


# TEST REPORT



1. Report No : DST-23E-1553
2. Date of incoming : 2023.09.13
3. Applicant
  - Name : VARWIN
  - Address : 40, Saengan-ro, Wonsam-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea
4. Manufacturer : VARWIN
5. Equipment
  - Product Name : Electric mat
  - Model Name : VS200J
  - Add Model Name : N/A
6. Purpose of a report : PSE Marking
7. Test Method Used : CISPR 14-1:2020 (J55014-1(H27))
8. Date of Test : 2023.10.04 – 2023.10.05
9. Test Result : Refer to the attached Test Result

Affirmation	Tested by :	Reviewed by:
	Name : KIM, Yerin 	Name : KIM, Changyoul 

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose.

This test report shall not be reproduced except in full, without the written approval of DSTech Co., Ltd.

**2023.11.16****DSTech Co., Ltd.**

※ This test report is not related to KS Q ISO/IEC 17025 and KOLAS Scheme & procedure





Test Report Revision History

Revisions	Issue Report No.	Issued Date	Description	Approved by
0	DST-23E-1553	2023.11.16	Initial Release	C.Y. Kim



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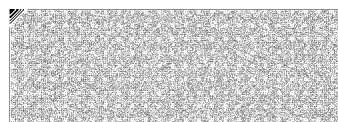
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## 1. Test Laboratory

This report contains the result of tests performed by:

Company Name	DSTech Co., Ltd.
Address	25, 2565beon-gil, Jungbu-daero, Yangji-myun, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea.
TEL	+82-31-336-1798
FAX	+82-31-336-3451



## 2. General Information of EUT

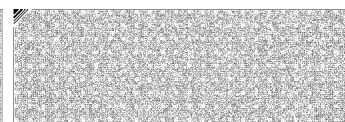
### 2.1 Basic description of EUT

Kind of Equipment	Electric mat
Model No	VS200J
Add Model	-
Serial No	-
Type of Sample Tested	Pre-Production
Rating Power Supply	100 V, (50 – 60) Hz
Max Internal Frequency	Below 108 MHz
Applicant	<b>VARWIN</b> 40, Saengan-ro, Wonsam-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea
Manufacturer	<b>VARWIN</b> 40, Saengan-ro, Wonsam-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea

### 2.2 Alternative type(s)/model(s); also covered by this test report.

- The following lists consist of the added model and their differences.

Model Name	Differences	Tested
-	-	<input type="checkbox"/>



### 3. Test Summary

#### 3.1 Applied standards and test results

Test Items	Applied Standards	Results
<b>Emission</b>		
Mains terminal continuous disturbance voltage	CISPR 14-1:2020(J55014-1(H27))	<b>C</b>
Radiated Disturbance	CISPR 14-1:2020(J55014-1(H27))	<b>C</b>
Disturbance Power	CISPR 14-1:2020(J55014-1(H27))	<b>N/A (Note 1)</b>
Discontinuous Disturbance	CISPR 14-1:2020(J55014-1(H27))	<b>C</b>
C=Comply    N/C=Not Comply    N/T=Not Tested    N/A=Not Applicable		

**The data in this test report are traceable to the national or international standards.**

Note 1) This test does not required because satisfied the Radiated Disturbance test.

Category I: apparatus containing no electronic control circuitry.

Category II: transformer toys, dual supply toys, mains powered motor operated appliances, tools, heating appliances and similar electric apparatus containing electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz.

Category III: battery powered apparatus, which in normal use is not connected to the mains, containing an electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz.

Category IV: all other apparatus covered by the scope of this standard.





## 4. Test Conditions

### 4.1 EUT and supporting equipment used during test

#### Type of Peripheral Equipment Used:

Description	Model Name	Serial No.	Manufacturer
Electric mat	VS200J	-	VARWIN
Electric mat (controller)	VS200J	-	VARWIN

### 4.2 EUT Operation Modes

No.	Mode	Description
1	Normal	Maintain the highest temperature. (Both 50 Hz and 60 Hz tested)

### 4.3 Description of EUT modification

- N/A

### 4.4 Variations covered by this report

- N/A

### 4.5 Additional information related to Testing

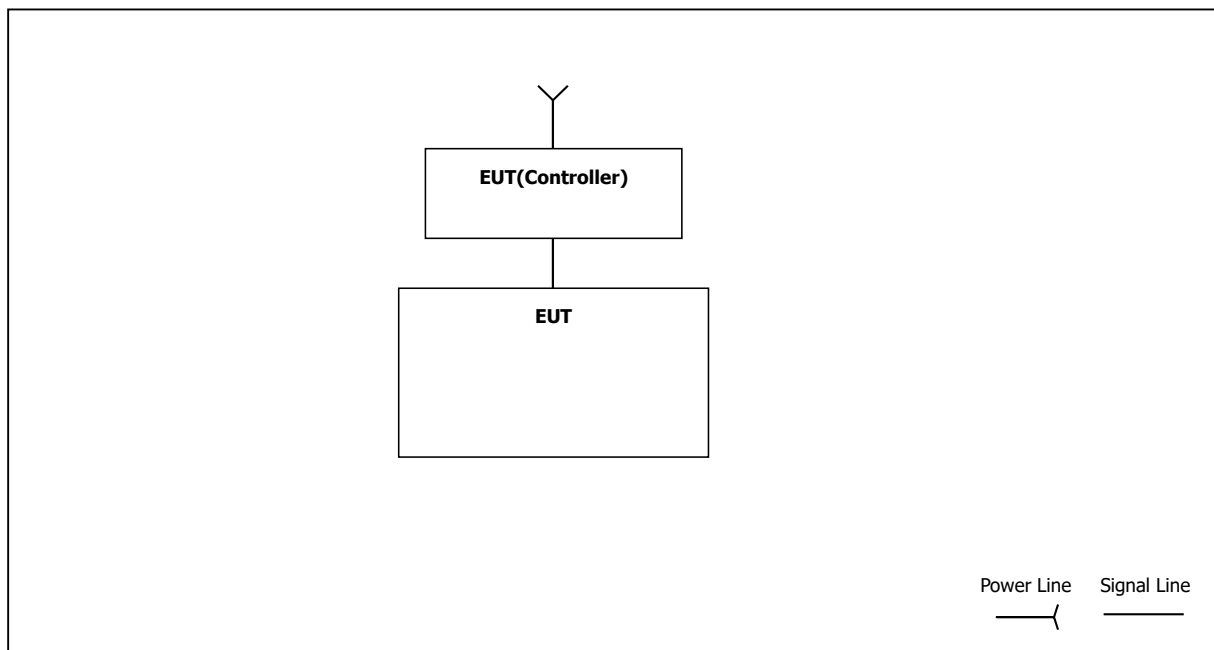
Test results apply only to the particular sample tested and functionality described in this test report. This report may be reproduced in full. Partial reproduction may only be made with the written permission of the DSTech Co., Ltd.



