Undervoltage test

Report Reference No......:	SN1307032-A
Complied by（+ signature）**..... :**	Joe Chen
Approved by（+ signature）**..... :**	Ben Hung
Date of issue.....:	October , 28 , 2013
Total number of pages.....	10
Testing Laboratory.....:	QuieTek Corporation
Address.....:	2F., No. 345, Xinhu 2nd Rd., Neihu District, Taipei, Taiwan, R.O.C.
Testing location.....:	As above
Applicant's name.....:	Alltek Marine Electronics Corp.
Address.....:	7F, No.605, Ruei Guang Rd., Neihu, Taipei, Taiwan, 114 R.O.C.
Manufacturer's name.....:	Alltek Marine Electronics Corp.
Address.....:	7F, No.605, Ruei Guang Rd., Neihu, Taipei, Taiwan, 114 R.O.C.
Factory's name.....:	Same as the manufacturer.
Address.....:	Same as the manufacturer.
Test item description :	AIS Class B Transponder
Trade Mark.....:	AMEC
Model/Type reference.....:	CAMINO-108、CAMINO-108W
Ratings.....:	12 / 24Vdc, 2.0A

Revision History

Rev.	Issue Date	Revisions	Effect page	Revised By
00	September 5, 2013	Initial Issue	All	Joe Chen
01	October 15, 2013	1) Add section 1.1 Tested System Details 2) Add section 1.2 EUT Test Setup Environment & Configuration of AIS System 3) Add section 1.3 Performance Check Method 4) Add section 1.4 EUT Operation Procedures 5) Add performance check data	3, 4, 6, 7	Joe Chen
02	October 28, 2013	Revise Test Report number to SN1307032-A	All	Joe Chen

1.1 Tested System Detalls

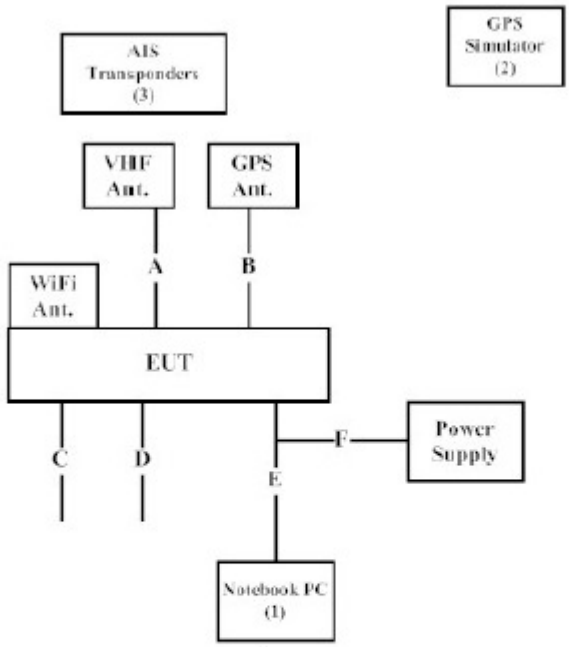
The types for all equipment , plus descriptions of all cables used in the tested system(including SD card) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	acer	V3-571G		
2	GPS Simulator	Agilent	E4438C	N/A	Non-shielded, 1.8m
3	AIS Transponders	AMEC	CAMINO-101 / CAMINO-701	N/A	Non-shielded, 1.8m

1.2 EUT Test Setup Environment & Configuration of AIS System

In order to do performance-check during EMC immunity tests, an equipment setup (AIS related) as shown in the following diagram is used in general.
A Satellite Simulator is used during the tests to emulate GPS signal source for the EUT.

Connection Diagram



Signal Cable Type		Signal cable Description
A	VHF Cable	Shielded, 10m
B	GPS Cable	Shielded, 10m
C	Mini USB to USB Cable	Shielded, 1.8m
D	NMEA 2000 Cable	Shielded, 3m
E	RS-232 Cable	Shielded, 1.5m
F	Power/Data Cable	Shielded, 1.4m

The Satellite Simulator (Agilent E4438C) is put outside the EMC chamber with cable connecting to GPS transmitting antenna inside the EMC chamber. The simulated-GPS-source-signal is transmitted from Satellite Simulator to EUT's GPS antenna (AMEC ANT-21) wirelessly.

