



# InterLab®

## Final Report on SS11-J01

**Report Reference:** ODE\_MJP\_TSBCEP\_1007\_FCC15b

**Date:** July 30, 2010

### Test Laboratory:

7 layers AG  
Borsigstr. 11  
40880 Ratingen  
Germany



DGA-PL-192/99-02

#### Note:

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the test laboratory.

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## 1 Administrative Data

### 1.1 Project Data

*Project Responsible:* Holger Leutfeld  
*Date Of Test Report:* 2010/07/30  
*Date of first test:* 2010/07/02  
*Date of last test:* 2010/07/23

### 1.2 Applicant Data

*Company Name:* Toshiba Corporation, Mobile Communications Co.,  
*Street:* 1-1, Asahigaoka 3-Chome  
*City:* Hino-Shi, Tokyo 191-8555  
*Country:* Japan  
*Contact Person:* Mr. Takao Kamei  
*Department:* Quality Management Division  
*Phone:* +81-42-585-3180  
*E-Mail:* takao.kamei@toshiba.co.jp

### 1.3 Test Laboratory Data

The following list shows all places and laboratories involved for test result generation:

#### 7 layers DE

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*Company Name :* 7 layers AG  
*Street :* Borsigstrasse 11  
*City :* 40880 Ratingen  
*Country :* Germany  
*Contact Person :* Mr. Michael Albert  
*Phone :* +49 2102 749 201  
*Fax :* +49 2102 749 444  
*E Mail :* michael.albert@7Layers.de

#### Laboratory Details

<i>Lab ID</i>	<i>Identification</i>	<i>Responsible</i>	<i>Accreditation Info</i>
Lab 1	Conducted Emissions	Mr. Robert Machulec Mr. Andreas Petz	DAR-Registration no. DGA-PL-192/99-02
Lab 2	Radiated Emissions	Mr. Robert Machulec Mr. Andreas Petz	DAR-Registration no. DGA-PL-192/99-02

## 1.4 Signature of the Testing Responsible




Andreas Petz  
responsible for tests performed in: Lab 1, Lab 2



7 layers AG, Borsigstr. 11  
40880 Ratingen, Germany  
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## 1.5 Signature of the Accreditation Responsible

 [B. RETKA]

Accreditation scope responsible person  
responsible for Lab 1, Lab 2

## 2 Test Object Data

### 2.1 General OUT Description

The following section lists all OUTs (Object's Under Test) involved during testing.

#### OUT: SS11-J01

Type / Model / Family:	SS11-J01
Product Category:	Mobile Phone
<b>Manufacturer:</b>	
Company Name:	see applicant

#### Parameter List:

Parameter name	Value
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#### Ancillary Equipment: AC/DC Adapter

Product Category:	Mobile Phone Accessory
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#### Ancillary Equipment: Desktop Charger Station

Product Category:	Mobile Phone Accessory
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## 2.2 Detailed Description of OUT Samples

### **Sample : O04**

<i>OUT Identifier</i>	SS11-J01		
<i>Sample Description</i>	Mobile Phone		
<i>Serial No.</i>	STSGV001046 41		
<i>HW Status</i>	001		
<i>SW Status</i>	5009 1907 0961		
<i>Date of Receipt</i>	2010/06/25		
<i>Low Voltage</i>	3.7 V	<i>Low Temp.</i>	-10 °C
<i>High Voltage</i>	4.2 V	<i>High Temp.</i>	55 °C
<i>Nominal Voltage</i>	4.2 V	<i>Normal Temp.</i>	21 °C

### **Sample : S04**

<i>OUT Identifier</i>	SS11-J01		
<i>Sample Description</i>	Mobile Phone		
<i>Serial No.</i>	STSGV001042 09		
<i>HW Status</i>	001		
<i>SW Status</i>	5009 1907 0961		
<i>Date of Receipt</i>	2010/06/29		
<i>Low Voltage</i>	3.7 V	<i>Low Temp.</i>	-10 °C
<i>High Voltage</i>	4.2 V	<i>High Temp.</i>	55 °C
<i>Nominal Voltage</i>	4.2 V	<i>Normal Temp.</i>	21 °C

### **Sample : ADA**

<i>OUT Identifier</i>	AC/DC Adapter
<i>Sample Description</i>	MITSUMI AC/DC Adapter
<i>HW Status</i>	0203PQA

### **Sample : Desk.CS**

<i>OUT Identifier</i>	Desktop Charger Station
<i>Sample Description</i>	Toshiba Desktop charger station

## 2.3 OUT Features

### Features for OUT: AC/DC Adapter

<i>Designation</i>	<i>Description</i>	<i>Allowed Values</i>	<i>Supported Value(s)</i>
<b>Features for scope: FCC_v2</b>			
AC	The OUT is powered by or connected to AC Mains		

### Features for OUT: SS11-J01

<i>Designation</i>	<i>Description</i>	<i>Allowed Values</i>	<i>Supported Value(s)</i>
<b>Features for scope: FCC_v2</b>			
BT	EUT supports Bluetooth data rate of 1 Mbps with GFSK modulation in the band 2400 MHz - 2483.5 MHz		
DC	The OUT is powered by or connected to DC Mains		
EDR2	EUT supports Bluetooth using data rate of 2 Mbps with PI/4 DQPSK modulation in the band 2400 MHz - 2483.5 MHz		
EDR3	EUT supports Bluetooth using data rate of 3 Mbps with 8DPSK modulation in the band 2400 MHz - 2483.5 MHz		
Iant	Integral Antenna: permanent fixed antenna, which may be built-in, designed as an indispensable part of the equipment		
PCS1900	EUT supports PCS1900 band 1850MHz - 1910MHz		
TantC	temporary antenna connector, which may be only built-in for testing, designed as an example part of the equipment		
WLAN	EUT supports WLAN channels 2412 MHz - 2462 MHz.		

## 2.4 Auxiliary Equipment

<i>AE No.</i>	<i>Type Designation</i>	<i>Serial No.</i>	<i>HW Status</i>	<i>SW Status</i>	<i>Description</i>
AE 02	Flatron L1740BQ	509WANF1W607	-	-	TFT Monitor LG
AE 04	M-BB48	LZC90505478	-	-	Mouse Logitech
AE 01	PA3378E-3AC3	G71C0006R310	-	-	AC/DC Adapter
AE 05	RS 6000	G 0000273 2P28	-	-	Keyboard CHERRY
AE 03	Tecra M9	87060248H	-	-	Laptop Toshiba

## 2.5 Operating Mode(s)

<i>Ref. -No.</i>	<i>Description</i>
TCH661	Sample is transmitting on channel TCH 661 GSM1900, WLAN module is powered and active, BT module is powered and active.

## 2.6 Setups used for Testing

For each setup a relation is given to determine if and which samples and auxiliary equipment is used. The left side list all OUT samples and the right side lists all auxiliary equipment for the given setup.

Setup No.	List of OUT samples		List of auxiliary equipment	
	Sample No.	Sample Description	AE No.	AE Description
<b>o04+AC</b>				
	Sample: ADA	MITSUMI AC/DC Adapter		
	Sample: O04	Mobile Phone		
<b>o04+comp</b>				
	Sample: O04	Mobile Phone	AE 02	TFT Monitor LG
			AE 04	Mouse Logitech
			AE 01	AC/DC Adapter
			AE 05	Keyboard CHERRY
			AE 03	Laptop Toshiba
<b>o04+desk.</b>				
	Sample: ADA	MITSUMI AC/DC Adapter		
	Sample: Desk.CS	Toshiba Desktop charger station		
	Sample: O04	Mobile Phone		
<b>s04+AC</b>				
	Sample: ADA	MITSUMI AC/DC Adapter		
	Sample: S04	Mobile Phone		

## 3 Results

### 3.1 General

**Documentation of tested devices:**

Available at the test laboratory.

