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G.S.D. Srl **PISA - Italy**	***Test Report n. FCC-14359***	Rev. 01

Manufacturer	**CAEN RFID s.r.l.**
Address	Via Vetraia, 11 55049 Viareggio (LU) Italy
Test Family Name	**R4300P ION (UHF)**
Testing Laboratory Name	**G.S.D. S.r.l.**
Address	Via Marmiceto, 8 56121 Ospedaletto Pisa (PI) Italy
Tel/Fax	+39 050 984254 / +39 050 984262
P.IVA/VAT	01343950505
http – e-mail	www.gsd.it - info@gsd.it
	FCC Listed: Registration Number: 424037
Location and Date of Issue	Pisa, 2014 April 22

G.S.D. s.r.l.
Via Marmiceto, 8
56121 OSPEDALETTO - PISA
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SENIOR EMC TEST MANAGER
Dr. Gian Luca Genovesi

QUALITY MANAGER
Dr. David Pelliccia

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1. MANUFACTURER AND EUT IDENTIFICATION[1]

Manufacturer	**CAEN RFID s.r.l..**
Address	Via Vetraia, 11 55049 Viareggio (LU) Italy
Test Family Name	**R4300P ION (UHF)**
Date of reception	**2014 January 23**
Sampling	**Laboratory sample for certification**
Test Item Description	**RFID Device**
Nominal Input Voltage	**24 Vdc**
FCC ID	**UVECAENRFID008**

[1]A detailed documentation is preserved in the internal fascicle.

Fig. 1.1
Equipment Photo

2. REFERENCE STANDARDS

Tests and measurements are performed accordingly to the reference standards given in the table below:

TEST	*STANDARD*
Emissions: Conducted and Radiated – Section 15.207 and 15.209	FCC Rules ad Regulations, Title 47 (2008) Part 15 – Sub part B ANSI C63.4 2009 – American National Standard for Methods of Measuring of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
Operation within the band 902-928 MHz: Alternative Test Procedures 15.247 (b) and (c) , and (a) Bandwidth and average time of occupancy, Band Edge 15.247 (d)	FCC Rules ad Regulations, Title 47 (2008) Part 15 – Sub part B DA 00-705 (30 March 2000) – Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems ANSI C63.4 2009 – American National Standard for Methods of Measuring of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
Maximum Permissible Exposure	OET Bulletin 65 Evaluating Compliance with FCC Guidelines for Human Exposure to Radio-Frequency Electromagnetic Fields FCC Rules ad Regulations, Title 47 (2008) Part 15 – Sub part B DA 00-705 (30 March 2010) – Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems

3. RESULT, CONDITION, MEASUREMENT UNCERTAINTY

Summary of Test Results

TEST	*RESULT*
Emissions: conducted *Section 15.207*	*Pass*
Emissions: radiated *Section 15.209*	*Pass*
Bandwidth and Average Time of Occupancy *Section 15.247 (a)*	*Pass*
Operation within the band 902-928 MHz: *Section 15.247 (b) and (c)*	*Pass*
Band Edge *Section 15.247 (d)*	*Pass*

Measurement uncertainty

TEST	*EXPANDED UNCERTAINTY*
Conducted Emission – 50Ω/50µH (150 kHz - 30 MHz)	± 3.5 dB
Radiated Emission – (Semianechoic Room) (30 MHz - 18 GHz)	± 4.7 dB

Climatic Conditions

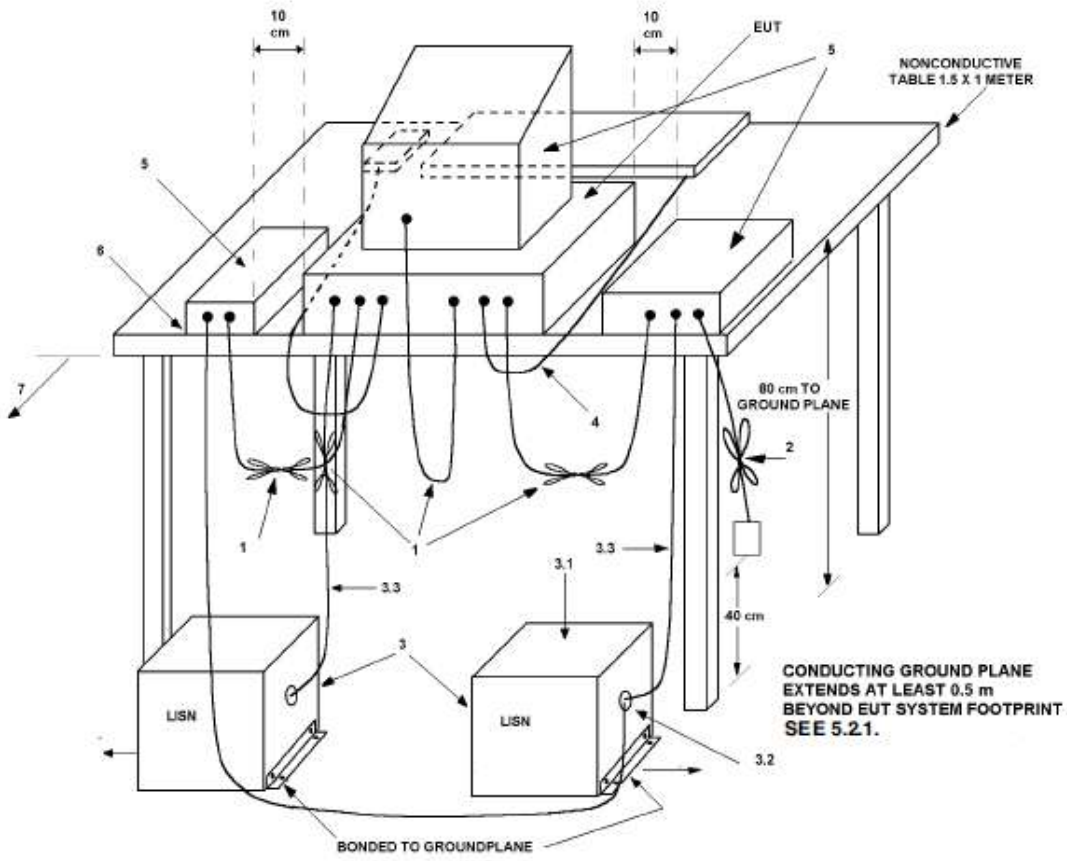
PARAMETER	*VALUE*
Temperature	(293 ± 3) K
Relative humidity	(50 ± 5) %

Extensions

The results refer only to the sampled EUT and under the specified conditions.

Modulations:

Type 1: DSB_ASK_FM0_TX160_RX400
Type 2: PR_ASK_M4_TX40RX250



Conducted and Radiated EUT Test Set-up example (ANSI C63.4 2009)

4. RADIATED EMISSIONS

In the following table you can find the limits established by the reference standard:

FREQUENCY RANGE *(MHz)*	***Field Strenght*** ***QUASI-PEAK LIMITS*** *[dB (μV/m)]*
30 ÷ 88	40
88 ÷ 216	43,5
216 ÷ 960	46
Above 960	54

Test Equipment

EQUIPMENT	MANUFACTURER	MODEL	CAL. DUE
MXE EMI Receiver	Agilent	N9038A	01/2015
Anechoic Chamber	Comtest	CSA01	01/2015
Bilog Antenna	Schaffner	CBL6112B	01/2015
Horn Antenna	EMCO	3115	01/2015
Horn Antenna	Alpha Industries	61932500	01/2015
Controller	Deisel	HD100	01/2015
Turn Table	Deisel	MA240	01/2015
LISN	GSD	NTW06	01/2015

Test procedure: RE22R02

Notes

Azimuth position EUT-Antenna corresponding to 0° identifies the rotating table orientation (TT) in which the instrument to be tested shows the front part turned towards the antenna. Positive grades individuate clockwise rotations of TT when this one is observed from the top. For negative degrees, TT rotation is anticlockwise.
Antenna height respect to the mass plane is conventionally individuated with: MA=XXX where XXX indicates the height (always positive for e>100) expressed in cm.
Antenna horizontal polarisation is indicated by POL=H.
Antenna vertical polarisation is indicated by POL=V.
EUT was tested in the three ortogonal planes.

Results and conclusions

In all the operative conditions, equipment complied with the standard limits. Graphics in following figures show the most significant registrations of the performed measurements.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)

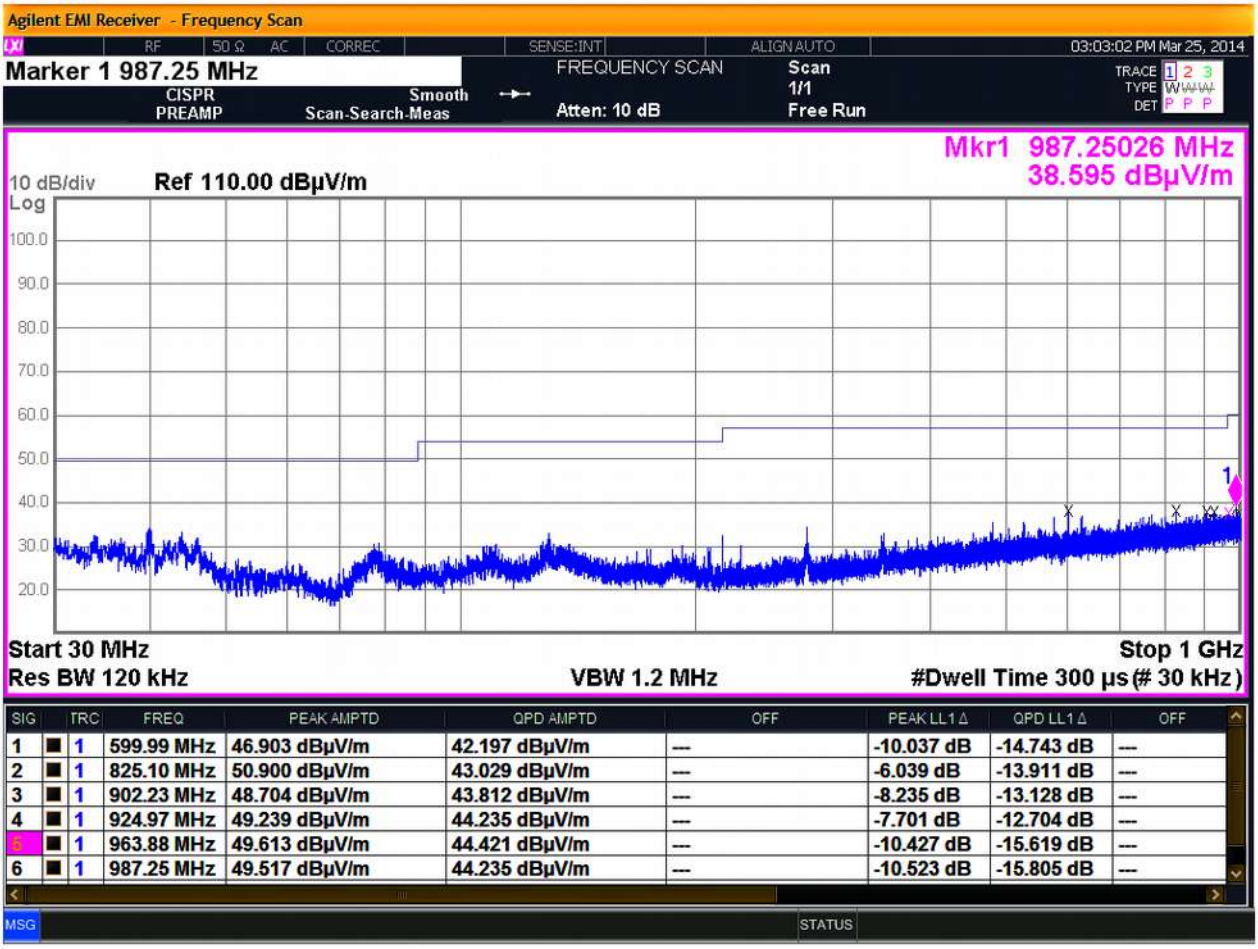


Fig. 4.1 - standby

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 30 – 1000 MHz, Pol. V.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)

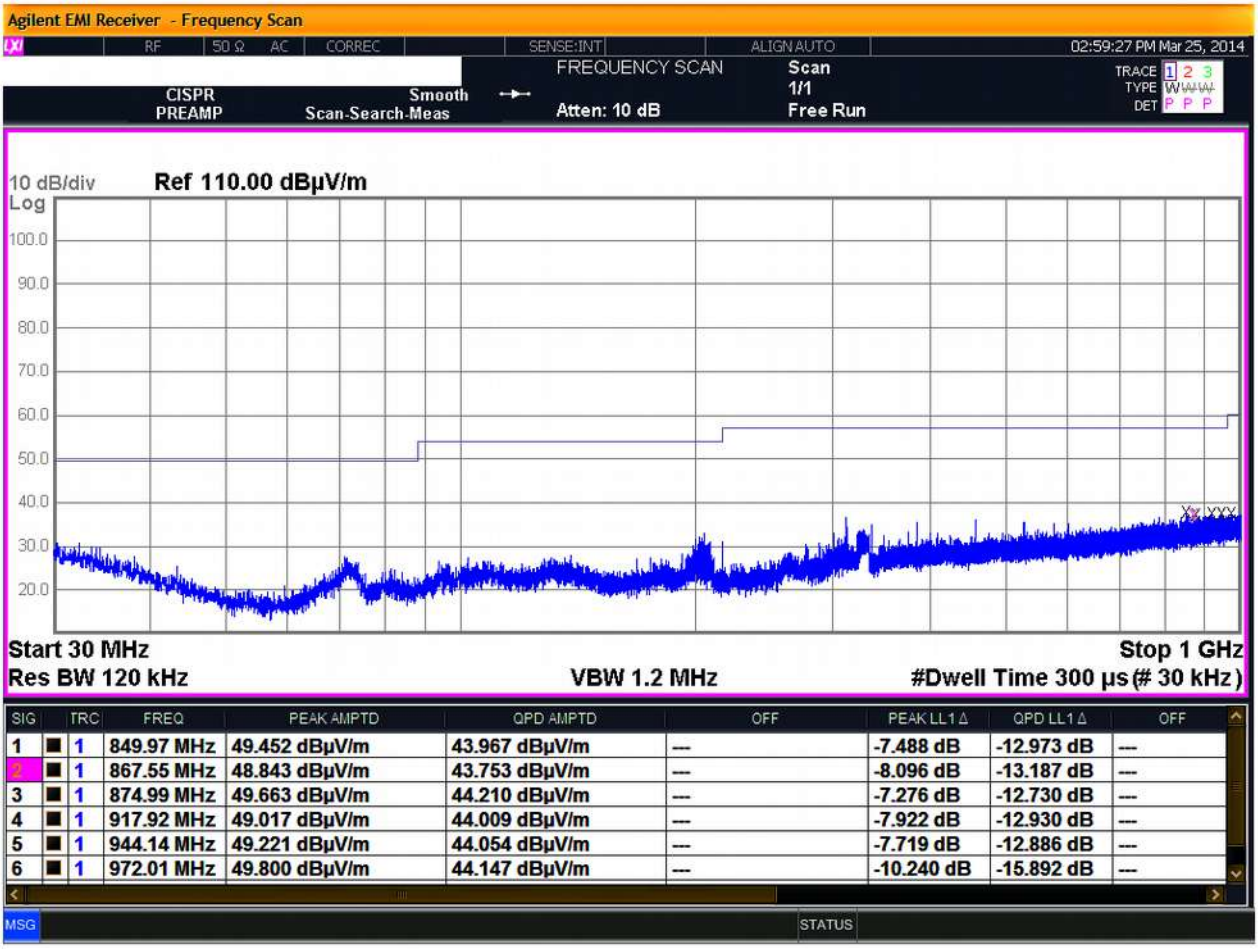


Fig. 4.2 - standby

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 30 – 1000 MHz, Pol. H.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)

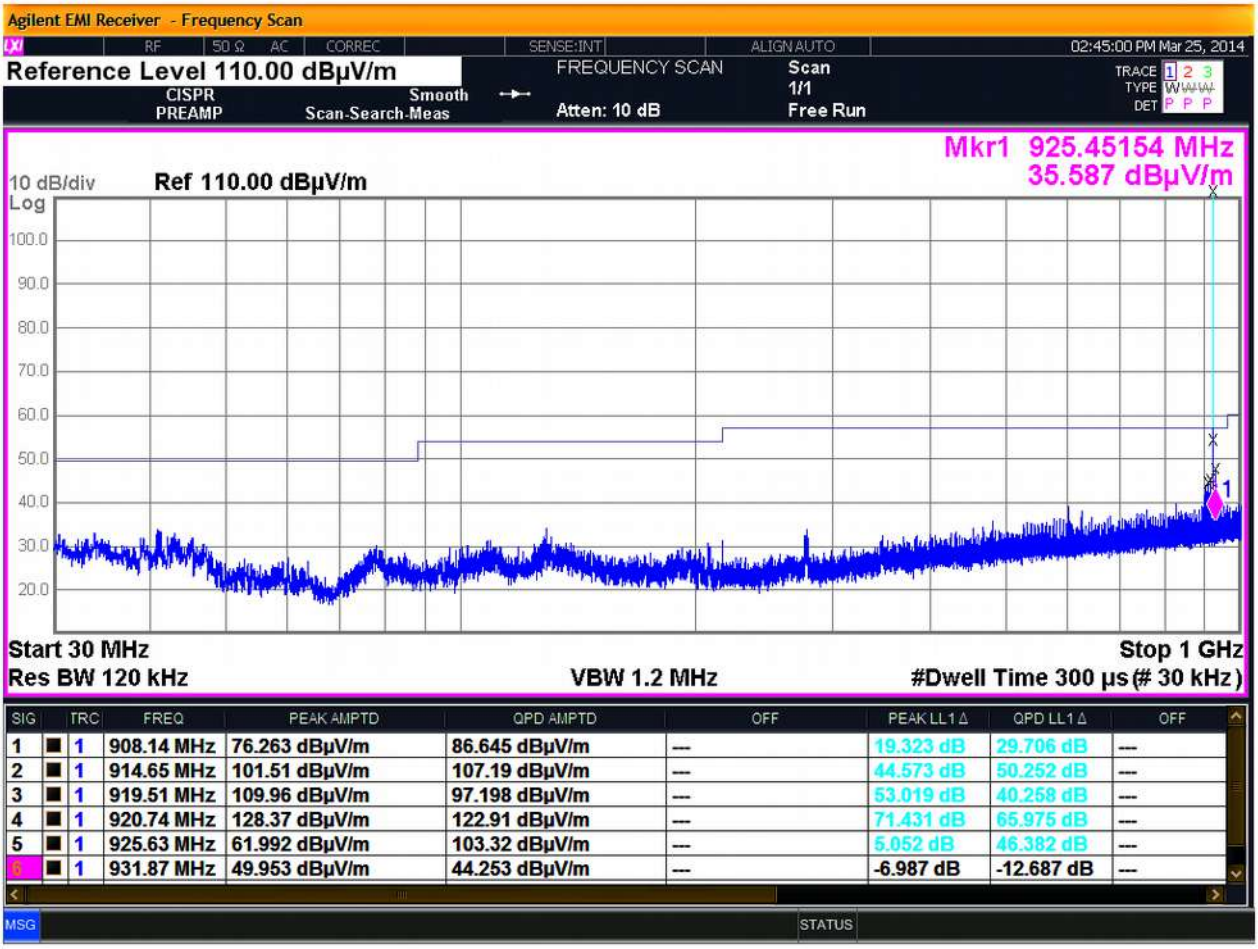
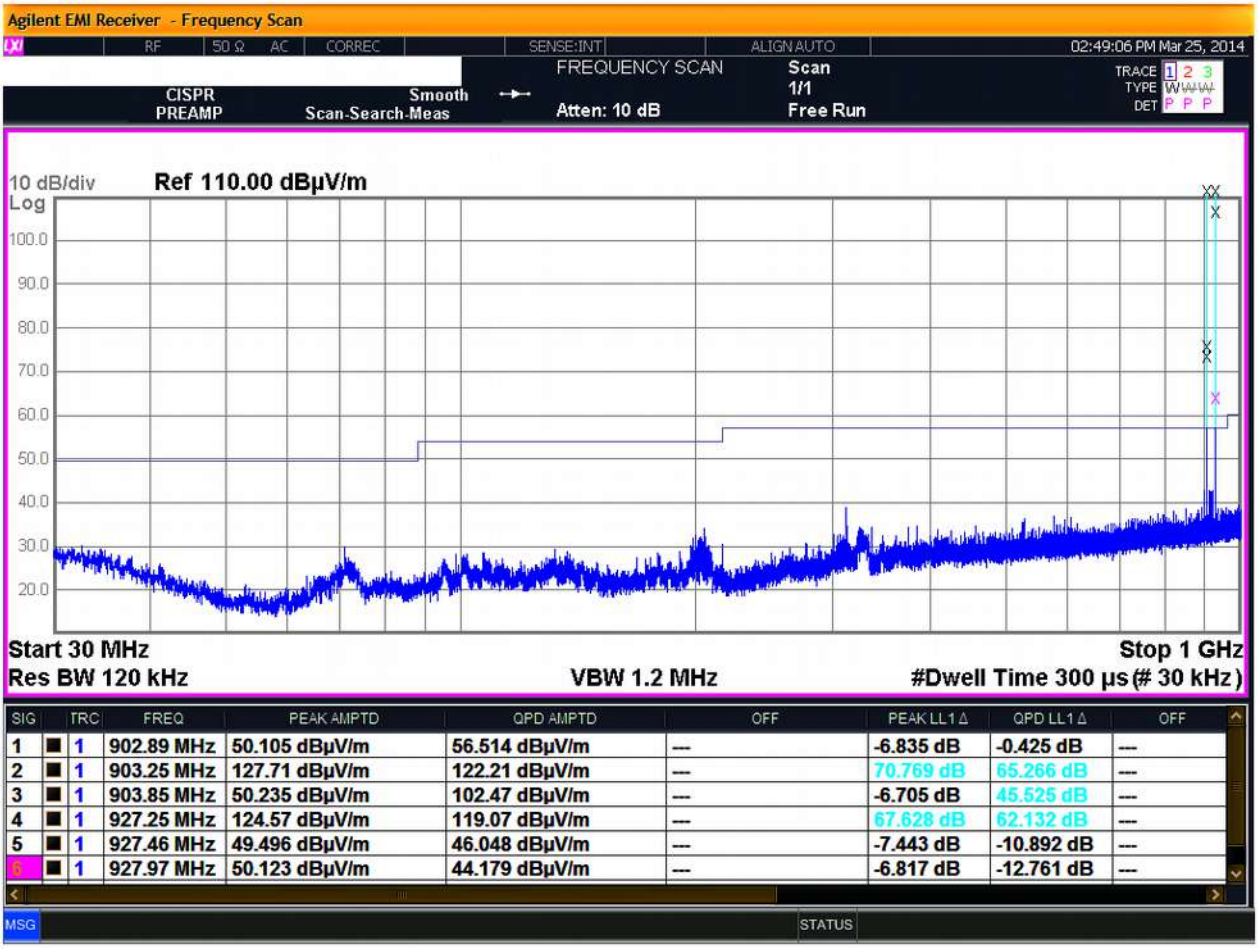


Fig. 4.3 - type 1 modulation

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 30 – 1000 MHz, Pol. V.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)

