

Shenzhen Bontek Electronic Technology Co., Ltd.

# Test Report of ETSI EN 300 330-1 V1.4.1 (2004-11) ETSI EN 300 330-2 V1.1.1 (2001-06)

# On Behalf of

# FINGERTEC WORLDWIDE SDN BHD

Product Description: Model No.: Brand Name: RFID Access Control Kadex FINGERTEC

**Prepared for:** 

Prepared by:

Report No.: TCF No.: Issue Date: Test Date:

Test by:

FINGERTEC WORLDWIDE SDN BHD NO.6, 8 & 10, JALAN BK 3/2, BANDAR KINRARA, 47100 PUCHONG, SELANGOR, MALAYSIA Bontek Compliance Testing Laboratory Ltd 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China Tel: 86-755-86337020 Fax: 86-755-86337028 BCT10FR-0853E-1 BCT10FR-0853E June 28, 2010 June 05 ~ June 28, 2010

**Reviewed By:** 

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Bontek Compliance Testing Laboratory Ltd.

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# **1. GENERAL INFORMATION**

#### **1.1 Product Description for Equipment Under Test (EUT)**

#### **Client Information**

Applicant:	FINGERTEC WORLDWIDE SDN BHD
Address of applicant:	NO.6, 8 & 10, JALAN BK 3/2, BANDAR KINRARA, 47100
	PUCHONG, SELANGOR, MALAYSIA
Manufacturer:	FINGERTEC WORLDWIDE LIMITED
Address of manufacturer:	Peking University Founder Shiyan Science Park, Bao'an, Shenzhen,
	China, 518108

#### **General Description of E.U.T**

Items	Description			
EUT Description:	RFID Access Control			
Model No.:	Kadex			
Trademark:	FINGERTEC			
RF Output Power:	26.82dBµA/m 3 meters			
Transmit Frequency:	125.2KHz			
Number of Channels:	1			
Emission designation:	3K9N0N			
Duty cycle:	100%			
Antenna Type:	Built-in Antenna			
Rated Voltage:	DC 12V 1.5 A			
Adapter specification:	Product name: AC ADAPTOR Trade Mark:Ktec Model:KSAD1200 150W1UV-1 Input:100-240V 50/60Hz 0.4A Output: DC 12V 1.5A			
Classification of Equipment:	The Transmitter is a narrow-band and without voice application. The Transmitter is ranged into Category I.			

\* The test data gathered are from the production sample provided by the manufacturer.

#### Category of Equipment

Category I	General
Category II	Portable Equipment
Category III	Equipment for normal indoor use



#### 1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with

ETSI EN 300 330-1V1.4.1 (2004-11)

ETSI EN 300 330-2 V1.1.1 (2001-06)

#### 1.3 Objective

The following Declaration of Conformity report of an ITE device is in accordance with ETSI EN 300 330-1 V1.4.1 (2004-11), Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices(SRD); Radio equipment in the frequency range 9KHz to 25 MHz and inductive loop systems in the frequency range 9KHz to 30MHz;and ETSI EN 300 330-2 V1.1.1 (2001-06), Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices(SRD); Radio equipment in the frequency range 9KHz to 25 MHz and inductive loop systems in the frequency range 9KHz to 30MHz; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive.

#### 1.4 Test Methodology

All measurement required was performed at laboratory of Bontek Compliance Testing Laboratory Ltd at 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

#### **1.5 Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

#### FCC – Registration No.: 338263

Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

#### IC Registration No.: 7631A

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on August 2009.

#### TUV - Registration No.: UA 50145371-0001

Shenzhen Bontek Electronic Technology Co.,Ltd An assessment of the laboratory was conducted according to the "Procedures and Conditions for EMC Test Laboratories" with reference to EN ISO/IEC 17025 by a TUV Rheinland auditor. Audit Report NO. 17010783-001

#### CNAS - Registration No.: L3923

Bontek Compliance Testing Laboratory Ltd has been accredited by China National Accreditation Service for Conformity Assessment (CNAS) for the competence in the field of EMC and Safety testing with the Registration No.: L3923 on February, 2009.

