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Test Report for FCC

FCC ID :TKWBSA2-OEPW

Report Number		ESTEFC1603-006		
Applicant	Company name	SUPREMA INC		
	Address	16F Parkview Office Tower, Jeongja-dong, Bundang-gu, Seongnam, Gyeonggi, 463-863 Korea		
	Telephone	82-31-710-4908		
	Contack person	Kyung-Jin Hong		
Product	Product name	Biostation A2		
	Model No.	BSA2-OEPW	Manufacturer	SUPREMA INC
	Serial No.	None	Country of origin	KOREA
Test date	2016-3-10 ~ 2016-3-18		Date of issue	28-Mar-16
Testing location	347-69, Jungbu-daero 147beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do 467-811, R. O. Korea			
Standard	FCC PART 15 Subpart C (15.247) , ANSI C 63.4(2009) , KDB 558074 D01(2016)			
Measurement facility registration number	659627			
Tested by	Senior Engineer S.S. An (Signature)			
Reviewed by	Engineering Manager J.M.Yang (Signature)			
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable			

* Note

- Basic Model : BSA2-OEPW , Additional Model : BSA2-OHPW
- This test report is not permitted to copy partly without our permission
- This test result is dependent on only equipment to be used
- This test result based on a single evaluation of one sample of the above mentioned

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Contents

1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.
ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.
ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co., Ltd.

Head Office : Suite 1015 World Meridian II, 123 Gasan Digital 2-ro, Geumcheon-gu, Seoul 153-759, R. O. Korea

EMC/Telecom/Safety Test Lab : 347-69, Jungbu-daero 147beon-gil, Majang-myeon, Icheon-si,
Gyeonggi-do 467-811, R. O. Korea

1.3 Official Qualification(s)

MSIP : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication
KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements
FCC : Conformity Assessment Body(CAB) with registration number 659627 under APEC TEL MRA between the RRA and the FCC
VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test

Modulation Type	: CCK, OFDM
Transfer Rate	: 11 Mbps , 54 Mbps
Number of Channel	: 11 ch
PEAK Output Power	: 14.09 dBm
Rating	: DC : 12 V
Receipt Date	: 11-Feb-16
Testing Voltage	: AC 120 V , 60 Hz
X-tal list(s) or Frequencies generated	: The highest operating frequency is 2 462 MHz

2.2 General descriptions of EUT

Product specifications

Category	Feature	Specification
General	Biometric	Fingerprint
	LFD	Supported
	RF Option	2.4 GHz, 125 kHz Mifare/DesFire/DesFire EV1/Felica/NFC, 125 kHz iClass SE
Storage capacity	Max. User (1:1)	500,000
	Max. User (1:N)	100,000
	Max. Template (1:1)	1,000,000
	Max. Template (1:N)	200,000
	Max. Text Log	5,000,000
	Max. Image Log	50,000
Interface	Wi-Fi	Supported
	TCP/IP	Supported
	RS-485	1ch Host or Slave (Selectable)
	RS-232	Supported
	Wiegand	1ch Input, 1ch Output
	TTL input	1ch Input
	Relay	2 Relay
	USB	USB 2.0 (Host)

3. Test Standards

Test Standard : FCC PART 15 Subpart C (15.247)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.10 (2009) & KDB558074 D01(2016)

This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain decides that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment These method apply to the measurement of individual units or systems comprised of multiple units

Summary of Test Results

Applied Satandard : 47 CFR Part 15 Subpart C				remark
Standard	Test Type	Result	Remark	Limit
15.207	AC Power Conducted Emission	Pass	Meet the requirement	
15.205 & 15.209	Restricted band / Intentional Radiated Emission	Pass	Meet the requirement	
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement	Min. 500 kHz
	99 % Bandwidth			
15.247(b)(3)	Maximum Peak/average ouput power	Pass	Meet the requirement	Max. 30 dBm
15.247(c)	Transmitter Radiated Emission	Pass	Meet the requirement	Table 15.209
15.247(e)	Power Spectral Density	Pass	Meet the requirement	Max. 8 dBm
15.247(d)	Band Edge Measurement	Pass	Meet the requirement	20 dB less

4. Measurement Condition

4.1 EUT Operation

a. Channel

Ch.	Frequency	Ch.	Frequency
1	2 412 MHz	7	2 442 MHz
2	2 417 MHz	8	2 447 MHz
3	2 422 MHz	9	2 452 MHz
4	2 427 MHz	10	2 457 MHz
5	2 432 MHz	11	2 462 MHz
6	2 437 MHz		

b. Measurement Channel : WLAN : Low(2 412 MHz), Middle(2 437 MHz), High(2 462 MHz)

c. Test Mode : Continuous Output, CCK, OFDM

d. Test rate : 11 Mbps, 54 Mbps

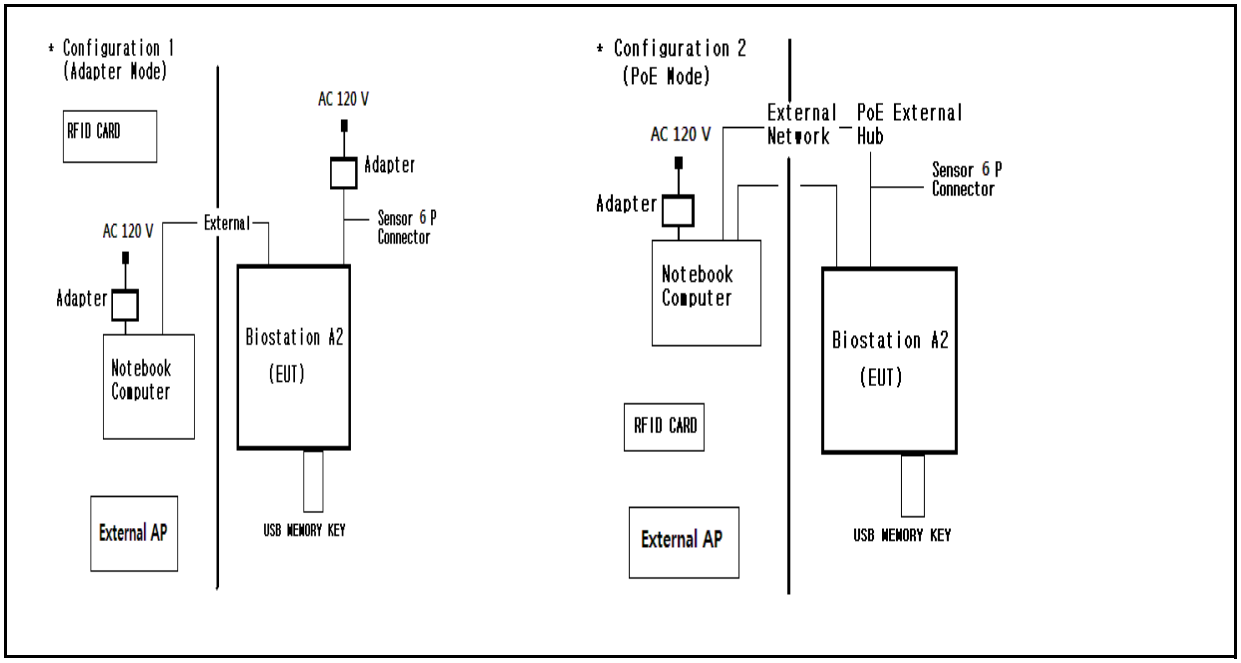
4.2 EUT Operation

-The EUT was tested, tested under transmission/receiving condition continuously between the EUT

1. Check normal communication with RF OUT Frequeny(125 kHz / 2.4 GHz Band).

2. The EUT is connected to the external wireless Spectrum Analyzer operation test.

4.3 Configuration and Peripherals



4.4 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
Biostation A2	BSA2-OEPW	NONE	SUPREMA INC	EUT
Adapter	JPW128KA1200N05	NONE	BridgePower Corp.	
USB Memory Key	NONE	NONE	NONE	

4.5 Cable Connecting

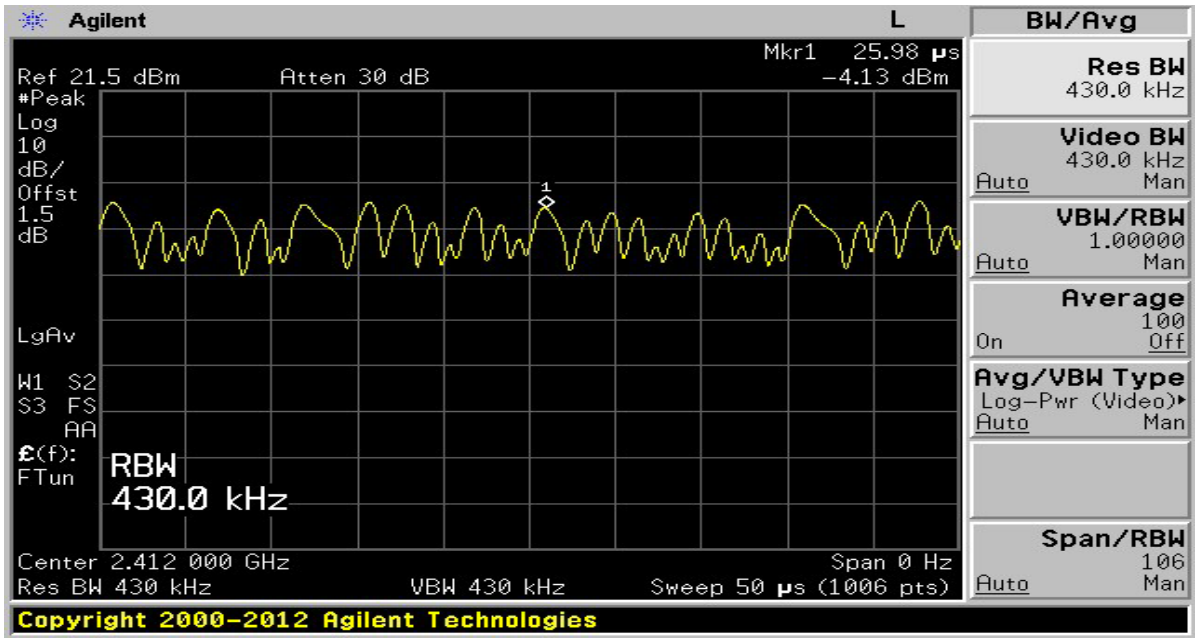
Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
Biostation A2	WIRELESS (2.4 GHz)	External AP	WIRELESS (2.4 GHz)	-	-	
Biostation A2	DC POWER	Adapter	AC Line	2.0	Shielded	
Biostation A2	125 kHz	RFID CARD	125 kHz	-	-	
Biostation A2	USB	USB Memory Key	USB	-	-	
Biostation A2	PoE(LAN)	PoE HUB (External Network)	LAN	20.0	Unshielded	
Biostation A2	RS-485	RS-485 CONVERTER	USB	3.0	Unshielded	

4.6 DUTY CYCLE OF TEST SIGNAL

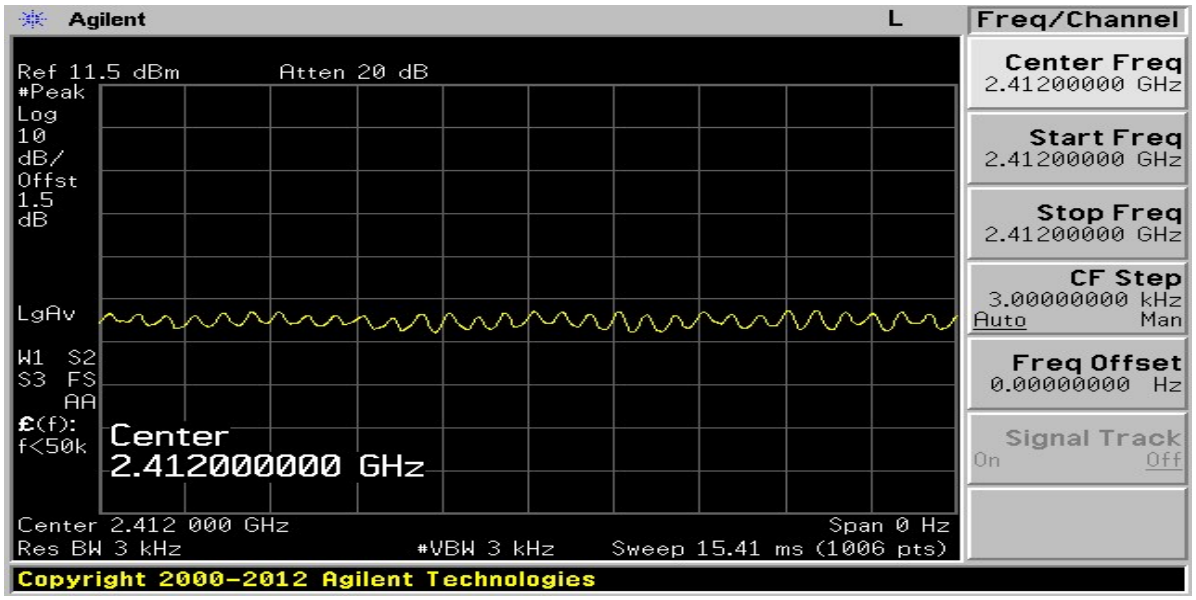
Duty cycle is > 98 %, duty factor shall be considered.

duty cycle = 100% , duty factor = 10*log(1/1) = 0

CCK



OFDM



5. DTS bandwidth

5.1 Test procedure

558074 D01 DTS Meas Guidance v03v04 8.2 Option 2 :The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW ≥ 3 x RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that

5.2 might be > 6 dB Test instruments and measurement setup

The spectrum analyzer is set to as following.

. RBW= 100 KHz . VBW≥ 3 x RBW

. Span= 20 MHz . Sweep= suitable duration based on the EUT specification.

Limits : FCC § 15.247(a)(2)

6dB Bandwidth Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041291	12-Jan-17
RF Cable	Length: 10 cm	-	
-Spectrum Analyzer <=> EUT	Loss: 1.5 dB	-	

5.3 Measurement results - Adapter

EUT	Biostation A2	MODEL	BSA2-OEPW
MODE	CCK, OFDM	ENVIRONMENTAL CONDITION	24.0 ℃, 44.0 % R.H.
INPUT POWER	12.0 Vd.c.		

MODE - CCK

Channel Frequency (MHz)	Emission bandwidth (MHz)	Bandwidth at 6dB below(MHz)	Minimum Limit (MHz)	PASS/FAIL
2 412	15.06	10.04	0.5	PASS
2 437	15.06	9.62	0.5	PASS
2 462	15.05	10.09	0.5	PASS

MODE - OFDM

Channel Frequency (MHz)	Emission bandwidth (MHz)	Bandwidth at 6dB below(MHz)	Minimum Limit (MHz)	PASS/FAIL
2 412	16.49	16.55	0.5	PASS
2 437	16.48	16.53	0.5	PASS
2 462	16.48	16.54	0.5	PASS

5.3 Measurement results - POE

EUT	Biostation A2	MODEL	BSA2-OEPW
MODE	CCK, OFDM	ENVIRONMENTAL CONDITION	24.0 ℃, 46.0 % R.H.
INPUT POWER	48.0 Vd.c.		

MODE - CCK

Channel Frequency (MHz)	Emission bandwidth (MHz)	Bandwidth at 6dB below(MHz)	Minimum Limit (MHz)	PASS/FAIL
2 412	15.04	9.58	0.5	PASS
2 437	15.04	10.06	0.5	PASS
2 462	15.03	10.05	0.5	PASS

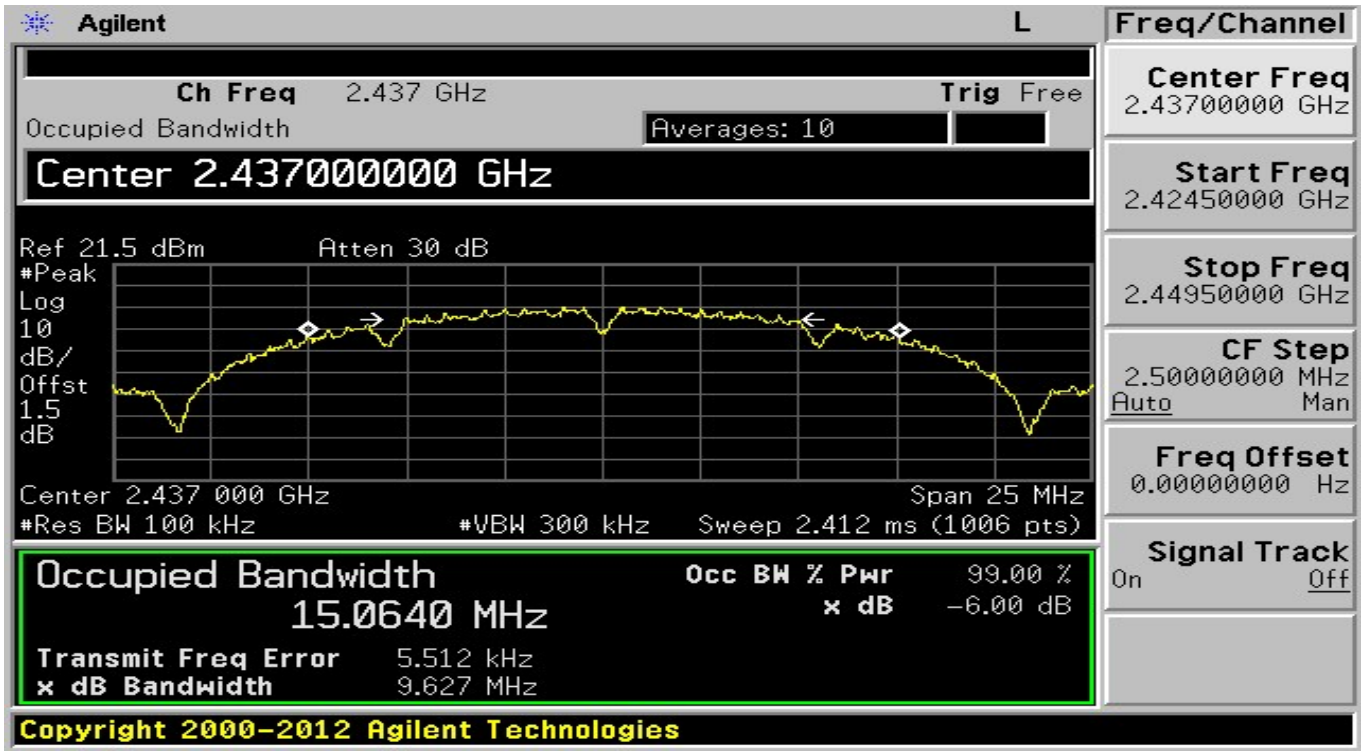
MODE - OFDM

Channel Frequency (MHz)	Emission bandwidth (MHz)	Bandwidth at 6dB below(MHz)	Minimum Limit (MHz)	PASS/FAIL
2 412	16.49	16.55	0.5	PASS
2 437	16.50	16.57	0.5	PASS
2 462	16.46	16.50	0.5	PASS

5.4 Trace data - Adapter

(ch_1)

(ch_6)