1.3 Performance Check Method

The EUT is set into autonomous mode with reporting interval of 180 seconds in the test environment in Section 1.2. Additional AIS transponders are used to monitor the content of reports and the reporting intervals of EUT. The EUT performance shall not be degraded during or after the test. A PC software tool is used in parallel to record the AIS transmitting rate and receiving rate. The data is used to check if there is any degradation of performance or loss of function.

An IEC-61162 Datalogger software is used (running on PC) to check the EUT performance during and after the test together with the additional AIS transponders. The method and screenshots on how to verify the transmitting and receiving performance at the EUT are shown at test data.

1.4 EUT Operation Procedures

1	Setup the EUT and simulator as show on 1.2.
2	Turn on the power of all equipment .
3	All of features of the EUT operation normally .

Undervoltage test

(Refer to IEC 62287 Section 9.4 requirements , Please see below)

9.4 Undervoltage test (brown out)

9.4.1 Purpose

This test simulates the situation where the nominal supply voltage drops to below acceptable levels and then recovers over a medium time period. This is consistent with the performance of a flat or unhealthy battery when an engine is started.

9.4.2 Method of test

Operate the EUT at the nominal supply voltage as indicated by the manufacturer.

a) Gradually reduce the supply voltage to 40 % of the nominal supply voltage over a time period of 30 s.

b) Gradually increase the supply voltage back to 80 % of the nominal supply voltage over a time period of 30 s.

9.4.3 Required result

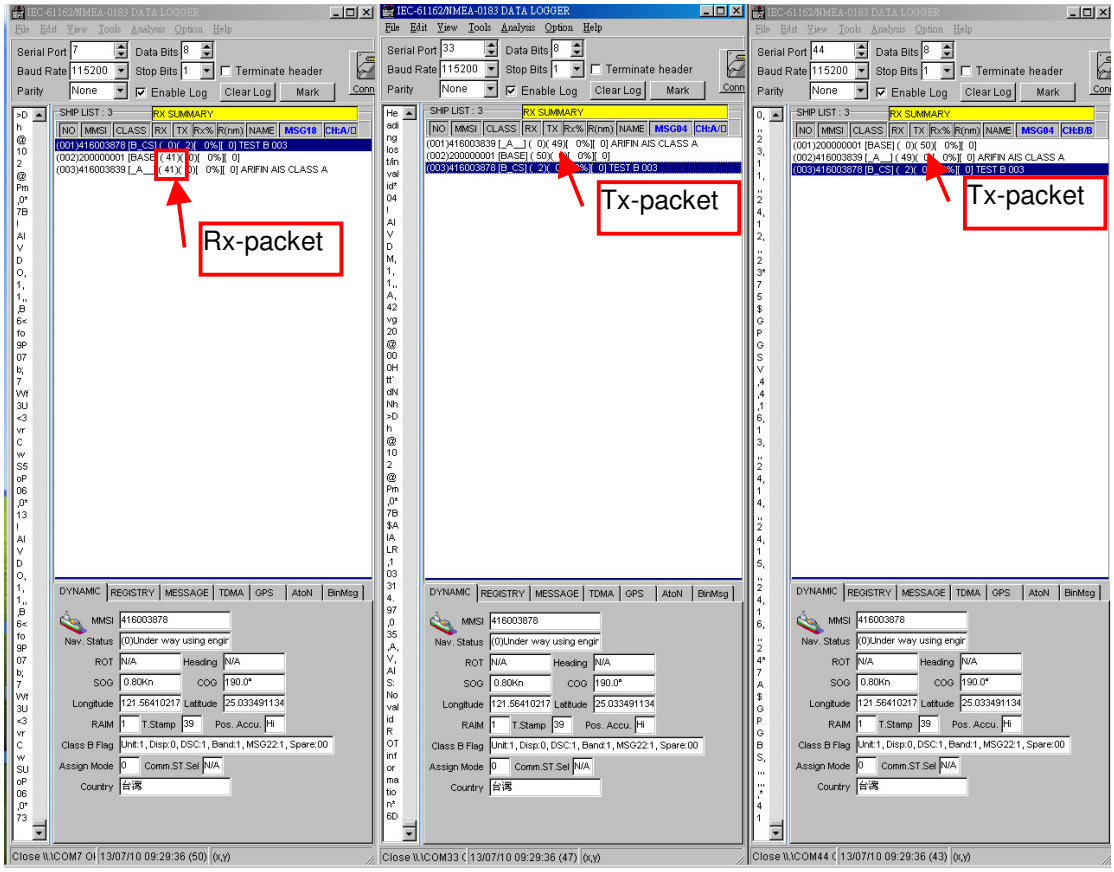
a) The unit shall not enter into any undefined or undesirable state as verified by a performance check.