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# 2. SYSTEM TEST CONFIGURATION

## 2.1 Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

#### 2.2 EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by BCT can exercise the EUT as data transferring between the EUT and the host.

#### 2.3 Equipment Modifications

BCT has not done any modification on the EUT.

#### 2.4 List of Measuring Equipments Used

Items	Equipment	Manufacturer	Model No.	Last Cal	Calibration Period
1	EMI Test Receiver	R&S	ESI 26	2010/6	1 year
2	Horn Antenna	R/S	CH14-H052	2010/6	1 year
3	3m Semi- Anechoic Chamber	ETS	N/A	2010/6	1 year
4	Horn Antenn <mark>a</mark>	R/S	HF906	2010/6	1 year
5	Spectrum Analyzer	HP	8594EM	2010/6	1 year
	Loop Antenna				

For other test: Bontek Compliance Testing Laboratory Ltd

Items	Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
1	EMI Test Receiver	R&S	ESCI	100687	2010/6	1 Year
2	EMI Test Receiver	R&S	ESPI7	100097	2010/6	1 Year
3	Amplifier	HP	8447D	1937A024 92	2010/6	1 Year
4	3 phase Artificial Mains (L.I.S.N)	SCHWARZBECK	NSLK 8128	8128247	2010/6	1 Year
5	TRILOG Broadband Test- Antenna	SCHWARZBECK	VULB9163	9163-324	2010/6	1 Year
6	Horn Antenna	SCHWARZBECK	BBHA9120A	D69250	2010/6	1 Year
7	High Field Biconical Antenna	ELECTRO- METRICS	EM-6913	166	2010/6	1 Year
8	Log Periodic Antenna	ELECTRO- METRICS	EM-6950	811	2010/6	1 Year
9	Remote Active Vertical Antenna	ELECTRO- METRICS	EM-6892	304	2010/6	1 Year
10	Power Clamp	SCHWARZBECK	MDS-21	3812	2010/6	1 Year
11	Temperature & Humidity Chamber	TOPSTAT	TOS-831A	3438A052 08	2010/6	1 year

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# **3. SUMMARY OF TEST RESULTS**

Results reported relate only to the product tested.

ETSI EN 300 330-2 V1.3.1	Description of Test	Lim	Results	
		Radiated H-field	< 64.5 dBµA/m	
Section 4.1.1	Radiated field strength or power	Radiated E-field	not applicable	Pass
	0. pono.	RF Carrierr current	not applicable	
Section 4.1.2	Permitted range of operating frequencies	See Secti	Pass	
		Conducted spurious emission	not applicable	
Section 4.1.2a	Spurious emissions	Radiated spurious emission	See Section 7.4.3.2 table 6 And Section 7.4.4.2 table 7	Pass
Section 4.1.3	Duty cycle	See Section 7.5.3 table 8		Pass
Section 4.2.3	Receiver spurious radiations	See Section 8.3.3 table 11		N/A

Table 2: test summary



# 4. ETSI EN 300 330-2 V1.1.1 (2001- 06)§4.1.1 – Radiated Field Strength or Power

#### 4.1 Standard Applicable

The limits presented in the present document are the required field strengths to allow satisfactory operation of inductive systems. These levels were determined after careful analysis within ETSI and ERC/ECC/CEPT.

Maximum H-field strength under normal and extreme conditions is given in table 3.

Exceptionally, some administrations may have a need to provide additional protection to some existing services operating on frequencies covered by table 3.

In all cases SRDs operate on a non-interference basis. Solutions can range from site engineering to field strength modification and can be used on a case by case basis. Additional information is available in CEPT/ERC Recommendation 70-03 [3] and where applicable ERC or ECC Decisions.

