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# EMC Test Report

Client Name : Sharkoon Technologies GmbH

Client Address : Grüninger Weg 48, 35415 Pohlheim, Germany

Product Name : PC Case

Report Date :

Dec. 08, 2022

# Shenzhen Anbotek Compliance Laboratory Limited

Approved

compliance Labo



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400-003-0500

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## Shenzhen Anbotek Compliance Laboratory Limited

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# TEST REPORT

Applicant :	Sharkoon Technologies GmbH
Manufacturer :	Sharkoon Technologies GmbH
Product Name :	PC Case
Test Model No. :	Sharkoon M30 RGB
Reference Model No. :	Sharkoon M30 Black
Trade Mark :	Sharkoon
Rating(s) :	100-240V~ 50-60Hz 10A

Test Standard(s)

BS EN 55032: 2015+A1:2020; BS EN IEC 61000-3-2: 2019+A1:2021; BS EN 61000-3-3: 2013+A1:2019+A2:2021; BS EN 55035: 2017+A11:2020; (IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4; IEC 61000-4-5; IEC 61000-4-6; IEC 61000-4-8; IEC 61000-4-11)

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the BS EN 55032, BS EN IEC 61000-3-2, BS EN 61000-3-3, BS EN 55035 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date	of	Receipt:	
Duio		ricocipi.	

Nov. 25, 2022

Date of Test:

Prepared By:

Nov. 25~Dec. 05, 2022

We le

(We Zeng)

(KingKong Jin)

And And ok botek Anbor

Approved & Authorized Signer:

Shenzhen Anbotek Compliance Laboratory Limited

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# 1. General Information

## 1.1. Client Information

DAY	25	
Applicant	:	Sharkoon Technologies GmbH
Address	:	Grüninger Weg 48, 35415 Pohlheim, Germany
Manufacturer	:	Sharkoon Technologies GmbH
Address	:	Grüninger Weg 48, 35415 Pohlheim, Germany
Factory	:	Sharkoon Technologies GmbH
Address	:	Grüninger Weg 48, 35415 Pohlheim, Germany

## 1.2. Description of Device (EUT)

Product Name	:	PC Case
Test Model No.	:	Sharkoon M30 RGB
Reference Model No.	:	Sharkoon M30 Black (Note: All samples are the same except the model number & appearance, so we prepare "Sharkoon M30 RGB" for test only.)
Trade Mark	:	Sharkoon
Test Power Supply	:	AC 230V, 50Hz
Test Sample No.	:	1-1-1 Anbotek Anbotek Anbotek Anbotek Anbotek Anbotek Anbotek
Product Description	:	N/A <sup>nd</sup> Anbotek Anbotek Anbotek Anbotek Anbotek Anbotek Anbotek
<b>Remark:</b> (1) For a r specifications or the		e detailed features description, please refer to the manufacturer's er's Manual.

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## 1.3. Auxiliary Equipment Used During Test

MONITOR1	:	Manufacturer: AOC
	:	M/N: LV273HUPR
		S/N: APMM79A00124 7Q
d		Input: 100-240~50/60Hz 1.5A
MONITOR2	:	Manufacturer: AOC
×	:	M/N: LV273HUPR
		S/N: APMM79A000961 6L
		Input: 100-240~50/60Hz 1.5A
KEYBOARD	:	Manufacturer: DELL
3		M/N: SK-8120
		S/N: CN-0DJ365-71616-49J-0MVR-A00
0		Input Rating: DC 5V, 0.05A
		CE, FCC, VCCI, KCC, TUV-GS
		Cable: 1.8m, unshielded
MOUSE	:	Manufacturer: DELL
		M/N: MS111-T
N.		S/N: CN-0KW2YH-71616-488-1CBJ
		Input Rating: DC 5V, 0.1A
		Cable: 1.8m, unshielded
		CE, FCC, VCCI, KCC, TUV-GS

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## 1.4. Description of Test Mode

Pretest Mode		Description		
Mode 1	Anboten Anbo	Mibote On Anbone	An	Anbo

For Mode 1 Block Diagram of Test Setup

nbotek A	KEYBOARD	MONITOR	U Disk	MOUSE	
AC mains	Anbo, A	anbotek Anb	oto Ann	otek Anbotek	
Anboten	Anthotek	Anbotek EU	hoore Air	nbotek phote	Earphone

## 1.5. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test	Mode 1	Anbote P Ar
Asymmetric Mode Conducted Emission at Telecom Port	Mode 1	Anbon Pek
Radiated Emission Test (Below 1 GHz)	Mode 1	Potek
Radiated Emission Test (Above 1GHz)	Mode 1	otek Panbot
Harmonic Current Test	ak Anbotan Ar	abotek N An
Voltage Fluctuations & Flicker Test	Mode 1	AnbotekP
Electrostatic Discharge Immunity Test	Mode 1	AntoPer
RF Field Strength Immunity Test	Mode 1	P <sup>orter</sup>
Electrical Fast Transient/Burst Immunity Test	Mode 1	PAnbo
Surge Immunity Test	Mode 1	Anbore P An
Injected Currents Susceptibility Test	Mode 1	P
Power frequency Magnetic Field Immunity Test	Anbotek / Anbote	k Notek
Voltage Dips and Interruptions Immunity Test	Mode 1	ptek Panbote
P) Indicates "PASS".	k Anboter Ant	tek al

F) Indicates "Fail".

N) Indicates "Not applicable".

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## 1.6. Test Equipment List

 $\boxtimes$  Power Line Conducted Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<sup>vek</sup> 1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Oct. 23, 2022	1 Year
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040D T001	Jul. 05, 2022	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 13, 2022	1 Year
<sup>4</sup> .	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2022	1 Year
5. re	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

 $\boxtimes$  Asymmetric Mode Conducted Emission at Telecom Port

	NO' P'	_20°	W .		NO. N.	-20
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ISN	Schwarzbeck	NTFM 8158	#172	Oct. 13, 2022	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 13, 2022	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2022	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A https://
5.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040D T001	Jul. 05, 2022	1 Year

 $\boxtimes$  Radiated Emission Test (Below 1 GHz)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 23, 2022	1 Year
2.	Pre-amplifier	SONOMA	310N	186860	Oct. 23, 2022	1 Year
3.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 23, 2022	1 Year
14. <sup>bot</sup>	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

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#### Radiated Emission Test (Above 1GHz)

	. 70a	V In O	DIT	*OF	000
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 23, 2022	1 Year
Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 23, 2022	1 Year
Pre-amplifier	SONOMA	310N	186860	Oct. 23, 2022	1 Year
Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A
EMI Preamplifier	SKET Electronic	LNPA-0118G- 45	SKET-PA-0 02	Oct. 13, 2022	1 Year
Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	Oct. 16, 2022	3 Year
	Equipment EMI Test Receiver Bilog Broadband Antenna Pre-amplifier Software Name EZ-EMC EMI Preamplifier Double Ridged	EquipmentManufacturerEMI Test ReceiverRohde & SchwarzBilog Broadband AntennaSchwarzbeckPre-amplifierSONOMASoftware Name EZ-EMCFerrari TechnologyEMI PreamplifierSKET ElectronicDouble RidgedSCHWARZBECK	EquipmentManufacturerModel No.EMI Test ReceiverRohde & SchwarzESR26Bilog Broadband AntennaSchwarzbeckVULB9163Pre-amplifierSONOMA310NSoftware Name EZ-EMCFerrari TechnologyANB-03AEMI PreamplifierSKET ElectronicLNPA-0118G- 45Double RidgedSCHWARZBECKBBHA 9120D	EquipmentManufacturerModel No.Serial No.EMI Test ReceiverRohde & SchwarzESR26101481Bilog Broadband AntennaSchwarzbeckVULB9163VULB 9163-289Pre-amplifierSONOMA310N186860Software Name EZ-EMCFerrari TechnologyANB-03AN/AEMI PreamplifierSKET ElectronicLNPA-0118G- 45SKET-PA-0 02Double RidgedSCHWARZBECKBBHA 9120D02555	EMI Test ReceiverRohde & SchwarzESR26101481Oct. 23, 2022Bilog Broadband AntennaSchwarzbeckVULB9163VULB 9163-289Oct. 23, 2022Pre-amplifierSONOMA310N186860Oct. 23, 2022Software Name EZ-EMCFerrari TechnologyANB-03AN/AN/AEMI PreamplifierSKET ElectronicLNPA-0118G- 45SKET-PA-0 02Oct. 13, 2022Double RidgedSCHWARZBECKBBHA 9120D02555Oct. 16, 2022

