Test Result and Measuring equipment for certification　　920MHz-BAND DATA TRANSMISSION RADIO EQUIPMENT　　Radio Law 49-14-7,8

Radio Equipment for test	Model or type name: IMR-L210	Test environment	Temperature : 21 ℃	Type of radio, frequency and antenna power	F1D, 920.6 MHz ~ 928.0 MHz	0.02 W
	Serial number: #0		Humidity : 51 %			

Equipment	Model and type name	Serial number	Manufacturer	Last Calibrated date	Calibration Company	Note
	Signal Analyzer(N9020A)	US46220219	AGILENT Technologies	2017-04-21	HCT Co., Ltd.	Based on Japanese Radio Law 24-2-4-2-ha
	DC Power Supply(E3632A)	KR75306225	AGILENT Technologies	2017-04-11	HCT Co., Ltd.	Based on Japanese Radio Law 24-2-4-2-ha
	POWER DIVIDER (11636B)	58755	HEWLETT PACKARD	2017/6/23	HCT Co., Ltd.	Based on Japanese Radio Law 24-2-4-2-ha
	Temp & Humidity Chamber (SH-642)	93010231	ESPEC	2017-10-12	HCT Co., Ltd.	Based on Japanese Radio Law 24-2-4-2-ha
	Fixed Attenuator (8493C)	10342	HEWLETT PACKARD	2017-05-17	HCT Co., Ltd.	Based on Japanese Radio Law 24-2-4-2-ha
	Signal Geneator(N5182A)	MY50141649	AGILENT Technologies	2018-03-05	HCT Co., Ltd.	Based on Japanese Radio Law 24-2-4-2-ha
	POWER METER(N1911A)	MY45100523	AGILENT Technologies	2018/4/16	HCT Co., Ltd.	Based on Japanese Radio Law 24-2-4-2-ha
	Power Sensor(N1921A)	MY52260025	AGILENT Technologies	2018-04-16	HCT Co., Ltd.	Based on Japanese Radio Law 24-2-4-2-ha

