TEST REPORT

Application No.:	SHCR2311002374EV
Applicant:	CSE Energy&Technology Co.,Ltd
Address of Applicant:	Building S4, No.777, Sizhuan Road, Shanghai, China
Manufacturer:	CSE Energy&Technology Co.,Ltd
Address of Manufacturer:	Building S4, No.777, Sizhuan Road, Shanghai, China
Equipment Under Test (EUT):	
EUT Name:	AC charging pile of electric vehicle
Model No.:	CSE-BCG-AS32-K01-3-CE, CSE-BCG-AS32-K01-1-CE
Remark:	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark:	CSE
Standard(s) :	EN 300 330 V2.1.1
Date of Receipt:	2023-10-09
Date of Test:	2023-10-17 to 2023-10-24
Date of Issue:	2023-11-21
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Co-license	2023-11-21	Base on SHCR231000209004

Authorized for issue by:				
Tested By		Bill Wu **Bill Wu/Project Engineer**		
Approved By		Parlam Zhan **Parlam Zhan / Reviewer**		

2 Test Summary

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Transmitter H-field requirements	EN 300 330 V2.1.1	EN 300 330 Clause 6.2.4	EN 300 330 Clause 4.3.4.1	Pass
Operating frequency ranges		EN 300 330 Clause 6.2.2	EN 300 330 Clause 4.3.2.1	Pass
Modulation bandwidth		EN 300 330 Clause 6.2.3	EN 300 330 Clause 4.3.3.1	Pass
Permitted range of operating frequencies		EN 300 330 Clause 6.2.2	EN 300 330 Clause 4.3.1.1	Pass
Transmitter radiated spurious domain emission limits below 30 MHz		EN 300 330 Clause 6.2.8	EN 300 330 Clause 4.3.8.1	Pass
Transmitter radiated spurious domain emission limits above 30 MHz		EN 300 330 Clause 6.2.9	EN 300 330 Clause 4.3.9.1	Pass
Receiver spurious emissions above 30 MHz		EN 300 330 Clause 6.3.1	EN 300 330 Clause 4.4.2.1	Pass
Receiver spurious emissions below 30 MHz		EN 300 330 Clause 6.3.1	EN 300 330 Clause 4.4.2.1	Pass

Note1: There are series models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model CSE-BCG-AS32-K01-3-CE was tested since their difference was the number of wireless modules varies.

Note2: This report was an additional report copied from the report SHCR231000209004, just changing the model name, company information and trade mark. Since the electrical circuit design, layout, components used and internal wiring for the model CSE-BCG-AS32-K01-3-CE in this report was exactly the same as the model CSG-BCG-AS32-K01-3-CE in the report SHCR231000209004.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power Supply:	AC 230V 50 32A
Test Voltage:	AC 230V 50Hz
Operation Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Type:	Loop Antenna

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
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The EUT has been tested as an independent unit.			

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty cycle	0.4%
4	Occupied Bandwidth	3%
5	RF conducted power	0.6dB
6	RF power density	2.9dB
7	Conducted Spurious emissions	0.75dB
8	RF Radiated power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious emission test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)
10	Temperature test	1°C
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab
588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China
Tel: +86 21 6191 5666 Fax: +86 21 6191 5678
No tests were sub-contracted.
Note:
1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc) is provided by the applicant. (if applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).
3. Sample source: sent by customer.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 6332.01)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

• FCC (Designation Number: CN1301)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

• ISED (CAB Identifier: CN0020)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.
Company Number: 8617A

• VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Conducted Test					
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2022-12-20	2023-12-19
Spectrum Analyzer	Keysight	N9020B	SHEM241-1	2022-12-20	2023-12-19
Spectrum Analyzer	Agilent	N9020A	SHEM181-1	2023-08-02	2024-08-01
Signal Generator	R&S	SMR20	SHEM006-1	2023-08-02	2024-08-01
Signal Generator	Agilent	N5182A	SHEM182-1	2023-08-02	2024-08-01
Communication Tester	R&S	CMW270	SHEM183-1	2023-06-01	2024-05-31
Communication Tester	R&S	CMW500	SHEM268-1	2023-06-01	2024-05-31
Power Sensor	Keysight	U2021XA * 4	SHEM184-1	2023-08-02	2024-08-01
Splitter	Anritsu	MA1612A	SHEM185-1	/	/
Coupler	e-meca	803-S-1	SHEM186-1	/	/
High-low Temp Cabinet	Suzhou Zhihe	TL-40	SHEM087-1	2022-11-08	2024-11-07
AC Power Stabilizer	APC	KDF-31020T-V0-F0	SHEM216-1	2022-12-20	2023-12-19
DC Power Supply	MCH	MCH-303A	SHEM210-1	2022-12-20	2023-12-19
Conducted test Cable	/	RF01~RF04	/	2022-12-20	2023-12-19
Switcher	Tonscend	JS0806	SHEM184-1	2023-08-02	2024-08-01
Test software	Tonscend	JS Tonscend BT/WIFI System	Version: 2.6	/	/
Coaxial Cable	TST		SHEM263-1	2023-08-02	2024-08-01
Test software	TST	TST PASS	Version: 2.0	/	/
RF Radiated Test					
EMI test Receiver	R&S	ESU40	SHEM051-1	2022-12-20	2023-12-19
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2022-12-20	2023-12-19
Communication Tester	R&S	CMW500	SHEM268-1	2023-06-01	2024-05-31
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2022-12-20	2023-12-19
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2022-09-11	2024-09-10
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM202-1	2022-05-07	2024-05-06
Horn Antenna (1-18GHz)	Schwarzbeck	HF906	SHEM009-1	2022-08-11	2024-08-10
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2022-09-18	2024-09-17
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2022-09-18	2024-09-17
Pre-Amplifier	HP	8447D	SHEM236-1	2023-08-02	2024-08-01
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2022-12-20	2023-12-19
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	/	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	/	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	/	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2021-05-25	2024-05-24
RE test Cable	/	RE01, RE02, RE06	/	2023-01-07	2024-01-06
Test software	ESE	E3	Version: 6.111221a	/	/

