

# EMC TEST REPORT ETSI EN 301 489-01 V1.9.2(2011-09) ETSI EN 301 489-17 V2.2.1 (2012-09)

Product: StiX

Trade Name: Navori

Model Name: 3500

Serial Model: N/A

Report No.: NTEK-2016NT05045500E

# Prepared for

Navori SA

Rue du Lion d'Or 4 1003 Lausanne - Switzerland

# Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

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Report No.: NTEK-2016NT05045500E

# **TEST RESULT CERTIFICATION**

Applicant's name	Navori SA			
Address	Rue du Lion	d'Or 4 1003	3 Lausanne - Swit	zerland
Manufacture's Name				
Address				
		(30		
Product description				
Product name	212			
Trademark :	Navori			
Model and/or type reference	3500			
Serial Model:	N/A			
Standards	ETSI EN 301 ETSI EN 301	489-01 V1 489-17 V2	.9.2(2011-09) 2.2.1 (2012-09)	
This device described ab equipment under test (El requirements. And it is a	UT) is in comp	liance with	the 1999/5/EC R	&TTE Directive Art.3.1(b)
This report shall not be re	eproduced exc	ept in full,	without the writter	approval of NTEK, this
document may be altered	d or revised by	NTEK, pe	rsonnel only, and	shall be noted in the revision of
the document.				*
Date of Test	•••••			
Date (s) of performance of	of tests 04	May. 2016	~17 Jun. 2016	
Date of Issue	17	Jun. 2016	la l	
Test Result	Pa	SS		
Testing	Engineer	:	(Allen Liu)	
Technic	al Manager	:	Jusen chen (Jason Chen	CHNOLOGY )
Authoriz	zed Signatory	±	(Sam Chen)	ROVED)S



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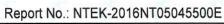


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### 1. TEST SUMMARY

Test procedures according to the technical standards:

ETSI EN 301 489-01 V1.9.2(2011-09) ETSI EN 301 489-17 V2.2.1 (2012-09)

	EMC Emission			
Standard	Test Item	Limit	Judgment	Remark
EN 55000.0040	Conducted Emission	Class B	PASS	
EN 55022:2010	Radiated Emission	Class B	PASS	
EN61000-3-2:2006+A2:2009	Harmonic Current Emission	Class A or D	N/A	
EN 61000-3-3:2008	Voltage Fluctuations & Flicker		N/A	
	EMC Immunity			
Section EN 55024:2010	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	В	PASS	
EN 61000-4-3:2006+A1:2008+A2 2010	2: RF electromagnetic field	А	PASS	
EN 61000-4-4:2012	Fast transients	В	N/A	
EN 61000-4-5:2006	Surges	В	N/A	
EN 61000-4-6:2012	Injected Current	Α	N/A	
EN 61000-4-11:2004	Volt. Interruptions Volt.  Dips	B/C/C NOTE (3)	N/A	

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### NOTE:

- (1)" N/A" denotes test is not applicable in this Test Report
- (2) The power consumption of EUT is less than 75W and no Limits apply.
- (3) Voltage dip: 100% reduction Performance Criteria B Voltage dip: 30% reduction – Performance Criteria C Voltage Interruption: 100% Interruption – Performance Criteria C
- (4) For client's request and manual description, the test will not be executed.



### 1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add.: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao' an District,

Shenzhen P.R. China

FCC Registered No.: 238937 IC Registered No.:9270A-1

CNAS Registered No.:L5516

### 1.2 MEASUREMENT UNCERTAINTY

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

### A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U · (dB)	NOTE
NTEKC01	ANSI	150 KHz ~ 30MHz	3.2	

### B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	4.7	
		1GHz ~6GHz	5.0	



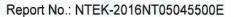
# 2. GENERAL INFORMATION

# 2.1 GENERAL DESCRIPTION OF EUT

Equipment	StiX
Trade Name	Navori
Model Name	3500
Serial Model	N/A
Model Difference	N/A
Frequency Bands:	BT: 2402~2480 MHz
Modulation Mode:	BT(1Mbps)/BLE: GFSK BT EDR(2Mbps): IT/4-DQPSK BT EDR(3Mbps): 8-DPSK IEEE 802.11b: DSSS (CCK, QPSK, DBPSK) IEEE 802.11g/n (HT20): OFDM(64QAM, 16QAM, QPSK, BPSK)
Power Rating	DC 5V, 2.5A
Adapter	N/A
Battery	N/A
Antenna:	External Antenna
Connecting I/O Port(s)	Please refer to the User's Manual
Hard Ware Version	N/A
Soft Ware Version	N/A

### Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.





# 2.1 DESCRIPTION OF TEST MODES

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

Pretest Mode	Description	
Mode 1	WLAN	
Mode 2	TF CARD	

For Radiated Test				
Final Test Mode	Description			
Mode 1	WLAN			

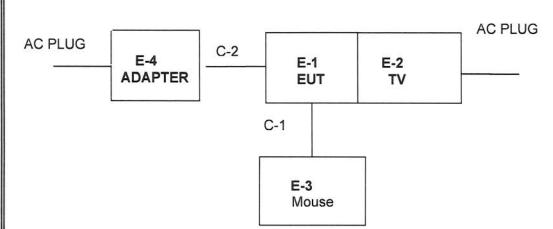
	For EMS Test
Final Test Mode	Description
Mode 1	WLAN
Mode 2	TF CARD

NOTE: The test modes were carried out for all operation modes. The final test mode of the EUT was the worst test mode for EMI, and its test data was showed.