#### Harmonic Current and Flicker Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1 <sup>Anb</sup>	Programmable AC Power source	IVYTECH	APS-5005A	632734	Oct. 23, 2022	1 Year
2.	Harmonic and Flicker Analyzer	EMC-PARTNER	HMONICS 1000-1P	164	Oct. 23, 2022	1 Year
3.	Harmonics-1000	N/A	Ed.3.0+4.0	N.A	N/A	N/A

## Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Simulators	emtest	ESD NX30.1	11936	Mar. 25, 2022	1 Year

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RF Field Strength Immunity Test

<u> </u>	184		(Que la Contraction de la Cont	DV.	*8**	
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1 pot	Signal Generator	Agilent	N5182A	MY4818065 6	Oct. 13, 2022	1 Year
2.	Amplifier	Micotoop	MPA-80-100 0-250	MPA190309 6	Oct. 23, 2022	1 Year
3.	Amplifier	Micotoop	MPA-1000-6 000-100	MPA190312 2	Oct. 23, 2022	1 Year
4. Anb	Log-Periodic Antenna	Schwarzbeck	VULP9118E	00992	N/A nbotek	N/A
5.	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	Oct. 16, 2022	3 Year
6.	Power Sensor	Agilent	E9301A	MY4149890 6	Oct. 23, 2022	1 Year
7.	Power Sensor	Agilent	E9301A	MY4149808 8	Oct. 23, 2022	1 Year
8.	Power Meter	Agilent	E4419B	GB4020290 9	Oct. 23, 2022	1 Year
9.	Electric field Probe	Narda	EP 601	811ZX10351	Oct. 23, 2022	1 Year
10.	RS Test software	EMtrace	EM 3	V1.1.7	N/A	N/A

## $\boxtimes$ Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1. P	Surge Generator	TESEQ	NSG 3060	1480	Oct. 23, 2022	1 Year
2.	CDN	TESEQ	CDN 3061	1408	Oct. 23, 2022	1 Year
3.	EFT-Clamp	PRIMA	EFT-Clamp	abhek	Oct. 13, 2022	1 Year

Surge Immunity Test

	ge minuting rest	1001	be.	N	NOD-	-Yes
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Ar 1.	Combined Wave Lightning Surge Simulator	3Ctest	CCS600	ES3771702	Jul. 05, 2022	1 Year
2.*	Three Phase Power Coupling Network	3Ctest	SEPN69100 T	ES0801757	Jul. 05, 2022	1 Year
3.	Telecom port surge generator	PMI Anbo	TW101	190411	May 13, 2022	1 Year

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## $\square$ Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1. <sup>Ant</sup>	C/S Conducted Immunity Test System	FRANKONIA	CIT-10	126A1196/20 12	Oct. 23, 2022	1 Year
2.	CDN MARK	FRANKONIA	CDN - M2+ M3	A2210178/20 12	Oct. 23, 2022	1 Year
3.	6dB Attenuator	FRANKONIA	DAM 26W	1172202	Oct. 23, 2022	1 Year
4.	CIT-10	FRANKONIA	Version1.1.7	N/A	N/A	N/A
5.	EM-Clamp	FRANKONIA	EMCL-20	18101728-01 03	May 17, 2022	1 Year

#### Power frequency Magnetic Field Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Anbor	Power Frequency Magnetic Field Generator	EVERFINE	EMS61000-8 K	906002	Oct. 23, 2022	1 Year

## $\boxtimes$ Voltage Dips and Interruptions Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
nbotek	CYCLE SAG	PRIMA	DRP61011A	DD10046024	Oct. 23, 2022	1 Voor
pri .	Simulator	PRIVIA	Ginbor	PR 12040234	Oct. 23, 2022	1 Year

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## 1.7. Description of Test Facility

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

## FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

## ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

## Test Location

Shenzhen Anbotek Compliance Laboratory Limited. 1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518128

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## 1.8. EMS Performance Criteria

#### Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### Performance criterion B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

#### Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

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# 2. Power Line Conducted Emission Test

## 2.1. Test Standard and Limit

DAY .		2. · · · · · · · · · · · · · · · · · · ·		1. O.V.	DAY -	(#P2V)	
	Test Standar	d:	BS EN 55032	Anb-	k anbote	k Aupor	AT.
	N.	-0' P''	10	- 02		V. 100'	Dr.

Limits for conducted emission at the AC mains power ports of Class A equipment

	Limits (dBµV)				
Frequency (MHz)	Quasi-peak Level	Average Level			
0.15 ~ 0.50	79.0	66.0			
0.50 ~ 30.00	73.0	60.0 M			
ok soon pri	hoten And	tet abor print			

Remark: The lower limit shall apply at the transition frequencies.

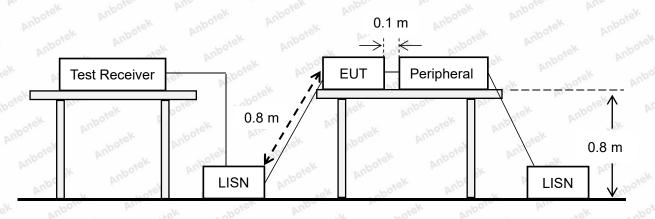
## ☑ Limits for conducted emission at the AC mains power ports of Class B equipment

	Limits (dBµV)					
Frequency (MHz)	Quasi-peak Level	Average Level				
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *				
0.50 ~ 5.00	56.0	46.0				
5.00 ~ 30.00	60.0	50.0				

## Remark:

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

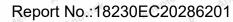
## 2.2. Test Setup



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## 2.3. Test Procedure

<u>Anbotek</u>

**Product Safety** 

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane, and the back of the EUT is 0.4 m away from the vertical ground reference plane, and at least 0.8 m from any other metal surface or ground plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plate, at least 0.8 m away from other metal objects.

Connect EUT to the power mains through an LISN. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the center into a bundle no longer than 0.4 m, so that its length is shortened to 1 m. All the peripherals are connecting to the other LISN.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest disturbance with respect to the limit was found by investigating disturbances at a number of significant frequencies. The probable frequency of maximum disturbance had been found and that the associated cable and EUT configuration and mode of operation had been identified.

Set the test-receiver to quasi peak detect function and average detect function, and to measure the conducted emissions values.

## 2.4. Test Results

#### PASS

The test curves are shown in the following pages.

