

**ETS Dr.GenZ Taiwan PS Co., LTD**

**FCC Registration No.: 930600**

**Industry Canada filed test laboratory Reg. No. IC 5679**

**Accredited Testing Laboratory**

**A2LA Cert.No.: 2300.01**

# **FCC TEST - REPORT**

**FCC RULES PART 15 / SUBPART C**

**FCC ID: CWTUGPZ4**

**Test report no.: J10M20504-0002-P-15**



Registration number: J10M20504-0002-P-15

FCC ID : CWTUGPZ4

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## **1 General Information**

### **1.1 Notes**

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has Passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems.

The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

The test results of this test report relate exclusively to the item tested as specified in 1.5.

The test report may only be reproduced or published in full.

Reproduction or publication of extracts from the report requires the prior written approval of the ETS DR. GENZ TAIWAN PS CO., LTD.

### **Tester:**

29.04.2005

Orville Chang

A handwritten signature in cursive script that reads 'Orville Chang'.

Date

ETSLab.

Name

Signature

### **Technical responsibility for area of testing:**

29.04.2005

Steven Chuang

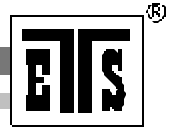
A handwritten signature in cursive script that reads 'Steven Chuang'.

Date

ETS

Name

Signature



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## 1.2 Testing laboratory

### 1.2.1 Location

OATS  
No.5-1, Shuang Sing Village,  
LiShuei Rd., Wanli Township,  
Taipei County 207, Taiwan (R.O.C.)

Company  
ETS DR. GENZ TAIWAN PS CO., LTD.  
6F, NO. 58, LANE 188, RUEY-KUANG RD.  
NEIHU, TAIPEI 114, TAIWAN R.O.C.  
Tel : 886-2-66068877  
Fax : 886-2-66068879

### 1.2.2 Details of accreditation status

#### Accredited testing laboratory

**A2LA-registration number: 2300.01**

**FCC filed test laboratory Reg. No. 930600**

**Industry Canada filed test laboratory Reg. No. IC 5679**

## 1.3 Details of approval holder

Name : ALPS ELECTRIC CO., LTD.  
Street : 1-7, YUKIGAYA-OTSUKA-CHO, OTA-KU  
Town : 145-8501 TOKYO  
Country : JAPAN  
Telephone : +81-3726-1211  
Fax : +81-3728-1741  
Contact : MR. MASA AKI UEKI  
Telephone : +81-3726-1211



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#### 1.4 Application details

Date of receipt of application : 27.04.2005  
 Date of receipt of test sample : 27.04.2005  
 Date of test : from 27.04.2005 to 29.04.2005

#### 1.5 General information of Test item

Type of test item : Bluetooth Transceiver Module  
 Model Number : UGPZ4  
 Hardware : Ver.1.0  
 Software : Ver.1.0  
 Serial number : without  
 Photos : see Annex

#### Technical data

Frequency band : 2.4 GHz – 2.4835 GHz  
 Frequency ( ch A) : 2.402 GHz  
 Frequency ( ch B) : 2.441 GHz  
 Frequency ( ch C) : 2.480 GHz

#### Transmitter                      Unom

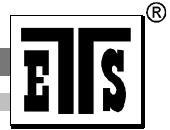
Power ( ch A or ch 0) : **Conducted: 1.53 dBm**  
 Power ( ch B or ch 39) : **Conducted: 1.28 dBm**  
 Power ( ch C or ch 78) : **Conducted: 1.09 dBm**

Power supply : 3.3 VDC  
 Operation modes : duplex  
 Modulation Type : FHSS / GFSK  
 Antenna Type : Mono-pole ceramic antenna  
 Antenna gain : 0 dBi

Remark:

FCC 15.31 (e)

The host device provides this EUT with stable power supply (DC3.3V) constantly to this module, and the power is not changed when the voltage of this EUT is varied. Therefore, this EUT complies with the requirement.



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Host device : none

Classification :

Fixed Device	<input type="checkbox"/>
Mobile Device (Human Body distance > 20cm)	<input checked="" type="checkbox"/>
Portable Device (Human Body distance < 20cm)	<input type="checkbox"/>

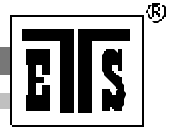
**Manufacturer:**  
 (if applicable)

Name : ./.  
 Street : ./.  
 Town : ./.  
 Country : ./.

Additional information : The test sample is designed as UGPZ4 device. Its pseudorandom hopping scheme, authentication, receiver parameters, synchronization procedure and other parameters are determined by UGPZ4 Specification.

**1.6 Test standards**

Technical standard : FCC RULES PART 15 / SUBPART C § 15.247



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## **2 Technical test**

### **2.1 Summary of test results**

No deviations from the technical specification(s) were ascertained in the course of the tests performed.



**or**

The deviations as specified in 2.5 were ascertained in the course of the tests performed.



### **2.2 Test environment**

Temperature : 23 °C  
Relative humidity content : 20 ... 75 %  
Air pressure : 86 ... 103 kPa  
Details of power supply : 120 VAC (ac/dc adaptor)

Extrem conditions parameters : test voltage : -- extreme  
min :- V  
max :- V

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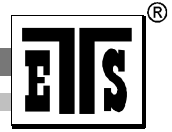
### 2.3 Test Equipment List

No.	Test equipment	Type	Serial No.	Manufacturer	Next Cal. Date
ETSTW-CE 001	EMI TEST RECEIVER	ESHS10	842121/013	R&S	08.11.2005
ETSTW-CE 002	PREREULATOR MODE DC POWER SUPPLY				
ETSTW-CE 003	AC POWER SOURCE	APS-9102	D161137	GW	
ETSTW-CE 004	ZWEILEITER-V-NETZNACHBILDUNG TWO-LINE V-NETWORK	ESH3-Z5	840731/011	R&S	08.11.2006
ETSTW-CE 005	Line-Impedance Stabilisation Network	NNBM 8126D	137	Schwarzbeck	03.11.2006
ETSTW-CE 006	IMPULS-BEGRENZER PULSE LIMITER	ESH3-Z2	100226	R&S	10.11.2006
ETSTW-CE 007	SPECTRUM ANALYZER 5GHz	FSB	849670/001	R&S	
ETSTW-CE 008	ABSORBING CLAMP	MDS 21	3469	ABSORPTIONS-MESSWANDLER-ZANGE	04.11.2006
ETSTW-CE 009	TEMP.&HUMIDITY CHAMBER	GTH-225-40-1P-U	MAA0305-009	GIANT FORCE	10.05.2005
ETSTW-CE 010	Comb Generator-conducted			ETS	
ETSTW-CE 011	Power Line Conducted Emission Only			ETS	
ETSTW-CS 001	SIGNAL GENERATOR	SMX	849254/003	R&S	31.10.2005
ETSTW-CS 002	COUPLING AND DECOUPLING NETWORK	CDN S751	19263	CHAFFNER	03.11.2006
ETSTW-CS 003	COUPLING AND DECOUPLING NETWORK	CDN T400	19820	CHAFFNER	03.11.2006
ETSTW-CS 004	COUPLING AND DECOUPLING NETWORK	CDN M016	20053	CHAFFNER	03.11.2006
ETSTW-CS 005	RF Power Amplifier	100A250A	306547	AR	03.11.2005
ETSTW-RE 001	2MHz SWEEP FUNCTION GENERATOR	EGC-3230	02050018	Escort	
ETSTW-RE 002	Function Generator	33220A	MY43004982	Agilent	03.11.2005
ETSTW-RE 003	EMI TEST RECEIVER	ESI	831438/001	R&S	16.11.2005
ETSTW-RE 004	EMI TEST RECEIVER	ESI	831459/012	R&S	09.11.2005
ETSTW-RE 005	EMI TEST RECEIVER	ESVS10	843207/020	R&S	01.11.2005
ETSTW-RE 006	HF-EICHLITUNG RF STEP ATTENUATOR	DPSP	848220/003	R&S	
ETSTW-RE 007	HF-EICHLITUNG RF STEP ATTENUATOR	DPSP	844581/024	R&S	
ETSTW-RE 008	Controller	HD100	C0100-L/047/6670703/L	Heinrich Deisel	
ETSTW-RE 009	Controller	HD100	100/341	Heinrich Deisel	
ETSTW-RE 010	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070181	MOTECH	
ETSTW-RE 011	PROGRAMMABLE LINEAR POWER SUPPLY	LPS-305	30503070165	MOTECH	
ETSTW-RE 012	TUNABLE BANDREJECT FILTER	D.C 0309	146	K&L	
ETSTW-RE 013	TUNABLE BANDREJECT FILTER	D.C 0036	397	K&L	
ETSTW-RE 014	DUAL TRACKING WITH 5V FIXED	GPC-3030D		GW	
ETSTW-RE 015	ANTENNA	HK116	841489/003	R&S	



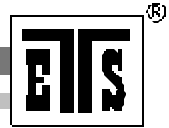
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ETSTW-RE 016	ANTENNA	HL223	848953/006	R&S	
ETSTW-RE 017	ANTENNA	HL025	352886/001	R&S	
ETSTW-RE 018	ANTENNA	AT4560	27212	AR	07.11.2006
ETSTW-RE 019	ANTENNA , HORN	22240-25	121074	FM	
ETSTW-RE 020	MICROWAVE HORN ANTENNA	AT4002A	306915	AR	
ETSTW-RE 021	SWEEP GENERATOR	SWM05	835130/010	R&S	10.11.2005
ETSTW-RE 022	AMPLIFIER	8447D	2944A09837	Agilent	01.11.2005
ETSTW-RE 023	Shielded room	SR 1		Frankonia	
ETSTW-RE 024	Anechoic Chamber	CHC 1		Frankonia	
ETSTW-RE 025	Anechoic Chamber	CHC 2		Frankonia	
ETSTW-RE 026	Open Area Test Site	10m		ETS	
ETSTW-RE 027	Passive Loop Antenna	6512	34563	EMCO	29.06.2006
ETSTW-RE 028	Log-Periodic DipoleArray Antenna	3148	34429	EMCO	14.06.2006
ETSTW-RE 029	Biconical Antenna	3109	33524	EMCO	16.06.2006
ETSTW-RE 030	Double-Ridged Waveguide Horn Antenna	3117	35224	EMCO	04.05.2006
ETSTW-RE 031	Comb Generator-radiated			ETS	
ETSTW-RE 032	Millivoltmeter	URV 55	849086/013	R&S	17.11.2005
ETSTW-RE 033	4CH 1GHz 5GS/s DSO	WAVERUNNER 6100A	LCRY0604P14508	LeCory	
ETSTW-RE 034	Power Sensor	URV5-Z4	839313/006	R&S	17.11.2005
ETSTW-RE 035	1.5GHz Active Voltage Probe	HFP1500	2332	LeCory	
ETSTW-RE 036	100MHz High Voltage Diff Probe	ADP305	3305	LeCory	
ETSTW-RE 037	Log-Periodic DipoleArray Antenna	3148	00034546	EMCO	17.11.2006
ETSTW-RE 038	Log-Periodic DipoleArray Antenna	3148	00034547	EMCO	17.11.2006
ETSTW-RE 039	Biconical Antenna	3110B	41760	EMCO	17.11.2006
ETSTW-RE 040	Biconical Antenna	3110B	41761	EMCO	17.11.2006
ETSTW-RE 041	Anechoic Chamber	CHC 3		Frankonia	
ETSTW-EMI 001	HARMONICS 1000	HAR1000-1P	93	EMC-PARTNER	17.11.2005
ETSTW-EMS 001	Clamp BASELSTRASSE 160 CH-4242 LAUFEN	CN-EFT1000	354	EMC-PARTNER	01.11.2005
ETSTW-EMS 002	Frequency Converter	YF-6020	0308014		
ETSTW-EMS 003	EMC Immunity Test System	TRA2000IN6	579	EMC-PARTNER	01.11.2005
ETSTW-EMS 004	ESD generator minizap	ESD2000	016	EMC-PARTNER	01.11.2005
ETSTW-EMS 005	Attenuator (50Ω)	VERI50	051	EMC-PARTNER	30.08.2006
ETSTW-EMS 006	Attenuator (1 KΩ)	VERI1K	019	EMC-PARTNER	20.10.2006
ETSTW-EMS 007	20GΩ Divider	ESD-VERI-V	021	EMC-PARTNER	16.03.2006
ETSTW-RS 001	14" COLOR VIDEO MONITOR	TP-1480HR	P009799	TOPICA	
ETSTW-RS 002	14" COLOR VIDEO MONITOR	TP-1480HR	P009814	TOPICA	
ETSTW-RS 003	AMPLIFIER RESEARCH	30S1G3	306933	AR	



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ETSTW-RS 004	RF Power Amplifier	150W1000	307009	AR	18.11.2005
ETSTW-RS 005	Electric Field Probe Type 8.3	EMR-20	BN 2244/20	GW	03.09.2005
ETSTW-RS 006	SIGNAL GENERATOR	SML03	101551	R&S	15.11.2005
ETSTW-RS 007	AUDIO ANALYZER	UPA3	843458/029	R&S	15.11.2005
ETSTW-GSM 01	SIM Simulator	IT3	B2004-50106	ORGA Testsystems GmbH	
ETSTW-GSM 02	Universal Radio Communication Tester	CMU 200	103489	R&S	
	Parts of Anite SAT (6)E Platform Protocol Test System				
ETSTW-GSM 03	Agilent 8960 Test Set 1	E5515C	GB44052675	Agilent	07.14.06
ETSTW-GSM 04	Agilent 8960 Test Set 2	E5515C	GB44052665	Agilent	07.14.06
ETSTW-GSM 05	Agilent 8960 Test Set 3	E5515C	GB44052852	Agilent	07.17.06
ETSTW-GSM 06	Agilent 8960 Test Set 4	E5515C	GB44052984	Agilent	07.16.06
ETSTW-GSM 07	Agilent 8960 Test Set 5	E5515C	GB44052658	Agilent	07.14.06
ETSTW-GSM 08	Agilent 8960 Test Set 6	E5515C	GB44052666	Agilent	07.16.06
ETSTW-GSM 09	Controler PC	Dell GX 270	700F61J	Dell	
ETSTW-GSM 10	Combiner Wessex / Anite	B4605/100	053	Wessex / Anite	07.06
ETSTW-GSM 11	GSM 850,900,1800,1900 Test system	TS8950G		Rohde & Schwarz	11.05



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#### 2.4 General Test Procedure

**POWER LINE CONDUCTED INTERFERENCE:** The procedure used was ANSI STANDARD C63.4-2003 using a 50 $\mu$ H LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

**RADIATION INTERFERENCE:** The test procedure used was according to ANSI STANDARD C63.4-2003 employing a spectrum analyzer. For investigated frequency is equal to or below 1GHz, the RBW and VBW of the spectrum analyzer was 100 kHz and 100kHz respectively with an appropriate sweep speed. For investigated frequency is above 1GHz, both of RBW and VBW of the spectrum analyzer were 1 MHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient. temperature of the UUT was 23°C with a humidity of 40 %.

**FORMULA OF CONVERSION FACTORS:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dB $\mu$ V) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

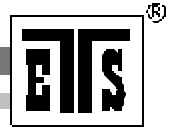
Freq (MHz)	METER READING + ACF + CABLE LOSS (to the receiver) = FS
33	20 dB $\mu$ V + 10.36 dB + 6 dB = 36.36 dB $\mu$ V/m @3m

The UUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table) and arranged according to ANSI C63.4-2003 Section 13.1.2. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to the frequency specified as follows:

- (1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
- (2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
- (3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
- (4) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a)(1)-(a)(3) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this Section, whichever is the higher frequency range of investigation.

For hand-held devices, a exploratory test was performed with three (3) orthogonal planes to determine the highest emissions.

Measurements were made by ETS Dr. Genz Taiwan PS Co., Ltd. at the registered open field test site located No.5-1, Shuang Sing Village, LiShuei Rd., Wanli Township, Taipei County 207, Taiwan (R.O.C.). The Registration Number: 930600.



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When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

When the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.

The formula is as follows:

Average = Peak + Duty Factor

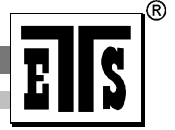
Duty Factor =  $20 \log(\text{dwell time}/T)$

T = 100ms when the pulse train period is over 100 ms or the period of the pulse train.

Modified Limits for peak according to 15.35 (b) = Max Permitted average Limits + 20dB

**ANTENNA & GROUND:**

**This unit uses Mono -pole ceramic antenna.**



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### **3 Test results (enclosure)**

TEST CASE	Para. Number	Required	Test passed	Test failed
Peak Output Power	15.247(b)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Equivalent radiated Power	15.247(b)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions radiated – Transmitter operating	15.247(c)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Emissions conducted – Transmitter operating	15.247	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Carrier Frequency Separation	15.247(a) (1)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Number of Hopping Frequencies	15.247(a) (1)(i)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Time of Occupancy (Dwell Time)	15.247(a) (1)(i)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20 dB Bandwidth	15.247(a) (1)(i)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Band-edge Compliance of RF Emission	15.247(c)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated Emission from Digital Part And Receiver L.O.	15.109	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Power Line Conducted Emission	15.207(a)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The follows is intended to leave blank.

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### 3.1 Peak Output Power (transmitter)

FCC Rule: 15.247

This measurement applies to equipment with an integral antenna and to equipment with an antenna connector and equipped with an antenna as declared by the applicant.

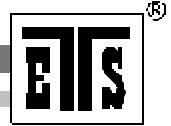
The power was measured with modulation (declared by the applicant).

Test conditions	Conducted Power		
	Channel A [dBm]	Channel B [dBm]	Channel C [dBm]
$T_{nom} = 23^{\circ}\text{C}$ $V_{nom} = 120\text{ V}$	1.53	1.28	1.09
Measurement uncertainty	< 3 dB		

Test conditions	Radiated Power		
	Channel A [dBm]	Channel B [dBm]	Channel C [dBm]
$T_{nom} = 23^{\circ}\text{C}$ $V_{nom} = 120\text{ V}$	--	--	--
Measurement uncertainty	< 3 dB		

Test conditions	Radiated Power		
	Channel A [dBm]	Channel B [dBm]	Channel C [dBm]
$T_{nom} = 23^{\circ}\text{C}$ $V_{nom} = 120\text{ V}$	--	--	--
Measurement uncertainty	< 3 dB		

Test conditions	Radiated Power		
	Channel A [dBm]	Channel B [dBm]	Channel C [dBm]
$T_{nom} = 23^{\circ}\text{C}$ $V_{nom} = 120\text{ V}$	--	--	--
Measurement uncertainty	< 3 dB		



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Test conditions $T_{nom} = 23^{\circ}C$ , $V_{nom} = 120 V$ Frequency[MHz]	Signal Field strength TX highest power mode dB $\mu$ V/m
2402	91.54
Measurement uncertainty	< 3 dB

The diagrams for the field strength measurements are included in Appendix.

### Maximum Peak Output Power

Limits:

Frequency MHz	Number of hopping channels			
	$\geq 75$	$\geq 50$	$49 \geq 25$	$74 \geq 15$
902-928		30 dBm	24 dBm	
2400-2483.5 MHz	30 dBm	-		21 dbm
5725-5850 MHz	30 dBm	-		

In case of employing transmitter antennas having antenna gain >dBi and using fixed poin-to point operation consider §15.247 (b)(4).

Test equipment used: ETSTW-RE 003, ETSTW-RE 012, ETSTW-RE 017, ETSTW-RE 024

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### 3.2 Equivalent isotropic radiated power

FCC Rule: 15.239(b), 15.35

Because using an internal antenna there are no deviations from the radiated test results according 3.1.

#### 3.2.1 Transmitter

##### Integral Antenna:

At the transmitter the measurement was transacted with the modulation declared by the manufacturer and the maximum available output power of the EUT.

In this arrangement the EUT fulfils the requirements of the FCC rules § 15.247, subpart C, section b. This unit uses an internal antenna. There is no provision for an external antenna (see photo).

### 3.3 RF Exposure Compliance Requirements

According to Supplement C, Edition 01-01 to OET Bulletin 65, Edition 97-01 this spread spectrum transmitter is categorically excluded from routine environmental evaluation because of the low power level, where there is a high likelihood of compliance with RF exposure standards.

The antenna used for this Bluetooth transceiver module must not be co-located or operating in conjunction with any other antenna or transmitter.

### 3.4 Out of Band Radiated Emissions

FCC Rule: 15.247(c) , 15.35

For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Limits:

For frequencies below 1GHz :

Max. reading – 20 dB

$91.54 \text{ dB}\mu\text{V/m} - 20 \text{ dB} = 71.54 \text{ dB}\mu\text{V/m}$

Guidance on Measurement of FHSS Systems:

“If the emission is pulsed, modify the unit for continuous operation , use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.” Here the correction was added to the limit instead subtracted from the reading.

Duty Cycle correction =  $20 \log (\text{dwell time}/100\text{ms})$

For frequencies above 1GHz (Peak measurements).

Limit = max. aver. reading-20dB +20dB(because Peak detector is used)

$71.54 \text{ dB}\mu\text{V/m}$

For frequencies above 1GHz (Average measurements).

Max. reading – 20 dB - duty cycle correction:

No duty cycle correction was added to the reading

$91.54 \text{ dB}\mu\text{V/m} - 20 \text{ dB} = 71.54 \text{ dB}\mu\text{V/m}$

Remarks: See attached diagrams.

Test equipment used: ETSTW-CE 003 , ETSTW-RE 003



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### 3.5 Transmitter Radiated Emissions in restricted Bands

FCC Rules: 15.247 (c), 15.205, 15.209, 15.35

Radiated emission measurements were performed from 30 MHz to 26000 MHz.

For radiated emission tests, the analyzer setting was as followings:

RES BW VID BW

Frequency <1 GHz 100 kHz 100 kHz (Peak measurements)

Frequency >1 GHz 1 MHz 1 MHz (Peak measurements)

1 MHz 1 MHz (Average measurements)

Limits:

For frequencies below 1GHz :

Frequency of Emission (MHz)	Field strength (microvolts/meter)	Field Strength (dB microvolts/meter)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

For frequencies above 1GHz (Average measurements).

Guidance on Measurement of FHSS Systems:

“If the emission is pulsed, modify the unit for continues operation , use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.” Here the correction was added to the limit instead subtracted from the reading.

Duty cycle correction =  $20 \log(\text{dwell time}/100\text{ms})$

For frequencies above 1GHz (Average measurements).

Limit – duty cycle correction

No duty cycle correction was added to the reading.

54.0dB $\mu$ V/m

For frequencies above 1GHz (Peak measurements).

Limit + 20dB

54.0dB $\mu$ V/m + 20 dB= 74 dB $\mu$ V/m

Remarks: See attached diagrams.

Test equipment used: ETSTW-RE 003, ETSTW-RE 012, ETSTW-RE 015, ETSTW-RE 016,  
ETSTW-RE 017, ETSTW-RE 024

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### 3.6 Spurious emissions (tx)

Spurious emission was measured with modulation (declared by manufacturer).

In any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

SAMPLE CALCULATION OF LIMIT. All results will be updated by an automatic measuring system in accordance to point 2.3.

Calculation of test results:

Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

The peak and average spurious emission plots was measured with the average limits.

In the Table being listed the critical peak and average value an exhibit the compliance with the above calculated Limits.

If in the column's correction factor states a value then the max. Field strength in the same row is corrected by a value gained from the "Marker-Delta-Method" or the „Duty-Cycle Correction Factor“.

#### Summary table with radiated data of the test plots

Freq.	Used Ch.	Frequency Marker [MHz]	Polarization	corrections dB	Corrected Reading [dBuV/m]	Compliance Limit [dBuV/m]	Detector	BW [MHz]	Margin
1	0	32.725	V		28.62	71.54	PK	0.1	42.92
1	0	32.725	H		19.50	71.54	PK	0.1	52.04
2	0	985.571	V		35.21	54	PK	0.1	18.79
2	0	985.571	H		35.78	54	PK	0.1	18.22
3	0	1601.202	V		37.03	54	PK	1	16.97
3	0	1601.202	H		45.66	54	PK	1	8.34
3	0	2370.347	V		39.92	54	PK	1	14.08
3	0	2370.347	H		45.26	54	PK	1	8.74
3	0	2386.373	H		42.44	54	AV	1	11.56
3	0	2386.373	V		44.17	54	PK	1	9.83
3	0	2386.373	H		54.03	74	PK	1	19.97
4	0	4801.603	V		43.90	54	AV	1	10.1
4	0	4801.603	H		53.66	54	PK	1	0.34

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4	0	4801.603	V		55.75	74	PK	1	18.25
5	0	11671.343	H		48.04	54	PK	1	5.96
5	0	11671.343	V		48.47	54	PK	1	5.53
6	0	17759.519	H		52.29	54	PK	1	1.71
6	0	17759.519	V		53.73	54	PK	1	0.27
7	0	23672.345	H		50.47	54	PK	1	3.53
7	0	23672.345	V		50.72	54	PK	1	3.28
1	39	32.725	V		28.33	71.54	PK	0.1	43.21
1	39	32.725	H		18.76	71.54	PK	0.1	52.78
2	39	996.774	V		36.73	54	PK	0.1	17.27
2	39	996.774	H		35.56	54	PK	0.1	18.74
3	39	1627.255	V		39.13	71.54	PK	1	14.87
3	39	1627.255	H		48.91	71.54	PK	1	5.09
4	39	4881.764	V		43.23	54	AV	1	10.77
4	39	4881.764	V		55.12	74	PK	1	18.88
4	39	4881.764	H		51.01	54	PK	1	2.99
5	39	11767.351	V		48.84	54	PK	1	5.16
5	39	11767.351	H		48.96	54	PK	1	5.04
6	39	17855.711	V		52.67	54	PK	1	1.33
6	39	17855.711	H		52.80	54	PK	1	1.2
7	39	23723.447	H		49.93	54	PK	1	4.07
7	39	23723.447	V		50.60	54	PK	1	3.4
1	78	32.725	V		29.13	71.54	PK	0.1	42.41
1	78	32.725	H		18.43	71.54	PK	0.1	53.11
3	78	1653.307	V		39.25	71.54	PK	1	32.29
3	78	1653.307	H		47.46	71.54	PK	1	24.08
3	78	2494.886	V		39.71	54	PK	1	14.29
3	78	2494.886	H		48.26	54	PK	1	5.74
2	78	995.180	V		35.55	54	PK	0.1	18.45
2	78	995.180	H		34.72	54	PK	0.1	19.28
4	78	4953.908	V		43.28	54	AV	1	10.72
4	78	4953.908	H		50.09	54	PK	1	3.91
4	78	4953.908	V		54.62	74	PK	1	19.38
4	78	7454.910	H		50.41	54	PK	1	3.59
4	78	7454.910	V		52.26	54	PK	1	1.74
5	78	11783.567	H		47.92	54	PK	1	6.08
5	78	11783.567	V		48.88	54	PK	1	5.12
6	78	17747.495	H		52.12	54	PK	1	1.88
6	78	17747.495	V		52.74	54	PK	1	1.26



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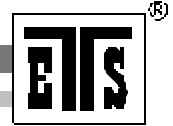
7	78	23025.050	V		50.64	54	PK	1	3.36
7	78	23025.050	H		51.12	54	PK	1	2.88

All other not noted test plots do not contain significant test results in relation to the limits.

**TEST RESULT (Transmitter):** The unit DOES meet the FCC requirements.

Comment: see attached diagrams

Test equipment used: ETSTW-RE 003, ETSTW-RE 012, ETSTW-RE 015, ETSTW-RE 016,  
 ETSTW-RE 017, ETSTW-RE 024



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### 3.7 Carrier Frequency Separation

Carrier Frequency Separation was measured with modulation (declared by manufacturer).

According to FCC rules part 15 subpart C §15.247 frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or 20 dB bandwidth of the hopping channel, whichever is greater.

Test conditions		Channel Separation	
		Channel B	Channel B+1
$T_{nom} = 23^{\circ}C$	$V_{nom} = 120 V$	0.997995991 MHz	
Measurement uncertainty		< 10 Hz	

**Limits:**

Frequency Range MHz	Limits	
	20 dB bandwidth < 25 kHz	20 dB bandwidth > 25 kHz
902-928	25 kHz	20 dB bandwidth
2400-2483.5 5725-5850.0	25 kHz	20 dB bandwidth

Test equipment used: ETSTW-CE 003, ETSTW-RE 003

Comment: see attached diagram

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### 3.8 Number of Hopping Frequencies

According to FCC rules part 15 subpart C §15.247 frequency hopping systems operating in the 2400-2483.5 MHz band shall use at least 15 hopping frequencies. Frequency hopping systems in 5725-5850 MHz bands shall use least 75 hopping frequencies.

For frequency hopping systems operating in the 902-928 MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies; if the 20dB bandwidth of the hopping channel 250 kHz or greater, the system shall use at least 25 hopping frequencies.

Test conditions		Operating Mode	Number of Channels
$T_{nom} = 23^{\circ}C$	$V_{nom} = 120 V$	normal transmitting	79
$T_{nom} = 23^{\circ}C$	$V_{nom} = 120 V$	Inquiry mode	32

#### Limits:

Frequency Range MHz	Limit			
	20dB Bandwidth		20dB Bandwidth < 250 kHz	20dB Bandwidth ≥ 250 kHz
	= 1MHz			
902-928 MHz			≥ 50	≥ 25
2400-2483.5	≥ 15	≥ 15		
5725-5850.0 MHz	≥ 75			

Test equipment used: ETSTW-CE 003 , ETSTW-RE 003

Comment: see attached diagrams

#### 3.8.1 Pseudorandom Frequency Hopping Sequence

The generation of the hopping sequence is determined by the Bluetooth cord specification and complies with the FCC requirements.

#### 3.8.2 Coordination of hopping sequences to other transmitters

According to the Bluetooth core specification V1.1 such a coordination is not possible. During scatternet function only one of the two hopping sequences will be used at a definite moment.

#### 3.8.3 System Receiver Hopping Capability

According to the Bluetooth core specification. The system receivers shift frequencies in synchronization with the transmitted signals.

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### 3.9 Time of Occupancy (Dwell Time)

Frequency hopping systems operating in the 5725-5850 MHz band shall use an average time of occupancy on any frequency not greater than 0.4 seconds within a 30 second period.

In 2400-2483,5 MHz band the average time of occupancy on any channel shall not be greater than 0,4 seconds multiplied by the number of hopping channels employed.

For frequency hopping systems operating in the 902-928 MHz band: if the 20dB bandwidth of the hopping channel is less than 250 kHz, the average time of occupancy on any frequency shall not greater than 0.4 seconds within a 20 second period; if the 20dB bandwidth of the hopping channel is 250 kHz or greater, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

Test conditions	Operating mode	Measurement periode	Time of Occupancy
$T_{nom} = 23^{\circ}C$ $V_{nom} = 120 V$ Channel B	normal transmitting		198.92 ms
	inquiry mode		58.62 ms
Measurement uncertainty	< 1 $\mu s$		

#### Limits and measurement periods:

Frequency MHz	Number of channels	Measurement Periode	Limit
902 – 928	$\geq 50$	20 s	0,4 s
	$49 \geq 25$	10 s	0,4 s
2400 – 2483,5	$\geq 15$	0,4 s * number of used channels	0,4 s
5725- 5850	$\geq 75$	30 s	0,4s

Test equipment used: ETSTW-CE 003 , ETSTW-RE 003

**Comment:** See attached diagram, which show the On-time and the number of counted events during the measurement period

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### 3.10 20dB Bandwidth

Frequency hopping systems operating in the 5725-5850 MHz bands shall use a maximum 20dB bandwidth of 1 MHz.

The 20dB bandwidth is measured on the lowest, middle and highest hopping channel.

For frequency hopping systems operating in the 902-928 MHz band the maximum 20dB bandwidth of the hopping channel is 500 kHz.

Test conditions		20 dB Bandwidth		
		Channel A	Channel B	Channel C
$T_{nom} = 23^{\circ}\text{C}$	$V_{nom} = 120\text{ V}$	937.87575150 kHz	953.90781563 kHz	953.90781563 kHz
Measurement uncertainty		< 10 Hz		

#### Limits:

Frequency Range / MHz	Number of channels	Limit
902-928	< 50	< 250 kHz
	$49 \geq 25$	500 kHz $\geq$ 250 kHz
2400-2483.5	$\geq 15$	not determined
5725-5850	75	= 1 MHz

Test equipment used: ETSTW-CE 003 , ETSTW-RE 003

Comment: see attached diagram

#### 3.10.1 System Receiver Input Bandwidth

It is determined in the Bluetooth core specification. The value matches to the bandwidth of transmitter signal.



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### 3.11 Band-edge Compliance of RF Emissions

According to FCC rules part 15 subpart C §15.247(c) in any 100 kHz bandwidth outside the frequency band in which the intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required.

In addition radiated emission which fall in the restricted bands, as defined in section 15.205(a), must also with the radiated emission limits.

Test conditions		Attenuation at or outside band-edges Single Frequency	
		Lower Band-edge	Upper Band-edge
$T_{nom} = 23^{\circ}\text{C}$	$V_{nom} = 120\text{ V}$	59.05 dB	62.45 dB
Measurement uncertainty		< 100 Hz	

Test conditions		Attenuation at or outside band-edges Hopping Frequency	
		Lower Band-edge	Upper Band-edge
$T_{nom} = 23^{\circ}\text{C}$	$V_{nom} = 120\text{ V}$	48.47 dB	51.06 dB
Measurement uncertainty		< 100 Hz	

#### Limits:

Frequency Range / MHz	Limit
902 – 928	- 20 dB
2400 – 2483.5	
5725 - 5850	

Test equipment used: ETSTW-CE 003 , ETSTW-RE 003

Comment: see attached diagrams

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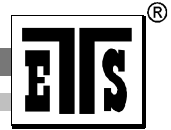
### 3.12 Radiated Emissions from Receiver Section of Transceiver

FCC Rule: 15.109

Freq,	Used Ch,	Frequency Marker [MHz]	Polarization	corrections dB	Corrected Reading [dBuV/m]	Compliance Limit [dBuV/m]	Detector	BW [MHz]	Margin
1	0	33.066	V		28.78	40	PK	0.1	11.22
1	0	33.066	H		21.31	40	PK	0.1	18.69
1	0	44.309	V		25.60	40	PK	0.1	14.4
1	0	44.309	H		17.56	40	PK	0.1	22.44
3	0	1601.202	H		40.61	54	PK	1	13.39
3	0	1601.202	V		43.05	54	PK	1	10.95
3	0	2400.802	H		42.52	54	PK	1	11.48
3	0	2400.802	V		41.37	54	PK	1	12.63
4	0	5811.623	H		42.27	54	PK	1	11.73
4	0	5811.623	V		40.40	54	PK	1	13.6
4	0	6404.810	H		43.87	54	PK	1	10.13
4	0	6404.810	V		42.05	54	PK	1	11.95
5	0	11543.086	H		52.01	54	PK	1	1.99
5	0	11543.086	V		51.13	54	PK	1	2.87
6	0	12697.395	H		50.43	54	PK	1	3.57
6	0	12697.395	V		49.36	54	PK	1	4.64
6	0	14789.579	H		51.19	54	PK	1	2.81
6	0	14789.579	V		50.34	54	PK	1	3.66
6	0	17675.351	H		52.94	54	PK	1	1.06
6	0	17675.351	V		52.05	54	PK	1	1.95
1	39	33.407	V		29.18	40	PK	0.1	10.82
1	39	33.407	H		20.12	40	PK	0.1	19.88
1	39	42.265	V		24.54	40	PK	0.1	15.46
1	39	42.265	H		18.02	40	PK	0.1	21.98
3	39	1625.251	H		40.65	54	PK	1	13.35
3	39	1625.251	V		42.58	54	PK	1	11.42
3	39	2436.874	H		41.74	54	PK	1	12.26
3	39	2436.874	V		41.72	54	PK	1	12.28
4	39	5090.180	H		39.36	54	PK	1	14.64
4	39	5090.180	V		41.07	54	PK	1	12.93
4	39	7150.301	H		44.49	54	PK	1	9.51

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4	39	7150.301	V		45.72	54	PK	1	8.28
4	39	7515.030	H		11.76	54	PK	1	42.24
4	39	7515.030	V		45.86	54	PK	1	8.14
5	39	8945.892	H		47.10	54	PK	1	6.9
5	39	8945.892	V		48.49	54	PK	1	5.51
5	39	10324.649	H		50.37	54	PK	1	3.63
5	39	10324.649	V		50.90	54	PK	1	3.1
5	39	11519.038	H		50.88	54	PK	1	3.12
5	39	11519.038	V		52.00	54	PK	1	2
6	39	14897.796	H		50.39	54	PK	1	3.61
6	39	14897.796	V		51.17	54	PK	1	2.83
6	39	17651.303	H		52.82	54	PK	1	1.18
6	39	17651.303	V		52.87	54	PK	1	1.13
1	78	32.385	V		27.32	40	PK	0.1	12.68
1	78	32.385	H		22.35	40	PK	0.1	17.65
1	78	41.924	V		24.87	40	PK	0.1	15.13
1	78	41.924	H		19.21	40	PK	0.1	20.79
3	78	1246.493	H		31.54	54	PK	1	22.46
3	78	1246.493	V		27.39	54	PK	1	26.61
3	78	1649.299	H		39.09	54	PK	1	14.91
3	78	1649.299	V		38.65	54	PK	1	15.35
3	78	2478.958	H		41.17	54	PK	1	12.83
3	78	2478.958	V		39.86	54	PK	1	14.14
4	78	4561.122	H		40.68	54	PK	1	13.32
4	78	4561.122	V		38.74	54	PK	1	15.26
4	78	6613.226	H		44.33	54	PK	1	9.67
4	78	6613.226	V		43.25	54	PK	1	10.75
4	78	7767.535	H		46.31	54	PK	1	7.69
4	78	7767.535	V		44.85	54	PK	1	9.15
5	78	8873.747	H		49.00	54	PK	1	5
5	78	8873.747	V		47.46	54	PK	1	6.54
5	78	9338.677	H		49.50	54	PK	1	4.5
5	78	9338.677	V		48.84	54	PK	1	5.16
5	78	10861.723	H		51.42	54	PK	1	2.58
5	78	10861.723	V		50.06	54	PK	1	3.94
5	78	11599.198	H		51.80	54	PK	1	2.2
5	78	11599.198	V		50.80	54	PK	1	3.2
6	78	14885.772	H		51.17	54	PK	1	2.83
6	78	14885.772	V		50.68	54	PK	1	3.32



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6	78	16184.369	H		51.35	54	PK	1	2.65
6	78	16184.369	V		51.04	54	PK	1	2.96
6	78	17771.543	H		52.94	54	PK	1	1.06
6	78	17771.543	V		52.32	54	PK	1	1.68

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field Strength (microvolts/meter)	Field Strength (dBmicrovolts/meter)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

Test equipment used: ETSTW-RE 015, ETSTW-RE 016, ETSTW-RE 017, ETSTW-CS 001, ETSTW-RE 026, ETSTW-RE 003, ETSTW-RE 025

Comment: see attached diagram

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### 3.13 Power Line Conducted Emission

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the table bellows with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transact first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.

Frequency	Level (dB $\mu$ V)	
	quasi-peak	average
150 kHz	lower limit line	Lower limit line

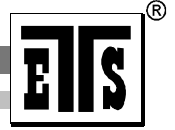
#### Limits:

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi Peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

Test is not required if the sample is using a battery.

Test equipment used: ETSTW-CE 004, ETSTW-CE 001, ETSTW-RE 023

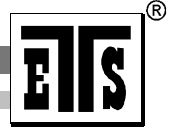
Comment: see attached diagrams



Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

**Appendix**

- A Peak Output Power
- B Spurious Emissions radiated - Transmitter operating
- C Carrier Frequency Separation
- D Number of Hopping Frequencies
- E Time of Occupancy (Dwell Time)
- F 20dB Bandwidth
- G Band-edge Compliance of RF Conducted Emissions
- H Radiated Emissions from Receiver Section of Transceiver
- I Power Line Conducted Emission
- J Pictures



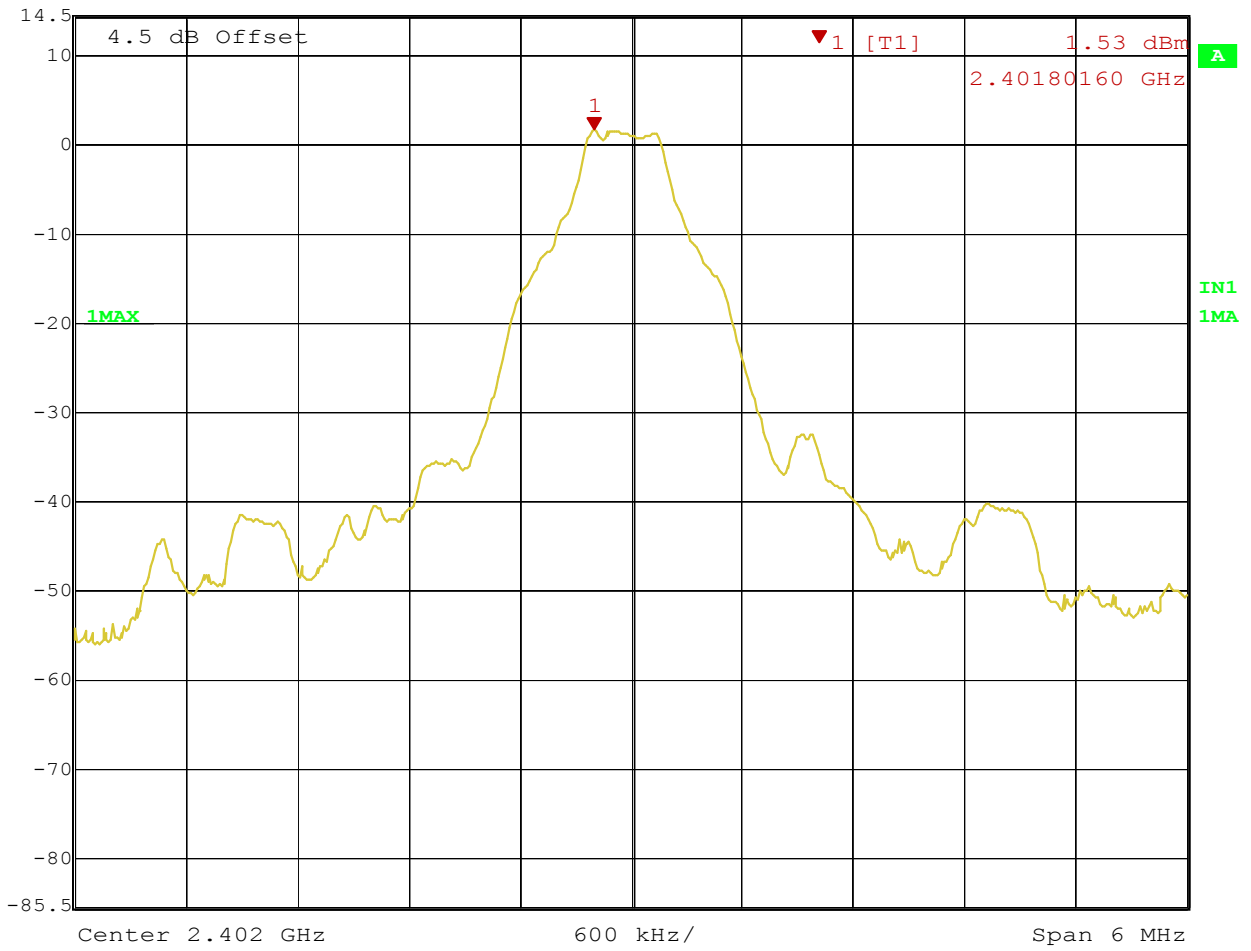
Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

**Appendix A**

Peak Output Power



Marker 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl 14.5 dBm 1.53 dBm VBW 300 kHz  
2.40180160 GHz SWT 200 ms Unit dBm

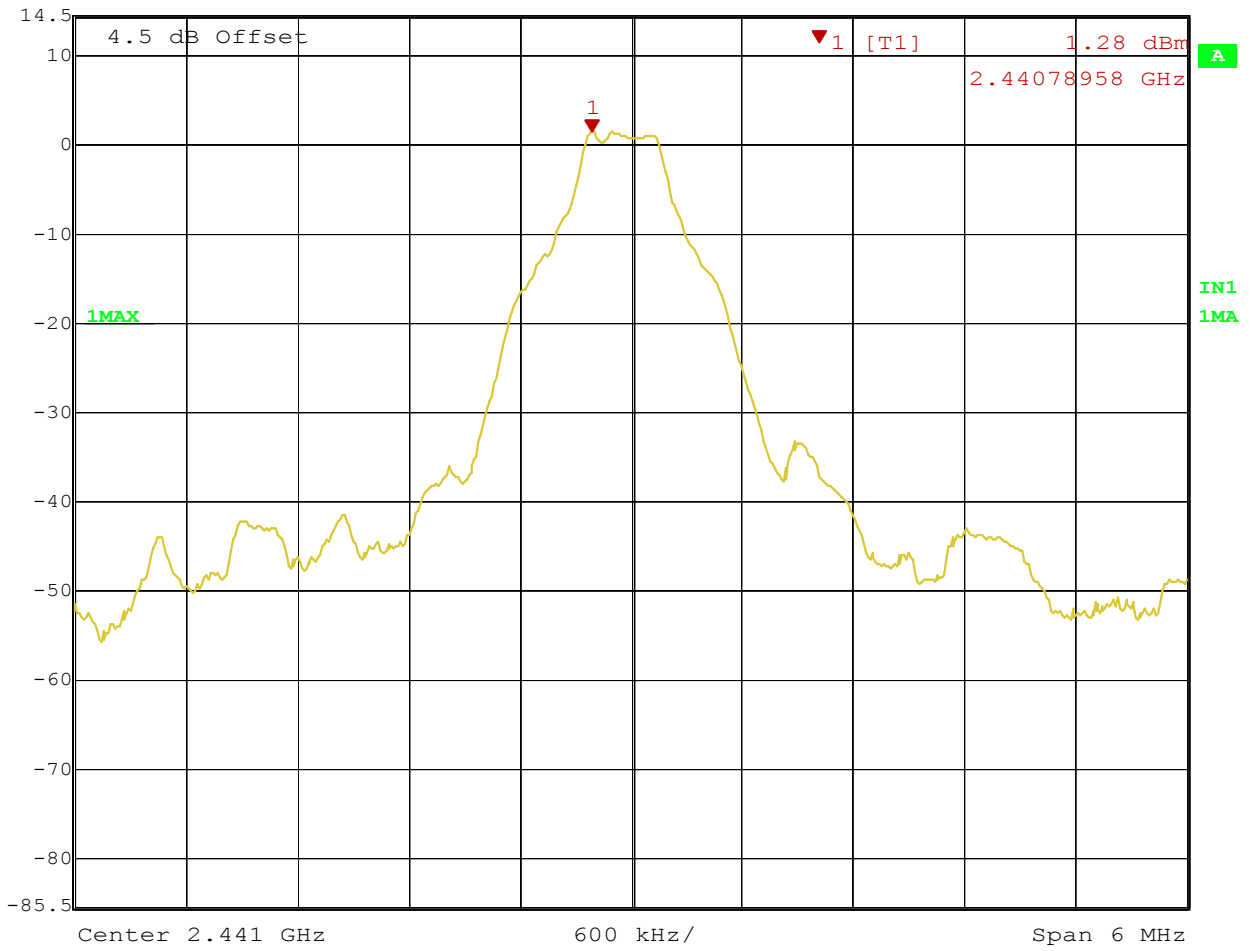


Title: MAX OUTPUT POWER CH0  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 10:23:51





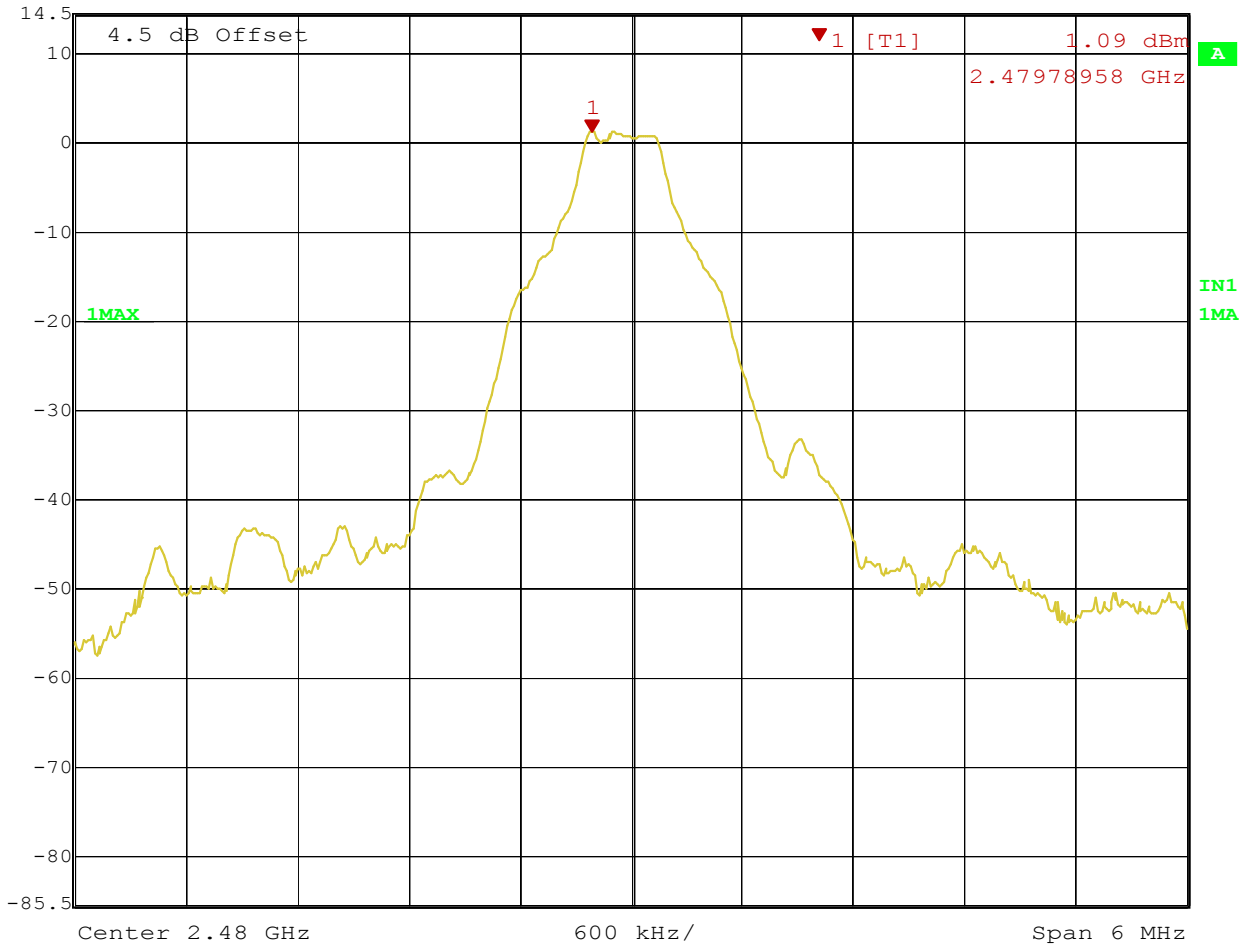
Marker 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl 14.5 dBm 1.28 dBm VBW 300 kHz  
2.44078958 GHz SWT 200 ms Unit dBm



Title: MAX OUTPUT POWER CH39  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 21.APR.2005 19:22:41



Marker 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl 14.5 dBm 1.09 dBm VBW 300 kHz  
2.47978958 GHz SWT 200 ms Unit dBm

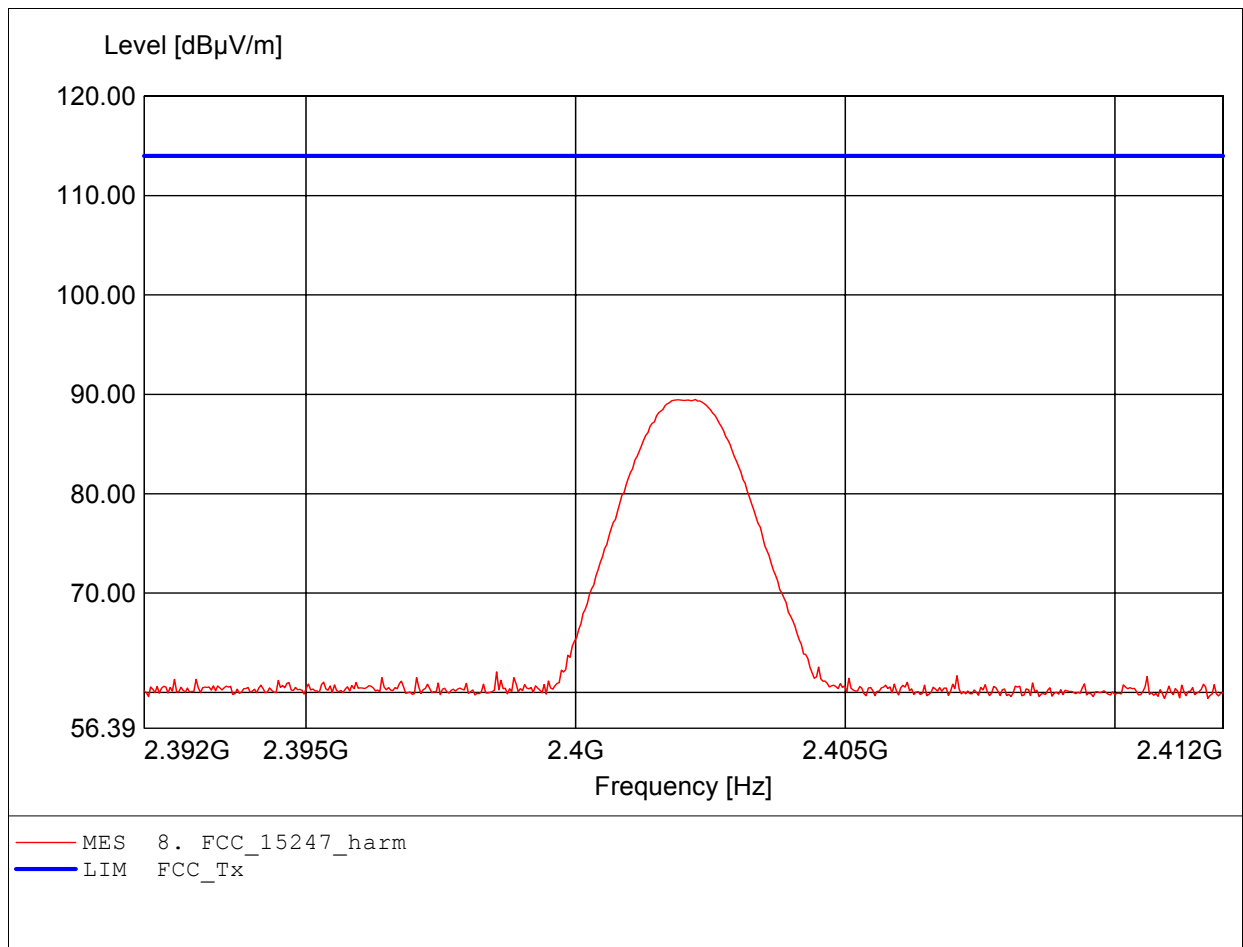


Title: MAX OUTPUT POWER CH78  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 21.APR.2005 19:21:04