**Type of Cables Used:**

Device from		Device to		Length (m)	Type of shield
Name of Device	I/O port	Name of Device	I/O port		
EUT	Signal Input	EUT(Controller)	Signal Output	1.8	NS
EUT(Controller)	AC Input	AC Mains	AC Mains	1.5	NS

\* NS = Unshield / S = Shield

**4.6 Test System layout on EUT and peripherals**



## 5. Test Results : Emission

### 5.1 Mains terminal continuous disturbance voltage Test

#### 5.1.1 Test Condition

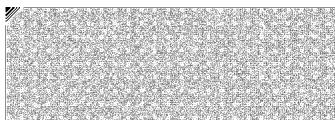
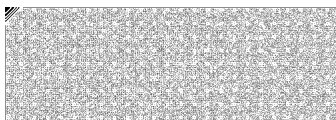
Test Method : CISPR 14-1:2020(J55014-1(H27))  
 Test Date : 2023.10.04  
 Temperature/Humidity : 25 °C / 45 % R.H.  
 Operation mode : Mode 1

#### 5.1.2 Test Limits

Frequency Range (MHz)	Limit [dB( $\mu$ V)]	
	Quasi-Peak	Average-Peak
0.15 - 0.50	66 – 56	59 - 46
0.50 - 5	56	46
5 - 30	60	50

#### 5.1.3 Test Equipment List

Equipment Type	Model	Serial No	Manufacture	Cal Due Date	Use
EMI Test Receiver	ESCI 3	100049	ROHDE & SCHWARZ	2024.06.19	<input checked="" type="checkbox"/>
Pulse Limiter(10 dB)	ESH3-Z2	102029	Rohde & Schwarz	2024.06.20	<input checked="" type="checkbox"/>
Two-Line V-network	ESH3-Z5	100193	ROHDE & SCHWARZ	2024.06.19	<input checked="" type="checkbox"/>



## 5.1.4 Test Result of Main Conducted Emission

Test Results: **PASS**

Test data sheets follow.

[100 V 50 Hz]

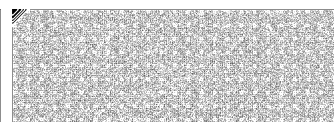
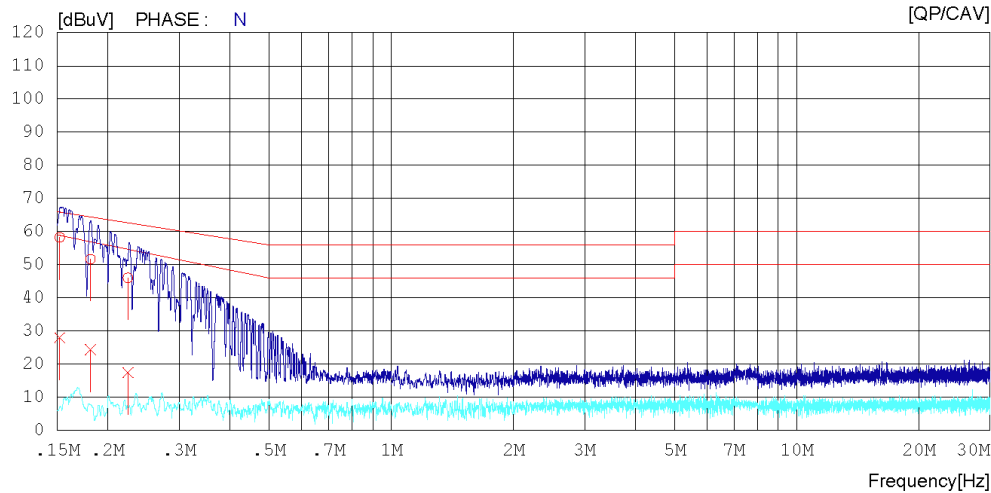
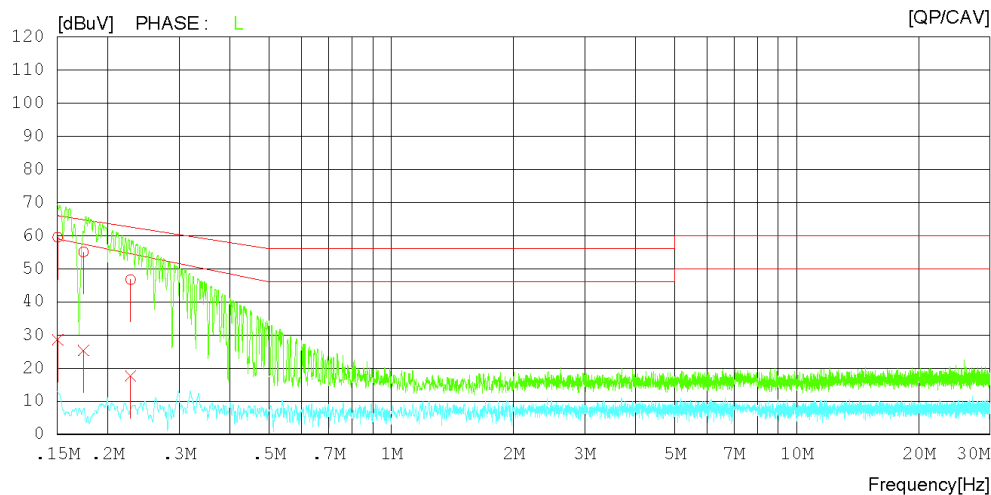
### Results of Conducted Emission