Test result	Electric performance			Unit	Limit	DC 3.60 V (normal)			DC 3.96 V (high)			DC 3.24 V (low)			Note
		Voltage		V											
		Test Frequency		MHz		920.6	924.2	928.0	920.6	924.2	928.0	920.6	924.2	928.0	
		Antenna power		mW	20	19.600	18.240	18.75	19.180	18.110	18.02	18.530	18.010	18.170	
		deviation		%	-80	-2.00	-8.80	-6.25	-4.10	-9.45	-9.90	-7.35	-9.95	-9.15	
		Frequency error(measured frequency)		MHz	± 0.01848	920.5999	924.2000	928.0003	920.6001	924.200	928.0002	920.6001	924.2001	928.0002	
		Frequency error		ppm	20	-0.091	0.008	0.304	0.079	0.124	0.256	0.074	0.095	0.175	
		Occupied bandwidth		kHz	200	127.926	127.942	127.974	127.949	128.003	127.889	127.677	128.030	127.903	
		Spurious Emission 920.5~928.1MHz :Tx frequency ±(200+100 x n) kHz	(measured frequency)	MHz	-	705.92	467.24	453.64	501.24	476.76	492.40	495.12	486.28	480.16	
			30 ~ 710 MHz	dBm/100kHz	-36	-70.345	-70.328	-70.496	-70.096	-70.574	-70.395	-70.304	-70.408	-70.159	
			(measured frequency)	MHz	-	896.20	767.95	896.01	895.82	892.21	896.01	896.01	767.95	896.01	
			710 ~ 900 MHz	dBm/1MHz	-55	-68.486	-68.404	-67.566	-68.390	-68.606	-67.753	-68.422	-68.651	-67.758	
			(measured frequency)	MHz	-	911.90	914.36	913.38	913.67	912.47	912.81	910.55	910.40	914.73	
			900 ~ 915 MHz	dBm/100kHz	-55	-66.282	-67.467	-69.677	-64.585	-68.716	-69.927	-67.684	-69.572	-69.562	
			(measured frequency)	MHz	-	920.19	923.55	927.70	920.19	923.90	927.70	920.03	923.37	927.66	
			915 ~ 930 MHz	dBm/100kHz	-36	-38.089	-43.494	-47.882	-39.058	-48.277	-48.343	-42.164	-46.510	-48.254	
			(measured frequency)	MHz	-	930.28	930.63	930.00	934.06	937.56	933.78	931.05	937.35	930.14	
			930 ~ 1000 MHz	dBm/100kHz	-55	-70.715	-69.868	-63.110	-68.855	-68.791	-61.838	-67.048	-69.223	-63.198	
			(measured frequency)	MHz	-	1207.69	1203.18	1087.94	1211.56	1210.49	1210.70	1214.36	1212.21	1174.37	
			1000 ~ 1215 MHz	dBm/1MHz	-45	-61.514	-61.571	-61.511	-61.540	-61.518	-61.581	-61.554	-61.541	-61.520	
			(measured frequency)	MHz	-	2761.74	2772.53	2784.07	2761.74	2772.53	2783.88	2761.74	2772.53	2783.88	
			1215 ~ 5000 MHz	dBm/1MHz	-30	-40.926	-40.910	-40.952	-41.238	-41.174	-41.026	-41.145	-41.190	-41.079	
		ACPL	200kHz detuining	dBm	-15	-36.08	-36.50	-35.98	-36.03	-36.63	-35.68	-36.59	-36.45	-35.95	
			-200kHz detuining	dBm	-15	-36.56	-36.94	-36.73	-37.99	-36.87	-36.97	-38.96	-39.35	-37.14	
		Collateral emission	(measured frequency)	MHz	-	469.74	641.86	467.57	405.04	207.69	563.02	536.38	483.35	673.51	
			30 ~ 710 MHz	dBm/100kHz	-54	-91.561	-91.181	-91.835	-92.047	-91.057	-90.698	-91.669	-91.140	-91.876	
			(measured frequency)	MHz	-	891.26	893.35	830.46	822.67	893.35	859.53	857.25	876.63	791.51	
			710 ~ 900 MHz	dBm/1MHz	-55	-91.532	-90.505	-90.145	-91.367	-91.735	-91.606	-91.317	-90.525	-90.910	
			(measured frequency)	MHz	-	904.13	906.53	902.34	900.92	907.76	906.69	908.69	903.47	914.94	
			900 ~ 915 MHz	dBm/100kHz	-55	-92.172	-91.119	-91.203	-92.360	-92.102	-91.978	-91.802	-90.993	-91.797	
			(measured frequency)	MHz	-	923.57	924.38	926.70	917.16	922.83	915.89	929.45	928.94	918.18	
			915 ~ 930 MHz	dBm/100kHz	-54	-91.979	-92.117	-92.276	-92.178	-92.204	-92.024	-91.607	-92.300	-91.952	
			(measured frequency)	MHz	-	943.23	960.87	931.68	979.70	932.87	947.92	989.29	968.22	998.81	
			930 ~ 1000 MHz	dBm/100kHz	-55	-91.915	-92.274	-92.105	-92.131	-92.041	-92.483	-91.981	-92.023	-92.032	
			(measured frequency)	MHz	-	4644.00	2688.00	4996.00	3164.00	1832.00	2768.00	4968.00	2800.00	3032.00	
			1000 ~ 5000 MHz	dBm/1MHz	-47	-77.733	-78.353	-78.480	-77.974	-78.157	-78.336	-78.023	-77.805	-78.009	
	Carrier Sense				yes		Complies			Complies			Complies		
	Total Transmission Time @ 1H			s/h	360	-	0.33	0.33	-	0.33	0.33	-	0.33	0.33	
	Transmission Time			s	4	1.3150	-	-	1.3150	-	-	1.3150	-	-	
				s	0.4	-	0.33	0.33	-	0.33	0.33	-	0.33	0.33	
	Transmission OFF Time			ms	50	2015	-	-	2015	-	-	2015	-	-	
				ms	2	-	4680	4680	-	4680	4680	-	4680	4680	

Antenna Gain: -1.57 dBi　　N/A = Not Applicable　　Engineer: N.H.KIM Reviewer: Y.H.Lee Date: APR.10.2018 ~ MAR.30.2018 Test location: HCT