**Carrier power (Field Strength)**

**FCC RULES PART 15, SUBPART C**

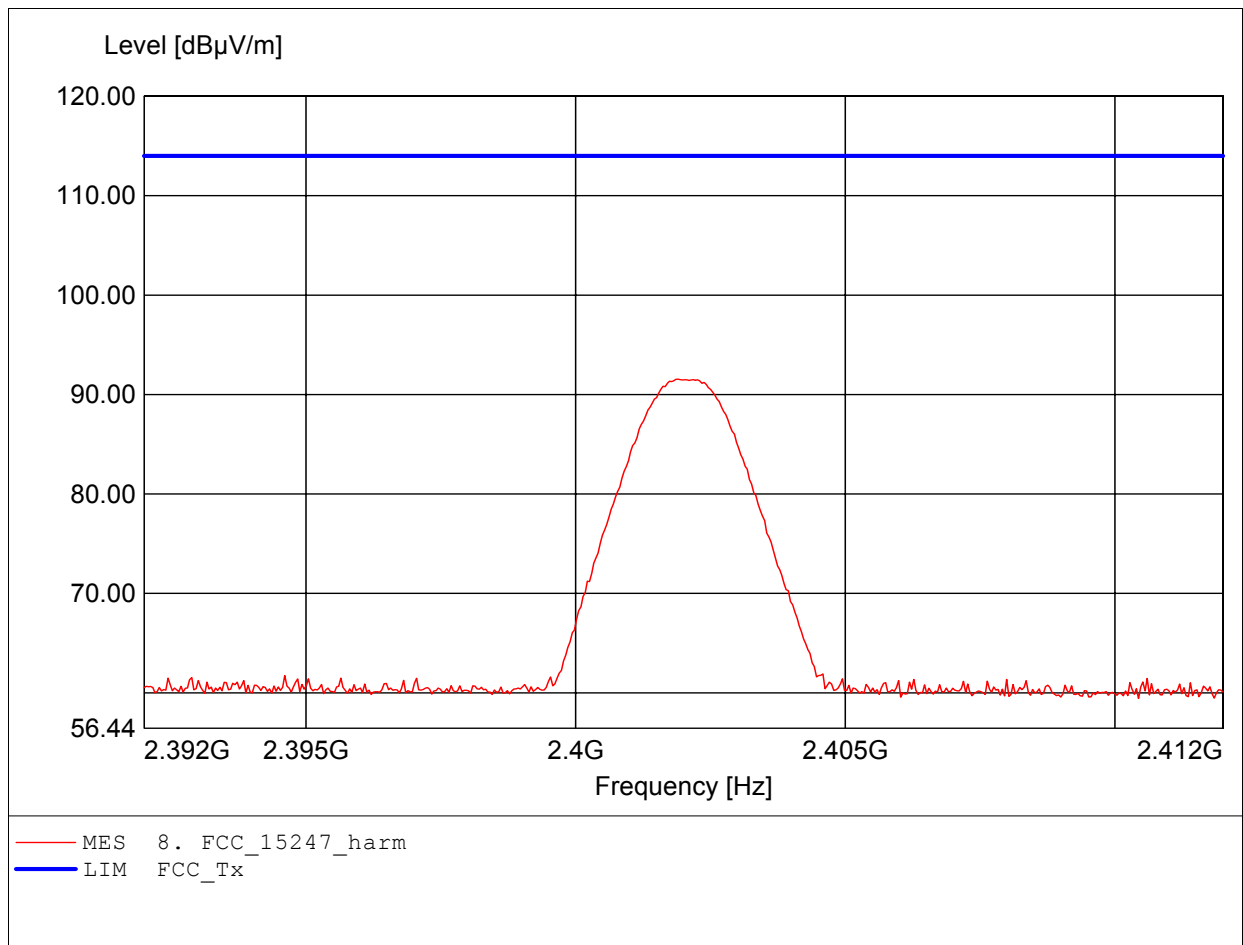
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL025  
Freq: 2.402GHz, Emax: 89.47dBµV/m, RBW: 1MHz



**Carrier power (Field Strength)**

**FCC RULES PART 15, SUBPART C**

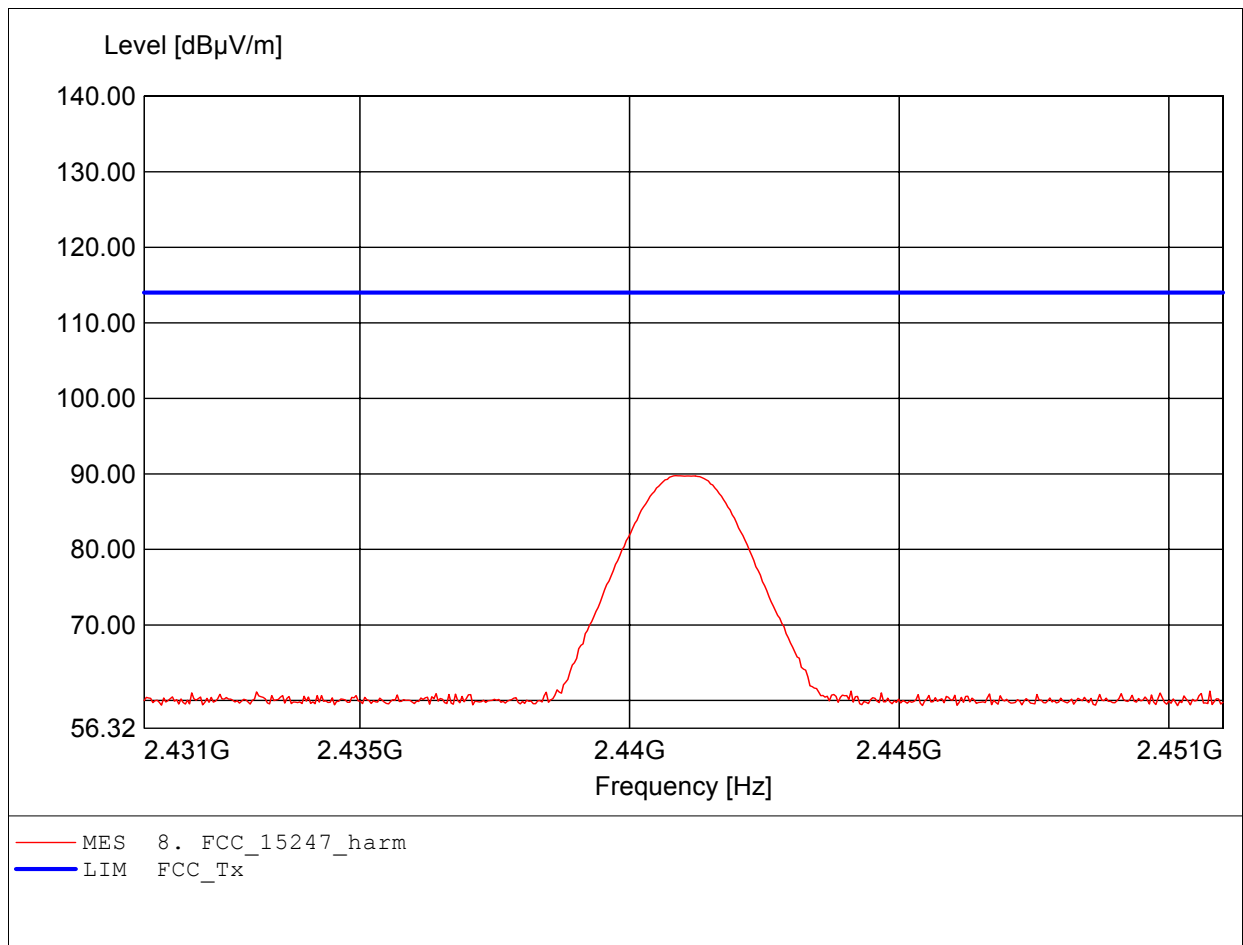
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL025  
Freq: 2.402GHz, Emax: 91.54dBµV/m, RBW: 1MHz



**Carrier power (Field Strength)**

**FCC RULES PART 15, SUBPART C**

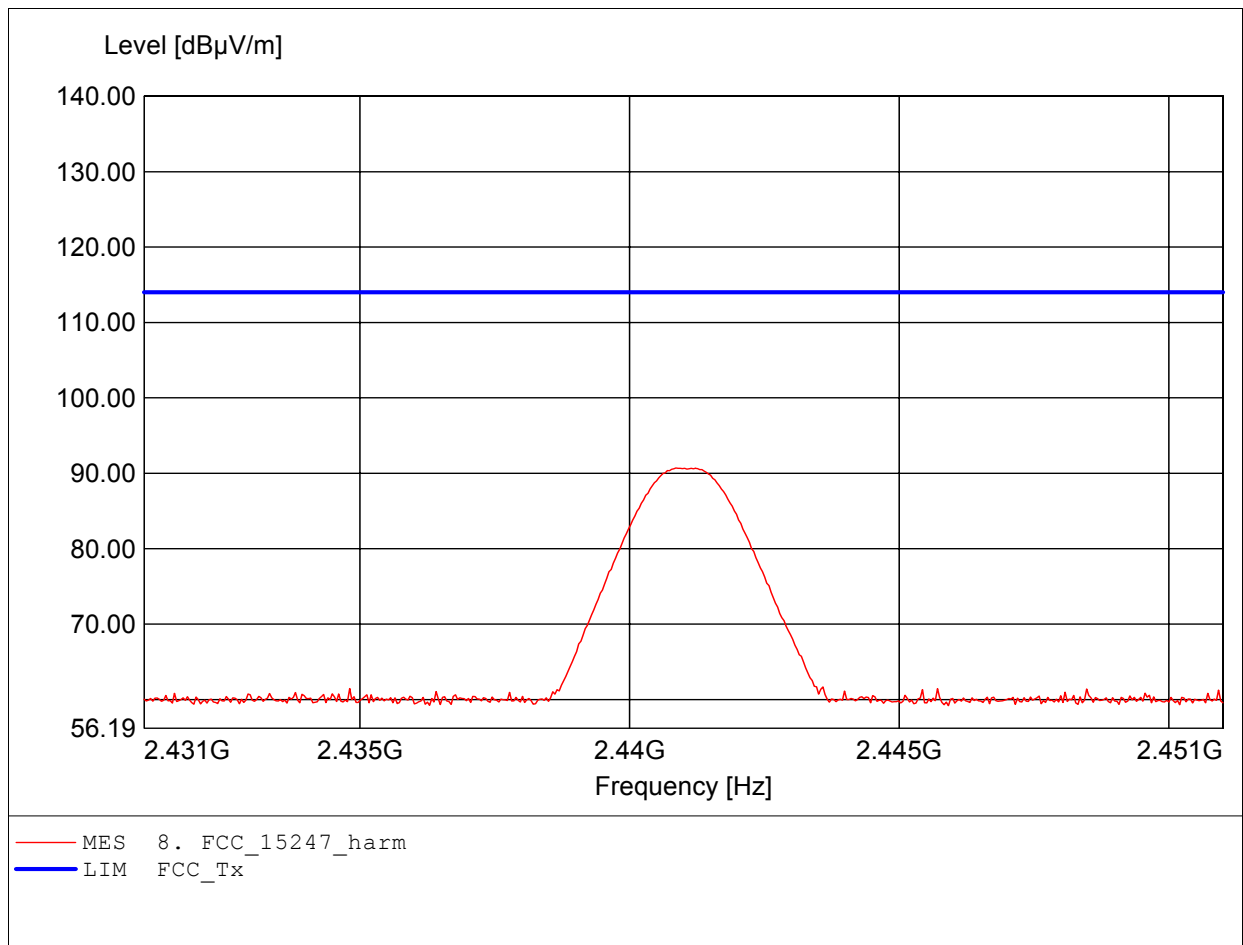
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL025  
Freq: 2.441GHz, Emax: 89.76dBµV/m, RBW: 1MHz



**Carrier power (Field Strength)**

**FCC RULES PART 15, SUBPART C**

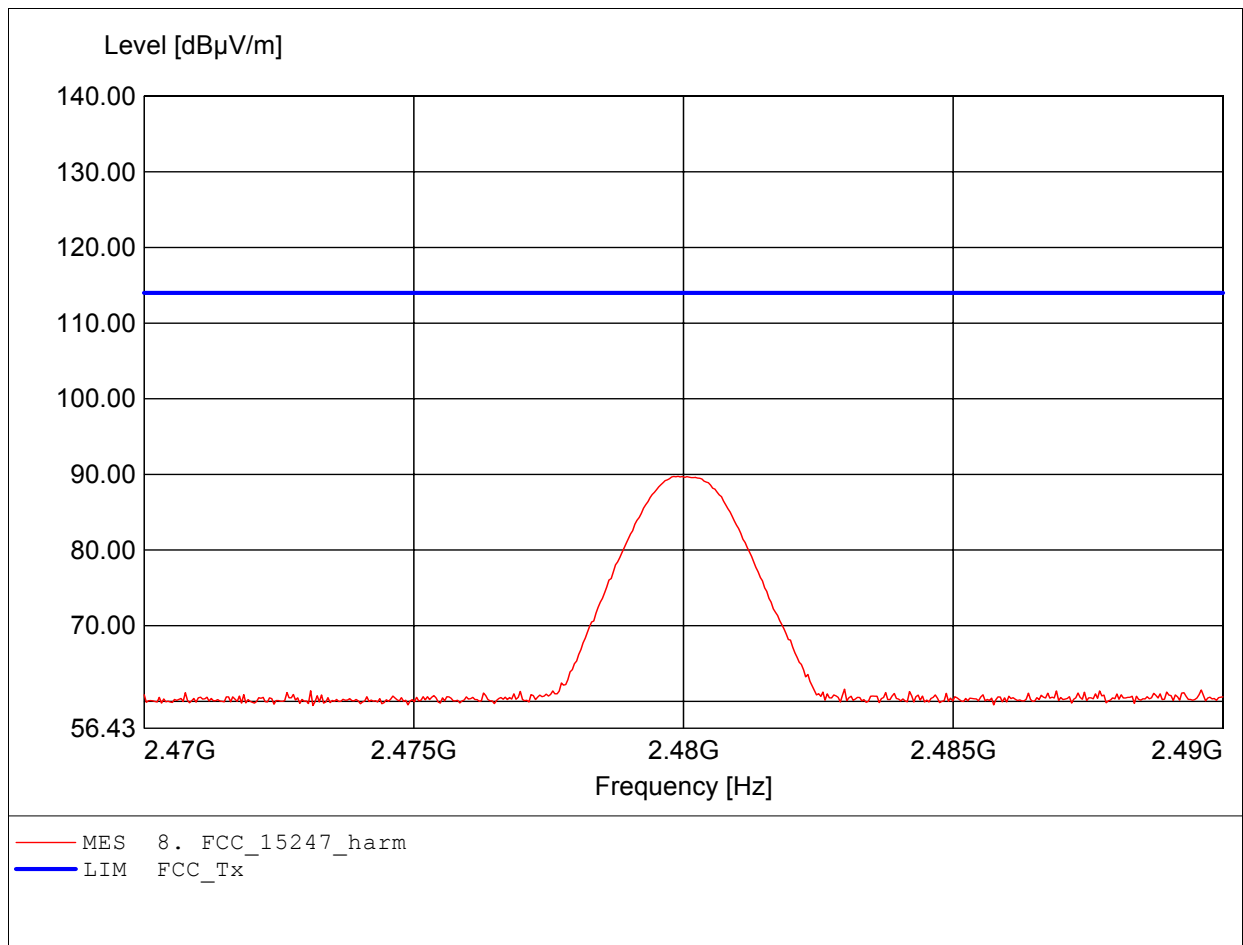
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL025  
Freq: 2.441GHz, Emax: 90.70dBµV/m, RBW: 1MHz



**Carrier power (Field Strength)**

**FCC RULES PART 15, SUBPART C**

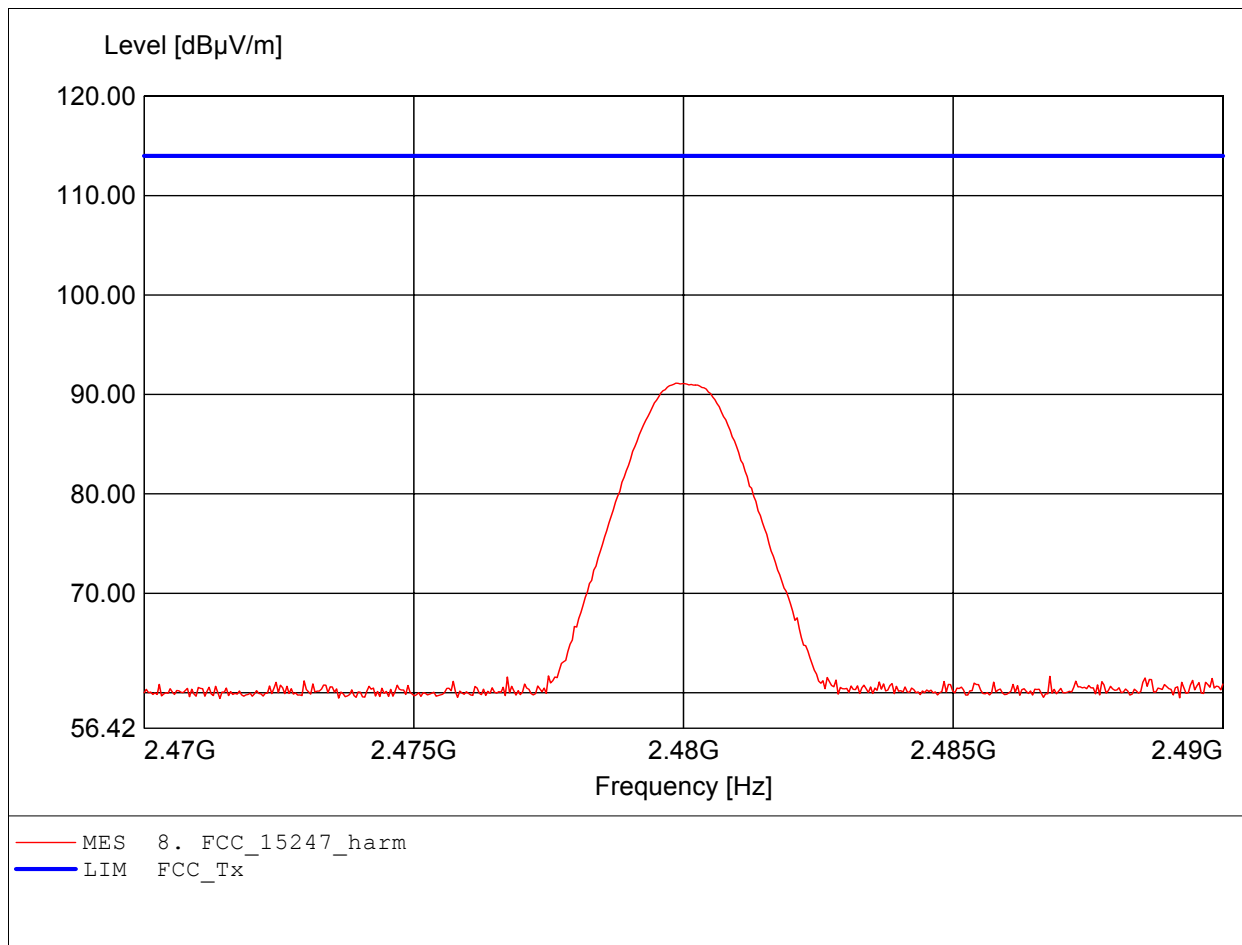
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL025  
Freq: 2.480GHz, Emax: 89.74dBµV/m, RBW: 1MHz



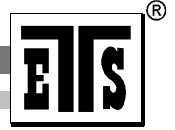
**Carrier power (Field Strength)**

**FCC RULES PART 15, SUBPART C**

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL025  
Freq: 2.480GHz, Emax: 91.14dBµV/m, RBW: 1MHz







Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

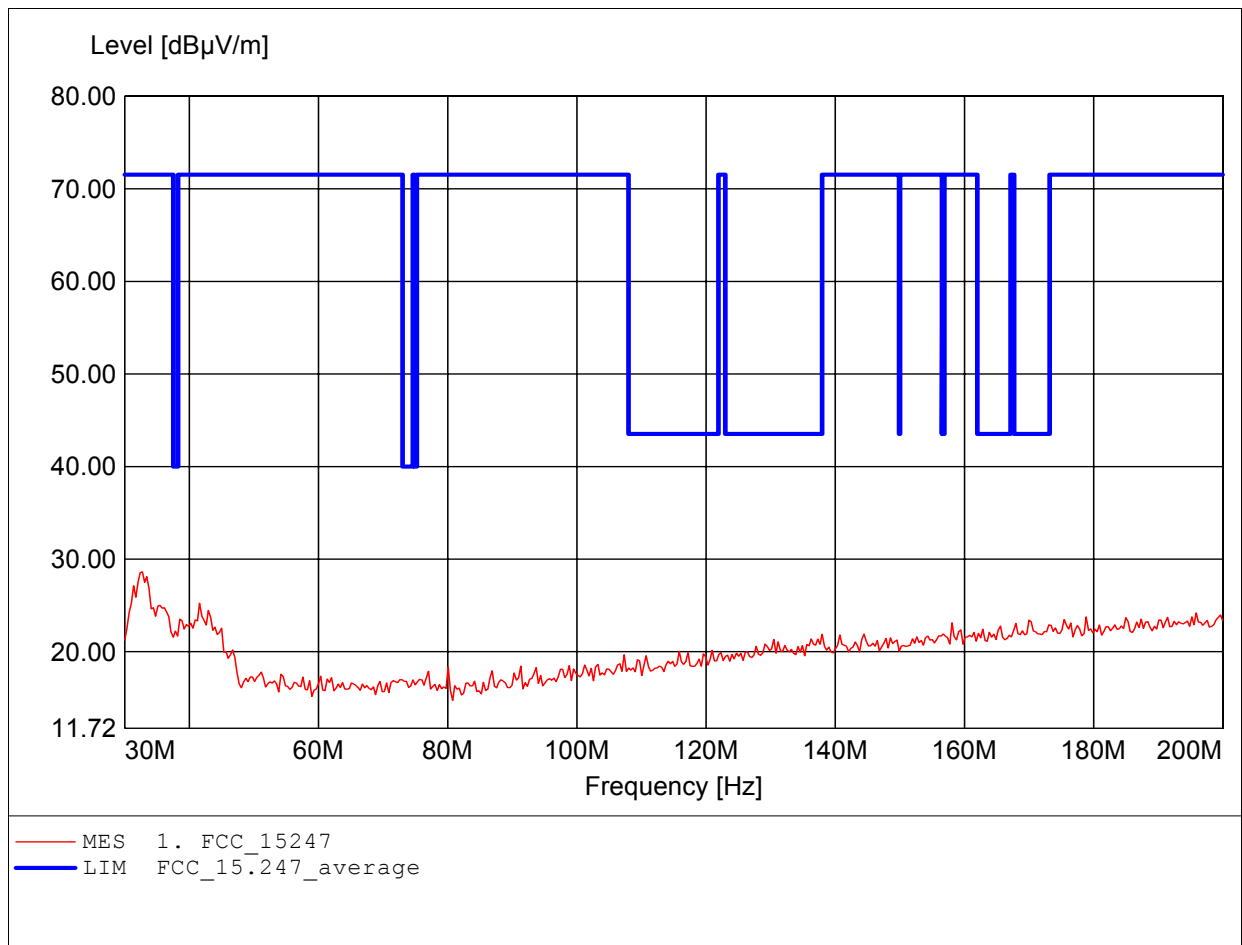
**Appendix B**

Spurious Emissions radiated - Transmitter operating

# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

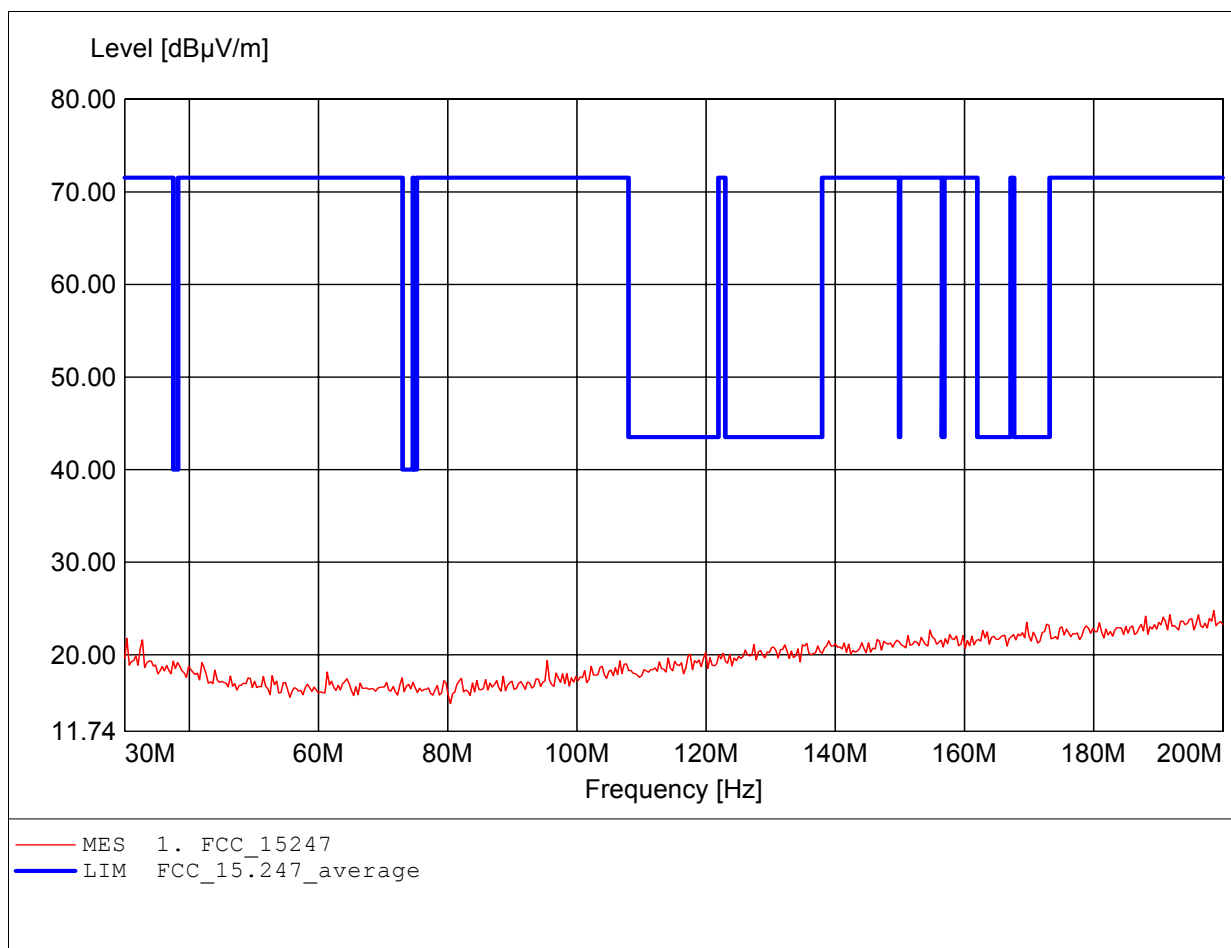
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq: 32.725MHz, Emax: 28.62dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

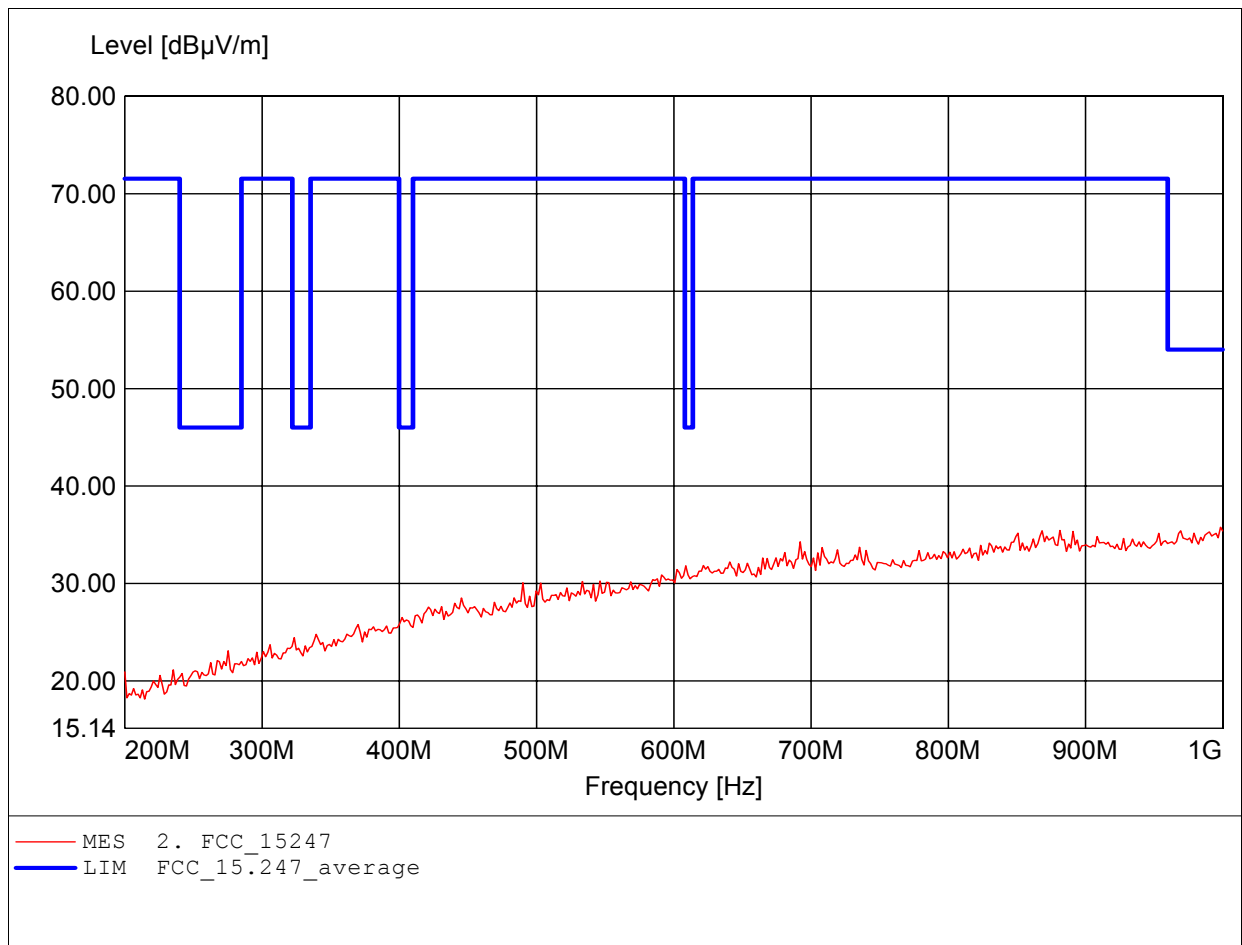
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq: 198.637MHz, Emax: 24.78dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

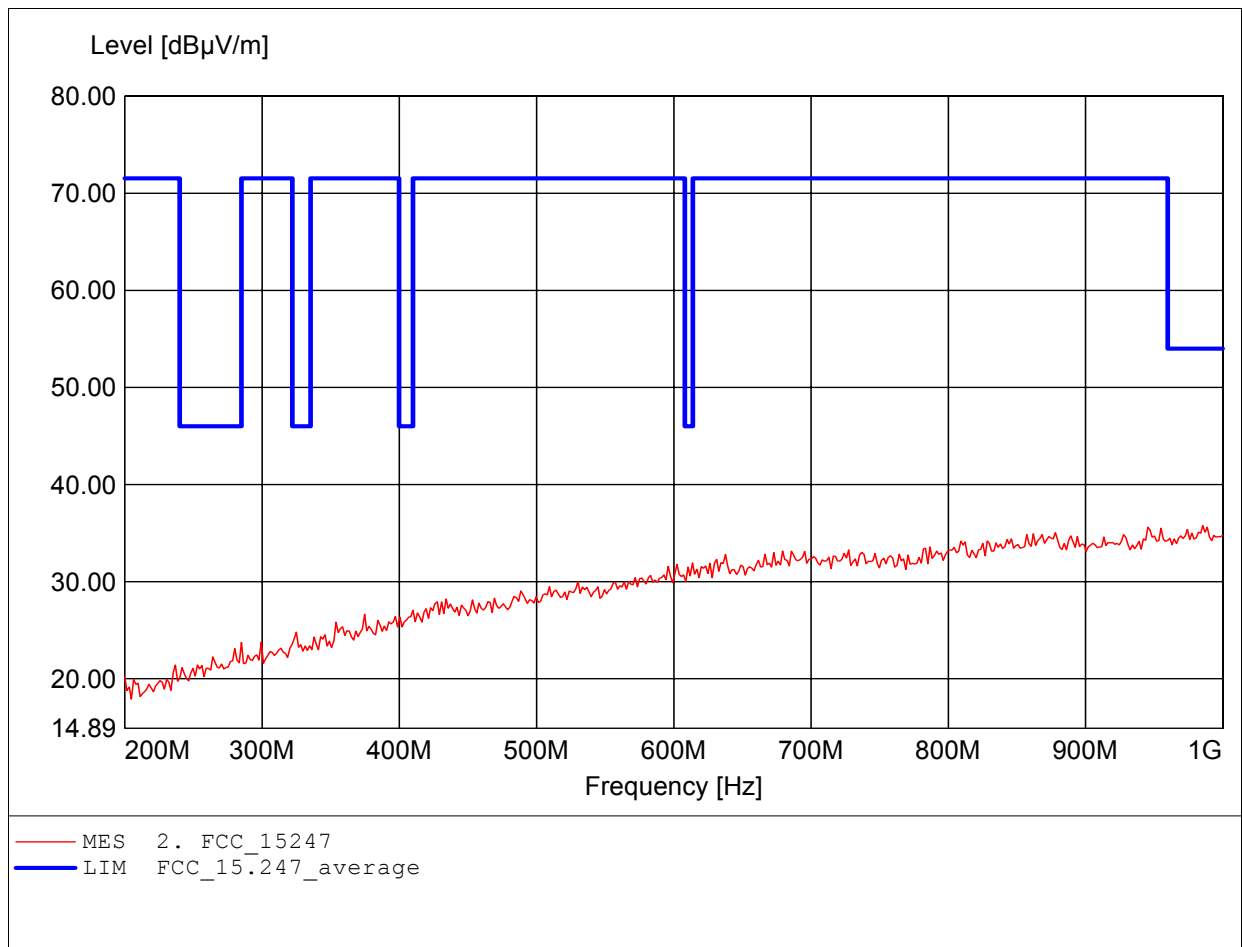
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL 223,  
Freq: 998.397MHz, Emax: 35.77dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

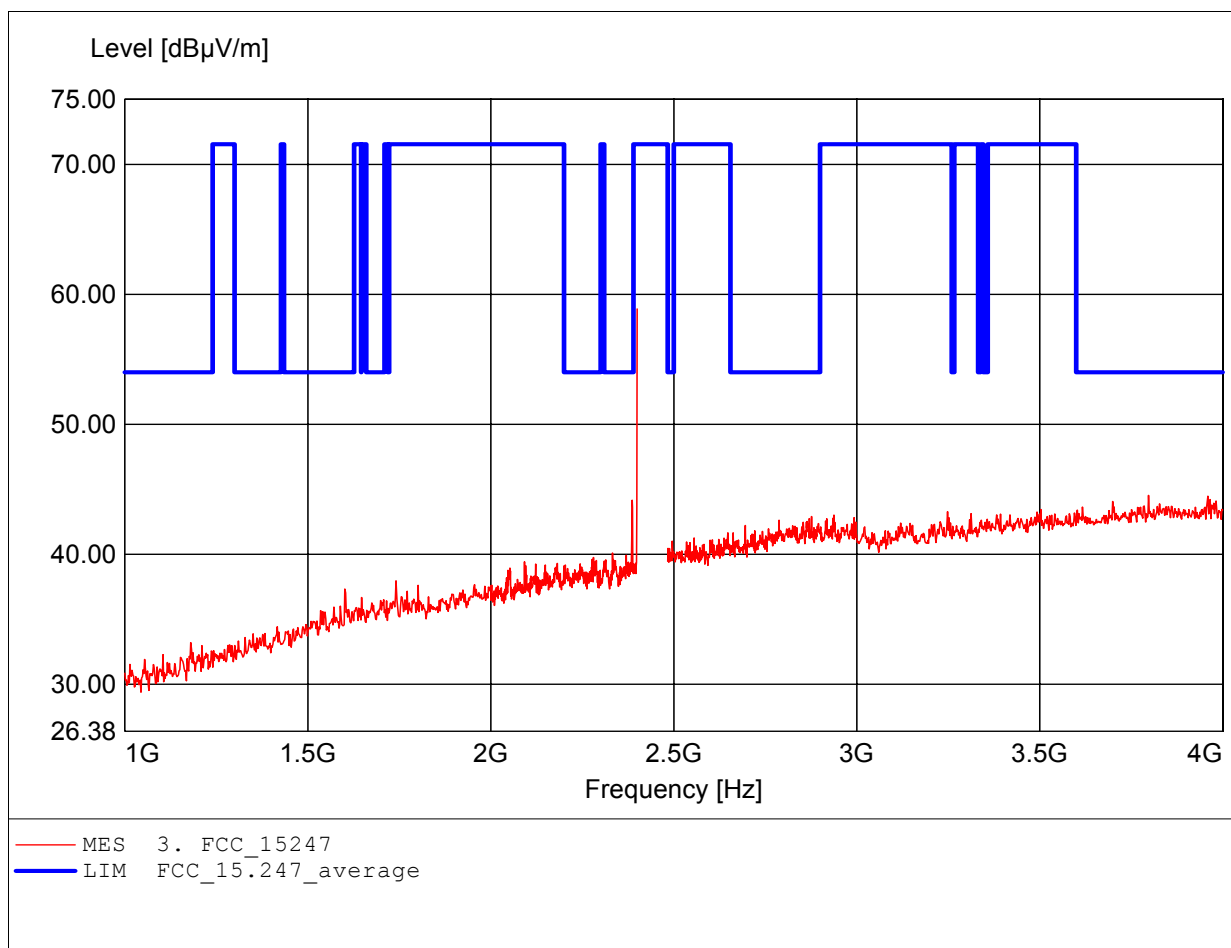
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL 223,  
Freq: 985.571MHz, Emax: 35.78dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

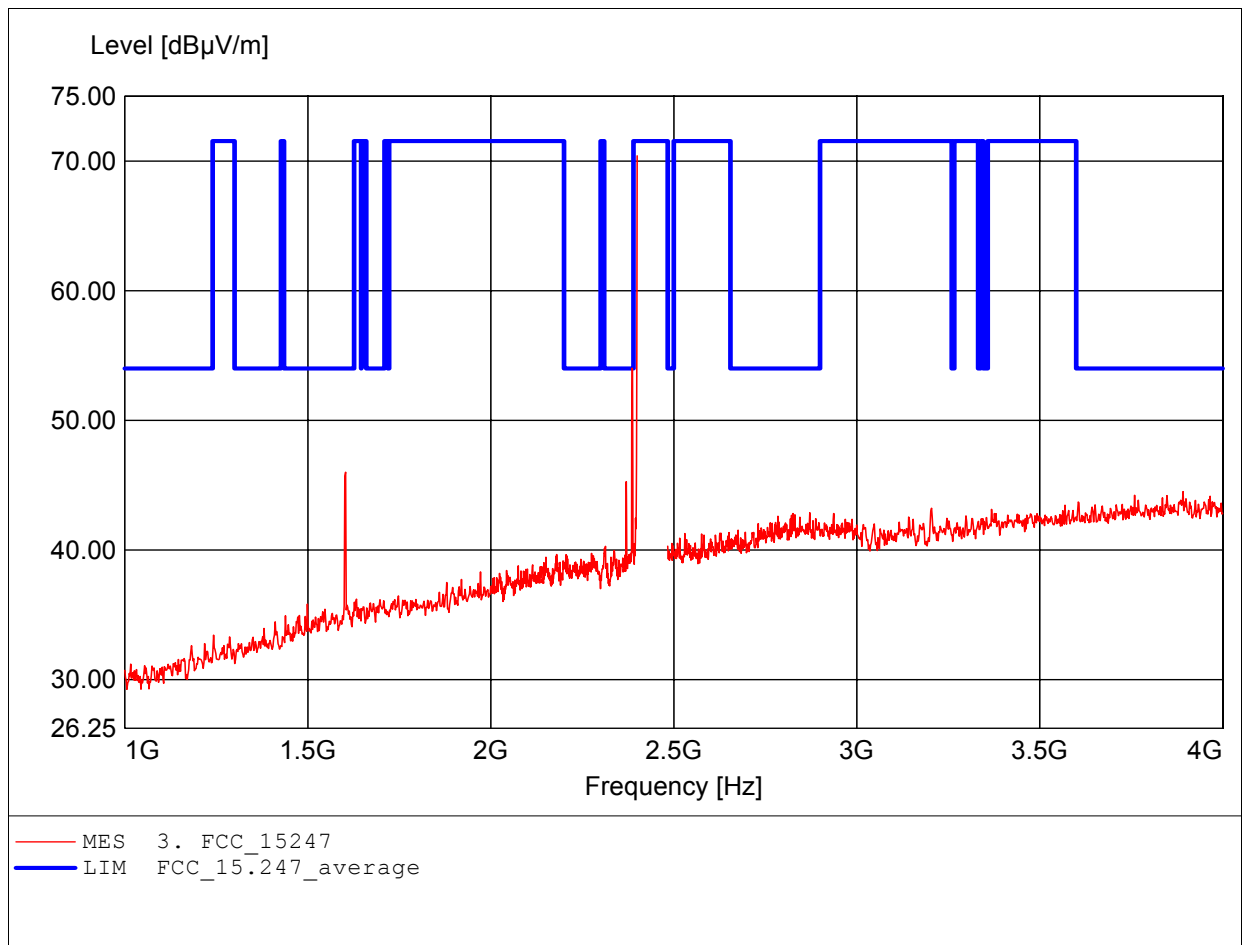
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 2.400GHz, Emax: 58.88dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

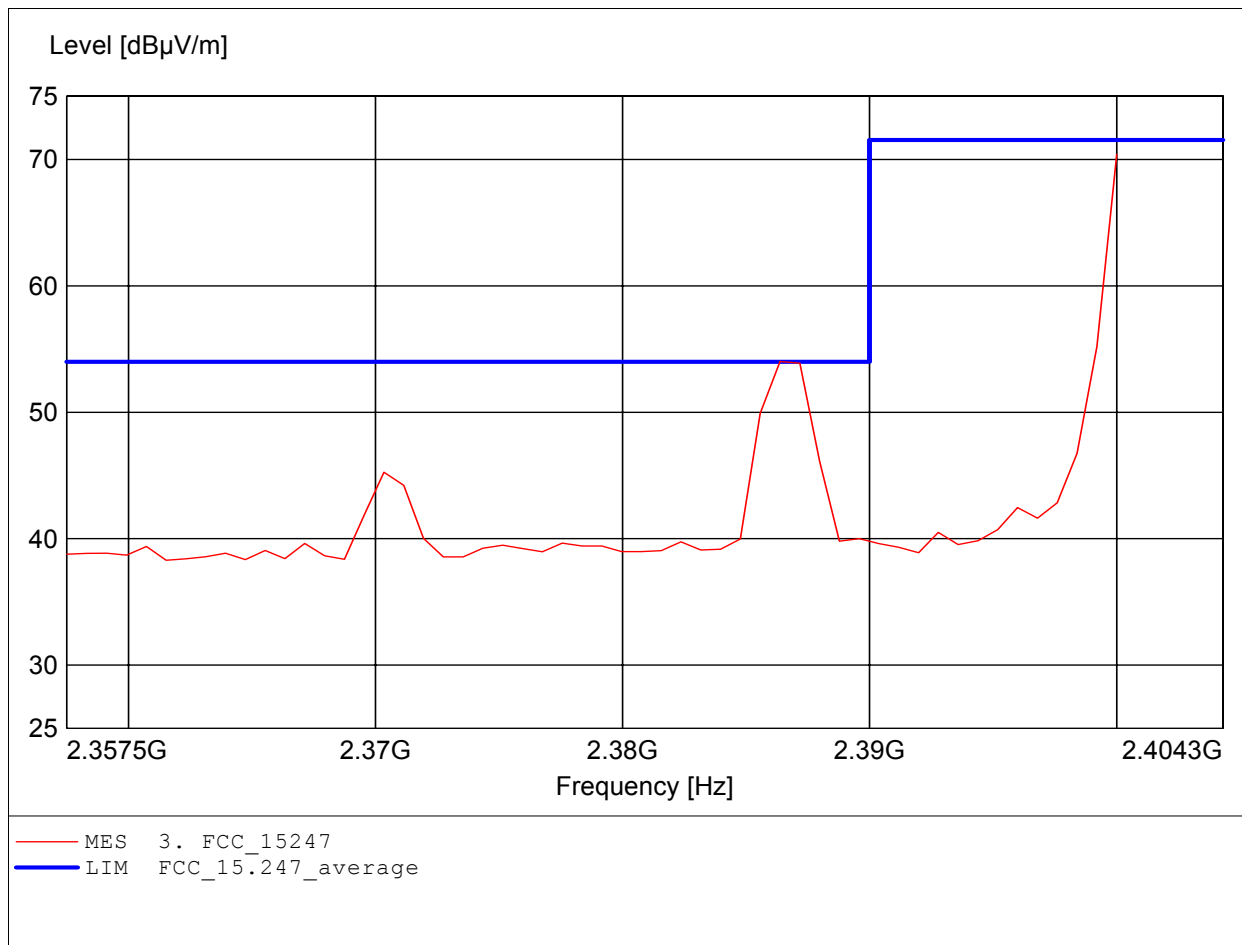
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 2.400GHz, Emax: 70.41dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

EUT: Bluetooth Transceiver Module  
 MODEL NO.: UGPZ4 Low Channel  
 Approval Holder: ALPS ELECTRIC CO., LTD.  
 Test Site / Operator: ETS / Orville Chang  
 Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
 Test Specification: according to §15.247, peak detector  
 Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
 Freq: 2.400GHz, Emax: 70.41dBµV/m, RBW: 1MHz



### MEASUREMENT RESULT:

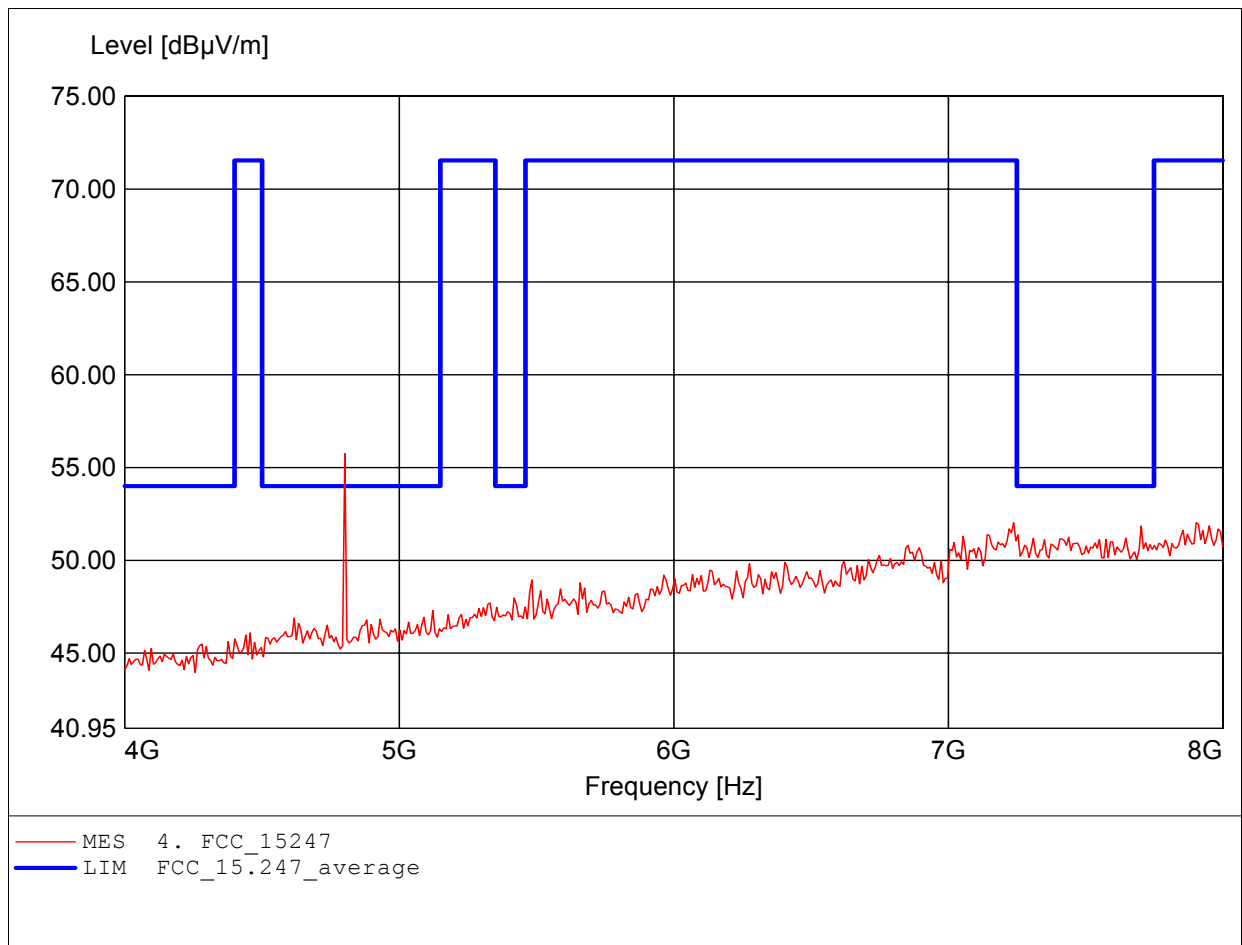
Frequency MHz	Level dBµV	Limit dBµV	Margin dB	Detector
2386.3727	44.42	54.0	9.58	Average



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 4.802GHz, Emax: 55.75dBµV/m, RBW: 1MHz



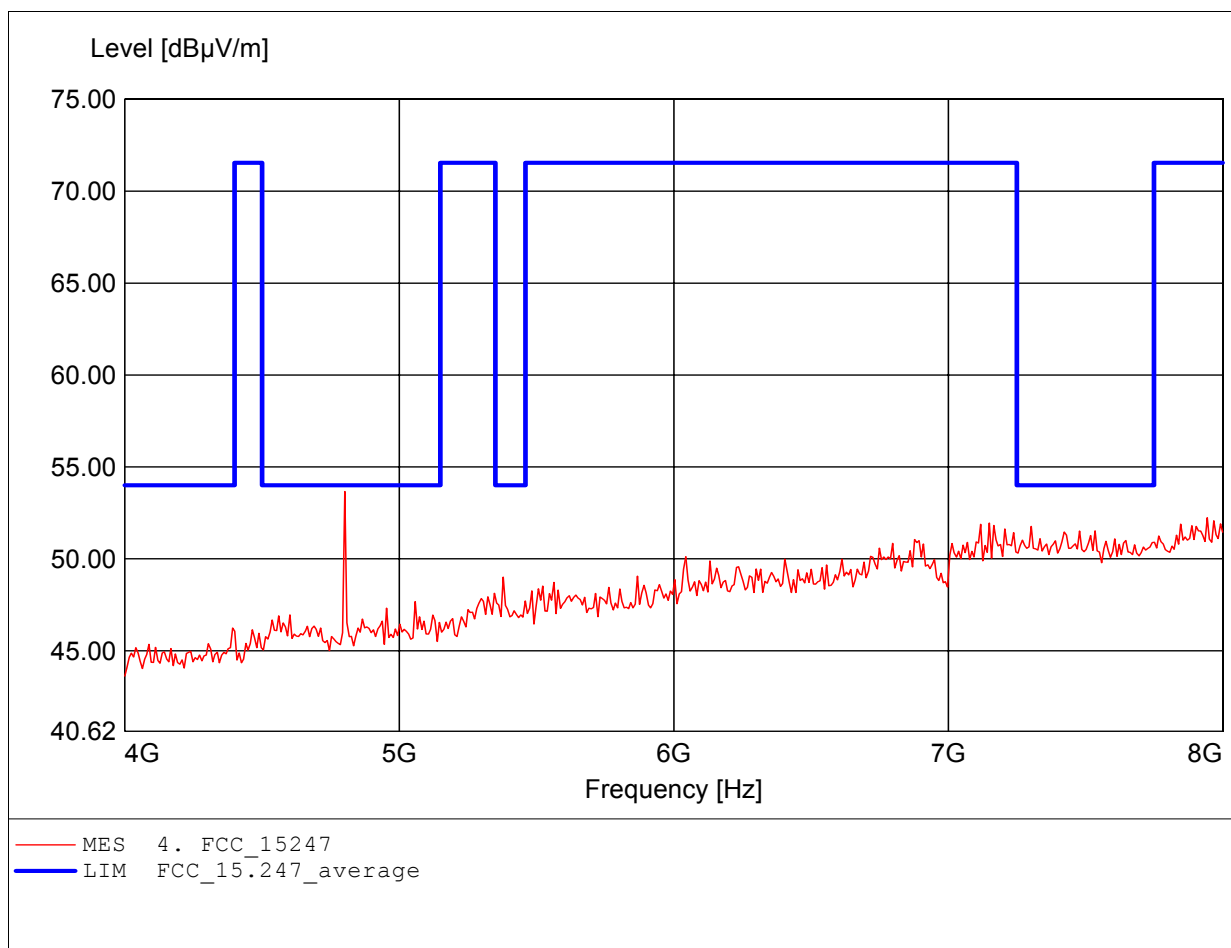
### MEASUREMENT RESULT:

Frequency	Level	Limit	Margin	Detector
MHz	dBµV	dBµV	dB	
4803.7607	43.90	54.0	10.10	Average

# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

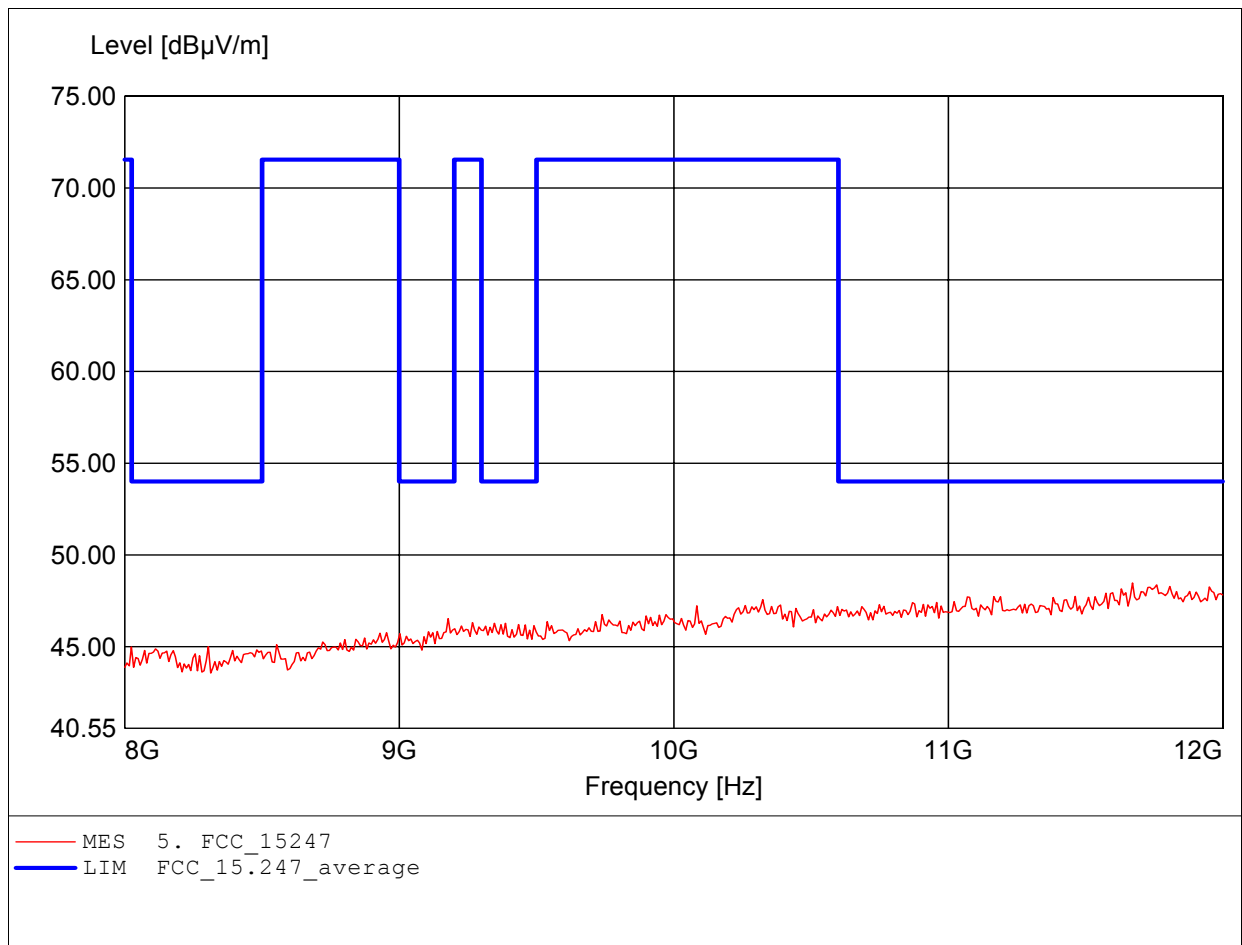
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 4.802GHz, Emax: 53.66dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