6 Radio Spectrum Matter Test Results

6.1 Transmitter H-field requirements

Test Requirement EN 300 330 Clause 4.3.4.1

Test Method: EN 300 330 Clause 6.2.4

Limit:

Table 2: H-field limits at 10 m

Frequency range (MHz)	H-field strength limit (Hf) dBuA/m at 10 m or specified in mW e.r.p.
0,009 ≤ f < 0,090	72 descending 3 dB/oct above 0,03 MHz or according to note 1 (see note 5)
0,09 ≤ f < 0,119	42
0,119 ≤ f < 0,135	66 descending 3 dB/oct above 0,119 MHz or according to note 1 (see notes 3 and 5)
0,135 ≤ f < 0,140	42
0,140 ≤ f < 0,1485	37,7
0,1485 ≤ f < 30	-5 (see note 4)
0,315 ≤ f < 0,600	-5
3,155 ≤ f < 3,400	13,5
4,234	9 (see note 9)
4,516	7
7,400 ≤ f < 8,800	9
10,2 ≤ f < 11,00	9
12,5 ≤ f ≤ 20	-7
6,765 ≤ f ≤ 6,795	42 (see notes 3 and 7)
26,957 ≤ f ≤ 27,283	42 (see note 3)
13,410 ≤ f ≤ 13,553, 13,567 ≤ f ≤ 13,710	9 (see note 6)
13,110 ≤ f ≤ 13,410, 13,710 ≤ f ≤ 14,010	-3,5 (see note 6)
12,660 ≤ f ≤ 13,110, 14,010 ≤ f ≤ 14,460	-10 (see note 6)
11,810 ≤ f ≤ 12,660, 14,460 ≤ f ≤ 15,310	-16 (see note 6)
13,460 ≤ f ≤ 13,553, 13,567 ≤ f ≤ 13,660	27 (see note 6)
13,360 ≤ f ≤ 13,460, 13,660 ≤ f ≤ 13,760	Linear transition from 27 to -3,5 (see note 6)
13,110 ≤ f ≤ 13,360, 13,760 ≤ f ≤ 14,010	-3,5 (see note 6)
12,660 ≤ f ≤ 13,110, 14,010 ≤ f ≤ 14,460	-5 (see note 6)
13,553 ≤ f ≤ 13,567	42 (see note 3) or 60 (see notes 2 and 3)
27,095	42
26,995, 27,045, 27,095, 27,145, 27,195 (see note 8)	100 mW
NOTE 1:	For the frequency ranges 9 kHz to 135 kHz, the following additional restrictions apply to limits above 42dBµA/m: - for loop coil antennas with an area ≥ 0,16 m2 this table and table B.1 with the antenna limitations apply; - for loop coil antennas with an area between 0,05 m2 and 0,16 m2 table B.1 applies with a correction factor. The limit is: table value + 10 × log (area/0,16 m2); - for loop coil antennas with an area 0,05 m2 the limit is 10 dB below table B.1.
NOTE 2:	For RFID (incl. NFC) and EAS applications only.
NOTE 3:	Spectrum mask limit, see annex I.
NOTE 4:	For further information see annex G.
NOTE 5:	Limit is 42 dBµA/m for the following spot frequencies: 60 kHz ± 250 Hz, 66,6 kHz ± 750 Hz, 75 kHz ± 250 Hz, 77,5 kHz ± 250 Hz, and 129,1 kHz ± 500

	Hz.
NOTE 6:	Only in conjunction with spectrum mask, see annex I.
NOTE 7:	The frequency range 6,765 MHz - 6,795 MHz is not a harmonised ISM frequency band according article 5.138 of the ITU Radio Regulations [i.13].
NOTE 8:	Center frequencies for channelized systems by using 10 kHz bandwidth.
NOTE 9:	The limit is valid in the range 984 kHz - 7 484 kHz for Transmitting only on receipt of a Balise/Eurobalise tele-powering signal from a train.