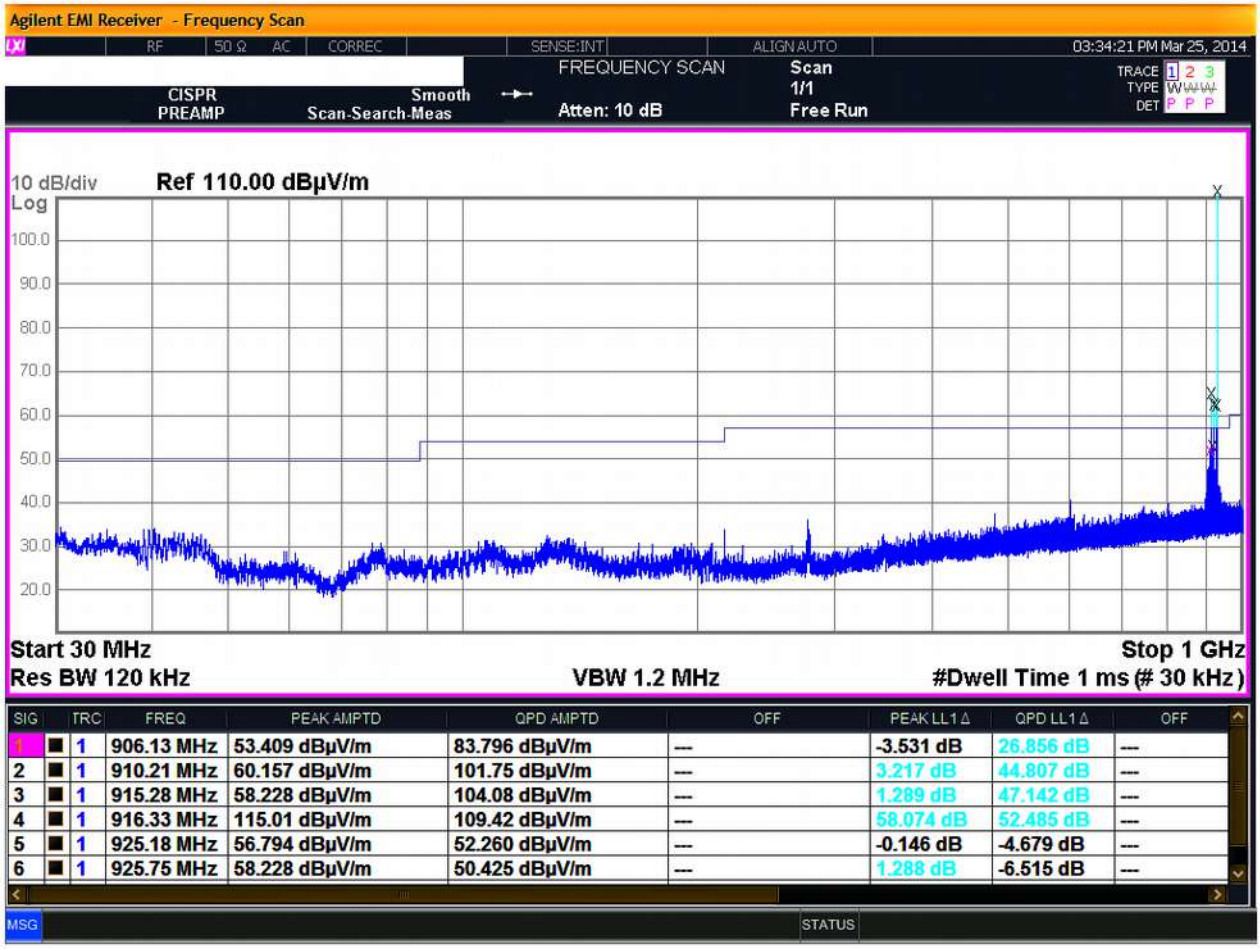


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	OFF	PEAK LL1 Δ	QPD LL1 Δ	OFF
1	1	902.89 MHz	50.105 dBµV/m	56.514 dBµV/m	---	-6.835 dB	-0.425 dB	---
2	1	903.25 MHz	127.71 dBµV/m	122.21 dBµV/m	---	70.769 dB	65.266 dB	---
3	1	903.85 MHz	50.235 dBµV/m	102.47 dBµV/m	---	-6.705 dB	45.525 dB	---
4	1	927.25 MHz	124.57 dBµV/m	119.07 dBµV/m	---	67.628 dB	62.132 dB	---
5	1	927.46 MHz	49.496 dBµV/m	46.048 dBµV/m	---	-7.443 dB	-10.892 dB	---
6	1	927.97 MHz	50.123 dBµV/m	44.179 dBµV/m	---	-6.817 dB	-12.761 dB	---

Fig. 4.4 - type 1 modulation

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 30 – 1000 MHz, Pol. H.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	OFF	PEAK LL1 Δ	QPD LL1 Δ	OFF
1	1	906.13 MHz	53.409 dBµV/m	83.796 dBµV/m	---	-3.531 dB	26.856 dB	---
2	1	910.21 MHz	60.157 dBµV/m	101.75 dBµV/m	---	3.217 dB	44.807 dB	---
3	1	915.28 MHz	58.228 dBµV/m	104.08 dBµV/m	---	1.289 dB	47.142 dB	---
4	1	916.33 MHz	115.01 dBµV/m	109.42 dBµV/m	---	58.074 dB	52.485 dB	---
5	1	925.18 MHz	56.794 dBµV/m	52.260 dBµV/m	---	-0.146 dB	-4.679 dB	---
6	1	925.75 MHz	58.228 dBµV/m	50.425 dBµV/m	---	1.288 dB	-6.515 dB	---

Fig. 4.5 - type 2 modulation

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 30 – 1000 MHz, Pol. V.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)

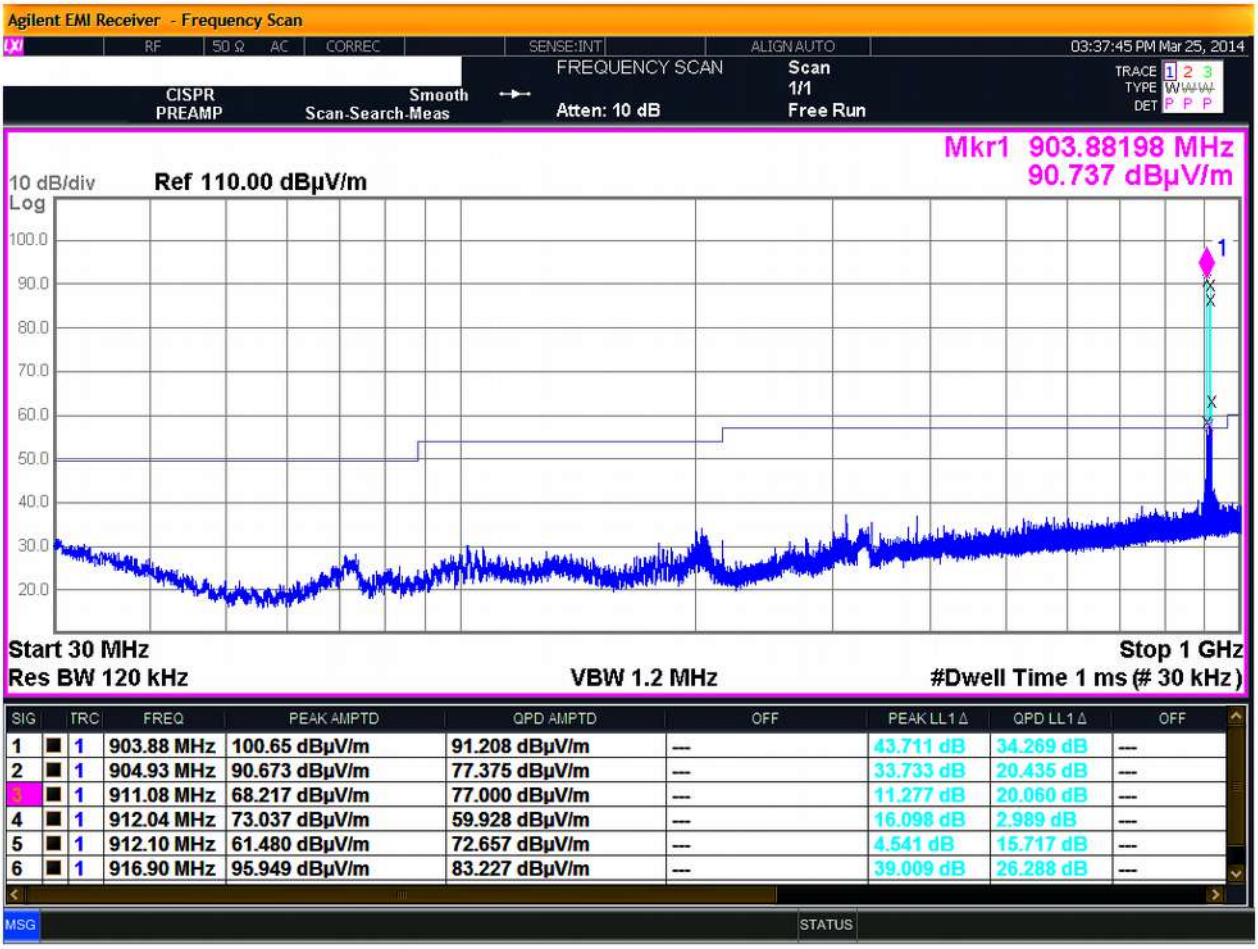
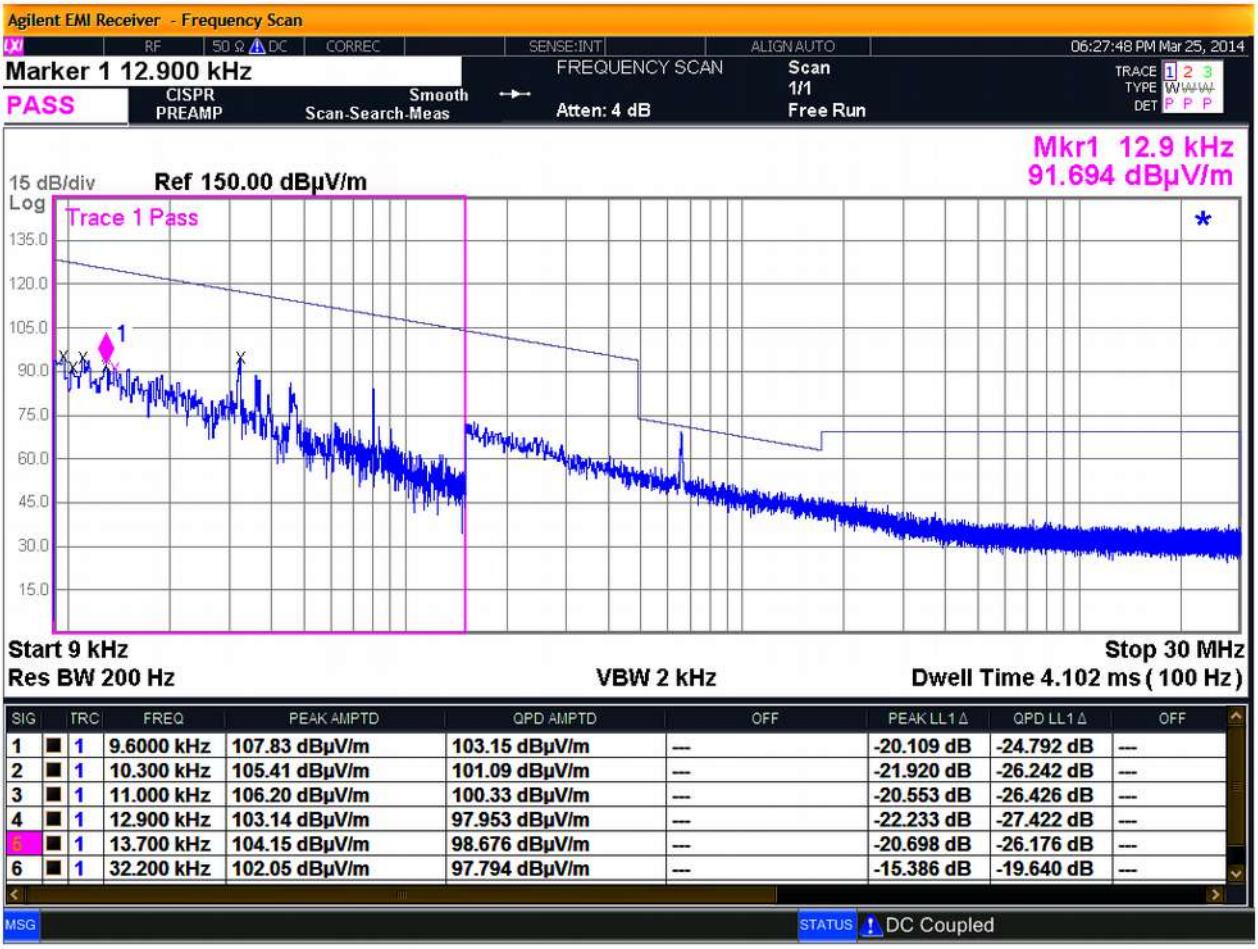


Fig. 4.6 - type 2 modulation

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 30 – 1000 MHz, Pol. H.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	OFF	PEAK LL1 Δ	QPD LL1 Δ	OFF
1	1	9.6000 kHz	107.83 dBµV/m	103.15 dBµV/m	---	-20.109 dB	-24.792 dB	---
2	1	10.300 kHz	105.41 dBµV/m	101.09 dBµV/m	---	-21.920 dB	-26.242 dB	---
3	1	11.000 kHz	106.20 dBµV/m	100.33 dBµV/m	---	-20.553 dB	-26.426 dB	---
4	1	12.900 kHz	103.14 dBµV/m	97.953 dBµV/m	---	-22.233 dB	-27.422 dB	---
5	1	13.700 kHz	104.15 dBµV/m	98.676 dBµV/m	---	-20.698 dB	-26.176 dB	---
6	1	32.200 kHz	102.05 dBµV/m	97.794 dBµV/m	---	-15.386 dB	-19.640 dB	---

Fig. 4.7 - standby

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 0.009 – 30 MHz, Pol. Parallel.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)

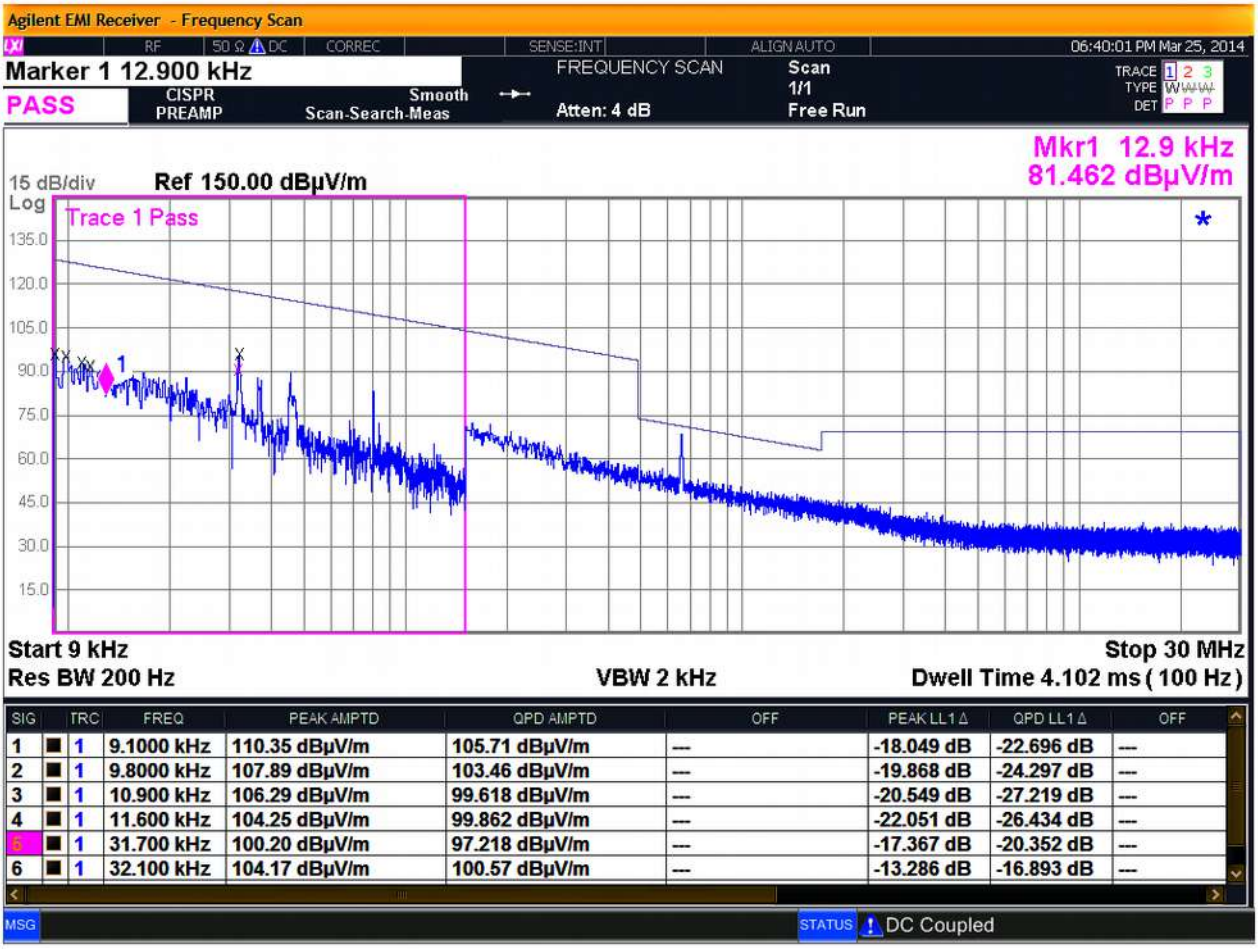
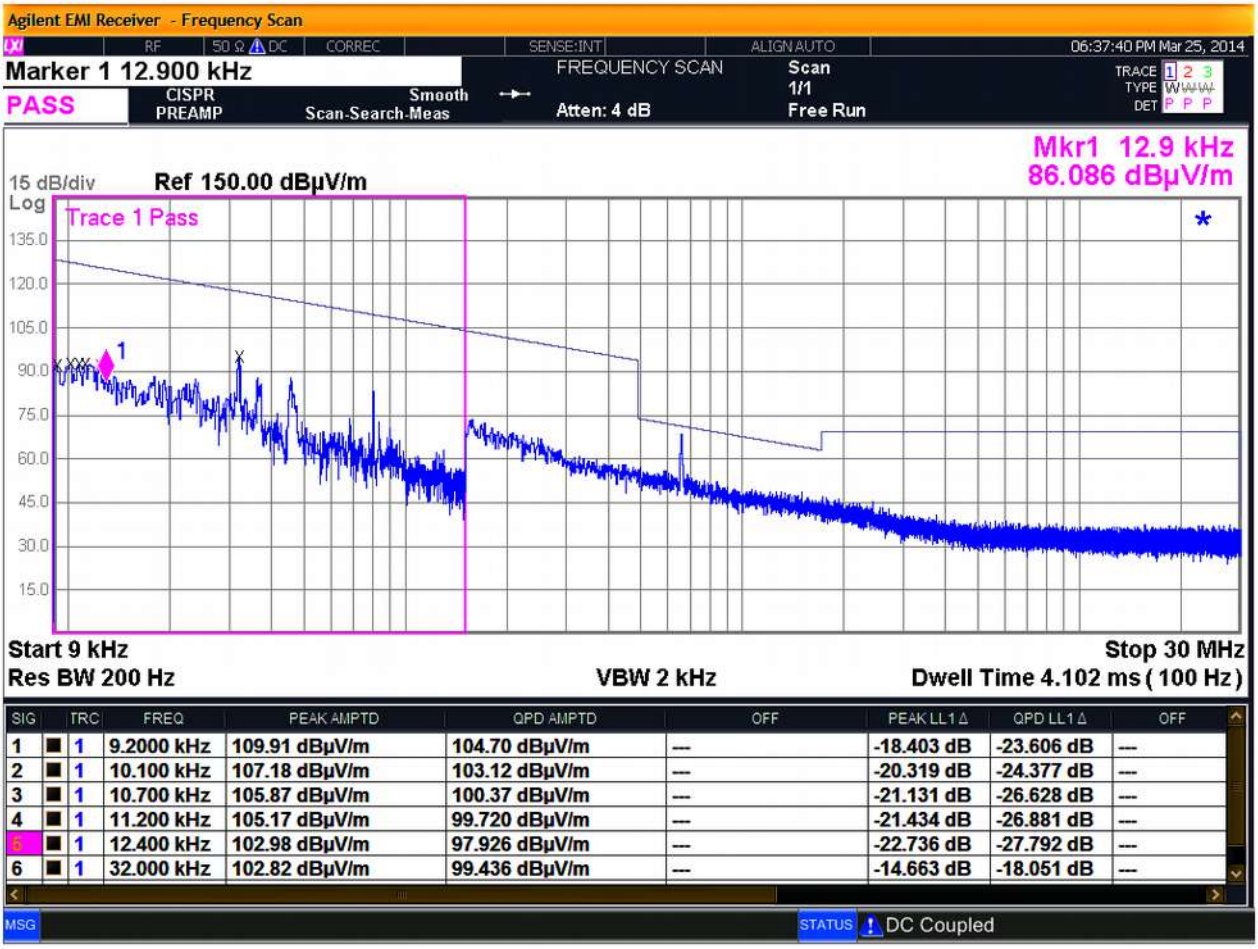


Fig. 4.8 - standby

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 0.009 – 30 MHz, Pol. Orthogonal.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)

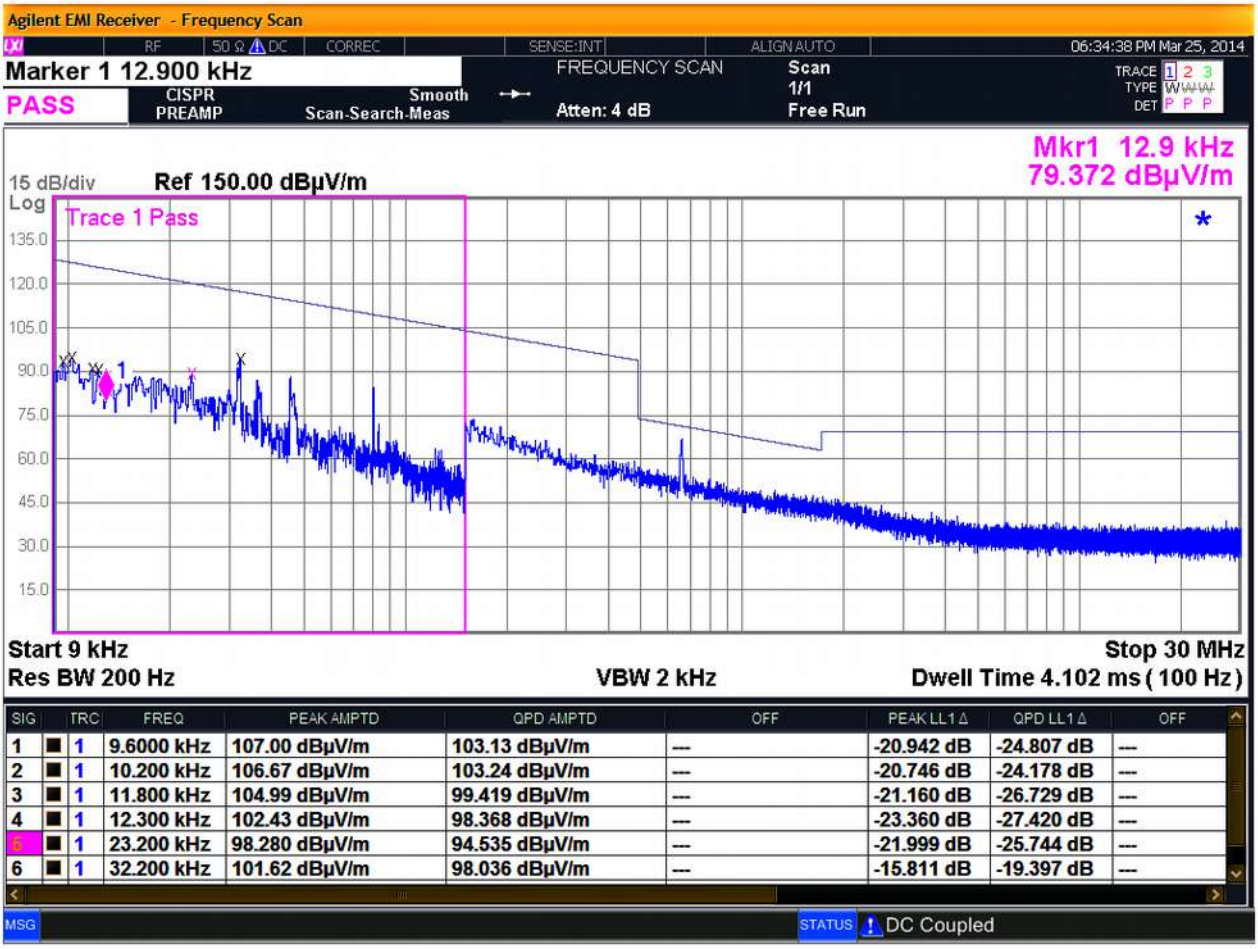


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	OFF	PEAK LL1 Δ	QPD LL1 Δ	OFF
1	1	9.2000 kHz	109.91 dBµV/m	104.70 dBµV/m	---	-18.403 dB	-23.606 dB	---
2	1	10.100 kHz	107.18 dBµV/m	103.12 dBµV/m	---	-20.319 dB	-24.377 dB	---
3	1	10.700 kHz	105.87 dBµV/m	100.37 dBµV/m	---	-21.131 dB	-26.628 dB	---
4	1	11.200 kHz	105.17 dBµV/m	99.720 dBµV/m	---	-21.434 dB	-26.881 dB	---
5	1	12.400 kHz	102.98 dBµV/m	97.926 dBµV/m	---	-22.736 dB	-27.792 dB	---
6	1	32.000 kHz	102.82 dBµV/m	99.436 dBµV/m	---	-14.663 dB	-18.051 dB	---

Fig. 4.9 - type 1 modulation

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 0.009 – 30 MHz, Pol. Parallel.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)

