Test Report No. P/13/01/24

Subject of test:	**GSM Desktop Phone GDP-06** **Manufacturer JABLOCOM s.r.o.**

Test standards:
CSN EN 61000-4-2 ed.2:2009
CSN EN 61000-4-3 ed3:2006 + A1 + A2
CSN EN 61000-4-4 ed2:2005 + A1
CSN EN 61000-4-5 ed.2:2007
CSN EN 61000-4-6 ed.3:2009
CSN EN 61000-4-8 ed.2:2010
CSN EN 61000-4-11 ed2:2005
* CSN EN 55011 ed.3:2010 cl. 8.3
* CSN EN 55022 ed.3:2011 cl. 10
* CSN EN 55016-2-3 ed.3:2010 cl. 7.3
* ... unaccredited test

Related standards:
CSN EN 55024 ed.2:2011
CSN ETSI EN 301 489-1 v1.9.2:2012

Customer: JABLOCOM s.r.o.
V Nivach 12, 466 01 Jablonec nad Nisou

Purchase Order Number: 000 / 130041

Person in charge: Zdenek Stastny, laboratory manager

Hereafter presented test results are applied to the tested equipment exclusively and they must not substitute other documents.

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Filing date of test subject:	13. 3. 2013
Time and place of test:	13. 3. and 18. 9. 2013, Test Room ABEGU, a.s.
Subject of test:	GSM Desktop Phone GDP-06
Manufacturer:	JABLOCOM s.r.o.
Customer:	JABLOCOM s.r.o.
Customer assistant:	-
Documentation:	-
Goal of test:	1. Check-up level of immunity against electromagnetic disturbance. 2. Check-up level of transmitted electromagnetic disturbance.
Date of report issue:	3. 12. 2013
Number of report pages:	15
Number of attachment pages:	0
Elaborated by:	Bohdan Balatka
Reviewed by:	Zdenek Stastny
Approved by:	Zdenek Stastny, laboratory manager

Distribution of test report:

1. JABLOCOM s.r.o.
2. ABEGU, a. s., ZKUSEBNA

Test classification, uncertainty of measurement:

1. Function of subject (equipment under test - EUT) is classified on the basic of operating condition and functional specification, as in the following (by standard CSN EN 55024, CSN ETSI EN 301 489-1 v1.9.2 and following test standards CSN EN 61000-4-x):

   - Criterion A: In the conditions of electromagnetic disturbance the EUT shall continue to operate as intended. The EUT keeps all properties guaranteed by the technical conditions.
   - Criterion B: In the conditions of electromagnetic disturbance there will be short decrease of the EUT performance caused by disturbing signal. After switching it off all the guaranteed functions of the EUT will be automatically renewed. No degradation is allowed during the process.
   - Criterion C: In the conditions of electromagnetic disturbance there will be temporary degradation or loss of function, which requires the service intervention or restoring the system.
   - Criterion D: In the conditions of electromagnetic disturbance there will be permanent degradation or loss of function, which is not recoverable due to the damage of equipment (components) or software, or loss of data.

   The formulation of uncertainty of measurement for the immunity test is not relevant.

2. Emission level of EUT is classified by the requirement of standards CSN EN 55022,

CSN ETSI EN 301 489-1 v1.9.2. The results are presented with total uncertainty *U*. This uncertainty is defined as standard uncertainty multiplied by coefficient k = 2, which warrants confidence interval approximately 95 % for standard distribution.

Traceability to national standards of measurement:

1. external calibrations
2. factory reference standard - digital scope HP 54616B, No. E-4.1-001, external calibration by CMI
3. factory reference standard - digital multimeter model 2000, No. E-4.1-002, external calibration by CMI
4. factory reference standard - digital multimeter model 8846A, No. E-4.1-004, external calibration by CMI

Equipment configuration:

EUT was powered by the AC/DC switching adapter Ktec KSAS0100600167D5. Telephonic communication was linked between tested and auxiliary phone.

