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GENERAL INFORMATION

1	APPLICANT	:	KYE SYSTEMS CORP.
2	ADDRESS	:	No. 492, Sec. 5, Chung Hsin Rd., San Chung, Taipei Hsien, 241, Taiwan, R.O.C.
3	MANUFACTURER	:	KYE SYSTEMS CORP.
4	ADDRESS	:	No. 492, Sec. 5, Chung Hsin Rd., San Chung, Taipei Hsien, 241, Taiwan, R.O.C.

5 DESCRIPTION OF EUT :

EUT	:	Traveler 600 Laser
FCC ID	:	FSUGMZHP
Model Number	:	GM-060021/T, GM-060021/R
Serial #	:	N/A

6 FEATURES OF EUT :

6.1 Frequency Band: 27MHz.

6.2 Carrier Frequency: 27.045MHz.

6.3 Modulation Type: FSK.

MODIFICATION LIST

THE FOLLOWING ACCESSORIES WERE ADDED TO THE EUT DURING TESTING :

NO MODIFICATION BY HOMETEK TECHNOLOGY INC.

CONDUCTED POWER LINE TEST

1 TEST PROCEDURE

According to **ANSI C63.4 – 2003**.

2 RESULT OF CONDUCTED EMISSION TEST

N/A(Conducted Power Line Test is not applicable to this EUT (Model : GM-060021/T, GM-060021/R).

RADIATED EMISSION TEST (3M)

1 TEST INSTRUMENTS & FACILITIES

The following test Instruments was used during the radiated emission test :

Item	Instruments /facilities	Specification	Manufacturer	Model # / S/N#	Date of Cal.
1	OPEN AREA TEST SITE	☑ OATS 3			JUL/2006
2	EMI TEST RECEIVER	20Hz ~ 26.5GHz	ROHDE & SCHWARZ	ESMI 845442/006	FEB/2006
3	PRE-AMPLIFIER	9KHz ~ 3000MHz	ADVANTEST	BB525C 90081001	OCT/2006
4	ANTENNA (LOOP)	10KHz ~ 30MHz	ZHINAN	ZN30900A	NOV/2005
5	Horn Antenna	1G ~ 18GHz	BJXIBAO	040506	OCT/2006
6	Attenuation	50Ω/6dB	JYE BAO	FAT-N (M-F) 001	JUL/2006
7	Cable	10m	SUHNER	RG214/U OS3-003	DEC/2005
8	Cable	14m	BELDEN	9913 OS3-001	DEC/2005
9	EMI 32 (software)	N/A	AUDIX	19991013-0923	N/A

Note : Items 1 ~ 8 were calibrated within period of 1 year.

2 EUT OPERATING CONDITION

2.1 Configure the EUT according to the **ANSI C63.4 - 2003**.

2.2 The frequency of the EUT is 27.045 MHz.

2.3 The radiated emission in the frequency range from 30 MHz - 1000 MHz was test in a horizontal and vertical polarization at HomeTek Lab's open site III.

2.4 The crystal frequency of the EUT is 26.59 MHz (For Model No.: GM-060021/R, GM-060024/R); the crystal frequencies of the EUT are 16 MHz and 27.042 MHz (For Model No.: GM-060021/T, GM-060024/T).