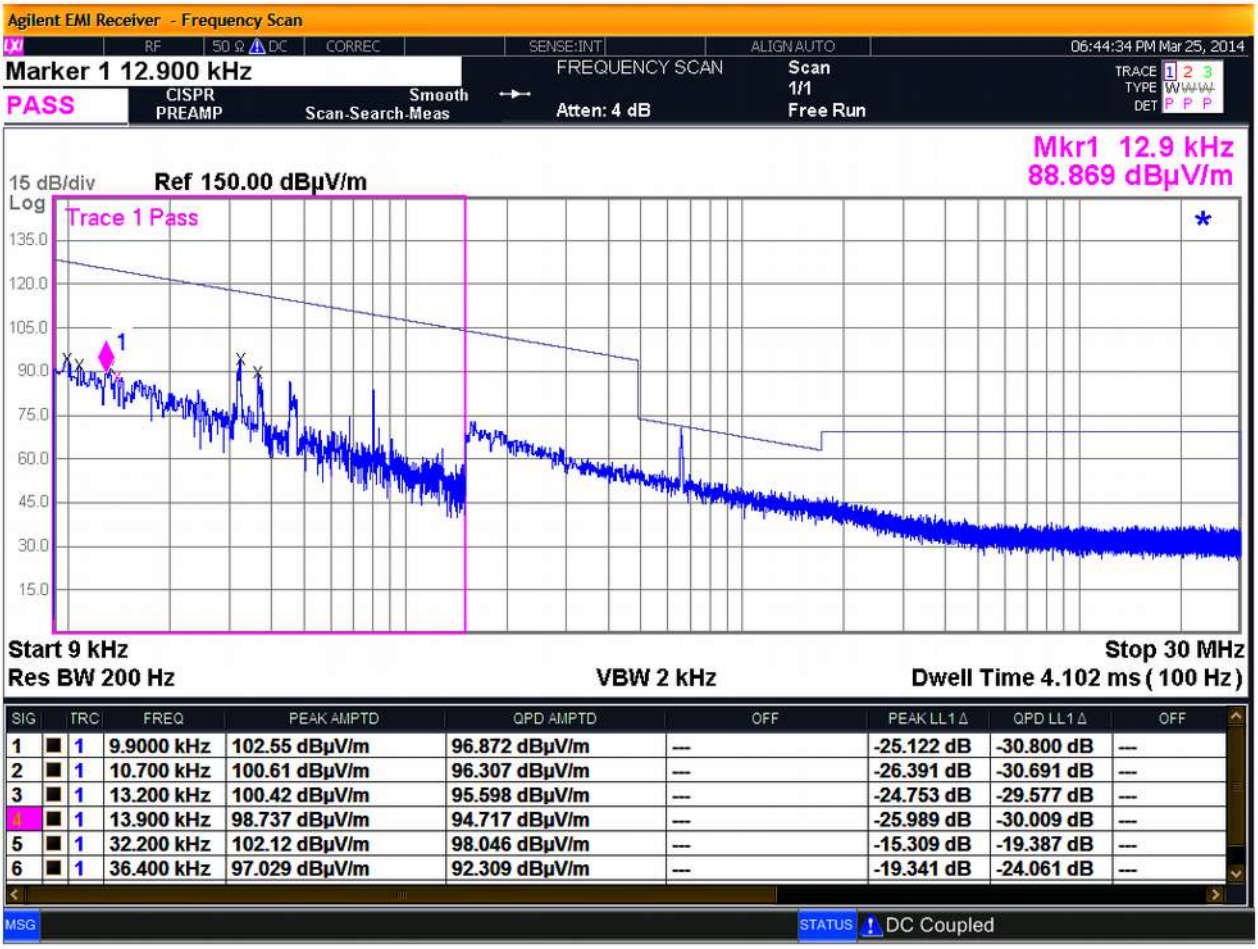


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	OFF	PEAK LL1 Δ	QPD LL1 Δ	OFF
1	1	9.6000 kHz	107.00 dBµV/m	103.13 dBµV/m	---	-20.942 dB	-24.807 dB	---
2	1	10.200 kHz	106.67 dBµV/m	103.24 dBµV/m	---	-20.746 dB	-24.178 dB	---
3	1	11.800 kHz	104.99 dBµV/m	99.419 dBµV/m	---	-21.160 dB	-26.729 dB	---
4	1	12.300 kHz	102.43 dBµV/m	98.368 dBµV/m	---	-23.360 dB	-27.420 dB	---
5	1	23.200 kHz	98.280 dBµV/m	94.535 dBµV/m	---	-21.999 dB	-25.744 dB	---
6	1	32.200 kHz	101.62 dBµV/m	98.036 dBµV/m	---	-15.811 dB	-19.397 dB	---

Fig. 4.10 - type 1 modulation

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 0.009 – 30 MHz, Pol. Orthogonal.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	OFF	PEAK LL1 Δ	QPD LL1 Δ	OFF
1	1	9.9000 kHz	102.55 dBµV/m	96.872 dBµV/m	---	-25.122 dB	-30.800 dB	---
2	1	10.700 kHz	100.61 dBµV/m	96.307 dBµV/m	---	-26.391 dB	-30.691 dB	---
3	1	13.200 kHz	100.42 dBµV/m	95.598 dBµV/m	---	-24.753 dB	-29.577 dB	---
4	1	13.900 kHz	98.737 dBµV/m	94.717 dBµV/m	---	-25.989 dB	-30.009 dB	---
5	1	32.200 kHz	102.12 dBµV/m	98.046 dBµV/m	---	-15.309 dB	-19.387 dB	---
6	1	36.400 kHz	97.029 dBµV/m	92.309 dBµV/m	---	-19.341 dB	-24.061 dB	---

Fig. 4.11 - type 2 modulation

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 0.009 – 30 MHz, Pol. Parallel.

Job Number	FCC-14359
Test Name	Radiated Emissions
EUT Name	CAEN RFID s.r.l. - R4300P ION (UHF)

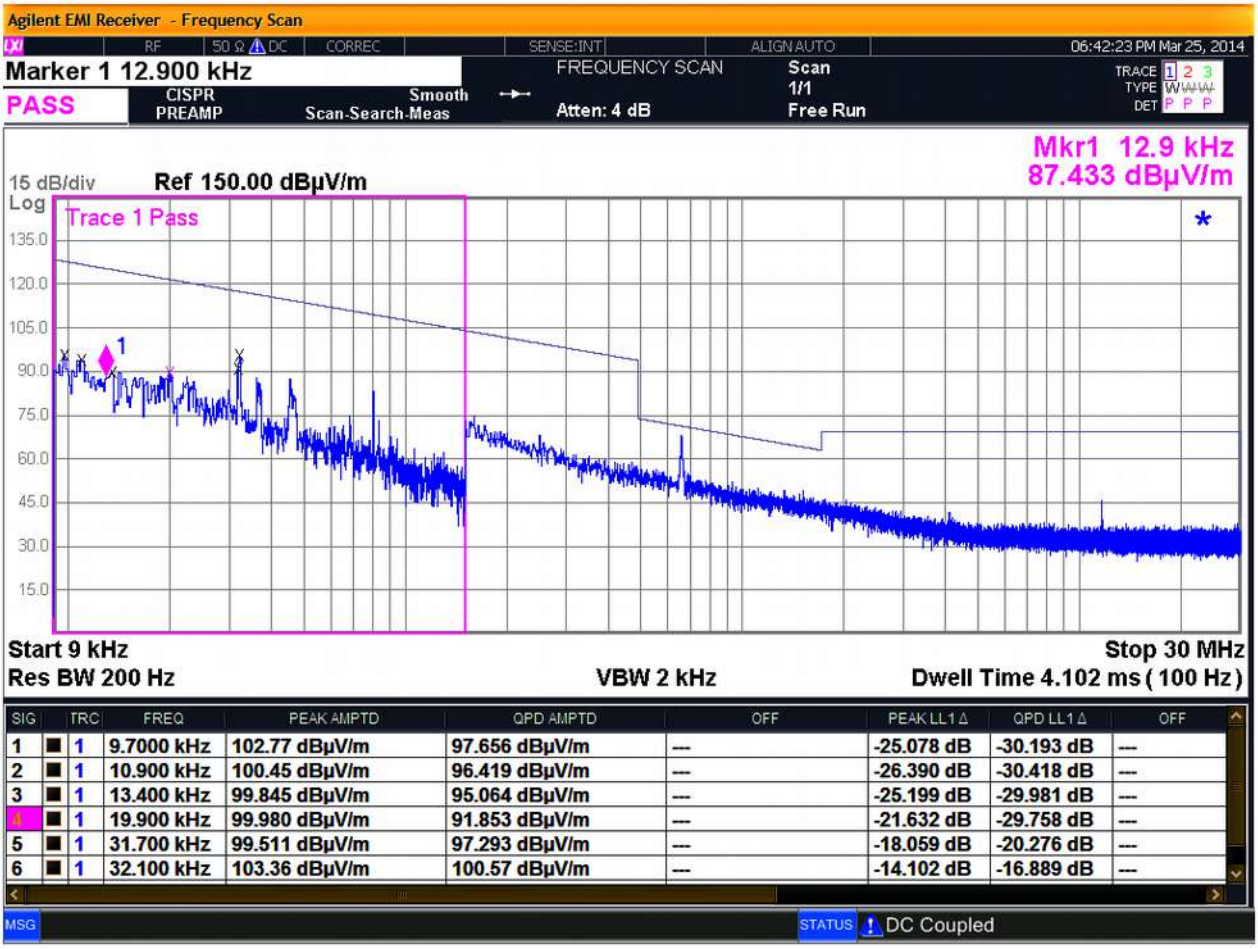


Fig. 4.12 - type 2 modulation

Record of the measurement of radiated emissions (PK)
Maximum disturbance determined in the frequency range 0.009 – 30 MHz, Pol. Orthogonal.

5. POWER LINES CONDUCTED EMISSIONS

Equipment shall meet the limits below when using a CISPR16 quasi-peak and average detector receivers.

FCC 15.207

FREQUENCY RANGE (MHz)	*QUASI-PEAK LIMIT* [dB (μV)]	*AVERAGE LIMIT* [dB (μV)]
0.15 ÷ 0.50	66 ÷ 56(*)	56 ÷ 46(*)
0.50 ÷ 5	56	46
5 ÷ 30	60	50

(*) *Limit decreasing linearly with logarithm of frequency*

Test Equipment

EQUIPMENT	MANUFACTURER	MODEL	CAL. DUE
MXE EMI Receiver	Agilent	N9038A	01/2015
Screened Room	GSD	CSC01	01/2015
LISN	GSD	GSDA01	01/2015
LISN	COMTEST	---	01/2015

Test procedure: CE22R01

The EUT power cable was connected to a LISN and the monitored output of the LISN was connected to a spectrum analyzer by a transient limiter. The conducted emissions from 150 kHz to 30 MHz were monitored and compared to the specification limits

Test method

Test method was in accordance with the reference standard.

EUT modes of operations were tested in order to achieve the maximum level of emission.

Results

Equipment complied with the test specification limits.

Graphics in following figures show some registrations of the frequency spectrum of the conducted emissions.

Job Number	FCC-14359
Test Name	Powerline Conducted Emissions FCC 15.207
EUT Name	R4300P ION (UHF)

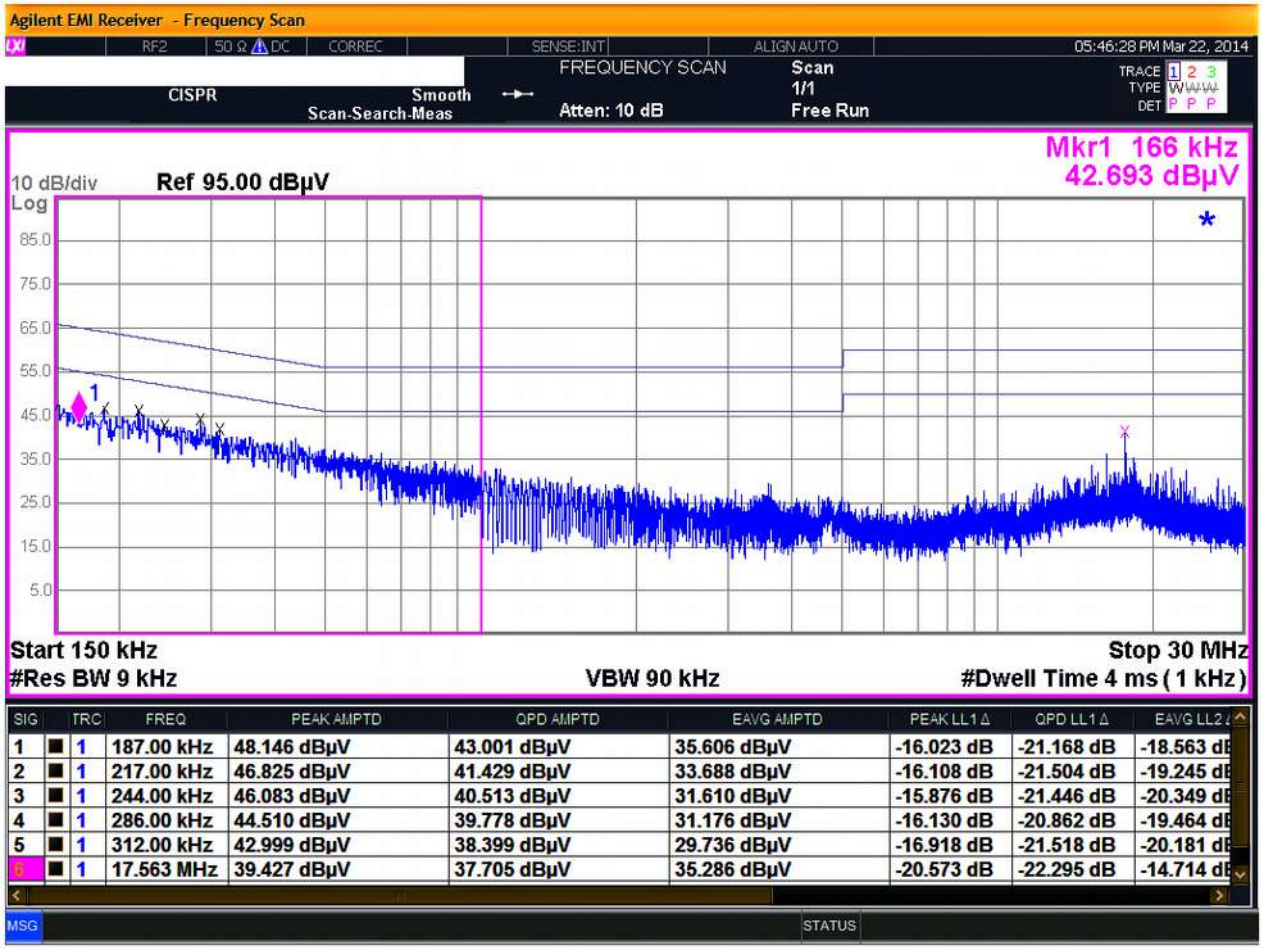
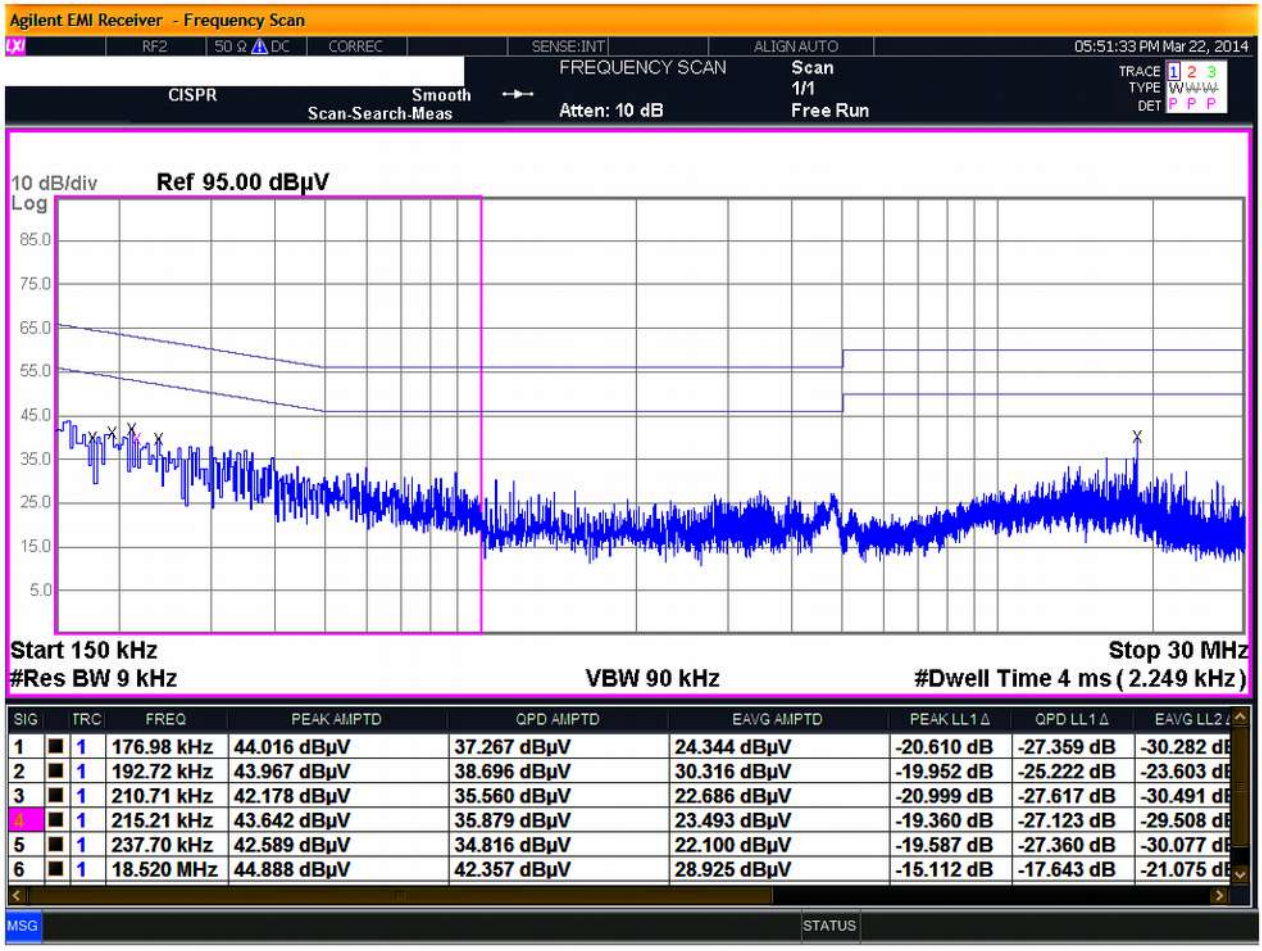


Fig. 5.1 - standby mode

B Band (0.15 – 30 MHz): phase 1

Job Number	FCC-14359
Test Name	Powerline Conducted Emissions FCC 15.207
EUT Name	R4300P ION (UHF)

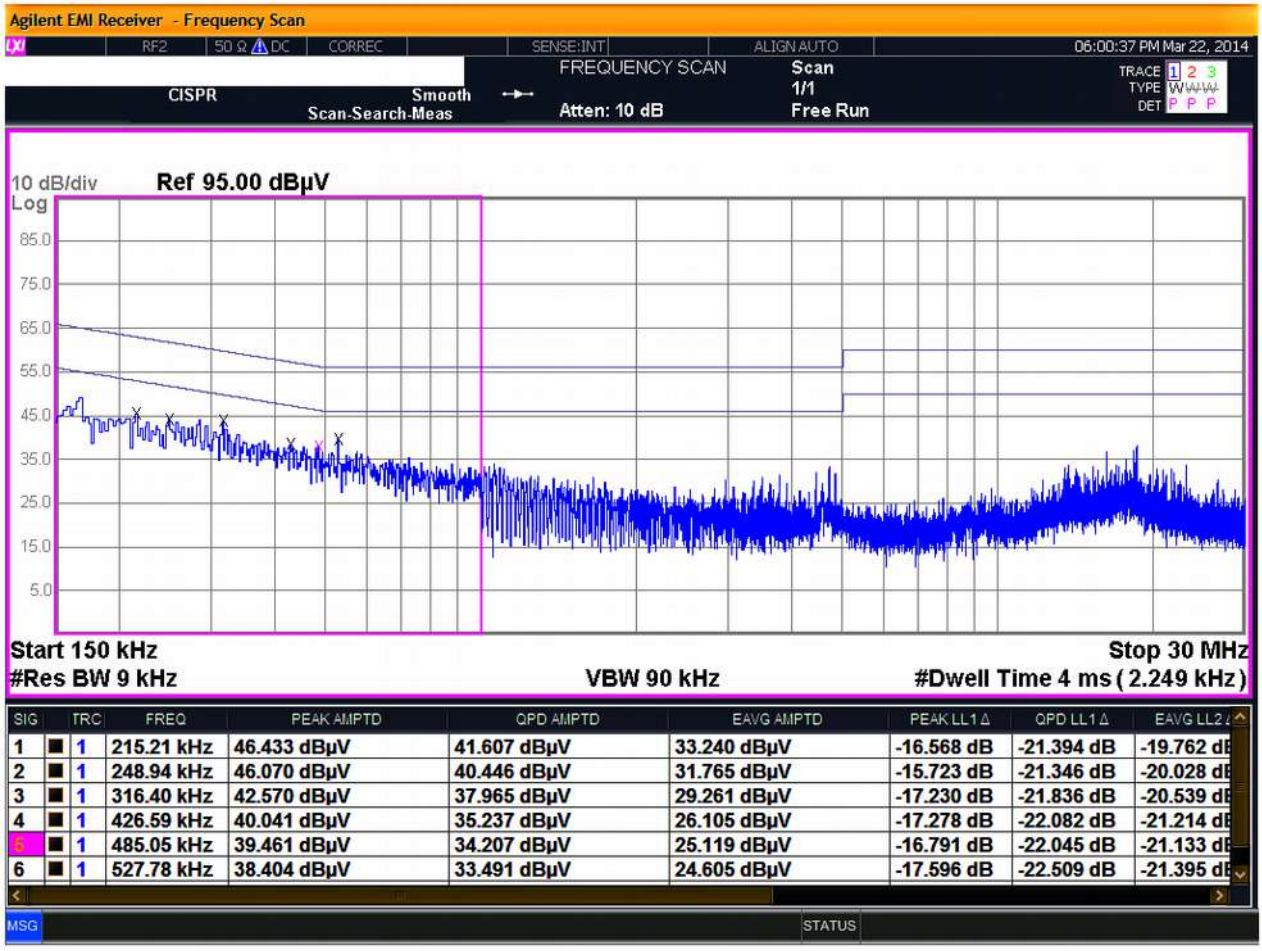


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL1 Δ	EAVG LL2 Δ
1	1	176.98 kHz	44.016 dBµV	37.267 dBµV	24.344 dBµV	-20.610 dB	-27.359 dB	-30.282 dB
2	1	192.72 kHz	43.967 dBµV	38.696 dBµV	30.316 dBµV	-19.952 dB	-25.222 dB	-23.603 dB
3	1	210.71 kHz	42.178 dBµV	35.560 dBµV	22.686 dBµV	-20.999 dB	-27.617 dB	-30.491 dB
4	1	215.21 kHz	43.642 dBµV	35.879 dBµV	23.493 dBµV	-19.360 dB	-27.123 dB	-29.508 dB
5	1	237.70 kHz	42.589 dBµV	34.816 dBµV	22.100 dBµV	-19.587 dB	-27.360 dB	-30.077 dB
6	1	18.520 MHz	44.888 dBµV	42.357 dBµV	28.925 dBµV	-15.112 dB	-17.643 dB	-21.075 dB

Fig. 5.2 - standby mode

B Band (0.15 – 30 MHz): phase 2

Job Number	FCC-14359
Test Name	Powerline Conducted Emissions FCC 15.207
EUT Name	R4300P ION (UHF)