Examined tests:

A.01: electrostatic discharge immunity test by CSN EN 61000-4-2
A.02: radiated, radio-frequency, electromagnetic field immunity test by CSN EN 61000-4-3
A.03: fast transient burst immunity test by CSN EN 61000-4-4
A.04: surge immunity test by CSN EN 61000-4-5
A.05: immunity to conducted disturbances inducted by radio-frequency fields by CSN EN 61000-4-6
A.06: power frequency magnetic field immunity test by CSN EN 61000-4-8
A.09: voltage dips and short interruptions immunity test by CSN EN 61000-4-11
B.03: electromagnetic field intensity measuring by CSN EN 55022
Note: The test program was based on requirement by standards CSN EN 50024 and CSN ETSI EN 301 489-1 v1.9.2.

Tested interfaces:

1. AC power 1~230V/50Hz
2. DC power 2-6V IT
3. Equipment surface

Test procedure and result:

A.01 Electrostatic discharge immunity test

Test standard: CSN EN 61000-4-2 ed.2:2009
Test equipment: Test generator SRG 200, No. A-4.1-001
Electrode for air discharge (fig. 4a at test standard)
Electrode for contact discharge (fig. 4b at test standard)
Horizontal coupling plane (HCP)
Vertical coupling plane (VCP)
Port under test: Air and contact discharge to HCP by fig. 4 at test standard - bottom EUT side
Air and contact discharge VCP by fig. 4 at test standard - rear, left and right EUT side
Air discharge to keyboard - near field
Test values: 2 - 4 - 8 kV for air discharge
2 - 4 kV for contact discharge
Requirement: Criterion B
Number of pulses: 10 pulses for each test level and polarity, time among two pulses not less than 10 s

Electrostatic discharge immunity test CSN EN 61000-4-2 ed.2:2009						
Subject of test	GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.					
Temperature: 22 ± 3 °C Humidity: 40 ± 5 %		Test level				Note
		1	2	3	4	
EUT configuration, Port under test		Test value for air discharge				Coupling path: Air discharge (continuous)
		2 kV	4 kV	8 kV	15 kV	
		Criterion				
HCP - bottom EUT side		**A**	**A**	**A**	n. a.	
VCP - left, rear and right EUT side		**A**	**A**	**A**	n. a.	
Keyboard - near field		**A**	**A**	**A**	n. a.	
		Test value for contact discharge				Coupling path: Contact discharge
		2 kV	4 kV	6 kV	8 kV	
		Criterion				
HCP - bottom EUT side		**A**	**A**	n. a.	n. a.	
VCP - left, rear and right EUT side		**A**	**A**	n. a.	n. a.	
n.a. ... test value was not applied - see test program						
Test identification	Test sequence number		Date		Examined by	
A.01	5		13. 3. 2010		Stastny	

No inacceptable changes were detected during the test.

A.02 Radio-frequency field immunity test

Test standard: CSN EN 61000-4-3 ed.3:2006 + A1 + A2
Test equipment: Signal generator SM 300, No. A-4.1-017
Power amplifier 30W1000A, No. A-4.1-004
Power amplifier 10S1G4A, No. A-4.1-018
Log-periodical antenna AT 1080, No. A-4.1-005
Horn antenna AT 4002A, No. A-4.1-019
Electric field meter CTR 1001A, No. A-4.1-007
Port under test: Keyboard side of EUT
Coupling path: Electromagnetic
Polarization: Horizontal, vertical
Frequency range: 80 - 3000 MHz
Frequency step: 1 %
Frequency time: 2 s
Test values: 1 - 3 V/m
Modulation: AM 80 % 400 Hz, AM 80 % 1 kHz
Requirement: Criterion A
Note: Test was made in the outside environment. Electric field transmitted by antenna was monitoring next to EUT and regulated to nominal value in the feedback loop. The test with lower value should not be necessary if the result of test with higher value is in criterion A.

