EMC Test Report

Report No.: AGC06276191201EV01

APPLICANT	:	GlobTek, Inc.
ADDRESS	:	186 Veterans Dr Northvale, NJ 07647, U.S.A.
PRODUCT DESIGNATION	:	DC/DC Switching Power Supply
TEST MODEL	:	GTD83050-0505
SERIES MODEL	:	GTD83050-WW05（WW is the standard output wattage, which can be “01” to “05”, with interval of 1.）
NUMBER OF TEST SAMPLES	:	1pcs
SAMPLE RECEIVED DATE	:	Dec. 18, 2019
DATE OF TEST	:	Dec. 18, 2019-Jan. 13, 2020
STANDARD(S)	:	EN 50498:2010
TEST RESULTS	:	Pass

Prepared By	Tom Yin(Yin Pan)	Jan. 15, 2020
Reviewed By	Saky Guo(Guo Yanchao)	Jan. 15, 2020
Approved By	Mark Yang(Yang Qian) Authorized Officer	Feb. 28, 2020

***New Energy Inspection*(Shenzhen) Co., Ltd**

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Report Revise Record

Report version	Revise time	Issued date	Valid version	Notes
V1.0	/	Feb. 28, 2020	valid	Original Report

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1. VERIFICATION OF CONFORMITY

Applicant	GlobTek, Inc.
Address	186 Veterans Dr Northvale, NJ 07647, U.S.A.
Manufacturer	GlobTek (Suzhou) Co., Ltd
Address	Building 4, No. 76 JinLing East Road, Suzhou Industrial Park, Suzhou, JiangSu, 215021, China
Product Designation	DC/DC Switching Power Supply
Test Model	GTD83050-0505
Series Model	GTD83050-WW05（WW is the standard output wattage, which can be “01” to “05”, with interval of 1.）
Brand Name	GlobTek
Sample number	191218008
Sample submitting way	■Provided by customer □Sampling
Sample grounding method	Remote ground
Deviation	None
Condition of Test Sample	Normal

Note: 1.The test results of this report relate only to the tested sample in this report.

2. Each test follows test standard in page 1 and with no deviation

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2. TEST RESULT SUMMARY

Test item	Test Standard	Result
RADIATED EMISSION	EN 50498:2010	Pass
TRANSIENT EMISSION	EN 50498:2010	Pass
TRANSIENT IMMUNITY	EN 50498:2010	Pass

3. TEST MODE

Mode	Mode description
Normal mode	Power on works normally

4. MEASUREMENT UNECERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by ISO.

- Uncertainty of Radiated Emission, Uc = ±3.73dB

5. PRODUCT INFORMATION

Housing Type	Plastic and metal
EUT Input Rating	DC 12V & DC 24V

6. TEST FACILITY AND LABORATORY

Site	New Energy Inspection(Shenzhen) Co., Ltd
Location	West,1/F., Building D, Qinyu Technical Industrial Park, Sanwei, Nanchang community ,Bao’an Road, Xixiang, Shenzhen, Guangdong, China
Description	Test Method according to EN 50498:2010

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7. TEST EQUIPMENT

7.1 SUPPORT EQUIPMENT

Cable of Product:

No.	Cable Type	Quantity	Provider	Length(m)	Specification	Note
1	Power line	2	/	1.7	Unshielded	NEI

Support equipment:

No.	Device Type	Brand	Model	Serial No.	Data Cable	Power Cable
1	Digit multimeter	UNI-T	UT33A+	C191174428	/	/
2	Load	/	/	/	/	/

7.2 OBSERVATIONMETHOD FOR IMMUNITY TEST

Method	Description of the monitoring methods
1	Monitor multimeter readings

7.3 EQUIPMENT LIST

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Chamber1#	ETS-Lindgren	/	CT001566-1317	2019.12.28	2022.12.27
Test Receiver	KEYSIGHT	N9038A	MY57290101	2019.05.17	2020.05.16
Biconical Antenna	Schwarzbeck	VHBB 9124	9124-769	2019.06.16	2021.06.15
Log Periodic Dipole antenna	ETS-Lindgren	3148B	00213123	2019.06.16	2021.06.15
V-network	Schwarzbeck	NNBM 8124	01221	2019.05.17	2020.05.16
V-network	Schwarzbeck	NNBM 8124	01229	2019.05.17	2020.05.16

TEST EQUIPMENT OF TRANSIENT EMISSION

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Switching mode power supply	Schwarzbeck	HCS-3604	UG271600882	2019.05.17	2020.05.16
VTE743T1 Master	3c-test	VTE 743T1	EC7141812	2019.06.20	2020.06.19
Mechanical switch	3c-test	MS-743T1	FJE331812	2019.06.20	2020.06.19
Electronic switch	3c-test	ES-74T1	FJE321812	2019.06.20	2020.06.19

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TEST EQUIPMENT OF TRANSIENT IMMUNITY TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Voltage Drop Simulator	EM Test	VDS 200	1199-06	2019.05.17	2020.05.16
Electrical Fast Transient Generator	EM Test	EFT 200	0503-03	2019.05.17	2020.05.16
Micropulse Generator	EM Test	MPG 200	0503-06	2019.05.17	2020.05.16

7.4 TEST SYSTEM

No.	Test system Type	Manufacturer	Model	version	Note
1	Radiated Emission	Tonscend	TS+Ver 2.1	2.5	/
2	Transient Immunity	EM Test AG	/	3.9.1	/

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8. RADIATED EMISSION TEST (TEST METHOD ACCORDING TO CISPR 25:2008)

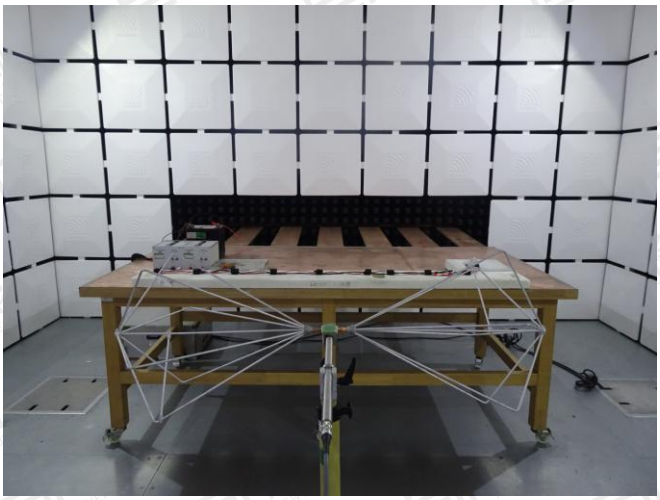
8.1 DESCRIPTION OF THE TEST LOCATION

Test location: Semi-anechoic Chamber

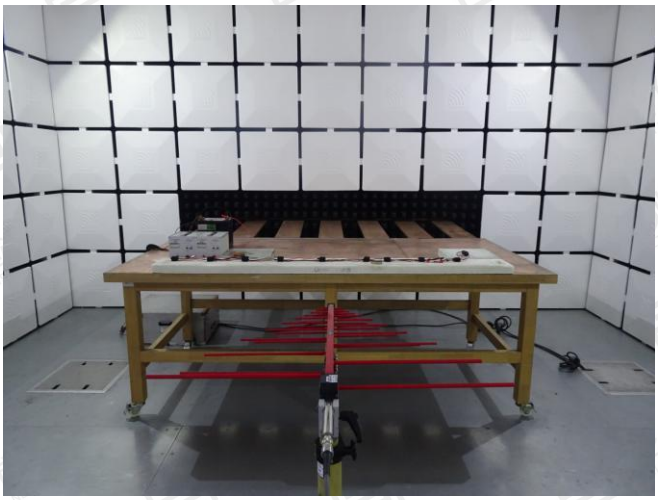
Test distance: 1 meter

8.2 PHOTO DOCUMENTATION OF THE TEST SET-UP

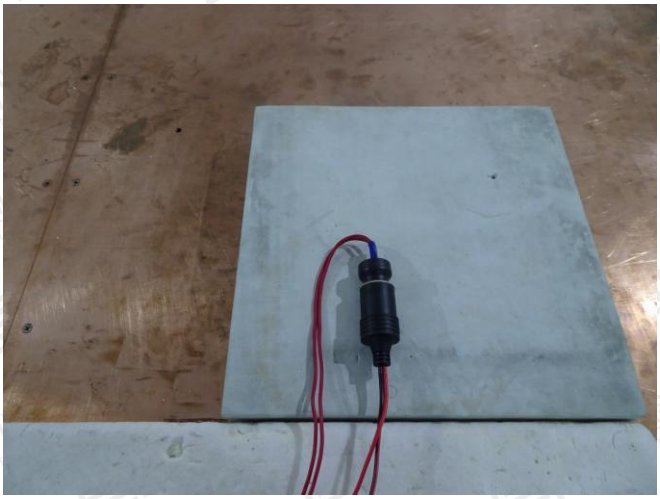
30MHz-200MHz (12V)



