

EMC TEST REPORT



Standard(s):

47 CFR FCC Part 90, Subpart M
RSS 137, Issue 2, 2009
47 CFR FCC Parts 15.107 and 15.109
FCC ID: M4Z6204
IC ID: 458C-6204

Product: Toll RFID READER and Reader Redundancy Switch
Model: 6204 and RRS
3M Division: TSSD

Report Number: RE1407019-2
Report Issue Date: November 13, 2014

Report Prepared By:

Signature: *Yuriy Litvinov*

Yuriy Litvinov
Lead EMC Engineer

Tested By:
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1.0 Test Summary

Based on the results of our investigation, we have concluded the product tested complies with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

No	Standard	Test Requirements	Result	Comments
4.1	Part15.107/RSS Gen	Conducted Emissions	pass	
4.2	Part 15.109/RSS-Gen	Radiated Emissions	pass	
4.3	Part 90.205/RSS137, 6.4	Conducted Output Power	pass	
4.4	Part 90.210/RSS137, 6.1	Occupied Bandwidth	pass	
4.5	Part 90.210/RSS137, 6.5	Spurious Emissions at Antenna terminals	pass	
4.6	Part 90.210/RSS137, 6.5	Field Strength of Spurious Emissions	pass	
4.7	Part 90.213/RSS137, 6.3	Frequency Stability	N/A	See note below
4.8	Part 2.1091/RSS102	RF Exposure Compliance	pass	

Note:	Fixed Non-Multilateral LMS transmitters with an emission bandwidth located more than 40 kHz from the band edge are exempt from meeting the frequency stability limits.
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1.1 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements. The measurement uncertainty figures were calculated and correspond to a coverage factor of $k=2$, providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Radiated emissions	5.20 dB
Conducted emissions	3.60 dB
Harmonics and Flicker	3.32 dB



2.0 Equipment Description

2.1 Equipment Under Test									
Description:	The four-port Toll RFID Reader is a multi-protocol, multi-regional Radio Frequency Identification (RFID) System that operates in the 902-928 MHz UHF band. All antenna ports operate sequentially with only one port transmitting at the time from a single transmit source (RF path is switched between selected ports) 3M Reader Redundancy Switch (RRS) interfaces with two RFID Readers and associated antenna systems to provide an antenna change over facility in the event of a reader failure. The RRS is controlled by TTL level input signals.								
Model(s):	6204 and RRS (SKU#75-0302-0128)								
Serial number(s):	ID6204000021 RRS00181								
Firmware:	Version # 1.4.25483								
Client Contact:	<table><thead><tr><th>Name:</th><th>Phone:</th></tr></thead><tbody><tr><td>Dave Missimer</td><td>919-281-1559</td></tr><tr><td>Randal D. Roebuck</td><td>512-984-5688</td></tr><tr><td>Jason Bram</td><td>512-984-5431</td></tr></tbody></table>	Name:	Phone:	Dave Missimer	919-281-1559	Randal D. Roebuck	512-984-5688	Jason Bram	512-984-5431
Name:	Phone:								
Dave Missimer	919-281-1559								
Randal D. Roebuck	512-984-5688								
Jason Bram	512-984-5431								
3M Division:	Traffic Safety and Security								
Modifications:	None								
Frequency Range (MHz) :	902.75 – 903.25MHz								
Modulation Type:	K1D								
RFID Protocols:	ISO 18000-6B ISO 18000-6C ISO 10374 (ATA)								
Maximum Output Power:	35.0dBm								
Equipment Category:	Non-Multilateral LMS								
Rated Input Power:	Voltage: <input checked="" type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input type="checkbox"/> VDC Frequency: <input type="checkbox"/> 50Hz <input checked="" type="checkbox"/> 60Hz Current: <input checked="" type="checkbox"/> 2.0A								
Test Dates:	08/04-09/18/2014								
Received Date:	06/26/2014								
Received Conditions:	<input type="checkbox"/> Poor <input checked="" type="checkbox"/> Good <input type="checkbox"/> Prototype <input checked="" type="checkbox"/> Production								



3.0 EUT Configuration

3.1 Support Equipment

No.	Product Type	Manufacturer	Model	Comments
1	Power Supply	TDK-Lambda	DSP100-24	24VDC/4.4A
2				

3.2 Cables/Ports

No.	Name	Type	Length	Shielding	Comments
1	RS232/Ethernet/Power Interface	Reader Wire Harness	13m	Unshielded	Digital I/O Connection
2	Ethernet/TTL Interface	Switch Wire Harness	2m	Unshielded	I/O Control

3.3 Operating Condition of EUT

Operation Modes	
<input type="checkbox"/>	Stand by
<input checked="" type="checkbox"/>	Continuous Monitored Operation
<input type="checkbox"/>	Continuous Unmonitored Operation
<input checked="" type="checkbox"/>	RFID reader was programmed for FHSS operation using RTS RFID software via Command Line Interface.
<input checked="" type="checkbox"/>	FCC 90 Dense mode – 911.25-920.75MHz with 500KHz channels
<input checked="" type="checkbox"/>	FCC 90 Band – 910.95-920.45MHz with 200KHz channels
<input checked="" type="checkbox"/>	FCC 90 Low Band – 902.75-903.25MHz with 200KHz channels

3.4 Exercising of EUT

No.	Description of EUT Exercising
1	Transmitting modulated carrier at the maximum rated RF output power
2	
3	

