# Test Report



Curtis-Straus LLC, a wholly owned subsidiary of BV CPS

Report No	ES1024-4
Client	ASSA ABLOY Inc.
Address	110 Sargent Drive New Haven, CT 06511
Phone	203-498-5686
Items tested FCC ID IC FRN	Aperio V3 iN100 U4A-SCYMCA1 6982A-SCYMCA1 0016550824
Equipment Type Equipment Code Emission Designator	Digital Transmission System DTS 2M77D1D
FCC/IC Rule Parts	CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2
Test Dates	1/7/2019 to 1/10/2019
Results	As detailed within this report
Prepared by	Arik Zwirner – Sr. EMC Engineer
Authorized by	Yunus Fazilogiu – Sr. EMC Engineer
Issue Date	2/25/2019
Conditions of Issue	This Test Report is issued subject to the conditions stated in the ' <i>Conditions of Testing</i> ' section on page 20 of this report.

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.





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Form Final Report REV 12-07-15



# Summary and Test Methodology

This test report supports an application for Class 2 Permissive Change for a transmitter

operating pursuant to:

CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2

EUT is the Aperio V3 iN100. It operates in the 2405MHz to 2475MHz frequency range.

All testing was performed according to the following rules/procedures/documents; CFR Title 47 FCC Part 15.247, ISED Canada RSS-247 Issue 2, ISED Canada RSS-Gen Issue 5, FCC KDB 558074 D01 15.247 Measurement Guidance v05 and ANSI C63.10-2013.

Radiated Emissions were maximized by rotating the device around its installation axes as well as varying the test antenna's height and polarity. EUT antenna is internal and cannot be maximized separately.

The EUT operating voltage is 9VDC from battery. Fresh batteries were used during testing. The environmental conditions during each test are detailed in the results tables for each section. Following bandwidths were used during radiated spurious and line conducted emissions testing.

Frequency	RBW	VBW
150kHz-30MHz	9kHz	30kHz
30MHz-1GHz	120kHz	1MHz
1-25GHz	1MHz	3MHz

EUT was tested for radiated spurious emissions and AC line conducted emissions and met the corresponding requirements. Test sample was received in good condition.





					EUT	Configuration									
Work	Order:	S1024				0									
Cor	npany:	Assa A	bloy												
Company A	ddress:	110 Sa	rgent Drive												
		New H	aven, CT 06	511											
С	ontact:	Steve M	Aorse												
				MN			PN			SN					
	EUT:		iN100 (with	New BT Modul	e)		iN100			1					
EUT Descr	ription:	Aperio	V3												
EUT Max Freq	uency:	2475 N	1Hz												
EUT Min Freq	uency:	0.032 N	MHz												
Support Equipment				M	N			SN							
AC/DC Brick				SYS1308-	2424-W2				SW-241	IPR					
Laptop computer				de	11										
Sargent 12V Supply				352	21				Sample	e 1					
Sargent 24V Supply				352	20				Sample	e 1					
Port Label	Port	Туре	# ports	# populated	cable type	shielded	ferrites	length (m)	in/out	under test	comment				
DC Power input	Powe	er DC	1	1	Power DC	No	No	10	in	yes	*not used for emissions. emissions done with battery power				
USB setup port	USB		1	1	USB	Yes	No	1	in	yes	*used to setup the radio power and channels				
Software Operating	Mode D	escriptio	n:												
Commands are given	to the EU	JT over U	JSB, setting	up the radio para	ameters. Then t	he laptop and us	sb are disconne	cted and the EU	Γ continues	operating ir	that mode until				
battery power is remo	oved.														

# **Product Tested - Configuration Documentation**

# Clock Frequencies frequencies (MHz) 2475, 48, 32, 27.12, 18, 16, 13.56, 8, 0.125, 0.1, 0.032768, 0.03216, 0.032

## Modifications Required for Compliance

None.





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# Test Results

# **Radiated Spurious Emissions**

## LIMITS

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a). [15.247(d)]

For the 2<sup>nd</sup> harmonic of the transmitter, duty-cycle correction factor was used to compute average values from peak values.

Worst Case 100ms duty-cycle is 13.75% (calculated from trace data via software) DCCF =  $20*\log(13.75/100) = -17.2$ dB

Agilen	t Spectrum /	Analyzer - Swe	ept SA								
(X/ RI Cen	ter Frec	resel 50 Ω	AC   10000 GH	łz		NSE:INT	Avg Type	ALIGN OFF : Log-Pwr	02:14:39 AM TRAC	1 Jan 10, 2019 E 1 2 3 4 5 6	Trace/Detector
40.45		.ef 400.00	PI IF(	NO: Fast ↔ Gain:Low	dtten:6 ¢	≥o dB			TYF De		Select Trace 1 ►
10 de Log	3/div R	er 100.00	αθμν								
90.0											Clear Write
00.0											
80.0											
70.0		++++			-						Trace Average
60.0											
50.0										TRIG LVL	Max Hold
40.0						ato a constant	4 10 10 10			L	Min Hold
30.0		anna ir ir argir i gal Lieni ir i sinaisi . Jaiki	i leje se per conjectori pi e con A la constanti all'antica di se constanti A la constanti all'antica di se constanti all'antica di se constanti A la constanti all'antica di se constanti all'antica di se constanti A la constanti all'antica di se constanti all'antica di se constanti A la constanti alla constanti alla constanti alla constanti alla constanti A la constanti alla constanti alla constanti alla constanti alla constanti alla constanti alla constanti alla constanti alla constanti alla constanti alla constanti alla constanti alla constanti alla constanti	and a state of the second s	rang saja sepaga pati pinan dinang sa	a na a la seconda da s Seconda da seconda da s	n se negenser er para av er Dis tersteringen in ser eine	ىدىرىدىغۇ جەمبىر مەربىدىيەت. 1. مەربار يەربى بەربىدىغىر بىلەر.	a ali e se de la calencia de la cale Esta de la calencia de	an an Maray ar Danganga an I	
20.0											View Blank Trace On
10.0											
											More
Cent	ter 2.440	1000000 G	Hz	#\/P\//	3.0 MH2			Sween	S	pan 0 Hz	1 of 3
MSG		1711 12		#VOV	5.0 191172			STATUS	1.000 5 (4	000 i proj	





Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance Top Peaks Horizontal 30-1000MHz Operator: AKZ Notes: ZigBee Channel 11 Work Order - S1024 EUT Power Input - Battery Test Site - CH-1 Conditions - 23°C; 21%RH; 1023mBar

#### Data Taken at 11:35:42 AM, Monday, January 07, 2019

Frequency (MHz)	Peak Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Lim1: FCC_pt15_1 09_Class_B (dBµV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: Cispr_Class _B (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
30.412	32	-7.7	24.2	40	-15.8	PASS		40.5	-16.3	PASS	-16.3	150	135
162.284	35.4	-15.9	19.5	43.5	-24.1	PASS		40.5	-21	PASS		250	45
946.189	32.3	-1.9	30.4	46	-15.6	PASS	-15.6	47.5	-17.1	PASS		200	270

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance Top Peaks Vertical 30-1000MHz Operator: AKZ Notes:

ZigBee Channel 11

Work Order - S1024 EUT Power Input - Battery Test Site - CH-1 Conditions - 23°C; 21%RH; 1023mBar

#### Data Taken at 11:35:42 AM, Monday, January 07, 2019

Frequency (MHz)	Peak Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBμV/m)	Lim1: FCC_pt15_1 09_Class_B (dBµV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: Cispr_Class _B (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	Turntable Azimuth (degrees)
30.388	33.2	-7.7	25.5	40	-14.5	PASS	-14.5	40.5	-15	PASS	-15	100	315
162.211	39.9	-15.9	23.9	43.5	-19.6	PASS		40.5	-16.6	PASS		100	225
165.267	38.7	-16.1	22.6	43.5	-20.9	PASS		40.5	-17.9	PASS		150	225
440.067	34.2	-10.2	24	46	-22	PASS		47.5	-23.5	PASS		100	180
920.46	32.3	-2.1	30.2	46	-15.8	PASS		47.5	-17.3	PASS		100	270
985.111	31.8	-1.3	30.5	54	-23.5	PASS		47.5	-17	PASS		200	225

30-1000MHz Low channel





February 28, 2019

Curtis Straus - a Bureau Veritas Company
Radiated Emissions Electric Field 3m Distance
Top Peaks Horizontal 30-1000MHz
Operator: AKZ
Notes:
ZigBee Channel 18

Work Order - S1024 EUT Power Input - Battery Test Site - CH-1 Conditions - 23°C; 21%RH; 1023mBar