Radiated, radio-frequency, electromagnetic field immunity test CSN EN 61000-4-3 ed.3:2006 + A1 + A2					
Subject of test	GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.				
Temperature:	23 ± 3 °C	Test level			Note
Humidity:	50 ± 5 %	1	2	3	
EUT configuration,		Test value (80MHz - 3GHz)			Coupling path: Electromagnetic,
Port under test		1 V/m	3 V/m	10 V/m	antennas AT 1080 / AT 4002
		Criterion - HP, amplitude modulation			Distance / height of antenna: 3,0 / 1,7 m
keyboard side		n.a.	**A**	n.a.	AM 80% 400 Hz
		n.a.	**A**	n.a.	AM 80% 1 kHz
		Criterion - VP, amplitude modulation			
keyboard side		n.a.	**A**	n.a.	AM 80% 400 Hz
		n.a.	**A**	n.a.	AM 80% 1 kHz
n.a. ... test value was not applied - see test program HP (VP) … horizontal (vertical) antenna polarization AM (PM) … amplitude (pulse) modulation					
Test identification	Test sequence number	Date	Examined by		
A.02	8	18. 9. 2013	Balatka		

No inacceptable changes were detected during the test.

A.03 Fast transient burst immunity test

Test standard: CSN EN 61000-4-4 ed.2:2005
Test equipment: Test generator PPG 4kV FAST, No. A-4.1-021a
Coupling clamp KK 400, No. A-4.1-009b

Interference to main 1~230V/50Hz TN-S

Port under test: Lines / Terminals L1, N
Coupling path: Internal artificial network PPG 4kV FAST
Test values: 0,5 - 1 kV, positive and negative polarity, pulse frequency 5 kHz, burst time 15 ms
Requirement: Criterion B
Time of test: 60 s for each coupling, test value and polarity

Interference to DC power 2-6V IT

Port under test: Unshielded cable to DC power input
Coupling path: Capacitive - coupling clamp KK 400
Test values: 0,25 - 0,5 kV, positive and negative polarity, pulse frequency 5 kHz, burst time 15 ms
Requirement: Criterion B
Time of test: 60 s for each coupling, test value and polarity
Note: The test with lower value should not be necessary if the result of test with higher value is in criterion A.

Fast transient burst immunity test CSN EN 61000-4-4 ed.2:2005						
Subject of test	GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.					
Temperature: 22 ± 3 °C Humidity: 40 ± 5 %		Test level				Note
		1	2	3	4	
EUT configuration, Port under test		Test value				Coupling path: Internal artificial network PPG 4kV FAST
		500 V	1 kV	2 kV	4 kV	
		Criterion for f_{imp} = 5 kHz				
AC main 1~230V/50Hz L1		**A**	**A**	n.a.	n.a.	
AC main 1~230V/50Hz N		**A**	**A**	n.a.	n.a.	
		Test value				Coupling path: Capacitive – coupling clamp KK 400
		250 V	500 V	1 kV	2 kV	
		Criterion for f_{imp} = 5 kHz				
DC main 2-6V IT		**A**	**A**	n.a.	n.a.	
n.a. ... test value was not applied - see test program						
Test identification	Test sequence number			Date		Examined by
A.03	1			13. 3. 2013		Stastny

No inacceptable changes were detected during the test.

A.04 Surge immunity test

Test standard: CSN EN 61000-4-5 ed.2:2007
Test equipment: Test generator PPG 4kV SLOW, No. A-4.1-021b
Coupling network SRF 511, No. A-4.1-010a

Interference to main 1~230V/50Hz TN-S

Port under test: Line to line mode L1-N
Coupling path: Artificial network SRF 511
Test values: 0,5 - 1 kV for line to line mode, positive and negative polarity, phase shift 0 - 90 - 180 - 270°, output generator impedance 2 Ω
Number of pulses: 5 for each value, polarity and phase shift, time among two pulses not less than 10 s
Requirement: Criterion B
Sequence of values: 0,5 kV line to line, 1 kV line to line

Surge immunity test CSN EN 61000-4-5 ed.2:2007						
Subject of test	GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.					
Temperature: 22 ± 3 °C Humidity: 40 ± 5 %		Test level				Note
		1	2	3	4	
EUT configuration, Port under test		Test value - line to line mode				Coupling path: Artificial network SRF 511, output generator impedance 2 Ω
		n.d.	0,5 kV	1 kV	2 kV	
		Criterion				
AC main 1~230V/50Hz L1-N		n.a.	**A**	**A**	n.a.	
n.a. ... test value was not applied - see test program n.d. ... test level was not defined - see test standard						
Test identification	Test sequence number		Date			Examined by
A.04	2		13. 3. 2013			Stastny

No inacceptable changes were detected during the test.

