

# RADIO TEST REPORT

Report No: STS1508078F03

Issued for

**EKO international Holding LTD** 

FLAT/RM A19, 9/F SILVERCORP INTERNATIONAL TOWER, 707-713 NATHAN ROAD, MONGKOK, KOWLOON, HONG KONG.

Product Name:	Smart Phone
Brand Name:	EKO
Model No.:	EKO DUO 4.0 A40
Series Model:	N/A
FCC ID:	2AFP3EKODUOA40
Test Standard:	FCC Part 15.247

Any reproduction of this document must be done in full. No single part of this document may be reproducted permission from STS, All Test Data Presented in this report is only applicable to presented test sample.









	TEST RESULT CERTIFICATION
Applicant'sname	EKO international Holding LTD
Address	FLAT/RM A19, 9/F SILVERCORP INTERNATIONAL TOWER, 707-713 NATHAN ROAD, MONGKOK, KOWLOON, HONG KONG.
	. LOHAS Technology Holdings Limited
Address	FLAT/RM A19, 9/F SILVERCORP INTERNATIONAL TOWER, 707-713 NATHAN ROAD, MONGKOK, KOWLOON, HONG KONG.
Product description	
Product name	. Smart Phone
Brand name	
Model and/or type reference	EKO DUO 4.0 A40
Ratings	. DC 5V/750mA
Standards	. FCC Part 15.247
Test procedure	. ANSI C63.10-2013
under test (EUT) is in compli- sample identified in the report This report shall not be re	has been tested by STS, and the test results show that the equipment ance with the FCC requirements. And it is applicable only to the tested rt.  produced except in full, without the written approval of STS, this revised by STS, personal only, and shall be noted in the revision of the
Date of Test	
Date (s) of performance of tes	sts 31 Aug. 2015 ~07 Sep. 2015
Date of Issue	08 Sep. 2015
Test Result	Pass
Testing En	gineer : Jin Ming)  (Jin Ming)
Technical N	Manager : (Vita Li)
Authorized	Signatory: Tony York

1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong, China Tel: 0755-36886288 Fax: 0755-36886277 Http://www.stsapp.com E-mail: sts@stsapp.com

(Bovey Yang)







Table of Contents	Page
1. SUMMARY OF TEST RESULTS	6
1.1 TEST FACTORY	7
1.2 MEASUREMENT UNCERTAINTY	7
2. GENERAL INFORMATION	8
2.1 GENERAL DESCRIPTION OF EUT 2.2 DESCRIPTION OF TEST MODES	8 10
2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	10
2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	11
2.5 DESCRIPTION OF SUPPORT UNITS	12
2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS	13
3. EMC EMISSION TEST	14
3.1 CONDUCTED EMISSION MEASUREMENT	14
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	14
3.1.2 TEST PROCEDURE 3.1.3 TEST SETUP	15 15
3.1.4 EUT OPERATING CONDITIONS	15
3.1.5 TEST RESULTS	16
3.2 RADIATED EMISSION MEASUREMENT	18
3.2.1 RADIATED EMISSION LIMITS 3.2.2 TEST PROCEDURE	18 19
3.2.3 DEVIATION FROM TEST STANDARD	19
3.2.4 TEST SETUP	20
3.2.5 EUT OPERATING CONDITIONS	21
3.2.6 TEST RESULTS	22
4. CONDUCTED SPURIOUS EMISSIONS	28
4.1 REQUIREMENT	28
4.2 TEST PROCEDURE	28
4.3 TEST SETUP	28
4.4 EUT OPERATION CONDITIONS	28
4.5 TEST RESULTS	29
5. NUMBER OF HOPPING CHANNEL	41
5.1 APPLIED PROCEDURES / LIMIT	41
5.2 TEST PROCEDURE	41
5.3 TEST SETUP	41
5.4 EUT OPERATION CONDITIONS	41



Table of Contents	Page
5.5 TEST RESULTS	42
6. AVERAGE TIME OF OCCUPANCY	43
6.1 APPLIED PROCEDURES / LIMIT	43
6.2 TEST PROCEDURE	43
6.3 TEST SETUP	43
6.4 EUT OPERATION CONDITIONS	43
6.5 TEST RESULTS	44
7. HOPPING CHANNEL SEPARATION MEASUREMEN	50
7.1 APPLIED PROCEDURES / LIMIT	50
7.2 TEST PROCEDURE	50
7.3 TEST SETUP	50
7.4 EUT OPERATION CONDITIONS	50
7.5 TEST RESULTS	51
8. BANDWIDTH TEST	57
8.1 APPLIED PROCEDURES / LIMIT	57
8.2 TEST PROCEDURE	57
8.3 TEST SETUP	57
8.4 EUT OPERATION CONDITIONS	57
8.5 TEST RESULTS	58
9. PEAK OUTPUT POWER TEST	64
9.1 APPLIED PROCEDURES / LIMIT	64
9.2 TEST PROCEDURE	64
9.3 TEST SETUP	64
9.4 EUT OPERATION CONDITIONS	64
9.5 TEST RESULTS	65
10. ANTENNA REQUIREMENT	71
10.1 STANDARD REQUIREMENT	71
10.2 EUT ANTENNA	71



Page 5 of 73 Report No.: STS1508078F03

# **Revision History**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	08 Sep. 2015	STS1508078F03	ALL	Initial Issue





# 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247), Subpart C				
Standard Section	I LOCT ITOM		Remark	
15.207	Conducted Emission	PASS		
15.247(a)(1)	Hopping Channel Separation	PASS		
15.247(b)(1)	Peak Output Power	PASS		
15.247(c)	Radiated Spurious Emission	PASS		
15.247(d)	Conducted Spurious Emission	PASS		
15.247(a)(iii)	a)(iii) Number of Hopping Frequency			
15.247(a)(iii)	15.247(a)(iii) Dwell Time			
15.247(a)(1)	Bandwidth	PASS		
15.205	Band Edge Emission	PASS		
15.203	Antenna Requirement	PASS		

#### NOTE:

(1)" N/A" denotes test is not applicable in this Test Report



#### 1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.

Add.: 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,

Fuyong Street, Bao'an District, Shenzhen, Guangdong, China

CNAS Registration No.: L7649;

FCC Registration No.: 842334; IC Registration No.: 12108A-1

#### 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $\mathbf{y} \pm \mathbf{U}$ , where expended uncertainty  $\mathbf{U}$  is based on a standard uncertainty multiplied by a coverage factor of  $\mathbf{k=2}$ , providing a level of confidence of approximately 95 %  $^{\circ}$ 

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	±2.88dB
2	Conducted Emission (150KHz-30MHz)	±2.67dB
3	RF power,conducted	±0.70dB
4	Spurious emissions,conducted	±1.19dB
5	All emissions,radiated(<1G) 30MHz-200MHz	±2.83dB
6	All emissions,radiated(<1G) 200MHz-1000MHz	±2.94dB
7	All emissions,radiated(>1G)	±3.03dB
8	Temperature	±0.5°C
9	Humidity	±2%





# 2. GENERAL INFORMATION

# 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Smart Phone
Trade Name	EKO
Model Name	EKO DUO 4.0 A40
Serial Model	N/A
Model Difference	N/A
Channel List	Please refer to the Note 2.
Bluetooth	Frequency:2402 – 2480 MHz Modulation: GFSK(1Mbps), π/4-DQPSK(2Mbps), 8-DPSK(3Mbps)
Adapter	Input:AC110-240V,50/60Hz,150mA
Adapter	Output:DC 5V,750mA
Pottony	Rated Voltage: 3.7V
Battery	capacity :1680mAh
Hardware version number	A7-02
Software versioning number	EKO_DUO_4.0_A40_V3_SP_20150826
Connecting I/O Port(s)	Please refer to the User's Manual

#### Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2.

	Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
00	2402	27	2429	54	2456	
01	2403	28	2430	55	2457	
02	2404	29	2431	56	2458	
03	2405	30	2432	57	2459	
04	2406	31	2433	58	2460	
05	2407	32	2434	59	2461	
06	2408	33	2435	60	2462	
07	2409	34	2436	61	2463	
08	2410	35	2437	62	2464	
09	2411	36	2438	63	2465	
10	2412	37	2439	64	2466	
11	2413	38	2440	65	2467	
12	2414	39	2441	66	2468	
13	2415	40	2442	67	2469	
14	2416	41	2443	68	2470	
15	2417	42	2444	69	2471	
16	2418	43	2445	70	2472	
17	2419	44	2446	71	2473	
18	2420	45	2447	72	2474	
19	2421	46	2448	73	2475	
20	2422	47	2449	74	2476	
21	2423	48	2450	75	2477	
22	2424	49	2451	76	2478	
23	2425	50	2452	77	2479	
24	2426	51	2453	78	2480	
25	2427	52	2454			
26	2428	53	2455			

# 3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	EKO	EKO DUO 4.0 A40	PIFA Antenna	N/A	-1	BT Antenna

The EUT antenna is PIFA Antenna. no antenna other than that furnished by the responsible party shall be used with the device.