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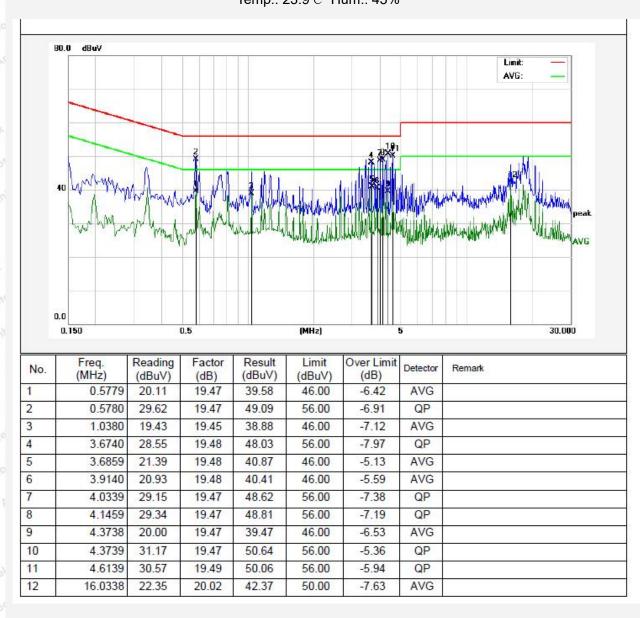


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#### **Power Line Conducted Test Data**

Test Site:
Test Specification:
Comment:

1# Shielded Room AC 230V, 50Hz Live Line Temp.: 23.9℃ Hum.: 45%



Note:

Result = Reading + Factor Over Limit = Result - Limit

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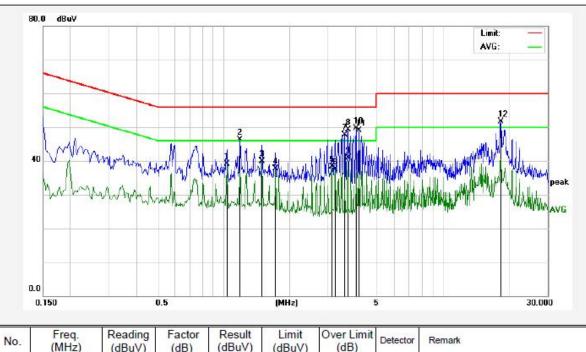


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#### **Power Line Conducted Test Data**

Test Site:
Test Specification:
Comment:

1# Shielded Room AC 230V, 50Hz Neutral Line Temp.: 23.9℃ Hum.: 45%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	(dBuV)	Over Limit (dB)	Detector	Remark
1	1.0380	19.64	19.45	39.09	46.00	-6.91	AVG	
2	1.1900	26.85	19.44	46.29	56.00	-9.71	QP	
3	1.5020	20.56	19.44	40.00	46.00	-6.00	AVG	
4	1.7260	18.22	19.45	37.67	46.00	-8.33	AVG	
5	3.11 <mark>4</mark> 0	18.94	19.46	38.40	46.00	-7.60	AVG	
6	3.2300	18.09	19.46	37.55	46.00	-8.45	AVG	
7	3.5700	28.18	19.48	47.66	56.00	-8.34	QP	
8	3.6860	29.75	19,48	49.23	56.00	-6.77	QP	
9	3.6860	21.35	19.48	40.83	46.00	-5.17	AVG	
10	4.0300	30.19	19.47	49.66	5 <mark>6.00</mark>	-6.34	QP	
11	4.1460	29.66	19.47	49.13	56.00	-6.87	QP	
12	18.3340	31.63	20.13	51.76	60.00	-8.24	QP	

Note:

Result = Reading + Factor Over Limit = Result - Limit

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# 3. Asymmetric Mode Conducted Emission at Telecom Port

## 3.1. Test Standard and Limit

Te	st Standard		BS EN 55032	Anbo, stek	Anbotek	Anboro	pro
	No wo	Der	-+6*	000	pa-	w0'	D.P.

□ Limits for asymmetric mode conducted en	emissions of Class A equipment
---	--------------------------------

Frequency (MHz)	Limits (dBµV)					
	Quasi-peak Level	Average Level				
0.15 ~ 0.50	97.0 ~ 87.0 *	87.0 ~ 74.0 *				
0.50 ~ 30.00	87.0	74.0 photo Andrew				

#### Remark:

The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

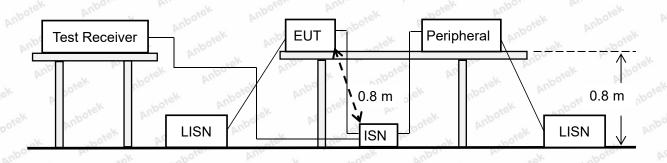
## Limits for asymmetric mode conducted emissions of Class B equipment

	Limits (dBµV)					
Frequency (MHz)	Quasi-peak Level	Average Level				
0.15 ~ 0.50	84.0 ~ 74.0 *	74.0 ~ 44.0 *				
0.50 ~ 30.00	74.0 otek Anborr	64.0				
indiek Aupor Ar.	aboter And	otek Anbo' At.				

#### Remark:

The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

## 3.2. Test Setup



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## 3.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane, and the back of the EUT is 0.4 m away from the vertical ground reference plane, and at least 0.8 m from any other metal surface or ground plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plane, at least 0.8 m away from other metal objects.

Connect EUT to the power mains through an LISN. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the center into a bundle no longer than 0.4 m, so that its length is shortened to 1 m. All the peripherals are connecting to the other LISN.

The EUT was connected to the peripheral equipment through the ISN and linked in normal condition.

Set the test-receiver to quasi peak detect function and average detect function, and to measure the asymmetric mode conducted emission values.

## 3.4. Test Results

PASS

The test curves are shown in the following pages.

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## Asymmetric Mode Conducted Emission Test Data

Test Site:	1# Shielded Room
Test Specification:	AC 230V, 50Hz
Comment:	Telecom Port
	Temp.: 23.9℃ Hum.: 45%

100.0 dBuV Limit: AVG: 50 0.0

	0.150		0.5		(MHz)		5	30.000
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBu∀)	Limit (dBu∀)	Over Limit (dB)	Detector	Remark
1	0.5940	42.43	19.14	61.57	74.00	-12.43	QP	
2	0.5940	40.39	19.14	59.53	64.00	-4.47	AVG	8
3	1.3820	37.40	19.11	56.51	64.00	-7.49	AVG	
4	2.3020	39.42	19.11	58.53	64.00	-5.47	AVG	
5	2.5260	42.04	19.12	61.16	74.00	-12.84	QP	
6	2.5340	39.92	19.12	59.04	64.00	-4.96	AVG	
7	3.6900	43.24	19.14	62.38	74.00	-11.62	QP	
8	3.6900	37.28	19.14	56.42	64.00	-7.58	AVG	
9	3.8980	42.83	19.14	61.97	74.00	-12.03	QP	
10	4.1500	42.31	19.14	61.45	74.00	-12.55	QP	
11	4.3740	44.44	19.14	63.58	74.00	-10.42	QP	
12	4.3740	39.27	19.14	58.41	64.00	-5.59	AVG	6

Note:

Result = Reading + Factor Over Limit = Result - Limit

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# 4. Radiated Emission Test (Below 1 GHz)

## 4.1. Test Standard and Limit

Test Standard		BS EN 55032	Anbo	otek p	Anbotek	Anboro	And And	ŝ
 N	0.5	- P.	-			1	D.	-

Limit for radiated emissions at frequencies up to 1 GHz for class A equipment

Frequency (MHz)				Distanc	e	Field Strengths Limit (dBµV/m)			
				(Meters	s)				
Anboten	30 ~ 230	Anboyek	Anb	o'	Anbotek	Anbore	50	Anbotek	
Anbor	230 ~ 1000	ANDO	ter l	3	Anbotek	Anbore	57 botek	Anbot	

Remark: The lower limit shall apply at the transition frequencies.

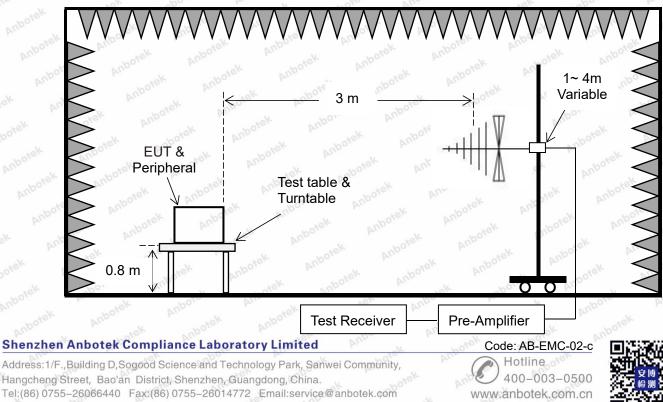
nbote	$\boxtimes$ Limit for radiated em	issions at frequencies up to 1 GH	Iz for class B equipment		
	Frequency	Distance	Field Strengths Limit (dBµV/m)		
	(MHz)	(Meters)			
Р К-	30 ~ 230	otek Anboig Anbo	40 <sup>botet</sup> 40 <sup>bote</sup>		

3

Remark: The lower limit shall apply at the transition frequencies.