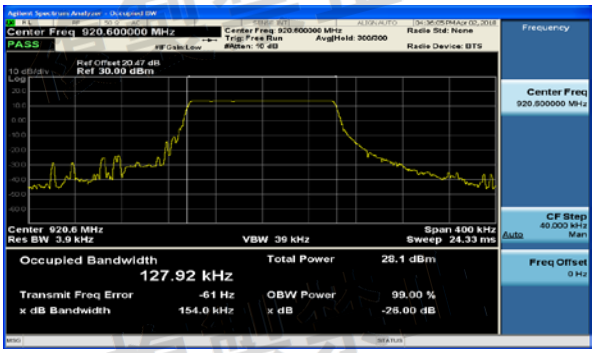
Carrier Sense signal type : basic operation test => Unmodulated continuous signal -80.1 dBm　　·Test method:TELEC-T245(rev.5.0)

Carrier Sense signal type : Judgment time test => Pulse modulated signal

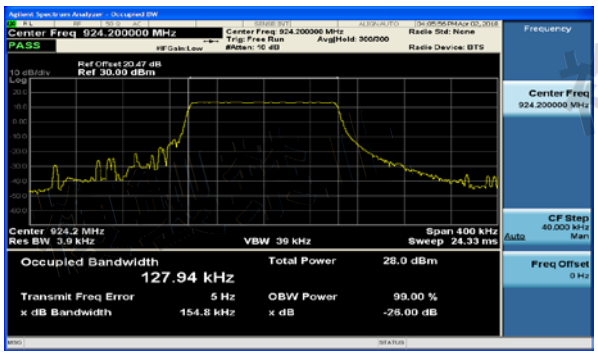
Carrier sense time: 5ms or more(920.6~923.4MHz), 128us or more (923.6~928.0MHz)