b) The EUT shall recover and be fully operational as verified by a performance check.

TEST DATA

9.4	TABLE: Undervoltage test (brown out)		
U (Vdc)	40% U(Vdc)	80% U(Vdc)	Condition/status
12	4.8	9.6	When EUT gradually reduce the supply voltage to 40 % of the nominal supply voltage over a time period of 30s , EUT shutdown ;When EUT Gradually increase the supply voltage back to 80 % of the nominal supply voltage over a time period of 30 s , EUT works normally .
24	9.6	19.2	When EUT gradually reduce the supply voltage to 40 % of the nominal supply voltage over a time period of 30s , EUT normal work ;When EUT Gradually increase the supply voltage back to 80 % of the nominal supply voltage over a time period of 30 s , EUT works normally .

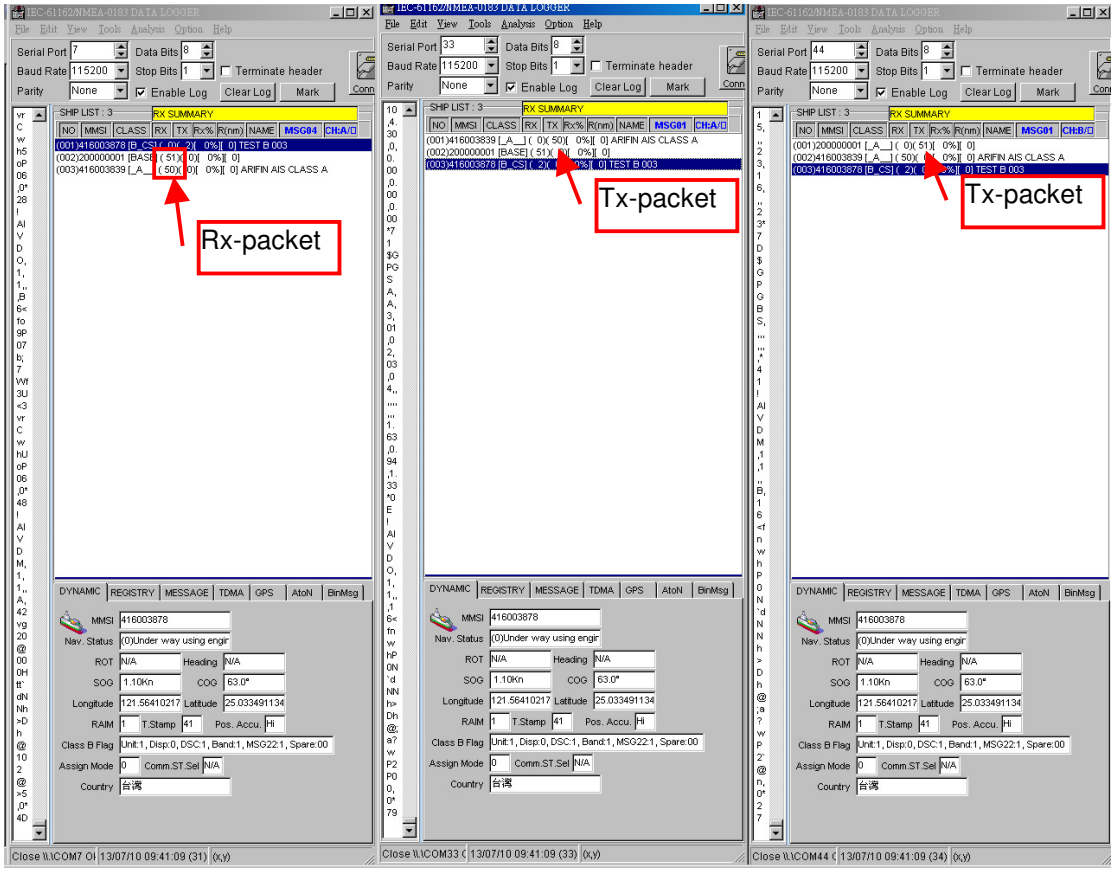
Test Record of Undervoltage (DC12V)
On the screenshot below, the transmitting packet quantity (of the additional AIS transponder) is marked by "Tx-packet" which is 99 (49 plus 50). The receiving packet quantity of the EUT is marked by "Rx-packet" which is 82 (41 plus 41).
Therefore, the PER (Packet Error Rate) of the EUT receiving performance under this test is 17.17%.