## 4.2. Test Setup

230~1000





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## 4.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plane.

The EUT was set 3 m away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 m to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The bandwidth of the Receiver is set at 120 kHz.

## 4.4. Test Results

PASS

The test curves are shown in the following pages.

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#### Report No.:18230EC20286201 Page 23 of 59 Test item: **Radiation Test** Polarization: Horizontal (RE)BS EN 55032 Power Source: Standard: AC 230V, 50Hz 30MHz ~ 1000MHz Frequency Range: Temp.(℃)/Hum.(%RH): 24.3( Distance: 3m



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	38.2120	50.05	-16.90	33.15	40.00	-6.85	QP			
2	74.1350	55.15	-22.03	33.12	40.00	-6.88	QP			
3	128.1128	54.79	-22.77	32.02	40.00	-7.98	QP			
4	181.2834	55.78	-23.13	32.65	40.00	-7.35	QP			
5	212.2693	55.90	-22.12	33.78	40.00	-6.22	QP			
6	360.4476	55.23	-16.02	39.21	47.00	-7.79	QP		1	
In:	N.	~0 <sup>70</sup>	DUn		*0 <sup>14</sup>	do			M	LOTO AN

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Code: AB-EMC-02-c Hotline 400-003-0500 www.anbotek.com.cn



°C)/49%RH



#### Page 24 of 59 Report No.:18230EC20286201 Test item: Radiation Test Polarization: Vertical Standard: (RE)BS EN 55032 Power Source: AC 230V, 50Hz Frequency Range: 30MHz ~ 1000MHz Temp.(°C)/Hum.(%RH): °C)/49%RH 24.3( Distance: 3m 80.0 dBuV/m Limit: Margin: 40 mum Mullipson min When low with the 1M Autouting 0.0 30.000 70 80 (MHz) 300 400 1000.000 40 50 60 500 600 700 Reading Factor Result Limit Over Limit Freq. Height degree Detector No. Remark (dBuV/m) (dB) (cm) (deg) (MHz) (dBuV) (dB/m)(dBuV/m) 44.99 -15.13 29.86 -10.14 QP 1 38.8878 40.00 2 -18.55 -7.72 QP 84.9993 50.83 32.28 40.00 3 33.36 40.00 QP 124.1329 53.93 -20.57 -6.64 33.00 40.00 -7.00 QP 4 183,8439 53.42 -20.42 33.14 360.4476 -14.88 47.00 -13.86 QP 5 48.02 6 701.7609 49.43 -9.89 39.54 47.00 -7.46 QP Over Limit=Result-Limit Note: Result= Reading + Factor

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# 5. Radiated Emission Test (Above 1GHz)

## 5.1. Test Standard and Limit

Iest Standard BS EN 55032	Test Standard BS EN 55032
---------------------------	---------------------------

Limit for radiated emissions at frequencies above 1 GHz for class A equipment

Frequency	Distance	Field Strengths Limit (dBµV/m)				
(MHz)	(Meters)	Peak	Average			
1000 ~ 3000	Anbore 3 And hotek	76 Million 76	56 Anbore			
3000 ~ 6000	Anboit 3 Annu sot	80 Ano	60 <sup>°</sup> M <sup>000</sup>			

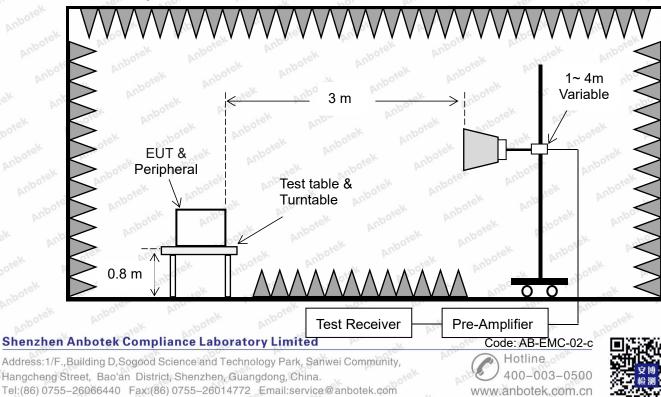
Remark: The lower limit shall apply at the transition frequencies.

#### ☑ Limit for radiated emissions at frequencies above 1 GHz for class B equipment

Frequency (MHz)		Distance (Meters)		Field Strengths Limit (dBµV/m)				
				Peak			Average	
1000 ~ 3000	rek p	3	Aupore	Ani ak	70	Anbolek	50	nb
3000 ~ 6000	otek	3 otek	Ant	ore	74 orek	Anbote	54	0
	(MHz) 1000 ~ 3000	(MHz) 1000 ~ 3000	(MHz) (Meters) 1000 ~ 3000 3	(MHz) (Meters) 1000 ~ 3000 3	(MHz) (Meters) 1000 ~ 3000 3	(MHz)         (Meters)         Peak           1000 ~ 3000         3         70	(MHz)         (Meters)         Peak           1000 ~ 3000         3         70	(MHz)         (Meters)         Peak         Average           1000 ~ 3000         3         70         50

Remark: The lower limit shall apply at the transition frequencies.

## 5.2. Test Setup





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## 5.3. Test Procedure

The table-top EUT is placed on a non-conductive table 0.8 m above the horizontal ground reference plane. The floor-standing EUT is placed on an insulating support 0.1 m above the horizontal ground reference plane.

The EUT was set 3 m away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 m to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The test receiver is set to peak and average detects function.

The bandwidth of the test receiver is set at 1MHz.

## 5.4. Test Results

PASS

The test curves are shown in the following pages.