200MHz-1000MHz (12V)



Connection photo 1 (12V)



Connection photo 2(12V)

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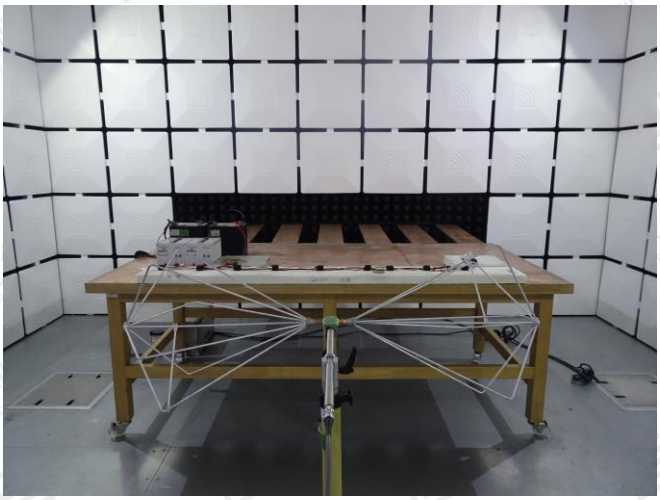
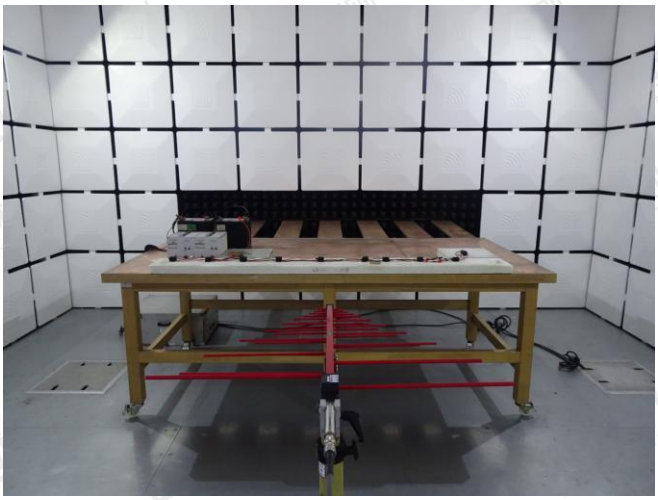
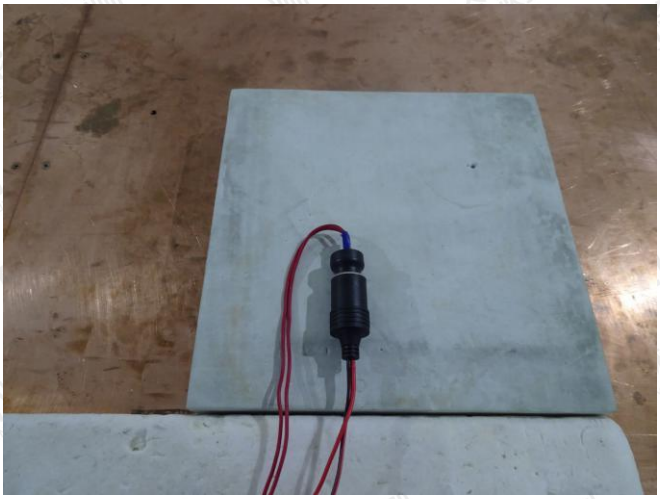
30MHz-200MHz (24V)



200MHz-1000MHz (24V)



Connection photo 1(24V)



Connection photo 2(24V)

Note: (1) The ESA was placed in a height of 5 cm, isolated to the ground plane. There was no connection to the ground plane. The ESA has to be installed isolated from the vehicle ground.

(2) Cables which are longer than 2m have been bundled to a length of 2 m.

8.3 TEST SPECIFICATION

Frequency range: 30MHz – 1000MHz

The test was carried out in the following operation mode(s):

- Normal mode for $12V_{DC}$
- Normal mode for $24V_{DC}$

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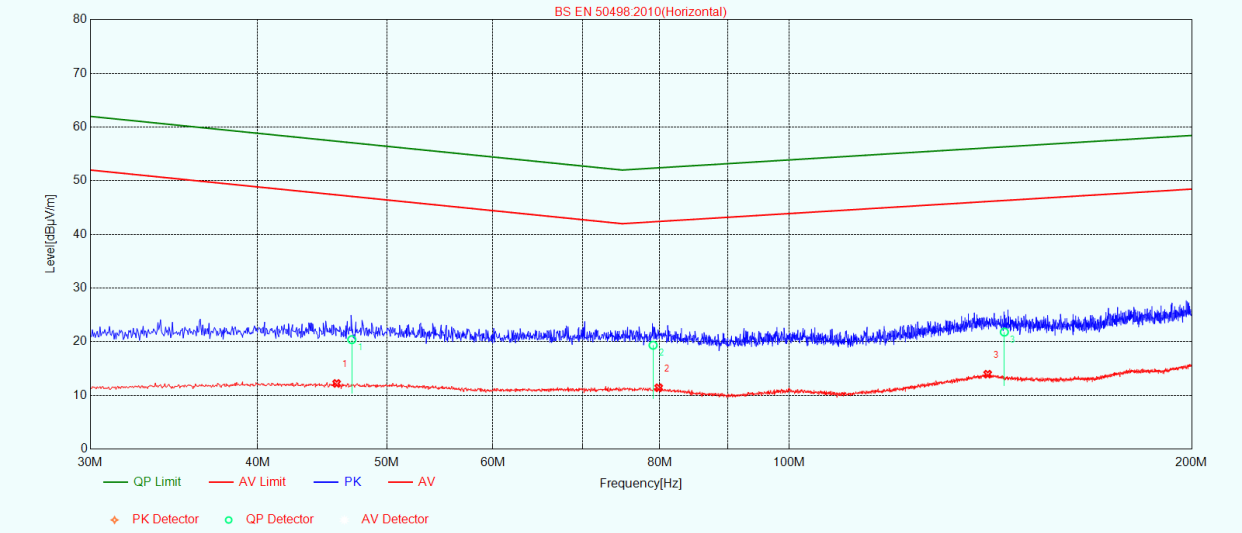
8.4 TEST RESULT

Product name:	DC/DC Switching Power Supply		
Test model:	GTD83050-0505	**Supply voltage:**	DC 13.45V
Environmental conditions:	21.3℃ 58%RH	**Sample direction:**	Front
Operation mode:	Normal mode	**Antenna polarisation:**	Horizontal
Frequency range:	30MHz-200MHz	**Test result:**	Pass



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Verdict
1	45.850000000	12.22	12.47	47.37	35.15	AV	PASS
2	79.850000000	11.42	11.57	42.41	30.99	AV	PASS
3	140.750000000	13.95	14.08	46.14	32.19	AV	PASS
1	47.0624212	20.38	12.44	57.09	36.71	QP	PASS
2	79.08201525	19.34	11.57	52.35	33.01	QP	PASS
3	144.8356208	21.80	13.80	56.32	34.52	QP	PASS