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# 2.2 DESCRIPTION OF TEST SETUP





# 2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	StiX	Navori	3500	N/A	EUT
E-2	TV	SONY	KDL-24EX520	N/A	
E-3	Mouse	DELL	MS111-P	cn-011d3v-7 1581-11e-1t h7	
E-4	Adapter	N/A	N/A	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.0m	
C-2	NO	NO	1.0m	

### Note:

- The support equipment was authorized by Declaration of Confirmation.
- (1) (2) For detachable type I/O cable should be specified the length in cm in <code>FLength\_</code> column.



# 2.4 MEASUREMENT INSTRUMENTS LIST

# 2.4.1CONDUCTED EMISSION

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibra tion period
1	LISN	R&S	ENV216	101313	Jul. 06, 2015	Jul. 05, 2016	1 year
2	LISN	SCHWARZBE CK	NNLK 8129	8129245	Dec. 25, 2015	Dec. 24, 2016	1 year
3	Pulse Limiter	SCHWARZBE CK	VTSD 9561F	9716	Dec. 25, 2015	Dec. 24, 2016	1 year
4	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Jul. 06, 2015	Jul. 05, 2016	1 year
5	Test Cable	N/A	C01	N/A	Jul. 06, 2015	Jul. 05, 2016	1 year
6	Test Cable	N/A	C02	N/A	Jul. 06, 2015	Jul. 05, 2016	1 year
7	Test Cable	N/A	C03	N/A	Jul. 06, 2015	Jul. 05, 2016	1 year
8	EMI Test Receiver	R&S	ESCI	101160	Jul. 06, 2015	Jul. 05, 2016	1 year
9	Passive Voltage Probe	ESH2-Z3	R&S	100196	Jul. 06, 2015	Jul. 05, 2016	1 year
10	Triple-Loop Antenna	EVERFINE	LIA-2	11020003	Jul. 06, 2015	Jul. 05, 2016	1 year
11	Absorbing Clamp	R&S	MDS-21	100423	Jul. 08, 2015	Jul. 07, 2016	1 year

# 2.4.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibra tion period
1	Bilog Antenna	TESEQ	CBL6111D	31216	Jul. 06, 2015	Jul. 05, 2016	1 year
2	Test Cable	N/A	R-01	N/A	Dec. 25, 2015	Dec. 24, 2016	1 year
3	Test Cable	N/A	R-02	N/A	Dec. 25, 2015	Dec. 24, 2016	1 year
4	EMI Test Receiver	R&S	ESCI-7	101318	Jul. 06, 2015	Jul. 05, 2016	1 year
5	Antenna Mast	EM	SC100_1	N/A	N/A	N/A	N/A
6	Turn Table	EM	SC100	060531	N/A	N/A	N/A
7	50Ω Switch	Anritsu Corp	MP59B	6200983705	Jul. 06, 2015	Jul. 05, 2016	1 year
8	Spectrum Analyzer	Aglient	E4407B	MY45108040	Jul. 06, 2015	Jul. 05, 2016	1 year
9	Horn Antenna	EM	EM-AH-10180	2011071402	Jul. 06, 2015	Jul. 05, 2016	1 year
10	Amplifier	EM	EM-30180	060538	Jul. 06, 2015	Jul. 05, 2016	1 year

# 2.4.3 HARMONICS AND FILCK

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibra tion period
1	Harmonic & Flicker	EM TEST	DPA500	0303-04	Jul. 06, 2015	Jul. 05, 2016	1 year



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				12 01 40	Report No., NTE		
2	AC Power Source	EM TEST	ACS500	0203-01	Jul. 06, 2015	Jul. 05, 2016	1 year
2.4.4	ESD						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibra tion period
1	ESD TEST GENERAT OR	SCHAFFNER	NSG438	859	Jul. 06, 2015	Jul. 05, 2016	1 year
2.4.5	RS						
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibra tion period
1	Signal Generator	R&S	SMT 06	832080/007	Jul. 24, 2015	Jul. 23, 2016	1 year
2	Log-Bicon Antenna	Schwarzbeck	VULB9161	4022	Aug. 15, 2015	Aug. 14, 2016	1 year
3	Power Amplifier	AR	150W1000M1	320946	Sep. 23, 2015	Sep. 22, 2016	1 year
4	Microwave Horn Antenna	AR	AT4002A	321467	Jun. 11, 2015	Jun. 10, 2016	1 year
5	Power Amplifier	AR	25S1G4A	308598	Sep. 23, 2015	Sep. 22, 2016	1 year
6	Unversal radio communica tion tester	R&S	CMU200	1100.008.02	June .28,2015	June .27,2016	1 year
7	Audio Power Amplifier	Brüel & Kjær	4602B	2185667	June .28,2015	June .27,2016	1 year
8	Mouth Simulator	Brüel & Kjær	2669	2143265	June .28,2015	June .27,2016	1 year
9	Sound Calibrator	Brüel & Kjær	4185	2194825	June .28,2015	June .27,2016	1 year
10	1/2" Pressure- field Microphone	Brüel & Kjær	735	2641678	June .28,2015	June .27,2016	1 year
11	Audio Analyzer	R&S	UPV	100419	June .28,2015	June .27,2016	1 year
12	Ear Simulator for Telephono metry	Brüel & Kjær	4185	2553612	June .28,2015	June .27,2016	1 year
13	Telephone Test Head	Brüel & Kjær	4185	2631728	June .28,2015	June .27,2016	1 year

