SAHYADRI®

ISO 9001:2015 Certified

SAHYADRI ELECTRO CONTROLS (I) PVT. LTD.

SECO

FACIA ANNUNCIATOR TYPE TEST REPORTS (SAN 200 SERIES)

10, VINAY COMPLEX, 1ST CROSS, RAJGOPAL NAGAR MAIN ROAD, GANAPATHI NAGAR, PEENYA III PHASE, BANGALORE – INDIA - 560058

Mail: mkt@secoindia.com & sales@secoindia.com, Web: www.secoindia.com

Form No.: FM/081-14

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: etdcbg@stqc.nic.in

Report No.: TR/ETL/63712 **TEST REPORT**

1. SCOPE.

1.	SERVICE REQUEST NUMBER	63712
2.	Test Requested by (Name of Organization)	M/s. Sahyadri Electro Controls(I) Pvt. Ltd. #10, Vinay Complex, 1st cross, Rajgopal Nagar Main road, Ganapathi Nagar, Bangalore-58
3.	Description of the Equipment	
	a). Nomenclature	SAN 200 SERIES MICROPROCESSOR based ANNUNCIATOR
	b). Manufactured by	M/s. Sahyadri Electro Controls(I) Pvt. Ltd.
	c). Model No. / Type No.	SAN200/M520UT12
	d). No. of Sampled Submitted	01
	e). Serial No.	16-02-2275
4.	Date of submission of samples	11/03/2016
5.	Condition of items on receipt	Good
6.	Test Carried Out at	ETDC Bangalore.
7.	Date of start of tests	14/03/2016
8.	Date of completion of test	14/03/2016
9.	Applicable test specification	Customer
10.	Test category	Performance
11.	Env. Condition During Measurements	Temperature: 15 - 35 °C, Relative humidity: 45-70%

2. MAJOR EQUIPMENT USED:

Sl. No.	Nomenclature	Make	Model	Cal. Due
1	DMM	Agilent	34401A	Jan 2017
3	DMM	HP	3478A	Feb 2017
4	Breakdown tester	BPL	RM 215G	May 2016

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 059. DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Date of Release: 16/05/201

3.0 Test Details and Test Results:

The unit energized by giving 230V AC between terminals P1 (Live) and P2 (Neutral) and Earth. DIP switch settings are configured for trip alarm contact.

Test No.	Test Parameter / Conditions	Test Specification Requirements	Test Results/Observations/ Remarks
1.0	**SELF TEST**		
	A)Test:- press and release the push button T	1) Before test, trip alarm contact (C3 & C4) & non-trip alarm contact contacts (C1 & C2) are in open condition. 2) All 20 windows start flashing (ON-OFF) continuously. 3) Trip alarm contacts (C3 & C4) & non-trip alarm contacts (C1 & C2) changes from open to closed condition- check this by using continuity meter.	Complies with requirement.
	B) Mute:- press and release the push button M	1) All 20 windows will be still flashing (ON-OFF) continuously. 2) Trip alarm contact (C3 & C4) & Non-trip alarm contacts (C1 & C2) changes from closed to open condition- check this by using continuity meter.	Complies with requirement.
	C) Accept:- press and release the push button A	1) All 20 windows will become steady (continuously ON). 3) Trip alarm contact (C3 & C4) & Non-trip alarm contacts (C1 & C2) changes from closed to open condition- check this by using continuity meter.	Complies with requirement.
	D) Reset:- press and release the push button R	1) All 20 windows will goes OFF.	Complies with requirement.

Tested By: Avinash Mahto

Approved By:

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

3.0 Test Details and Test Results: Continued…

Test No.	Test Parameter / Conditions	Test Specification Requirements	Test Results/Observations/ Remarks
2.0	**INITIATION TEST**		
	A) Connect and release a wire between the terminal CF & F1	1) Window-1 starts flashing. 2) Trip alarm contact (C3 & C4) changes from open to closed condition- check this by using continuity meter.	Complies with requirement.
	B) Mute:- press and release the push button M	1) Window-1 will be still flashing. 2) Trip alarm contact (C3 & C4) changes from closed to open condition- check this by using continuity meter.	Complies with requirement.
	C)Accept:- press and release the push button A	1) Window-1 will become steady (continuously on). 2) Trip alarm contact (C3 & C4) changes from closed to open condition- check this by using continuity meter.	Complies with requirement.
	D) Connect and release a wire between the terminal CF & F4	1) Window- 4 starts flashing. 2) Trip alarm contact (C3 & C4) changes from open to closed condition- check this by using continuity meter.	Complies with requirement.
	E)Accept:- press and release the push button A.	1) Window- 4 will become steady (continuously on). 2) Trip alarm contact (C3 & C4) changes from closed to open condition- check this by using continuity meter.	Complies with requirement.

Tested By: Ashwath Mahto

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Approved By: .....

3.0 Test Details and Test Results: Continued…

Test No.	Test Parameter / Conditions	Test Specification Requirements	Test Results/Observations/ Remarks
2.0	**INITIATION TEST Continued…**		
	F) Connect and release a wire between the terminal CF & F12	1) Window-12 starts flashing. 2) Trip alarm contact (C3 & C4) changes from open to closed condition- check this by using continuity meter.	Complies with requirement.
	G) Accept:- press and release the push button A.	1) Window- 12 will become steady (continuously ON). 2) Trip alarm contact (C3 & C4) changes from closed to open condition- check this by using continuity meter.	Complies with requirement.
	H) Reset the windows by pressing the push button R.	1) All windows go OFF.	Complies with requirement.
3.0	**WINDOW CONTACT TEST/SCADA CONTACT TEST**		
	A) Connect a wire between the terminal CF & F3	1) Window-3 starts flashing. 2) Contacts between EC & E3 closes.	Complies with requirement.
	B) Connect a wire between the terminal CF & F8	1) Window-8 starts flashing. 2) Contacts between EC & E8 closes.	Complies with requirement.
	C)Connect a wire between the terminal CF & F10	1) Window-10 starts flashing. 2) Contacts between EC & E10 closes.	Complies with requirement.
4.0	**BURDEN TEST**	Switch ON the 230V AC Supply and measure the input AC Current when All Windows are at steady (continuously ON) condition (Accepted). The Input Power Consumed should be < 30 Watts	Input Voltage: 230.4 VAC Input Current measured: 49.9 mA Input Power Consumed: 11.5 Watts

Tested By.....

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Approved By.....

3.0 Test Details and Test Results: Continued…

Test No.	Test Parameter / Conditions	Test Specification Requirements	Test Results/Observations/ Remarks
5.0	**DIELECTRIC TEST(HIGH VOLTAGE BREAK DOWN TEST)**		
	A) Connect all terminals except Earth terminal. Apply 2 kVrms , 50 Hz between all terminals shorted together and Earth terminal for 1 minute.	No Flashover Or Breakdown should be Observed.	Complies with requirement.
	B) Apply 1 kVrms, 50 Hz between Open Contacts - Trip Contacts (C3 & C4) for 1 minute.	No Flashover Or Breakdown should be Observed.	Complies with requirement.
	C) Apply 1kVrms,50 Hz between Open Contacts – Non-Trip Contacts (C1 & C2) for 1 minute	No Flashover Or Breakdown should be Observed	Complies with requirement.
6.0	**AUXILIARY SUPPLY VARIATION TEST**		
	A) Apply 75V AC Self-Test	EUT should be energized with 75 VAC and SELF TEST as per test no. 1.0 to be carried out and it should comply with the requirements of SELF TEST.	Complies with requirement.
	B) Apply 275V AC Self-Test	EUT should be energized with 275 VAC and SELF TEST as per test no. 1.0 to be carried out and it should comply with the requirements of SELF TEST.	Complies with requirement.

Tested By..... Approved By..... 29.03.2016 Issued By:.....

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 058. DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

K. Swarupa
Scientist 'E'
Electronics Test & Development Centre,
Government of India,
STQC Directorate,
Department of Electronics & Information Technology
100 Feet Road, Peenya Industrial Estate,
Bangalore - 560 058.