**Interpretation of the test results:**

The results of the inspection are described on the following pages, where 'Conformity' or 'Passed' means that the certification criteria were verified and that the tested device is conform to the applied standard.

In cases where 'Declaration' is printed, the required documents are available in the manufacturers product documentation.

In cases where 'not applicable' is printed, the test case requirements are not relevant to the specific equipment implementation.

### 3.2 List of the Applicable Body

(Body for Scope: FCC\_v2)

<i>Designation</i>	<i>Description</i>
FCC47CFRChIPART15bRADIO FREQUENCY DEVICES	Part 15, Subpart B - Unintentional Radiators

### 3.3 List of Test Specification

<i>Test Specification:</i>	<b>FCC part 2 and 15</b>
<i>Version</i>	10-1-09 Edition
<i>Title:</i>	PART 2 - GENERAL RULES AND REGULATIONS PART 15 - RADIO FREQUENCY DEVICES

### 3.4 Summary

<i>Test Case Identifier / Name</i>	<i>Result</i>	<i>Date of Test</i>	<i>Lab Ref.</i>	<i>Setup</i>
<b>15b.1 Conducted Emissions (AC Power Line) §15.107</b>				
15b.1; Mode = transmit	Passed	2010/07/23	Lab 1	o04+comp
	operating mode: TCH661			
	Passed	2010/07/20	Lab 1	o04+desk.
	operating mode: TCH661			
	Passed	2010/07/05	Lab 1	s04+AC
	operating mode: TCH661			
<b>15b.2 Spurious Radiated Emissions §15.109</b>				
15b.2; Mode = transmit	Passed	2010/07/20	Lab 2	o04+desk.
	operating mode: TCH661			
	Passed	2010/07/02	Lab 2	o04+comp
	operating mode: TCH661			
	Passed	2010/07/02	Lab 2	o04+AC
	operating mode: TCH661			



### **3.5 Detailed Results**

#### **3.5.1 15b.1 Conducted Emissions (AC Power Line) §15.107**

**Test1: 15b.1; Mode = transmit**

<i>Result:</i>	Passed
<i>Setup No.:</i>	s04+AC
<i>Date of Test:</i>	2010/07/05 13:00
<i>Body:</i>	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
<i>Test Specification:</i>	FCC part 2 and 15

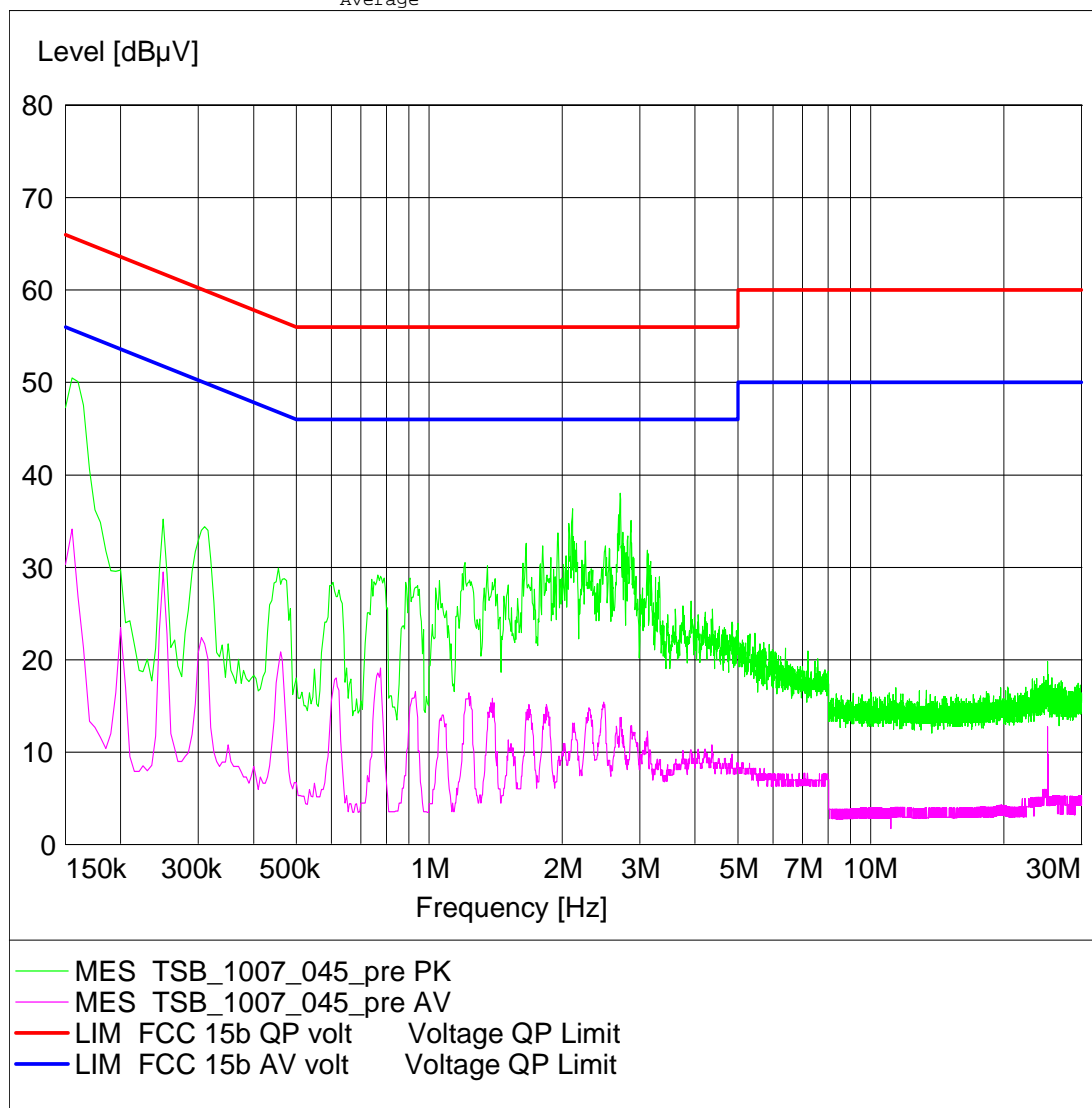
# Detailed Results:

## AC MAINS CONDUCTED

EUT: E31T (Y2001s04) / 05.07.2010  
 Manufacturer: Toshiba Corp.  
 Operating Condition: GSM 1900 TCH 661, BT and WLAN powered.  
 Test Site: 7 layers Ratingen  
 Operator: Doe  
 Test Specification: ANSI C63.4; FCC 15.107 / 15.207  
 Comment: Powered by AC charger  
 Start of Test: 05.07.2010 / 20:09:42

## SCAN TABLE: "FCC Voltage"

Start	Stop	Step	FCC Voltage	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width			Time	Bandw.	
150.0 kHz	30.0 MHz	5.0 kHz	MaxPeak		20.0 ms	9 kHz	ESH3-Z5
Average							