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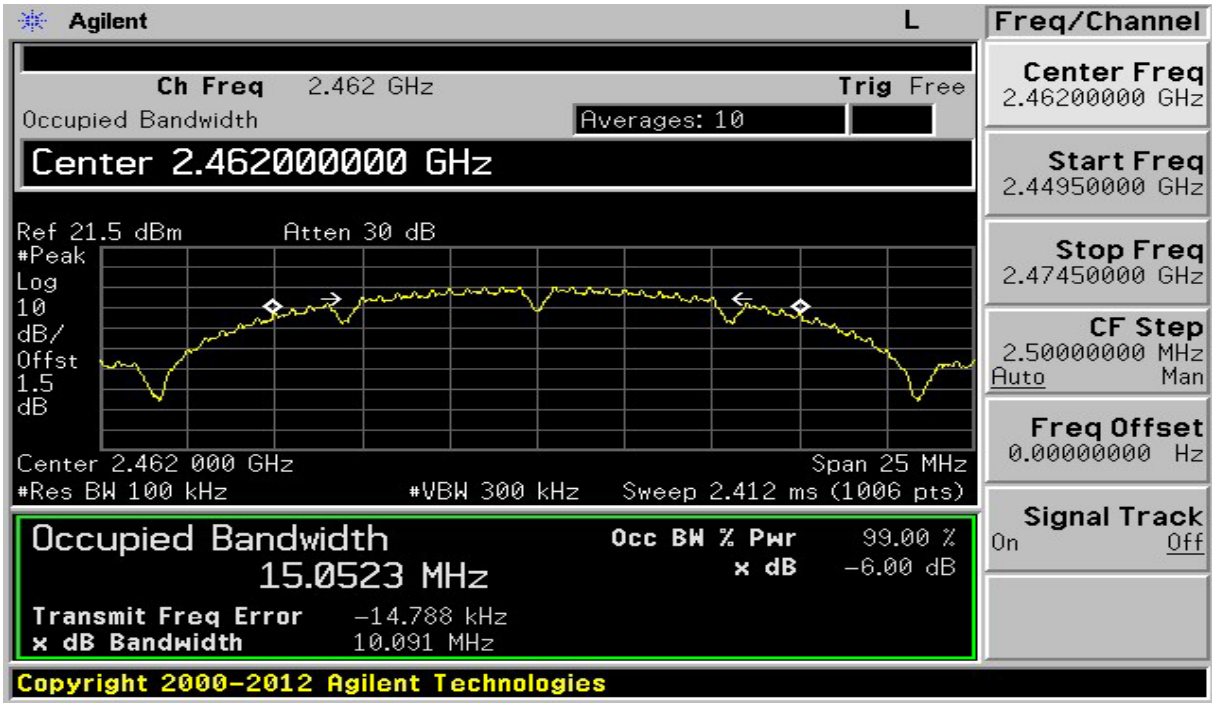
Agilent
L
Freq/Channel
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Averages: 10
Center 2.462000000 GHz
Ref 21.5 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
1.5
dB
Center 2.462 000 GHz
Span 25 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.412 ms (1006 pts)
Occupied Bandwidth
15.0523 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error -14.788 kHz
x dB Bandwidth 10.091 MHz
Center Freq
2.46200000 GHz
Start Freq
2.44950000 GHz
Stop Freq
2.47450000 GHz
CF Step
2.50000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
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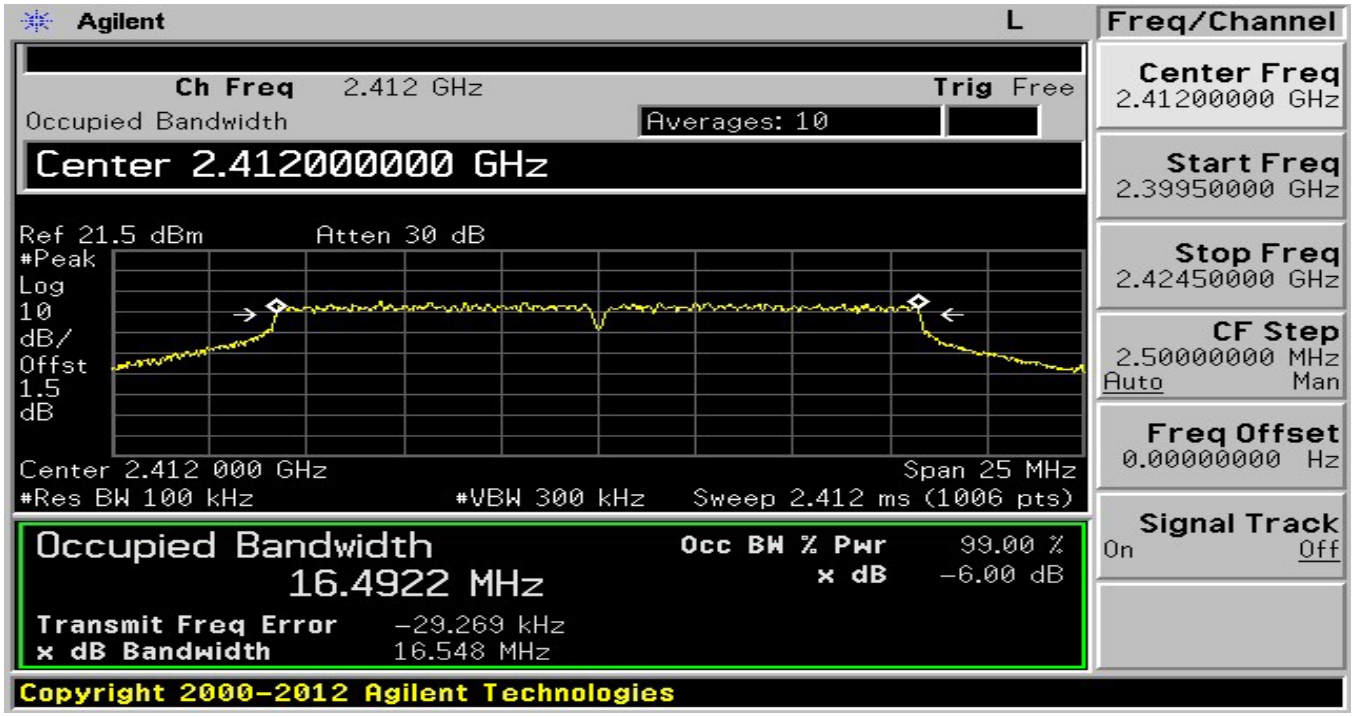
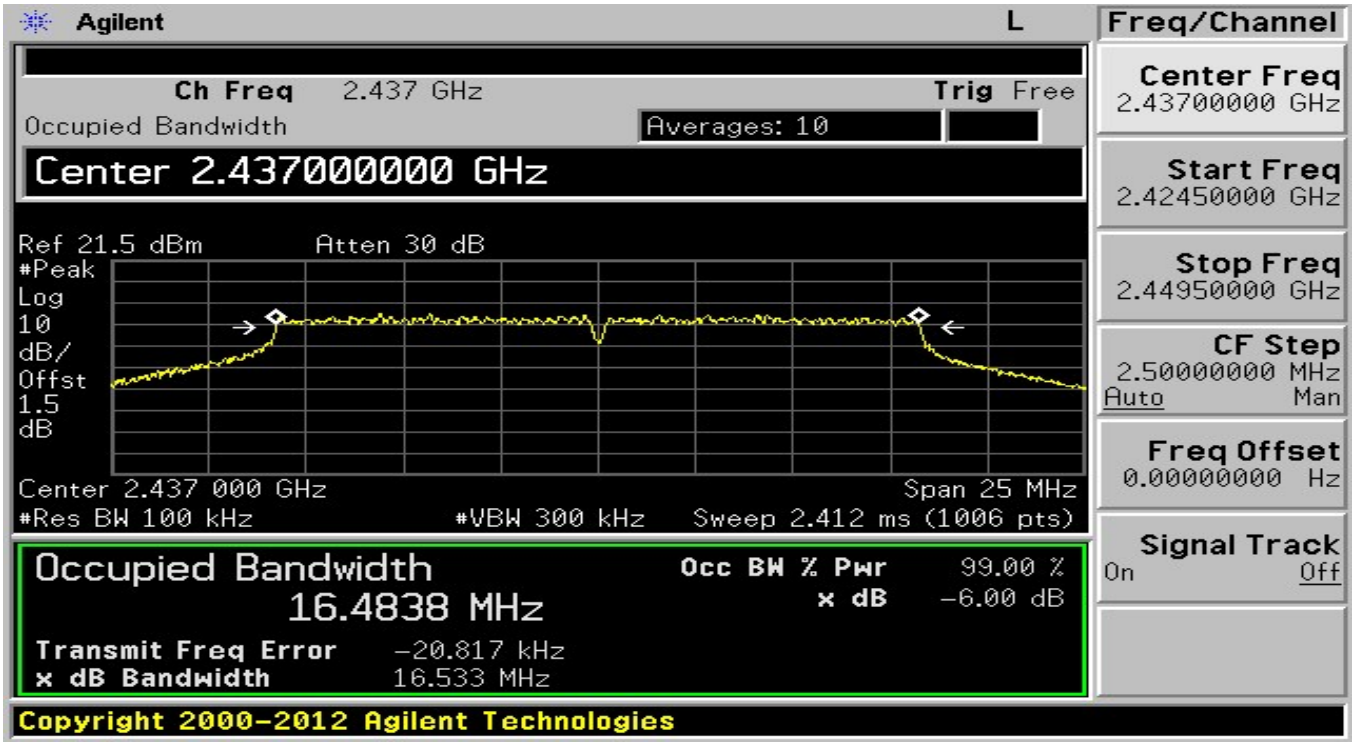
5.4 Trace data - Adapter

(ch_1)



(ch_6)



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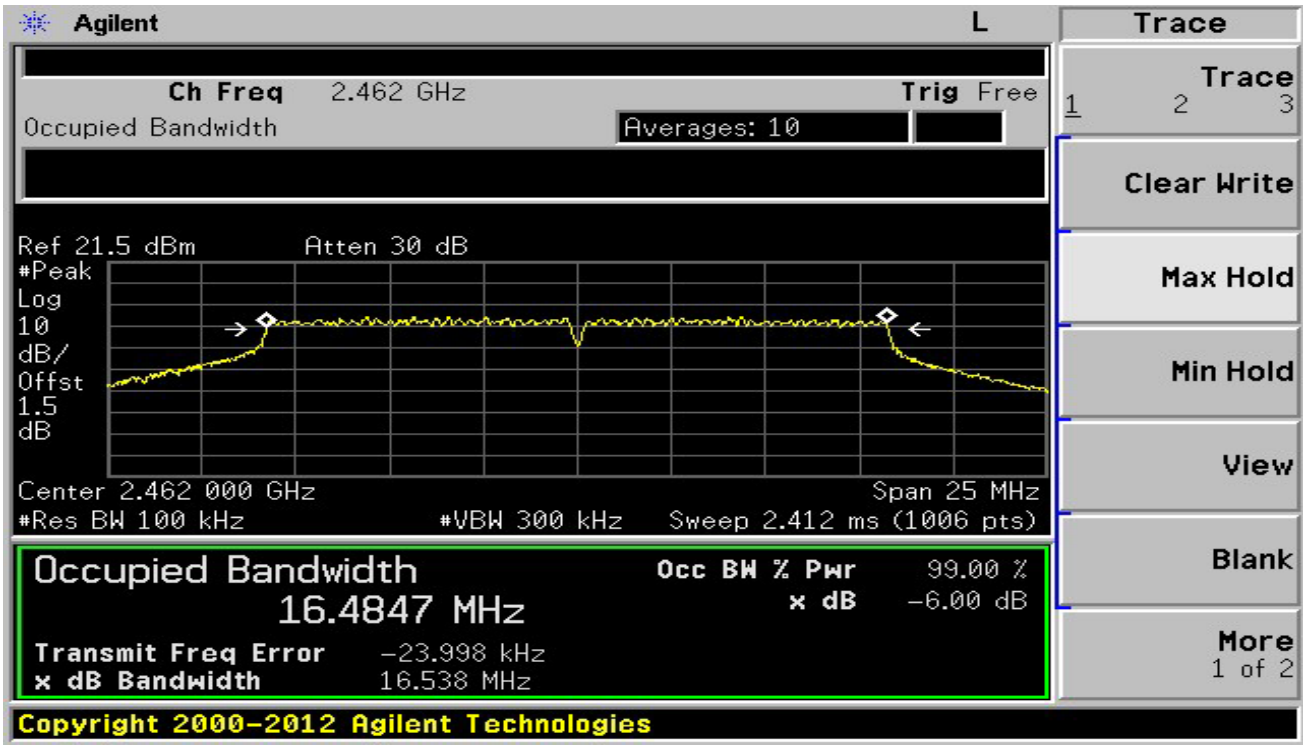
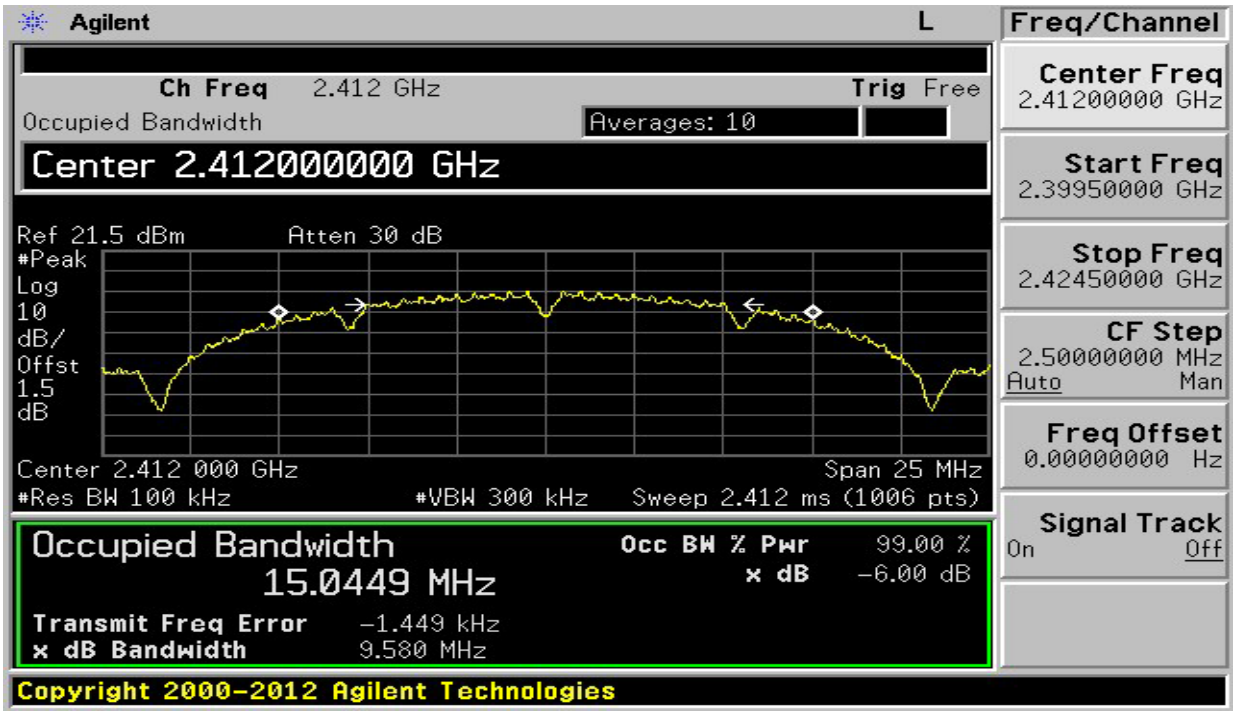

Agilent
L
Trace
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Averages: 10
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Ref 21.5 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
1.5
dB
Center 2.462 000 GHz
Span 25 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.412 ms (1006 pts)
Occupied Bandwidth
16.4847 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error -23.998 kHz
x dB Bandwidth 16.538 MHz
Copyright 2000-2012 Agilent Technologies

5.4 Trace data – POE

(ch_1)



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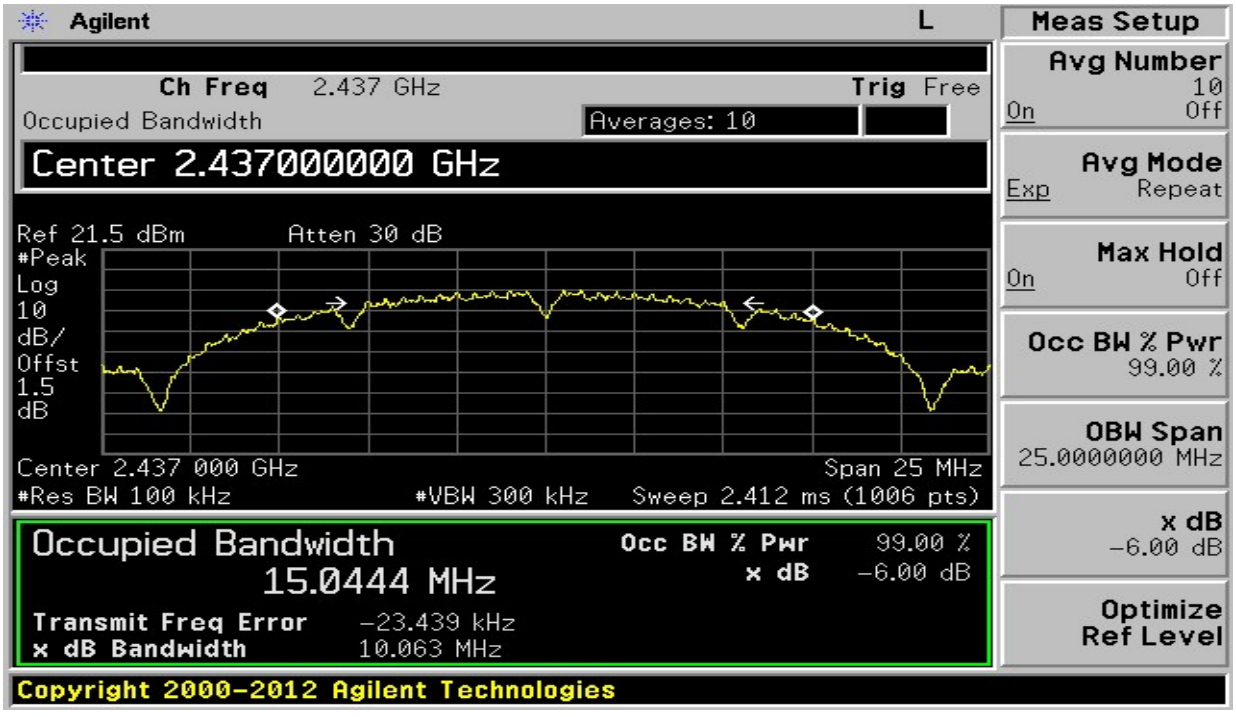
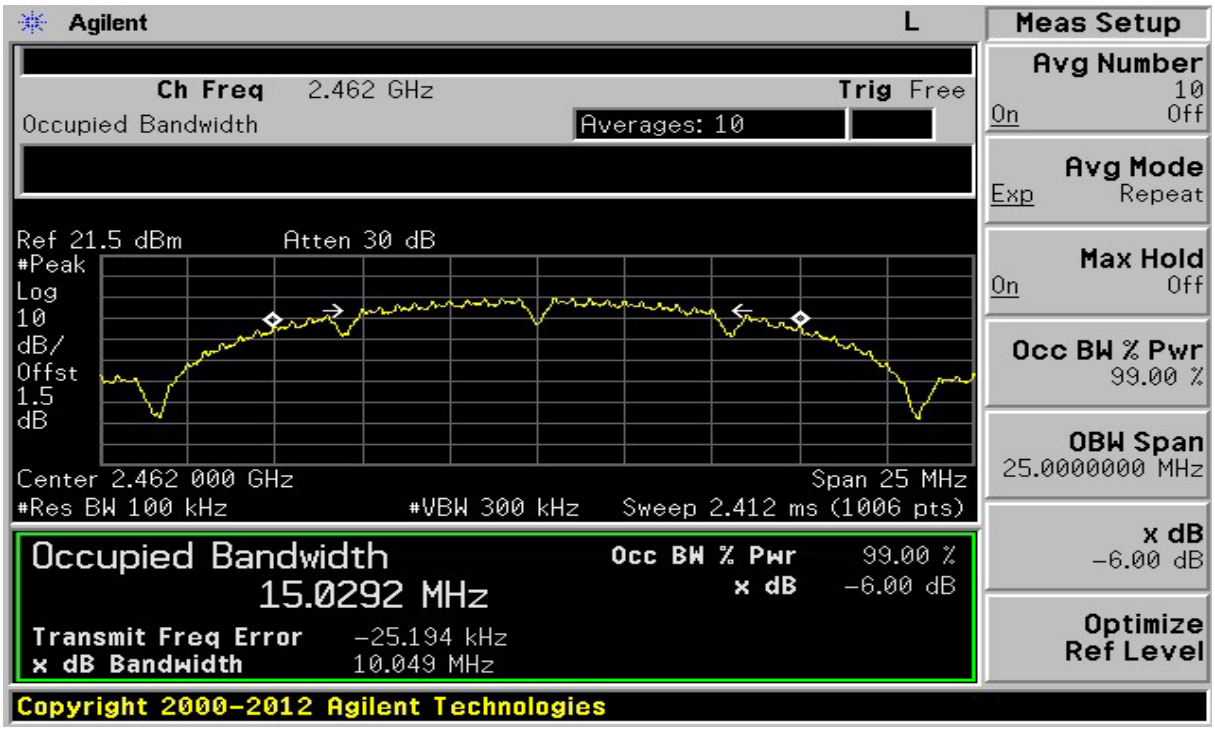
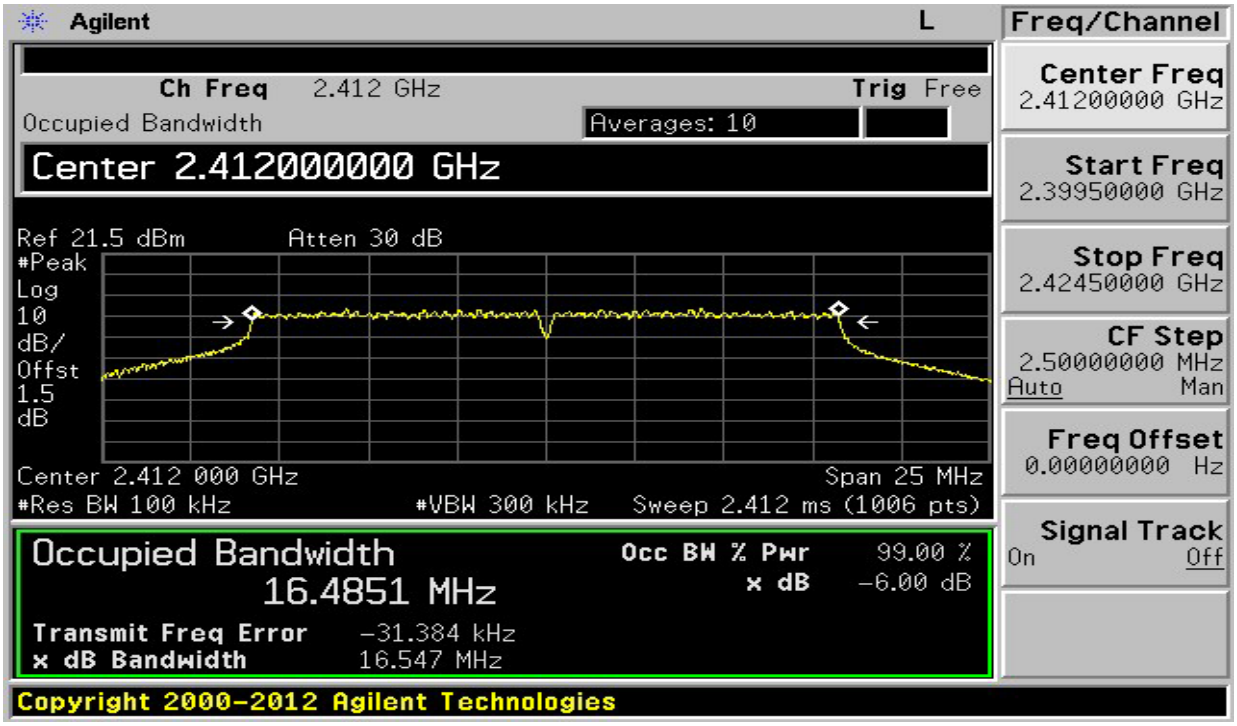