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

Form No.: FM/081-14

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

T-0044

Report No.: TR/EMC/63712 **TEST REPORT** Page 01 of 22

1. Scope

1.	Service request number	63712
2.	Test requested by (Name & Address of the Organization)	M/s. Sahyadri Electro Controls (I) Pvt. LTD. #10, Vinay Complex, 1st Cross, Rajgopalnagar Main Road, Ganapatinagar, Peenya 3rd Phase, Bangalore-560058.
3.	Description of the equipment:	
	a) Nomenclature	SAN200 Series Microprocessor Based Annunciator
	b) Manufactured by	SECO
	c) Model / type no.	SAN200/M520UT12
	d) No. of samples submitted	01
	e) Serial no.	16-02-2275
4.	Date of submission of test samples	21-03-2016
5.	Condition of test samples on receipt	Good
6.	Test carried out at	In-house/~~On-site~~
7.	Date of start of tests	21-03-2016
8.	Date of completion of tests	22-03-2016
9.	Applicable test specification	CISPR 11 Class A:2010, IEC61000-4-2:2008, IEC61000-4-4:2012, IEC61000-4-5:2014, IEC61000-4-6:2013 and IEC61000-4-11:2004.
10.	Test category	Performance Test
11.	Environment condition	Temp: 25±5 °C RH: 45 to 70% except for ESD test For ESD test RH: <60%. Atmospheric pressure: 860mbar-1060mbar

2. Major equipment used

SN	Nomenclature	Make	Model	Cal. Due
01	EMI test receiver	R&S	ESCI	30-11-2016
02	V-Network	R&S	ESH3Z5	04-12-2016
03	EMI test receiver	R&S	ESCI7	25-02-2017
04	Bi-Log Antenna	Electro metrics	EM-6917B-1	04-06-2016
05	ESD Gun & Simulator	EM Test	30C/P30C	18-03-2017
06	EFT Generator	EM Test	UCS500-M4	16-03-2017
07	Surge Generator	Keytek	801-plus	01-05-2016
08	Continuous Wave Simulator	EM Test	CWS 500C	17-08-2016
09	Voltage Dips (AC power source)	Pacific	140TMX	12-05-2016

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 058. DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Date of Release: 16/05/2014

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Test Parameter : 1) Mains terminal disturbance voltage measurement
2) Electromagnetic radiation disturbance measurement@ 3 mtr. distance
Test Specification : CISPR11:2010, Class A
Detector Used : Quasi Peak (Qp) / Average (Avg)
Detector Bandwidth

Frequency (MHz)	Detector Bandwidth (kHz)
0.15 - 30	9
30 – 1000	120

Limits:

Class A				
Mains terminal disturbance voltage measurement			Electromagnetic radiation disturbance measurement@ 3 mtr distance	
Frequency (MHz)	Quasi-peak Limit (dBµV)	Average Limit (dBµV)	Frequency (MHz)	Quasi-peak Limit (dBµV/m)
0.15 – 0.5	79	66	30 - 230	50
0.5 - 30	73	60	230 - 1000	57

EUT Configuration: The EUT is a SAN200 Series Microprocessor Based Annunciator, powered by 230V, 50Hz, AC mains supply.

Remark: The Image of EUT and test setup for Electromagnetic radiation disturbance measurement@ 3mtr distance are shown in Annexure 'A' and 'B' respectively. The graphs for Mains terminal disturbance voltage measurement and Electromagnetic radiation disturbance measurement@ 3mtr distance are shown in Annexure 'C' and 'D' respectively.

Summary of test results:

Mains terminal disturbance voltage measurement : Meets the Class A Limits of CISPR 11:2010 Few Significant emission are reported in page no. 04
Electromagnetic radiation disturbance measurement@ 3 mtr distance: Meets the Class A Limits of CISPR 11:2010 Few Significant emission are reported in page no. 05

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 058. DEPT. OF ELECTRONICS & IT, STQC DIRECTORATE

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Performance Criteria

Performance criterion A: The apparatus shall continue to operate as intended **during and after the test.** No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

Performance criterion B: The apparatus shall continue to operate as intended **after the test.** No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed.

Performance criterion C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

Performance level specified by the manufacturer:

- Background lights (RED) of 20 windows (W1 to W20) of EUT should glow continuously.

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 053. DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Performance Criteria

Performance criterion A: The apparatus shall continue to operate as intended **during and after the test.** No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

Performance criterion B: The apparatus shall continue to operate as intended **after the test.** No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed.

Performance criterion C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

Performance level specified by the manufacturer:

- Background lights (RED) of 20 windows (W1 to W20) of EUT should glow continuously.

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 058. DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Results: (2) Electromagnetic radiation disturbance measurement@ 3 mtr distance.

Frequency (MHz)	Quasi-peak emission level* (dBµV/m)	Angle (deg)	Polarisation (H/V)**	Quasi-peak Limit (dBµV/m)
31.52	33.25	180	H	50
34.40	34.65	90	V	50
53.56	39.33	180	V	50
55.04	33.85	0	V	50
88.40	32.20	180	V	50
92.96	32.12	90	V	50

*-The antenna height adjusted between 1 m and 4 m above the ground plane for maximum emission level at each test frequency.

** (H/V): H-Horizontal polarization, V-Vertical polarization

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & I.T. STQC DIRECTORATE

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Results (3):
Test parameter : Electrostatic discharge immunity
Test specification : IEC 61000-4-2:2008
EUT Configuration : Refer Page No.02

Wave shape / severity	Performance criteria	Test results
Storage Capacitance:150pf Discharge Resistance:330Ω Discharge Mode: Contact Discharge : : Direct Application : Indirect Application (i) HCP (ii) VCP Test Level : 1 to 2 Test Voltage : 2 kV to 4kV Polarity: + Ve & -Ve Air Discharge : Test Level : 1 to 3 Test Voltage : 2 kV to 8kV Polarity: + Ve & -Ve No of discharges: 10 single discharges of each polarity at selected points.	Performance criterion "B" -After the test, Background lights (RED) of 20 windows (W1 to W20) of EUT should glow continuously.	Meets the performance criteria "B". -After the test, Background lights (RED) of 20 windows (W1 to W20) of EUT were glowing continuously.

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Results (4):
Test Parameter : Electrical fast transient / burst immunity
Test Specification : IEC 61000-4-4:2012
EUT Configuration : Refer page 02.

Wave shape / severity	Performance criteria	Test Results
Pulse Rise time: 5nS Pulse Duration: 50nS Burst Duration: 15mS Burst period: 300mS Repetition rate of impulse:5kHz *Coupling on AC Power supply port* *Coupling Type: Common mode* Test Level: 3 Test Voltage: 2 kV Peak Polarity: +ve & -ve Test duration: 1 minute in each polarity.	Performance criterion "B" -After the test, Background lights (RED) of 20 windows (W1 to W20) of EUT should glow continuously.	Meets the performance criteria "B". -After the test, Background lights (RED) of 20 windows (W1 to W20) of EUT were glowing continuously.

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 058. DEPT. OF ELECTRONICS & IT, STQC DIRECTORATE

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Results (5):
Test Parameter : Surge Immunity
Test Specification : IEC 61000-4-5:2014
EUT Configuration : Refer page 02

Wave shape / severity	Performance criteria	Test results
Combination wave: Surge Voltage Front time: 1.2µS Duration: 50µS Surge current Front time: 8µS Duration: 20µS *Coupling on AC Power supply port* *Coupling type: Symmetrical* Test Level: 2 to 4 Test Voltage: 0.5kV to 2kV Peak Polarity: Positive & Negative Phase angle:0°,90°,180° and 270° No. of surges :5 in each polarity	Performance criterion "B" -After the test, Background lights (RED) of 20 windows (W1 to W20) of EUT should glow continuously.	Meets the performance criteria "B". -After the test, Background lights (RED) of 20 windows (W1 to W20) of EUT were glowing continuously.

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU-560 058. DEPTT. OF ELECTRONICS & IT, STQC

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Results (6):

Test Parameter : Immunity to conducted disturbances, induced by RF fields
Test Specification : IEC 61000-4-6:2013
EUT Configuration : Refer Page No.02

Wave shape / severity	Performance criteria	Test results
R.F Freq: 150kHz-80MHz Sweep rate: 1% Dwell time: 3Sec Mod Freq: 1kHz Amplitude Modulation:80% in depth *Coupling on AC Power Supply* *Coupling type: CDN* Test Level: 2 Test Voltage : 3 Vrms	Performance criterion "A" -During and after the test, Background lights (RED) of 20 windows (W1 to W20) of EUT should glow continuously.	Meets the performance criteria "A". -During and after the test, Background lights (RED) of 20 windows (W1 to W20) of EUT were glowing continuously.

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 058. DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Results (7):

Test Parameter : Voltage dips
Test Specification : IEC 61000-4-11:2004
EUT Configuration : Refer Page No.02

Wave shape / severity	Performance criteria	Test Results
Test Conditions : Standard Test Frequency : 50.00 Hz Test Voltage : 230.00 V Waveform : Sine No. of Dips : 3 Interval between Dips: 10 sec Mode : Synchronous Angle : 0 deg Test Level : Class 3 Voltage Dips :	Performance criterion "B"	Meets the performance criteria "B".
	-After the test, Background lights (RED) of 20 windows (W1 to W20) should glow continuously.	-After the test, Background lights (RED) of 20 windows (W1 to W20) were glowing continuously.