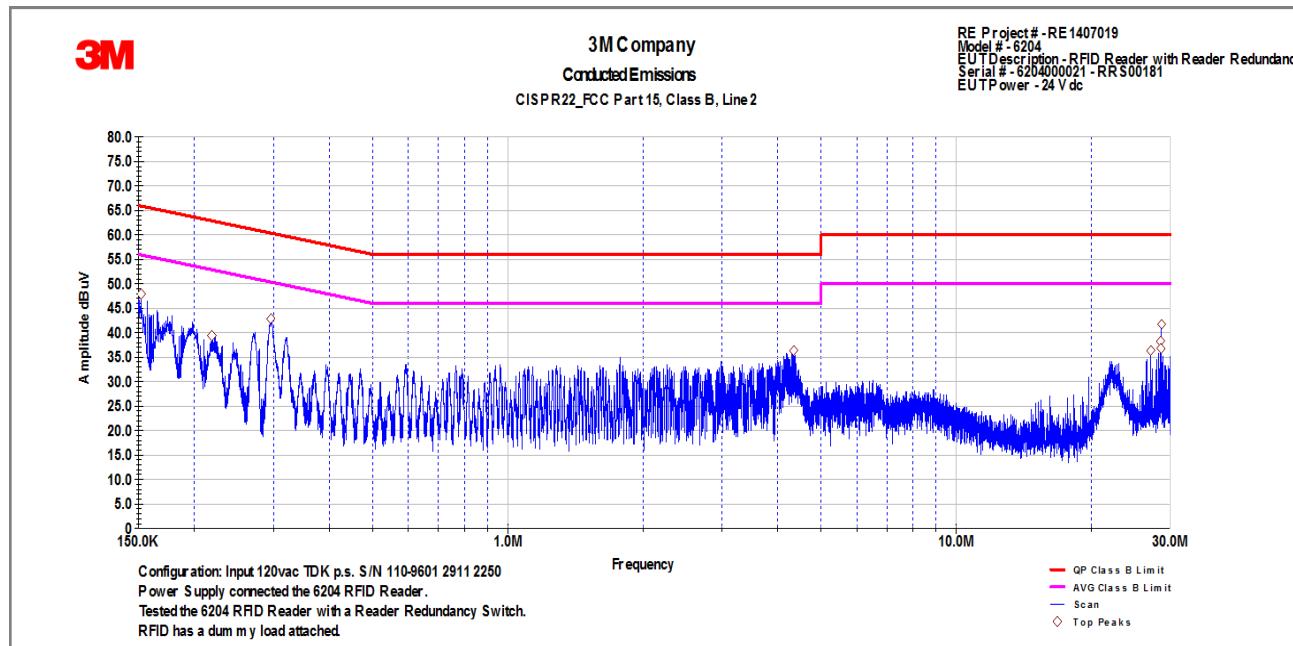
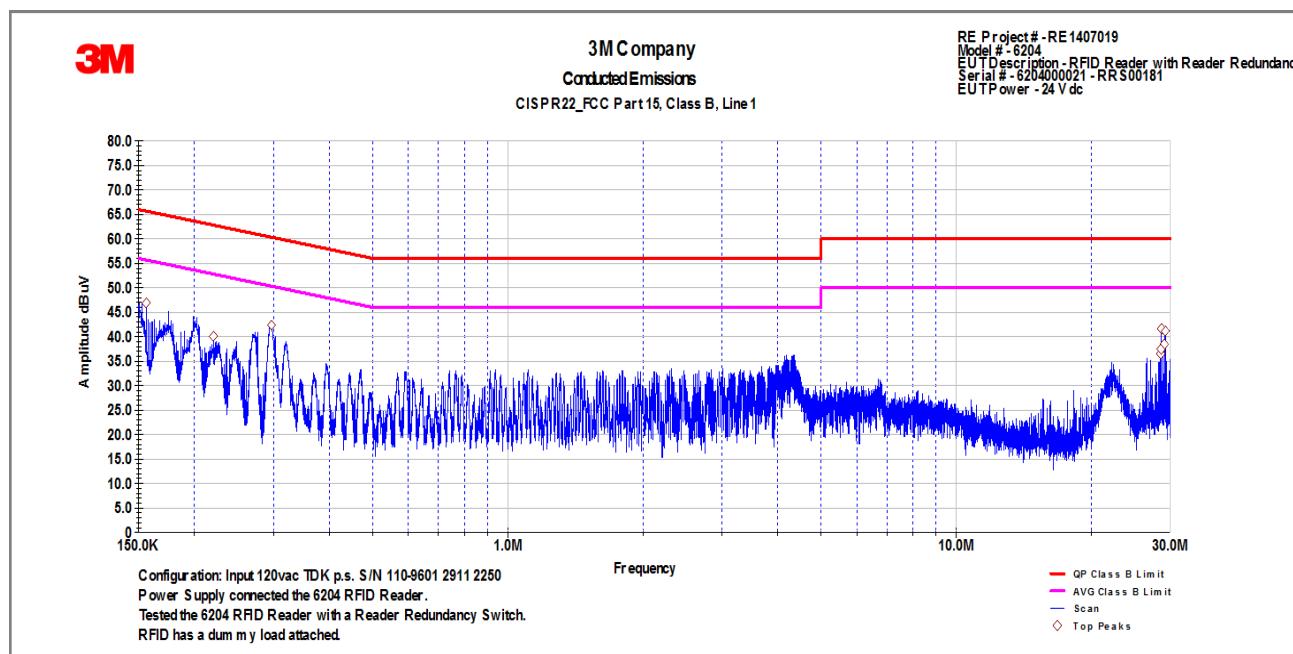


4.0 Test Conditions and Results

4.1 Conducted Emissions Data				
Method:	The AMN was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.			
Test Verification: <input checked="" type="checkbox"/>	Laboratory Ambient Temperature	21°C		
	Relative Humidity	45%		
Reference Standard:	<input type="checkbox"/> ANSI C63.4:2003 <input checked="" type="checkbox"/> ANSI C63.4:2009 <input type="checkbox"/> ANSI C63.10:2009 <input checked="" type="checkbox"/> FCC Part 15.107/RSS Gen <input type="checkbox"/>	Measurement Point <input checked="" type="checkbox"/> Mains <input type="checkbox"/> Telecommunication ports <input type="checkbox"/>		
Frequency Range:	<input checked="" type="checkbox"/> 150KHz to 30KHz <input type="checkbox"/>			
Nominal Voltage:	<input checked="" type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input type="checkbox"/>			
Tested By:	Mike Schultz	Date: 09/15/2014		
Limits				
Frequency (MHz)	Limit dB (μV)			
	Quasi-Peak	Average	Result	Comments
0.15 to 0.50	66 to 56	56 to 46	pass	
0.50 to 5	56	46	pass	
5 to 30	60	50	pass	
Modifications:				
Note:				

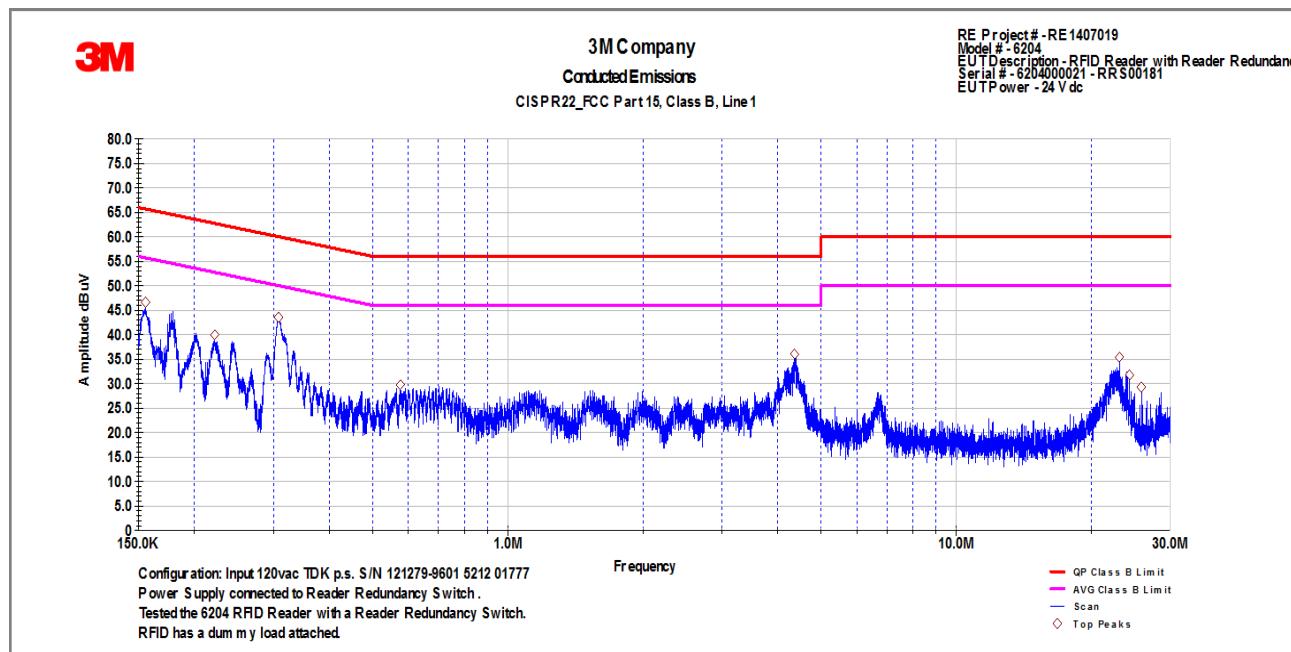
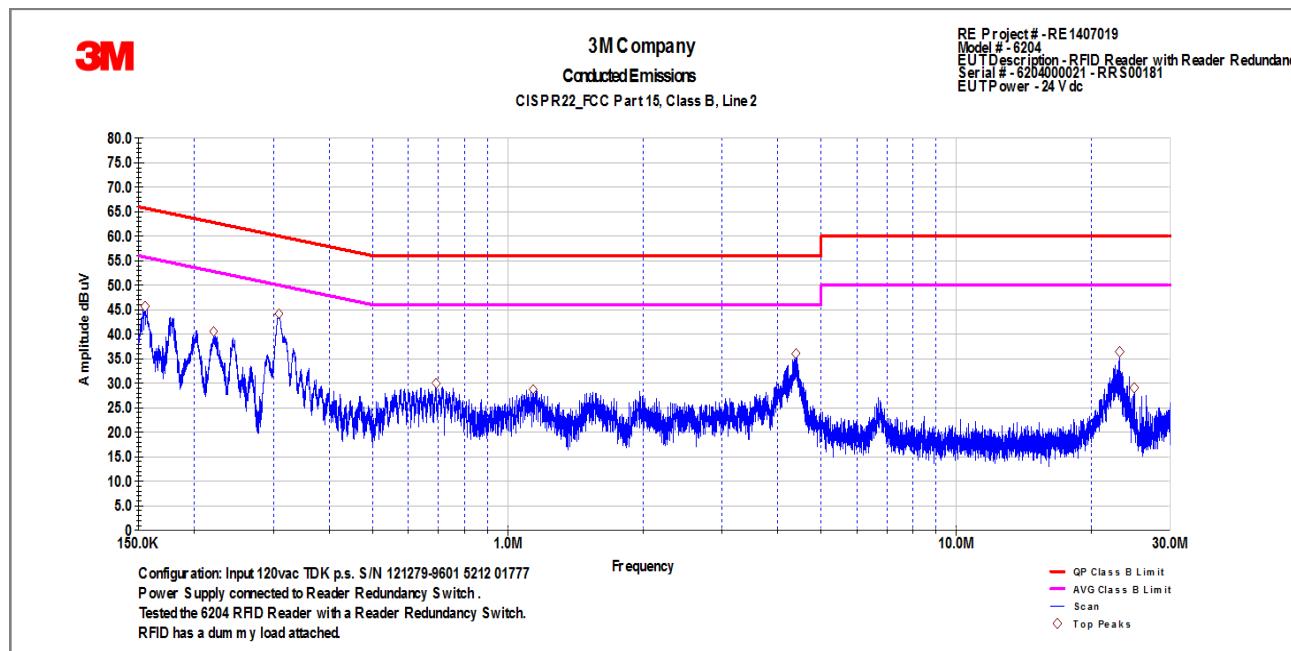