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# 2.4.6 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibra tion period
1	Surge Generator	EVERFINE	EMS61000-5A	1101002	Jul. 06, 2015	Jul. 05, 2016	1 year
2	DIPS Generator	EVERFINE	EMS61000-11 K	1011002	Jul. 06, 2015	Jul. 05, 2016	1 year
3	EFT/B Generator	EVERFINE	EMS61000-4A- V2	1012005	Aug. 04, 2015	Aug. 03, 2016	1 year

# 2.4.7 INJECTION CURRENT

	HOLOHOI	OUNTEN					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibra tion period
1	Signal Generator	IFR	2023A	202301/368	Mar. 31, 2016	Mar. 30, 2017	1 year
2	Power Amplifier	AR	75A250AM1	0320709	Sep. 23, 2015	Sep. 22, 2016	1 year
3	CDN	FCC	FCC-801-M2	06043	Jun. 02, 2016	Jun. 01, 2017	1 year
4	EM Clamp	FCC	F-203I-23MM	504	Jun. 09, 2015	Jun. 08, 2016	1 year
5	Unversal radio communica tion tester	R&S	CMU200	1100.008.02	June .28,2015	June .27,2016	1 year
6	Unversal radio communica tion tester	R&S	CMU200	1100.008.02	June .28,2015	June .27,2016	1 year
7	Audio Power Amplifier	Brüel & Kjær	4602B	2185667	June .28,2015	June .27,2016	1 year
8	Mouth Simulator	Brüel & Kjær	2669	2143265	June .28,2015	June .27,2016	1 year
9	Sound Calibrator	Brüel & Kjær	4185	2194825	June .28,2015	June .27,2016	1 year
10	1/2" Pressure- field Microphone	Brüel & Kjær	735	2641678	June .28,2015	June .27,2016	1 year
11	Audio Analyzer	R&S	UPV	100419	June .28,2015	June .27,2016	1 year
12	Ear Simulator for Telephono metry	Brüel & Kjær	4185	2553612	June .28,2015	June .27,2016	1 year
13	Telephone Test Head	Brüel & Kjær	4185	2631728	June .28,2015	June .27,2016	1 year



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Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibra tion period
1	Generator	EVERFINE	EMS61000-8K	1007001	Jul. 06, 2015	Jul. 05, 2016	1 year



# 3. EMC EMISSION TEST

### 3.1 CONDUCTED EMISSION MEASUREMENT

# 3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A	(dBuV)	Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

### Note:

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

The following table is the setting of the receiver

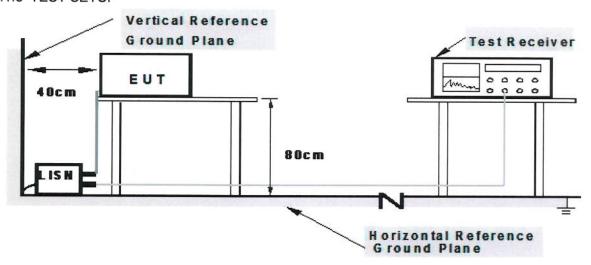
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



### 3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

### 3.1.3 TEST SETUP



Note: 1.Support units were connected to second LISM.

2.Both of LISMs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

### 3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.



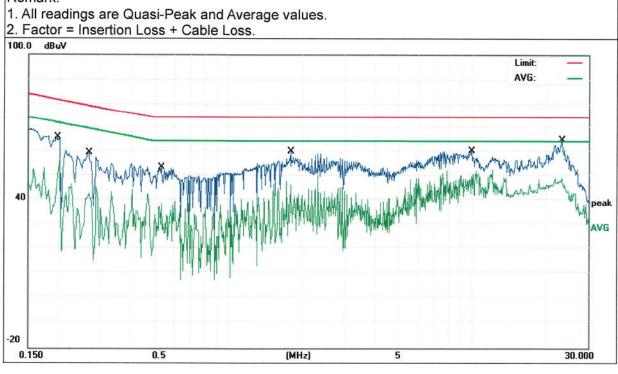
# 3.1.5 TEST RESULTS

EUT:	StiX	Model Name. :	3500	
Temperature :	26 ℃	Relative Humidity:	54%	
Pressure :	1010hPa	Rate:	RJ11	
Test Voltage :	DC 48V	Test Mode:	Mode 1	