2.5 Provided by 2AA battery to Mouse. Connect receiver to USB port of Person computer.

2.6 Turn on all the power of EUT and peripheral.

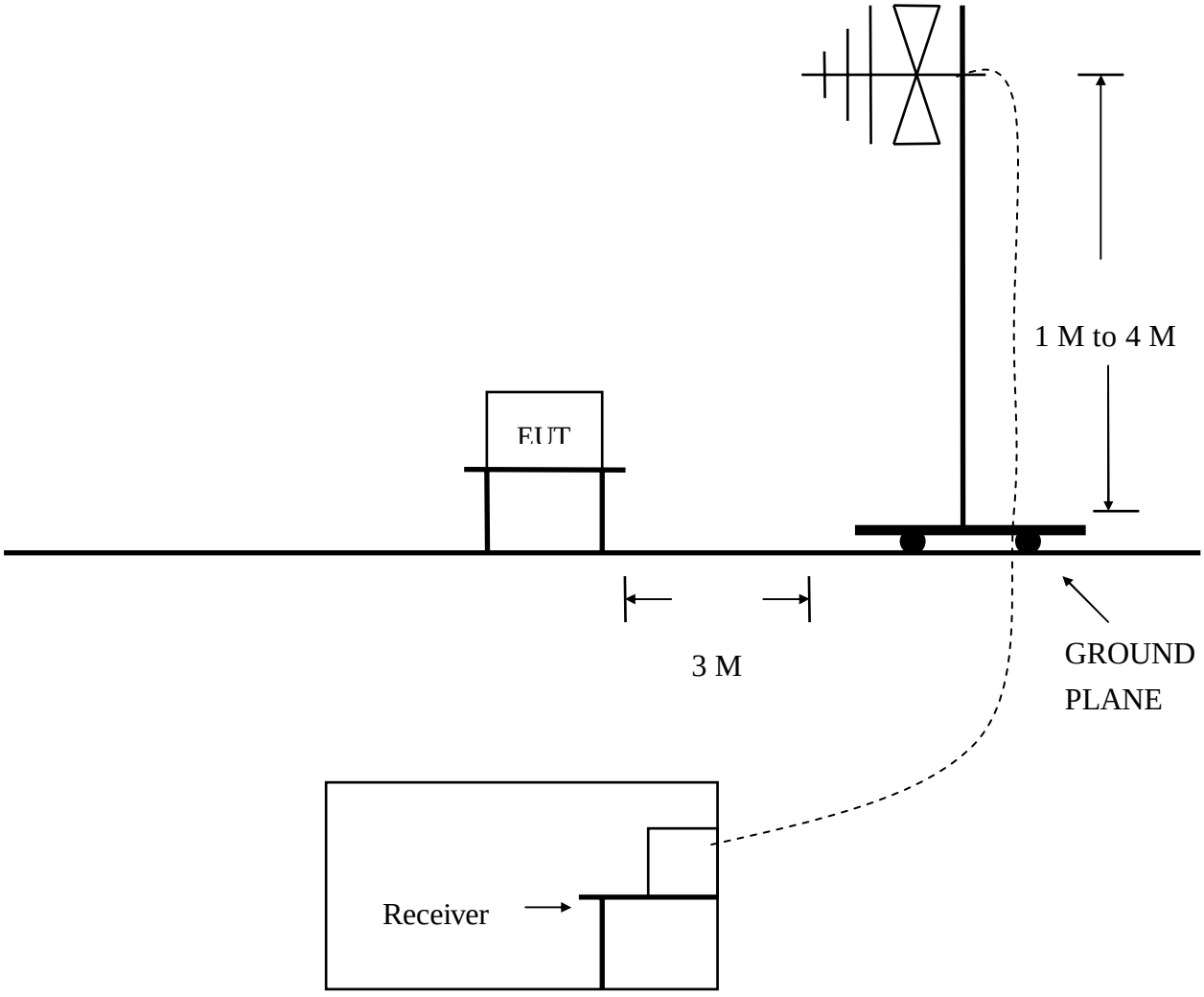
2.7 The EUT was operated in its normal operating mode for the purpose of the measurements.

2.8 The receiving antenna polarized horizontally was varied from 1 to 4 meters and the wooden turntable was rotated through 360 degrees to obtain the highest reading on the ESMI test receiver or on the display of the spectrum analyzer. And also, each emission was to be maximized by changing the orientation of the EUT.