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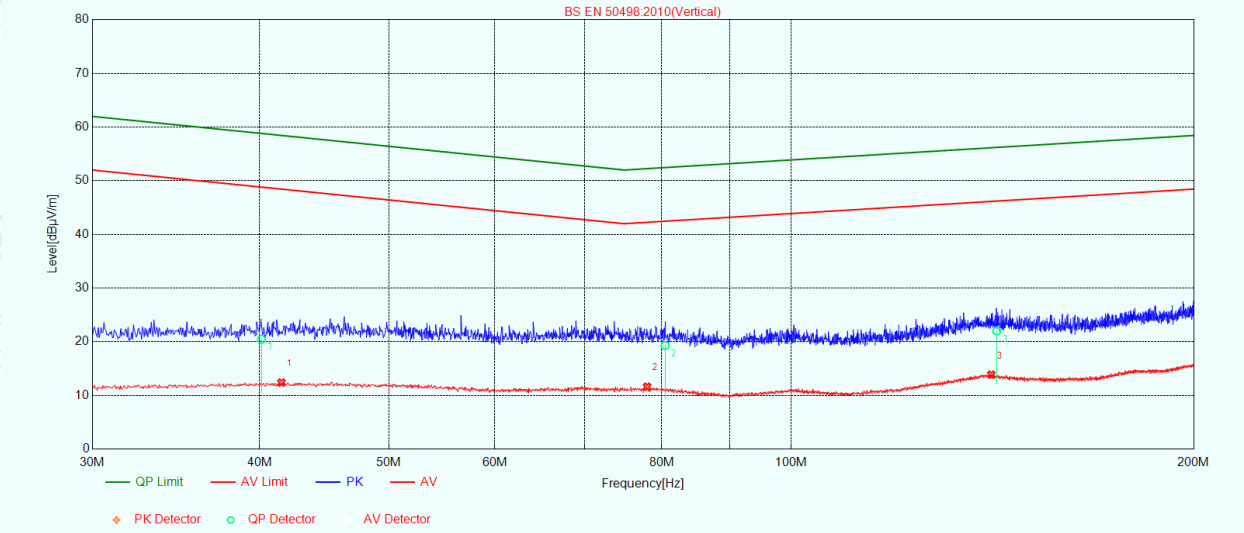
Product name:	DC/DC Switching Power Supply		
Test model:	GTD83050-0505	**Supply voltage:**	DC 13.45V
Environmental conditions:	21.3℃ 58%RH	**Sample direction:**	Front
Operation mode:	Normal mode	**Antenna polarisation:**	Vertical
Frequency range:	30MHz-200MHz	**Test result:**	Pass



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Verdict
1	41.550000000	12.38	12.59	48.45	36.07	AV	PASS
2	78.000000000	11.61	11.57	42.26	30.65	AV	PASS
3	141.150000000	13.86	14.05	46.16	32.30	AV	PASS
1	40.14241165	20.45	12.63	58.82	38.37	QP	PASS
2	80.463936	19.28	11.51	52.46	33.18	QP	PASS
3	142.4545425	22.00	13.97	56.22	34.22	QP	PASS

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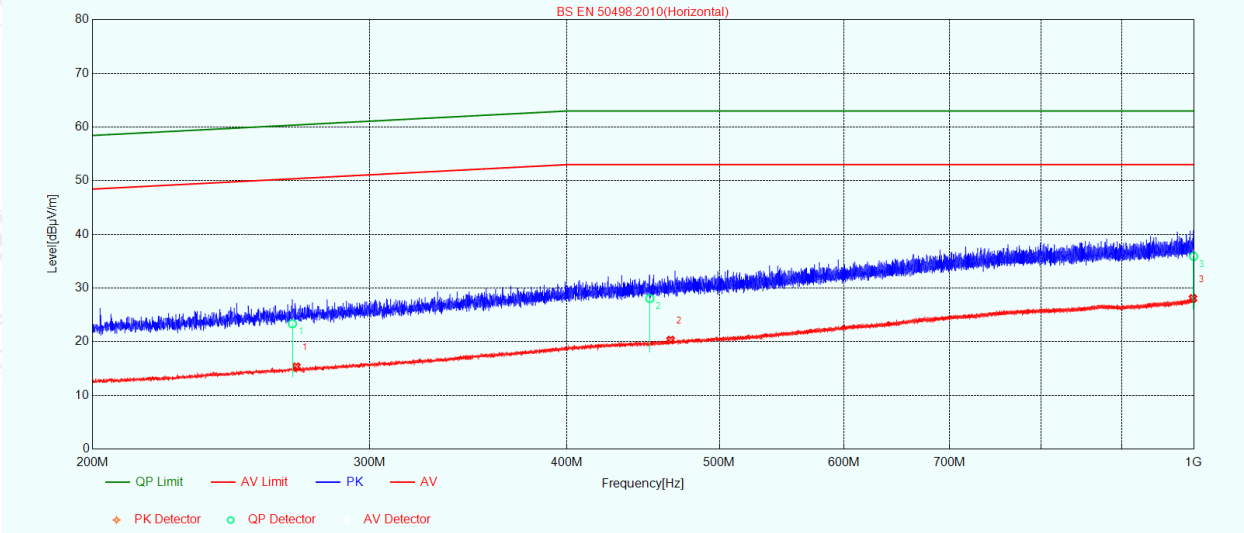
Product name:	DC/DC Switching Power Supply		
Test model:	GTD83050-0505	**Supply voltage:**	DC 13.45V
Environmental conditions:	21.3℃ 58%RH	**Sample direction:**	Front
Operation mode:	Normal mode	**Antenna polarisation:**	Horizontal
Frequency range:	200MHz-1000MHz	**Test result:**	Pass



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Verdict
1	269.450000000	15.34	15.25	50.40	35.06	AV	PASS
2	465.600000000	20.31	19.87	53.00	32.69	AV	PASS
3	999.000000000	28.07	26.85	53.00	24.93	AV	PASS
1	267.894676	23.35	15.21	60.37	37.02	QP	PASS
2	451.70939715	28.04	19.69	63.00	34.96	QP	PASS
3	999.85454365	35.91	26.87	63.00	27.09	QP	PASS

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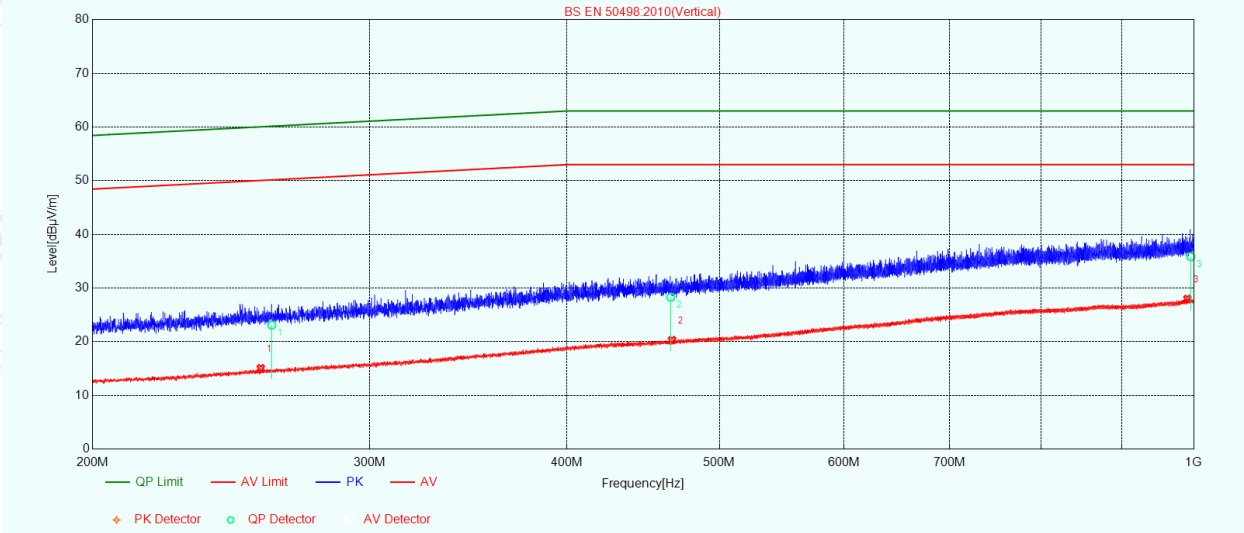
Product name:	DC/DC Switching Power Supply		
Test model:	GTD83050-0505	**Supply voltage:**	DC 13.45V
Environmental conditions:	21.3℃ 58%RH	**Sample direction:**	Front
Operation mode:	Normal mode	**Antenna polarisation:**	Vertical
Frequency range:	200MHz-1000MHz	**Test result:**	Pass