Frequency range (MHz)	H-field strength limit (H <sub>f</sub> ) dBμA/m at 10 m					
0,009 ≤ f < 0,315	30					
0,009 ≤ f < 0,03	72 or according to note 1					
0,03 ≤ f < 0,07	72 at 0,03 MHz descending 3 dB/oct					
0,119 ≤ f < 0,135	or according to note 1					
0,05975 ≤ f < 0,06025						
0,07 ≤ f < 0,119	42					
0,135 ≤ f < 0,140						
0,140 ≤ f < 0,1485	37,7					
0,135 ≤ f < 1,0	37,7 at 0,135 MHz descending 3 dB/oct					
$1,0 \le f < 4,642$	29 at 1,0 MHz descending 9 dB/oct					
4,642 ≤ f < 30	9					
$6,765 \le f \le 6,795$						
13,553 ≤ f ≤ 13,567	42, note 3					
26,957 ≤ f ≤ 27,283						
13,553 ≤ f ≤ 13,567	60 (see notes 2 and 3)					
NOTE 1: For the frequency ranges 9 to 70 kHz	and 119 to 135 kHz, the following additional					
restrictions apply to limits above 42 d	BμA/m:					
<ul> <li>for loop coil antennas with an area</li> </ul>	a ≥ 0,16 m <sup>2</sup> table 3 applies directly;					
<ul> <li>for loop coil antennas with an area</li> </ul>	<ul> <li>for loop coil antennas with an area between 0,05 m<sup>2</sup> and 0,16 m<sup>2</sup> table 3 applies</li> </ul>					
with a correction factor. The limit is	with a correction factor. The limit is: table value + $10 \times \log (area/0, 16 \text{ m}^2)$ ;					
<ul> <li>for loop coil antennas with an area</li> </ul>	a < 0,05 m <sup>2</sup> the limit is 10 dB below table 3.					
NOTE 2: For RFID and EAS applications only.						
NOTE 3: Spectrum mask limit, see annex L.						

#### Table 3: H-field limits at 10 m

Warning: The limit be given in below test data and table 2 is at 3 m ,is converted value( see Annex A ).





9-135 kHz magnetic field strength limits overview at 10-metre measurement distance

#### 4.2 Methods of Measurement

The measurements of the transmitter radiated H-field shall be made on an open field test site as specified in clause A.1.3. Any measured values shall be at least 6 dB above the ambient noise level.

The H-field produced by the equipment shall be measured at standard distance of 10 m. Where this is not practical, e.g. due to physical size of the equipment including the antenna or with use of special field cancelling antenna, then other distances may be used. When another distance is used, the distance used and the field strength value measured shall be stated in the test report. In this case, the measured value at actual test distance shall be extrapolated to 10 m according to annex J and these calculations shall be stated in the test report.

The H-field is measured with a shielded loop antenna connected to a measurement receiver. The measuring bandwidth and detector type of the measurement receiver shall be in accordance with clause 6.6.

The equipment under test shall operate where possible, with modulation. Where this is not possible, it shall be stated in the test report.

For transmitters using a continuous wideband swept carrier, the measurement shall be made with the sweep off. When it is not possible to turn the sweep off the measurements shall be made with the sweep on and this shall be stated in the test report.

For measuring equipment calibrated in dB $\mu$ V, the reading should be reduced by 51,5 dB to be converted to dB $\mu$ A/m.



#### 4.3 Basic Test Setup Block Diagram



Figure 2 : Frequencies measured below 30 MHz configuration

#### 4.4 Test Result

Temperature ( ℃ ) : 22~23	EUT: RFID Access Control
Humidity (%RH ): 50~54	M/N: Kadex
Barometric Pressure (mbar): 950~1000	Operation Condition: continue transmitting Mode

Indi	cated	Transfer factor	Table	Test	Antenna	Convert	Limit	Margin
Frequency MHz	Ampl./ dBuV	dB	Angle Degree	Height Meter	Polar H/V	dBuA/m	dBuA/m	dB
125.21	80.94	20.14	45	1.5	V	26.82	64.5	37.68
125.21	80.09	20.19	75	1.5	Н	25.92	64.5	38.58

Note: The limit in above table is at 3 m measurement distance, and comply with table 3 note 1.



Antenna horizontal





## 5. ETSI EN 300 330-2 V1.1.1 (2001- 06)§4.1.2 – Permitted Frequency Range of The Modulation Bandwidth

#### **5.1 Standard Application**

According to ETSI EN 300 330-1 V1.4.1, This clause refers to clause 7.3.

