

Report No.: SZEM210100098401 Page: 1 of 21

## TEST REPORT

Application No.:	SZEM2101000984CR			
Applicant:	DT Research, Inc.			
Address of Applicant:	3RD FL NO 36 WUQUAN 7TH RD WUGU DISTRICT, NEW TAIPEI, Taiwan			
Manufacturer:	DT Research, Inc.			
Address of Manufacturer:	2000 Concourse Drive, San Jose, CA 95131, USA			
Factory:	DT Research, Inc. Taiwan Branch			
Address of Factory:	6F., No.36 Wuquan 7 th Rd., Wugu Dist. New Taipei City 248 Taiwan			
Equipment Under Test (EUT	):			
EUT Name:	Rugged Convertible Laptop			
Model No.:	LT350, LT35XX-XXX(X=blank, A~Z or 0~9) 🌲			
*	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.			
Trade Mark:	DT Research, Inc.			
FCC ID:	YE3600-AX200NG			
Standard(s) :	47 CFR Part 15, Subpart B			
Date of Receipt:	2021-01-22			
Date of Test:	2021-01-25 to 2021-03-01			
Date of Issue:	2021-03-03			
Test Result:	Pass*			

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

Keny. Ku

Keny Xu EMC Laboratory Manager



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	Revision Record							
Version Chapter Date Modifier Rema								
01		2021-03-03		Original				

Authorized for issue by:		
	Rolisonti	
	Edison Li/Project Engineer	-
	Evic Fu	
	Eric Fu/Reviewer	-



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### 2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass*
Radiated Emissions (above 1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass*

\*: the radiated emissions were scanned from 30MHz-40GHz, only the 30MHz-18GHz data is shown in the report, No emission was detected in the range 18GHz-40GHz.

#### Remark:

Model No.: LT350, LT35XX-XXX(X=blank, A~Z or 0~9)

Only the model LT350 was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on model No..



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## 4 General Information

#### 4.1 Details of E.U.T.

AC Adapter
Model: A11-065N1A
Input: AC 100-240V, 50/60Hz, 1.7A
Output: DC 19V, 3.42A
AC 120V, 60Hz or AC 230V, 50Hz
Note: Both nominal AC 120V, 60Hz and AC 240 V, 50Hz are required for testing in accordance with FCC KDB174176, this report only shows the results of the worst test result(AC 120V, 60Hz);
Rechargeable Lithium-Ion Polymer Battery
Model: ACC-006-60K(3ICP9/36/115)
Rated Capacity: 5400mAh
Voltage: DC 11.4V
Watt-Hour: 61.56Wh
Max Charge Voltage: 13.05V
DC cable: 170cm unshielded
COM port, HDMI Port, Audio Jack, DC-in Jack, RJ45, USB Type-C, USB3.0
More than 108MHz
Portable device

#### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Earphone	PHILIPS	SHE6000	REF. No.SEA1000
HDMI Cable	Apple	MC838FE/B	REF. No.SEA0900
Network Cable	SGS	N/A	REF. No.SEA1100
Router	NETGEAR	DGN2200	REF. No.SEA2200
U-disk	Sandisk	SDCZ60-016G	REF. No.SEA0100
Television	HISENSE	TLM19V66	REF. No.SEA2600

#### 4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at Mains Terminals (150kHz-30MHz)	± 3.0dB
Radiated Emissions (30MHz-1GHz)	± 4.5dB
Radiated Emissions (above 1GHz)	± 4.8dB

Remark:

The  $U_{lab}$  (lab Uncertainty) is less than  $U_{cispr}$  (CISPR Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;

- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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#### 4.4 Test Location

All tests were performed at: SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057. Tel: +86 755 2601 2053 Fax: +86 755 2671 0594 No tests were sub-contracted.

