

FCC TEST REPORT

(PART 22)

REPORT NO.: RF141226C02B-4

MODEL NO.: RS30

FCC ID: Q3N-RS30

RECEIVED: Apr. 24, 2015

TESTED: May 13, 2015

ISSUED: May 13, 2015

APPLICANT: CIPHERLAB CO., LTD

ADDRESS: 12F, 333 Dunhua S. Rd., Sec.2 Taipei, Taiwan 106

ISSUED BY: Bureau Veritas Consumer Products Services
(H.K.) Ltd., Taoyuan Branch

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New Taipei City, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan
Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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TABLE OF CONTENTS

RELEASE CONTROL RECORD.....	3
1 CERTIFICATION	4
2 SUMMARY OF TEST RESULTS	5
2.1 MEASUREMENT UNCERTAINTY	5
2.2 TEST SITE AND INSTRUMENTS	6
3 GENERAL INFORMATION.....	7
3.1 GENERAL DESCRIPTION OF EUT.....	7
3.2 CONFIGURATION OF SYSTEM UNDER TEST	8
3.3 DESCRIPTION OF SUPPORT UNITS.....	8
3.4 TEST ITEM AND TEST CONFIGURATION	9
3.5 EUT OPERATING CONDITIONS	10
3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS	10
4 TEST TYPES AND RESULTS.....	11
4.1 RADIATED EMISSION MEASUREMENT	11
4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT	11
4.1.2 TEST PROCEDURES	11
4.1.3 DEVIATION FROM TEST STANDARD	11
4.1.4 TEST SETUP	12
4.1.5 TEST RESULTS	13
5 PHOTOGRAPHS OF THE TEST CONFIGURATION.....	16
6 INFORMATION ON THE TESTING LABORATORIES.....	17
7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	18



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF141226C02B-4	Original release	May 13, 2015



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1 CERTIFICATION

PRODUCT: Mobile Computer

MODEL: RS30

BRAND: CIPHERLAB

APPLICANT: CIPHERLAB CO., LTD

TESTED: May 13, 2015

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: FCC PART 22, Subpart H

This report is issued as a supplementary report of **RF141226C02-4**. This report shall be used combined together with its original report.

PREPARED BY : Celine Chou , **DATE** : May 13, 2015
Celine Chou / Specialist

APPROVED BY : Bruce Chen , **DATE** : May 13, 2015
Bruce Chen / Project Engineer

NOTE: The radiated emission below 1GHz test was performed for the modification. Refer to original report for the other test data.

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 22 & Part 2			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
2.1046 22.913 (a)	Effective radiated power	PASS	Refer to NOTE below
---	Peak To Average Ratio	PASS	Refer to NOTE below
2.1055 22.355	Frequency Stability	PASS	Refer to NOTE below
2.1049	Occupied Bandwidth	PASS	Refer to NOTE below
22.917	Band Edge Measurements	PASS	Refer to NOTE below
2.1051 22.917	Conducted Spurious Emissions	PASS	Refer to NOTE below
2.1053 22.917	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -41.77dB at 39.72MHz.

NOTE: The radiated emission below 1GHz test was performed for the modification. Refer to original report for the other test data.