(ch_11)

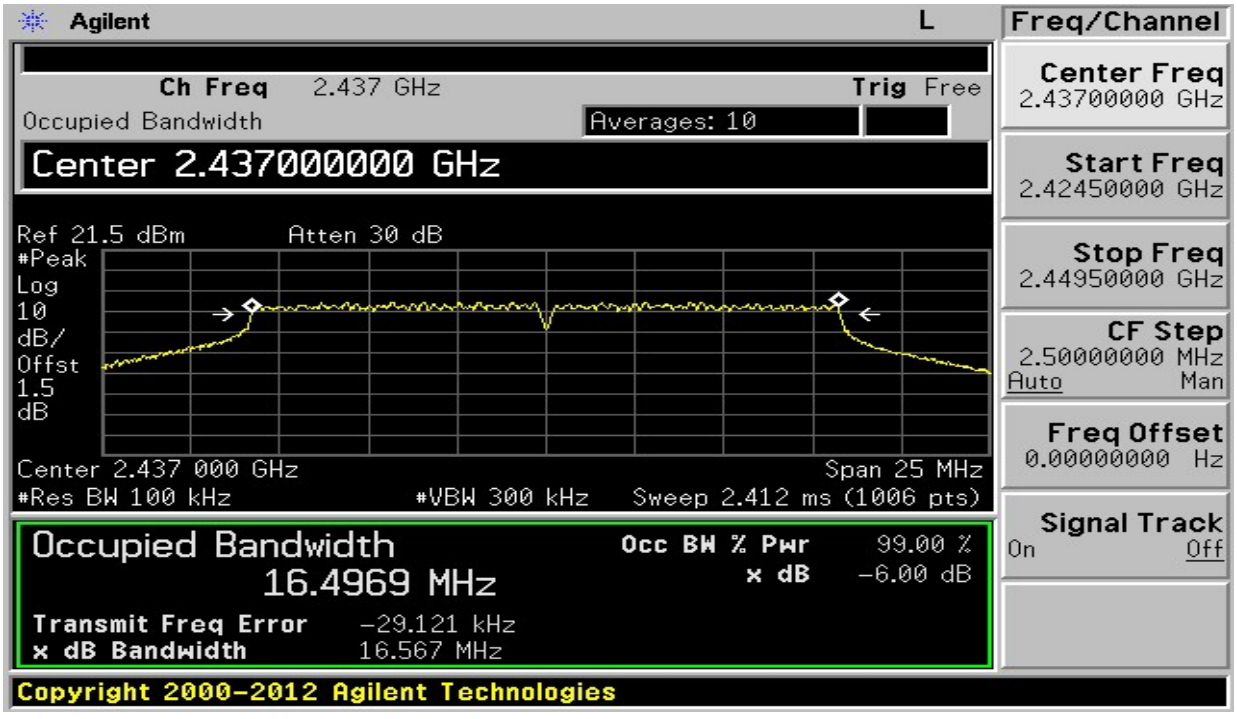

Agilent
L
Meas Setup
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Averages: 10
Avg Number
10
On Off
Avg Mode
Exp Repeat
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
25.0000000 MHz
x dB
-6.00 dB
Optimize
Ref Level
Ref 21.5 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
1.5
dB
Center 2.462 000 GHz
Span 25 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.412 ms (1006 pts)
Occupied Bandwidth
15.0292 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error -25.194 kHz
x dB Bandwidth 10.049 MHz
Copyright 2000-2012 Agilent Technologies

5.4 Trace data - POE

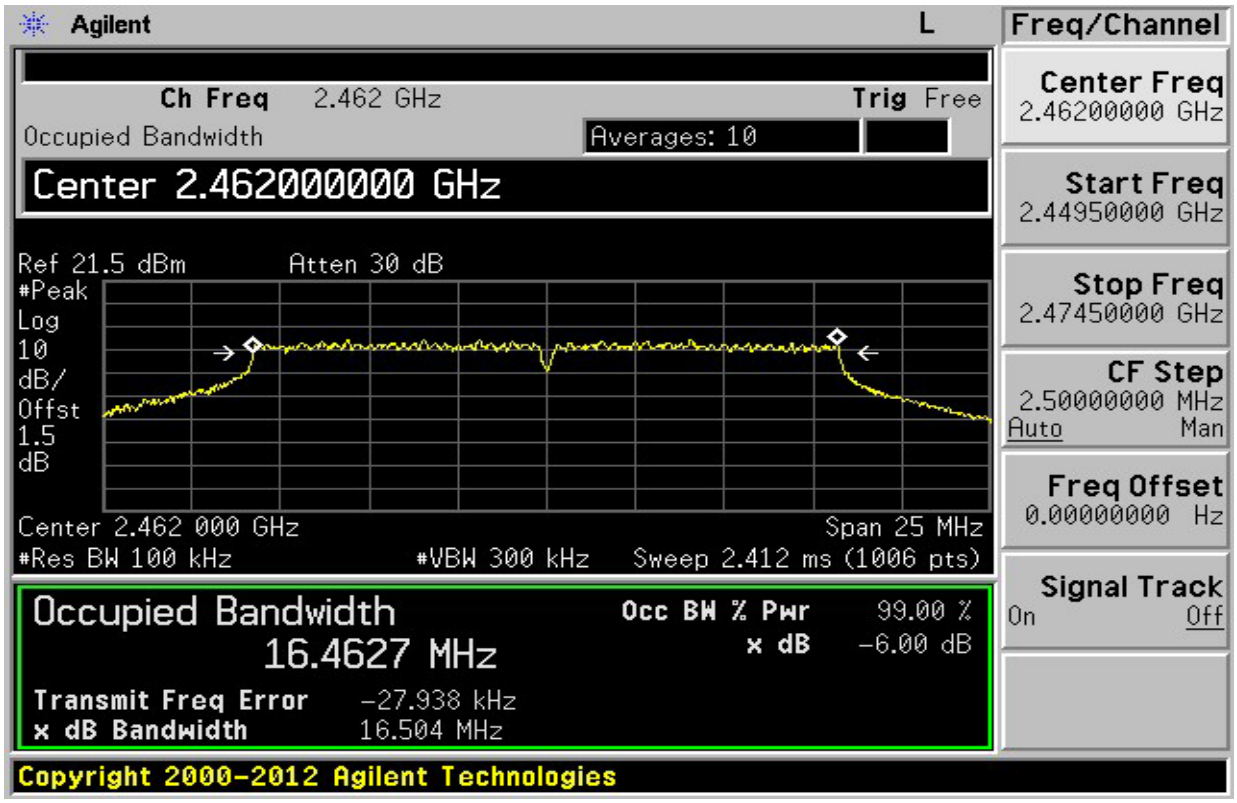
(ch_1)



(ch_6)



(ch_11)


Agilent
L
Freq/Channel
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Averages: 10
Center 2.462000000 GHz
Center Freq
2.46200000 GHz
Start Freq
2.44950000 GHz
Stop Freq
2.47450000 GHz
CF Step
2.50000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Ref 21.5 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
1.5
dB
Center 2.462 000 GHz
Span 25 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.412 ms (1006 pts)
Occupied Bandwidth
16.4627 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error -27.938 kHz
x dB Bandwidth 16.504 MHz
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6. Maximum peak conducted output power

6.1 Test procedure

KDB 558074 D01 DTS Meas Guidance V03r04 9.1.1 Integrated band power method

6.2 Test instruments and measurement setup

a) Set the RBW >DTS bandwidth
b) Set VBW ≥ 3 × RBW.
c) Set span ≥ 3 x RBW
d) Detector = peak.
e) Sweep time = auto couple.
f) Trace mode = max hold.
g) Allow trace to fully stabilize.
h) Use peak marker function to determine the peak amplitude level.

Limits : FCC § 15.247

Maximum Peak Output Power Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041291	12-Jan-17
RF Cable	Length: 10 cm	-	
-Spectrum Analyzer <=> EUT	Loss: 1.5 dB	-	

6.3 Measurement results - Adapter

EUT	Biostation A2	MODEL	BSA2-OEPW
MODE	CCK, OFDM	ENVIRONMENTAL CONDITION	22.0 ℃, 48.0 % R.H.
INPUT POWER	12.0 Vd.c.		

MODE - CCK

CHANNEL	Channel requency (MHz)	Conducted Power Output(dBm)			Limit[1W] (dBm)	PASS/FAIL
		Detector	(dBm)	(W)		
1	2 412	PEAK	14.09	0.0256	30.0	PASS
6	2 437	PEAK	13.73	0.0236	30.0	PASS
11	2 462	PEAK	13.44	0.0221	30.0	PASS

MODE - OFDM

CHANNEL	Channel requency (MHz)	Conducted Power Output(dBm)			Limit[1W] (dBm)	PASS/FAIL
		Detector	(dBm)	(W)		
1	2 412	PEAK	11.43	0.0139	30.0	PASS
6	2 437	PEAK	11.45	0.0140	30.0	PASS
11	2 462	PEAK	11.08	0.0128	30.0	PASS

6.3 Measurement results - POE

EUT	Biostation A2	MODEL	BSA2-OEPW
MODE	CCK, OFDM	ENVIRONMENTAL CONDITION	23.0 ℃, 48.0 % R.H.
INPUT POWER	48.0 Vd.c.		

MODE - CCK

CHANNEL	Channel requency (MHz)	Conducted Power Output(dBm)			Limit[1W] (dBm)	PASS/FAIL
		Detector	(dBm)	(W)		
1	2 412	PEAK	14.45	0.0279	30.0	PASS
6	2 437	PEAK	13.52	0.0225	30.0	PASS
11	2 462	PEAK	13.16	0.0207	30.0	PASS

MODE - OFDM

CHANNEL	Channel requency (MHz)	Conducted Power Output(dBm)			Limit[1W] (dBm)	PASS/FAIL
		Detector	(dBm)	(W)		
1	2 412	PEAK	11.42	0.0139	30.0	PASS
6	2 437	PEAK	11.28	0.0134	30.0	PASS
11	2 462	PEAK	10.89	0.0123	30.0	PASS

7. Maximum conducted (average) output power

7.1 Test procedure

KDB 558074 D01 DTS Meas Guidance V03r04 9.2.2.4 Method AVGSA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction)

7.2 Test instruments and measurement setup

a) Measure the duty cycle, x, of the transmitter output signal as described in 6.0.
b) Set span to at least 1.5 times the OBW.
c) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
d) Set VBW ≥ 3 x RBW.
e) Number of points in sweep ≥ 2 x span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
f) Sweep time = auto.
g) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
h) Do not use sweep triggering. Allow the sweep to "free run".
i) Trace average at least 100 traces in power averaging (i.e., RMS) mode; however, the number of traces to be averaged shall be increased above 100 as needed such that the average accurately represents the true average over the on and off periods of the transmitter.
j) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
k) Add 10 log (1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times (because the measurement represents an average over both the on and off times of the transmission). For example, add 10 log (1/0.25) = 6 dB if the duty cycle is 25 %.

Maximum conducted (average) output power Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E4440A	US42041291	12-Jan-17
RF Cable	Length: 10 cm	-	
-Spectrum Analyzer <=> EUT	Loss: 1.5 dB	-	

7.3 Measurement results - Adapter

EUT	Biostation A2	MODEL	BSA2-OEPW
MODE	CCK, OFDM	ENVIRONMENTAL CONDITION	24.0 ℃, 44.0 % R.H.
INPUT POWER	12.0 Vd.c.		

MODE - CCK

CHANNEL	Channel requency (MHz)	Conducted Power Output(dBm)			Measured + Duty Cycle(dBm)	Measured + Duty Cycle(W)
		Detector	(dBm)	Duty Cycle		
1	2 412	AVG	11.65	1.00	11.7	0.0146
6	2 437	AVG	11.62	1.00	11.6	0.0145
11	2 462	AVG	11.08	1.00	11.1	0.0128

MODE - OFDM

CHANNEL	Channel requency (MHz)	Conducted Power Output(dBm)			Measured + Duty Cycle(dBm)	Measured + Duty Cycle(W)
		Detector	(dBm)	Duty Cycle		
1	2 412	AVG	8.68	1.00	9.7	0.0093
6	2 437	AVG	8.58	1.00	9.6	0.0091
11	2 462	AVG	8.33	1.00	9.3	0.0086

7.3 Measurement results - PoE

EUT	Biostation A2	MODEL	BSA2-OEPW
MODE	CCK, OFDM	ENVIRONMENTAL CONDITION	24.0 ℃, 43.0 % R.H.
INPUT POWER	48.0 Vd.c.		

MODE - CCK

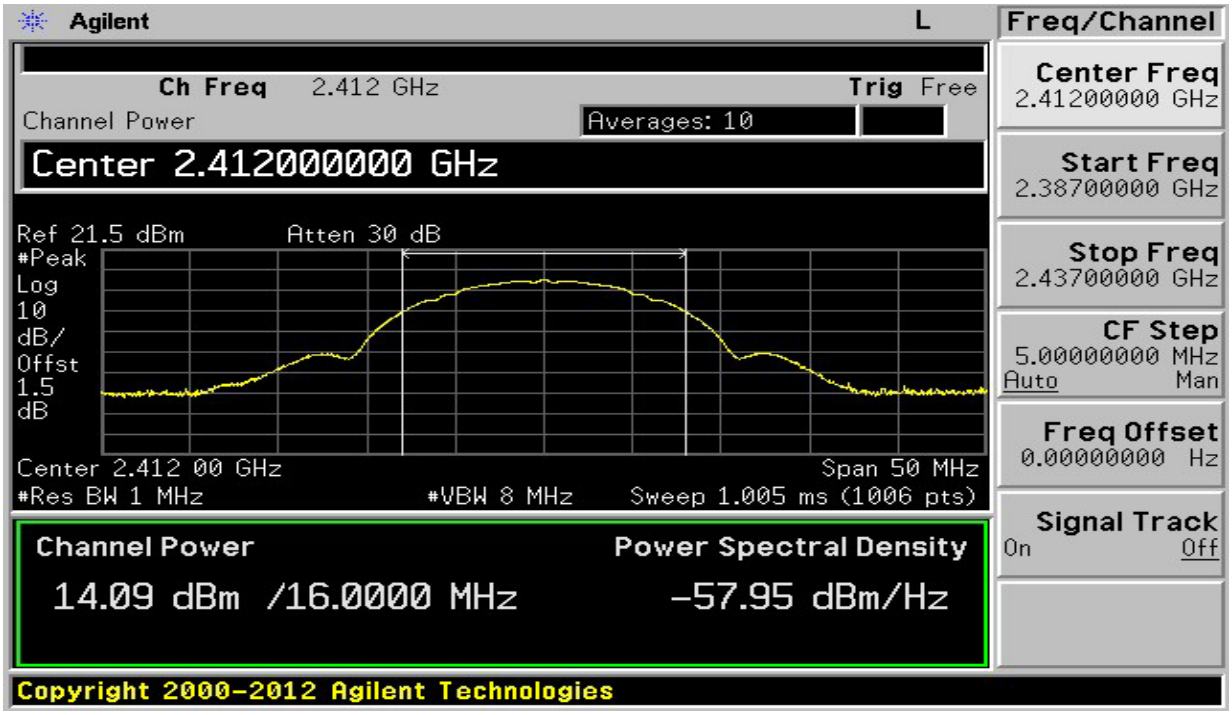
CHANNEL	Channel requency (MHz)	Conducted Power Output(dBm)			Measured + Duty Cycle(dBm)	Measured + Duty Cycle(W)
		Detector	(dBm)	Duty Cycle		
1	2 412	AVG	11.23	1.00	11.2	0.0133
6	2 437	AVG	11.08	1.00	11.1	0.0128
11	2 462	AVG	10.66	1.00	10.7	0.0116