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Verdict
1	255.800000000	15.04	14.85	50.06	35.02	AV	PASS
2	466.600000000	20.31	19.88	53.00	32.69	AV	PASS
3	990.950000000	27.98	26.68	53.00	25.02	AV	PASS
1	259.9402845	23.08	14.97	60.17	37.09	QP	PASS
2	465.662856	28.29	19.87	63.00	34.71	QP	PASS
3	995.6647719	35.84	26.78	63.00	27.16	QP	PASS

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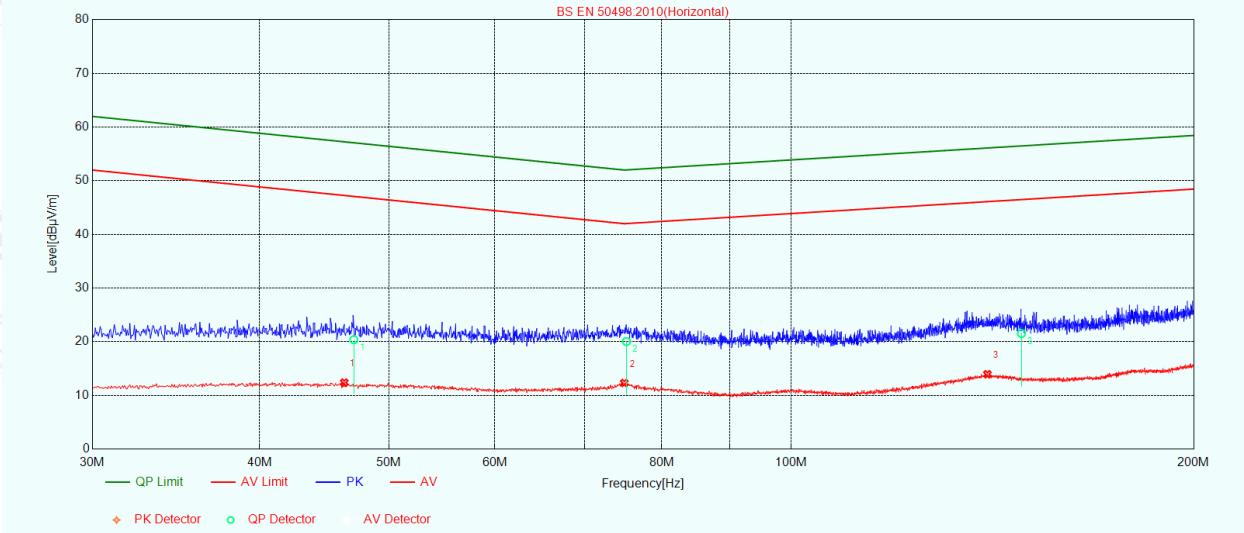
Product name:	DC/DC Switching Power Supply		
Test model:	GTD83050-0505	**Supply voltage:**	DC 26.36V
Environmental conditions:	21.3℃ 58%RH	**Sample direction:**	Front
Operation mode:	Normal mode	**Antenna polarisation:**	Horizontal
Frequency range:	30MHz-200MHz	**Test result:**	Pass



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Verdict
1	46.300000000	12.38	12.46	47.26	34.88	AV	PASS
2	75.000000000	12.30	11.57	42.00	29.70	AV	PASS
3	140.200000000	13.93	14.12	46.11	32.18	AV	PASS
1	47.0615743	20.38	12.44	57.09	36.71	QP	PASS
2	75.2769395	20.05	11.57	52.02	31.97	QP	PASS
3	148.6511184	21.55	13.53	56.50	34.95	QP	PASS

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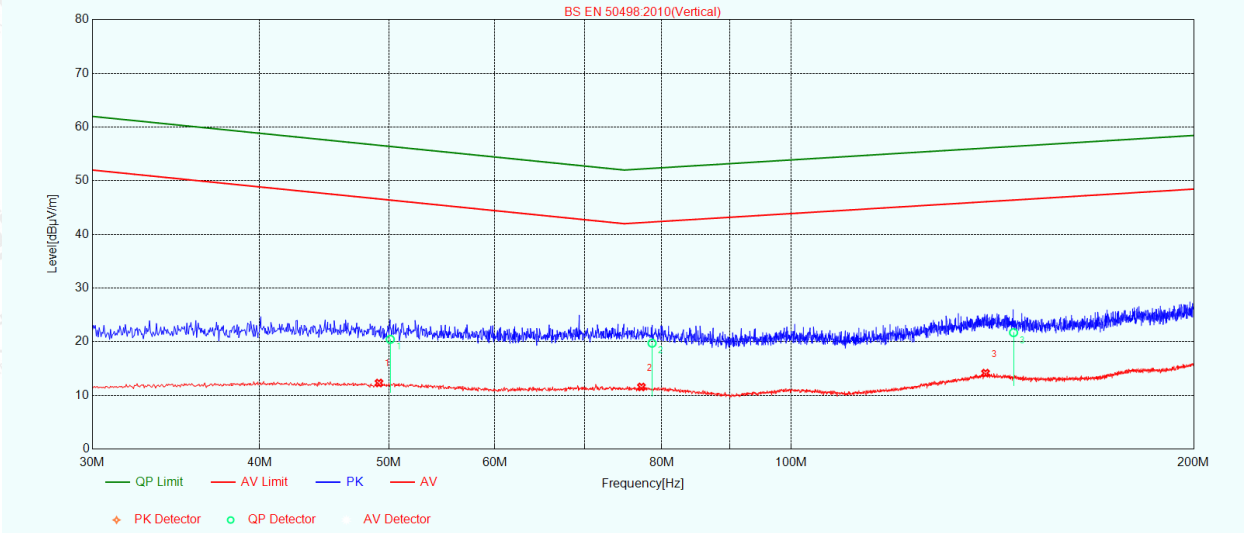
Product name:	DC/DC Switching Power Supply		
Test model:	GTD83050-0505	**Supply voltage:**	DC 26.36V
Environmental conditions:	21.3℃ 58%RH	**Sample direction:**	Front
Operation mode:	Normal mode	**Antenna polarisation:**	Vertical
Frequency range:	30MHz-200MHz	**Test result:**	Pass



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Verdict
1	49.150000000	12.31	12.37	46.61	34.30	AV	PASS
2	77.250000000	11.57	11.57	42.19	30.62	AV	PASS
3	139.750000000	14.15	14.10	46.09	31.94	AV	PASS
1	50.1153306	20.45	12.34	56.40	35.95	QP	PASS
2	78.6693857	19.73	11.57	52.31	32.58	QP	PASS
3	146.65190645	21.70	13.67	56.41	34.71	QP	PASS