Voltage Dips %	Cycle
0	1
40	10
70	25
80	250

Tested By
(Hemant Kumar Sahu)
(Scientist 'C')

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Approved By

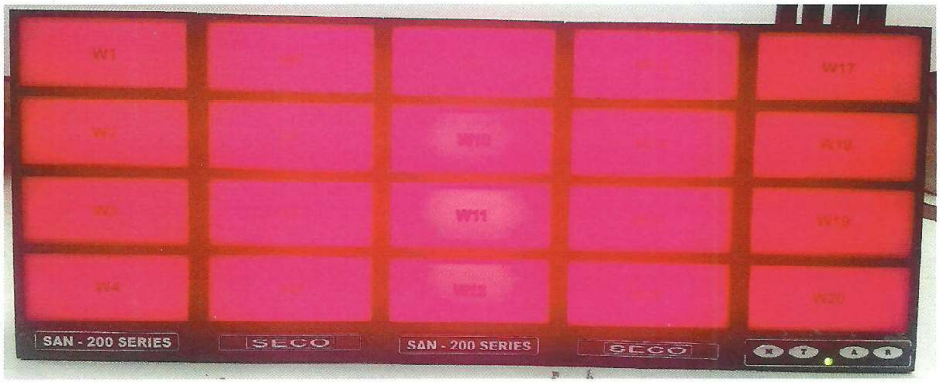
Dr. M.C. JOSHI
Scientist 'E'
Electronics Test & Development Centre
Ministry of Comm. & IT., STQC Directorate
Govt. of India, Bangalore - 560 058

Issued By

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

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Image of EUT

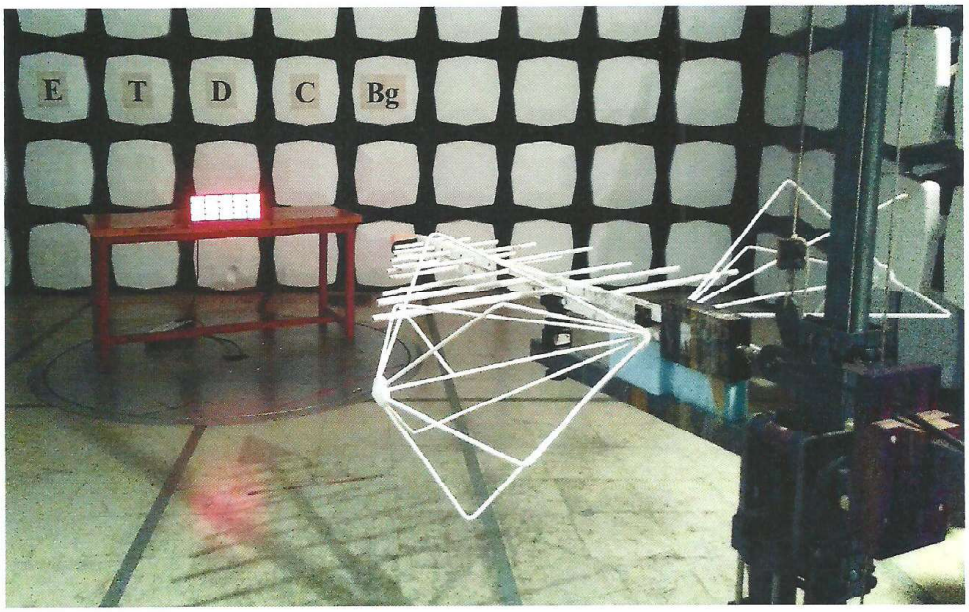


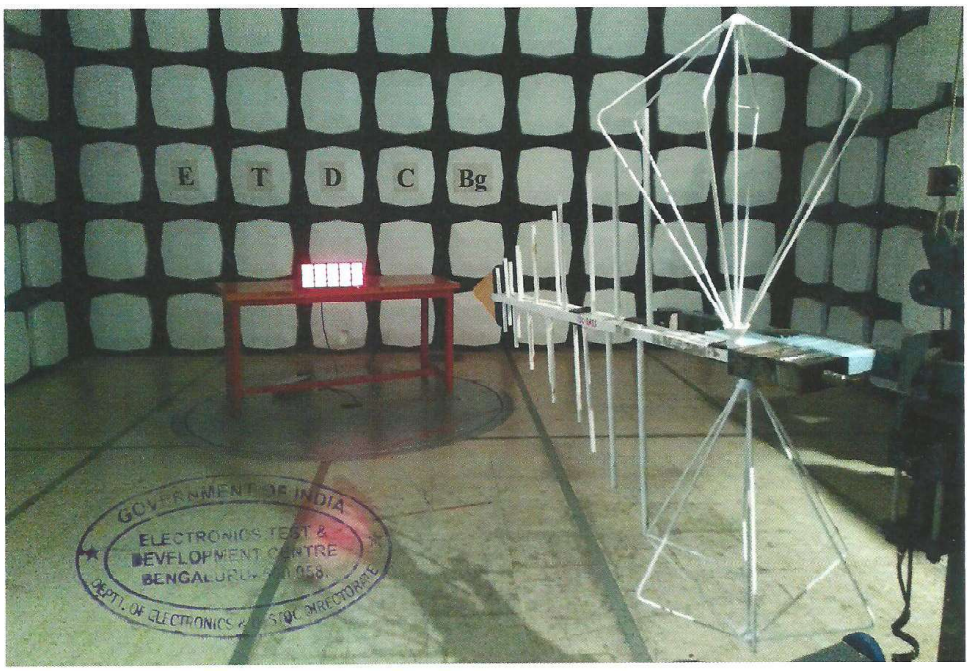
Marking Plate of EUT

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU
DEPTT. OF ELECTRONICS

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

EUT Test Setup for Electromagnetic radiation disturbance measurement@ 3mtr distance

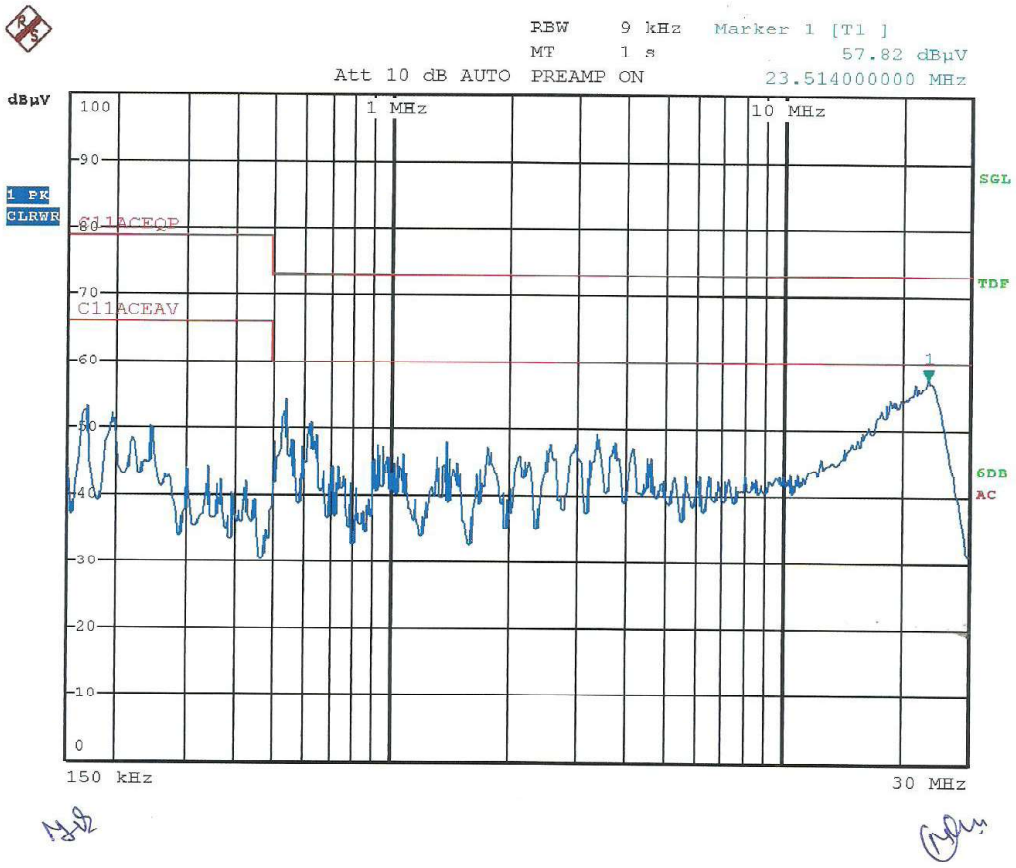




Report No.: TR/EMC/63712

Annexure 'C' (Continued…)