A.05 Immunity to conducted disturbances inducted by radio-frequency

Test standard: CSN EN 61000-4-6 ed.3:2009
Test equipment: Signal generator SM 300, No. A-4.1-017
Power amplifier 25A250A, No. A-4.1-011
Ferrite clamp F-203i, No. A-4.1-012
Frequency range: 0,15 - 80 MHz
Frequency step: 1 %
Frequency time: 1 s

Interference to main 1~230V/50Hz TN-S

Port under test: Lines / Terminals L1, N
Coupling path: Inductive - ferrite clamp F-203i
Test values: 1 - 3 V
Modulation: AM 80 %, 400 Hz / 1 kHz
Requirement: Criterion A

Interference to DC power 2-6V IT

Port under test: Unshielded cable to DC power input
Coupling path: Inductive - ferrite clamp F-203i
Test values: 1 - 3 V
Modulation: AM 80 %, 400 Hz / 1 kHz
Criterion request: A
Requirement: Criterion A
Notice: The test with lower value should not be necessary if the result of test with higher value is in criterion A.

Immunity to conducted disturbances inducted by radio-frequency CSN EN 61000-4-6 ed.3:2009					
Subject of test	GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.				
Temperature:	23 ± 3 °C	Test level			Note
Humidity:	50 ± 5 %	1	2	3	
EUT configuration, Port under test		Test value (0,15 - 80 MHz)			Coupling path: Inductive - ferrite clamp F-203i
		1 V	3 V	10 V	
		Criterion - AM 80% 400Hz			
AC main 1~230V/50Hz		n.a.	**A**	n.a.	
DC main 2-6V IT		n.a.	**A**	n.a.	
		Criterion - AM 80% 1kHz			
AC main 1~230V/50Hz		n.a.	**A**	n.a.	
DC main 2-6V IT		n.a.	**A**	n.a.	
n.a. ... test value was not applied - see test program AM (PM) … amplitude (pulse) modulation					
Test identification	Test sequence number	Date	Examined by		
A.05	7	18. 9. 2013	Balatka		

No inacceptable changes were detected during the test.

A.06 Power frequency magnetic field immunity test

Test standard: CSN EN 61000-4-8 ed.2:2010
Test equipment: Sinusoidal generator SRG 810, No. A-4.1-013
Multimeter PK 435, No. P-4.1-010
Induction coil MFA 100, No. A-4.2-013a
Port under test: EUT enclosure in the area axis x, y, z by the fig. 1 at test standard
Type of coupling: Electromagnetic - induction coil MFA 100
Test value: 1 A/m for continuous field
Time of test: > 20 min for continuous field
Requirement: Criterion A

Power frequency magnetic field immunity test CSN EN 61000-4-8 ed.2:2010							
Subject of test	GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.						
Temperature: 22 ± 3 °C Humidity: 40 ± 5 %		Test level					Note
		1	2	3	4	5	
EUT configuration, Port under test		Test value - continuous field [A/m]					Coupling path: Inductive – induction coil MFA 100
		1	3	10	30	100	
		Criterion					
EUT surface - axis X		**A**	n.a.	n.a.	n.a.	n.a.	
EUT surface - axis Y		**A**	n.a.	n.a.	n.a.	n.a.	
EUT surface - axis Z		**A**	n.a.	n.a.	n.a.	n.a.	
n.a. ... test value was not applied - see test program							
Test identification	Test sequence number			Date			Examined by
A.06	4			13. 3. 2013			Stastny

No inacceptable changes were detected during the test.

