

# RADIO TEST REPORT ETSI EN 300 220-1 V2.4.1(2012-05) ETSI EN 300 220-2 V2.4.1(2012-05)

Product : Ajax SpaceControl Trade Name : AJAX Model Name : Ajax SpaceControl Serial Model : N/A Report No. : NTEK- 2016NT05246039R

# Prepared for

Ajax Systems Inc

910 Foulk Rd., Wilmington, DE 19803, United States

# Prepared by

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# TEST RESULT CERTIFICATION

Applicant's name:	Ajax Systems Inc
Address:	910 Foulk Rd., Wilmington, DE 19803, United States
Manufacture's Name:	"Research and Production Enterprise "Ajax"LLC
Address:	5, Sklyarenko, Kyiv04073, Ukraine.

# Product description

Product name	Ajax SpaceControl
Trademark	XVIV
Model and/or type reference	Ajax SpaceControl
Serial Model :	N/A

Rating(s) ..... DC 3.0V

Standards .....

EN 300 220-1 V2.4.1: 2012-05 EN 300 220-2 V2.4.1: 2012-05

This device described above has been tested by Shenzhen NTEK, and the test results show that the equipment under test (EUT) is in compliance with the of article 3.2 of the Directive 1999/5/EC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test

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Date of Issue 14 June 2016

Testing Engineer

Jack Li)

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Authorized Signatory

(Sam Chen)

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# 1. Summary Of Test Results

Test procedures according to the technical standards: ETSI EN 300 220-1 V2.4.1 (2012-05)

ETSI EN 300 220-2 V2.4.1 (2012-05)

Clause	Description of Test Item	Results(Pass/Fail)	N.T(Not Test)
2	Transmitter Parar	neters 🖉 🔬	5 5 6
7.1	Frequency error and frequency drift	* * *	N.T.
7.2	Average power	Pass	
7.3	Effective radiated power	at at at	N.T L
7.4	Spread spectrum modulation		N.T
7.5	Transient power	Pass	2 2 4
7.6	Adjacent channel power		N.T
7.7	Modulation bandwidth	Pass	5 5 6
7.8	spurious emissions	Pass	4.4
7.9	Frequency stability under low-voltage conditions	Pass	2 2 2
7.10	Duty cycle		N.T
7.11	Time-out-timer	2 2 2	NT
4. 4	Receiver Param	eters	A A
8.1	Receiver sensitivity	1 2 Z	NT C
8.2	Receiver LBT threshold	x x x	N.T
8.3	Adjacent channel selectivity	ST ST ST	N.T
8.4	Blocking	Pass -	* *
8.5	Spurious response rejection		N.T
8.6	Receiver spurious radiation	Pass	+ +



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1.1 Test Facility

NTEK Testing Technology Co., Ltd. Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China

FCC Registered No.: 791972 IC Registered No.: 9270A-1

CNAS Registration No.:L5516

1.2 Measurement Uncertainty

The reported uncertainty of measurement  $\mathbf{y} \pm \mathbf{U}$ , where expended uncertainty  $\mathbf{U}$  is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately 95 % ·

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB 💉 💉
2	RF power,conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions, radiated (>1G)	±4.89dB
6	Temperature	±0.5°C
7.0	Humidity A A	±2%

# 2. General Information

# 2.1 General Description Of EUT

-	* * *	* * * * * * * *						
	Equipment	Ajax SpaceControl						
	Brand Name	VIVX T T T T T T						
	Model Name.	Ajax SpaceControl						
	Serial Model	N/A						
	Model Difference	N/A A A A A A A						
		The EUT is Ajax SpaceControl						
		Operation Frequency: 868 MHz – 868.5MHz;						
		Channel number 3 Channels						
		Modulation Type:FM						
		Antenna Gain(Peak)						
	Product Description	Antenna Designation: Built-in Planar Inverted L-antenna						
		Power Rating DC 3.0V						
		Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.						
	Channel List	Refer to below						
	Adapter	N/A						
	Battery	DC 3.0V						
	Hardware Version (wireless module)	N/A to to to to to to						
	Hardware Version	N/A C C C C C C						
	Software Version	N/A A A A A A A						

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

	-	_				_			-
		Chann	ol				Frequency (MHz)		
1	A	Channe		X	A	~	(MHz)	A	~
	1 N	< 00	N	1	N	1	868.1	N	1
	7	<b>1</b> 0	7	1	7	7	868.3	7	7
X	X	02	X	Y	X	X	868.5	X	X
V		N.	A.	N.		N.			~



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2.2 Description Of Test Conditions

1.Block diagram of transmitter

2.2.1 Test Conditions and Channel

	Normal Test Conditions	Extreme Test Conditions
Temperature	15°C - 35°C	-10°C ~ 40°C Note: (1)
Relative Humidity	20% - 75%	N/A 🔨 🕴
Supply Voltage	AC 230V	AC 207-253V
Supply Voltage	DC 3.0V	DC 2.9-3.5V

E-1 Eut

# Note:

- (1) For tests at extreme temperatures, measurements shall be made in accordance with the procedures specified in clause 5.4.1.2, at the upper and lower temperatures of the range as follow: temperature: -10°C to +40°C;
- (2) For the Leclanché or lithium type battery: 0.85 times the nominal voltage of the battery; for the mercury or nickel-cadmium type of battery: 0.9 times the nominal voltage of the battery. In both cases, the upper extreme test voltage shall be 1.15 times the nominal voltage of the battery.
- (3) The measurements are performed at the highest, middle, lowest available channels.



# 2.3 Description Of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

2	77	7 7	<u> </u>	7 7 7	<u> </u>
Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-15	Ajax SpaceControl	XALA	Ajax SpaceControl	💉 N/A 🛛 🎽	~ ~
At	x x x	x x	x x x	x x	A
1	ST ST.	S S	si si si	Si Si S	× 3
At .	x x x	x x	* * *	x x	A
1		S S	STV STV STV	5 5 5	Y S
× `	x x x		x x x	x x	x `
					<u> </u>
Item	Shielded Type	Ferrite Core	Length	Note	
St.					4
1		5 2	2 2 2	1 1 1	-
1×	t t t	t t	t t t	* *	A
1 2	·	5° 2°	2 2 2	5 5 3	
At .	x x x	x x	t t t	x x	A
		XV XV		AV AV A	N A

# Note:

- (1)
- The support equipment was authorized by Declaration of Confirmation. For detachable type I/O cable should be specified the length in cm in <sup>C</sup>Length <sub>2</sub> column. (2)