Mains terminal disturbance voltage **Peak** measurement



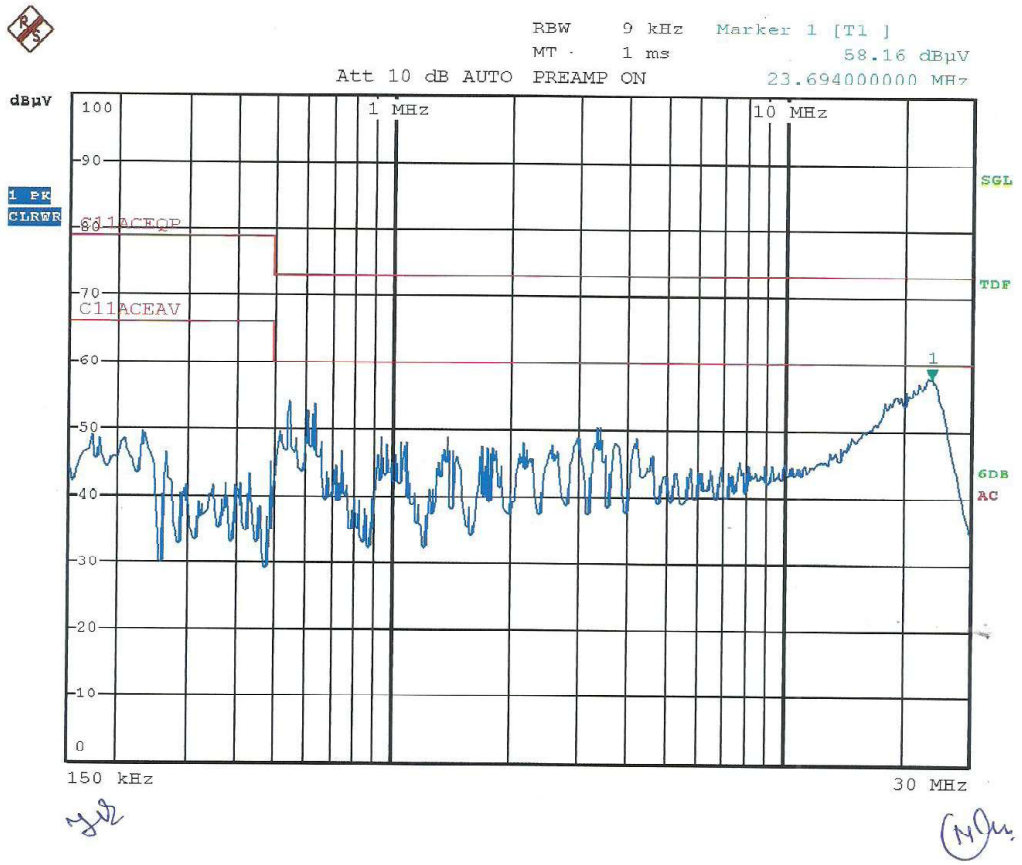
SRF:63712,CE TEST ON SAN200 SERIES,MODEL NO:SAN200/M520UT12,

SR.NO:16-02-2275 ON LINE

Date: 21.MAR.2016 14:51:45

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Mains terminal disturbance voltage **Peak** measurement



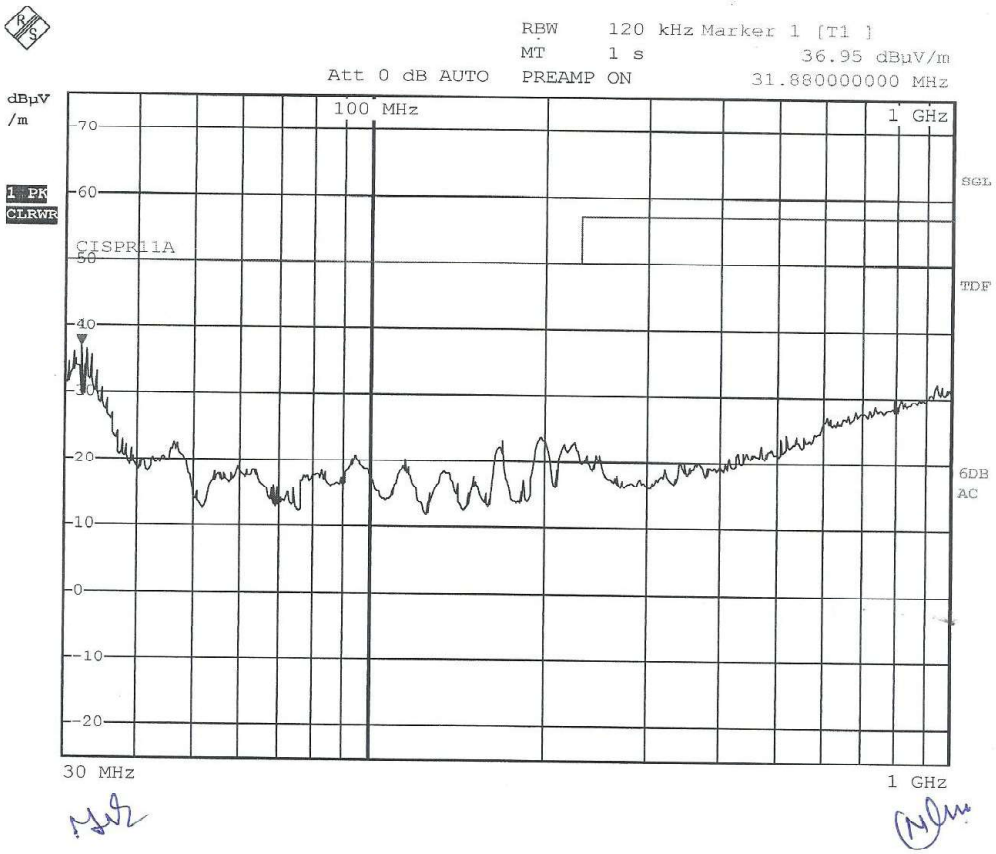
SRF:63712,CE TEST ON SAN200 SERIES,MODEL NO:SAN200/M520UT12,

SR.NO:16-02-2275 ON NEUTRAL

Date: 21.MAR.2016 14:54:03

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

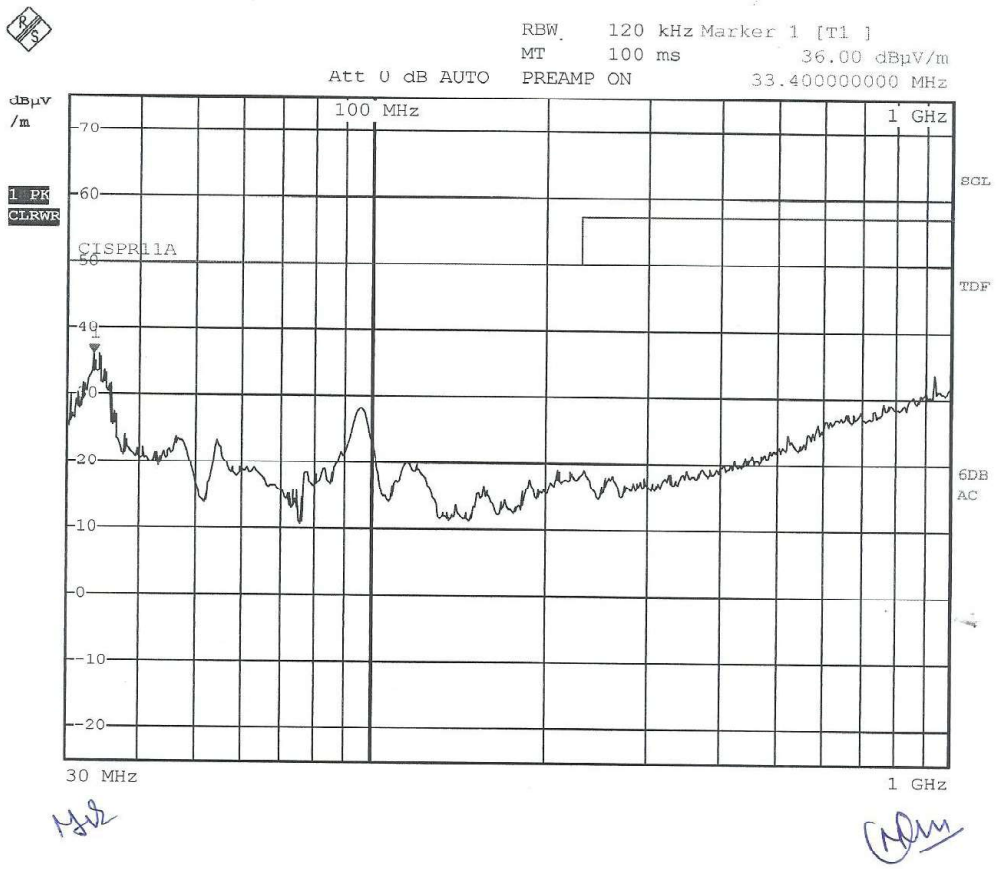
Graphs of Electromagnetic radiation disturbance Measurement@ 3mts distance



SRF No:63712, RE test on SAN 200 series, Model:SAN200/M520UT
12, Sl.No:16-02-2275, EUT:0 deg, Antenna:HP
Date: 21.MAR.2016 10:36:44

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU-560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