#### Data Taken at 02:45:20 PM, Monday, January 07, 2019

Data Tante			iaa,,, sanac	., ., .,									
Frequency (MHz)	Peak Reading (dBuV)	Correction Factor (dB/m)	Adjusted Peak Amplitude	Lim1: FCC_pt15_1 09_Class_B (dBuV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: Cispr_Class _B (dBuV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
(14112)	(ubµv)	(ub/iii)	(00µ0/11)	(00µ1/11)	(ub)	(rass/ran)	(ub)	(00µ4/11)	(ub)	(rass/ran)	(ub)	(cm)	(uegrees)
30.267	32.4	-7.6	24.8	40	-15.2	PASS	-15.2	40.5	-15.7	PASS	-15.7	150	90
127.194	32.9	-14.2	18.7	43.5	-24.8	PASS		40.5	-21.8	PASS		250	0
959.721	32	-1.9	30.1	46	-16	PASS		47.5	-17.4	PASS		250	270

Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance Top Peaks Vertical 30-1000MHz Operator: AKZ Notes: ZigBee Channel 18

Work Order - S1024 EUT Power Input - Battery Test Site - CH-1 Conditions - 23°C; 21%RH; 1023mBar

#### Data Taken at 02:45:19 PM, Monday, January 07, 2019

Frequency (MHz)	Peak Reading (dBμV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Lim1: FCC_pt15_1 09_Class_B (dBµV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: Cispr_Class _B (dBµV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	Turntable Azimuth (degrees)
30.703	32.8	-8	24.8	40	-15.2	PASS	-15.2	40.5	-15.7	PASS	-15.7	100	180
162.09	39	-15.9	23.1	43.5	-20.5	PASS		40.5	-17.4	PASS		150	225
165.315	39.8	-16.1	23.7	43.5	-19.9	PASS		40.5	-16.8	PASS		100	225
554.431	33.6	-8.2	25.3	46	-20.7	PASS		47.5	-22.2	PASS		200	315
695.371	33.7	-5.9	27.8	46	-18.2	PASS		47.5	-19.7	PASS		150	180
927.371	32.4	-2	30.4	46	-15.7	PASS		47.5	-17.1	PASS		200	315

30-1000MHz Middle channel





Curtis Stra Radiated E	ius - a Bure Emissions E	au Veritas Iectric Fiel	Company d 3m Dista	nce		Work Orde	er - S1024 r Input - Ba	attery						
Top Peaks	Horizontal	30-1000M	Hz			Test Site -	CH-1							
Operator:	AKZ					Conditions	s - 23°C; 21	%RH; 1023r	nBar					
Notes:														
ZigBee Ch	annel 25													
Data Takei	n at 03:38:2	1 PM, Mon	iday, Janua	ry 07, 2019										
Frequency (MHz)	Peak Reading (dBuV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBuV/m)	Lim1: FCC_pt15_1 09_Class_B (dBuV/m)	Lim1 Margin (dB)	Lim1 Test Results (Pass/Fail)	Worst Margin Lim1 (dB)	Lim2: Cispr_Class _B (dBuV/m)	Lim2 Margin (dB)	Lim2 Test Results (Pass/Fail)	Worst Margin Lim2 (dB)	Antenna Height (cm)	EUT Azimuth (degrees)	
30.461	32.4	-7.8	24.6	40	-15.4	PASS	-15.4	40.5	-15.9	PASS	-15.9	250	225	
133.548	33.4	-14.4	18.9	43.5	-24.6	PASS		40.5	-21.6	PASS		250	0	
162.308	36.4	-15.9	20.5	43.5	-23	PASS		40.5	-20	PASS		200	45	
921.115	31.9	-2.1	29.8	46	-16.2	PASS		47.5	-17.7	PASS		200	135	
972.112	32.2	-1.7	30.5	54	-23.4	PASS		47.5	-17	PASS		150	270	
Curtis Stra	us - a Bure	au Veritas	Company			Work Orde	er - S1024							
Radiated E	Emissions E	lectric Fiel	d 3m Dista	nce		EUT Power	r Input - Ba	attery						
Top Peaks	Vertical 30	0-1000MHz				Test Site -	CH-1							
Operator:	AKZ					Conditions	s - 23°C; 21	%RH; 1023r	nBar					
Notes:														
ZigBee Ch	annel 25													
Data Takei	n at 03:38:2	1 PM, Mon	iday, Janua	ry 07, 2019										
Frequency	Peak Reading	Correction Factor	Adjusted Peak Amplitude	Lim1: FCC_pt15_1 09_Class_B	Lim1 Margin	Lim1 Test Results	Worst Margin Lim1	Lim2: Cispr_Class _B	Lim2 Margin	Lim2 Test Results	Worst Margin Lim2	Antenna Height	Turntable Azimuth	
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)	
30.703	33.1	-8	25.1	40	-14.9	PASS	-14.9	40.5	-15.4	PASS	-15.4	150	315	
162.041	39.8	-15.9	23.9	43.5	-19.6	PASS		40.5	-16.6	PASS		100	225	
165.267	40.7	-16.1	24.6	43.5	-18.9	PASS		40.5	-15.9	PASS		150	225	
168.249	38.8	-16.3	22.5	43.5	-21	PASS		40.5	-18	PASS		100	225	
778.84	33	-4.2	28.7	46	-17.3	PASS		47.5	-18.8	PASS		100	0	
947.523	32.1	-1.9	30.2	46	-15.8	PASS 47.5 -17.3 PASS 100 180								

30-1000MHz High channel





Curtis Stra	ius - a Bure	au Veritas	Company	V	Vork Orde	r - S1024									
Radiated I	Emissions E	lectric Fiel	d 3m Distai	nce E	UT Power	Input - Ba	attery								
1-6GHz Ho	rizontal Da	ta		Т	est Site - C	CH-1									
Operator:	AKZ			C	onditions	- 24°C; 21	.%RH; 10	001mBar							
NULES. ZigBoo Ch	annel 11 B	I F Channe	10	г	CCE - 17 2	dB									
Ligbee en	unner 11, D	EL CHAINIC	115	L		ub									
Data Take	n at 11:20:1	7 AM, Wed	Inesday, Ja	nuary 09, 20	19										
			Adjusted	Pk Lim:						Adjusted	Av Lim:				
	Raw Peak	Correction	Peak	FCC_pt15_2	Peak	Peak	Worst Pe	eak		Avg	FCC_pt15_2	2		Antenna	
Frequency	Reading	Factor	Amplitude	09_Peak	Margin	Results	Margi	n DC	CF A	mplitude	09_Average	Avg Marg	in Avg Results	Height	EUT Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(d	B) (i	dBμV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)
Curtis Stra	is - a Burea	ı Veritas Co	mpany	74	Work	Order - S	1024	-17	.2	35.1	54	-14.5	17,55		
Radiated E	missions Ele	ectric Field	3m Distance	1	EUT F	Power Inp	ut - Batte	ery							
1-6GHz Vei	rtical Data				Test	Site - CH-2	1								
Operator:	AKZ				Cond	litions - 24	₽°C; 21%F	RH; 1001m	nBar						
Notes:	nnol 11 DU	Channel 1	0		0										
Zigbee Cild	inner 11, bli		9		0										
Data Taker	ata Taken at 11:20:17 AM, Wednesday, January 09, 2019														
	Raw Peak     Raw Avg     Correction     Peak     FCC     pt15     2     Peak     Worst Peak     Adjusted     Av Lim:														
Frequency	requency Reading Reading Factor Amplitude 09_Peak Margin Results Margin Amplitude 09_Peak Margin EUT Azimuth														
(MHz)	(dBµV)	(dBµV)	(dB/m) (di	BμV/m) (dBμ	V/m) (d	B) (Pas	s/Fail)	(dB)	(dBµV/m	) (dBμV	/m) (dB)	(Pass/I	ail) (dB)	(cm)	(degrees)
2122.4	44.5	35.4	-5	39.4 7	4 -34	4.6 P	ASS		30.4	54	-23.	5 PAS	S	275	71
4810	50.5	47.8	-1.3	49.2 7	4 -24	4.8 P	ASS	-24.8	46.5	54	-7.5	PAS	S -7.5	125	327
5481.3	42.2	32.7	1.1	43.3 7	4 -30	D.7 P	ASS		33.8	54	-20.	2 PAS	S	105	230
	1-6GHz Low Channel														
Curtis Stra	Curtis Straus - a Bureau Veritas Company Work Order - S1024														
Radiated I	Emissions E	lectric Fiel	d 3m Distai	nce E	UT Power	Input - Ba	attery								
1-6GHz Ho	rizontal Da	ta		Т	est Site - C	CH-1									
Operator:	AKZ			C	onditions	- 24°C; 21	1%RH; 10	001mBar							
Notes: ZigBoo Ch	annal 18 B	I E Channe	10		CCE: 17 3	dD									
Ligbee Ci	аппет 10, в	LE Channe	19	L	CCF: -17.2	ав									
Data Take	n at 01:16:0	5 PM, Wed	Inesday, Ja	nuary 09, 20	19										
			Adjusted	Pk Lim:						Adjusted	Av Lim:				
	Raw Peak	Correction	Peak	FCC_pt15_2	Peak	Peak	Worst Pe	eak		Avg	FCC_pt15_2	:		Antenna	
Frequency	Reading	Factor	Amplitude	09_Peak	Margin	Results	Margi	n DC	CF A	Amplitude	09_Average	Avg Marg	in Avg Results	Height	EUT Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(d	B) ((	dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(cm)	(degrees)
4880.1	59.4	-0.7	58.8	74	-15.2	PASS	-15.2	-1	/.2	41.6	54	-12.4	Pass	225	48
Curtis Str	aus - a Bur	eau verita	as Compan	У		Worl	(Order	- S1024							
Radiated	Emissions	Electric Fi	eid 3m Dis	stance		EUTI	ower i	приt - Ва	attery						
Тор Реак	s vertical .	L-6GHZ				Test	Site - Ci	H-1 24°C: 21	0/ 011. 1	1001 m D c					
Operator	: AKZ					Conc	ittions -	24°C; 21	1%KH; 1	LOOTUBS	ar				
Notes:	annal 10		ol 10												
Zigbee Ci	141111121 10,		19 19												
Data Take	on at 01·16	05 PM W	ednesdav	lanuary 00	2019										
	at 01.10		cancouay,		, 2015										
	Raw Pool	Correctio	Adjuster	Pk Lim:	2 Margin	to Pask	P Limit	eak Limit	Av Li	m: M	argin to	Average	Average	Antenna	FUT
Frequency	Reading	Factor	Amplitud	le 09_Peak	Peak Lir	nit Test R	esults	Margin	09_Ave	erage	Limit	Result	Margin	Height	Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/n	n) (dBµV/m	) (dB)	(Pass	/Fail)	(dB)	(dBµV	//m)	(dB) (	Pass/Fail)	(dB)	(cm)	(degrees)
2131.25	47.8	-5	42.8	74	-31.2	PA	SS		54	t ·	-11.2	PASS		300	47
4880			-		-										
	48.2	-0.7	47.6	74	-26.4	PA	SS		54	Ļ	-6.4	PASS		100	47
5762.75	48.2 47.2	-0.7 0.9	47.6 48	74 74	-26.4 -26	PA PA	ISS ISS	-26	54 54	L	-6.4 -6	PASS PASS	-6	100 200	47 146