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Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	_
(MHz)	(dBµV)	(dB)	(dBµV)	(dBµV)	(dB)	Remark
0.198	55.43	10.12	65.55	81.69	-16.14	QP
0.198	30.20	10.12	40.32	71.69	-31.37	AVG
0.266	49.39	9.98	59.37	79.24	-19.87	QP
0.266	30.17	9.98	40.15	69.24	-29.09	AVG
0.5299	43.58	9.72	53.30	74.00	-20.70	QP
0.5299	26.30	9.72	36.02	64.00	-27.98	AVG
1.794	50.48	9.45	59.93	74.00	-14.07	QP
1.794	25.67	9.45	35.12	64.00	-28.88	AVG
9.9138	51.01	9.25	60.26	74.00	-13.74	QP
9.9138	32.00	9.25	41.25	64.00	-22.75	AVG
23.3217	55.14	9.67	64.81	74.00	-9.19	QP
23.3217	34.68	9.67	44.35	64.00	-19.65	AVG

### Remark:





### 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

EDECLIENCY (MHz)	Class A (at 10m)	Class B (at 10m)
FREQUENCY (MHz)	dBuV/m	dBuV/m
30 – 230	40	30
230 – 1000	47	37

3.2.2 LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (at	Class A (at 3m) dBuV/m		m) dBuV/m
FREQUENCY (MINZ)	Peak	Avg	Peak	Avg
1000-3000	76	56	70	50
3000-6000	80	60	74	54

#### Notes:

- (1) The limit for radiated test was performed according to as following: CISPR 22/ FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

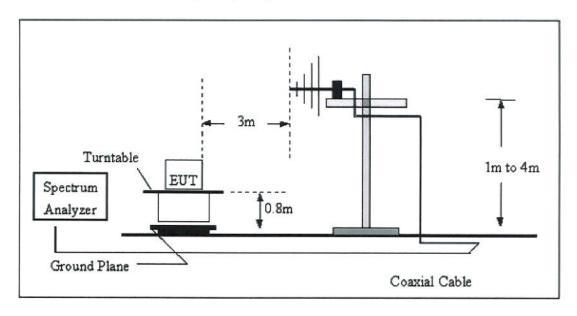
#### 3.2.3 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

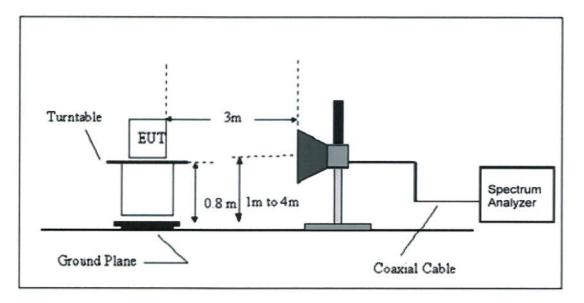


### 3.2.4 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz

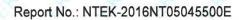


(B) Radiated Emission Test Set-Up Frequency Above 1GHz



### 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.



# 3.2.6 TEST RESULTS (30-1000MHz)

EUT:	StiX	Model Name :	3500
Temperature :	24 ℃	Relative Humidity:	54%
Pressure :	1010 hPa	Polarization :	Horizontal
Test Power :	DC 5V, 2.5A	Test Mode :	Mode 1

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Remark
125.0066	14.98	11.76	26.74	40	-13.26	QP
258.3264	31.08	12.22	43.3	47	-3.7	QP
375.9385	26.09	16.14	42.23	47	-4.77	QP
501.1788	19.06	18.78	37.84	47	-9.16	QP
625.0778	19.24	21.13	40.37	47	-6.63	QP
774.1584	20.81	23.31	44.12	47	-2.88	QP

# Remark:

1. Factor = Antenna Factor + Cable Loss - Pre-amplifier.





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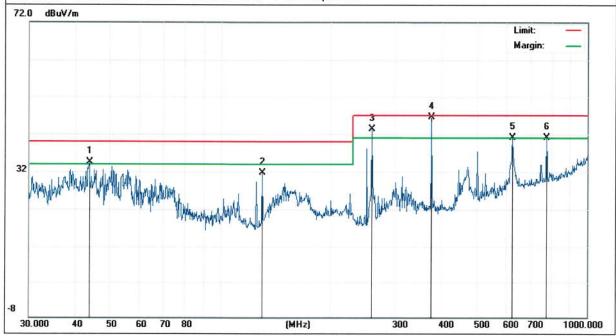
	Report	NO IN	IEN-2	וואוטונ	150455	UUE
_						

EUT:	StiX	Model Name :	3500
Temperature :	24 ℃	Relative Humidity:	54%
Pressure :	1010 hPa	Polarization :	Vertical
Test Power :	DC 5V, 2.5A	Test Mode :	Mode 1

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Remark	
43.8119	21.00	13.45	34.45	40	-5.55	QP	
129.9225	19.69	11.99	31.68	40	-8.32	QP	
258.3264	31.02	12.22	43.24	47	-3.76	QP	
375.9385	30.36	16.14	46.50	47	-0.50	QP	
625.0778	19.97	21.13	41.10	47	-5.90	QP	
774.1584	17.79	23.31	41.10	47	-5.90	QP	

# Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.