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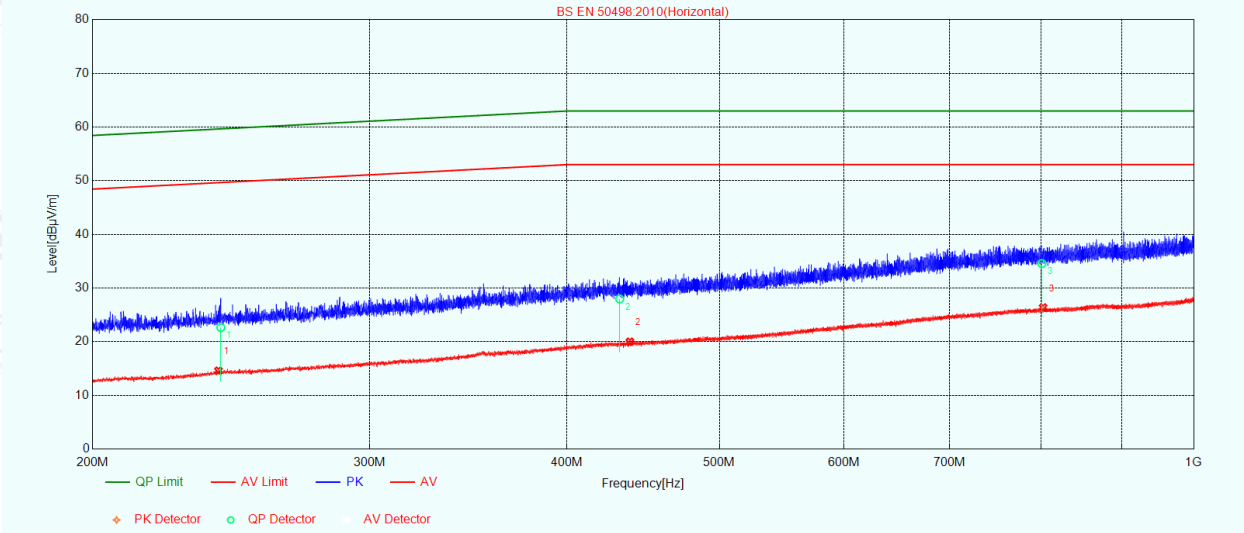
Product name:	DC/DC Switching Power Supply		
Test model:	GTD83050-0505	**Supply voltage:**	DC 26.36V
Environmental conditions:	21.3℃ 58%RH	**Sample direction:**	Front
Operation mode:	Normal mode	**Antenna polarisation:**	Horizontal
Frequency range:	200MHz-1000MHz	**Test result:**	Pass



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Verdict
1	240.450000000	14.59	14.28	49.66	35.07	AV	PASS
2	438.750000000	20.00	19.61	53.00	33.00	AV	PASS
3	802.550000000	26.37	25.33	53.00	26.63	AV	PASS
1	241.29825	22.64	14.32	59.68	37.04	QP	PASS
2	432.20980075	27.97	19.58	63.00	35.03	QP	PASS
3	801.15264035	34.56	25.32	63.00	28.44	QP	PASS

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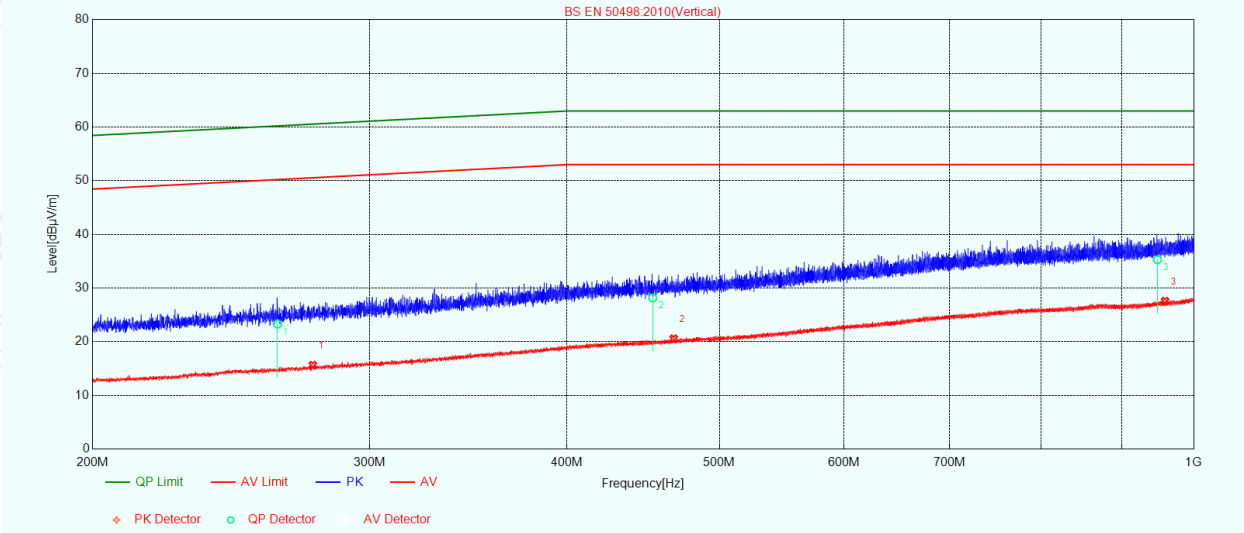
Product name:	DC/DC Switching Power Supply		
Test model:	GTD83050-0505	**Supply voltage:**	DC 26.36V
Environmental conditions:	21.3℃ 58%RH	**Sample direction:**	Front
Operation mode:	Normal mode	**Antenna polarisation:**	Vertical
Frequency range:	200MHz-1000MHz	**Test result:**	Pass



NO.	Freq. [MHz]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Detector	Verdict
1	276.000000000	15.64	15.45	50.56	34.92	AV	PASS
2	467.700000000	20.57	19.89	53.00	32.43	AV	PASS
3	959.150000000	27.58	26.22	53.00	25.42	AV	PASS
1	262.120029	23.28	15.04	60.22	36.94	QP	PASS
2	453.55790905	28.15	19.71	63.00	34.85	QP	PASS
3	948.34715495	35.30	26.12	63.00	27.70	QP	PASS

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9. TRANSIENT EMISSION TEST(TEST METHOD ACCORDING TO ISO 7637-2:2004)

9.1 TEST LIMIT

Suggested limits for the classification of 12V equipment	
Positive	+ 75 V
Negative	− 100 V

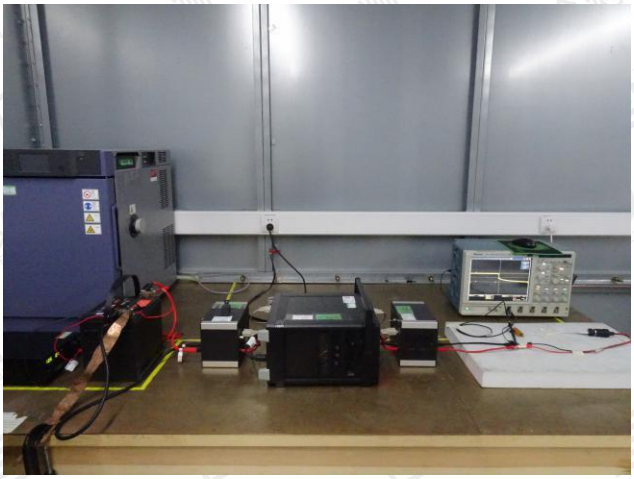
Suggested limits for the classification of 24V equipment	
Positive	+150 V
Negative	− 450 V

9.2 DESCRIPTION OF THE TEST LOCATION

Test location: Shielded room

9.3 PHOTO DOCUMENTATION OF THE TEST SET-UP

Connection photo 1（12V）



Connection photo 1（24V）

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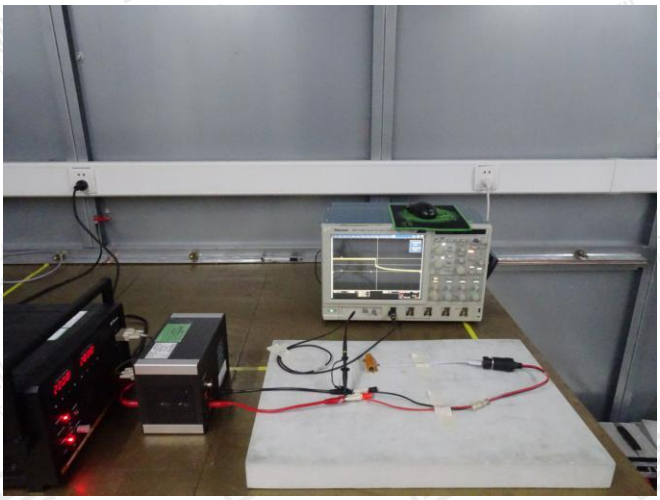
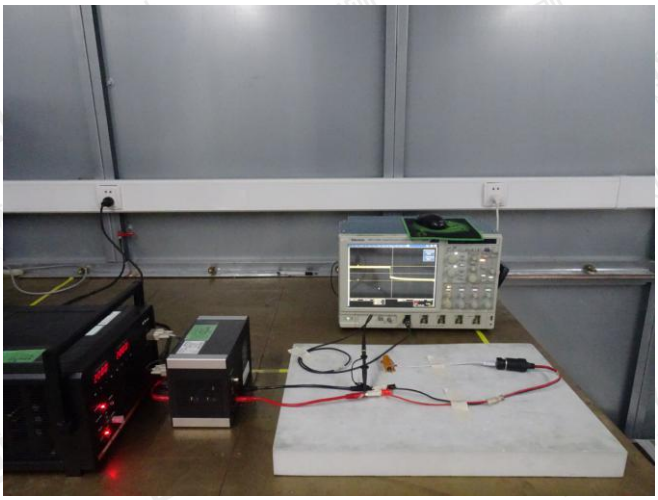
Connection photo 2（12V）