DSTech  
Date : 2023-10-04

Order No. : DST-23E-1553  
Test Condition : 100 V 50 Hz  
Test Mode : Normal  
:

Test engineer : Y.R.KIM  
:  
:

LIMIT : Household\_QP\_Mains port  
Household\_CAV\_Mains port





Results of Conducted Emission

DSTech  
Date : 2023-10-04

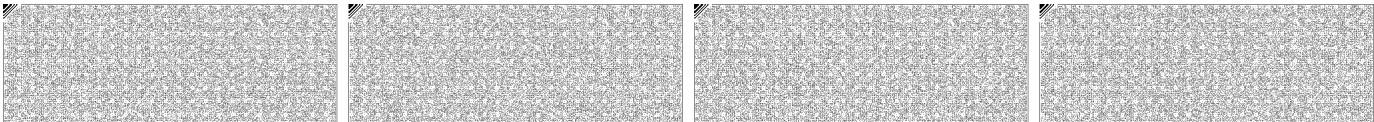
Order No. : DST-23E-1553                      Test engineer : Y.R.KIM  
Test Condition : 100 V 50 Hz  
Test Mode : Normal  
:

LIMIT : Household\_QP\_Mains port  
Household\_CAV\_Mains port

NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	CAV [dBuV]		QP [dBuV]	CAV [dBuV]	QP [dBuV]	CAV [dBuV]	QP [dBuV]	CAV [dBuV]	
1	0.15023	49.27	18.36	10.16	59.43	28.52	65.99	58.98	6.56	30.46	L
2	0.17409	44.85	15.12	10.15	55.00	25.27	64.76	57.39	9.76	32.12	L
3	0.22755	36.48	7.47	10.15	46.63	17.62	62.54	54.50	15.91	36.88	L
4	0.15209	48.10	17.78	10.13	58.23	27.91	65.89	58.85	7.66	30.94	N
5	0.18119	41.56	14.21	10.13	51.69	24.34	64.43	56.96	12.74	32.62	N
6	0.22383	35.90	7.32	10.13	46.03	17.45	62.68	54.68	16.65	37.23	N

Description of Calculation

C.FACTOR(dB) :	LISN Factor(dB) + Cable loss(dB) + Pulse Limiter Loss(dB)
Result(dBμV) :	Reading Value(dBμV) + C.FACTOR(dB)
Margin(dBμV) :	Limit(dBμV) - Result(dBμV)



[100 V 60 Hz]

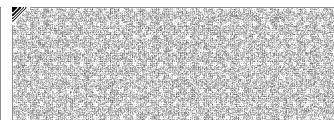
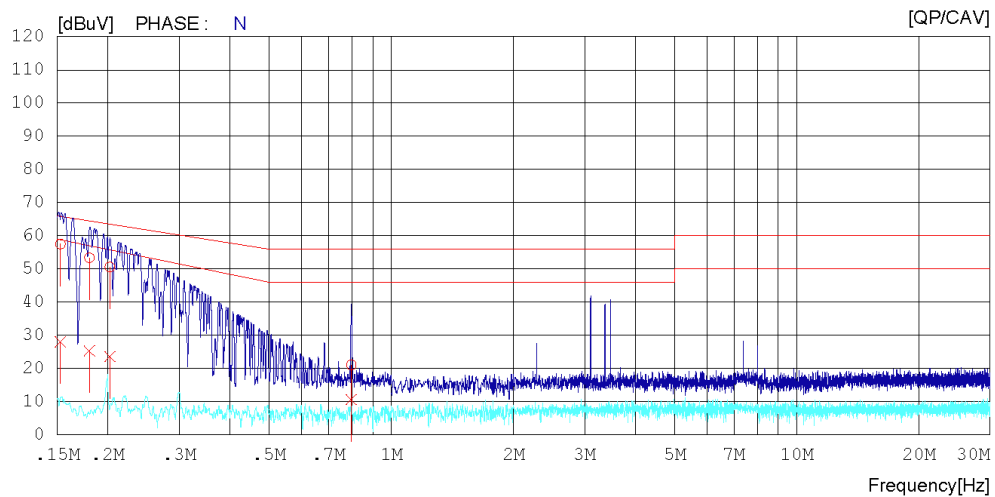
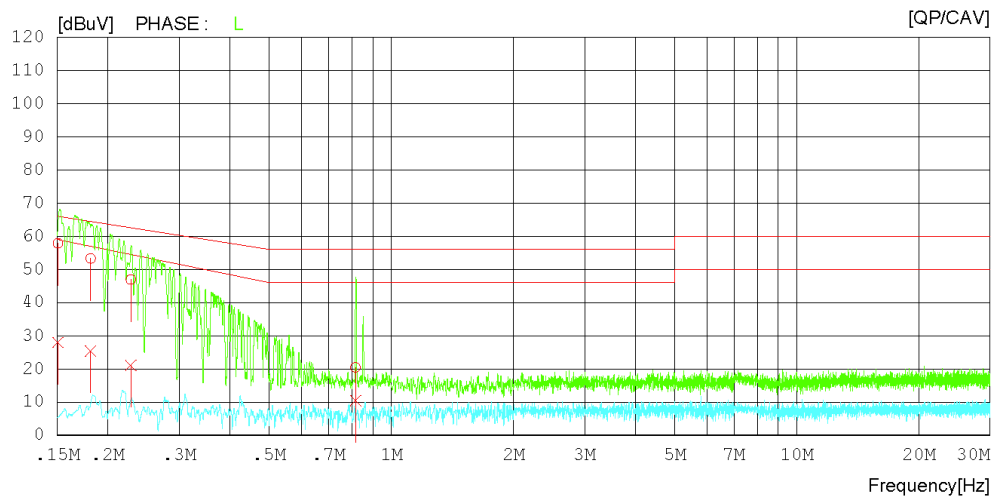
## Results of Conducted Emission