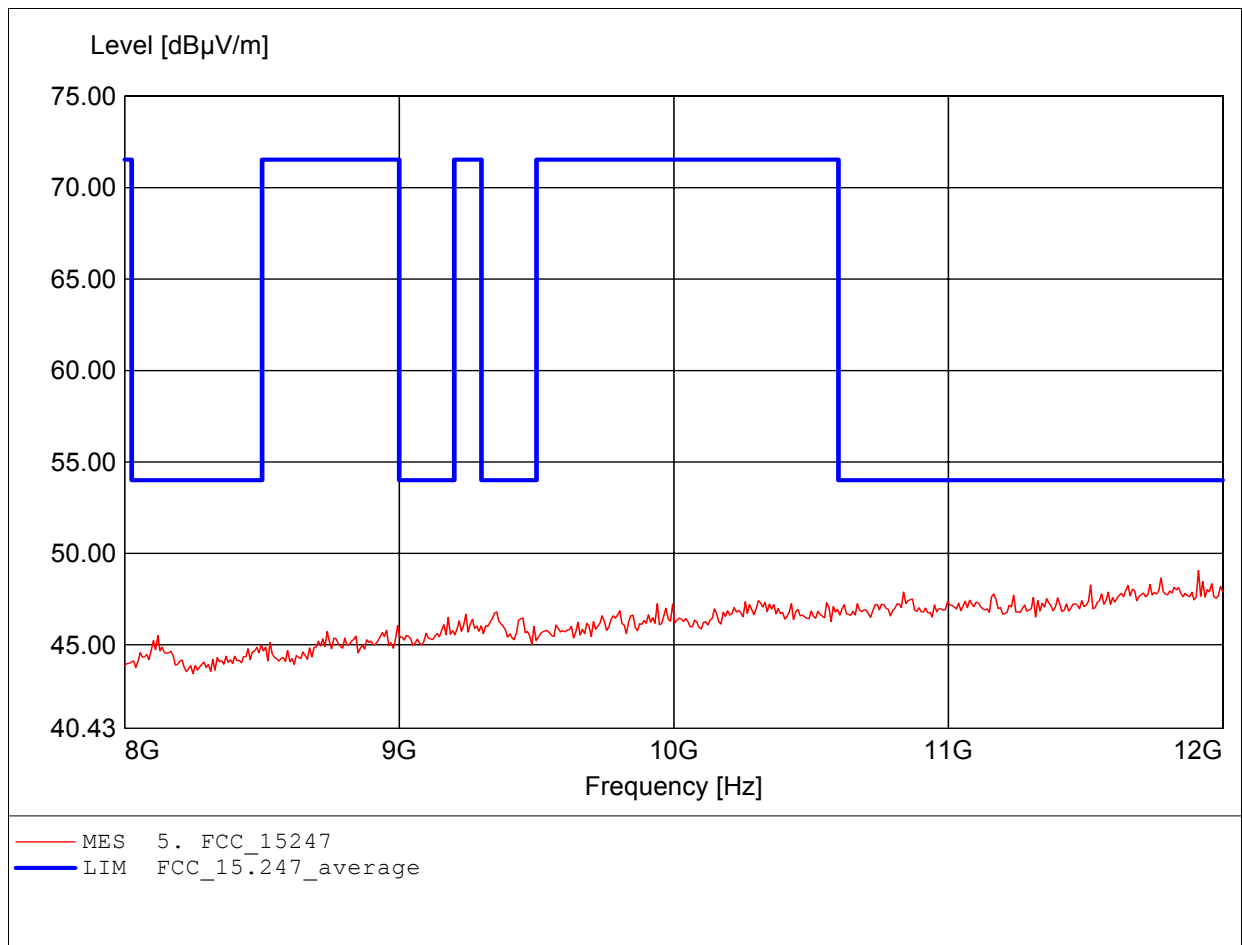
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 11.671GHz, Emax: 48.47dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

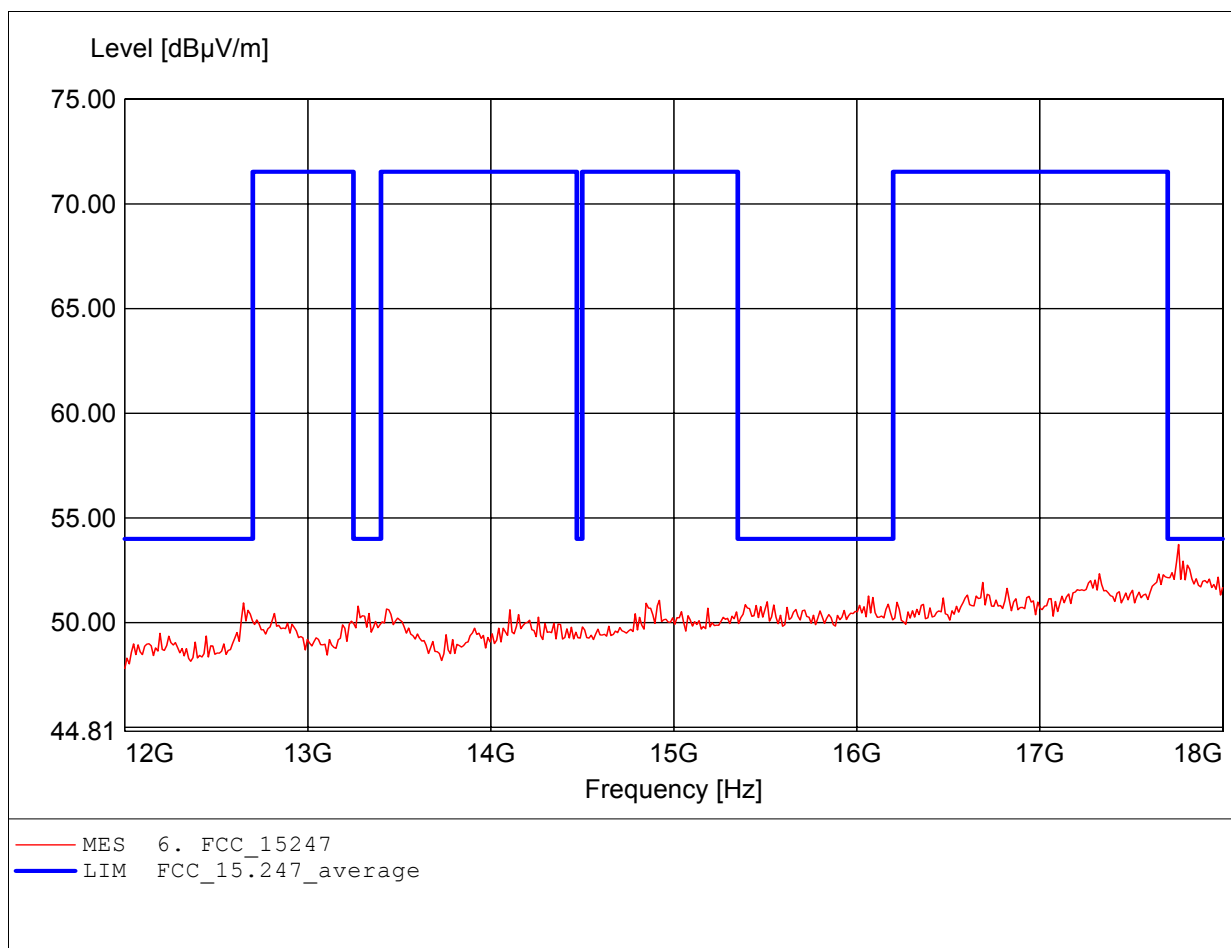
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 11.912GHz, Emax: 49.07dBμV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

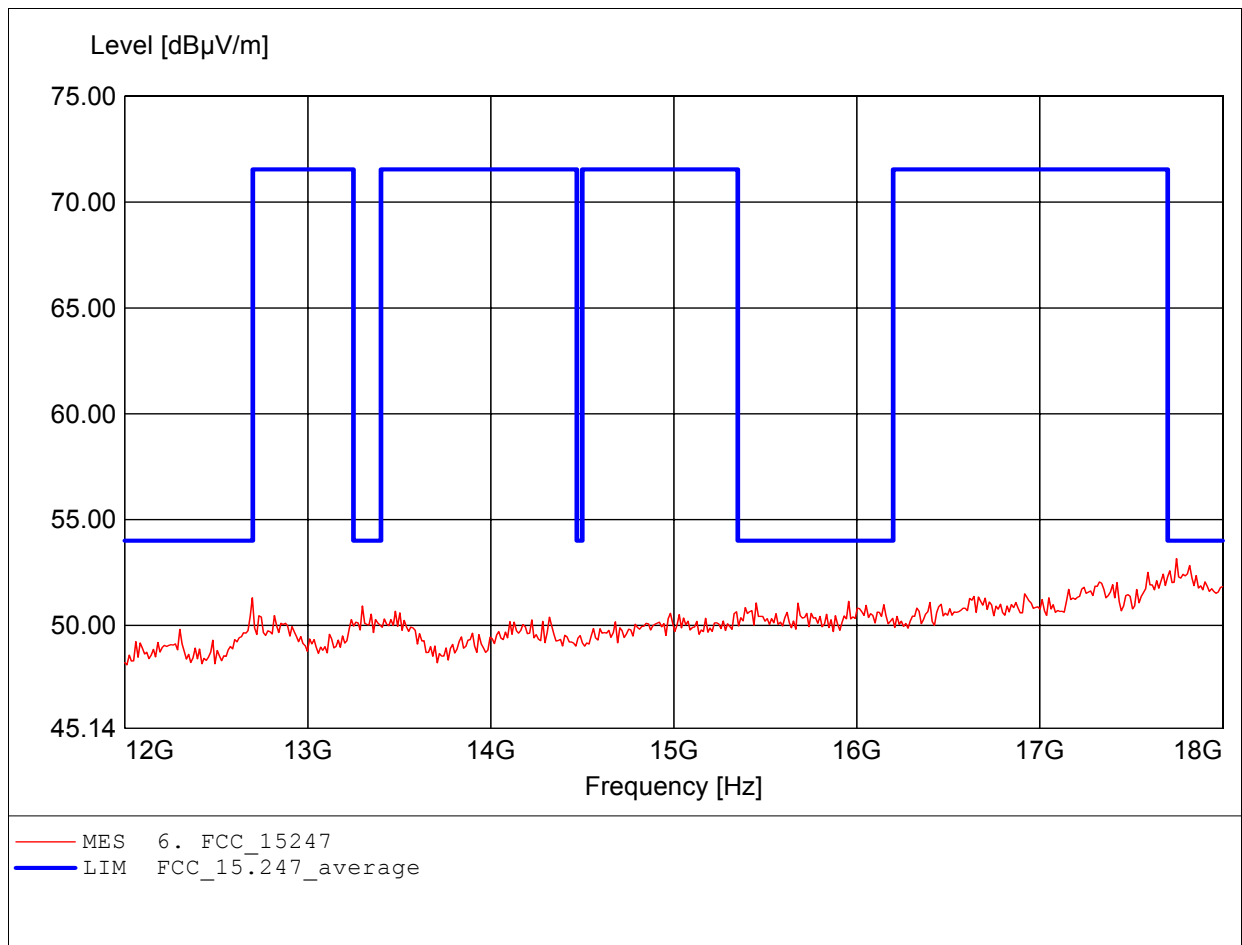
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 17.760GHz, Emax: 53.73dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

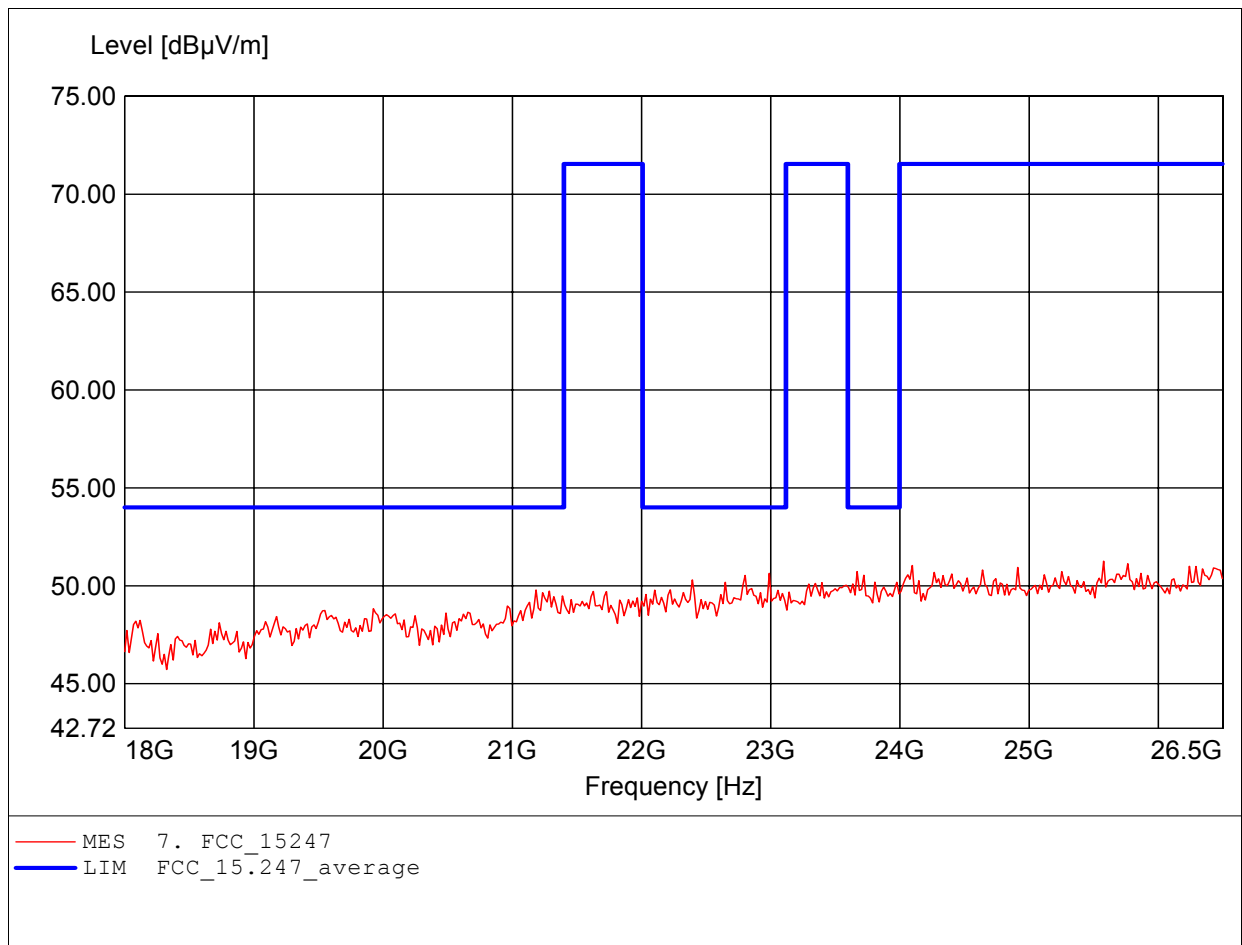
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 17.747GHz, Emax: 53.16dBμV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

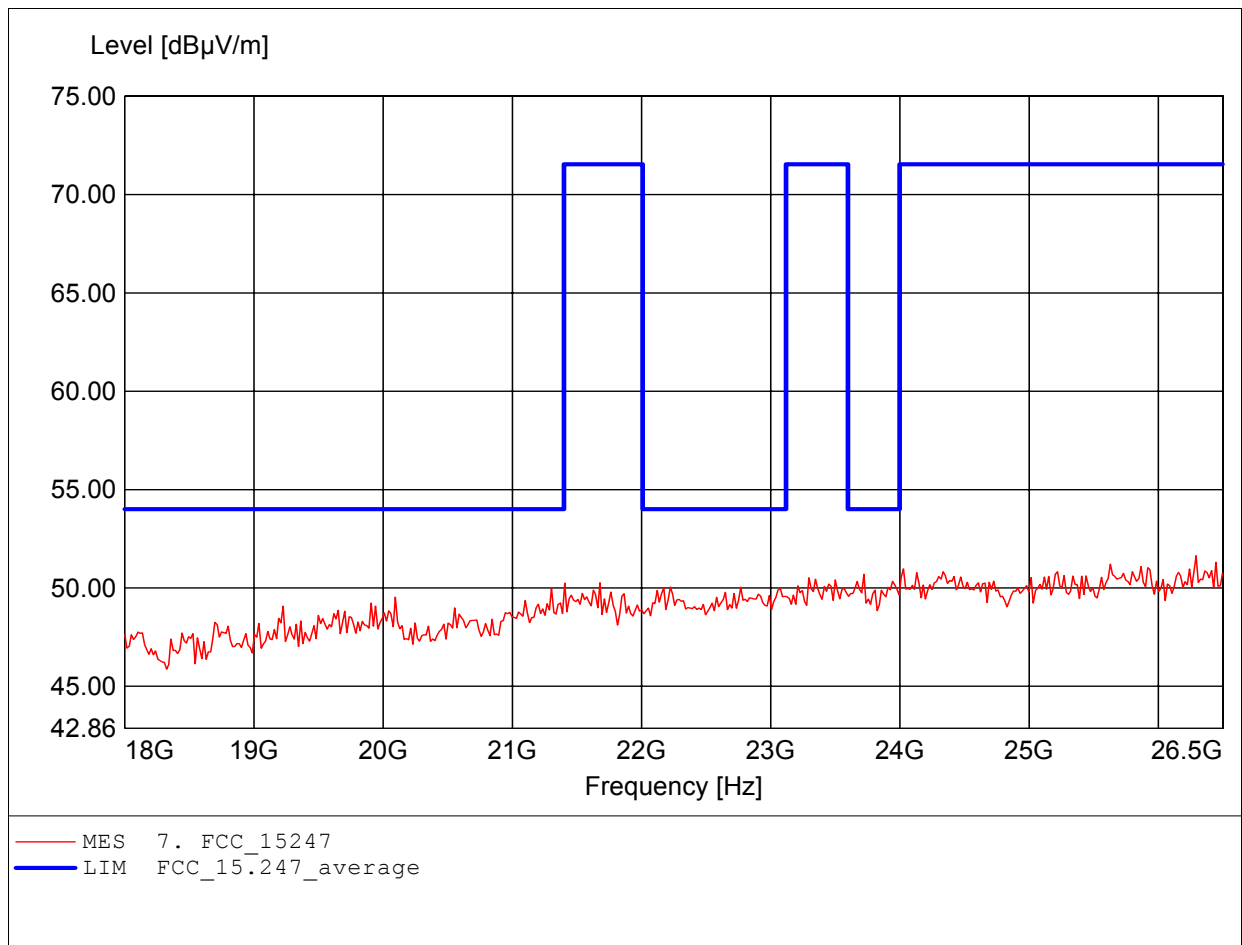
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 25.580GHz, Emax: 51.25dBμV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 26.296GHz, Emax: 51.64dBμV/m, RBW: 1MHz

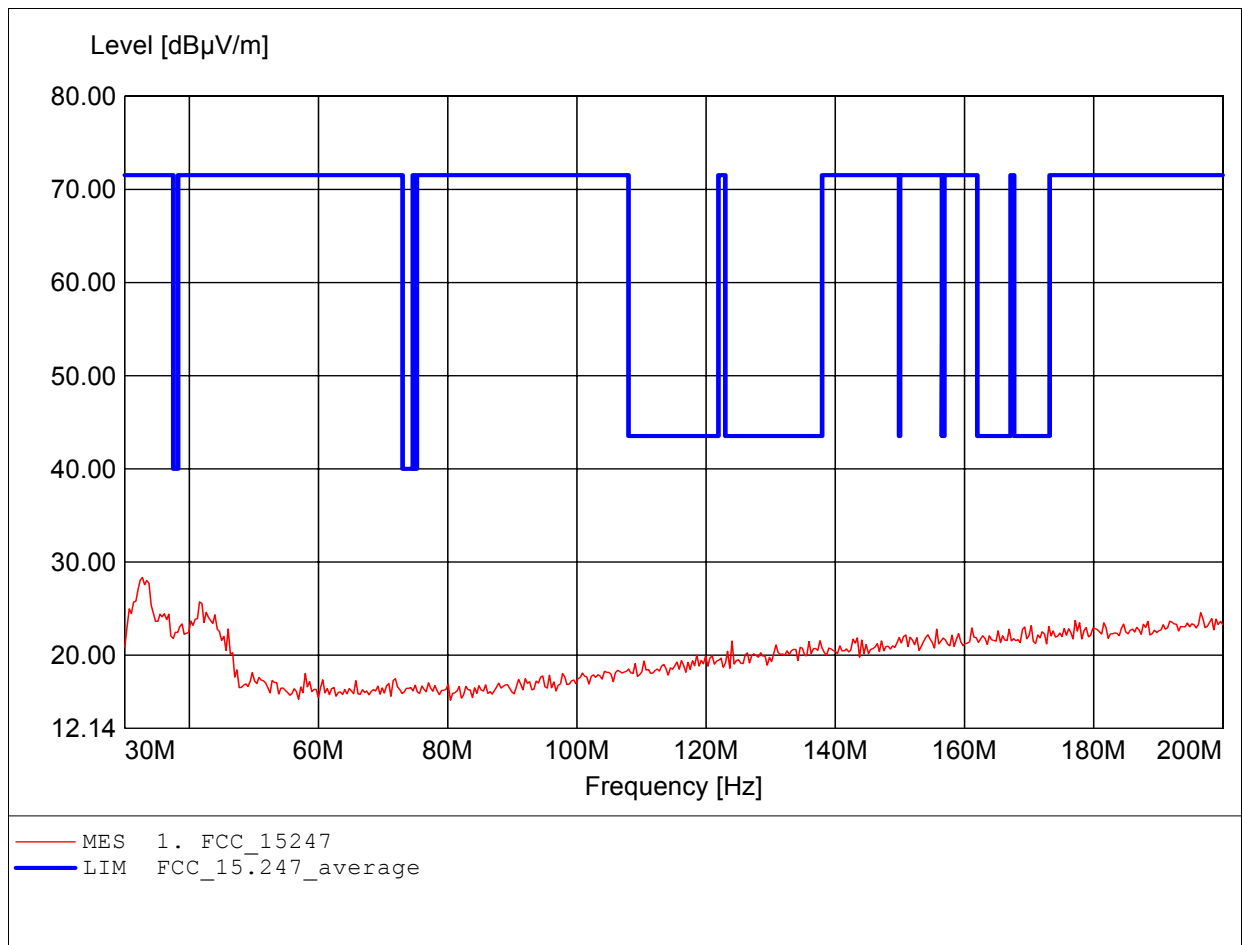




# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

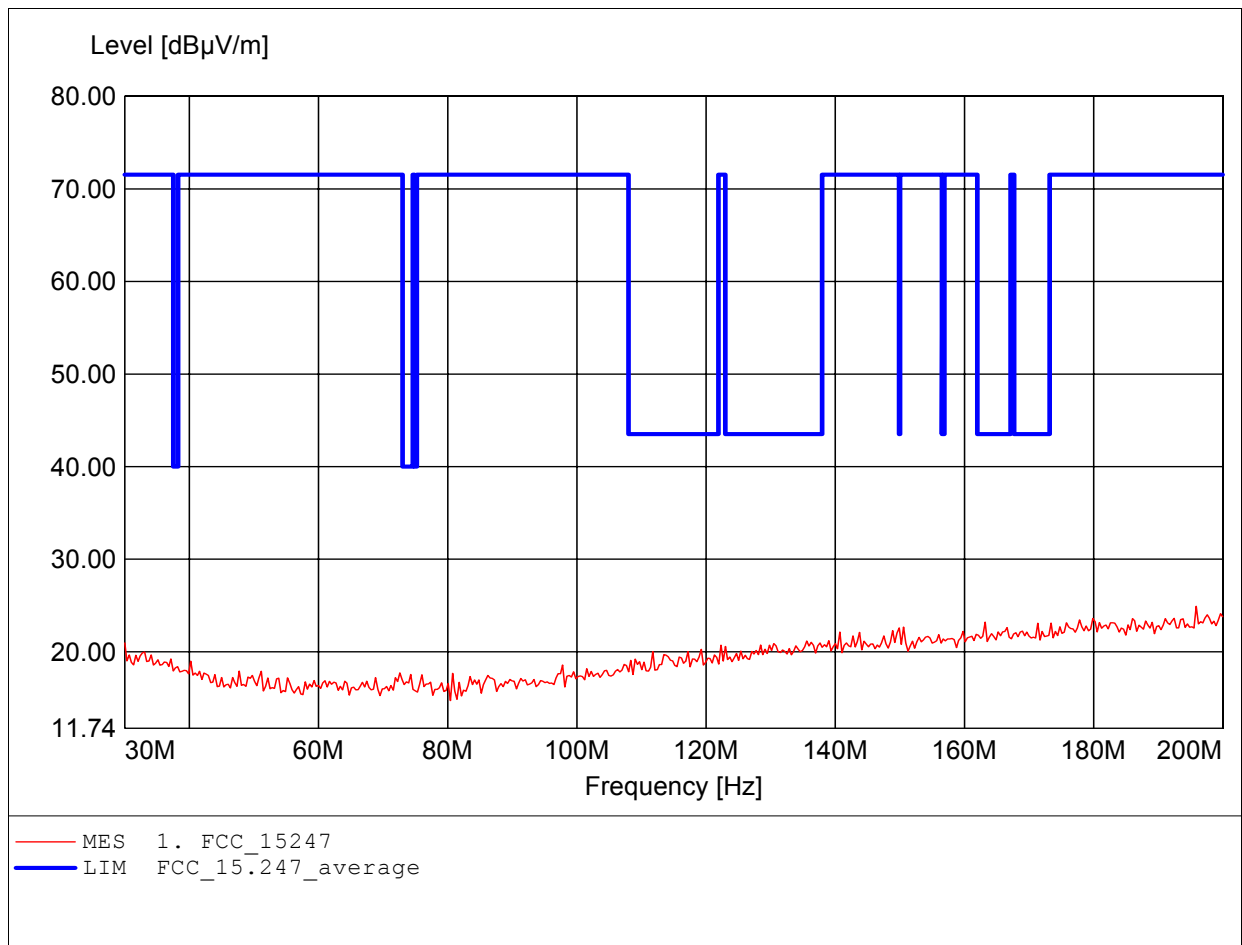
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq: 32.725MHz, Emax: 28.33dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

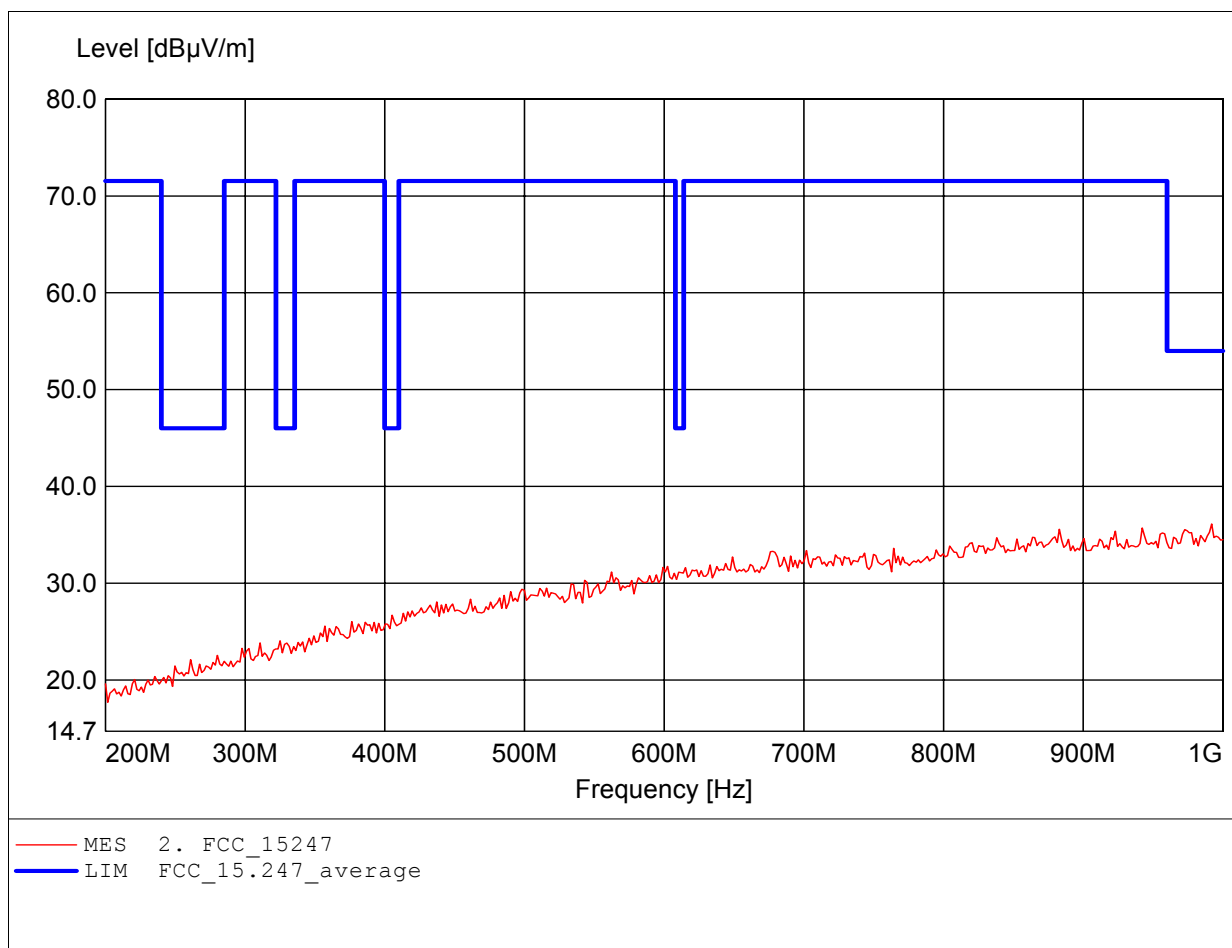
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq: 195.912MHz, Emax: 24.91dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

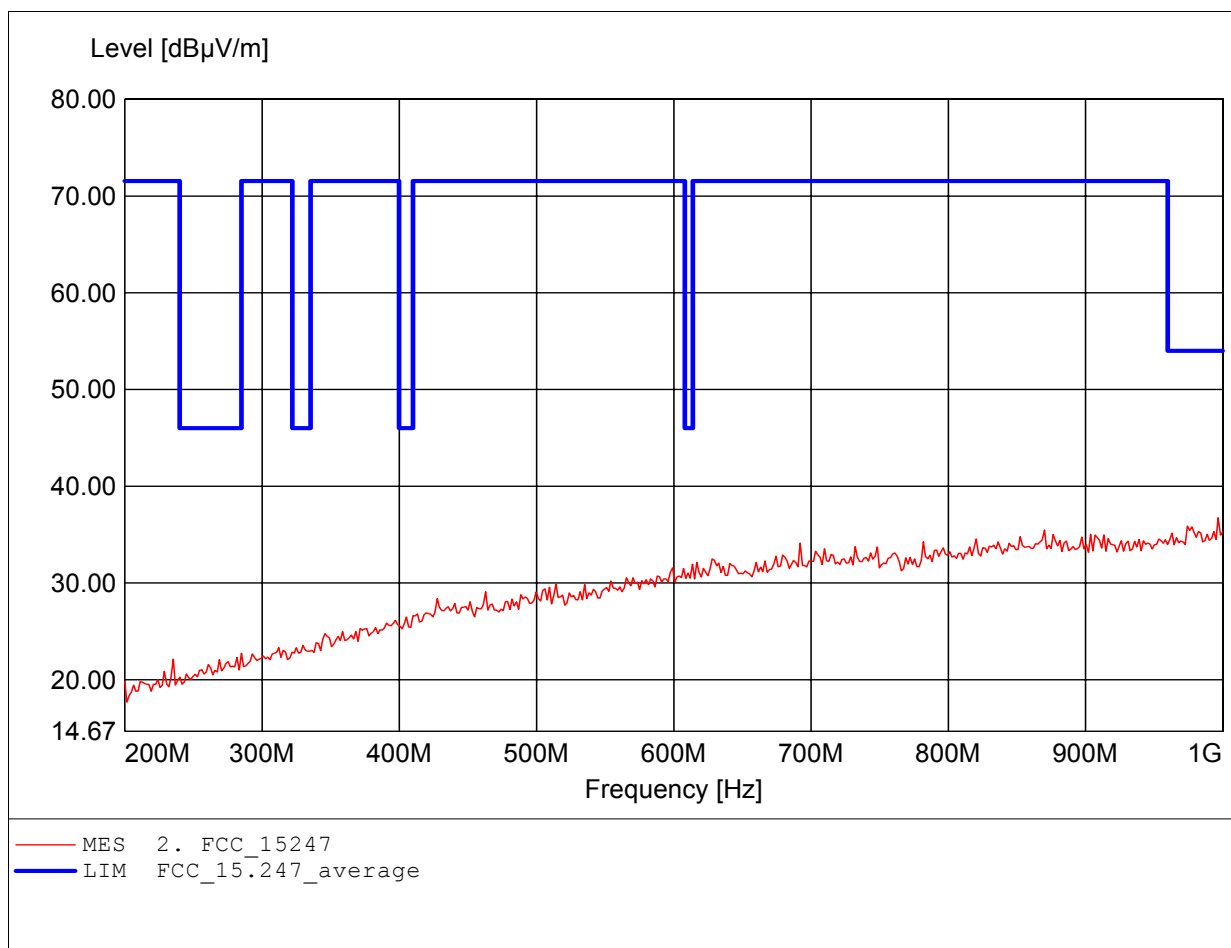
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL 223,  
Freq: 991.984MHz, Emax: 36.10dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

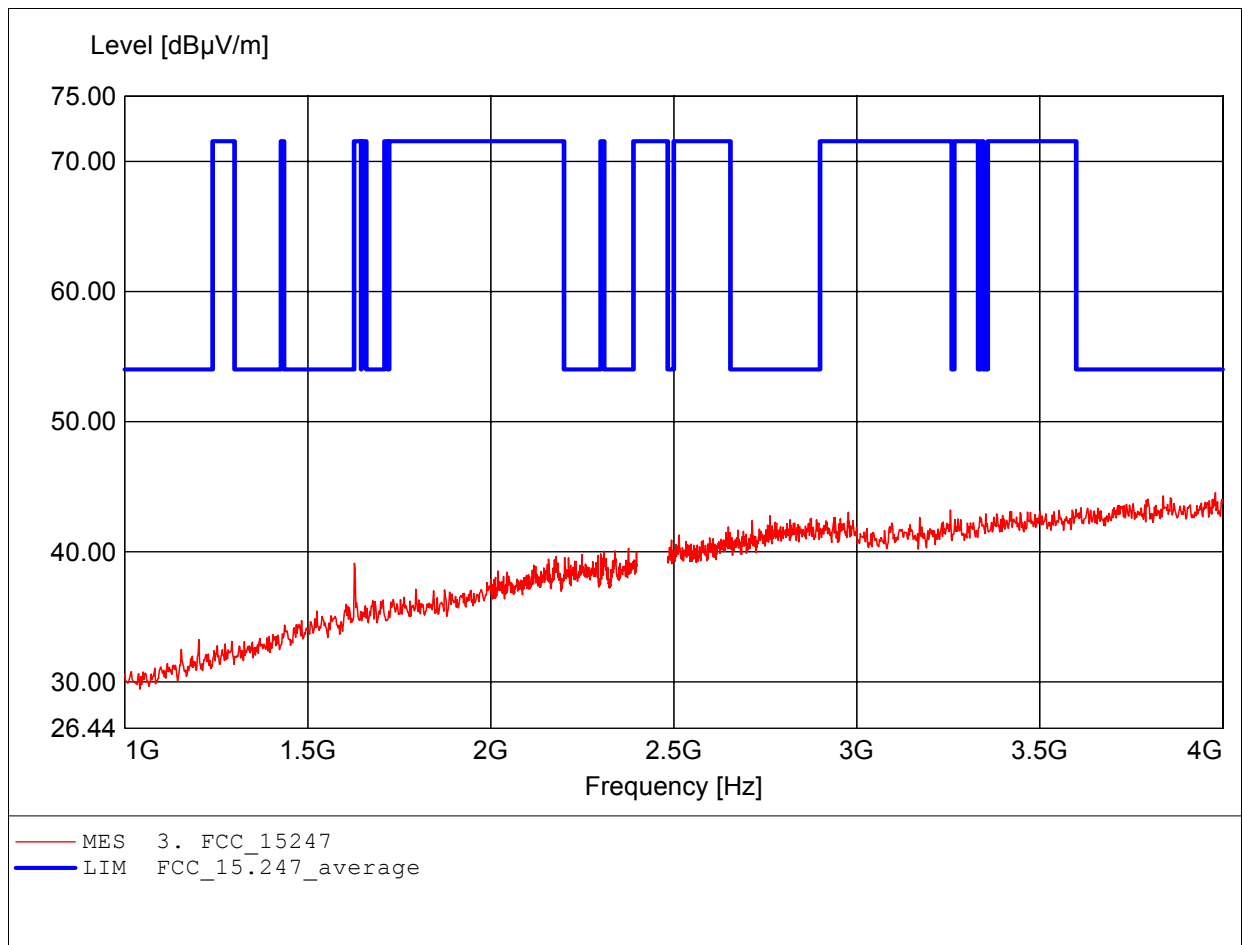
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL 223,  
Freq: 996.794MHz, Emax: 36.73dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

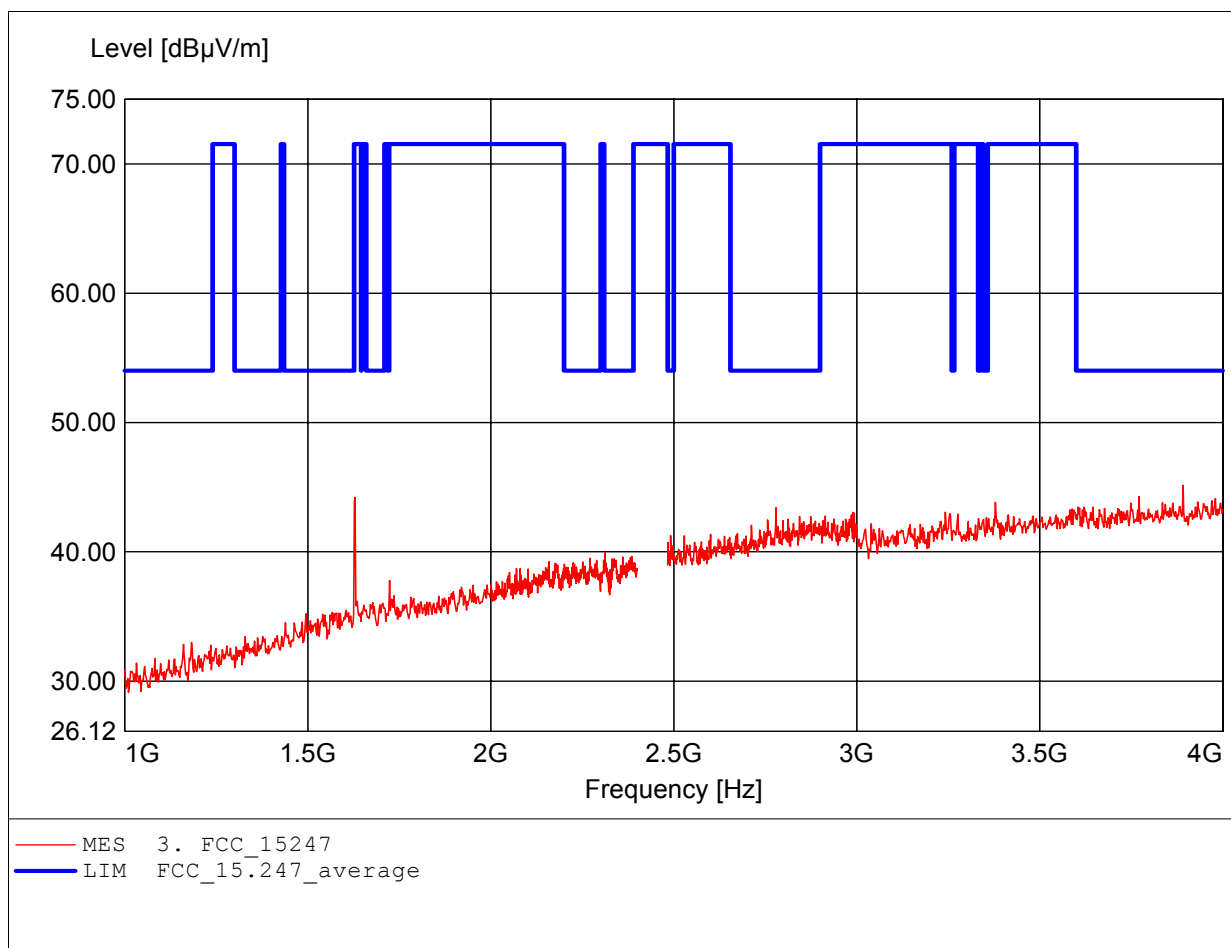
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 3.980GHz, Emax: 44.54dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

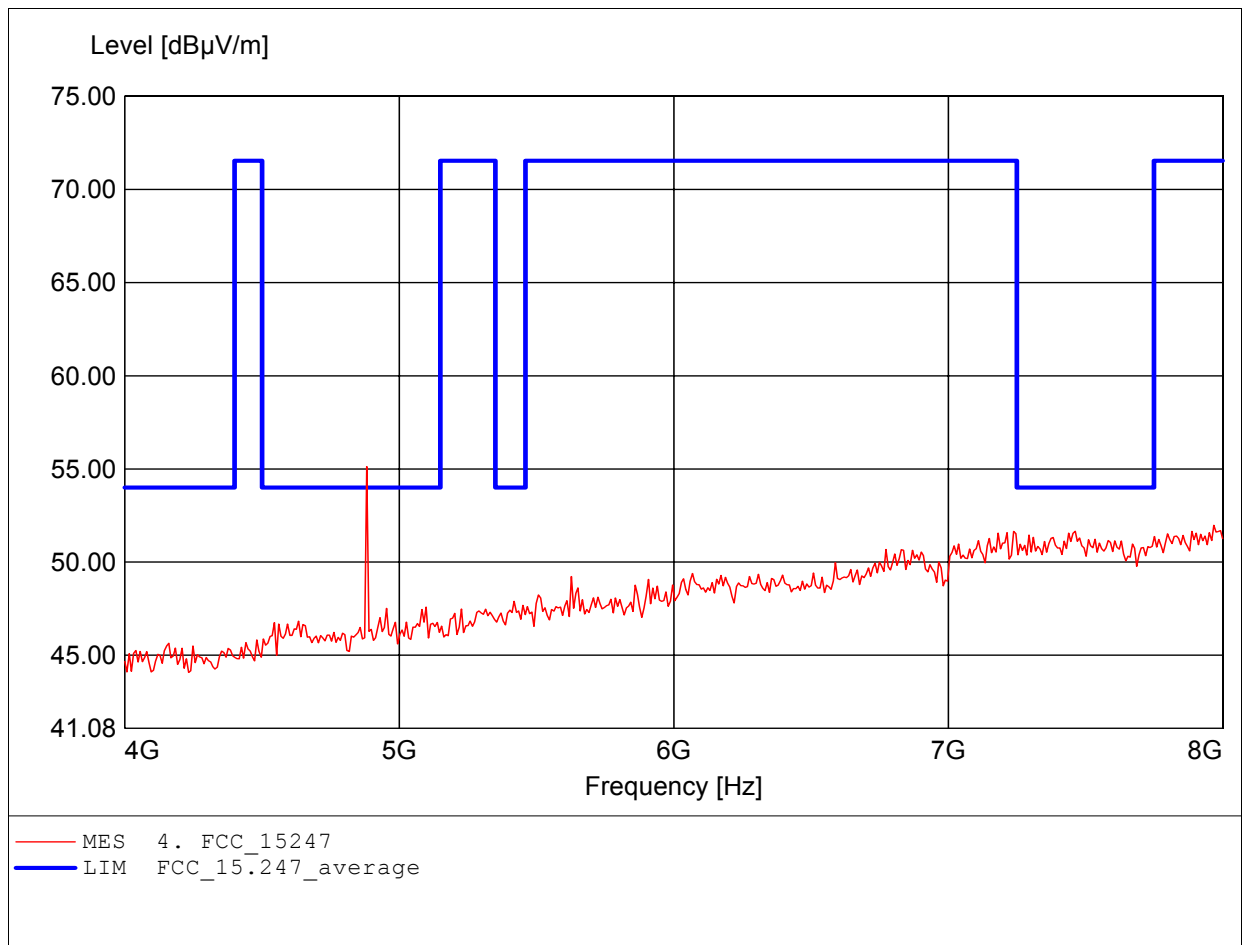
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 3.892GHz, Emax: 45.16dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 4.882GHz, Emax: 55.12dBµV/m, RBW: 1MHz



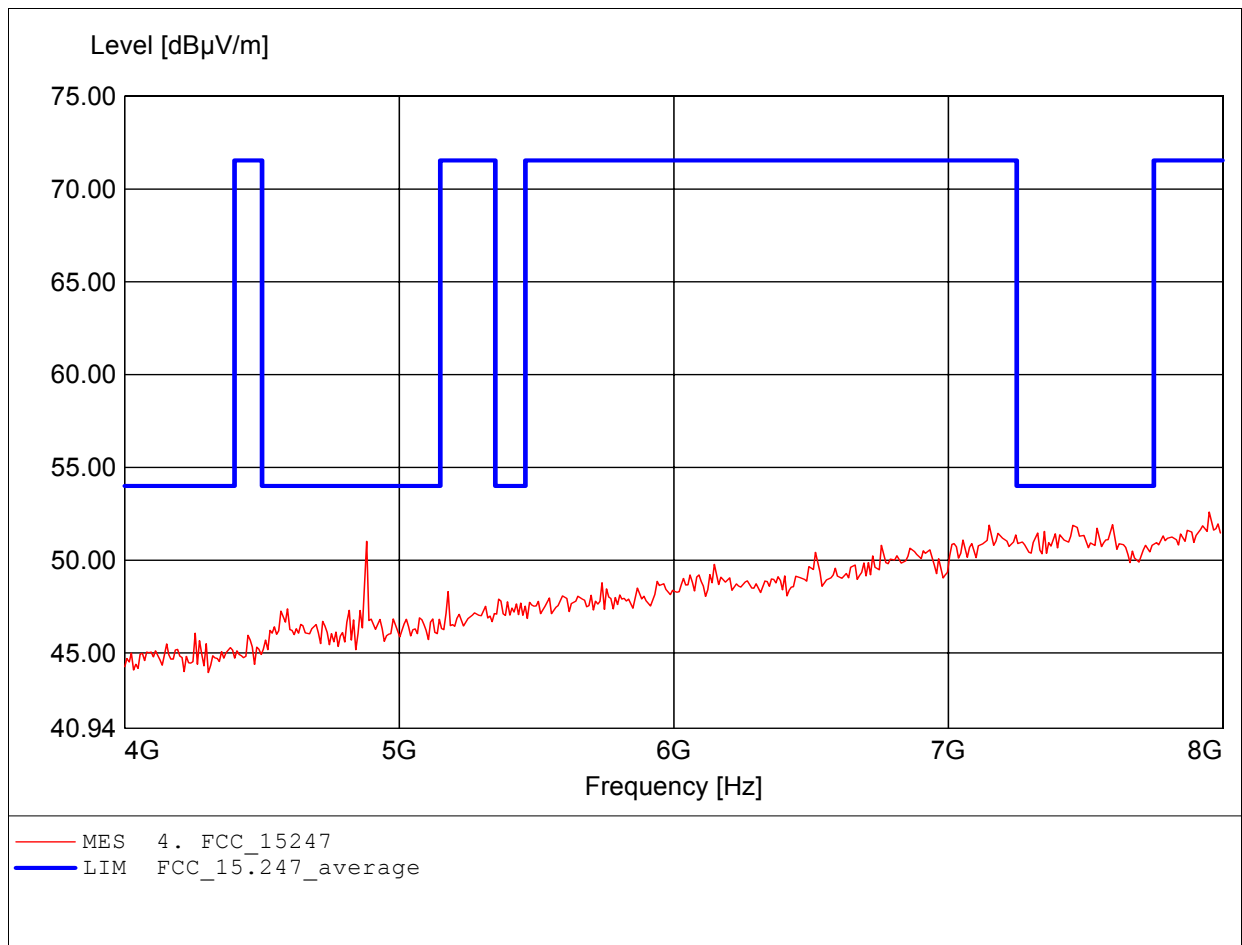
### MEASUREMENT RESULT:

Frequency	Level	Limit	Margin	Detector
MHz	dBµV	dBµV	dB	
4881.6969	43.23	54.0	10.77	Average

# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 7.952GHz, Emax: 52.59dBµV/m, RBW: 1MHz

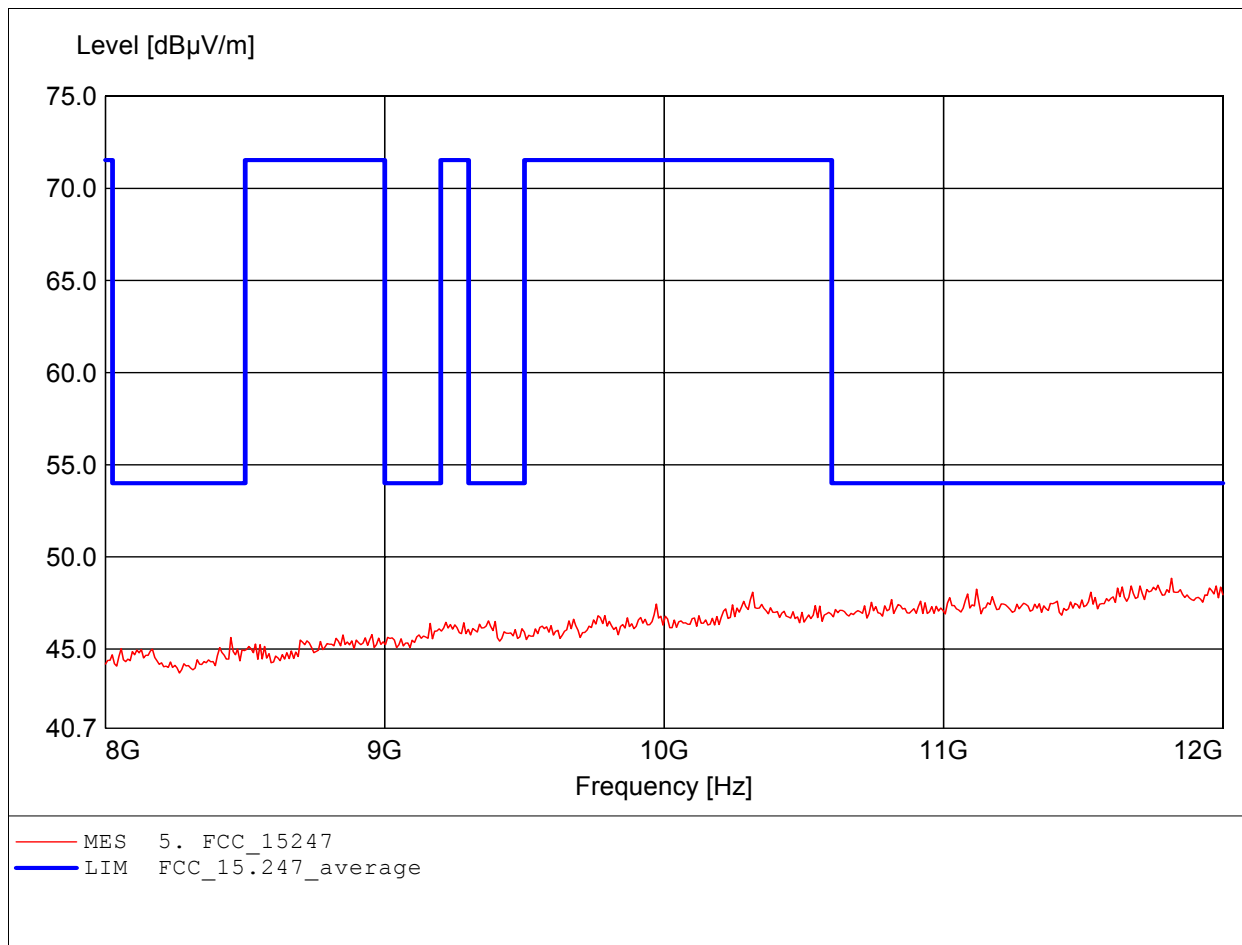




# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

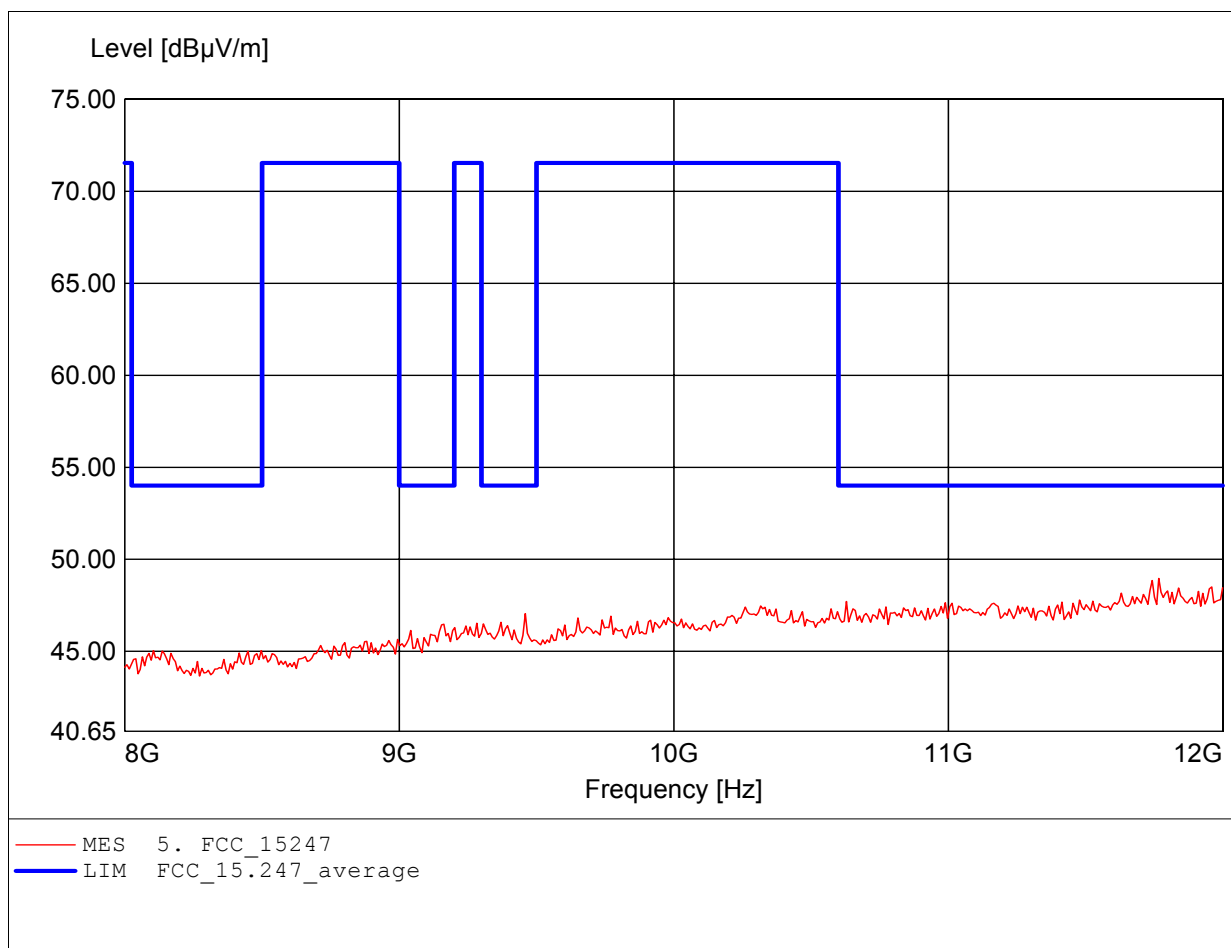
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 11.816GHz, Emax: 48.84dBμV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