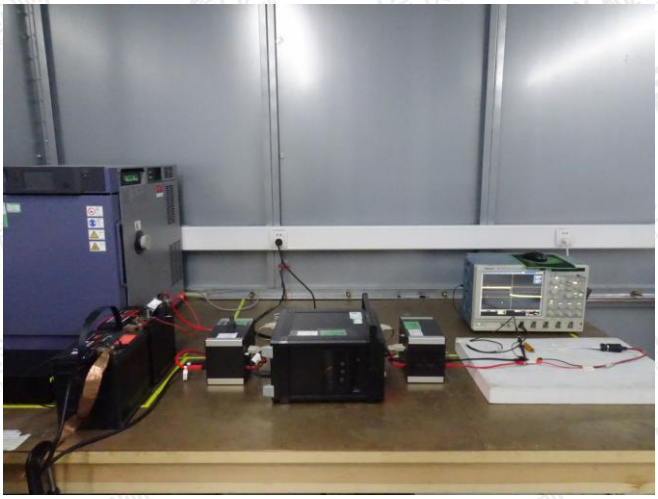


Connection photo 2（24V）



Connection photo 3（12V）

Connection photo 3（24V）



9.4 TEST SPECIFICATION

The test was carried out in the following operation mode(s):

-Normal mode for $12V_{DC}$

-Normal mode for $24V_{DC}$

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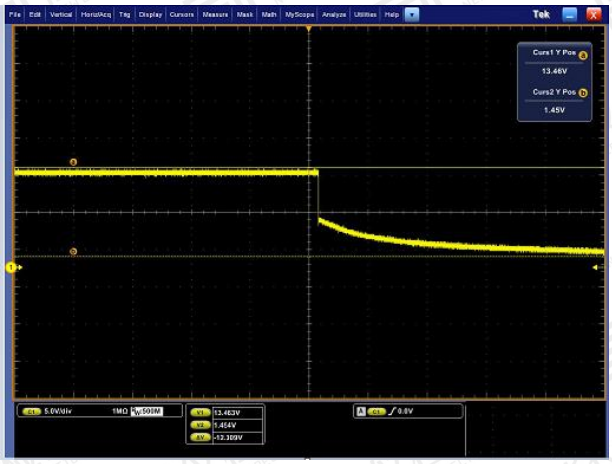
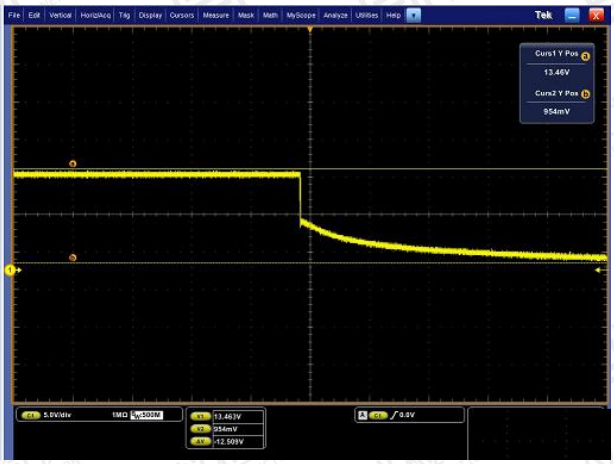
9.5 TEST RESULT

Product name:	DC/DC Switching Power Supply	**Test model:**	GTD83050-0505
Environmental conditions:	24.3℃ 42%RH	**Supply voltage:**	DC 13.50V
Operation mode:	Normal mode	**Test result:**	Pass

Fast pulse			
Switch status: On->Off		**Switch status:** Off->On	
Max. Positive:	13.46V-13.50V=-0.04V	**Max. Positive:**	13.46V-13.50V=-0.04V
Max. Negative:	1.45V-13.50V=-12.25V	**Max. Negative:**	0.45V-13.50V=-13.05V
			

Slow pulse			
Switch status: On->Off		**Switch status:** Off->On	
Max. Positive:	13.46V-13.50V=-0.04V	**Max. Positive:**	13.46V-13.50V=-0.04V
Max. Negative:	0.95V-13.50V=-12.55V	**Max. Negative:**	0.15V-13.50V=-13.35V
			

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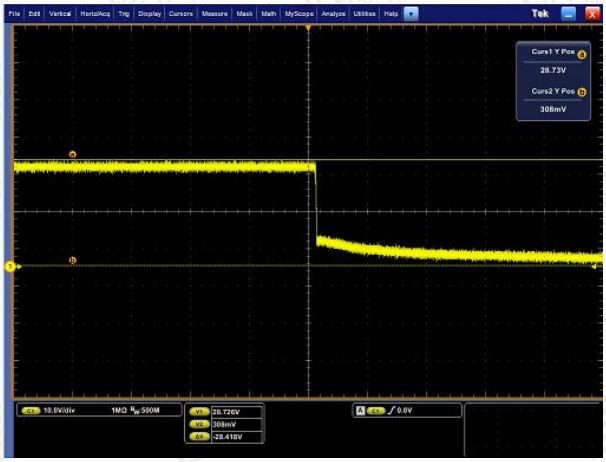
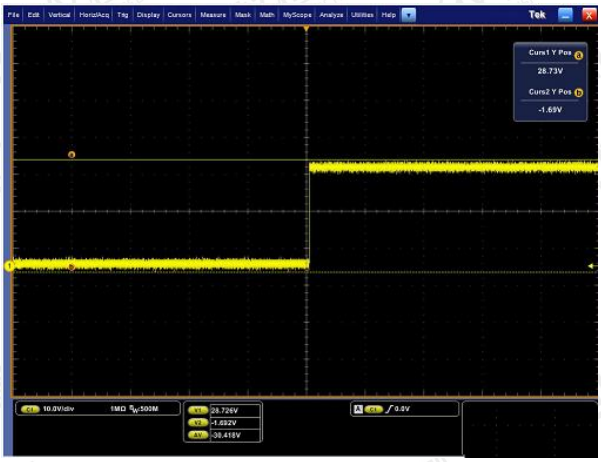
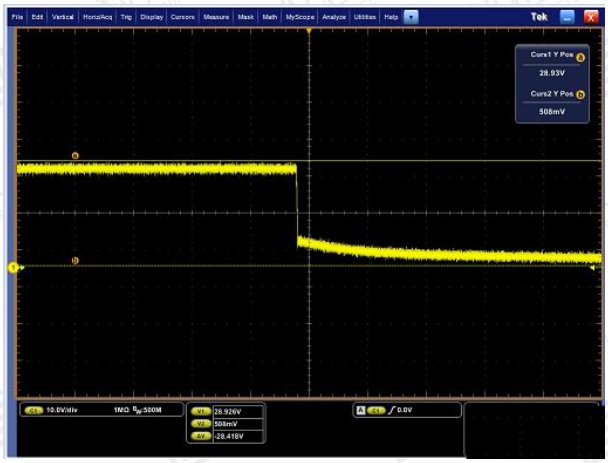
Product name:	DC/DC Switching Power Supply	**Test model:**	GTD83050-0505
Environmental conditions:	24.3℃42%RH	**Supply voltage:**	DC 27.00V
Operation mode:	Normal mode	**Test result:**	Pass

Fast pulse			
Switch status: On->Off		**Switch status:** Off->On	
Max. Positive:	28.72V-27.00V=1.72V	**Max. Positive:**	28.72V-27.00V=1.72V
Max. Negative:	0.30V-27.00V=-26.70V	**Max. Negative:**	-1.69V-27.00V=-28.69V
			