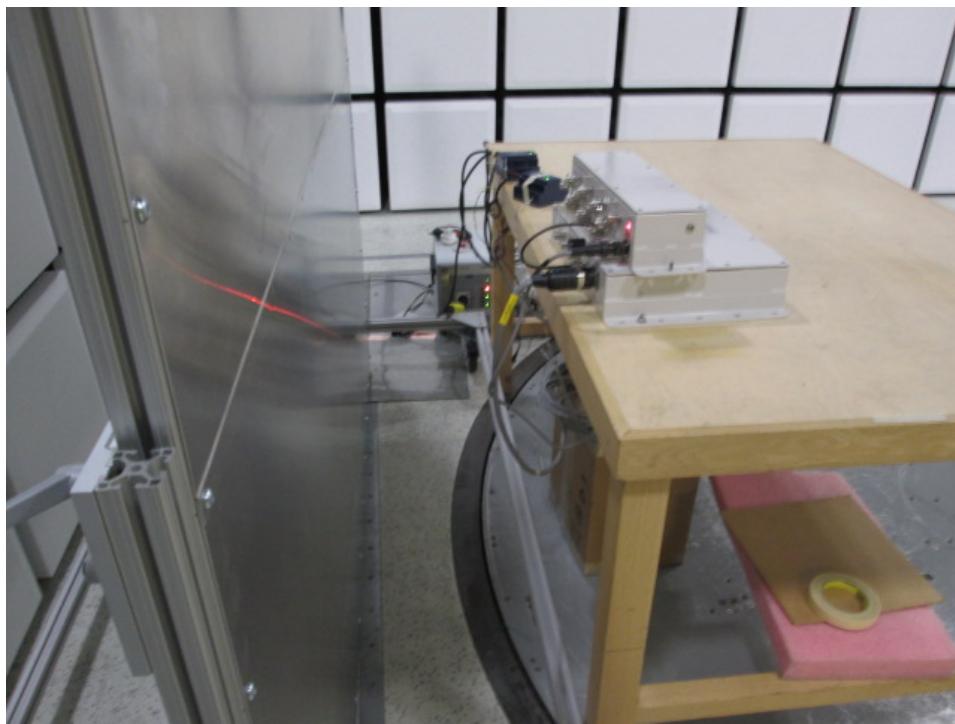
Frequency (MHz)	QP Line 1 dB (µV)	AVG Line 1 dB (µV)	QP Limit dB (µV)	AVG Limit dB (µV)	QP Margin dB	AVG Margin dB
0.154	43.31	38.33	65.78	55.78	-22.47	-17.45
0.221	38.44	34.31	62.78	52.78	-24.34	-18.47
0.294	41.4	39.16	60.42	50.42	-19.02	-11.26
28.686	41.63	38.56	60	50	-18.37	-11.44
28.687	41.22	38.21	60	50	-18.78	-11.79
29.234	40.43	36.73	60	50	-19.57	-13.27
Frequency (MHz)	QP Line 2 dB (µV)	AVG Line 2 dB (µV)	QP Limit dB (µV)	AVG Limit dB (µV)	QP Margin dB	AVG Margin dB
0.153	44.04	39.46	65.86	55.86	-21.82	-16.39
0.221	37.67	33.45	62.78	52.78	-25.11	-19.33
0.295	41.96	40.34	60.39	50.39	-18.43	-10.05
4.275	35.29	29.09	56	46	-20.71	-16.91
27.158	35.84	31.67	60	50	-24.16	-18.33
28.686	41.67	38.61	60	50	-18.33	-11.39
Voltage		<input checked="" type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input type="checkbox"/>				
Notes		RFID Reader 6204				





Frequency (MHz)	QP Line 1 dB (µV)	AVG Line 1 dB (µV)	QP Limit dB (µV)	AVG Limit dB (µV)	QP Margin dB	AVG Margin dB
0.155	44.33	40.33	65.75	55.75	-21.42	-15.41
0.222	38.22	34.5	62.75	52.75	-24.53	-18.25
0.308	42.6	40.09	60.02	50.02	-17.42	-9.93
0.574	27.31	23.43	56	46	-28.69	-22.57
4.362	34.6	29.45	56	46	-21.4	-16.55
23.128	37.72	34.63	60	50	-22.28	-15.37
24.348	31.62	42.73	60	50	-28.38	-7.27
Frequency (MHz)	QP Line 2 dB (µV)	AVG Line 2 dB (µV)	QP Limit dB (µV)	AVG Limit dB (µV)	QP Margin dB	AVG Margin dB
0.154	43.87	39.43	65.77	55.77	-21.9	-16.34
0.223	38.32	35.3	62.72	52.72	-24.4	-17.41
0.309	42.48	39.06	60.01	50.01	-17.53	-10.95
0.69	27.93	23.78	56	46	-28.07	-22.22
1.147	27.81	23.35	56	46	-28.19	-22.65
4.389	33.55	27.46	56	46	-22.45	-18.54
23.127	36.82	33.52	60	50	-23.18	-16.48
24.899	29.03	24.7	60	50	-30.97	-25.3
Voltage		<input checked="" type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input type="checkbox"/>				
Notes		RF Switch				