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# 3.2.7 TEST RESULTS(1000-6000)

EUT:	StiX	Model Name :	3500	
Temperature :	24 ℃	Relative Humidity:	54%	
Pressure :	1010 hPa	Test Mode :	Mode 1	
Test Power :	DC 5V, 2.5A			

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(H/V)	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	Kemark
V	1187.688	68.81	-12.46	56.35	70	-13.65	peak
V	1187.688	54.46	-12.46	42.00	50	-8.00	peak
V	1559.486	57.56	-12.78	44.78	70	-25.22	peak
V	1559.486	39.93	-12.78	27.15	50	-22.85	peak
V	1979.136	54.76	-11.85	42.91	70	-27.09	peak
V	1979.136	37.18	-11.85	25.33	50	-24.67	peak
Н	1187.688	65.19	-12.46	52.73	70	-17.27	peak
Н	1187.688	52.96	-12.46	40.5	50	-9.50	peak
Н	1559.486	57.08	-12.78	44.3	70	-25.7	peak
Н	1559.486	38.41	-12.78	25.63	50	-24.37	peak
Н	1979.136	54.25	-11.85	42.4	70	-27.6	peak
Н	1979.136	39.98	-11.85	28.13	50	-21.87	peak

# Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



# 3.3 HARMONICS CURRENT

# 3.3.1LIMITS OF HARMONICS CURRENT

		IEC 5	555-2		
	Table -	L		Table -	-11
Equipment	Harmonic	Max. Permissible	Equipment	Harmonic	Max. Permissible
Category	Order	Harmonic Current	Category	Order	Harmonic Current
	n	(in Ampers)		n	(in Ampers)
	Odd	Harmonics		Odd	Harmonics
	3	2.30		3	0.80
	5 7	1.14		5	0.60
	7	0.77		7	0.45
Non	9	0.40	TV	9	0.30
Portable	11	0.33	Receivers	11	0.17
Tools	13	0.21		13	0.12
or	15≤n≤39	0.15 · 15/n		15≤n≤39	0.10 · 15/n
TV	Even	Harmonics		Even Harmonics	
Receivers	2	1.08		2	0.30
	4	0.43		4	0.15
	4 8	0.30			
	8≤n≤40	0.23 · 8/n		DC	0.05

	EN 6	31000-3-2/IEC	61000-3-2		
Equipment Category	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Perr Harmonic (in A)	
	(		3	2.30	3.4
	Same as Limits		5	1.14	1.9
Class A	Specified in	Class D	7	0.77	1.0
	4-2.1, Table - I,		9	0.40	0.5
	but only odd		11	0.33	0.35
	harmonics required		13≤n≤39	see Table I	3.85/n
-112 2 10 10			only o	dd harmonics re	equired



### 3.3.1.1 TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.

b. The classification of EUT is according to section 5 of EN 61000-3-2: 2000. The EUT is classified as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as

Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.

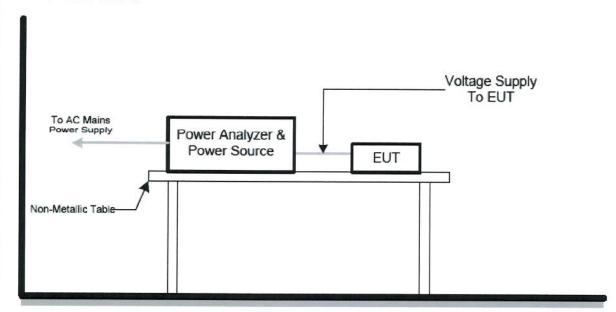
c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

d. For the actual test configuration, please refer to the related item -EUT Test Photos.

### 3.3.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

#### 3.3.1.3 TEST SETUP





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# 3.3.2 TEST RESULTS

EUT:	StiX	Model Name :	3500	
Temperature :	25 ℃	Relative Humidity:	45%	
Pressure :	1010 hPa	Test Power :	N/A	
Test Power :	N/A		•	

Note: The active input power of the EUT is less than 75 **W.** No limits apply for equipment with an active input power up to and including 75W



### 3.4 VOLTAGE FLUCTUATION AND FLICKERS

### 3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Tests		mits	Descriptions	
16212	IEC555-3	IEC/EN 61000-3-3	Descriptions	
Pst	≤ 1.0, Tp= 10 min.	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator	
Plt	N/A	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator	
dc	≤ 3%	≤ 3.3%	Relative Steady-State V-Chang	
dmax	≤ 4%	≤ 4%	Maximum Relative V-change	
d (t)	N/A	≤ 3.3% for > 500 ms	Relative V-change characteristic	

#### 3.4.1.1TEST PROCEDURE

### a. Harmonic Current Test:

Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.

b. Fluctuation and Flickers Test:

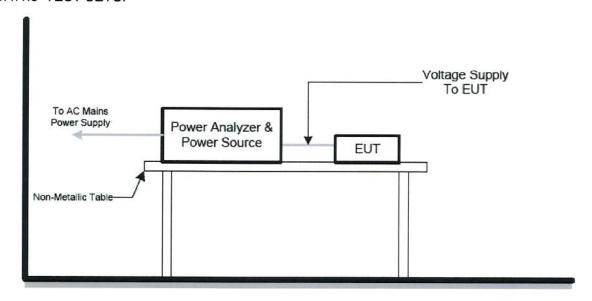
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.