6.1.1 E.U.T. Operation

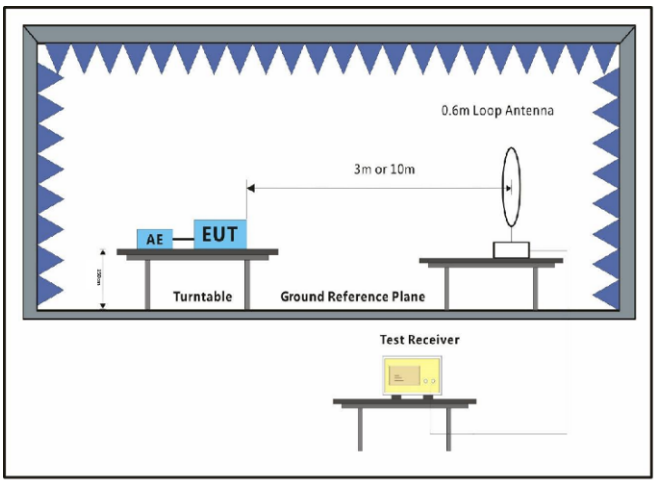
Operating Environment:

Temperature: 26.5 °C Humidity: 54.8 % RH Atmospheric Pressure: 1010 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	06	TX mode_Keep the EUT in transmitting mode

6.1.3 Test Setup Diagram



6.1.4 Measurement Procedure and Data

a. All radiated emission measurements in terms of magnetic field strength shall be performed with a shielded loop antenna.

b. For all radiated emission measurements in terms of magnetic field strength, the loop antenna were placed such that:

i. its centre shall be at 1.3 m height above the ground plane;

ii. the projection of its centre onto the ground plane shall be at the specified measurement distance from the projection on the ground plane of the closest point on the boundary of the equipment under test (EUT); and

iii. measurements shall be performed with the loop antenna placed vertically, in turn, in two polarizations (the measurement axis specified below is the line segment connecting the projections on the ground plane of the centre of the loop antenna and the centre of the EUT arrangement):

· coaxial (loop plane perpendicular to the ground plane and to the measurement axis); and

· coplanar (loop plane perpendicular to the ground plane and coplanar with the measurement axis).

Please Refer to Appendix for Details

6.2 Operating frequency ranges

Test Requirement EN 300 330 Clause 4.3.2.1

Test Method: EN 300 330 Clause 6.2.2

Limit:

Table 1: Short Range Devices within the 9 kHz to 30 MHz permitted frequency bands

	Frequency Bands/frequencies	Applications
Transmit and Receive	9 kHz to 90 kHz	Inductive devices
Transmit and Receive	90 kHz to 119 kHz	Inductive devices
Transmit and Receive	119 kHz to 140 kHz	Inductive devices
Transmit and Receive	140 kHz to 148,5 kHz	Inductive devices
Transmit and Receive	148,5 kHz to 5 MHz	Inductive devices
Transmit and Receive	400 kHz to 600 kHz	RFID only
Transmit and Receive	5 MHz to 30 MHz	Inductive devices
Transmit and Receive	3 155 kHz to 3 400 kHz	Inductive devices
Transmit and Receive	984 kHz to 7 484 kHz (Note 3, Centre frequency is 4 234 kHz)	Inductive devices, Railway applications
Transmit and Receive	4 516 kHz	Inductive devices, Railway applications
Transmit and Receive	6 765 kHz to 6 795 kHz	Inductive devices, Generic use
Transmit and Receive	7 400 kHz to 8 800 kHz	Inductive devices, Generic use
Transmit and Receive	10 200 kHz to 11,000 MHz	Inductive devices, Generic use
Transmit and Receive	11,810 MHz to 15,310 MHz (Centre frequency is 13,56 MHz)	RFID only
Transmit and Receive	12,5 MHz to 20 MHz	Inductive devices, Wireless healthcare
Transmit and Receive	13,553 MHz to 13,567 MHz	Inductive devices, Generic use
Transmit and Receive	26,957 MHz to 27,283 MHz	Inductive devices, Generic use
Transmit and Receive	27,090 MHz to 27,100 MHz	Inductive devices, Railway applications

NOTE 1: In addition, it should be noted that other frequency bands may be available in a country within the frequency range 9 kHz to 30 MHz.

NOTE 2: On non-harmonised parameters, national administrations may impose certain conditions such as the type of modulation, frequency, channel/frequency separations, maximum transmitter radiated power, duty cycle, and the inclusion of an automatic transmitter shut-off facility, as a condition for the issue of an Individual Rights for use of spectrum or General Authorization, or as a condition for use under "licence exemption" as it is in most cases for Short Range Devices.

NOTE 3: Transmitting only on receipt of a Balise/Eurobalise tele-powering signal from a train.

6.2.1 E.U.T. Operation

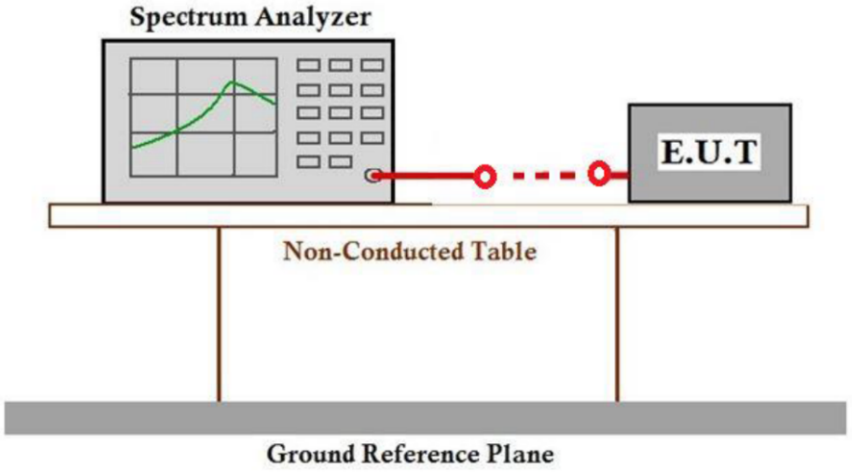
Operating Environment:

Temperature: 26.5 °C Humidity: 54.6 % RH Atmospheric Pressure: 1010 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	06	TX mode_Keep the EUT in transmitting mode

6.2.3 Test Setup Diagram



6.2.4 Measurement Procedure and Data

Please Refer to Appendix for Details

6.3 Modulation bandwidth

Test Requirement EN 300 330 Clause 4.3.3.1

Test Method: EN 300 330 Clause 6.2.3

Limit:

The modulation bandwidth shall be within the assigned frequency band see table 1 or ±7,5 % of the carrier frequency whichever is the smallest. For RFID and EAS Systems, the modulation bandwidth shall be within the transmitter emission boundary of figures I.1, I.2, I.3 and I.4.