MODE - OFDM

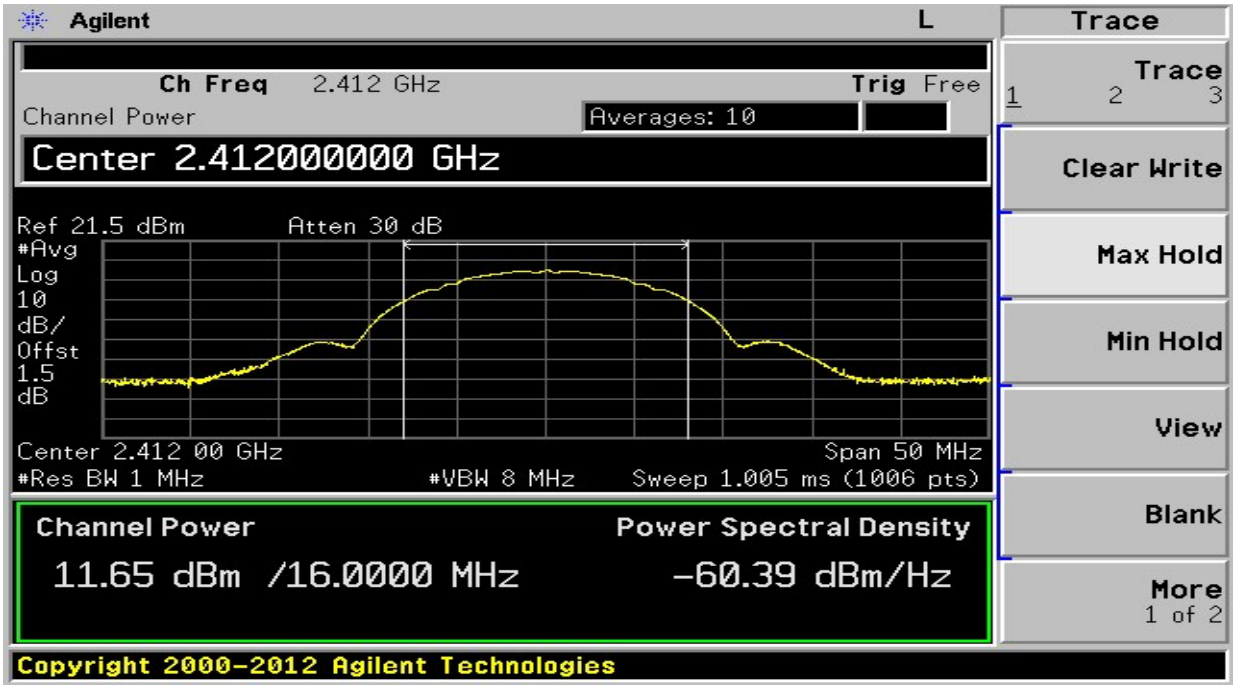
CHANNEL	Channel requency (MHz)	Conducted Power Output(dBm)			Measured + Duty Cycle(dBm)	Measured + Duty Cycle(W)
		Detector	(dBm)	Duty Cycle		
1	2 412	AVG	8.50	1.00	9.5	0.0089
6	2 437	AVG	8.56	1.00	9.6	0.0090
11	2 462	AVG	8.13	1.00	9.1	0.0082

7.4 Trace data (Peak, Average) - CCK Adapter mode (ch_1)

(Peak)

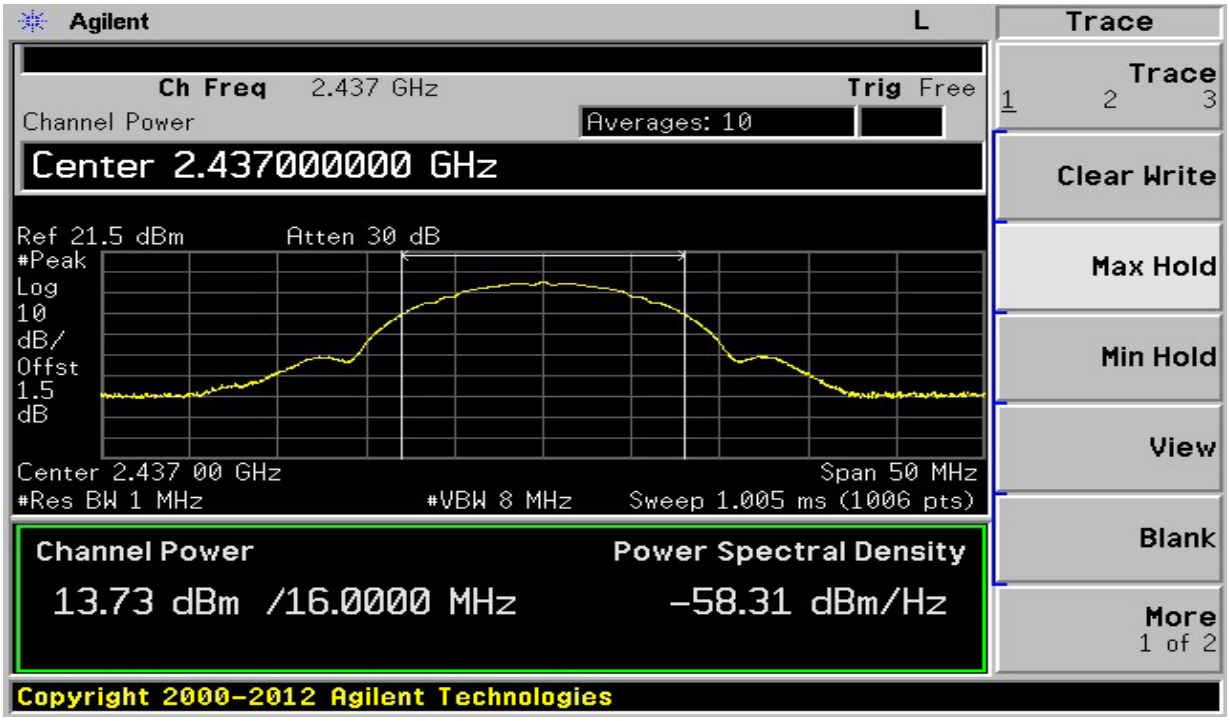


(Avg)

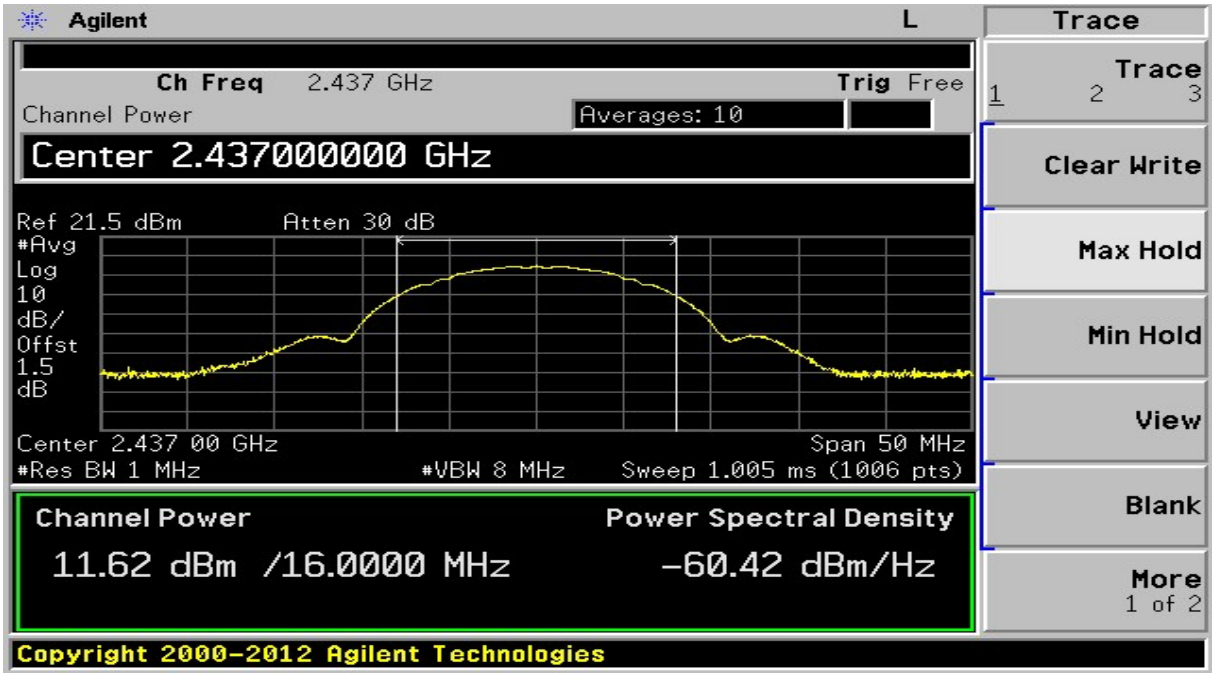


(ch_6)

(Peak)

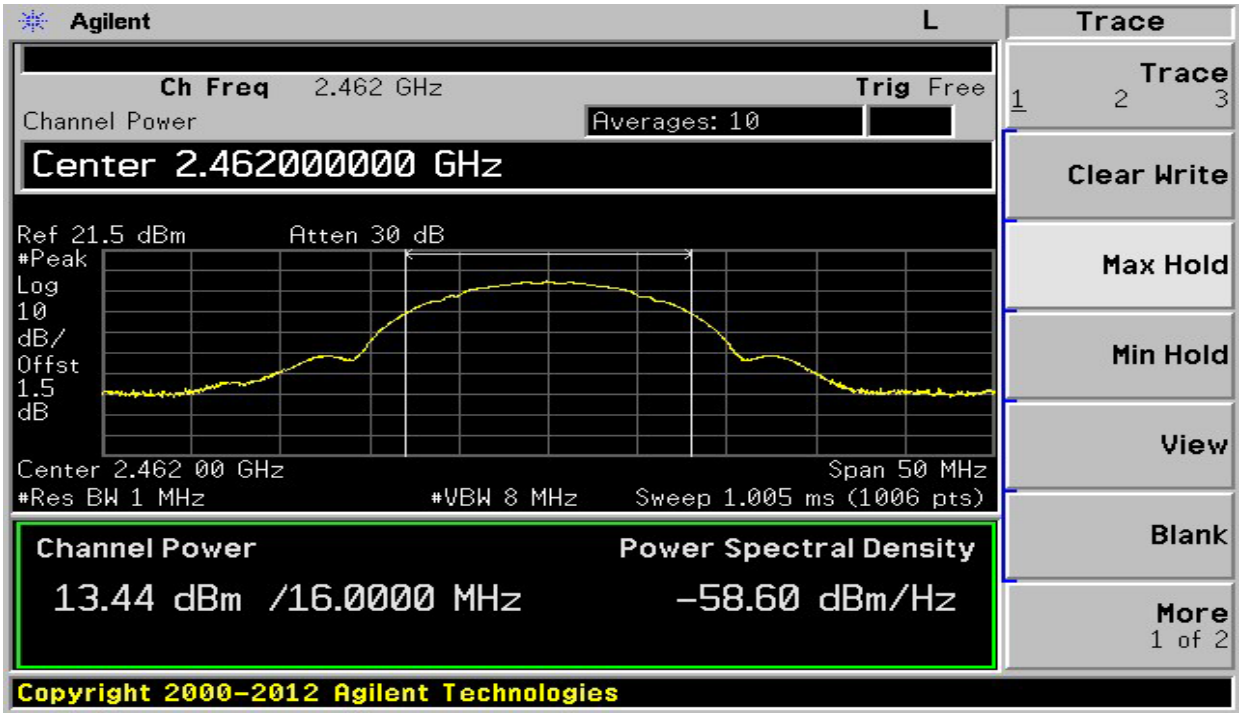

Agilent
L
Trace
Ch Freq 2.437 GHz
Trig Free
Channel Power
Averages: 10
Center 2.437000000 GHz
Ref 21.5 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
1.5
dB
Center 2.437 00 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 8 MHz
Sweep 1.005 ms (1006 pts)
Channel Power
13.73 dBm /16.0000 MHz
Power Spectral Density
-58.31 dBm/Hz
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2012 Agilent Technologies

(Avg)

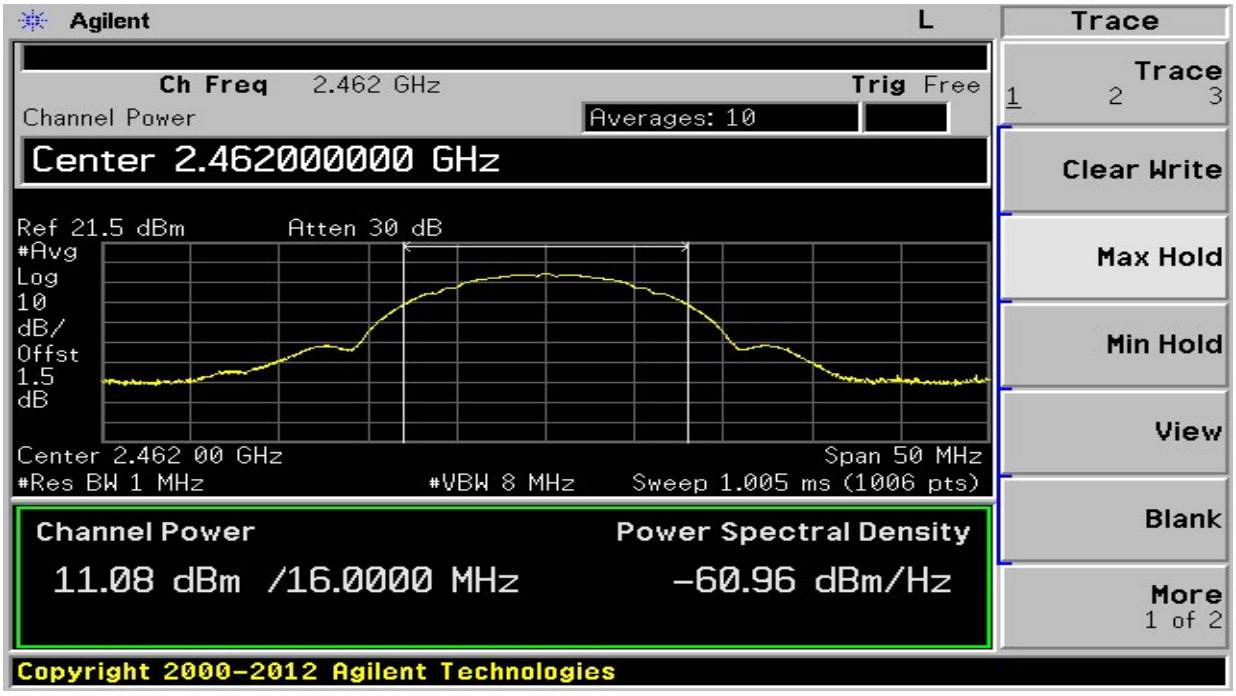

Agilent
L
Trace
Ch Freq 2.437 GHz
Trig Free
Channel Power
Averages: 10
Center 2.437000000 GHz
Ref 21.5 dBm
Atten 30 dB
#Avg
Log
10
dB/
Offst
1.5
dB
Center 2.437 00 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 8 MHz
Sweep 1.005 ms (1006 pts)
Channel Power
11.62 dBm /16.0000 MHz
Power Spectral Density
-60.42 dBm/Hz
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2012 Agilent Technologies

(ch_11)

(Peak)

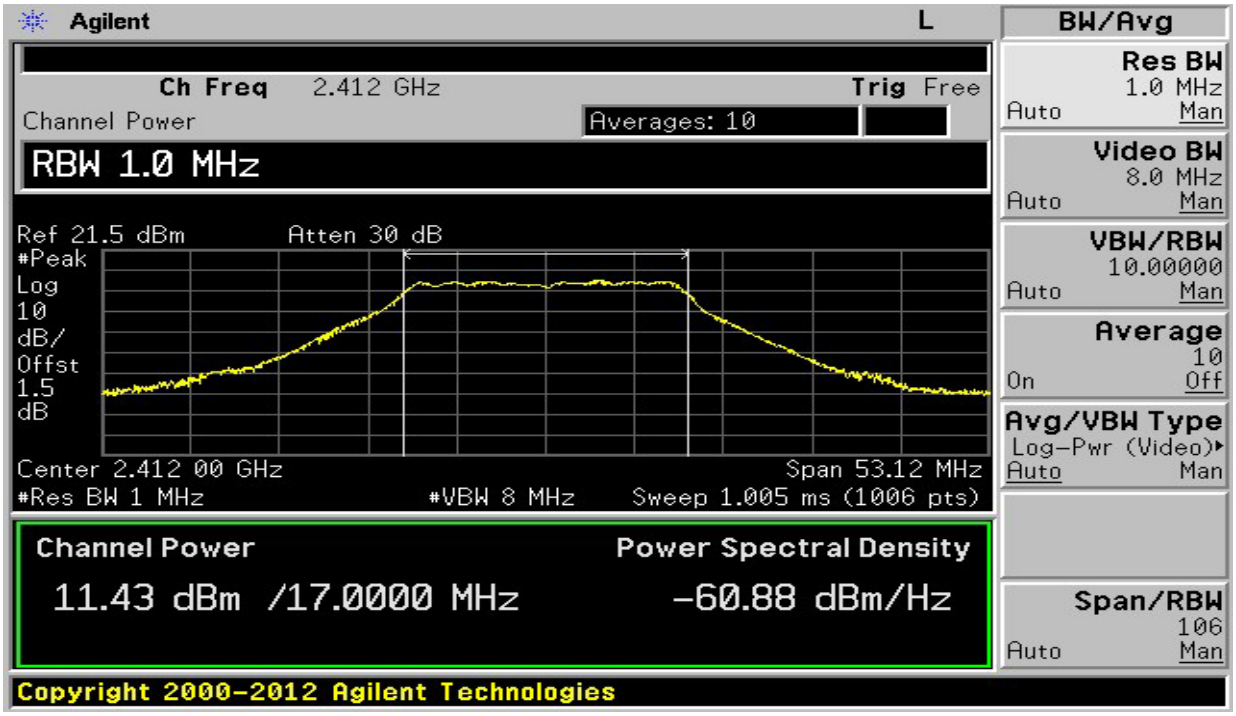


(Avg)