-6GHz Mid Channel





Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 3m Distance 1-6GHz Horizontal Data Operator: AKZ Notes: Ziegeo Chappel 25, BLE Chappel 10,					Vork Order UT Power II est Site - CH conditions -	- S1024 nput - Bat I-1 24°C; 219	ttery %RH; 1001r	nBar							
ZigBee Cha Data Taker	annel 25, Bl n at 01:46:2	LE Channel 5 PM, Wed	19 nesday, Jar	נו 10 10 10 10 10 10 10 10 10 10 10 10 10 1	0CCF: -17.2d	В									
Frequency (MHz)	Raw Peak Reading (dBµV)	Correction Factor (dB/m)	Adjusted Peak Amplitude (dBµV/m)	Pk Lim: FCC_pt15_2 09_Peak (dBµV/m)	Peak Margin (dB) (F	Peak Results Pass/Fail)	Worst Peak Margin (dB)	DCCI (dB)	Adjust Avg F Amplite (dBμV/	ed Av FCC_i ude 09_A (m) (dBµ	Lim: ht15_2 verage V/m)	Avg Margin (dB)	Avg Result (Pass/Fail)	Antenna S Height (cm)	EUT Azimuth (degrees)
4950.1	58.2	-0.3	57.9	74	-16.1	PASS	-16.1	-17.2	2 40.7	7 5	4	-13.3	Pass	211	18
Radiated Top Peaks Operator: Notes: ZigBee Ch	Curtis Straus - a Bureau Veritas Company Work Order - S1024 tadiated Emissions Electric Field 3m Distance EUT Power Input - Battery op Peaks Vertical 1-6GHz Test Site - CH-1 Operator: AKZ Conditions - 24°C; 21%RH; 1001mBar Votes: ZigBee Channel 25, BLE Channel 19														
Frequency (MHz)	Raw Peak Reading (dBµV)	Correction Factor (dB/m)	Adjusteo Peak Amplitud (dBµV/m	Pk Lim: FCC_pt15 e 09_Peak ) (dBµV/m	_2 Margin to Peak Lim ) (dB)	D Peak L it Test Re (Pass/	Peak imit Wo sults Ma Fail) (d	Limit orst   rgin (  B)	Av Lim: FCC_pt15_2 09_Average (dBµV/m)	Margin t Average Limit (dB)	o Av Lin F (Pa	verage nit Test L Result ss/Fail)	Average imit Worst Margin (dB)	Antenna Height (cm)	EUT Azimuth (degrees)
2107.25	47.5	-5.2	42.3	74	-31.7	PAS	S		54	-11.7		PASS		100	315
2883.38	47.8	-3.2	44.6	74	-29.4	PAS	5		54	-9.4				200	315
4949 88	43.7	-1.3	44.4	74	-29.0	PAS PAS	S -2	4.2	54	-9.0		PASS	-4.2	100	315
5413.13	45.5	1.1         46.6         74         -27.4         PASS         -24.2         54         -7.4         PASS         -4.2         100         315													

1-6GHz High Channel





Curtis Straus - a Bureau Veritas Company						Work Order - S1024								
Radiated I	Emissions E	lectric Fiel	d 1m Dista	nce		EUT Power Input - Battery								
Top Peaks	Horizontal	6-18GHz				Test Site -	CH-1							
Operator:	AKZ					Condition	s - 24°C; 21	.%RH; 1001r	nBar					
Notes:														
ZigBee Ch	annel 11, B	LE Channe	l 19											
Data Take	n at 03:34:0	7 PM, Wed	dnesday, Ja	inuary 09, 2	019									
			Adjusted	Pk Lim:			Peak Limit	Av Lim:				Avg Limit		
	Raw Peak	Correction	Peak	FCC_pt15_2	Margin to	Peak Limit	Worst	FCC_pt15_2		Margin to	Avg Limit	Worst	Antenna	EUT
Frequency	Reading	Factor	Amplitude	09_Peak	Peak Limit	Test Results	Margin	09_Average	DCCF	Avg Limit	Test Results	Margin	Height	Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	-17.2dB	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
7215	60.1	5.1	65.1	83.5	-18.4	PASS	-18.4	63.5	-17.2	-15.6	PASS		200	22
7320.3	53.5	5	58.5	83.5	-25	PASS		63.5		-5	PASS		200	292
9620.1	54.3	6.8	61.1	83.5	-22.4	PASS		63.5		-2.4	PASS	-2.4	200	71
12024.9	50.7	9.4	60.1	83.5	-23.4	PASS		63.5		-3.4	PASS		200	47
14007.9	45.3	13.8	59.1	83.5	-24.4	PASS		63.5		-4.4	PASS		100	97
Curtis Stra	ius - a Bure	au Veritas	Company			Work Orde	er - S1024							
Radiated B	Emissions E	lectric Fiel	d 1m Dista	nce		EUT Powe	r Input - Ba	attery						
Top Peaks	Vertical 6-	18GHz				Test Site -	CH-1							
Operator:	AKZ					Condition	s - 24°C; 21	.%RH; 1001r	nBar					
Notes:														
ZigBee Ch	annel 11, B	LE Channe	l 19											
Data Take	n at 03:34:0	7 PM, Wed	dnesday, Ja	nuary 09, 2	019					-				
			Adjusted	Pk Lim:			Peak Limit	Av Lim:				Avg Limit		
	Raw Peak	Correction	Peak	FCC_pt15_2	Margin to	Peak Limit	Worst	FCC_pt15_2		Margin to	Avg Limit	Worst	Antenna	EUT
Frequency	Reading	Factor	Amplitude	09_Peak	Peak Limit	Test Results	Margin	09_Average	DCCF	Avg Limit	Test Results	Margin	Height	Azimuth
(MHz)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	-17.2dB	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
7215	62.3	5.1	67.3	83.5	-16.2	PASS	-16.2	63.5	-17.2	-13.4	PASS		175	0
7320.3	51.8	5	56.9	83.5	-26.6	PASS		63.5		-6.6	PASS		200	23
9620.1	53.9	6.8	60.7	83.5	-22.8	PASS		63.5		-2.8	PASS	-2.8	150	47
14376.3	46.9	13	59.9	83.5	-23.6	PASS		63.5		-3.6	PASS		150	195