#### 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH00
Mode 2	CH39
Mode 3	CH78
Mode 4	Charging + Keeping TX mode

For Conducted Emission		
Final Test Mode	Description	
Mode 4	Charging + Keeping TX mode	

For Radiated Emission				
Final Test Mode Description				
Mode 1	CH00			
Mode 2	CH39			
Mode 3	CH78			
Mode 4	Charging + Keeping TX mode			

#### Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) We have be tested for all avaiable U.S. voltage and frequencies(For 120V,50/60Hz and 240V, 50/60Hz) for which the device is capable of operation.

# 2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

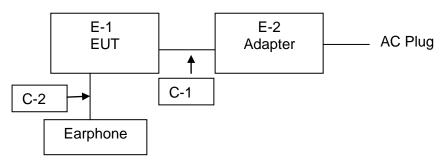
Test software Version	Test program: N/A			
Frequency	2402 MHz 2441 MHz 2480 MHz			
Parameters(1Mbps)	DEF DEF DEF			



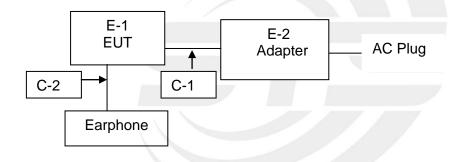
#### 2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

#### Radiated Spurious Emission Test



#### Conducted Emission Test





#### 2.5 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.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Smart Phone	EKO	EKO DUO 4.0 A40	N/A	EUT
E-2	Adapter	EKO	HJ-0501000	N/A	EUT
E-3	Earphone	N/A	N/A	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	unshielded	NO	100cm	N/A
C-2	unshielded	NO	117cm	N/A

#### Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in <code>"Length\_"</code> column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".





# 2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Spectrum Analyzer	Agilent	E4407B	MY50140340	2014.10.25	2015.10.24
Test Receiver	R&S	ESCI	101427	2014.10.25	2015.10.24
Bilog Antenna	TESEQ	CBL6111D	34678	2014.11.25	2015.11.24
Horn Antenna	Schwarzbeck	BBHA 9120D(1201)	9120D-1343	2015.03.06	2016.03.05
50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.06.06	2016.06.05
PreAmplifier	Agilent	8449B	60538	2014.10.25	2015.10.24
Loop Antenna	ARA	PLA-1030/B	1029	2015.06.08	2016.06.07
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2014.10.25	2015.10.24

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	102086	2014.11.20	2015.11.19
LISN	R&S	ENV216	101242	2014.10.25	2015.10.24
LISN	EMCO	3810/2NM	000-23625	2014.10.25	2015.10.24



#### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

#### 3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.247&207(a) limit in the table below has to be followed.

EDECLIENCY (MHz)	Class B	Standard	
FREQUENCY (MHz)	Quasi-peak	Average	Standard
0.15 -0.5	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	56.00	46.00	CISPR
5.0 -30.0	60.00	50.00	CISPR

0.15 -0.5	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	56.00	46.00	FCC
5.0 -30.0	60.00	50.00	FCC

#### Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

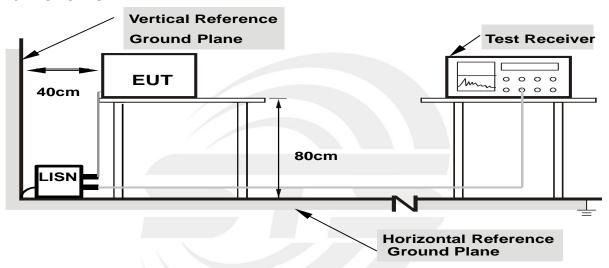
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



#### 3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 3.1.3 TEST SETUP



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

#### 3.1.4 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.





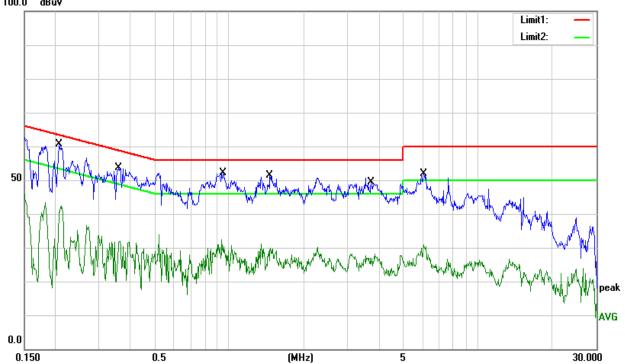
# 3.1.5 TEST RESULTS

EUT:	Smart Phone	Model Name.:	EKO DUO 4.0 A40
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	L
Test Voltage:	DC 5V from Adapter AC120V/60Hz	Test Mode:	Mode 4

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	Remark
0.2071	50.61	9.99	60.60	63.32	-2.72	QP
0.2071	30.54	9.99	40.53	53.32	-12.79	AVG
0.3558	43.48	10.07	53.55	58.83	-5.28	QP
0.3558	16.99	10.07	27.06	48.83	-21.77	AVG
0.9460	42.09	9.92	52.01	56.00	-3.99	QP
0.9460	18.96	9.92	28.88	46.00	-17.12	AVG
1.4580	41.49	9.95	51.44	56.00	-4.56	QP
1.4580	19.14	9.95	29.09	46.00	-16.91	AVG
3.7340	39.14	10.19	49.33	56.00	-6.67	QP
3.7340	15.04	10.19	25.23	46.00	-20.77	AVG
6.0580	41.79	10.20	51.99	60.00	-8.01	QP
6.0580	20.73	10.20	30.93	50.00	-19.07	AVG

# Remark:

1. Factor = Antenna Factor + Cable Loss - Pre-amplifier.





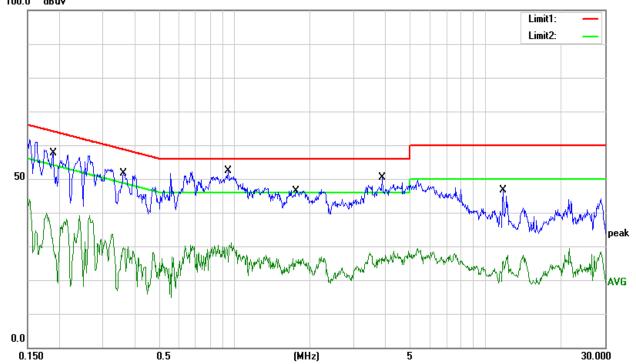


EUT:	Smart Phone	Model Name.:	EKO DUO 4.0 A40
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	N
Test Voltage:	DC 5V from Adapter AC120V/60Hz	Test Mode:	Mode 4

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	Remark
0.1900	47.67	10.00	57.67	64.04	-6.37	QP
0.1900	22.44	10.00	32.44	54.04	-21.60	AVG
0.3620	41.63	9.96	51.59	58.68	-7.09	QP
0.3620	19.60	9.96	29.56	48.68	-19.12	AVG
0.9460	42.25	10.00	52.25	56.00	-3.75	QP
0.9460	15.34	10.00	25.34	46.00	-20.66	AVG
1.7900	36.33	10.00	46.33	56.00	-9.67	QP
1.7900	15.40	10.00	25.40	46.00	-20.60	AVG
3.8860	40.19	10.20	50.39	56.00	-5.61	QP
3.8860	16.35	10.20	26.55	46.00	-19.45	AVG
11.7580	36.26	10.30	46.56	60.00	-13.44	QP
11.7580	15.36	10.30	25.66	50.00	-24.34	AVG

#### Remark:

1. Factor = Antenna Factor + Cable Loss - Pre-amplifier.





#### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 RADIATED EMISSION LIMITS

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on Part 15247&205(a), then the Part 15 247&209(a) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (30MHz - 1000MHz)

Zimire or to the Zime of orthogonal to the Zime of the					
Frequencies	Field Strength	Measurement Distance			
(MHz)	(micorvolts/meter)	(meters)			
0.009~0.490	2400/F(KHz)	300			
0.490~1.705	24000/F(KHz)	30			
1.705~30.0	30	30			
30~88	100	3			
88~216	150	3			
216~960	200	3			
Above 960	500	3			

#### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)			
FREQUENCT (MINZ)	PEAK	AVERAGE		
Above 1000	74	54		

#### Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

# FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower



Page 19 of 73 Report No.: STS1508078F03

Spectrum Parameter	Setting		
Attenuation	Auto		
Detector	Peak		
Start Frequency	1000 MHz(Peak/AV)		
Stop Frequency	10th carrier harmonic(Peak/AV)		
RB / VB (emission in restricted	4 MI I- / 4 MI I- AV/ 2 MI I-		
band)	1 MHz / 1 MHz, AV=3 MHz		

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

#### 3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters(above 1GHz is 1.5 m) above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m(above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos. Note:

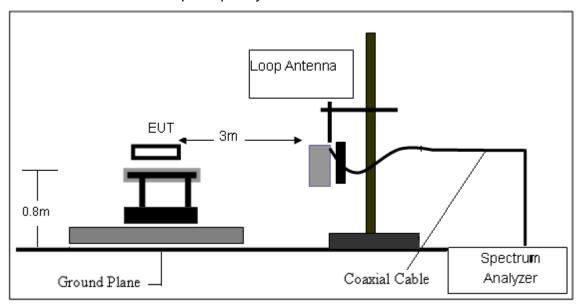
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD No deviation