- c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.
- d. For the actual test configuration, please refer to the related Item -EUT Test Photos.

### 3.4.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.

### **3.4.1.3 TEST SETUP**





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# 3.4.2 TEST RESULTS

EUT:	StiX	Model Name :	3500	
Temperature :	25 ℃	Relative Humidity:	45%	
Pressure :	1010 hPa	Test Power :	N/A	
Test Mode	N/A			



### 4. EMC IMMUNITY TEST

4.1 GENERAL PERFORMANCE CRITERIA

4.1.1 PERFORMANCE CRITERIA

According to EN 301489 -17standard, the general performance criteria as following:

Criteria	During the test	After the test
Α	Shall operate as intended May show degradation of performance (see note 1) Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended Shall be no degradation of performance (see note 2) Shall be no loss of function Shall be no loss of stored data or user programmable functions
В	May show loss of function (one or more) May show degradation of performance (see note 1) No unintentional transmissions	Functions shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance (see note 2) Shall be no loss of stored data or user programmable functions
С	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be no degradation of performance (see note 2)

NOTE 1: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2: no degradation of performance after the test is understood as any degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.



#### PERFORMANCE FOR TT

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

#### PERFORMANCE FOR TR

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

#### PERFORMANCE FOR CT

The performance criteria A shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an Acknowledgement (ACK) or Not Acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

#### PERFORMANCE FOR CR

The performance criteria A shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

### 4.2 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.2** Unless otherwise a special operating condition is specified in the follows during the testing.



4.3 ESD TESTING

### 4.3.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	В
Discharge Voltage:	Air Discharge: 2kV/4kV/8kV
	Contact Discharge : 2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 200 times in total
Discharge Mode:	A/C Discharge
Discharge Period:	1 second minimum

### 4.3.2 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT. During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge. Horizontal Coupling Plane (HCP):

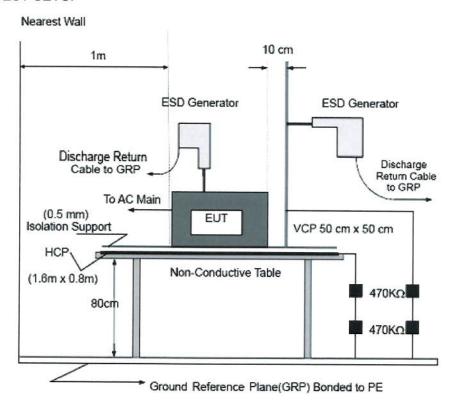
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

- b. Air discharges at insulation surfaces of the EUT.
  - It was at least ten single discharges with positive and negative at the same selected point.
- c. For the actual test configuration, please refer to the related Item –EUT Test Photos.





#### 4.3.3 TEST SETUP



#### Note:

#### TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

#### FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.



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# 4.3.4 TEST RESULTS

EUT:	StiX	Model Name :	3500
Temperature :	25 ℃	Relative Humidity:	45%
Pressure :	1010 hPa	Test Power :	DC 5V, 2.5A
Test Mode	Mode1/2	•	

Mode		Conta	ct Disch	arge (In	direct)				
Test level (kV)	Test Point		2		4	(	3	Criterion	Result
Test Location		+	-	+		+			
	Front	Р	Р	Р	Р			-	
HCP	Rear	Р	Р	Р	Р				0
ПСР	Left	Р	Р	Р	Р				
	Right	Р	Р	Р	Р			В	
	Front	Р	Р	Р	Р			] <b>P</b>	Complies
VCD	Rear	Р	Р	Р	Р				
VCP	Left	Р	Р	Р	Р				
	Right	Р	Р	Р	Р				

Mode			Air	Dis	cha	rge				Co	onta	ct C	)isc	har	ge				
Mode Test level (kV) Test Location A1 A2 A3	2	2	4	4	8	3	1	5	2	2		4	(	3	8	В	Obser vation	Criterion	Result
Test Location	+	1	+	1	+	1	+	-	+	1	+	-	+	1	+	-			
A1	Р	Р	Р	Р	Р	Р													
A2	Р	Р	Р	Р	Р	Р													
A3	Р	Р	Р	Р	Р	Р													
C1									Р	Р	Р	Р							
C2									Р	Р	Р	Р							
C3									Р	Р	Р	Р							
C4									Р	Р	Р	Р							
C5									Р	Р	Р	Р					TR/TT	В	Complies
C6									Р	Р	Р	Р							
C7									Р	Р	Р	Р							
C8									Р	Р	Р	Р							
C9									Р	Р	Р	Р							
C10									Р	Р	Р	Р							
C11									Р	Р	Р	Р							
C12									Р	Р	Р	Р							