#### 5.2 Limit of Permitted Frequency Range of The Modulation Bandwidth

The permitted range of the modulation bandwidth shall be within the limits of the assigned frequency band stated in CEPT/ERC Recommendation 70-03 [3] or ERC/ECC/CEPT Decisions.

#### 5.3 Methods of Measurement

The transmitter shall be connected to an artificial antenna or if the transmitter has an integral antenna a test fixture shall be used (see clause 6.3). The RF output of the equipment shall be connected to a spectrum analyser via a 50  $\Omega$  variable attenuator.

The transmitter shall be operated at the nominal carrier power or field strength measured under normal test conditions in clause 7.2. The attenuator shall be adjusted to an appropriate level displayed at the spectrum analyser screen.

The transmitter shall be modulated with standard test modulation (see clauses 6.1.1 and 6.1.2). If the equipment cannot be modulated externally, the internal modulation shall be used.

The output of the transmitter, with or without test fixture, shall be measured by using a spectrum analyser with a resolution bandwidth appropriate to accept all major side bands. The power level calibration of the spectrum analyser shall then be related to the power level or field strength measured in clause 7.2. The calculation will be used to calculate the absolute level of the sideband power.

The frequencies of the upper and lower points, where the displayed power envelope of the modulation including frequency drift is equal to the appropriate level defined in clause 7.3.1 is recorded as the modulation bandwidth.

The measurements shall be made during normal and extreme test conditions (clauses 5.4.1 and 5.4.2 applied simultaneously).

#### 5.4 Test Result

Temperature ( ℃ ) : 22~23	EUT: RFID Access Control
Humidity (%RH ): 50~54	M/N: Kadex
Barometric Pressure (mbar): 950~1000	Operation Condition: continue transmitting Mode

Test Conditions	Frequency (KHz) at -30dBm / 100KHz (eirp)				
	fL fH				
Tnor =20 C	125.245	125.252			
Tmin = -20 C	125.256	125.261			
Tmax =55 C	125.259	125.273			



## 6. ETSI EN 300 330-2 V1.1.1 (2001- 06)§4.1.2a – Spurious emissions

#### 6.1 Standard Application

According to ETSI EN 300 330-1 V1.4.1, This clause refers to clause 7.4.

#### 6.2 Limit of Spurious Emissions

#### 6.2.1 Limit of Radiated Field Strength

Radiated emissions below 30 MHz shall not exceed the generated H-field dB $\mu\text{A/m}$  at 10 m given in below table.

State	Frequency 9 kHz ≤ f < 10 MHz	Frequency 10 MHz ≤ f < 30 MHz
Transmit	27 dBµA/m descending 3 dB/oct	-3,5 dBµA/m
Standby	6 dBµA/m descending 3 dB/oct	-24,5 dBμA/m

Note: The limit be given in below test data is at 3 m, is converted value(see Annex A).

#### 6.2.2 Limit of Effective Radiated Power

State	47 MHz to 74 MHz 87,5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies between 30 MHz to 1 000 MHz
Operating	4 nW	250 nW
Standby	2 nW	2 nW

Note: The limit be given in below test data is at 3 m, is converted value( see Annex A ).

#### 6.3 Methods of measurement

#### 6.3.1 Methods of measurement of Radiated Field Strength (< 30 MHz)

The field strength shall be measured for frequencies below 30 MHz. The equipment under test shall be measured at a distance of 10 m on an outdoor test site. The test antenna shall be a calibrated shielded magnetic field antenna. The equipment under test and test antenna shall be arranged as stated in clause A.1.

The equipment under test shall be switched on with normal modulation. The characteristics of the modulation signal used shall be stated on the test report. The measuring receiver shall be tuned over the frequency range 9 kHz to 30 MHz, except for the frequency band on which the transmitter is intended to operate.

At each frequency at which a relevant spurious signal is detected the equipment under test and the test antenna shall be rotated until maximum field strength is indicated on the measuring receiver. This level shall be noted.

If the transmitter can be operated in the standby mode, then the measurements shall be repeated in the standby mode.

For measuring equipment calibrated in dB $\mu$ V, the reading should be reduced by 51,5 dB to be converted to dB $\mu$ A/m.