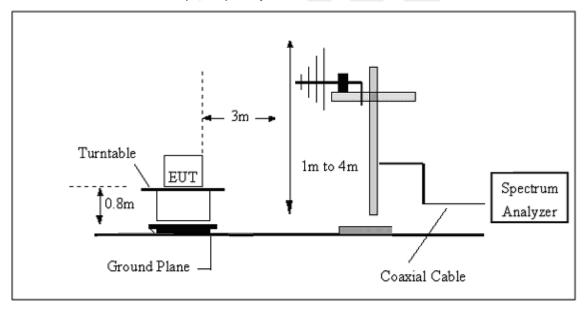


# 3.2.4 TEST SETUP

# (A) Radiated Emission Test-Up Frequency Below 30MHz

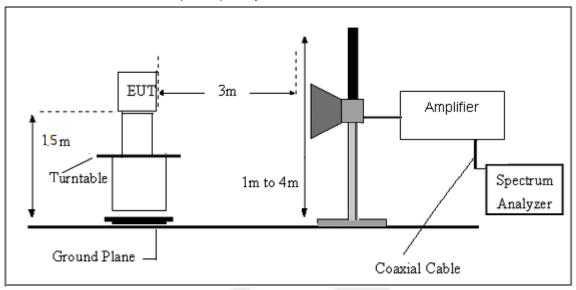


# (B) Radiated Emission Test-Up Frequency 30MHz~1GHz





# (C) Radiated Emission Test-Up Frequency Above 1GHz



# 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



# 3.2.6 TEST RESULTS

#### Below 30MHz

EUT:	Smart Phone	Model Name.:	EKO DUO 4.0 A40
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Mode:	Mode 4
Test Voltage:	DC 5V from Adapter AC120V/60Hz		

Freq.	Reading	Limit	Margin	State	Test Result	
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F	rest Result	
					PASS	
					PASS	

#### NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.





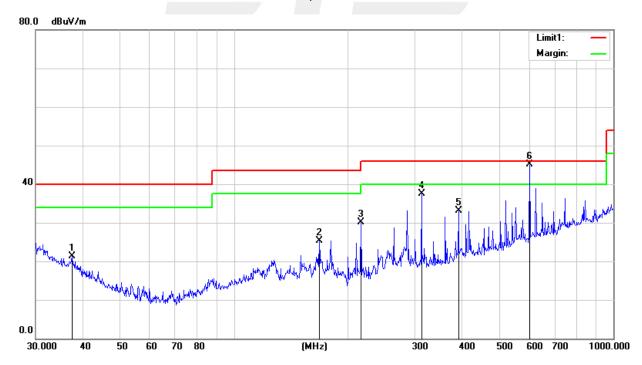
# Between 30-1000MHz

EUT:	Smart Phone	Model Name.:	EKO DUO 4.0 A40
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	Horizontal
Test Voltage:	DC 5V from Adapter AC 120V/60Hz	Test Mode:	Mode 4

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
37.4164	6.45	14.84	21.29	40.00	-18.71	QP
167.8242	14.61	10.75	25.36	43.50	-18.14	QP
216.0240	20.10	10.09	30.19	46.00	-15.81	QP
312.1794	22.40	15.10	37.50	46.00	-8.50	QP
390.7225	15.55	17.59	33.14	46.00	-12.86	QP
600.0065	22.94	22.15	45.09	46.00	-0.91	QP

#### Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



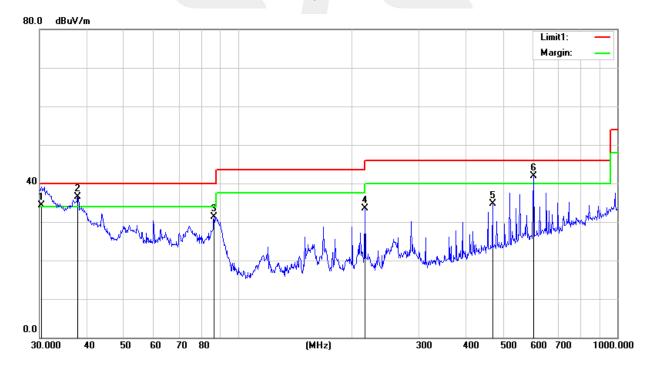


EUT:	Smart Phone	Model Name.:	EKO DUO 4.0 A40
Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	Vertical
Test Voltage:	DC 5V from Adapter AC 120V/60Hz	Test Mode:	Mode 4

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
30.3173	15.76	18.54	34.30	40.00	-5.70	QP
37.8121	21.88	14.64	36.52	40.00	-3.48	QP
86.5030	22.23	9.06	31.29	40.00	-8.71	QP
216.0240	23.42	10.09	33.51	46.00	-12.49	QP
468.8762	15.14	19.63	34.77	46.00	-11.23	QP
601.4265	19.62	22.19	41.81	46.00	-4.19	QP

#### Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.







# Above 1000 MHz

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	0
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	Comment
		Lo	ow Channel (2402	MHz)			
4804.20	66.45	-3.62	62.83	74	-11.17	PK	Vertical
4804.21	47.07	-3.62	43.45	54	-10.55	AV	Vertical
7206.13	62.34	-0.9	61.44	74	-12.56	PK	Vertical
7206.12	41.40	-0.9	40.5	54	-13.5	AV	Vertical
4803.99	62.15	-3.65	58.5	74	-15.5	PK	Horizontal
4803.98	44.56	-3.65	40.91	54	-13.09	AV	Horizontal
	Mid Channel (2441 MHz)						
4882.08	64.91	-3.65	61.26	74	-12.74	PK	Vertical
4882.07	49.19	-3.65	45.54	54	-8.46	AV	Vertical
7323.21	60.95	-0.84	60.11	74	-13.89	PK	Vertical
7323.21	44.29	-0.84	43.45	54	-10.55	AV	Vertical
4882.18	61.38	-3.68	57.7	74	-16.3	PK	Horizontal
4882.15	45.07	-3.68	41.39	54	-12.61	AV	Horizontal
	High Channel (2480 MHz)						
4960.26	61.40	-3.59	57.81	74	-16.19	PK	Vertical
4960.31	45.54	-3.59	41.95	54	-12.05	AV	Vertical
7440.33	61.23	-0.83	60.4	74	-13.6	PK	Vertical
7440.30	45.62	-0.83	44.79	54	-9.21	AV	Vertical
4960.33	61.45	-3.59	57.86	74	-16.14	PK	Horizontal
4960.31	45.60	-3.59	42.01	54	-11.99	AV	Horizontal

#### Note:

- 1) 30MHz~25GHz:(Scan with GFSK, π/4-DQPSK,8DPSK, the worst case is GFSK Mode)
- 2) Factor = Antenna Factor + Cable Loss Pre-amplifier.

Emission Level = Meter Reading + Factor

Margin = Limit - Emission Leve



# Band edge

Гиодинальн	Motor Deading	Foster	Emissis a Lavel	l incito	Moreir	Dotostan	
Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	
	GFSK						
2399.9	68.45	-12.99	55.46	74	-18.54	PK	Vertical
2399.9	54.29	-12.99	41.3	54	-12.7	AV	Vertical
2399.9	69.46	-12.99	56.47	74	-17.53	PK	Horizontal
2399.9	53.08	-12.99	40.09	54	-13.91	AV	Horizontal
2483.6	70.44	-12.78	57.66	74	-16.34	PK	Vertical
2483.6	53.53	-12.78	40.75	54	-13.25	AV	Vertical
2483.6	70.32	-12.78	57.54	74	-16.46	PK	Horizontal
2483.6	53.22	-12.78	40.44	54	-13.56	AV	Horizontal
			π/4-DQPSK				
2399.9	70.45	-12.99	57.46	74	-16.54	PK	Vertical
2399.9	53.30	-12.99	40.31	54	-13.69	AV	Vertical
2399.9	69.65	-12.99	56.66	74	-17.34	PK	Horizontal
2399.9	54.63	-12.99	41.64	54	-12.36	AV	Horizontal
2483.6	70.46	-12.78	57.68	74	-16.32	PK	Vertical
2483.6	55.35	-12.78	42.57	54	-11.43	AV	Vertical
2483.6	70.33	-12.78	57.55	74	-16.45	PK	Horizontal
2483.6	54.10	-12.78	41.32	54	-12.68	AV	Horizontal
	8DPSK						
2399.9	70.52	-12.99	57.53	74	-16.47	PK	Vertical
2399.9	54.75	-12.99	41.76	54	-12.24	AV	Vertical
2399.9	69.87	-12.99	56.88	74	-17.12	PK	Horizontal
2399.9	55.12	-12.99	42.13	54	-11.87	AV	Horizontal
2483.6	70.19	-12.78	57.41	74	-16.59	PK	Vertical
2483.6	53.92	-12.78	41.14	54	-12.86	AV	Vertical
2483.6	70.57	-12.78	57.79	74	-16.21	PK	Horizontal
2483.6	53.38	-12.78	40.6	54	-13.40	AV	Horizontal

Low measurement frequencies is range from 2310 to 2400 MHz, high measurement frequencies is range from 2483.5 to 2500 MHz.