#### 4.5 Test Facility

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

#### A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

#### VCCI

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

#### • FCC – Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

#### • Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None



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#### 5 **Equipment List**

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2019-06-13	2022-06-12
EMI Test Receiver	Rohde&Schwarz	ESCI	SEM004-02	2020-03-24	2021-03-23
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2020-07-10	2021-07-09
LISN	Rohde&Schwarz	ENV216	SEM007-01	2020-09-23	2021-09-22
LISN	ETS-LINDGREN	3816/2	SEM007-02	2020-04-01	2021-03-31

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2020-07-19	2023-07-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2020-11-02	2021-11-01
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-02	2019-05-24	2022-05-23
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2020-04-01	2021-03-31
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2020-07-10	2021-07-09

Radiated Emissions (above 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
EXA Signal Analyzer (10Hz-44GHz)	Agilent Technologies Inc	N9010A	SEM004-12	2020-04-09	2021-04-08
Horn Antenna (800MHz-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2020-11-14	2023-11-13
Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEM004-11	2020-09-23	2021-09-22
Pre-amplifier (26- 40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2020-03-24	2021-03-23
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2020-07-10	2021-07-09



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General used equipment						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2020-09-15	2021-09-14	
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2020-09-15	2021-09-14	
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2020-04-07	2021-04-06	



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#### **Emission Test Results** 6

#### 6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

47 CFR Part 15, Subpart B
ANSI C63.4:2014
66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
56dB(μV) quasi-peak, 46dB(μV) average
60dB(μV) quasi-peak, 50dB(μV) average
Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

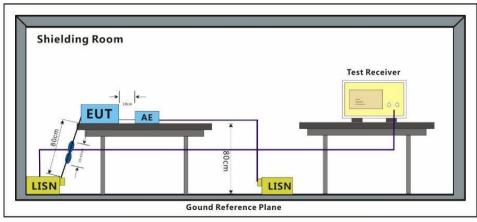
#### 6.1.1 E.U.T. Operation

Operating Environment:						
Temperature:	20.1 °C	Humidity:	47.5 % RH	Atmospheric Pressure:	1010	mbar

#### 6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	On mode, keep EUT working normally.
Pre-scan	01	Charging mode, keep EUT in charging with Adapter, earphone, keyboard.
Pre-scan	02	USB1 Play: Keep EUT playing with USB stick.
Pre-scan	03	USB2 Play: Keep EUT playing with USB stick.
Pre-scan	04	USB Type C: Keep EUT connected to an external devices.
Pre-scan	05	HDMI: Keep EUT working with external monitor.
Pre-scan	06	LAN: Keep EUT working via LAN port.
Pre-scan	07	Idle mode, Keep the EUT at standby mode.

#### 6.1.3 Test Setup Diagram





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#### 6.1.4 Measurement Procedure and Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.



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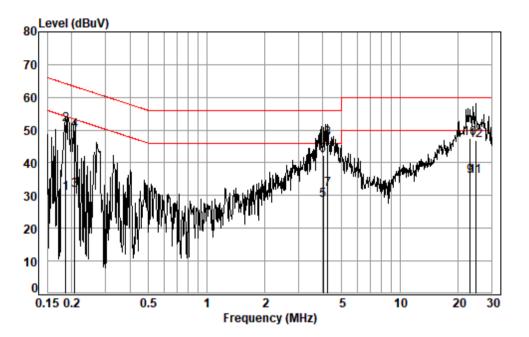
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Test Mode: 00; Line: Live line



Site :	Shielding	Room
Condition:	Line	
Job No. :	00984CR	
Test mode:	00	
		1.7.611