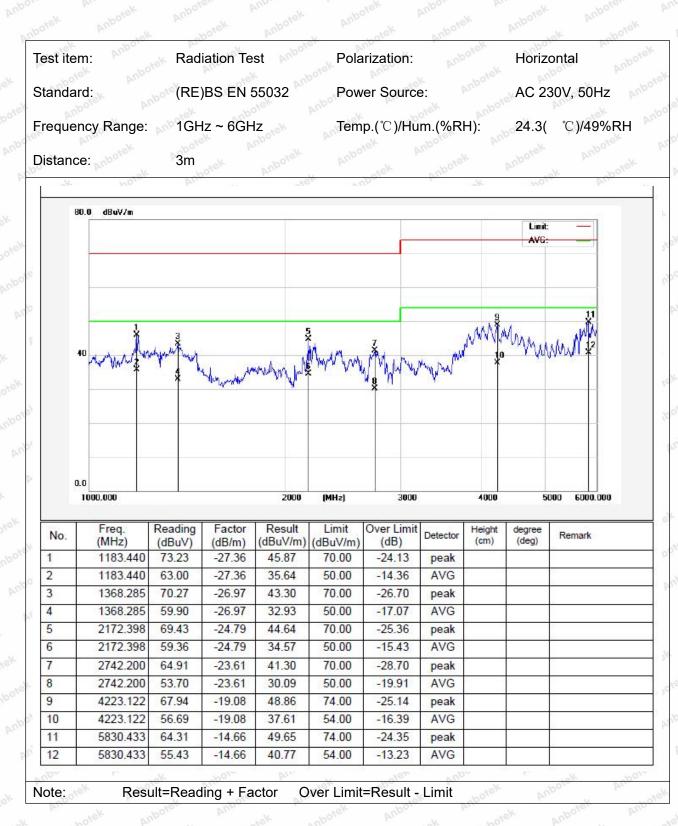
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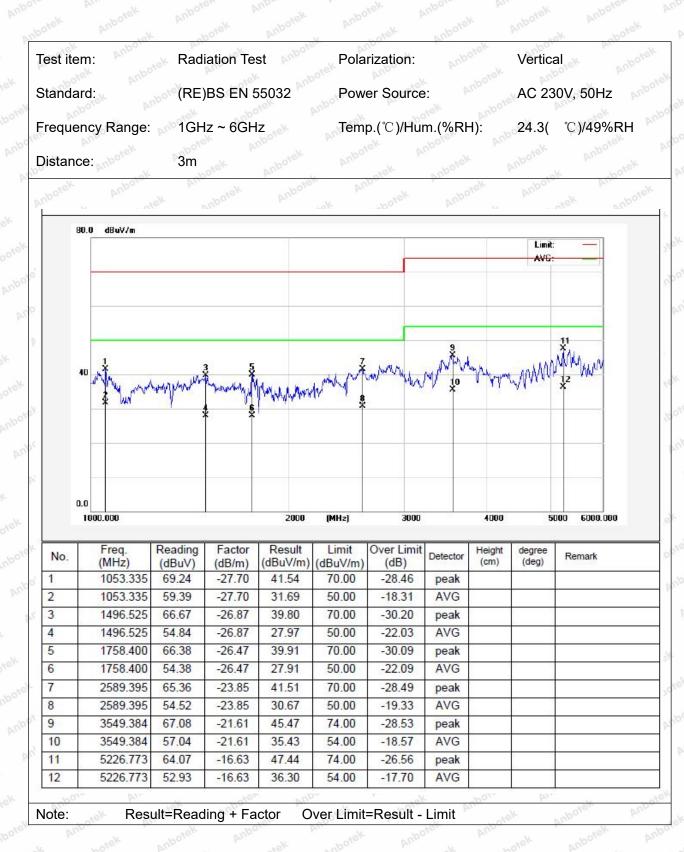
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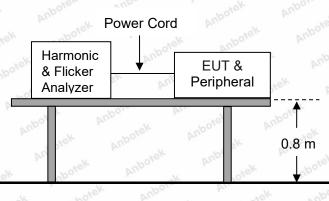
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# 6. Harmonic Current Test

## 6.1. Test Standard

	Test Star	ndard:	BS EN I	EC 61000-3-2	nbo votek	Anbotek	Anbore	Ano
ek v	Anbotek	Anbo,	Anbotek	Anboten	Anbotek	Anbotek	Anborek	Anbo

## 6.2. Test Setup



## 6.3. Test Procedure

The table-top EUT is placed on the top of a wooden table 0.8 m above the ground (0.1 m for the floor-standing EUT) and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn. 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 necessary for the EUT to be exercised.

## 6.4. Test Results

(The active input power of the EUT is less than 75W. Therefore, according to BS EN IEC 61000-3-2, no limits are necessary.)

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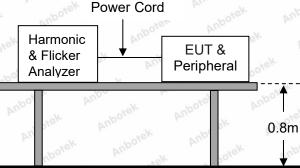


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# 7. Voltage Fluctuations & Flicker Test

## 7.1. Test Standard

	Test Stan	dard:	BS EN 61	000-3-3	housek	Anbotek	Anbots	Annabotek
rek.	Anbotek	Anbo' A	Anbotek	Anboten	Anbotek	Anbotek	Anbor	Anbo
7.2.	Test Setup							
			Anbore	Anconbo				



## 7.3. Test Procedure

The table-top EUT is placed on the top of a wooden table 0.8 m above the ground (0.1 m for the floor-standing EUT) and operated to produce the most unfavorable sequence of voltage changes under normal conditions during the flicker measurement. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

## 7.4. Test Results

## PASS

The test curves are shown in the following pages.

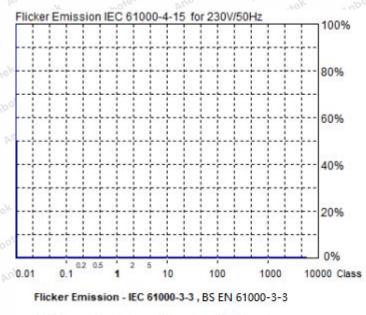
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Actual Flicker (Fli):	0.00
Short-term Flicker (Pst)	0.07
Limit (Pst):	1.00
Long-term Flicker (Plt):	0.00
Limit (Plt):	0.65
Maximum Relative Volt. Change (dmax):	0.00%
Limit (dmax):	4.00%
Relative Steady-state Voltage Change (dc):	0.02%
Limit (dc):	3.30%
Tmax 3.30% (dt):	0.00ms
Limit (dt>Lim):	500ms

Range:

V-nom:

Urms =	229.5	V	P =	55.22 W	
irms =	0.317	A	pf =	0.758	

#### Test aborted, Result: PASSED

Flicker Test Summary (Run time)

HAR-1000 EMC-Parts

50 A 230 V

Full Bar : Actual Values Empty Bar : Maximum Values Circles : Average Values Blue : Current , Green : Voltage , Red : Failed

Urms =	229.5V	Freq =	50.000	Range:	50 A
Irms =	0.317A	lpk =	0.537A	cf =	1.692
P =>	55.22W	S=**	72.85VA	pf =	0.758

Test - Time : 10 x 1min = 10min (100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits : Plt	: 0.65	Pst :	1.00	
	dmax :	4.00 %	dc :	3.30 %
	dtLim:	3.30 %	dt>Lim:	500ms

Test aborted, Result: PASSED

1

dmax	dc	dt>Lim	
[%]	[%]	[ms]	
0.000	0.000	0.000	

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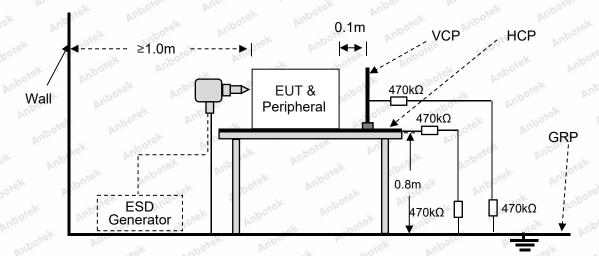
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## 8. Electrostatic Discharge Immunity Test

## 8.1. Test Specification

Test Standard :		BS EN 55035	Anbo	Anbotek	Anbote	Ano
Basic standard :		IEC 61000-4-2	2: 2008	ak Anbotek	Anbor	K Pr.
Performance criter	ia:	Bek Anbor	and And	otek Anbot	Anbo	otek
Test Level :		± 8kV (Air Dis	charge)	± 4kV (Co	ontact Discha	irge)

## 8.2. Test Setup



## 8.3. Test Procedure

a. In the case of air discharge testing, the climatic conditions shall be within the following ranges:

- Ambient temperature: 15°C to 35°C;
- Relative humidity: 30% to 60%;
- Atmospheric pressure: 86 kPa (860 mbar) to 106 kPa (1060 mbar)

b. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

c. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted: - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate. - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge. - The contact discharge test shall not be applied to such surfaces.

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**Product Safety** 

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d. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

e. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final test level should not exceed the product specification value in order to avoid damage to the equipment.

f. The test shall be performed with both air discharge and contact discharge. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied. For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

g. Ensure that the applied charge on the EUT has been dis-charged before next ESD pulse.