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#### 6.3.2 Methods of Measurement of Effective Radiated Power (> 30 MHz)

The equipment shall be placed at the specified height on a non-conducting support and in the position closest to normal use as declared by the provider.

The test antenna shall be oriented for vertical polarization. The output of the test antenna shall be connected to a measuring receiver.

The transmitter shall be switched on with normal modulation, and the measuring receiver shall be tuned over the frequency range 30 MHz to 1 000 MHz.

At each frequency at which a relevant spurious component is detected, the test antenna shall be raised and lowered through the specified range of heights until a maximum signal level is detected on the measuring receiver.

The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver. The maximum signal level detected by the measuring receiver shall be noted.

The substitution antenna shall be oriented for vertical polarization and calibrated for the frequency of the spurious component detected.

The frequency of the calibrated signal generator shall be set to the frequency of the spurious component detected. The input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver, if necessary.

The test antenna shall be raised and lowered through the specified range of heights to ensure that the maximum signal is received. When a test site according to clause A.1 is used, there is no need to vary the height of the antenna.

The input signal to the substitution antenna shall be adjusted until an equal or a known related level to that detected from the transmitter is obtained on the measuring receiver. The input signal to the substitution antenna shall be recorded as a power level and corrected for any change of input attenuator setting of the measuring receiver.

The measure of the effective radiated power of the spurious components is the larger of the two power levels recorded for each spurious component at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

If an unmodulated carrier cannot be obtained then the measurements shall be made with the transmitter modulated by the normal test signal (see clause 6.1.2) in which case this fact shall be recorded in the test report.

If standby mode is available, the measurements shall be repeated in that mode.

#### 6.4 Test Result

Temperature ( $^{\circ}C$ ) : 22~23	EUT: RFID Access Control
Humidity (%RH ): 50~54	M/N: Kadex
Barometric Pressure (mbar): 950~1000	Operation Condition: continue transmitting Mode



Indicated		Table	Test Antenna		Substituted			
Frequency MHz	Meter Reading dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Limit dBuA/m	Margin dB
below 30MHz								
	_	_		Tx mo	de	_		
0.251	31.2	100	1.50	Н	0.251	-2 0.3	-14.3	6.0
Stand by								
0.232	20.1	150	1.47	Н	0.232	-38.4	-8.00	30.4

Indicated		Table	Test Antenna		Substituted			
Frequency MHz	Meter Reading dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Limit dBuA/m	Margin dB
			A	bove 30	MHz			
	-	-	-	Tx mo	de		-	
36.72	45.66	254	1.50	V	36.72	-5.72	29.48	34.3
81.05	43.32	126	1.45	V	81.05	-9.02	29.48	38.50
142.3	42.11	105	1.54	Н	142.3	-8.52	29.48	37.00
326.7	37.32	225	1.55	Н	326.7	-13.44	29.48	42.94
Stand by								
36.72	9.21	225	1.49	V	36.72	-46.21	8.51	54.72
81.05	6.56	100	1.46	V	81.05	-49.33	8.51	57.84





# 7. ETSI EN 300 330-2 V1.1.1 (2001- 06)§4.1.3 – Duty Cycle

#### 7.1 Standard Application

According to ETSI EN 300 330-1 V1.4.1, This clause refers to clause 7.5;

#### 7.2 Definition

For the purpose of the present document the term duty cycle refers to the ratio of the total on time of the "message" during any one hour relative to one hour period. The device may be triggered either automatically or manually and depending on how the device is triggered will also depend on whether the duty cycle is fixed or random.

#### 7.3 Duty Cycle Classes

In a period of 1 hour the duty cycle shall not exceed the values given in below table.

Duty cycle Class	Duty cycle ratio
1	< 0,1 %
2	< 1,0 %
3	< 10 %
4	Up to 100 %

#### 7.4 Test Result

Temperature ( $^{\circ}$ C ) : 22~23	EUT: RFID Access Control
Humidity (%RH ): 50~54	M/N: Kadex
Barometric Pressure ( mbar ): 950~1000	Operation Condition: continue transmitting Mode

Test plots see following pages

The Duty Cycle= 1= 100%







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# 8. ETSI EN 300 330-2 V1.1.1 (2001- 06)§4.2 – Receiver Requirements

#### **8.1 Standard Application**

The adjacent channel selectivity in-band, as defined in EN 300 330-1 [2], clause 8.1.1, shall not be less than the limits in EN 300 330-1 [2], clause 8.1.3, table 10.