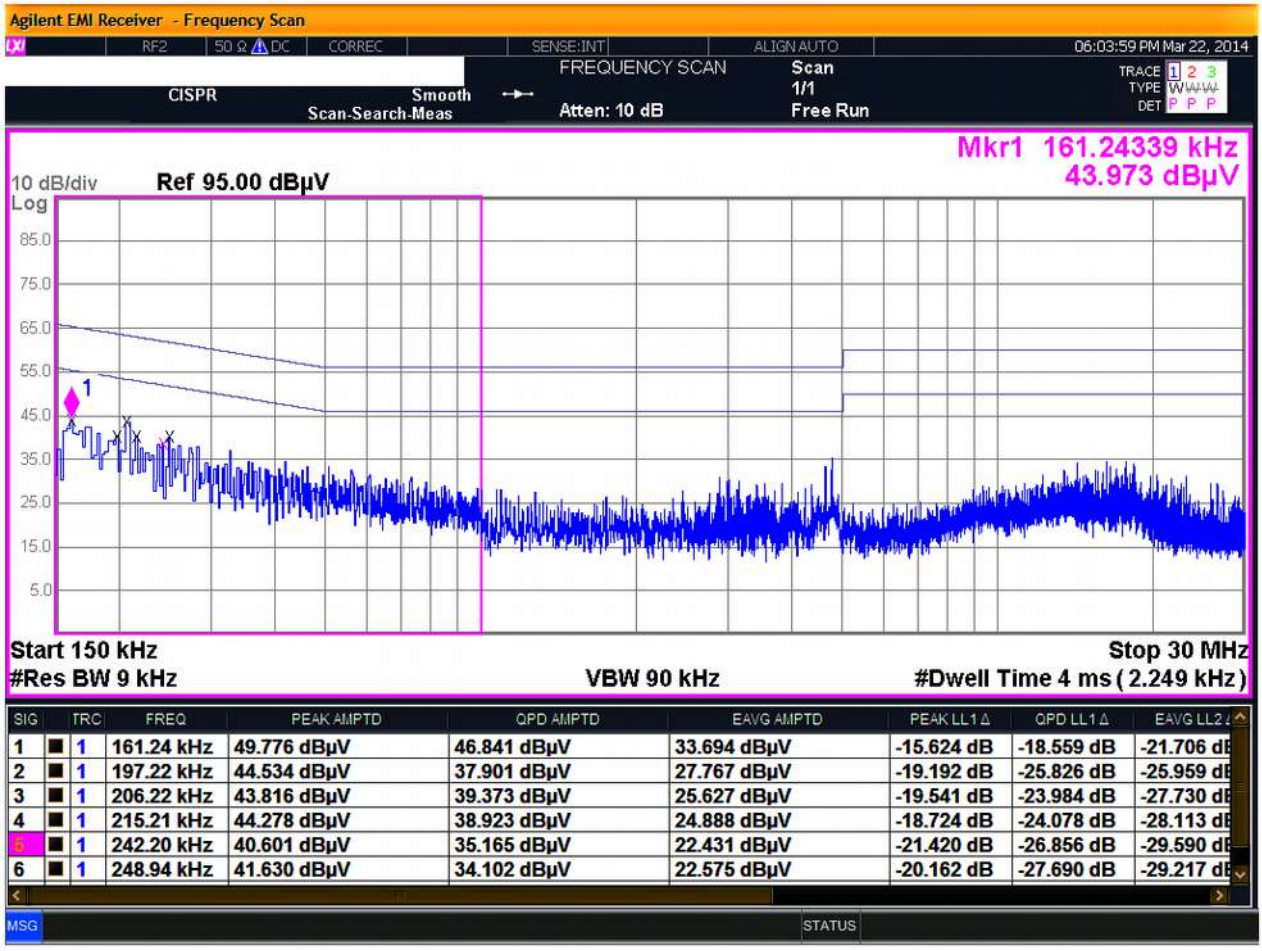


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL1 Δ	EAVG LL2 Δ
1	1	215.21 kHz	46.433 dBµV	41.607 dBµV	33.240 dBµV	-16.568 dB	-21.394 dB	-19.762 dB
2	1	248.94 kHz	46.070 dBµV	40.446 dBµV	31.765 dBµV	-15.723 dB	-21.346 dB	-20.028 dB
3	1	316.40 kHz	42.570 dBµV	37.965 dBµV	29.261 dBµV	-17.230 dB	-21.836 dB	-20.539 dB
4	1	426.59 kHz	40.041 dBµV	35.237 dBµV	26.105 dBµV	-17.278 dB	-22.082 dB	-21.214 dB
5	1	485.05 kHz	39.461 dBµV	34.207 dBµV	25.119 dBµV	-16.791 dB	-22.045 dB	-21.133 dB
6	1	527.78 kHz	38.404 dBµV	33.491 dBµV	24.605 dBµV	-17.596 dB	-22.509 dB	-21.395 dB

Fig. 5.3 - type 1 modulation

B Band (0.15 – 30 MHz): phase 1

Job Number	FCC-14359
Test Name	Powerline Conducted Emissions FCC 15.207
EUT Name	R4300P ION (UHF)

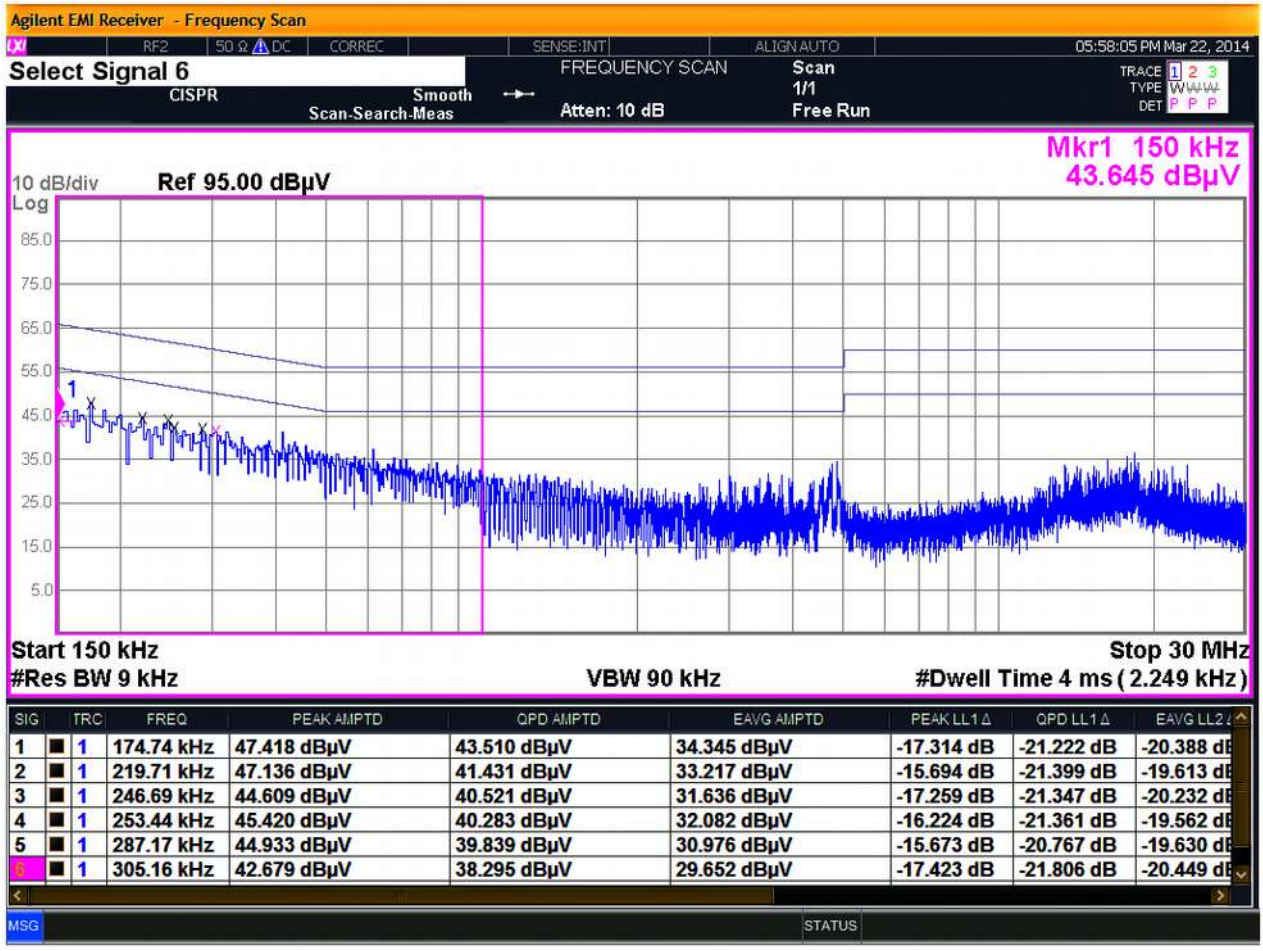


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL1 Δ	EAVG LL2 Δ
1	1	161.24 kHz	49.776 dBµV	46.841 dBµV	33.694 dBµV	-15.624 dB	-18.559 dB	-21.706 dB
2	1	197.22 kHz	44.534 dBµV	37.901 dBµV	27.767 dBµV	-19.192 dB	-25.826 dB	-25.959 dB
3	1	206.22 kHz	43.816 dBµV	39.373 dBµV	25.627 dBµV	-19.541 dB	-23.984 dB	-27.730 dB
4	1	215.21 kHz	44.278 dBµV	38.923 dBµV	24.888 dBµV	-18.724 dB	-24.078 dB	-28.113 dB
5	1	242.20 kHz	40.601 dBµV	35.165 dBµV	22.431 dBµV	-21.420 dB	-26.856 dB	-29.590 dB
6	1	248.94 kHz	41.630 dBµV	34.102 dBµV	22.575 dBµV	-20.162 dB	-27.690 dB	-29.217 dB

Fig. 5.4 - type 1 modulation

B Band (0.15 – 30 MHz): phase 2

Job Number	FCC-14359
Test Name	Powerline Conducted Emissions FCC 15.207
EUT Name	R4300P ION (UHF)

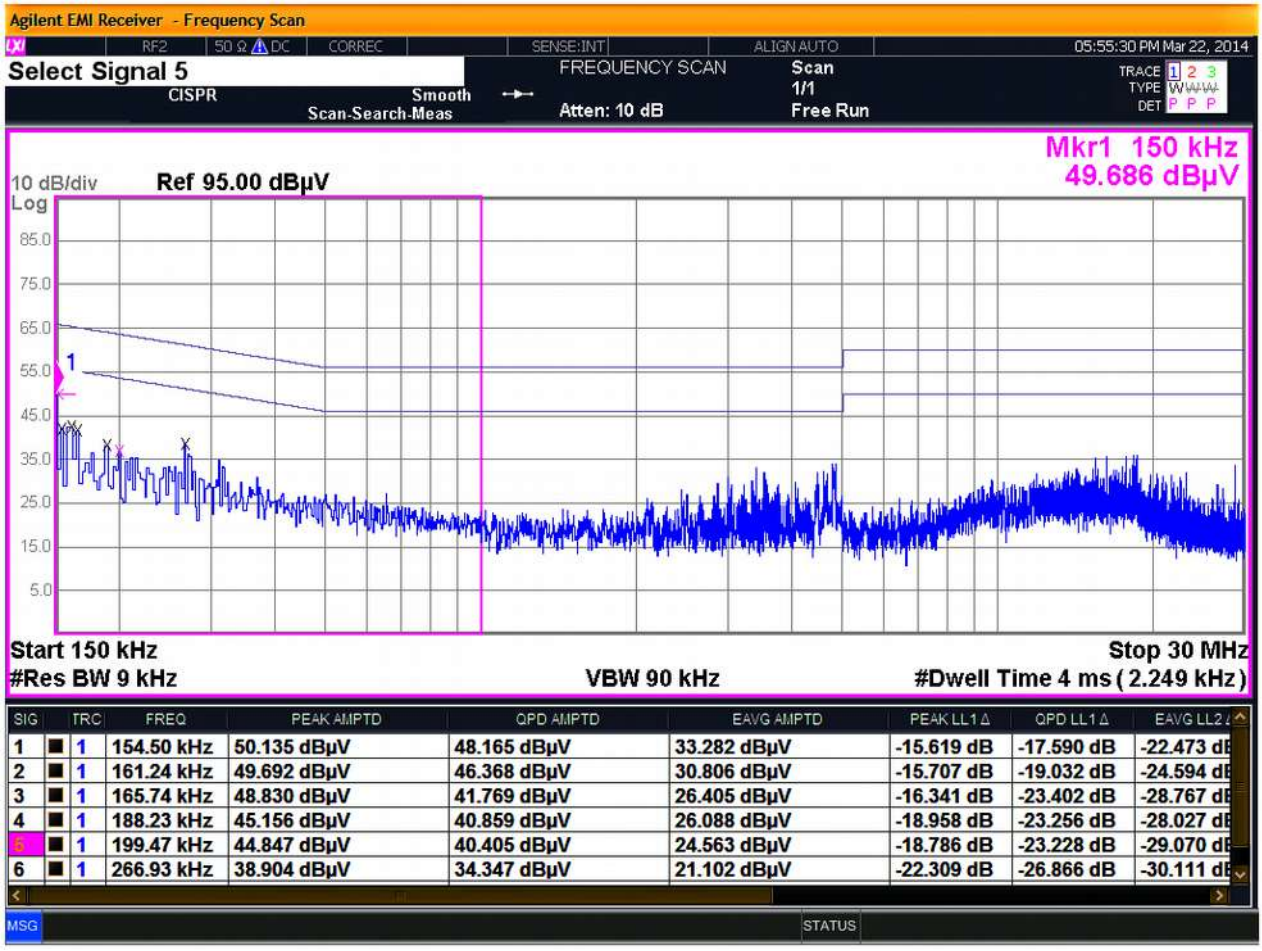


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL1 Δ	EAVG LL2 Δ
1	1	174.74 kHz	47.418 dBµV	43.510 dBµV	34.345 dBµV	-17.314 dB	-21.222 dB	-20.388 dB
2	1	219.71 kHz	47.136 dBµV	41.431 dBµV	33.217 dBµV	-15.694 dB	-21.399 dB	-19.613 dB
3	1	246.69 kHz	44.609 dBµV	40.521 dBµV	31.636 dBµV	-17.259 dB	-21.347 dB	-20.232 dB
4	1	253.44 kHz	45.420 dBµV	40.283 dBµV	32.082 dBµV	-16.224 dB	-21.361 dB	-19.562 dB
5	1	287.17 kHz	44.933 dBµV	39.839 dBµV	30.976 dBµV	-15.673 dB	-20.767 dB	-19.630 dB
6	1	305.16 kHz	42.679 dBµV	38.295 dBµV	29.652 dBµV	-17.423 dB	-21.806 dB	-20.449 dB

Fig. 5.5 - type 2 modulation

B Band (0.15 – 30 MHz): phase 1

Job Number	FCC-14359
Test Name	Powerline Conducted Emissions FCC 15.207
EUT Name	R4300P ION (UHF)

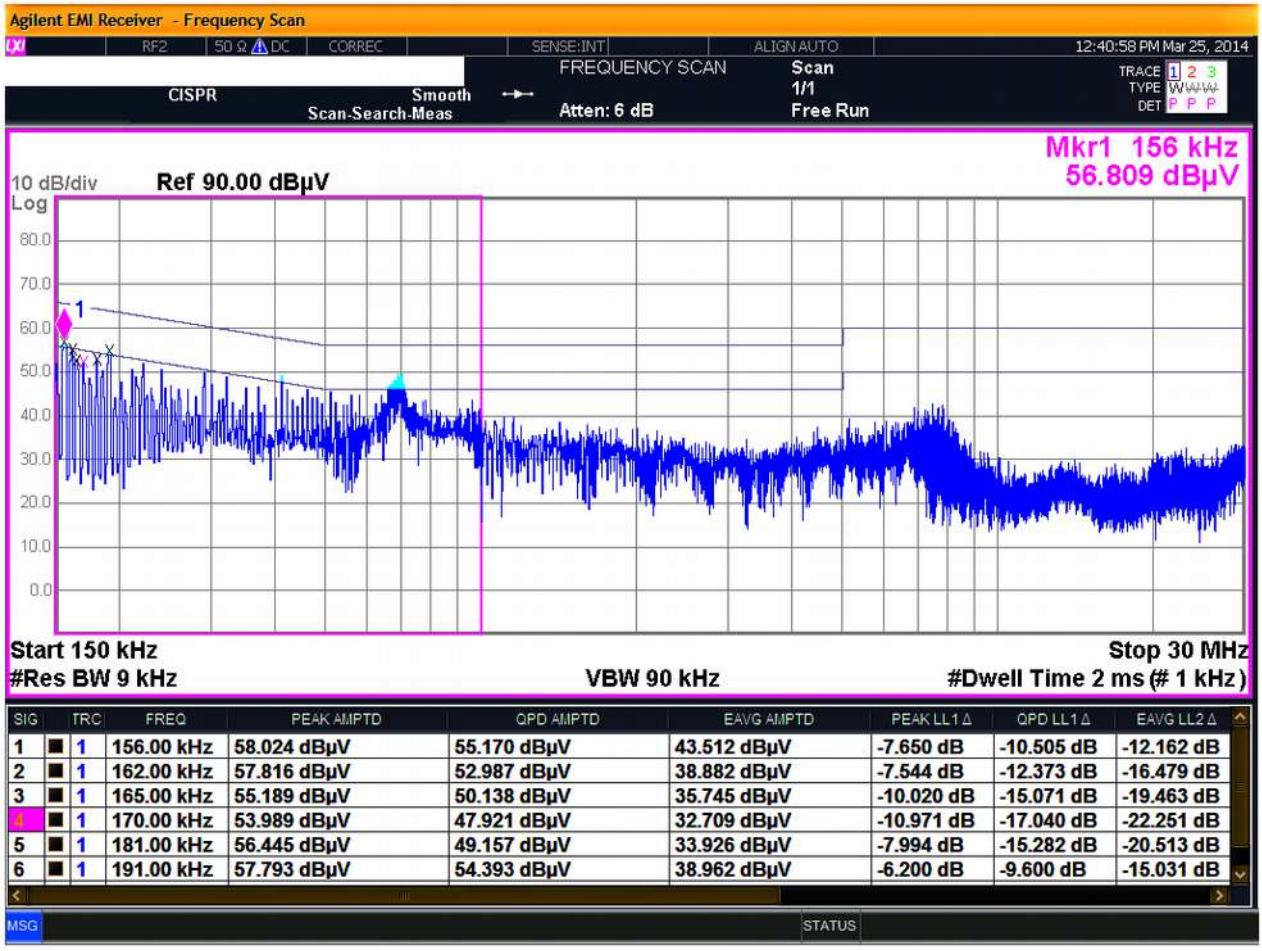


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL1 Δ	EAVG LL2 Δ
1	1	154.50 kHz	50.135 dBµV	48.165 dBµV	33.282 dBµV	-15.619 dB	-17.590 dB	-22.473 dB
2	1	161.24 kHz	49.692 dBµV	46.368 dBµV	30.806 dBµV	-15.707 dB	-19.032 dB	-24.594 dB
3	1	165.74 kHz	48.830 dBµV	41.769 dBµV	26.405 dBµV	-16.341 dB	-23.402 dB	-28.767 dB
4	1	188.23 kHz	45.156 dBµV	40.859 dBµV	26.088 dBµV	-18.958 dB	-23.256 dB	-28.027 dB
5	1	199.47 kHz	44.847 dBµV	40.405 dBµV	24.563 dBµV	-18.786 dB	-23.228 dB	-29.070 dB
6	1	266.93 kHz	38.904 dBµV	34.347 dBµV	21.102 dBµV	-22.309 dB	-26.866 dB	-30.111 dB

Fig. 5.6 - type 2 modulation

B Band (0.15 – 30 MHz): phase 2

Job Number	FCC-14359
Test Name	Powerline Conducted Emissions FCC 15.207
EUT Name	R4300P ION (UHF)

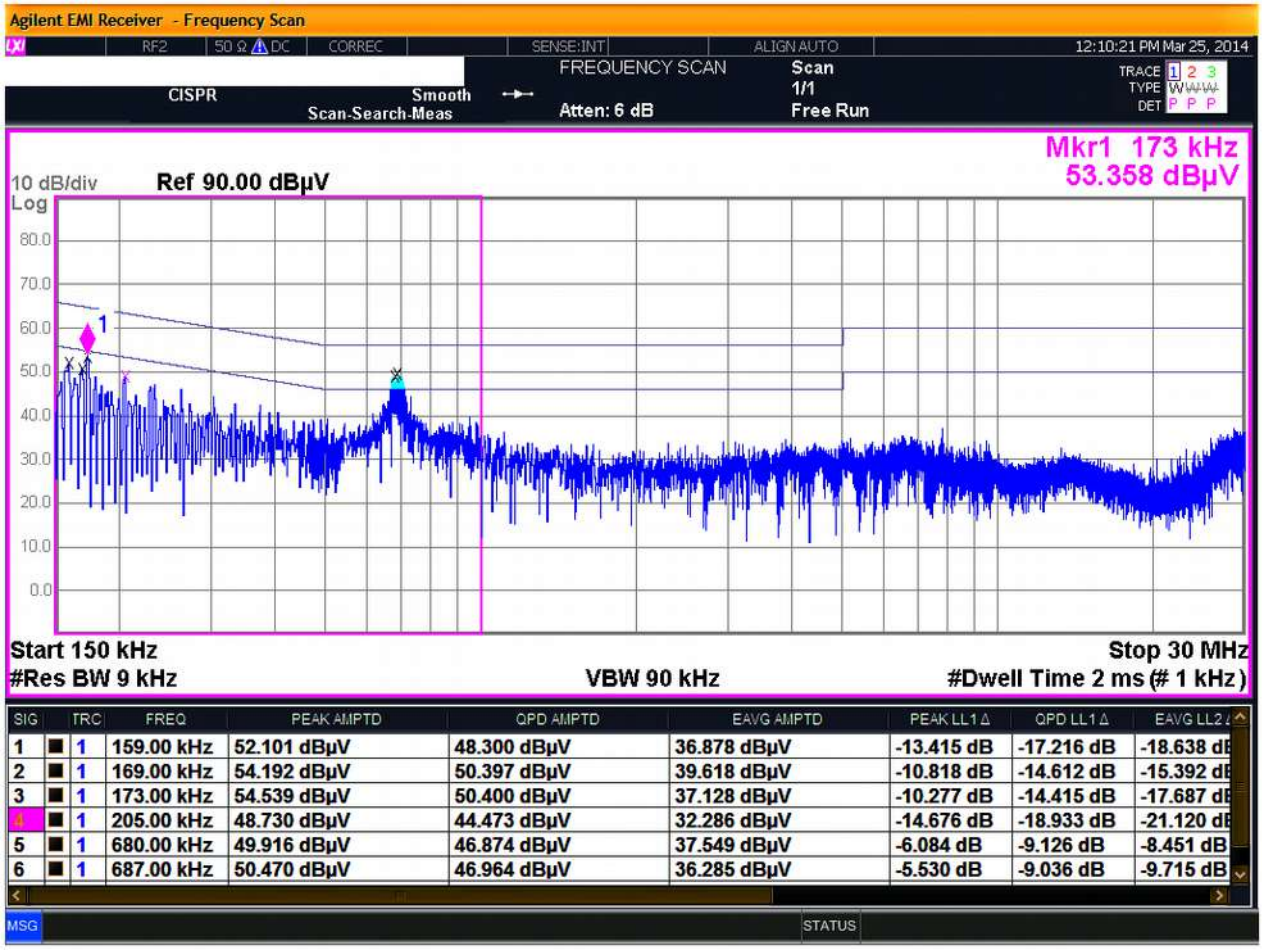


SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL1 Δ	EAVG LL2 Δ
1	1	156.00 kHz	58.024 dBµV	55.170 dBµV	43.512 dBµV	-7.650 dB	-10.505 dB	-12.162 dB
2	1	162.00 kHz	57.816 dBµV	52.987 dBµV	38.882 dBµV	-7.544 dB	-12.373 dB	-16.479 dB
3	1	165.00 kHz	55.189 dBµV	50.138 dBµV	35.745 dBµV	-10.020 dB	-15.071 dB	-19.463 dB
4	1	170.00 kHz	53.989 dBµV	47.921 dBµV	32.709 dBµV	-10.971 dB	-17.040 dB	-22.251 dB
5	1	181.00 kHz	56.445 dBµV	49.157 dBµV	33.926 dBµV	-7.994 dB	-15.282 dB	-20.513 dB
6	1	191.00 kHz	57.793 dBµV	54.393 dBµV	38.962 dBµV	-6.200 dB	-9.600 dB	-15.031 dB

Fig. 5.7

B Band (0.15 – 30 MHz): PC (auxiliary equipment), phase 1 (worst case)

Job Number	FCC-14359
Test Name	Powerline Conducted Emissions FCC 15.207
EUT Name	R4300P ION (UHF)



SIG	TRC	FREQ	PEAK AMPTD	QPD AMPTD	EAVG AMPTD	PEAK LL1 Δ	QPD LL1 Δ	EAVG LL2 Δ
1	1	159.00 kHz	52.101 dBµV	48.300 dBµV	36.878 dBµV	-13.415 dB	-17.216 dB	-18.638 dB
2	1	169.00 kHz	54.192 dBµV	50.397 dBµV	39.618 dBµV	-10.818 dB	-14.612 dB	-15.392 dB
3	1	173.00 kHz	54.539 dBµV	50.400 dBµV	37.128 dBµV	-10.277 dB	-14.415 dB	-17.687 dB
4	1	205.00 kHz	48.730 dBµV	44.473 dBµV	32.286 dBµV	-14.676 dB	-18.933 dB	-21.120 dB
5	1	680.00 kHz	49.916 dBµV	46.874 dBµV	37.549 dBµV	-6.084 dB	-9.126 dB	-8.451 dB
6	1	687.00 kHz	50.470 dBµV	46.964 dBµV	36.285 dBµV	-5.530 dB	-9.036 dB	-9.715 dB

Fig. 5.8

B Band (0.15 – 30 MHz): PC (auxiliary equipment), phase 2 (worst case)

6. OPERATION WITHIN THE BAND 902 - 928 MHZ: PEAK OUTPUT POWER – SPURIOUS RF EMISSION – BAND EDGE

Peak Output Power

Equipment shall meet the limits below.

