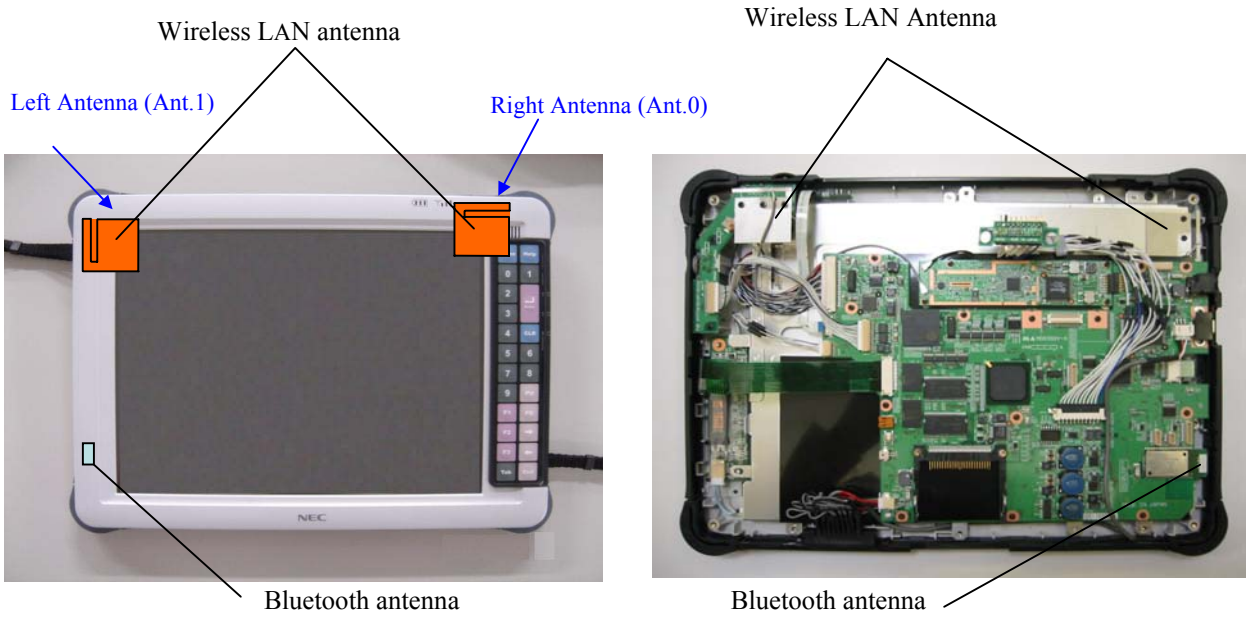
SECTION 6 : Test setup of EUT

6.1 Location of antennas



6.2 Photographs of test setup

When users operate or carry this EUT, it could be considered to touch or get close to their bodies.
In order to assume these situation, we performed the test at the following positions. Please refer to "APPENDIX 1" for more details.

1.Right Front : The test was performed in touch with front surface on the right antenna to the flat section of SAM Twin Phantom.

2.Left Front : The test was performed in touch with front surface on the left antenna to the flat section of SAM Twin Phantom.

3.Right Back : The test was performed in touch with back surface on the right antenna to the flat section of SAM Twin Phantom.

4.Left Back : The test was performed in touch with back surface on the left antenna to the flat section of SAM Twin Phantom.