A.09 Voltage dips and short interruptions immunity test

Test standard: CSN EN 61000-4-11 ed.2:2005 (except art. 5.2)
Test equipment: Test generator SRG 101, No. A-4.1-014
Variable-voltage transformer SST 250/4E
Digital multi-meter M 2000, No. Z-4.1-052
Type of coupling: Direct coupling
Port under test: Main 1~230V/50Hz
Test value: ΔU > 95%, t = 0,5 period, criterion request B
ΔU > 95%, t = 1 period, criterion request B
ΔU = 30%, t = 25 periods, criterion request C
ΔU > 95%, t = 250 period, criterion request C
Number od dips: 3 for dips shorter than 5 periods, time among two dips 10 s
1 for dips longer than 10 periods
Note: The test with dips 0,5 period has be made for both polarity of halfwave.

Voltage dips, short interruptions and voltage variations immunity test CSN EN 61000-4-11 ed.2:2005						
Subject of test	GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.					
Temperature: 23 ± 3 °C Humidity: 50 ± 5 %		Test level Test standard doesn´t specify				Note
EUT configuration, Port under test		Criterion				Coupling path: Direct coupling
		Time duration	Voltage U_T			
			0%	40%	70%	
AC main 1~230V/50Hz		0,5 per.	**A**	n. a.	n. a.	
		1 per.	**A**	n. a.	n. a.	
		25 per.	n. a.	n. a.	**B**	
		250 per.	**C**	n. a.	n. a.	
n.a. ... test value was not applied - see test program						
Test identification	Test sequence number		Date			Examined by
A.09	3		13. 3. 2013			Stastny

No inacceptable changes were detected during the test.

B.03 Electromagnetic field intensity measurement (high-frequency disturbance) - unaccredited test

Test standard: CSN EN 55022 ed.3:2011 art. 10
CSN EN 55011 ed.3:2010 art. 8.3

Test equipment: Spectral analyzer FSP 7, No. B-4.1-027
Broadband preamplifier LN 1000A, No. B-4.1-004a
Biconical antenna BC 01, No. B-4.1-026a
Log-periodical antenna LP 02, No. B-4.1-026b
Software (Fsp)7_ep_cd.xls

Coupling path: Electromagnetic

Frequency range: 30 to 200 MHz (BC 01)
200 to 1000 MHz (LP 02)

Bandwidth: 120 kHz

Detector: Peak, quasi-peak

Note: Test was made with peak detector (green line). Frequencies, for which the peak value exceeds limit value, were analyzed by the quasi-peak detector (red marks "X"). The quasi-peak value is critical for qualification. This method is in accordance with CSN EN 55022 ed.3 cl. 9.1 and att. B.
The test was made in the non-shielding room. The electromagnetic field intensity for frequencies, for which the ambient electromagnetic field exceeds limit value, were based by the interpolation of two adjacent values. Interpolated values are marked by blue mark "X". This method is in accordance with CSN EN 55022 ed.3 cl. 10.8.
This measuring method is accredited for using in the open test area space (OTAS).

Electromagnetic field measurement - high frequency disturbance - unaccredited test
CSN EN 55011 ed.3:2010 art. 8.3 / CSN EN 55022 ed.3:2011 art. 10

Subject of test: GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.

Electromagnetic field measurement

Frequency (MHz)	PeakDet (dBuV)	Frequency (MHz)	QpkDet (dBuV)
648,1	35,7	652,7	26,3
652,7	35,6	648,1	25,4
30,6	33,2	30,6	25,1
975,4	32,5	31,4	22,2
997,2	32,4	199,8	12,9
971,6	32,2	-	-
990,0	32,1	-	-
873,7	31,8	-	-
985,2	31,7	-	-
999,6	31,6	-	-