Only show the worst point data of the emissions in the frequency 2310-2400 MHz and 2483.5-2500 MHz.



# Hopping

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector	Comment
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре	Comment
			GFSK				
2390.0	68.54	-12.99	55.55	74	-18.45	PK	Vertical
2390.0	55.13	-12.99	42.14	54	-11.86	AV	Vertical
2390.0	66.88	-12.99	53.89	74	-20.11	PK	Horizontal
2390.0	53.36	-12.99	40.37	54	-13.63	AV	Horizontal
2483.5	67.07	-12.78	54.29	74	-19.71	PK	Vertical
2483.5	53.58	-12.78	40.8	54	-13.2	AV	Vertical
2483.5	68.58	-12.78	55.8	74	-18.2	PK	Horizontal
2483.5	54.28	-12.78	41.5	54	-12.5	AV	Horizontal
	π/4-DQPSK						
2390.0	67.83	-12.99	54.84	74	-19.16	PK	Vertical
2390.0	55.05	-12.99	42.06	54	-11.94	AV	Vertical
2390.0	67.29	-12.99	54.3	74	-19.7	PK	Horizontal
2390.0	52.92	-12.99	39.93	54	-14.07	AV	Horizontal
2483.5	66.98	-12.78	54.2	74	-19.8	PK	Vertical
2483.5	53.67	-12.78	40.89	54	-13.11	AV	Vertical
2483.5	68.75	-12.78	55.97	74	-18.03	PK	Horizontal
2483.5	54.00	-12.78	41.22	54	-12.78	AV	Horizontal
	8DPSK						
2390.0	67.96	-12.99	54.97	74	-19.03	PK	Vertical
2390.0	55.26	-12.99	42.27	54	-11.73	AV	Vertical
2390.0	66.89	-12.99	53.9	74	-20.1	PK	Horizontal
2390.0	53.55	-12.99	40.56	54	-13.44	AV	Horizontal
2483.5	66.84	-12.78	54.06	74	-19.94	PK	Vertical
2483.5	52.97	-12.78	40.19	54	-13.81	AV	Vertical
2483.5	68.56	-12.78	55.78	74	-18.22	PK	Horizontal
2483.5	54.47	-12.78	41.69	54	-12.31	AV	Horizontal

Low measurement frequencies is range from 2310 to 2400 MHz, high measurement frequencies is range from 2483.5 to 2500 MHz.

Only show the worst point data of the emissions in the frequency 2310-2400 MHz and 2483.5-2500 MHz.

#### 4. CONDUCTED SPURIOUS EMISSIONS

#### 4.1 REQUIREMENT

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

#### **4.2 TEST PROCEDURE**

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

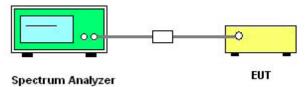
Spectrum Parameter	Setting		
Detector	Peak		
Start/Stop Frequency	30 MHz to 10th carrier harmonic		
RB / VB (emission in restricted band)	100 KHz/300 KHz		
Trace-Mode:	Max hold		

# For Band edge

Spectrum Parameter	Setting		
Detector	Peak		
Start/Stan Eraguanay	Lower Band Edge: 2310 – 2404 MHz		
Start/Stop Frequency	Upper Band Edge: 2478 – 2500 MHz		
RB / VB (emission in restricted band)	100 KHz/300 KHz		
Trace-Mode:	Max hold		

Remark: Hopping on and Hopping off mode all have been tested, only worst case hopping off is reported.

#### 4.3 TEST SETUP



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 500hm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth(RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

#### 4.4 EUT OPERATION CONDITIONS

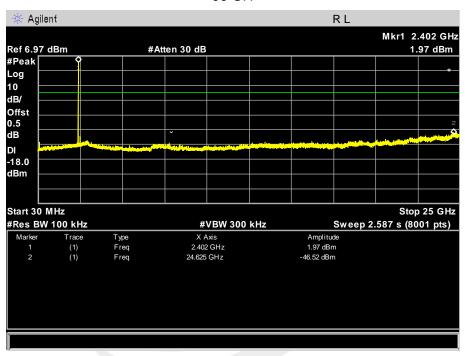
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

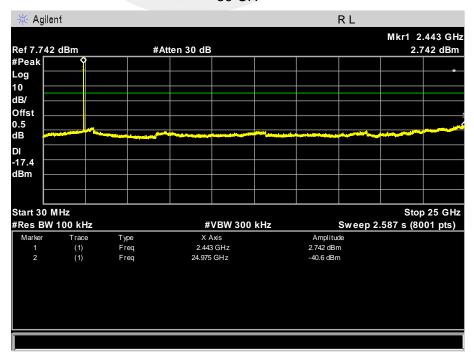


#### 4.5 TEST RESULTS

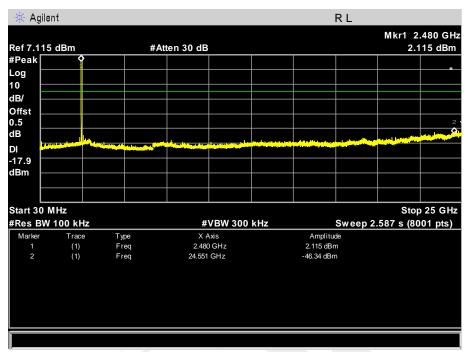
EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature :	25 ℃	Relative Humidity:	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	GFSK(1Mbps)-00/39/78 CH		

#### 00 CH







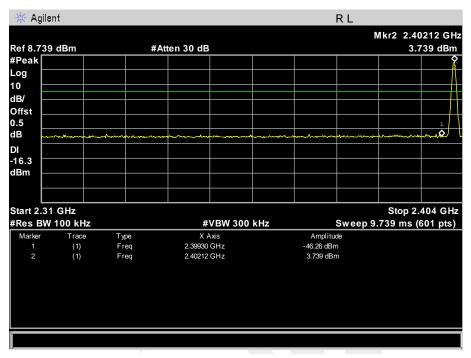


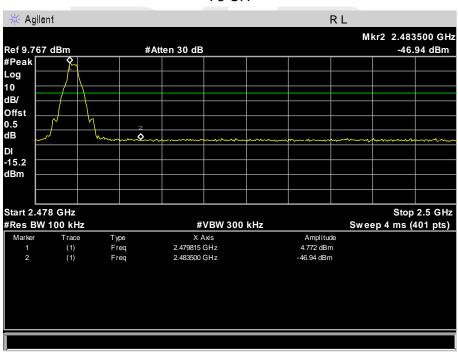




# For Band edge

# 00 CH



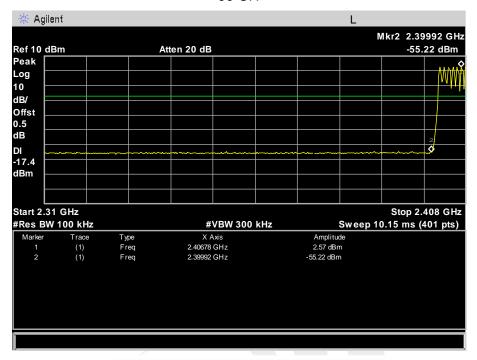


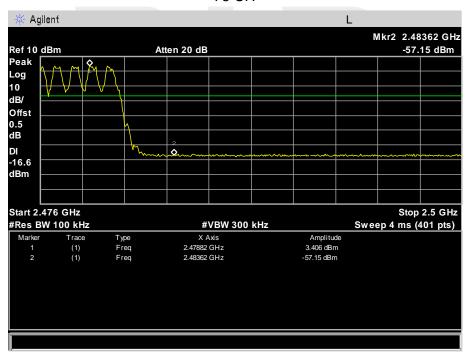




# For Hopping Band edge

#### 00 CH

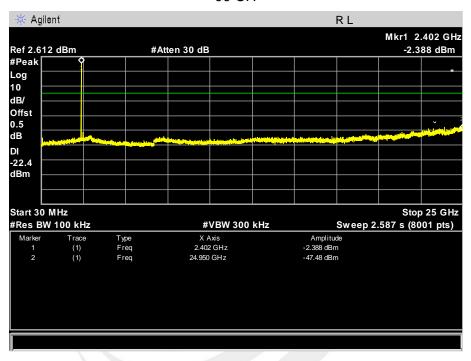




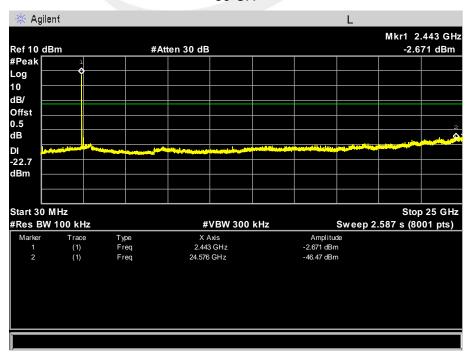


Page 33 of 73 Report No.: STS1508078F03

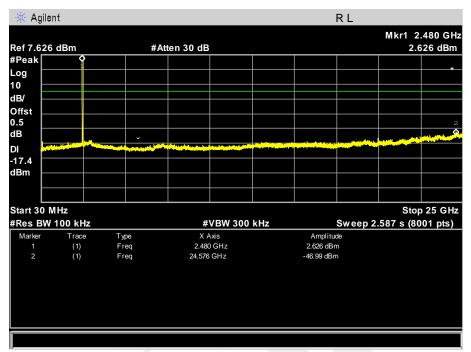
EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40		
Temperature:	<b>25</b> ℃	Relative Humidity:	50%		
Pressure :	1012 hPa	Test Voltage :	DC 3.7V		
Test Mode :	π/4-DQPSK(2Mbps) –00/39/78 CH				