2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emissions	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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2.2 TEST SITE AND INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Oct. 06, 2014	Oct. 05, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Jul. 25, 2014	Jul. 24, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Feb. 06, 2015	Feb. 05, 2016
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8449B	3008A01960	Aug. 09, 2014	Aug. 08, 2015
Preamplifier Agilent	8447D	2944A10631	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 09, 2014	Aug. 08, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 09, 2014	Aug. 08, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100.	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100.	SC93021703	NA	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 4.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 460141.
5. The IC Site Registration No. is IC7450F-4.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Mobile Computer
MODEL NO.	RS30
POWER SUPPLY	3.7Vdc (Battery) 5Vdc (Adapter)
MODULATION TYPE	GSM, GPRS: GMSK EDGE: 8PSK WCDMA: BPSK, QPSK HSPDA: BPSK HUPDA: QPSK
FREQUENCY RANGE	GSM, GPRS, EDGE: 824.2MHz ~ 848.8MHz WCDMA: 826.4MHz ~ 846.6MHz
MAX. ERP POWER	GSM: 928.966mW (29.68dBm) EDGE: 899.498mW (29.54dBm) WCDMA: 72.946mW (18.63dBm)
ANTENNA TYPE	PIFA antenna with -4.90dBi gain
ANTENNC CONNECTOR	Spring
DATA CABLE	1.0m shielded USB cable without core 1.6m non-shielded snapon cable with one core
DATA CABLE	Refer to users' manual
ACCESSORY DEVICES	Adapter, Battery

NOTE:

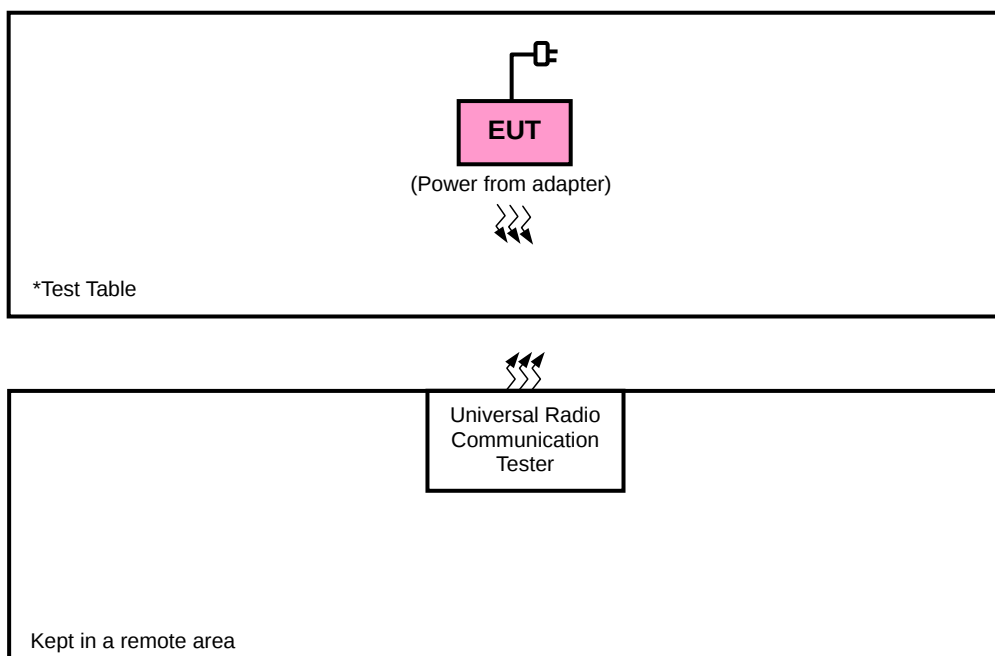
1. This report is prepared for FCC class II permissive change.
2. This report is issued as a supplementary report to BV ADT report no. RF141226C02-4. The differences compared with original report are changing EUT's appearance, battery and NFC's antenna position. The radiated emission below 1GHz test was performed for the modification. Refer to original report for the other test data. This report shall be combined together with its original report.
3. The EUT consumes power from the following adapter and battery. (Changed part is marked in boldface.)

ADAPTER	
BRAND	Sunny COMPUTER TECHNOLOGY CO., LTD.
MODEL	SYS1460-1005
INPUT POWER	100-240Vac, 50-60Hz, 1.0A
OUTPUT POWER	5Vdc, 2A

BATTERY	
BRAND	CIPHERLAB
MODEL	BA-0092A5
POWER RATING	3.7Vdc, 2500mAh, 9.25Wh

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 CONFIGURATION OF SYSTEM UNDER TEST



3.3 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	UNIVERSAL RADIO COMMUNICATION TESTER	R&S	CMU200	123112	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

NOTE:

1. All power cords of the above support units are non shielded (1.8m).
2. Item 1 acted as a communication partner to transfer data.