		Cable	LISN	Read		Limit	0ver	
	Freq	Loss	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1864	0.03	9.64	21.16	30.83	54.20	-23.37	Average
2	0.1864	0.03	9.64	41.89	51.56	64.20	-12.64	QP
3	0.2072	0.04	9.64	22.10	31.78	53.32	-21.54	Average
4	0.2072	0.04	9.64	40.11	49.79	63.32	-13.53	QP
5	4.0275	0.15	9.74	18.67	28.56	46.00	-17.44	Average
6	4.0275	0.15	9.74	32.43	42.32	56.00	-13.68	QP
7	4.2466	0.15	9.75	22.05	31.95	46.00	-14.05	Average
8	4.2466	0.15	9.75	37.63	47.53	56.00	-8.47	QP
9	23.1404	0.18	9.96	25.73	35.87	50.00	-14.13	Average
10	23.1404	0.18	9.96	37.36	47.50	60.00	-12.50	QP
11	24.6594	0.18	9.97	25.64	35.79	50.00	-14.21	Average
12	24.6594	0.18	9.97	36.61	46.76	60.00	-13.24	QP



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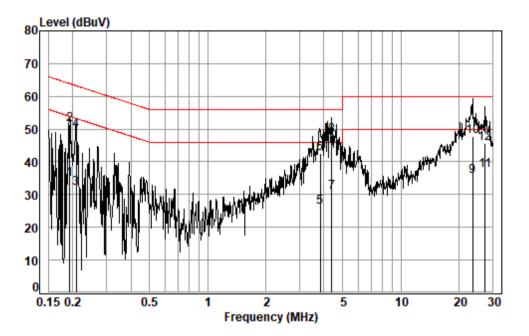
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Test Mode: 00; Line: Neutral Line



Site :	Shielding	Room
Condition:	Neutral	
Job No. :	00984CR	
Test mode:	00	

		Cable	LISN	Read		Limit	0ver	
	Freq	Loss	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1934	0.04	9.63	24.90	34.57	53.89	-19.32	Average
2	0.1934	0.04	9.63	41.61	51.28	63.89	-12.61	QP
3	0.2083	0.04	9.63	22.17	31.84	53.27	-21.43	Average
4	0.2083	0.04	9.63	39.90	49.57	63.27	-13.70	QP
5	3.8196	0.15	9.73	16.15	26.03	46.00	-19.97	Average
6	3.8196	0.15	9.73	32.66	42.54	56.00	-13.46	QP
7	4.3838	0.16	9.74	20.84	30.74	46.00	-15.26	Average
8	4.3838	0.16	9.74	38.07	47.97	56.00	-8.03	QP
9	23.5850	0.18	10.03	25.27	35.48	50.00	-14.52	Average
10	23.5850	0.18	10.03	37.51	47.72	60.00	-12.28	QP
11	27.2711	0.19	10.08	27.29	37.56	50.00	-12.44	Average
12	27.2711	0.19	10.08	35.47	45.74	60.00	-14.26	QP



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#### 6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Measurement Distance:	3m
Limit:	

dBµV/m (At 10m) dBµV/m (At 3m) FREQUENCY (MHz) Class B Class B 30MHz -88MHz 29.5 40.0 88MHz-216MHz 33.1 43.5 216MHz-960MHz 35.6 46.0 43.5 54.0 960MHz-1000MHz Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

#### 6.2.1 E.U.T. Operation

**Operating Environment:** 

Temperature: 25.5 °C

Humidity: 51.4 % RH

Atmospheric Pressure: 1010 mbar

#### 6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	On mode, keep EUT working normally.
Pre-scan	01	Charging mode, keep EUT in charging with Adapter, earphone, keyboard.
Pre-scan	02	USB1 Play: Keep EUT playing with USB stick.
Pre-scan	03	USB2 Play: Keep EUT playing with USB stick.
Pre-scan	04	USB Type C: Keep EUT connected to an external devices.
Final test	05	HDMI: Keep EUT working with external monitor.
Pre-scan	06	LAN: Keep EUT working via LAN port.
Pre-scan	07	Idle mode, Keep the EUT at standby mode.