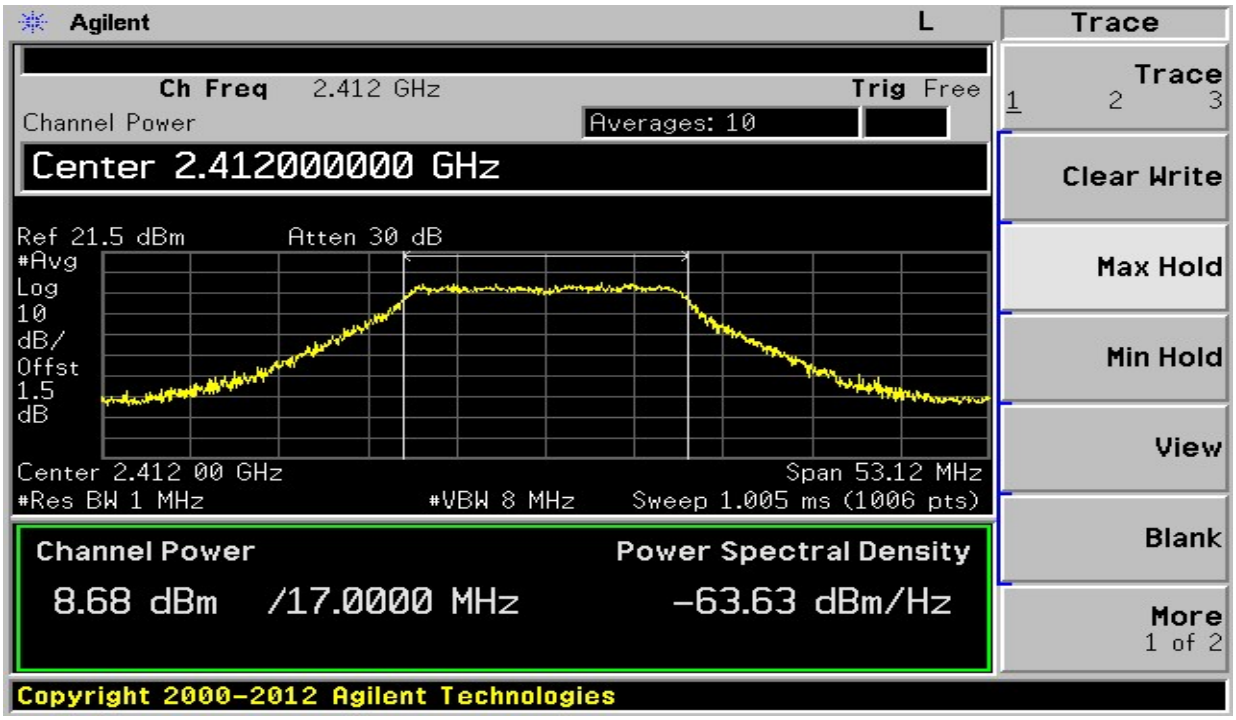


7.4 Trace data (Peak, Average) - OFDM Adapter mode (ch_1)

(Peak)

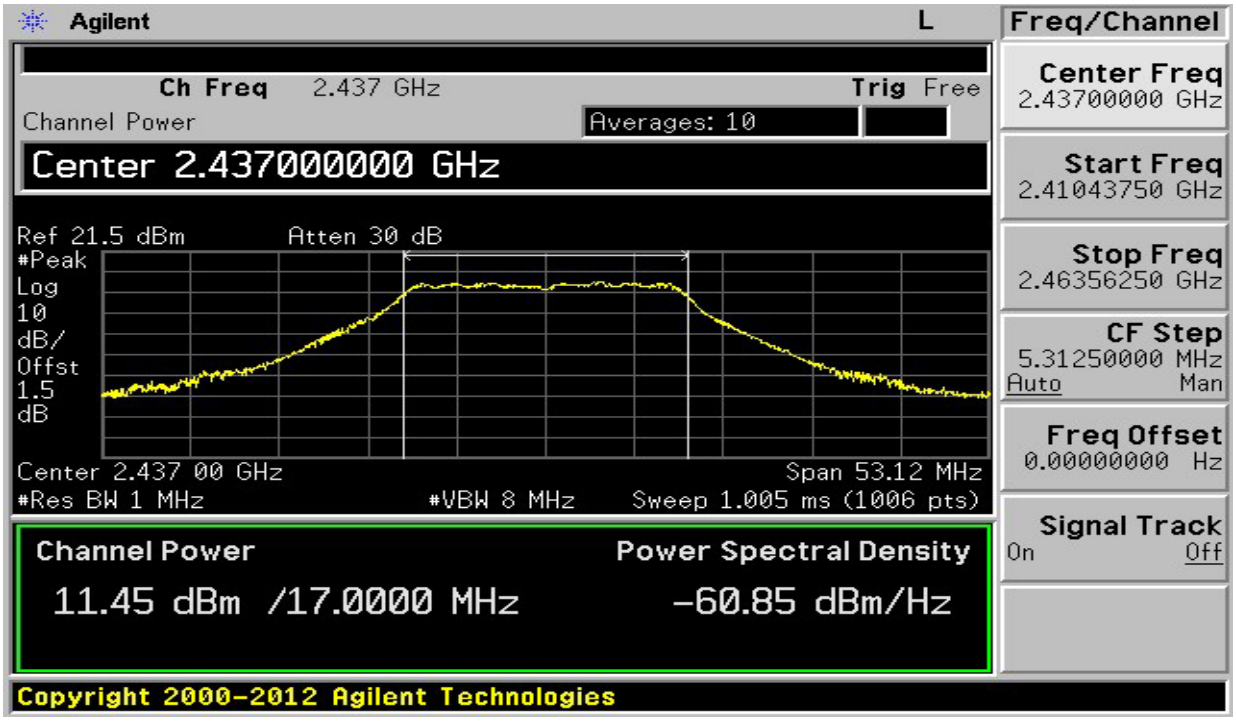


(Avg)

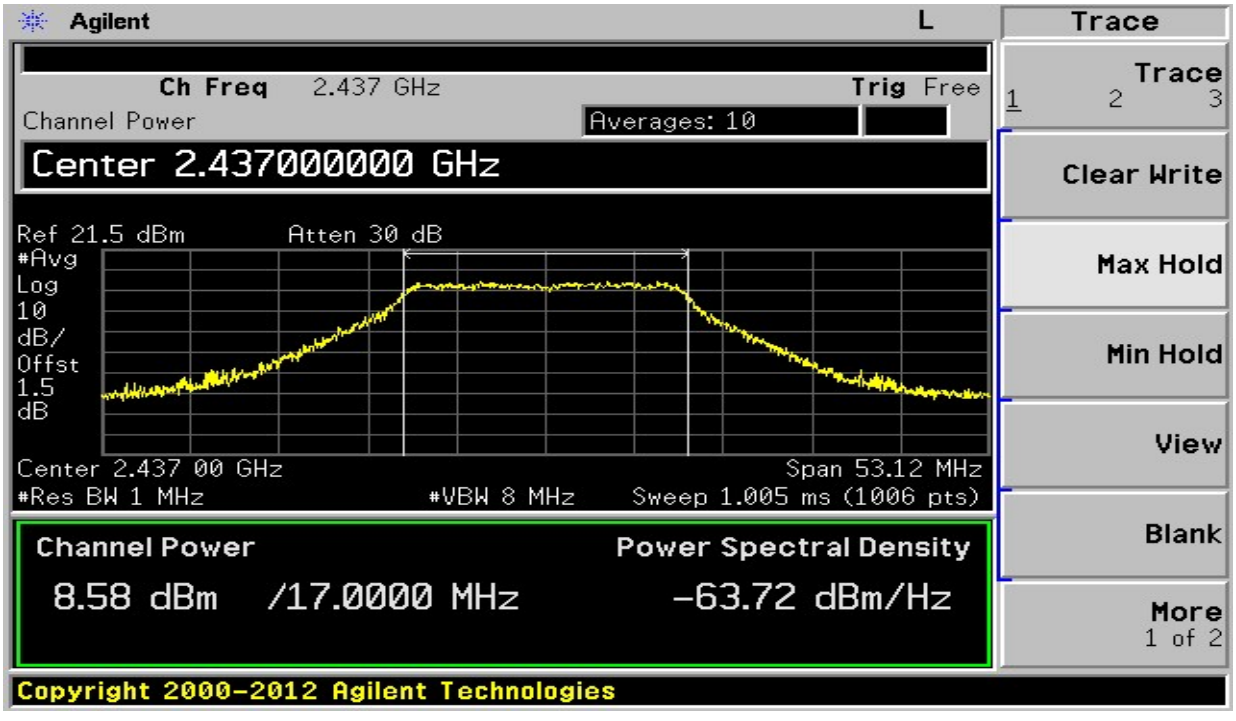


(ch_6)

(Peak)

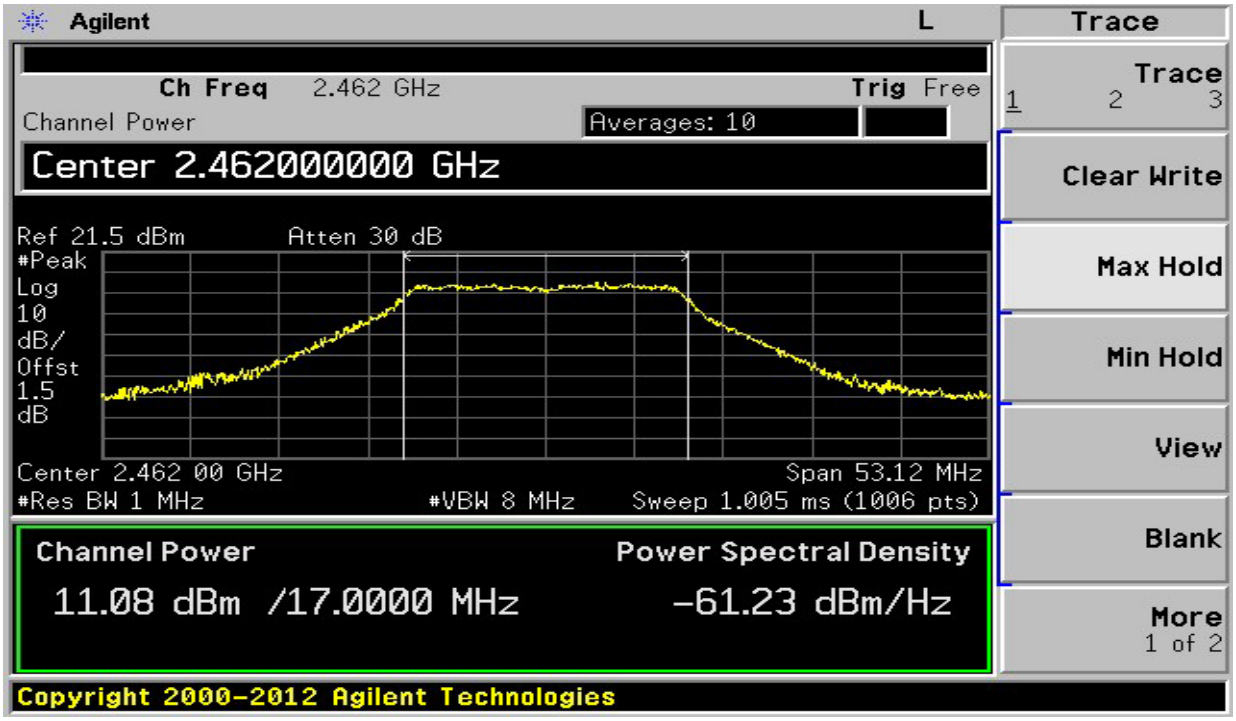

Agilent
L
Freq/Channel
Ch Freq 2.437 GHz
Trig Free
Channel Power
Averages: 10
Center 2.437000000 GHz
Center Freq
2.43700000 GHz
Start Freq
2.41043750 GHz
Stop Freq
2.46356250 GHz
CF Step
5.31250000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Ref 21.5 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
1.5
dB
Center 2.437 00 GHz
Span 53.12 MHz
#Res BW 1 MHz
#VBW 8 MHz
Sweep 1.005 ms (1006 pts)
Channel Power
11.45 dBm /17.0000 MHz
Power Spectral Density
-60.85 dBm/Hz
Copyright 2000-2012 Agilent Technologies

(Avg)

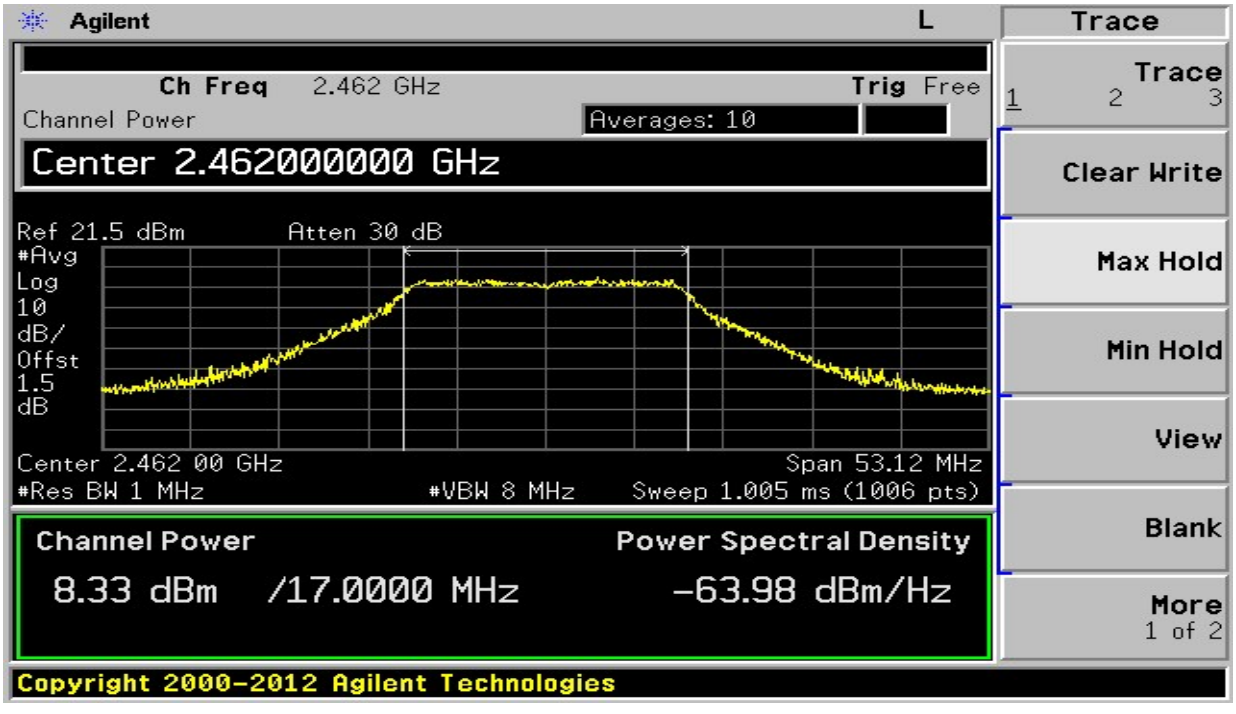

Agilent
L
Trace
Ch Freq 2.437 GHz
Trig Free
Channel Power
Averages: 10
Center 2.437000000 GHz
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Ref 21.5 dBm
Atten 30 dB
#Avg
Log
10
dB/
Offst
1.5
dB
Center 2.437 00 GHz
Span 53.12 MHz
#Res BW 1 MHz
#VBW 8 MHz
Sweep 1.005 ms (1006 pts)
Channel Power
8.58 dBm /17.0000 MHz
Power Spectral Density
-63.72 dBm/Hz
Copyright 2000-2012 Agilent Technologies

(ch_11)

(Peak)



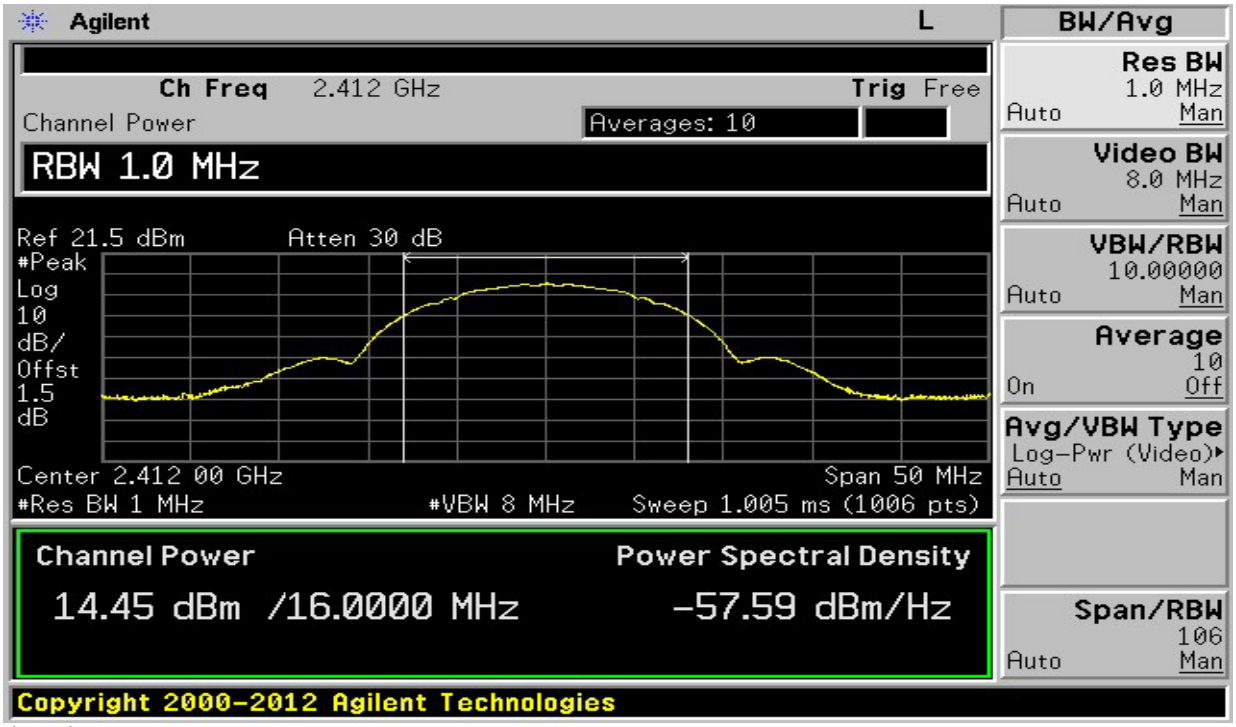
(Avg)



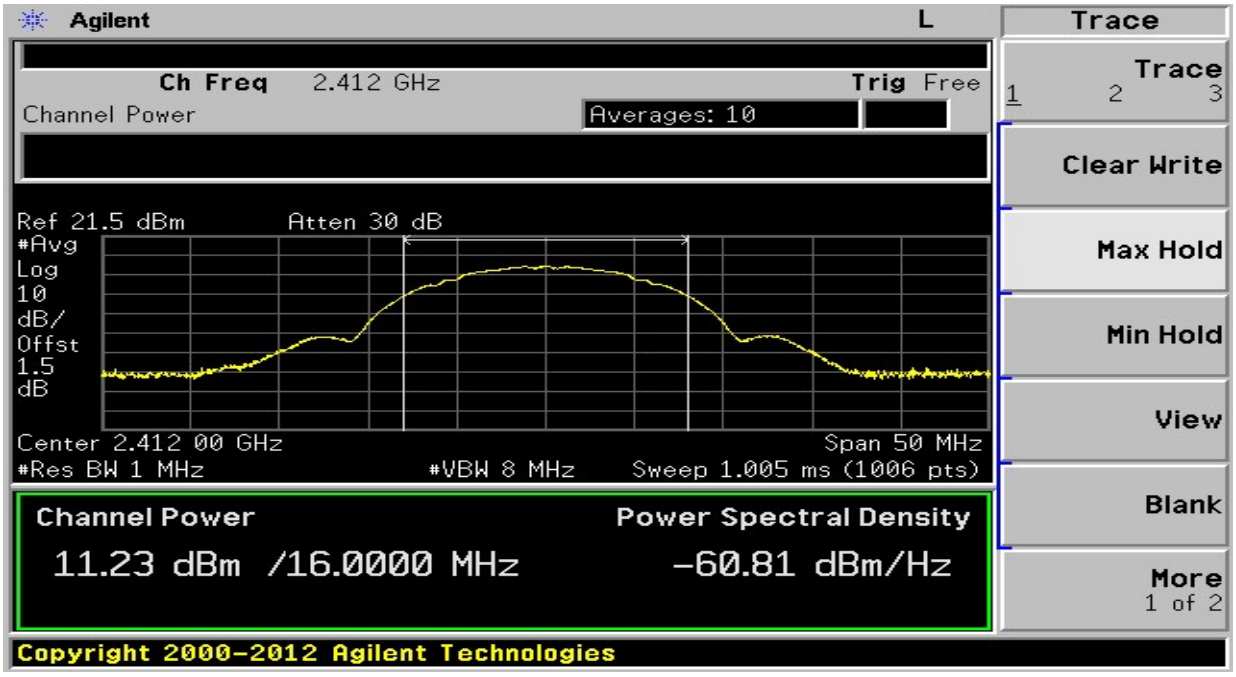
7.4 Trace data (Peak, Average) - CCK Poe mode