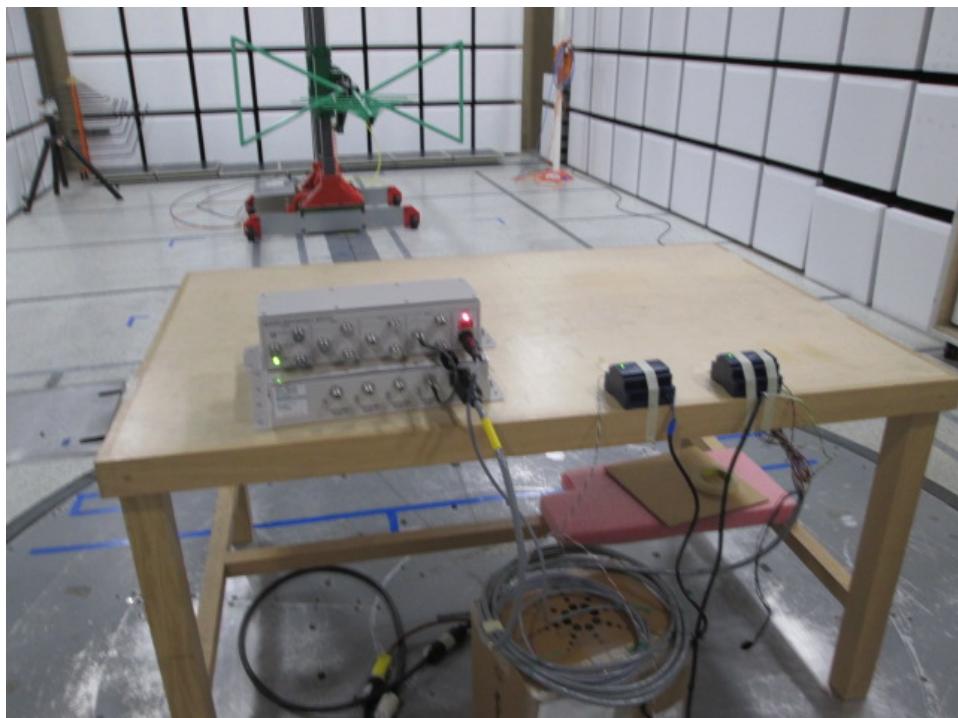


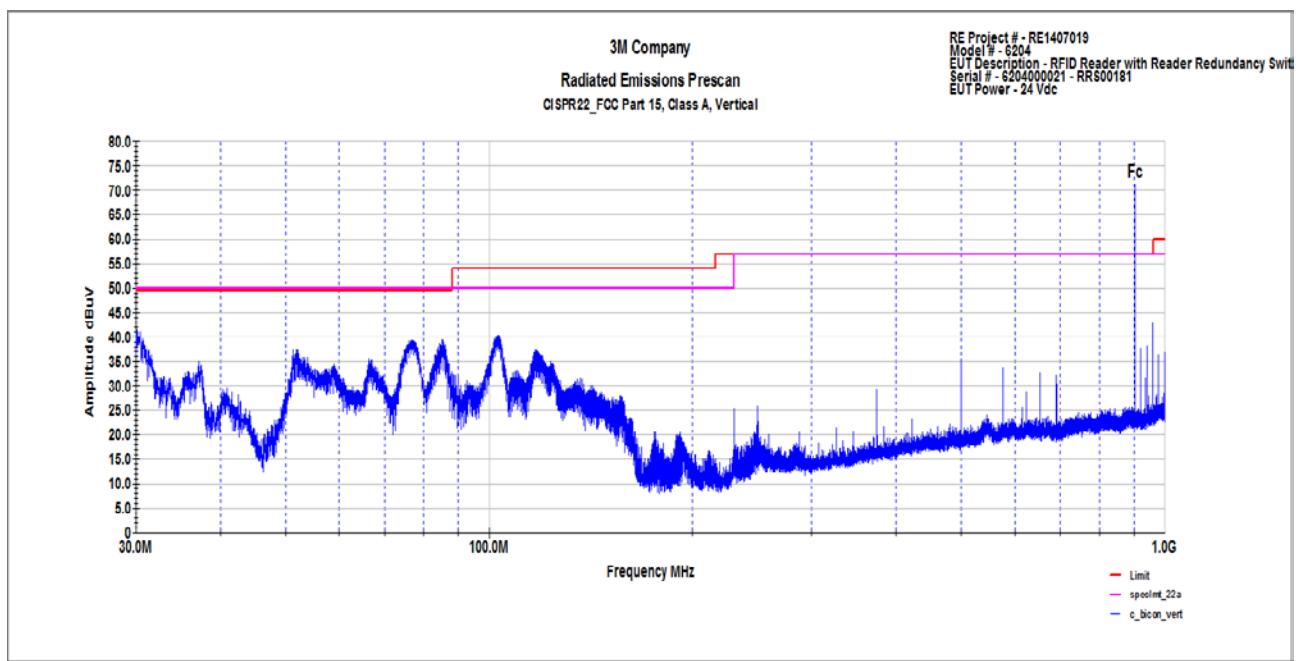
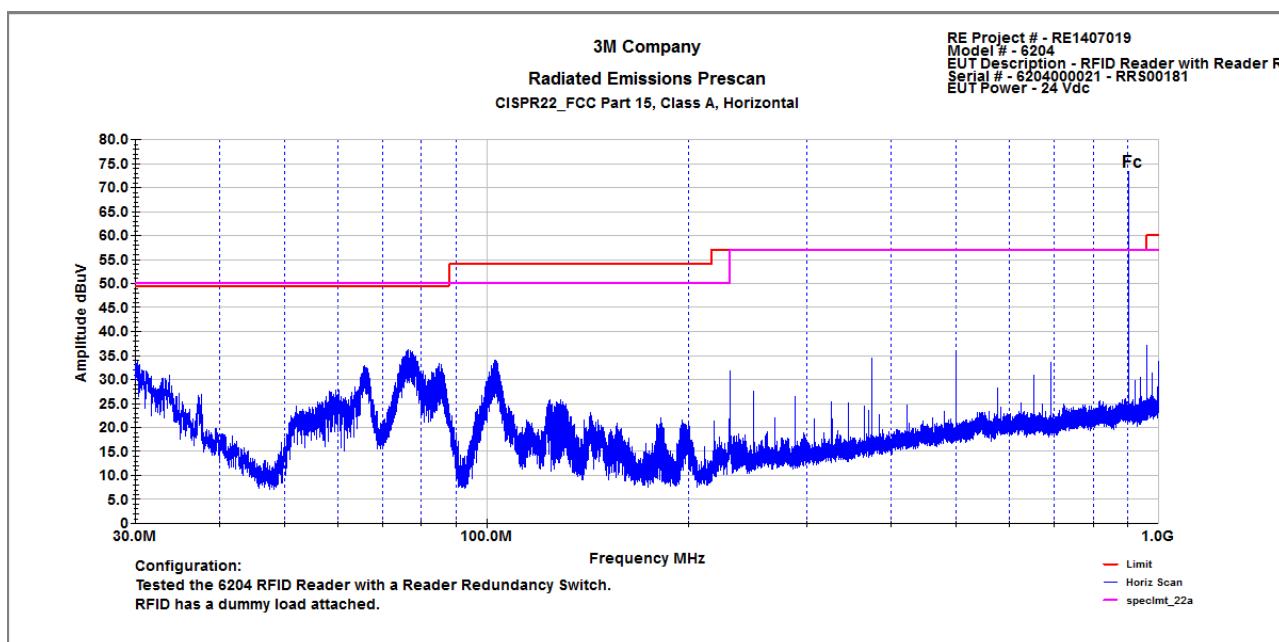
**Test Set Up Photo**