## 8.4. Test Results

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# **Electrostatic Discharge Test Results**

Test Result:	🛛 Pass 🗌 Fail	Temperature:	23.5℃
Power Supply:	AC 230V, 50Hz	Humidity:	45%

potek Anbore Anbotek Anbotek	Location	botek Anbot	<b>Kind</b> A-Air Discharge C-Contact Discharge	Result
Air discharge: ±2.0 kV,	±4.0 kV, ±8.0 kV	Anbo, Al.	Contact discharge: ±4.0	kV potek Anbotek
USB Port	otek Anboter 4	points	Anbotek C Anbore	A B C
Screw	nbolek Anbole 4	points	Ambotek C Ambo	A B C
Slot	Anb4	points	Anboten Anbo	A B C
Metal	Anbotek P4	points	stek Ant C Ant	A B C
Button	Anbotek 4	points	obotek Abote A	A B C
AC Port	tek Anboten 4	points	Anbotek AAnbote	A B C
Type-C Port	tootek Anboten 4	points	Anbotek C Anbot	A B C
LAN Port	Anbotek Anbote	points	Anbore C Anbor	A B C
VGA Port	Anbotek A4	points	rek Anb C Anbo	A B C
HDMI Port	Anbotek 4	points	botek ACoten Ar	A B C
AUX IN Port	ek Anbotek 4	points	anbotek Anbote	A B C
AUX OUT Port	botek Anbotek 4	points	Anbotek A Anbote	A B C
Light	atotek Anbola	points	Anbotek A Anbote	A B C
Switch	abotek Ar4	points	ek AnbolAk Anbo	A B C
DVI Port	Anbotek 4	points	Dotek Art An	A B C
HCP	ak anbotek 4	points	abotek Cobotek	A B C
VCP of the front	oter Anbotek 4	points	And Abotek C Anboten	A B C
VCP of the rear	atek Anboia	points	Anbotek C Anbote	A DB DC
VCP of the left	And abotek Ani4	points	A Anboi C Anboi	A B C
VCP of the right	abotek 4	points	atek Ant	A DB C
Note: N/A	k abotek	Anboren An	hotek Anbotek	Inpo. All All All

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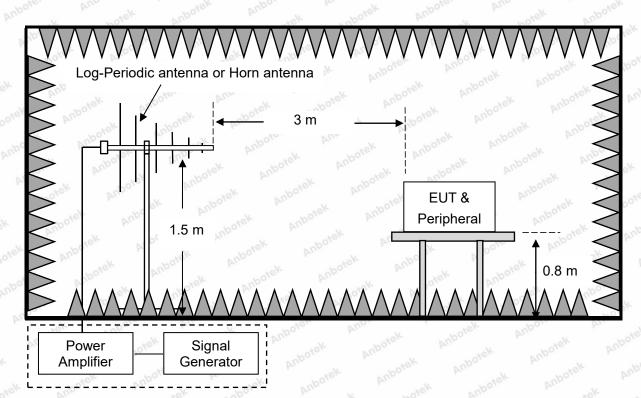
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# 9. RF Field Strength Immunity Test

## 9.1. Test Specification

Test Standard:	BS EN 55035	lek Aupon p	unbotek Anboten Ano		
Basic standard:	IEC 61000-4-3: 2020				
Performance criteria:	A	Aoten Anbou	A abotek Anbote At		
Frequency Range:	80MHz to 1000MHz	Spot frequencies	Additional spot frequencies		
Test level:	3 V/m	3 V/m 👓	3 V/m		
Modulation:	1kHz Sine Wave, 80%, AM Modulation				
Frequency Step:	1 % of preceding frequency value				
Polarity of Antenna:	Horizontal and Vertical				
Test Distance:	3 m	Anboy ek abotek	Anboten And hotek		
Antenna Height:	1.5 m	Anbo, ak abo	iek Anboren Andrek		
Dwell Time:	at least 0.5s	Anbor An	botek Anboter Anb		
-00 ··· Pr.			Additional spot frequencies:		
80 MHz, 120 MHz, 160	MHz, 230 MHz, 434 MHz	z, 460 MHz, 600 MHz	, 863 MHz and 900 MHz .		

## 9.2. Test Setup



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## 9.3. Test Procedure

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**Product Safety** 

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semi-anechoic chamber.

a. The antenna is placed 3 m from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the antenna.

b. The test shall normally be performed with the generating antenna facing each side of the EUT. When equipment can be used in different orientations (i.e. vertical or horizontal) all sides shall be exposed to the field during the test. When technically justified, some EUTs can be tested by exposing fewer faces to the generating antenna. In other cases, as determined for example by the type and size of EUT or the frequencies of test, more than four azimuths may need to be exposed.

c. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.

d. The step size of the frequency is set to 1%. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond. However, the dwell time should not exceed 5 s at each of the frequencies during the scan.

## 9.4. Test Results

PASS

Please refer to the following page.

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# Report No.:18230EC20286201 Page 37 of 59 RF Field Strength Susceptibility Test Results

DID CONTRACT	2010	P.U.	10ton	10 m	r .	N.	1001
Test Result:	🛛 🖂 Pas	s 🗌 Fail	Temperature:	Anbotek	23.8℃ <sup>°</sup>	otek I	Anbote
Power Supply:	AC 230	V, 50Hz	Humidity:		51%		
tek Anborr Ai	botek	Anboren Anb	stek nbotek	Anb	on of	p	L P
	Antenna Polarity	R.F. Field Strength	Dwell Time	Azin	nuth	Res	sult
Anbotek Anbot	ek Anbo	ek Anboter	Anbotek	Anbotek	ont Anbo	otek	Anbotek
80 MHz ~ 1000	H/V	3 V/m	ek taboten	Re	ear		A B
MHz	Anbotek	Anborto Villi Ant	potek Anbotek	Le	eft	Anb	C
thek abotek	Anbotek	Anbornotek	Anbotek Anbo	Rię	ght	Anbo	tek.
Anbotek Anbotek		ak Anbotek	Anbotek An	Fre	0.00		
	H/V Anbot	3 V/m	1s of	Re	ear 📈		A <sup>botek</sup>
frequencies	H/V An	Anbotek Anbot	otek Anbotek	Le	eft	Anbore L	C
potek Anboten	Anochotek	Anbotek An	por An	Rig	ght	Anbabo	eK.
Anbotek Anbotek		Anbotek	Anbotek Ant	o <sup>vek</sup> Fro	ont		
Additional spot	H / V Anbote	3 V/m	nboten	Re	ear <sup>And</sup>	otek	A B
frequencies	otek Ant	obotek Anbote	-tek	AnborLe	eft	nbotek 🗌	CAnbot
Anb abotek A	nbotek I	an otek ant	pren Ano	Rig	ght	Anbotek	PUL
Note: N/A		Anbo Anbotek					

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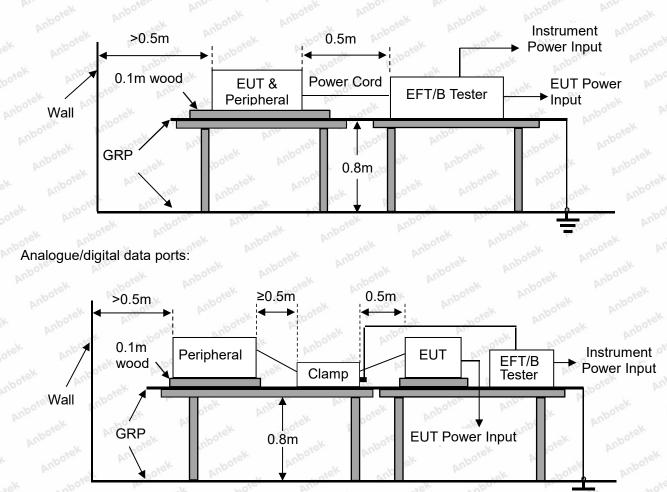
## **10. Electrical Fast Transient/Burst Immunity Test**

## 10.1. Test Specification

Test Standard:	BS EN 55035
Basic standard:	IEC 61000-4-4: 2012
Performance criteria:	B tek subotek Anbotek Anbotek Anbotek Anbotek Anbotek
Test Level:	□ 1 kV, AC mains power ports
	□ 0.5 kV, DC network power ports
4	0.5 kV, Analogue/digital data ports

## 10.2. Test Setup

AC mains power ports and DC network power ports:



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## 10.3. Test Procedure

The table-top EUT is placed on a table that is 0.8 m height, a ground reference plane is placed on the table, and uses 0.1 m insulation between the EUT and ground reference plane. The floor-standing EUT is placed on a ground reference plane and insulated from it by an insulating support with a thickness of 0.1 m. This reference ground plane shall project beyond the EUT by at least 0.1 m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5 m.