FREQUENCY RANGE (MHz)	RF power output Limit dBm
902 - 928	30,0

The measured values are:

Channel	Output Power	
	Modulation type 1	Modulation type 2
0	29.3	29.3
25	29.2	29.3
49	29.3	29.3

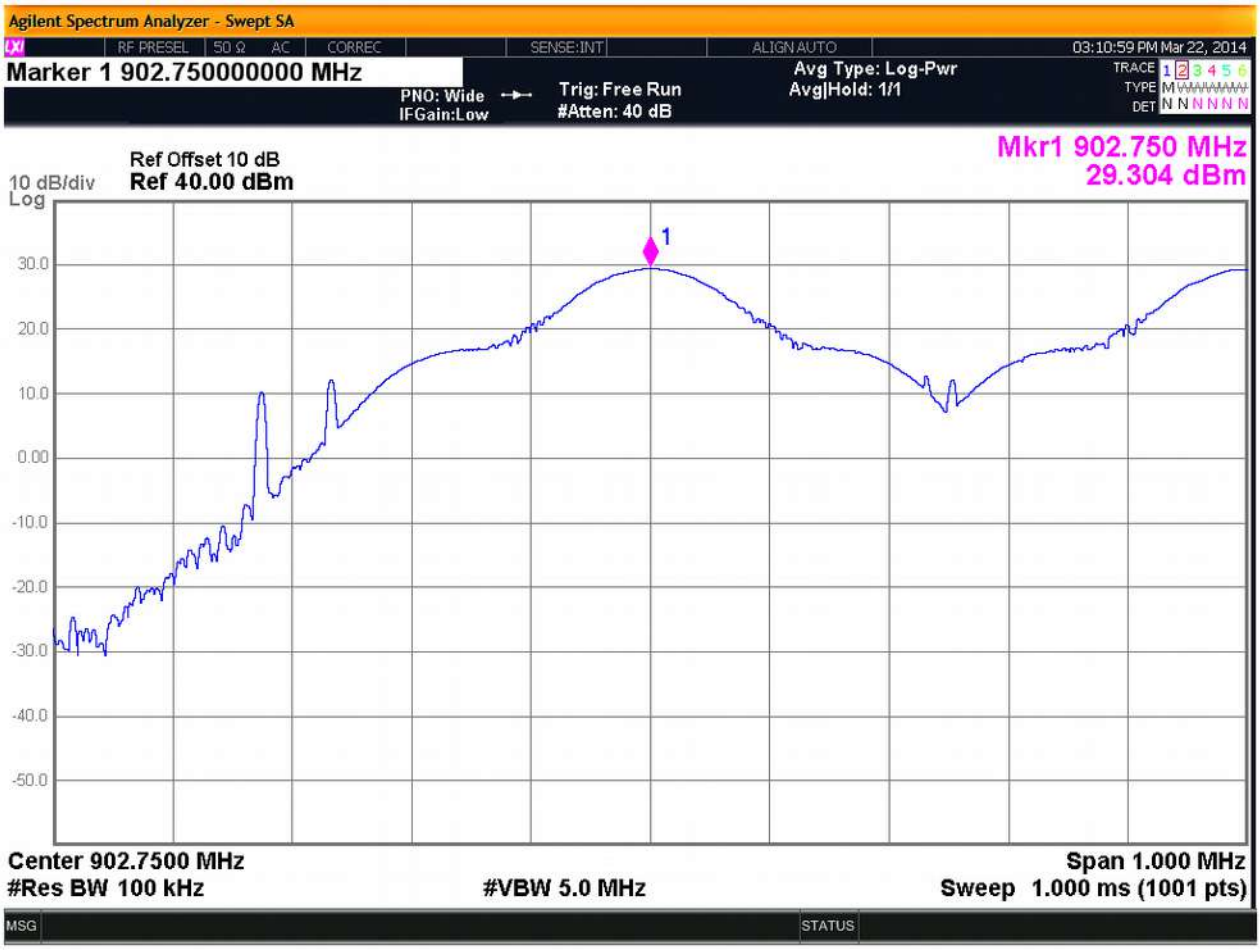


Fig. 6.1
Modulation Type 1, Channel 0, Max Hold

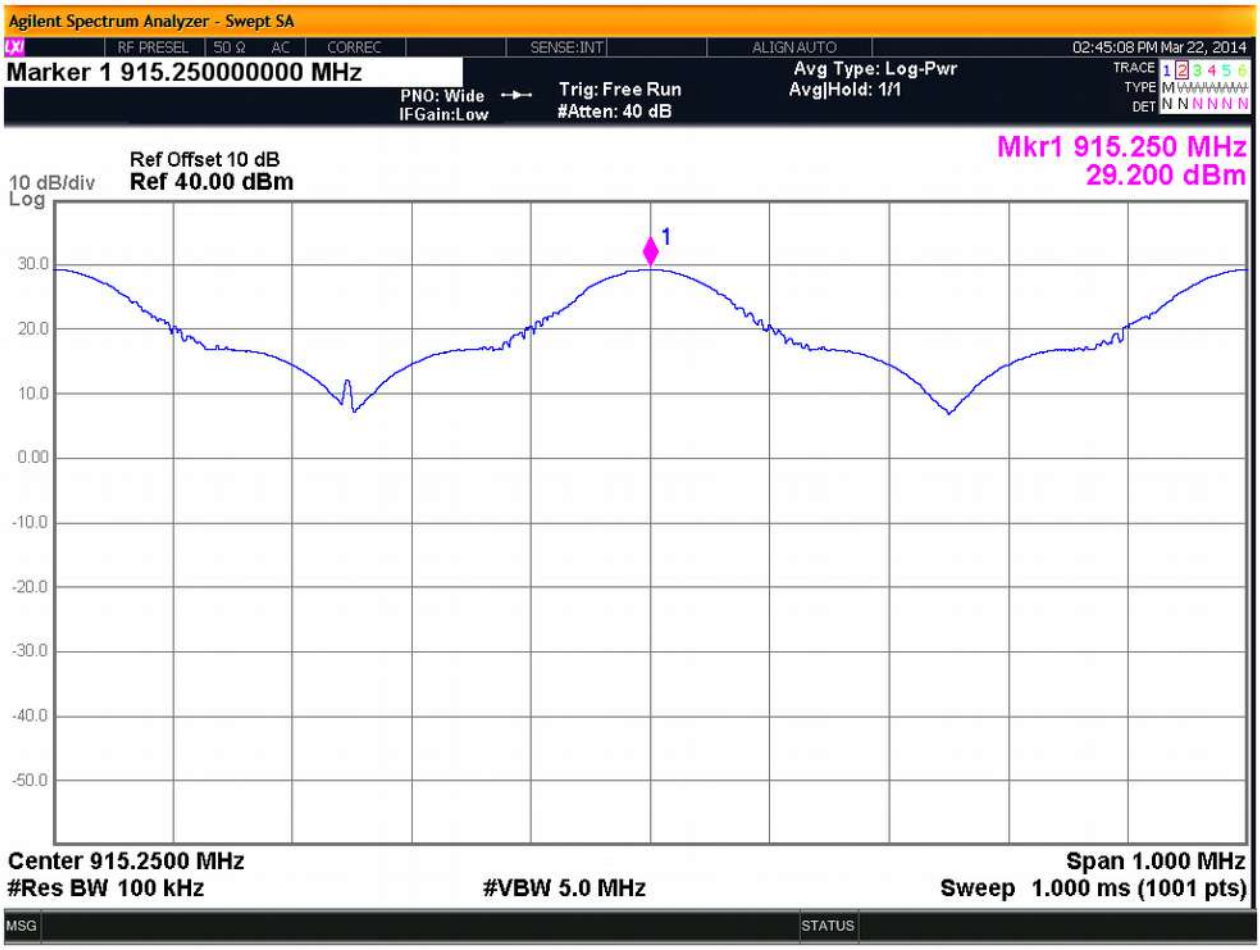


Fig. 6.2
Modulation Type 1, Channel 25, Max Hold

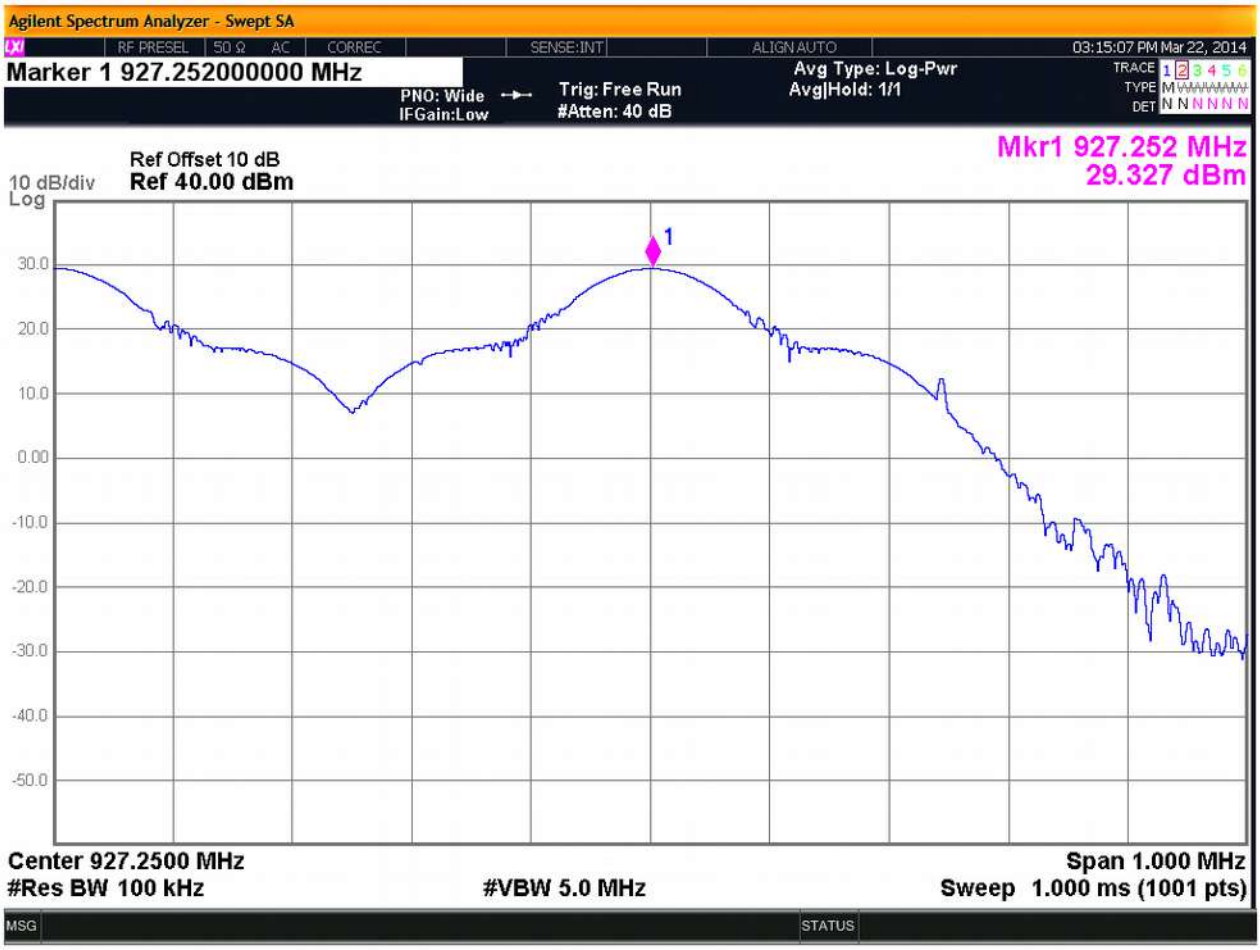


Fig. 6.3
Modulation Type 1, Channel 49

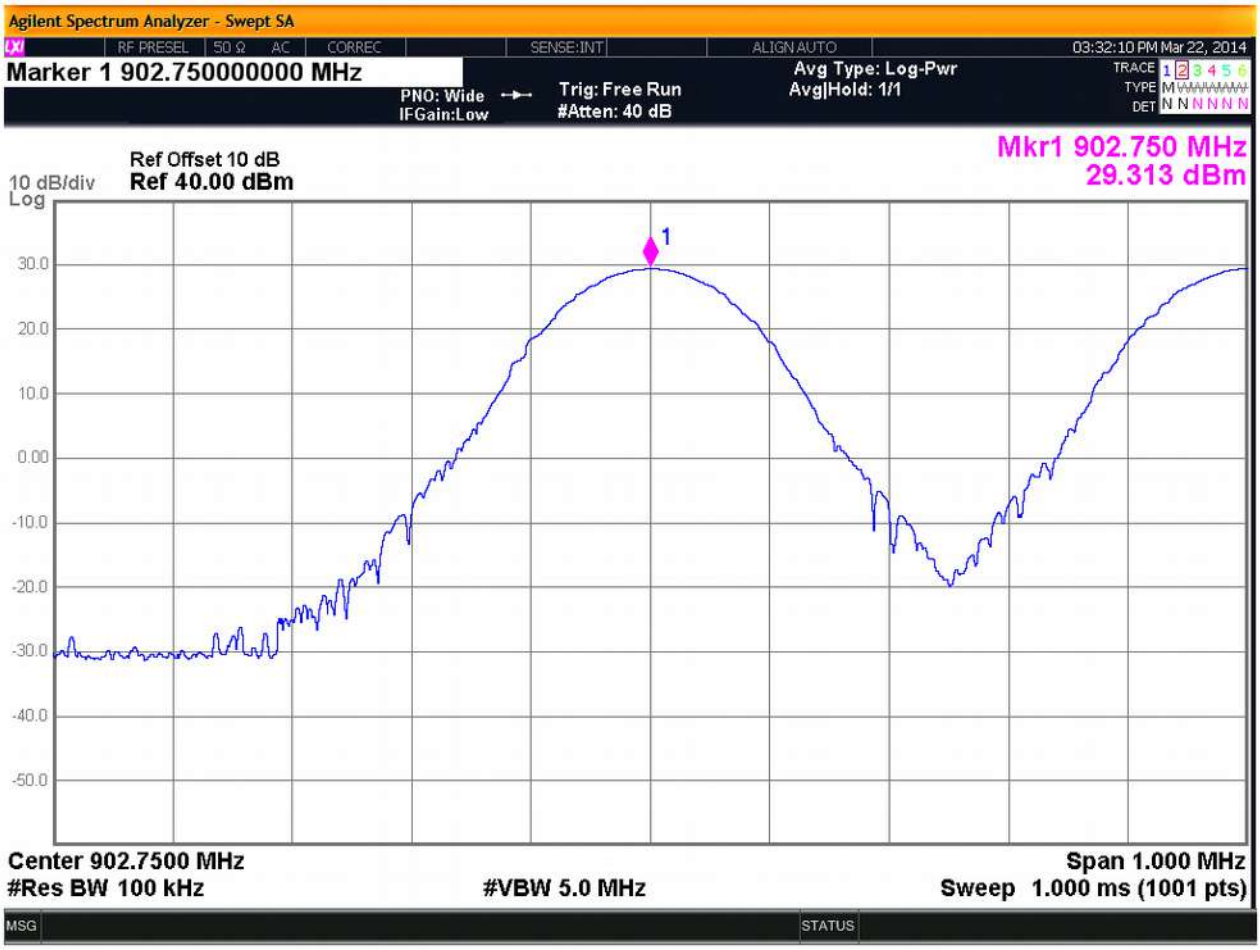


Fig. 6.4
Modulation Type 2, Channel 0, Max Hold

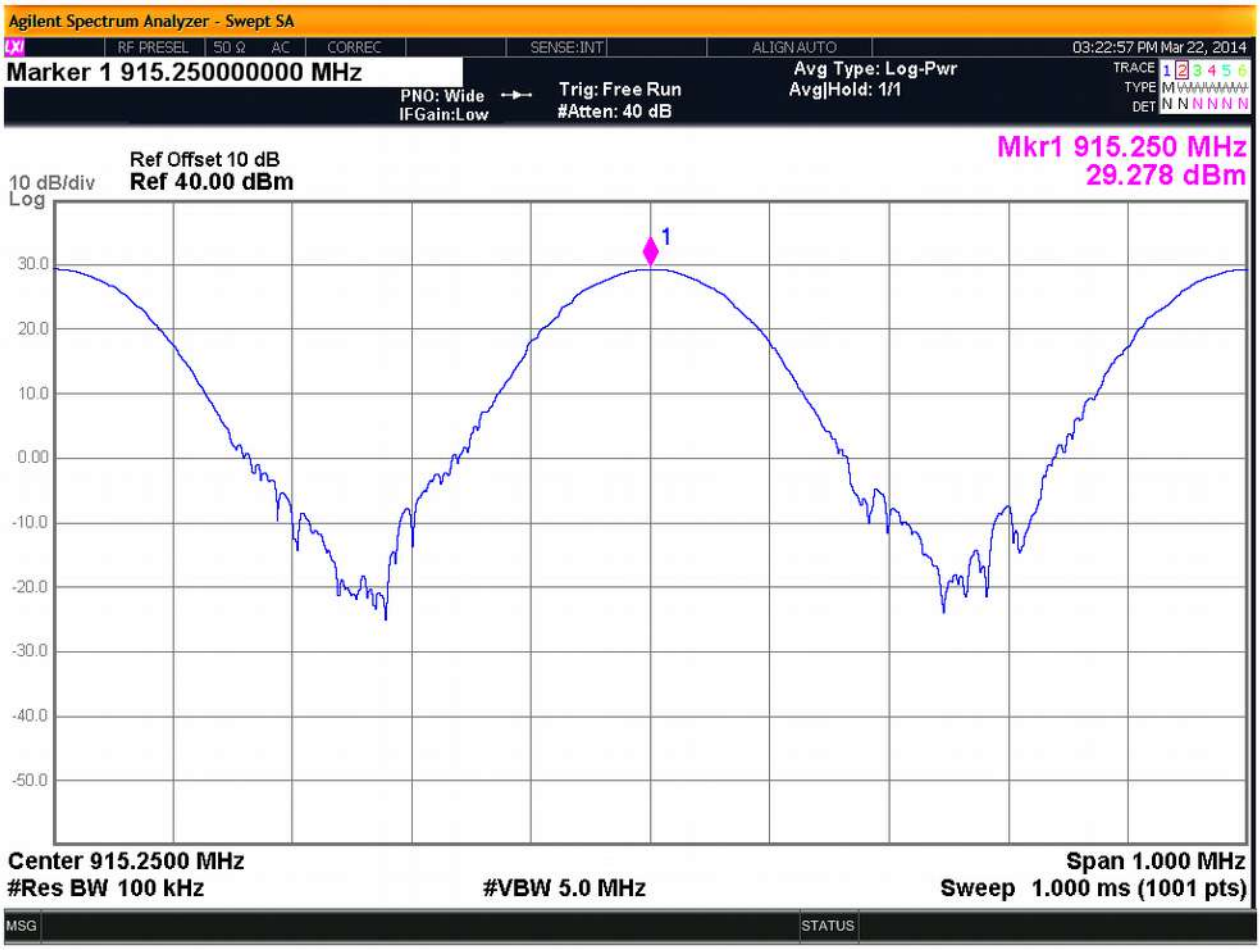


Fig. 6.5
Modulation Type 2, Channel 25, Max Hold

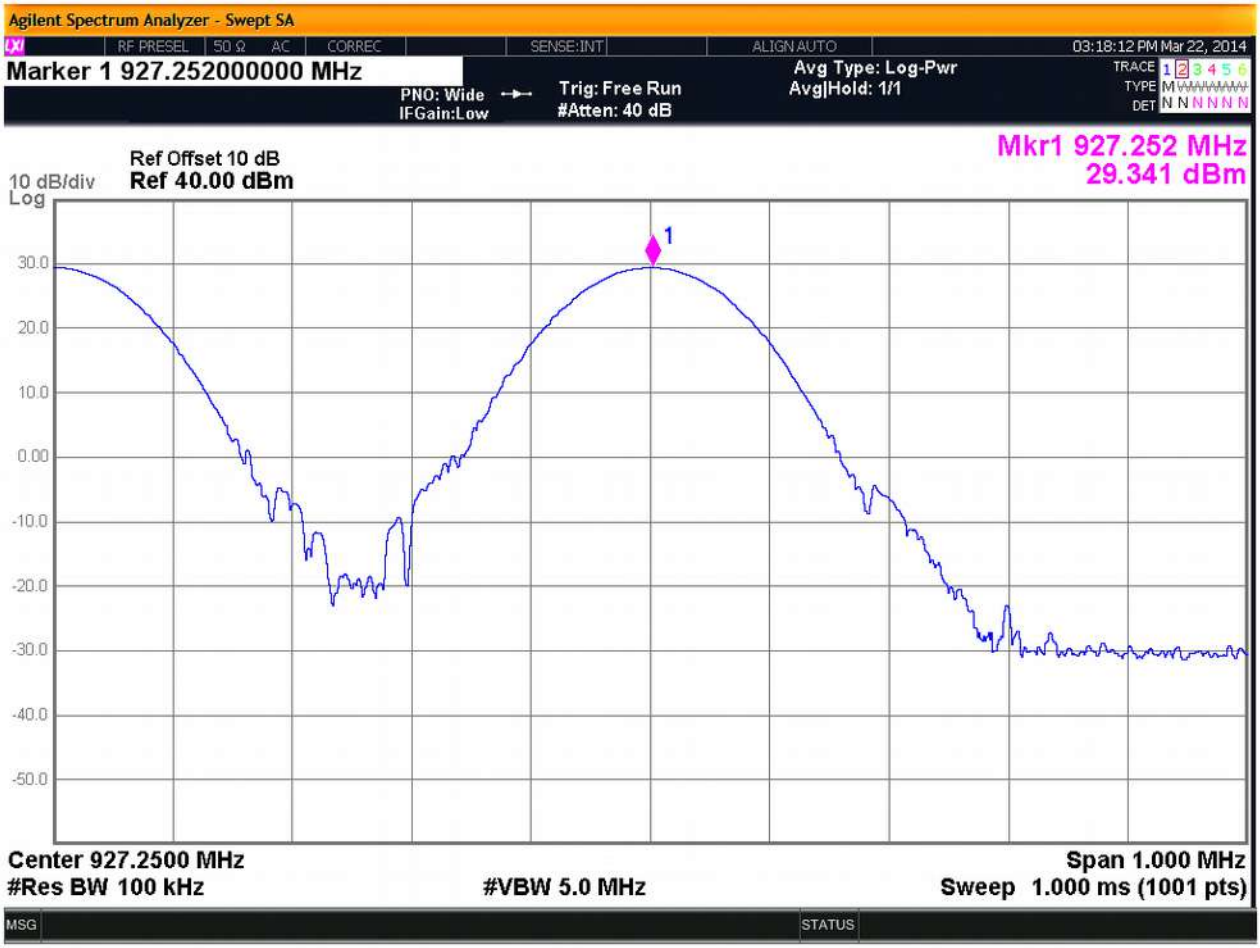


Fig. 6.6
Modulation Type 2, Channel 49, Max Hold

Spurious Emissions

Nr Harmonics	AV Level (dBµV/m)						AV Limits (dBµV/m)	Remark
	Ch 0		Ch 25		Ch 49			
	F (MHz)	(dBµV/m)	F (MHz)	(dBµV/m)	F (MHz)	(dBµV/m)		
2	1805.5	--	1830.5	--	1854.5	--	54.0	
3		--		--		--	54.0	
4		--		--		--	54.0	
5		--		--		--	54.0	
6		--		--		--	54.0	
7		--		--		--	54.0	
8		--		--		--	54.0	
9		--		--		--	54.0	
10		--		--		--	54.0	

Note: Levels below 20 dB of limits are indicated with (--).

Nr Harmonics	Peak Level (dBµV/m)						AV Limits (dBµV/m)	Remark
	Ch 0		Ch 25		Ch 49			
	F (MHz)	(dBµV/m)	F (MHz)	(dBµV/m)	F (MHz)	(dBµV/m)		
2	1805.5	--	1830.5	--	1854.5	--	74.0	
3		--		--		--	74.0	
4		--		--		--	74.0	
5		--		--		--	74.0	
6		--		--		--	74.0	
7		--		--		--	74.0	
8		--		--		--	74.0	
9		--		--		--	74.0	
10		--		--		--	74.0	

Note: Levels below 20 dB of limits are indicated with (--).