# Ariet Ariet NTEK

		TEK		Pa	age 11 of 45	Report	No.: NTEK-20	16NT05246039
1	2.4 E	iquipments Li	st For All Tes	t Items		* *	4 7	
110	Item	Kind of Equipment	Manufactur er	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
10	at 1	Spectrum Analyzer	Agilent	E4407B	160400005	2015.07.06	2016.07.05	1 year
	2	Test Receiver	R&S	ESPI	101318	2015.07.06	2016.07.05	1 year
11.	3	Bilog Antenna	TESEQ	CBL6111D	31216	2015.07.06	2016.07.05	1 year
	4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.07.06	2016.07.05	1 year
	5	Spectrum Analyzer	ADVANTES T	R3132	150900201	2015.07.06	2016.07.05	1 year
~	6	Horn Antenna	EM	EM-AH-20 180	2011071402	2015.07.06	2016.07.05	1 year
	7	N N	Schwarzbec k	9170	9170-181	2015.07.06		1 year
110	8	Amplifier	SEM S	EM-30180	060538	2015.07.06	2016.07.05	1 year
	9	Loop Antenna	ARA	PLA-2030/ B	1029	2015.07.06	2016.07.05	1 year
100	10	Power Meter	R&S	NRVS	100696	2015.07.06	2016.07.05	1 year
1	11	Signal Generator	R&S	SMT 06	832080/007	2015.07.06	2016.07.05	1 year
1000	12	Temperatur e & Humitidy Chamber	GIANT FORCE	GTH-056P	GF-94454-1	2015.07.06	2016.07.05	1 year
	13	Power Sensor	R&S	URV5-Z4	0395.1619.05	2015.07.06	2016.07.05	1 year
14. 14. 1		stat stat	1 WHIT I	int with			1 Will Will Will	at with a
11.			STOR S				AND AN	
100		STOR ASTOR	AT A	A A		A AND	ATTE ATT	
100		STAT ASTA	AND A	A AN	AND AN	A AND	ATT AT	AND S
100		STOT ASTO	AT A	AT A	AND A	at white	ATTER AT	AND S
11.	AT &	Sigt Sigt	AND A	AT AN	T ATTER AN	et siet	with st	A AND &
	dt.	A 4	- dt	A 0	t dt	4 4	At 1	* *



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3. Frequency error and frequency drift

# 3.1 Applied procedures / limit

The frequency error and drift shall not exceed the values given in table 1 or 2 under normal and extreme conditions.

Table 1: Frequency error for systems with channel spacings of less than or equal to 25 kHz

	0		Freque	ency error limit	(kHz)	
5	Channelization	47 MHz	47 MHz to 137 MHz	137 MHz to 300 MHz	300 MHz to 500 MHz	500 MHz to 1000 MHz
ν.	Channelized systems	±10	±10	±10	±12	±12.5
	Note · For equir	ment having a	channel spaci	ng of 12 5 kHz	or less the f	requency error

Note : For equipment having a channel spacing of 12,5 kHz or less, the frequency error limit shall not exceed 50 % of the channel spacing.50 % of the channel spacing.

Table 2: Frequency error for all other systems

Operating frequency	Frequency error limit (ppm),seenote				
≤ 1 000 MHz	±100				

NOTE: The frequency error measured shall not exceed the designated frequency band.

# 3.2 Measuring Instruments and Setting

The following table is the setting of Spectrum Analyzer.

Spectrum Analyzer	Setting
Attenuation	10~20dB
Span Frequency	500kHz
RB	
VB	30 kHz
Detector	Peak
Trace	Peak 50 sweeps



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# 3.3 Test Procedures

a)Connected the antenna port to the Spectrum Analyzer via a Attenuator,

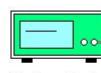
b)Set center frequency of spectrum analyzer = operating carrier frequency.

set the Spectrum Analyzer as below:

Resolution BW: 10 kHz Video BW: 30 kHz Span: 500 kHz

c)When the trace completed, find the peak value of the power envelope and record the frequency. The above procedure shall be performed at normal and extreme test conditions.d. The measurement shall be repeated at the lowest, the middle, and the highest channel of the stated frequency range. These measurements shall also be performed at normal and extreme test conditions.

# 3.4 Test Setup Layout



0 Spectrum Analayzer EUT OVEN

3.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.



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# 3.6 TEST RESULTS

EUT :	Ajax SpaceControl	Model Name :	Ajax SpaceControl
Temperature :	26°C	Relative Humidity :	
Pressure :	1012 hPa	Test Voltage :	N/A <
Test Mode :	N/A	- t t t	- A A A
		N & N	
Note: the equipm	nent is not capable of produc	ing an unmodulated carri	er.
2° 2'	2 2 2	2 2 2	2 2 2
* *	* * * *	- ~ ~ ~	· A A A
2 3		St St St	St St St
5. 4.	4. 4. 4.	5. 5. 5.	4. 4. 4.
t at a	t t t t	- at at at	t t t
12 12 N	N ST ST ST	ST ST ST	ST ST ST
the the	the the the the	- I I I I	- the the
5. 5	5 5 5	5 5 5	5. 5. 5
t at a			t t t
5 5	1 5° 5° 5°	5 5 5 St	J' J' J'
t t	x x x x	- 't 't 't	- t t t
		A LA LA	
4 4	4 4 4	4 4 4	2 2 2
5 5	2 2 2	2 2 2	L' L' L'
t	t t t t	- * * *	
4 4	4 4 4	4 4 4	2 2 2
L 2	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	L L L	2 2 2
* *	* * * *		* * * *
			N N N
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# 4. Average power (conducted)

4.1 Limits

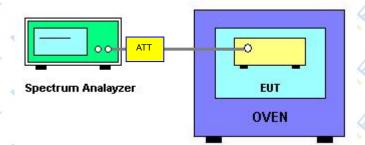
Under normal and extreme test conditions, the average output power (conducted) shall be less than or equal to the value given in table 3 for the respective frequency band, application, and channel spacing.