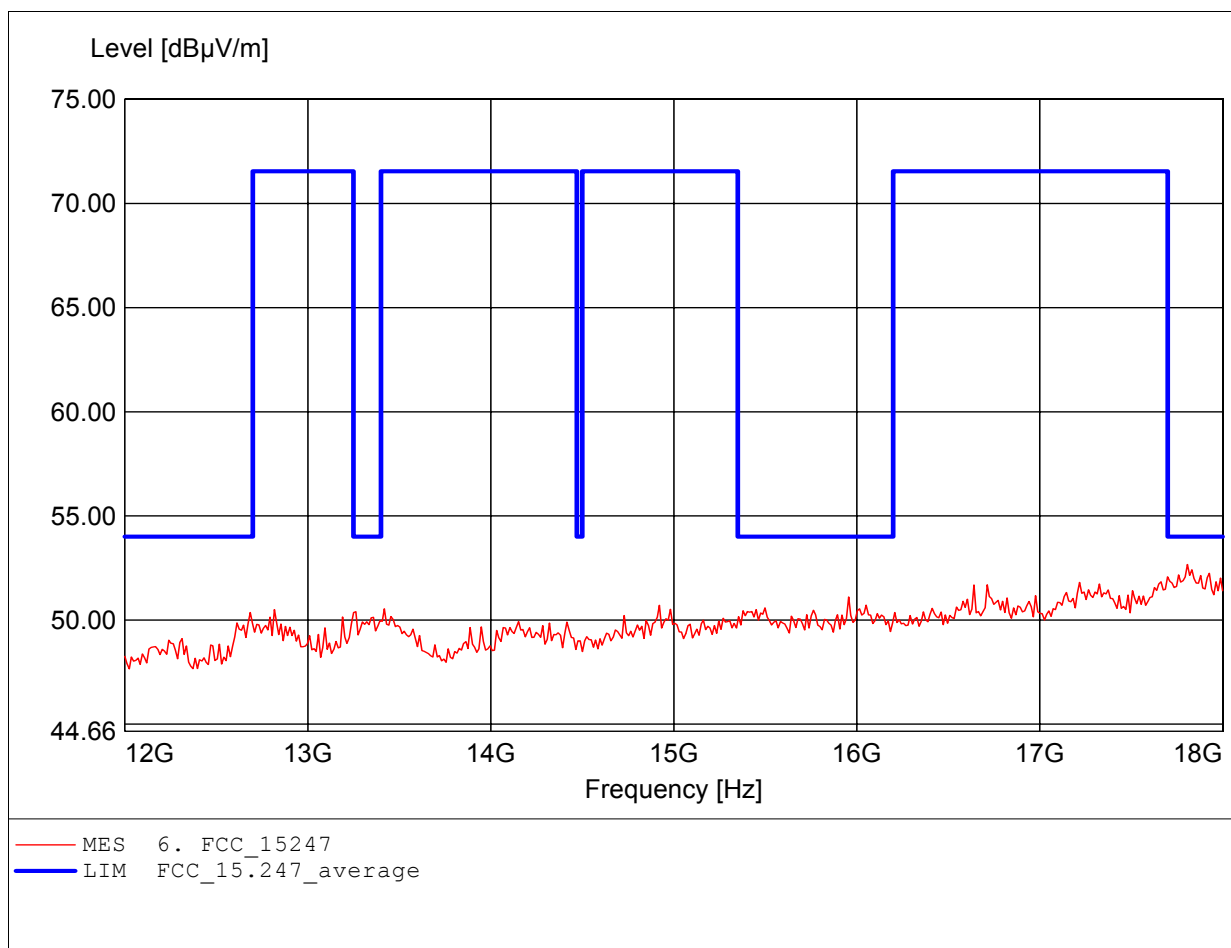
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 11.768GHz, Emax: 48.96dBμV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

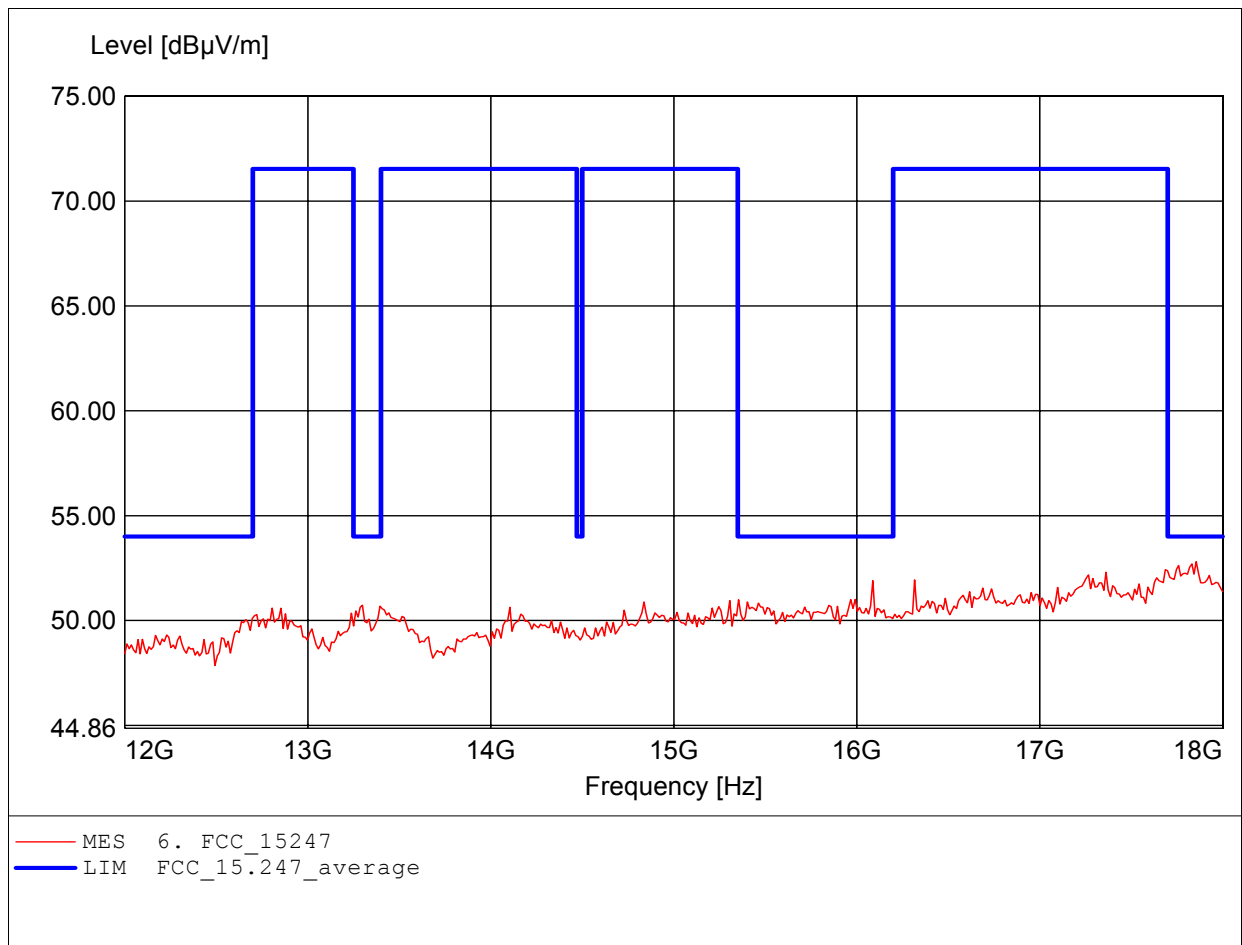
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 17.808GHz, Emax: 52.67dBμV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

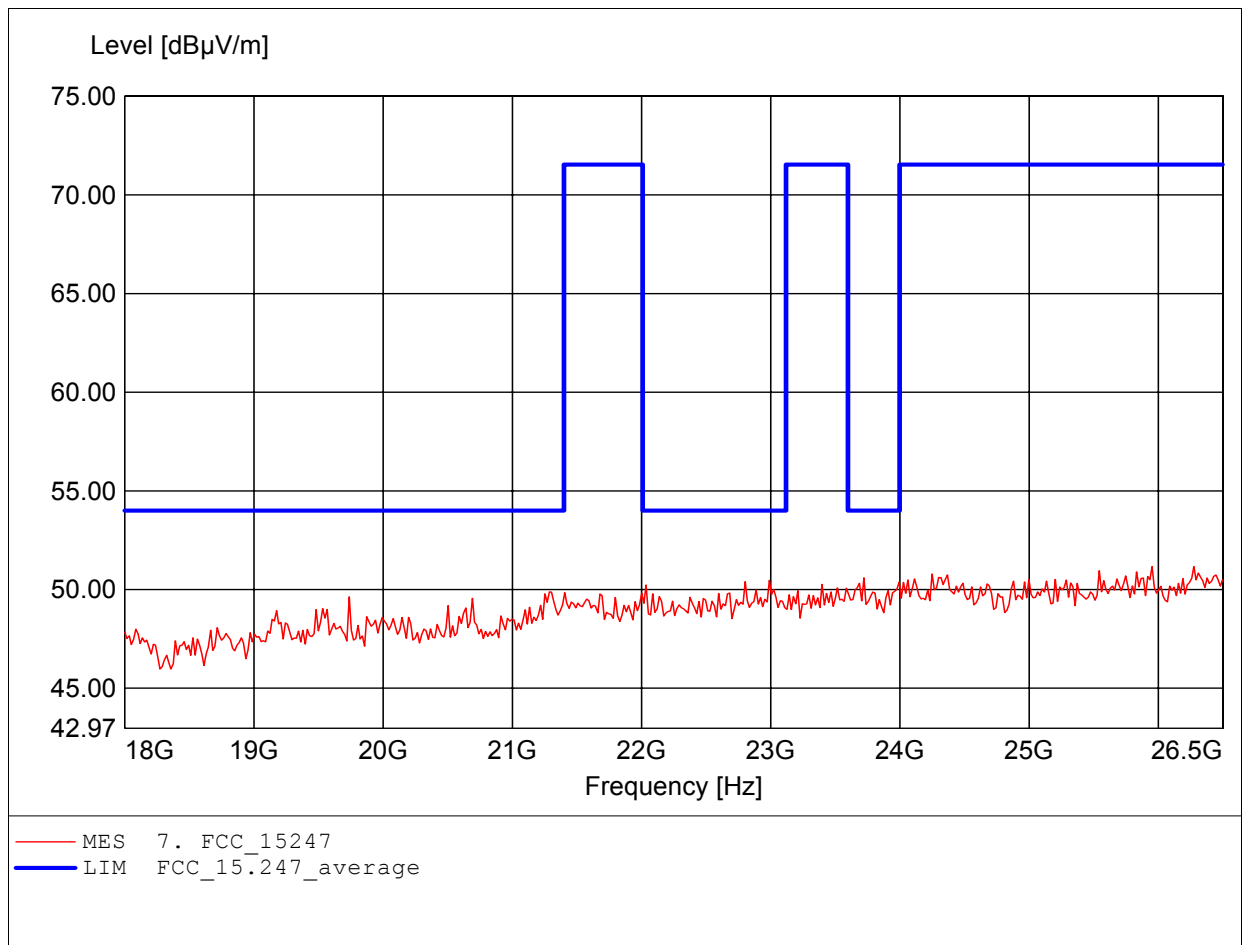
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 17.856GHz, Emax: 52.80dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

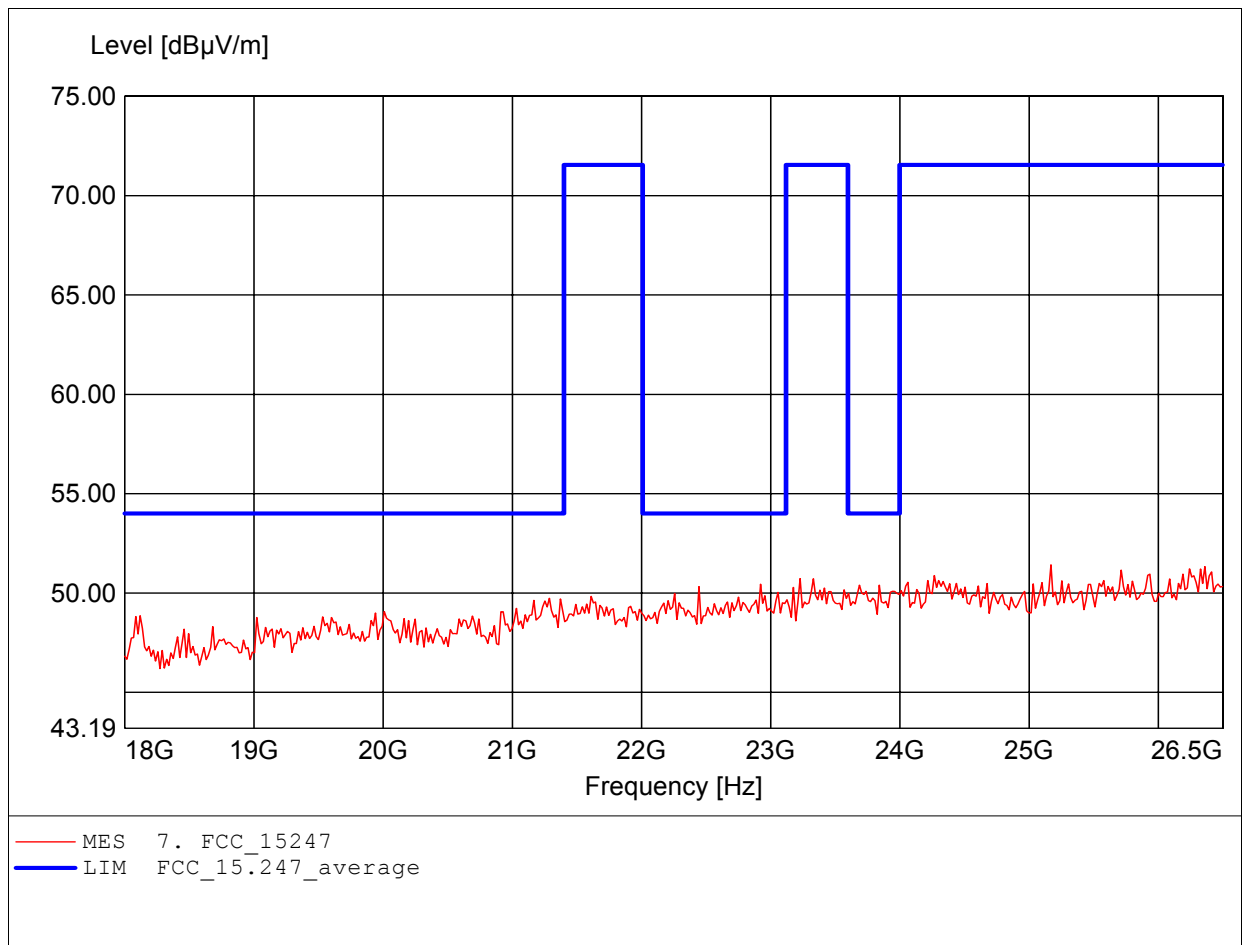
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 25.955GHz, Emax: 51.17dBμV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

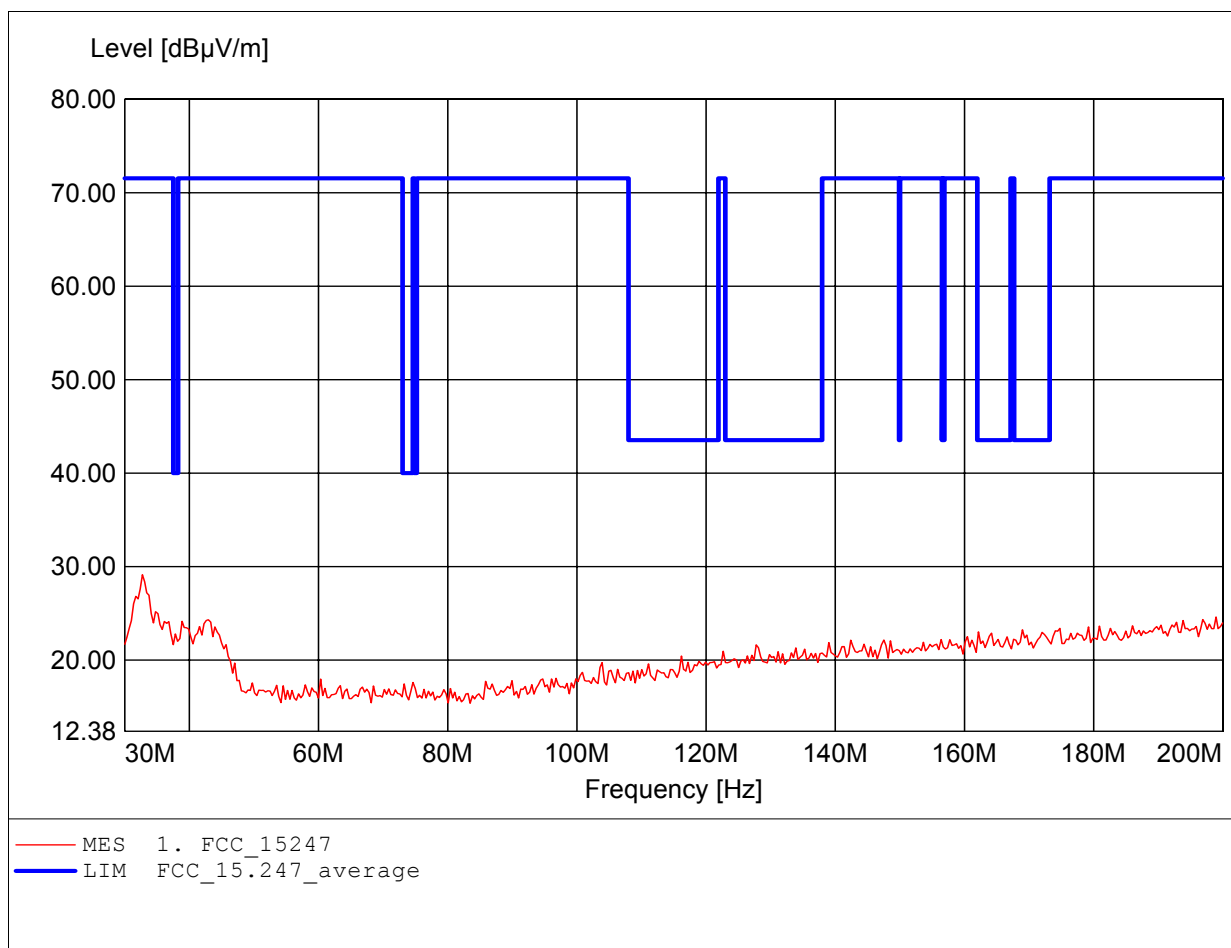
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 25.171GHz, Emax: 51.41dBμV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

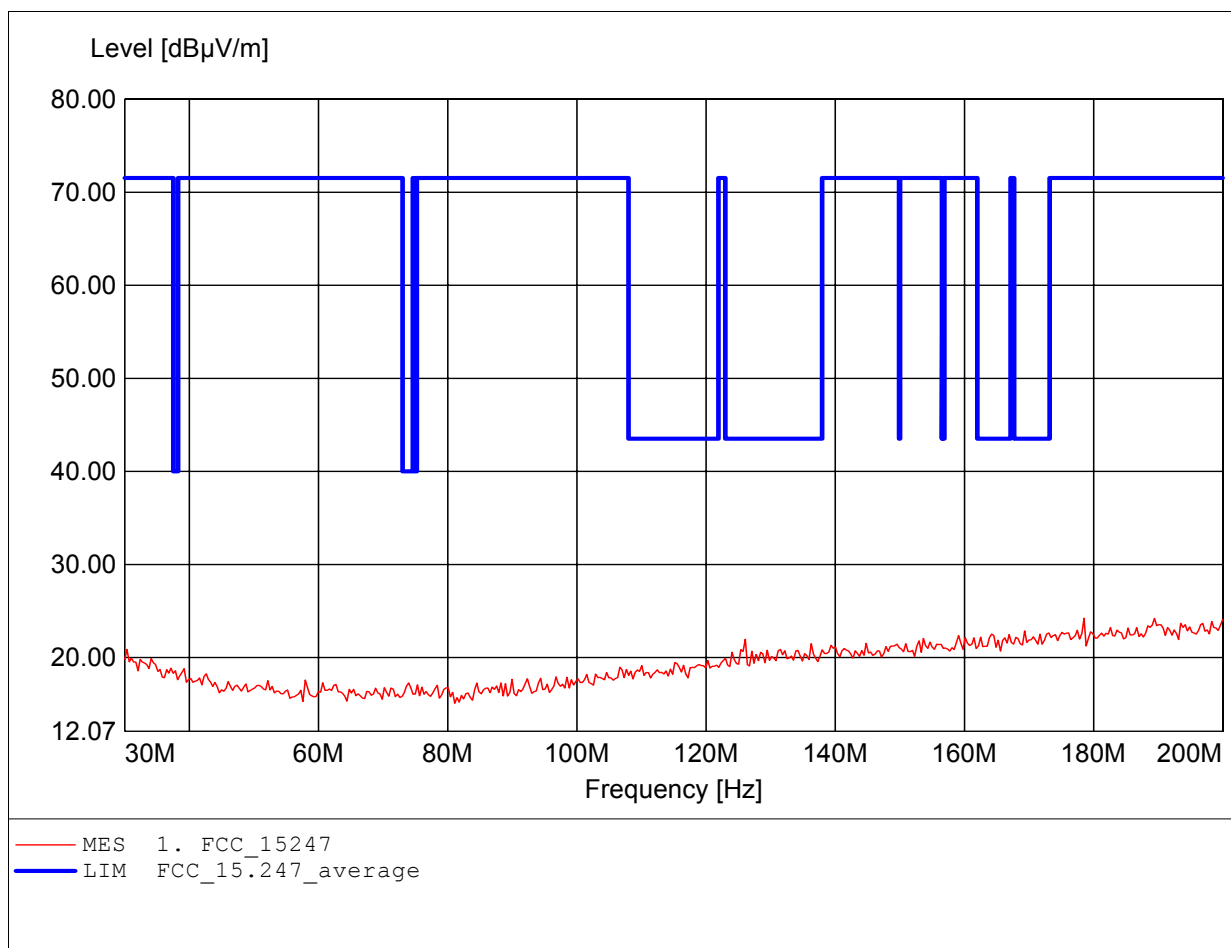
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq: 32.725MHz, Emax: 29.13dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq: 178.537MHz, Emax: 24.23dBµV/m, RBW: 100kHz

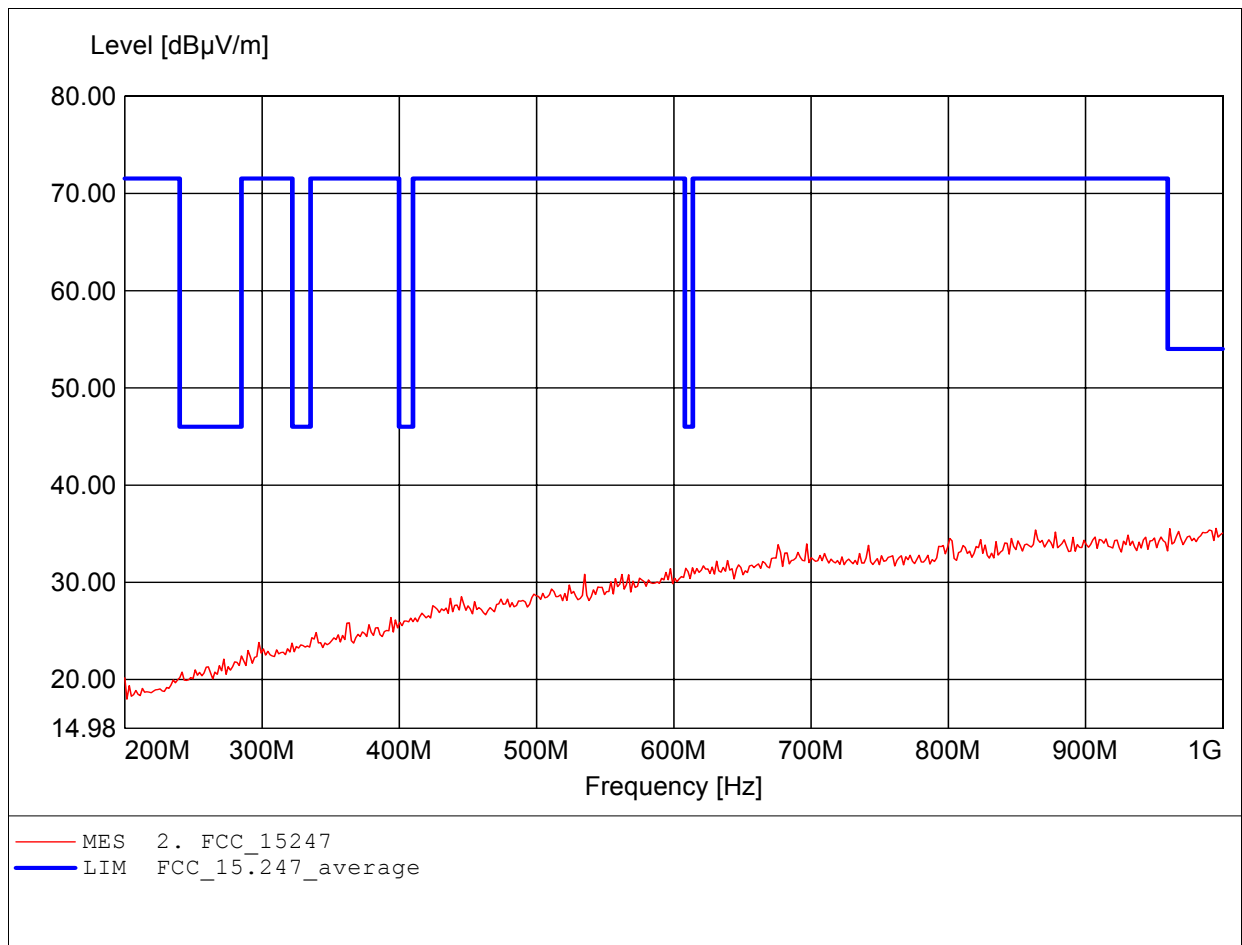




# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

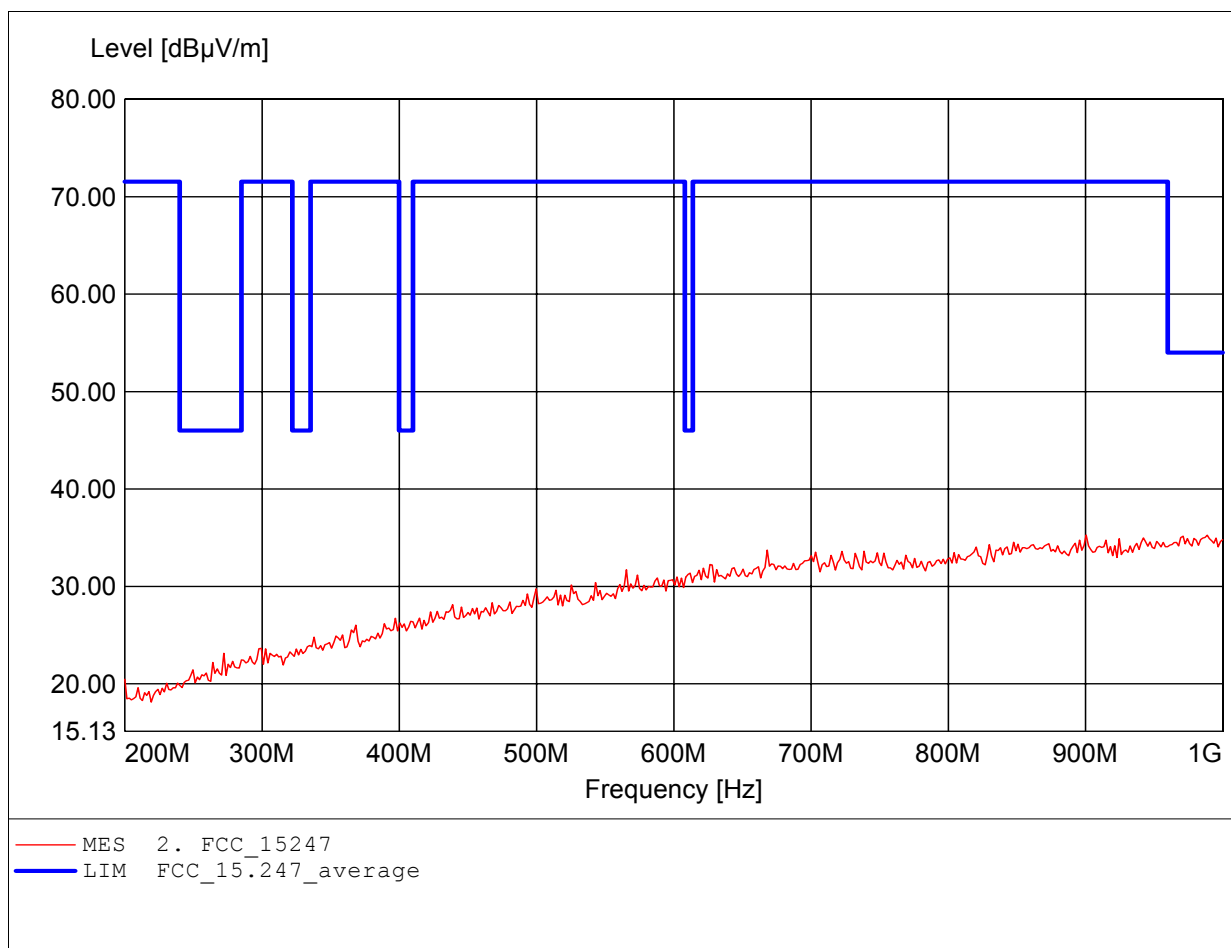
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL 223,  
Freq: 995.190MHz, Emax: 35.55dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

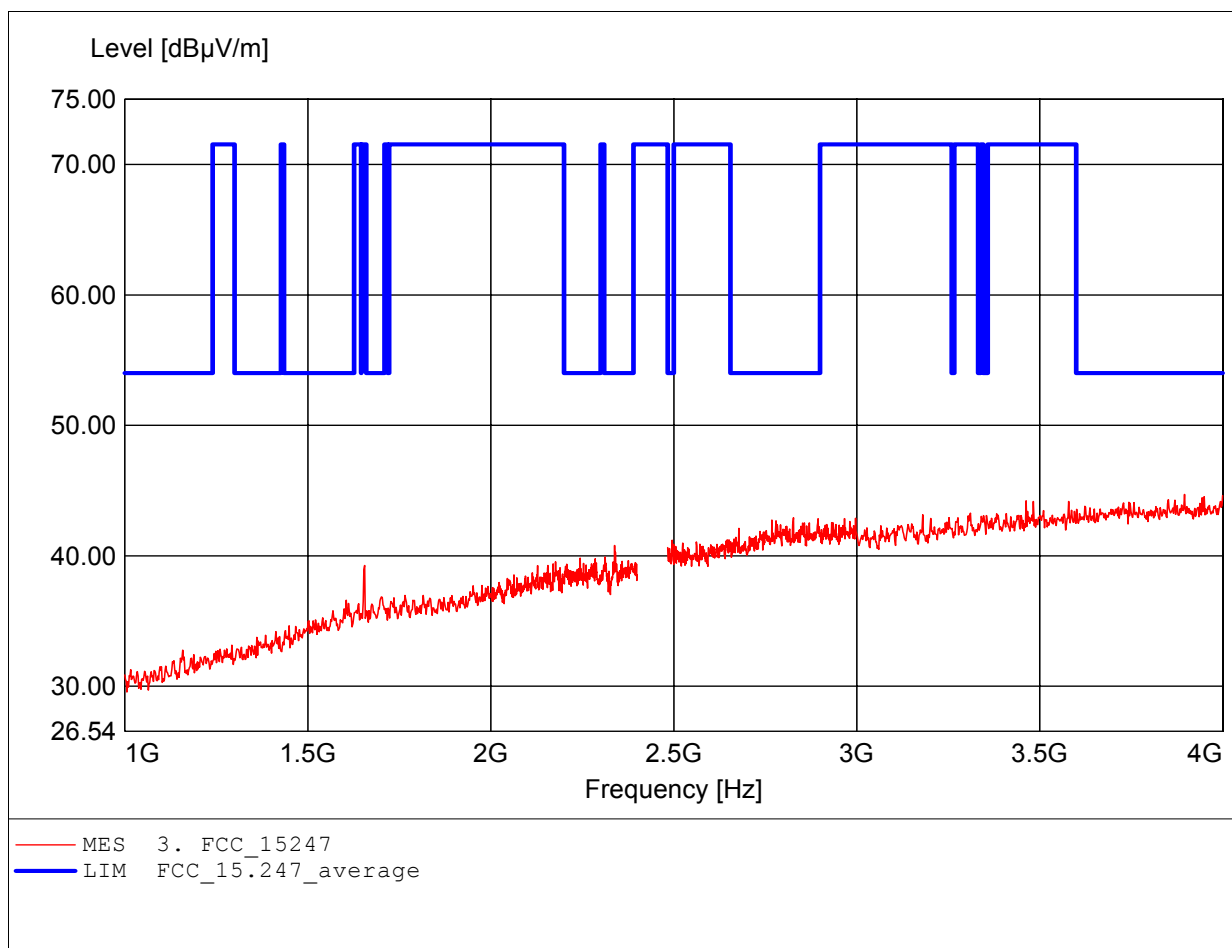
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247  
Comment 1: Dist.: 3m, Ant.: HL 223,  
Freq: 900.601MHz, Emax: 35.28dBµV/m, RBW: 100kHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

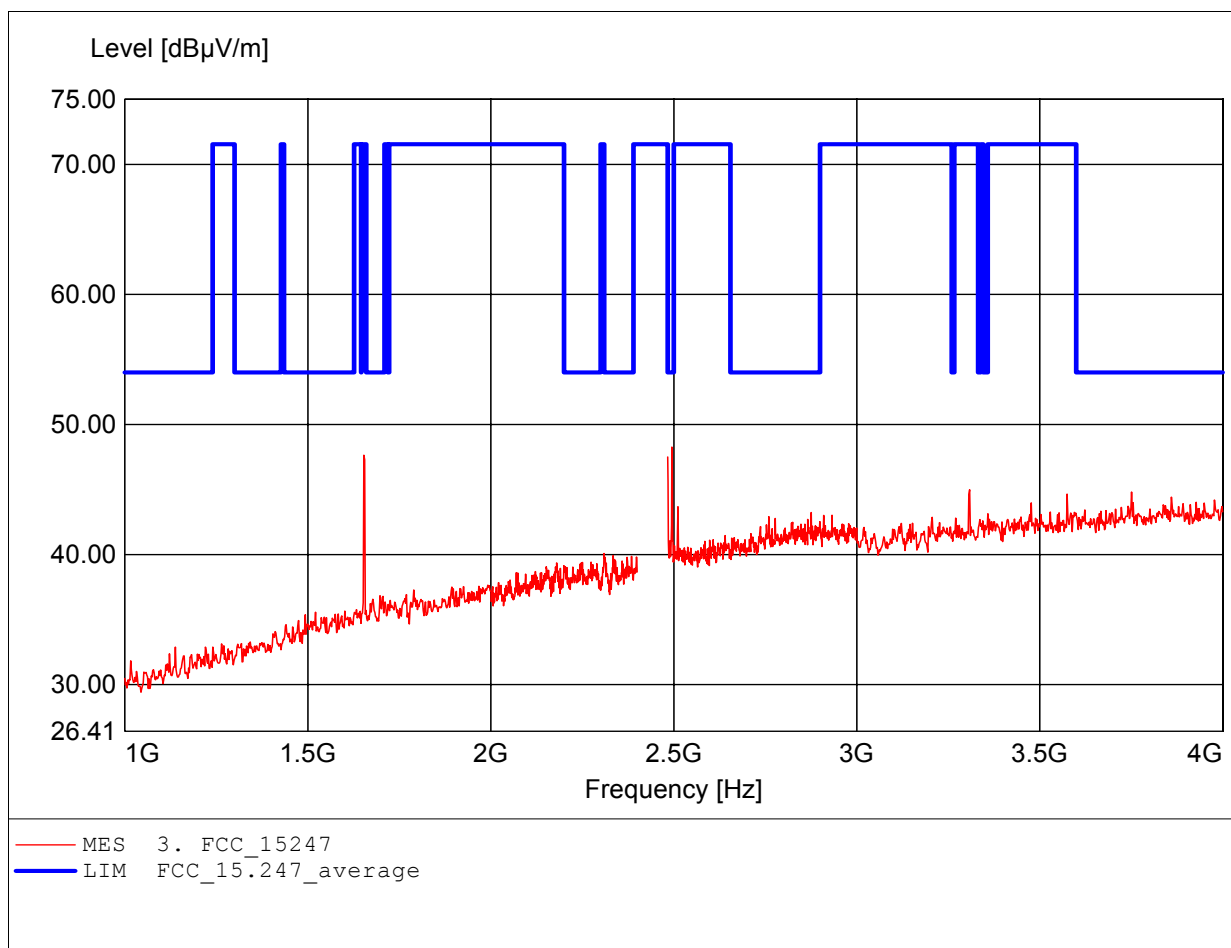
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 3.896GHz, Emax: 44.70dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

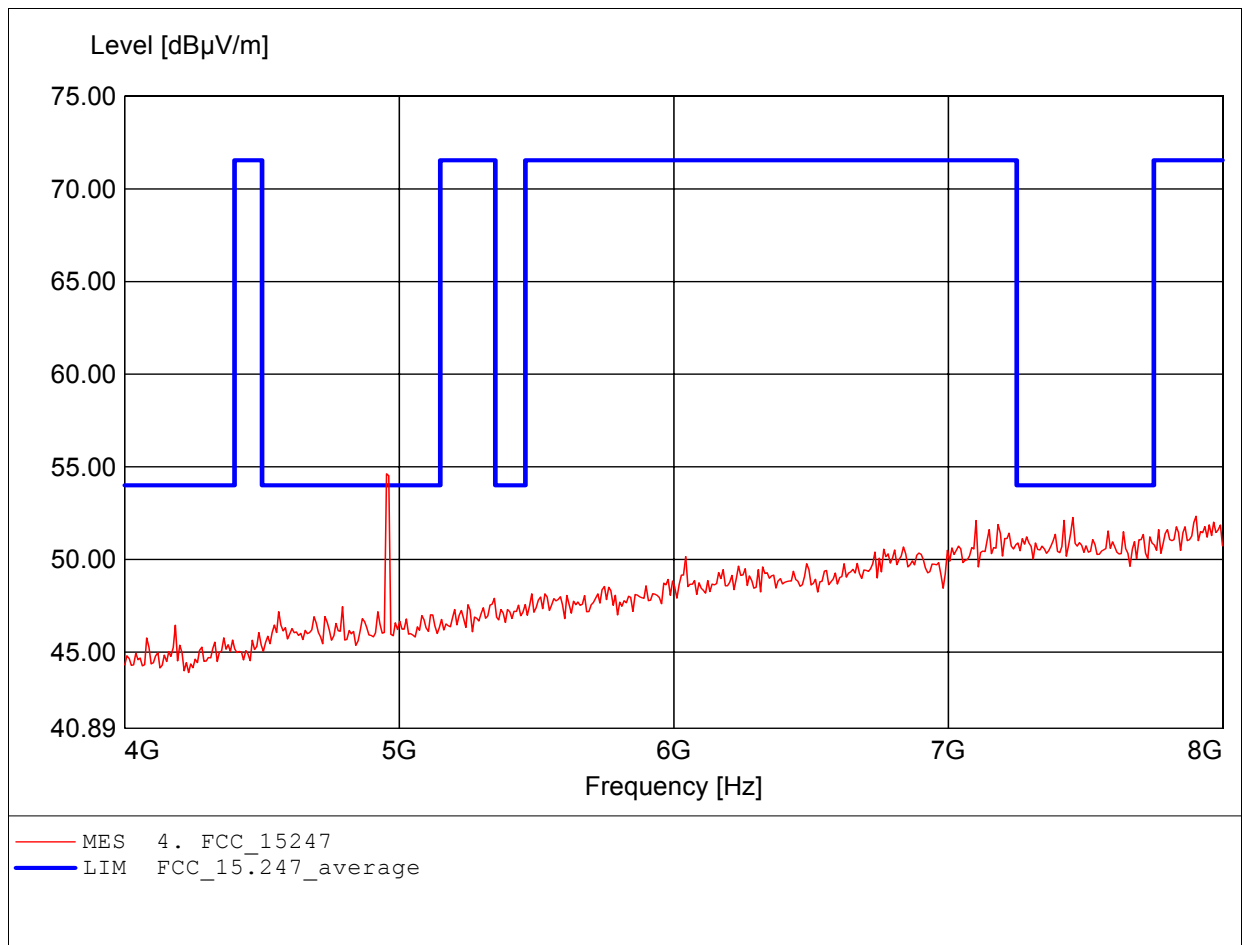
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 2.495GHz, Emax: 48.26dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

EUT: Bluetooth Transceiver Module  
 MODEL NO.: UGPZ4 High Channel  
 Approval Holder: ALPS ELECTRIC CO., LTD.  
 Test Site / Operator: ETS / Orville Chang  
 Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
 Test Specification: according to §15.247, peak detector  
 Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
 Freq: 4.954GHz, Emax: 54.62dBµV/m, RBW: 1MHz



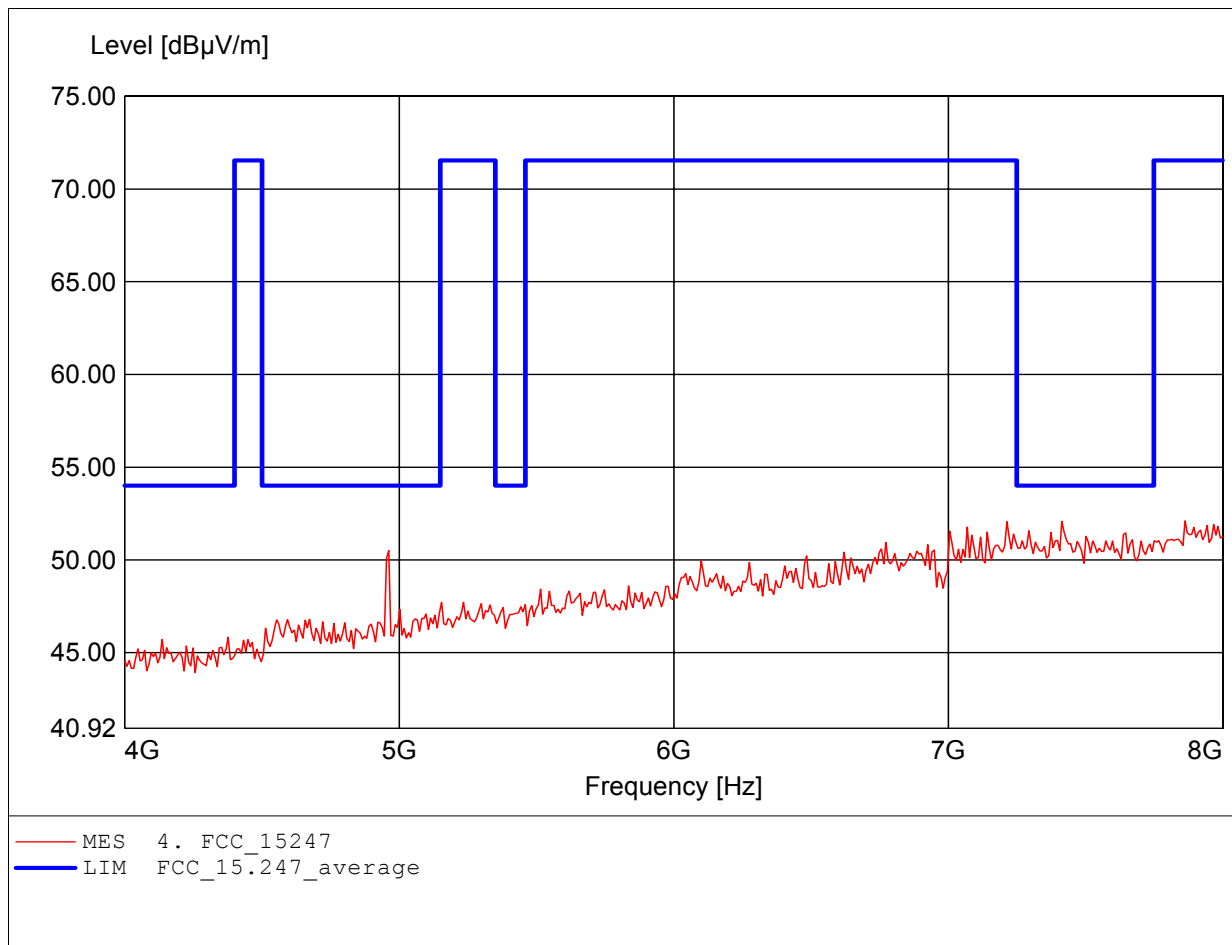
### MEASUREMENT RESULT:

Frequency	Level	Limit	Margin	Detector
MHz	dBµV	dBµV	dB	
4959.8947	43.28	54.0	10.72	Average

# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

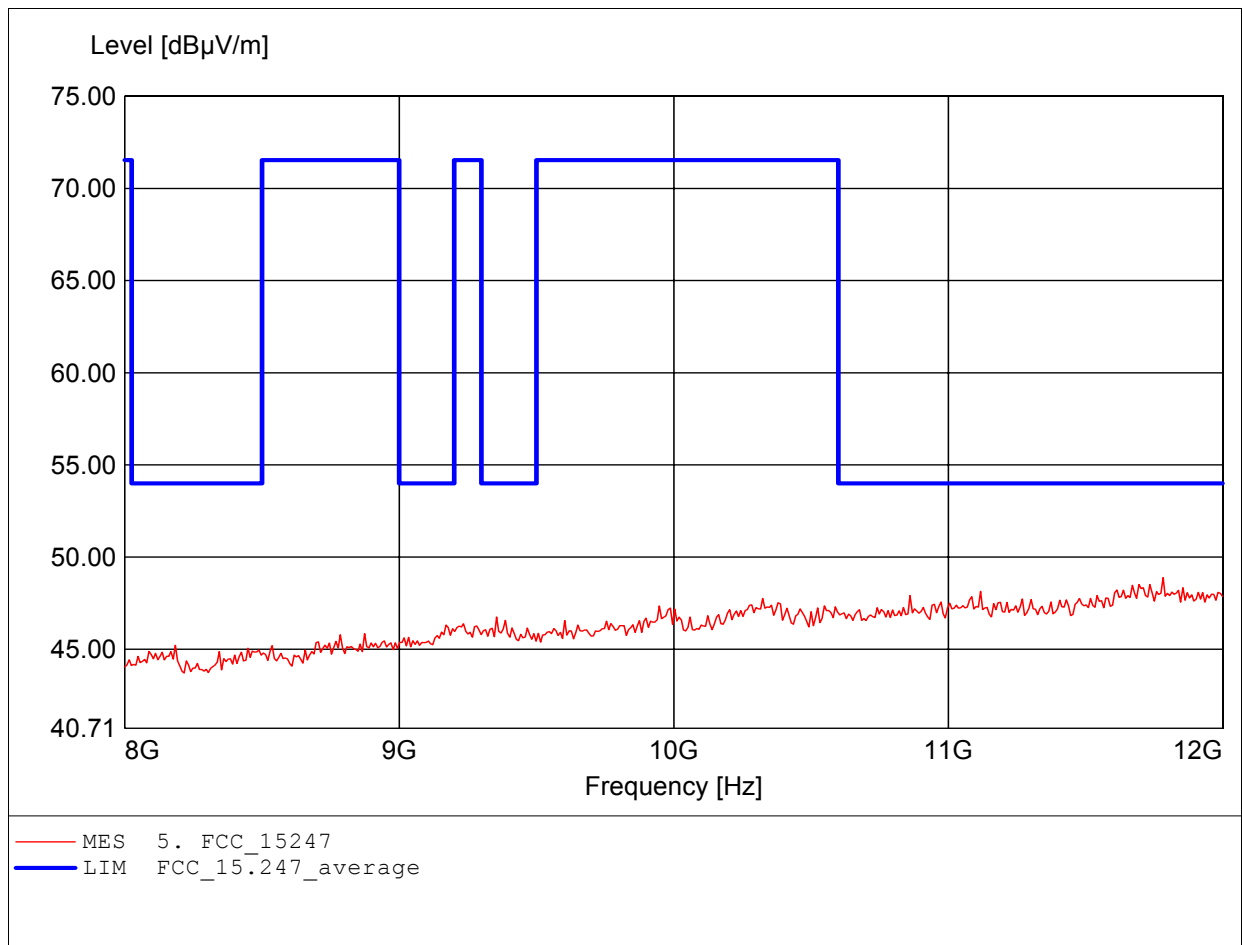
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 7.864GHz, Emax: 52.10dBµV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

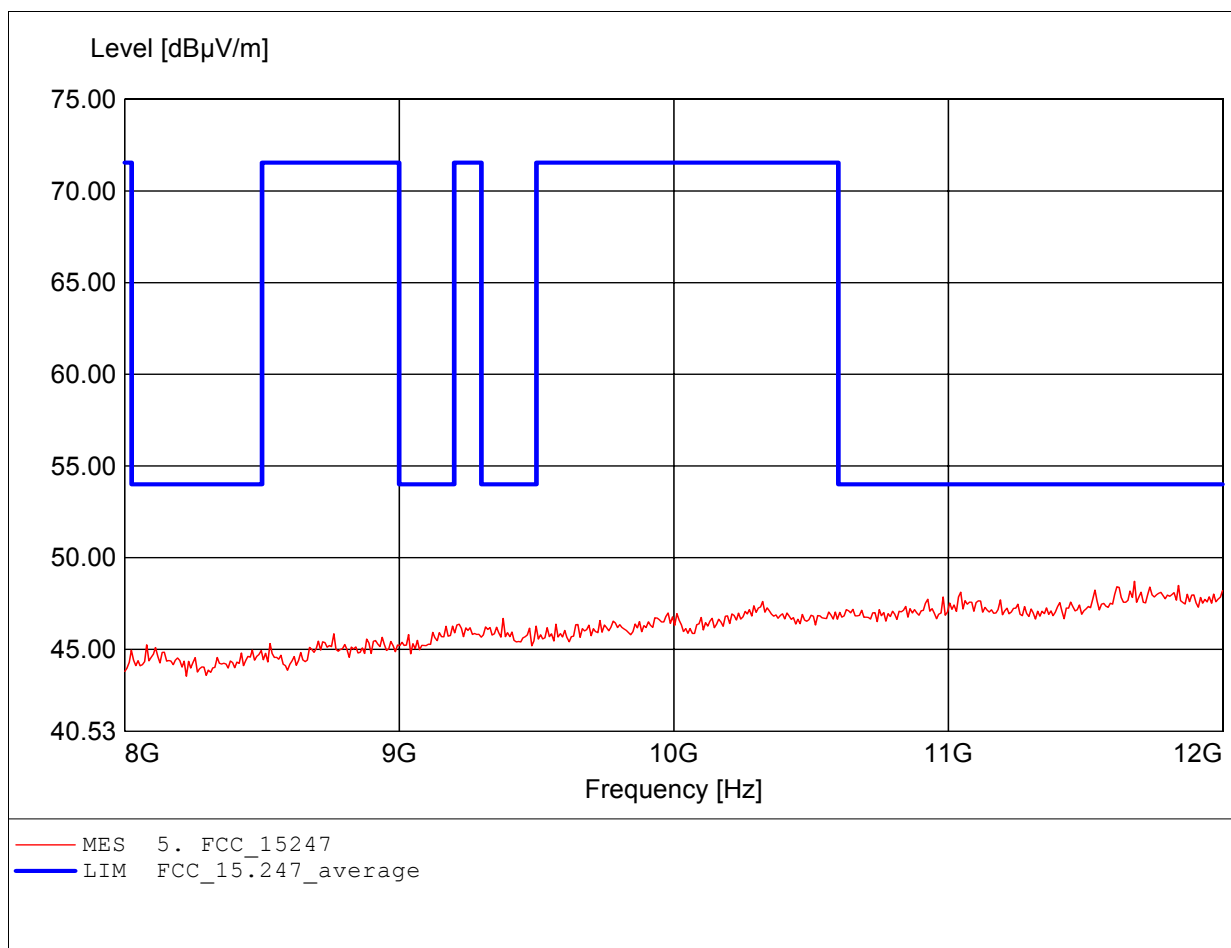
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 11.784GHz, Emax: 48.88dBμV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 11.679GHz, Emax: 48.71dBμV/m, RBW: 1MHz

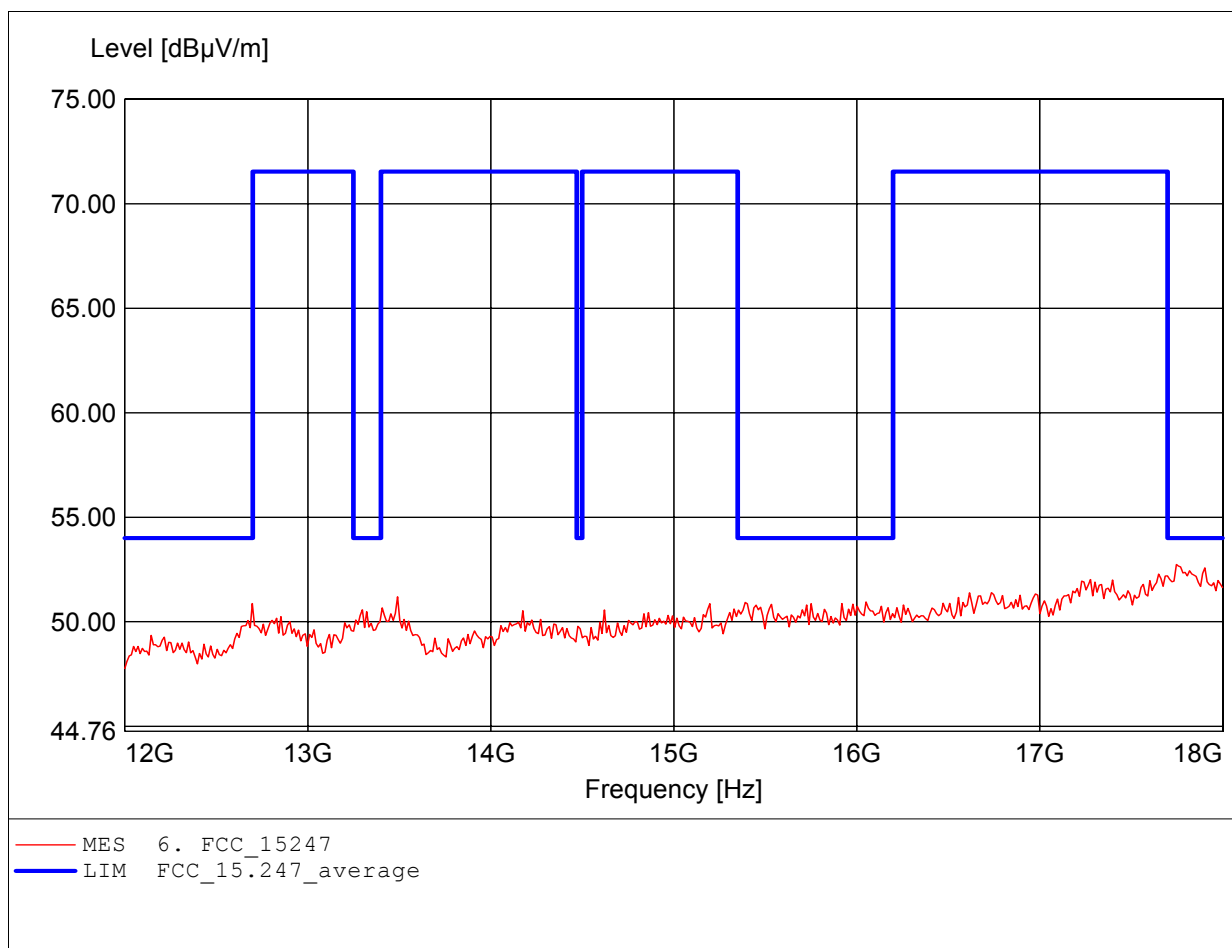




# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

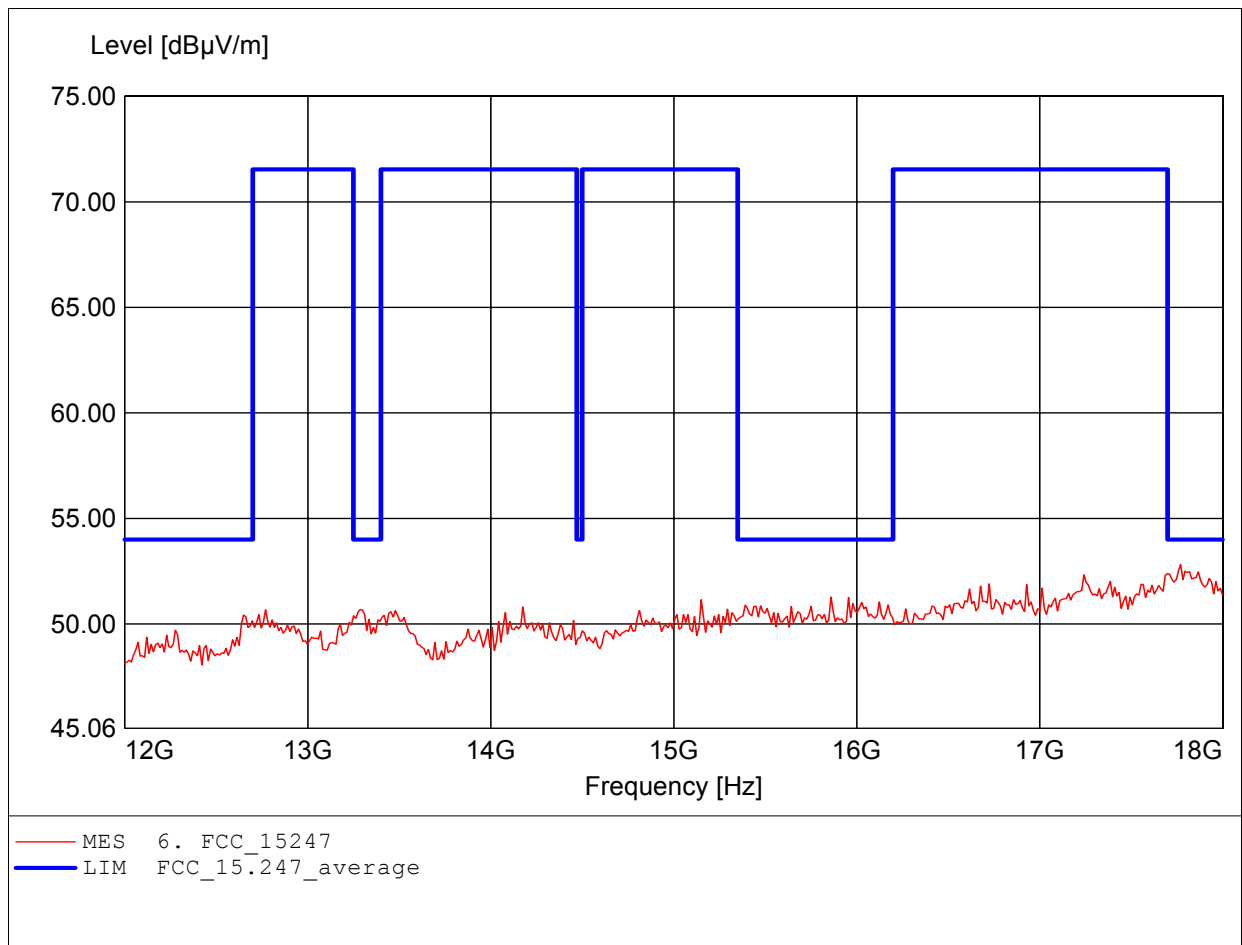
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 17.747GHz, Emax: 52.74dBμV/m, RBW: 1MHz



# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

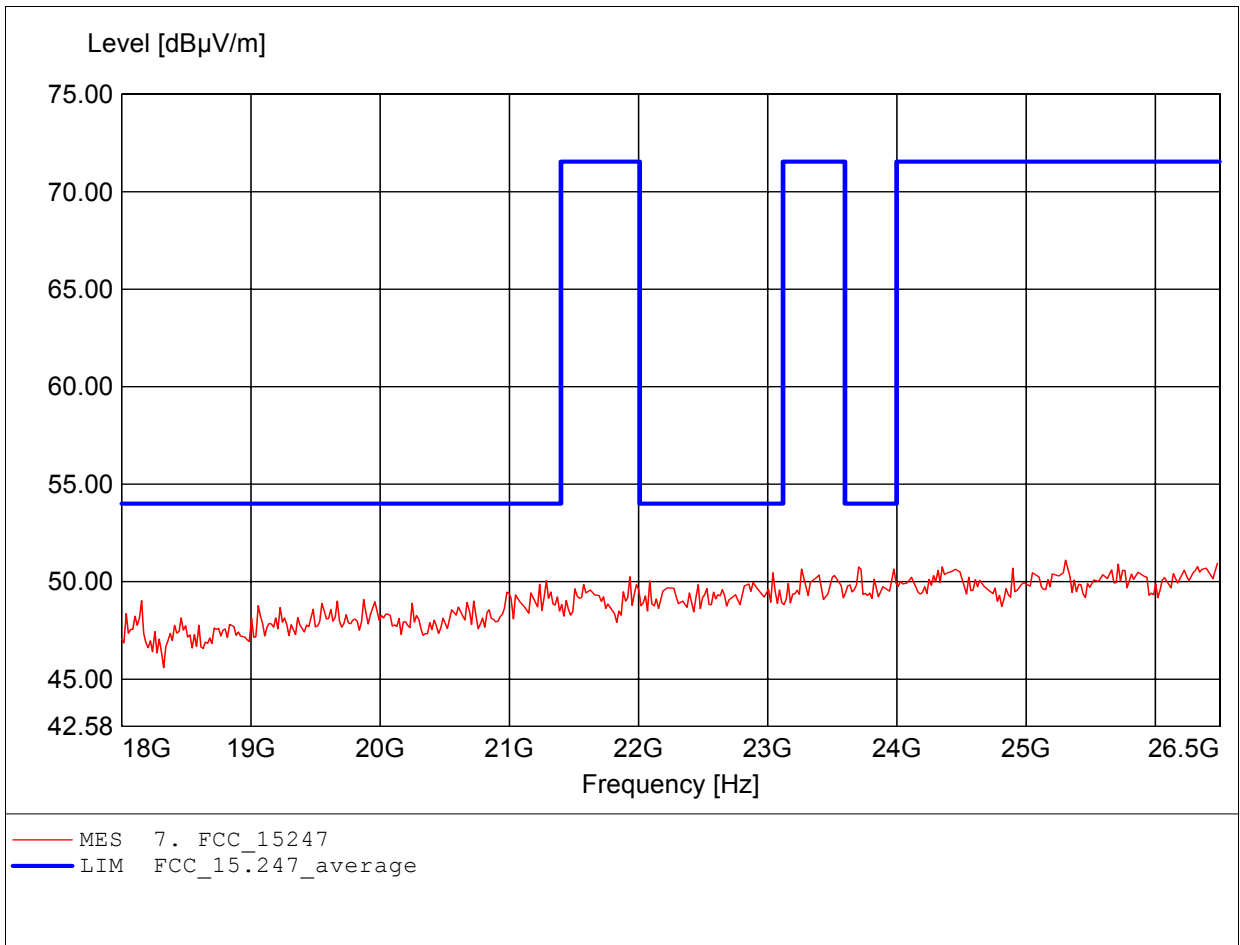
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, ampl.+HP.  
Freq: 17.772GHz, Emax: 52.81dBµV/m, RBW: 1MHz



**Spurious emissions Field Strength**

**FCC RULES PART 15, SUBPART C**

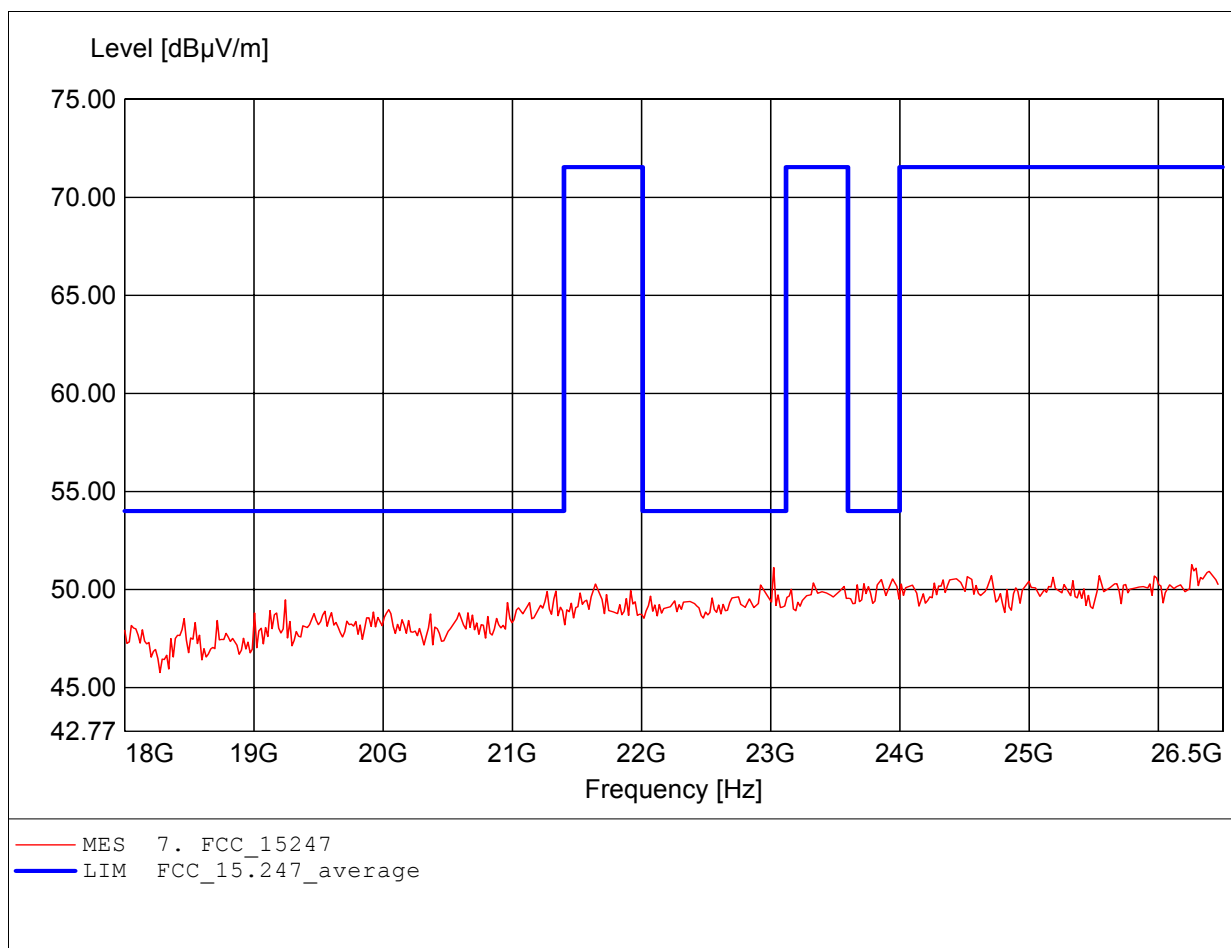
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 25.308GHz, Emax: 51.10dBµV/m, RBW: 1MHz

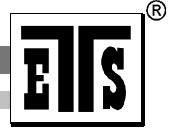


# Spurious emissions Field Strength

## FCC RULES PART 15, SUBPART C

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to §15.247, peak detector  
Comment 1: Dist.: 3m, Ant.: HL025, amplif.  
Freq: 26.262GHz, Emax: 51.26dBμV/m, RBW: 1MHz





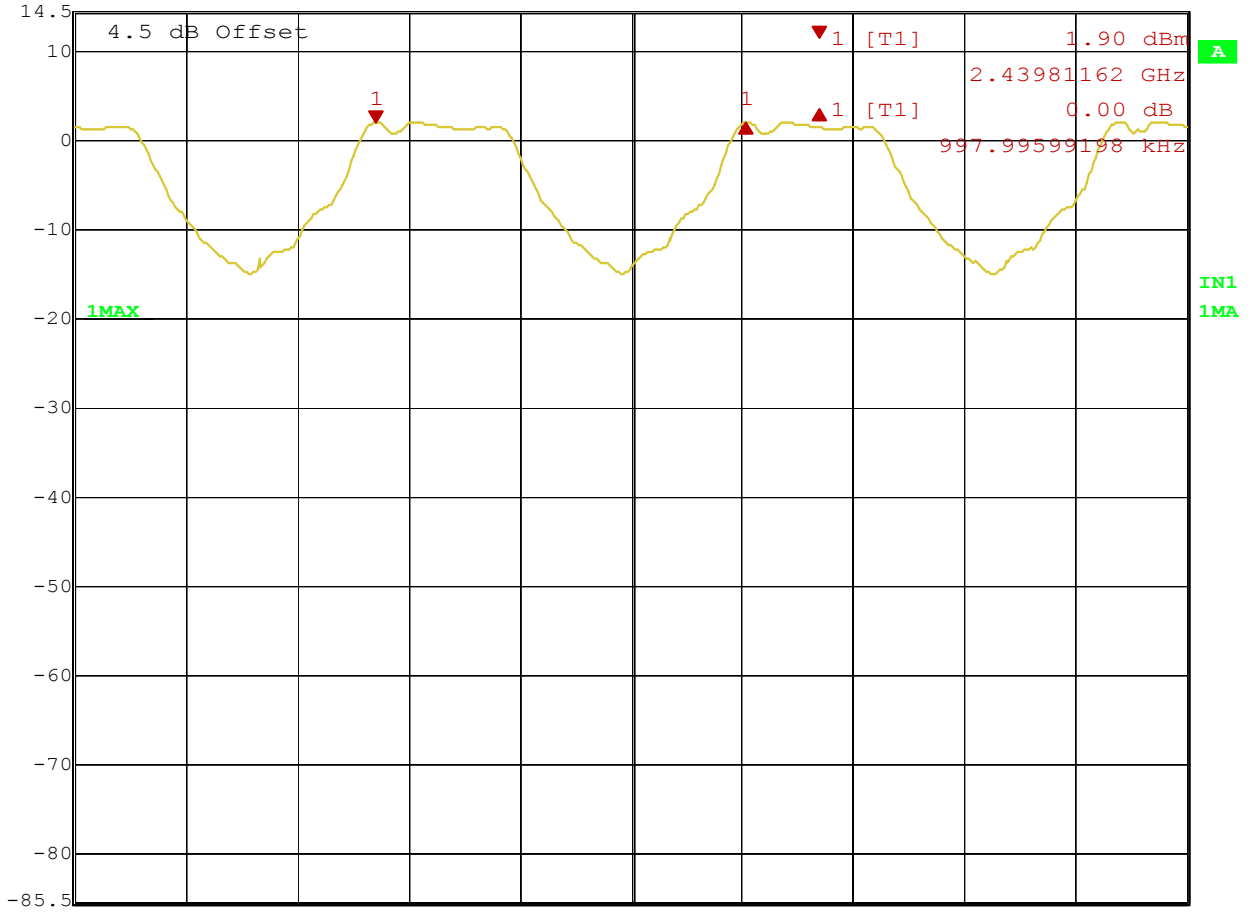
Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

## Appendix C

### Carrier Frequency Separation

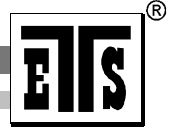


Delta 1 [T1]      RBW 100 kHz      RF Att 20 dB  
 Ref Lvl 14.5 dBm      0.00 dB      VBW 100 kHz  
 997.99599198 kHz      SWT 200 ms      Unit dBm



Center 2.4405 GHz      300 kHz/      Span 3 MHz

Title:      FREQUENCY SEPARTION CH38 AND CH39  
 Comment A: ALPS ELECTRIC CO., LTD.  
 Date:      26.APR.2005 14:45:14



Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

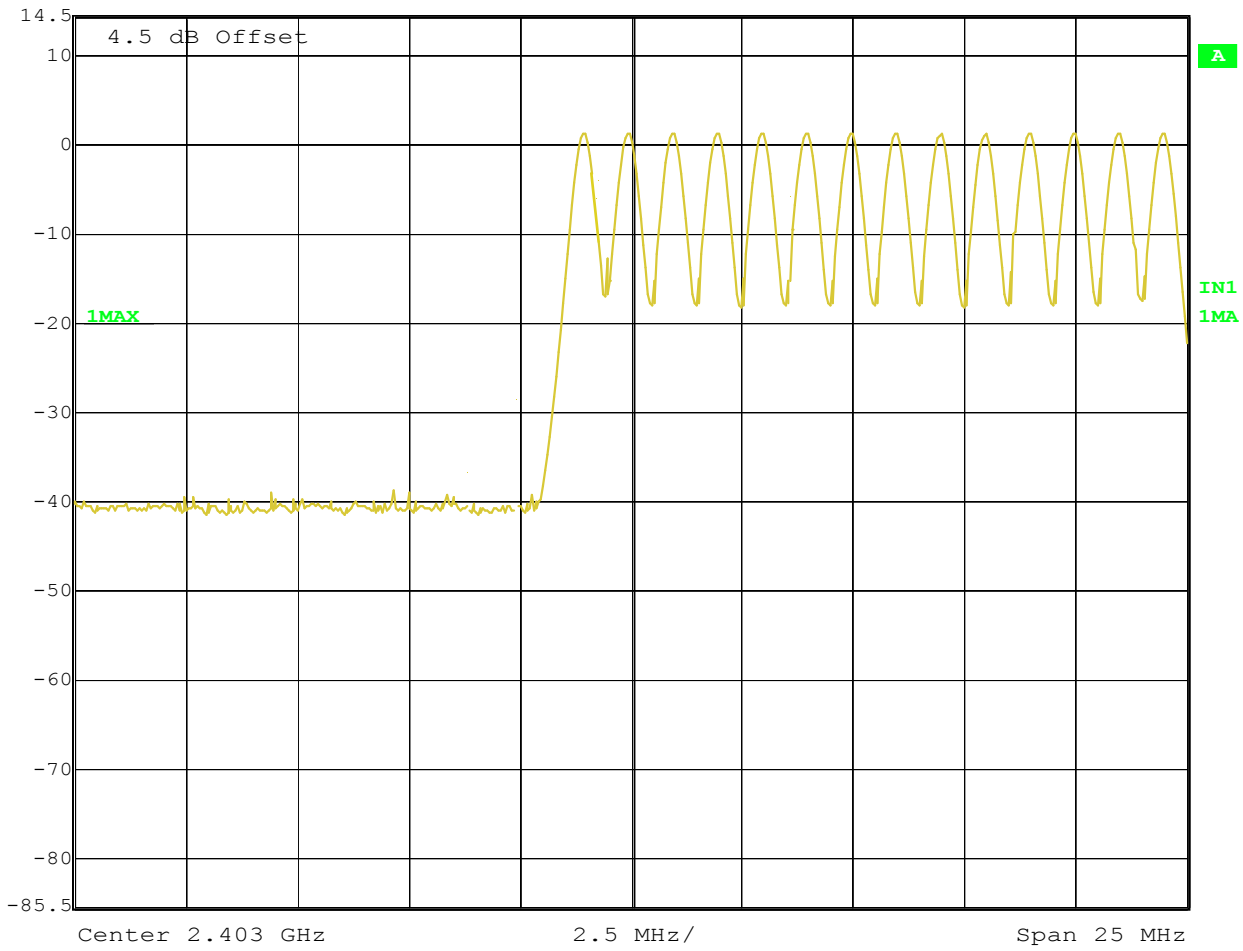
## Appendix D

### Number of Hopping Frequencies



Ref Lvl  
14.5 dBm

RBW 300 kHz RF Att 40 dB  
VBW 300 kHz  
SWT 200 ms Unit dBm



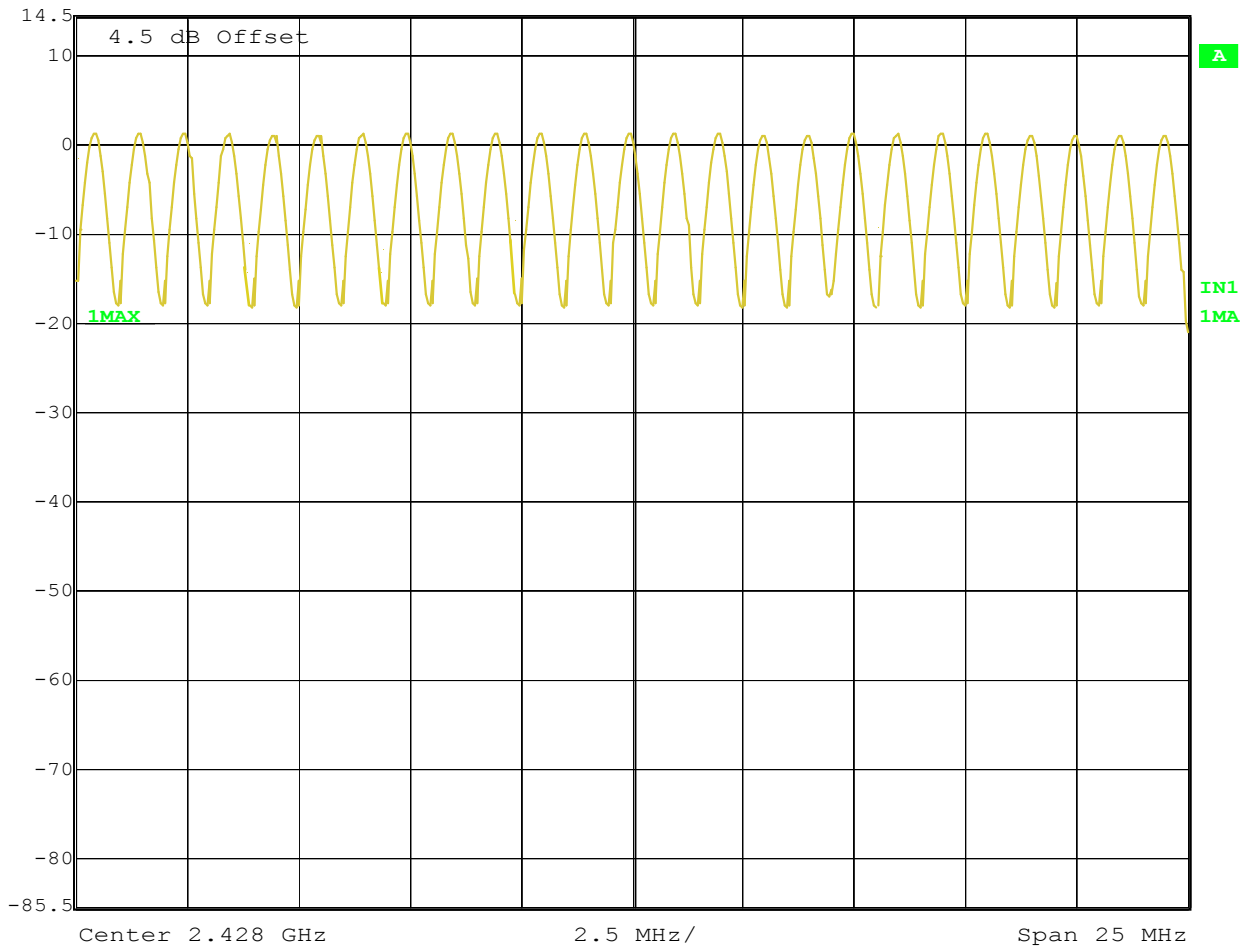
Title: NUMBER OF HOPPING FREQUENCIES (CH:0-13)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 11:03:39





Ref Lvl  
14.5 dBm

RBW 300 kHz RF Att 40 dB  
VBW 300 kHz  
SWT 200 ms Unit dBm

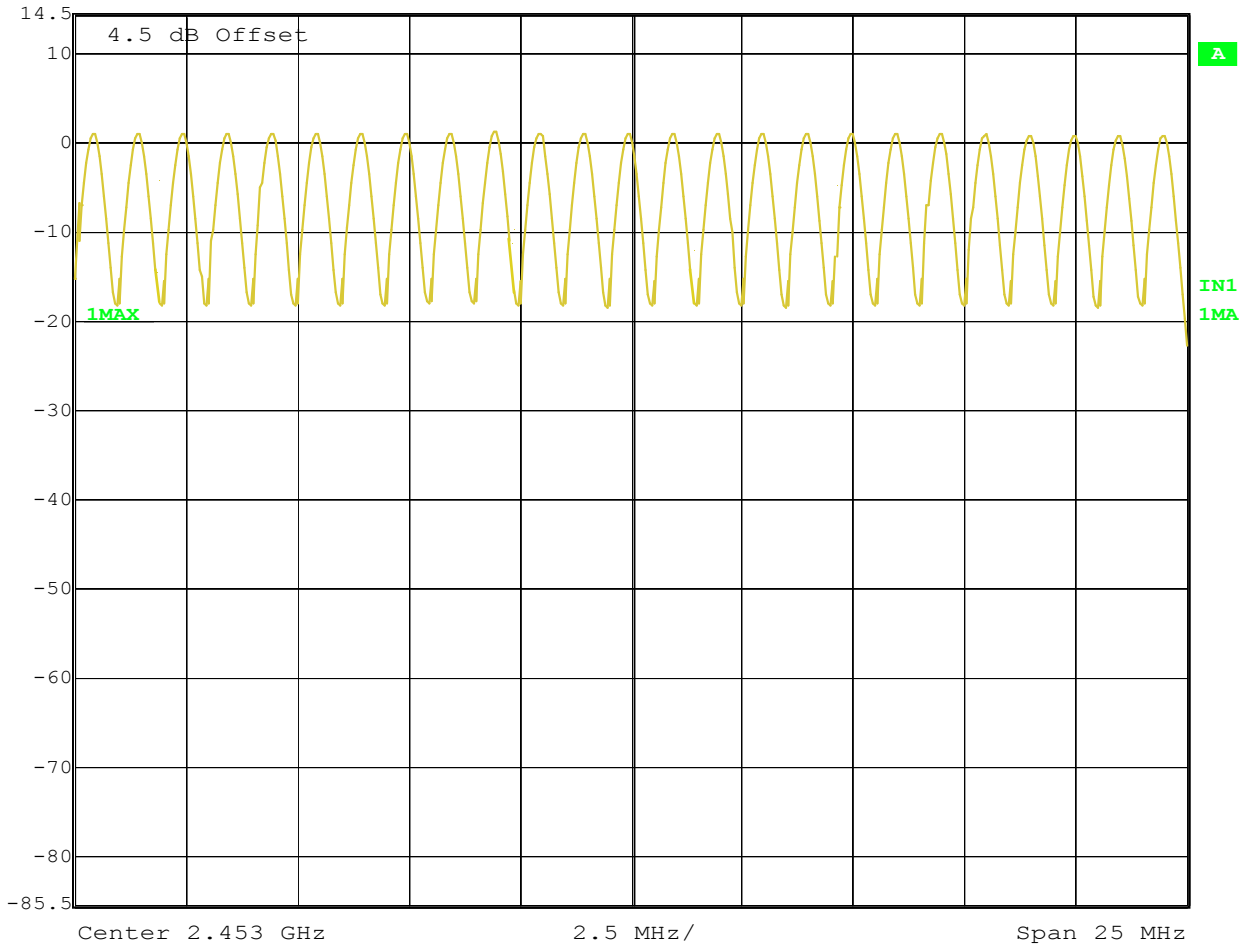


Title: NUMBER OF HOPPING FREQUENCIES (CH:14-38)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 11:05:31



Ref Lvl  
14.5 dBm

RBW 300 kHz RF Att 40 dB  
VBW 300 kHz  
SWT 200 ms Unit dBm

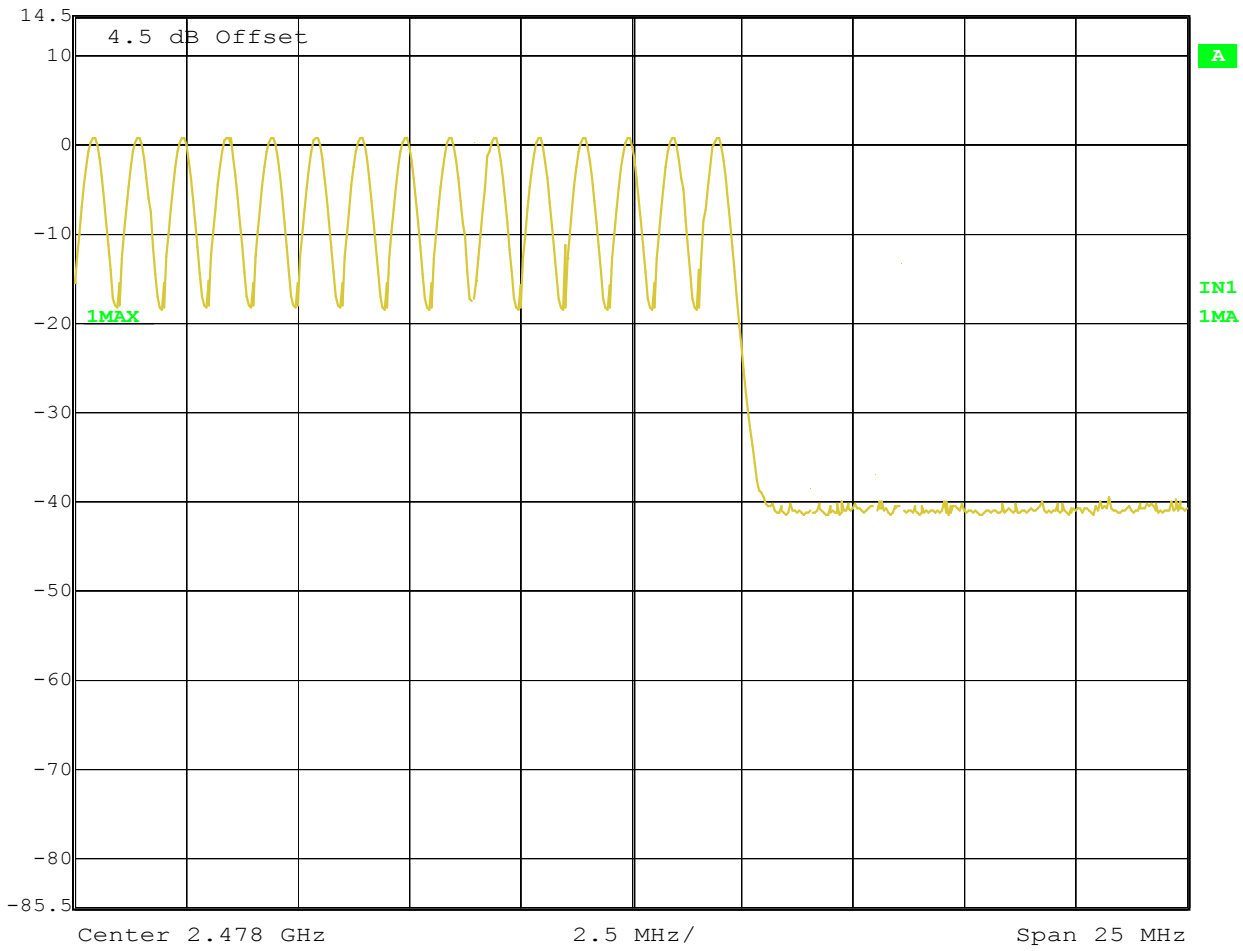


Title: NUMBER OF HOPPING FREQUENCIES (CH:39-63)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 11:07:12



Ref Lvl  
14.5 dBm

RBW 300 kHz RF Att 40 dB  
VBW 300 kHz  
SWT 200 ms Unit dBm

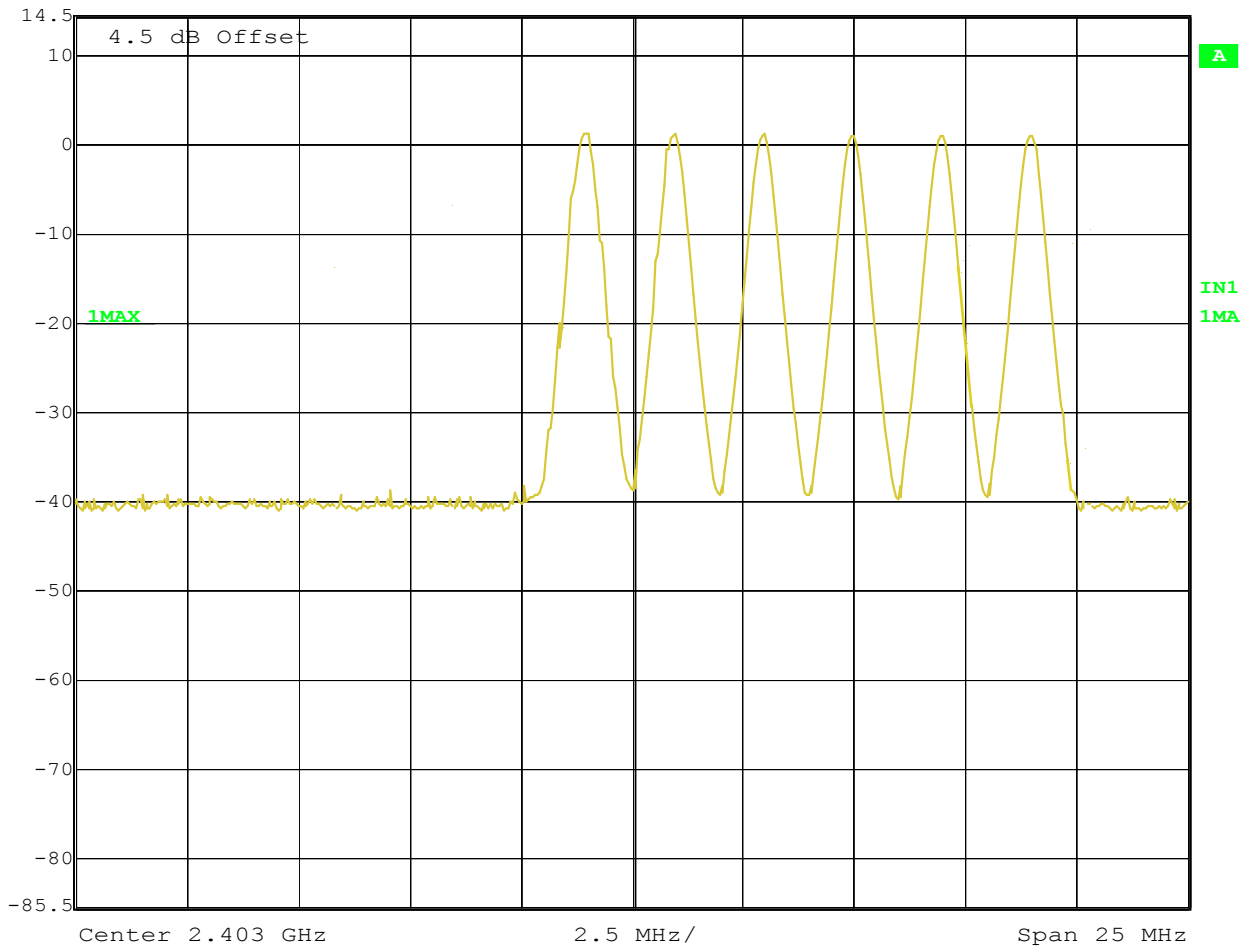


Title: NUMBER OF HOPPING FREQUENCIES (CH:64-78)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 11:08:35



Ref Lvl  
14.5 dBm

RBW 300 kHz RF Att 40 dB  
VBW 300 kHz  
SWT 200 ms Unit dBm

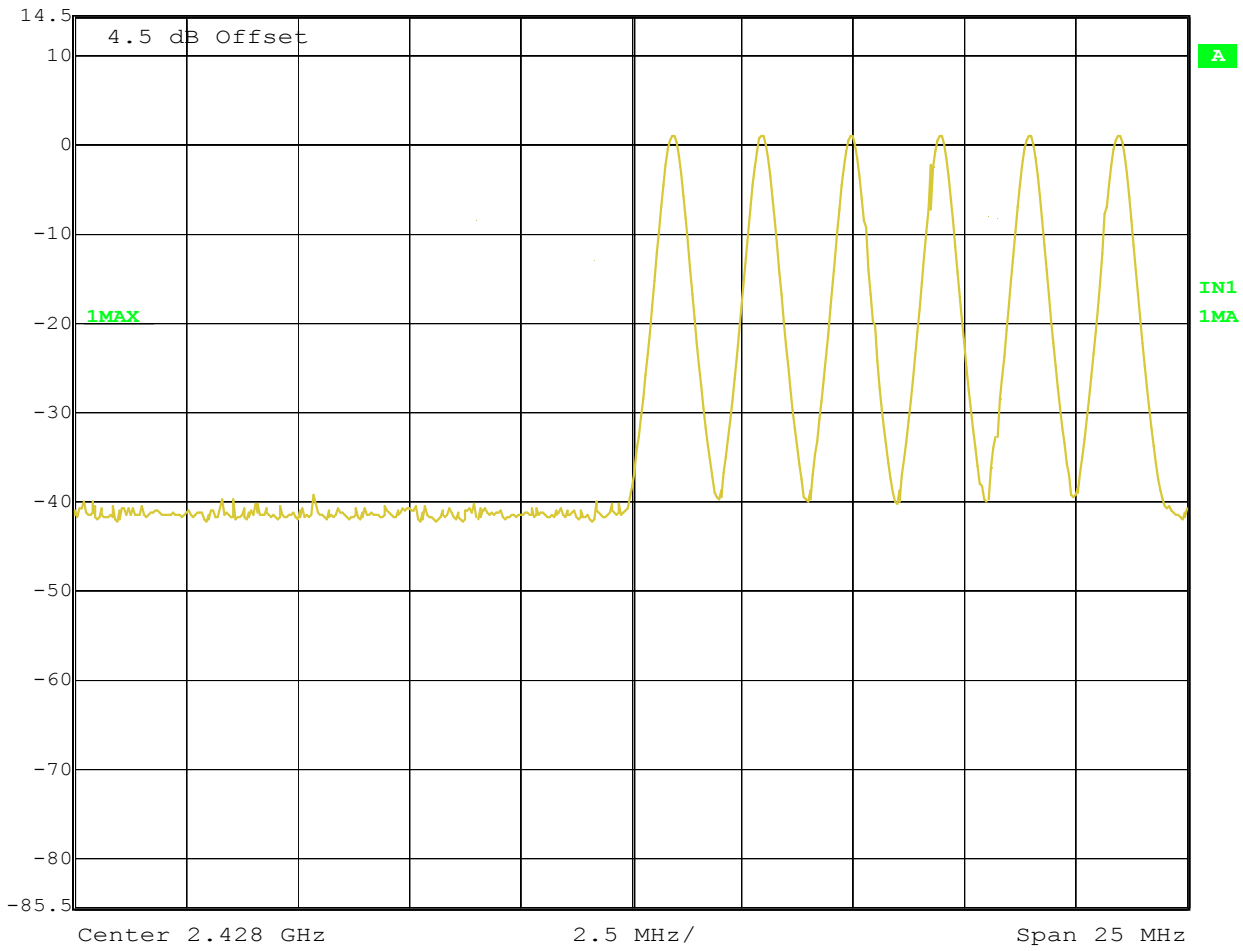


Title: NUMBER OF HOPPING FREQUENCIES (MASTER INQUIRY MODE)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 10:56:52



Ref Lvl  
14.5 dBm

RBW 300 kHz RF Att 40 dB  
VBW 300 kHz  
SWT 200 ms Unit dBm

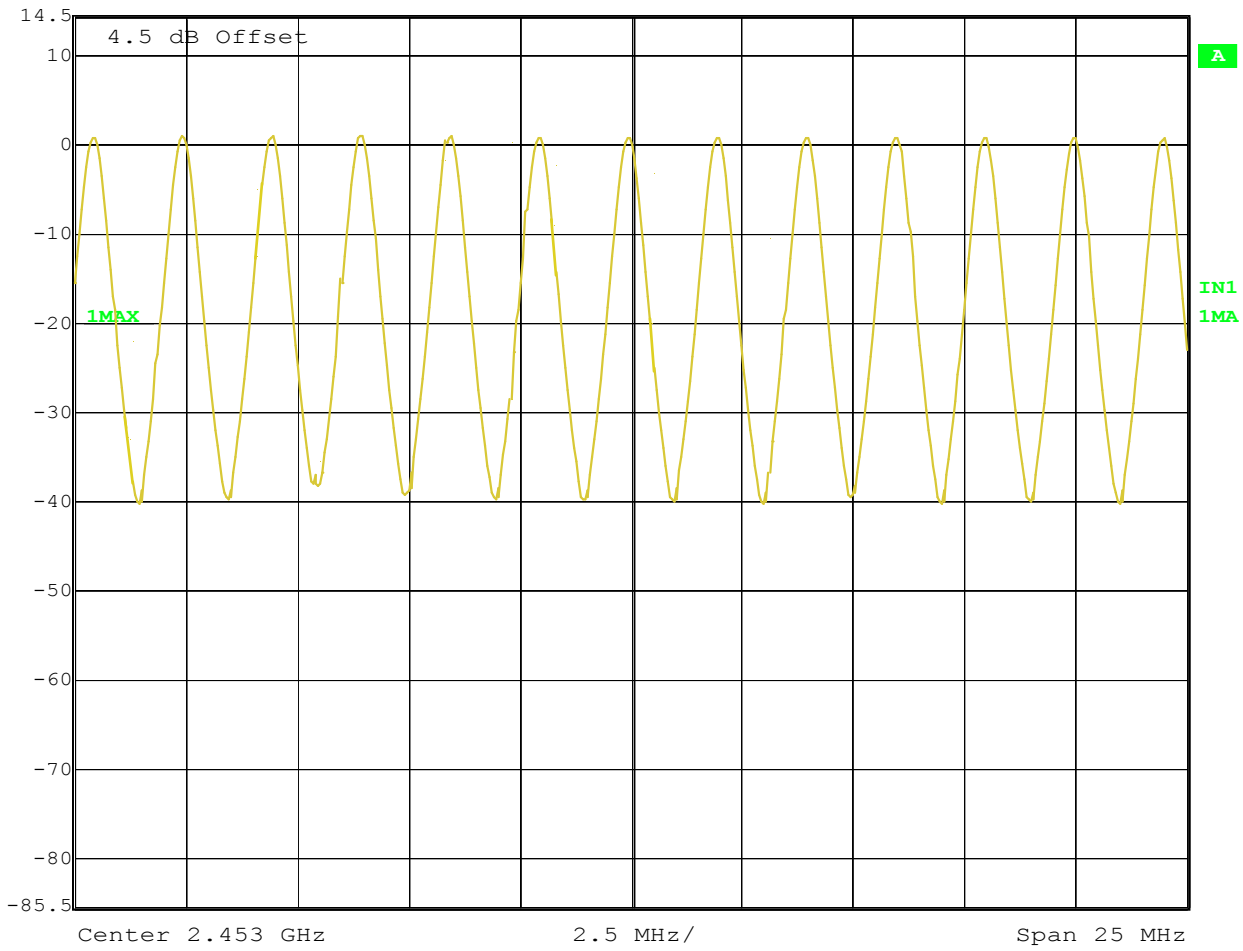


Title: NUMBER OF HOPPING FREQUENCIES (MASTER INQUIRY MODE)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 11:00:22



Ref Lvl  
14.5 dBm

RBW 300 kHz RF Att 40 dB  
VBW 300 kHz  
SWT 200 ms Unit dBm

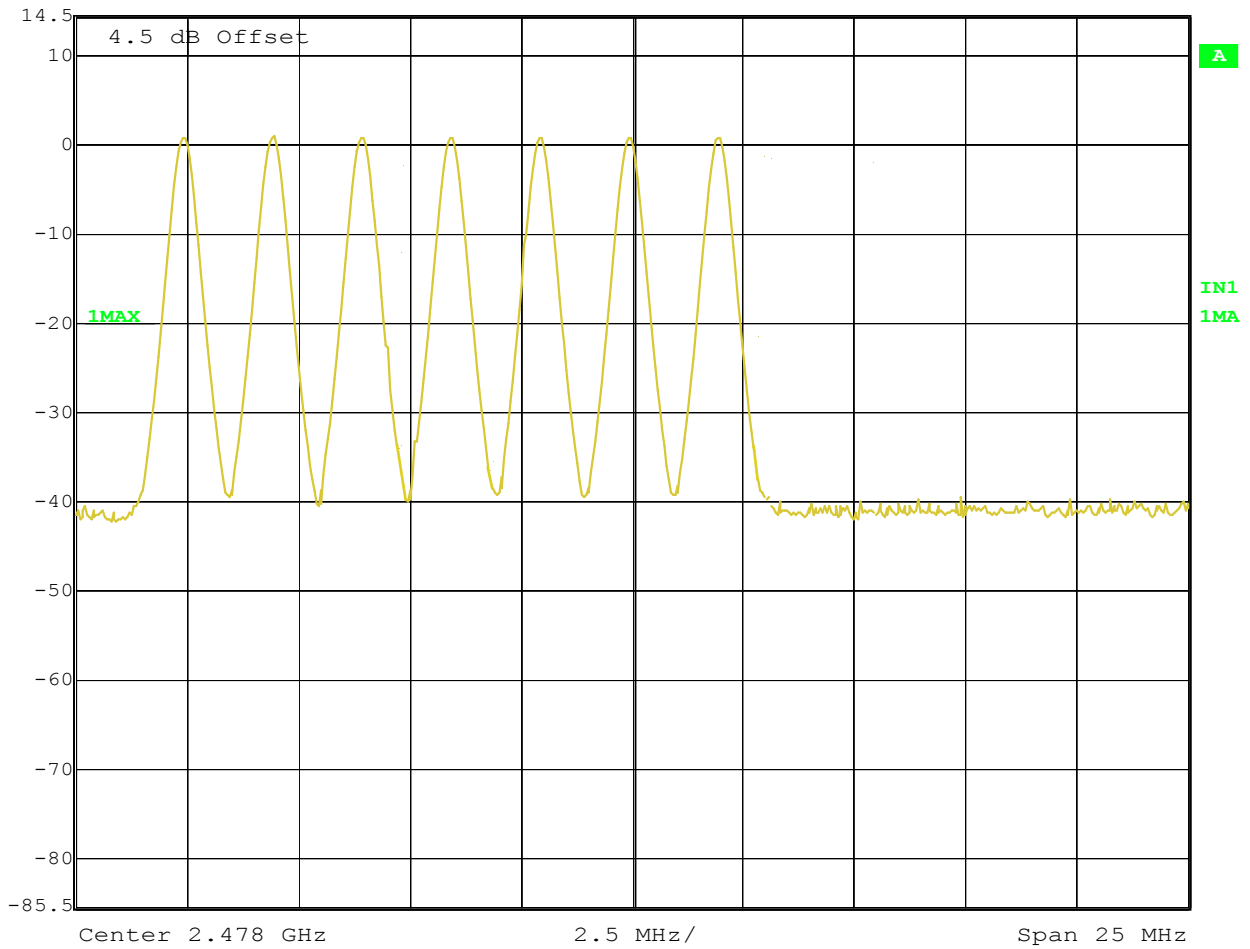


Title: NUMBER OF HOPPING FREQUENCIES (MASTER INQUIRY MODE)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 10:59:27

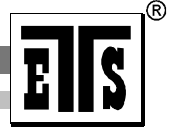


Ref Lvl  
14.5 dBm

RBW 300 kHz RF Att 40 dB  
VBW 300 kHz  
SWT 200 ms Unit dBm



Title: NUMBER OF HOPPING FREQUENCIES (MASTER INQUIRY MODE)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 10:58:00



Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

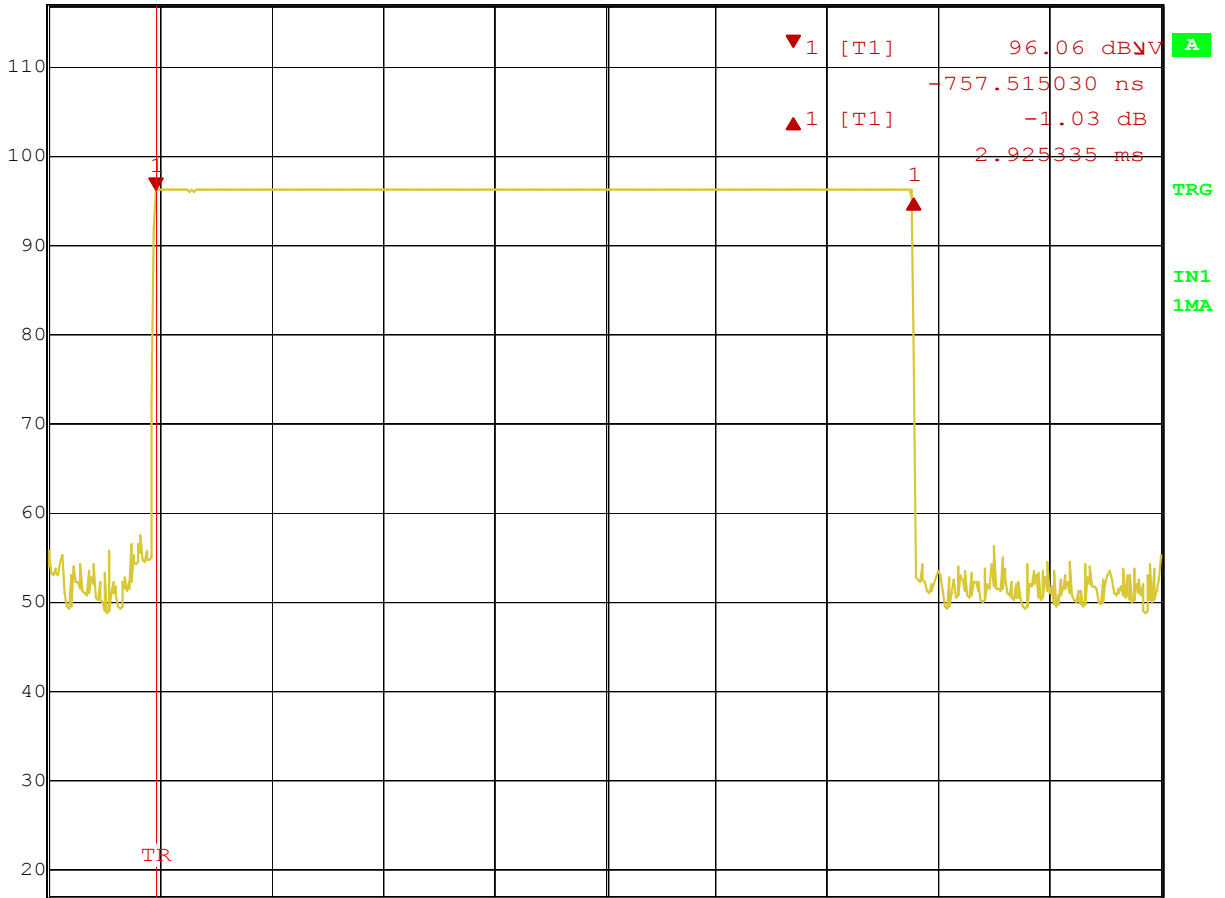
**Appendix E**

Time of Occupancy (Dwell Time)





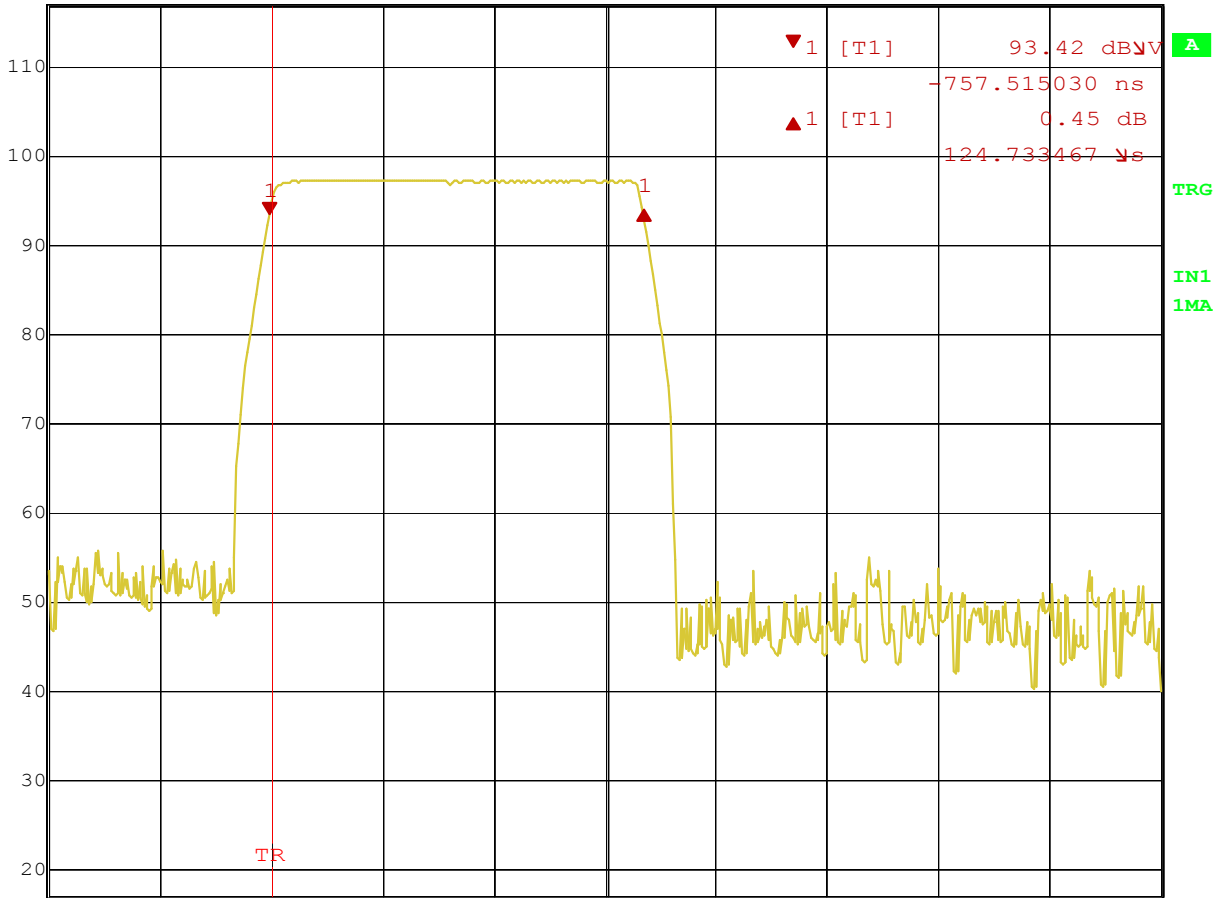
	Delta 1 [T1]	RBW	1 MHz	RF Att	30 dB
Ref Lvl	-1.03 dB	VBW	1 MHz		
117 dB $\mu$ V	2.925335 ms	SWT	4.3 ms	Unit	dB $\mu$ V



Title: Time of occupancy ( Hopping Mode) 2925.335us x 68events=198.92ms  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 28.APR.2005 19:34:06



Delta 1 [T1] RBW 1 MHz RF Att 30 dB  
Ref Lvl 0.45 dB VBW 1 MHz  
117 dBμV 124.733467 μs SWT 370 μs Unit dBμV



Center 2.41 GHz 37 μs/

Title: Time of occupancy ( Inquiry Mode) 124.73us x 470events=58.62ms  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 28.APR.2005 19:27:48