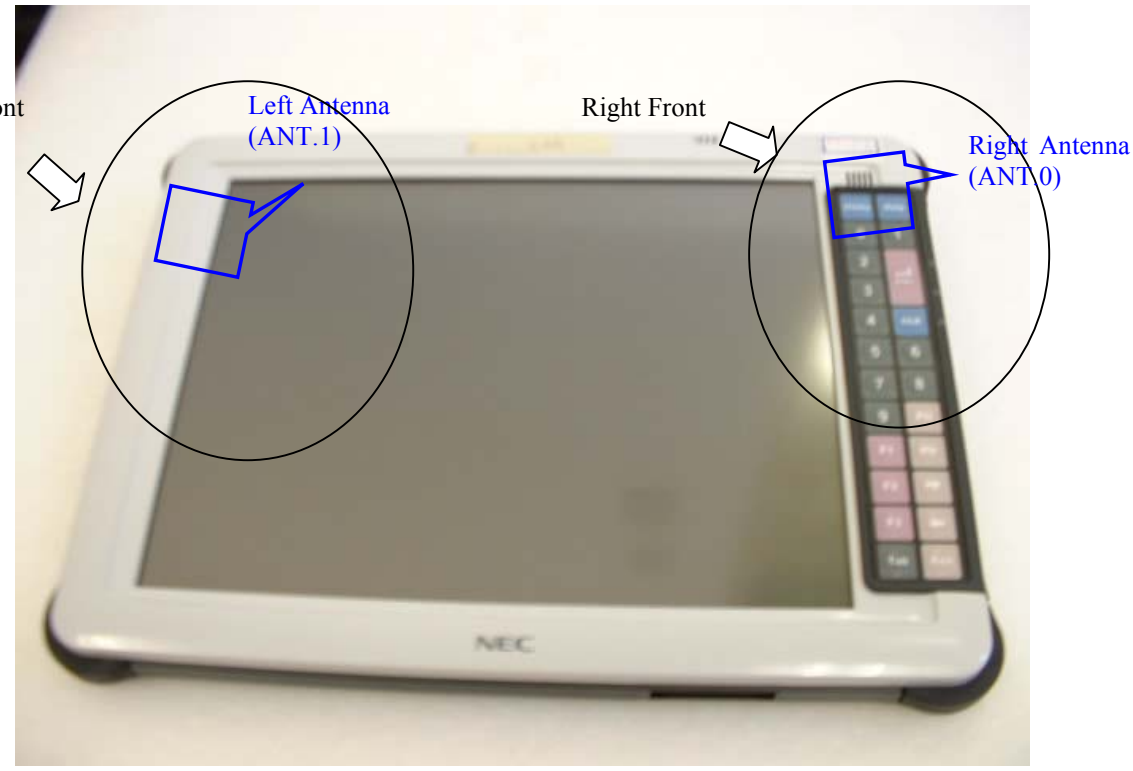
5.Right Top: The test was performed in touch with top surface on the right antenna to the flat section of SAM Twin Phantom.

6.Left Top : The test was performed in touch with top surface on the left antenna to the flat section of SAM Twin Phantom.

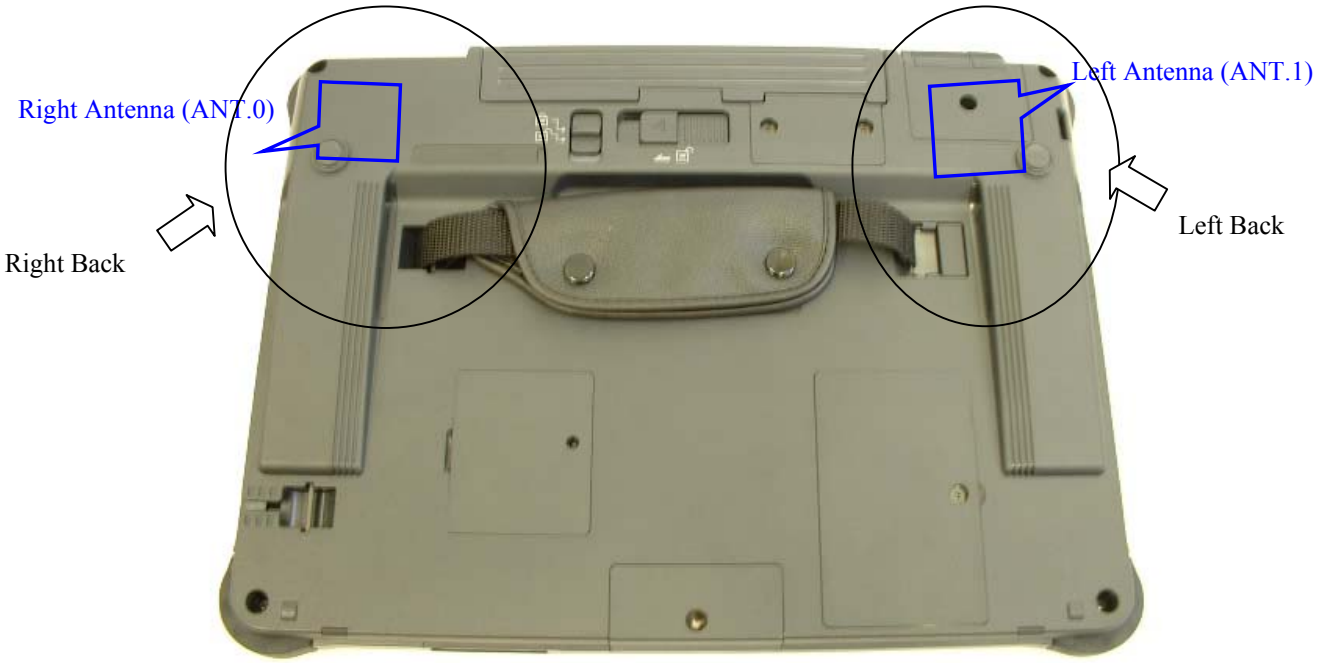
7.Right Side : The test was performed in touch with right side on the right antenna to the flat section of SAM Twin Phantom.