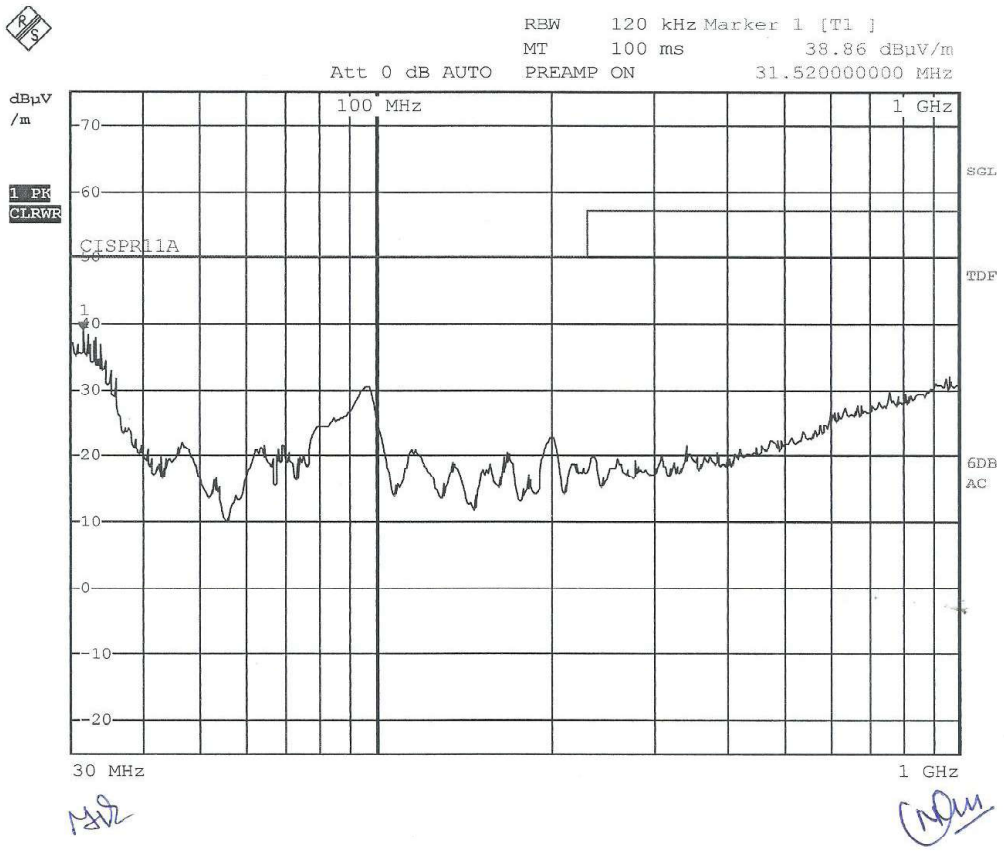
Graphs of Electromagnetic radiation disturbance measurement@ 3mtr distance



SRF No:63712, RE test on SAN 200 series, Model:SAN200/M520UT
12, Sl.No:16-02-2275, EUT:90 deg, Antenna:HP
Date: 21.MAR.2016 10:48:40

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, S&C DIRECTORATE

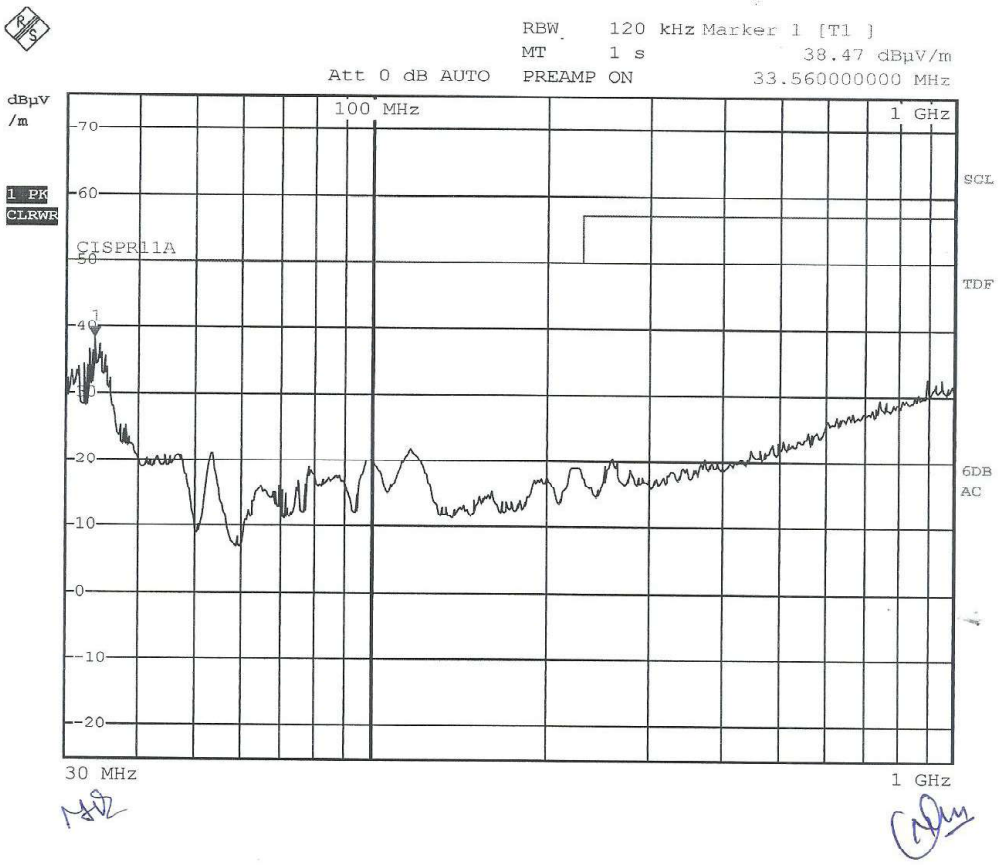
Graphs of Electromagnetic radiation disturbance measurement@ 3mtr distance



SRF No:63712, RE test on SAN 200 series, Model:SAN200/M520UT
12, Sl.No:16-02-2275, EUT:180 deg, Antenna:HP
Date: 21.MAR.2016 10:58:52

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Graphs of Electromagnetic radiation disturbance measurement@ 3mtr distance

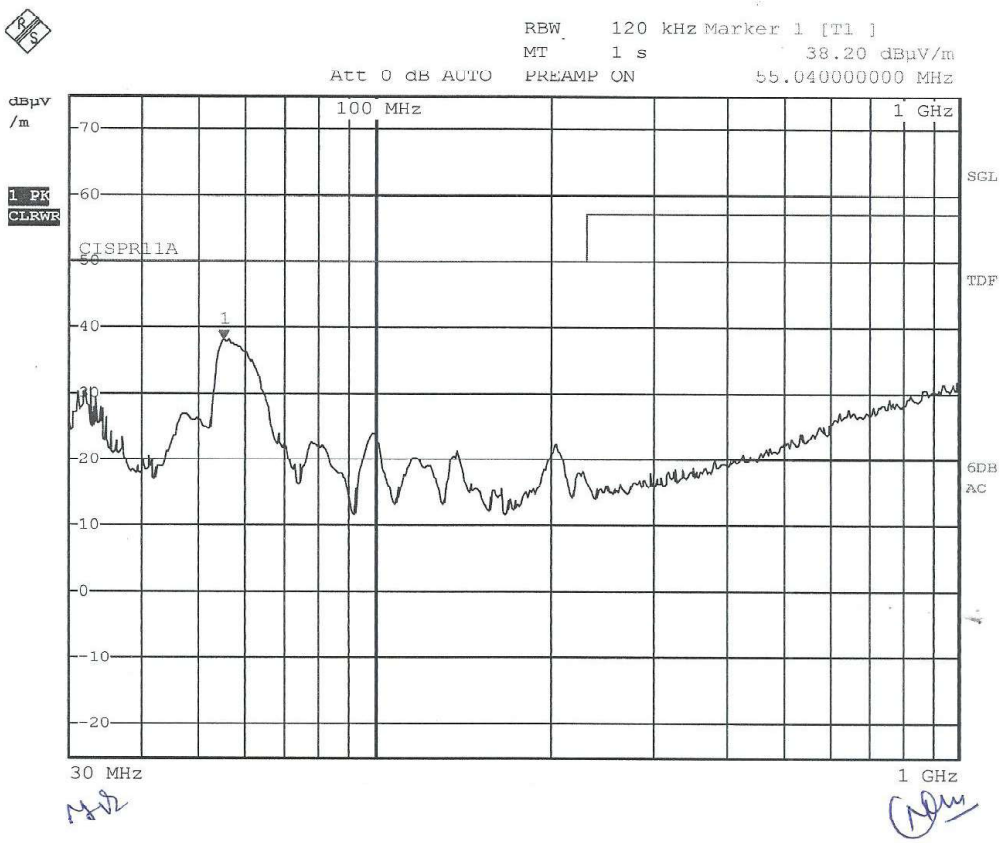


SRF No:63712, RE test on SAN 200 series, Model:SAN200/M520UT 12, Sl.No:16-02-2275, EUT:270 deg, Antenna:HP