6.3.1 E.U.T. Operation

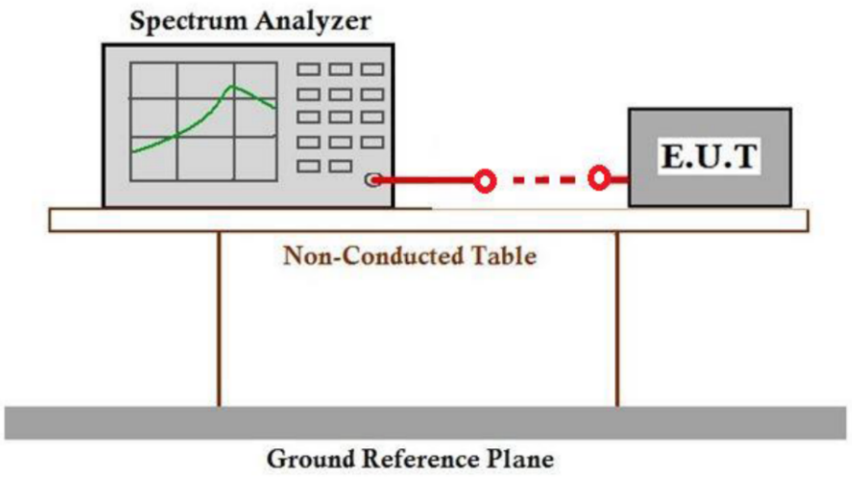
Operating Environment:

Temperature: 26.5 °C Humidity: 54.5 % RH Atmospheric Pressure: 1010 mbar

6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	06	TX mode_Keep the EUT in transmitting mode

6.3.3 Test Setup Diagram



6.3.4 Measurement Procedure and Data

The level of carrier frequency below the limit of spurious, so the test no contect.

6.4 Permitted range of operating frequencies

Test Requirement EN 300 330 Clause 4.3.1.1

Test Method: EN 300 330 Clause 6.2.2

Limit:

Table 1: Short Range Devices within the 9 kHz to 30 MHz permitted frequency bands

	Frequency Bands/frequencies	Applications
Transmit and Receive	9 kHz to 90 kHz	Inductive devices
Transmit and Receive	90 kHz to 119 kHz	Inductive devices
Transmit and Receive	119 kHz to 140 kHz	Inductive devices
Transmit and Receive	140 kHz to 148,5 kHz	Inductive devices
Transmit and Receive	148,5 kHz to 5 MHz	Inductive devices
Transmit and Receive	400 kHz to 600 kHz	RFID only
Transmit and Receive	5 MHz to 30 MHz	Inductive devices
Transmit and Receive	3 155 kHz to 3 400 kHz	Inductive devices
Transmit and Receive	984 kHz to 7 484 kHz (Note 3, Centre frequency is 4 234 kHz)	Inductive devices, Railway applications
Transmit and Receive	4 516 kHz	Inductive devices, Railway applications
Transmit and Receive	6 765 kHz to 6 795 kHz	Inductive devices, Generic use
Transmit and Receive	7 400 kHz to 8 800 kHz	Inductive devices, Generic use
Transmit and Receive	10 200 kHz to 11,000 MHz	Inductive devices, Generic use
Transmit and Receive	11,810 MHz to 15,310 MHz (Centre frequency is 13,56 MHz)	RFID only
Transmit and Receive	12,5 MHz to 20 MHz	Inductive devices, Wireless healthcare
Transmit and Receive	13,553 MHz to 13,567 MHz	Inductive devices, Generic use
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Transmit and Receive	27,090 MHz to 27,100 MHz	Inductive devices, Railway applications

NOTE 1: In addition, it should be noted that other frequency bands may be available in a country within the frequency range 9 kHz to 30 MHz.

NOTE 2: On non-harmonised parameters, national administrations may impose certain conditions such as the type of modulation, frequency, channel/frequency separations, maximum transmitter radiated power, duty cycle, and the inclusion of an automatic transmitter shut-off facility, as a condition for the issue of an Individual Rights for use of spectrum or General Authorization, or as a condition for use under "licence exemption" as it is in most cases for Short Range Devices.

NOTE 3: Transmitting only on receipt of a Balise/Eurobalise tele-powering signal from a train.