6-18GHz Low Channel





Curtis Straus - a Bureau Veritas Company						Work Orde	er - S1024		Work Order - S1024							
Radiated E	Emissions E	lectric Fiel	d 1m Dista	nce		EUT Powe	r Input - Ba	attery								
Top Peaks	Horizonta	6-18GHz				Test Site -	CH-1									
Operator:	AKZ					Condition	s - 24°C; 21	%RH; 1001ı	nBar							
Notes:																
ZigBee Ch	annel 18, B	LE Channe	19													
Data Take	n at 04:34:3	84 PM, Wed	inesday, Ja	nuary 09, 2	019											
Frequency	Raw Peak Reading	Correction Factor	Adjusted Peak Amplitude	Pk Lim: FCC_pt15_2 09_Peak	Margin to Peak Limit (dB)	Peak Limit Test Results (Pass /Eail)	Peak Limit Worst Margin (dB)	Av Lim: FCC_pt15_2 09_Average	DCCF	Margin to Avg Limit	Avg Limit Test Results (Pass/Eail)	Avg Limit Worst Margin (dB)	Antenna Height	EUT Azimuth		
7320	62.1	(ub/iii) 5	(ασμν/m) 67.1	(ubµv/m) 83.5	-16.4	DASS	-16.4	(ubµv/iii) 63.5	-17.200	-13.6	DASS	(ub)	200	300		
9760.2	54.5	73	61.7	83.5	-21.8	DASS	10.4	63.5	17.2	-1.8	DASS	-1.8	200	55		
13971 3	46.4	13.5	59.8	83.5	-21.0	PASS		63.5		-1.0	PASS	-1.0	125	74		
Curtic Stra	HUC - 2 BURG	20.5	Company	05.5	25.7	Work Orde	or - \$1024	05.5		5.7	1765		125	74		
Padiated P	missions E	loctric Fiol	d 1m Dicta	200		ELIT Dowo	r Input Da	tton								
Ton Peaks	Vertical 6	18GH7		nee		Test Site -	CH_1	ittery								
Operator:		100112				Condition	c - 24°C· 21	% PH· 1001,	mBar							
Notes:	ANZ					conuntion	5 - 24 C, 21	/0111, 10011	IIDai							
ZigPoo Ch	annol 19 🛛	E Channa	1 10													
Data Takei	n at 04:34:3	34 PM, Wed	i 15 Inesday, Ja	nuary 09, 2	019											
			Adjusto	Dk Lim:			Dook Limit	Aulim				Auglimit				
Frequency (MHz)	Raw Peak Reading (dBµV)	Correction Factor (dB/m)	Peak Amplitude (dBµV/m)	FCC_pt15_2 09_Peak (dBµV/m)	Margin to Peak Limit (dB)	Peak Limit Test Results (Pass/Fail)	Worst Margin (dB)	FCC_pt15_2 09_Average (dBµV/m)	DCCF -17.2dB	Margin to Avg Limit (dB)	Avg Limit Test Results (Pass/Fail)	Worst Margin (dB)	Antenna Height (cm)	EUT Azimuth (degrees)		
7320	64	5	69	83.5	-14.5	PASS	-14.5	63.5	-17.2	-11.7	PASS		175	0		
9760.2	52.1	7.3	59.4	83.5	-24.1	PASS		63.5		-4.1	PASS		175	72		