Test Record of Undervoltage (DC24V)

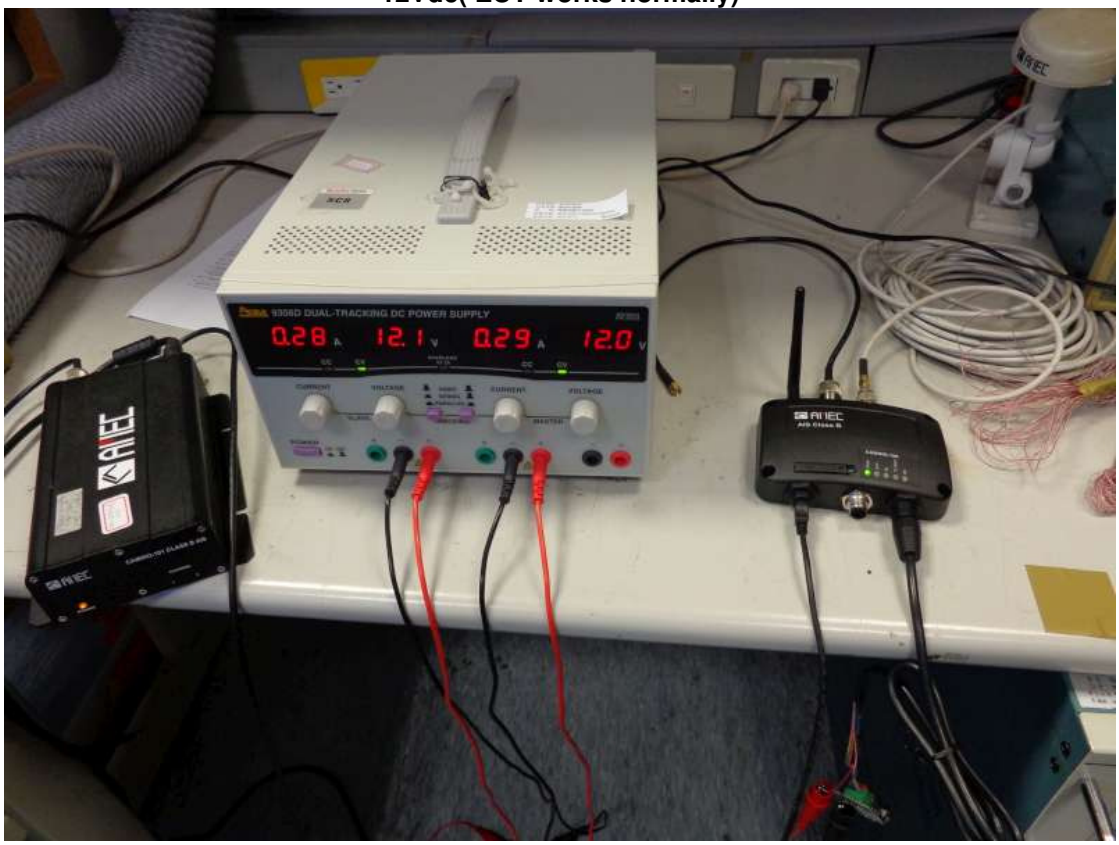
On the screenshot below, the transmitting packet quantity (of the additional AIS transponder) is marked by "Tx-packet" which is 101 (50 plus 51). The receiving packet quantity of the EUT is marked by "Rx-packet" which is 101 (51 plus 50).