DSTech  
Date : 2023-10-04

Order No. : DST-23E-1553  
Test Condition : 100 V 60 Hz  
Test Mode : Normal  
:

Test engineer : Y.R.KIM  
:  
:

LIMIT : Household\_QP\_Mains port  
Household\_CAV\_Mains port





Results of Conducted Emission

DSTech  
Date : 2023-10-04

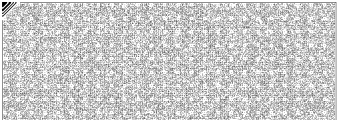
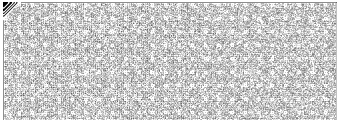
Order No. : DST-23E-1553                      Test engineer : Y.R.KIM  
Test Condition : 100 V 60 Hz  
Test Mode : Normal  
:

LIMIT : Household\_QP\_Mains port  
Household\_CAV\_Mains port

NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	CAV [dBuV]		QP [dBuV]	CAV [dBuV]	QP [dBuV]	CAV [dBuV]	QP [dBuV]	CAV [dBuV]	
1	0.15044	47.66	17.83	10.16	57.82	27.99	65.98	58.97	8.16	30.98	L
2	0.18129	43.10	15.25	10.15	53.25	25.40	64.43	56.95	11.18	31.55	L
3	0.22773	36.75	10.92	10.15	46.90	21.07	62.53	54.49	15.63	33.42	L
4	0.81509	10.27	0.28	10.18	20.45	10.46	56.00	46.00	35.55	35.54	L
5	0.15267	47.36	17.93	10.13	57.49	28.06	65.85	58.81	8.36	30.75	N
6	0.18000	43.23	15.20	10.13	53.36	25.33	64.49	57.03	11.13	31.70	N
7	0.20200	40.45	13.45	10.13	50.58	23.58	63.53	55.79	12.95	32.21	N
8	0.79700	10.91	0.48	10.15	21.06	10.63	56.00	46.00	34.94	35.37	N

Description of Calculation

C.FACTOR(dB) :	LISN Factor(dB) + Cable loss(dB) + Pulse Limiter Loss(dB)
Result(dBμV) :	Reading Value(dBμV) + C.FACTOR(dB)
Margin(dBμV) :	Limit(dBμV) - Result(dBμV)



## 5.2 Mains Terminal Discontinuous Disturbance (CLICK) Test

### 5.2.1 Test Condition

Test Method : CISPR 14-1:2020(J55014-1(H27))

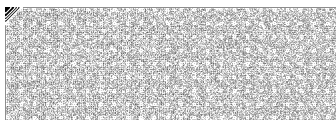
Test Date : 2023.10.04

Temperature/Humidity : 25 °C / 45 % R.H.

Operation mode : Mode 1

### 5.2.2 Test Equipment List

Equipment Type	Model	Serial No	Manufacture	Cal Due Date	Use
EMC Receiver	DDA55+	14042025170	AFJ	2024.06.19	<input checked="" type="checkbox"/>
Switching Operation Box	SW04	SW042030133	AFJ	N/A	<input checked="" type="checkbox"/>
Two-Line V-network	ESH3-Z5	100193	ROHDE & SCHWARZ	2024.06.19	<input checked="" type="checkbox"/>



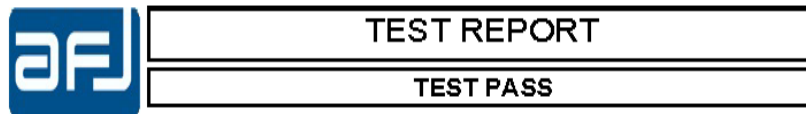


### 5.2.3 Test Result of Mains Terminal Discontinuous Disturbance

Test Results: **PASS**

Test data sheets follow.

[100 V 50 Hz]



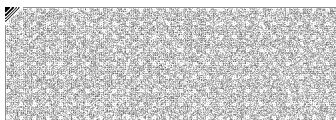
4/10/2023 14:58:24

Title	DST-23E-1553	Time Test	02:00:00.00
Required	100 V 50 Hz	Executed by	Y.R.KIM
Description	Normal		
Model			
Type		SN	
Report			

Mode Click Measurements

Type of Eut Type of Eut

Rx 150 KHz Att. [dB]	20	Rx 500 kHz Att. [dB]	20
Rx 1.4 MHz Att. [dB]	20	Rx 30 MHz Att. [dB]	20
Rx 150 kHz Input Offset [dB]	0.29	Rx 500 kHz Input Offset [dB]	0.31
Rx 1.4 MHz Input Offset [dB]	0.35	Rx 30 MHz Input Offset [dB]	0.95
External Att. [dB]	NONE		
Remote	SW04 LT32 - LINE 1		





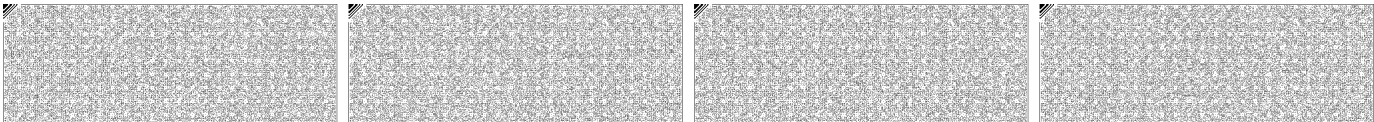
	150 kHz	500 kHz	1.4 MHz	30 MHz
First Run				
Short	0	0	0	0
Long	0	0	0	0
Long (10< t ≤20 ms)	0	0	0	0
Tot. Clicks Corr	0	0	0	0
Events	0	0	0	0
Time(s)	0.00	0.00	0.00	0.00
Sw.Op.	0	0	0	0
5.4.3.5 events	0	0	0	0
Limit dBuV	66	56	56	60
N	0.00	0.00	0.00	0.00
	PASS	PASS	PASS	PASS