39 CH





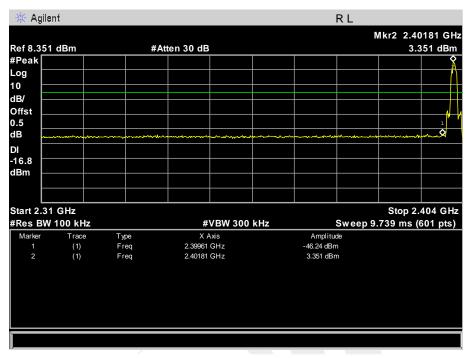


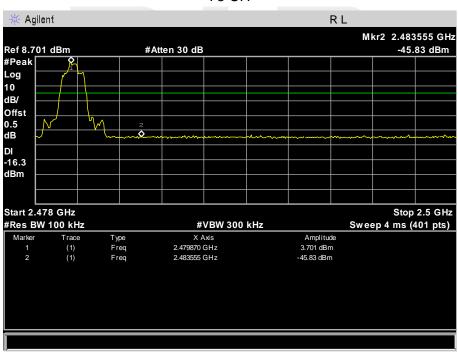




# For Band edge

# 00 CH



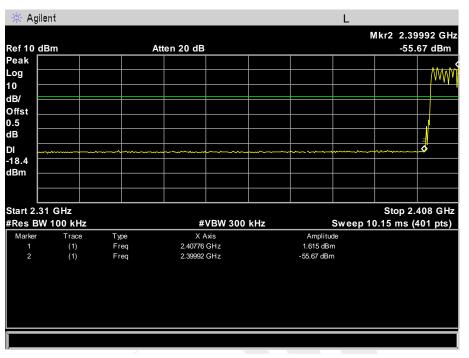


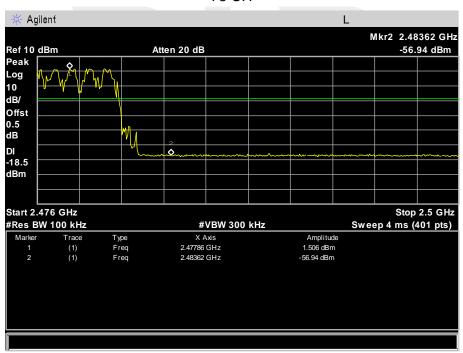




# For Hopping Band edge

# 00 CH

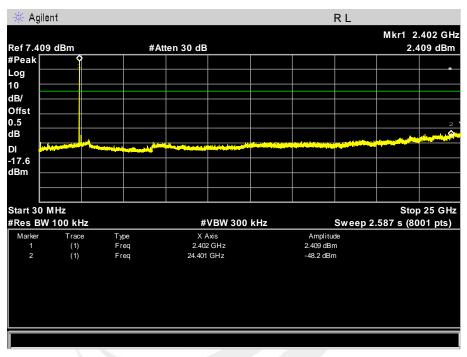




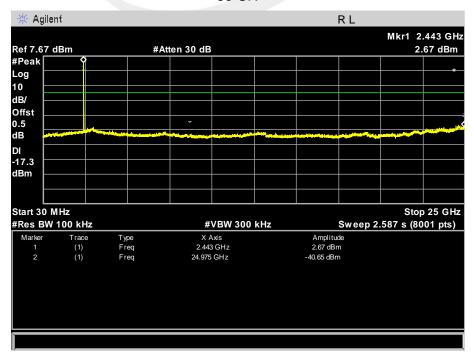


Page 37 of 73 Report No.: STS1508078F03

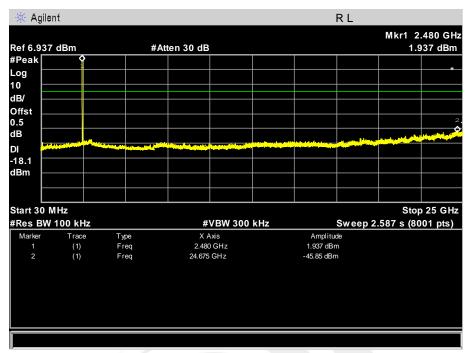
EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40	
Temperature :	25 ℃	Relative Humidity:	50%	
Pressure :	1012 hPa	Test Voltage :	DC 3.7V	
Test Mode :	8-DPSK(3Mbps) -00/39/78 CH			



39 CH





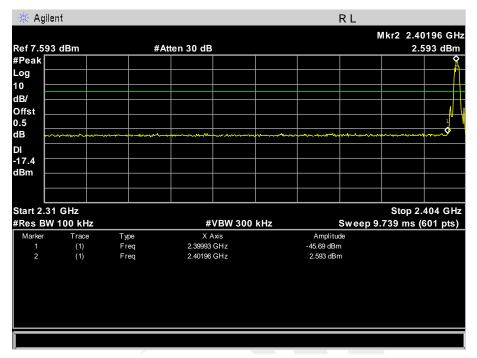


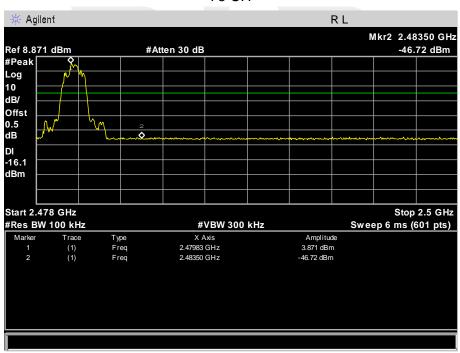




### For Band edge

### 00 CH



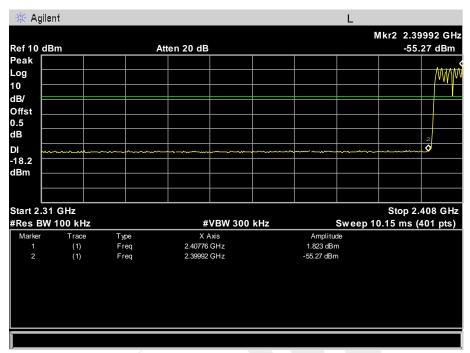


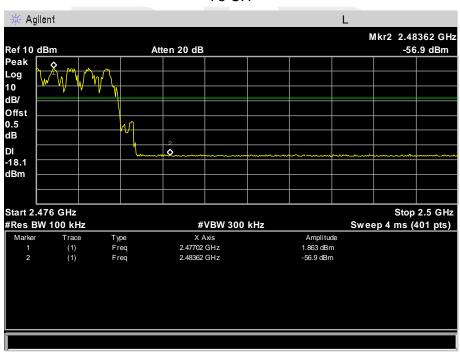




### For Hopping Band edge

### 00 CH







### 5. NUMBER OF HOPPING CHANNEL

### 5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)(iii)	Number of Hopping Channel	≥15	2400-2483.5	PASS

Spectrum Parameters	Setting	
Attenuation	Auto	
Span Frequency	> Operating Frequency Range	
RB	100 KHz	
VB	100 KHz	
Detector Peak		
Trace Max Hold		
Sweep Time Auto		

### **5.2 TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 100K, VBW=100K, Sweep time = Auto.

### 5.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

### 5.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



Page 42 of 73 Report No.: STS1508078F03

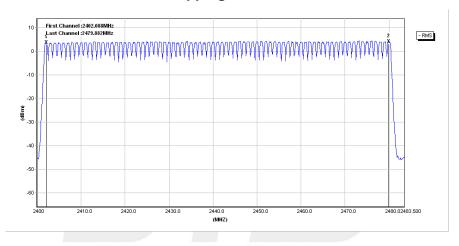
### 5.5 TEST RESULTS

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature :	25 ℃	Relative Humidity:	60%
Pressure :	1015 hPa	Test Voltage :	DC 3.7V
Test Mode :	Hopping Mode		

# Number of Hopping Channel

79

# **Hopping channel**





Report No.: STS1508078F03

# 6. AVERAGE TIME OF OCCUPANCY

### 6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section Test Item Limit Frequency Range (MHz) Result				Result
15.247 (a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

### **6.2 TEST PROCEDURE**

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to e. zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.
- i. DH5 Packet permit maximum 1600/79 / 6 = 3.37 hops per second in each channel (5 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 3.37 x 31.6 = 106.6 within 31.6 seconds.
- j. DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times  $5.06 \times 31.6 = 160$  within 31.6 seconds.
- k. DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot RX, 1 time slot TX). So, the dwell time is the time duration of the pulse times 10.12 x 31.6 = 320 within 31.6 seconds.

