Voltage: DC 3.85V

Date: 2022-10-26

#### **10. POWER SPECTRAL DENSITY**

#### 10.1 LIMITS

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

#### **10.2 TEST PROCEDURES**

- 1) Remove the antenna from the EUT, and then connect a low loss RF cable from antenna port to the spectrum analyzer.
- 2) Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- 3) Set the analyzer span to 1.5 times the DTS bandwidth. Set the RBW to  $3 \text{ kHz} \le \text{RBW} \le 100 \text{ kHz}$ . Set the VBW  $\ge [3 \times \text{RBW}]$ . Detector = peak. Sweep time = auto couple. Trace mode = max hold. Allow trace to fully stabilize. Use the peak marker function to determine the maximum amplitude level within the RBW. If measured value exceeds requirement, then reduce RBW (but no less than 3kHz) and repeat.
- 4) Repeat above procedures until all frequencies measured were complete.

#### 10.3 TEST SETUP



#### **10.4 TEST RESULTS**

Environment: 24.2°C/48%RH/101.0kPa Tested By: Yang Zhaoyun

#### Left earphone

BLE\_1M

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Test Result
Lowest	2402	-5.55		PASS
Middle	2440	-5.4	8.00	PASS
Highest	2480	-5.43		PASS

#### BLE\_2M

Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Test Result
Lowest	2402	-5.9	»	PASS
Middle	2440	-5.75	8.00	PASS
Highest	2480	-5.73		PASS

# **Right earphone**

BLE\_1M

				/ _\\\*\) /
Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Test Result
Lowest	2402	-5.09		PASS
Middle	2440	-5.06	8.00	PASS
Highest	2480	-5.2		PASS

# BLE\_2M

NS	Channel	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Test Result
	Lowest	2402	-5.48		PASS
	Middle	2440	-5.41	8.00	PASS
	Highest	2480	-5.48		PASS

#### Left earphone

#### BLE\_1M



#### Middle Frequency (2440 MHz)



Highest Frequency (2480MHz)



## BLE\_2M

#### Lowest Frequency (2402MHz)



Date: 26.0CT.2022 09:59:27

#### Middle Frequency (2440 MHz)



## Highest Frequency (2480MHz)



Date: 26.0CT.2022 10:03:00

#### **Right earphone**

BLE\_1M



#### Middle Frequency (2440 MHz)



Highest Frequency (2480MHz) Spectrum RefLevel 20.00 dBm Att 30 dB 
 Offset
 11.20 dB ●
 RBW
 3 kHz

 SWT
 632.1 μs
 ♥BW
 10 kHz
 Mode Auto FFT Count 100/100 ●1Pk View M1[1] -5.20 dBm 2.4800005450 GHz 10 dBm 0 dBm -10 dBm MM MMMMMMMM MMMM MMM 30 dB 40 dBm -50 dBm -60 dBm -70 dBm 30000 pts Span 990.0 kHz CF 2.48 GHz Date: 26.0CT.2022 10:56:50

#### BLE\_2M



#### Middle Frequency (2440 MHz)



Date: 26.0CT.2022 11:01:07

Highest Frequency (2480MHz)



#### 11. CONDUCTED BAND EDGES AND SPURIOUS EMISSIONS

#### 11.1 LIMITS

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB.

#### **11.2 TEST PROCEDURES**

Test procedures follow KDB 558074 D01 15.247 Measurement Guidance v05r02.

Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.