#### 8.2 Limit of Spurious Emissions

#### 8.2.1 Limit of Radiated Field Strength

Radiated emissions below 30 MHz shall not exceed the generated H-field dB $\mu\text{A/m}$  at 10 m given in below table.

Frequency 9 kHz ≤ f < 10 MHz	Frequency 10 MHz ≤ f < 10 MHz
6 dBµA/m descending 3 dB/oct	-24,5 dBμA/m

#### Spurious limits, radiated H-field at 10 m distances



Figure E.1

#### 8.2.2 Limit of Effective Radiated Power

The measured values shall not exceed 2 nW.



#### 8.3 Methods of measurement

#### 8.3.1 Methods of measurement of Radiated Field Strength (< 30 MHz)

The field strength shall be measured for frequencies below 30 MHz. The equipment under test shall be measured at a distance of 10 m on an outdoor test site. The test antenna shall be a calibrated shielded magnetic field antenna. The equipment under test and test antenna shall be arranged as stated in clause A.1.

The equipment under test shall be switched on with normal modulation. The characteristics of the modulation signal used shall be stated on the test report. The measuring receiver shall be tuned over the frequency range 9 kHz to 30 MHz, except for the frequency band on which the transmitter is intended to operate.

At each frequency at which a relevant spurious signal is detected the equipment under test and the test antenna shall be rotated until maximum field strength is indicated on the measuring receiver. This level shall be noted.

If the transmitter can be operated in the standby mode, then the measurements shall be repeated in the standby mode.

For measuring equipment calibrated in  $dB\mu V$ , the reading should be reduced by 51,5 dB to be converted to  $dB\mu A/m$ .

#### 8.3.2 Methods of Measurement of Effective Radiated Power (> 30 MHz)

The equipment shall be placed at the specified height on a non-conducting support and in the position closest to normal use as declared by the provider.

The test antenna shall be oriented for vertical polarization. The output of the test antenna shall be connected to a measuring receiver.

The transmitter shall be switched on with normal modulation, and the measuring receiver shall be tuned over the frequency range 30 MHz to 1 000 MHz.

At each frequency at which a relevant spurious component is detected, the test antenna shall be raised and lowered through the specified range of heights until a maximum signal level is detected on the measuring receiver.

The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver. The maximum signal level detected by the measuring receiver shall be noted.

The substitution antenna shall be oriented for vertical polarization and calibrated for the frequency of the spurious component detected.

The frequency of the calibrated signal generator shall be set to the frequency of the spurious component detected. The input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver, if necessary.

The test antenna shall be raised and lowered through the specified range of heights to ensure that the maximum signal is received. When a test site according to clause A.1 is used, there is no



need to vary the height of the antenna.

The input signal to the substitution antenna shall be adjusted until an equal or a known related level to that detected from the transmitter is obtained on the measuring receiver. The input signal to the substitution antenna shall be recorded as a power level and corrected for any change of input attenuator setting of the measuring receiver.

The measure of the effective radiated power of the spurious components is the larger of the two power levels recorded for each spurious component at the input to the substitution antenna, corrected for the gain of the substitution antenna if necessary.

If an unmodulated carrier cannot be obtained then the measurements shall be made with the transmitter modulated by the normal test signal (see clause 6.1.2) in which case this fact shall be recorded in the test report.

Note: The EUT have not clarify receiver ,so this test is not applicable



## Annex A: H-field measurements and limits at 3 m

The H-field limit in dBµA/m at 3 m, H3m, is determined by the following equation:

where:

H10m is the H-field limit in  $dB\mu A/m$  at 10m distance according to the present document; and C3 is a conversion factor in dB determined from figure A.



Correction factor, C3, for limits at 3 m distance, dB

Figure A: Conversion factor C3 versus frequency



# Annex B: EUT-Setup photo



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