3.4 TEST ITEM AND TEST CONFIGURATION

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on **Y-plane**. Following channel(s) was (were) selected for the final test as listed below:

GSM MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
-	RADIATED EMISSION BELOW 1GHz	128 to 251	128	GSM, EDGE

WCDMA MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
-	RADIATED EMISSION BELOW 1GHz	4132 to 4233	4132	WCDMA

TEST CONDITION:

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RADIATED EMISSION	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu



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3.5 EUT OPERATING CONDITIONS

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.6 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 22

ANSI/TIA/EIA-603-C 2004

NOTE: All test items have been performed and recorded as per the above standards.

4 TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13dBm .

4.1.2 TEST PROCEDURES

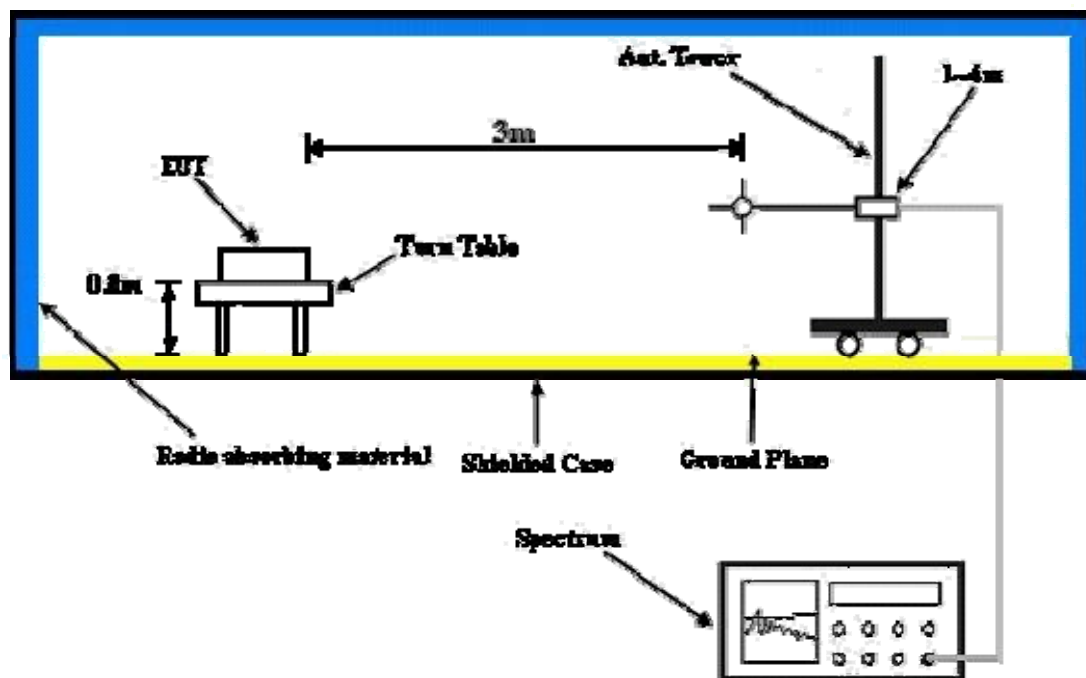
- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G
- c. $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,
 $\text{E.R.P power} = \text{E.I.R.P power} - 2.15\text{dBi}$.