All cables to the EUT shall be placed on the insulation support 0.1 m above the ground reference plane. Cables not subject to electrical fast transients shall be routed as far as possible from the cable under test to minimize the coupling between the cables.

## 10.4. Test Results

## PASS

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# Report No.:18230EC20286201 Page 40 of 59 Electrical Fast Transient/Burst Test Results

	VL 140'	D.1. *C.	- 00-	V. VaO'
Test Result:	🛛 Pass 🗌	Fail Temperat	ure: 23.1	°C
Power Supply:	AC 230V, 50H	z Humidity:	48%	Anototek Anbo
tek Anbor	abotek Anbote	Antowotek	Anbotek Anbo	K shotek Ar
Ports	Polarity	Inject Time(s)	Test Voltage (kV)	Result
AC mains power ports	otek ±lbotek	120 s	1.0 kV	⊠A □B □C
DC network power ports	Anbotek ± Anbotek	120 s	0.5 kV	□A □B □C
Analogue/digital data ports (xx Line)	Anbotan And	120 s	0.5 kV	□A □B □C
Note: N/A	otek Anboten otek	Anto Anbotek Anbote	Anbour A	Anbotek Anboten

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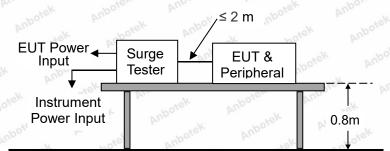
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## 11. Surge Immunity Test

## 11.1. Test Specification

	0.00	-ok -bo.	An in the solution of the solu
3 <sup>1</sup> 4		Test Standard:	BS EN 55035
		Basic standard:	IEC 61000-4-5: 2014+A1:2017
			⊠ 1 kV, Line to Line, Criterion B
Þ2	AC power port:		⊠ 2kV, Line to Ground, Criterion B
-	Test	DC network power port:	0.5kV, Line to Reference Ground, Criterion B
4	evel	Coaxial or shielded port:	0.5kV, Shield to Ground, Criterion B
		Unshielded symmetrical port:	$\Box$ 1 kV and 4 kV, Lines to Ground , Primary protection, Criterion C
05			□ 1 kV, Lines to Ground , Non primary protection, Criterion C
ΩÎ	Numb	per of surges	5 (for each combination of parameters)
F	Repet	tition rate	1 minute / time
F	Polarity:		Positive / Negative
F	Phase angle:		90°, 270° (Only AC mains power ports)
ze'		NOP N	note Ann rick adam we have

## 11.2. Test Setup



## 11.3. Test Procedure

Table-top EUT is placed on a table of 0.8 m heights above a metal ground reference plane. Floor standing EUT is placed on a ground reference plane and insulated from it by an insulating support with a thickness of 0.1 m. The length of the power cord between the EUT and the coupling/decoupling network is not more than 2 m, and the length of the interconnection line between the EUT and the coupling/decoupling network is not more than 2 m. The tests were done at repetition rate 1 per minute.

## 11.4. Test Results

## PASS

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# Surge Immunity Test Results

abold All	No.	noter	Anb	*ek	abort a	Pro	No. No.	oter
Test Result:		🛛 Pas	s 🗌 Fail	Temperature :		<b>23</b> .1℃		
Power Supply :	Anbo	AC 230	√, 50Hz	Humidity :	Anborr	48%	anbotek.	P
ar Aupor	- A	otek	Anboron Ann	otek Anbotek	AUL	e.	pir botek	
Location	e Pol	arity	Phase Angle	Number of Pulse		Voltage XV)	Resul	t
AC power po	rt (Wav	eform: 1.	2 us / 50 us (8 us	s / 20us))				
Anbotek	Anbotek	+ Anbo	□ 0° ⊠ 90° □ 180° □ 270°	Anbotek 5	0.5,	1kV	⊠A□B	
k L-Notek	Ant	otek	□ 0° □ 90° □ 180° ⊠ 270°	potek 5 Anbotek	0.5,	1kV	⊠A□B	
L-GND	ek p	Anbotek	□ 0° ⊠ 90° □ 180° □ 270°	Anboren 5	0.5, ŕ	1, 2kV	⊠A□B	e
Anborotek	Anbotek	Anbot	□ 0° □ 90° □ 180° ⊠ 270°	Anto 5 <sup>ekt</sup>	0.5, 1	1, 2kV	AB	ľ
N-GND	Anbors	Jiek Ar.	□ 0° ⊠ 90° □ 180° □ 270°	otek 5 Anbotek	0.5, 1	1, 2kV	⊠A□B	
abotek Anbote	K P	+botek	□ 0° □ 90° □ 180° ⊠ 270°	anbotek 5 Anbot	0.5, <sup>2</sup>	1, 2kV	⊠A⊡B	e <sup>k</sup>
DC network p	power po	rts (Wa	veform: 1.2 us / 5	50 us (8 us / 20us	)) otek	Anbore	Ann	
Line to	Inboten	+ Ano	stek Inbotek	Anbot 5	0.5	5kV 🔊		
Reference ground	Anboten	Anb	stek / subote	5	0.5	ōkV	AB	201
Analogue/dig	ital data	ports (V	Vaveform: 10 us /	/ 700 us (5 us / 32	20us)) :	hotek	Anbotek	
te Any note	r Þí	porek	Anbo	nbotek 5 Anbote	0.5,	1kV	AB	
Lines to ground	otek	Anbotek	Anbo	anbotek 5 Anb	0.5,	1kV	AB	
Analogue/dig	ital data	ports (V	Vaveform: 10 us /	/ 700 us (5 us / 3	20us)) :	Ann	Hek Ant	pore
Anbois	botek	+ Anbr	non Anbu	5 <sup>oten</sup>	100)	2, 4kV	AB	2.00
Lines to ground	Put of	et p	nboten / Anbo	tek 5.nbotek	0.5, 1,	2, 4kV	□A□B	
Analogue/dig	ital data	ports (V	Vaveform: 1.2 us	/ 50 us (8 us / 20	us)): C	oaxial or	shielded lin	es
potek Anbor	40%	+ nbotek	Anboten	botek 5 Anb	0.5	ōkV	AB	
Shield to ground	dek.	Anbotek	Angore	bos 5 p	0.5	ōkV	AB	079
Note: N/A	nbotek	Anbo	tek Anborek	Anbotek	Anbotek	Anbe	botek p	Anbr

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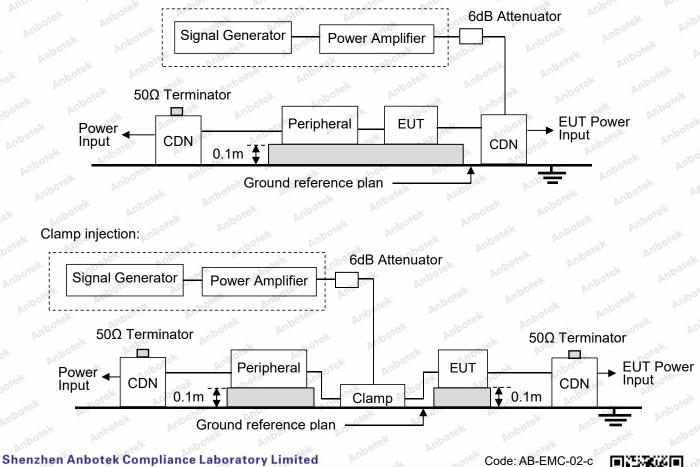
## 12. Injected Currents Susceptibility Test