7 7	Table	3 ~ ~	7 7 7
Frequency Bands	Maximum radiated power, e.r.p. / power spectral density	Channel spacing	Spectrum access and mitigation requirement (e.g. Duty cycle or LBT + AFA)
863,000 MHz ~ 870,000 MHz	25 mW Power density is limited to -4,5 dBm/100 kHz	No requirement	0,1 % or LBT +
868,000 MHz ~868,600 MHz	25 mW	No requirement	1 % or LBT + AFA
869,400 MHz ~869,650 MHz	500 mW	<25 kHz The whole stated frequency band may be used as 1 wideband channel for high speed data transmission	10 % or LBT + AFA

# 4.2 Measuring Instruments and Setting

Spectrum Analyzer	Setting	
Attenuation	Auto A A A A	4
Center Frequency	The frequency which is transmitting	2
Detector	Average	
Sweep Time	Auto	4
RBW <	S100 kHz S S S S	5
VBW	≧RBW	

# 4.3 Test setup



# NTEK

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4.4 EUT Operation during Test The EUT was programmed to be in continuously transmitting mode.

# 4.5 TEST RESULTS

EUT :	Ajax SpaceControl	Model Name :	Ajax SpaceControl
Temperature :	26°C	Relative Humidity:	60 %
Pressure :	1012 hPa	Test Voltage :	DC 3.0V(NORMAL)
Test Mode :	TX CH00 🔝 🔬 🔬	12 2	5 2 2 3

# 868MHz~868.6MHz

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00010112 000.0				N.						-
5 5	EST CO	5 5	4	5	Total	e.i. <b>r.</b> p ( d	Bm)	5		
	ESTUC	NDITIONS			CH00	1				
T nom (°C)	20.00	V nom (V)	3.0	S.	9.37			AN OF	A. C.	1
T min (°C)	-10.00	V max (V)	3.5		9.33	2	2	2	2	2
1 1111 (-0)	-10.00	V min (V)	2.9		9.36	A CO		and the		
T max (°C)	40.00	V max (V)	3.5		9.32	2	2	2	7	2
	40.00	V min (V)	2.9		9.26		and the second s	and the	A. C.	1
* * *	Max RF Power					4	9.37	1	24	4
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# 5. Effective radiated power

5.1 Applied procedures / limit

The effective radiated power shall not exceed the values 25mW

# 5.2 Measuring Instruments and Setting

The following	table is	the setting	of the	nower meter
The following	lable 15	ule setting	or the	power meter.

The following table is the setting	ig of the power meter.						
< Spectrum Analyzer	Setting						
Attenuation	SAuto S	5	5	5	5	5	-
Start Frequency	25 MHz						
Stop Frequency	1000 MHz	A.	5	A.	S.	5	
Detector	Positive Peak	5	5	~	~		
Sweep Time	Auto						
RB/VB	100 kHz/100 kHz	4	5	5	5	5	
	NY NY NY	N.Y				N.Y.	

# 5.3 Test Procedures

EUT was placed on a 1.5m outdoor wooden table. The search antenna is placed at 3m distances from the EUT and search antenna height is from 1-4m. With the transmitter operating at continuously mode, the turntable was slowly rotated to locate the direction of maximum emission. Once maximum direction is determined, the search antenna was raised and lowered in both vertical and horizontal polarizations.

The EUT was removed from the turntable and replaced with a linearly polarized antenna connected to a calibrated RF signal generator. The RF generator was set to a measured emission frequency and the search antenna was raised and lowered to produced a maximum received reading. The generator output was increased to match the radiated emission reading measured previously, and the result expressed in dB E.I.R.P. or ERP.



and

Receiver

Coaxial Cable

1.5 m

5.5 EUT Operation during Test

Ground Plane

The EUT was programmed to be in continuously transmitting mode.

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# RAVER ANTER 5.6 TEST RESULTS

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Υ,	5.6 TES		TS	r.tt	P. At	P. Et	- at	T at	T.At	T.At	T.At	7
5	EUT :		Ajax Spac	ceContro		Mod	el Name	<del>)</del> :	Ajax Sp	aceCont	rol	
7	Temper		26°C	A.			tive Hur		60 %	4	4	
5	Pressur		1012 hPa	5	5	< Test	Voltage	:	N/A	5	2	~
F	Test Mo	ode :	N/A	A	A	A	A	A	A	A	A	_
	st st	S' S'	Sil	Siv	SIV	STV .	Siv	Siv	Siv	SIV	SIV	S
F	t.	t A	tit	t	t	· t	t	· t	t	· t	A	
	Nº S	I Store	S.C.	S	Star	Star	S.C.	S.C.	S.C.	S	Sil	3
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7				A.	A.C.	A.	A.C.	enter a	N. C.	N.	A.C.	20
L		L T		7.1	7.1	Z L	7 .L	7 .L	5.1	5.1	5	5
				A.C.	A.	A. C.	a la	a la	1	A.	a la	1
5		4	~	2	2	2	~	7	2	2	2	4
5		T S		A.	A		A.	A.		A.		
5	5	4	2	4	4	2	4	2	4	4	2	2
5	AT .	1 A		4	A	1	4	4	1	1	4	
5		~	4	5	-5	5	~	~	5	5	~	~
F	at .	t .0	t st	t	At	at	A	t	A	t	at the	-
<			L	2	2ª	S.	2ª	2ª	2ª	2	L	2
F	x	t a	t At	A	A	A	A	A	A	A	A	
	\$` _S	× 5°	LIN	SIV	SIV	Str.	SIV	25'V	SIV	Siv	Siv	S
Ţ		* *	t x	A	×	A	X	A	A	A	A	-
	s s	ST ST	Silv	SIV	Sil	STV .	SIV	SIL	SIV	SIL	SIL	5
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		S S	St	SIV	Ster	S.Y	SIL	Sil	SIV	SIL	Sil	S
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<				5	2	5	5	5	2	2	2	~
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	t.	t a	t at	t	At	tet	t	A	.tt	t	T.	



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- 6. Frequency stability under low voltage conditions
  - 6.1 Applied procedures / limit

This test is for battery operated equipment only.

- The equipment shall either:
  - a) remain on channel, for channelized equipment within the limits stated in clause 5.1.1, or within the assigned operating frequency band, for non-channelized equipment, whilst the radiated or conducted power is greater than the spurious emission limits; or
  - b) the equipment cease to function below the providers declared operating voltage.
- 6.2 Measuring Instruments and Setting

	The following table is the settir	ig of Spectrum Analyzer.	5
	Spectrum Analyzer	Setting	
	Attenuation	10~20dB	
4	Span Frequency	500kHz	5
	RB	10 kHz	1
ĺ	VB	30 kHz	
4	Detector	Peak A A A A	
	Trace	Peak 50 sweeps	



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# 6.3 Test Procedures

a)Connected the antenna port to the Spectrum Analyzer via a Attenuator,

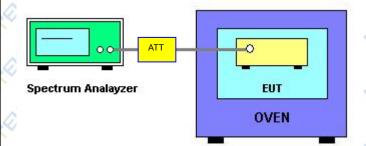
b)Set center frequency of spectrum analyzer = operating carrier frequency.

set the Spectrum Analyzer as below:

Resolution BW: 10 kHz Video BW: 30 kHz Span: 500 kHz

c)When the trace completed, find the peak value of the power envelope and record the frequency. The above procedure shall be performed at normal and extreme test conditions.d. The measurement shall be repeated at the lowest, the middle, and the highest channel of the stated frequency range. These measurements shall also be performed at normal and extreme test conditions.