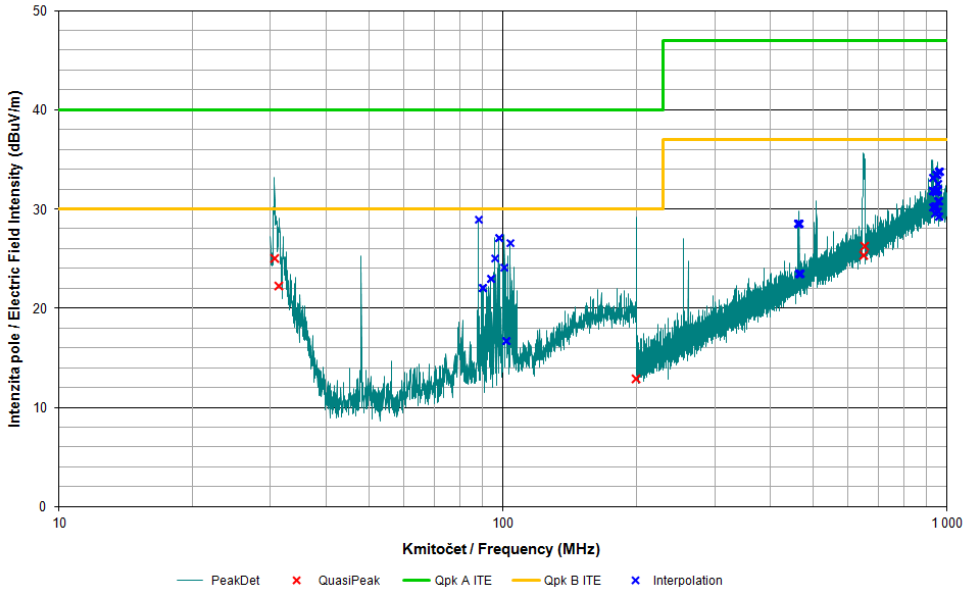
List of maximum values – horizontal polarization

Electromagnetic field measurement

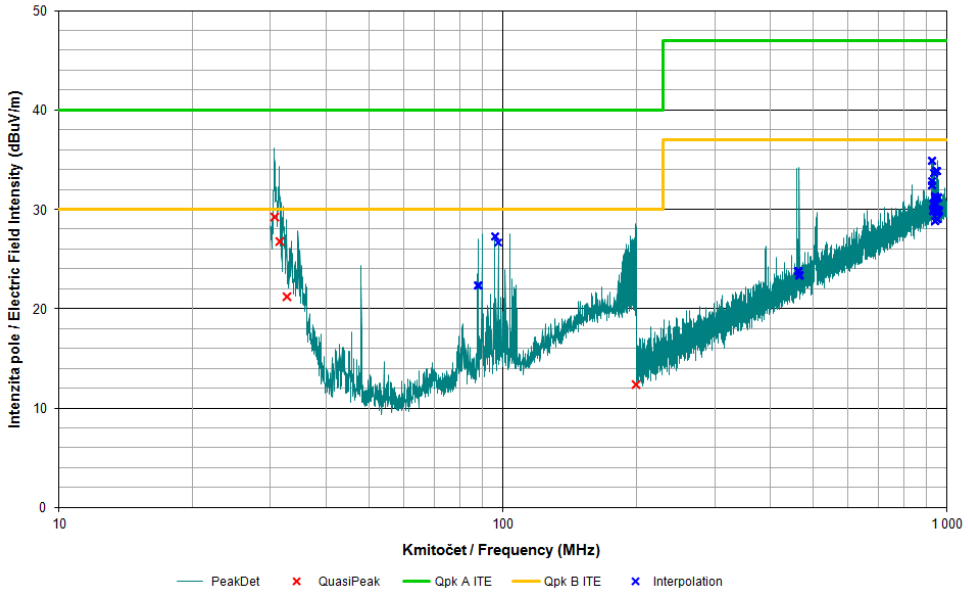
Frequency (MHz)	PeakDet (dBuV)	Frequency (MHz)	QpkDet (dBuV)
30,6	36,1	30,6	29,3
31,4	34,3	31,4	26,9
459,6	34,1	32,6	21,3
835,4	32,5	199,4	12,4
989,0	32,2	-	-
970,3	31,7	-	-
982,3	31,5	-	-
991,8	31,5	-	-
831,4	31,4	-	-
862,9	31,4	-	-

List of maximum values - vertical polarization

Electromagnetic field measurement - high frequency disturbance - unaccredited test CSN EN 55011 ed.3:2010 art. 8.3 / CSN EN 55022 ed.3:2011 art. 10	
Subject of test	GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.