- 1) Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
- 2) Set the spectrum analyzer: RBW =100kHz; VBW =300kHz, Frequency range = 30MHz to 26.5GHz; Sweep = auto; Detector Function = Peak. Trace = Max, hold.
- 3) Measure and record the results in the test report.
- 4) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

#### 11.3 TEST SETUP



Report No.: E20221011998501-2

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## 11.4 TEST RESULTS

Environment: 24.2°C/48%RH/101.0kPa Tested By: Yang Zhaoyun

#### Left earphone

**Band edge measurements** 

BLE\_1M

Lowest Frequency (2402MHz) 2.35GHz-2.405GHz

Spect	rum										₩
Ref L	evel	20.00 dBm 30 dB	Offset SWT	11.20 dB 75.8 µs	<ul> <li>RBW 100 kH</li> <li>VBW 300 kH</li> </ul>	iz Iz Mode	Auto F	FT			
⊖1Pk Vi	ew			0.5							
10 dBm 0 dBm-						M	1[1] 2[1]		2	6.57 4020159 -46.47 4000000	dBm GHz dBm GHz
o abiii											
-10 dBm			In	-			16				
-20 dBn	<del>ا ا</del>	)1 -13.430	dBm-								
-30 dBn	-										
-40 dBn	1							мз	ol i birdin	M2	14
-50 dBn	Juna	10 sunths wards	malen www	mary	Mary mary	10 CONCIDENCIA	Montered	man we the	a conserver	and i	0
-60 dBn	-						-		_		
-70 dBn	1						-		-		-
Start 2	.35 G	Hz			691 (	ots			Stor	0 2.405 (	GHz
Marker											
Type	Ref	Trc	X-valu	e	Y-value	Func	tion	F	unction Resu	ılt	1
M1		1	2.4020	15 GHz	6.57 dBr	n					
M2		1		2.4 GHz	-46.44 dBr	n					
M3		1	2.	39 GHz	-49.09 dBr	n					
M4		1	2.35278	99 GHz	-44.69 dBr	n					
		1						ana si na		LAKA	-

Date: 26.0CT.2022 09:41:33

----- The following blanks ------

Voltage: DC 3.85V Date: 2022-10-26 Highest Frequency (2480MHz) 2.47GHz-2.55GHz



Date: 26.0CT.2022 09:45:59

#### BLE\_2M

# Lowest Frequency (2402MHz) 2.35GHz-2.405GHz

	in Onsec 11.20 up i	• RBW 100 kHz			
30 d	lB <b>SWT</b> 75.8 µs (	VBW 300 kHz	Mode Auto	FFT	
¥		1	M1[1]		6 60 dp
			witti		2.4020150 GF
-		-	M2[1]		-37.57 dB
				10	2.400000 GH
_		+ +			
D1 -13.40	0 dBm				
-		-			
					Ma
					<b>Y</b> "
	Contactory of Second		1.1.	MB	
muldereden	-Anador Marchands	mainten and a M	newsland	der Arend the man	hummely
1					
				1. A. A.	
5 GHz		691 pts	5		Stop 2.405 GH:
Ref   Trc	X-value	Y-value	Function	Fund	ction Result
1	2.402015 GHz	6.60 dBm			
1	2.4 GHz	-37.54 dBm			
1	2.39 GHz	-48.63 dBm			
	D1 -13.40		D1 -13.400 dBm D1 -13.400 dBm D1 -13.400 dBm C	D1 -13.400 dBm         M1[1]           -D1 -13.400 dBm	M1[1]           D1 -13.400 dBm         M2[1]           D1 -13.400 dBm         M2[1]           SG Brack         M3           M3         M3           M4         M3           M4         M4           M3         M3           M4         M4           M4         M4 <t< td=""></t<>

Date: 26.0CT.2022 09:59:37

Defle	unt		Offect 11 0	a da la	DDW 100 H	12					
Att	ever	20.00 aBi 30 d	m Offset 11.20 B SWT 94.1	) ав 🖷 8 µs 🖷	VBW 300 kH	⊣z ⊣z Mode	Auto F	FΤ			
●1Pk Vi	вw	6.5.15									
						M	1[1]				6.77 dB
10 dBm-	1	41								2.4	80010 G
20 0000		T			1	M	2[1]				48.83 dB
0 dBm-	_	ry					-	- 6	, a	2.4	83500 G
-10 dBm		1 12.02	0 dB m				2	-			
	Ĭ	1 -13.23	UBII								
-20 dBm											
20 dBm											
-30 UDII		h				-					
-40 dBm						ç	lotal				
		M2	Des Lors of the second	МЗ			Y				10 10 100 100
-50 dBm	us	Ulas	parameter	Mound	processing	Willartwiller	the marin	man	Le Jonte	manner	matuhan
-60 dBm	+		-				-	-	0		
-70 dBm							1	1.5			
Start 2	.47 G	Hz			691	pts				Stop	2.55 GH
Marker											
Type	Ref	Trc	X-value	11-	Y-value	Func	tion	2	Fun	ction Result	t
M2	-	1	2,48001 G	HZ	6.77 dBi	m					
M3		1	2.4035 G	Hz	-48 67 dB	m					
644		1	2 520203 6	Hz	-45 10 dB	m					