# 6.4Test Setup Layout



# 6.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.



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# RANGE ANTER 6.6 TEST RESULTS

L the s	6.6 TEST RESUL	rs with with		T at	THE REAL	t r
4 4	EUT :	Ajax SpaceControl	Model Name	:	Ajax SpaceControl	1
	Temperature :	26 °C	Relative Hur	nidity:	60 %	7
~ ~	Pressure :	1012 hPa	S Test Voltage	:	DC 3.0V 🤶 💦 🧹	~
A	Test Mode :	TX CH1	x x x	A	tt	F
AND A	10 2 C	STO STO	athe athe athe	AT'	Lite Lite Lite	2
at	AC power	Conducted		Limits		

	aat Mada		
	est Mode :	TX CH1	
	2 2	2 2	21 21 21 21 21 21 21
A.	AC power Supplied (V) AC	Conducted Power	Limits
	3.0V	5.04dBm	a) Remain on channel, for channelized equipment within the
0	3.5V	2.18dBm	limits stated in clause 7.1.3, or within the assigned operating frequency band, for non-channelized equipment, whilst the
	2.9V	- 0.54dBm	radiated or conducted power is greater than the spurious emission limits; or
	≤1.6	No function	b) The equipment cease to function below the providers declared operating voltage.
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		the lat	
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	5 5	<u> </u>	

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7. Spurious emissions – Transmitter (25- 1000MHz)

# 7.1 Applied procedures / limit

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# 7.2 Measuring Instruments and Setting

# The following table is the setting of the Spectrum Analyzer.

( e		
	Spectrum Analyzer	Setting
ſ	Attenuation	
	Start Frequency	
4	Stop Frequency	1000 MHz
	Detector	Positive Peak
	Sweep Time	Auto de de de de de de
4	RB/VB	100 kHz/100 kHz

# 7.3 Test Procedures

- a. The EUT was placed on the top of the turntable in open test site area.
- b. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- c. This measurement shall be repeated with the transmitter in standby mode where applicable.
- d. For 30~1000MHz spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable.
- e. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
- f. Replace the EUT by standard antenna and feed the RF port by signal generator.
- g. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
- h. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).
- i. The level of the spurious emission is the power level of (8) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.
- j. If the level calculated in (9) is higher than limit by more than 6dB, then lower the RBW of the spectrum analyzer to 30KHz. If the level of this emission does not change by more than 2dB, then it is taken as narrowband emission, otherwise, wideband emission.
- k. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.

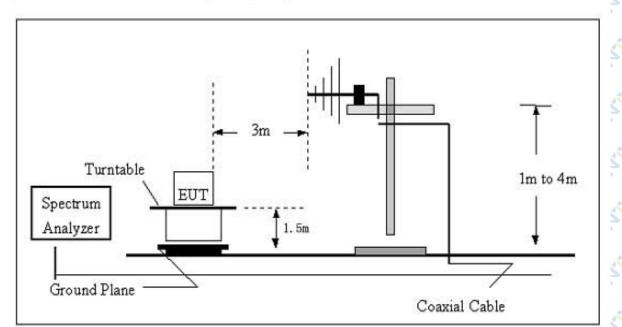


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7.4 Test Setup Layout

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



7.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

7.6 Results of Standby Mode Spurious Emissions

For the initial investigation on standby mode and receiving mode, no significant differences in spurious emissions were observed between these 2 modes. So test data for standby mode was omitted in this section.



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# 7.7 TEST RESULTS (25MHz ~ 1000MHz)

EUT :	Ajax SpaceControl	Model Name :	Ajax SpaceControl
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa 🤶 🔶 🤶	Test Power :	DC 3.0V
Test Mode :	TX + + +	x x x	* * *
Gi Gi Gi		li gi gi	di di di

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector		
(H/V)	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	Туре		
V	34.14	60.44	18.95	-79.73	-36.00	-43.73	peak		
V	173.20	40.31	12.51	-86.38	-36.00	-50.38	peak		
V	672.90	58.54	20.87	-76.10 🍝	-54.00	-22.10	peak		
V	902.56	39.39	24.09	-69.47	-36.00	-33.47	peak		
H	32.83	58.51	19.42	-79.31	-36.00	-43.31	peak		
Н	149.30	35.61 🔬	-5.17	-86.77 🔬	-36.00	-50.77	peak		
H	409.92	62.26	-10.82	-83.29	-36.00	-47.29	peak		
H	34.14	60.44	18.95	-79.73	-36.00	-43.73	peak		
Remark:   Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit									

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Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit



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8. Spurious emissions – Transmitter (Above 1000MHZ)

# 8.1 Applied procedures / limit

		47 MHz to 74 MHz		
	State	87.5 MHz to 118 MHz	Other frequencies	Frequencies
	Sidle	174 MHz to 230 MHz	≤ 1 000 MHz	> 1 000 MHz
		470 MHz to 862 MHz		
	Operating	4 nW /-54dBm	250 nW/-36dBm	1 μW /-30dBm
F	Standby	2 nW /-57dBm 📈	2 nW /-57dBm	20 nW /-47dBm

# 8.2 Measuring Instruments and Setting

# The following table is the setting of the Spectrum Analyzer.

Spectrum Analyzer	Setting
Attenuation	Auto
Start Frequency	
Stop Frequency	10th carrier frequency
Detector	Positive Peak
Sweep Time	
RB / VB	1 MHz / 1 MHz

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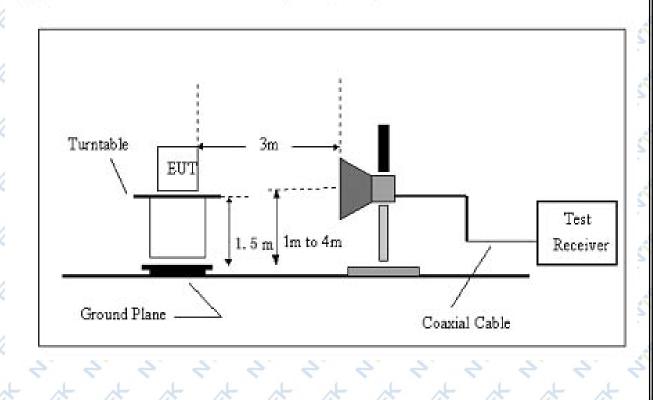
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## 8.3 Test Procedures