**Test1: 15b.1; Mode = transmit**

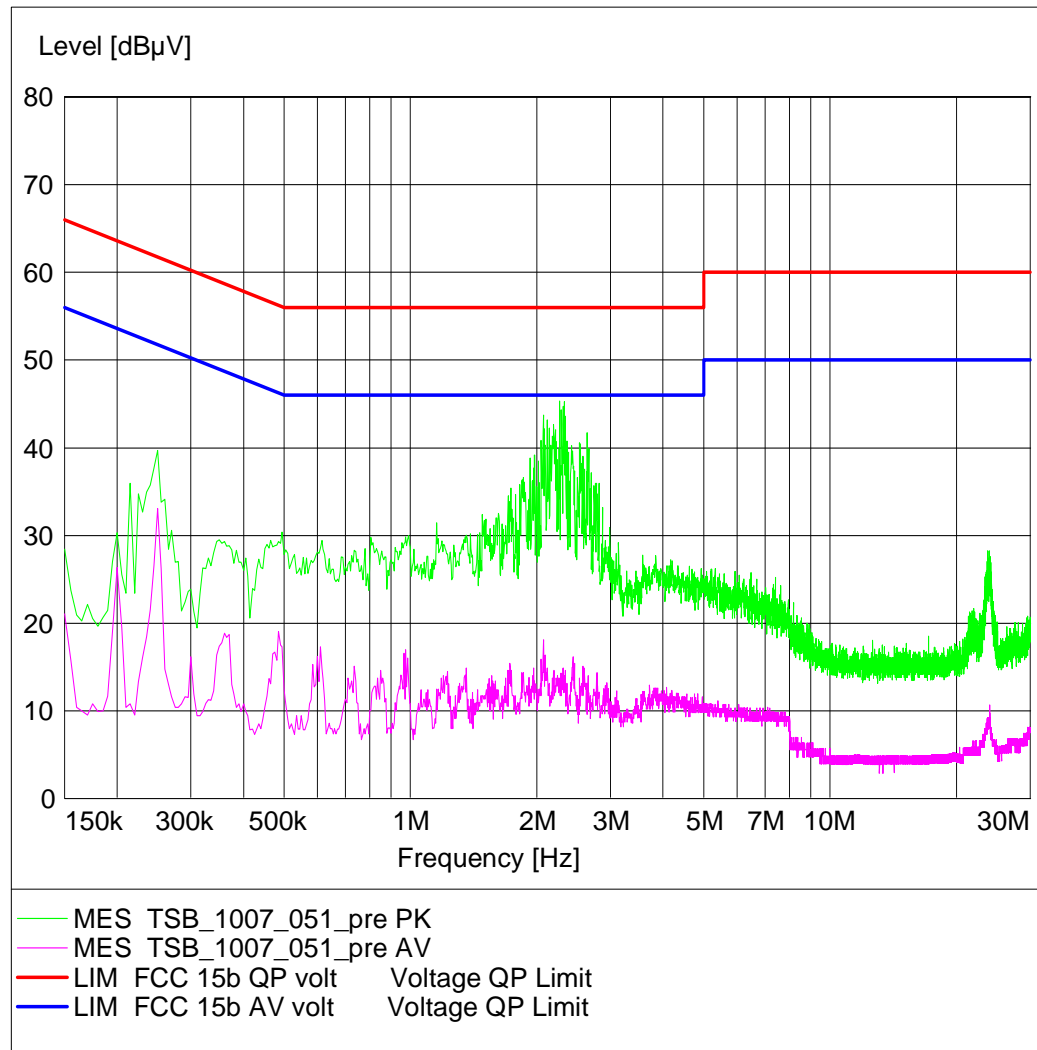
<i>Result:</i>	Passed
<i>Setup No.:</i>	o04+desk.
<i>Date of Test:</i>	2010/07/20 15:39
<i>Body:</i>	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
<i>Test Specification:</i>	FCC part 2 and 15

# Detailed Results: AC MAINS CONDUCTED

EUT: E31T (Y2001o04) + AC/Dc converter in desktop station  
Manufacturer: Toshiba Corp.  
Operating Condition: GSM1900 TCH661; BT powered; WLAN powered  
Test Site: 7 layers Ratingen  
Operator: Doe  
Test Specification: ANSI C63.4; FCC 15.107 / 15.207  
Comment:  
Start of Test: 20.07.2010 / 15:26:00

## SCAN TABLE: "FCC Voltage"

Short Description:	FCC Voltage					
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
150.0 kHz	30.0 MHz	5.0 kHz	MaxPeak	20.0 ms	9 kHz	ESH3-Z5
			Average			





**Test1: 15b.1; Mode = transmit**

<i>Result:</i>	Passed
<i>Setup No.:</i>	o04+comp
<i>Date of Test:</i>	2010/07/23 11:01
<i>Body:</i>	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
<i>Test Specification:</i>	FCC part 2 and 15

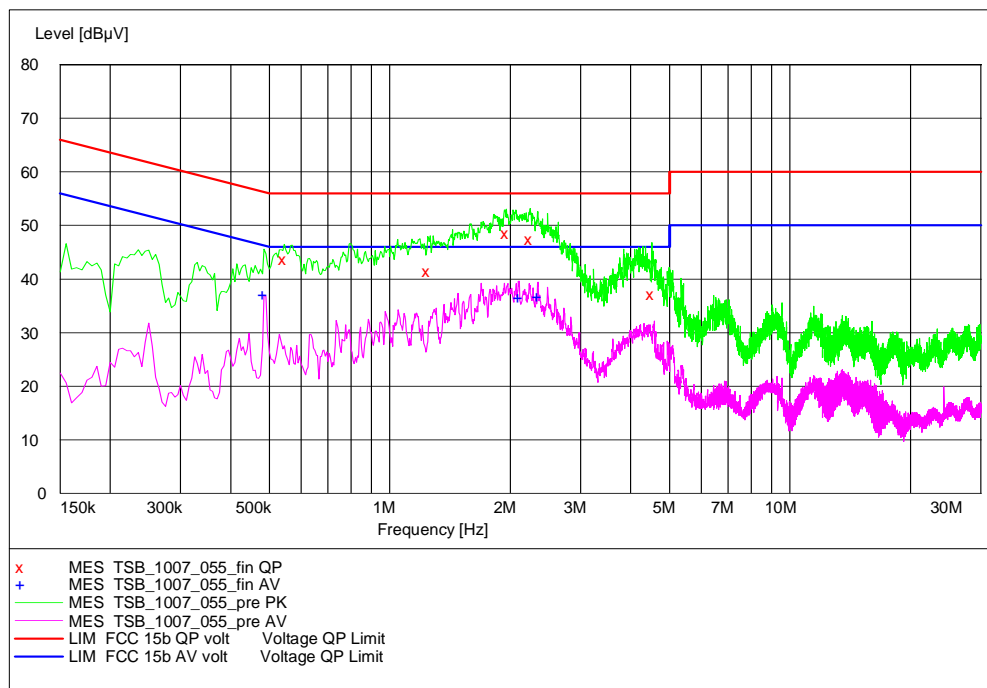
## Detailed Results:

### AC MAINS CONDUCTED

EUT: E31T (Y2001o04)  
 Manufacturer: Toshiba Corp.  
 Operating Condition: GSM 1900 TCH 661, BT and WLAN powered  
 Test Site: 7 layers Ratingen  
 Operator: Gal  
 Test Specification: ANSI C63.4; FCC 15.107 / 15.207  
 Comment:  
 Start of Test: 23.07.2010 / 11:55:09