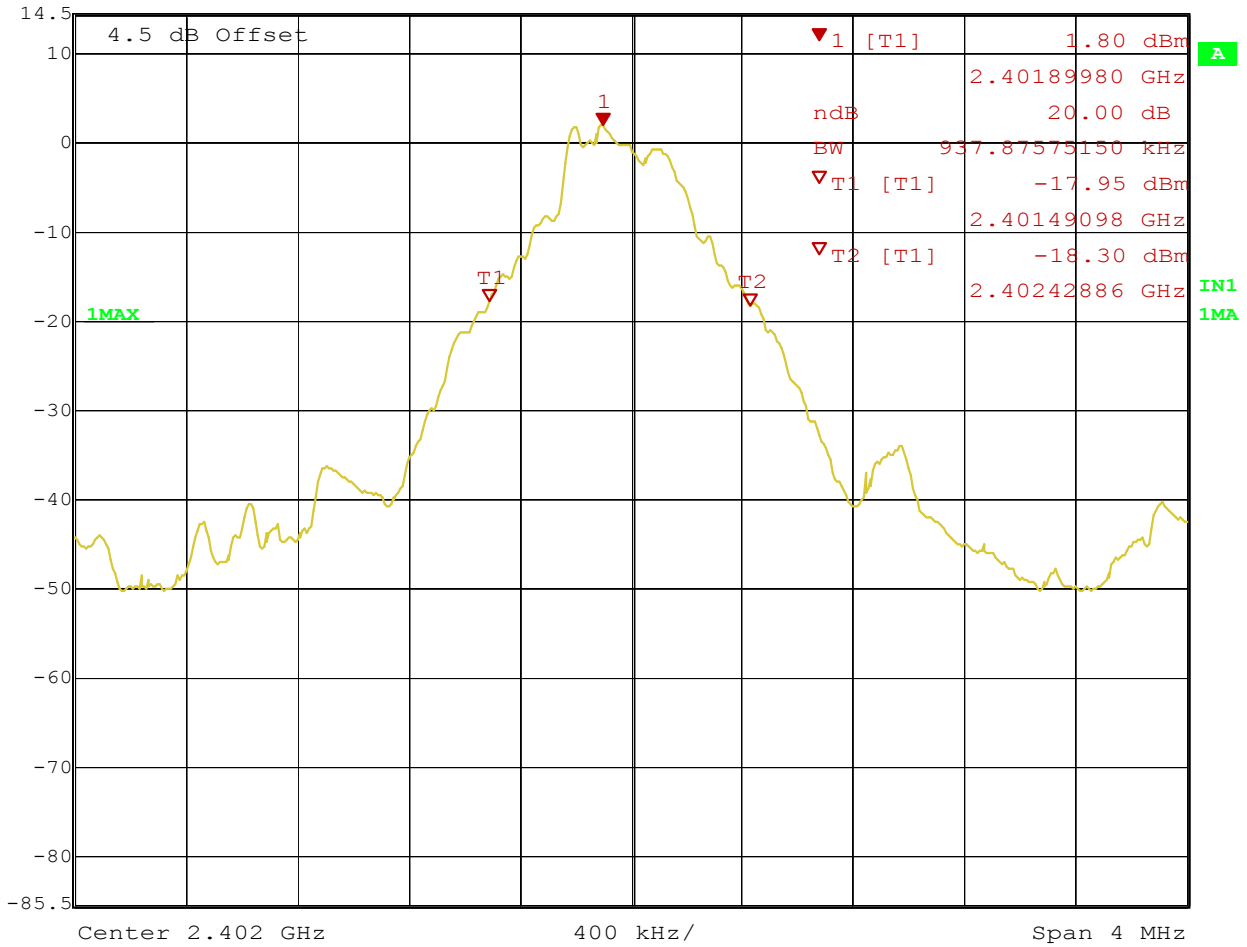
Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

**Appendix F**

20dB Bandwidth



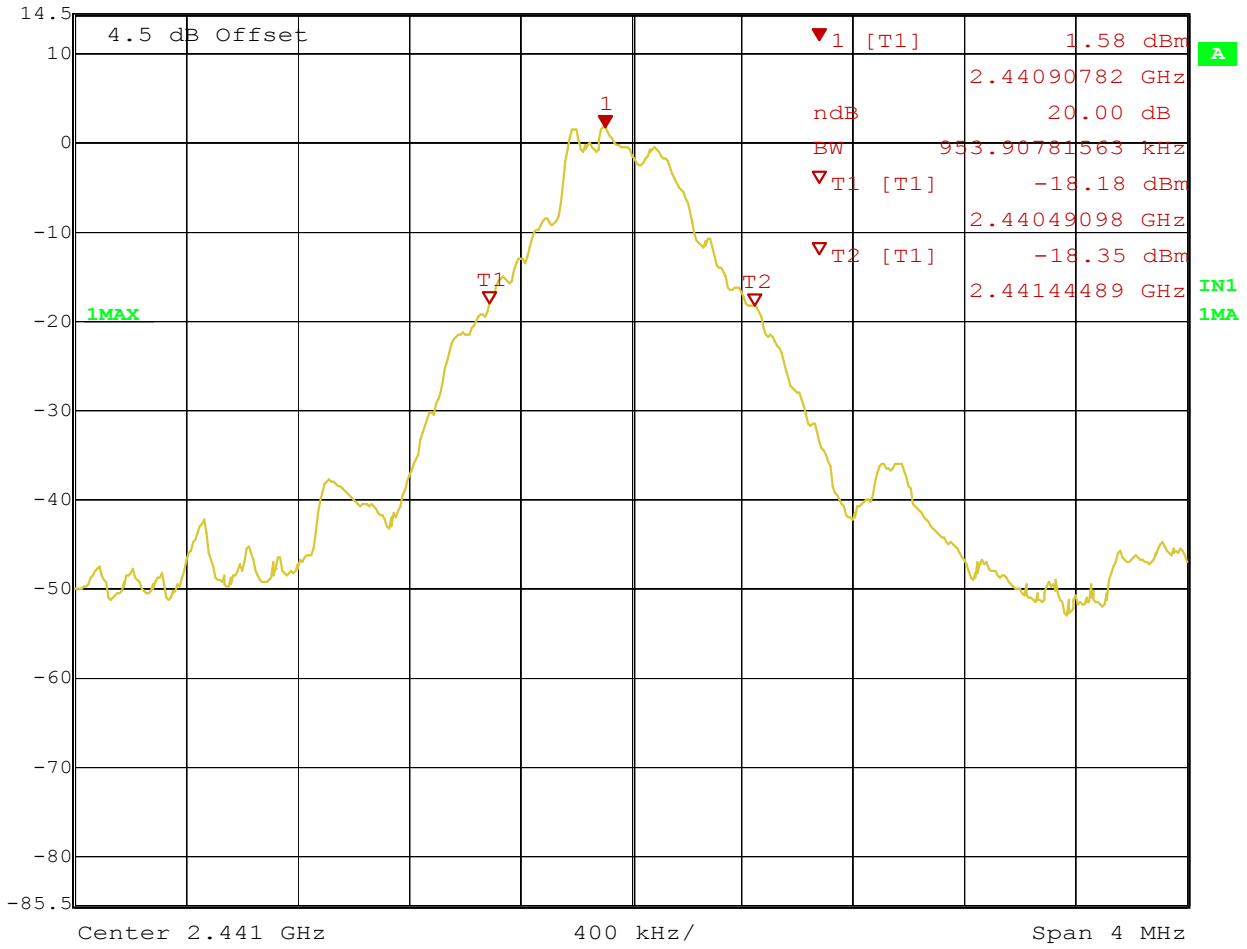
	Marker 1 [T1 ndB]	RBW	50 kHz	RF Att	20 dB
Ref Lvl	ndB	20.00 dB	VBW	100 kHz	
14.5 dBm	BW	937.87575150 kHz	SWT	200 ms	Unit dBm



Title: 20dB BANDWIDTH CH0  
 Comment A: ALPS ELECTRIC CO., LTD.  
 Date: 22.APR.2005 10:26:48



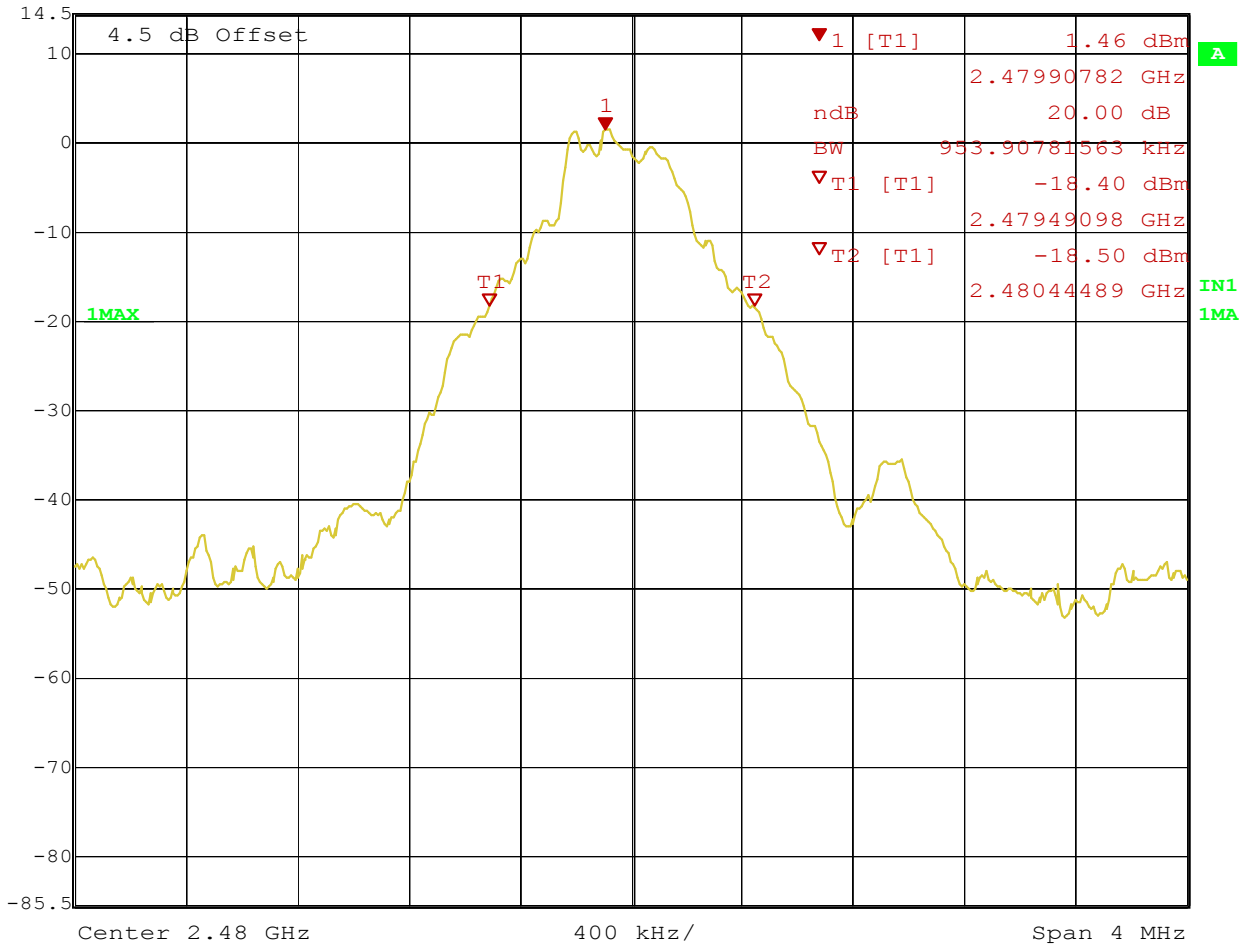
	Marker 1 [T1 ndB]	RBW	50 kHz	RF Att	20 dB
Ref Lvl	ndB	20.00 dB	VBW	100 kHz	
14.5 dBm	BW	953.90781563 kHz	SWT	200 ms	Unit dBm



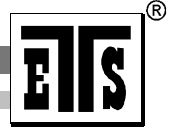
Title: 20dB BANDWIDTH CH39  
 Comment A: ALPS ELECTRIC CO., LTD.  
 Date: 22.APR.2005 10:29:59



Marker 1 [T1 ndB]      RBW    50 kHz    RF Att    20 dB  
 Ref Lvl                ndB            20.00 dB    VBW    100 kHz  
 14.5 dBm              BW    953.90781563 kHz    SWT    200 ms    Unit                dBm



Title:            20dB BANDWIDTH CH78  
 Comment A:    ALPS ELECTRIC CO., LTD.  
 Date:            22.APR.2005 10:29:15



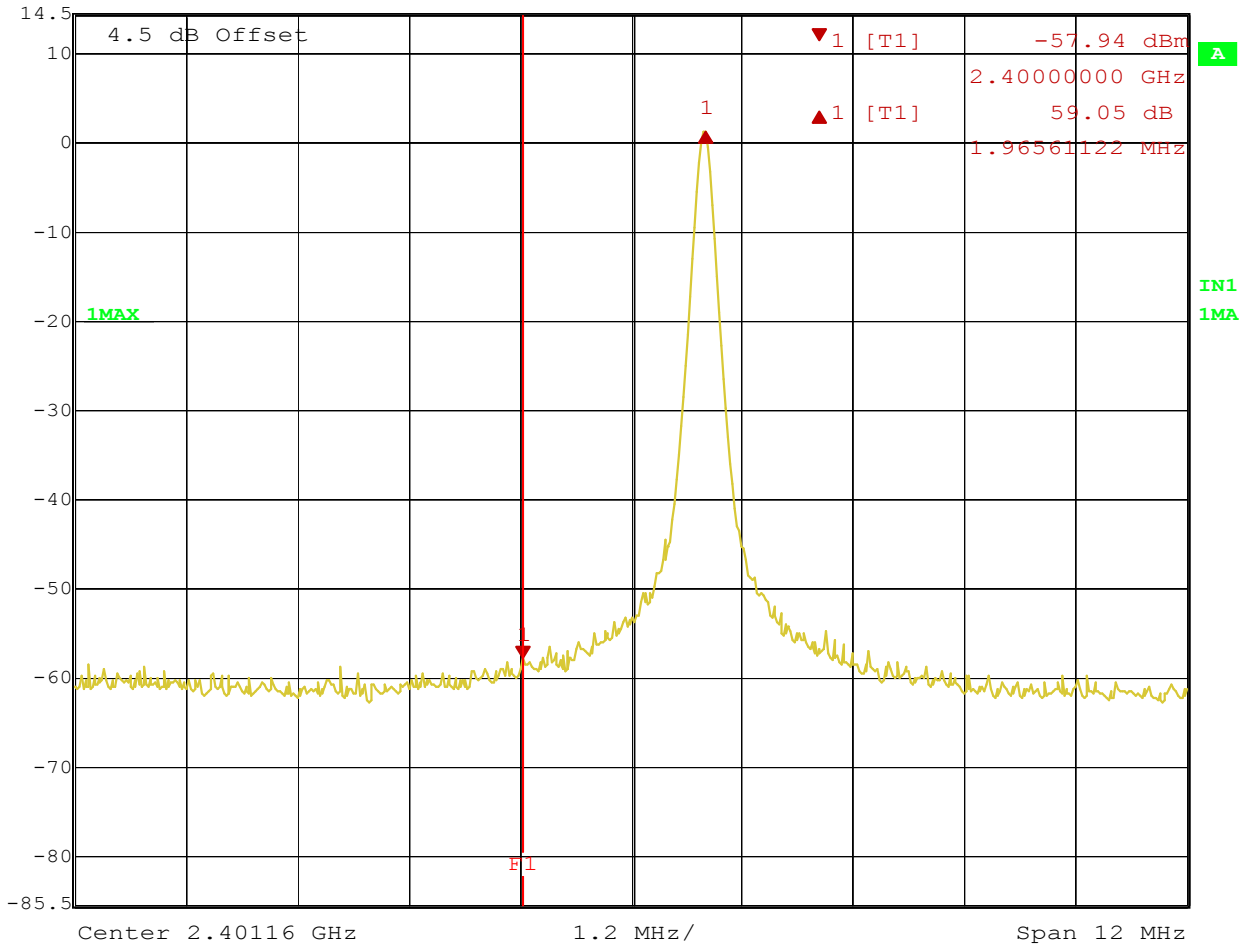
Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

## Appendix G

### Band-edge Compliance of RF Conducted Emissions



	Delta 1 [T1]	RBW	100 kHz	RF Att	20 dB
Ref Lvl	59.05 dB	VBW	100 kHz		
14.5 dBm	1.96561122 MHz	SWT	200 ms	Unit	dBm

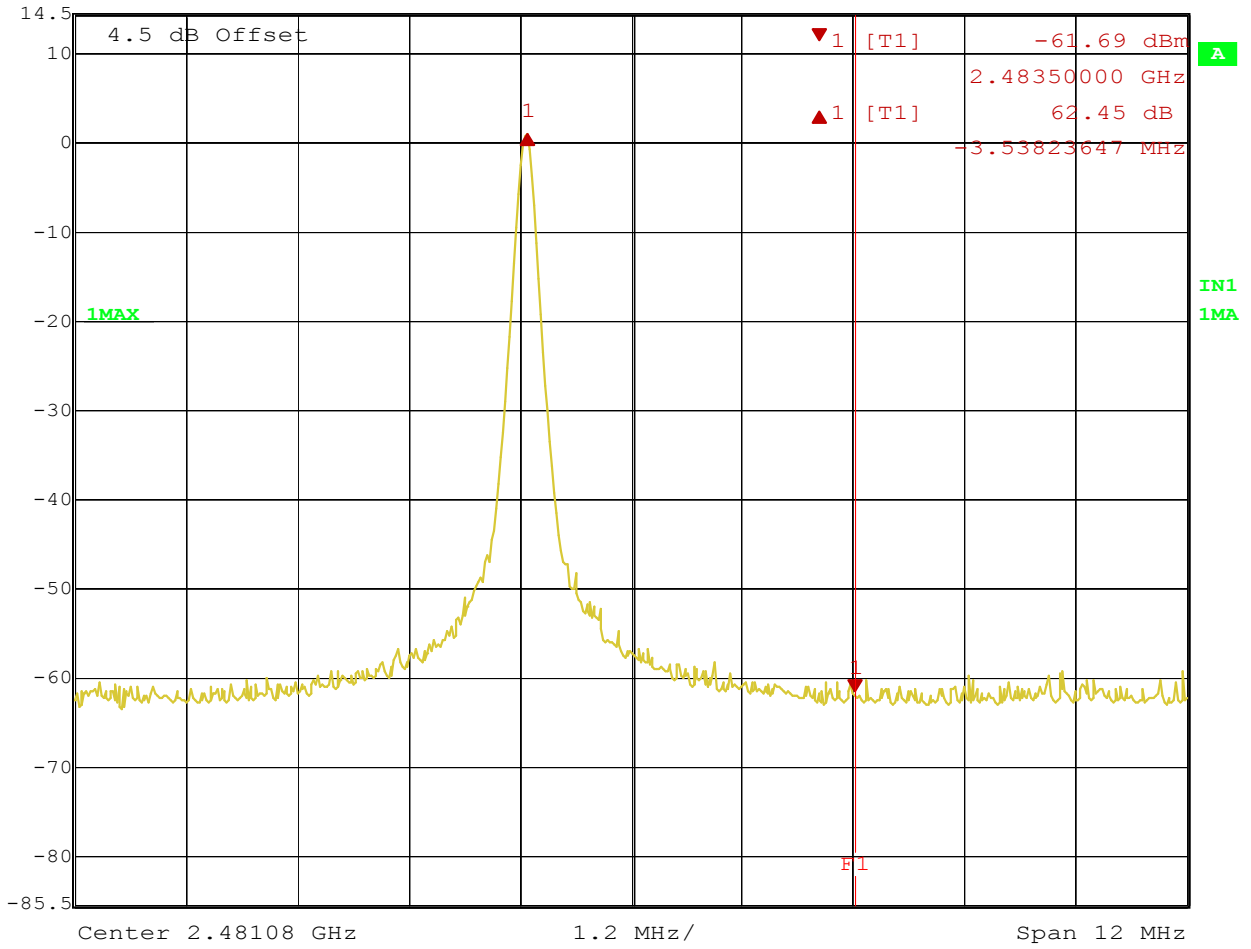


Title:      BANDEDGE COMPLIANCE CH0 (CONDUCT,SINGLE MODE)  
 Comment A: ALPS ELECTRIC CO., LTD.  
 Date:      22.APR.2005 10:42:01





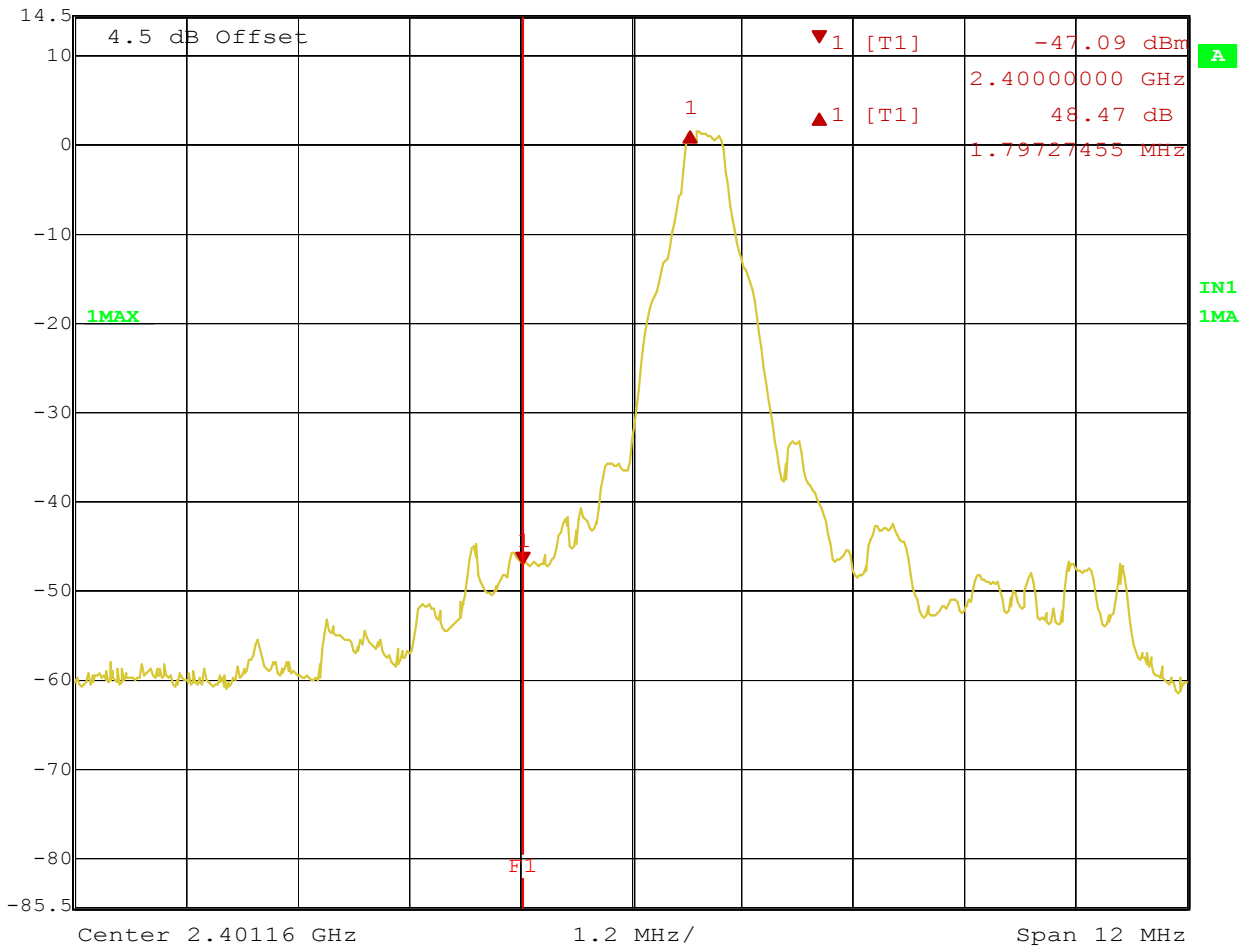
Delta 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl 62.45 dB VBW 100 kHz  
14.5 dBm -3.53823647 MHz SWT 200 ms Unit dBm



Title: BANDEDGE COMPLIANCE CH78 (CONDUCT,SINGLE MODE)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 10:40:02



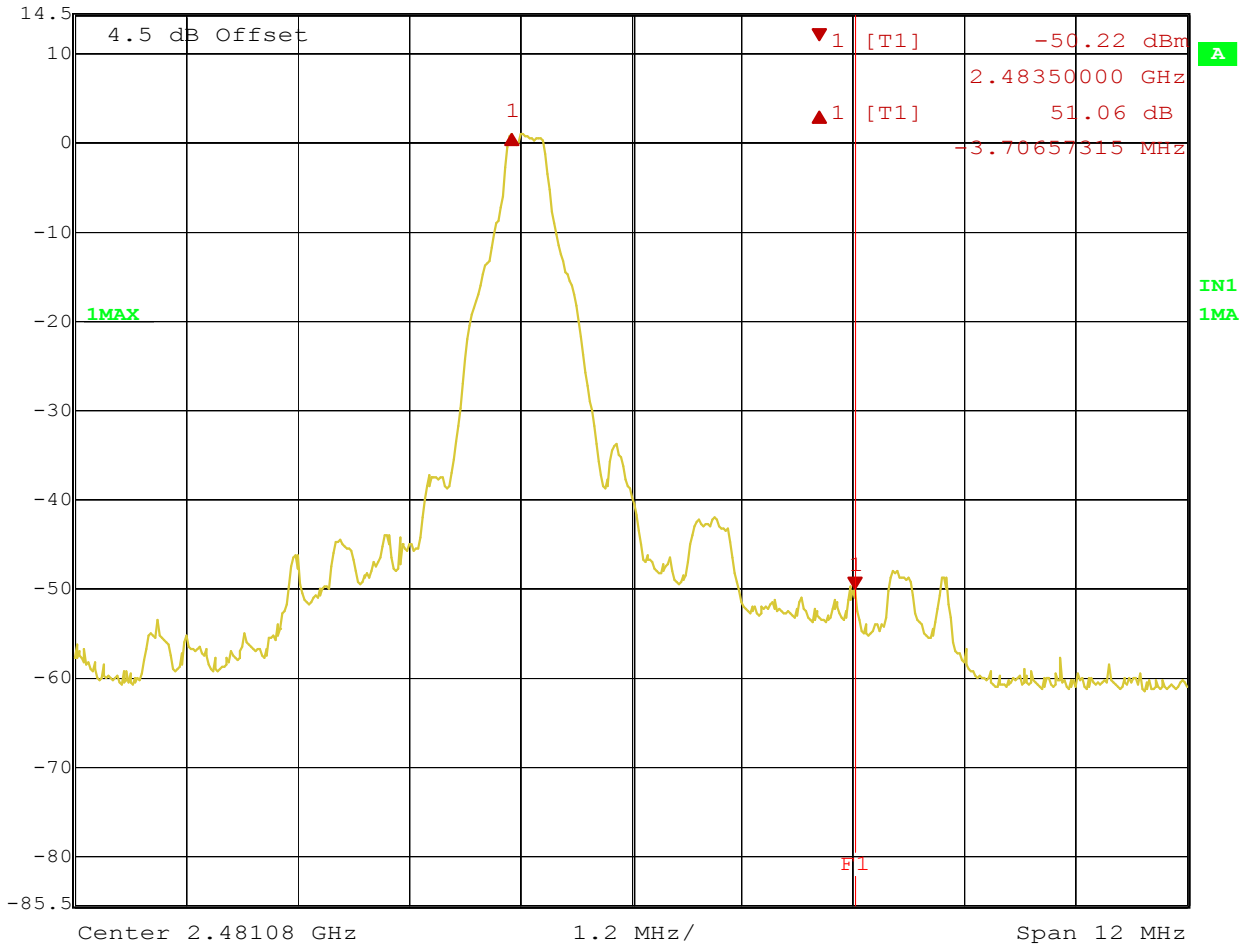
Delta 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl 48.47 dB VBW 100 kHz  
14.5 dBm 1.79727455 MHz SWT 200 ms Unit dBm



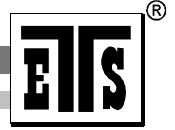
Title: BANDEDGE COMPLIANCE CH0 (CONDUCT,HOPPING MODE)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 10:35:30



Delta 1 [T1] RBW 100 kHz RF Att 20 dB  
Ref Lvl 51.06 dB VBW 100 kHz  
14.5 dBm -3.70657315 MHz SWT 200 ms Unit dBm



Title: BANDEDGE COMPLIANCE CH78 (CONDUCT,HOPPING MODE)  
Comment A: ALPS ELECTRIC CO., LTD.  
Date: 22.APR.2005 10:37:21



Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

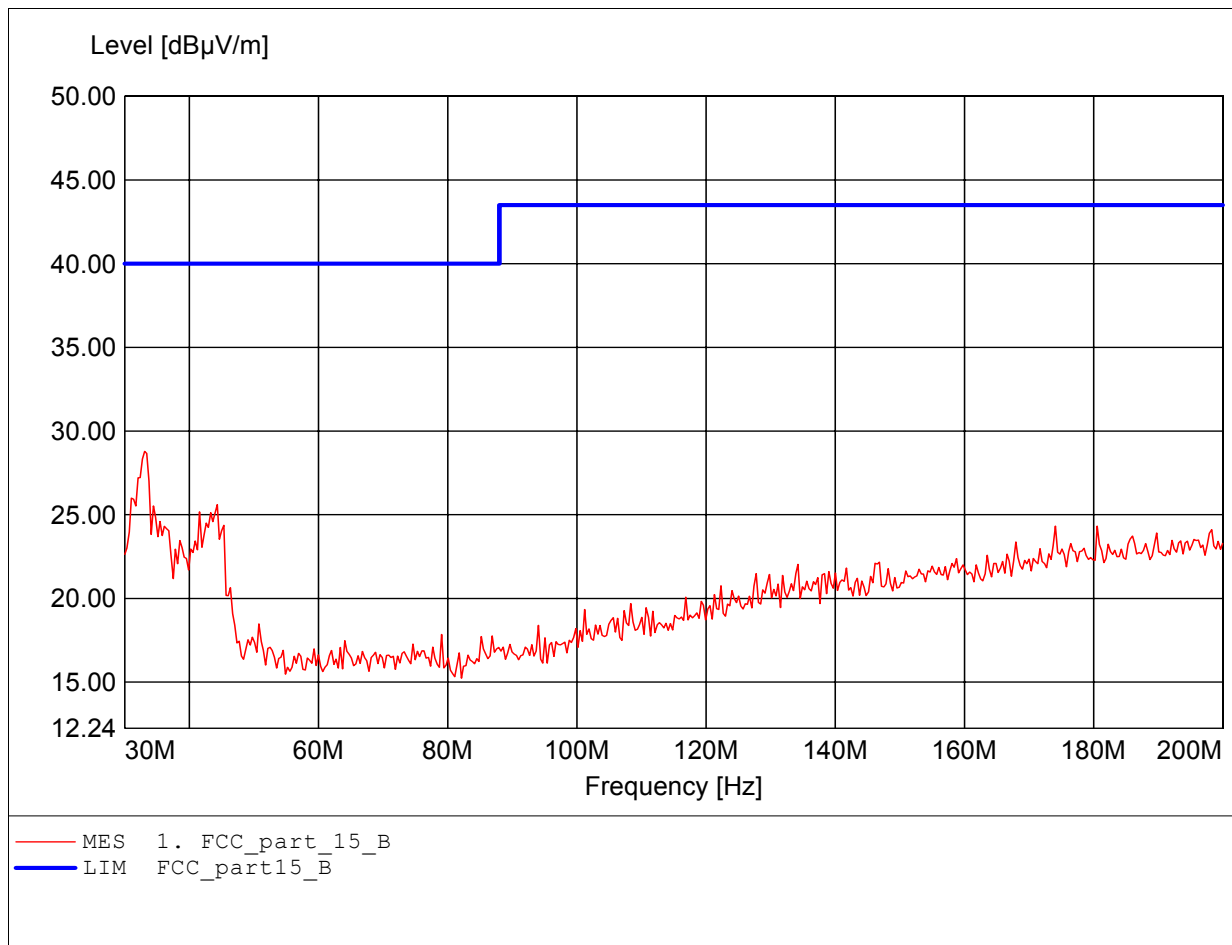
**Appendix H**

Radiated Emissions from Receiver Section of Transceiver

**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

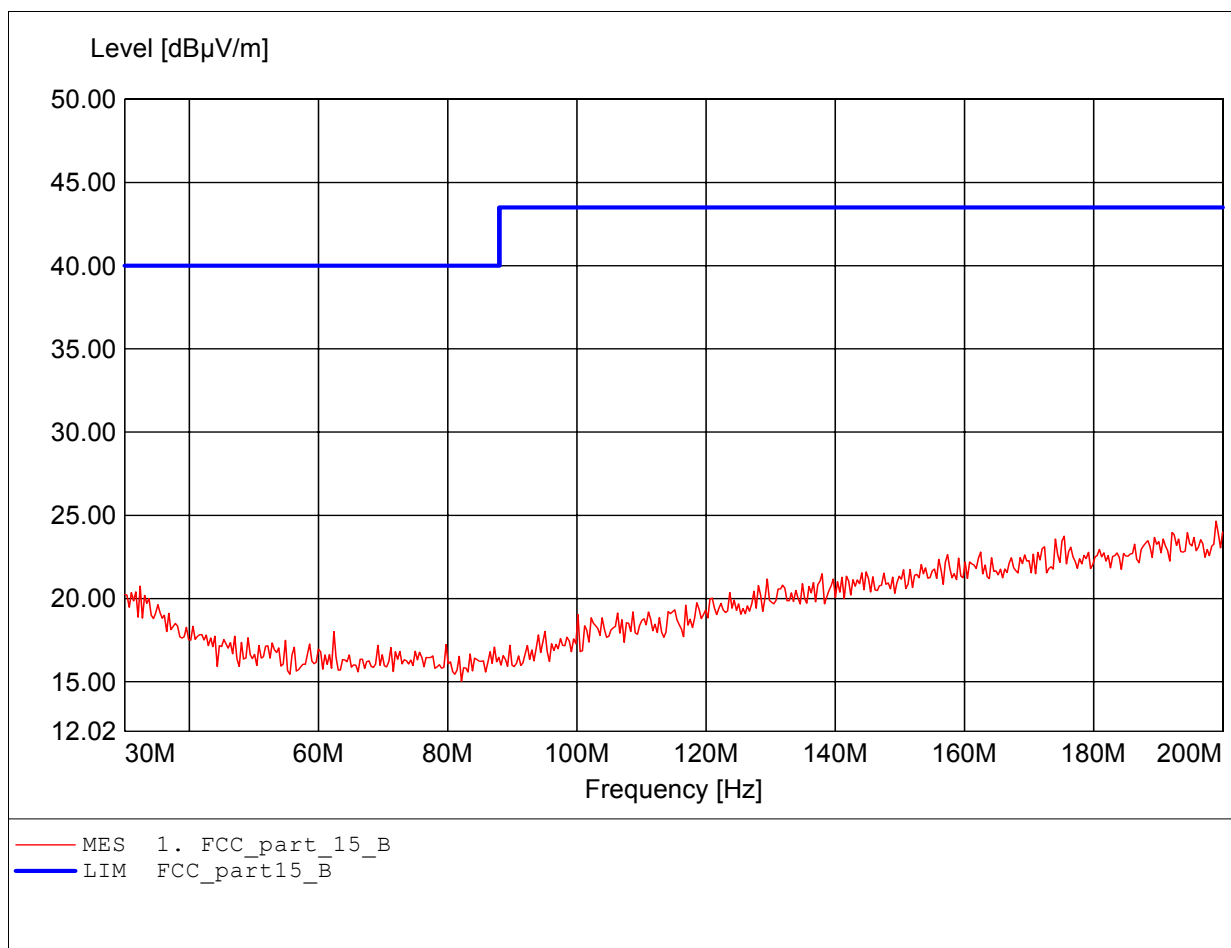
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq:33.066MHz Emax:28.78dBµV/m RBW: 100 kHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

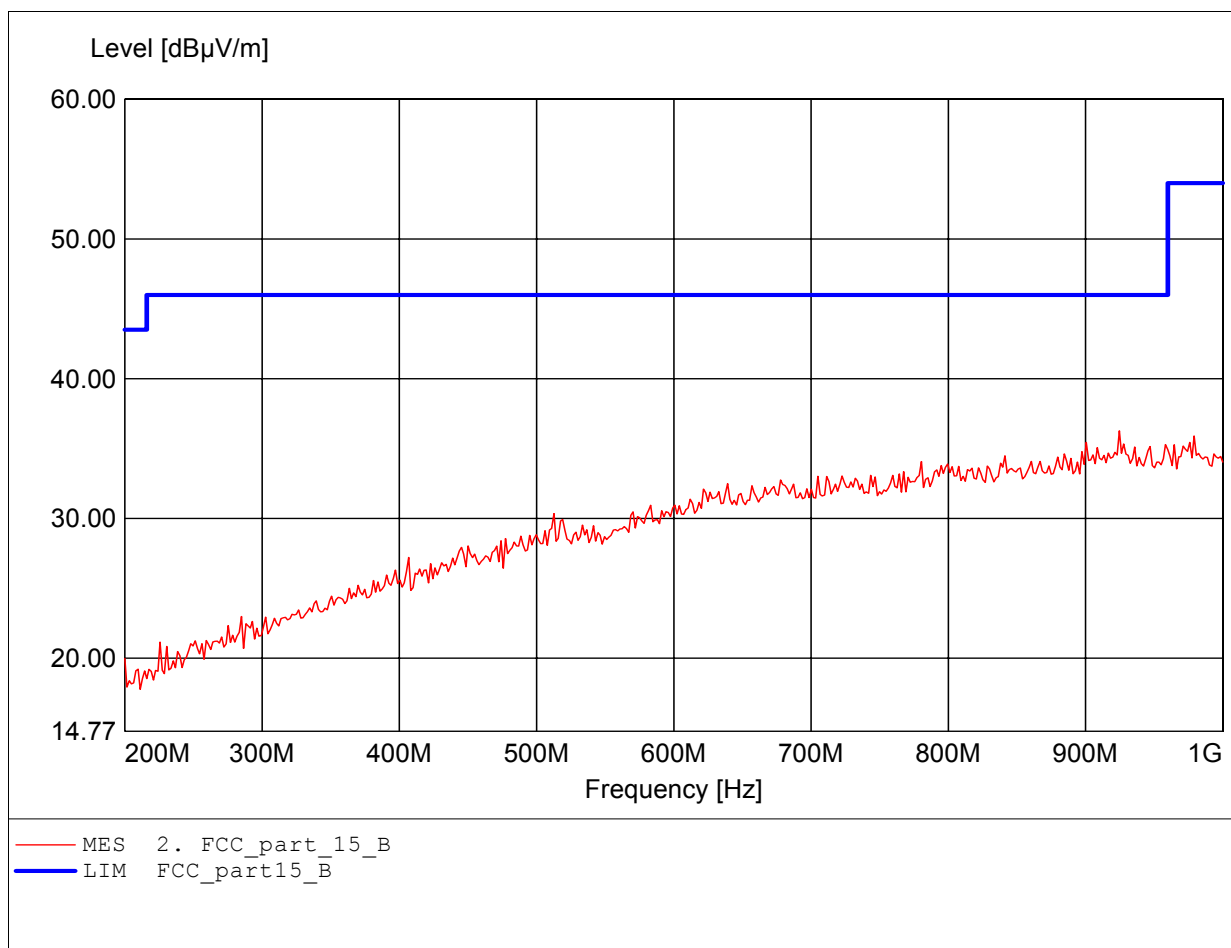
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq:198.978MHz Emax:24.65dBμV/m RBW: 100 kHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

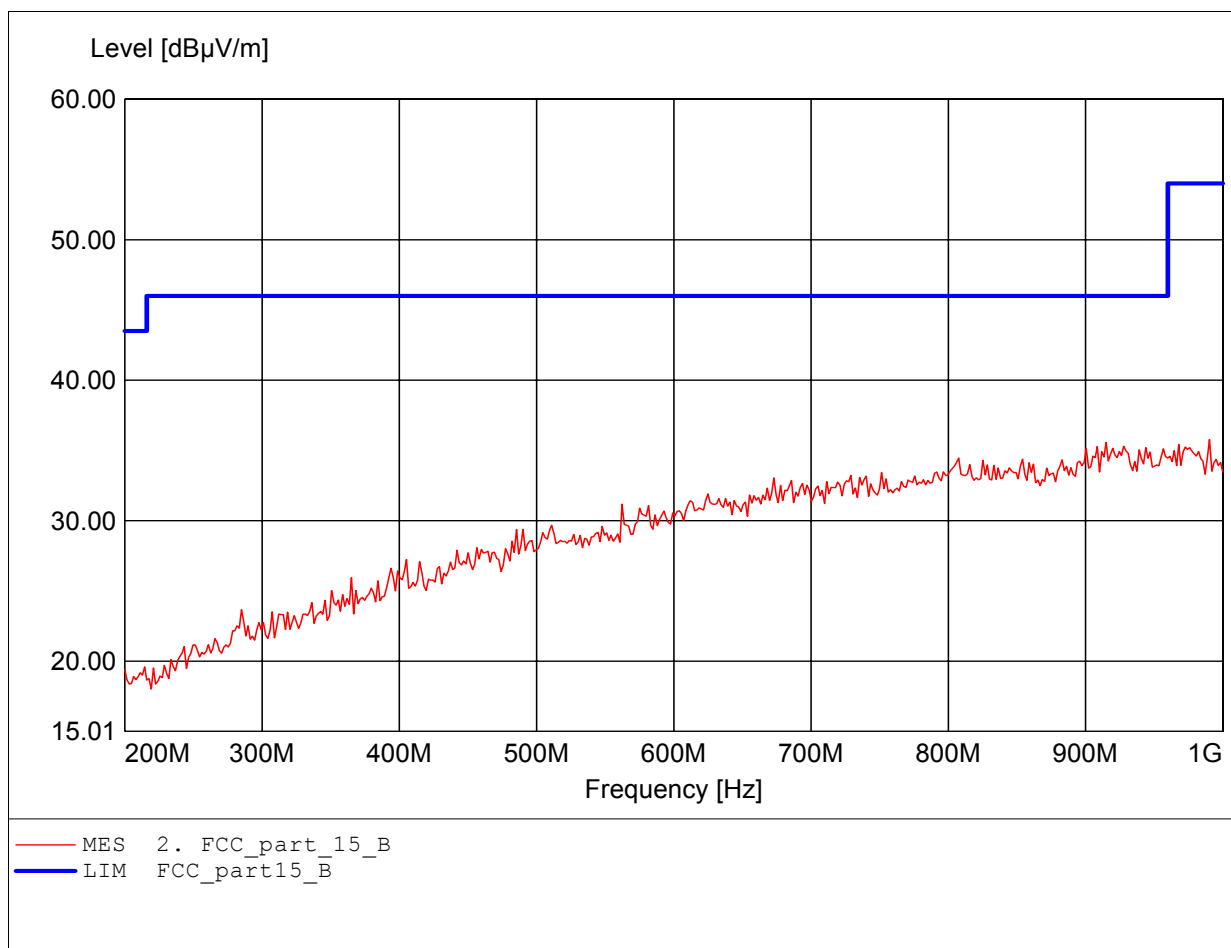
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL 223, ampl.  
Freq:924.649MHz Emax:36.26dBμV/m RBW: 100 kHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL 223, ampl.  
Freq:990.381MHz Emax:35.78dBμV/m RBW: 100 kHz

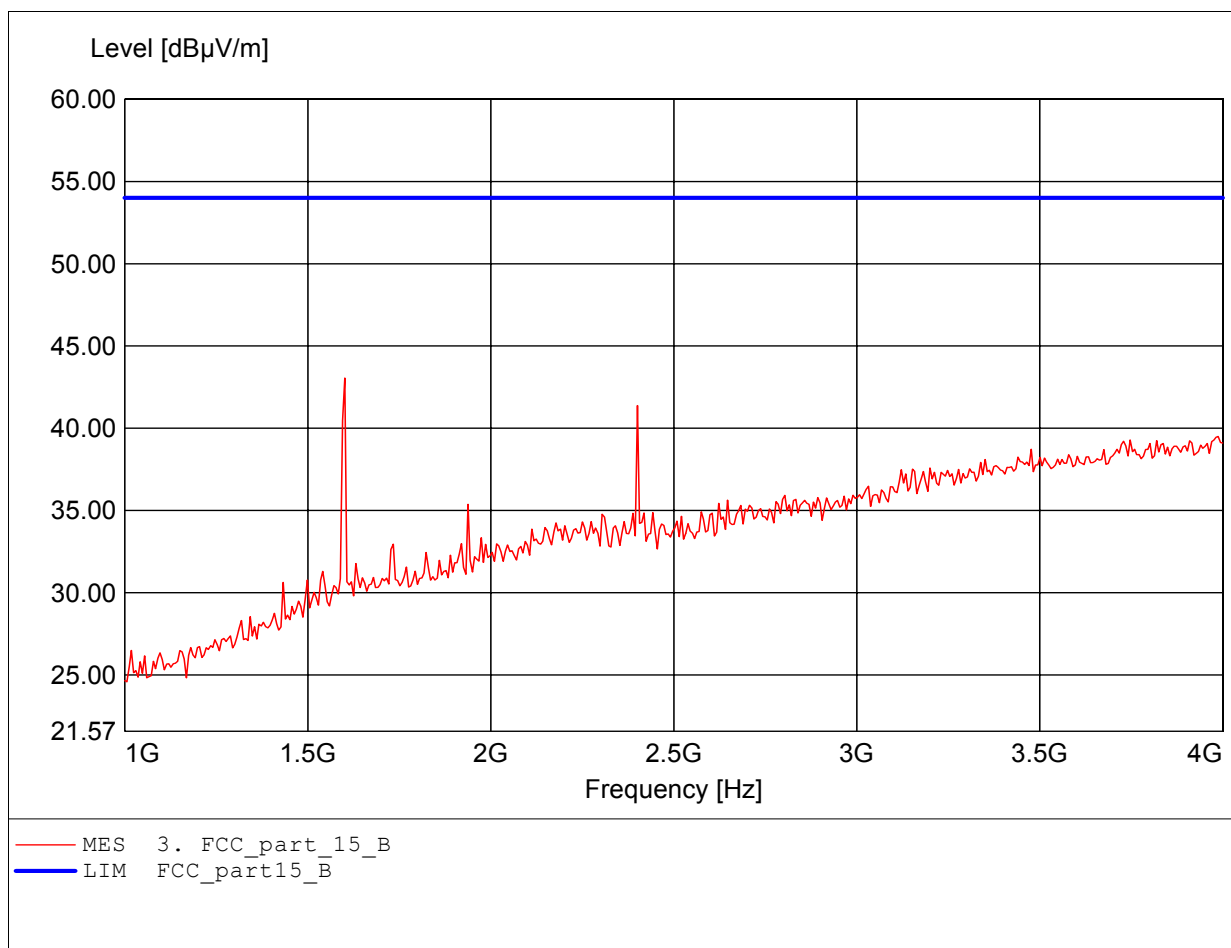




**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

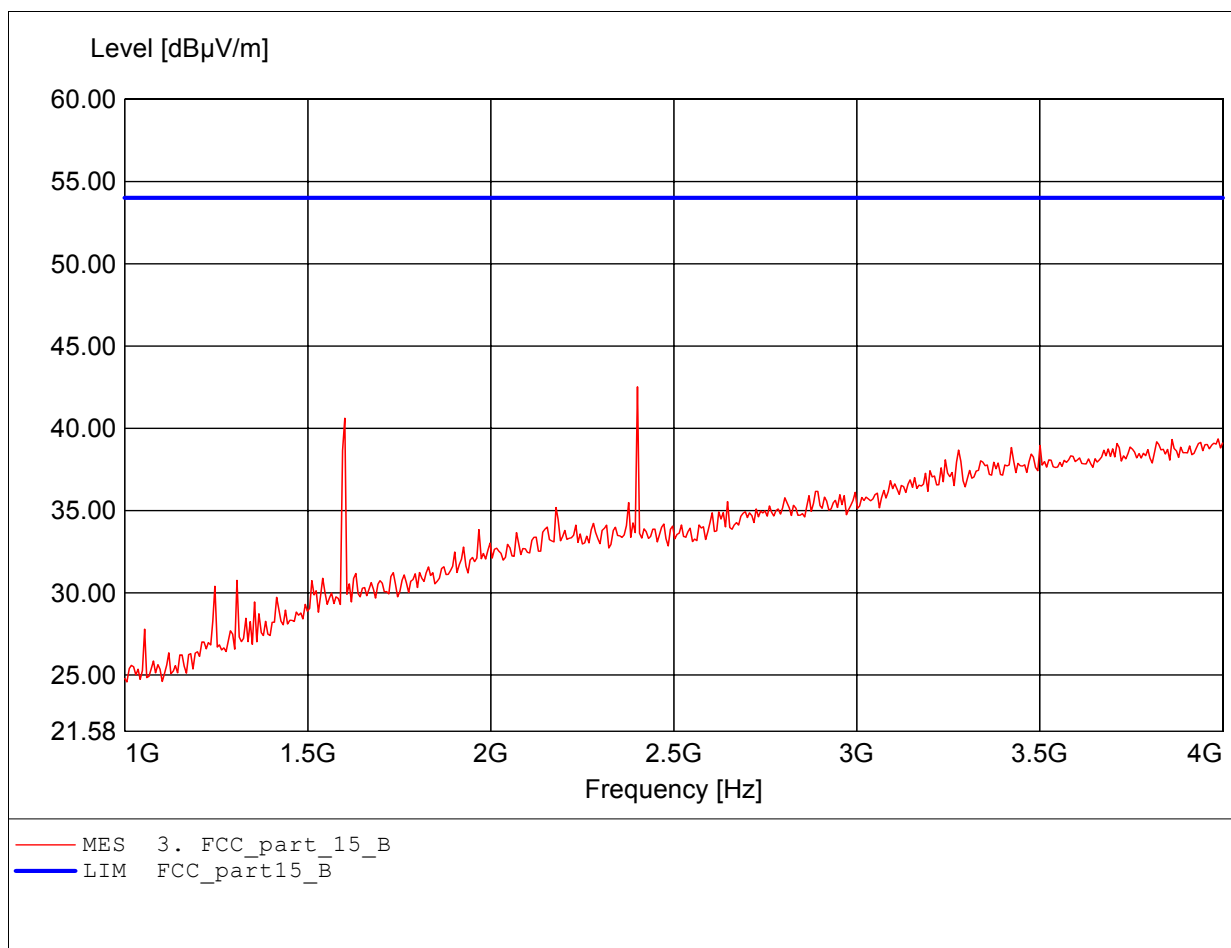
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:1.601GHz Emax:43.05dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

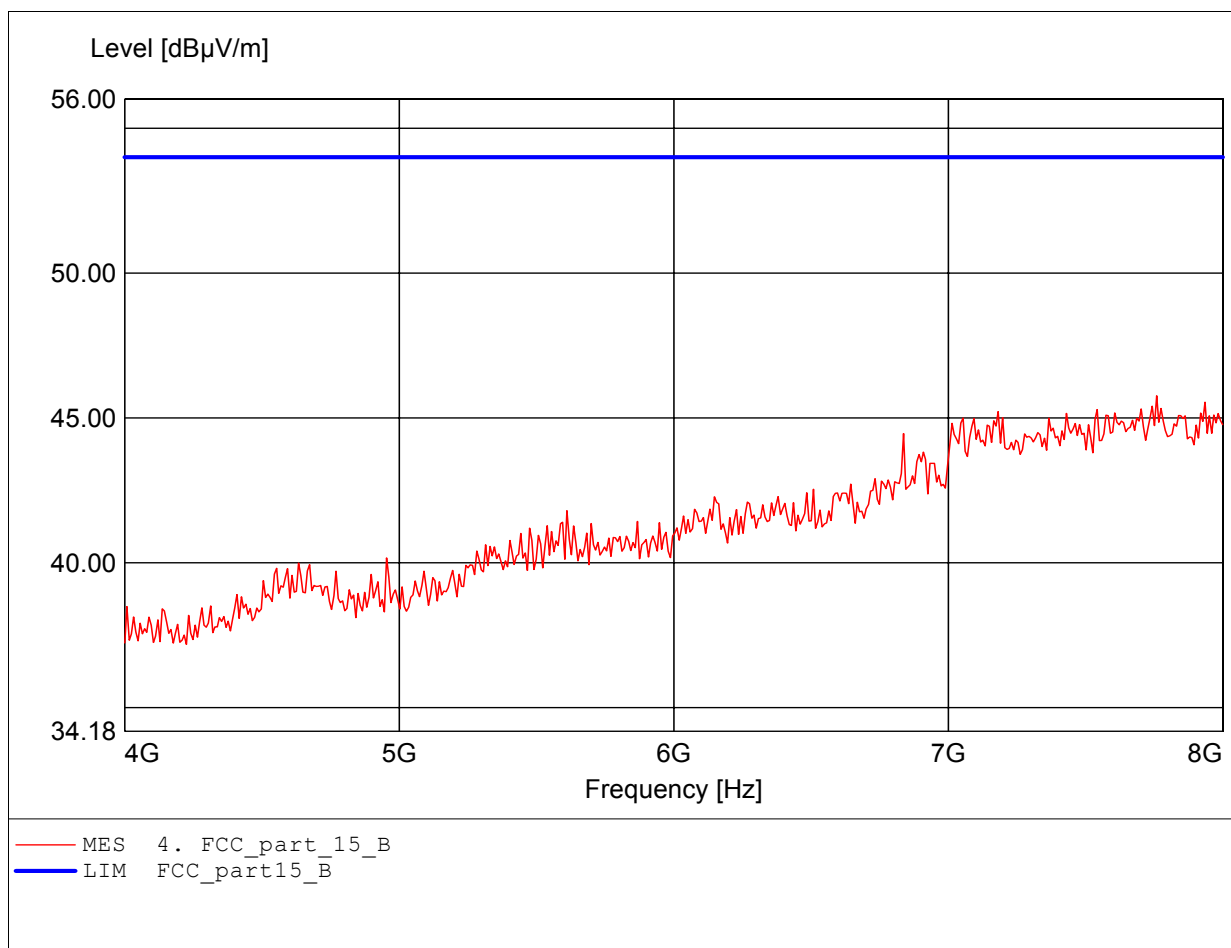
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:2.401GHz Emax:42.52dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

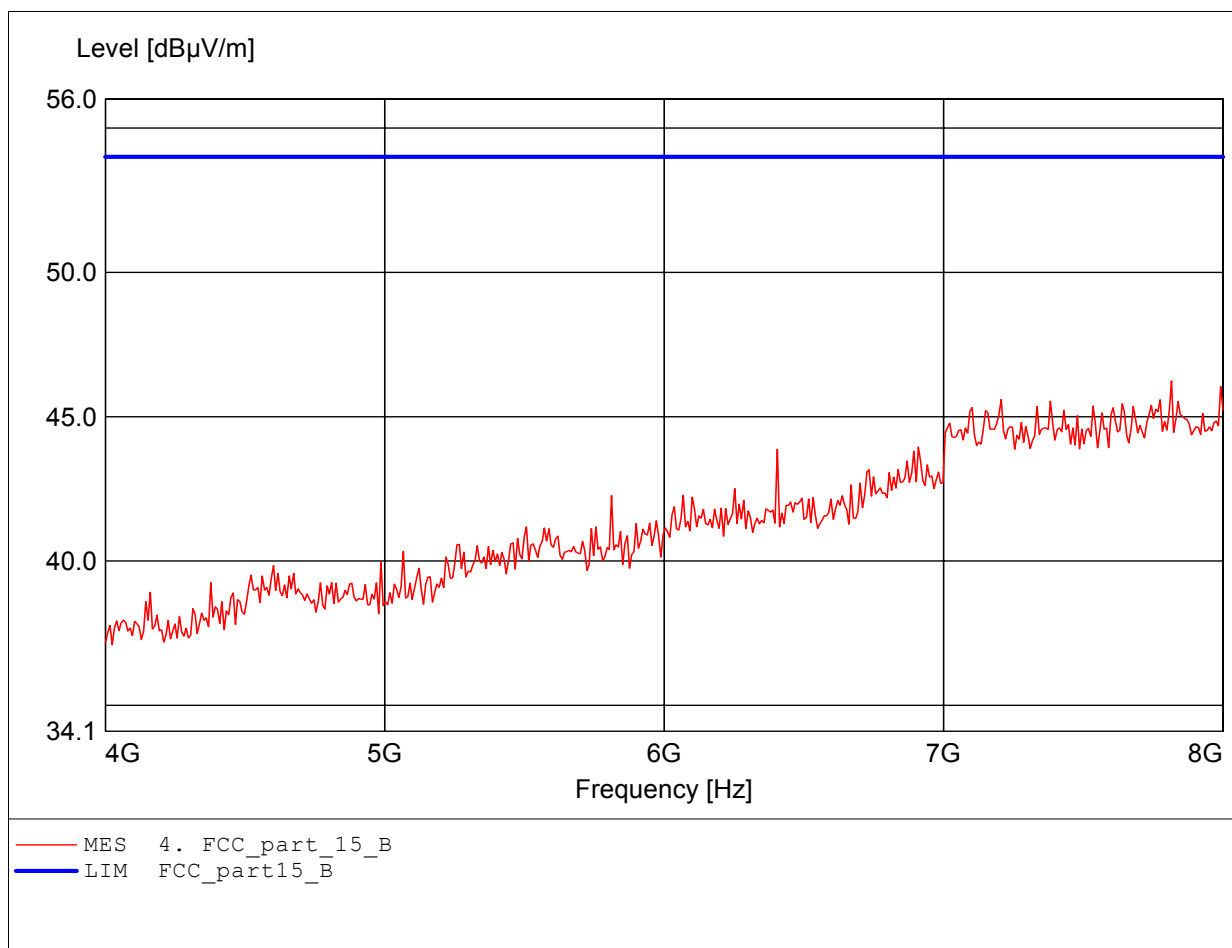
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:7.760GHz Emax:45.76dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