Therefore, the PER (Packet Error Rate) of the EUT receiving performance under this test is 0.00%.

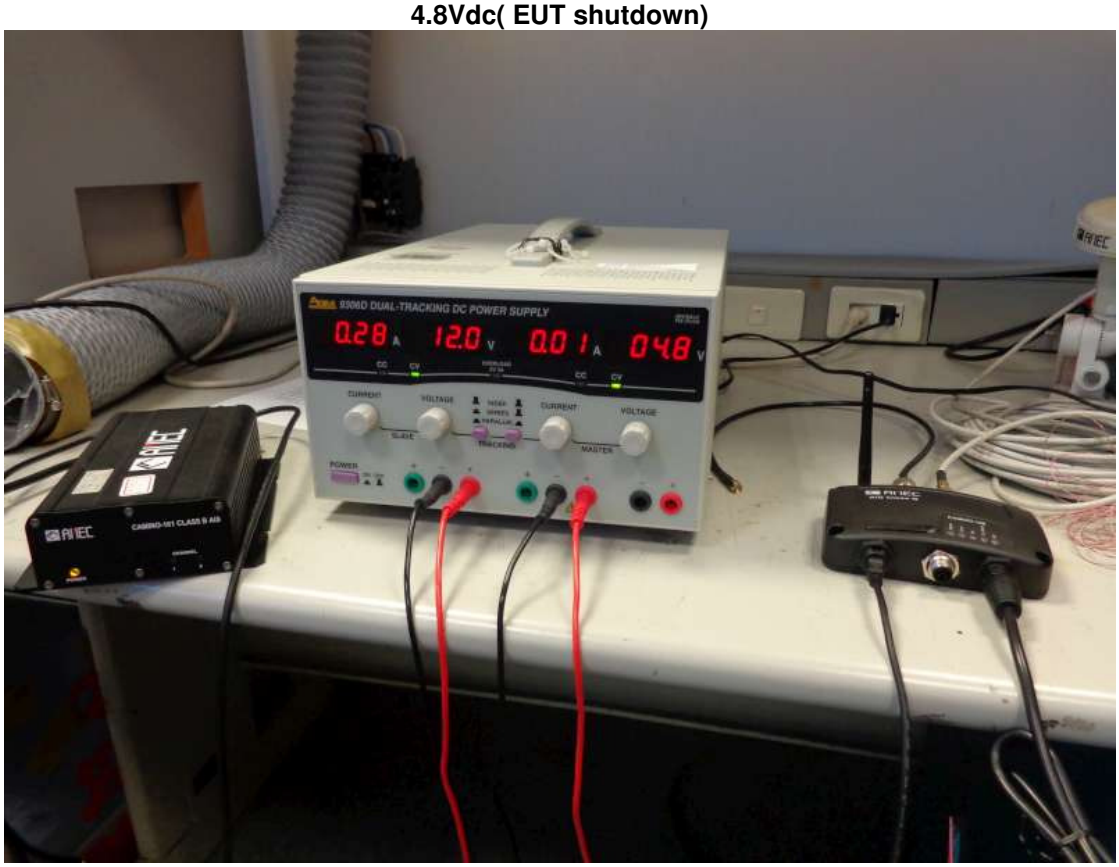


PHOTO

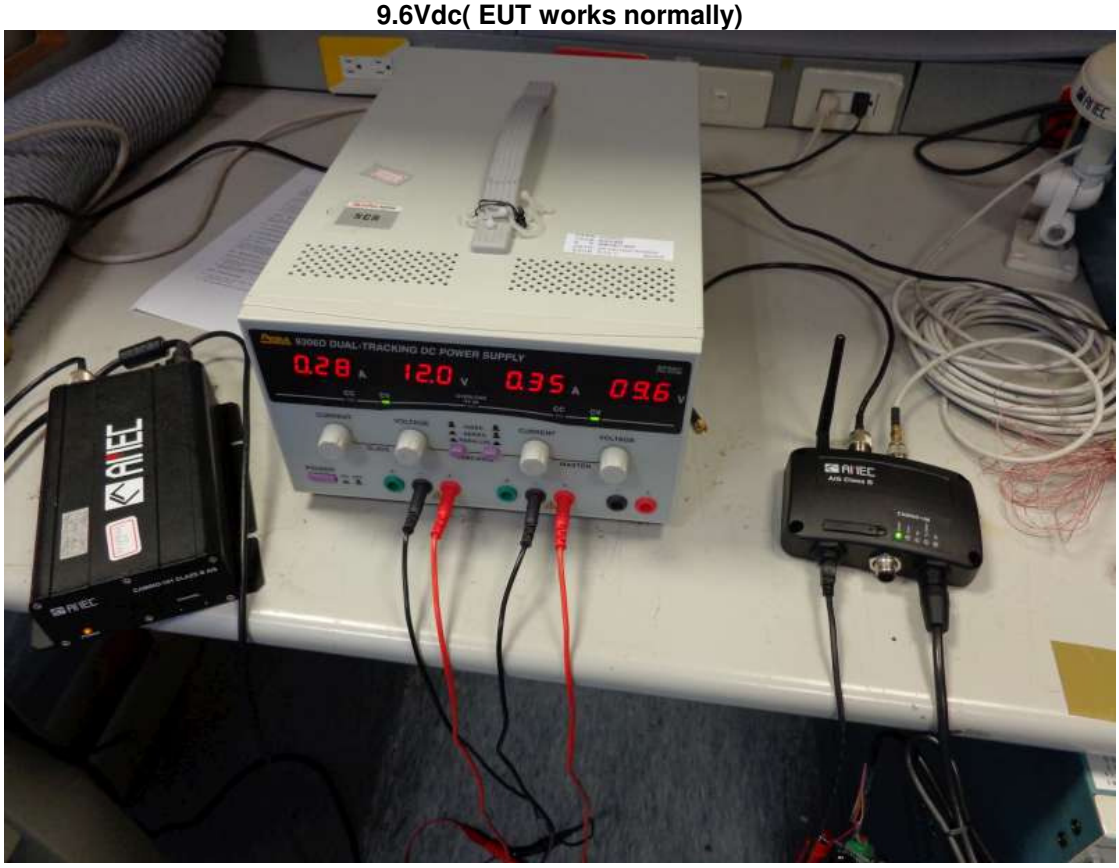
12Vdc(EUT works normally)