### SCAN TABLE: "FCC Voltage"

Short Description:	FCC Voltage	Meas.	IF	Transducer
Start Stop Step	Detector	Time	Bandw.	
Frequency Frequency Width				
150.0 kHz 30.0 MHz 5.0 kHz	MaxPeak	20.0 ms	9 kHz	ESH3-Z5
	Average			



### MEASUREMENT RESULT: "TSB\_1007\_055\_fin QP"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.545000	43.70	9.9	56	12.3	L1	GND
1.245000	41.40	10.0	56	14.6	N	GND
1.955000	48.60	10.1	56	7.4	N	GND
2.240000	47.40	10.1	56	8.6	N	GND
4.515000	37.20	10.3	56	18.8	N	FLO

### MEASUREMENT RESULT: "TSB\_1007\_055\_fin AV"

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.485000	37.20	10.0	46	9.0	L1	GND
2.105000	36.60	10.1	46	9.4	N	GND
2.350000	36.80	10.1	46	9.2	N	GND



### **3.5.2 15b.2 Spurious Radiated Emissions §15.109**

#### **Test1: 15b.2; Mode = transmit**

<i>Result:</i>	Passed
<i>Setup No.:</i>	o04+AC
<i>Date of Test:</i>	2010/07/02 12:50
<i>Body:</i>	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
<i>Test Specification:</i>	FCC part 2 and 15

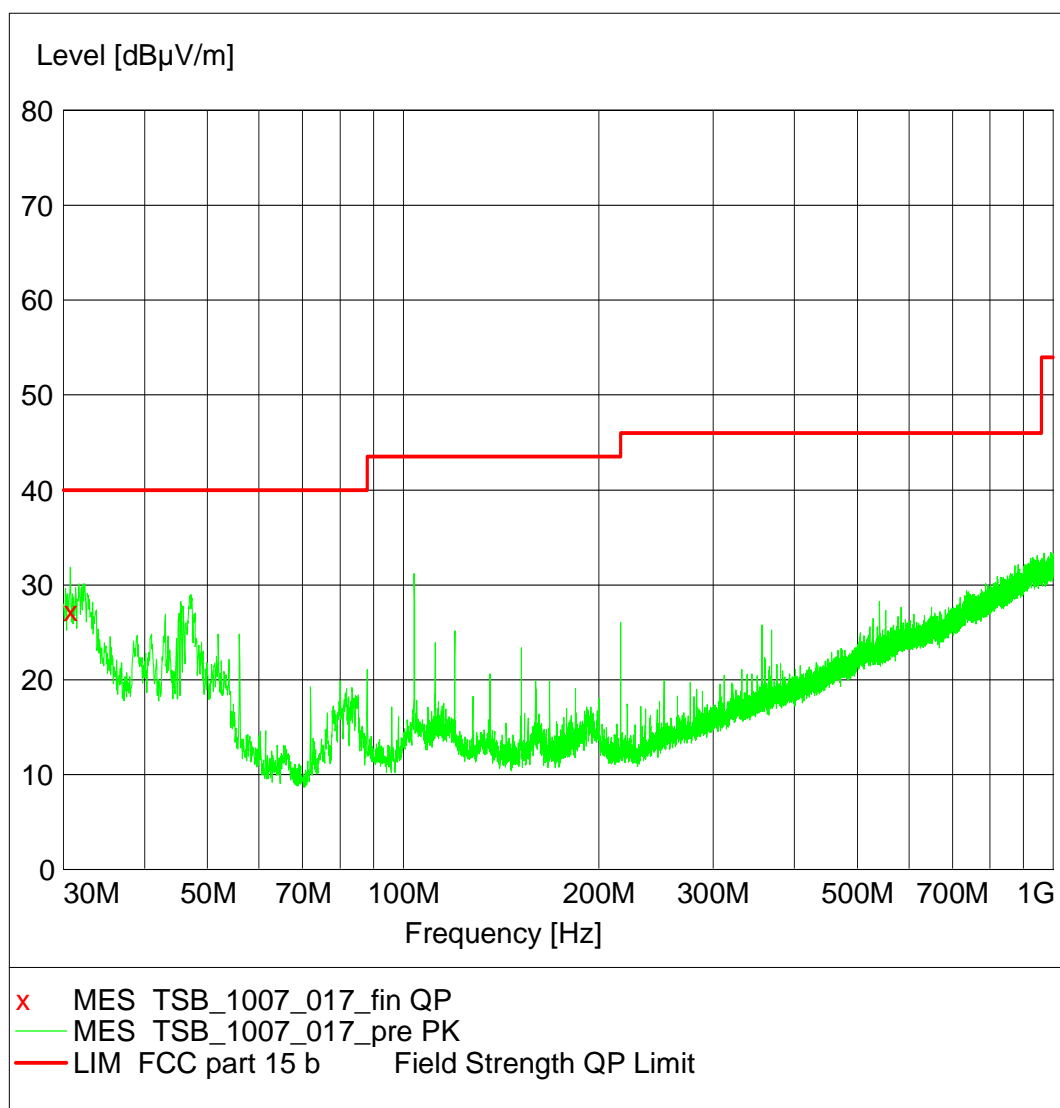
# Detailed Results:

## EMI RADIATED TEST

EUT: E31T (Y2001o04)  
Manufacturer: Toshiba Corp.  
Operating Condition: GSM 1900 TCH 661, BT and WLAN powered.  
Test Site: 7 layers, Ratingen  
Operator: Gal  
Test Specification: FCC part 15 b  
Comment: Powered by AC charger  
Start of Test: 02.07.2010 / 06:27:35

## SCAN TABLE: "FCC part 15 b"

Short Description:	FCC part 15 b
Start	Stop
Frequency	Frequency
Step	Step
Width	Width
Detector	Detector
Meas.	Meas.
Time	Time
IF	IF
Bandw.	Bandw.
Transducer	Transducer
30.0 MHz	1.0 GHz
60.0 kHz	60.0 kHz
MaxPeak	1.0 ms
	120 kHz
	HL562



## MEASUREMENT RESULT: "TSB\_1007\_017\_fin QP"

Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBµV/m	dB	dBµV/m	dB	cm	deg	
30.720000	27.20	20.4	40.0	12.8	101.0	178.00	VERTICAL



**Test1: 15b.2; Mode = transmit**

<i>Result:</i>	Passed
<i>Setup No.:</i>	o04+comp
<i>Date of Test:</i>	2010/07/02 12:52
<i>Body:</i>	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
<i>Test Specification:</i>	FCC part 2 and 15