- a. The EUT was placed on the top of the turntable in open test site area.
- b. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- c. This measurement shall be repeated with the transmitter in standby mode where applicable.
- d. For 30~1000MHz spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable.
- e. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
- f. Replace the EUT by standard antenna and feed the RF port by signal generator.
- g. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
- h. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).
- i. The level of the spurious emission is the power level of (8) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.
- j. If the level calculated in (9) is higher than limit by more than 6dB, then lower the RBW of the spectrum analyzer to 30KHz. If the level of this emission does not change by more than 2dB, then it is taken as narrowband emission, otherwise, wideband emission.
- k. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.

## 8.4 Test Setup Layout

(B) Radiated Emission Test Set-Up Frequency Above 1 GHz





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8.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

8.6 Results of Standby Mode Spurious Emissions

For the initial investigation on standby mode and receiving mode, no significant differences in spurious emissions were observed between these mode. So test data for standby mode was omitted in this section.



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# 8.7 TEST RESULTS

	2 2	2 2 2 2	2 2	2 2 2 2
	EUT :	Ajax SpaceControl	Model Name :	Ajax SpaceControl
4	Temperature :	26°C	Relative Humidity :	53 %
	Pressure :	1012 hPa 🤝 🔍 🦿	Test Voltage :	DC 3.0V
	Test Mode :	TX	4 4 4	

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(H/V)	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	Туре
V	1736.78	60.44	3.14	-40.23	-30.00	-10.23	peak
V	2618.03	40.31	9.27 🔨	-40.91	-30.00	-10.91	peak
V	3469.91	58.54	8.61	-49.55	-30.00	-19.55	peak
V	9491.78	39.39	14.83	-47.70	-30.00	-17.70	peak
н	1736.78	58.51	3.45	-44.16	-30.00	-14.16	peak
H	2676.78	35.61	-5.17	-49.56	-30.00	-19.56	peak
H	4145.53	62.26	-10.82	-51.32	-30.00	-21.32	peak
H	10784.28	44.51	-10.82	-43.11	-30.00	-13.11	peak
Remark	c7 7		, 4	5 5	7	2	2

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Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

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# 9. Duty cycle

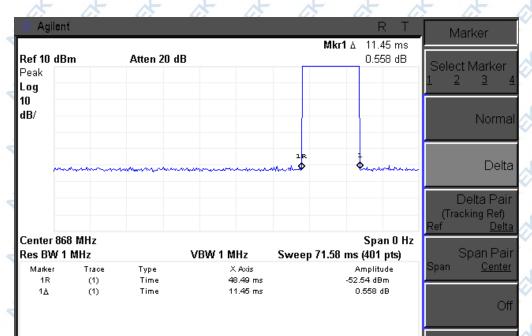
- 9.1 Applied procedures / limit
- In a period of 1 hour the duty cycle shall not exceed 1%

# 9.2 TEST RESULTS

Test Result

Duty Cycle	Limit	Result
$\leq 1\%_{Note}$	1%	Complies

Note: The result is that the customer claims that its prototype emission per hour less than 3144 times the number obtained.



# 10. Transient power

# 10.1 Applied procedures / limit

At all frequencies where the emission levels measured in step 1 exceed the spurious domain limits (clause 7.8.3), the power level measured in step 1 shall not exceed the power level measured in Step 2 by more than 3 dB.

# 10.2 Test Procedures

# Step 1

The transmitter shall be operated with powering on and off (e.g. by switching between active and standby state) at least 5 times within a maximum period of 60 seconds. The recommended powering on- and off-time is at least 1 s respectively. If other on- and off-times are used, this shall be stated in th test report.

The measured power level shall be recorded for the measurement period covering at least 5 powering on and off events for the measurement receiver setting above and below the wanted channel. If the resulting maximum power level in step 1 is above the spurious domain limit (clause 7.8.3), the second measurement step shall be performed.

## Step 2

In the second measurement, the procedure shall be repeated with the same settings of the measuring receiver, whereas

the transmitter shall be set on continuous transmission. If this is not possible, the measurements shall be carried out in a period shorter than the duration of the modulated transmitted burst.

The measured power level shall be recorded for the measurement period identical to the one in step 1 for the measurement receiver setting above and below the wanted channel.

Measurement step 1 shall be repeated within the spectrum mask every 120 kHz from the primarily adjusted point to both sides of the wanted frequencies, until either it is clearly ascertained that no powe increases or limit exceeding appear, or until the frequency offset to the wanted frequency exceeds 2 MHz.

10.3 Test Result



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AT .	EUT :	Ajax SpaceContro	ol Mode	el Name :	Ajax SpaceC	ontrol
5 3	Temperature :	26°C	Relat	tive Humidity:	53 %	5 5
int i	Pressure :	1012 hPa	Test \	Voltage :	DC 3.0V	at at
	Test Mode :	TX CH0	47 47	AT AT	A A	
4. 4	5 5	2 2	4 4 4	5. 4	4 4	4 4
t	FA A	t at at	to to	at at	At .	大大
4	Channel Spacing	Step 1	Step 2	∆(Step 1-Step2)	Limit	Results
X	(times)	(dBm)	(dBm)	dB	dB	(P/F)

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A.	4				A A	AT .	
4		Channel Spacing	Step 1	Step 2	∆(Step 1-Step2)	Limit	Results
	4	(times)	(dBm)	(dBm)	dB	dB	(P/F)
2 4		1(+100kHz)	4.183	4.368	-0.185	<ul><li>3 &lt;</li></ul>	PASS
A	0	2(+120kHz)		414	414	3	PASS
2 ×	F	BATA	L' L'	1 1 1 1		11° 11	~ ~ ~ ~
X		F +	t t t	t t	t t	x	t t