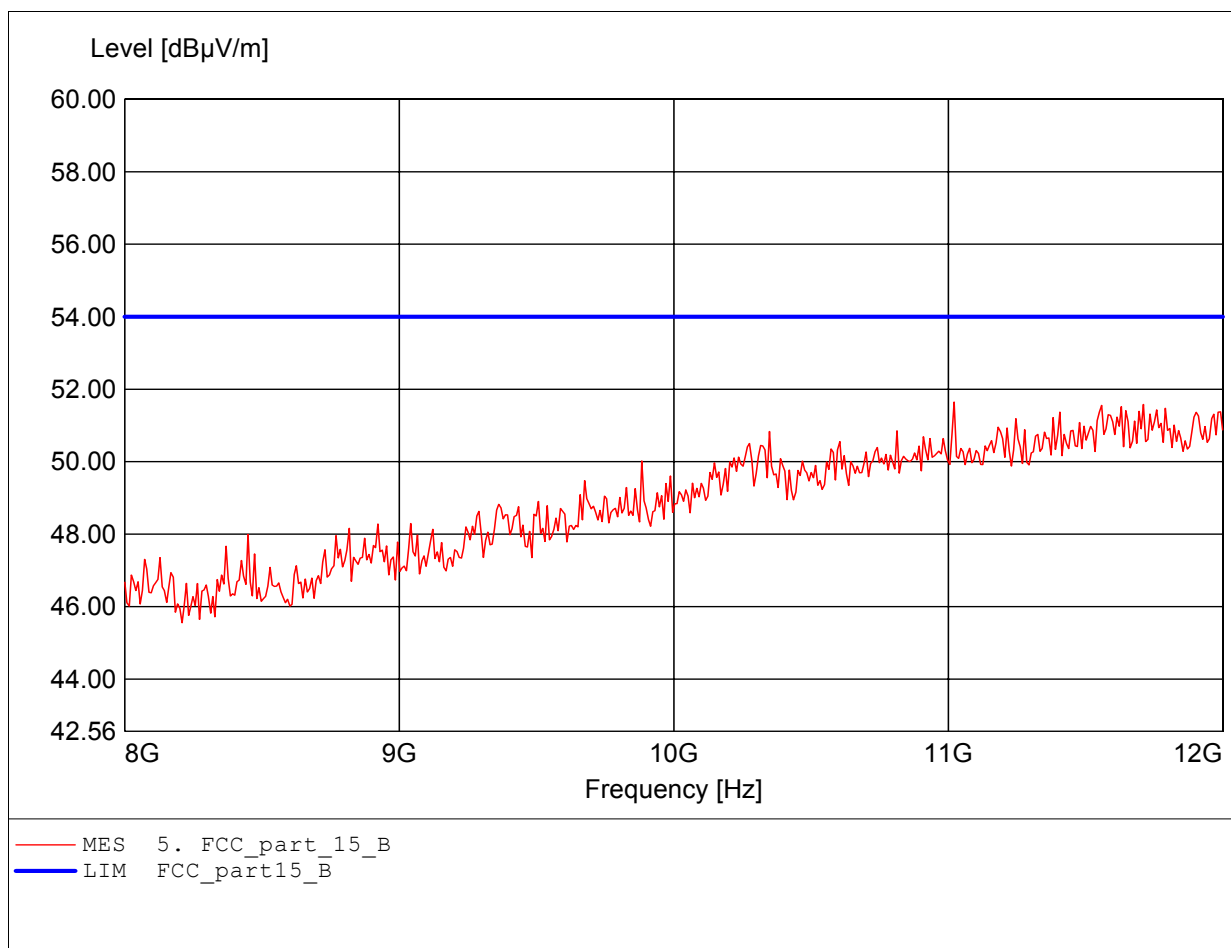
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:7.816GHz Emax:46.24dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

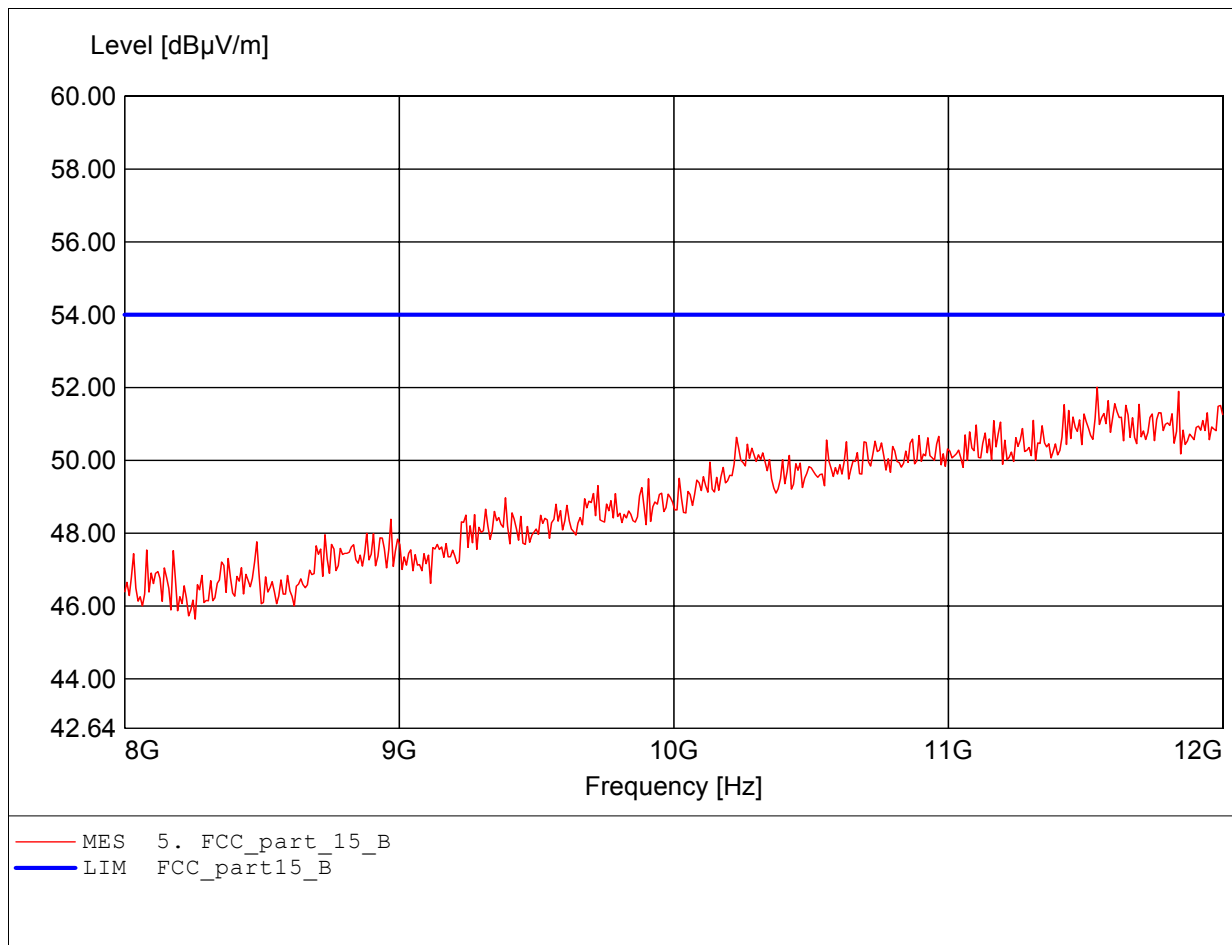
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:11.022GHz Emax:51.65dBµV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

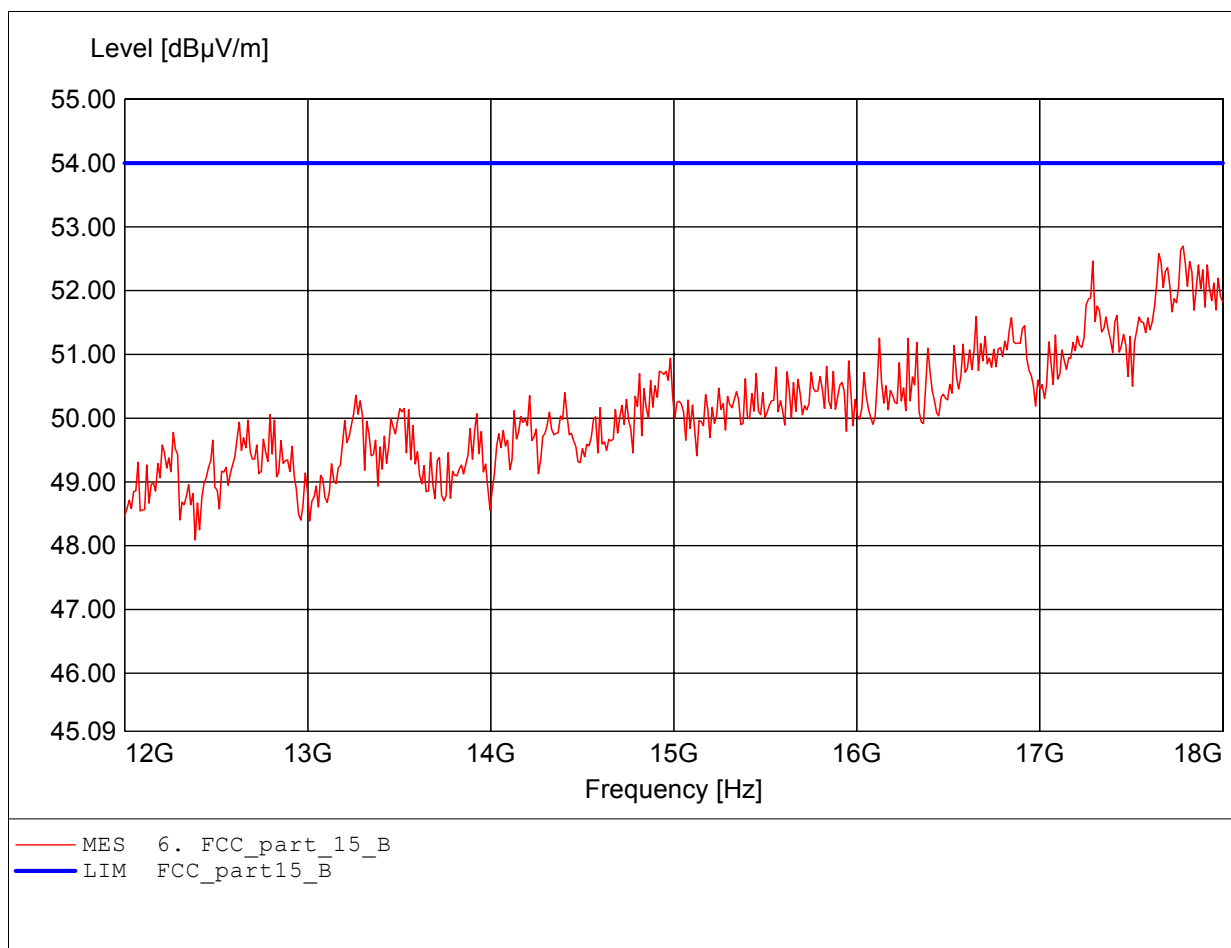
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:11.543GHz Emax:52.01dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

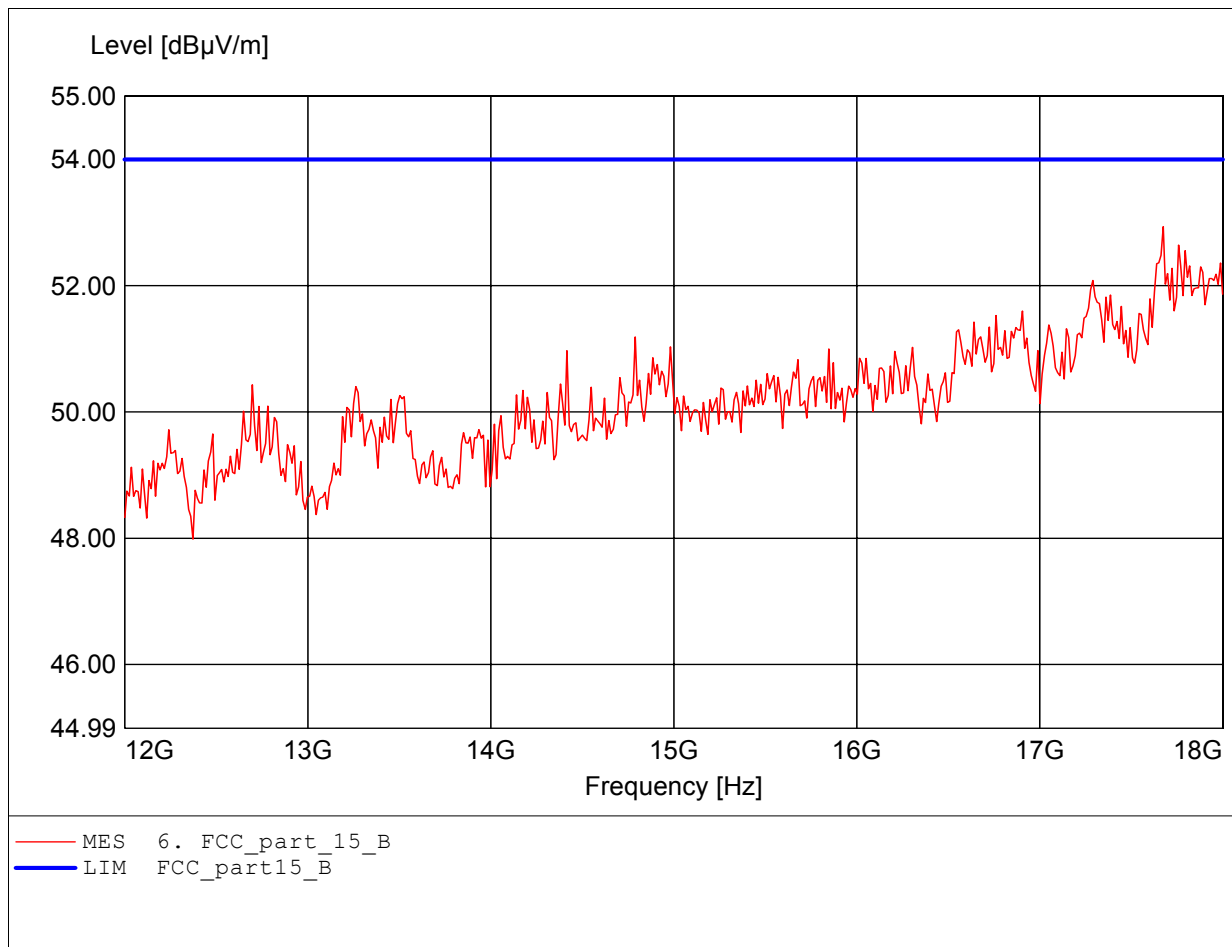
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:17.784GHz Emax:52.70dBµV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Low Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:17.675GHz Emax:52.94dBμV/m RBW: 1 MHz

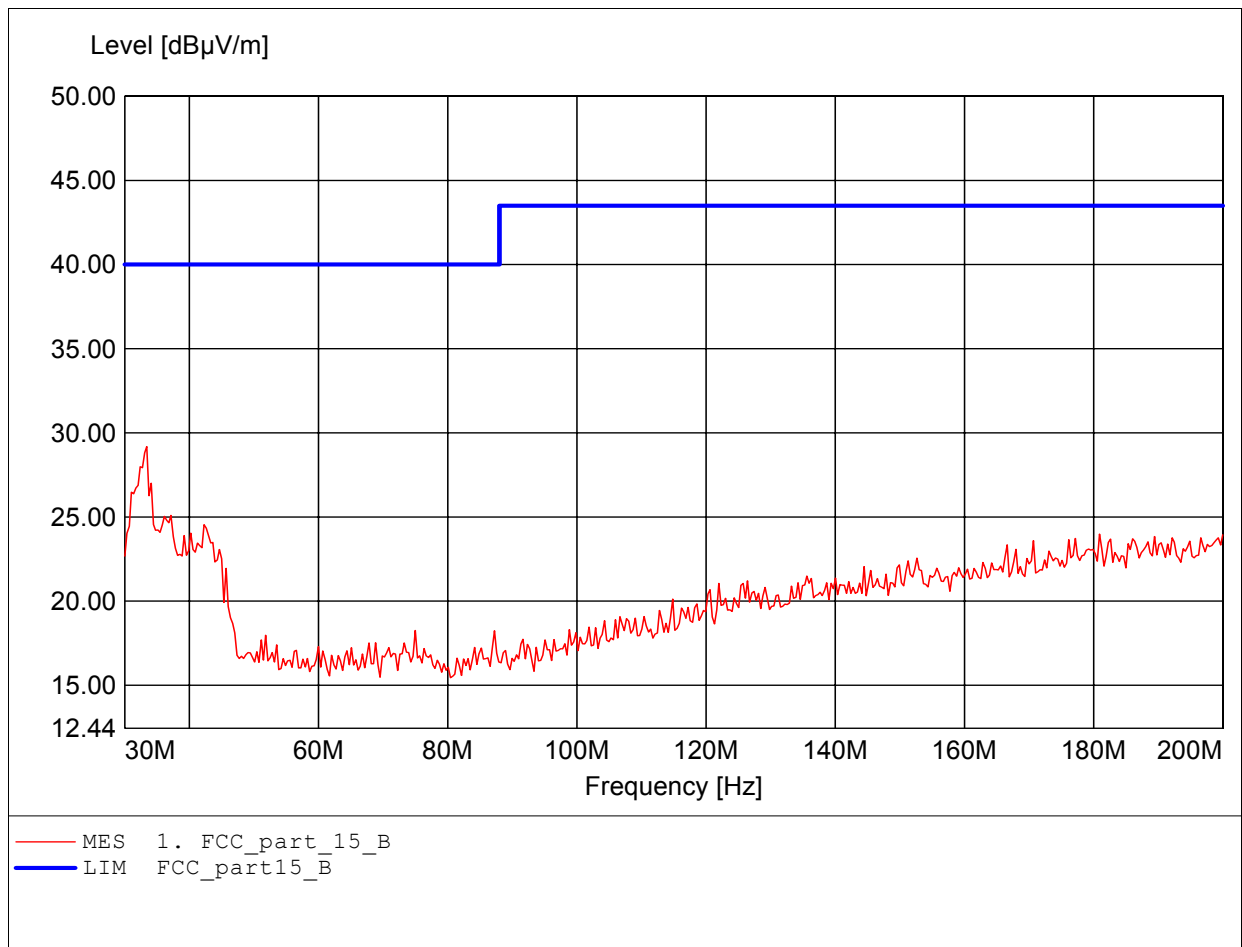




**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

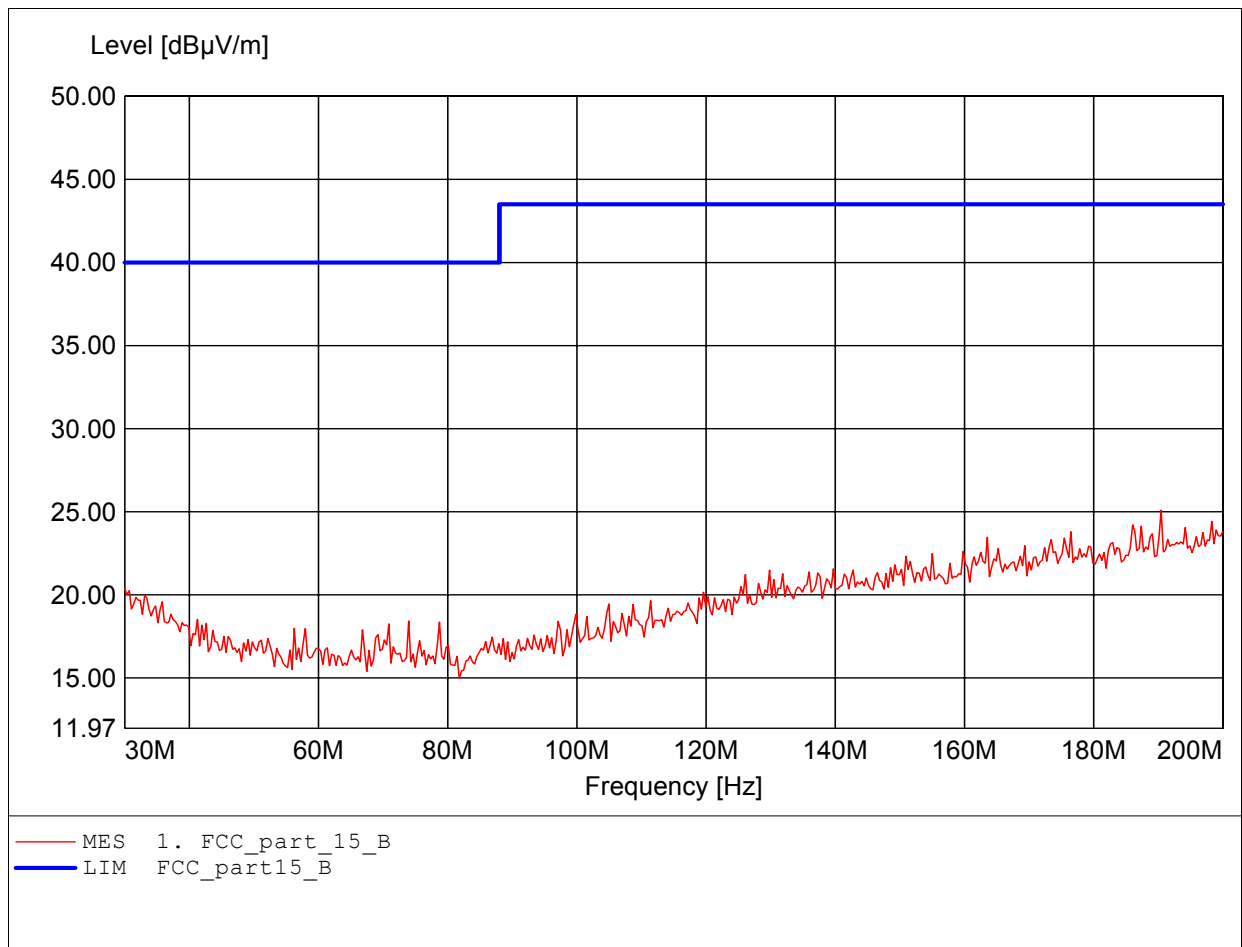
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq:33.407MHz Emax:29.18dBμV/m RBW: 100 kHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

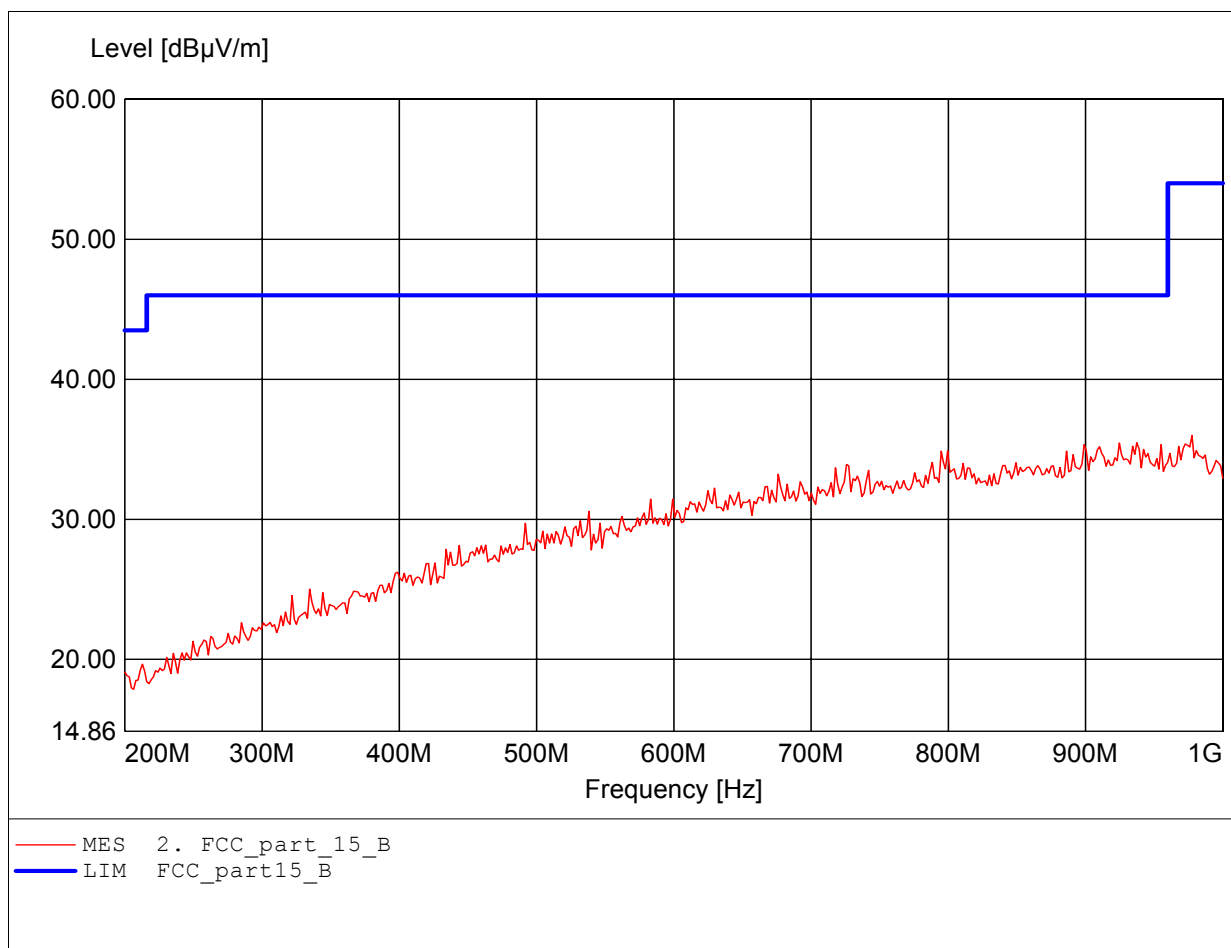
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq:190.461MHz Emax:25.09dBµV/m RBW: 100 kHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

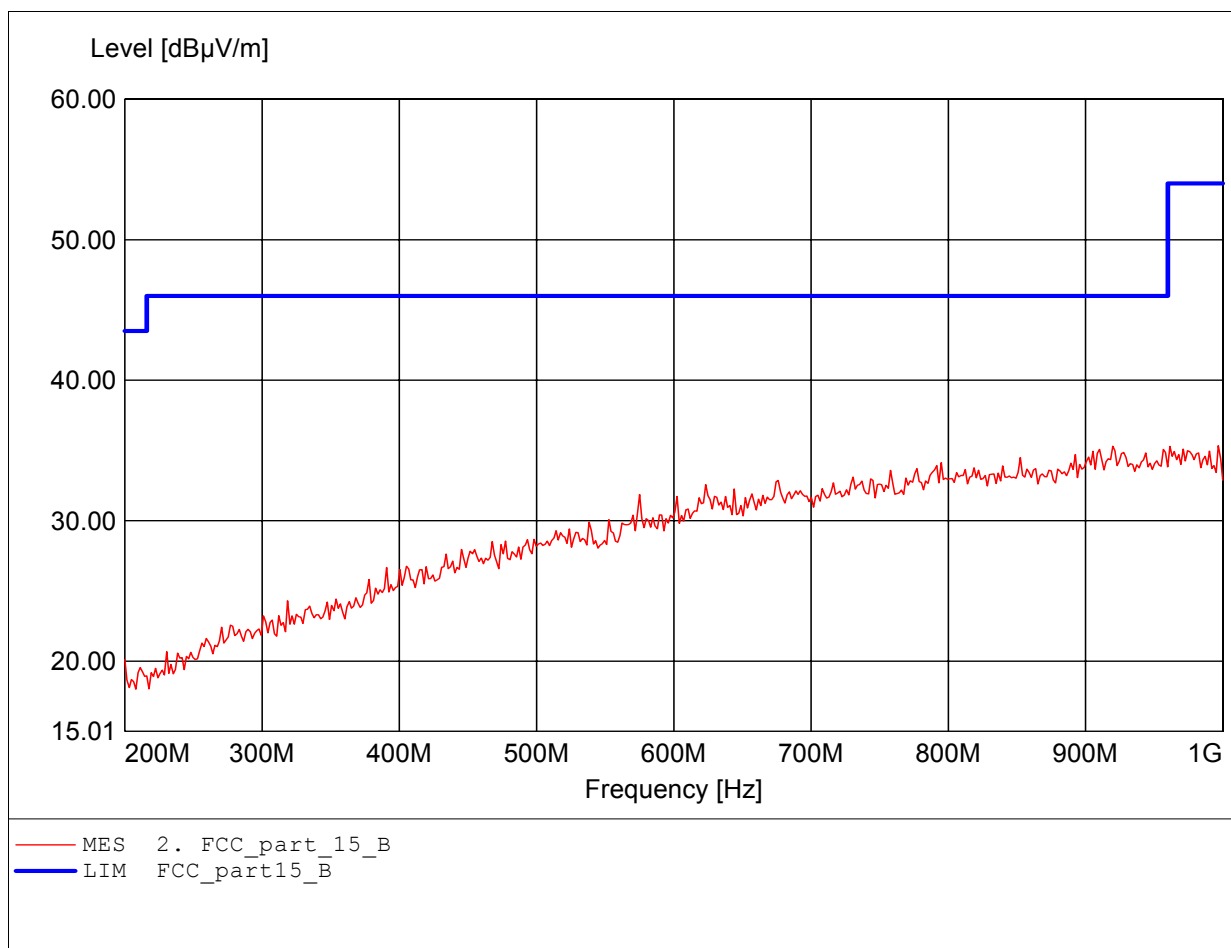
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL 223, ampl.  
Freq:977.555MHz Emax:35.99dBμV/m RBW: 100 kHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

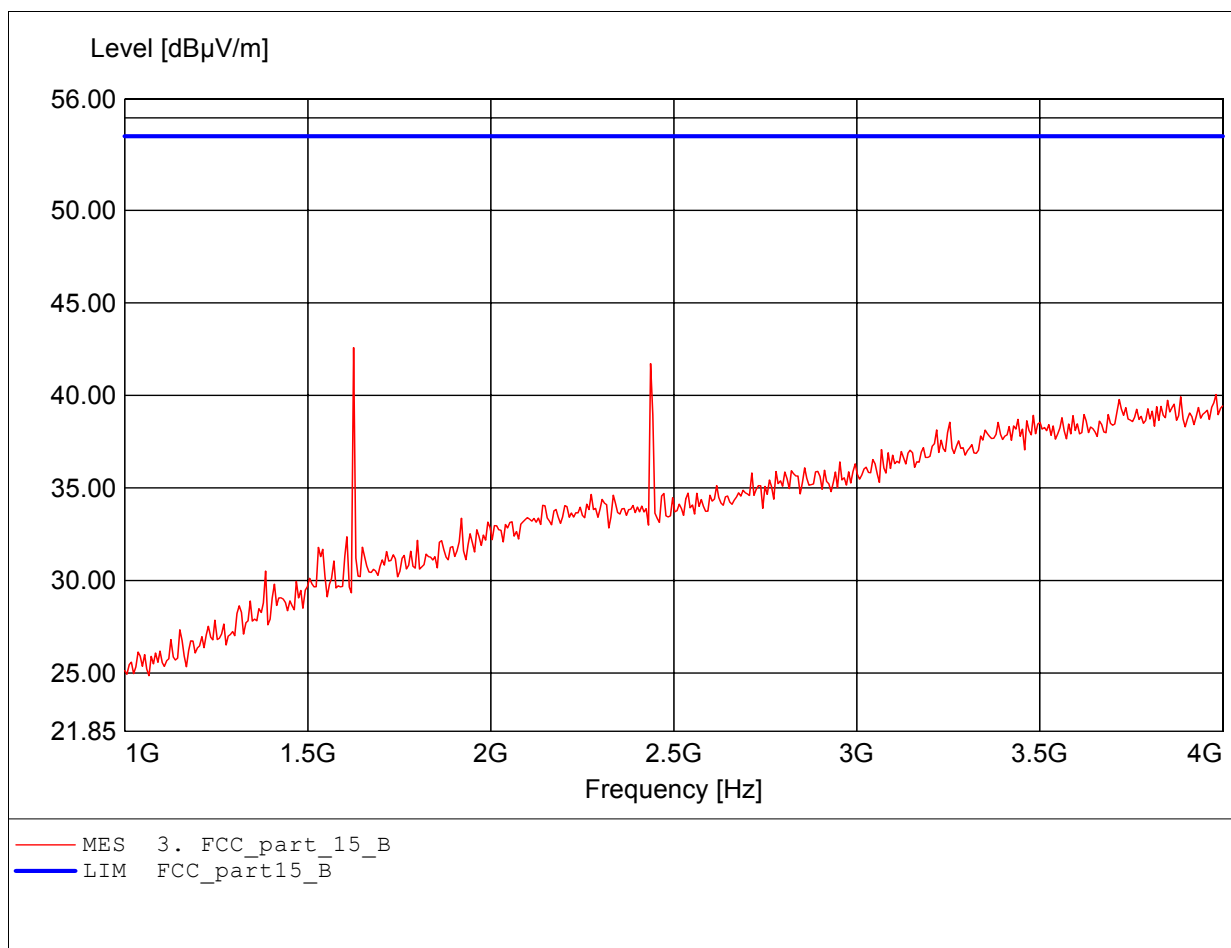
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL 223, ampl.  
Freq:996.794MHz Emax:35.34dBμV/m RBW: 100 kHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

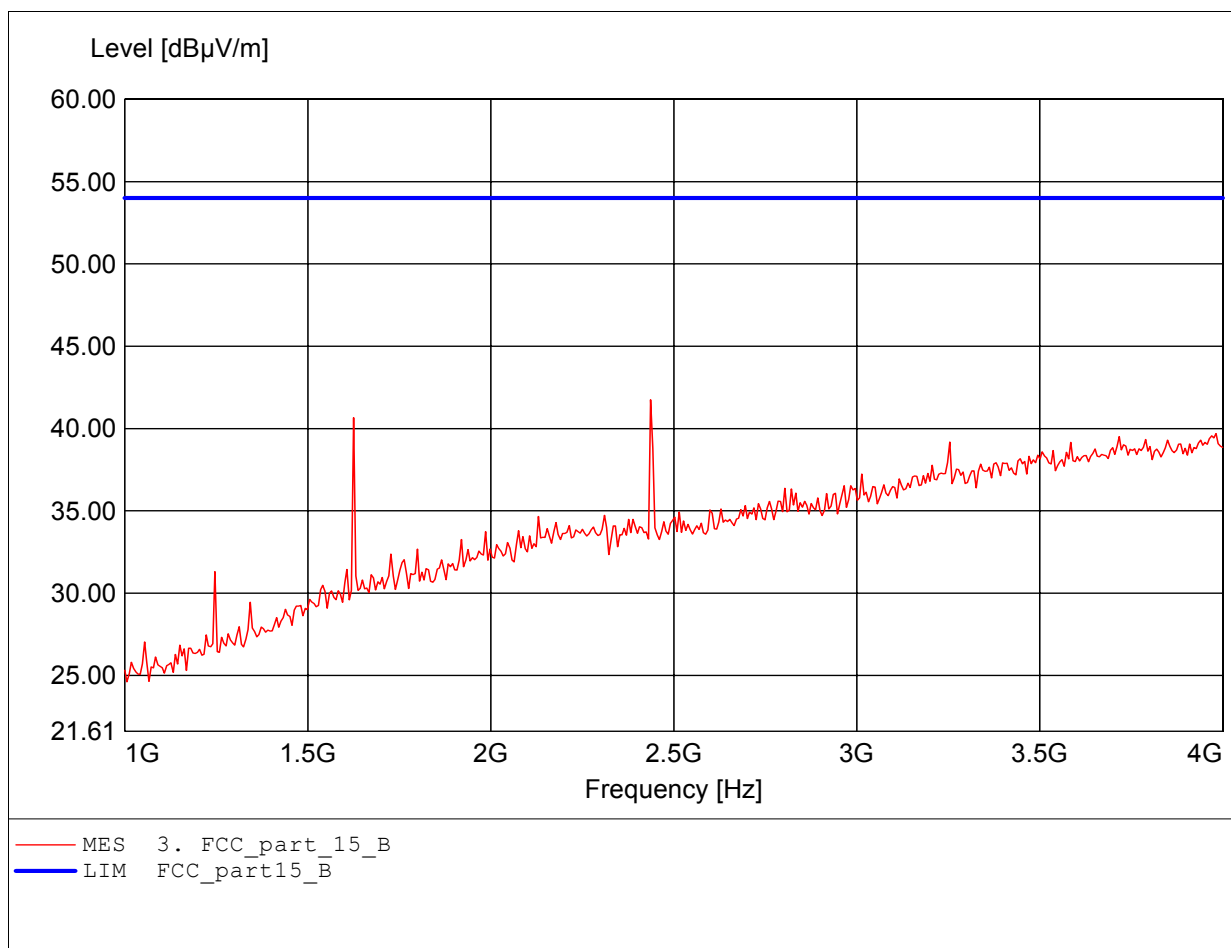
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:1.625GHz Emax:42.58dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

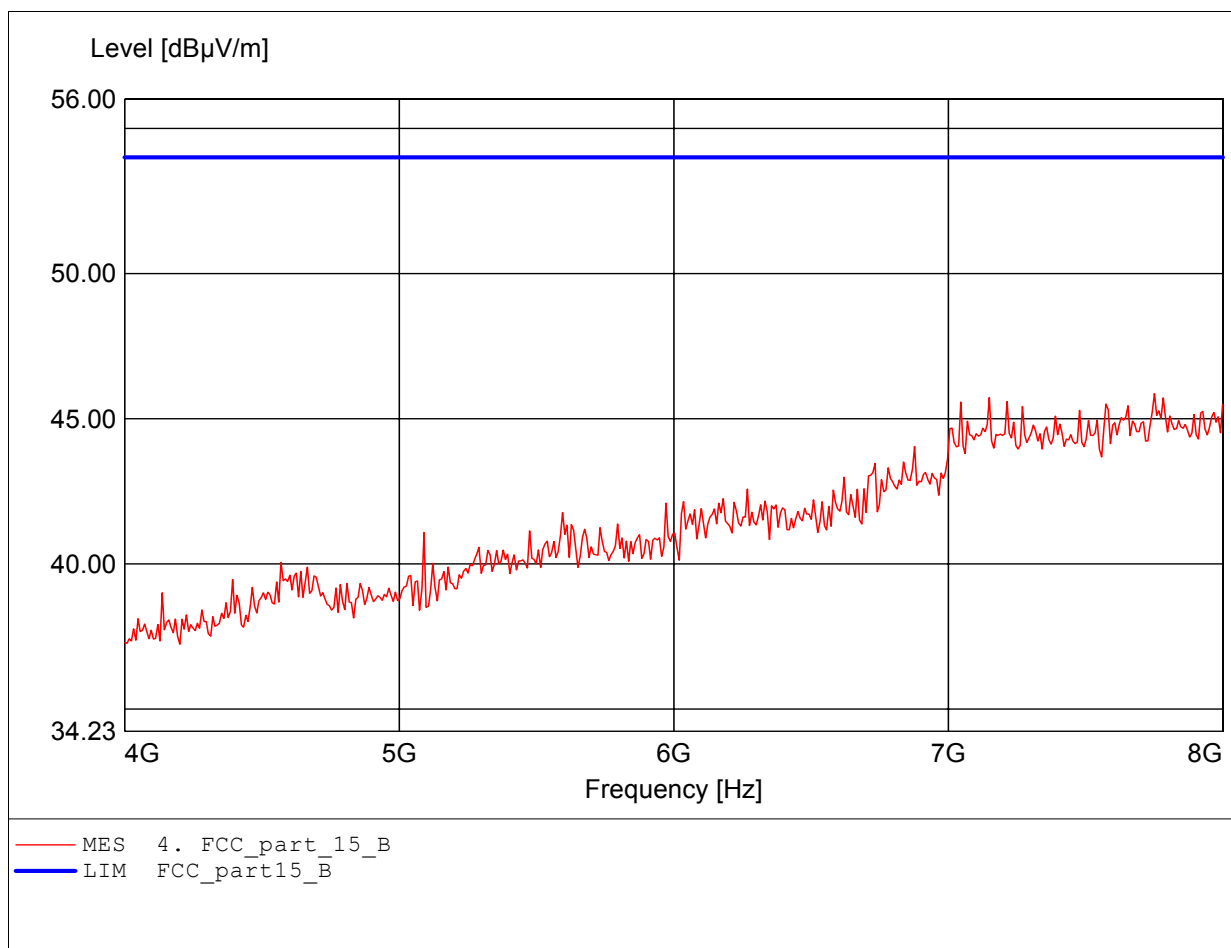
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:2.437GHz Emax:41.74dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

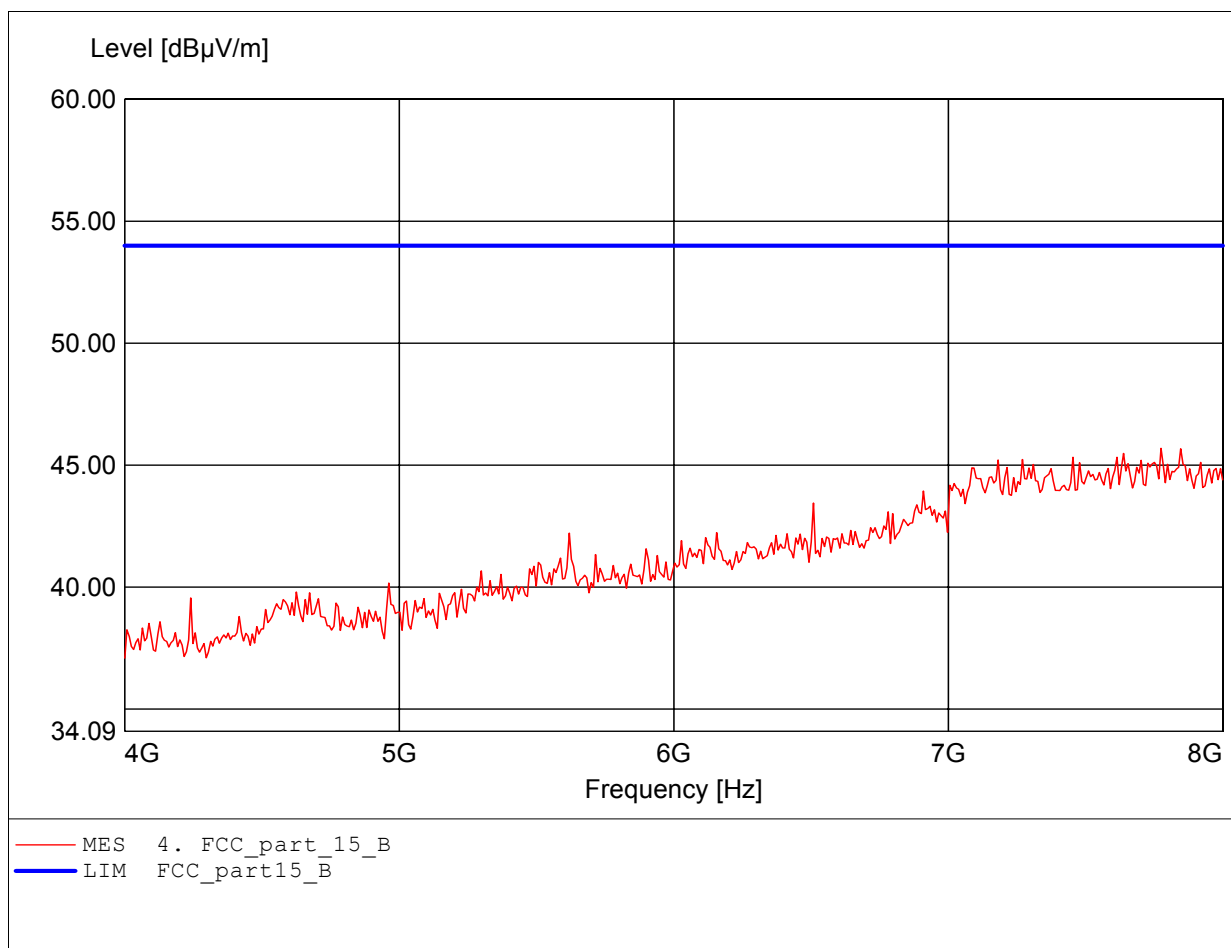
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:7.752GHz Emax:45.86dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:7.776GHz Emax:45.69dBμV/m RBW: 1 MHz

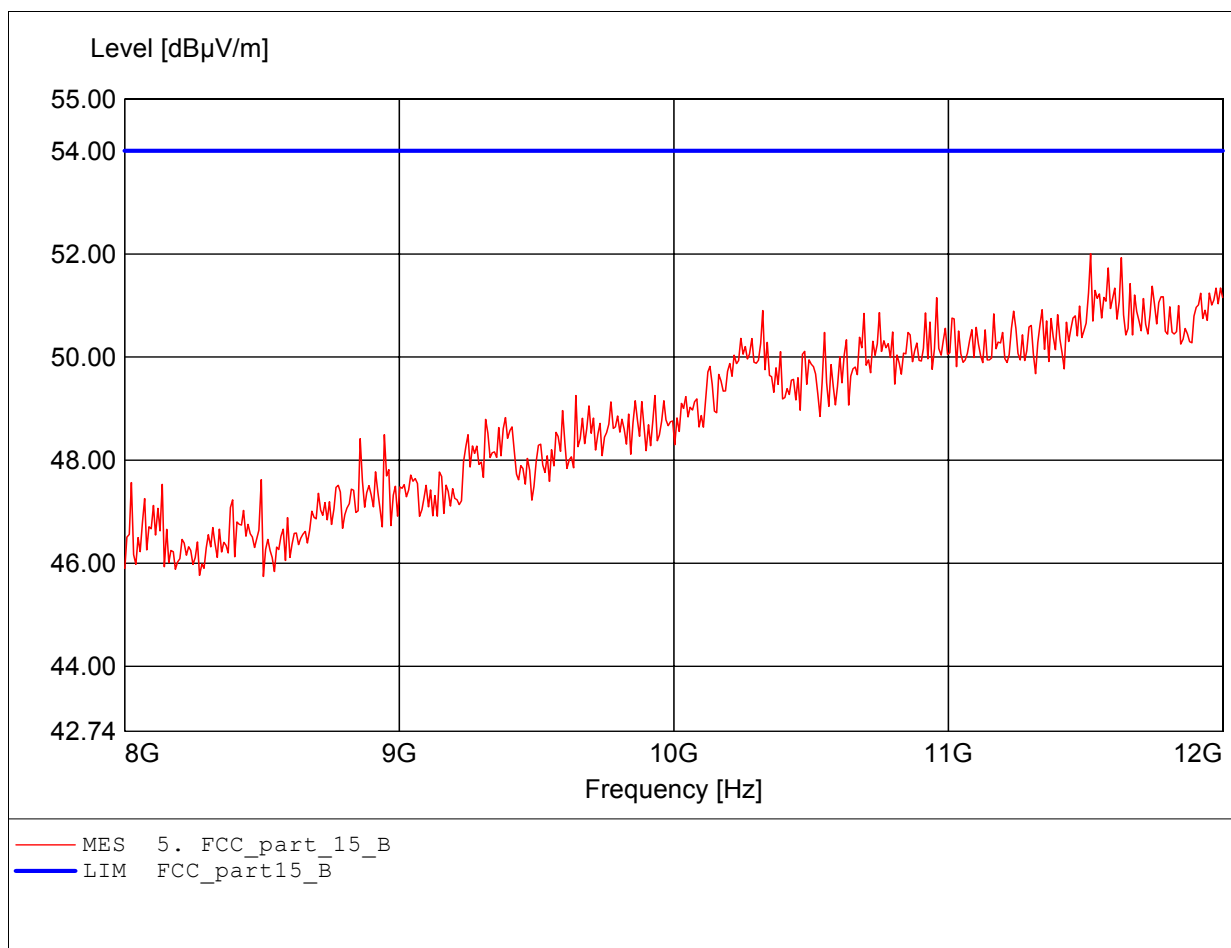




**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

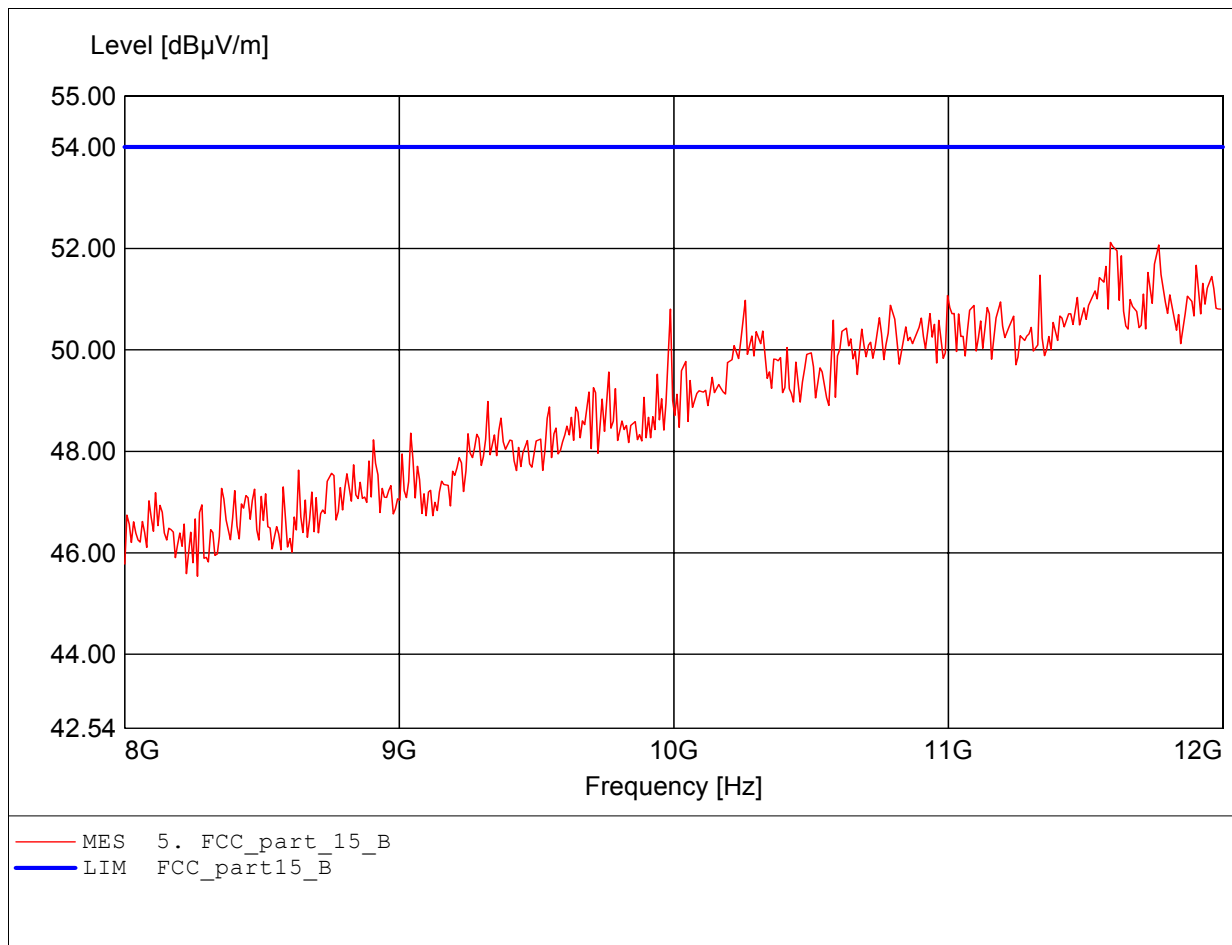
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:11.519GHz Emax:52.00dBµV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

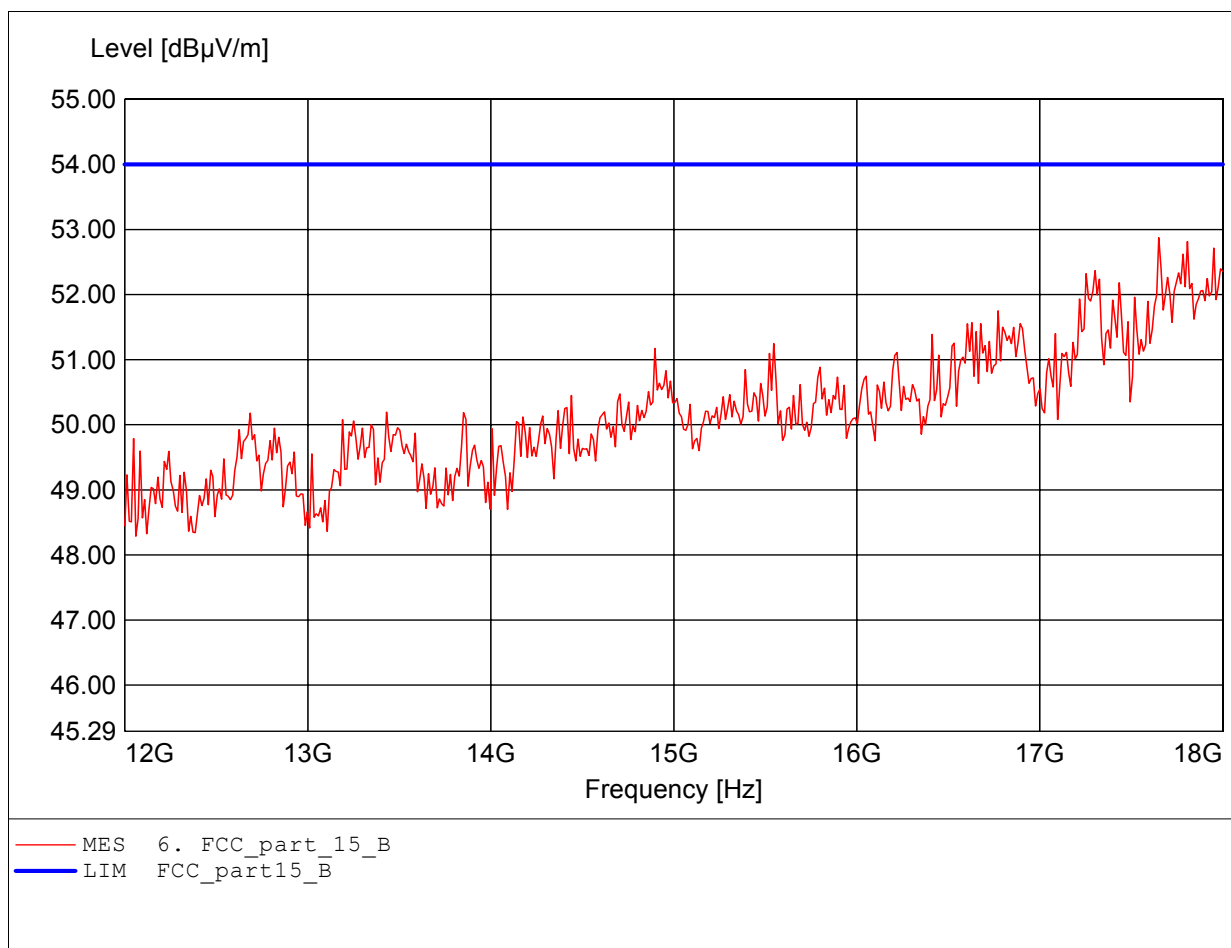
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:11.591GHz Emax:52.12dBµV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