6.4.1 E.U.T. Operation

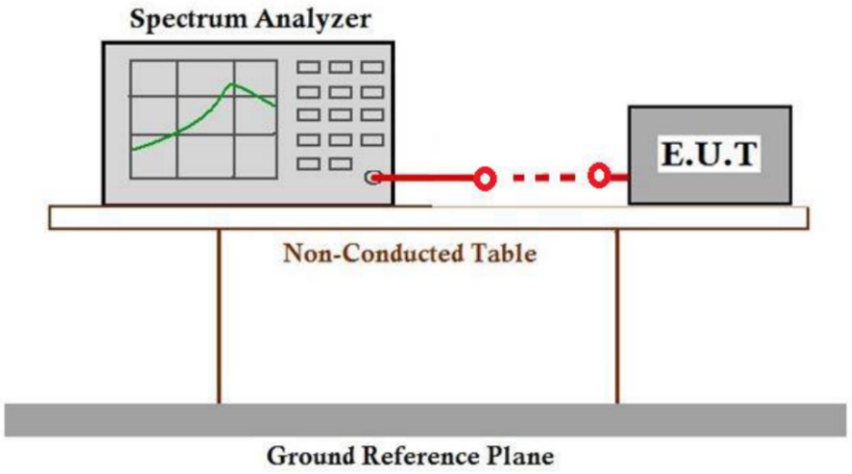
Operating Environment:

Temperature: 26.5 °C Humidity: 54.5 % RH Atmospheric Pressure: 1010 mbar

6.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	06	TX mode_Keep the EUT in transmitting mode

6.4.3 Test Setup Diagram



6.4.4 Measurement Procedure and Data

Please refer to the test result of clause 6.2

Not applicable, Fundamental signal is below the limit of radiated spurious emission. Please refer to ETSI EN 300 330 V2.1.1 Clause 6.2.3

6.5 Transmitter radiated spurious domain emission limits below 30 MHz

Test Requirement EN 300 330 Clause 4.3.8.1

Test Method: EN 300 330 Clause 6.2.8

Limit:

The radiated field strength of the spurious domain emissions below 30 MHz shall not exceed the generated H-field dBµA/m at 10 m given in table 5.

Table 5

State	Frequency 9 kHz≤f < 10 MHz	Frequency 10 MHz ≤f < 30 MHz
Operating	27 dBµA/m at 9 kHz descending 3 dB/oct	-3,5 dBµA/m
Standby	5,5 dBµA/m at 9 kHz descending 3 dB/oct	-25 dBµA/m

6.5.1 E.U.T. Operation

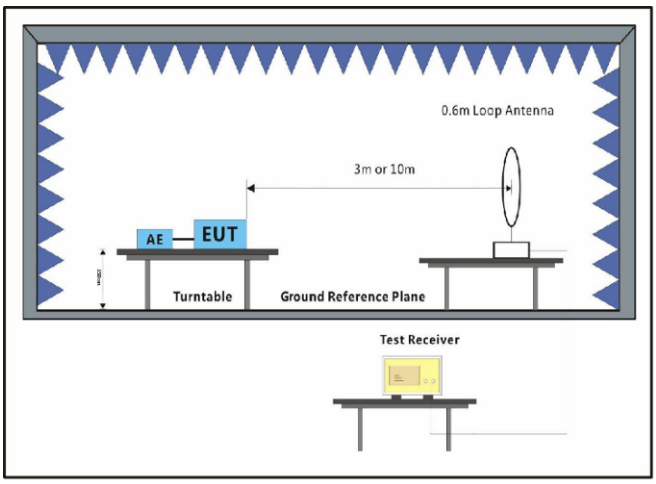
Operating Environment:

Temperature: 26.6 °C Humidity: 54.5 % RH Atmospheric Pressure: 1010 mbar

6.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	06	TX mode_Keep the EUT in transmitting mode

6.5.3 Test Setup Diagram



6.5.4 Measurement Procedure and Data

a. All radiated emission measurements in terms of magnetic field strength shall be performed with a shielded loop antenna.

b. For all radiated emission measurements in terms of magnetic field strength, the loop antenna were placed such that:

i. its centre shall be at 1.3 m height above the ground plane;

ii. the projection of its centre onto the ground plane shall be at the specified measurement distance from the projection on the ground plane of the closest point on the boundary of the equipment under test (EUT); and

iii. measurements shall be performed with the loop antenna placed vertically, in turn, in two polarizations (the measurement axis specified below is the line segment connecting the projections on the ground plane of the centre of the loop antenna and the centre of the EUT arrangement):

· coaxial (loop plane perpendicular to the ground plane and to the measurement axis); and

· coplanar (loop plane perpendicular to the ground plane and coplanar with the measurement axis).

Please Refer to Appendix for Details

6.6 Transmitter radiated spurious domain emission limits above 30 MHz

Test Requirement EN 300 330 Clause 4.3.9.1

Test Method: EN 300 330 Clause 6.2.9

Limit:

The power of any radiated emission shall not exceed the values given in table 6.