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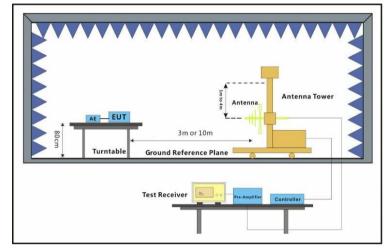
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#### 6.2.3 Test Setup Diagram



#### 6.2.4 Measurement Procedure and Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.



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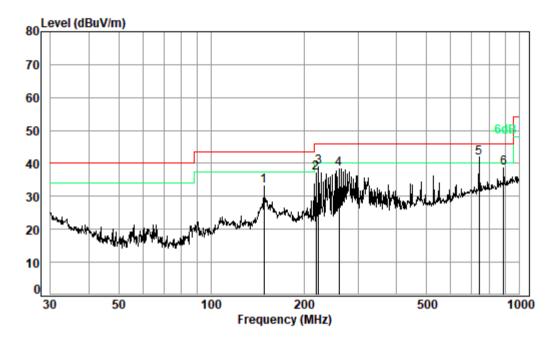
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Test Mode: 05; Polarity: Horizontal



Condition: 3m HORIZONTAL Job No. : 00984CR Test Mode: 05

	Freq			Preamp Factor					Remark
-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	148.44	1.16	14.50	27.34	44.71	33.03	43.50	-10.47	QP
2	219.08	1.38	16.66	27.08	46.24	37.20	46.00	-8.80	QP
3	222.95	1.41	16.95	27.07	47.79	39.08	46.00	-6.92	QP
4	260.14	1.72	18.11	26.97	45.49	38.35	46.00	-7.65	QP
5 pp	742.26	3.08	27.99	27.83	38.37	41.61	46.00	-4.39	QP
6	890.73	3.48	28.99	27.21	33.43	38.69	46.00	-7.31	QP



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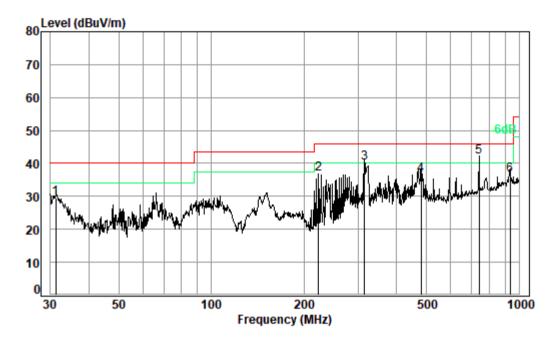
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Test Mode: 05; Polarity: Vertical



Condition: 3m VERTICAL Job No. : 00984CR Test Mode: 05

	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	31.29	0.61	22.02	27.73	34.60	29.50	40.00	-10.50	QP
2	222.95	1.41	16.95	27.07	45.61	36.90	46.00	-9.10	QP
3	314.38	2.05	19.58	26.96	45.42	40.09	46.00	-5.91	QP
4	480.53	2.46	24.30	27.73	37.60	36.63	46.00	-9.37	QP
5 pp	742.26	3.08	27.99	27.83	38.64	41.88	46.00	-4.12	QP
6	935.55	3.54	29.20	26.98	30.71	36.47	46.00	-9.53	QP



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#### 6.3 Radiated Emissions (above 1GHz)

Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Limit:	
Above 1GHz	74(dBμV/m) peak, 54(dBμV/m) average
Detector:	Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

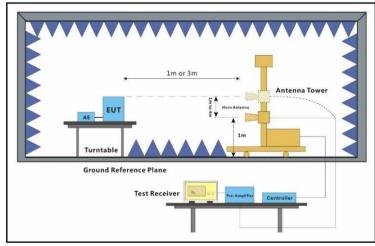
#### 6.3.1 E.U.T. Operation

Operating Enviro	nment:					
Temperature:	23.5 °C	Humidity:	56.3 % RH	Atmospheric Pressure:	1010	mbar

#### 6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	On mode, keep EUT working normally.
Pre-scan	01	Charging mode, keep EUT in charging with Adapter, earphone, keyboard.
Pre-scan	02	USB1 Play: Keep EUT playing with USB stick.
Pre-scan	03	USB2 Play: Keep EUT playing with USB stick.
Pre-scan	04	USB Type C: Keep EUT connected to an external devices.
Final test	05	HDMI: Keep EUT working with external monitor.
Pre-scan	06	LAN: Keep EUT working via LAN port.
Pre-scan	07	Idle mode, Keep the EUT at standby mode.