Spurious Emissions – Peak limit

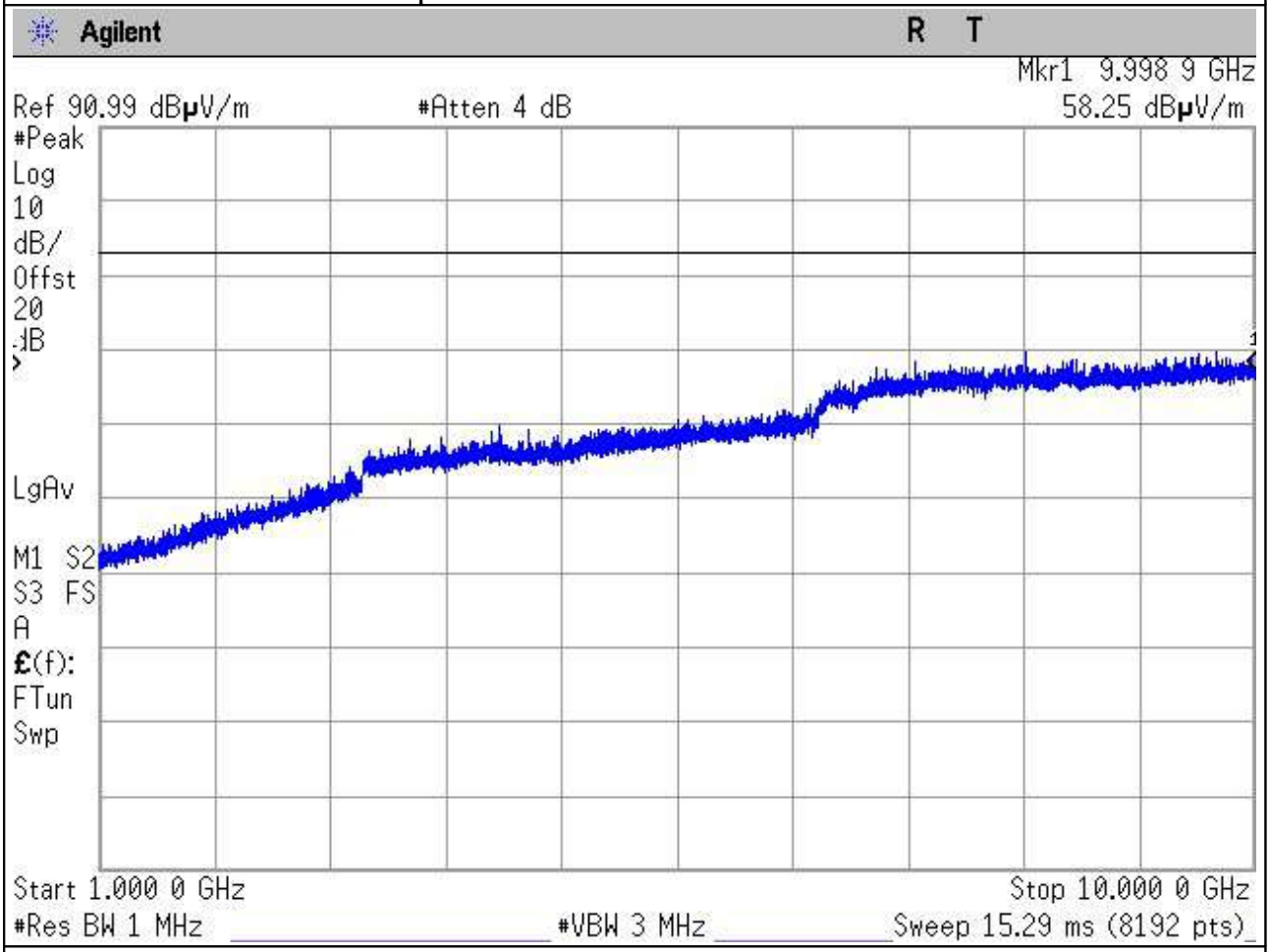


Fig. 6.7

Note:

Range: 1 GHz - 10 GHz
Pol. = V

Spurious Emissions – AVG limit

Fig. 6.8

Note:

Range: 1 GHz - 10 GHz
Pol. = V

Spurious Emissions – Peak limit

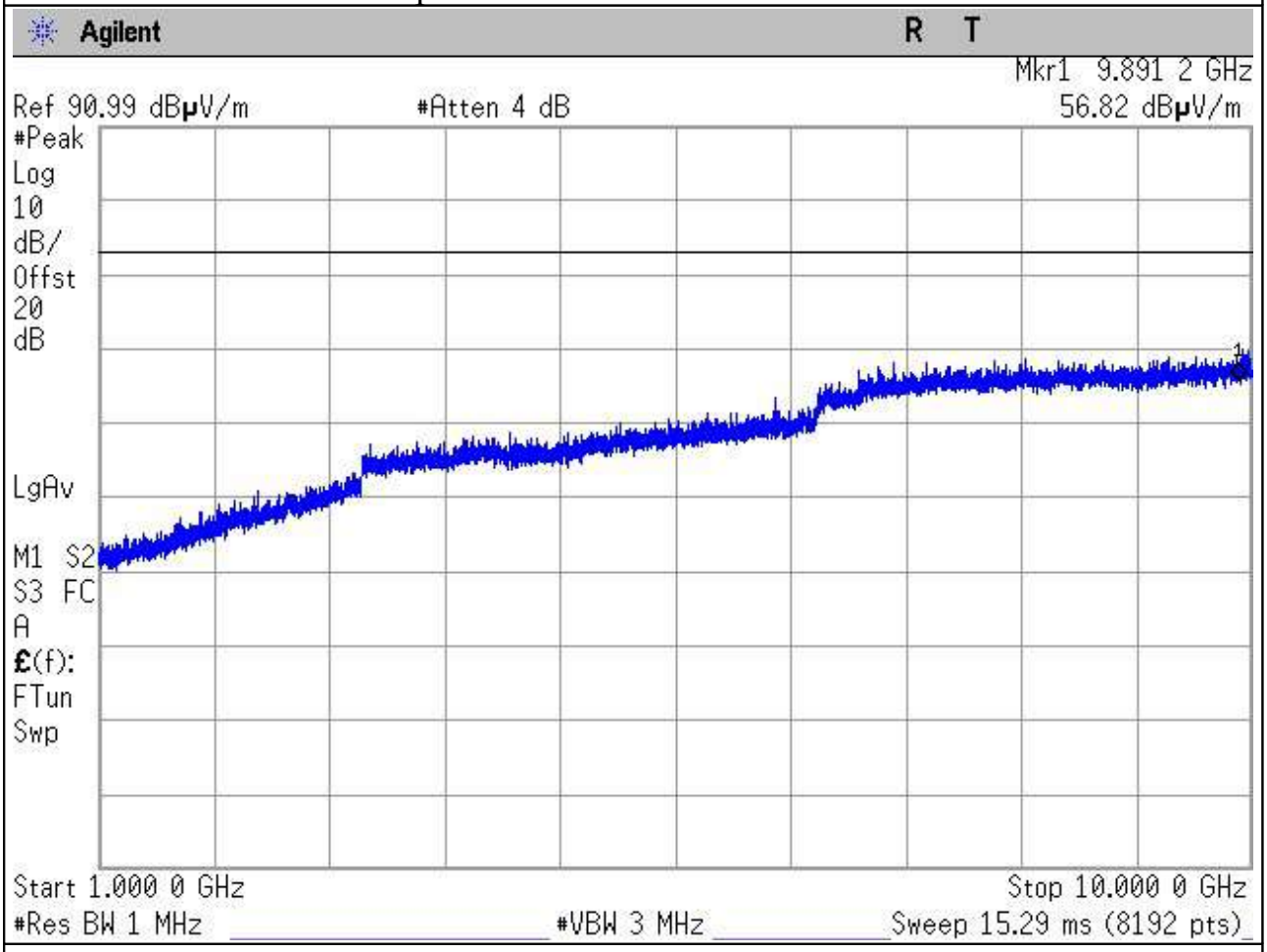


Fig. 6.9

Note:

Range: 1 GHz - 10 GHz
Pol. = H

Spurious Emissions – AVG limit

Fig. 6.10

Note:

Range: 1 GHz - 10 GHz
Pol. = H

Band Edge

Emissions must be within the band 902-928 MHz.

In any 100 kHz 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 20 dB 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, provided the transmitter demonstrates compliance with the peak conducted power limits.