### 6.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

### 6.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

Report No.: STS1508078F03

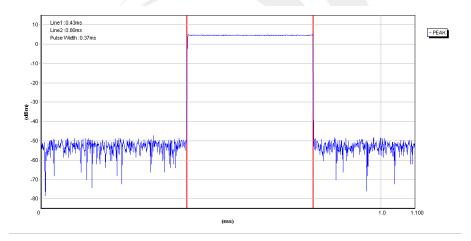


### 6.5 TEST RESULTS

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature :	25 ℃	Relative Humidity:	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	GFSK(1Mbps)-DH1/DH3/DH5		

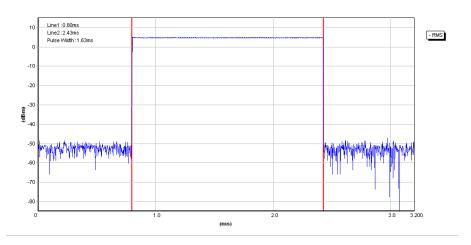
Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits(s)
DH1	2441 MHz	0.370	0.118	0.4
DH3	2441 MHz	1.630	0.261	0.4
DH5	2441 MHz	2.880	0.307	0.4

### CH39-DH1

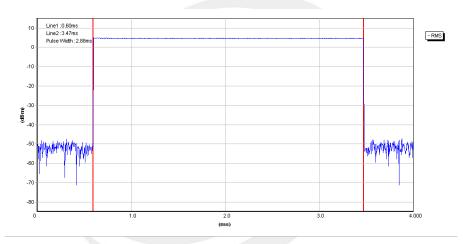




### **CH39-DH3**



### **CH39-DH5**



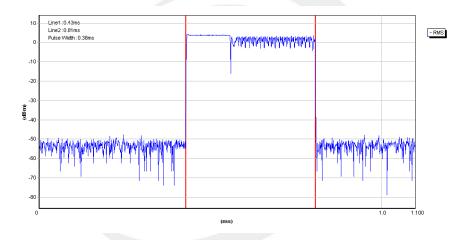


Page 46 of 73 Report No.: STS1508078F03

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40		
Temperature:	<b>25</b> ℃	Relative Humidity:	50%		
Pressure :	1012 hPa	Test Voltage :	DC 3.7V		
Test Mode :	est Mode : π/4-DQPSK(2Mbps) –2DH1/2DH3/2DH5				

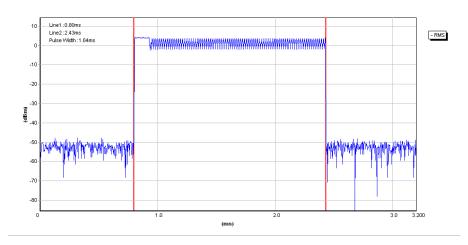
Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits(s)
2DH1	2441 MHz	0.380	0.122	0.4
2DH3	2441 MHz	1.640	0.262	0.4
2DH5	2441 MHz	2.880	0.307	0.4

# CH39-2DH1

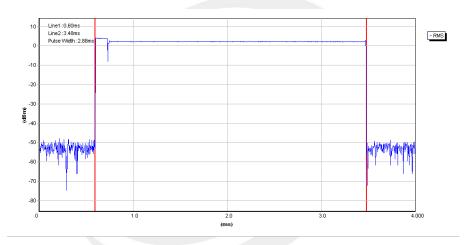




### CH39-2DH3



### CH39-2DH5



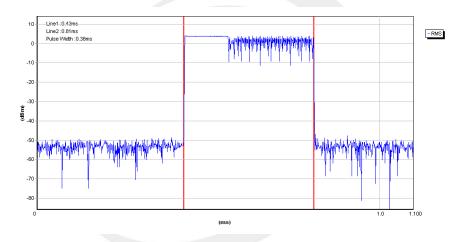


Page 48 of 73 Report No.: STS1508078F03

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40	
Temperature:	<b>25</b> ℃	Relative Humidity:	50%	
Pressure :	1012 hPa	Test Voltage :	DC 3.7V	
Test Mode : 8DPSK(3Mbps) –3DH1/3DH3/3DH5				

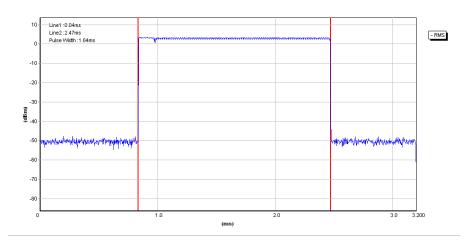
Data Packet	Frequency	Pulse Duration (ms)	Dwell Time (s)	Limits(s)
3DH1	2441 MHz	0.380	0.122	0.4
3DH3	2441 MHz	1.640	0.262	0.4
3DH5	2441 MHz	2.880	0.307	0.4

# CH39-3DH1

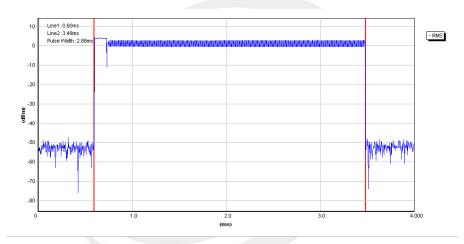




### CH39-3DH3



### CH39-3DH5





Report No.: STS1508078F03

### 7. HOPPING CHANNEL SEPARATION MEASUREMEN

### 7.1 APPLIED PROCEDURES / LIMIT

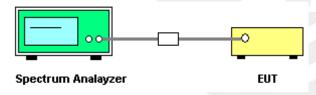
Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

### 7.2 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyser in peak hold mode.
- b. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for 20 dB bandwidth measurement.
- c. The resolution bandwidth of 30 kHz and the video bandwidth of 100 kHz were utilised for channel separation measurement.

### 7.3 TEST SETUP



### 7.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

Report No.: STS1508078F03



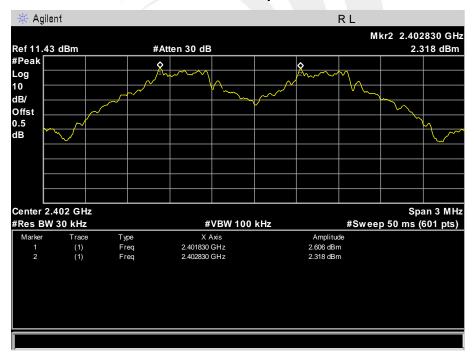
### 7.5 TEST RESULTS

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature :	25 ℃	Relative Humidity:	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (GFSK(1Mbps) Mode)		

Frequency	Ch. Separation (MHz)	Limit	Result
2402 MHz	≥1.000	0.897	Complies
2441 MHz	≥1.000	0.872	Complies
2480 MHz	≥1.000	0.838	Complies

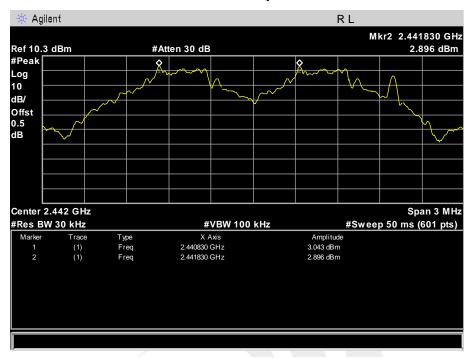
For GFSK: Ch. Separation Limits: >20dB bandwidth

### CH00 -1Mbps

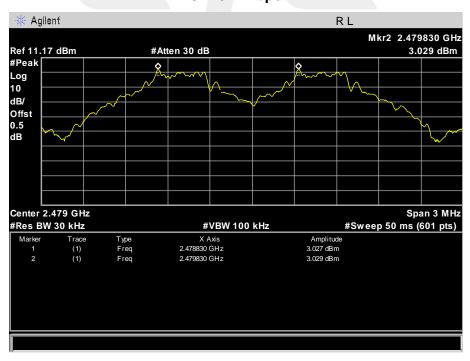




### CH39 -1Mbps



### CH78 -1Mbps



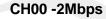


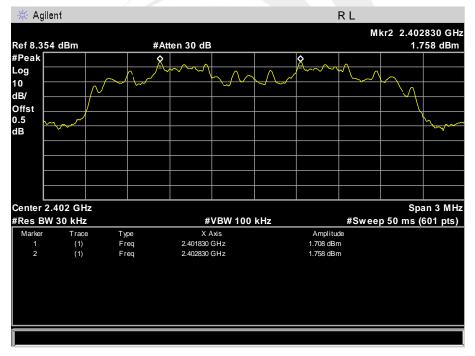
Page 53 of 73 Report No.: STS1508078F03

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature :	25 ℃	Relative Humidity:	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (π/4-DQPSK(2Mbps) Mode)		

Frequency	Ch. Separation (MHz)	Limit	Result
2402 MHz	≥1.000	0.858	Complies
2441 MHz	≥1.000	0.864	Complies
2480 MHz	≥1.000	0.859	Complies