Electromagnetic field frequency characteristic – horizontal polarization



Electromagnetic field frequency characteristic – vertical polarization

The uncertainty is determined by calculation, based on known interval of values on condition of uniform distribution input value. The calculation process is present either in document Test Laboratory Records - Measuring Uncertainty or in Calibration Certificate.

Uncertainty of electromagnetic field intensity measurement: $U_{epHM5014}$ = 5,0 dB (k = 2)

Test identification	Test sequence number	Date	Examined by
B.03	6	13. 3. 2013	Stastny

Result evaluation (interpretation): The intensity of electromagnetic field did not exceed limit values according to CSN EN 55022 ed.3 for class A and class B. The result is in accordance with requirements of standard CSN ETSI EN 301 489-1 v1.9.2.

Electromagnetic field intensity measurement (high-frequency disturbance) for frequency over 1 GHz - unaccredited test

Test standard: CSN EN 55022 ed.3:2011 art. 10
Test equipment: Spectral analyzer FSP 7, No. B-4.1-027
Log-periodical antenna LP 02, No. B-4.1-026b
Software (Fsp)7_ep_e.xls
Coupling path: Electromagnetic
Frequency range: 1000 to 3000 MHz
Bandwidth: 1 MHz
Detector: Peak, average
Note: The test was made in the non-shielding room. The electromagnetic field intensity for frequencies, for which the ambient electromagnetic field exceeds limit value, were based by the interpolation of two adjacent values. Interpolated values are marked by blue mark "**X**".

Electromagnetic field measurement - high frequency disturbance - unaccredited test
CSN EN 55022 ed.3:2011 art. 10

Subject of test	GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.

Electromagnetic field measurement

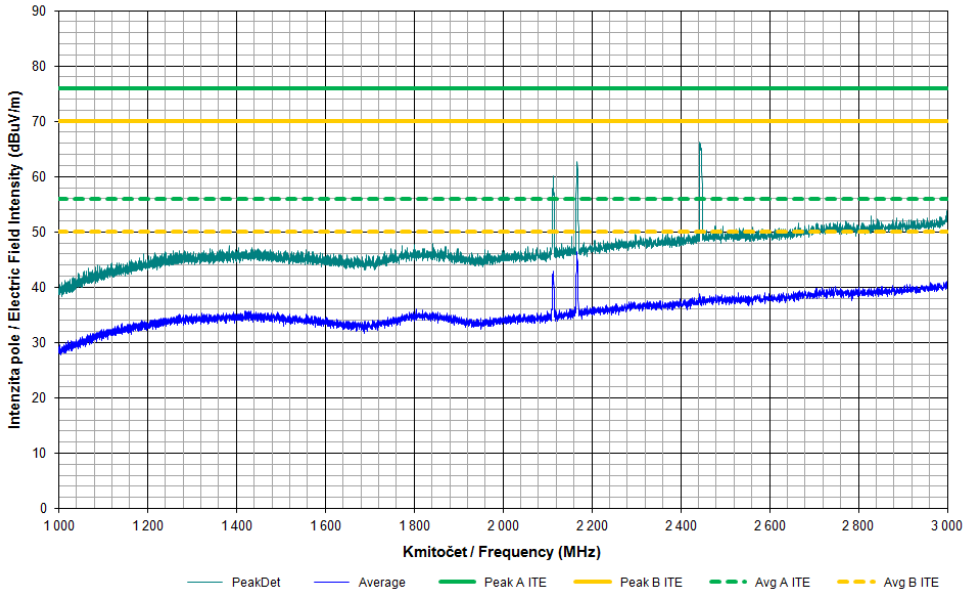
Frequency (MHz)	PeakDet (dBuV)	Frequency (MHz)	AvgkDet (dBuV)
2443,3	66,1	2443,3	50,9
2165,8	62,7	2165,8	48,1
2113,5	60,1	2113,5	46,4
2998,4	53,8	2998,4	42,3
2829,2	52,9	2975,4	41,9
2986,0	52,7	2986,0	41,8
2886,5	52,6	2955,4	41,7
2955,4	52,5	2932,8	41,7
2900,0	52,4	2965,6	41,6
2932,8	52,4	2829,2	41,6