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.5 TEST RESULTS

BELOW 1GHz WORST-CASE DATA:

FOR GSM MODE

MODE	TX channel 128	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	18deg. C, 70%RH	INPUT POWER	120Vac, 60Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	82.48	-53.25	-54.73	-0.95	-55.68	-13.00	-42.68
2	183.57	-58.97	-60.12	3.37	-56.75	-13.00	-43.75
3	218.56	-59.95	-61.01	5.45	-55.56	-13.00	-42.56
4	253.55	-60.56	-61.54	5.38	-56.16	-13.00	-43.16
5	292.42	-62.53	-63.43	5.17	-58.26	-13.00	-45.26
6	547.07	-66.81	-67.22	4.65	-62.57	-13.00	-49.57
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	45.55	-45.00	-47.15	-9.97	-57.12	-13.00	-44.12
2	82.48	-54.10	-55.58	-0.95	-56.53	-13.00	-43.53
3	193.29	-62.39	-63.52	4.62	-58.90	-13.00	-45.90
4	331.30	-61.98	-62.80	5.18	-57.62	-13.00	-44.62
5	374.07	-62.44	-63.16	5.23	-57.93	-13.00	-44.93
6	840.60	-63.58	-63.58	3.97	-59.61	-13.00	-46.61

REMARKS:

- ERP(dBm) = S.G Power Value (dBm) + Correction Factor (dB).
- Correction Factor = gain of substitution antenna + cable loss



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FOR EDGE MODE

MODE	TX channel 128	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	18deg. C, 70%RH	INPUT POWER	120Vac, 60Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	82.48	-53.81	-55.29	-0.95	-56.24	-13.00	-43.24
2	146.63	-58.24	-59.50	-0.21	-59.71	-13.00	-46.71
3	183.57	-59.49	-60.64	3.37	-57.27	-13.00	-44.27
4	218.56	-60.21	-61.27	5.45	-55.82	-13.00	-42.82
5	302.14	-62.30	-63.18	5.14	-58.04	-13.00	-45.04
6	547.07	-67.45	-67.86	4.65	-63.21	-13.00	-50.21
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	39.72	-41.69	-43.84	-10.93	-54.77	-13.00	-41.77
2	80.54	-54.89	-56.38	-1.49	-57.87	-13.00	-44.87
3	144.69	-60.88	-62.15	-0.24	-62.39	-13.00	-49.39
4	187.45	-63.13	-64.28	3.88	-60.40	-13.00	-47.40
5	267.15	-66.77	-67.72	5.31	-62.41	-13.00	-49.41
6	298.26	-66.35	-67.23	5.14	-62.09	-13.00	-49.09

REMARKS:

1. $ERP(dBm) = S.G \text{ Power Value (dBm)} + \text{Correction Factor (dB)}$.
2. Correction Factor = gain of substitution antenna + cable loss



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FOR WCDMA MODE

MODE	TX channel 4132	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	18deg. C, 70%RH	INPUT POWER	120Vac, 60Hz
TESTED BY	Nick Hsu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	86.37	-54.66	-56.12	0.12	-56.00	-13.00	-43.00
2	146.63	-58.62	-59.88	-0.21	-60.09	-13.00	-47.09
3	220.50	-60.45	-61.51	5.45	-56.06	-13.00	-43.06
4	267.15	-65.65	-66.60	5.31	-61.29	-13.00	-48.29
5	298.26	-62.10	-62.98	5.14	-57.84	-13.00	-44.84
6	547.07	-67.17	-67.58	4.65	-62.93	-13.00	-49.93
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)
1	45.55	-43.70	-45.85	-9.97	-55.82	-13.00	-42.82
2	82.48	-55.27	-56.75	-0.95	-57.70	-13.00	-44.70
3	146.63	-61.45	-62.71	-0.21	-62.92	-13.00	-49.92
4	224.39	-64.83	-65.88	5.44	-60.44	-13.00	-47.44
5	304.09	-66.20	-67.07	5.14	-61.93	-13.00	-48.93
6	358.52	-64.93	-65.69	5.22	-60.47	-13.00	-47.47

REMARKS:

1. $ERP(dBm) = S.G \text{ Power Value (dBm)} + \text{Correction Factor (dB)}$.
2. Correction Factor = gain of substitution antenna + cable loss



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5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.



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7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---