# FB

(times)     (dBm)     (dBm)     dB     dB     (P/F)       1(+100kHz)     -27.53     -28.55     1.02     3     PASS       2(+120kHz)     -37.37     -39.24     1.87     3     PASS       3(+240kHz)     /     /     /     /     PASS       4(+360kHz)     /     /     /     PASS		Channel Spacing	Step 1	Step 2	∆(Step 1-Step2)	Limit	Results
2(+120kHz)   -37.37   -39.24   1.87   3   PASS     3(+240kHz)   i   i   i   i   PASS     4(+360kHz)   i   i   i   PASS		(times)	(dBm)	(dBm)	dB	dB	(P/F)
3(+240kHz)   1   1   I   PASS     4(+360kHz)   1   1   1   PASS	1	1(+100kHz)	-27.53	-28.55	1.02	3	PASS
4(+360kHz)     /     /     /     /     /     /     /     PASS	At	2(+120kHz)		-39.24	1.87	3	
		A. A.				Nº X	
		4(+360kHz)	~/~		F	7 7	PASS
		A R	A R	A A	A A	R R	
	4	4 4	2 2	2 2 .	2 2	4 4	
	A.		AT AT				F JF
	2	2 2	5 5	2 2 .	2 2	2 2	4 4
	A.					AT &	
	<	4. 4.	4. 4.	4.4.	5. 5.	5. 5.	4. 4
	4				AT AT	AT &	* *
	Č.	4 4	4 4	4 4	2° 2°	2, 2,	2 4
	St.	本 本	to the	A A	to the	At &	t at
	2	2 2	2 2	2 2 .	2° 2°	<i>4 4</i>	~ ~
	d.	to to	t t	at at	t t	t t	t st
	-	L' L'		L. L.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	L. L.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
	t	at at	at at	A A	at at	t l	t st
	-	L. L.	L. L.	L. L.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	L L	
	t	at at	at at	at at	at at	at a	t at
	2	L' L'	25 25	L' L'	2° 2°	25 25	
	A	at at	at at	at at	at at	at a	t at
	1 the	SIV SIV	ST ST	L' L'	ST ST	1 <sup>1</sup> 1	ST &
		x x	A A	x x	XX	1 th	* *
	5		~ ~	5 5	5 5	5 5	
* * * * * * * * * * * *	t	at at	A A	THE A			* [dt]



# 11. Adjacent channel power

11.1 Applied procedures / limit

These measurements are applicable to narrowband systems.

# Adjacent channel power limits applicable to narrowband systems

* * * *	Channel separation < 20 kHz	Channel separation ≥ 20 kHz				
Normal test conditions	10 µW 💉 🔮	200 nW				
Extreme test conditions 32 µW 640 nW						
NOTE: These limits also apply to spread spectrum equipment.						

# 11.2 Test Procedures

- a) The transmitter shall be operated at the carrier power determined under normal test conditions.
  - The output of the transmitter shall be linked to the input of the "receiver" by a connecting device such that the impedancepresented to the transmitter is 50  $\Omega$  and the level at the "receiver input" is appropriate
- b) With the transmitter unmodulated, the tuning of the "receiver" shall be adjusted so that a maximum response is obtained. This is the 0 dB response point. The "receiver" attenuator setting and the reading of the meter shall be recorded. If an unmodulated carrier cannot be obtained, then the measurement shall be made with the transmitter modulated with the normal test signal as appropriate, in which case this fact shall be recorded in test reports.
- c) The transmitter shall be modulated by a normal test signal as appropriate.
- d) The "receiver" variable attenuator shall be adjusted to obtain the same meter reading as in step b), or a known relation to it.
- e) The ratio of the adjacent channel power to the carrier power is the difference between the attenuator settings in steps b) and d), corrected for any differences in the reading of the meter.



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# 11.3 Test Result

			A I						
EU.	Т:	Ajax SpaceControl	N N	Model Name	:	Ajax Sp	aceCont	rol	1
Ten	nperature :	26°C		Relative Hum	nidity :	53 %			
Pre	ssure :	1012 hPa 🛛 💉		Test Voltage	:	N/A		A.	4
Tes	t Mode :	N/A	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	2	~	~	2	2	2

# 12. Modulation bandwidth

# 12.1 Applied procedures / limit

Emission Limits of the modulated signal							
Reference Bandwidth (RBW)		Lower envelope point minimum frequency	Upper envelope point maximum frequency				
1 kHz	1 uW	fe, lower	fe, upper				
1 kHz	250 nW	(fe, lower - 200 kHz)	(fe, upper + 200 kHz)				
🔨 10 kHz 🛛 🔨	250 nW	(fe, lower - 400 kHz)	(fe, upper + 400 kHz)				
100 kHz	250 nW	(fe, lower - 1 000 kHz)	(fe, upper + 1000kHz)				

In table , fe, lower and fe, upper are the lower and upper edges of the band in which the equipment operates.

# 12.2 Measuring Instruments and Setting

47 47 47	
Spectrum Analyzer	Setting
Attenuation	Auto
Detector	Positive Peak
Sweep Time <	Auto
RB	1KHZ, 10KHz, 100KHz
VB	3RB

12.3 Test Procedures In clauses 7.2 or 7.3

12.4 Test Result



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EUT :	Ajax SpaceControl	Model Name :	Ajax SpaceControl
Temperature :	26°C	Relative Humidity :	53 %
Pressure :	1012 hPa	Test Voltage :	DC 3.0V
Test Mode :	TX CH0 🔶 🦂 🦂	2 2	2 2 2 2

Test Conditions : TNVN

Upper envelope point maximum frequency	Max Vaule (dBm)	Limit	Reference Bandwidth (RBW)	Result
(fe, upper + 200 kHz)	-32.27	-30dBm	KHz K	PASS 🔨
(fe, upper + 400 kHz)	-50.10	-36dBm	10KHz	PASS
(fe, upper + 1 000 kHz)	-49.85	-36dBm	100KHz	PASS 🔨
> (fe, upper + 1 000 kHz)	-46.75	-36dBm	100KHz	PASS

Lower envelope point minimum frequency	Max Vaule (dBm)	Limit	Reference Bandwidth (RBW)	Result
(fe, lower - 200 kHz)	-32.73	-30dBm	1KHz	PASS
(fe, lower - 400 kHz)	-51.9	-36dBm	10KHz	PASS
(fe, lower - 1 000 kHz)	-50.44	-36dBm	100KHz	PASS
< (fe, lower - 1 000 kHz)	-47.31	-36dBm	100KHz	PASS