1. Occupied bandwidth

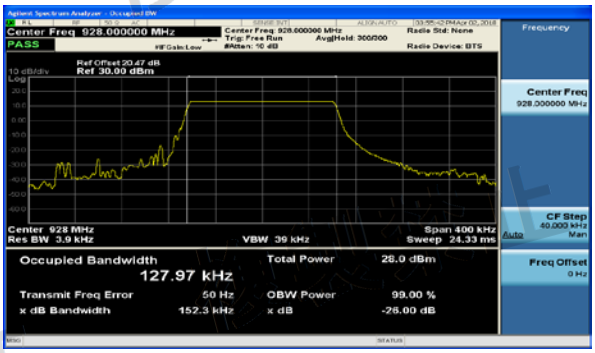
920.6 MHz



924.2 MHz

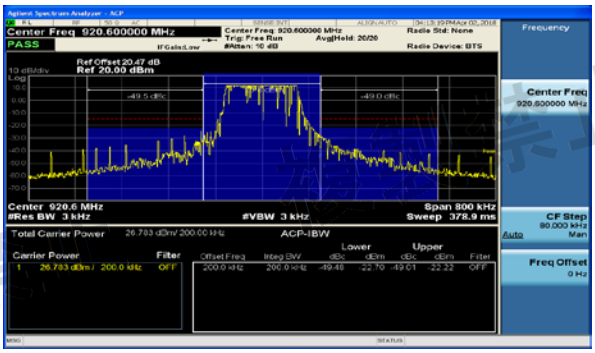


928.0 MHz

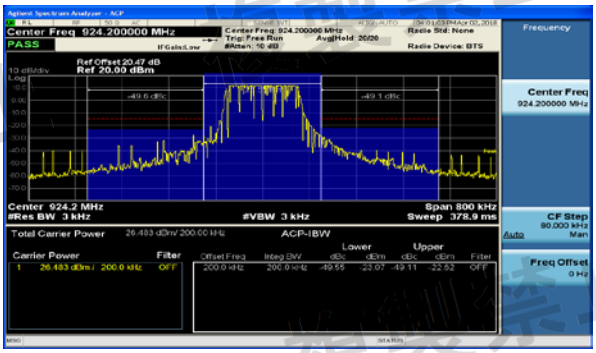


2. Adjacent channel leakage power

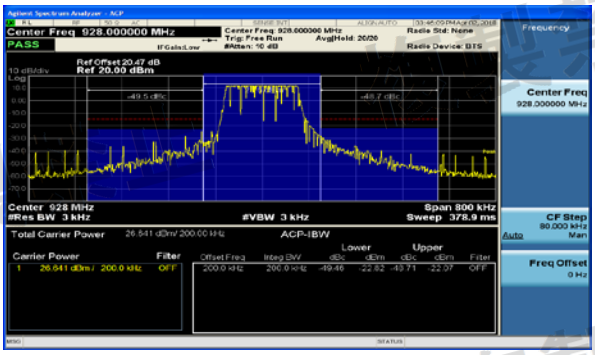
920.6 MHz



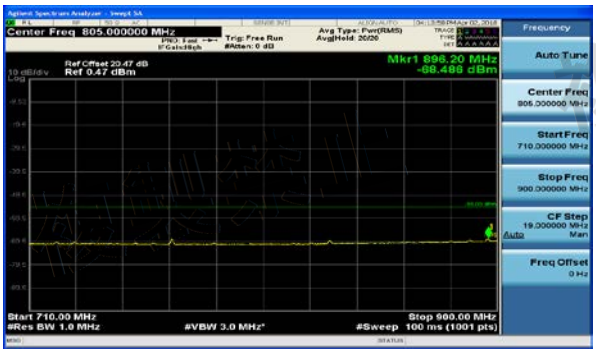
924.2 MHz

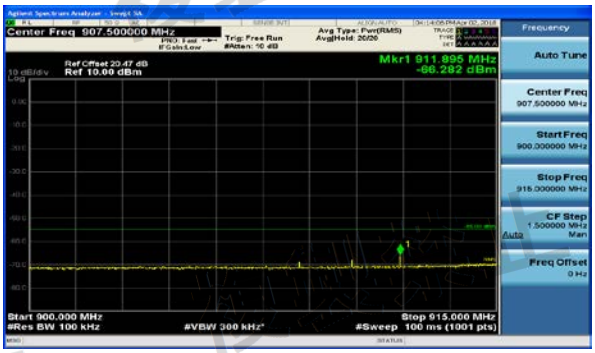


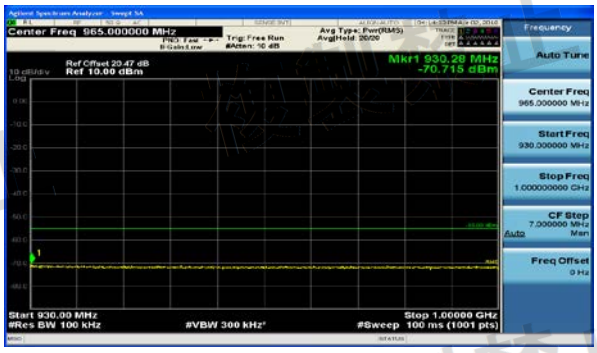
928 MHz

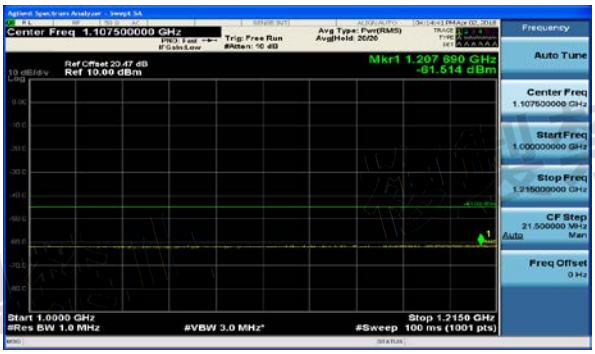


3. Tolerance of spurious emission intensity
920.6 MHz

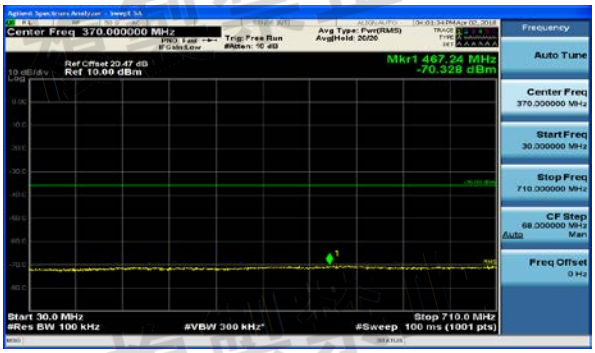


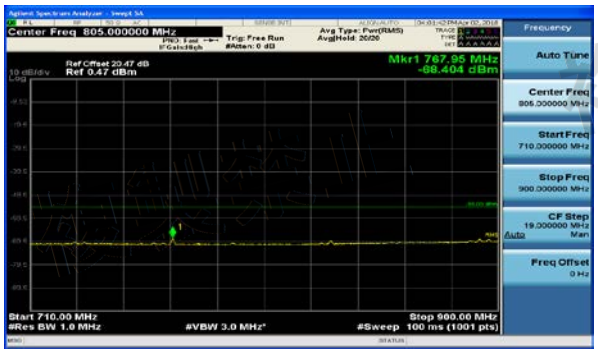