6-18GHz Mid Channel

63.5

-4.1

PASS

-4.1

150

145



14257.8

46.3

13.1

59.4

83.5

-24.1

PASS



February 28, 2019

Notes:       Bigge Channel 25, BEC Channel 19         Data Taken at 09:59:41 AM, Thursday, January 10, 2019.         Frequency Reading Rea	Curtis Straus - a Bureau Veritas Company Radiated Emissions Electric Field 1m Distance 5-18GHz Horizontal Data Operator: AKZ						Work Order - S1024 EUT Power Input - Battery Test Site - CH-1 Conditions - 24°C: 21%RH: 1001mBar										
ZigBee Channel 29, BLE Channel 19         Data Taken at 09:59:41 AM, Thursday, January 10, 2019.         Frequency, Reak Reak Reak Reak Reak Reak Reak Reak	Notes:																
Data Taken at 09:59:41 AM, Thursday, January 10, 2019           Image: Reading Readin	ZigBee Cha	annel 25, BL	E Channe	l 19													
Data Taken at 09:59:41 AM, Thursday, January 10, 2019           Frequency Reading Reading Status         Adjusted PL Lim: (09:00)         Pask Te Wort Pesk Margin Reading Status         Ange Te Status																	
Data Taken at 09:59:41 AM, Thursday, January 10, 2019         Image: Reading																	
Construction         Construction         Adjusted Peak         Pk Lim: Peak         Peak Test Margin         Adjusted Peak Test Margin         Adjusted Peak Test Margin         Au Lim: Aug Margin         Aug Test Margin         Worst Aug Margin         Aug Test Margin         Worst Aug         Auterna         EUT           1785.0         34.2         19.8         62.7         83.5         -20.8         PASS         10.0         33.3           Curves Fault         Augusted         Four Margin         Four Margin         Four Margin         Four Margin         Four Margin	Data Taker	n at 09:59:41	LAM. Thu	rsdav. Janu	arv 10. 201	9											
Frequency Reading         Raw Peak Reading         Raw Arg Reading         Correction Factor         Adjusted (FC, pti 2, 2) (FC, pti 2, 2)         Peak Tet Naminuk         Worst Peak (Margin         Adjusted (FC, pti 2, 2)         Anginue (FC, pti 2, 2) <th< th=""><th>Bata raiter</th><th>1 41 05 15 51 1</th><th>27111) 1110</th><th>suuj, sune</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<>	Bata raiter	1 41 05 15 51 1	27111) 1110	suuj, sune													
Trequency Rad Fast Nation (etail products)       Treat Nation (etail products)       Peak (etail products)       Peak (etail products)       Nation (etail products)       Natio				<b>.</b>	Adjusted	Pk Lim:				Adjusted	Av Lim:						
Productivity         Productity         Productivity         Productivity <td>Fraguanau</td> <td>Raw Peak</td> <td>Raw Avg</td> <td>Correction</td> <td>Peak</td> <td>FCC_pt15_2</td> <td>Peak</td> <td>Peak Test</td> <td>Worst Peak</td> <td>Avg</td> <td>FCC_pt15_2</td> <td>Aug Margin</td> <td>Avg lest</td> <td>Worst Avg</td> <td>Antenna</td> <td>EUI</td>	Fraguanau	Raw Peak	Raw Avg	Correction	Peak	FCC_pt15_2	Peak	Peak Test	Worst Peak	Avg	FCC_pt15_2	Aug Margin	Avg lest	Worst Avg	Antenna	EUI	
Unital         Use (u)         Use (u)         Use (u)	(requeitcy	( ID ) ()	(ID )()			U9_Peak	(up)	results	iviargin		U9_Average	Avg iviargin	results	ividigiti	Height	Azimum	
7425       58.3       56.9       5.5       6.3.9       13.6       PASS       -13.6       6.3.5       1.1       PASS       -1       PASS       100       333         Curits Straus - a Bureau Veritas Company       Work Order - S1024       EUT Peak       Pass       Pass       Pass       -1       Pass       -1       Pass       -1       Pass       -1 <td>(IVIHZ)</td> <td>(ash<sub>A</sub>)</td> <td>(ακμν)</td> <td>(dB/m)</td> <td>(dBµV/m)</td> <td>(dBµV/m)</td> <td>(as)</td> <td>(Pass/Fail)</td> <td>(as)</td> <td>(dBµV/m)</td> <td>(dBµV/m)</td> <td>(ar)</td> <td>(Pass/Fail)</td> <td>(aB)</td> <td>(cm)</td> <td>(degrees)</td>	(IVIHZ)	(ash <sub>A</sub> )	(ακμν)	(dB/m)	(dBµV/m)	(dBµV/m)	(as)	(Pass/Fail)	(as)	(dBµV/m)	(dBµV/m)	(ar)	(Pass/Fail)	(aB)	(cm)	(degrees)	
12868.2       42.9       3.4.2       13.8       62.7       8.3.5       2.0.8       PASS       5.4       6.3.5       9.5       PASS       10.0       333         Cuttifs Straus - Bureau Vertias Company Radiated Emissions Electric Field Im Distance 5.18/GHZ Vertical Data Doperator: AKZ       Work Order: 5.102/4       EUT Power Input - Battery Test Site - CH-1       Doperator: AKZ       Conditions - 24*C; 21%RH; 1001mBar         Data Taken at 09:59:41 AM, Thursday, January 10, 2019       Frequency (day/m)       Adjusted (day/m)       Pk Lim: (day/m)       Peak (day/m)       Peak (day/m)       Adjusted (day/m)       Avg meritude (D_pArerage Avg Margin Avg Results Margin       Avg meritude (D_pArerage Avg Margin Avg Results Margin       Adjusted (day/m)       Avg meritude (D_pArerage Avg Margin Avg Results Margin       Adjusted (day/m)       Avg meritude (D_pArerage Avg Margin Avg Results Margin       Adjusted (D_pArerage Avg Margin Avg Results Margin       Avg meritude (D_pArerage Avg Margin Avg Results Margin       Margin (day/m)       Avg meritude (D_pArerage Avg Margin Avg Results Margin       Avg meritude (D_pArerage Avg Margin Avg Results Margin       Margin (Avg Margin Avg Results Margin       Margin Margin Margin Avg Results (Margin Margin Margin Avg Results Margin Margin Margin Margin Avg Results (D_pArerage Avg Margin Avg Results (D_pArerage Avg Margin Avg Results (D_pArerage Picture Michael Picture Pict	7425	58.3	56.9	5.6	63.9	83.5	-19.6	PASS	-19.6	62.5	63.5	-1	PASS	-1	199	18	
Curtis Straus - a Bureau Veritas Company       Work Order - 51024         Radiated Emissions Electric Field 1m Distance       EUT Power Input - Battery         T-SIGH2 Veritical Data       Test Site - CH - 1         Operator: AKZ       Conditions - 24°C; 21%RH; 1001mBar         Notes:       Test Site - CH - 1         Operator: AKZ       Conditions - 24°C; 21%RH; 1001mBar         Data Taken at 09-59-41 AM, Thursday, January 10, 2019       Test Site - CH - 1         Data Taken at 09-59-41 AM, Thursday, January 10, 2019       Peak         Prequency       Reading       Reading       Reading / Correction       Peak         Raw Pask       Raw Age       Correction       Peak       Worst Peak       Adjusted       Av Lim::         Frequency       Reading       Reading       Reading / Magina       Results       Margin       Margina       Height       Adjusted         17822.1       43.3       32.7       5.6       48.4       83.5       -19.9       54.2       63.5       -9.3       20.0       218         17822.1       43.7       3.6       83.5       -19.9       54.2       63.5       -9.3       20.0       218         1782.2       43.7       5.6       48.4       83.5       -19.9       Fector <td< td=""><td>17868.7</td><td>42.9</td><td>34.2</td><td>19.8</td><td>62.7</td><td>83.5</td><td>-20.8</td><td>PASS</td><td></td><td>54</td><td>63.5</td><td>-9.5</td><td>PASS</td><td></td><td>100</td><td>333</td></td<>	17868.7	42.9	34.2	19.8	62.7	83.5	-20.8	PASS		54	63.5	-9.5	PASS		100	333	
Radiated Emissions Electric Field 1m Distance       EUT Power Input - Battery         5-136 H2 Vertical Data       Test Site - CH-1         Operator: AZ       Conditions - 24°C; 21%RH; 1001mBar         Notes:       Data         ZigBee Channel 25, BLE Channel 19       Data         Pater Taken at 09:59:41 AM, Thursday, January 10, 2019         Prequency frequency frequ	Curtis Stra	us - a Burea	u Veritas	Company			Work Ord	er - S1024									
518GHz Vertical Data       Test Site - CH-1         Operator: AKZ       Conditions - 24°C; 21%RH; 1001mBar         Notes:       ZigBee Channel 25, BLE Channel 19         Data Taken at 09:59:41 AM, Thursday, January 10, 2019	Radiated E	missions El	ectric Fiel	d 1m Dista	nce		EUT Powe	er Input - Ba	ttery								
Operator: AKZ Note: IzgBee Channel 25, BLE Channel 19       Conditions - 24°C; 21%RH; 1001mBar         Data Taken at 09:59:41 AM, Thursday, January 10, 2019       Image: Condition of the condit of the condition of the condition of the co	6-18GHz V	-18GHz Vertical Data Test Site - CH-1															
Control of Cyclema (19)       Definition of Cyclema (19)         Vortes:       ZgBee Channel 25, BLE Channel 19         Data Taken at 09:59:41 AM, Thursday, January 10, 2019.         Frequency       Reading       Factor       Adjusted       PCC, pt15, 2       Peak       Peak       Peak       Adjusted       Adjusted       Adjusted       Adjusted       Adjusted       Adjusted       Adjusted       Adjusted       Aug       PCC, pt15, 2       Avg Margin       Avg Margin       Avg Margin       Aug       EUT         Mintal       (dB)       (dB) <t< td=""><td>Operator:</td><td colspan="11">perator: AKZ Conditions - 24°C: 21%RH: 1001mBar</td></t<>	Operator:	perator: AKZ Conditions - 24°C: 21%RH: 1001mBar															
Contraction         Data Taken at 09:59:41 AM, Thursday, January 10, 2019         Frequency       Reading Reading Factor Adjusted FCC, ptt5, 2       Peak Margin Ang Korst Ang Ang Margin Ang Results Worst Ang Margin Ang Results Worst Ang Angen Ange Margin Ange Results Worst Ange Antenna EUT Margin (dBµV/m) (dB	Notes:	ישרומנטו. אהב כטווטונוטווג - 24 כ; 21%רח; בטטבווושמי וחדפי															
Date Taken at 09:59:41 AM, Thursday, January 10, 2019         Frequency Reading Reading Factor Amplitude 09, Peak Margin Results Margin Results Margin Amplitude 09, Average Avg Margin Avg Results Margin Height Azimuth (MHz) (dBµV/) (dBµV) (dBµV/) (dBµV/) (dBµV/m (dB) (Pass/Fail) (dB) (Pass) (dB) (Pass/Fail) (dB) (Pass/Fail) (dB) (P	TigRoo Ch	nnol 25 Pl	E Channel	1 10													
Data Taken at 09:59:41 AM, Thursday, January 10, 2019         Frequency       Adjusted       Peak       Worst Peak       Adjusted       AV       Worst Peak       Adjusted       AV       Worst Peak       Adjusted       AV       Morst In       Adjusted       AV       Worst Peak       Adjusted       AV       Morst In       Adjusted	Zigbee Cha	annei 25, di	E Channe	119													
Data Taken at 09:59:41 AM, Thursday, January 10, 2019         Frequency       Raw Pak       Raw Avg       Correction       Pak       Pk lim:       Peak       Worst Peak       Adjusted       Avg limit       Avg limit       Avg limit       Avg limit       Adjusted       Avg limit																	
Data Taken at 09:59:41 AM, Thursday, January 10, 2019           Frequency         Raw Pask Reading (dBjuV)         Raw Avg (dBjuV)         Correction (dBjuV/m)         Peak (dBjuV/m)         Peak (dBjuV/m)         Peak Results         Margin (dBj         Adjusted Avg (dBjuV/m)         Avg (dBjuV/m)         Avg (d																	
Raw Peak Reading (MHz)         Raw Avg Reading (dBµV)         Correction (dBµV)         Adjusted (dBµV)         Peak (dBµV)         Worst Peak Results (dBµV)         Adjusted (dBµV)         Avg (dBµV)         Worst Avg (dBµV)         Antenna (dBµV)         EUT (dBµV)           7425         42.8         32.7         5.6         48.4         83.5         -35.1         PASS         38.3         63.5         -25.2         PASS         200         218           7425         42.8         32.7         5.6         48.4         83.5         -35.1         PASS         -19.9         54.2         63.5         -9.3         PASS         -9.3         200         340           Stellet Stores Table           Exercises on the second state of	Data Taker	n at 09:59:42	LAM, Thui	rsday, Janu	ary 10, 201	9											
Raw Peak Reading         Raw Avg Reading         Correction Factor         Peak Amplitude         Peak Margin (dBjuV/m)         Peak Margin (dBjuV/m)         Worst Peak Margin (dBjuV/m)         Avg Margin (dBjuV/m)         Worst Avg (dBjuV/m)         Antenna Height         EUT Azimuth (dBjuV/m)           (MHz)         (dBjuV)         (dBjuV/m)					Adjusted	Pk Lim:				Adjusted	Av Lim:						
Frequency (MHz)         Reading (dBµV)         Frequency (dBµV)         Reading (dBµV/m)         Frequency (dBµV/m)         Reading (dBµV/m)         Reading (dBµV/m) </td <td></td> <td>Raw Peak</td> <td>Raw Avg</td> <td>Correction</td> <td>Peak</td> <td>FCC pt15 2</td> <td>Peak</td> <td>Peak</td> <td>Worst Peak</td> <td>Avg</td> <td>FCC pt15 2</td> <td></td> <td></td> <td>Worst Avg</td> <td>Antenna</td> <td>EUT</td>		Raw Peak	Raw Avg	Correction	Peak	FCC pt15 2	Peak	Peak	Worst Peak	Avg	FCC pt15 2			Worst Avg	Antenna	EUT	