8.Left Side : The test was performed in touch with left side on the left antenna to the flat section of SAM Twin Phantom.

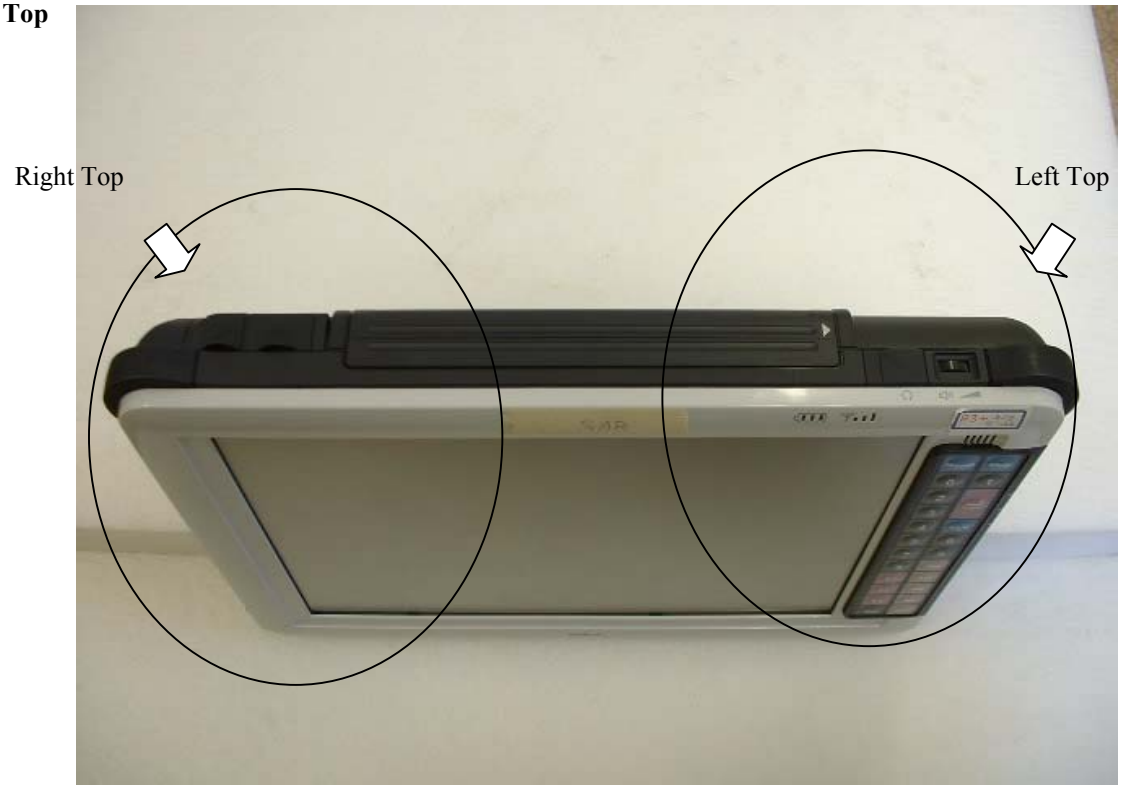
1. Front



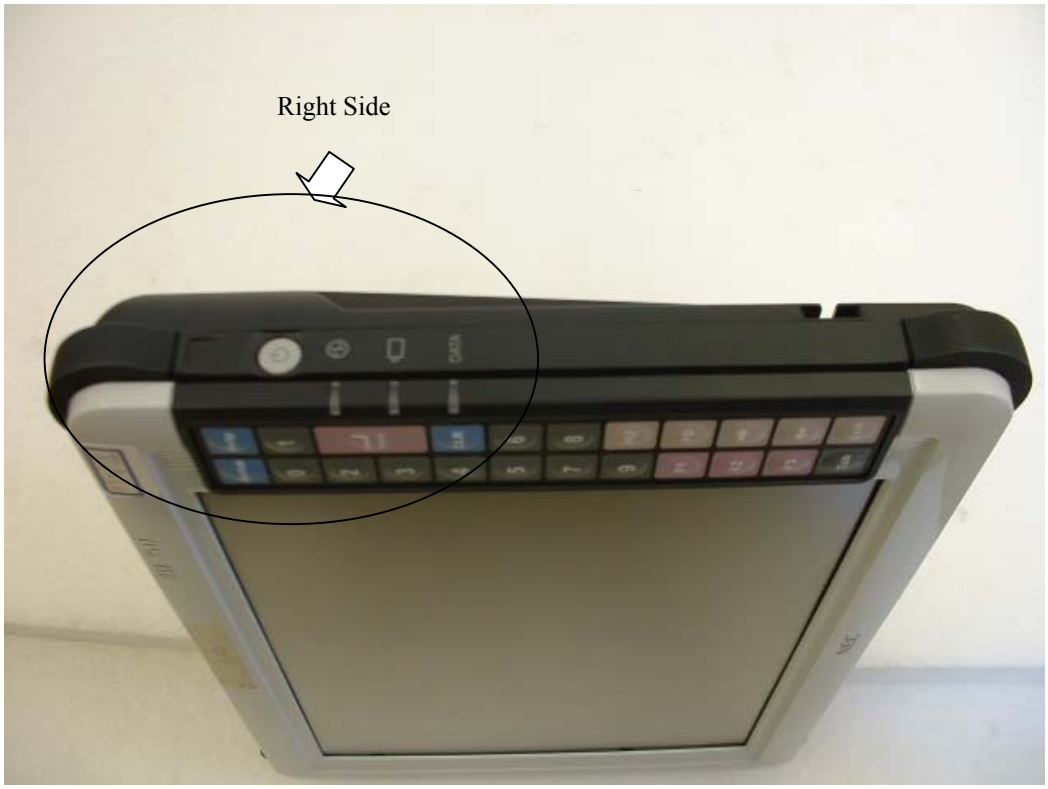
2. Back


Right Antenna (ANT.0)
Left Antenna (ANT.1)
Right Back
Left Back

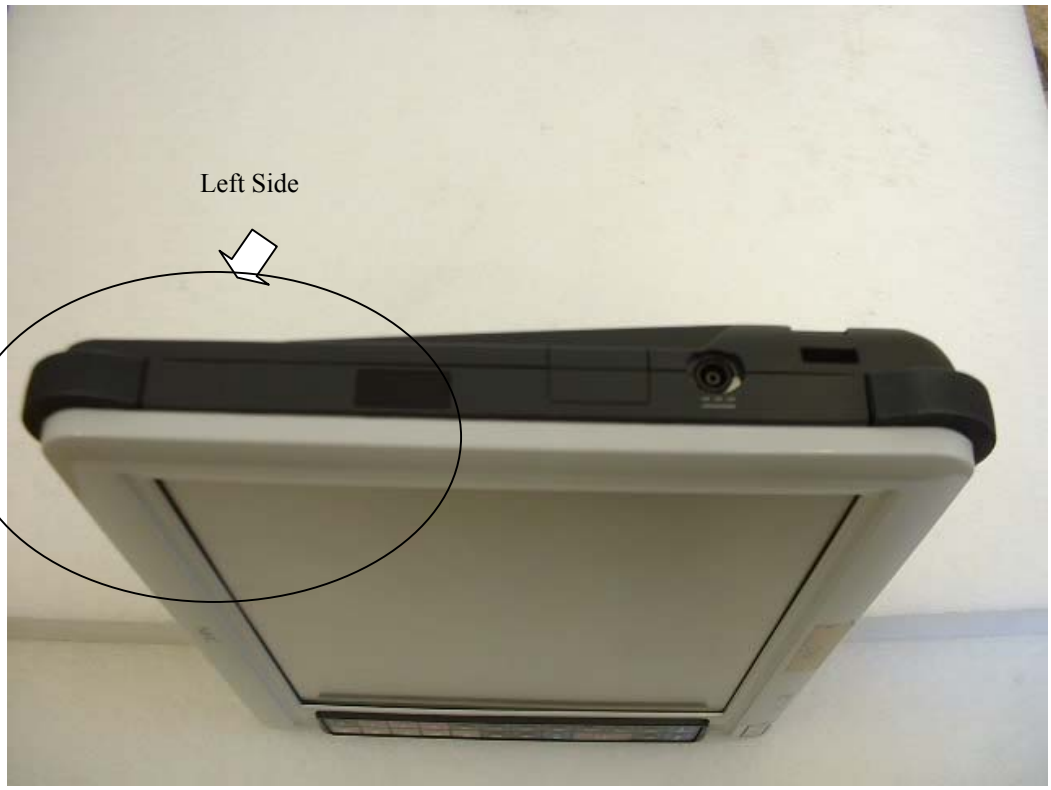
3. Top


Right Top
Left Top

4. Right Side



5. Left Side



6.2 EUT Tune-up procedure

This EUT has Wireless LAN and Bluetooth. The Wireless LAN module has IEEE.802.11b/11g.
The frequency range and the modulation were performed on the following. The Crest factors were performed on the usual condition that the user actually used.

1. IEEE 802.11b

TX Frequency : 2412-2462MHz
Channel : 1ch(2412MHz),6ch(2437MHz),11ch(2462MHz)
Modulation : DSSS (DBPSK[1Mbps] / DQPSK[2Mbps] / CCK [5.5Mbps&11Mbps])
Crest factor : 1.3(1M),1.5(2M),1.9(5.5M),2.3(11M)*

2. IEEE 802.11g

TX Frequency : 2412-2462MHz
Channel : 1ch(2412MHz),6ch(2437MHz),11ch(2462MHz)
Modulation : OFDM (BPSK[6Mbps] / QPSK[18Mbps] / 16QAM [36Mbps] / 64QAM[54Mbps])
Crest factor : 2.2(6M),2.2(18M),2.4(36M),2.5(54M)*

3. Bluetooth

TX Frequency : 2402-2480MHz
Modulation : Hopping (DH5)

***Details of crest factor**

(1) NJT-496, WLAN Module, can be switched to Burst TX Mode by software.