150 kHz	No Clicks	500 kHz	No Clicks
1.4 MHz	No Clicks	30 MHz	No Clicks

New Limit  
[dBuV]  
Allowed Clicks

SECOND PASS NOT ALLOWED

Short  
Long  
Tot. Clicks Corr  
Events  
Time(s)  
5.4.3.5 events



[100 V 60 Hz]

**TEST REPORT****TEST PASS**

4/10/2023 17:53:07

Title	DST-23E-1553	Time Test	02:00:00.00
Required	100 V 60 Hz	Executed by	Y.R.KIM
Description	Normal		
Model			
Type		SN	
Report			

Mode Click Measurements

Type of Eut Type of Eut

Rx 150 KHz Att. [dB]	20	Rx 500 kHz Att. [dB]	20
Rx 1.4 MHz Att. [dB]	20	Rx 30 MHz Att. [dB]	20
Rx 150 kHz Input Offset [dB]	0.29	Rx 500 kHz Input Offset [dB]	0.31
Rx 1.4 MHz Input Offset [dB]	0.35	Rx 30 MHz Input Offset [dB]	0.95
External Att. [dB]	NONE		
Remote	SW04 LT32 - LINE 1		





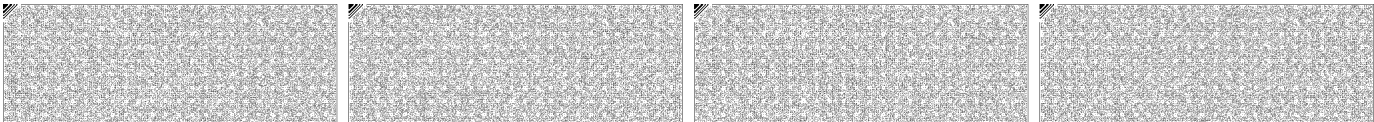
	150 kHz	500 kHz	1.4 MHz	30 MHz
First Run				
Short	0	0	0	0
Long	0	0	0	0
Long (10< t ≤20 ms)	0	0	0	0
Tot. Clicks Corr	0	0	0	0
Events	0	0	0	0
Time(s)	0.00	0.00	0.00	0.00
Sw.Op.	0	0	0	0
5.4.3.5 events	0	0	0	0
Limit dBuV	66	56	56	60
N	0.00	0.00	0.00	0.00
	PASS	PASS	PASS	PASS

150 kHz	No Clicks	500 kHz	No Clicks
1.4 MHz	No Clicks	30 MHz	No Clicks

New Limit  
[dBuV]  
Allowed Clicks

SECOND PASS NOT ALLOWED

Short  
Long  
Tot. Clicks Corr  
Events  
Time(s)  
5.4.3.5 events



## 5.3 Radiated Emission Test

### 5.3.1 Test Condition

Frequency Range of Test : 30 MHz to 1 000 MHz  
 Test Method : CISPR 14-1:2020(J55014-1(H27))  
 Test Date : 2023.10.05  
 Distance : 10 m  
 Temperature/Humidity : 21 °C / 47 % R.H.  
 Operation mode : Mode 1

### 5.3.2 Test Limits

Frequency range (MHz)	Resolution bandwidth	Quasi-peak limits (dB $\mu$ V/m)	
		Class A	Class B
30 to 230	120 kHz	40	30
230 to 1 000		47	37

### 5.3.3 Test Equipment List

Equipment Type	Model	Serial No	Manufacture	Cal Due Date	Use
EMI Test Receiver	ESW 44	101545	ROHDE & SCHWARZ	2024.06.19	<input checked="" type="checkbox"/>
Low Noise Pre Amplifier	MLA-1M01-B01-13	2600017	TSJ	2024.06.19	<input checked="" type="checkbox"/>
TRILOG Broadband Antenna	VULB 9168	00904	SCHWARZBECK	2024.07.27	<input checked="" type="checkbox"/>
COMMON MODE ABSORPTION DEVICE	CMAD1614	00156	SCHWARZBECK	2024.02.13	<input checked="" type="checkbox"/>



### 5.3.4 Test Result of Radiated Emission (30 MHz ~ 300 MHz)

Test Results: **PASS**

Test data sheets follow.

EUT No. [ #1 ] / [ 100 V / 50 Hz ] / Frequency Range [ 30 MHz – 1 GHz ]