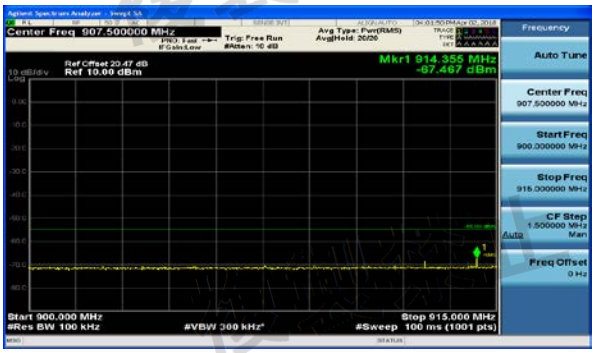


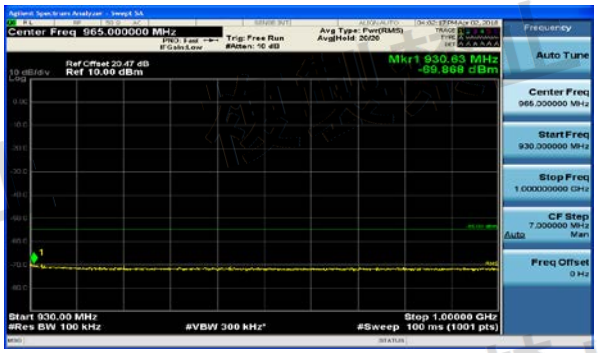


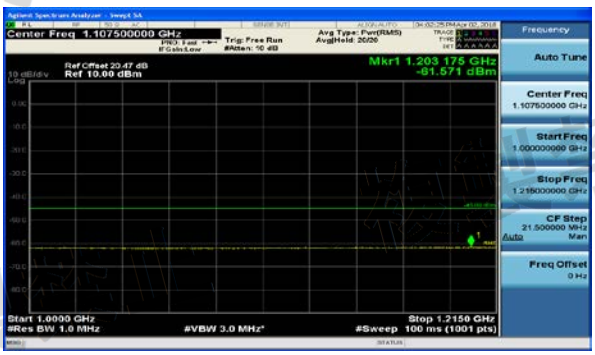
924.2 MHz

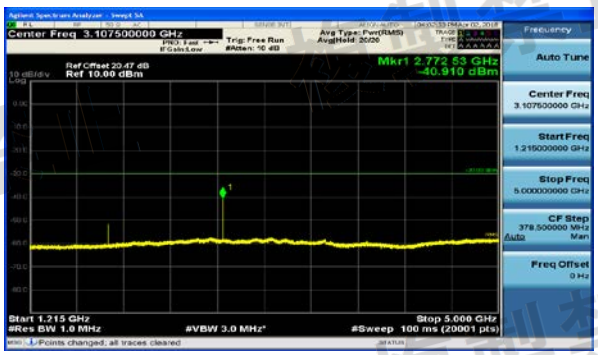




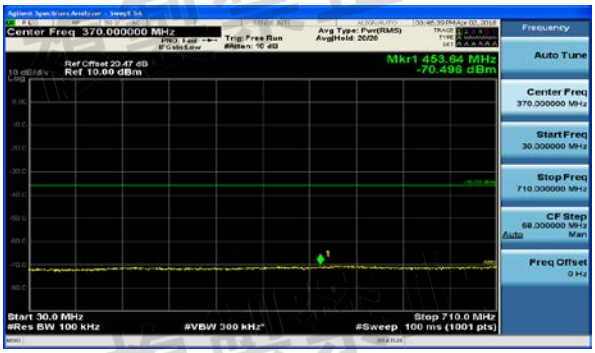




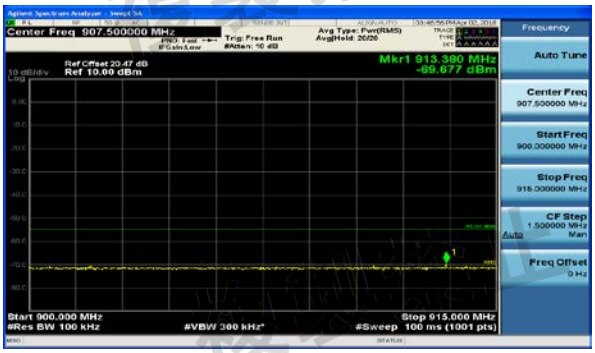




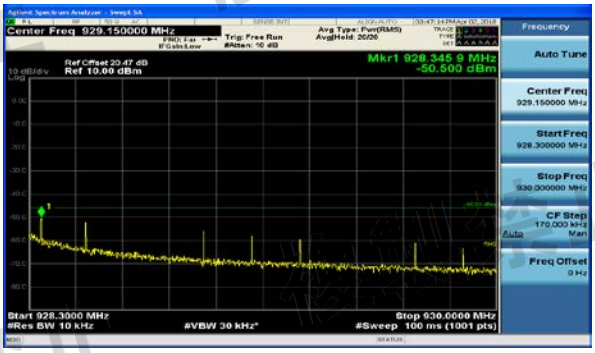
928 MHz

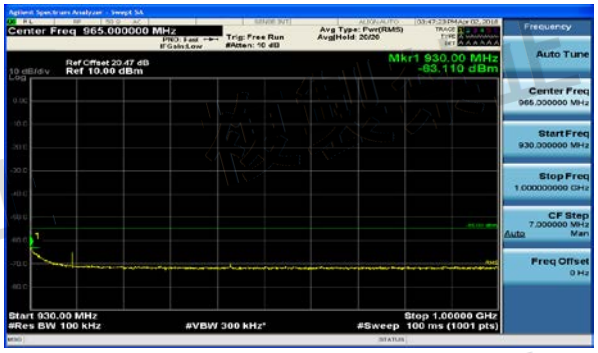

Agilent Spectrum Analyzer - Swept SA
Center Freq 370.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Pwr(RMS)
Avg|Hold: 20/20
Ref Offset 20.47 dB
10 dB/div Ref 10.00 dBm
Mkr1 453.64 MHz
-70.498 dBm
Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz*
Stop 710.0 MHz
#Sweep 100 ms (1001 pts)
Frequency
Auto Tune
Center Freq
370.000000 MHz
Start Freq
30.000000 MHz
Stop Freq
710.000000 MHz
CF Step
68.000000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 805.000000 MHz
PNO: Fast
IFGain:High
Trig: Free Run
#Atten: 0 dB
Avg Type: Pwr(RMS)
Avg|Hold: 20/20
Ref Offset 20.47 dB
10 dB/div Ref 0.47 dBm
Mkr1 896.01 MHz
-67.568 dBm
Start 710.00 MHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 900.00 MHz
#Sweep 100 ms (1001 pts)
Frequency
Auto Tune
Center Freq
805.000000 MHz
Start Freq
710.000000 MHz
Stop Freq
900.000000 MHz
CF Step
19.000000 MHz
Auto
Man
Freq Offset
0 Hz