Date: 21.MAR.2016 11:08:38

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

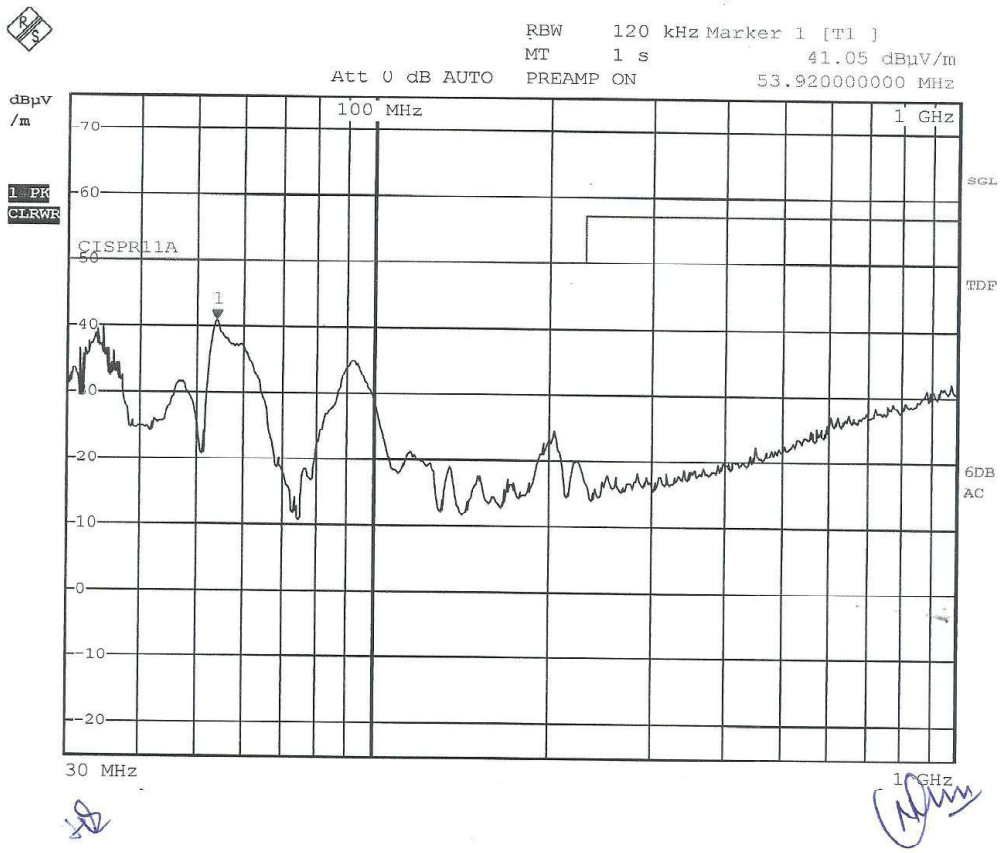
Graphs of Electromagnetic radiation disturbance measurement@ 3mtr distance



SRF No:63712, RE test on SAN 200 series, Model:SAN200/M520UT
12, Sl.No:16-02-2275, EUT:0 deg, Antenna:VP
Date: 21.MAR.2016 11:25:08

GOVERNMENT OF INDIA ELECTRONICS DEVELOPMENT CENTRE BENGALURU DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Graphs of Electromagnetic radiation disturbance measurement@ 3mtr distance

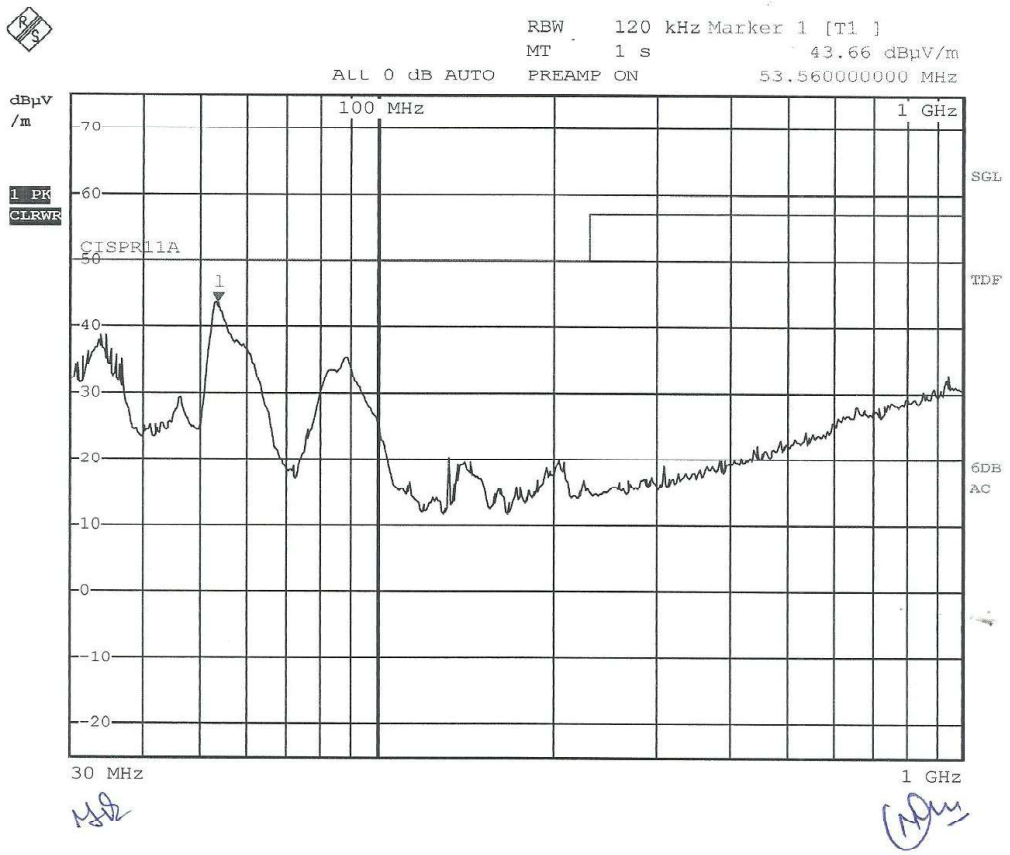


SRF No:63712, RE test on SAN 200 series, Model:SAN200/M520UT 12, Sl.No:16-02-2275, EUT:90 deg, Antenna:VP

Date: 21.MAR.2016 11:51:13

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU-560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

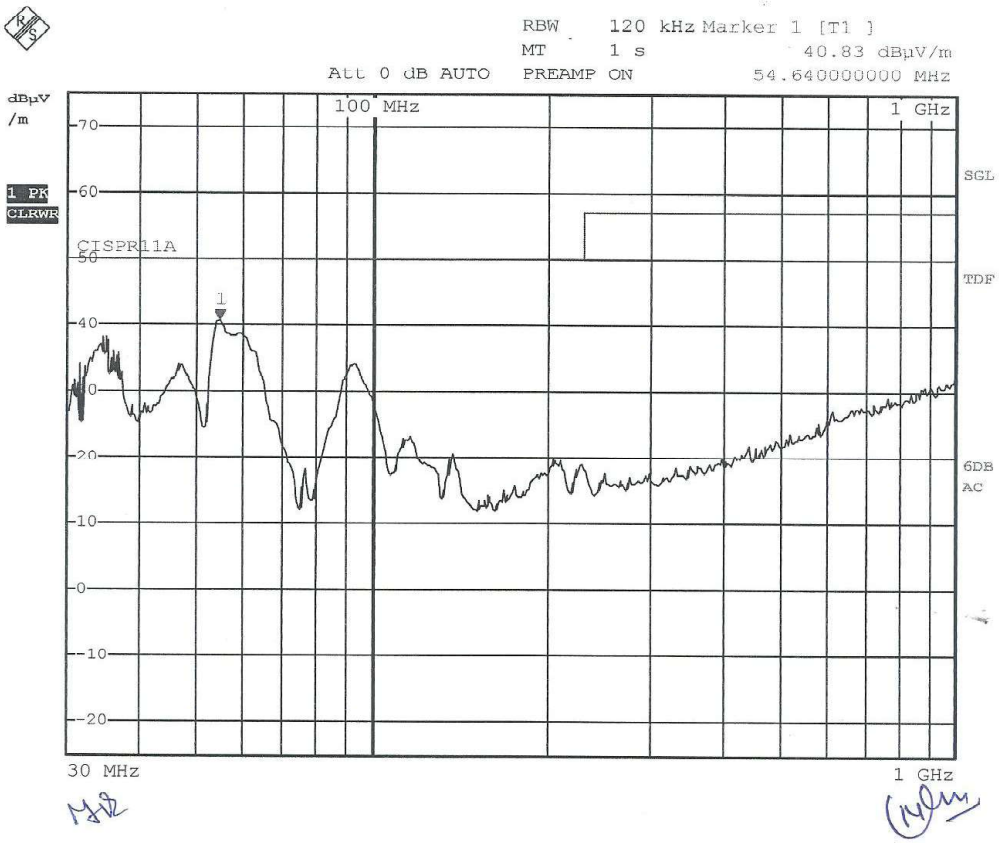
Graphs of Electromagnetic radiation disturbance measurement@ 3mtr distance