4.2 Radiated Emissions Data					
Method:	Measurements were made in a 3-meter semi-anechoic chamber that complies to CISPR 16. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.				
Test Verification: <input checked="" type="checkbox"/>	Laboratory Ambient Temperature 23°C				
	Relative Humidity 45%				
Reference Standard:	<input type="checkbox"/> ANSI C63.4:2003 <input checked="" type="checkbox"/> ANSI C63.4:2009 <input type="checkbox"/> ANSI C63.10:2009 <input checked="" type="checkbox"/> FCC Part 15.109/RSS Gen <input type="checkbox"/> FCC Part 15.209	Measurement Distance <input checked="" type="checkbox"/> 3 Meters <input type="checkbox"/>			
Frequency Range:	<input checked="" type="checkbox"/> 30 MHz TO 10GHz <input type="checkbox"/>				
Nominal Voltage:	<input checked="" type="checkbox"/> 120VAC <input type="checkbox"/> 230VAC <input type="checkbox"/>				
Tested By:	Mike Schultz <i>MS</i>	Date: 09/18/2014			
Limits - Class A					
Frequency (MHz)	Limit dB (μ V/m)				
	Quasi-Peak	Average	Peak	Distance	Results
30 to 230	40			10	pass
230 to 1000	47			10	pass
1000 to 3000		56	76	3	N/A
3000 to 6000		60	80	3	N/A
Limits - Class B					
30 to 230	30			10	N/A
230 to 1000	37			10	N/A
1000 to 3000		50	70	3	N/A
3000 to 6000		54	74	3	N/A
Modifications:					
Note:	For emission in the restricted bands, the limit of 15.209 was used.				

Frequency (MHz)	Pol.	QP Reading dB μ V/m	Total CF dB	Net at 3 m dB μ V/m	Limit (dB μ V/m)	Margin dB
30.12	V	18.4	21.62	40.02	49.5	-9.48
37.02	V	12.87	17.98	30.84	49.5	-18.66
51.34	V	22.86	11.31	34.17	49.5	-15.33
66.35	H	23.01	9.86	32.87	49.5	-16.63
77.1	V	25.63	10.62	36.26	49.5	-13.24
84.97	V	22.14	11.81	33.96	49.5	-15.54
102.43	V	22.92	14.96	37.87	54	-16.13
960	V	16.4	26.06	42.46	57	-14.54
Notes		Total CF = Antenna Factor + Cable Factor - AMP Gain				

**Test Set Up Photo**





4.3 Conducted Output Power		
Method:		Measurements was performed with modulated carrier at the highest power level at which the transmitter is intended to operate. The carrier or mean power delivered to antenna was measured under normal test conditions. The analyzer offset was adjusted to compensate for the attenuator and other losses. The RF Power output listed in the table is the power delivered to the antenna.
		Laboratory Ambient Temperature
		23°C
		Relative Humidity
		45%
Reference Standard:		<input type="checkbox"/> ANSI C63.10:2009 <input checked="" type="checkbox"/> FCC Part 90.205/RSS 137 <input checked="" type="checkbox"/> FCC Part 2.1046
Frequency Range:		<input checked="" type="checkbox"/> 902.75-920.45MHz
		Measurement Point <input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/>
		927.25-928MHz
Limit ERP		<input checked="" type="checkbox"/> 30 Watts
		<input type="checkbox"/> 300 Watts
Nominal Voltage:		<input checked="" type="checkbox"/> 120VAC <input type="checkbox"/> VDC
Tested By:		Date: 09/12/2014

Frequency (MHz)	Operating Mode	RF Power Output (dBm)	RF Power Output (Watts)	OBW (KHz)
902.75	ISO10374(CW)	34.6	2.9	399.2
903.25	ISO10374(CW)	34.6	2.9	397.5
902.75	ISO18000-6C(ISOC)	34.8	3.0	431.8
903.25	ISO18000-6C(ISOC)	34.8	3.0	431.9
911.75	Title 21	35	3.16	1006.4
919.25	Title 21	35	3.16	1004.2
911.25	ISO18000-6C(ISOC)	34.5	2.8	423.5
920.25	ISO18000-6C(ISOC)	34.6	2.9	427.0
911.25	EASALARM	34.5	2.8	423.5
920.25	EASALARM	34.5	2.8	428.9
914.25	PS111	34	2.5	758.0
915.75	PS111	33.7	2.5	757.7
910.95	ISO18000-6C(ISOC)	34.6	2.9	421.6
920.45	ISO18000-6C(ISOC)	34.6	2.9	424.7