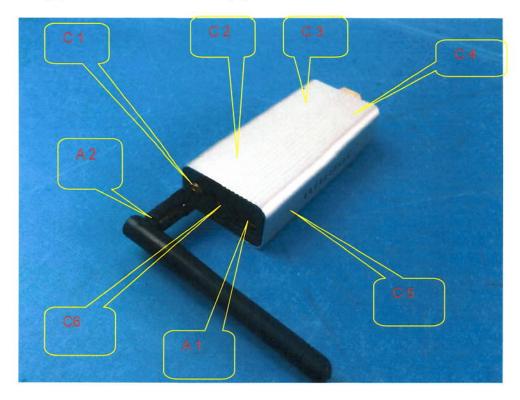
# Note:

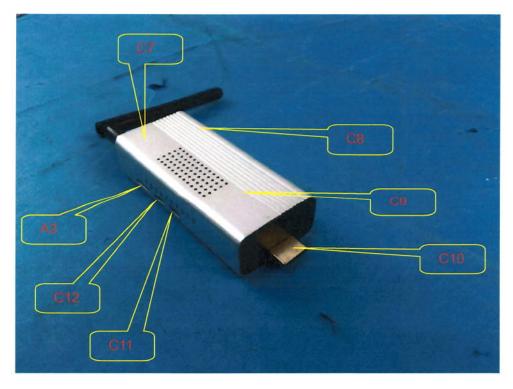
- 1) +/- denotes the Positive/Negative polarity of the output voltage.
  2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.





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### 4.4 RS TESTING

### 4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz ,1400MHz-2700MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds

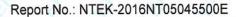
### 4.4.2 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

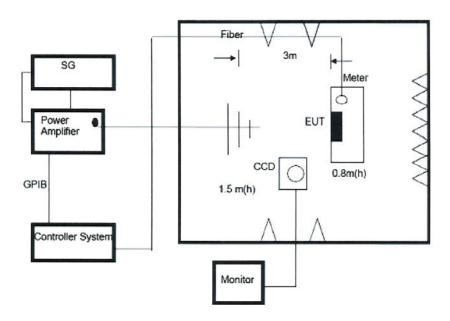
The testing distance from antenna to the EUT was 3 meters.

The other condition as following manner:

- a. The field strength level was 3V/m.
- b. The frequency range is swept from 80 MHz to 1000 MHz, & 1400MHz 2700MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- Sweep Frequency 900 MHz, with the Duty Cycle:1/8 and Modulation: Pulse 217 Hz(if applicable)
- d. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.
- f. For the actual test configuration, please refer to the related Item -EUT Test Photos.



# 4.4.3 TEST SETUP



### Note:

### TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

### FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

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# 4.4.4 TEST RESULTS

EUT:	StiX	Model Name :	3500
Temperature :	25 ℃	Relative Humidity:	45%
Pressure :	1010 hPa	Test Power :	DC 5V, 2.5A
Test Mode	Mode1/2		

# **TEST RESULT**

Frequency Range (MHz)	RF Field Position		Azimuth	Observation	Perform. Criteria	Results
			Front			Р
80~1000	ши	3 V/m (rms) AM Modulated	Rear	CT CP		
1400-2700	H/V	1000Hz, 80%	Left	CT,CR	Α	
			Right			

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

# Note:

- 1) N/A denotes test is not applicable in this test report.
- 2) There was not any unintentional transmission in standby mode
- 3) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.



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## 4.5 EFT/BURST TESTING

## 4.5.1 TEST SPECIFICATION

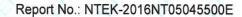
Basic Standard:	IEC/EN 61000-4-4
Required Performance	В
Test Voltage:	Power Line : 1 kV Signal/Control Line : 0.5 KV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

#### 4.5.2 TEST PROCEDURE

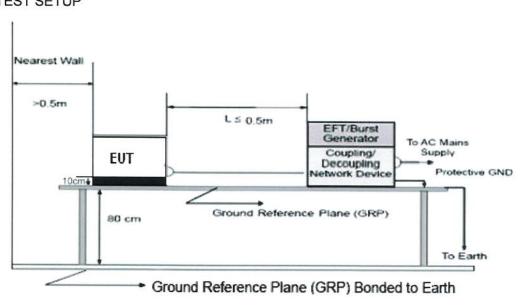
The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

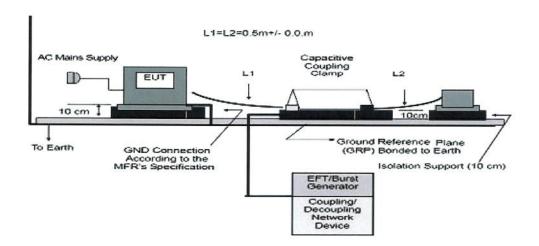
The other condition as following manner:

- a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.
- b. Both positive and negative polarity discharges were applied.
- c. The duration time of each test sequential was 1 minute
- d. For the actual test configuration, please refer to the related Item -EUT Test Photos.









