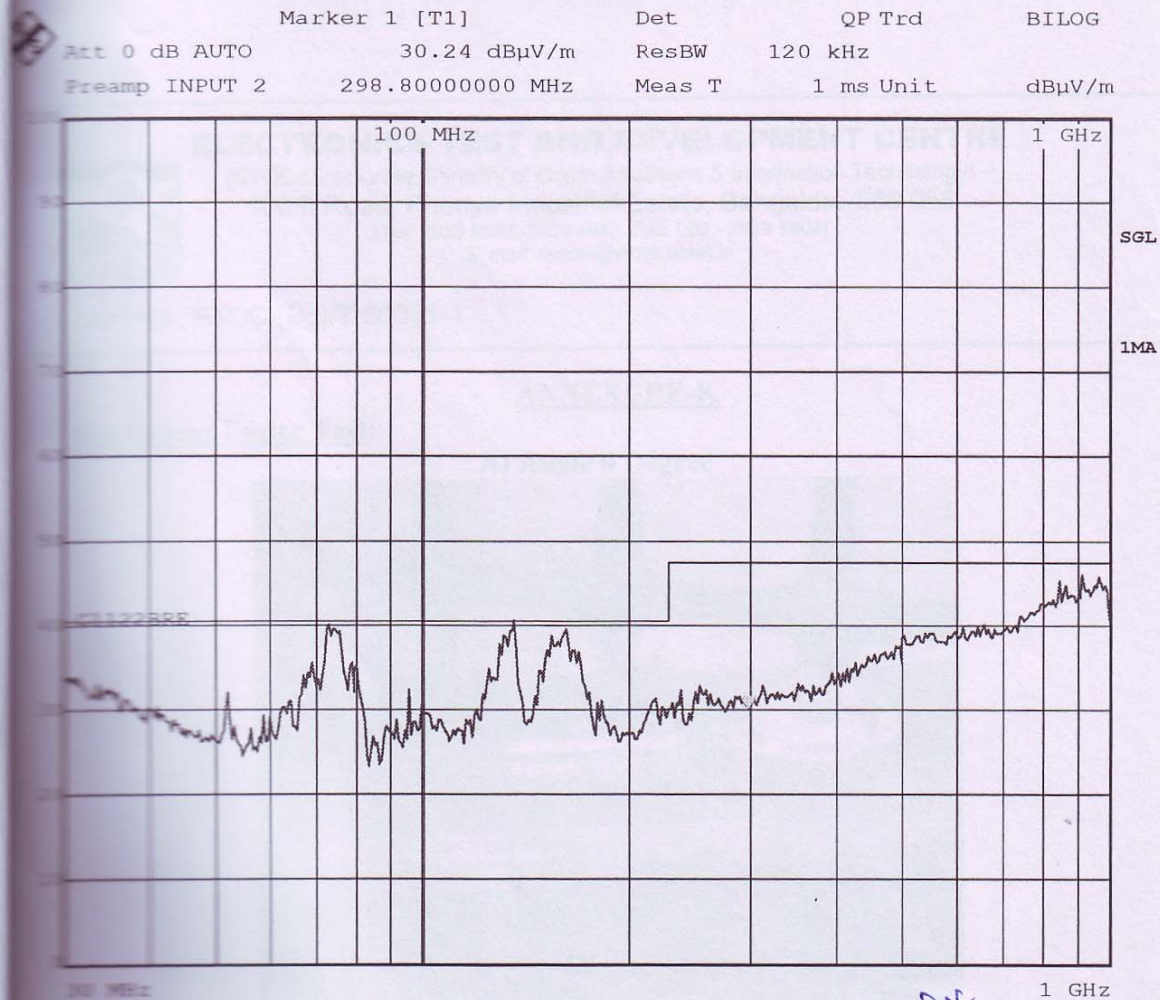


Title: Radiated disturbance, class B(H,270)
 Date: 30.SEP.2009 13:09:54

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Handwritten signature/initials



Radiated disturbance, class B(V,270)

30.SEP.2009 12:55:32





DECLARATION OF CONFORMITY

Application of Council Directives: Radio Equipment and telecommunication Terminal Equipment Directive(R&TTE) 1999/5/EC.