(ch_1)

(Peak)

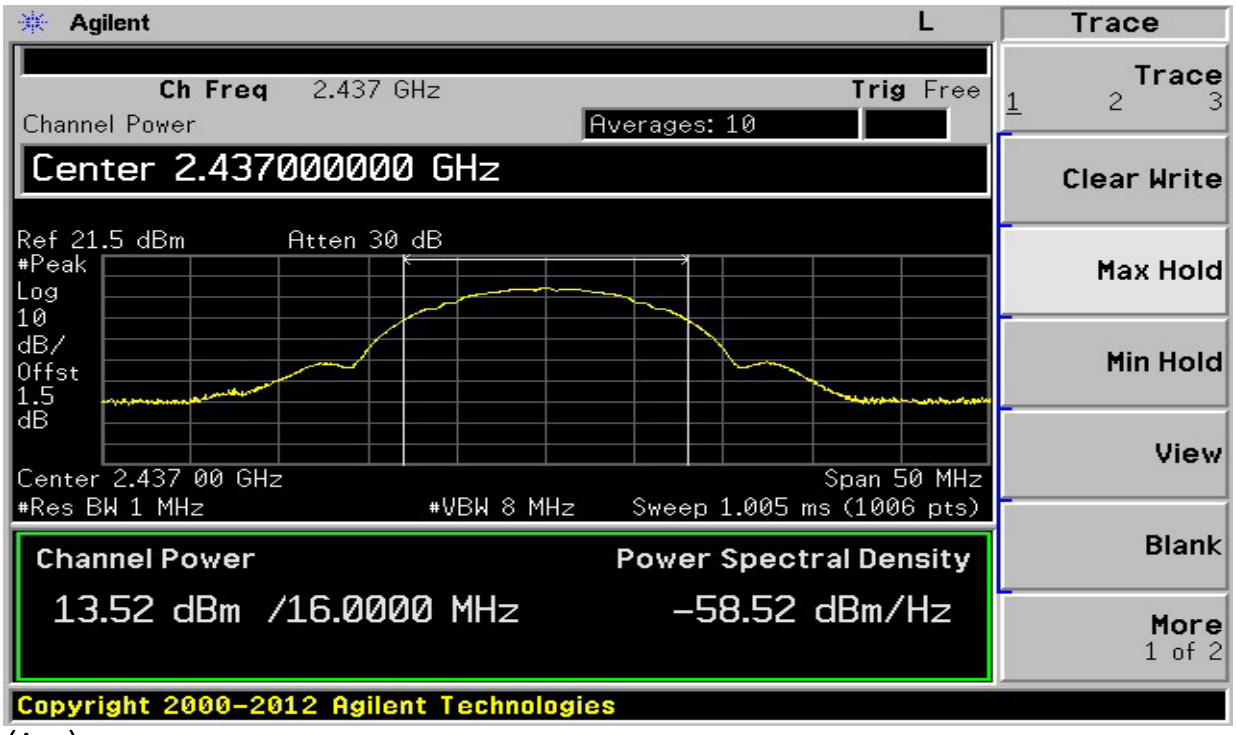


(Avg)

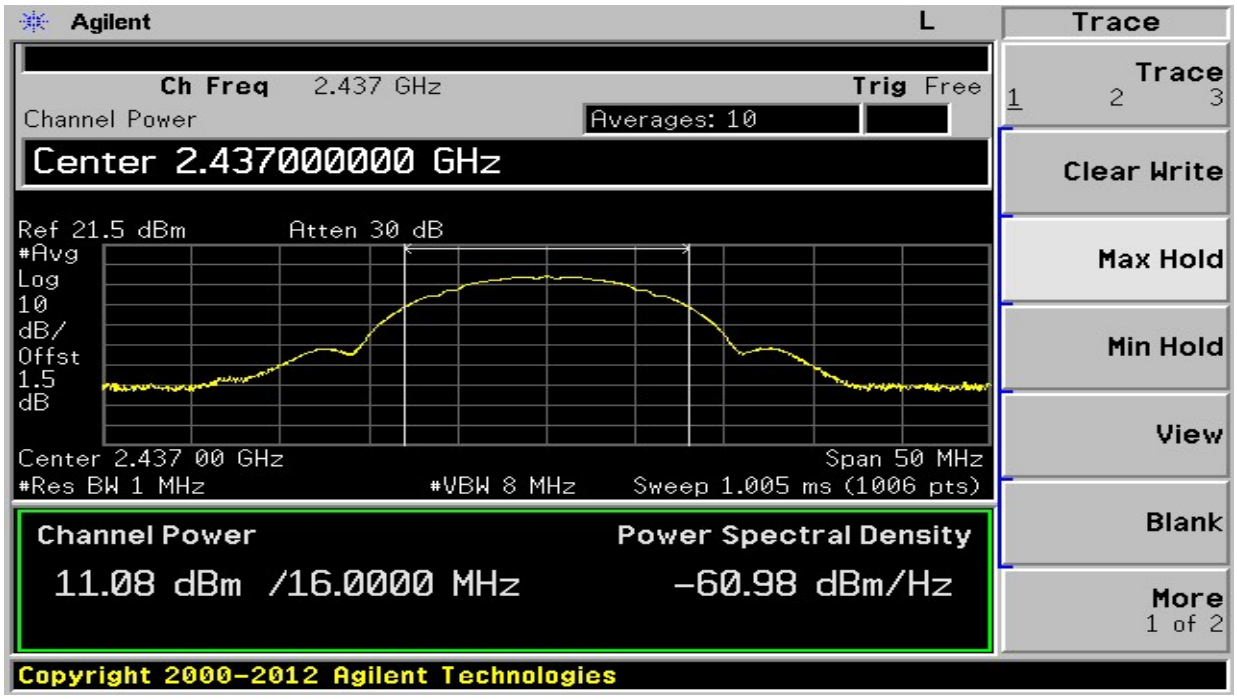


(ch_6)

(Peak)

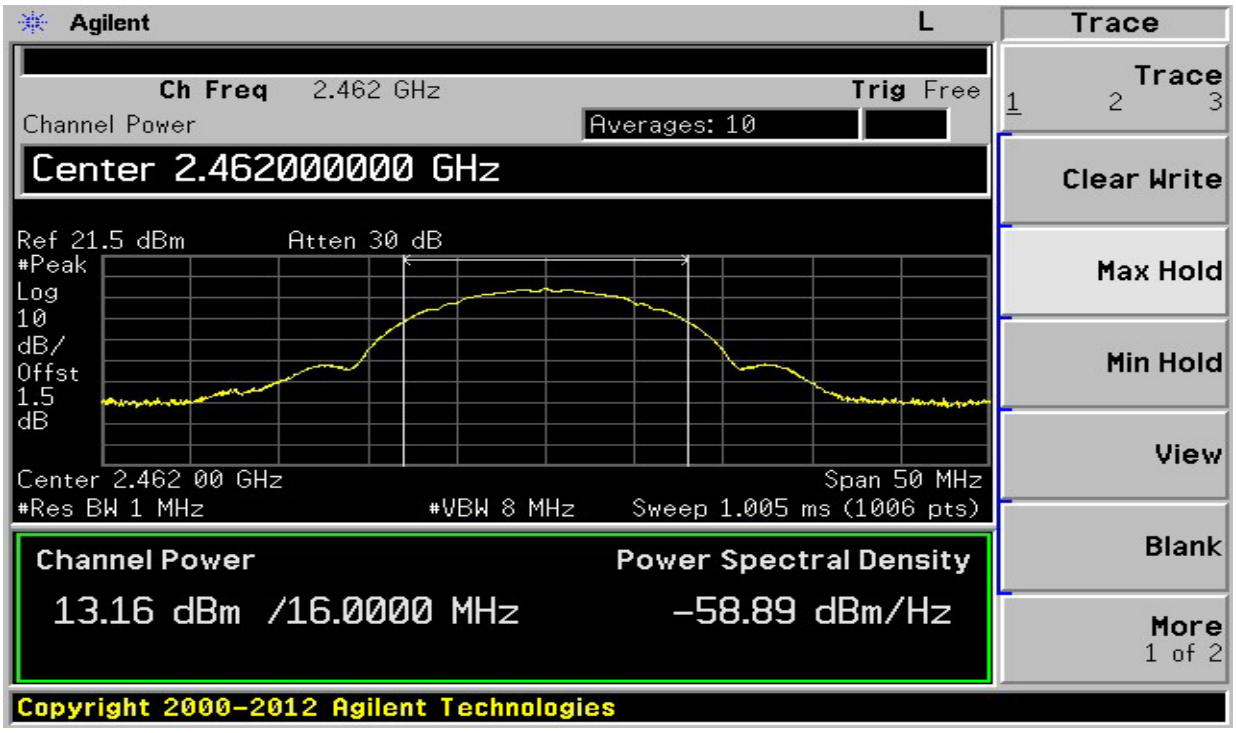

Agilent
L
Trace
Ch Freq 2.437 GHz
Trig Free
Channel Power
Averages: 10
Center 2.437000000 GHz
Ref 21.5 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
1.5
dB
Center 2.437 00 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 8 MHz
Sweep 1.005 ms (1006 pts)
Channel Power
13.52 dBm /16.0000 MHz
Power Spectral Density
-58.52 dBm/Hz
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2012 Agilent Technologies

(Avg)

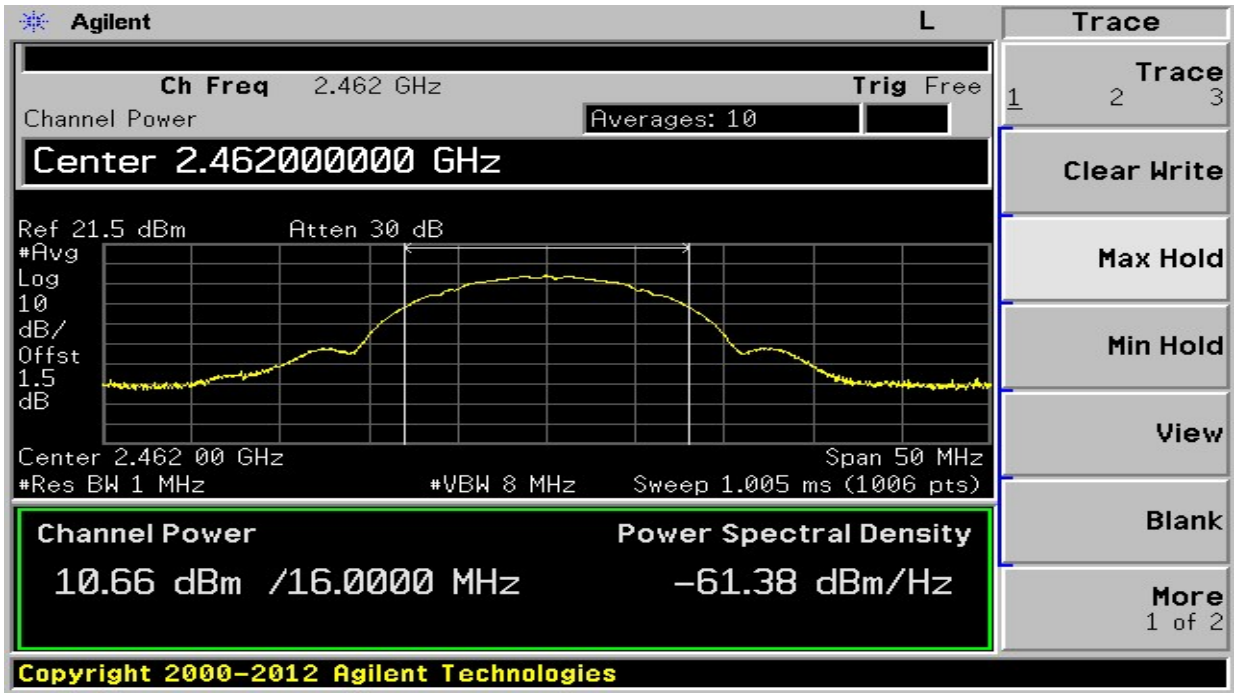

Agilent
L
Trace
Ch Freq 2.437 GHz
Trig Free
Channel Power
Averages: 10
Center 2.437000000 GHz
Ref 21.5 dBm
Atten 30 dB
#Avg
Log
10
dB/
Offst
1.5
dB
Center 2.437 00 GHz
Span 50 MHz
#Res BW 1 MHz
#VBW 8 MHz
Sweep 1.005 ms (1006 pts)
Channel Power
11.08 dBm /16.0000 MHz
Power Spectral Density
-60.98 dBm/Hz
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2012 Agilent Technologies

(ch_11)

(Peak)



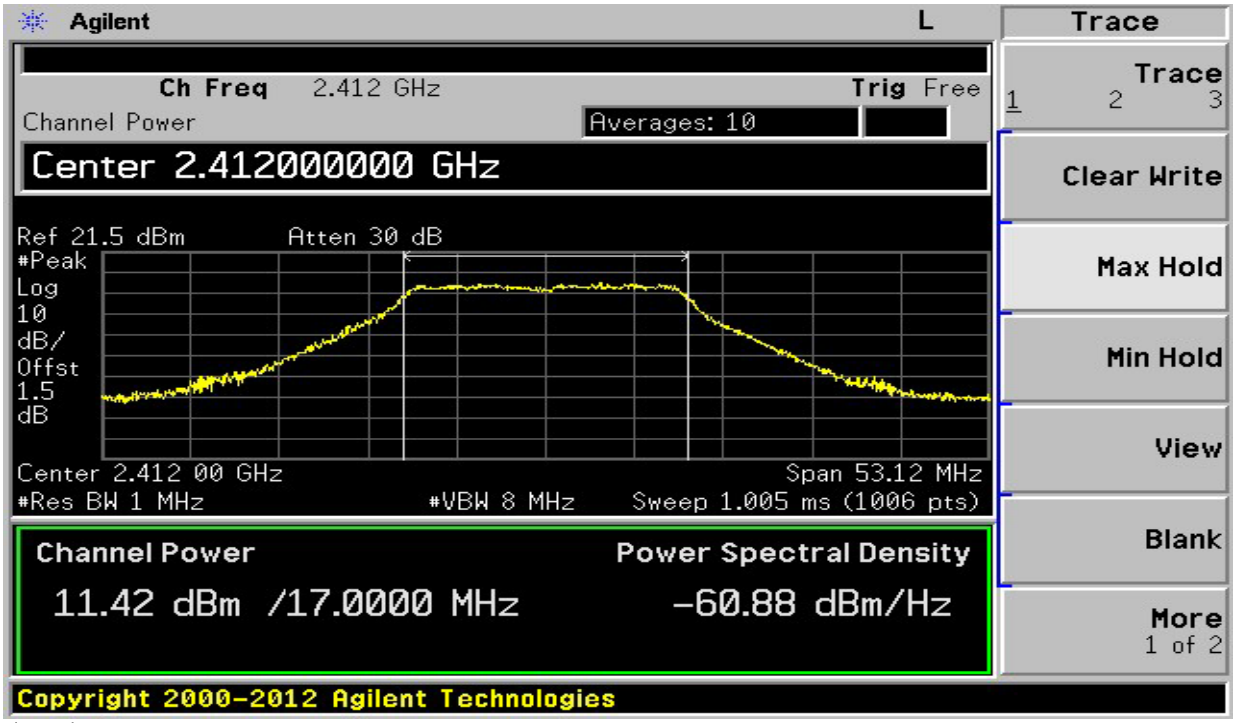
(Avg)



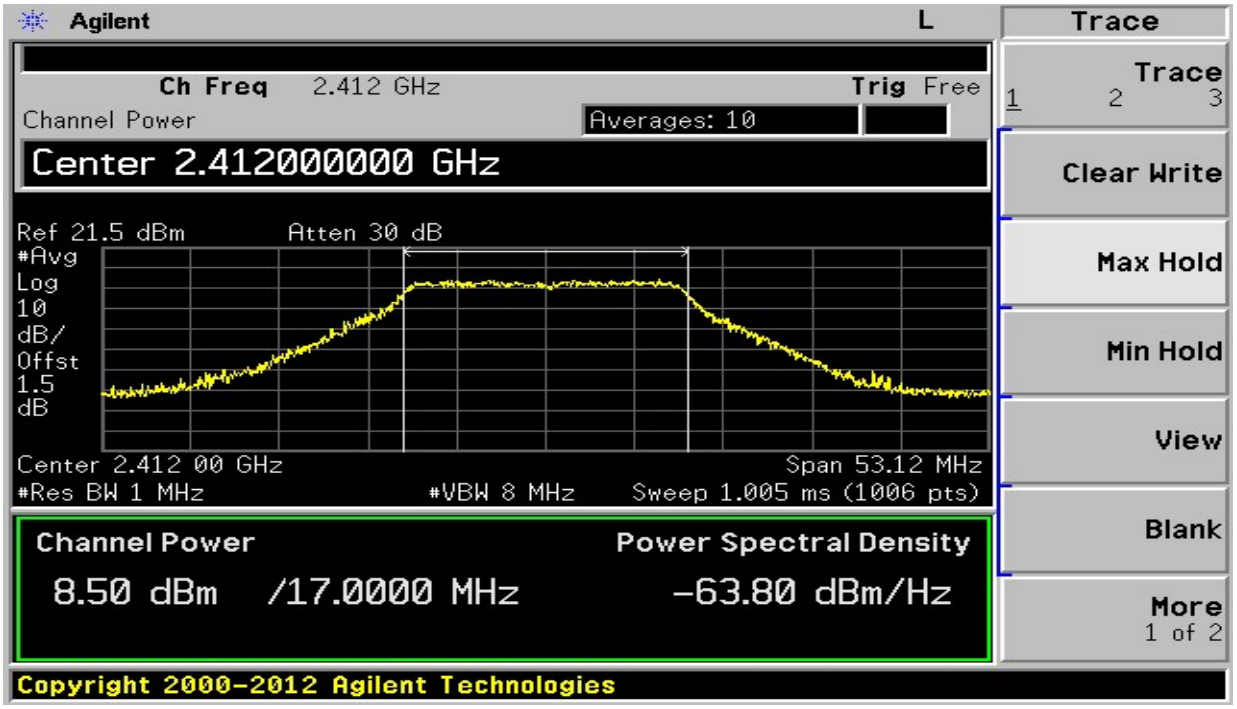
7.4 Trace data (Peak, Average) - OFDM

(ch_1)

(Peak)