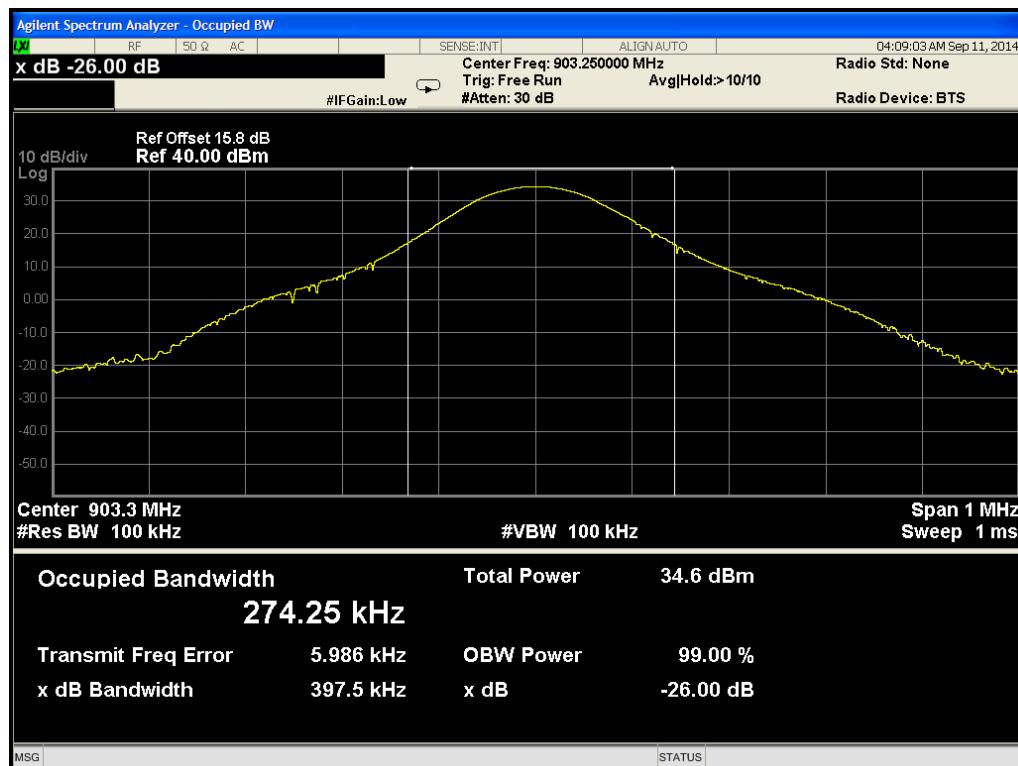
Note:	The devices may employ any type of modulation technique. The worst case modulations used by the device have been reported.
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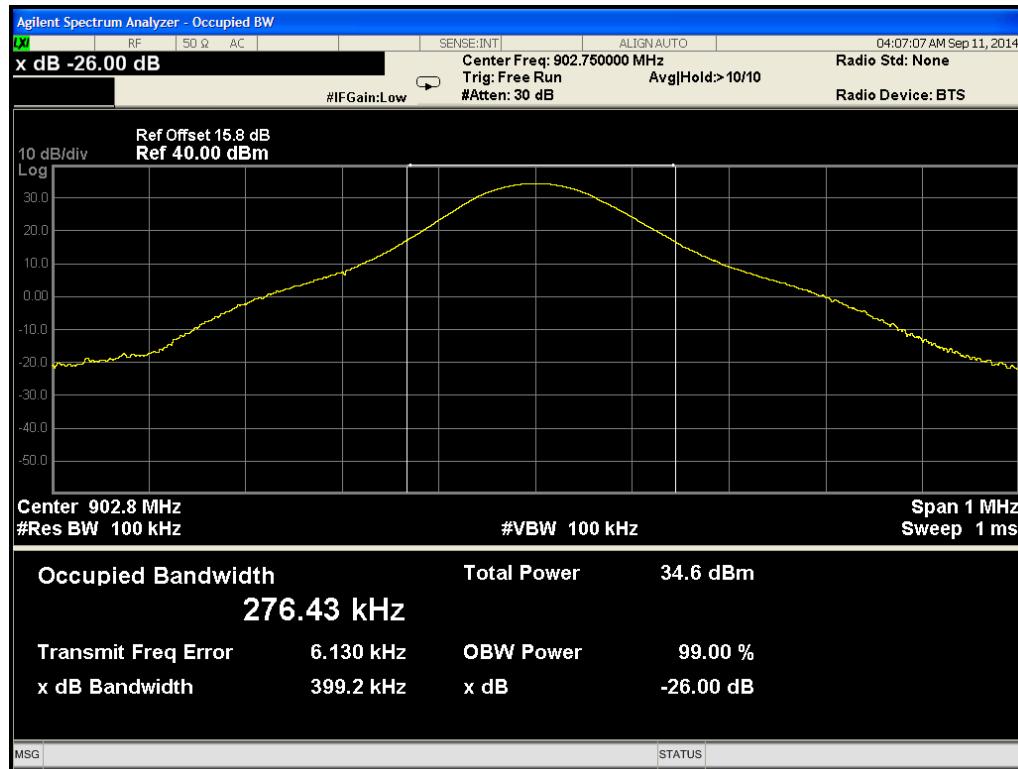
4.4 Occupied Bandwidth		
Method:	The measurements were made with transmitter set to transmit continuously modulated signal. The marker delta method was used to determine the 26dB bandwidth.	
	Laboratory Ambient Temperature	23°C
	Relative Humidity	45%
Reference Standard:	<input type="checkbox"/> FCC Part 15.109/ICES 003 <input checked="" type="checkbox"/> FCC Part 90.209/RSS 137 <input checked="" type="checkbox"/> FCC Part 2.1046	Measurement Point <input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/>
Frequency Range:	<input checked="" type="checkbox"/> 902.75-920.45MHz	909.75-921.75MHz
Maximum OBW	<input checked="" type="checkbox"/> 2MHz	<input checked="" type="checkbox"/> 12MHz
Nominal Voltage:	<input checked="" type="checkbox"/> 120VAC <input type="checkbox"/> VDC	
Tested By:	Yuriy Litvinov	Date: 09/11/2014

Note:	The devices may employ any type of modulation technique. The worst case modulations used by the device have been reported.
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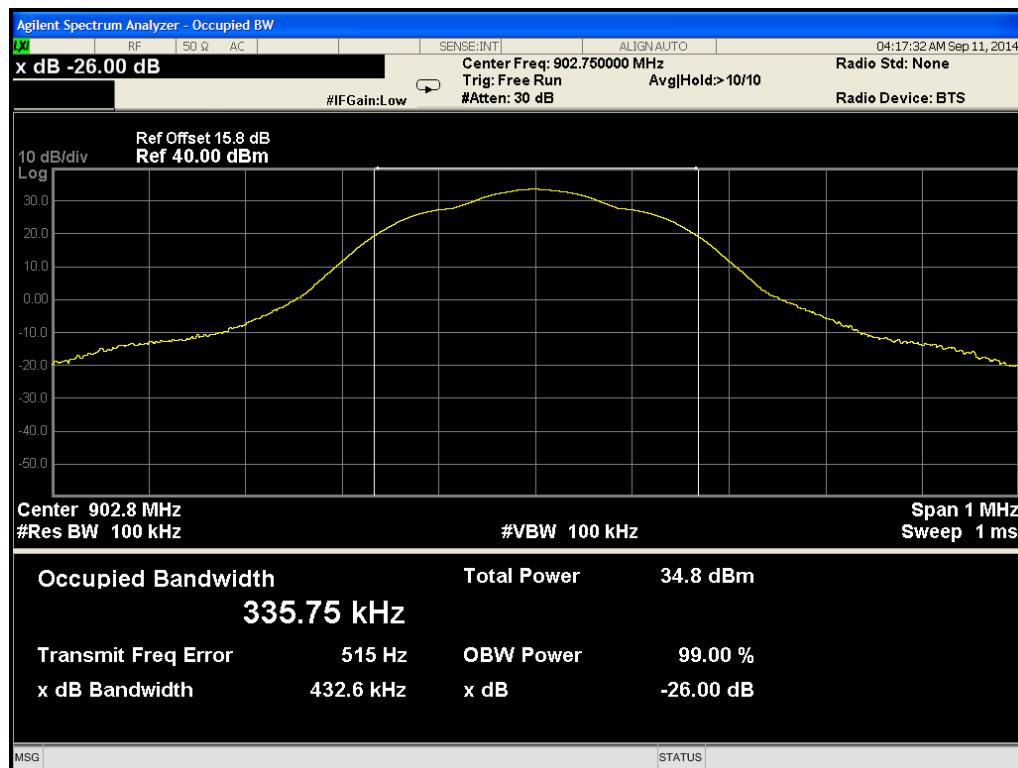
Operation Mode	Frequency Bands (MHz)	Occupied Bandwidth (KHz)
CW	902.75-903.25	399.2
ISO 18000-6C	902.75-903.25	432.6
ISO 18000-6C	911.25-920.25	427.1
PS111	914.25-915.75	755.8
Title 21	911.75-919.25	1006.4
ISO 18000-6C	910.95-920.45	421.1