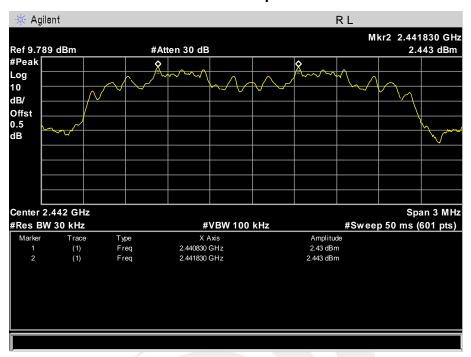
For  $\pi/4$ -DQPSK(2Mbps): Ch. Separation Limits: > two-thirds 20dB bandwidth



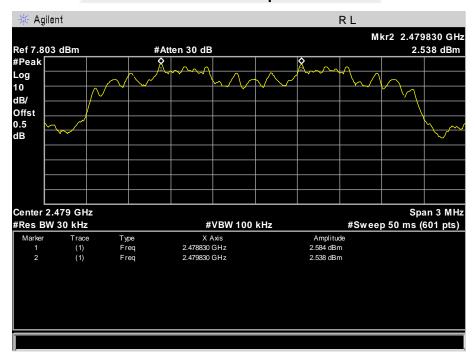




### CH39 -2Mbps



### CH78 -2Mbps





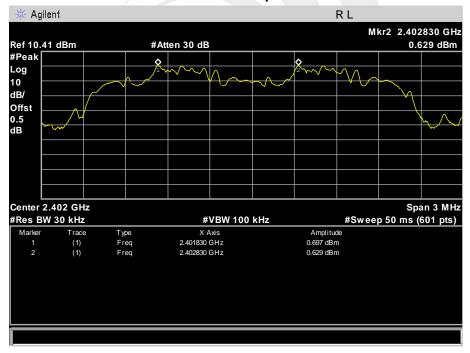
Page 55 of 73 Report No.: STS1508078F03

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature:	<b>25</b> ℃	Relative Humidity:	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00 / CH39 /CH78 (8-DPSK(3Mbps)Mode)		

Frequency	Ch. Separation (MHz)	Limit	Result
2402 MHz	≥1.000	0.853	Complies
2441 MHz	≥1.000	0.851	Complies
2480 MHz	≥1.000	0.854	Complies

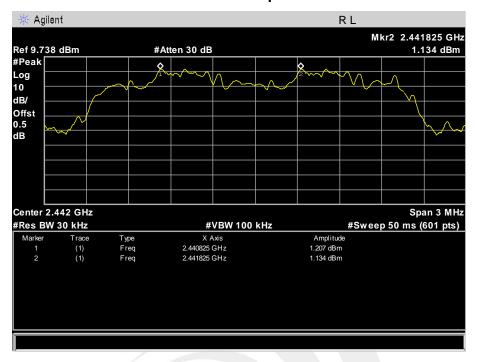
# For 8-DPSK(3Mbps):

# Ch. Separation Limits: > two-thirds 20dB bandwidth CH00 -3Mbps

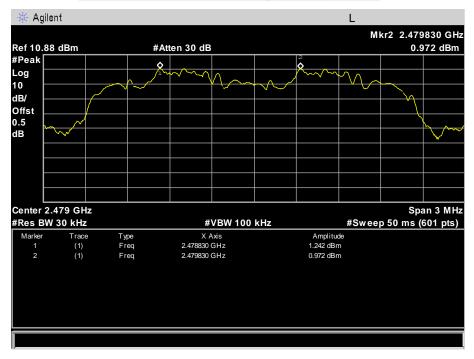




### CH39 -3Mbps



### CH78 -3Mbps







### 8. BANDWIDTH TEST

### 8.1 APPLIED PROCEDURES / LIMIT

# FCC Part15 (15.247), Subpart C

Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247 (a)(1)	Bandwidth	(20dB bandwidth)	2400-2483.5	PASS

Spectrum Parameter	Setting	
Attenuation	Auto	
Span Frequency	> Measurement Bandwidth or Channel Separation	
RB	30 kHz (20dB Bandwidth) / 30 kHz (Channel Separation)	
VB	100 kHz (20dB Bandwidth) / 100 kHz (Channel Separation)	
Detector	Peak	
Trace	Max Hold	
Sweep Time	Auto	

### 8.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 30KHz, VBW=100KHz, Sweep time = Auto.

### 8.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

### 8.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

Report No.: STS1508078F03

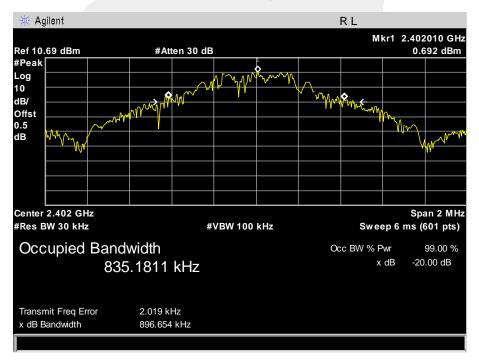


### 8.5 TEST RESULTS

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature :	25 ℃	Relative Humidity:	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	GFSK(1Mbps)CH00 / CH39 /C78		

Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	0.897	PASS
2441 MHz	0.872	PASS
2480 MHz	0.838	PASS

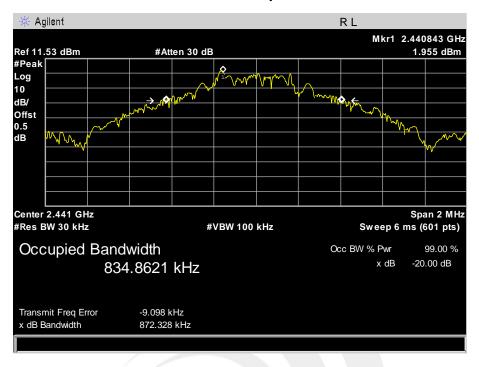
# CH00 -1Mbps



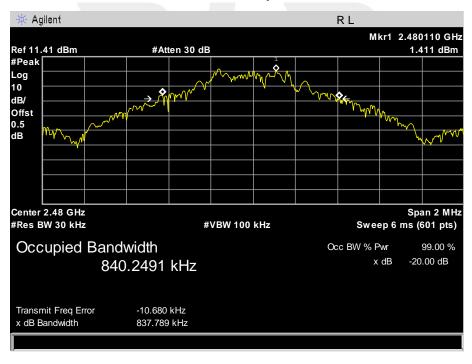




### CH39 -1Mbps



### CH78 -1Mbps



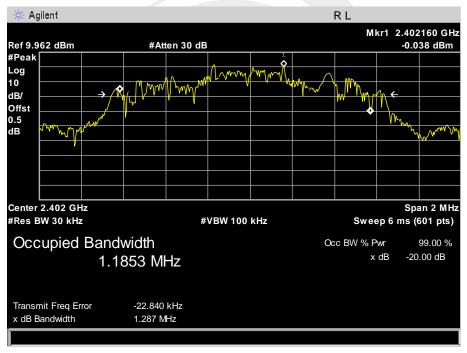


Page 60 of 73 Report No.: STS1508078F03

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature:	<b>25</b> ℃	Relative Humidity:	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	π/4-DQPSK(2Mbps)CH00 / CH39 /C78		

Frequency	20dB Bandwidth(MHz)	Result
2402 MHz	1.287	PASS
2441 MHz	1.296	PASS
2480 MHz	1.288	PASS

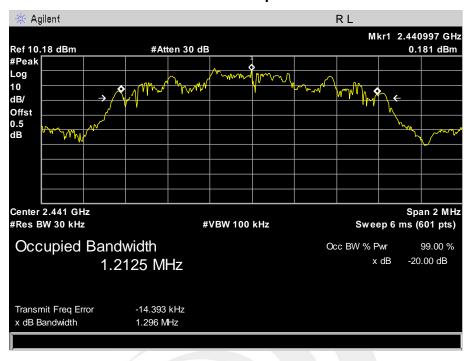
# CH00 -2Mbps



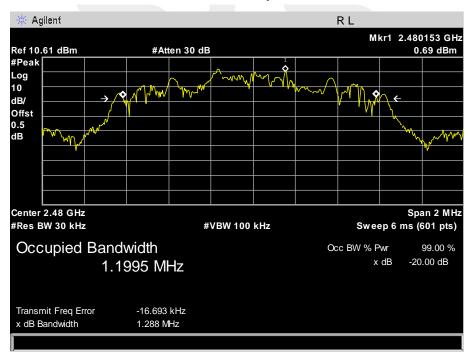




### CH39 -2Mbps



### CH78 -2Mbps



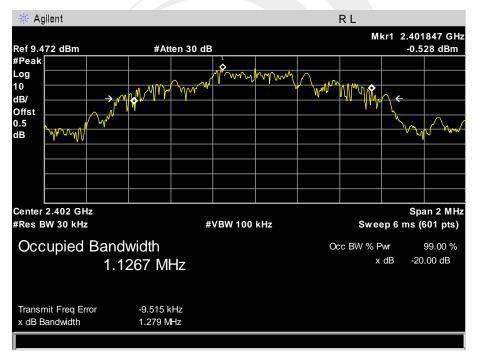


Page 62 of 73 Report No.: STS1508078F03

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature :	<b>25</b> ℃	Relative Humidity:	50%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	8DPSK(3Mbps)CH00 / CH39 /C78		