## 12.1. Test Specification

Test Standard:	BS EN 55035	Anboin Alin	ak Anboren And
Basic standard:	IEC 61000-4-6: 2013	botek Anbor An	potek Anboten Anu
Performance criteria:	Abotek Anbounder	Anbotek Anbotek	Anbotek Anbotek
Frequency range:	0.15MHz to 10MHz	10MHz to 30MHz	30MHz to 80MHz
Test level:	3V Antoniol Antoniol	3V to 1V	1V Anbore Anbor
Modulation:	AM 80%, 1kHz sine-wave	hotek Anbotek Anb	oter And And
Frequency Step:	1% of fundamental	Anbotek Anbotek	Anbotek Anbotek

## 12.2. Test Setup

CDN injection:



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## 12.3. Test Procedure

a. The EUT and peripheral are placed on an insulating support of 0.1 m height above a ground reference plan. The distance between EUT and CDN is 0.1 m to 0.3 m. All cables exiting the EUT are supported at a height of at least 30 mm above the ground reference plan.

b. The frequency range is swept from 150 kHz to 80MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. The frequency range is swept incrementally. The step size was 1% of fundamental from 0.15MHz to 80MHz.

c. The dwell time at each frequency isn't less than the time necessary for the EUT to be able to respond.

## 12.4. Test Results

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# Report No.:18230EC20286201 Page 45 of 59 Injected Currents Susceptibility Test Results

Test Result:	🛛 Pass 🗌 Fail	Temperature:	Anbotek	23.1℃	antek Anbote
Power Supply:	AC 230V, 50Hz	Humidity:	Anbote	48%	abotek Anb
ek Anbore Ain	botek Anboten Anb	tek obotek	AND	.V.	prin wotek
Frequency Range (MHz)	Injected Position	Strength (Un-mod	dulated)	nbotek	Result
0.15 ~ 10	AC Mains	Antonie 3V	anbotek	⊠A	□в □С
10 ~ 30	AC Mains	3V to 1V	Anbotel	⊠A	□в □С
30 ~ 80	AC Mains	Jorek 1Vek	Anbr	⊠A	□B □C
poter Andrek	Anbotek Anboi An	Anborek Anbore	A	no botek	Anbotek
0.15 ~ 10	Anbotek Anbo	Anborek 3V Anb	botek	A	□в □С
10 ~ 30	Anboi Anboitek	3V to 1V	Anbotek		□в □С
30 ~ 80	otek Anbotek Anbot	1V	Anbo	A	□B □C
Note: N/A	hotek Anbotek An	otek nbotel	r pr	ibolic ok	Ann hotek

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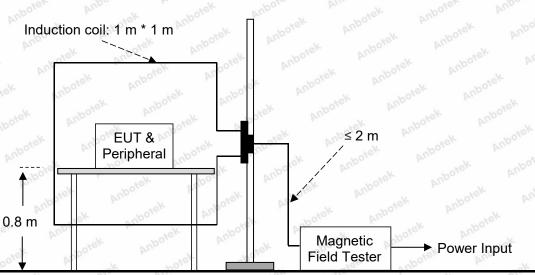
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## **13. Power Frequency Magnetic Field Immunity Test**

## 13.1. Test Specification

Test Standard:	BS EN 55035
Basic Standard	IEC 61000-4-8: 2009
Performance criteria	Apotek Anbotek Anbotek Anbotek Anbotek Anbotek Anbotek Anbotek
Test level	1A/m Andrek Andrek Andrek Andrek Andrek Andrek Andrek

## 13.2. Test Setup



## 13.3. Test Procedure

Table-top EUT is placed on a table that is 0.8 m height. Floor standing EUT is placed on a ground reference plane and insulated from it by an insulating support with a thickness of 0.1 m.

The EUT is placed in the middle of an induction coil. The proximity method is used when the EUT does not fit into the standard inductive coil

## 13.4. Test Results

#### Not applicable.

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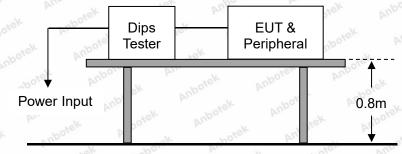
## Report No.:18230EC20286201

## 14. Voltage Dips and Interruptions Immunity Test

## 14.1. Test Specification

Test Standard:	BS EN 55035
Basic standard:	IEC 61000-4-11: 2020
Test level:	⊠ 0%, 0.5 period, Criterion B
	⊠ 70%, 25 periods for 50Hz, Criteria C
	⊠ 0%, 250 periods for 50Hz, Criteria C
-	☐ 70%, 30 periods for 60Hz, Criteria C
5	□ 0%, 300 periods for 60Hz, Criteria C

## 14.2. Test Setup



## 14.3. Test Procedure

- a. Where the equipment has a rated voltage the following shall apply:
- If the voltage range does not exceed 20% of the lower voltage specified for the rated voltage range, a single voltage within that range may be specified as a basis for test level specification.
- In all other cases, the test procedure shall be applied for both the lowest and highest voltages declared
- in the voltage range.
- b. Test Conditions
- Select operated voltage and frequency of EUT Test of interval: 10 sec.
- Level and duration: Sequence of 3 dips/interrupts.
- Voltage rise (and fall) time: 1.5  $\mu$ s.
- c. Changes to occur at 0 degree crossover point of the voltage waveform.

## 14.4. Test Results

## PASS

Please refer to the following page.

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# Report No.:18230EC20286201 Page 48 of 59 Voltage Dips and Interruptions Test Results

D.1 **			
Test Result:	🛛 Pass 🗌 Fail	Temperature :	23.1℃
Power Supply :	AC 230V, 50Hz	Humidity :	48%
her Anbo ek ab	otek Anbots Am	otek Anbotek Ant	ok spotek Ar
Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (in periods)	Result
Anborek 0 Anborek	100	Antone 0.5P	A B C
70 Million	30 And	25P	⊠A □B □C
potek Anboten Anb	nbotek Anbotek An	botek Anbotek A	hbotek Anbotek
Anbotek Anbo	Anbotek Anbotek	Anbotek Anbotek	Anbo
Anbo. A botek	Anbote. And stek	unbotek Anbo	hi botek Anbote
Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (in periods)	Result
hotek Onbotek A	100	250P	□A □B ⊠C
Anbotek Anbotek	Anbotek Anbotek	Anborek Anborek	Anbotek Anbotek
Anbote, Anu botek	Anbotek Anbor		ek abotek Anbote

Note: N/A

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## **APPENDIX I -- TEST SETUP PHOTOGRAPH**

Photo of Power Line Conducted Emission Test



Photo of Asymmetric Mode Conducted Emission at Telecom Port



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## Photo of Radiated Emission Test (Below 1 GHz)

### Photo of Radiated Emission Test (Above 1GHz)



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#### Photo of Harmonic Current And Flicker Test

Photo of Electrostatic Discharge Immunity Test



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## Photo of RF Field Strength Immunity Test



## Photo of Electrical Fast Transient/Burst Immunity Test



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#### Photo of Surge Immunity Test

Photo of Injected Currents Susceptibility Test



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## Photo of Voltage Dips and Interruptions Immunity Test

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## **APPENDIX II -- EXTERNAL PHOTOGRAPH**

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NOITUAS





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## **APPENDIX III -- INTERNAL PHOTOGRAPH**

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## **UKCA Label**

- The UKCA conformity marking must consist of the initials 'UKCA' taking the following form: If the UKCA marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.
- 2. The UKCA marking must have a height of at least 5 mm except where this is not possible on account of the nature of the apparatus.
- 3. The UKCA marking must be affixed visibly, legibly and indelibly.
- It must have the same height as the initials 'UKCA'.

----- End of Report ----

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