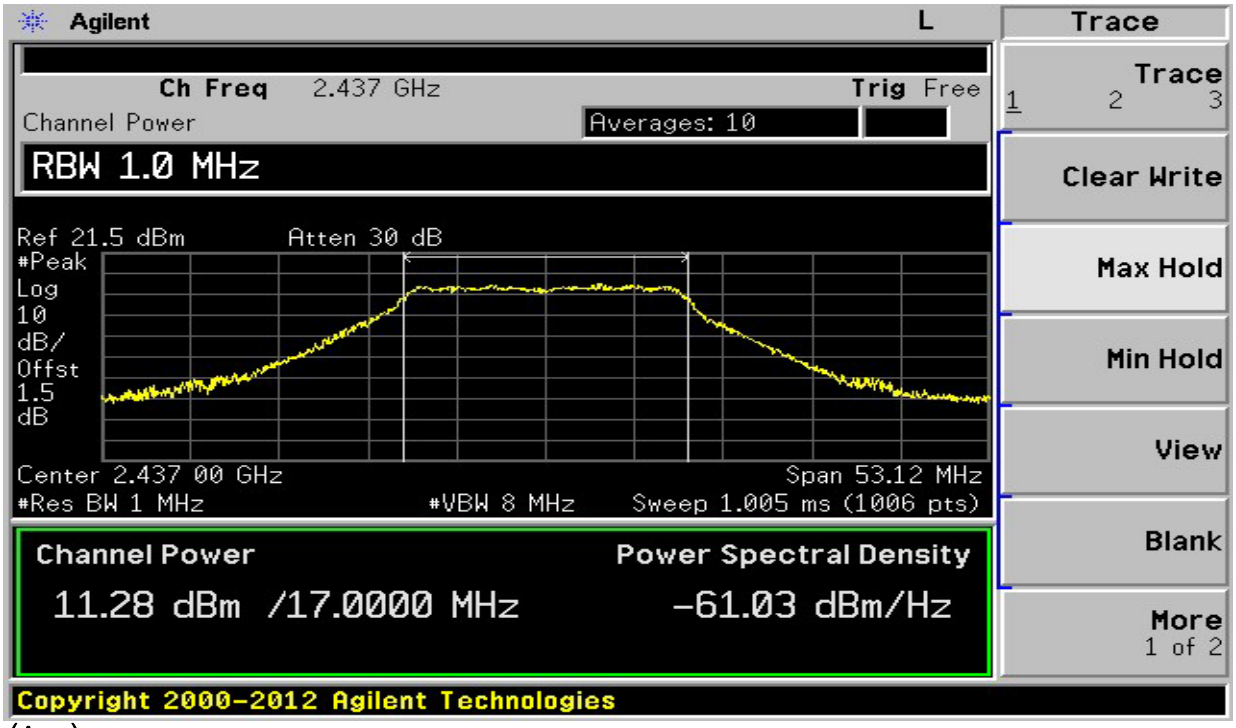


(Avg)

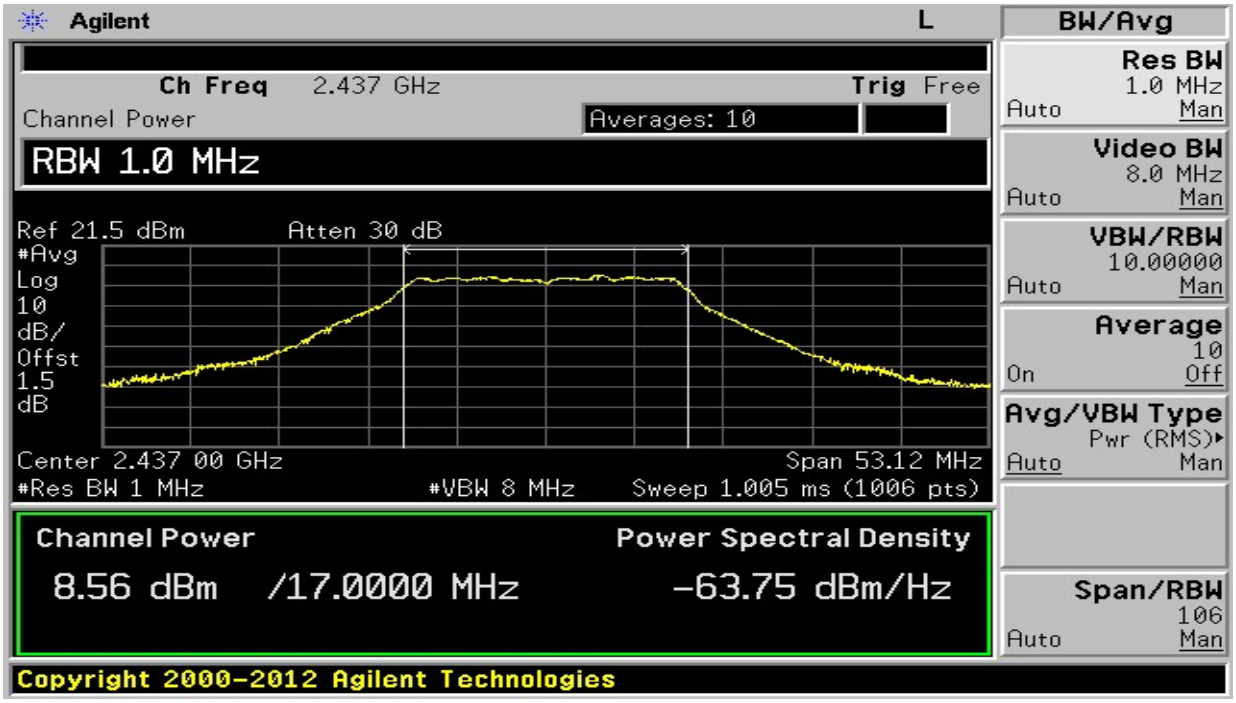


(ch_6)

(Peak)

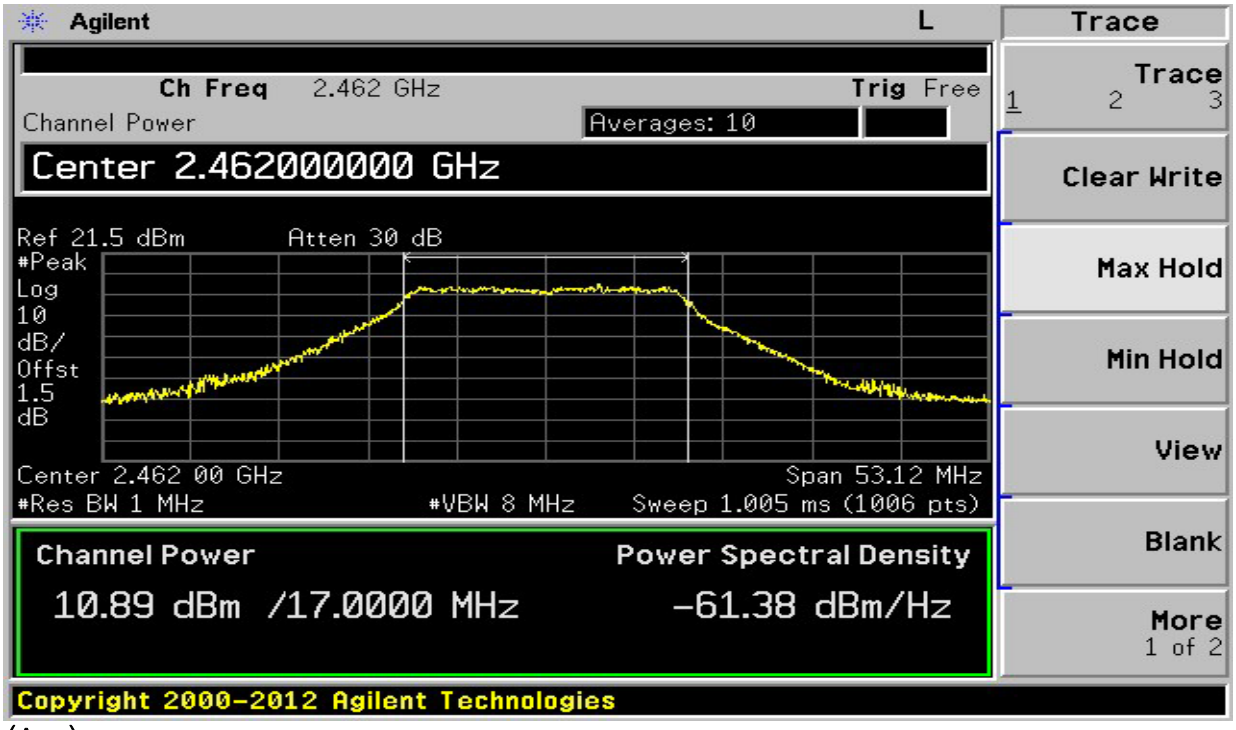

Agilent
L
Trace
Ch Freq 2.437 GHz
Trig Free
Channel Power
Averages: 10
RBW 1.0 MHz
Ref 21.5 dBm
Atten 30 dB
#Peak
Log
10
dB/
Offst
1.5
dB
Center 2.437 00 GHz
Span 53.12 MHz
#Res BW 1 MHz
#VBW 8 MHz
Sweep 1.005 ms (1006 pts)
Channel Power
11.28 dBm /17.0000 MHz
Power Spectral Density
-61.03 dBm/Hz
Trace
1 2 3
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Copyright 2000-2012 Agilent Technologies

(Avg)

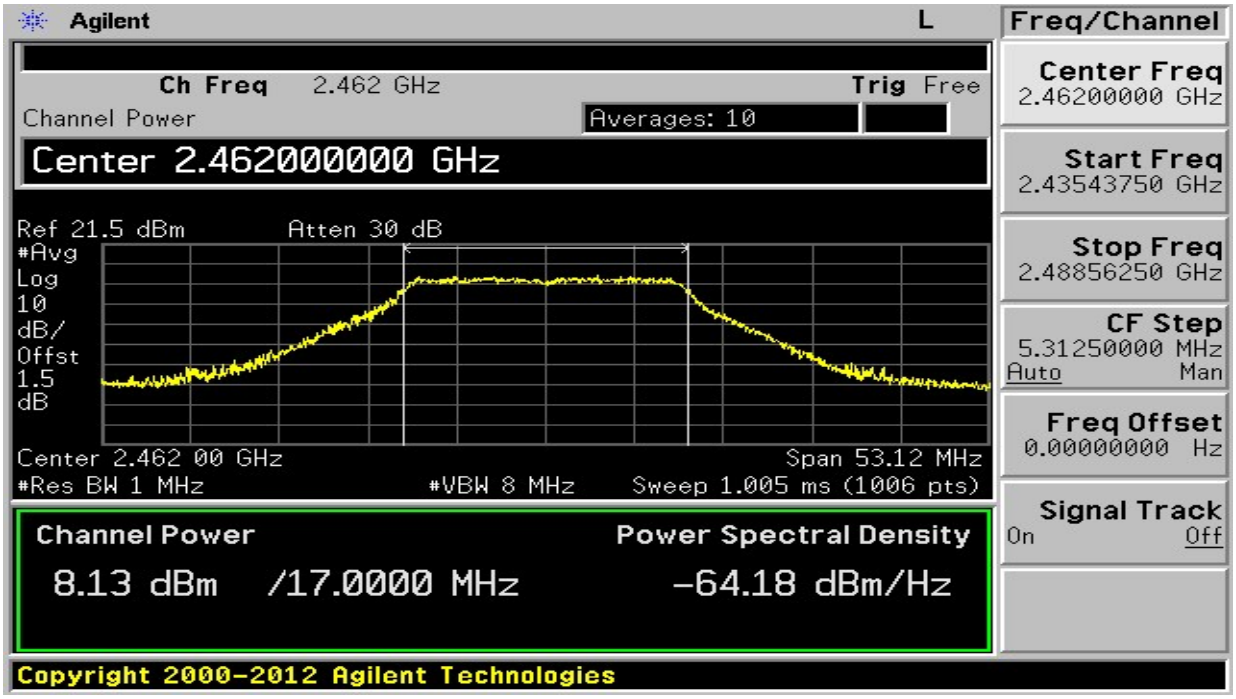

Agilent
L
BW/Avg
Ch Freq 2.437 GHz
Trig Free
Channel Power
Averages: 10
RBW 1.0 MHz
Ref 21.5 dBm
Atten 30 dB
#Avg
Log
10
dB/
Offst
1.5
dB
Center 2.437 00 GHz
Span 53.12 MHz
#Res BW 1 MHz
#VBW 8 MHz
Sweep 1.005 ms (1006 pts)
Channel Power
8.56 dBm /17.0000 MHz
Power Spectral Density
-63.75 dBm/Hz
Res BW
1.0 MHz
Auto Man
Video BW
8.0 MHz
Auto Man
VBW/RBW
10.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Pwr (RMS)
Auto Man
Span/RBW
106
Auto Man
Copyright 2000-2012 Agilent Technologies

(ch_11)

(Peak)



(Avg)



8. Maximum power spectral density level in the fundamental emission

8.1 Test procedure

KDB 558074 D01 DTS Meas Guidance V03r04 10.2 Method PKPSD (peak PSD)

8.2 Test instruments and measurement setup

The spectrum analyzer is set to as following.

a) Set analyzer center frequency to DTS channel center frequency.

b) Set the span to 1.5 times the DTS bandwidth.

c) Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.

d) Set the VBW ≥ 3 x RBW. e) Detector = peak.

f) Sweep time = auto couple. g) Trace mode = max hold.

h) Allow trace to fully stabilize.

i) Use the peak marker function to determine the maximum amplitude level within the RBW.

j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Limits FCC § 15.247

The peak power density Test Instruments

Description	Model	Serial Number	Cal. Due Date
Spectrum Analyzer	E440A	US42041291	12-Jan-17
RF Cable	Length: 10 cm	-	
-Spectrum Analyzer <=> EUT	Loss: 1.5 dB	-	

8.3 Measurement results - Adapter

EUT	Biostation A2	MODEL	BSA2-OEPW
MODE	CCK, OFDM	ENVIRONMENTAL CONDITION	22.0 ℃, 45.0 % R.H.
INPUT POWER	12.0 Vd.c.		

MODE - CCK

CHANNEL	Channel Frequency (MHz)	Measured Power Spectral Density (dBm)	Maximum Permissible Power Density (dBm/3kHz)	Margin
1	2 412	-18.12	8.0	26.12
6	2 437	-18.53	8.0	26.53
11	2 462	-18.59	8.0	26.59

MODE - OFDM

CHANNEL	Channel Frequency (MHz)	Measured Power Spectral Density (dBm)	Maximum Permissible Power Density (dBm/3kHz)	Margin
1	2 412	-17.93	8.0	25.93
6	2 437	-18.17	8.0	26.17
11	2 462	-18.38	8.0	26.38

8.3 Measurement results - POE

EUT	Biostation A2	MODEL	BSA2-OEPW
MODE	CCK, OFDM	ENVIRONMENTAL CONDITION	23.0 ℃, 43.0 % R.H.
INPUT POWER	48 Vd.c.		

MODE - CCK

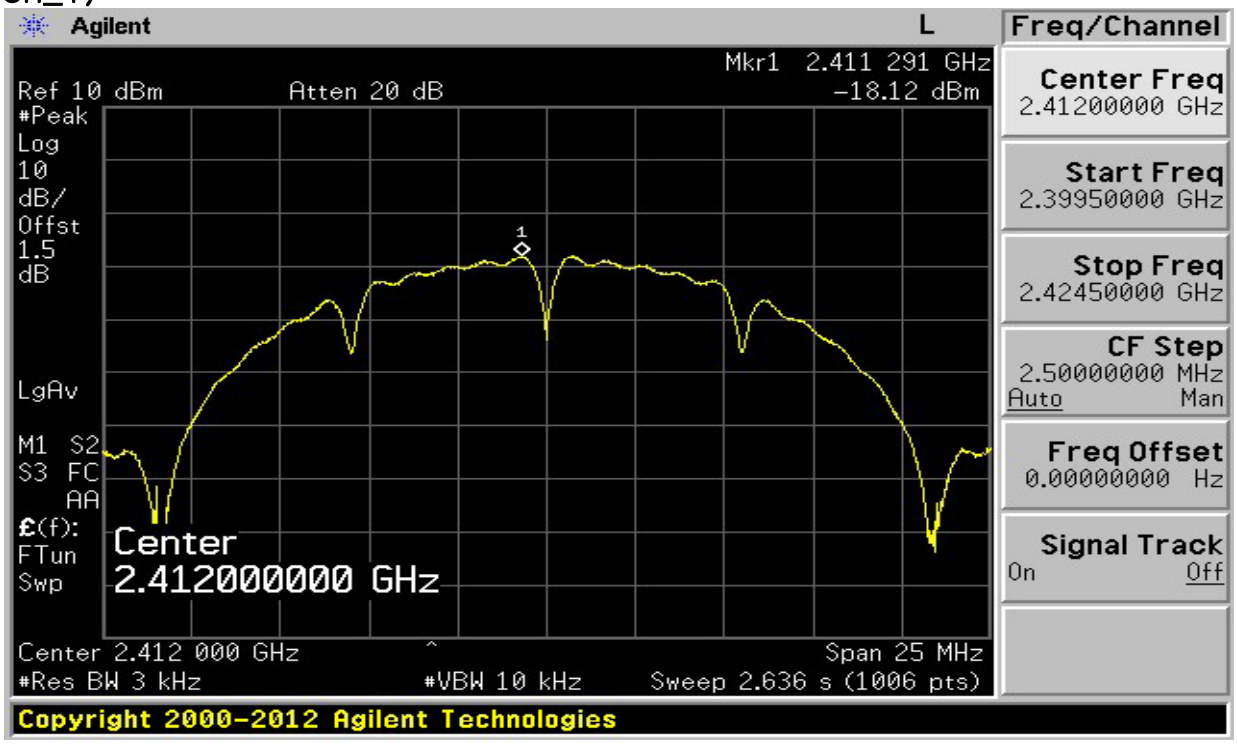
CHANNEL	Channel Frequency (MHz)	Measured Power Spectral Density (dBm)	Maximum Permissible Power Density (dBm/3kHz)	Margin
1	2 412	-18.44	8.0	26.44
6	2 437	-18.50	8.0	26.50
11	2 462	-18.75	8.0	26.75

MODE - OFDM

CHANNEL	Channel Frequency (MHz)	Measured Power Spectral Density (dBm)	Maximum Permissible Power Density (dBm/3kHz)	Margin
1	2 412	-18.02	8.0	26.02
6	2 437	-18.22	8.0	26.22
11	2 462	-18.49	8.0	26.49

8.4 Trace data - CCK (Adapter)

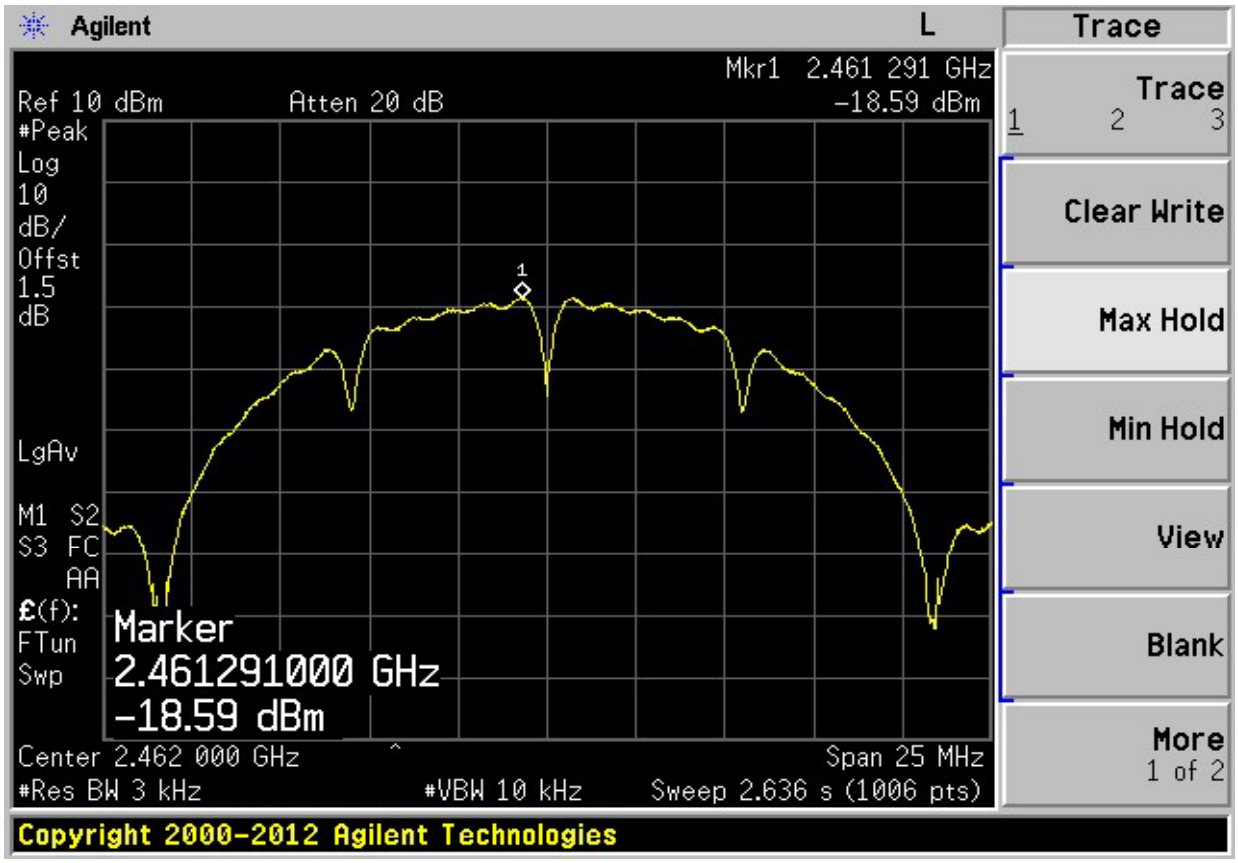
(ch_1)