Table 6

State	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 790 MHz	Other frequencies between 30 MHz to 1 000 MHz
Operating	4nW	250nW
Standby	2nW	2nW

6.6.1 E.U.T. Operation

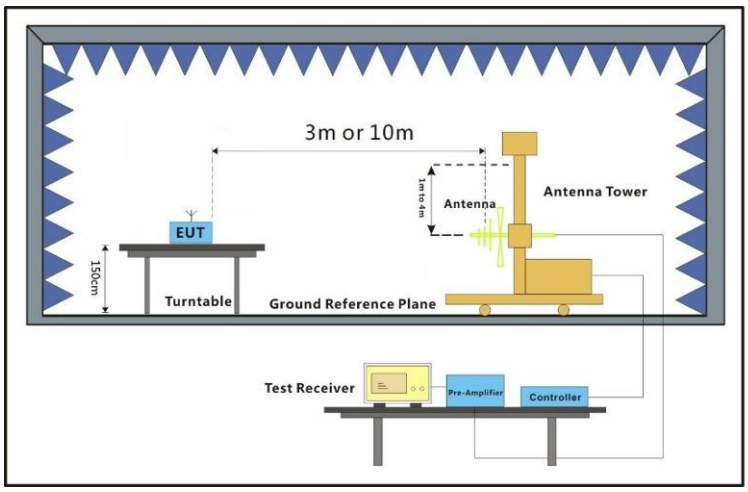
Operating Environment:

Temperature: 26.6 °C Humidity: 54.5 % RH Atmospheric Pressure: 1010 mbar

6.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	06	TX mode_Keep the EUT in transmitting mode

6.6.3 Test Setup Diagram



6.6.4 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground for below 1GHz at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Please Refer to Appendix for Details

6.7 Receiver spurious emissions above 30 MHz

Test Requirement EN 300 330 Clause 4.4.2.1

Test Method: EN 300 330 Clause 6.3.1

6.7.1 E.U.T. Operation

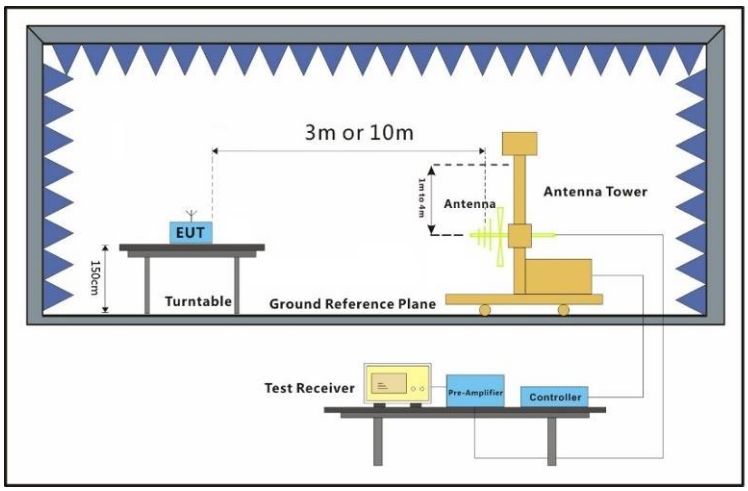
Operating Environment:

Temperature: 26.6 °C Humidity: 54.5 % RH Atmospheric Pressure: 1010 mbar

6.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	07	RX mode_Keep the EUT in receiving mode

6.7.3 Test Setup Diagram



6.7.4 Measurement Procedure and Data

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground for below 1GHz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Please Refer to Appendix for Details

6.8 Receiver spurious emissions below 30 MHz

Test Requirement EN 300 330 Clause 4.4.2.1

Test Method: EN 300 330 Clause 6.3.1

6.8.1 E.U.T. Operation

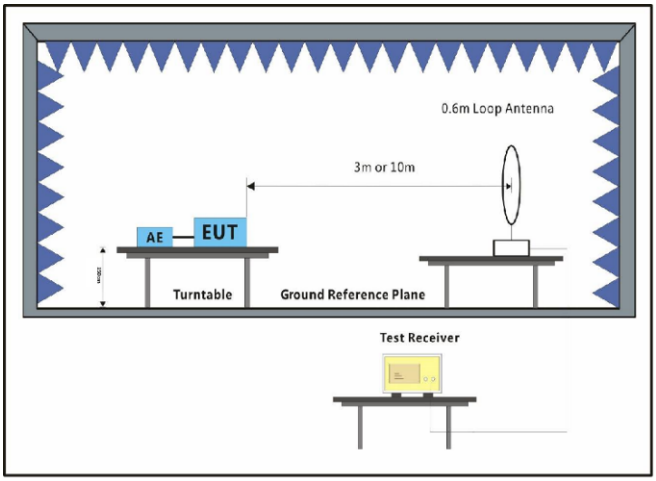
Operating Environment:

Temperature: 26.6 °C Humidity: 54.5 % RH Atmospheric Pressure: 1010 mbar

6.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	07	RX mode_Keep the EUT in receiving mode

6.8.3 Test Setup Diagram



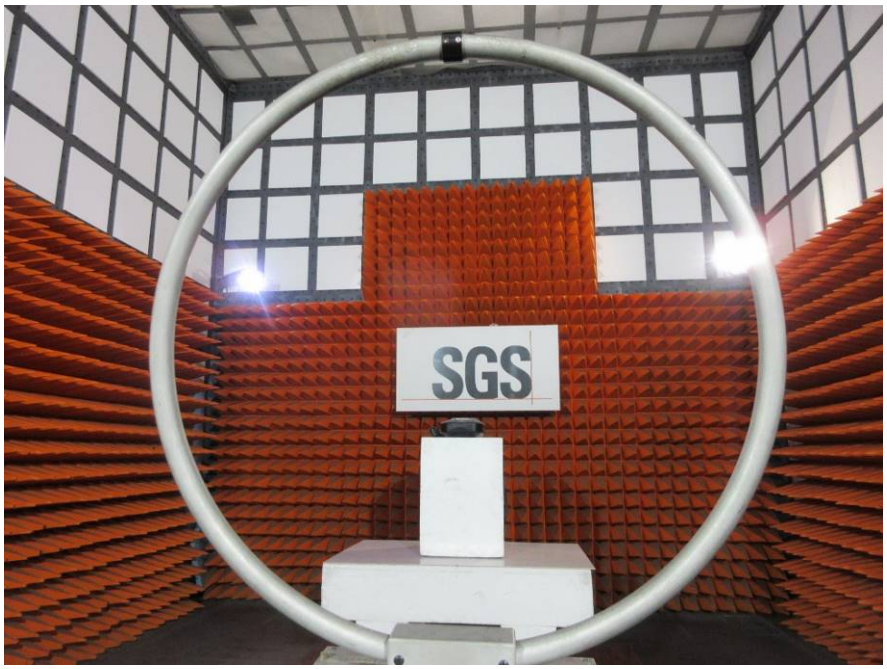
6.8.4 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