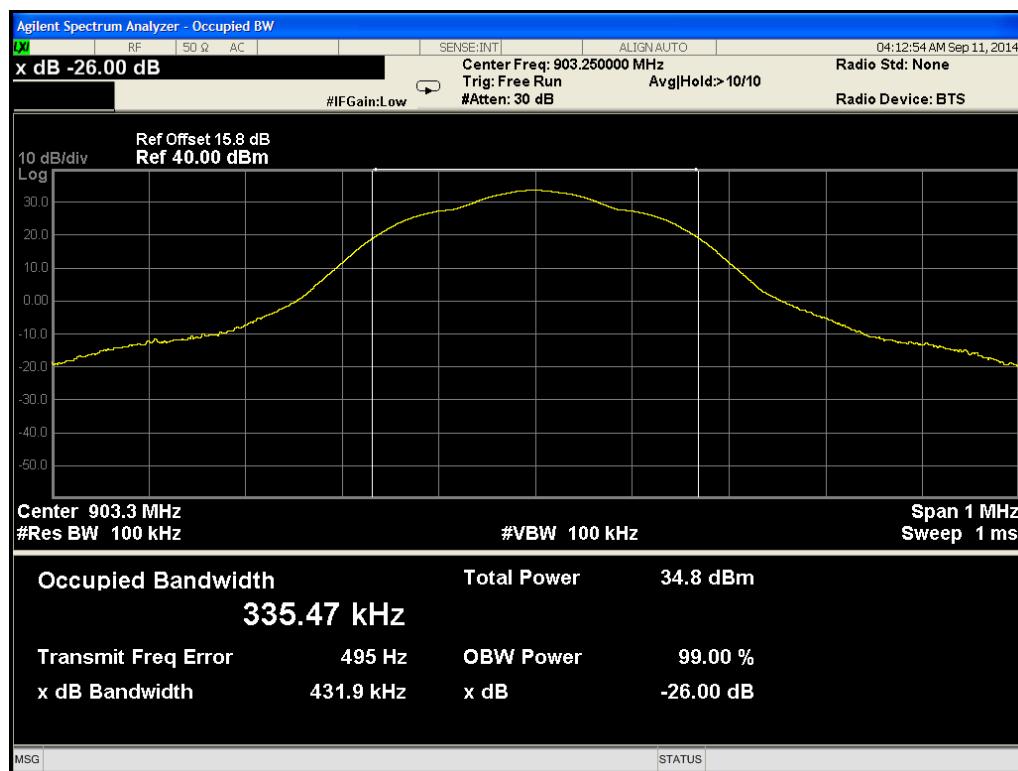
Occupied Bandwidth – Low Band CW



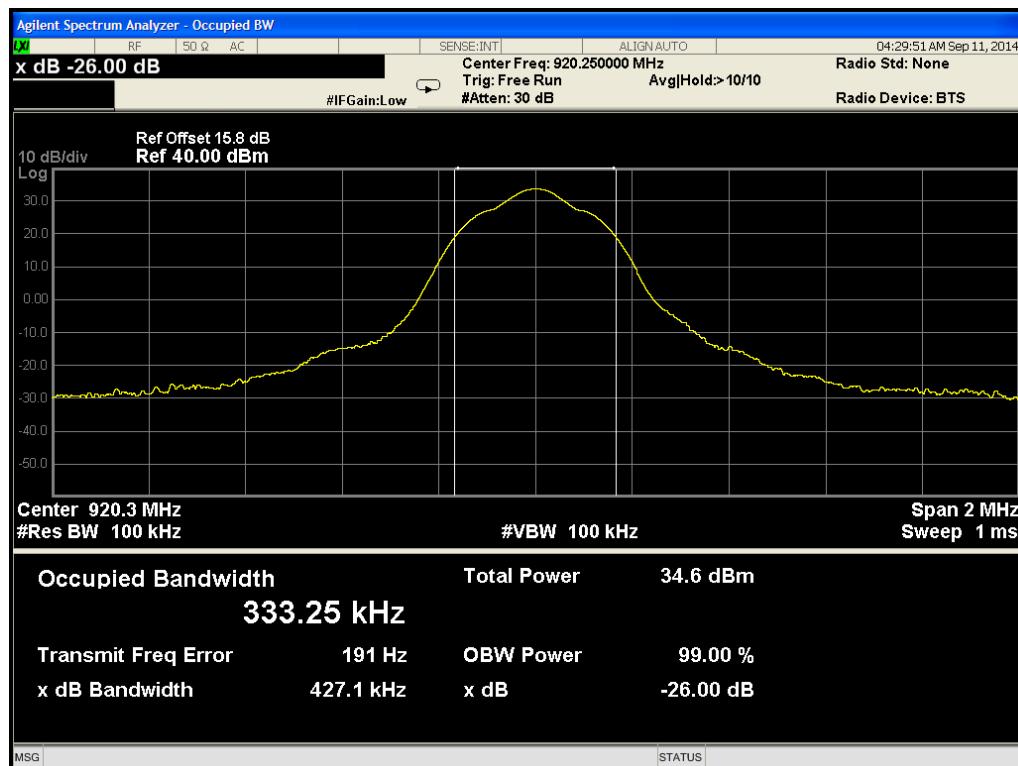
Occupied Bandwidth – Low Band CW



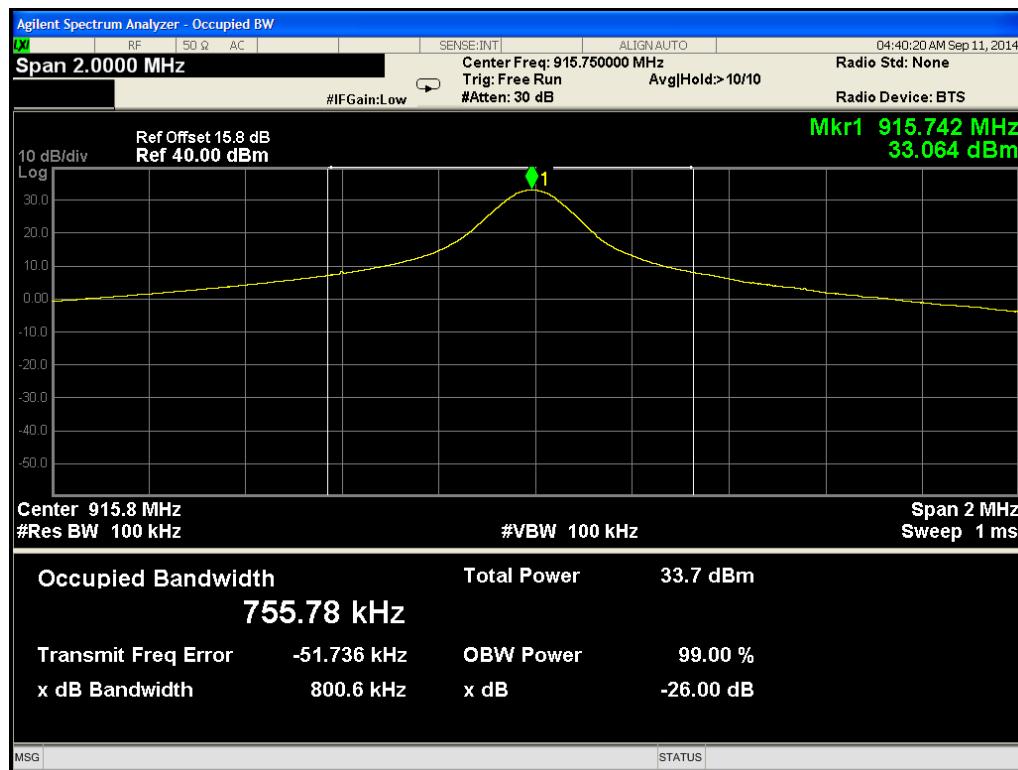
Occupied Bandwidth – Low Band ISOC



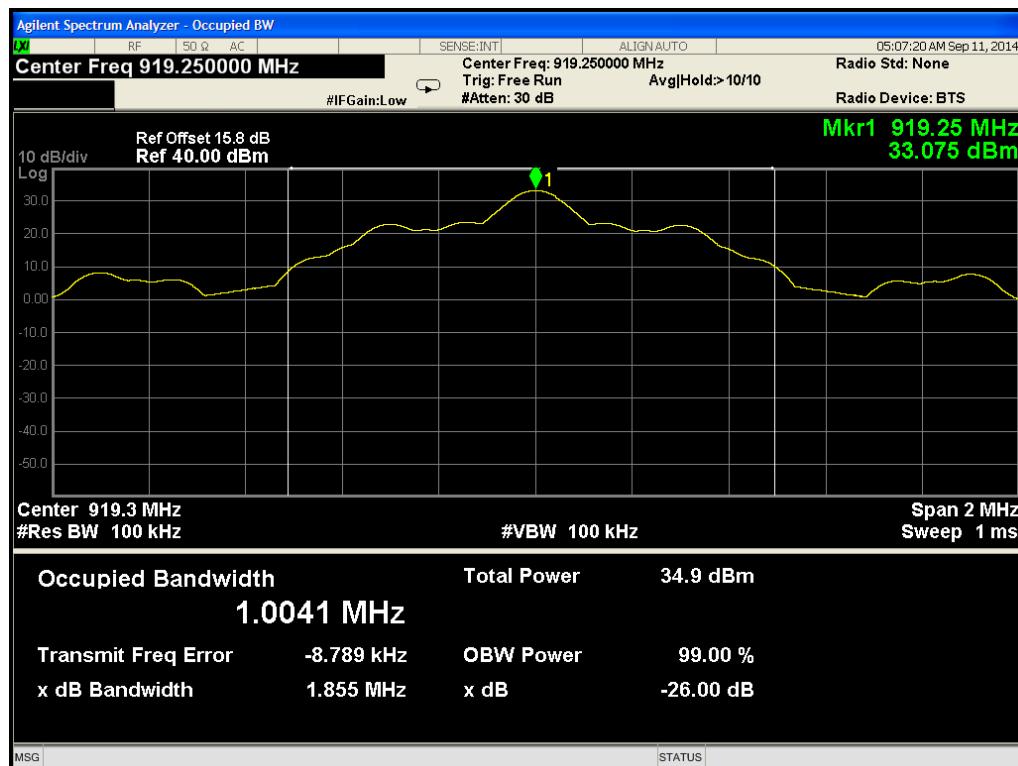