Slow pulse			
Switch status: On->Off		**Switch status:** Off->On	
Max. Positive:	28.92V-27.00V=1.92V	**Max. Positive:**	28.92V-27.00V=1.92V
Max. Negative:	0.50V-27.00V=-26.50V	**Max. Negative:**	-1.09V-27.00V=-28.09V
			

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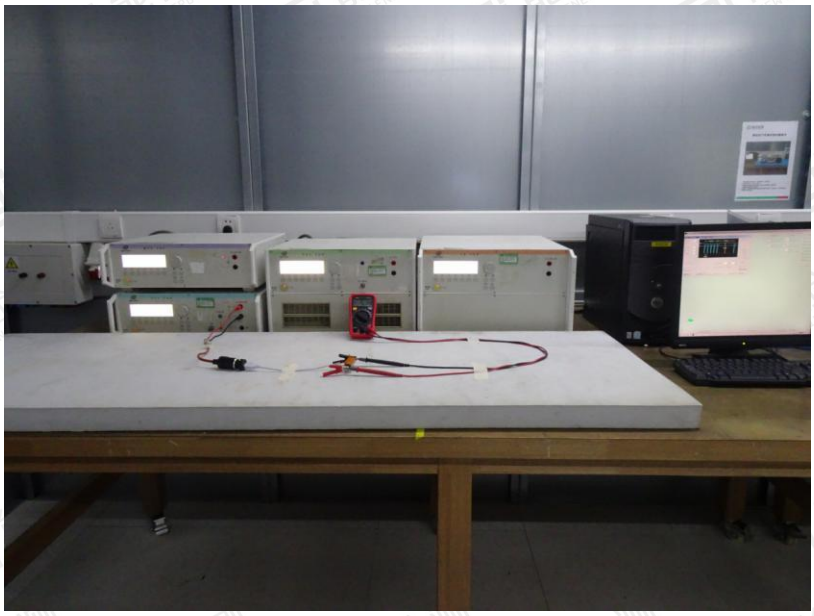
10. TRANSIENT IMMUNITY TEST (TEST METHOD ACCORDING TO ISO 7637-2:2004)

10.1DESCRIPTION OF THE TEST LOCATION

Test location: Shielded room

10.2PHOTO DOCUMENTATION OF THE TEST SET-UP

TRANSIENT IMMUNITY TEST



10.3TEST SPECIFICATION

Pulse 1:	Test level:	-75 V($12V_{DC}$), -450V($24V_{DC}$)
	Number of pulses:	5000
Pulse 2a:	Test level:	+37 V($12V_{DC}$), +37V($24V_{DC}$)
	Number of pulses:	5000
Pulse 2b:	Test level:	+10 V($12V_{DC}$), +20V($24V_{DC}$)
	Number of pulses:	10
Pulse 3a:	Test level:	-112 V($12V_{DC}$), -150V($24V_{DC}$)
	Coupling duration:	1 h
Pulse 3b:	Test level:	+75 V($12V_{DC}$), +150V($24V_{DC}$)
	Coupling duration:	1 h
Pulse 4:	Test level:	-6 V($12V_{DC}$), -12V($24V_{DC}$)
	Number of pulses:	1
Operation mode:		- Normal mode

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10.4TEST RESULT

Product name:	DC/DC Switching Power Supply	**Test model:**	GTD83050-0505
Environmental conditions:	24.3℃ 59%RH	**Supply voltage:**	DC 13.50V
Operation mode:	Normal mode	**Test result:**	Pass

Test pulse	Test voltage	Number of pulses / duration	Required status	Functional status
1 (12V)	-75 V	5000	D	C[1]
2a (12V)	+37 V	5000	D	A
2b (12V)	+10 V	10	D	C[2]
3a (12V)	-112 V	1 h	D	A
3b (12V)	+75 V	1 h	D	A
4 (12V)	-6 V	1	D	C[3]

Remark:
1. During test, the EUT indicator flashes and the EUT output changes from normal 5V to beats in 2-5V, after test, it can recover to normal automatically.
2. During test, the EUT indicator flashes and the EUT output beats in 0-5V, after test, it can recover to normal automatically.
3. During test, the EUT indicator flashes and the EUT output beats in 4.7-5V, after test, it can recover to normal automatically.

Product name:	DC/DC Switching Power Supply	**Test model:**	GTD83050-0505
Environmental conditions:	24.3℃ 59%RH	**Supply voltage:**	DC 27.00V
Operation mode:	Normal mode	**Test result:**	Pass

Test pulse	Test voltage	Number of pulses / duration	Required status	Functional status
1 (24V)	-450V	5000	D	C[1]
2a (24V)	+37V	5000	D	A
2b (24V)	+20V	10	D	C[2]
3a (24V)	-150V	1 h	D	A
3b (24V)	+150V	1 h	D	A
4 (24V)	-12V	1	D	A

Remark:
1. During test, the EUT output beats in 2-5V, after test, it can recover to normal automatically.
2. During test, the EUT output beats in 0-5V, after test, it can recover to normal automatically.

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10.5CLASSIFICATION OF FUNCTIONAL STATUS

Criteria A:	All functions of a device/system perform as designed during and after exposure to disturbance.
Criteria B:	All functions of a device/system perform as designed during exposure. However, one or more of them can go beyond specified tolerance. All functions return automatically to within normal limits after exposure is removed. Memory functions shall remain class A.
Criteria C:	One or more functions of a device/system do not perform as designed during exposure but return automatically to normal operation after exposure is removed.
Criteria D:	One or more functions of a device/system do not perform as designed during exposure and do not return to normal operation until exposure is removed and the device/system is reset by simple “operator/use” action.
Criteria E:	One or more functions of a device/system do not perform as designed during and after exposure and cannot be returned to proper operation without repairing or replacing the device/system.

☒***PASS***	☐***FAIL***

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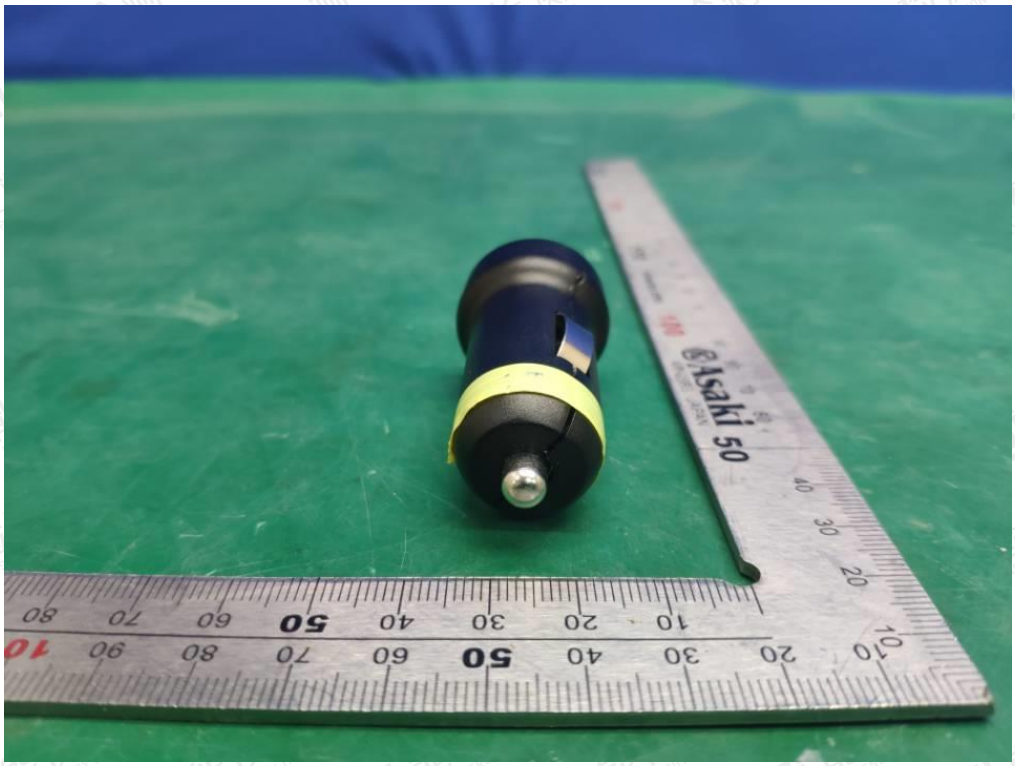
APPENDIX A: PHOTOGRAPHS OF EUT