(MH2)         (dBµV)         (dBµV)         (dBµV/m)         (dBµV/m)         (dB)         (Pass/Fail)         (dB)         (Pass/Fail)         (dB)         (mm)         (degrees)           7425         42.8         32.7         5.6         48.4         83.5         -35.1         PASS         38.3         63.5         -25.2         PASS         200         218           17852.1         43.7         34.3         19.9         63.6         83.5         -19.9         54.2         63.5         -9.3         PASS         9.9.3         200         340           Gentation of the standing of the	Frequency	Reading	Reading	Factor	Amplitude	09_Peak	Margin	Results	Margin	Amplitude	09_Average	Avg Margin	Avg Results	Margin	Height	Azimuth	
7425       42.8       32.7       5.6       48.4       83.5       -35.1       PASS       1       38.3       63.5       -25.2       PASS       200       218         17852.1       43.7       34.3       19.9       63.6       83.5       -19.9       PASS       -19.9       54.2       63.5       -9.3       PASS       -9.3       200       340         Gendated Emissions Table         Work Order: S1024         Engineer: AKZ       Work Order: S1024         Temp: 24°C       Humidity: 21%       Pressure: 991mbar         Frequency Range: 18-25GHz       Measurement Distance: 0.1 m         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Antenna Polarization       Frequency Peak       Average       Preamp       Antenna Cable       Adjusted       Adjusted <th <="" colspa="4" td=""><td>(MHz)</td><td>(dBµV)</td><td>(dBµV)</td><td>(dB/m)</td><td>(dBµV/m)</td><td>(dBµV/m)</td><td>(dB)</td><td>(Pass/Fail)</td><td>(dB)</td><td>(dBµV/m)</td><td>(dBµV/m)</td><td>(dB)</td><td>(Pass/Fail)</td><td>(dB)</td><td>(cm)</td><td>(degrees)</td></th>	<td>(MHz)</td> <td>(dBµV)</td> <td>(dBµV)</td> <td>(dB/m)</td> <td>(dBµV/m)</td> <td>(dBµV/m)</td> <td>(dB)</td> <td>(Pass/Fail)</td> <td>(dB)</td> <td>(dBµV/m)</td> <td>(dBµV/m)</td> <td>(dB)</td> <td>(Pass/Fail)</td> <td>(dB)</td> <td>(cm)</td> <td>(degrees)</td>	(MHz)	(dBµV)	(dBµV)	(dB/m)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(Pass/Fail)	(dB)	(cm)	(degrees)
17852.1       43.7       34.3       19.9       63.6       83.5       -19.9       PASS       -19.3       PASS       -9.3       200       340         Gendiated Emissions Table         Mode: 10.4an-19       Company: Assa Abloy       Work Order: S1024         Europerating Voltage/Frequency: Battery         Teny: 24°C       Humidity: 21%       Pressure: 991mbar         Frequency Range: 18-25GHz       Measurement Distance: 0.1 m         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Frequency       Preamp       Antenna         Polarization       Frequency       FCC Class B High Frequency -         Average       Preamp         Antenna       Cable       Adjusted       Adjusted         Antenna       Cable       Adjusted       Adjusted       Adjusted         Merage       Preamp       Antenna         Frequency       FCC Class B High Frequency -         Average         Matenna       Cable	7425	42.8	32.7	5.6	48.4	83.5	-35.1	PASS		38.3	63.5	-25.2	PASS		200	218	
Institute       45.5       54.5	17852.1	43.7	34.3	19.9	63.6	83.5	-19.9	PASS	-19.9	54.2	63.5	_9.3	PASS	-9.3	200	340	
6-18GHz High Channel         Section Stable         Date: 10-Jan-19       Company: Assa Abloy       Work Order: S102         Engineer: AKZ       EUT Operating Voltage/Frequency: Battery         Temp: 24°C       Humidity: 21%       Pressure: 991mbar         Measurement Distance: 0.1 m         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Frequency       FCC Class B High Frequency - FCC Class B High Frequency - Average         Polarization       Frequency       FCC Class B High Frequency - Average         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Materna       Frequency - FCC Class B High Frequency - Average         Antenna       Frequency - FCC Class B High Frequency - Average         Antenna       Cable (Asynt)       (dBµV/m)       (dBµV/m)       (dBµV/m)       Claspe (BapV/m)         OLIMARY IN 2004B OF THE LIMT.	17052.1	45.7	54.5	15.5	05.0	05.5	0 100		1	34.2	05.5	5.5	1765	5.5	200	540	
Aradiated Emissions Table         Bate: 10.Jan-19       Company: Assa Abloy       Work Order: \$1024         Engineer: AKZ       EUT Operating Voltage/Frequency: Battery         Temp: 24°C       Humidity: 21%       Pressure: 991mbar         Measurement Distance: 0.1 m         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Frequency Reading Reading (dBµV)       Average Reading (dBµV)       Antenna Cable Adjusted (dBµV/m) (dBµV/m) (dBµV/m)       FCC Class B High Frequency - FCC Class B High Frequency - Average         Polarization (H/V)       Preak Reading (dBµV)       Average (dBµV/m) (dBµV/m)       Adjusted (dBµV/m) (dBµV/m)       Agjusted (dBµV/m) (dBµV/m)       FCC Class B High Frequency - FCC Class B High (PeasuFea)         No EMISSIONS WITHIN 20dB OF THE LIMIT.							6-180	Hz Hi	igh Ch	anne							
Radiated Emissions Table         Date: 10-Jan-19       Company: Assa Abloy       Work Order: S1024         Engineer: AKZ       EUT Operating Voltage/Frequency: Battery         Temp: 24°C       Measurement Distance: 0.1 m         Terquency Range: 18-25GHz       Measurement Distance: 0.1 m         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Antenna       Peak       Average       Frequency - FCC Class B High Frequency - Peak         Polarization       Frequency       Reading       Antenna       Cable Adjusted       Adjusted       Adjusted       Average         Polarization       Frequency (dB/V)       Frequency - FCC Class B High Frequency - Average         Measure (dB/W)       Cable (dB/W)       Margin Result       Limit Margin Result       Class B High Frequency - Average         Polarization       Frequency (dB/W)       Frequency - FCC Class B High Frequency - Average         Meading Reading Reading Reading Reading (dB/W/m)       Autemation Reading (dB/W/m)       Cable 32:       Cable 32:									-								
Reclifated Emissions Table         Date:       10-Jan-19       Company: Assa Abloy       Work Order: \$1024         Engineer:       AKZ       EUT Operating Voltage/Frequency:       Battery         Temp:       24°C       Humidity:       21%       Pressure:       991mbar         Measurement Distance:       0.1 m         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Frequency Reading Reading Reading (dBµV)       Antenna Factor (dB/m)       Adjusted (dBµV/m)       Adjusted (dBµV/m)       FCC Class B High Frequency - Average (dB/µV/m)       FCC Class B High Frequency - Average (dB/µV/m)       Fequency - Average (dB/µV/m)       FCC Class B High Frequency - Average (dB/µV/m)       Fequency -			_														
Date: 10-Jan-19       Company: Assa Abloy       Work Order: S1024         Engineer: AKZ       EUT Operating Voltage/Frequency: Battery         Temp: 24°C       Humidity: 21%       Pressure: 991mbar         Measurement Distance: 0.1 m         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Frequency Raaging Reading (dBµV)       Antenna Factor (dBm)       Adjusted (dBµV/m)       Adjusted (dBµV/m)       FCC Class B High Frequency - Average       FCC Class B High Frequency - Average         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19       Antenna Factor (dBm)       Adjusted (dBµV/m)       Adjusted (dBµV/m)       Margin (dBµV/m)       FCC Class B High Frequency - Average         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19       Teator (dBm)       Factor (dBm)	Radiate	ed Emis	sions 7	Table													
Engineer: AKZ         EUT Operating Voltage/Frequency: Battery           Temp: 24°C         Humidity: 21%         Pressure: 991mbar           Frequency Range: 18-25GHz         Measurement Distance: 0.1 m           Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Average         Preamp         Antenna         Cable         Adjusted         Adjusted         FCC Class B High Frequency - Peak         FCC Class B High Frequency - Average         FCC Class B High (BpV/P)         Result         Limit         Margin         Result         Result           Notes: SigNors WITHIN 20dB OF THE LIMIT.	Dat	e: 10-Jan-19			Compa	ny: Assa Ab	oloy							Wa	rk Order: S	51024	
Temp: 24°C         Humidity: 21%         Pressure: 991mbar           Frequency Range: 18-25GHz           Measurement Distance: 0.1 m           Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19           Antenna         Peak         Average         Preamp         Antenna         Cable         Adjusted         Adjusted         FCC Class B High Frequency -	Enginee	er: AKZ										EU	T Operating	y Voltage/Fr	equency: E	Battery	
Frequency Range: 18-25GHz       Measurement Distance: 0.1 m         Measurement Distance: 0.1 m         Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Antenna       Peak       Average       Preamp       Antenna       Cable       Adjusted       Adjusted       FCC Class B High Frequency -	Tem	<b>p:</b> 24°C			Humic	lity: 21%			Pre	ssure: 991	mbar						
Notes: ZigBee Channels 11, 18, & 25. BLE Channel 19         Antenna       Preak       Average       Preamp       Antenna       Cable       Adjusted       Adjusted       Adjusted       ECC Class B High Frequency - Average       FCC Class B High Frequency - Average         Polarization       Frequency       Reading       Reading       Reading       GdB///(dB///)       GdB///(dB///)       GdB///(dB///)       GdB///(dB///)       GdB////(dB///)       GdB////(dB///)       Ecc or (dB////)       FCC Class B High Frequency - Average       Average         VO EMISSIONS WITHIN 20dB OF THE LIMIT.       IIII       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII			Fre	equency Ra	nge: 18-250	SHz						Ме	asurement	Distance: 0.	1 m		
Antenna Polarization (H/V)     Peak (M+z)     Average Reading (dBµV)     Preamp Reading (dBµV)     Antenna Factor (dB)     Cable Factor (dB)     Adjusted Factor (dB)     Adjusted Peak Reading (dBµV/m)     Adjusted Avg Reading (dBµV/m)     FCC Class B High Frequency - Peak     FCC Class B High Frequency - Average       No EMISSIONS WITHIN 20dB OF THE LIMIT.	Note	s: ZigBee Ch	nannels 11.	18, & 25. B	LE Channel	19											
Antenna Polarization (H/V)     Peak Reading (Bb/V)     Average Reading (dBµV)     Preamp Factor (dB/W)     Antenna Factor (dB/W)     Cable Factor (dB/W)     Adjusted Peak Reading (dBµV/m)     Adjusted Adjusted (dBµV/m)     FCC Class B High Frequency - Peak     Average       V0 EMISSIONS WITHIN 200B OF THE LIMIT.		3222 01	,	.,													
Antenna Polarization (H/V)         Peak Reading (H/V)         Average Reading (H/V)         Preamp (B)/V         Antenna Factor (B)/V         Cable Factor (B)/V         Adjusted Factor (B)/V         Adjusted Peak Reading (B)/V/M         Adjusted Avg Reading (B)/V/M         Margin (B)/V/M         Result (B)/V/M         Limit (B)/V/M         Margin (B)/V/M         Average           VO EMISSIONS WITHIN 200B OF THE LIMIT.         T         <					1					F	FCC Class B	High Frequ	ency -	FCC Class	B High Free	quency -	
Polarization (H/V)         Frequency (MHz)         Reading (BBµV)         Factor (dBµV)         Factor (dB/m)         Factor (dB/m)         Factor (dB/m)         Peak Reading (dBµV/m)         Limit (dBµV/m)         Margin (dBµV/m)         Result (dBµV/m)         Result (dBµV/m)         Margin (dBµV/m)         Result (dBµV/m)         Margin (dBµV/m)         Result (dBµV/m)         Result (dBµV/m)         Limit (dBµV/m)         Margin (dBµV/m)         Result (dBµV/m)         (dBµV/m)	Antenna		Pea	k Avera	ige Prear	np Antenn	a Cable	Adjusted	Adjus	sted	_	Peak			Average		
(H/V)       (MHz)       (dBµV)       (dB)       (dB/m)       (dB)       (dBµV/m)	Polarization	Frequen	cy Readi	ing Read	ng Facto	or Factor	Factor	Peak Readin	ng Avg Re	ading	Limit I	Margin	Result	Limit	Margin	Result	
NO EMISSIONS WITHIN 20dB OF THE LIMT.	(H/V)	(MHz)	(dBµ)	V) (dBµ	V) (dB	) (dB/m)	(dB)	(dBµV/m)	(dBµ)	//m) (c	dBμV/m)	(dB) (	Pass/Fail)	(dBµV/m)	(dB)	(Pass/Fail)	
NO EMISSIONS WITHIN 200B OF THE LIMIT.   <										·							
Test Site: EMI Chamber 1         Cable 1: Asset #2324         Cable 2:         Cable 3:           Analyzer: Gold         Pream: 18-26 5CHz         Analyzer: Gold         Pream: 18-26 5CHz         Analyzer: Gold	NU EMISSIO	NS WITHIN 20		LIMIT.						·							
Analyzer Gold Prozent 1926 FUHz	Test Sit	e EMI Char	ber 1		 Cabl	 1 • Accot-#						Cable 2:			Cable 3:		
	Analyze	er: Gold			Prea	mn: 18-26-50	GHz					ntenna: 18	-26 5GHz Ho	rn Bre	selector:	-	