Highest Frequency (2480MHz) 2.47GHz-2.55GHz

Date: 26.0CT.2022 10:03:10

# **Conducted Spurious Emission** BLE\_1M

Lowest Frequency (2402MHz)



Date: 26.0CT.2022 09:41:42

Ref Level	15.00 dBm	Offset	11.20 dB 👄	<b>RBW</b> 100 k	Hz				
Att	20 dB	SWT	1.1 ms 👄	<b>VBW</b> 300 k	Hz Mode	Auto FFT			
Count 10/1	.0								
					M	1[1]			-56.10 dB
LO dBm							r s	17:	1.0170 MH
o dom									
J asm									
10 dBm									
10 0011	D1 -13.400	dBm							
20 dBm			-						_
-30 dBm				-		-			
-40 dBm				5					
50 dBm									
-30 ubm	M1								
60 dBm	A solution bearing	and an Name of State	N. H. M. HILL	here and	to the made that	الم الحريم ال	when have	a de sai ha	will have be
a property and	P.H. M. Dans	A PART A M	State of the state	ANNAR		PARTICIPATION OF	A ALMAN .	1	A. 10. 10. 10. 10.
70 dBm-			-						
-80 dBm			1	-					

Date: 26.0CT.2022 09:41:54





## Middle Frequency (2440MHz)



Date: 26.0CT.2022 09:44:15



Date: 26.0CT.2022 09:44:27



Date: 26.0CT.2022 09:44:46

## Highest Frequency (2480MHz)

₽ Spectrum RefLevel 30.00 dBm Att 30 dB 
 Offset
 11.20 dB
 RBW
 100 kHz

 SWT
 19 μs
 VBW
 300 kHz
 Mode Auto FFT Att
 Count 10/10
 1Pk View M1[1] 6.65 dBm 2.48000000 GHz 20 dBm 10 dBm-0 dBm -10 dBm--20 dBm--30 dBm -40 dBm--50 dBm--60 dBm-Span 3.0 MHz CF 2.48 GHz 691 pts Date: 26.0CT.2022 09:46:07

20 dE	SWT	1.1 ms 🖷	<b>VBW</b> 300 k	Hz Mode	Auto FFT			
U								
				M	1[1]		893	55.13 dB 7.2320 MF
D1 -13.350	dBm							
							M	-
					HAA!	WHIM	<b>NHHH</b>	white the
			**************************************					
							-	
	20 de 0	20 dB SWT 0 D1 -13.350 dBm D1 -13.350 dBm	20 dB SWT 1.1 ms 0	20 dB SWT 1.1 ms VBW 300 k 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	13:30 dBm         Oriset         11:20 dB         Coverage         Mode           20 dB         SWT         1.1 ms         VBW 300 kHz         Mode           0	13:30 dBm         Mode Auto FFT           0         Mode Auto FFT           0         M1[1]           1         M1[1]	13:30 dBm     11:ms     VBW     300 kHz     Mode Auto FFT       0	13:30 dBm     Mail       0     M1[1]       0     M1[1]       0     M1[1]       0     M1[1]