Please Refer to Appendix for Details

7 Test Setup Photo

Radiated Spurious Emissions below 30 MHz



Radiated Spurious Emissions above 30 MHz

The EUT Details of Zoom

8 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for SHCR2311002374EV

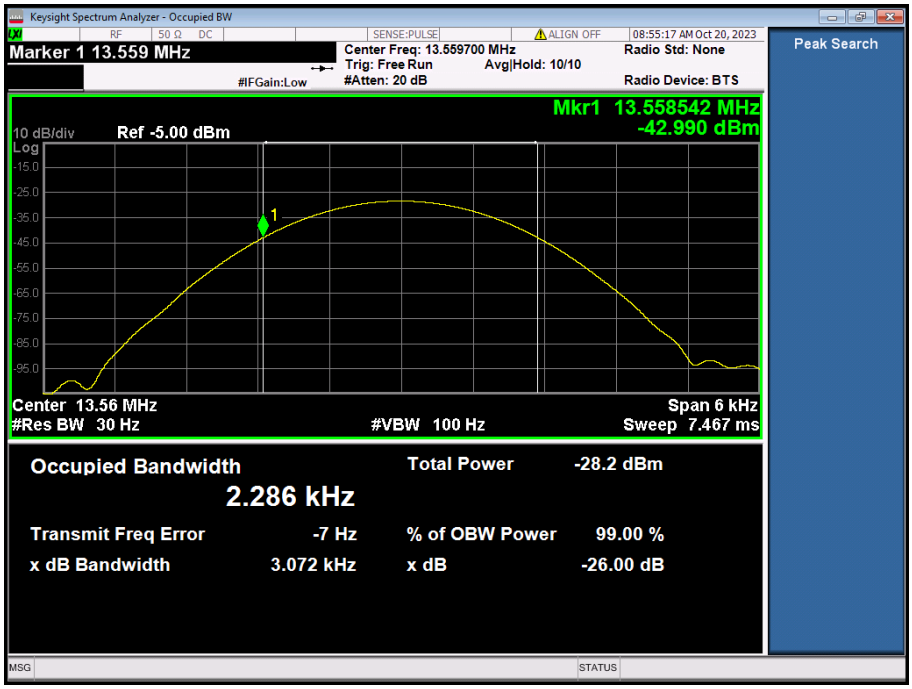
9 Appendix

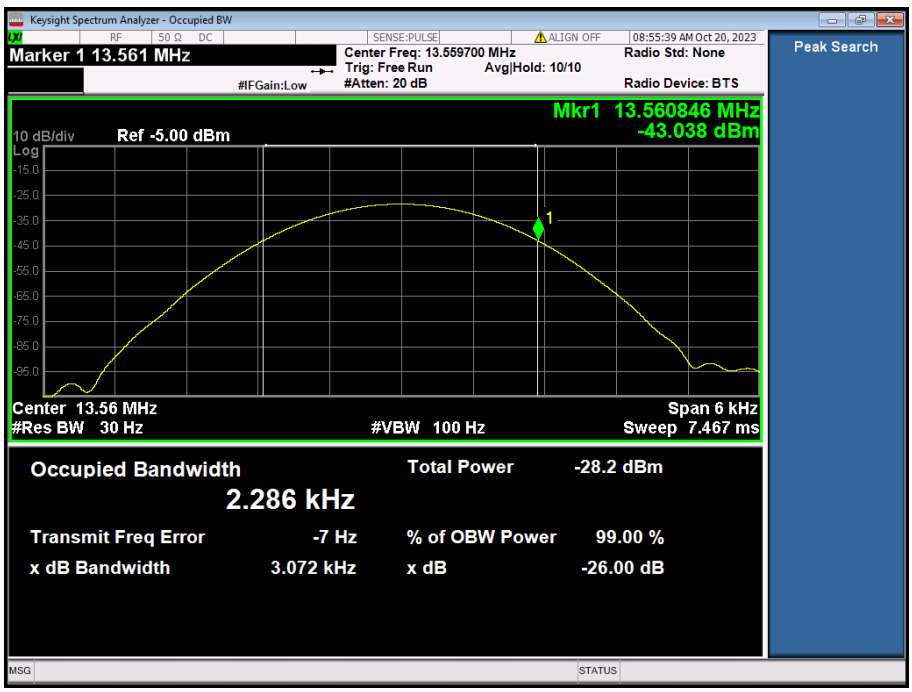
1. **Transmitter H-field requirements**

Test Conditions		Frequency (MHz)	H-field value (dBuA/m)	Limit (dBuA/m)	Result
Temp (℃)	Volt (V DC)				
Normal (25)	$V_{norm:}$ 24	13.56	2.02	83	Pass
-20	$V_{min:}$ 26.4	13.56	2.01	83	Pass
-20	$V_{max:}$ 21.6	13.56	2.02	83	Pass
55	$V_{min:}$ 26.4	13.56	2.03	83	Pass
55	$V_{max:}$ 21.6	13.56	2.03	83	Pass