(ch_6)

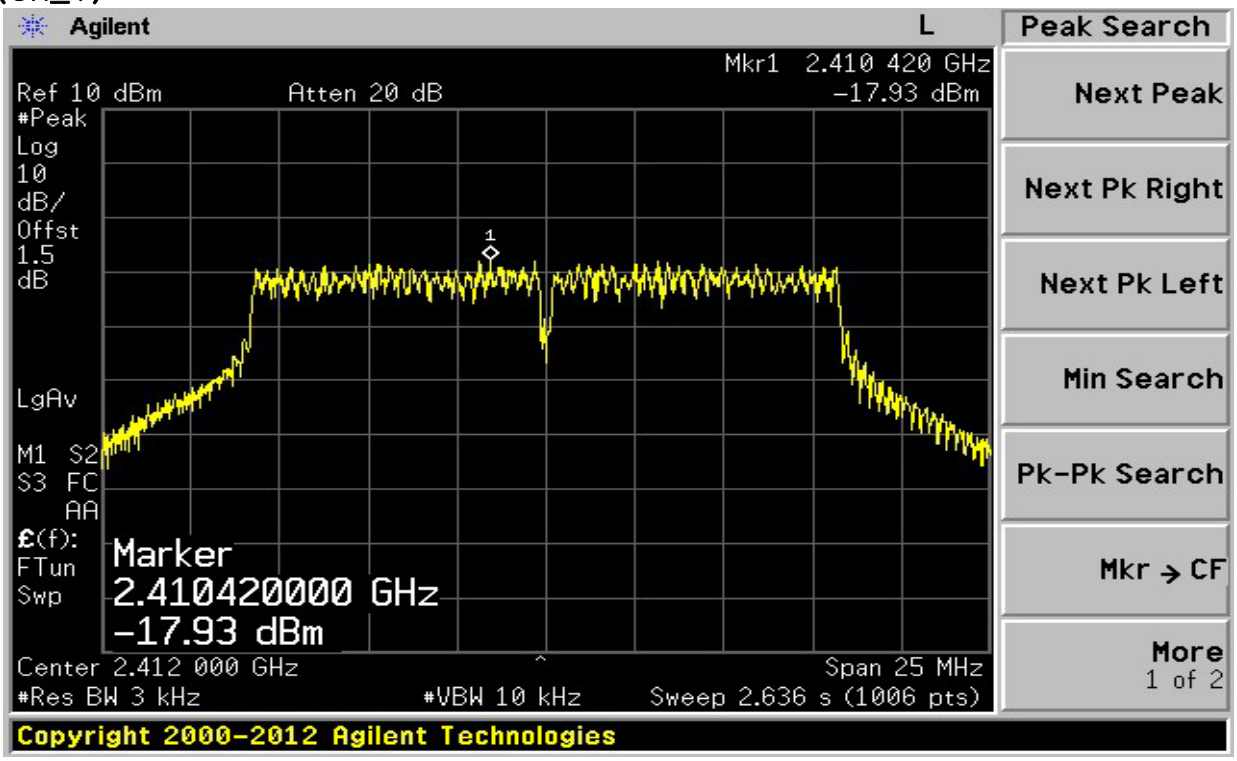
8.4 Trace data - CCK

(ch_11)

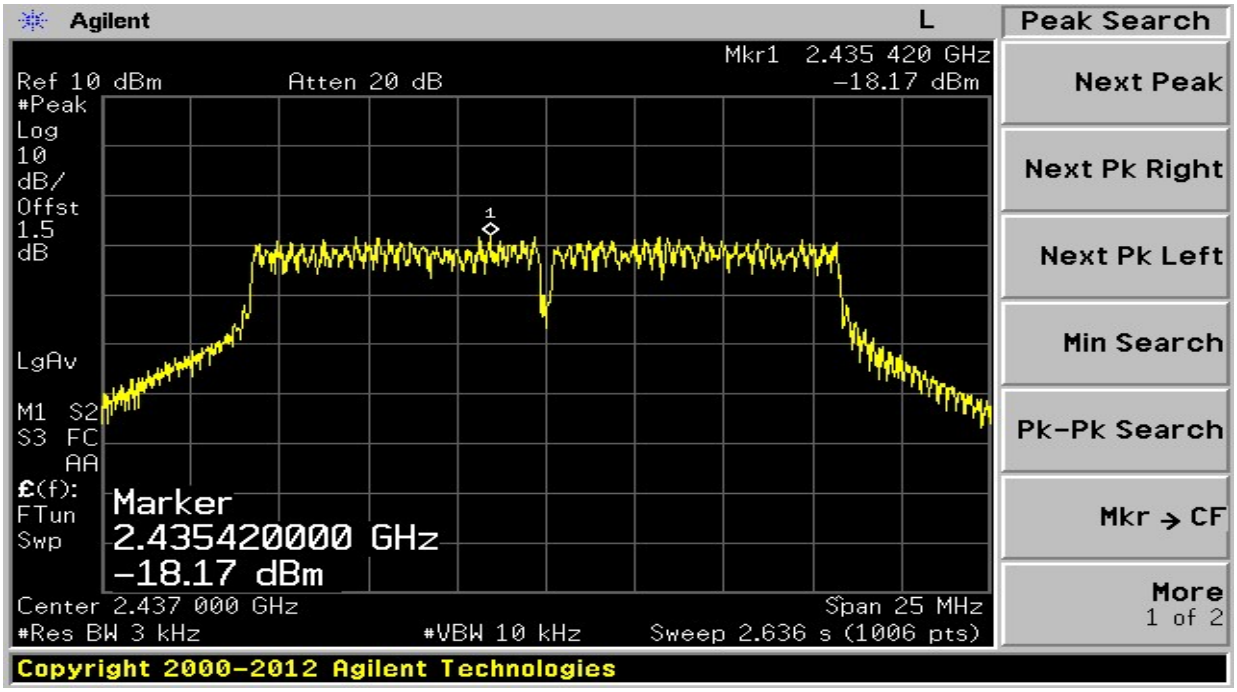


8.4 Trace data - OFDM

(ch_1)

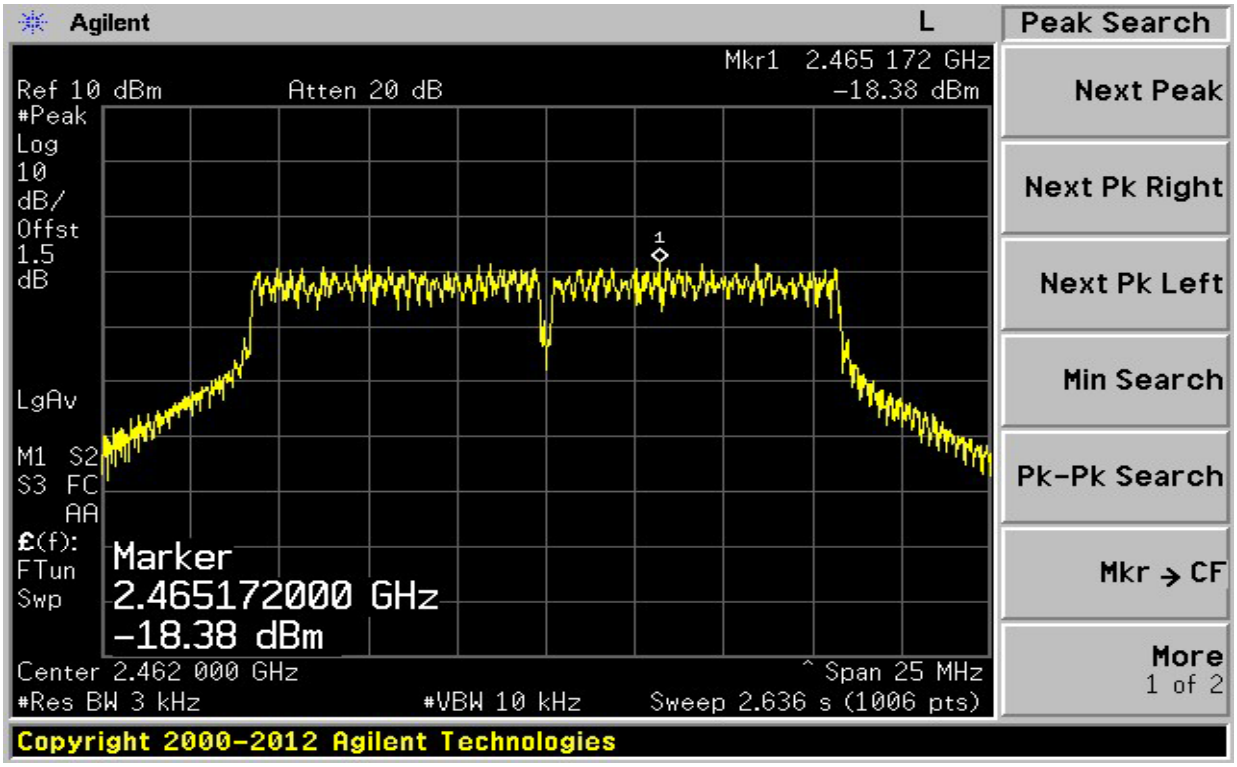


(ch_6)



8.4 Trace data - OFDM

(ch_11)



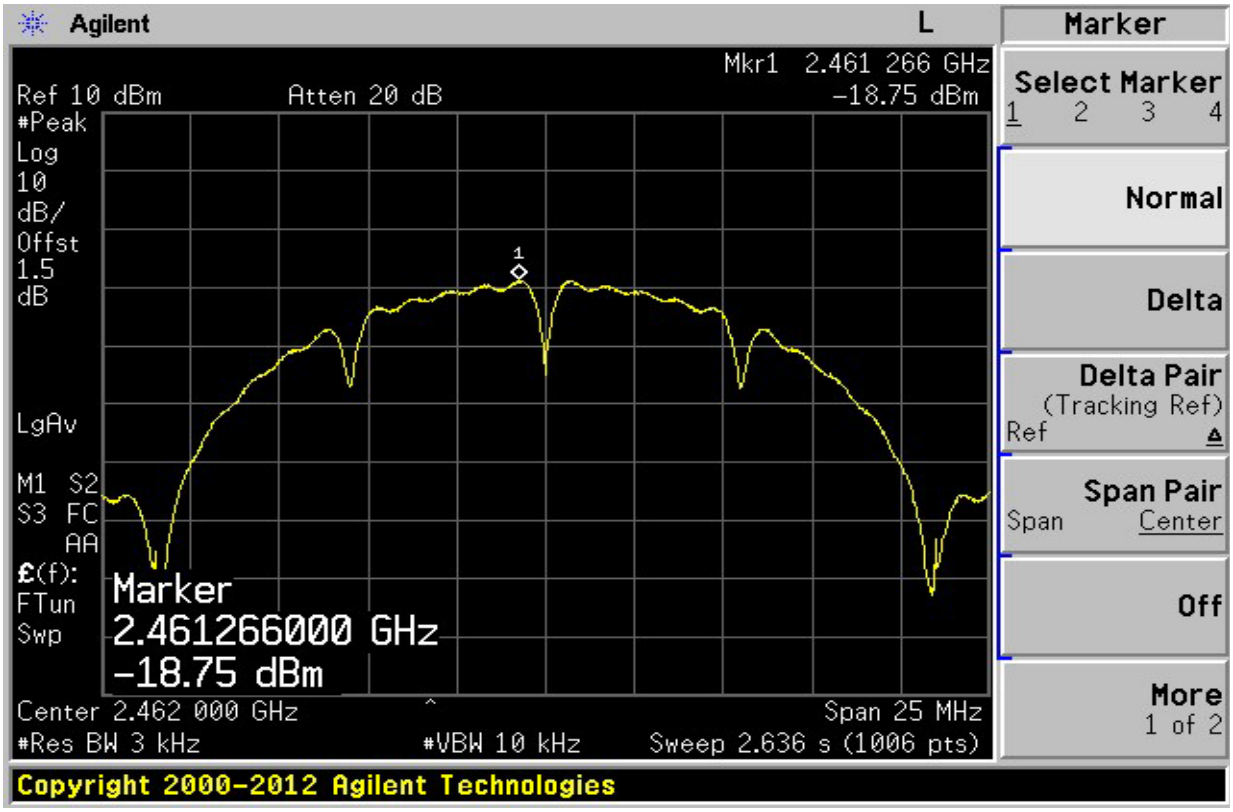
8.4 Trace data - CCK (POE)

(ch_1)

(ch_6)

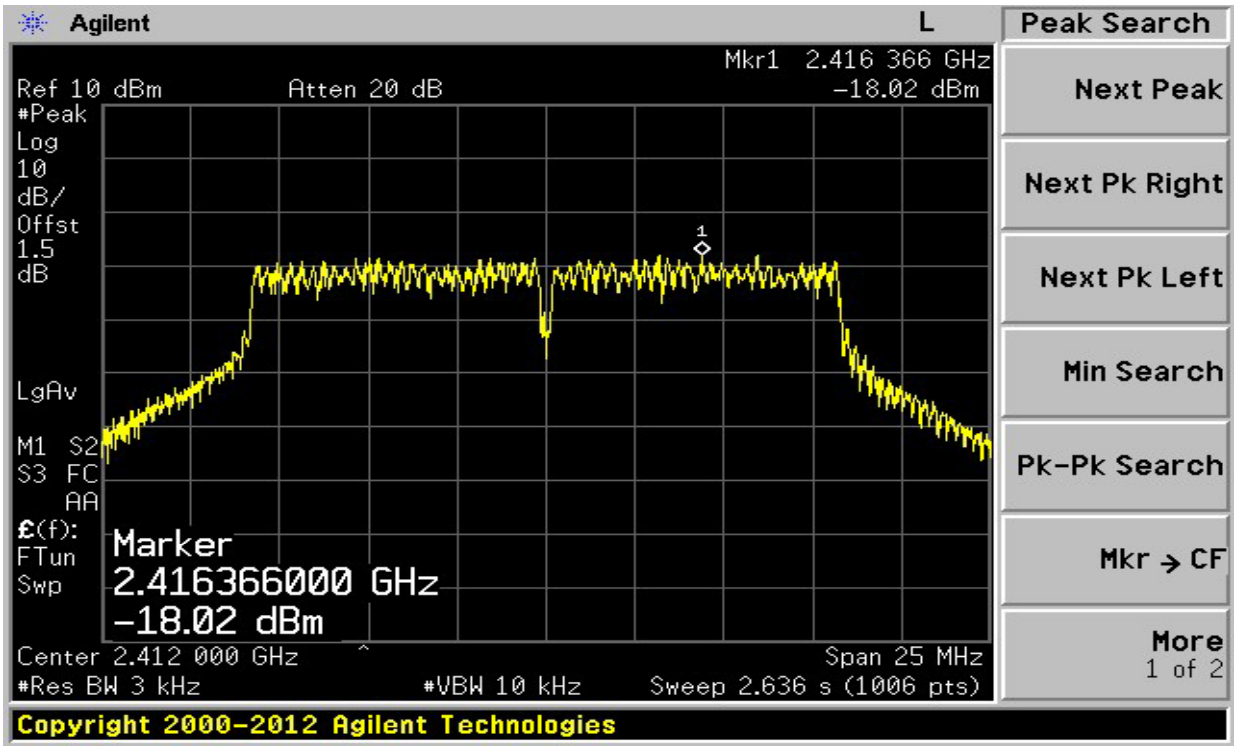
8.4 Trace data - CCK

(ch_11)

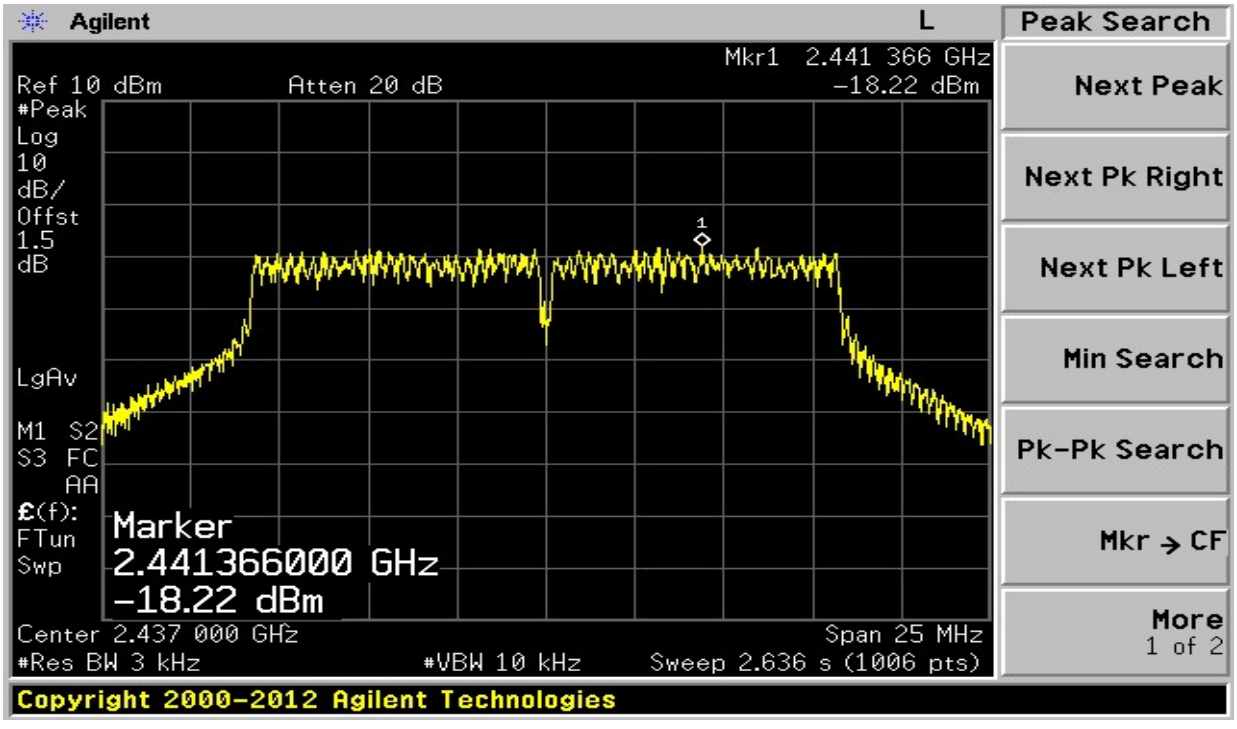


8.4 Trace data - OFDM

(ch_1)



(ch_6)



8.4 Trace data - OFDM

(ch_11)