Date: 26.0CT.2022 09:46:19

#### Report No.: E20221011998501-2

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Date: 26.0CT.2022 09:46:38

#### BLE\_2M



₽ Spectrum Ref Level 30.00 dBm Att 30 dB Count 10/10 1Pk View Offset 11.20 dB ● RBW 100 kHz SWT 19 µs ● VBW 300 kHz Mode Auto FFT 6.61 dBm 2.40200000 GHz M1[1] 20 dBm-10 dBm 0 dBm -10 dBm--20 dBm -30 dBm--40 dBm--50 dBm--60 dBm-Span 3.0 MHz 691 pts CF 2.402 GHz 100 

Date: 26.0CT.2022 09:59:45

Count 10/	20 di 10	SWT	1.1 ms 👄	<b>VBW</b> 300 k	Hz Mode	Auto FFT			
1Pk View		,							
10 dBm					M	11[1]	r s	95	-55.72 dBn 1.9060 MH
) dBm									
10 dBm—	D1 -13.390	dBm		R					
20 dBm—									
30 dBm—									
40 dBm—				7					~
50 dBm—									M1
			ANNA	WWW	www			white	<b>hinder</b>
70 dBm									
						-			-

Date: 26.0CT.2022 09:59:57





## Middle Frequency (2440MHz)



Date: 26.0CT.2022 10:01:25





Date: 26.0CT.2022 10:01:37



Date: 26.0CT.2022 10:01:56

## Highest Frequency (2480MHz)



Att Count 10/10	20 dB	Onsor		RBW 100 k	Hz				
1Dk View		SWT	1.1 ms 👄	<b>VBW</b> 300 k	Hz Mode	Auto FFT			
TLK AIGH									
0 dBm					M	1[1]	re i i i	79:	-55.81 dBn 3.7690 MH
dBm									
LO dBm	-13 290	dBm	3						
20 dBm	10.200	Gom							
30 dBm			-						
40 dBm			-	5					
50 dBm						×.	M1		-
			which the				-	-	www
70 dBm									
30 dBm									
tart 30.0 MH	Ηz			3000	1 pts			Sto	p 1.0 GHz

Date: 26.0CT.2022 10:03:30

#### Report No.: E20221011998501-2



Date: 26.0CT.2022 10:03:49

## **Right earphone**

## BLE\_1M

## Lowest Frequency (2402MHz) 2.35GHz-2.405GHz

Ref L	evel	20.00 dBn	n Offset 11	.20 dB 🔵	RBW 1	00 kHz						
Att		30 dE	B SWT 7	75.8 µs 👄	VBW 3	DO kHz	Mode	Auto FF	Т			
∂1Pk Vi	ew				02							
							M	1[1]		2.4	6.8	8 dBn
10 dBm	-				-	0	M	2[1]		2.4	-43.0	dBn
								~[~]		2.4	00000	GH
0 dBm-												1
-10 dBm												
10 0011	D	1 -13.120	dBm		-						+	-
-20 dBm	1-							-			4	_
												Ь
-30 dBm	1-					13						
40 d0 m											12	
-40 080	1	10					1.6		M3		3	V
-Sto den	here	manghum	alum roma	allen my	American	une na	Mun	human	mound	nomentime	N.	
-60 dBm	∩— -		+ +		-			-				
-70 dBm	1										-	
Start 2	.35 G	Hz				691 pts				Stop	2.405	i GHz
Marker												
Туре	Ref	Trc	X-value		Y-valu	le	Func	tion	F	unction Resu	lt	
M1		1	2.40201	5 GHz	6.8	8 dBm						
M2	-	1	2.4	4 GHZ	-43.0	4 dBm						
M4	1	1	2 300078	3 GHz	-44 5	1 dBm						