### Results of Radiated Emission

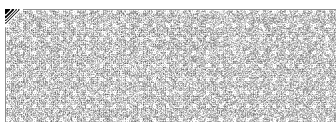
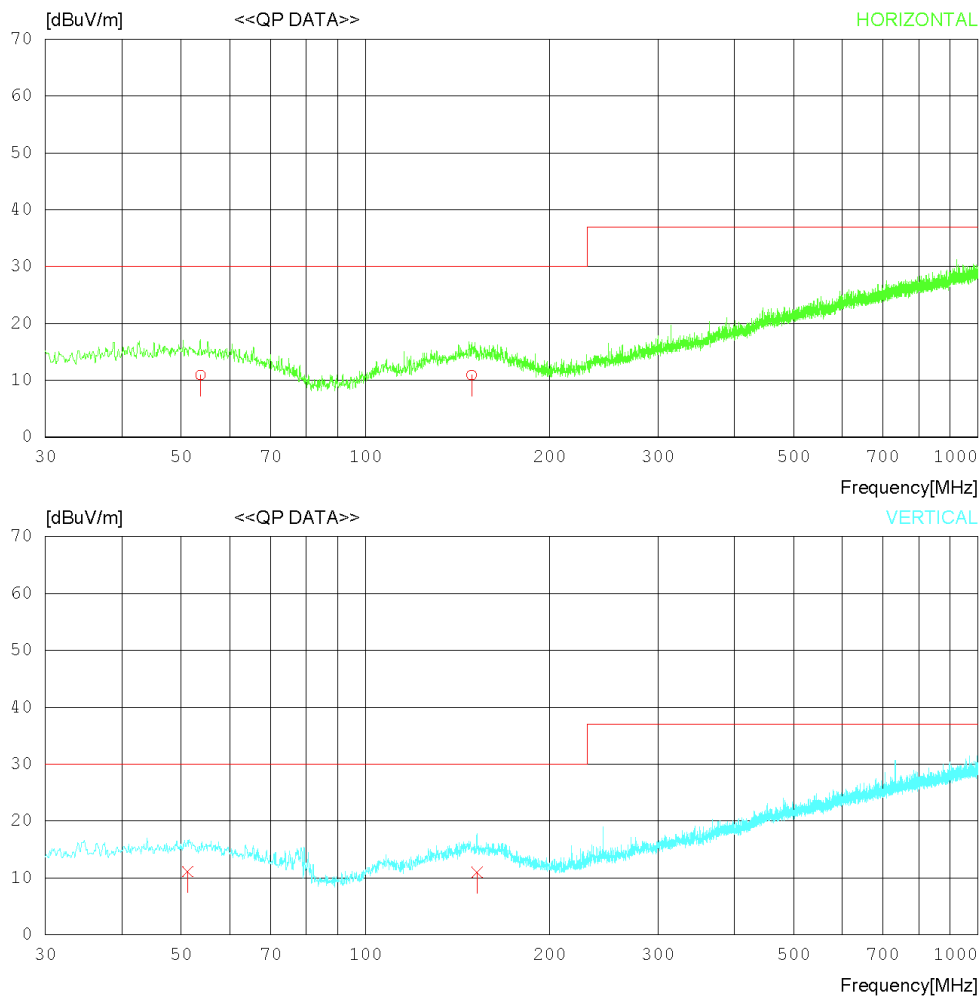
DSTech Co., Ltd.  
Date : 2023-10-05

Order No. : DST-23E-1553  
Test condition : 100 V 50 Hz  
Test Mode : Normal

Test engineer : Y.R.KIM

Comment :

LIMIT : Class B\_30 MHz - 1000 MHz







Results of Radiated Emission

DSTech Co., Ltd.  
Date : 2023-10-05

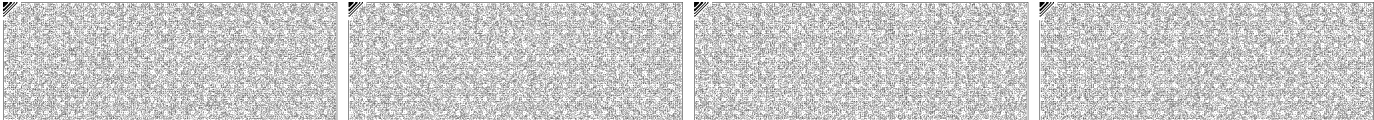
Order No. : DST-23E-1553                      Test engineer : Y.R.KIM  
Test condition : 100 V 50 Hz  
Test Mode : Normal

Comment :  
LIMIT : Class B\_30 MHz - 1000 MHz

No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	53.765	19.6	19.4	1.3	29.4	10.9	30.0	19.1	400	128
2	148.944	19.5	19.2	2.2	30.0	10.9	30.0	19.1	400	164
----- Vertical -----										
3	51.219	19.7	19.5	1.3	29.4	11.1	30.0	18.9	100	6
4	151.975	19.6	19.2	2.2	30.0	11.0	30.0	19.0	100	22

Description of Calculation

C.FACTOR(dB) :	Ant factor(dB) + Cable loss(dB) – Amp Gain(dB)
Result(dBμV) :	Reading Value(dBμV) + C.FACTOR(dB)
Margin(dBμV) :	Limit(dBμV) - Result(dBμV)



EUT No. [ #1 ] / [ 100 V / 60 Hz ] / Frequency Range [ 30 MHz – 1 GHz ]