THV						0
A. A.	Upper envelope point maximum frequency	Max Vaule (dBm)	Limit	Reference Bandwidth (RBW)	Result	4
*	(fe, upper + 200 kHz)	-32.95	-30dBm	1KHz	PASS	ł
Λ.	(fe, upper + 400 kHz)	-52.57	-36dBm	10KHz	PASS	
*	(fe, upper + 1 000 kHz)	-49.67	-36dBm	100KHz	PASS	t
	> (fe, upper + 1 000 kHz)	-46.12	-36dBm	100KHz	PASS	

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Lower envelope point minimum frequency	Max Vaule (dBm)	Limit	Reference Bandwidth (RBW)	Result
(fe, lower - 200 kHz)	-32.69	-30dBm	1KHz	PASS
(fe, lower - 400 kHz)	-51.64	-36dBm	10KHz	PASS
(fe, lower - 1 000 kHz)	-50.84	-36dBm	100KHz	PASS
< (fe, lower - 1 000 kHz)	-46.58	-36dBm	100KHz	PASS

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5	< (fe, lower - 1 000 kHz)	-46.58	-36dBm	100KHz	FA00
TLV		2 2	2 2	2 2	2 2
4 4	Upper envelope point maximum frequency	Max Vaule (dBm)	Limit	Reference Bandwidth (RBW)	Result
	(fe, upper + 200 kHz)	-32.06	-30dBm	1KHz	PASS
A	(fe, upper + 400 kHz)	-52.89	-36dBm	10KHz	PASS
	(fe, upper + 1 000 kHz)	-49.91	-36dBm	100KHz	PASS S
A	> (fe, upper + 1 000 kHz)	-46.94	-36dBm	100KHz	PASS
				ALL ALL	

Lower envelope point minimum frequency	Max Vaule (dBm)	Limit	Reference Bandwidth (RBW)	Result
(fe, lower - 200 kHz)	-32.92	-30dBm	1KHz	PASS
(fe, lower - 400 kHz)	-51.01	-36dBm	10KHz	PASS
(fe, lower - 1 000 kHz)	-50.68	-36dBm	100KHz	PASS
< (fe, lower - 1 000 kHz)	-46.66	-36dBm	100KHz	PASS

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Max Vaule (dBm)	Limit	Reference Bandwidth (RBW)	Result
-32.79	-30dBm	1KHz	PASS
-52.51	-36dBm	10KHz	PASS
-49.68	-36dBm	100KHz	PASS
-47.04	-36dBm	100KHz	PASS
	(dBm) -32.79 -52.51 -49.68	(dBm)   Limit     -32.79   -30dBm     -52.51   -36dBm     -49.68   -36dBm	Max Vaule (dBm)LimitBandwidth (RBW)-32.79-30dBm1KHz-52.51-36dBm10KHz-49.68-36dBm100KHz

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Lower envelope point minimum frequency	Max Vaule (dBm)	Limit	Reference Bandwidth (RBW)	Result	.بل. بل
fe, lower - 200 kHz)	-33.09	-30dBm	1KHz	PASS	
fe, lower - 400 kHz)	-51.64	-36dBm	10KHz	PASS	Ļ
fe, lower - 1 000 kHz)	-50.58	-36dBm	100KHz	PASS	
< (fe, lower - 1 000 kHz)	-47.14	-36dBm	100KHz	PASS	Ļ
				<u> </u>	4

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Upper envelope point maximum frequency	Max Vaule (dBm)	Limit	Reference Bandwidth (RBW)	Result
(fe, upper + 200 kHz)	-32.26	-30dBm	1KHz	PASS
(fe, upper + 400 kHz)	-52.52	-36dBm	10KHz	PASS
(fe, upper + 1 000 kHz)	-49.91	-36dBm	100KHz	PASS
> (fe, upper + 1 000 kHz)	-47.29	-36dBm	100KHz	PASS

Lower envelope point minimum frequency	Max Vaule (dBm)	Limit	Reference Bandwidth (RBW)	Result
(fe, lower - 200 kHz)	-33.02	-30dBm	1KHz	PASS
(fe, lower - 400 kHz)	-51.64	-36dBm	10KHz	PASS
(fe, lower - 1 000 kHz)	-51.96	-36dBm	100KHz	PASS
< (fe, lower - 1 000 kHz)	-48.87	-36dBm	100KHz	PASS
5 5 5	2 2	5 5	L L	2 2
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	2 2	2 2	2 2	2 2
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5 5 5	5 5	2 2	L L	5 5
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stat stat stat	sitt sitt	sitt sitt	sitt sit	- sitt sit
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# 13 Receiver sensitivity

#### 13.1 Limit

Under normal test conditions, the value of the maximum usable sensitivity for a 25 kHz channel spacing equipment with a 16 kHz bandwidth shall not exceed +6 dB $\mu$ V emf for a 50  $\Omega$  receiver input mpedance. This corresponds to a receiver sensitivity of -107 dBm which shall not be exceeded. The limit for usable sensitivity for other receiver bandwidths than 16 kHz is given by:

 $S = +6 + 10\log \frac{BW}{16} dB\mu V emf$  $S_{P} = 10\log \frac{BW}{16} - 107 dBm$ 

#### where:

S is the sensitivity in dBµV emf;

 $S_P$  is the sensitivity in dBm;

BW is the receiver bandwidth in kHz. The receiver bandwidth is a declaration by the manufacturer.

declaration shall be stated in the test report.

13.2 Method of measurement with continuous bit streams The method please refer to the standard ETSI EN 300 220-1 V2.4.1: 2012-05 clause 8.1.2.

13.3 Method of measurement with messages The method please refer to the standard ETSI EN 300 220-1 V2.4.1: 2012-05 clause 8.1.3.



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# 14. Blocking

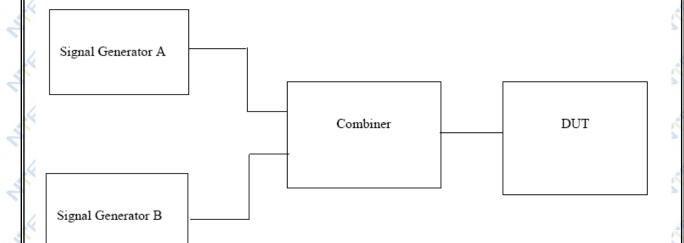
# 14.1 Applied procedures / limit

Receiver category	Frequency offset	Limit
	±2 MHz	≥84 dB -A (note 2)
2 $2$ $2$ $2$	±2 MHz	≥35 dB -A (note 2)
	±2 MHz	≥24 dB -A (note 2)
2 21 2 2	±10 MHz 🔶 🔶	≥84 dB -A (note 2)
1 12 1	±10 MHz	≥60 dB -A (note 2)
2 23 2 2	±10 MHz 🖉 🏑	≥44 dB -A (note 2)

NOTE 1: The limits apply also for the repeated tests in case of equipment using LBT or category 1 receivers, reduced by 13 dB or 40 dB, respectively, to account for the increased wanted signal level.