Name of Equipment : Nano PBX.

Model Number : CPX-002

Description: Nano PBX is 8 port PBX equipment used for Voice and data Call.

Manufacturer's Name: CEM Solutions Pvt. Ltd.

Manufacturer' Address: 143-A1, Bommasandra Industrial Area, Hebbagodi Village, Anekal

Taluk, Bangalore 560099.

Test Lab Name and Address: Electronics Test and Development centre, 100ft Road Peenya Industrial Estate, Bangalore-560058

Test Lab report No.: ETDC(Bg)/T-60331-1

Conforms the Following Standard:

| EMC Standards | CISPR22:2006 Class B | ETDC(Bg)/T-60331-1 |
|---|--|--------------------|
| Emission Standards | | |
| 1. Harmonics Current 2. Voltage fluctuation and flicker test | IEC61000-3-2:2005 IEC61000-3-3:2005 | ETDC(Bg)/T-60331-1 |
| Immunity Standards 1.ESD 2.RS 3.EFTB 4.SURGE 5.Conducted RF 6.Magnetic Field 7.Dip | IEC61000-4-2:2001 IEC61000-4-3:2006 IEC61000-4-4:2004 IEC61000-4-5:2005 IEC61000-4-6:2004 IEC61000-4-8:2001 IEC61000-4-11:2004 | ETDC(Bg)/T-60331-1 |

when installed and operated in accordance with the manufacturers installation and operating instructions.

Signature

ADDL. GENERAL MANAGER

Position

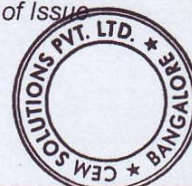
(SMT)

BANGALORE

Place & Date of Issue

11/12/09

(T. KRISHNA KUMAR)





ELECTRONICS TEST AND DEVELOPMENT CENTRE

(STQC Directorate, Ministry of Communications & Information Technology)

100 ft Road, Peenya Industrial Estate, Bangalore-560 058

(Tel: 2839 5992, 2839 4647. Fax: 080 - 2839 1804)

E-mail: centre@etdcbg.org



T-0044

Report No.: ETDC (Bg)/T-60321

TEST REPORT

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1. Scope

| | | |
|----|--|---|
| 1. | Service request number | 60321 |
| 2. | Requested by (Name & Address of the Organization) | M/s. CEM Solutions Pvt Ltd, Akarsh Eco Place ,Ground Floor, 176 EPIP, Industrial Area, Kundalahalli, Whitefield, Bangalore-560066. |
| 3. | Description of the equipment: | |
| | a) Nomenclature | NANO PBX |
| | b) Manufactured by | CEM Solutions |
| | c) Model / type no. | CPX-002 |
| | d) Serial no. | 001(Prototype) |
| 4. | Date of submission of samples | 25-09-2009 |
| 5. | Condition of item on receipt | Good |
| 6. | Date of completion of tests | 25-09-2009 |
| 7. | Applicable test specification | IEC 61000-4-3:2006 |
| 8. | Test category | Performance Test |
| 9. | Environment condition | Temp: 26 °C, RH: 65% |

2. Major equipments used

| Sl No | Nomenclature | Make | Model | Cal. Due |
|-------|---------------------|-----------------|------------|-------------|
| 1 | Signal Generator | Marconi | 2030 | MAY 2010 |
| 2 | Biconicalog Antenna | Electro-metrics | EM-6917B-1 | AUGUST 2010 |
| 3 | E-field Sensor | DARE | RADISENSE | JAN 2010 |

This report refers only to the item tested and shall not be reproduced except in full. Refer to Information contained on the cover.





STQC
॥ गुणोत्कर्षे सदाधिः ॥

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CO-ORDINATOR
TESTING SERVICES,
E.T.D.C., BANGALORE