### Note:

#### TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

# FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.



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# 4.5.4 TEST RESULTS

EUT:	StiX	Model Name :	3500	
Temperature :	25 ℃	Relative Humidity:	45%	
Pressure :	1010 hPa	Test Power :	N/A	
Test Mode	N/A	•		



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#### 4.6 SURGE TESTING

#### 4.6.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance	В
Wave-Shape:	Combination Wave
	1.2/50 us Open Circuit Voltage
	8 /20 us Short Circuit Current
Test Voltage:	Power Line: 0.5 kV, 1 kV
Surge Input/Output:	L-N
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0 /90/180/270
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

#### 4.6.2 TEST PROCEDURE

### a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

- b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

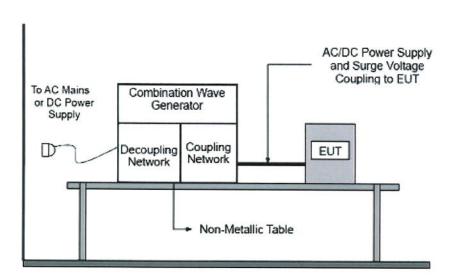
  The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).
- c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:
  - The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).
- d. For the actual test configuration, please refer to the related Item –EUT Test Photos.



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# 4.6.3 TEST SETUP



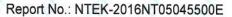


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# 4.6.4 TEST RESULTS

EUT:	StiX	Model Name :	3500	
Temperature :	25 ℃	Relative Humidity:	45%	
Pressure :	1010 hPa	Test Power :	N/A	
Test Mode	N/A			





## 4.7 INJECTION CURRENT TESTING

#### 4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	at least 3 seconds

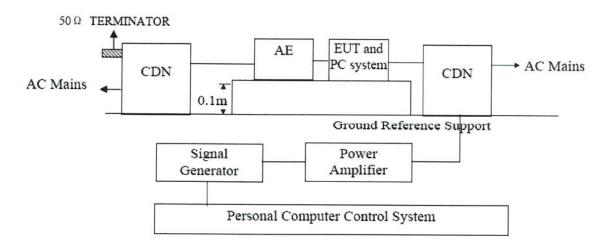
#### 4.7.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

The other condition as following manner:

- a. The field strength level was 3V.
- b. The frequency range is swept from 150 KHz to 80 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- d. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 4.7.3 TEST SETUP



For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### NOTE:

### FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.



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# 4.7.4 TEST RESULTS

EUT:	StiX	Model Name :	3500	
Temperature :	25 ℃	Relative Humidity:	45%	
Pressure :	1010 hPa	Test Power :	N/A	
Test Mode	N/A			



# 4.8 VOLTAGE INTERRUPTION/DIPS TESTING

# 4.8.1 TEST SPECIFICATION

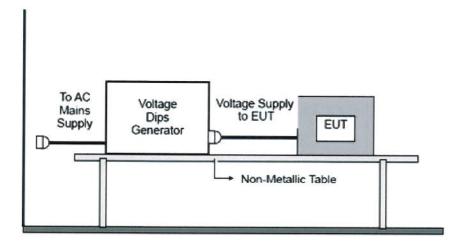
Basic Standard:	IEC/EN 61000-4-11
Required Performance	100% reduction, 0.5 Cycle 100% reduction, 1.0 Cycle
	30% reduction, 25 Cycles
Voltage Interruptions:	100% reduction, 250 Cycles
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

#### 4.8.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

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# 4.8.3 TEST SETUP



For the actual test configuration, please refer to the related Item -EUT Test Photos.



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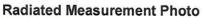
Report No.: NTEK-2016NT05045500E

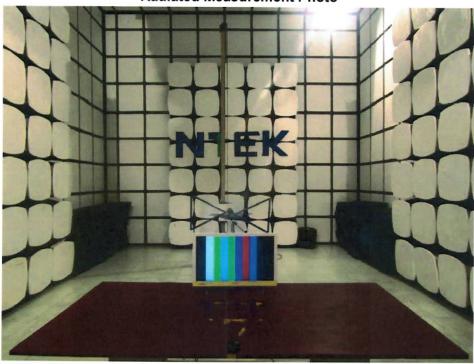
# 4.8.4 TEST RESULTS

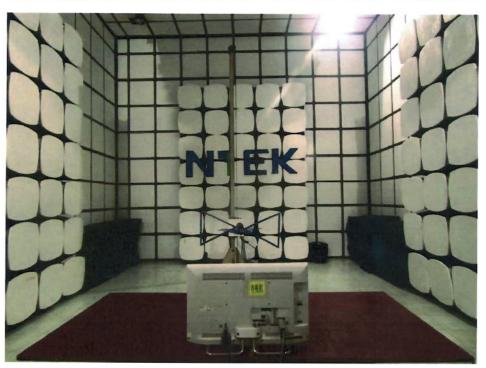
EUT:	StiX	Model Name :	3500	
Temperature :	25 ℃	Relative Humidity:	45%	
Pressure :	1010 hPa	Test Power :	N/A	
Test Mode	N/A	•		



# 5. EUT TEST PHOTO









NTEK