Frequency	20dB Bandwidth (MHz)	Result
2402 MHz	1.279	PASS
2441 MHz	1.276	PASS
2480 MHz	1.281	PASS

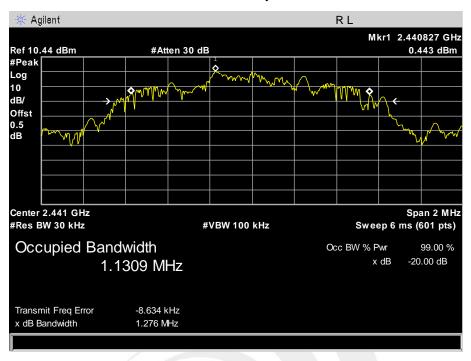
# CH00 -3Mbps



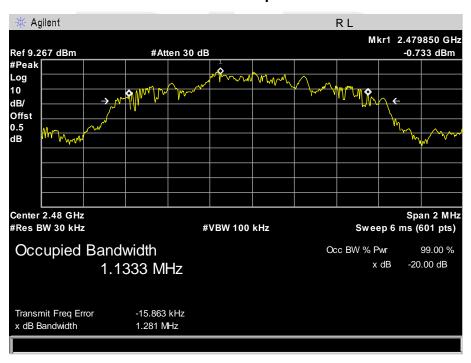




### CH39 -3Mbps



### CH78 -3Mbps







### 9. PEAK OUTPUT POWER TEST

### 9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Peak	1 W or 0.125W		
(b)(i)	Output Power	Or if channel separation > 2/3 bandwidthprovided the systems operatewith an output power no greater than125 mW(20.96dBm)	2400-2483.5	PASS

### 9.2 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: GFSK(1Mbps):RBW= 1MHz, VBW= 3MHz, Sweep time = Auto.
- c. Spectrum Setting:  $\pi/4$ -DQPSK(2Mbps):RBW= 3MHz, VBW= 3MHz, Sweep time = Auto.
- d. Spectrum Setting: 8-DPSK(3Mbps):RBW= 3MHz, VBW= 3MHz, Sweep time = Auto.

### 9.3 TEST SETUP

EUT	SPECTRUM
	ANALYZER

### 9.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

Report No.: STS1508078F03



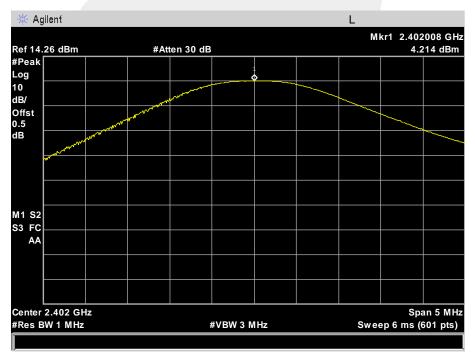
### 9.5 TEST RESULTS

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature :	25 ℃	Relative Humidity:	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00/ CH39 /CH78 GFSK(1Mbps)		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)
CH00	2402	4.214	30
CH39	2441	4.834	30
CH78	2480	4.982	30

Note: the channel separation > bandwidth

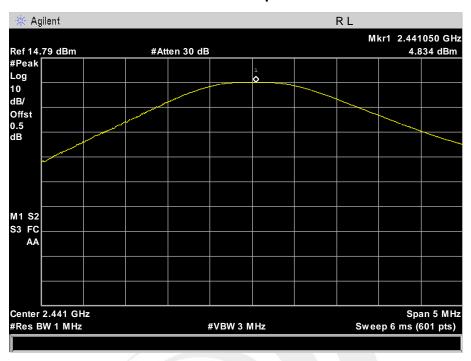
CH00 -1Mbps



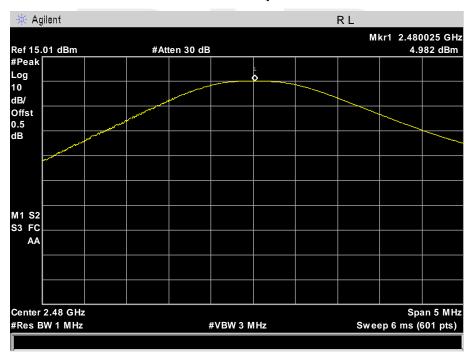




### CH39 -1Mbps



### CH78 -1Mbps





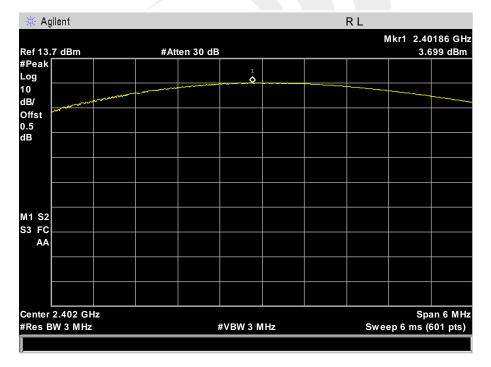
Page 67 of 73 Report No.: STS1508078F03

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature:	<b>25</b> ℃	Relative Humidity:	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00/ CH39 /CH78 π/4-DQPSK(2Mbps)		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)
CH00	2402	3.699	20.96
CH39	2441	4.682	20.96
CH78	2480	4.793	20.96

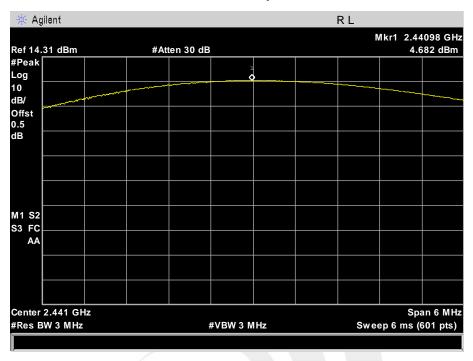
Note: the channel separation >2/3 bandwidth

CH00 -2Mbps

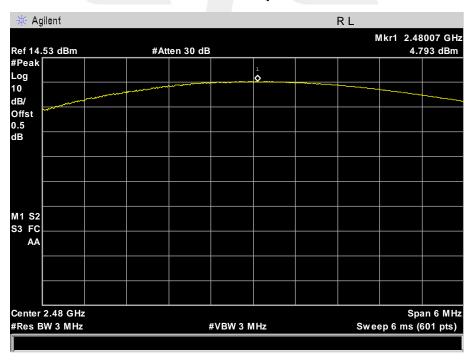




### CH39 -2Mbps



### CH78 -2Mbps





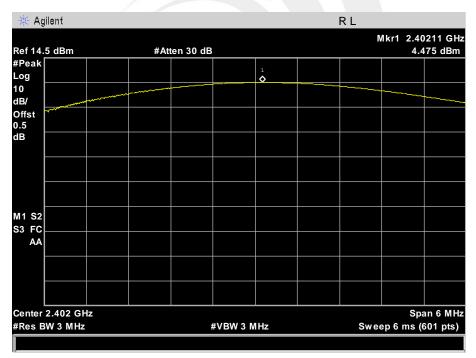
Page 69 of 73 Report No.: STS1508078F03

EUT:	Smart Phone	Model Name :	EKO DUO 4.0 A40
Temperature :	25 ℃	Relative Humidity:	60%
Pressure :	1012 hPa	Test Voltage :	DC 3.7V
Test Mode :	CH00/ CH39 /CH78 8-DPSK(3Mbps)		

Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)
CH00	2402	4.475	20.96
CH39	2441	5.027	20.96
CH78	2480	4.804	20.96

Note: the channel separation >2/3 bandwidth

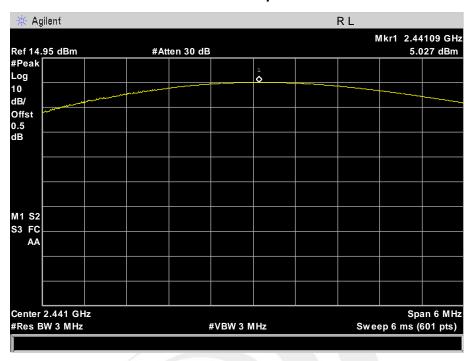
CH00 -3Mbps



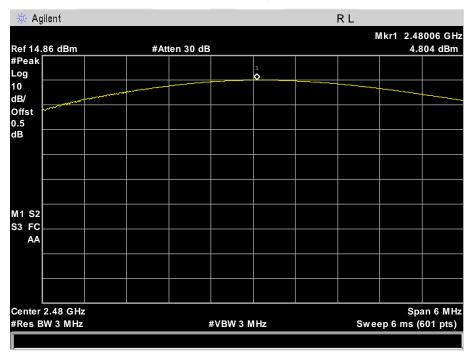




### CH39 -3Mbps



### CH78 -3Mbps







### 10. ANTENNA REQUIREMENT

### 10.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### 10.2 EUT ANTENNA

The EUT antenna is PIFA Antenna. It comply with the standard requirement.





# **APPENDIX- PHOTOS OF TEST SETUP**









# **Conducted Measurement Photos**



\* \* \* \* \* END OF THE REPORT \* \* \* \*