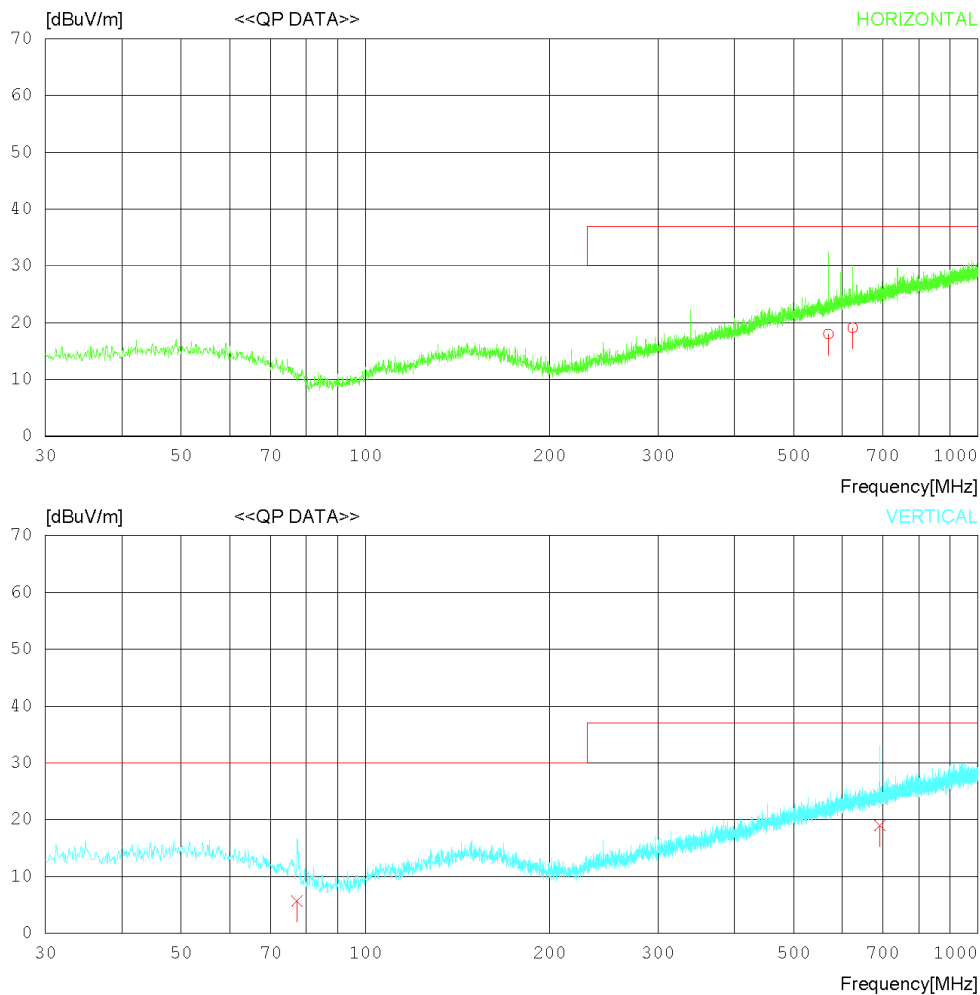
## Results of Radiated Emission

DSTech Co., Ltd.  
Date : 2023-10-05
 Order No. : DST-23E-1553  
 Test condition : 100 V 60 Hz  
 Test Mode : Normal

 Test engineer : Y.R.KIM  
 :  
 :  
 :

Comment :

LIMIT : Class B\_30 MHz - 1000 MHz





Results of Radiated Emission

DSTech Co., Ltd.  
Date : 2023-10-05

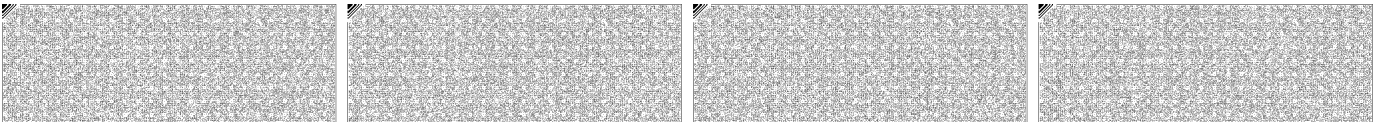
Order No. : DST-23E-1553                      Test engineer : Y.R.KIM  
Test condition : 100 V 60 Hz  
Test Mode : Normal

Comment :  
LIMIT : Class B\_30 MHz - 1000 MHz

No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	569.562	19.3	24.6	4.3	30.2	18.0	37.0	19.0	260	347
2	623.894	19.0	26.0	4.5	30.4	19.1	37.0	17.9	250	62
----- Vertical -----										
3	77.287	18.6	15.1	1.6	29.6	5.7	30.0	24.3	100	312
4	691.688	18.0	26.8	4.8	30.6	19.0	37.0	18.0	320	340

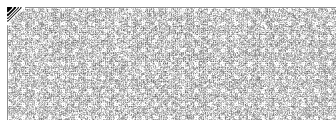
Description of Calculation

C.FACTOR(dB) :	Ant factor(dB) + Cable loss(dB) – Amp Gain(dB)
Result(dBμV) :	Reading Value(dBμV) + C.FACTOR(dB)
Margin(dBμV) :	Limit(dBμV) - Result(dBμV)