2.9 The photos of radiated test configuration, please refer to appendix A.

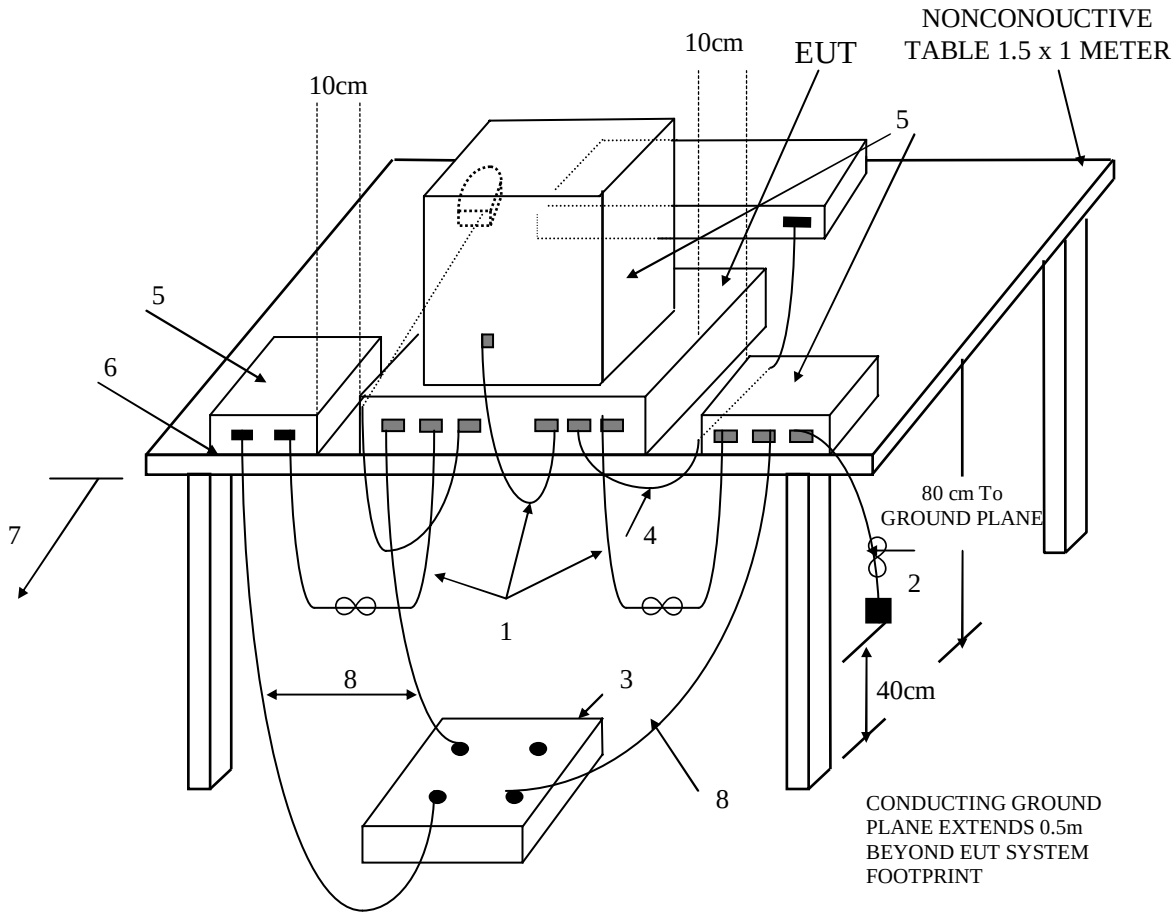
3 TEST SETUP

3.1 TEST SETUP OF OPEN SITE.



3.2 TEST SETUP OF EUT

ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE OF 9kHz TO 40 GHz ANSI C63.4-2003



(Details for setup configuration, please refer to appendix A.)

LEGEND:

1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.
2. I/O cables that are connected to a peripheral shall be bundled in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1m.
3. If LISNs are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground plane with the receptacle flush with the ground plane.
4. Cables of hand-operated devices, such as keyboards, mouses, etc., have to be placed as close as possible to the controller.
5. Non-EUT components of EUT system being tested.
6. The rear of all components of the system under test shall be located flush with the rear of the table.
7. No vertical conducting wall used.
8. Power cords drape to the floor and are routed over to receptacle.