2. Operating frequency ranges

Test Conditions		Frequency	Frequency (MHz)	Limit (MHz)	Result
Temp (℃)	Volt (V DC)				
Normal (25)	V_{norm}: 24	Minimum output frequency	13.559	≥11.81	Pass
		Maximum output frequency	13.561	≤15.31	Pass
Remark: EUT operation frequency is 13.56MHz					





3. Transmitter radiated spurious domain emission limits below 30 MHz

Frequency (MHz)	Read Level (dBuA)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuA/m)	Limit (dBuA/m)	Over Limit (dB)	Polarity
0.010	23.78	-31.40	0.20	-7.42	57.87	-65.29	Coaxial
0.014	18.62	-31.40	0.20	-12.58	56.43	-69.01	Coaxial
0.035	18.14	-31.46	0.20	-13.12	52.50	-65.62	Coaxial
0.077	14.76	-31.60	0.20	-16.64	49.12	-65.76	Coaxial
0.151	21.98	-31.40	0.20	-9.22	46.22	-55.44	Coaxial
1.644	14.43	-31.20	0.20	-16.57	35.59	-52.16	Coaxial
0.015	28.91	-31.40	0.20	-2.29	56.08	-58.37	Coplanar
0.039	30.75	-31.49	0.20	-0.54	52.08	-52.62	Coplanar
0.163	24.54	-31.40	0.20	-6.66	45.95	-52.61	Coplanar
0.314	21.84	-31.39	0.20	-9.35	42.75	-52.10	Coplanar
1.644	23.77	-31.20	0.20	-7.23	35.59	-42.82	Coplanar
8.602	18.93	-31.37	0.20	-12.24	23.60	-35.84	Coplanar

4. Transmitter radiated spurious domain emission limits above 30 MHz

Frequency	Spurious Emission Polarization and Level		Limit	Margin
MHz	polarization	dBm	dBm	dBm
57.999	Vertical	-74.40	-54.00	-20.40
61.132	Vertical	-75.20	-54.00	-21.20
176.269	Vertical	-73.09	-54.00	-19.09
462.346	Vertical	-62.43	-36.00	-26.43
530.101	Vertical	-62.62	-54.00	-8.62
763.376	Vertical	-62.61	-54.00	-8.61
59.441	Horizontal	-79.24	-54.00	-25.24
176.888	Horizontal	-75.66	-54.00	-21.66
475.499	Horizontal	-65.45	-54.00	-11.45
502.940	Horizontal	-65.19	-54.00	-11.19
706.700	Horizontal	-65.61	-54.00	-11.61
771.449	Horizontal	-62.35	-54.00	-8.35

EUT operating Standby mode:

Since the spurious emission of the EUT is too weak to be detected, so no data has been record

5. Receiver spurious emissions

Below 30MHz:

Frequency (MHz)	Read Level (dBuA)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuA/m)	Limit (dBuA/m)	Over Limit (dB)	Polarity
0.010	32.64	-31.40	0.20	1.44	36.41	-34.97	Coaxial
0.014	29.75	-31.40	0.20	-1.45	34.90	-36.35	Coaxial
0.035	24.61	-31.46	0.20	-6.65	31.00	-37.65	Coaxial
1.618	20.22	-31.20	0.20	-10.78	14.18	-24.96	Coaxial
2.997	16.09	-31.20	0.20	-14.91	10.71	-25.62	Coaxial
18.291	14.15	-31.42	0.33	-16.94	-6.68	-10.26	Coaxial
0.015	39.14	-31.40	0.20	7.94	34.76	-26.82	Coplanar
0.039	37.41	-31.49	0.20	6.12	30.58	-24.46	Coplanar
0.078	19.84	-31.60	0.20	-11.56	27.59	-39.15	Coplanar
1.528	23.55	-31.20	0.20	-7.45	14.50	-21.95	Coplanar
3.303	13.16	-31.23	0.20	-17.87	10.03	-27.90	Coplanar
12.291	4.12	-31.45	0.33	-27.00	-0.38	-26.62	Coplanar

30MHz -1GHz:

Frequency	Spurious Emission polarization and Level		Limit	Margin
MHz	polarization	dBm	dBm	dBm
59.859	Vertical	-84.77	-57.00	-27.77
69.357	Vertical	-86.20	-57.00	-29.20
169.005	Vertical	-83.77	-57.00	-26.77
397.633	Vertical	-80.54	-57.00	-23.54
582.742	Vertical	-75.02	-57.00	-18.02
955.438	Vertical	-70.23	-57.00	-13.23
58.203	Horizontal	-83.56	-57.00	-26.56
145.861	Horizontal	-84.04	-57.00	-27.04
260.144	Horizontal	-83.97	-57.00	-26.97
411.824	Horizontal	-80.29	-57.00	-23.29
633.907	Horizontal	-74.10	-57.00	-17.10
929.008	Horizontal	-70.84	-57.00	-13.84

- End of the Report -