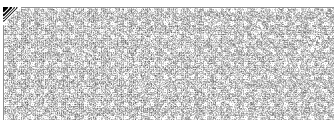
## 6. Photographs of Test Configuration

### 6.1 Photographs of Main Conducted Emission Test Configuration

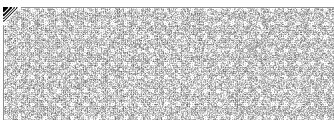
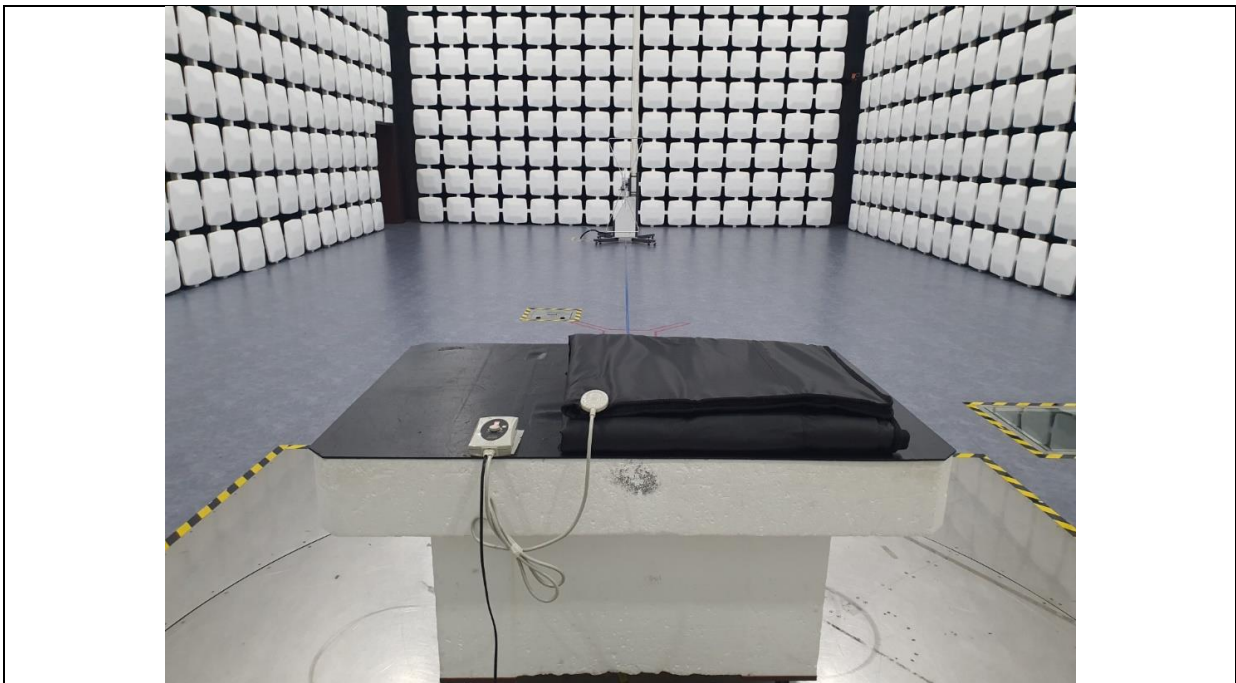
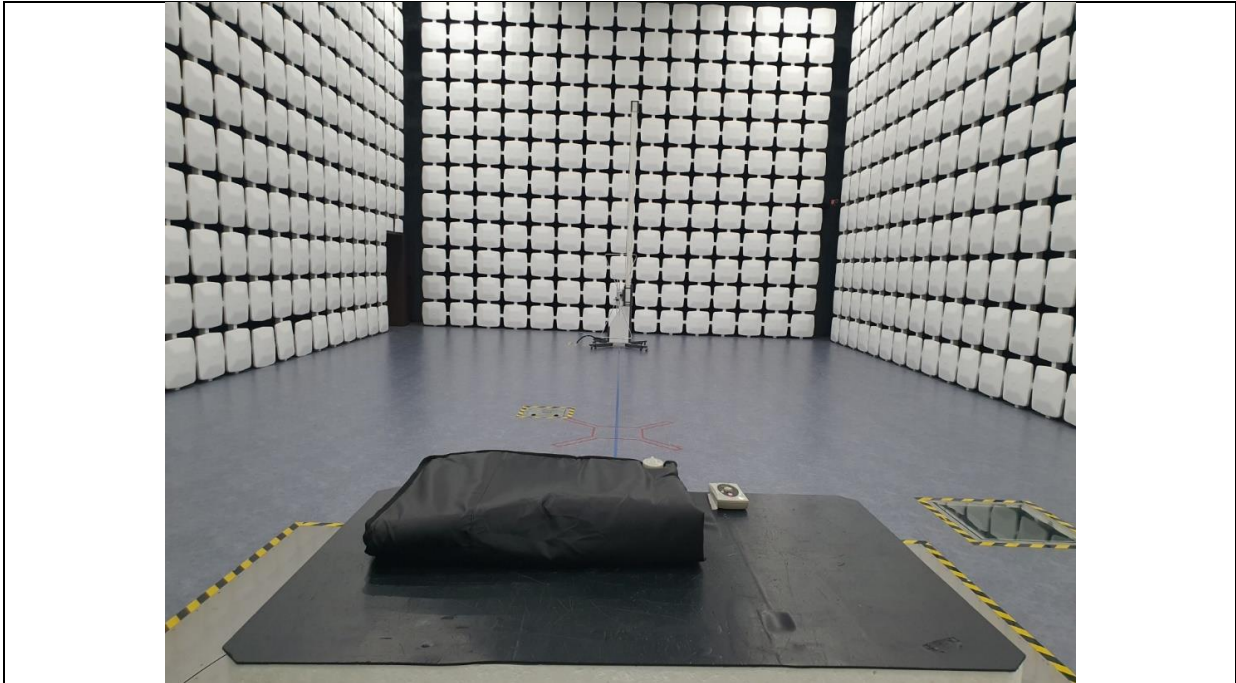




## 6.2 Photographs of Main Conducted Emission Test Configuration



### 6.3 Photographs of Radiated Emission Test Configuration





## 7. Photographs of EUT

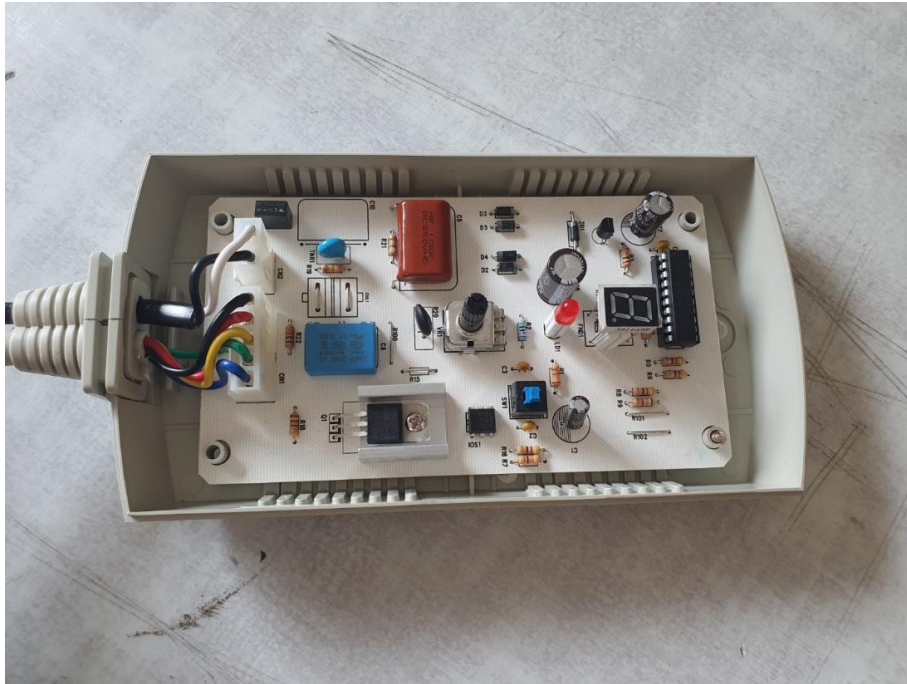
Front View of EUT



Rear View of EUT



**Inside View of EUT**



**- End of test report -**