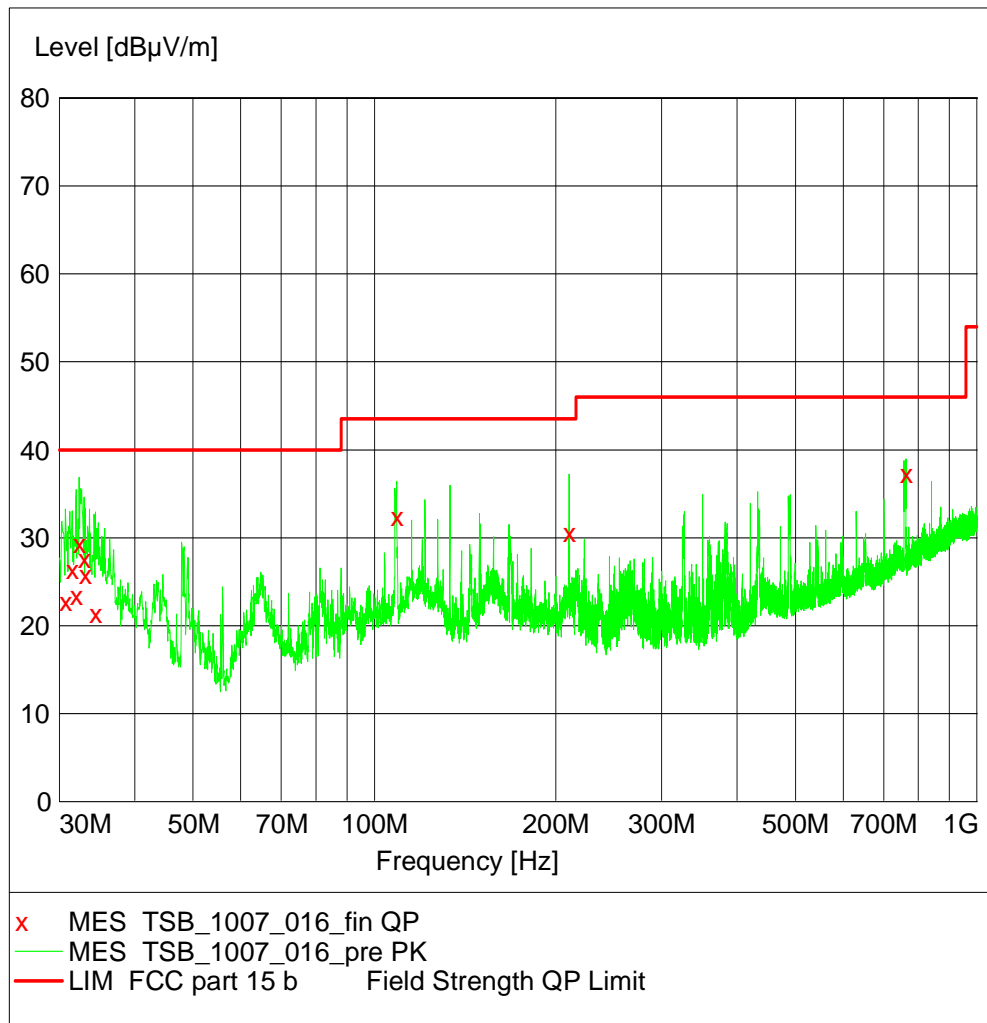
### Detailed Results:

#### EMI RADIATED TEST

EUT: E31T (Y2001o04)  
 Manufacturer: Toshiba Corp.  
 Operating Condition: GSM 1900 TCH 661, BT and WLAN powered.  
 Test Site: 7 layers, Ratingen  
 Operator: Gal  
 Test Specification: FCC part 15 b  
 Comment: Computer periphery setup  
 Start of Test: 02.07.2010 / 00:25:59

#### SCAN TABLE: "FCC part 15 b"

Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	60.0 kHz	MaxPeak	1.0 ms	120 kHz	HL562



#### MEASUREMENT RESULT: "TSB\_1007\_016\_fin QP"

Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
MHz	dBμV/m	dB	dBμV/m	dB	cm	deg	
30.660000	22.70	20.6	40.0	17.3	181.0	292.00	VERTICAL
31.500000	26.40	19.9	40.0	13.6	100.0	332.00	VERTICAL
31.980000	23.50	19.7	40.0	16.5	192.0	49.00	VERTICAL
32.340000	29.30	19.4	40.0	10.7	104.0	340.00	VERTICAL
32.940000	27.60	19.1	40.0	12.4	100.0	247.00	VERTICAL
33.060000	25.80	19.1	40.0	14.2	106.0	247.00	VERTICAL
34.440000	21.40	18.4	40.0	18.6	191.0	324.00	VERTICAL
108.900000	32.40	10.9	43.5	11.1	119.0	247.00	VERTICAL
210.360000	30.60	10.0	43.5	12.9	175.0	112.00	HORIZONTAL
762.000000	37.30	24.6	46.0	8.7	190.0	208.00	VERTICAL



**Test1: 15b.2; Mode = transmit**

<i>Result:</i>	Passed
<i>Setup No.:</i>	o04+desk.
<i>Date of Test:</i>	2010/07/20 18:30
<i>Body:</i>	FCC47CFRChIPART15bRADIO FREQUENCY DEVICES
<i>Test Specification:</i>	FCC part 2 and 15

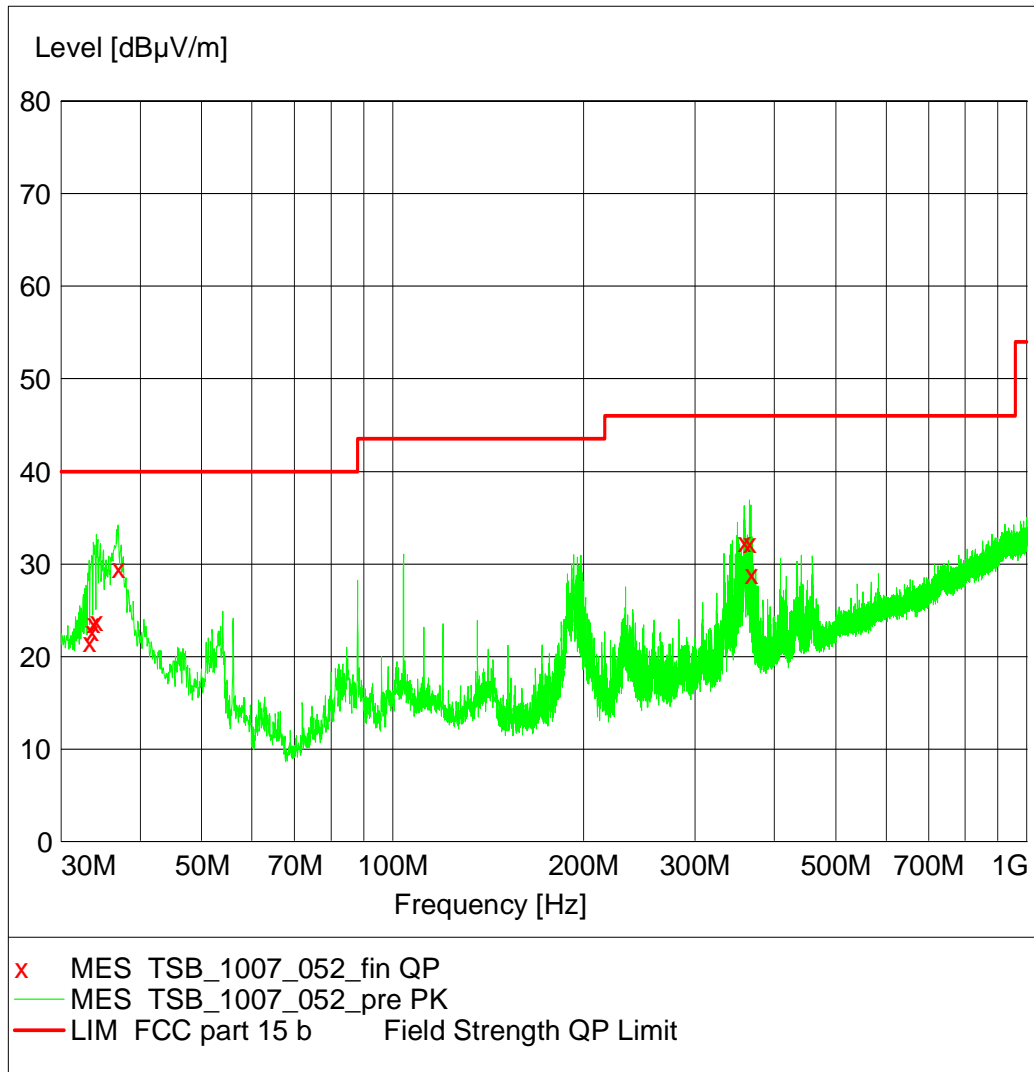
## Detailed Results:

### EMI RADIATED TEST

EUT: E31T (Y2001o04) + desktop station / 20.07.2010  
 Manufacturer: Toshiba Corp.  
 Operating Condition: GSM1900 TCH661; BT powered; WLAN powered  
 Test Site: 7 layers, Ratingen  
 Operator: Doe  
 Test Specification: FCC part 15 b  
 Comment: Horizontal EUT position  
 Start of Test: 20.07.2010 / 17:31:29

### SCAN TABLE: "FCC part 15 b"

Short Description:	FCC part 15 b					
Start	Stop	Step	Detector	Meas.	IF	Transducer
Frequency	Frequency	Width		Time	Bandw.	
30.0 MHz	1.0 GHz	60.0 kHz	MaxPeak	1.0 ms	120 kHz	HL562



## 4 Test Equipment Details

### 4.1 List of Used Test Equipment

The calibration, hardware and software states are shown for the testing period.

#### Test Equipment Anechoic Chamber

<b>Lab ID:</b>	<b>Lab 2</b>		
<b>Manufacturer:</b>	Frankonia		
<b>Description:</b>	Anechoic Chamber for radiated testing		
<b>Type:</b>	10.58x6.38x6		
	<i>Calibration Details</i>	<i>Last Execution</i>	<i>Next Execution</i>
	IC renewal	2009/01/21	2011/01/20
	FCC renewal	2009/01/07	2011/01/06

#### Single Devices for Anechoic Chamber

<i>Single Device Name</i>	<i>Type</i>	<i>Serial Number</i>	<i>Manufacturer</i>
Air compressor	none	-	Atlas Copco
Anechoic Chamber	10.58 x 6.38 x 6	none	Frankonia
	<i>Calibration Details</i>		<i>Last Execution</i> <i>Next Execution</i>
	FCC listing 96716 3m Part15/18		2009/01/07 2011/01/06
	ANSI C64.3 NSA		2009/01/21 2011/01/20
Controller Innco 2000	CO 2000	CO2000/328/1247 0406/L	Innco innovative constructions GmbH
EMC camera	CE-CAM/1	-	CE-SYS
EMC camera Nr.2	CCD-400E	0005033	Mitsubishi
Filter ISDN	B84312-C110-E1		Siemens&Matsushita
Filter Universal 1A	BB4312-C30-H3	-	Siemens&Matsushita

#### Test Equipment Auxiliary Equipment for Conducted emissions

<b>Lab ID:</b>	<b>Lab 1</b>
<b>Manufacturer:</b>	Rohde & Schwarz GmbH & Co.KG
<b>Description:</b>	EMI Conducted Auxiliary Equipment

#### Single Devices for Auxiliary Equipment for Conducted emissions

<i>Single Device Name</i>	<i>Type</i>	<i>Serial Number</i>	<i>Manufacturer</i>
Cable "LISN to ESI"	RG214	W18.03+W48.03	Huber&Suhner
Coupling-Decoupling- Network	CDN ENY41	100002	Rohde & Schwarz GmbH & Co. KG
	<i>Calibration Details</i>		<i>Last Execution</i> <i>Next Execution</i>
	Standard Calibration		2008/03/06 2011/03/05
Two-Line V-Network	ESH 3-Z5	828304/029	Rohde & Schwarz GmbH & Co. KG
Two-Line V-Network	ESH 3-Z5	829996/002	Rohde & Schwarz GmbH & Co. KG
	<i>Calibration Details</i>		<i>Last Execution</i> <i>Next Execution</i>
	DKD calibration		2008/10/13 2011/10/12

## Test Equipment Auxiliary Equipment for Radiated emissions

**Lab ID:** Lab 2  
**Description:** Equipment for emission measurements  
**Serial Number:** see single devices

### Single Devices for Auxiliary Equipment for Radiated emissions

Single Device Name	Type	Serial Number	Manufacturer
Antenna mast	AS 620 P		HD GmbH
Biconical dipole	VUBA 9117	9117108	Schwarzbeck
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Standard Calibration		2008/10/27 2013/10/26
Broadband Amplifier 18MHz-26GHz	JS4-18002600-32-5P	849785	Miteq
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Path Calibration		2010/05/10 2010/11/09
Broadband Amplifier 1GHz-4GHz	AFS4-01000400-1Q-10P-4	-	Miteq
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Path Calibration		2010/05/10 2010/11/09
Broadband Amplifier 30MHz-18GHz	JS4-00101800-35-5P	896037	Miteq
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Path Calibration		2010/05/10 2010/11/09
Cable "ESI to EMI Antenna"	EcoFlex10	W18.01- 2+W38.01-2	Kabel Kusch
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Path Calibration		2010/05/10 2010/11/09
Cable "ESI to Horn Antenna"	UFB311A+UFB293C	W18.02- 2+W38.02-2	Rosenberger Micro-Coax
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Path Calibration		2010/05/10 2010/11/09
Double-ridged horn	HF 906	357357/001	Rohde & Schwarz GmbH & Co. KG
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Standard Calibration		2009/04/16 2012/04/15
Double-ridged horn	HF 906	357357/002	Rohde & Schwarz GmbH & Co. KG
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Standard Calibration		2009/04/28 2012/04/27
Dreheinheit	DE 325		HD GmbH
High Pass Filter	4HC1600/12750-1.5-KK	9942011	Trilithic
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Path Calibration		2010/05/10 2010/11/09
High Pass Filter	5HC2700/12750-1.5-KK	9942012	Trilithic
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Path Calibration		2010/05/10 2010/11/09
High Pass Filter	5HC3500/12750-1.2-KK	200035008	Trilithic
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Path Calibration		2010/05/10 2010/11/09
Log.-per. Antenna	HL 562 Ultralog	830547/003	Rohde & Schwarz GmbH & Co. KG
	<i>Calibration Details</i>		<i>Last Execution Next Execution</i>
	Standard Calibration		2009/05/27 2012/05/26

### Single Devices for Auxiliary Equipment for Radiated emissions (continued)

Single Device Name	Type	Serial Number	Manufacturer
Loop Antenna	HFH2-Z2	829324/006	Rohde & Schwarz GmbH & Co. KG
		<i>Calibration Details</i>	<i>Last Execution Next Execution</i>
		DKD calibration	2008/10/07 2011/10/06
Pyramidal Horn Antenna 26,5 GHz	3160-09	00083069	EMCO Elektronik GmbH
Pyramidal Horn Antenna 40 GHz	3160-10	00086675	EMCO Elektronik GmbH

### Test Equipment Auxiliary Test Equipment

<b>Lab ID:</b>	<b>Lab 2</b>
<b>Manufacturer:</b>	see single devices
<b>Description:</b>	Single Devices for various Test Equipment
<b>Type:</b>	various
<b>Serial Number:</b>	none