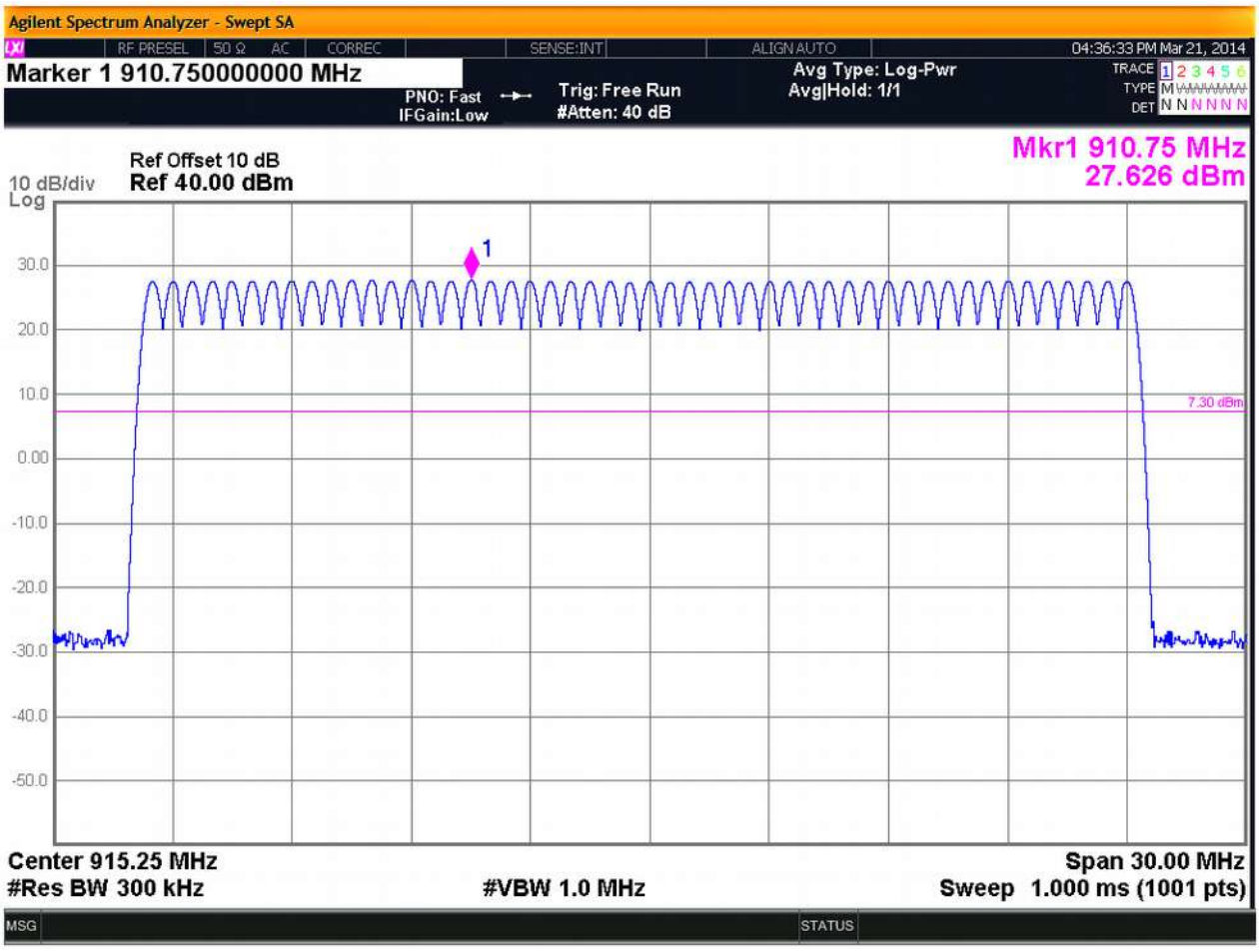


Fig. 6.11
Modulation Type: PR_ASK_M4_TX40RX250

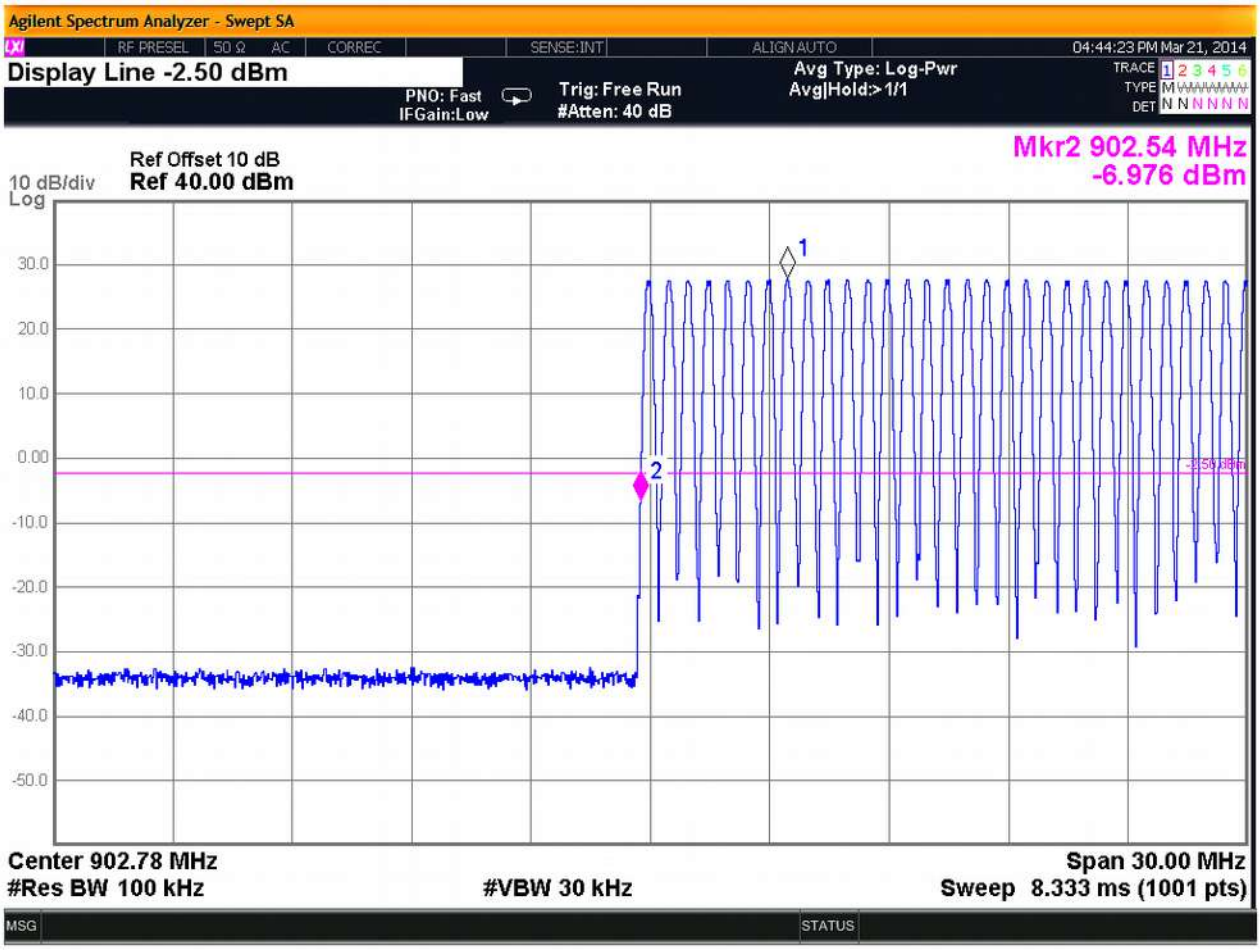


Fig. 6.12
Modulation Type: PR_ASK_M4_TX40RX250

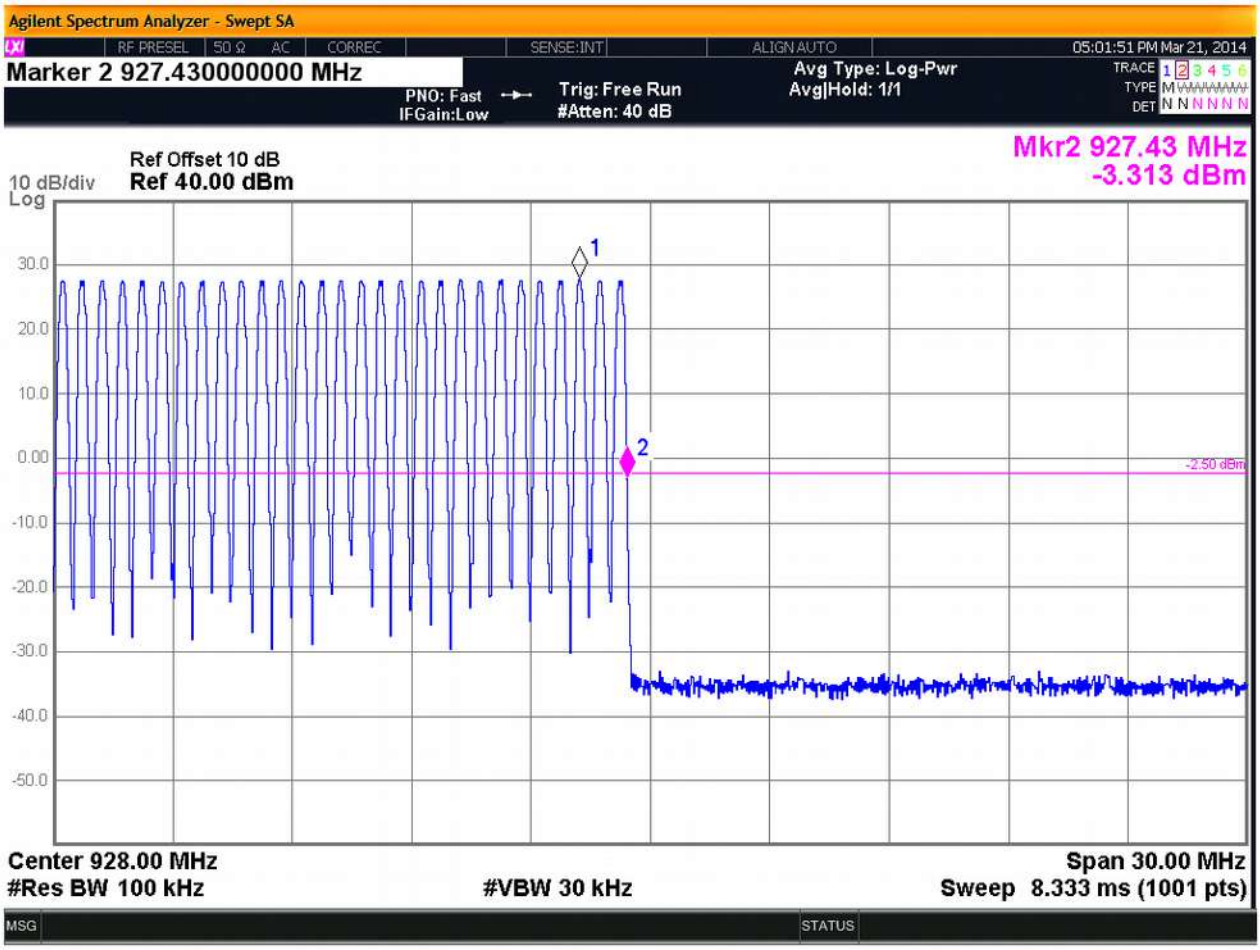


Fig. 6.13
Modulation Type: PR_ASK_M4_TX40RX250

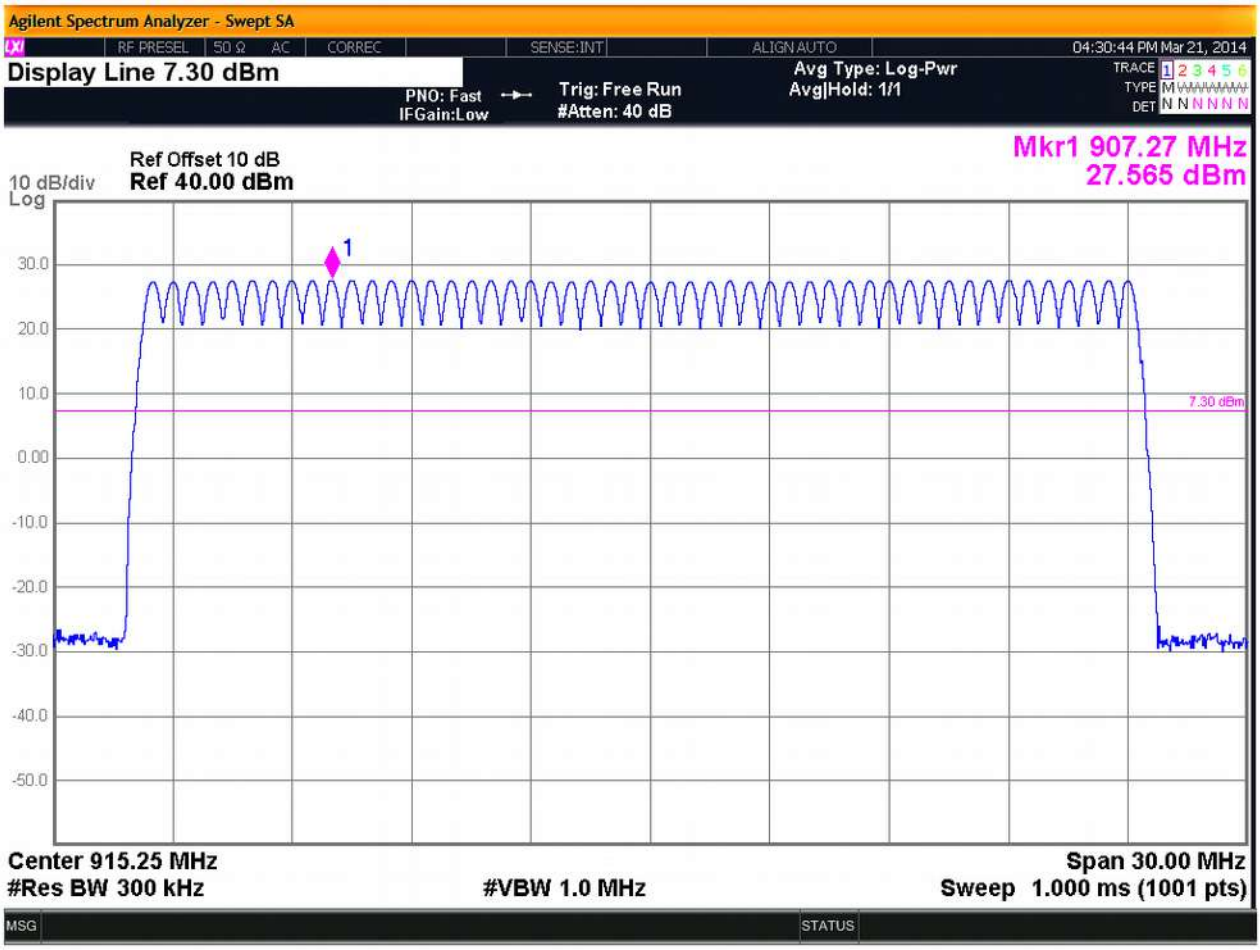


Fig. 6.14
Modulation Type: DSB_ASK_FM0_TX160RX400

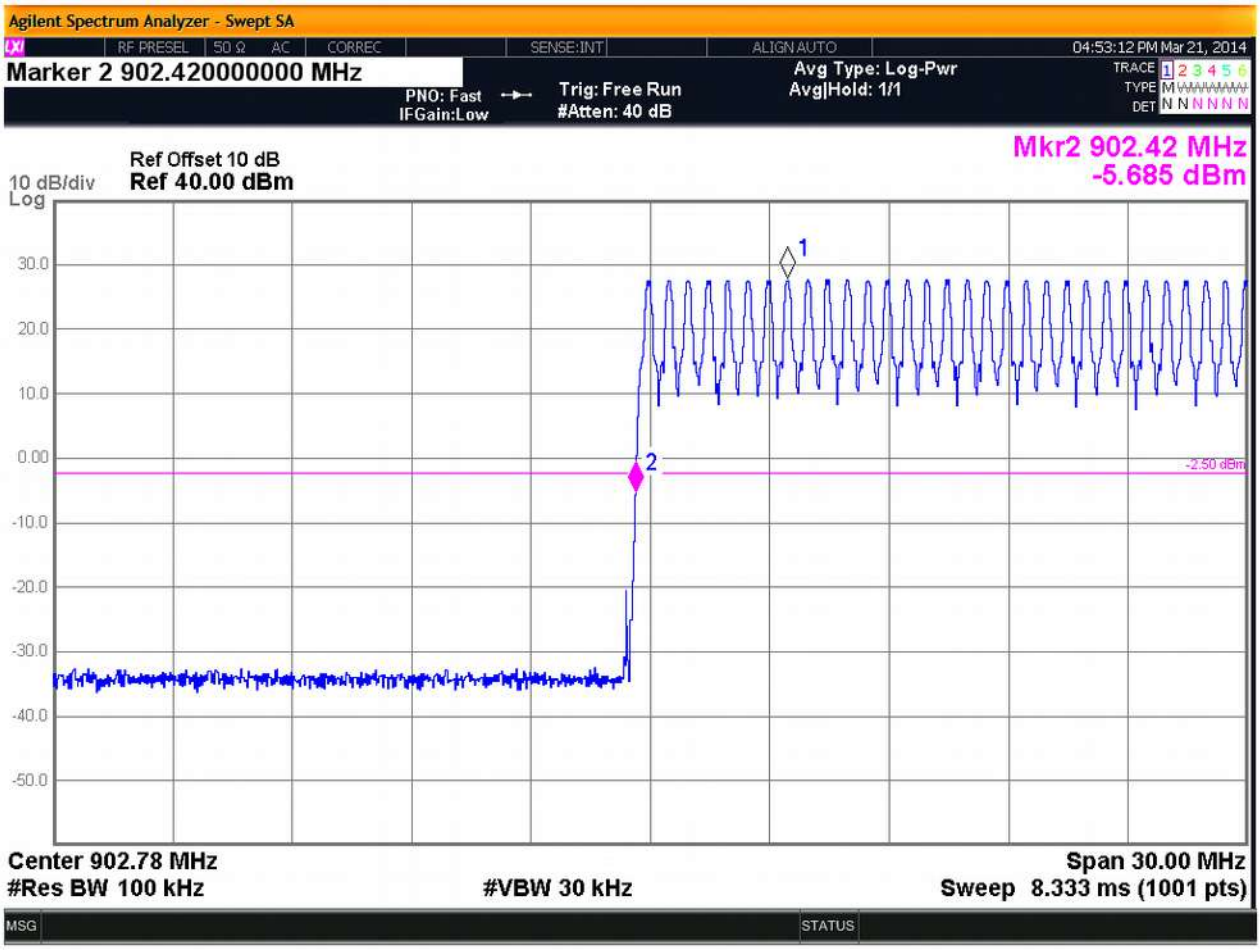


Fig. 6.15
Modulation Type: DSB_ASK_FM0_TX160RX400

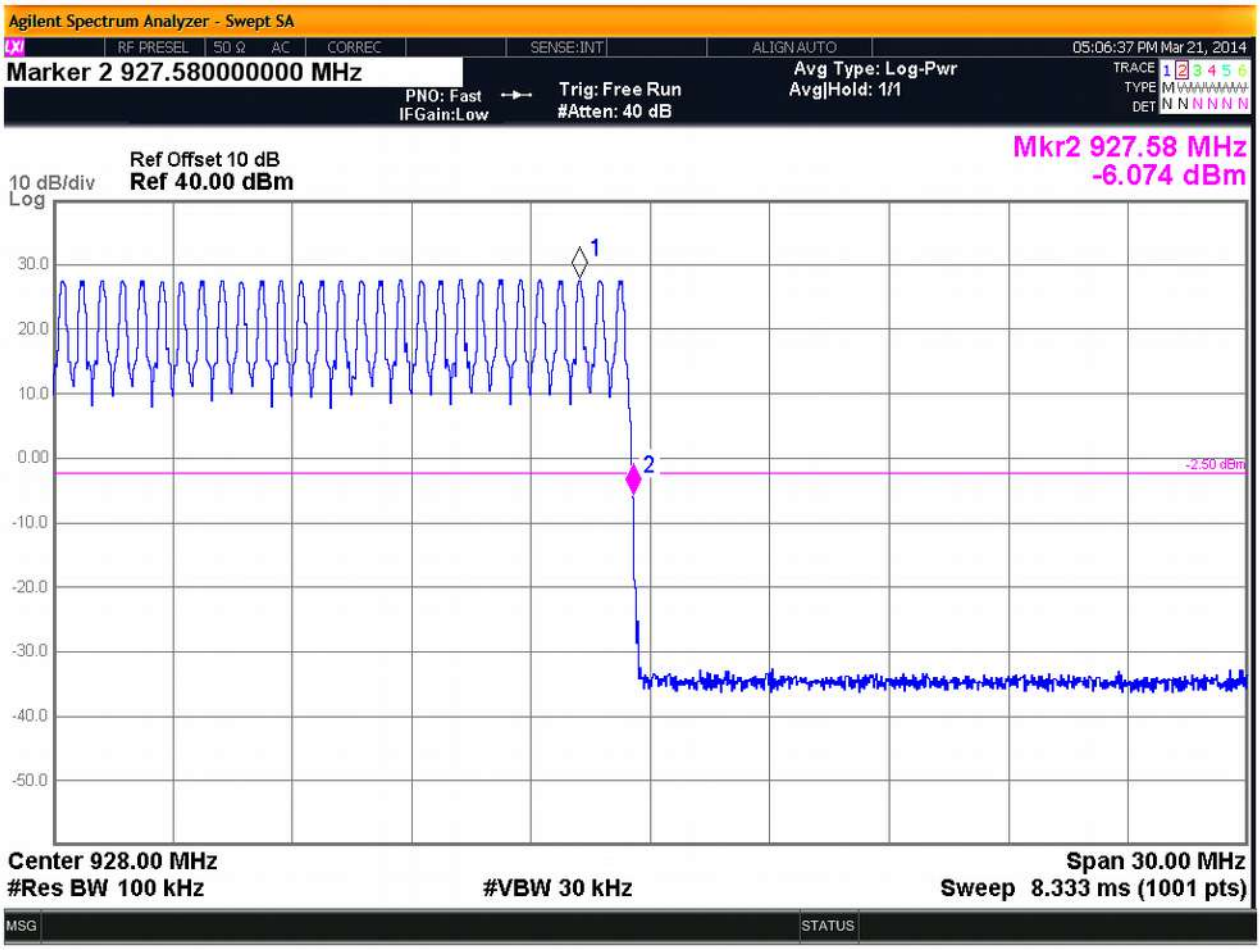


Fig. 6.16
Modulation Type: DSB_ASK_FM0_TX160RX400

Test Equipment

EQUIPMENT	MANUFACTURER	MODEL	CAL. DUE
MXE EMI Receiver	Agilent	N9038A	01/2015
Anechoic Chamber	Comtest	CSA01	01/2015
Bilog Antenna	Schaffner	CBL6112B	01/2015
Horn Antenna	EMCO	3115	01/2015
Controller	Deisel	HD100	01/2015
Turn Table	Deisel	MA240	01/2015
Attenuator	Narda	768-10	01/2015

Test procedure: CE22R01

7. BANDWIDTH AND AVERAGE TIME OF OCCUPANCY

Equipment shall meet the limits below.

Systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period.

Bandwidth

Channel	Frequency	Bandwidth (Type1/Type2) [kHz]
0	902.75023 MHz	56.5/31.5
25	915.25022 MHz	55.0/30.5
49	927.25023 MHz	57.0/16.0