SRF No:63712, RE test on SAN 200 series, Model:SAN200/M520UT
12, Sl.No:16-02-2275, EUT:180 deg, Antenna:VP
Date: 21.MAR.2016 11:57:57

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU-560 058.
DEPTT. OF ELECTRONICS & INFORMATION TECHNOLOGY

Graphs of Electromagnetic radiation disturbance measurement@ 3mtr distance



SRF No:63712, RE test on SAN 200 series, Model:SAN200/M520UT
12, Sl.No:16-02-2275, EUT:270 deg, Antenna:VP
Date: 21.MAR.2016 12:03:00

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Form No.: FM/081-14

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Report No.: TR/EMC/63856 **TEST REPORT**

1. Scope

1.	Service request number	63856
2.	Test requested by (Name & Address of the Organization)	M/s. Sahyadri Electro Controls (I) Pvt. Ltd. #10, Vinay Complex, 1st Cross, Rajgopalnagar Main Road, Ganapatinagar, Peenya 3rd Phase, Bangalore-560058.
3.	Description of the equipment:	
	a) Nomenclature	SAN200 Series Microprocessor Based Annunciator
	b) Manufactured by	Sahyadri Electro Controls (I) Pvt. Ltd.
	c) Model / type no.	SAN200/M520UT12
	d) No. of samples submitted	01
	e) Serial no.	16-02-2275
4.	Date of submission of test samples	02-08-2016
5.	Condition of test samples on receipt	Good
6.	Test carried out at	In-house/~~On-site~~
7.	Date of start of tests	02-08-2016
8.	Date of completion of tests	02-08-2016
9.	Applicable test specification	As per customer requirement
10.	Test category	Performance Test
11.	Environment condition	Temp: 15 to 35 °C RH: 45 to 70%

2. Major equipment used

SN	Nomenclature	Make	Model	Cal. Due
1.	Voltage Surge Simulator (Impulse tester)	EM Test	VSS 500M	23-03-2017

Gupta

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 058. DEPTT. OF ELECTRONICS & INFO. TECH. DIRECTORATE

Date of Release: 16/05/2014

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

3. Results:
Test Parameter : Impulse
Test Specification : As per customer requirement
EUT Configuration : The EUT is a SAN200 Series Microprocessor Based Annunciator, tested in de-energized condition.

Wave shape / severity	Requirements	Test results
Front Time : 1.2 µSec Time to half value : 50 µSec Output impedance : 500 Ω Test Voltage : 5kV Polarity : +ve & -ve No. of pulses : 5 in each polarity Interval of pulses : 10 sec	Performance criterion - No flash over / Disruptive discharge/Puncture shall occur during the test.	- No flash over / Disruptive discharge/Puncture occurred during the test.
Point of application : Between all shorted terminals (Except earth terminal) & Body wrapped with metal foil.	-After the test, Background lights (RED) of 20 windows (W1 to W20) of EUT should glow continuously.	-After the test, Background lights (RED) of 20 windows (W1 to W20) of EUT were glowing continuously.

Remark: 1. The Image of EUT and its marking plate are shown in Annexure 'A'.
2. Test is witnessed by Mr. Manjunatha, Director, Sahyadri Electro Controls (I) Pvt. Ltd, Bangalore.

Tested By
(Neeraj Gupta)
(SA 'A')

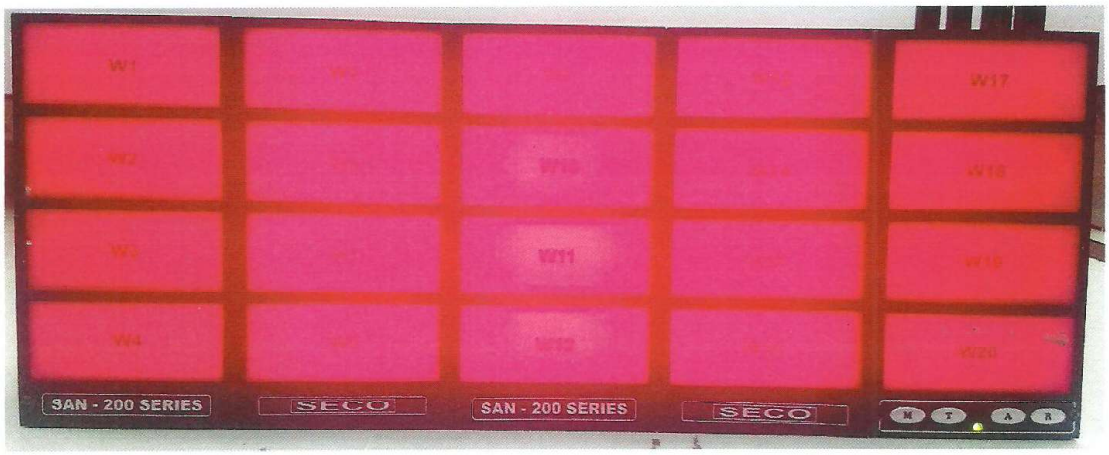
GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT STQC DIRECTORATE

Approved By
हेमन्त कुमार साहू / HEMANT KUMAR SAHU
वैज्ञानिक "सी" / Scientist "C"
इ.टी.डी.सी. -बेंगलोर / E.T.D.C.
भारत सरकार /Govt. of India
इले और सू. प्रौ. विभाग / Dept. of Ele. & IT
संचार एवम् सूचना प्रौद्योगिकी मंत्रालय / Ministry of Commn. & IT
बेंगलूर / Bengaluru - 560 058.

Issued By
CO-ORDINATOR
TESTING SERVICES
E.T.D.C., BENGALURU

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Phone: (080) 2839 4252/4647/4766/5992; Telefax: +91-080- 23722314)
E-mail: etdcbg@stqc.gov.in

Image of EUT



Marking Plate of EUT

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE
BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Form No.: FM/081-16

ELECTRONICS TEST AND DEVELOPMENT CENTRE
(STQC Directorate, Ministry of Communications & Information Technology)
100 ft Road, Peenya Industrial Estate, Bengaluru-560 058
(Tel: (080)2839 4252/4647/4766/5992, Telefax: +91-080 -23722314)
E-mail: etdcbg@stqc.gov.in

Report No.: TR/ETL/63856 **TEST REPORT**

1. SCOPE

1.	Service Request Number: 63856	Date: 01/08/2016	Job no.: ----
2.	Test Requested by (Name & Address of the Organization)	M/s. Sahyadri Electro Controls(India) Pvt. Ltd. No. 10, Vinay Complex, 1st cross, Rajagopal Nagar Main Road, Bangalore-58	
3.	Description/Unambiguous identification of item:		
	a) Nomenclature	SAN200 SERIES MICROPROCESSOR BASED ANNUNCIATOR-20 WINDOWS	
	b) Manufactured by	Sahyadri Electro Controls(India) Pvt. Ltd. (SECO)	
	c) Model No. / Type No.	SAN200/M520UT12	
	d) No. of items Submitted	01 No.	Sampling: Not Applicable
	e) Serial No.	16-02-2275	
4.	Date of submission of samples	01/08/2016	
5.	Condition of items on receipt	Good	
6.	Test Carried Out at	In-house	
7.	Date of start of tests	01/08/2016	
8.	Date of completion of test	04/08/2016	
9.	Date of issue of test report	05/08/2016	
10.	Applicable standard/test specification	IEC 60255-1:2009 & Customer specification	
11.	Test category	Performance Test	
12.	Laboratory Environmental Conditions	Temperature: 15-35°C, Relative humidity: 45-70% & as specified for environmental tests	

2. MAJOR EQUIPMENT USED:

Sl. No.	Nomenclature	Make	Model	Cal. Due
1	DMM	KUSAM-MECO	KM869/BM869	Mar 2017
2	DRY HEAT CHAMBER	SUPER	E-7224	May 2017
3	CLIMATIC TEST CHAMBER	ANGELANTONI	E-9491	Oct 2016
4	DATA COLLECTOR WITH SUB UNIT I/F	YOKOGAWA	DC100-22-21-1F DS600-00-1F	Apr 2017

- This report refers only to the item tested and shall not be reproduced except in full, without the written approval from Director, ETDC, Bengaluru
- Refer to information contained on the cover

GOVERNMENT OF INDIA ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU-560 058. DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

Date of Release: 15/06/2016

ELECTRONICS TEST AND DEVELOPMENT CENTRE, BANGALORE – 58
Test Report No.: TR/ETL/ 63856

3.0 Test Details & Test Results.

Test No.	Test parameter / Condition	Requirement	Measured Value / Observation / Remarks
01	**Dry heat test** as per IEC 60255-1:2009, Cl. 6.12.3.1 Temp.: 55±2°C Duration: 24 Hrs. Aux. supply: 230VAC Condition: Power ON	Shall be conditioned. Performance check after completion of the Dry heat test : All the windows shall glow, when the TEST push button pressed. Temperature rise test: The temperature at following points at the end of Dry Heat Test shall be measured. 1. Aux. supply terminals (P1 & P2) 2. Fault input terminal (F3). 3. At window front acrylic plate. 4. At terminals of output relay terminals (C1 & C2). 5. On top of the body.	Conditioned. Performance check carried out and found as per requirement. Temperature at specified points: 1. P1: 54.6°C , P2: 54.6°C 2. F3: 57.3°C 3. At window front acrylic Plate: 54.4°C 4. C1: 56.7°C , C2: 56.8°C 5. On top of the body: 57.8°C
02	**Cold Test** as per IEC 60255-1:2009, Cl. 6.12.3.2 Temp.: -40±2°C Duration: 2 Hrs. Aux. supply: 230V Condition: Power ON	Shall be conditioned. Performance check after completion of the Cold test (after recovery period of 1 hr.): All the windows shall glow, when the TEST push button pressed.	Conditioned. Performance check carried out and found as per requirement

Tested By..... Approved By.. 05.08.2016 Issued By:.....