a Factor + Cable Factor 18-25GHz All Channels



CSsoft Radiated Emissions Calculator v1.017.211 Adjusted Reading = Reading - Preamp Factor + Anten



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Rev. 1/5/2019								
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	Ι	11/21/2019	11/21/2018
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	Т	12/7/2020	12/7/2018
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	Ι	12/7/2020	12/7/2018
Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	Т	5/15/2020	5/15/2018
TH A#2082		HTC-1	HDE		2082	II	3/23/2019	3/23/2018
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2456	9KHz-18GHz		MegaPhase			Ш	10/31/2019	10/31/2018
Asset #2464	9KHz-18GHz		MegaPhase			Ш	10/31/2019	10/31/2018
Asset #2480	9KHz-18GHz		MegaPhase			Ш	10/29/2019	10/29/2018
2489(6dB)	9KHz-18GHz					Ш	11/27/2019	11/27/2018

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Rev. 2/5/2019								
Spectrum Analyzers / Receivers / Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
2093 MXE EMI Receiver	20Hz-26.5GHz	N9038A	Agilent	MY51210181	2093	I	11/21/2019	11/21/2018
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	1	12/7/2020	12/7/2018
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I	12/7/2020	12/7/2018
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
8449B HF Preamp	1-18GHz	8449B	Agilent	1149055		Ш	11/26/2019	11/26/2018
2116 BRF	0.009-18000MHz	BRM50702	Micro-Tronics	G226	2116	Ш	11/8/2019	11/8/2018
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Orange Horn	1-18GHz	3115	EMCO	0004-6123	390	I	11/6/2020	11/6/2018
Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
TH A#2077		HTC-1	HDE		2077	11	3/23/2019	3/23/2018
TH A#2082		HTC-1	HDE		2082	Ш	3/23/2019	3/23/2018
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2464	9KHz-18GHz		MegaPhase			11	10/31/2019	10/31/2018
Asset #2465	9KHz-18GHz		MegaPhase			П	10/31/2019	10/31/2018
Asset #2480	9KHz-18GHz		MegaPhase			Ш	10/29/2019	10/29/2018
			-					

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

Rev. 2/5/2019								
Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Gold	100Hz-26.5 GHz	E4407B	Agilent	MY45113816	1284	I.	3/19/2019	3/19/2018
Radiated Emissions Sites	FCC Code	IC Code	VCCI Code	Range	Asset	Cat	Calibration Due	Calibrated on
EMI Chamber 1	719150	2762A-6	A-0015	30-1000MHz	1685	1	12/7/2020	12/7/2018
EMI Chamber 1	719150	2762A-6	A-0015	1-18GHz	1685	I.	12/7/2020	12/7/2018
Preamps /Couplers Attenuators / Filters	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
HF (Yellow)	18-26.5GHz	AFS4-18002650-60-8P-4	CS	467559	1266	П	10/24/2019	10/24/2018
Antennas	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
HF (White) Horn	18-26.5GHz	801-WLM	Waveline	758	758	III	Verify before Use	date of test
Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	I.	5/15/2020	5/15/2018
TH A#2082		HTC-1	HDE		2082	Ш	3/23/2019	3/23/2018
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
Asset #2324	1-26.5GHz	TM26-S1S1-120	MEGAPHASE	17139101 001	2324	Ш	8/9/2019	8/9/2018

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.