Ch 0: Bandwidth

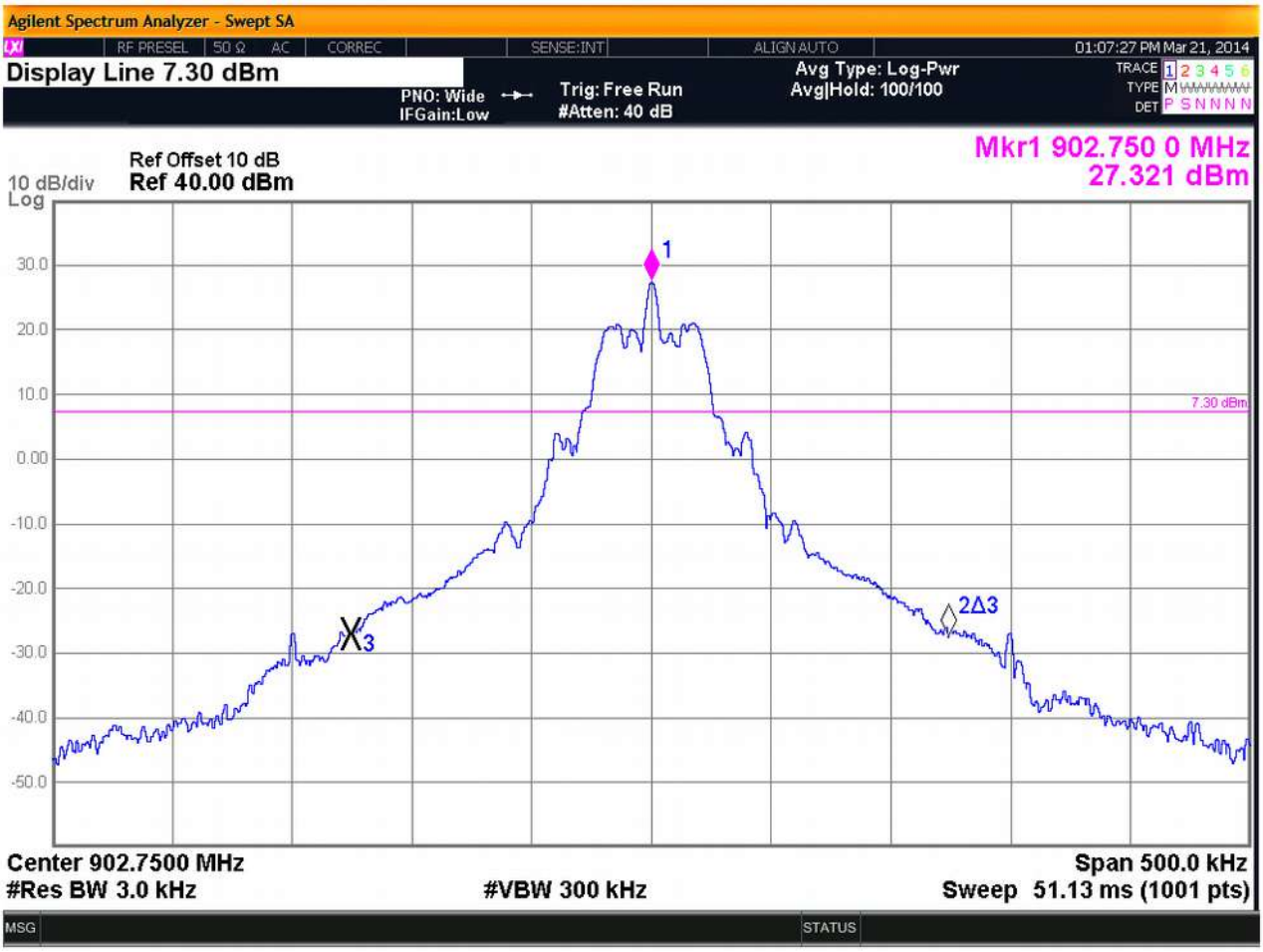


Fig. 7.1
Modulation Type: PR_ASK_M4_TX40RX250

Ch 25: Bandwidth

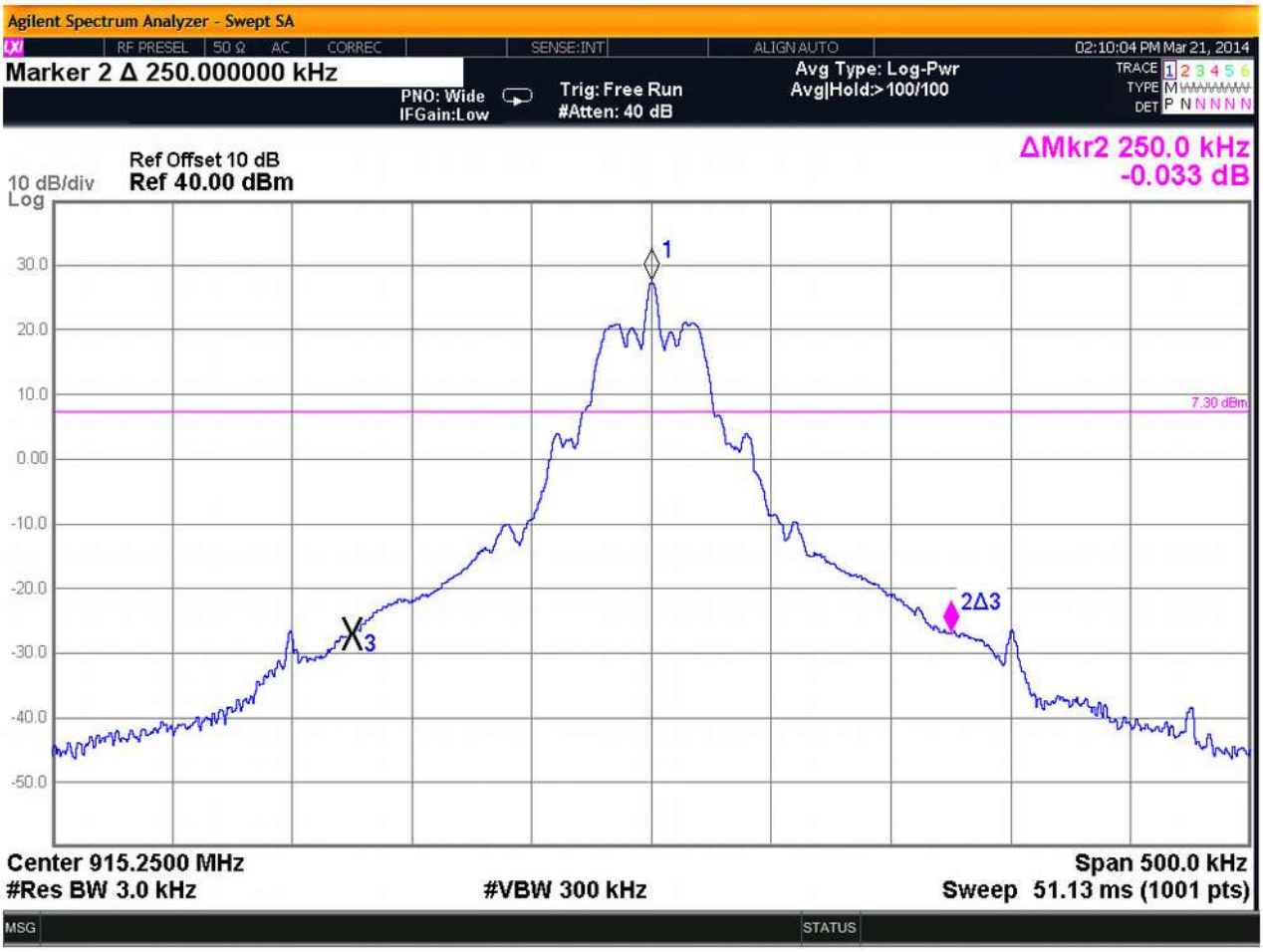


Fig. 7.2
Modulation Type: PR_ASK_M4_TX40RX250

Ch 49: Bandwidth

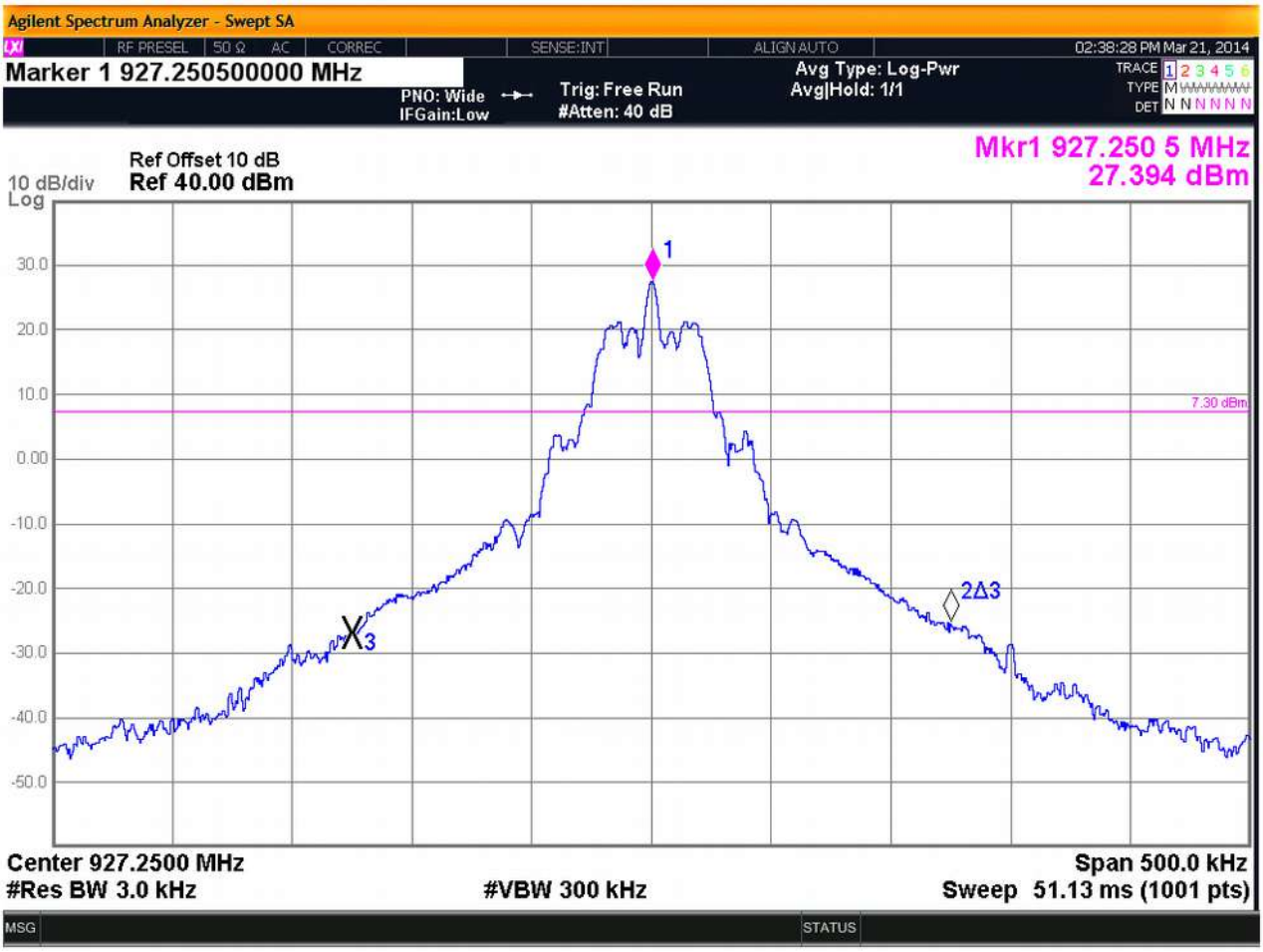


Fig. 7.3
Modulation Type: PR_ASK_M4_TX40RX250

Ch 0: Bandwidth

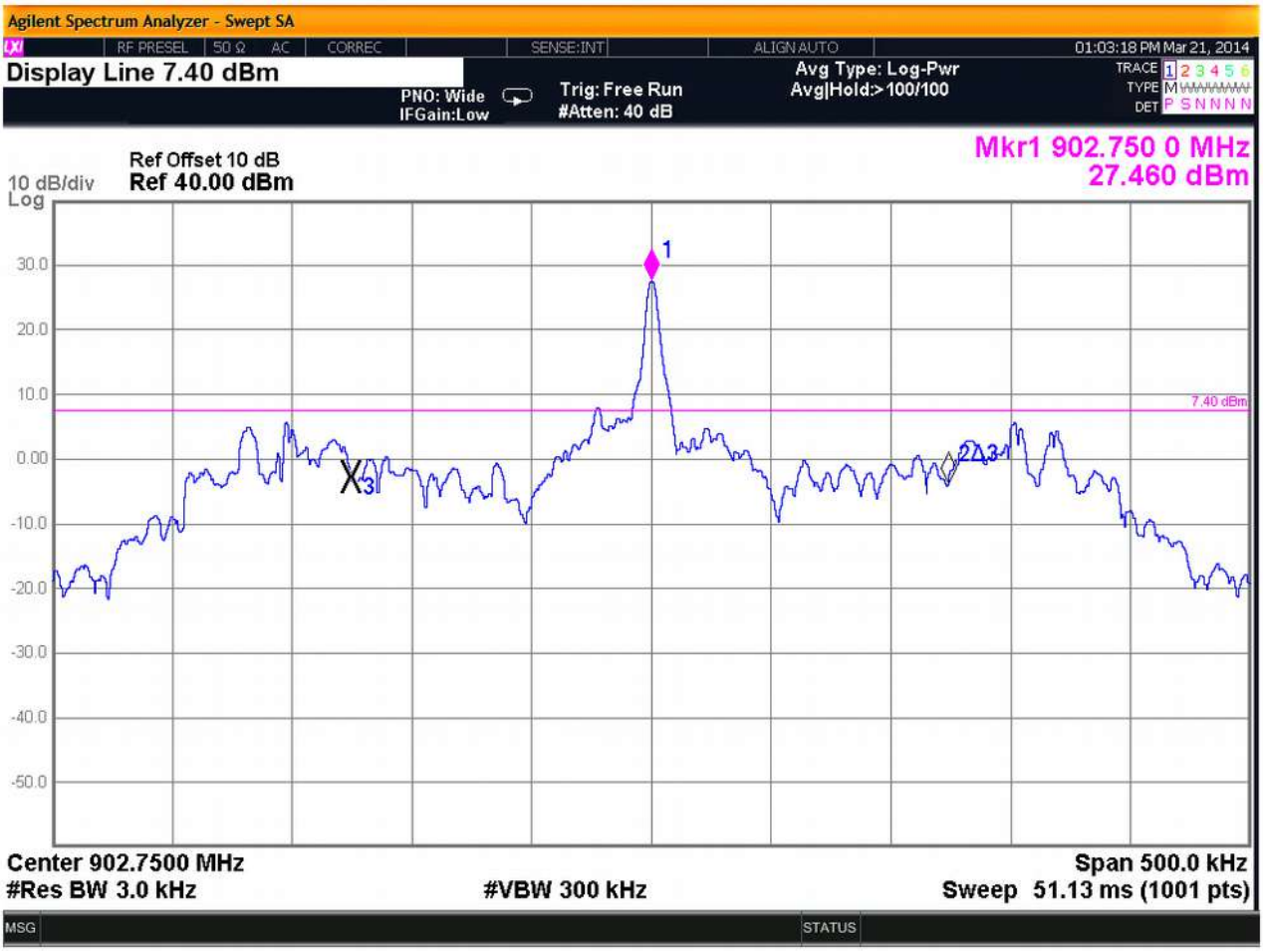


Fig. 7.4
Modulation Type: DSB_ASK_FM0_TX160RX400

Ch 25: Bandwidth

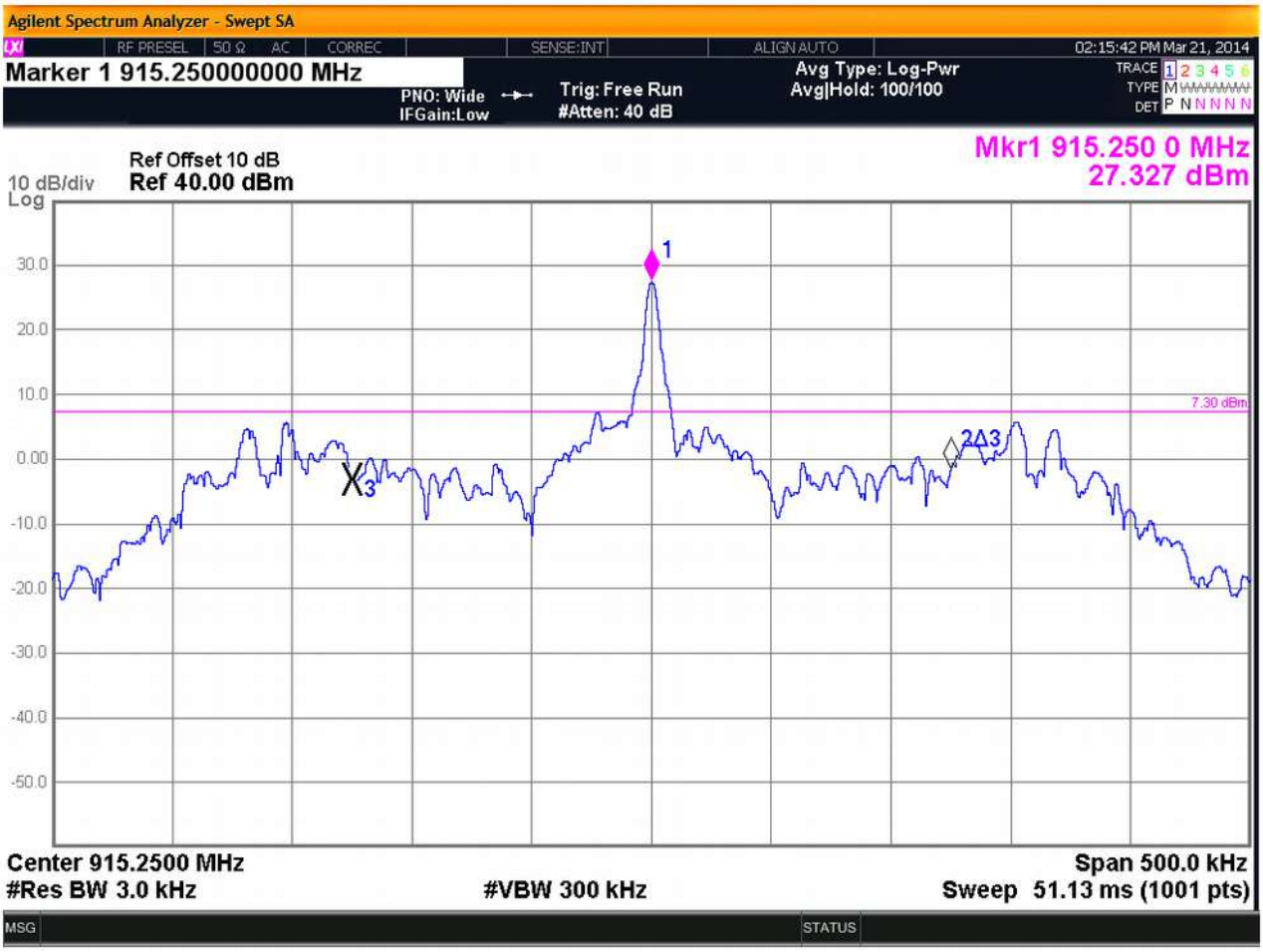


Fig. 7.5
Modulation Type: DSB_ASK_FM0_TX160RX400

Ch 49: Bandwidth

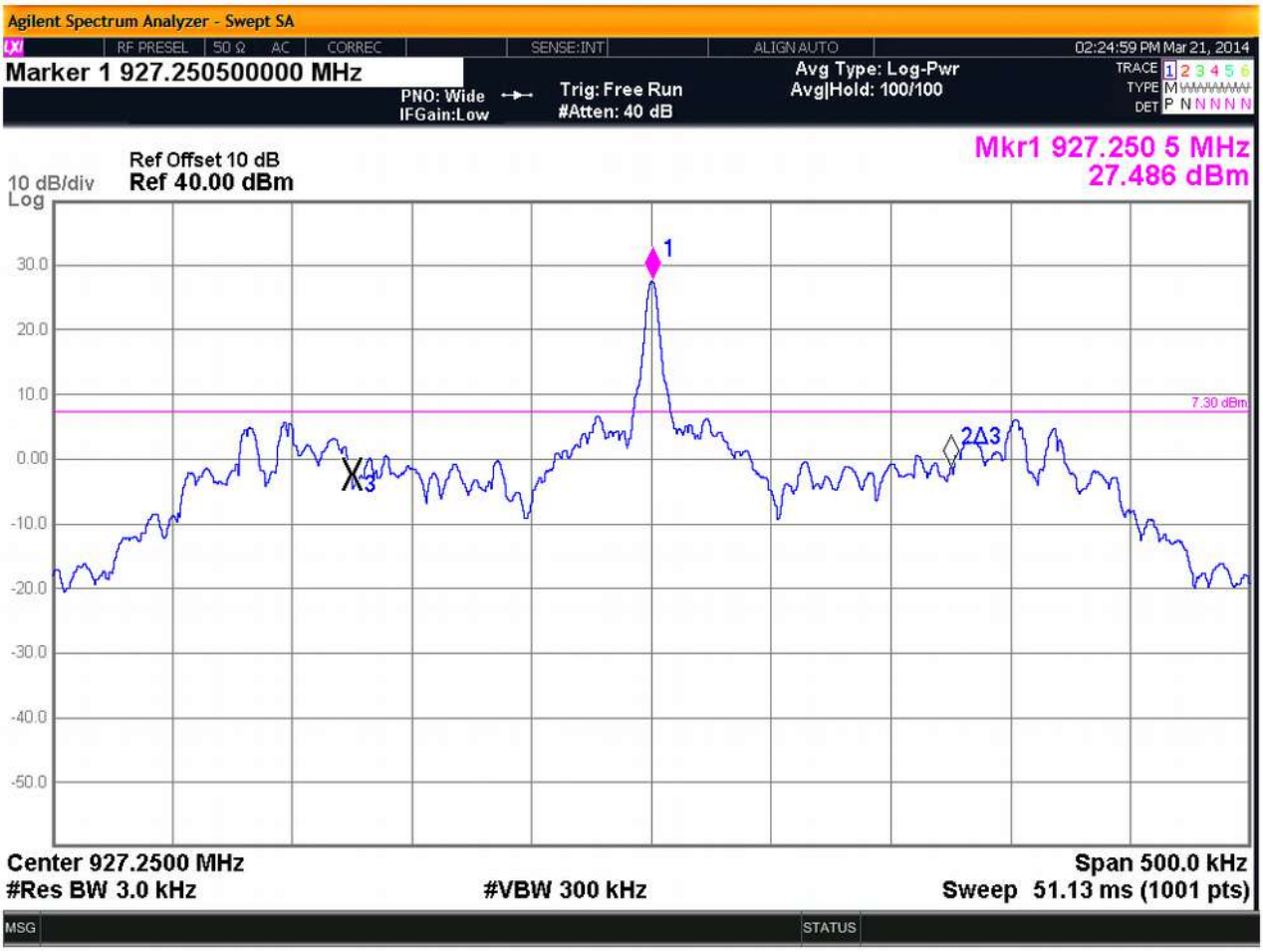


Fig. 7.6
Modulation Type: DSB_ASK_FM0_TX160RX400

Average Time of Occupancy:

Channel	Dwell Time (ms)	Nr. of Transmission for channel (average)	Modulation	Time of Occupancy (ms)
25	11.7	7	Type 1	81.9
25	34.4	5.0	Type 2	172.0

Time of transmission

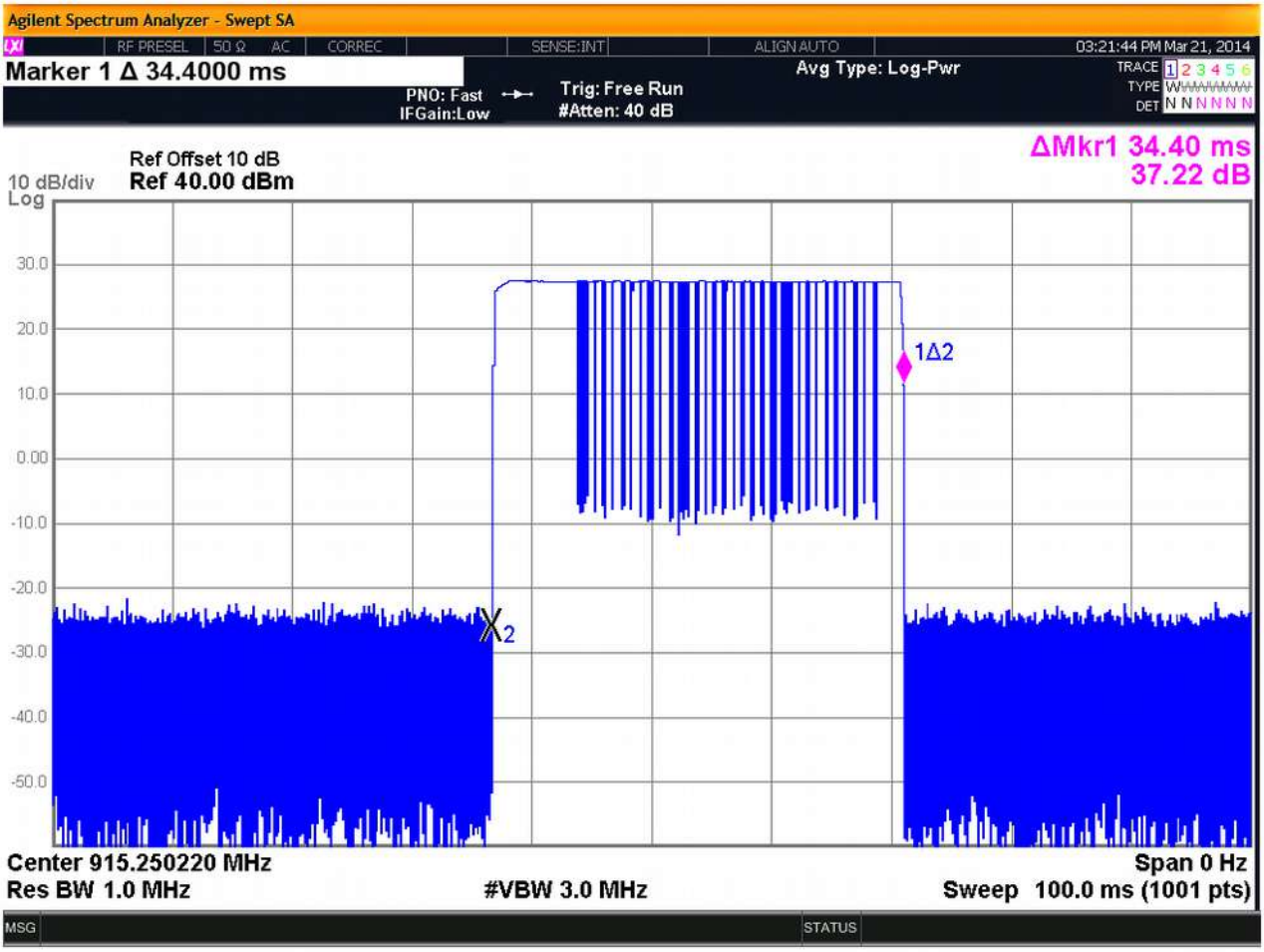


Fig. 7.7
Modulation Type: PR_ASK_M4_TX40RX250

Fig. 7.8
Modulation Type: PR_ASK_M4_TX40RX250

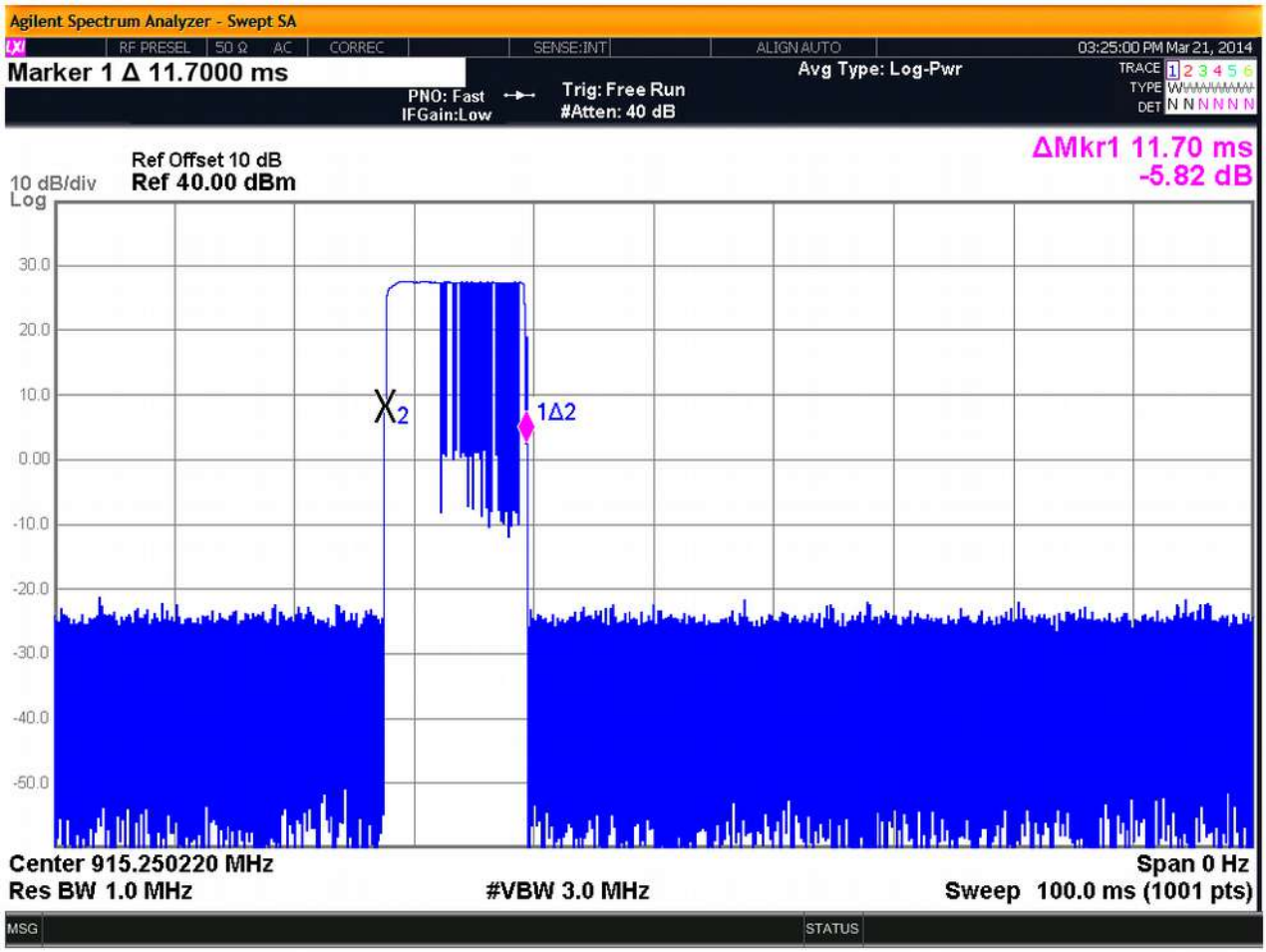


Fig. 7.9
Modulation Type: DSB_ASK_FM0_TX160RX400

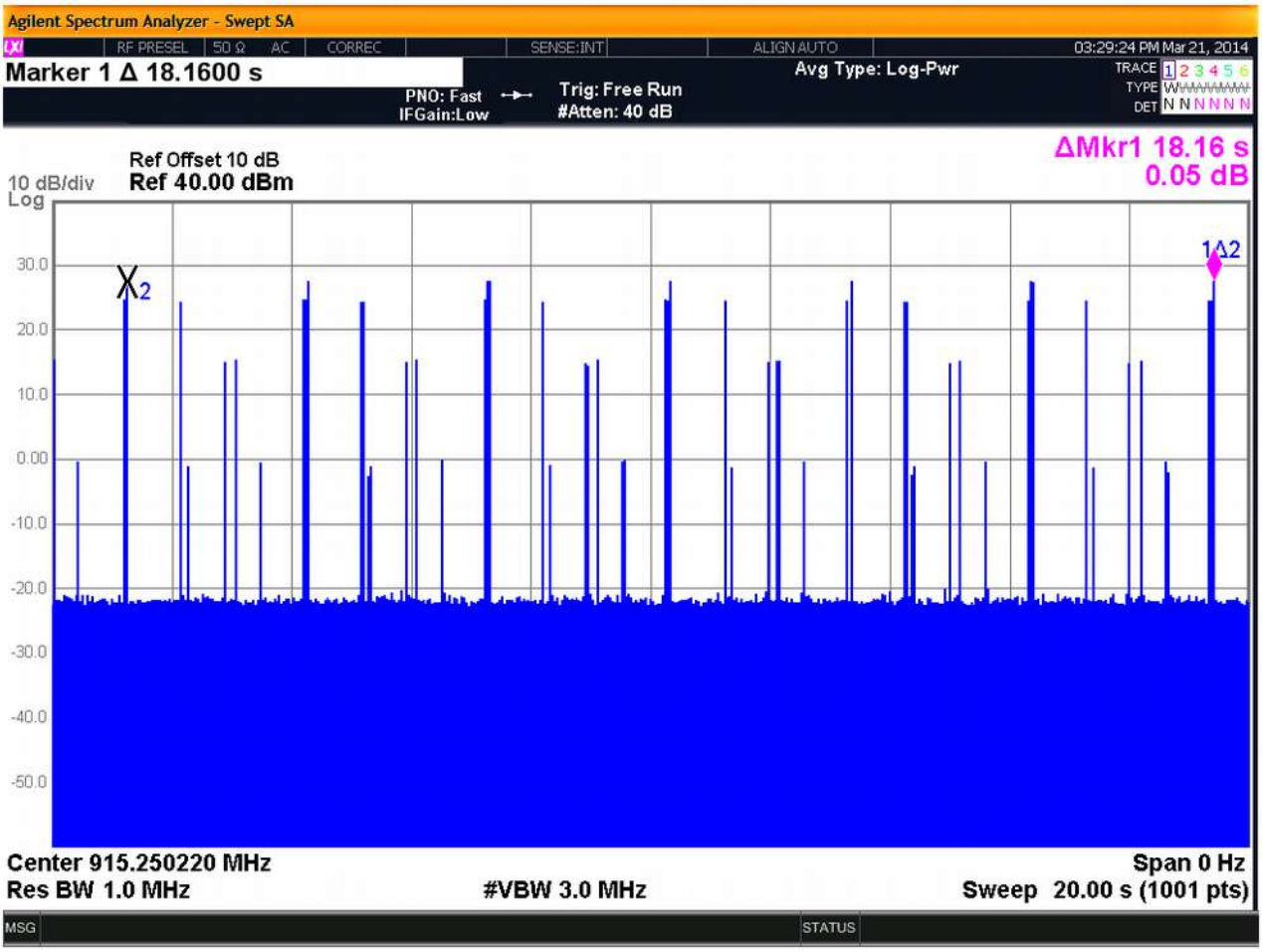


Fig. 7.10
Modulation Type: DSB_ASK_FM0_TX160RX400

Test Equipment

EQUIPMENT	MANUFACTURER	MODEL	CAL. DUE
EMI Receiver	HP	HP8546A	01/2015
EMI Receiver Filter Section	HP	HP85460A	01/2015
MXE EMI Receiver	Agilent	N9038A	01/2015
Anechoic Chamber	Comtest	CSA01	01/2015
Bilog Antenna	Schaffner	CBL6112B	01/2015
Horn Antenna	EMCO	3115	01/2015
Controller	Deisel	HD100	01/2015
Turn Table	Deisel	MA240	01/2015
LISN	GSD	NTW06	01/2015

Test procedure: CE22R01

8. PHOTO

Fig. 8.1

Conducted Emissions Test Set-up

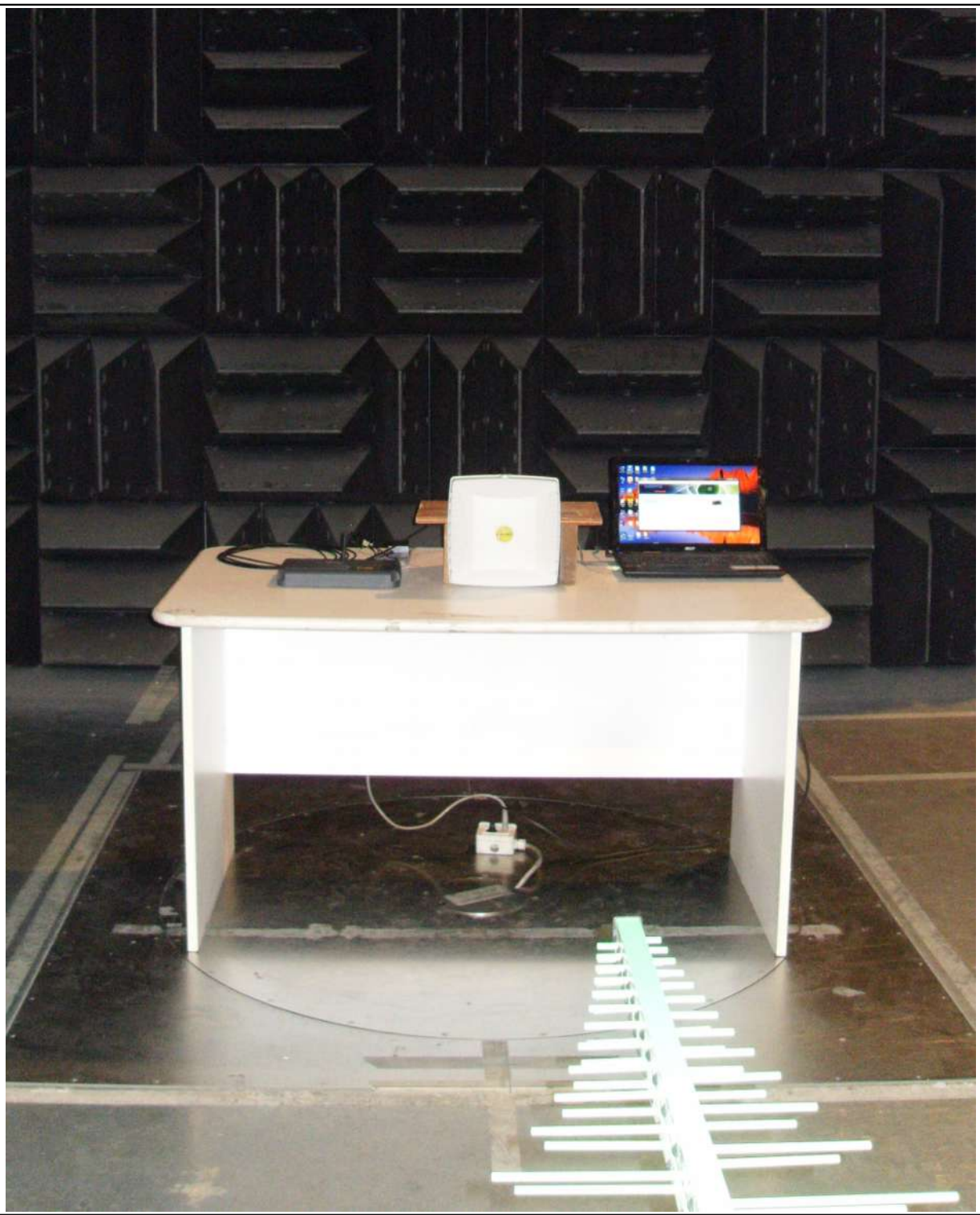


Fig. 8.2

Radiated Emissions Test Set-up

Fig. 8.3
Radiated Emissions Test Set-up

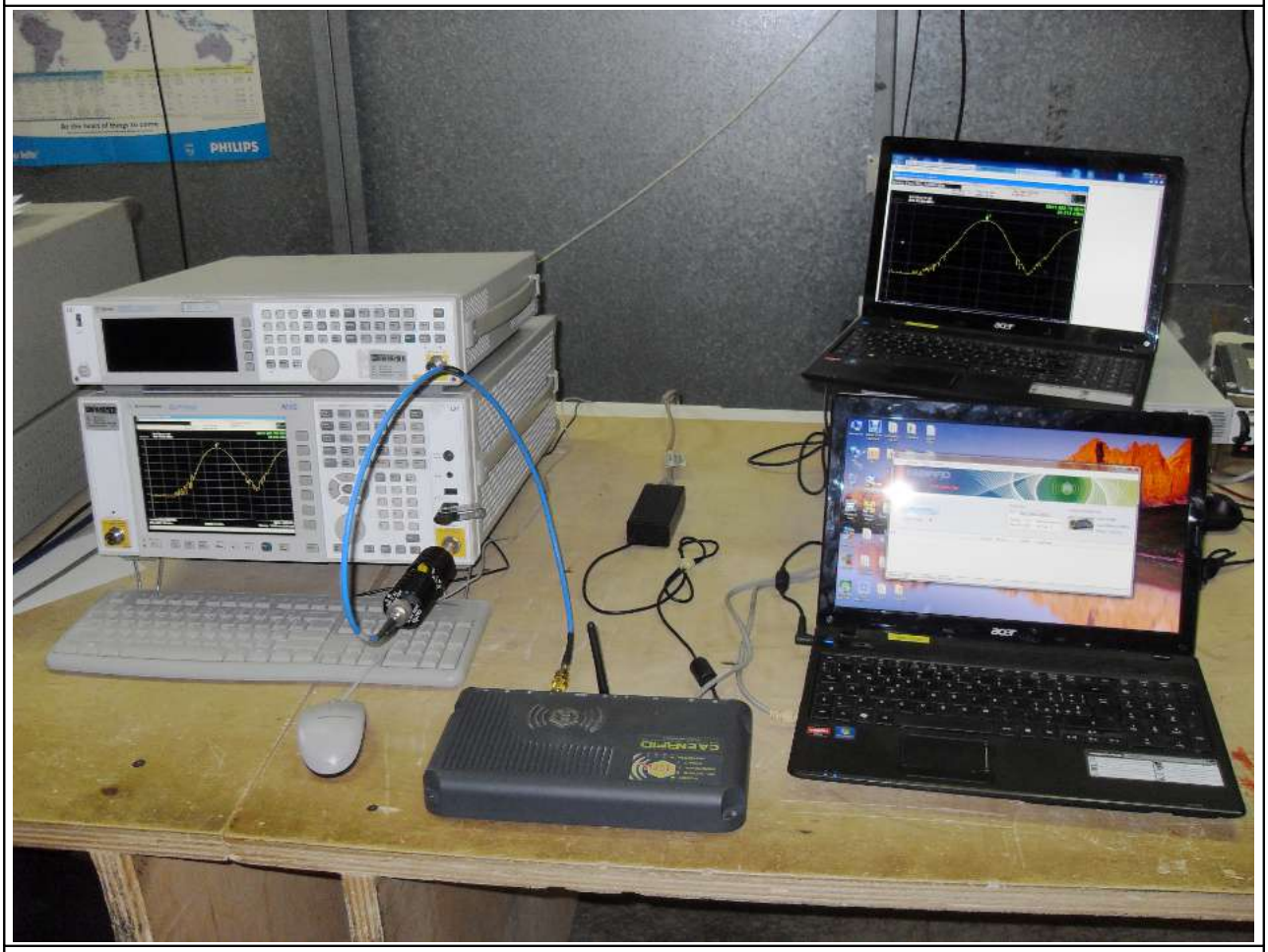


Fig. 8.4

Conducted Transmission Test Set-up