Date: 26.0CT.2022 10:53:33

## Highest Frequency (2480MHz) 2.47GHz-2.55GHz

Spectrum									4	
Ref Level	20.00 dB	m Offset 1	1.20 dB (	• RBW 100 kHz						
Att	30 (	SWI	94.8 µs (	<b>VBW</b> 300 KH2	Mode	Auto FF	Т			
1PK VIEW				1 1		1547			c 00 JD	
					IVI.	1[1]		6.82		
10 dBm	T	-		-	M	2[1]		-	-48.25 dB	
0 dDm	n							2	.483500 GI	
J dBm	1									
-10 dBm	11									
(	01 -13.18	0 dBm		-						
-20 dBm	1							_		
	1.6									
-30 dBm		-		-					-	
10 -10										
-40 aBm	UM2		Ma	3						
-50 dBm	tra	y menourney	Mound	moundation	homenally	portuna	Myman	monorman	unum with	
-60 dBm		-				-				
-70 dBm		-							-	
									0.55.011	
start 2.47 (	iHZ			641 b	ts			Sto	ip 2.55 GH	
larker	1 - 1				1 -	1				
Type Ref	Irc	x-value		f-value	Func	ion	F	unction Resu	iit	
M2	1	2.48	35 GHz	-48.25 dBm						
M3	1	2	.5 GHz	-48.25 dBm						
M4	1	2.502	58 GHz	-44.98 dBm	č.					

Date: 26.0CT.2022 10:56:59

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# BLE\_2M

Spect	rum							Ē
opeee			011 1 11 00 10					( V
Ref L	evel	20.00 dB 30 (	Im Offset 11.20 dB	RBW 100 kHz	Mode Auto FE	т		
1Pk Vi	ew	50 (	ab <b>0111</b> 10.0 ps		Mode Adtorr			
					M1[1]			6.91 dBm
10 dBm							2.402	01 A GHz
10 0000					M2[1]		-3	5.50 dBm
0 dBm-	-			-		1	2.400	UUDU GHZ
								11
-10 dBn		1 -13.09	0 dBm					
-20 dBn	1-							
-30 dBn	n						M	2
40 dBa								PP (1)
-40 080						M3		L.
-50 dBn	when	month a	use an entremander	undorgunation of	www.unununu	willow Manuth	philippin	
-60 dBn	n							
-70 dBn								
, o abii								
Start 2	.35 G	Hz		691 pt	ts		Stop 2.	405 GHz
Marker								
Туре	Ref	Trc	X-value	Y-value	Function	Fund	ction Result	
M1	-	1	2.402015 GHz	6.91 dBm				
M3	7	1	2.39 GHz	-49.52 dBm				
M4	1	1	2.3999783 GHz	-35.80 dBm				

Date: 26.0CT.2022 10:59:24

## Highest Frequency (2480MHz) 2.47GHz-2.55GHz

Ref Level	20.00 dBr 30 d	n Offset 11.20 B SWT 94.8	dB 👄 RB	W 100 kHz	Mode	Auto FE	r:		
1Pk View	00 0				moue	Auton			
10 dBm	MI				M: M:	L[1] 2[1]		2.4	6.94 dBr 180010 GH -47.99 dBr
0 dBm	M					-		2.4	183500 GF
-10 dBm	01 -13.060	) dBm							-
-20 dBm							-		
-30 dBm-						2	-		
-40 dBm	M2	M4	M3	wholended	rentrolwy	Mulliontro	when the man	porenter	mound
-60 dBm									
-70 dBm							1. 1.4	-	
Start 2.47	GHz			691 pts				Stop	p 2.55 GH:
larker									
Type Ref	Trc	X-value	Y	-value	Funct	ion	Fun	ction Result	t
M1	1	2.48001 GH	z	6.94 dBm		-			
M2	1	2.4835 GH	Z .	-47.99 dBm					
M3	1	2.5 GH	Z .	49.36 dBm					

Date: 26.0CT.2022 11:02:55

# **Conducted Spurious Emission** BLE\_1M

Lowest Frequency (2402MHz)