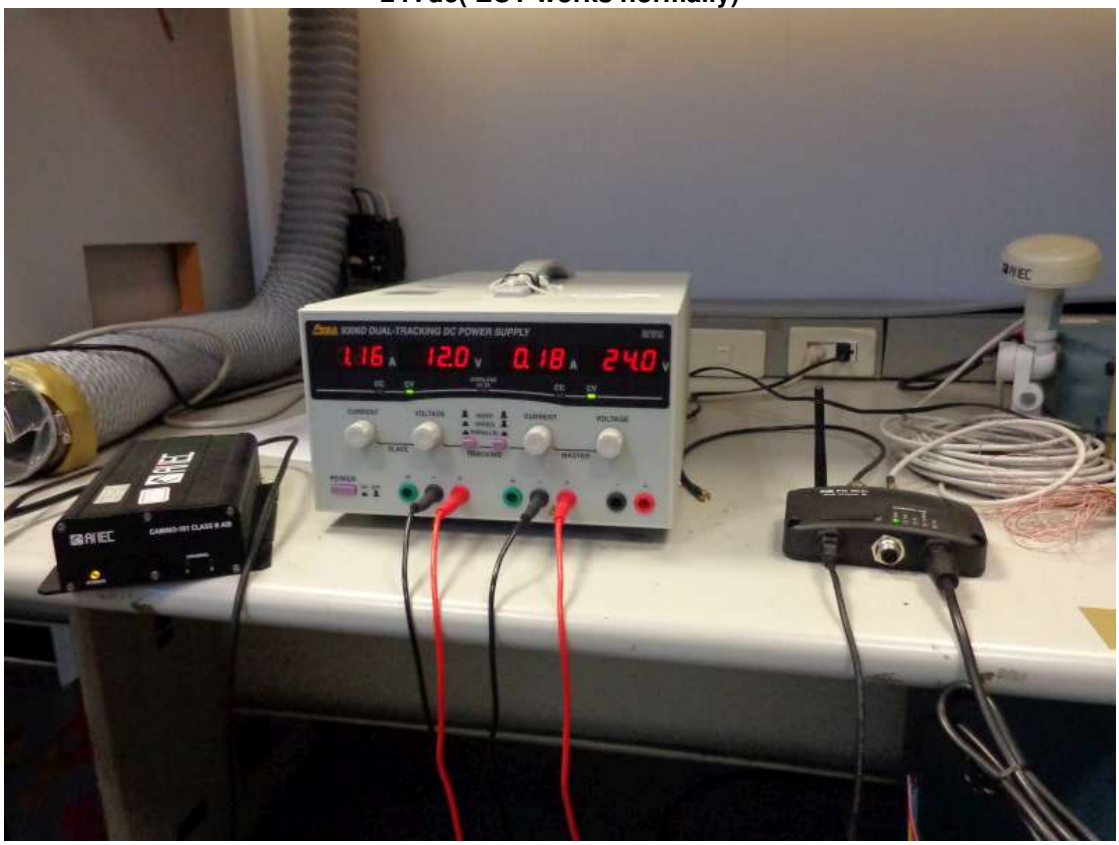
4.8Vdc(EUT shutdown)