#### 6.3.3 Test Setup Diagram



#### 6.3.4 Measurement Procedure and Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.



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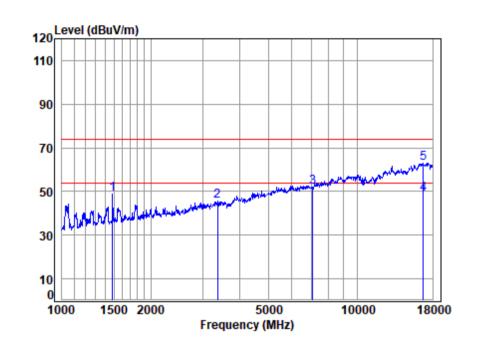
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Test Mode: 05; Polarity: Horizontal



Site : chamber Condition: 3m HORIZONTAL Job No : 00984CR Mode : 05 Note :									
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1485.841	3.24	25.75	39.94	59.68	48.73	74.00	-25.27	Peak
2	3366.778	5.35	31.50	40.98	49.72	45.59	74.00	-28.41	Peak
3	7076.516	8.61	35.96	41.63	49.26	52.20	74.00	-21.80	Peak
4	16745.210	14.50	42.40	40.41	32.24	48.73	54.00	-5.27	Average
5	16745.210	14.50	42.40	40.41	46.29	62.78	74.00	-11.22	Peak



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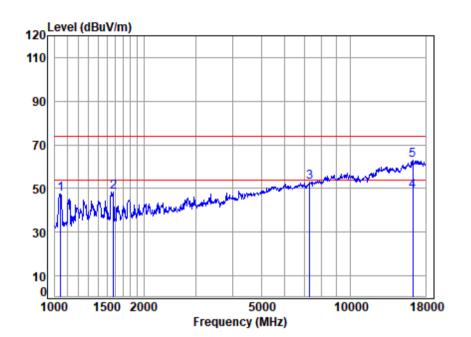
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Test Mode: 05; Polarity: Vertical



Site :	chamber
Condition:	3m VERTICAL
Job No :	00984CR
Mode :	05
Note :	

	•								
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1047.332	2.46	23.85	39.64	60.84	47.51	74.00	-26.49	Peak
2	1578.822	3.33	26.16	40.00	59.01	48.50	74.00	-25.50	Peak
3	7284.038	8.81	36.13	41.43	49.53	53.04	74.00	-20.96	Peak
4	16268.140	14.52	41.65	40.53	33.27	48.91	54.00	-5.09	Average
5	16268.140	14.52	41.65	40.53	47.41	63.05	74.00	-10.95	Peak



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#### **Test Setup Photo** 7

Conducted Emissions at Mains Terminals (150kHz-30MHz)



Radiated Emissions (30MHz-1GHz)





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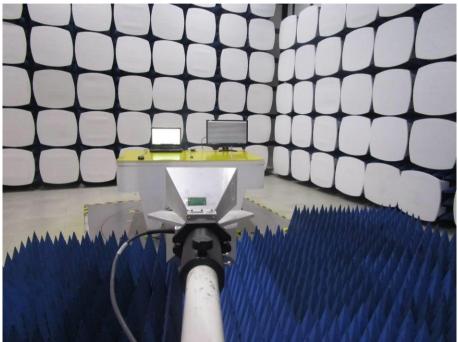
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**Radiated Emissions (Above 1GHz)** 



## 8 EUT Constructional Details (EUT Photos)

Please Refer to external and internal photos for details.

- End of the Report -



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