# AC Line Conducted Emissions LIMITS

Frequency of emission (MHz)	Quasi-peak limit (dBµV)	Average limit (dBµV)
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency. [47 CFR 15.207(a)]





## MEASUREMENTS / RESULTS

Curtis Straus - a Bureau Veritas Company Conducted Emissions per CISPR 16-2-1 Peak Detector Data Notes: EUT Line tested: 120VAC/60Hz; Neutral (line 0) Work Order # - S1024 EUT Power Input - 120VAC/ 60Hz Test Site - CEMI-3 Conditions: - 19.4°C; 35%RH; 1003mBar Test Engineer - Patrick Crozier Witnessed by - Steve Morse

Data Taken at 05:03:45 PM, Friday, January 11, 2019

Frequency (MHz)	Raw Pk Reading (dBμV)	Correction Factor (dB)	Adjusted Pk Amplitude (dBµV)	QP Lim: Mains_FCC&CISP R_QP_Class_B (dBμV)	Margin to the QP Limit (dB)	Pk to QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)
0.15	36	20.7	56.7	66.0	-9.3	PASS	
0.167	33.8	20.8	54.6	65.1	-10.5	PASS	
0.213	29.9	20.8	50.7	63.1	-12.4	PASS	
0.251	32.8	20.8	53.5	61.7	-8.2	PASS	-8.2
0.315	26.6	20.8	47.3	59.8	-12.5	PASS	
0.51	20.1	20.8	40.8	56.0	-15.2	PASS	

Curtis Straus - a Bureau Veritas Company

Conducted Emissions per CISPR 16-2-1, CISPR Average Detector Quick Average Detector Data Notes:

EUT Line tested: 120VAC/60Hz; Neutral (line 0)

Work Order # - S1024 EUT Power Input - 120VAC/ 60Hz Test Site - CEMI-3 Conditions: - 19.4°C; 35%RH; 1003mBar Test Engineer - Patrick Crozier Witnessed by - Steve Morse

#### Data Taken at 05:03:45 PM, Friday, January 11, 2019

Frequency (MHz)	Raw Avg Reading (dBμV)	Correction Factor (dB)	Adjusted Avg Amplitude (dBµV)	Av Lim: Mains_FCC&CISP R_Avg_Class_B (dBμV)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
0.155	26.2	20.7	46.9	55.7	-8.8	PASS	
0.251	22.9	20.8	43.6	51.7	-8.1	PASS	-8.1
0.312	20.5	20.8	41.2	49.9	-8.7	PASS	
0.337	18.5	20.8	39.2	49.3	-10.1	PASS	
0.505	12.3	20.8	33.1	46.0	-12.9	PASS	
0.582	12.2	20.8	32.9	46.0	-13.1	PASS	





Curtis Straus - a Bureau Veritas Company Conducted Emissions per CISPR 16-2-1 Peak Detector Data Notes: EUT Line tested: 120VAC/60Hz; Phase (line 1) Work Order # - S1024 EUT Power Input - 120VAC/ 60Hz Test Site - CEMI-3 Conditions: - 19.4°C; 35%RH; 1003mBar Test Engineer - Patrick Crozier Witnessed by - Steve Morse

Data Taken at	04.45.22110,1	inday, sanaary	11, 2015				
Frequency (MHz)	Raw Pk Reading (dBμV)	Correction Factor (dB)	Adjusted Pk Amplitude (dBμV)	QP Lim: Mains_FCC&CISP R_QP_Class_B (dBμV)	Margin to the QP Limit (dB)	Pk to QP Limit Results (Pass/Fail)	Worst Margin (QP Limit) (dB)
0.153	37	20.7	57.8	65.8	-8.0	PASS	-8.0
0.184	31.5	20.8	52.2	64.3	-12.1	PASS	
0.25	28.5	20.7	49.3	61.8	-12.5	PASS	
0.332	24.7	20.7	45.4	59.4	-14.0	PASS	
0.508	19.2	20.8	40	56.0	-16.0	PASS	
0.617	19	20.8	39.7	56.0	-16.3	PASS	

Data Taken at 04:43:22 PM, Friday, January 11, 2019

Curtis Straus - a Bureau Veritas Company

Conducted Emissions per CISPR 16-2-1, CISPR Average Detector Quick Average Detector Data Notes:

EUT Line tested: 120VAC/60Hz; Phase (line 1)

## Work Order # - S1024

EUT Power Input - 120VAC/ 60Hz Test Site - CEMI-3 Conditions: - 19.4°C; 35%RH; 1003mBar Test Engineer - Patrick Crozier Witnessed by - Steve Morse

### Data Taken at 04:43:22 PM, Friday, January 11, 2019

Frequency (MHz)	Raw Avg Reading (dBµV)	Correction Factor (dB)	Adjusted Avg Amplitude (dBµV)	Av Lim: Mains_FCC&CISP R_Avg_Class_B (dBμV)	Avg Margin (dB)	Avg Results (Pass/Fail)	Worst Avg Margin (dB)
0.15	26.7	20.7	47.4	56.0	-8.6	PASS	
0.253	23.4	20.7	44.1	51.7	-7.6	PASS	-7.6
0.306	21	20.7	41.8	50.1	-8.3	PASS	
0.513	12.3	20.8	33	46.0	-13.0	PASS	
0.546	11.9	20.8	32.7	46.0	-13.3	PASS	
0.602	11.4	20.8	32.1	46.0	-13.9	PASS	





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Rev. 1/5/2019								
Spectrum Analyzers / Receivers /Preselectors	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Rental MXE EMI Receiver(1168255)	20Hz-8.4GHz	N9038A	Agilent	MY53290009	1168255	1	8/23/2019	8/23/2018
LISNs/Measurement Probes	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
LISN Asset 2092	9KHz-30MHz	NNLK 8121	Schwarzbeck	NNLK 8121-66	2092	-	7/31/2019	7/31/2018
Conducted Test Sites (Mains / Telco)	FCC Code		VCCI Code			Cat	Calibration Due	Calibrated on
CEMI 3	719150		A-0015			=	NA	N/A
Meteorological Meters/Chambers		MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
Weather Clock (Pressure Only)		BA928	Oregon Scientific	C3166-1	831	-	5/15/2020	5/15/2018
TH A#2077		HTC-1	HDE		2077	Ш	3/23/2019	3/23/2018
Cables	Range		Mfr			Cat	Calibration Due	Calibrated on
CEMI-18	9kHz - 2GHz		C-S			Ш	11/5/2019	11/5/2018
Attenuators	Range	MN	Mfr	SN	Asset	Cat	Calibration Due	Calibrated on
20dB Attenuator-64	9kHz-2GHz			N/A		П	11/15/2019	11/15/2018
Il equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.								

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.





## Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty		
Radiated Emissions (30-1000MHz)	5 0.4D			
	5.6dB 4.6dB	N/A 5.2dB (Ucispr)		
Radiated Emissions (1-26.5GHz)	4.6dB	N/A		
Radiated Emissions (above 26.5GHz)	4.9dB	N/A		
Magnetic Radiated Emissions	5.6dB	N/A		
Conducted Emissions NIST	3.9dB	N/A		
CISPR	3.6dB	3.6dB (Ucispr)		
Telco Conducted Emissions (Current)	2.9dB	N/A		
Telco Conducted Emissions (Voltage)	4.4dB	N/A		
Electrostatic Discharge	11.5%	N/A		
Radiated RF Immunity (Uniform Field)	1.6dB	N/A		
Electrical Fast Transients	23.1%	N/A		
Surge	23.1%	N/A		
Conducted RF Immunity	3dB	N/A		
Magnetic Immunity	12.8%	N/A		
Dips and Interrupts	2.3V	N/A		
Harmonics	3.5%	N/A		
Flicker	3.5%	N/A		
Radio frequency (@ 2.4GHz)	3.23 x 10 <sup>-8</sup>	1 x 10 <sup>.7</sup>		
RF power, conducted	0.40dB	0.75dB		
Maximum frequency deviation: • Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency	3.4% 0.3dB	5% 3dB		
Adjacent channel power	1.9dB	3dB		
Conducted spurious emission of transmitter, valid up to 12.75GHz	2.39dB	3dB		
Conducted emission of receivers	1.3dB	3dB		
Radiated emission of transmitter, valid up to 26.5GHz	3.9dB	6dB		
Radiated emission of transmitter, valid up to 80GHz	3.3dB	6dB		
Radiated emission of receiver, valid up to 26.5GHz	3.9dB	6dB		
Radiated emission of receiver, valid up to 80GHz	3.3dB	6dB		
Humidity	2.37%	5%		
Temperature	0.7°C	1.0°C		
Time	4.1%	10%		
RF Power Density, Conducted	0.4dB	3dB		
DC and low frequency voltages	1.3%	3%		
Voltage (AC, <10kHz)	1.3%	2%		
Voltage (DC)	0.62%	1%		
The above reflects a 95% confidence level				



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ACCREDITED

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## **Conditions Of Testing**

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "Conditions"): 1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("Test Report") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.

2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.

 The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
 These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof

4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.

5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "BUREAU VERITAS," "BUREAU VERITAS CONSUMER PRODUCTS SERVICES," "BVCPS", "MTL", "ACTS", "MTL-ACTS" and CURTIS-STRAUS (collectively, the "Marks") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.

6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.

The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
 Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.

9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.

10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.

11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only were such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.

12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.

13. CLIÉNT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.





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15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B)NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

The complete list of the Approved Subcontractors Curtis-Straus may use to delegate the performance of work can be provided upon request. Rev.160009121(2)\_#684340 v14CS





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