Test Configuration

Tabletop Equipment Radiated Emission

4 CONFIGURATION OF THE EUT

The EUT was configured according to **ANSI C63.4 - 2003**. All I/O ports were connected to the appropriate peripherals. All peripherals and cables are listed below (including internal device) :

4.1 EUT

EUT Type	:	☐Proto Type ☑Engineer Type ☐Mass Production
Condition when received	:	☑Good ☐Damage : _____
Device	:	Traveler 600 Laser
Applicant	:	KYE SYSTEMS CORP.
Manufacturer	:	KYE SYSTEMS CORP.
Model Number	:	GM-060021/T, GM-060021/R
Serial Number	:	N/A
FCC ID	:	FSUGMZHP
I/O Port	:	N/A
Power Cord	:	N/A
Power Supply Type	:	Battery

4.2 PERIPHERALS

☑ Host Personal Computer

Manufacturer	:	HP/COMPAQ
Model Number	:	D330UT
Serial Number	:	SGH40606Z1
FCC ID	:	FCC DoC
Data Cable	:	Shielded
Power Cord	:	Shielded, 1.8 m

☑ Monitor

Manufacturer	:	SAMSUNG
Model Number	:	GH19BS
Serial Number	:	GH19H4JW103538B
FCC ID	:	FCC DoC
Data Cable	:	Shielded, 1.5 m, Connected to the VGA port
Power Cord	:	Un-Shielded, 1.8 m

☑ Printer

Manufacturer	:	HP
Model Number	:	DJ400
Serial Number	:	MY7781C1BB
FCC ID	:	B94C2642X
Data Cable	:	Shielded, 1.5 m, Connected to the Printer port
Power Cord & Adaptor	:	Un-Shielded, 1.8 m

☑ Modem

Manufacturer	:	ACEEX
Model Number	:	1414
Serial Number	:	9013526
FCC ID	:	IFAXDM1414
Data Cable	:	Shielded, 1.5 m, Connected to the COM port
Power Cord & Adaptor	:	Un-Shielded, 1.8 m

☑ Mouse (PSII)

Manufacturer	:	HP
Model Number	:	M-S69
Serial Number	:	334684-002
FCC ID	:	FCC DoC
Data Cable	:	Shielded, 1.8 m, Connected to the PSII port
Power Cord	:	N/A

☑ KeyBoard (PSII)

Manufacturer	:	HP
Model Number	:	KB-0133
Serial Number	:	323686-AB1
FCC ID	:	FCC DoC
Data Cable	:	Shielded, 1.5 m, Connected to the PSII port
Power Cord	:	N/A

4.3 REMARK : N/A

5 TEST PROCEDURE

5.1 The EUT was test according to **ANSI C63.4 – 2003 & FCC Part 15.205/15.209/15.231**.

5.2 The radiated test was performed at HomeTek Lab's Open Site III.

5.3 This site is on file with the FCC laboratory division, test firm registration number: 713630, expiration Date : 2005/10/20.

5.4 For emission frequencies measured below 1 GHz, a pre-scan is performed in a shielded chamber to determine the accurate frequencies. The signal of higher emissions will be checked on a open test site. As the same purpose, for emission frequencies measured above 1 GHz, a pre-scan also be performed with a 1 meter measuring distance before final test.

5.5 For emission frequencies measured below and above 1 GHz, set the spectrum analyzer or a 100KHz and 1MHz resolution bandwidth respectively for each frequency measured in item 5.4.

5.6 The receiving antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Move the antenna to a position where the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0^{o} to 360^{o} with a speed as slow as possible and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.

5.7 Repeat item 5.6 until all frequencies need to be measured were completed.

5.8 Repeat item 5.7 with search antenna in vertical polarized orientations.

5.9 Check seven frequencies of highest emission with varying the placement of cables (if any) associated with EUT to obtain the worst case and record the result.

5.10 The frequency range from 30 MHz to 1 GHz were investigated, the measurement were made at 3 meters, with a BI-log antenna.