GOVERNMENT OF INDIA
ELECTRONICS TEST & DEVELOPMENT CENTRE BENGALURU- 560 058.
DEPTT. OF ELECTRONICS & IT, STQC DIRECTORATE

K. Swarupa
Scientist 'E'
Electronics Test & Development Centre,
Government of India,
STQC Directorate,
Department of Electronics & Information Technology
100 Feet Road, Peenya Industrial Estate,
Bangalore - 560 058.

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

EMI/EMC TEST REPORT FOR SAN200 SERIES MICROPROCESSOR BASED ANNUNICIATOR MANUFACTURED BY M/s. SAHYADRI ELECTRO CONTROLS (I) PVT, LTD., BANGALORE.

Test Request Particulars

1.	Test Request From	:	M/s. Sahyadri Electro Controls(I)Pvt Ltd,Bangalore
2.	Equipment Under Test (EUT)	:	SAN200 Series Microprocessor based Annunciator.
3.	Number of Test Sample(s)	:	One
4.	Type of Tests Requested *(Applicable Standard)*	:	High Energy Surge Immunity Test as per IEC 61000-4-5,2014
5.	Manufacturer	:	M/s. Sahyadri Electro Controls(I)Pvt Ltd,Bangalore
6.	Model Number of EUT	:	SAN200/M520UT12
7.	Serial Number of EUT	:	16-02-2275
8.	Test plan concurred by *(Customer Representative)*	:	Mr. Bheemaraju. G,Testing Engineer. M/s. Sahyadri Electro Controls(I)Pvt Ltd,Bangalore
9.	EUT Arrived On	:	21 August, 2019
10.	Tested On	:	22 August, 2019
11.	Test Venue	:	SAMEER-CEM, Chennai
12.	Status of the EUT on Receipt	:	Functional

Certified that the data reported in this report are valid only for the test sample mentioned above at the time of and under the stated conditions of measurement. Particulars of Manufacturer / Supplier, given in this report, are based on the information given by the customer, along with test request and SAMEER-CEM does not assume any responsibility for the correctness of that information for the above mentioned equipment under test.

Test Plan & Reviewed by:

(P.Sudhakar)
Scientific-Officer SB

Approved by:

(K. George Thomas)
Head, EMCD

Office Seal

EMI/EMC TEST RESULTS AND SUMMARY FOR SAN200 SERIES MICROPROCESSOR BASED ANNUNICIATOR

EMC EMISSION TEST AND RESULTS

Name of the Test	Standard	Enclosure/ AC/DC/ Signal Port	Specifications	* Performance criteria met by EUT
High Energy Surge	IEC 61000-4-5	220V DC Power Port	1.2/50 µs , ±2 kV for Differential mode ±4 kV for Common mode	Criteria-A

*Note: * → Annexure-1 shows the Performance Criteria as per Applicable Standard.*

SAMEER CENTRE FOR ELECTROMAGNETICS * 7th CROSS ROAD, CIT CAMPUS, TARAMANI, CHENNAI-600 113 * SAMEER 22 AUG 2019 Ministry of Electronics & Information Technology Govt of India

SAMEER	Equipment Under Test (EUT)	:	SAN200 Series Microprocessor based Annunciator	Certificate No. T-0464
	Model Number of EUT	:	SAN200/M520UT12	
	Serial Number of EUT	:	16-02-2275	
	Manufactured by	:	M/s. Sahyadri Electro Controls(I)Pvt Ltd,Bangalore	

HIGH ENERGY SURGE IMMUNITY TEST

1. **Applicable Standard:** Test as per IEC 61000-4-5,2014
   Test level as per customer specifications

2. **Environmental Conditions:**

Ambient Temperature : 24°C
Relative Humidity : 53%
Atmospheric Pressure : 1005 mbar (abs)

3. **Test Instrumentation:**

Item Description	Make	Model Number	Serial Number
High Energy Surge Generator	EMC Partner	EXT-IMU4000 S	1719

4. **EUT Configuration:** Given in Annexure-2.

5. **Test Specifications:**

Pulse form : 1.2/50 µs (Open circuit voltage); 8.0/20 µs (Short circuit current)
Pulse amplitude : ± 2 kV for Differential mode, ±4 kV for Common mode
Impedance : 2Ω → Differential mode, 12Ω → Common mode
Polarity : Positive and Negative
Repetition : 60 seconds
Number of pulses : 10 (5 on each polarity)
Coupling mode : L→N (Differential mode); L→PE & N→PE (Common mode)

6. **Test Procedure:**

The 220V DC input power line of the EUT was subjected to High Energy Surge of amplitudes ±0.5 kV, ±1.0 kV & ±2.0 kV in differential mode and ±0.5 kV, ±1.0 kV, ±2.0 kV & ±4.0 kV in common mode by superimposing the surge using Coupling and Decoupling Network (CDN). During the test, EUT was monitored for malfunction if any. Monitoring parameters are given in Annexure-2.

7. **Test Observations:**

Level in kV	Differential Mode				Common Mode							
	L→N				L→PE				N→PE			
± 0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
± 1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
± 2.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
± 4.0	-NA-				✓	✓	✓	✓	✓	✓	✓	✓

Note: ✓ → *During the test, no malfunction was observed in the EUT.*
-NA- → Not Applicable

8. **Enclosed Documents:**

Annexure – 3 : Photograph of the EUT and High Energy Surge Immunity Test setup

Test Conducted by:

(N. Amirtha)
Project Assistant-A

SAMEER CENTRE FOR ELECTROMAGNETICS * 2nd CROSS ROAD, CIT CAMPUS, TARAMANI, CHENNAI-600 113 *
SAMEER
22 AUG 2019
Ministry of Electronics & Information Technology Govt. of India

Annexure - 1

Performance Criteria

Immunity:

Performance criteria	Description
A	Normal performance within limits specified by the manufacturer, requestor or purchaser.
B	Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention.
C	Temporary loss of function or degradation of performance, the correction of which requires operator intervention.
D	Loss of function or degradation of performance, which is not recoverable, owing to damage to hardware or software, or loss of data.

SAMEER CENTRE FOR ELECTROMAGNETICS * 2nd CROSS ROAD, CIT CAMPUS, TARAMANI, CHENNAI-600 113 *
SAMEER
22 AUG 2019
Ministry of Electronics & Information Technology Govt. of India

Annexure - 2
(Given by Customer)

EUT Description:

The EUT is SAN200 Series Microprocessor based Annunciator. It is having fault initiating contacts, Potential free contacts for alarm and 20 windows LED type window display.

EUT Configuration:

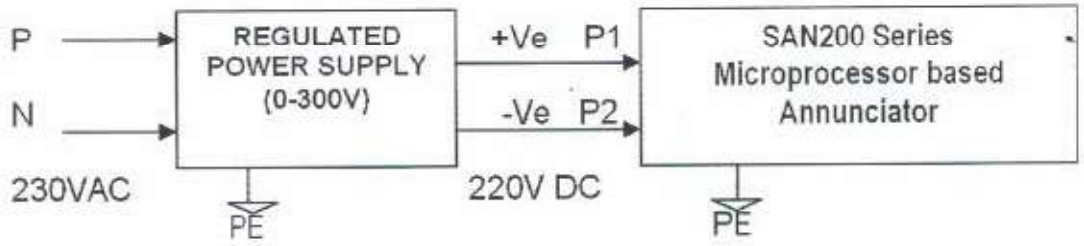
During the test, the EUT was powered by 220V DC.

Application:

It is used in control and relay panels for trip and alarm indications.

Monitoring Parameter:

- 20 windows LED (RED) should glow continuously.



Block Diagram of the EUT Configuration

Annexure – 3

Photograph of the EUT

Model and Serial Number of the EUT

SAMEER CENTRE FOR ELECTROMAGNETICS * CIT CAMPUS, TARAMANI, CHENNAI-600 113 * 2nd CROSS ROAD
22 AUG 2019
Ministry of Electronics & Information Technology Govt. of India

Annexure - 3

High Energy Surge Immunity Test Setup