NOTE 2: A = 10 log (BWkHz / 16 kHz) BW is the receiver bandwidth.

# 14.2 Method of measurement



14.3 Test Procedures In clauses EN 300 220-1 8.4.2



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# 14.4 Test Result:

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6.7	4.4 Test Result: Receiver bandwidtl	h=788.59KHz	a ta ta	
	2 2	4 4 4 4	4.4.	4 4 4 4
2	EUT :	Ajax SpaceControl	Model Name :	Ajax SpaceControl
	Temperature :	26°C	Relative Humidity :	53 %
	Pressure :	1012 hPa	Test Voltage :	DC 3.0V
4	Test Mode :	RX 🖉 🖉 🦉		
	2 2	4 4 4 4	2 2	2 2 2 2

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Receiver category	Frequency	Reciever BW(kHz)	Measurement Vause(dB)	Limit(dB)
	-2 MHz	788.59	21.54	7.07
	+2 MHz	788.59	23.08	7.07
3	-10 MHz	788.59	34.57	27.07
	-10 MHz	788.59	36.91	27.07
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15. Spurious emissions – Receiver (30-1000MHz)

# 15.1 Applied procedures / limit

·.	i Applica pi				
-	Clause	Test Item	Frequency(MHz)	Limit	
		Spurious emissions 🔨	25-1000	-57dBm	S
	4.3.5	(radiated)	Above 1000	-47dBm	

# 15.2 Measuring Instruments and Setting

The following table is the setting of the Spectrum Analyzer.

Spectrum Analyzer	Setting
Attenuation	Auto
Start Frequency	25 MHz
Stop Frequency	1000 MHz
Detector	Positive Peak
Sweep Time	Auto
RB / VB	100 kHz/100 kHz

# 15.3 Test Procedures

- a. The EUT was placed on the top of the turntable in open test site area.
- b. The test shall be made in the receiving mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- c. For 30~1000MHz spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable.
- d. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
- e. Replace the EUT by standard antenna and feed the RF port by signal generator.
- f. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
- g. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).
- h. The level of the spurious emission is the power level of (7) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.
- i. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.

# 15.4 Test Setup Layout

This test setup layout is the same as that shown in section 5.1.3

# 15.5 EUT Operation during Test

The EUT was programmed to be in continuously receiving mode.



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# 15.6 TEST RESULTS (25MHz-1000MHz)

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-	15.6 TEST RESU	LTS (25MHz-1000MHz)	t set set	stet stet stet s
	EUT :	Ajax SpaceControl	Model Name :	Ajax SpaceControl
	Temperature :	26°C	Relative Humidity :	53 %
2	Pressure :	1012 hPa	Test Voltage :	DC 3.0V
	Test Mode :	RX	* * *	
11.	2 2	2 2 2 2 2	21 21	2 2 2 2

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Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detecto
(H/V)	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	Туре
V	37.17	60.44	17.31	-81.14	-57.00	-24.14	peak
V	175.01	40.31	12.42	-85.18	-57.00	-28.18	peak
V	331.45	58.54	13.60	-75.36	-57.00	-18.36	peak
Н	39.69	39.39	16.17	-79.40	-57.00	-22.40	peak
Н	336.09	58.51	13.75	-75.90	-57.00	-18.90	peak
ЧÇ	390.40	35.61	-5.17	-76.70	-57.00	-19.70	peak
Remar	k: 🖍 🔄	2 2 2	5 5	5 2	2 2	5	5
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2	5 2	5 5 2	5 5	5 2	5 5	5	2
			1	.L .L	L.	L	
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16. Spurious emissions – Receiver (above 1000MHz)

# 16.1 Applied procedures / limit

	Clause	Test Item	Frequency(MHz)	Limit	
	🔨 Spurious emissions 🔨	25-1000	-57dBm	Ś	
4.3.5		(narrowband)	Above 1000	-47dBm	

# 16.2 Measuring Instruments and Setting

Please refer to section 9.1.1 in this report. The following table is the setting of the Spectrum Analyzer.

Spectrum Analyzer	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	12750 MHz
Detector	Positive Peak
Sweep Time	Auto
RB / VB	1MHz / 1MHz

# 16.3 Test Procedures

- a. The EUT was placed on the top of the turntable in open test site area.
- b. The test shall be made in the receiving mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- c. For 30~1000MHz spurious emissions measurement, the broad band bi-log receiving antenna was placed 3 meters far away from the turntable.
- d. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
- e. Replace the EUT by standard antenna and feed the RF port by signal generator.
- f. Adjust the frequency of the signal generator to the suspected emission and slightly rotate the turntable to locate the position with maximum reading.
- g. Adjust the power level of the signal generator to reach the same reading with Read Level (Raw).
- h. The level of the spurious emission is the power level of (7) plus the gain of the standard antenna in dBi and minus the loss of the cable used between the signal generator and the standard antenna.
- i. The measurement shall be repeated at the lowest and the highest channel of the stated frequency range.

# 16.4 Test Setup Layout

This test setup layout is the same as that shown in section 6.1.3

16.5 EUT Operation during Test

The EUT was programmed to be in continuously receiving mode.



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16.6 TEST RESULTS (Above 1000MHz)

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EUT :	Ajax SpaceControl	Model Name :	Ajax SpaceControl
Temperature :	26°C	Relative Humidity :	53 %
Pressure :	1012 hPa 🧼 🔶 🤶	Test Voltage :	DC 3.0V 🔶 🚽 🚽
Test Mode :	RX	t t t	x x x

(H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	Туре
V	2970.53	60.44	8.96	-58.36	-47.00	-11.36	peak
V	6436.78	40.31 🔬	12.99	-57.48 🔬	-47.00	-10.48	peak
V	8463.66	58.54	15.69	-55.94	-47.00	-8.94	peak
V	10343.66	39.39	16.44	-55.89	-47.00	-8.89	peak
Н	2823.66	58.51 🗹	8.71	-59.73 🗹	-47.00	-12.73	peak
Н	6613.03	35.61	-5.17	-58.19	-47.00	-11.19	peak
H	7964.28	62.26	-10.82	-57.05	-47.00	-10.05	peak
H	10784.28	44.51	-10.82	-51.46	-47.00	-4.46	peak
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