### Single Devices for Auxiliary Test Equipment

Single Device Name	Type	Serial Number	Manufacturer
AC Power Source	Chroma 6404	64040001304	Chroma ATE INC.
Broadband Power Divider N (Aux)	1506A / 93459	LM390	Weinschel Associates
Broadband Power Divider SMA	WA1515	A855	Weinschel Associates
Digital Multimeter 01 (Multimeter)	Voltcraft M-3860M	IJ096055	Conrad Electronics
Digital Multimeter 03 (Multimeter)	Fluke 177	86670383	Fluke Europe B.V.
		<i>Calibration Details</i>	<i>Last Execution Next Execution</i>
		Standard calibration	2009/10/07 2011/10/06
Digital Oscilloscope [SA2] (Aux)	TDS 784C	B021311	Tektronix GmbH
Fibre optic link Satellite (Aux)	FO RS232 Link	181-018	Pontis
Fibre optic link Transceiver (Aux)	FO RS232 Link	182-018	Pontis
Isolating Transformer	LTS 604	1888	Thalheimer Transformatorenwerke GmbH
Notch Filter Ultra Stable (Aux)	WRCA800/960-6EEK	24	Wainwright
Spectrum Analyser	FSP3	836722/011	Rohde & Schwarz GmbH & Co. KG
		<i>Calibration Details</i>	<i>Last Execution Next Execution</i>
		DKD calibration	2008/10/06 2011/10/05
Vector Signal Generator	SMIQ B3	832492/061	

## Test Equipment Digital Signalling Devices

### Lab ID:

Lab 1, Lab 2

### Description:

Signalling equipment for various wireless technologies.

### Single Devices for Digital Signalling Devices

Single Device Name	Type	Serial Number	Manufacturer
Bluetooth Signalling Unit CBT	CBT	100589	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Execution
	Standard Calibration		2008/08/14 2011/08/13
Digital Radio Communication Tester	CMD 55	831050/020	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Execution
	Standard calibration		2008/10/07 2010/10/06
Digital Radio Test Set	6103E	2359	Racal Instruments, Ltd.
Universal Radio Communication Tester	CMU 200	102366	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Execution
	Standard calibration		2009/02/16 2012/02/15
	HW/SW Status		Date of Start Date of End
	Hardware:		2007/07/16
	B11, B21V14, B21-2, B41, B52V14, B52-2, B53-2, B56V14, B68 3v04, PCMCIA, U65V04		
	Software:		
Universal Radio Communication Tester	K21 4v21, K22 4v21, K23 4v21, K24 4v21, K42 4v21, K43 4v21, K53 4v21, K56 4v22, K57 4v22, K58 4v22, K59 4v22, K61 4v22, K62 4v22, K63 4v22, K64 4v22, K65 4v22, K66 4v22, K67 4v22, K68 4v22, K69 4v22		
	Firmware:		
	µP1 8v50 02.05.06		
	---		
	CMU 200	837983/052	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Execution
	Standard calibration		2008/12/01 2011/11/30
Universal Radio Communication Tester	HW/SW Status		Date of Start Date of End
	HW options:		2007/01/02
	B11, B21V14, B21-2, B41, B52V14, B52-2, B53-2, B54V14, B56V14, B68 3v04, B95, PCMCIA, U65V02		
	SW options:		
	K21 4v11, K22 4v11, K23 4v11, K24 4v11, K27 4v10, K28 4v10, K42 4v11, K43 4v11, K53 4v10, K65 4v10, K66 4v10, K68 4v10,		
	Firmware:		
	µP1 8v40 01.12.05		
Universal Radio Communication Tester	---		
	SW:		2008/11/03
	K62, K69		
Vector Signal Generator	SMU200A	100912	Rohde & Schwarz GmbH & Co. KG
	Calibration Details		Last Execution Next Execution
	Standard calibration		2008/10/28 2011/10/27

### Test Equipment Emission measurement devices

**Lab ID:** Lab 1, Lab 2  
**Description:** Equipment for emission measurements  
**Serial Number:** see single devices

#### Single Devices for Emission measurement devices

Single Device Name	Type	Serial Number	Manufacturer
Personal Computer	Dell	30304832059	Dell
Signal Generator	SMR 20	846834/008	Rohde & Schwarz GmbH & Co. KG
<i>Calibration Details</i>			<i>Last Execution Next Execution</i>
	Standard Calibration		2007/12/05 2010/12/04
Spectrum Analyzer	ESIB 26	830482/004	Rohde & Schwarz GmbH & Co. KG
<i>Calibration Details</i>			<i>Last Execution Next Execution</i>
	Standard Calibration		2009/12/03 2011/12/02

### Test Equipment Shielded Room 02

**Lab ID:** Lab 1  
**Manufacturer:** Frankonia  
**Description:** Shielded Room for conducted testing  
**Type:** 12 qm  
**Serial Number:** none

## 4.2 Laboratory Environmental Conditions

Laboratory	Date	Temperature	Humidity	Air Pressure
Lab 1	2010/07/05	27 °C	41 %	1014 hPa
	2010/07/20	29 °C	32 %	1007 hPa
	2010/07/23	27 °C	38 %	1011 hPa
Lab 2	2010/07/02	29 °C	38 %	1009 hPa
	2010/07/20	29 °C	32 %	1006 hPa

**5      Annex**

**5.1    Additional Information for Report**

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#### Test Description

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#### Conducted emissions (AC power line)

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Standard     FCC Part 15  
Subpart B

The test was performed according to: ANSI C 63.4, 2003

#### Test Description

The test set-up was made in accordance to the general provisions of ANSI C 63.4-2003.

The Equipment Under Test (EUT) was setup in a shielded room to perform the conducted emissions measurements in a typical installation configuration. The EUT was powered from 50 $\mu$ H || 50 Ohm Line Impedance Stabilization Network (LISN). The LISN's unused connections were terminated with 50 Ohm loads.

The measurement procedure consists of two steps. It is implemented into the EMI test software ES-K1 from R&S.

#### Step 1: Preliminary scan

Intention of this step is, to determine the conducted EMI-profile of the EUT.

EMI receiver settings:

- Detector: Peak - Maxhold
- Frequency range: 150 kHz – 30 MHz
- Frequency steps: 5 kHz
- IF-Bandwidth: 9 kHz
- Measuring time / Frequency step: 20 ms
- Measurement on phase + neutral lines of the power cords

On basis of this preliminary scan the highest amplitudes and the corresponding frequencies relative to the limit are identified. Emissions above the limit and emissions which are in the 10 dB range below the limit are considered.

#### Step 2: Final measurement

Intention of this step is, to determine the highest emissions with the settings defined in the test specification for the frequencies identified in step 1.

EMI receiver settings:

- Detector: Quasi-Peak
- IF - Bandwidth: 9 kHz
- Measuring time: 1 s / frequency

At each frequency determined in step 1, four measurements are performed in the following combinations:

- 1) Neutral lead - reference ground (PE grounded)
- 2) Phase lead - reference ground (PE grounded)
- 3) Neutral lead - reference ground (PE floating)
- 4) Phase lead - reference ground (PE floating)

The highest value is reported.

#### Test Requirements / Limits

If not stated within the measurement plot and/or test result, class B limits are applied.

FCC Part 15, Subpart B, §15.107, Class B Limit

Frequency Range (MHz)	QP Limit (dB $\mu$ V)	AV Limit (dB $\mu$ V)
0.15 – 0.5	66 to 56	56 to 46
0.5 – 5	56	46
5 – 30	60	50

FCC Part 15, Subpart B, §15.107, Class A Limit

Frequency Range (MHz)	QP Limit (dBµV)	AV Limit (dBµV)
0.15 - 0.5	79	66
0.5 - 30	73	60

Used conversion factor: Limit (dBµV) = 20 log (Limit (µV)/1µV).