EUT-1

EUT-2



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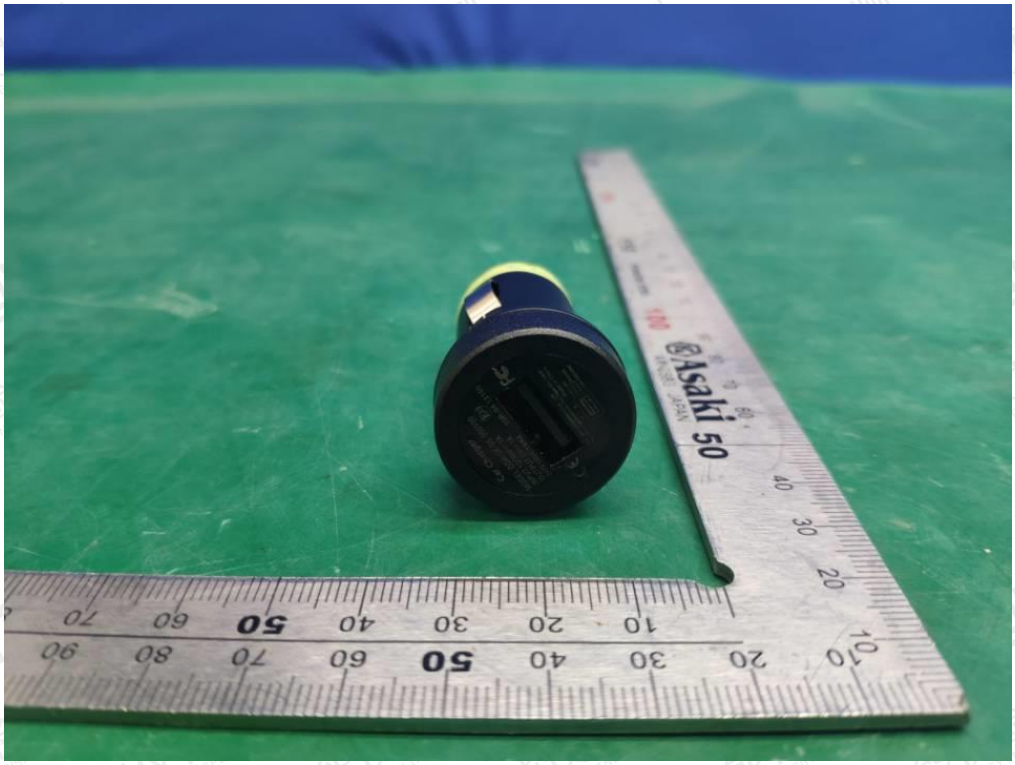
EUT-3



EUT-4

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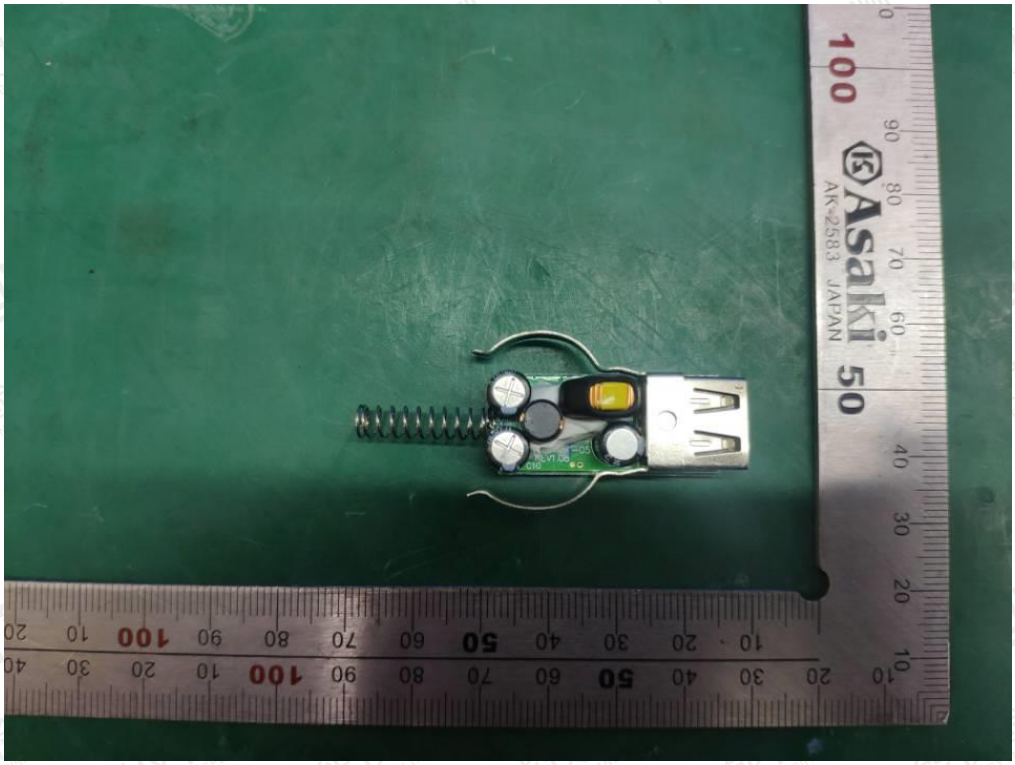
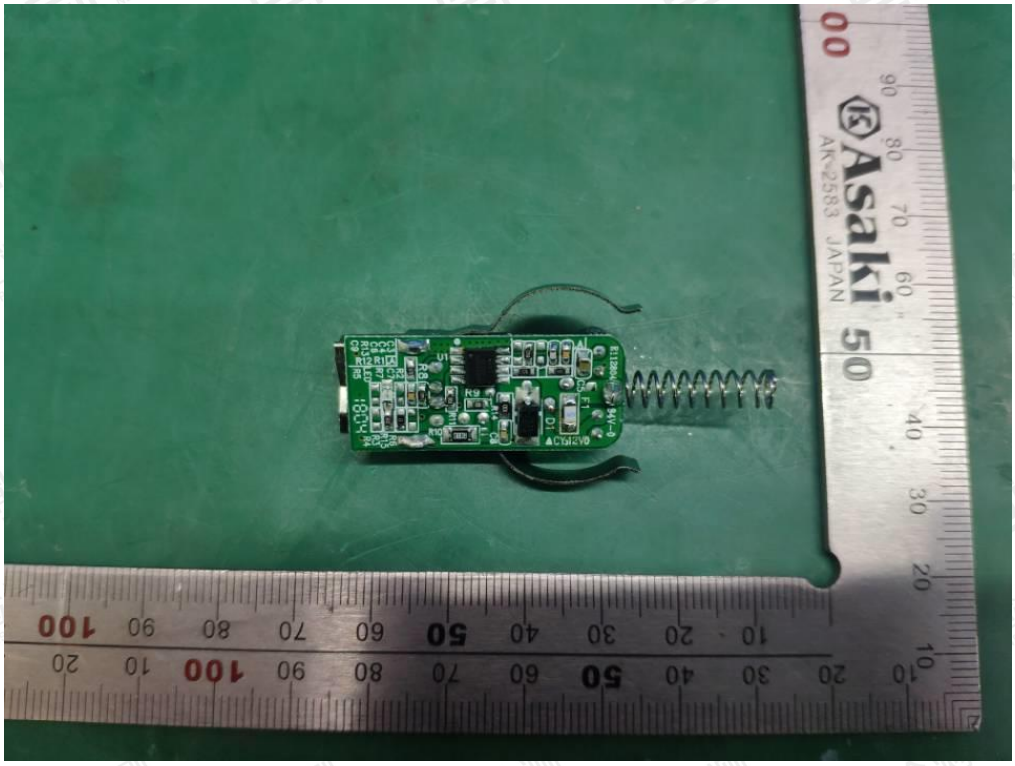
EUT-5



EUT-6



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