List of maximum values – horizontal polarization

Electromagnetic field measurement

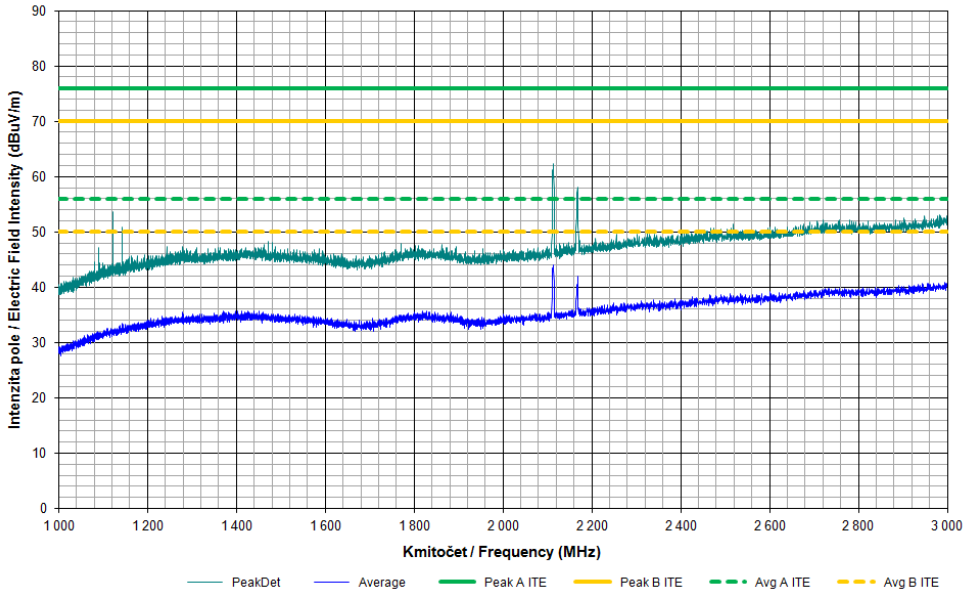
Frequency (MHz)	PeakDet (dBuV)	Frequency (MHz)	AvgkDet (dBuV)
2113,2	62,3	2113,2	47,9
2167,6	58,0	2167,6	44,3
1121,8	53,6	2998,4	42,0
2982,3	53,0	2982,3	41,9
2948,9	53,0	2948,9	41,6
2998,4	53,0	2935,2	41,6
2902,7	52,6	2963,2	41,5
2927,2	52,4	2902,7	41,5
2963,2	52,4	2927,2	41,5
2968,4	52,3	2882,9	41,5

List of maximum values - vertical polarization



Electromagnetic field frequency characteristic – horizontal polarization

Electromagnetic field measurement - high frequency disturbance - unaccredited test CSN EN 55022 ed.3:2011 art. 10	
Subject of test	GSM Desktop Phone GDP-06, manufacturer JABLOCOM s.r.o.



Electromagnetic field frequency characteristic – vertical polarization

The uncertainty is determined by calculation, based on known interval of values on condition of uniform distribution input value. The calculation process is present either in document Test Laboratory Records - Measuring Uncertainty or in Calibration Certificate.

Uncertainty of electromagnetic field intensity measurement: $U_{epHM5014}$ = 5,0 dB (k = 2)

Test identification	Test sequence number	Date	Examined by
B.03	6	13. 3. 2013	Stastny

Result evaluation (interpretation): The intensity of electromagnetic field did not exceed limit values according to CSN EN 55022 ed.3 for class A and class B. The result is in accordance with requirements of standard CSN ETSI EN 301 489-1 v1.9.2.