NOTE: a missing result table in the corresponding test report section means, that no final measurement was performed because no relevant frequencies (peaks) were found in the preliminary scan.

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#### Spurious radiated emissions

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Standard     FCC Part 15, Subpart B

The test was performed according to: ANSI C 63.4, 2003

#### Test Description

Measurement below 1 GHz:

The test set-up was made in accordance to the general provisions of ANSI C 63.4-2003.

The Equipment Under Test (EUT) was set up on a non-conductive table 1.0 x 2.0 m in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna.

The radiated emissions measurements were made in a typical installation configuration.

The measurement procedure is implemented into the EMI test software ES-K1 from R&S.

Step 1: Preliminary scan (test to identify the highest amplitudes relative to the limit)

Intention of this step is, to determine the radiated EMI-profile of the EUT.

Settings for step 1:

- Detector: Peak-Maxhold
- Frequency range: 30 – 1000 MHz
- Frequency steps: 60 kHz
- IF-Bandwidth: 120 kHz
- Measuring time / Frequency step: 100 µs
- Turntable angle range: -180° to 180°
- Turntable step size: 90°
- Height variation range: 1 – 3 m
- Height variation step size: 2 m
- Polarisation: Horizontal + Vertical

On basis of this preliminary scan the highest amplitudes and the corresponding frequencies relative to the limit are identified. Emissions above the limit and emissions which are in the 10 dB range below the limit are considered.

Step 2:

A further measurement will be performed on the frequencies determined in step 1. Intention of this step is, to find out the approximate turntable angle and antenna height for each frequency.

Settings for step 2:

- Detector: Peak – Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 100 ms
- Turntable angle range: -180° to 180°
- Turntable step size: 45°
- Height variation range: 1 – 4 m
- Height variation step size: 0.5 m
- Polarisation: horizontal + vertical

After this step the EMI test system has determined the following values for each frequency (of step 1):

- Frequency
- Azimuth value (of turntable)
- Antenna height

The last two values have now the following accuracy:

- Azimuth value (of turntable): 45°
- Antenna height: 0.5 m

Step 3: final measurement

In this step the accuracy of the turntable azimuth and antenna height will be improved. This is necessary to find out the maximum value of every frequency.

For each frequency, which was determined the turntable azimuth and antenna height will be adjusted. The turntable azimuth will be slowly varied by  $\pm 22.5^\circ$  around this value. During this action the value of emission is continuously measured. The turntable azimuth at the highest emission will be recorded and adjusted. In this position the antenna height is also slowly varied by  $\pm 25$  cm around the antenna height determined. During this action the value of emission is also continuously measured. The antenna height of the highest emission will also be recorded and adjusted.

- Detector: Peak – Maxhold
- Measured frequencies: in step 1 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 100ms
- Turntable angle range:  $-22.5^\circ$  to  $+ 22.5^\circ$  around the determined value
- Height variation range: -0.25m to  $+ 0.25$ m around the determined value

Step 4: Final measurement (with QP detector)

With the settings determined in step 3, the final measurement will be performed:

EMI receiver settings for step 4:

- Detector: Quasi-Peak(< 1GHz)
- Measured frequencies: in step 3 determined frequencies
- IF – Bandwidth: 120 kHz
- Measuring time: 1 s

Measurement above 1 GHz:

The following modifications apply to the measurement procedure for the frequency range above 1 GHz:

The measurement distance was reduced to 1 m. The results were extrapolated by the extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements, inverse-linear-distance-squared for the power density measurements). Due to the fact that in this frequency range a double ridged wave guided horn antenna (up to 18 GHz) and a horn antenna (18–25 GHz) are used, the steps 2-4 as described before, are omitted. Step 1 was performed at one height of the receiving antenna only.

Detector: Peak, Average (simultaneously)

RBW = VBW = 1 MHz; above 7 GHz 100 kHz

#### Test Requirements / Limits

If not stated within the measurement plot and/or test result, class B limits are applied.

FCC Part 15, Subpart B, §15.109, Radiated Emission Limits

Frequency Range (MHz): Class B Limit (dB $\mu$ V/m)

Frequency Range (MHz)	Class B Limit (dB $\mu$ V/m)
30 – 88	40.0
88 – 216	43.5
216 – 960	46.0
above 960	54.0

Frequency Range (MHz) Class A Limit (dB $\mu$ V/m) / @ 3m !

30 - 88	49.5
88 - 216	54.0
216 - 960	56.9
above 960	60.0

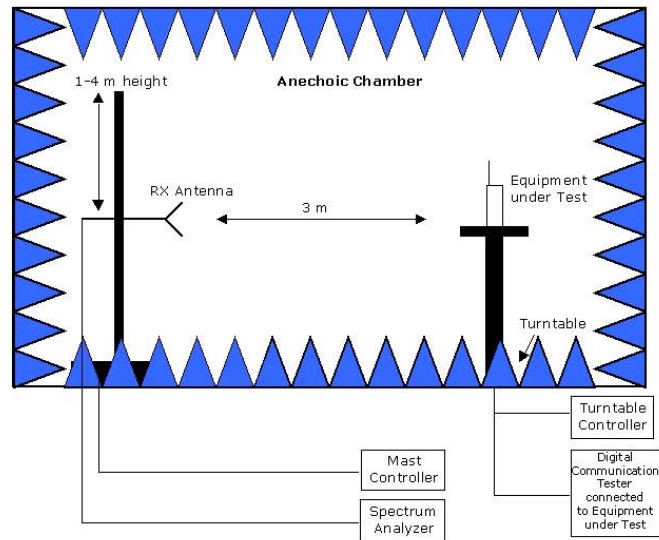
#### §15.35(b)

..., there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit....

Used conversion factor: Limit (dB $\mu$ V/m) =  $20 \log (\text{Limit } (\mu\text{V/m})/1\mu\text{V/m})$

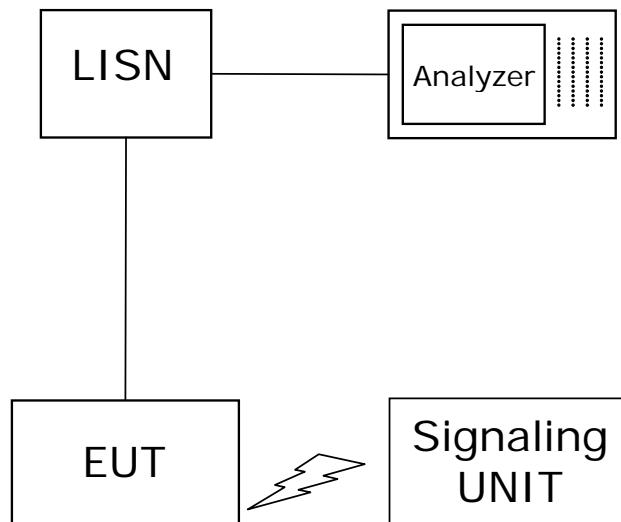
NOTE: a missing result table in the corresponding test report section means, that no final measurement was performed because no relevant frequencies (peaks) were found in the preliminary scan.

## Setup Drawings



Remark: Depending on the frequency range suitable antenna types, attenuators or preamplifiers are used.

Setup in the Anechoic chamber. For measurements below 1 GHz the ground was replaced by a conducting ground plane.



Setup in the shielded room for conducted measurements at AC mains port

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