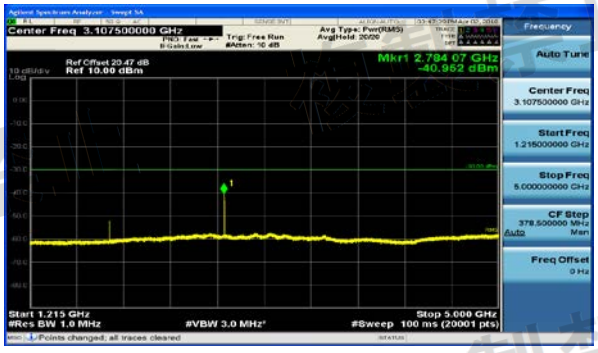

Agilent Spectrum Analyzer - Swept SA
Center Freq 907.500000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Pwr(RMS)
Avg|Hold: 20/20
Ref Offset 20.47 dB
10 dB/div Ref 10.00 dBm
Mkr1 913.380 MHz
-69.677 dBm
Start 900.000 MHz
#Res BW 100 kHz
#VBW 300 kHz*
Stop 915.000 MHz
#Sweep 100 ms (1001 pts)
Frequency
Auto Tune
Center Freq
907.500000 MHz
Start Freq
900.000000 MHz
Stop Freq
915.000000 MHz
CF Step
1.500000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 921.350000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Pwr(RMS)
Avg|Hold: 20/20
Ref Offset 20.47 dB
10 dB/div Ref 10.00 dBm
Mkr1 927.700 0 MHz
-57.882 dBm
Start 915.000 MHz
#Res BW 10 kHz
#VBW 30 kHz*
Stop 927.700 MHz
#Sweep 136 ms (1001 pts)
Meas Uncal
Frequency
Auto Tune
Center Freq
921.350000 MHz
Start Freq
915.000000 MHz
Stop Freq
927.700000 MHz
CF Step
1.270000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 929.150000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Pwr(RMS)
Avg|Hold: 20/20
Ref Offset 20.47 dB
10 dB/div Ref 10.00 dBm
Mkr1 928.345 9 MHz
-50.500 dBm
Start 928.3000 MHz
#Res BW 10 kHz
#VBW 30 kHz*
Stop 930.0000 MHz
#Sweep 100 ms (1001 pts)
Frequency
Auto Tune
Center Freq
929.150000 MHz
Start Freq
928.300000 MHz
Stop Freq
930.000000 MHz
CF Step
170.000 kHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 965.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Pwr(RMS)
Avg|Hold: 20/20
Ref Offset 20.47 dB
10 dB/div Ref 10.00 dBm
Mkr1 930.00 MHz
-63.110 dBm
Start 930.00 MHz
#Res BW 100 kHz
#VBW 300 kHz*
Stop 1.00000 GHz
#Sweep 100 ms (1001 pts)
Frequency
Auto Tune
Center Freq
965.000000 MHz
Start Freq
930.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
7.000000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 1.107500000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Pwr(RMS)
Avg|Hold: 20/20
Ref Offset 20.47 dB
10 dB/div Ref 10.00 dBm
Mkr1 1.087 935 GHz
-61.511 dBm
Start 1.0000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 1.2150 GHz
#Sweep 100 ms (1001 pts)
Frequency
Auto Tune
Center Freq
1.107500000 GHz
Start Freq
1.000000000 GHz
Stop Freq
1.215000000 GHz
CF Step
21.500000 MHz
Auto
Man
Freq Offset
0 Hz


Agilent Spectrum Analyzer - Swept SA
Center Freq 3.107500000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Pwr(RMS)
Avg|Hold: 20/20
Ref Offset 20.47 dB
10 dB/div Ref 10.00 dBm
Mkr1 2.794 07 GHz
-40.962 dBm
Start 1.215 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz*
Stop 5.000 GHz
#Sweep 100 ms (20001 pts)
Points changed; all traces cleared
Frequency
Auto Tune
Center Freq
3.107500000 GHz
Start Freq
1.215000000 GHz
Stop Freq
5.000000000 GHz
CF Step
378.500000 MHz
Auto
Man
Freq Offset
0 Hz