6 LIMIT OF RADIATED EMISSION CLASS B

Frequency (MHz)	Measurement Distance	dBuV/m	uV/m
Fundamental frequency	3 (M)	48	250
30 - 88	3 (M)	40	100
88 - 216	3 (M)	43.5	150
216 - 960	3 (M)	46	200
Above 960	3 (M)	54	500

6.1 The tighter limit shall apply at the edge between two frequency bands.

6.1 Measurement distance in meters between the measuring instrument antenna and the closed point of any part of the EUT or peripherals.

7 RESULT OF RADIATED EMISSION TEST

7.1 The frequency range from 30 MHz to 1 GHz was investigated.

7.2 All readings below or equal 1 GHz are quasi-peak or peak values with resolution bandwidth of 120 KHz. The reading of fundamental frequency is peak or average values. With resolution bandwidth of 120KHz.

7.3 The measurements were made at 3 meters of HomeTek Lab's open site III.

7.4 Temperature : 27 ℃, Humidity : 59 % RH.

7.5 Deviation form the test standards and rules : None.

7.6 Radiated Emission data : **Horizontal**

Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Read Level (dBuV)	ANT Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Detector
* 27.045	45.09	80.00	-34.91	49.18	15.20	0.74	20.03	Peak
243.411	29.42	46.00	-16.58	41.15	11.74	2.15	25.62	Peak
270.518	29.09	46.00	-16.91	39.78	12.62	2.25	25.56	Peak
297.471	28.35	46.00	-17.65	38.44	13.06	2.35	25.50	Peak
324.591	28.51	46.00	-17.49	37.70	13.75	2.49	25.43	Peak
405.538	30.79	46.00	-15.21	37.34	15.72	2.92	25.19	Peak
432.698	31.77	46.00	-14.23	37.55	16.26	3.04	25.08	Peak
540.304	30.79	46.00	-15.21	33.56	18.44	3.47	24.68	Peak

- Emission Level = Read Level – Preamp Factor + ANT Factor + Cable Loss.
- Sample Calculation for 540.304 MHz .
- Corrected Reading : (33.56) - (24.68) + (18.44) + (3.47) = 30.79 .

7.6 Radiated Emission data : **Vertical**

Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Read Level (dBuV)	ANT Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Detector
* 27.045	39.56	80.00	-40.44	43.65	15.20	0.74	20.03	Peak
162.107	20.84	43.50	-22.66	35.03	9.84	1.75	25.78	Peak
270.453	25.18	46.00	-20.82	35.87	12.62	2.25	25.56	Peak
297.567	29.49	46.00	-16.51	39.58	13.06	2.35	25.50	Peak
324.640	25.56	46.00	-20.44	34.75	13.75	2.49	25.43	Peak
378.527	27.09	46.00	-18.91	34.50	15.09	2.78	25.28	Peak
405.227	26.37	46.00	-19.63	32.98	15.68	2.91	25.20	Peak
432.733	28.29	46.00	-17.71	34.07	16.26	3.04	25.08	Peak

- Emission Level = Read Level – Preamp Factor + ANT Factor + Cable Loss.
- Sample Calculation for 432.733 MHz .
- Corrected Reading : (34.07) - (25.08) + (16.26) + (3.04) = 28.29 .

REMARK :
1. Model : GM-060021/T.
2. Measuring mode : RF Mode.
3. "*", means this frequency is fundamental.
4. Result : **PASSED**

8 Emission Band Measurement

8.1 According to **FCC Part 15.239(a)** emissions from the intentional radiator shall be confined within a band 200KHz wide centered on the operating frequency. The 200KHz band shall lie wholly within the frequency range of 27.045 MHz.

8.2 All reading are peak values with resolution bandwidth of 50 KHz.

8.3 Temperature : 21 ℃, Humidity : 59 % RH.

8.4 Deviation form the test standards and rules : None.

8.5 The test data of Emission Band, please refer to appendix C.

PHOTO OF FCC ID LABEL

SAMPLE OF FCC ID LABEL :

FCC ID : FSUGMZHP

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference. And (2) this device must accept any interference that may cause undesired operation.

Please refer to appendix B photo of ID location.