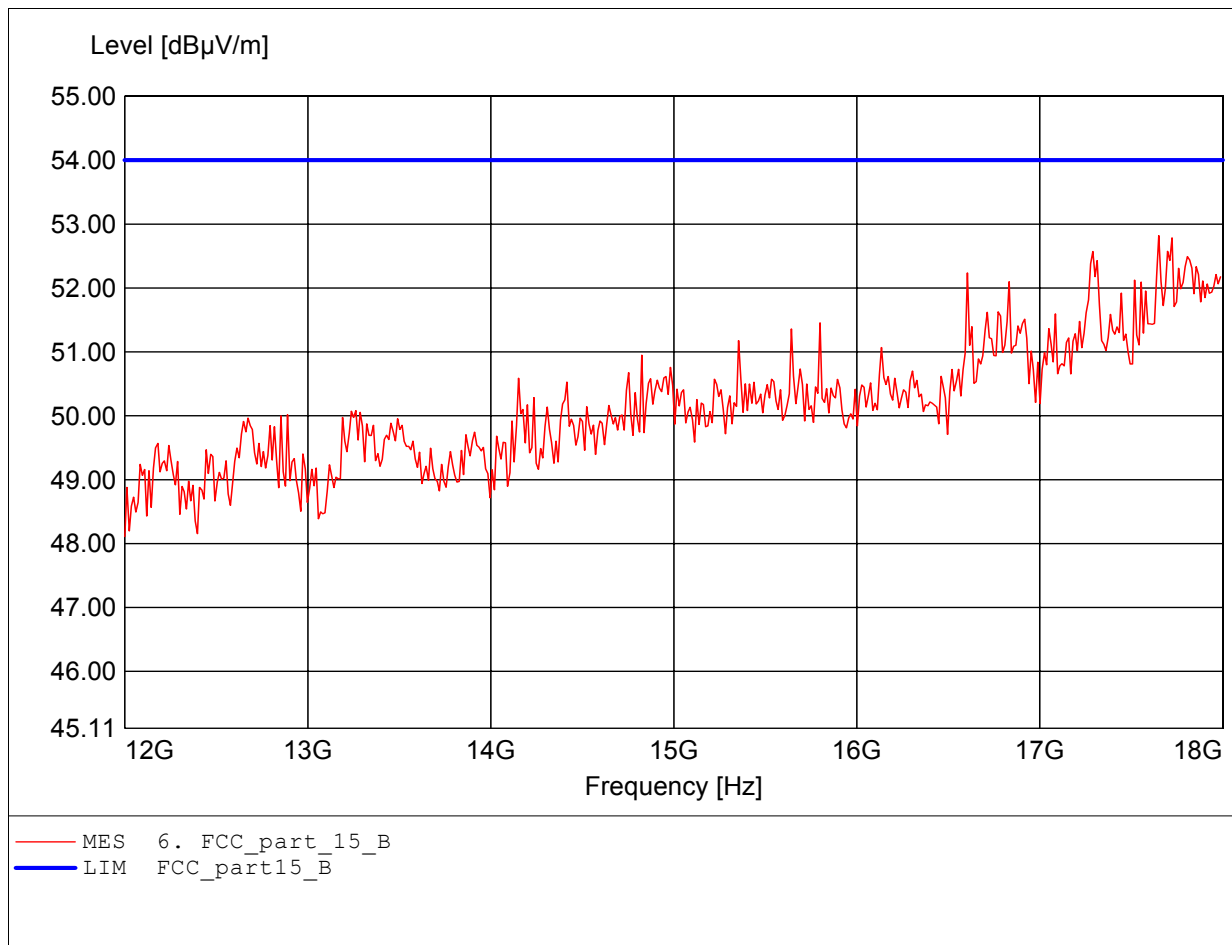
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:17.651GHz Emax:52.87dBµV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

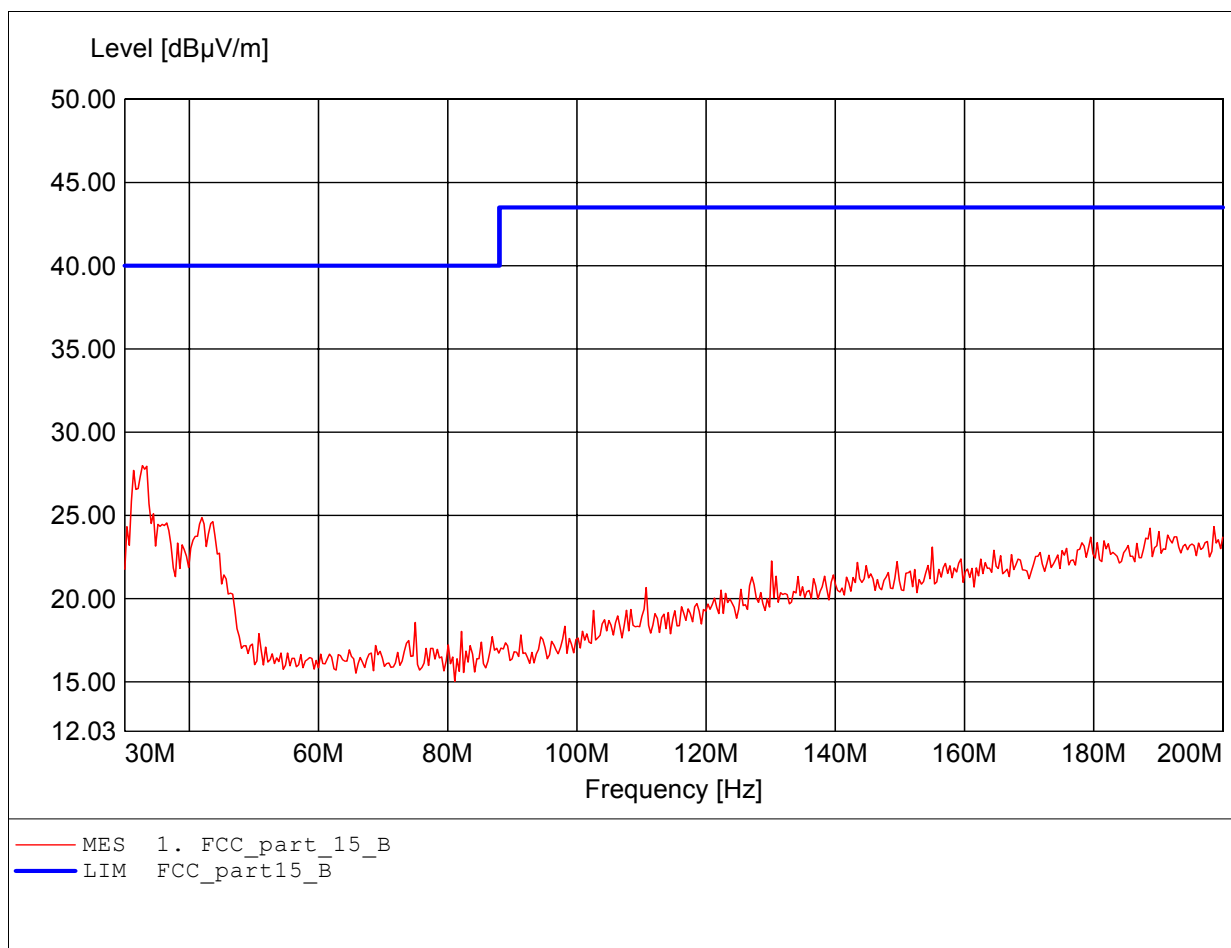
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 Middle Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:17.651GHz Emax:52.82dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

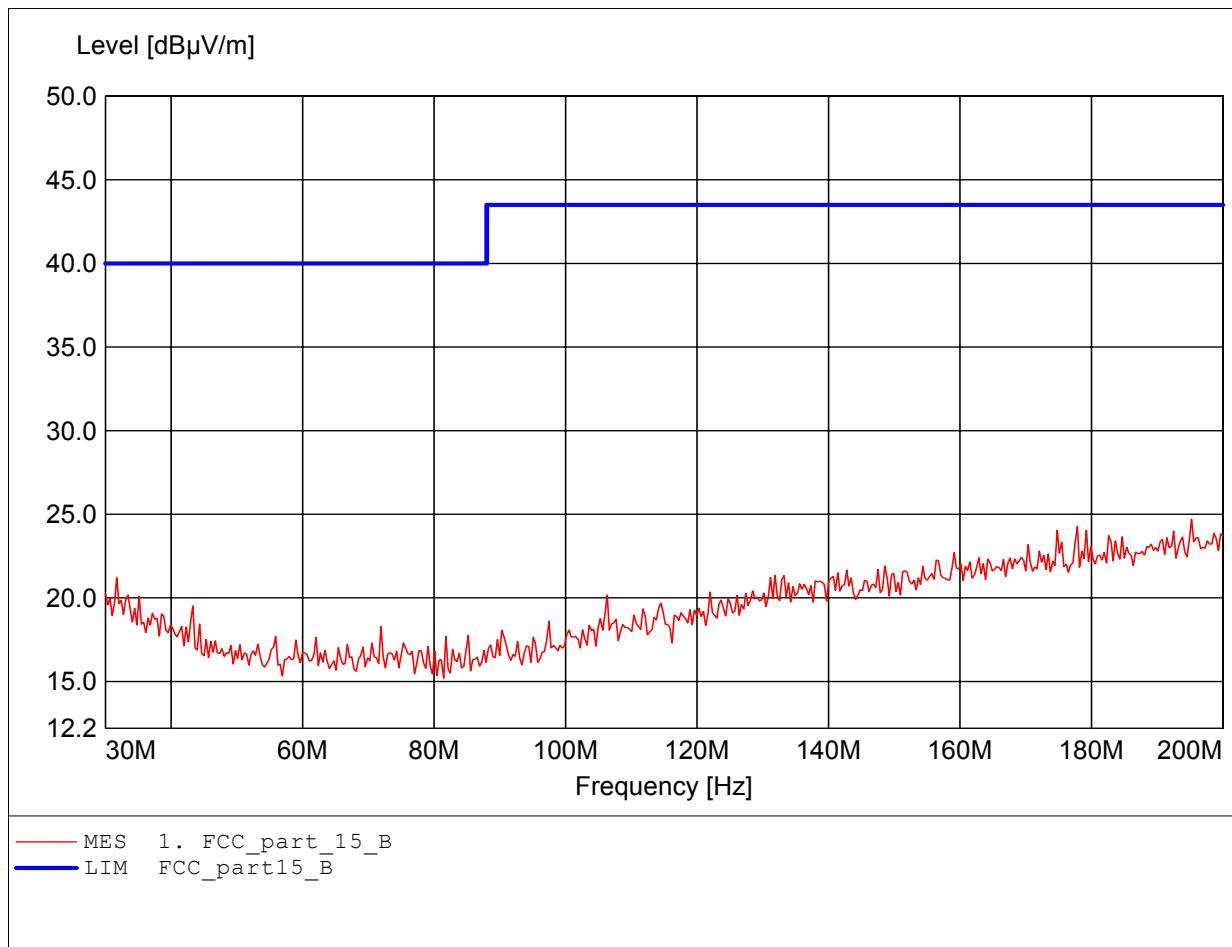
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq:32.725MHz Emax:27.99dBµV/m RBW: 100 kHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

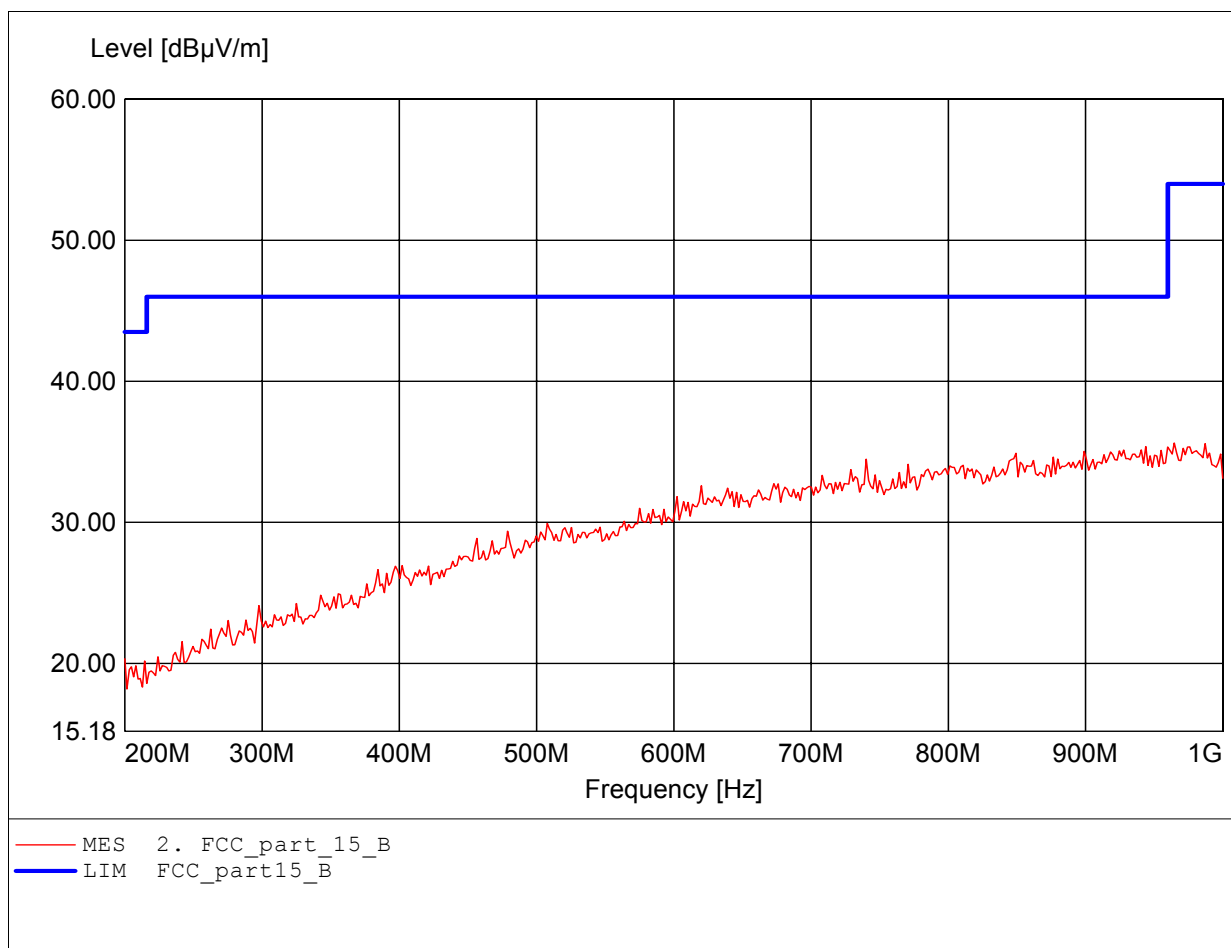
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HK 116  
Freq:195.230MHz Emax:24.70dBµV/m RBW: 100 kHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

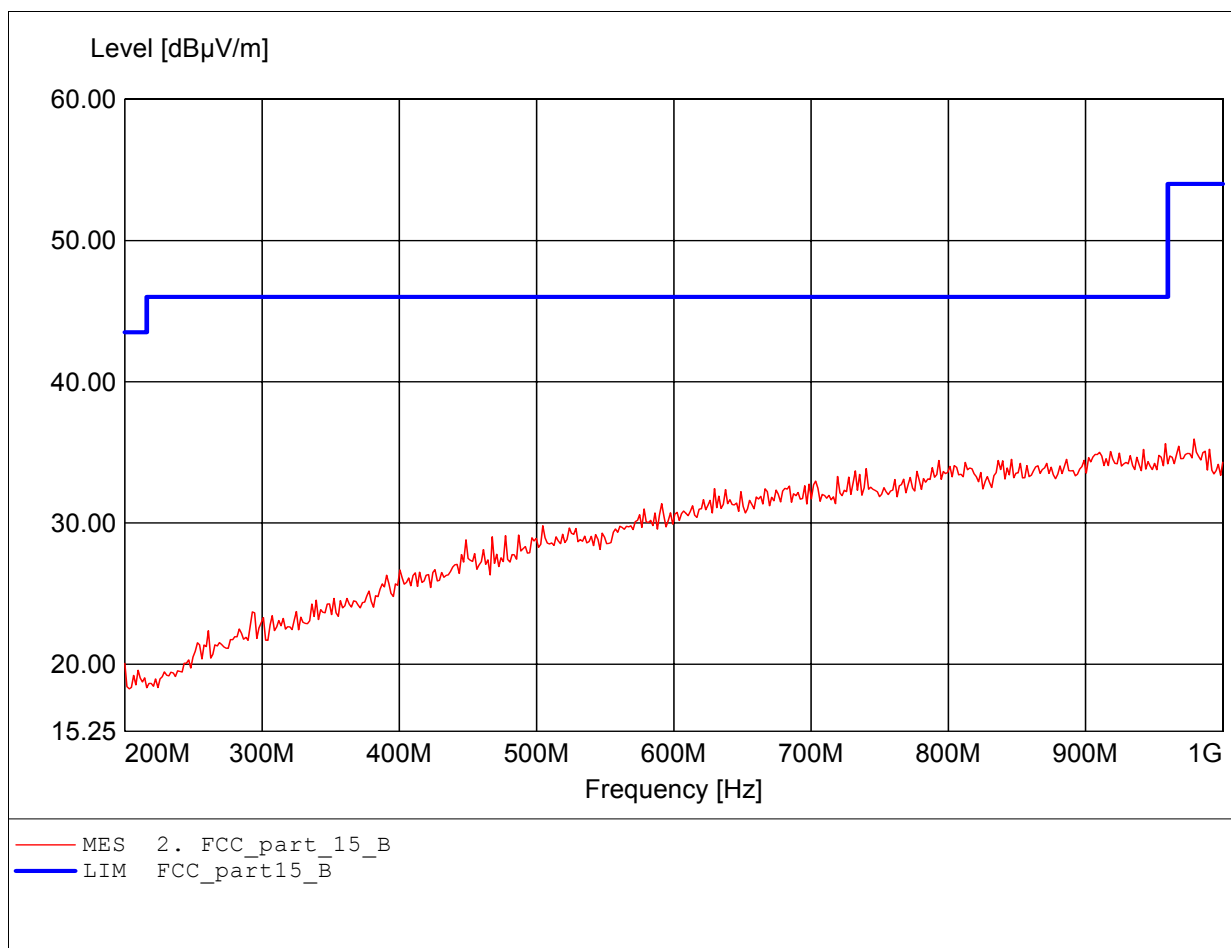
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL 223, ampl.  
Freq:964.729MHz Emax:35.62dBμV/m RBW: 100 kHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL 223, ampl.  
Freq:979.158MHz Emax:35.95dBμV/m RBW: 100 kHz

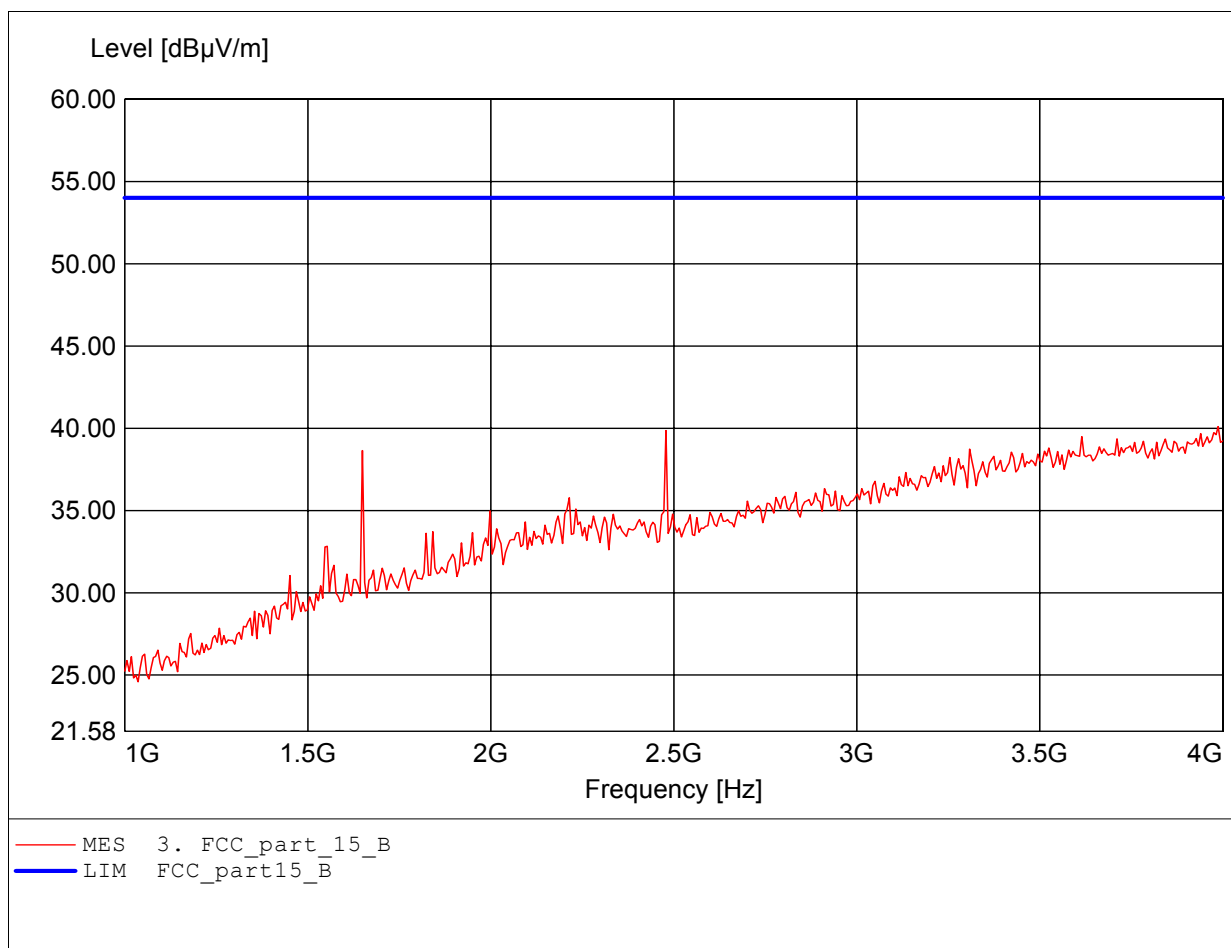




**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

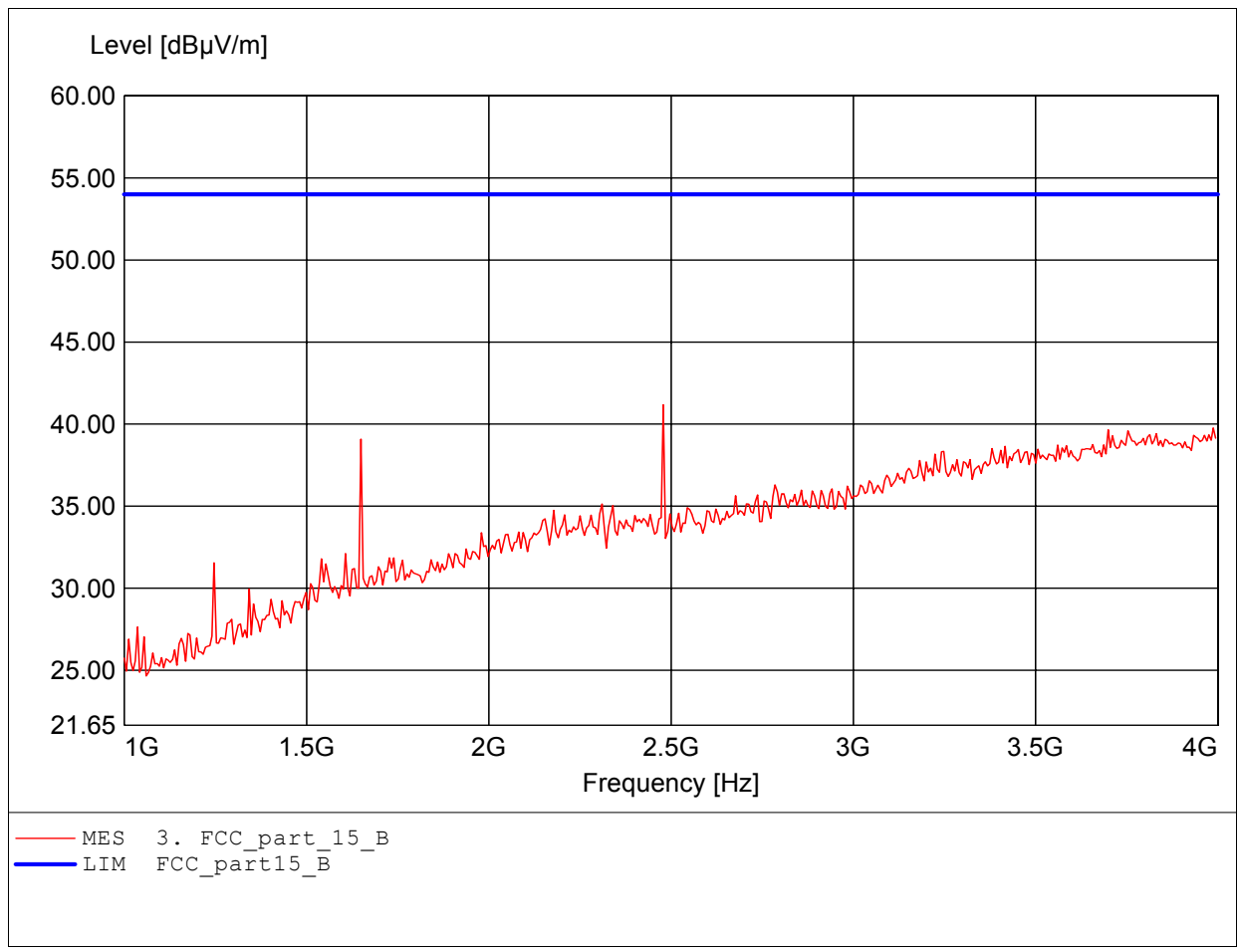
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:3.988GHz Emax:40.10dBµV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

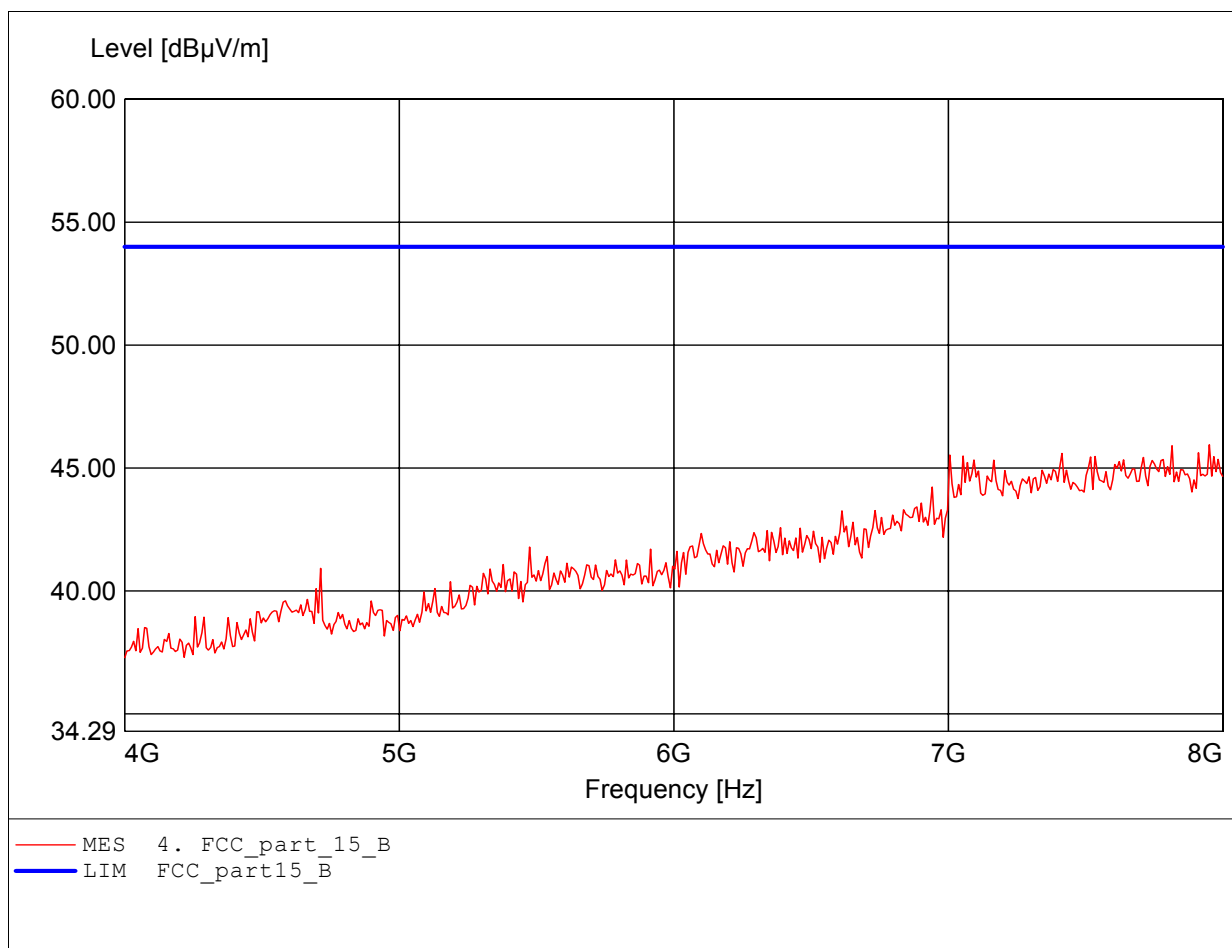
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:2.479GHz Emax:41.17dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

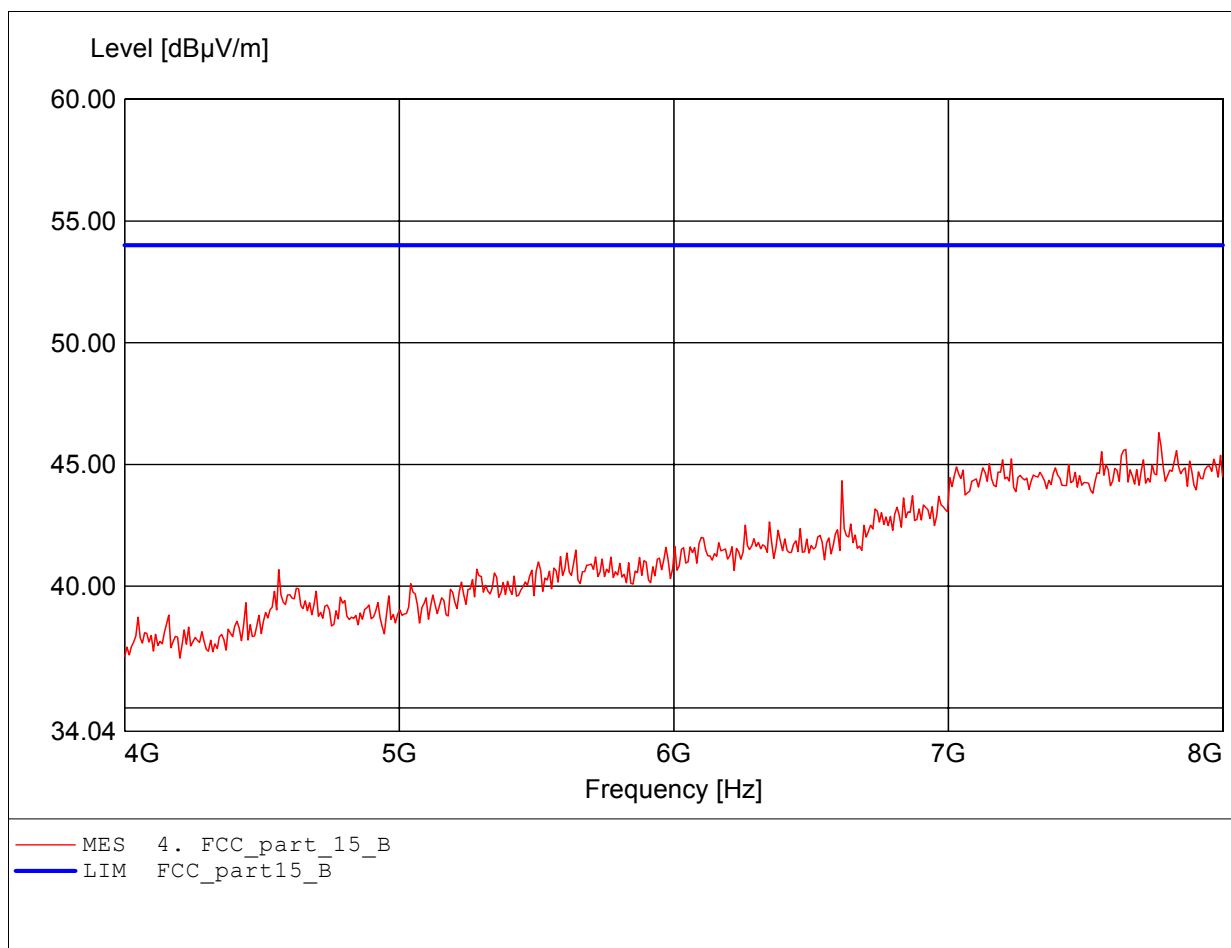
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:7.952GHz Emax:45.95dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

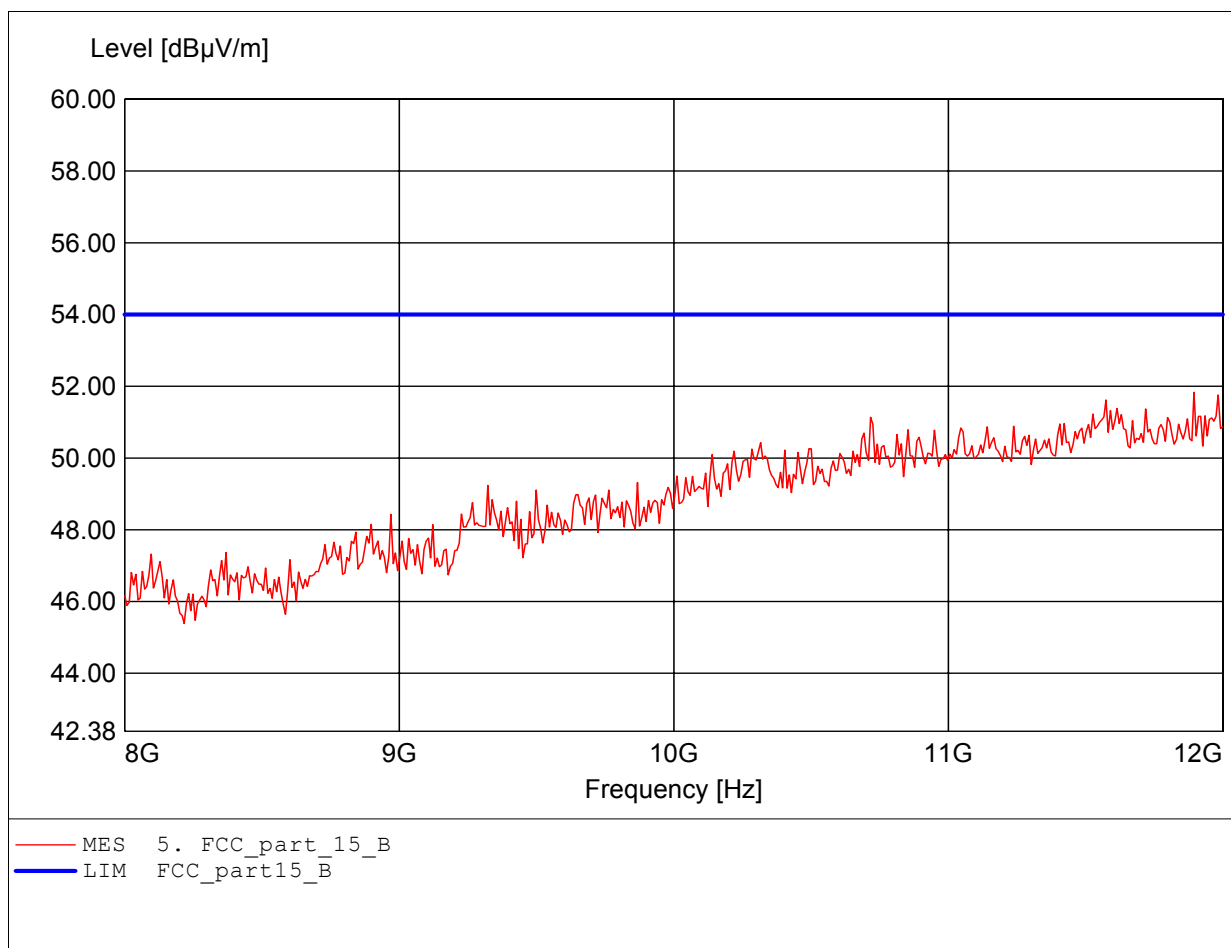
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:7.768GHz Emax:46.31dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

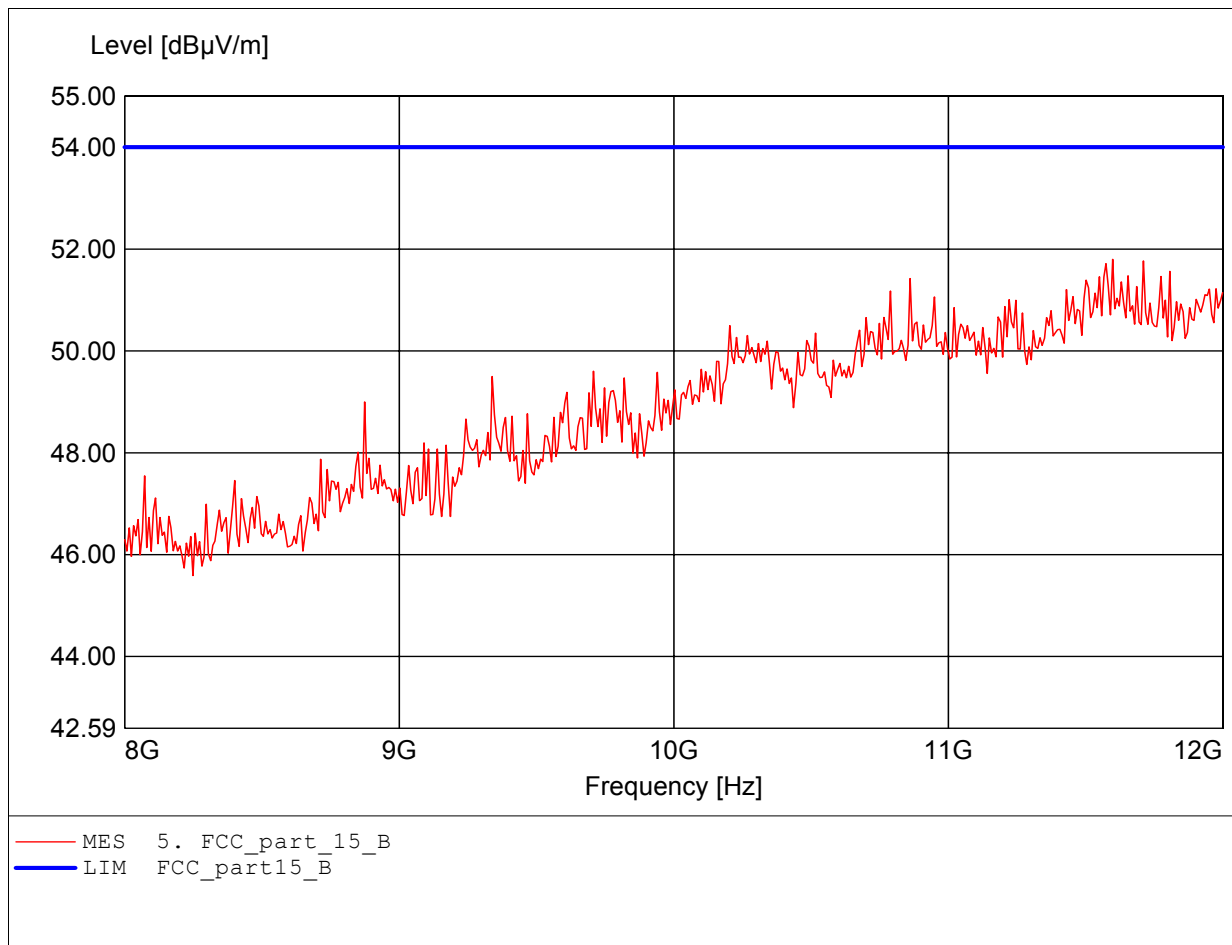
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:11.896GHz Emax:51.83dBμV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

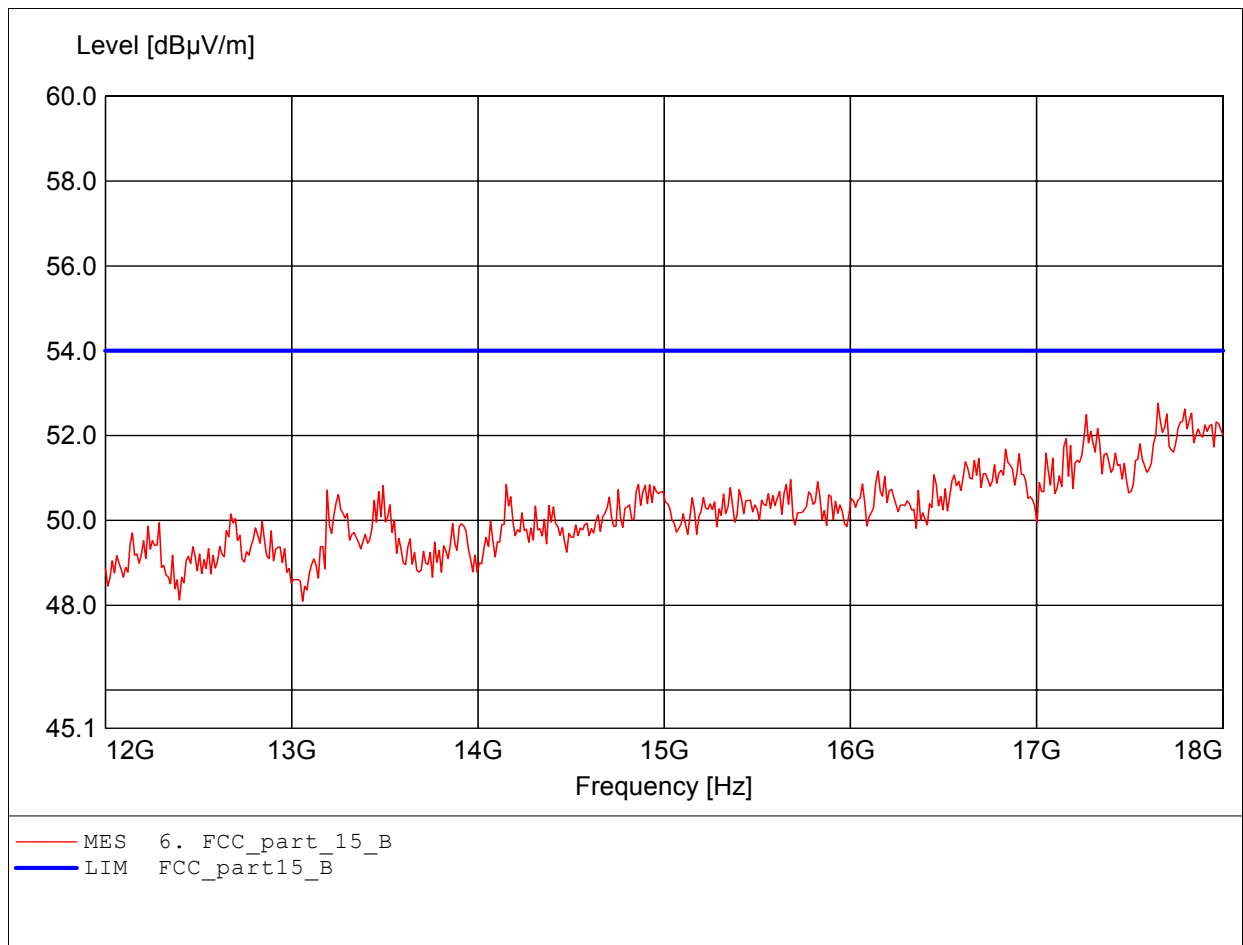
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:11.599GHz Emax:51.80dBµV/m RBW: 1 MHz



**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

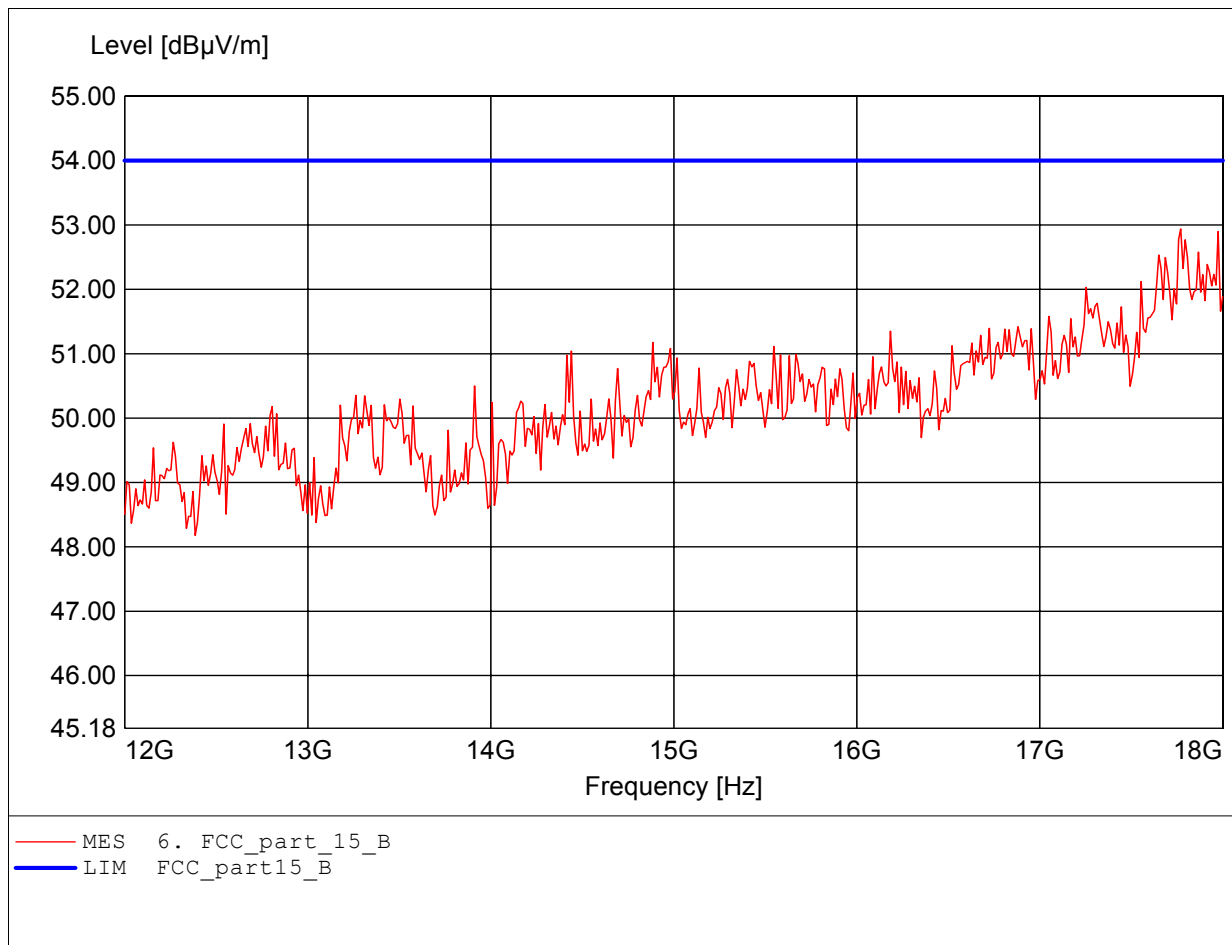
EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:17.651GHz Emax:52.76dBµV/m RBW: 1 MHz



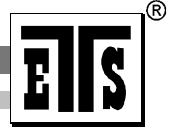
**Field Strength under normal conditions**

**FCC RULES PART 15, SUBPART B**

EUT: Bluetooth Transceiver Module  
MODEL NO.: UGPZ4 High Channel  
Approval Holder: ALPS ELECTRIC CO., LTD.  
Test Site / Operator: ETS / Orville Chang  
Temperature/Voltage: Temp.: 23°C/ Unom.: 120 VAC ( ac / dc Adaptor )  
Test Specification: according to subpart B  
Comment 1: Dist.: 3m, Ant.: HL25, ampl.  
Freq:17.772GHz Emax:52.94dBμV/m RBW: 1 MHz







Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

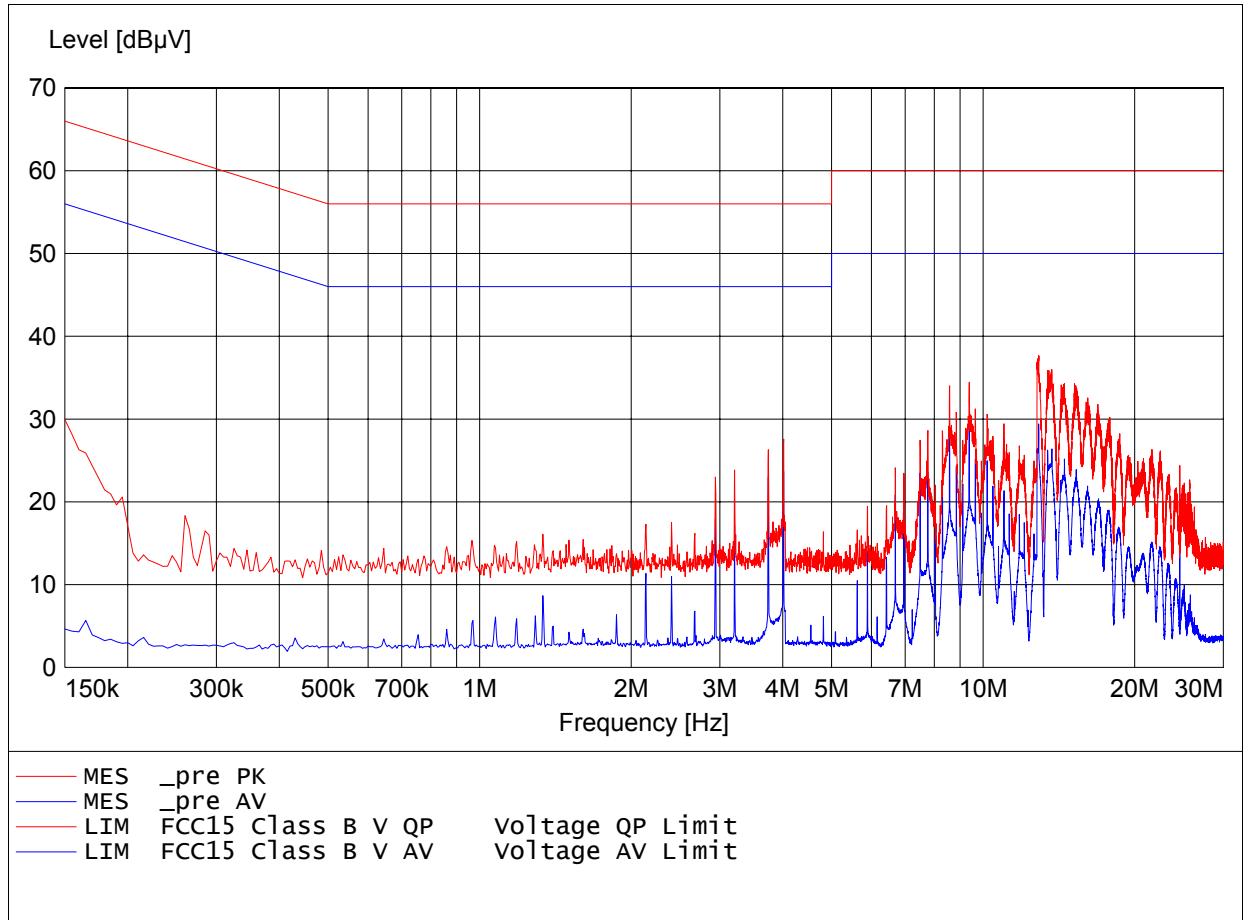
**Appendix I**

Power Line Conducted Emission

**EMI voltage test in the ac-mains according to FCC Part 15**

**Class B**

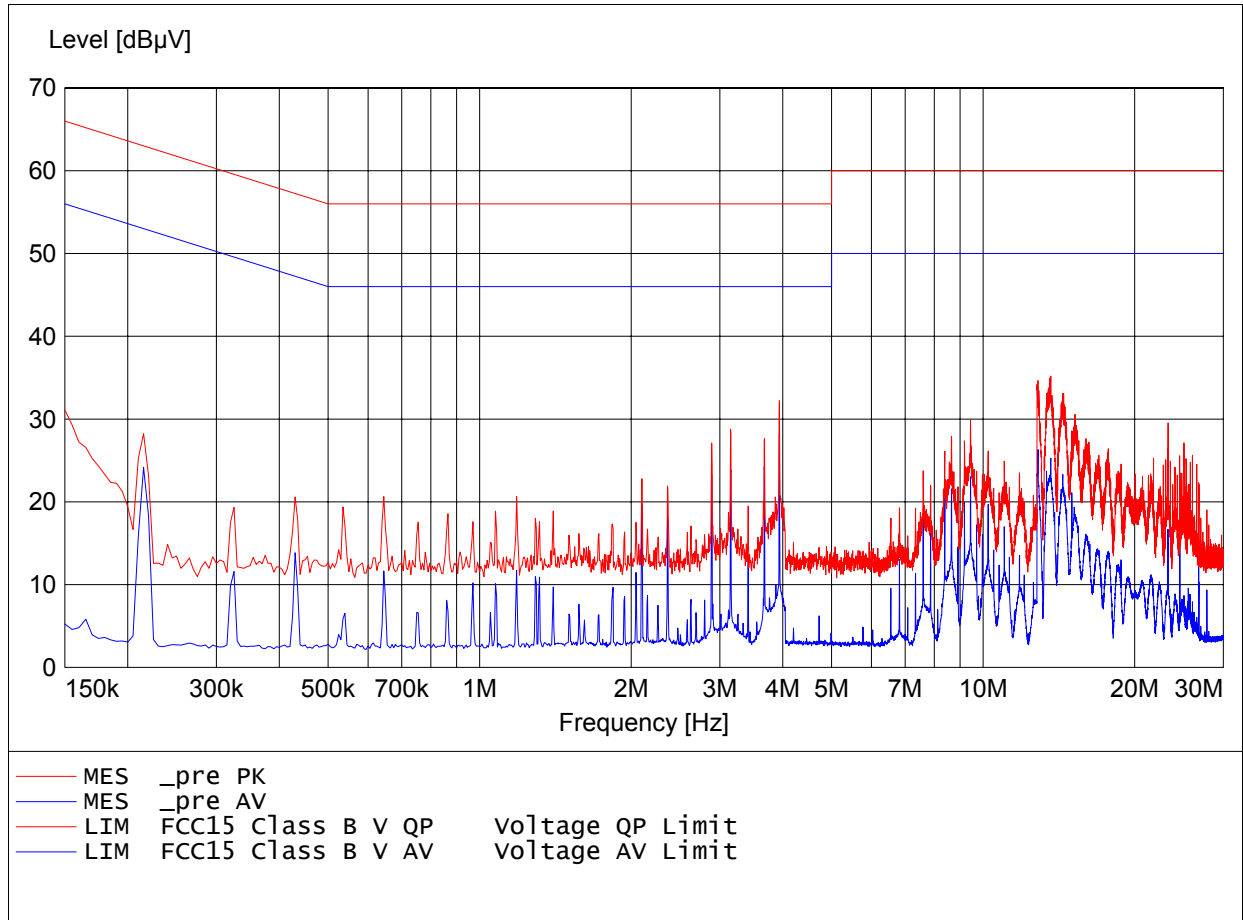
EUT: Bluetooth Transceiver Module  
Manufacturer: ALPS ELECTRIC CO.,LTD.  
Operating Condition: Unom: 120VAC , Tnom: 23°C  
Test Site: ETS  
Operator: Henry  
Test Specification: V-network: ESH3-Z5 N  
Comment: model: UGPZ4 mode: active

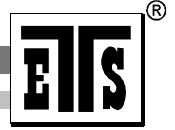


**EMI voltage test in the ac-mains according to FCC Part 15**

**Class B**

EUT: Bluetooth Transceiver Module  
Manufacturer: ALPS ELECTRIC CO.,LTD.  
Operating Condition: Unom: 120VAC , Tnom: 23°C  
Test Site: ETS  
Operator: Henry  
Test Specification: V-network: ESH3-Z5 L1  
Comment: model: UGPZ4 mode: active





Registration number: J10M20504-0002-P-15  
FCC ID : CWTUGPZ4

**Appendix J**

Pictures