Date: 26.0CT.2022 10:53:41

Ref Level 15.00	dBm Offset	11.20 dB 👄	RBW 100 ki	Hz				
Att 20	D dB SWT	1.1 ms 👄	<b>VBW</b> 300 ki	Hz Mode	Auto FFT			
Count 10/10								
TPK VIEW		-		5.4	1[1]			56 04 db
10 dBm				M	T[T]		86	2.9920 MH
								-
) dBm		-						
10 dBm	110 d0m						8	
DI -13.	110 GBII							
20 dBm								
30 dBm-								
40 d0m								
40 uBm								
50 d8m								
oo abiii							M1	
eq demt. b. b. t. H.	des a M. S. no. b. d	4.4.4.4.4	a sub de s	Will bene	4 H. M. H. H.	hill hat been	M. L. W. L. K.	parte Marchar Mar
<b>MANNANA</b>	THE HALL	A MARANA A	NAM AND	ARMAN	A PARTY AND	A MARIAN	1 <b>11 11 11 11 11</b> 11	14, 21, 4, 19, 14
70 dBm								
80 dBm					-			
			0000					10.011

Date: 26.0CT.2022 10:53:53





## Middle Frequency (2440MHz)



Date: 26.0CT.2022 10:55:19

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Date: 26.0CT.2022 10:55:31

1Pk View	-								
0 dBm					M	1[1]		2.4	6.42 dBr
T					м	2[1]			-51.09 dBr
dBm						1	ř i	3.0	659650 GF
U UBIII	D1 -13.160	dBm		<i></i>					
20 dBm—							-		-
30 dBm —									
0 dBm									
N	2								
50 dBm —	-								
المحمد المحمد وهرا	م المثلية المعلية م مدينة	1. martinette	and the strategicture of the	مازير بحدودهم وطاريا	Albarra	and the second second second	Mail Considerate	Jacobi she was	Winder Magazine
application of the second s		States.	washing to an	Print of the second	August Cont.		and the second	and the state of the	a second second
70 dBm									
				1		1			

Date: 26.0CT.2022 10:55:50

#### Highest Frequency (2480MHz)





Date: 26.0CT.2022 10:57:19



Date: 26.0CT.2022 10:57:38

#### BLE\_2M



₽ Spectrum Ref Level 30.00 dBm Att 30 dB Count 10/10 1Pk View 
 Offset
 11.20 dB
 ■
 RBW
 100 kHz

 SWT
 19 μs
 ■
 VBW
 300 kHz
 Mode Auto FFT 6.94 dBm 2.40200000 GHz M1[1] 20 dBm-10 dBm 0 dBm -10 dBm--20 dBm -30 dBm--40 dBm--50 dBm -60 dBm 691 pts Span 3.0 MHz CF 2.402 GHz

Date: 26.0CT.2022 10:59:33

1Pk View	10								
10 dBm					M	1[1]		86	-56.41 dBr 5.6760 MH
dBm					-				
10 dBm—	D1 -13.060	) dBm			2				
20 dBm—				-					
30 dBm—									
40 dBm—	1			0	2				
50 dBm—								M1	
	-	ANNON	WWW	-	-	ANNIN	-	HANN	White
70 dBm—			10.0007.00						

Date: 26.0CT.2022 10:59:45





## Middle Frequency (2440MHz)



Date: 26.0CT.2022 11:01:15



Date: 26.0CT.2022 11:01:26



Date: 26.0CT.2022 11:01:45

## Highest Frequency (2480MHz)



Spectrun	n								
Ref Leve Att Count 10/:	1 15.00 dB 20 c	m Offset IB SWT	11.20 dB 👄 1.1 ms 👄	RBW 100 k VBW 300 k	Hz Hz <b>Mode</b>	Auto FFT			
1Pk View									
10 dBm					M	1[1]	r	989	56.00 dBm 9.4760 MHz
0 dBm									
-10 dBm	-D1 -13 13	0 dBm							
-20 dBm									-
-30 dBm									
-40 dBm									
-50 dBm						c.			M1
af 9, detailet	the second		WHW W			ANNA			www
-70 dBm	a a control								
-80 dBm				-					
Start 30.0	MHz		d.	3000	1 pts	L		Sto	p 1.0 GHz
						Newsur		1000 B	9

Date: 26.0CT.2022 11:03:15