(2) In Burst TX Mode, TX data is generated by the software for each packet.
The software concentrates on generating and sending the data in this mode.
(3) In Normal Operation Mode*[1], TX duty ratio is lower than that in Burst TX Mode*[2] because the software processes more jobs than described in (2).
(4) Effective TX duty ratios in Burst TX Mode (manufacturer's DATA and our measurement results) are shown in the following table.
This manufacturer's data are calculated values from the statistical analysis*[3].
When SAR was tested, we checked the duty ratios and the crest factors were calculated by duty ratios of our measurement results.

*[1] Normal Operation Mode is actually operation by the user.
*[2] Burst TX Mode is SAR testing mode.
*[3]The measurement time of statistical analysis was shorter enough than time of SAR testing.

Effective TX duty ratios in Burst TX Mode

Mode	Modulation	Data rate [bps]	Manufacture's data [%]	Measurement result [%]	Crest facror of SAR test
11b	DBPSK	1M	80	74.5	1.3
	DQPSK	2M	63	65.4	1.5
	CCK	5.5M	57	53.7	1.9
		11M	46	43.8	2.3
11g	BPSK	6M	54	45.7	2.2
		9M	52	Not tested	-
	QPSK	12M	40	Not tested	-
		18M	43	47.4	2.2
	16QAM	24M	39	Not tested	-
		36M	46	42.4	2.4
	64QAM	48M	40	Not tested	-
		54M	37	40.9	2.5

Example of sample calculation

We show the calculated crest factor in 11b /CCK(11Mbps).

On time : 1.65 [ms]
On + Off time : 3.767 [ms]
Duty [%] = on time / on + off time x 100
= 1.65 / 3.767 x 100
= 43.8 %

Therefore,

Crestfactor = 1 / 0.438
≒ 2.3

6.3 Method of measurement

1. IEEE 802.11b + Bluetooh(Hopping)

Step1. The searching for the worst modulation

Step2. The searching for the worst position
This test was performed at the worst modulation of Step1.

Step3. The changing to the Low and High channels
This test was performed at the worst conditions of Step1 and Step2.

2. IEEE 802.11g + Bluetooh(Hopping)

Step1. The data rate in the higher average power * of each modulation was decided, and the worst modulation was searching in the SAR testing.
*Average power : calucated value by manufacture's duty ratios and peak power

Step2. The searching for the worst position
This test was performed at the worst modulation of Step1.

Step3. The changing to the Low and High channels
This test was performed at the worst conditions of Step1 and Step2.

3. Transmission of only W-LAN (Bluetooth hopping off)

This test was performed at the worst conditions of each antenna.