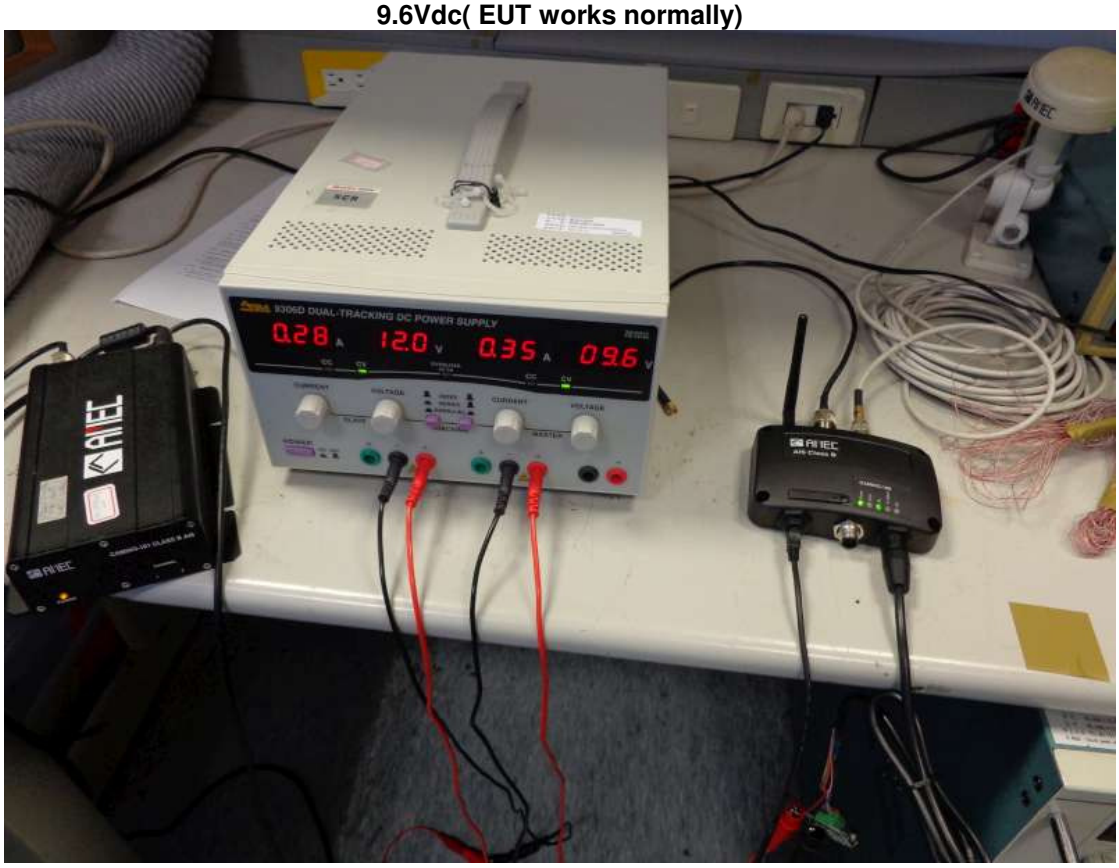
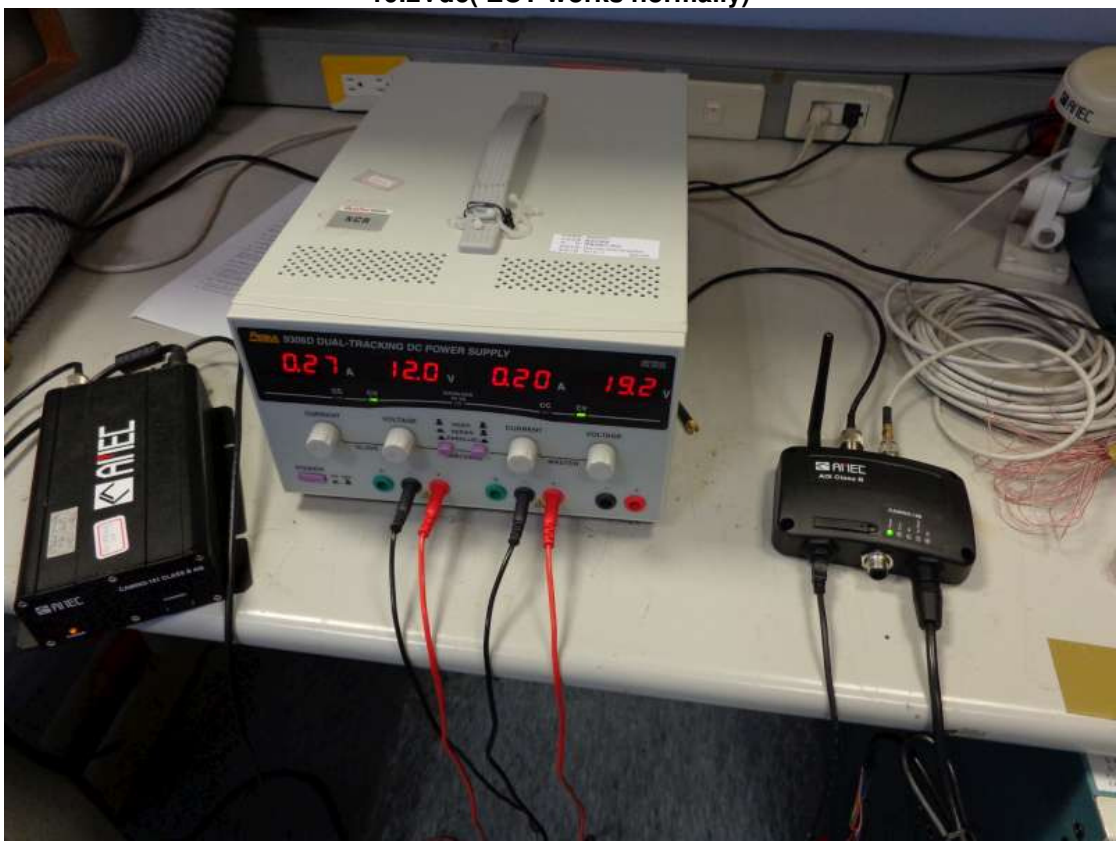
9.6Vdc(EUT works normally)



24Vdc(EUT works normally)



9.6Vdc(EUT works normally)



19.2Vdc(EUT works normally)