Occupied Bandwidth – Low Band ISOC



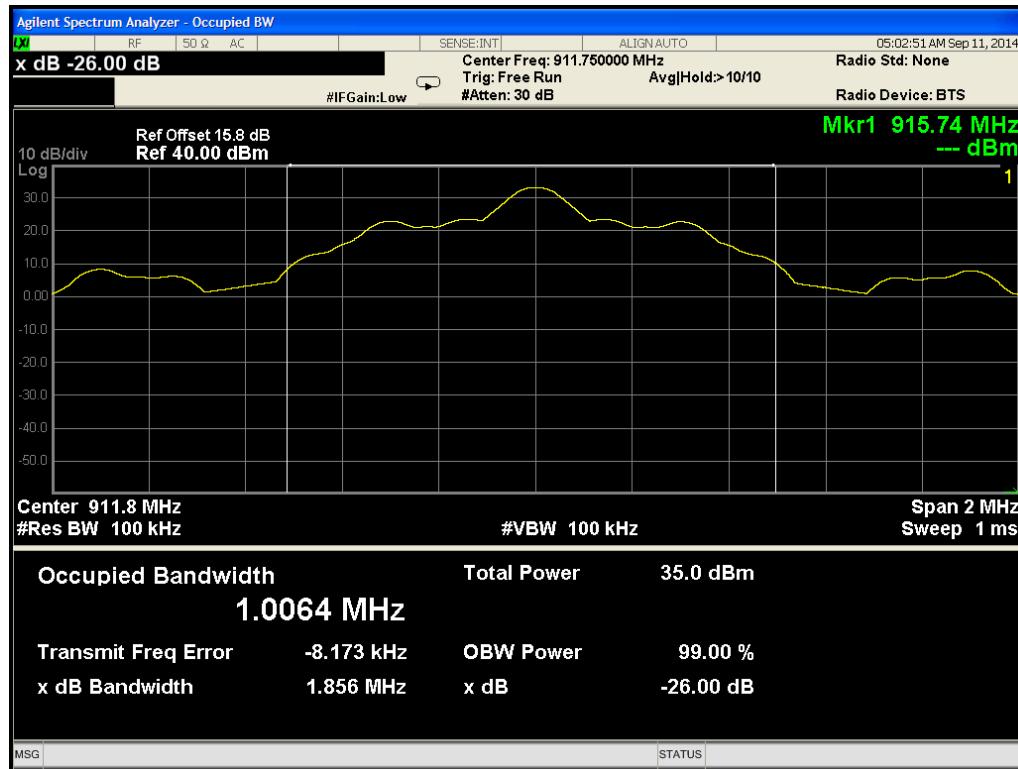
Occupied Bandwidth – FCC 90_dense ISOC



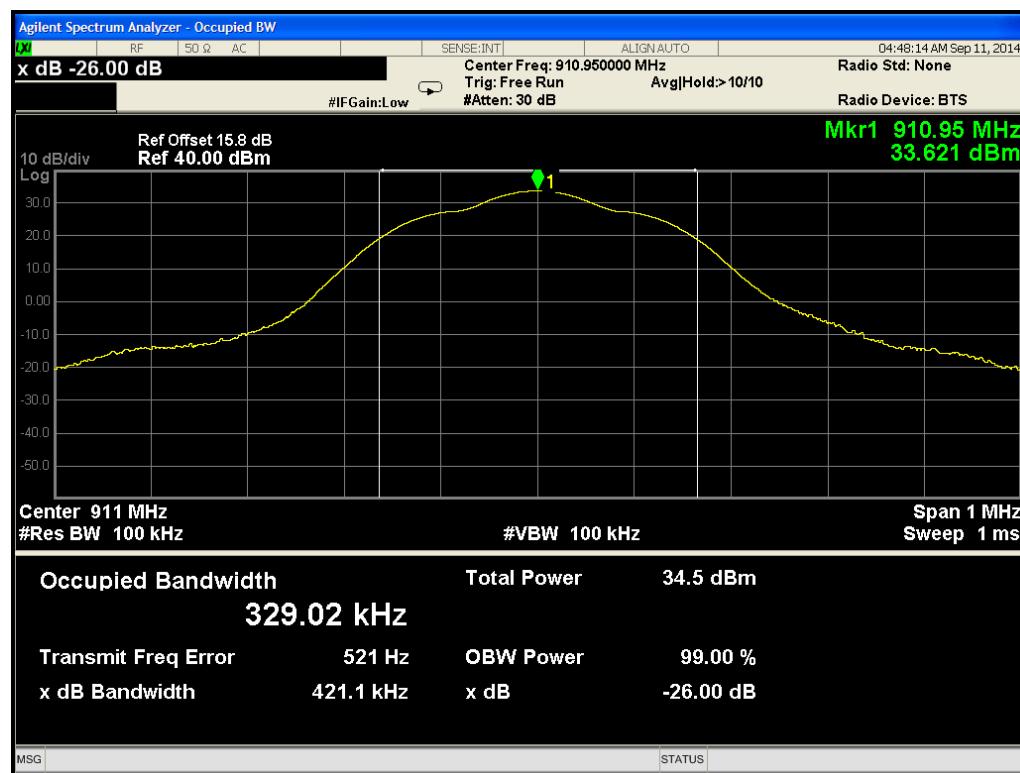
Occupied Bandwidth – FCC 90_dense PS111



Occupied Bandwidth – FCC 90_dense T21



Occupied Bandwidth – FCC 90_dense T21

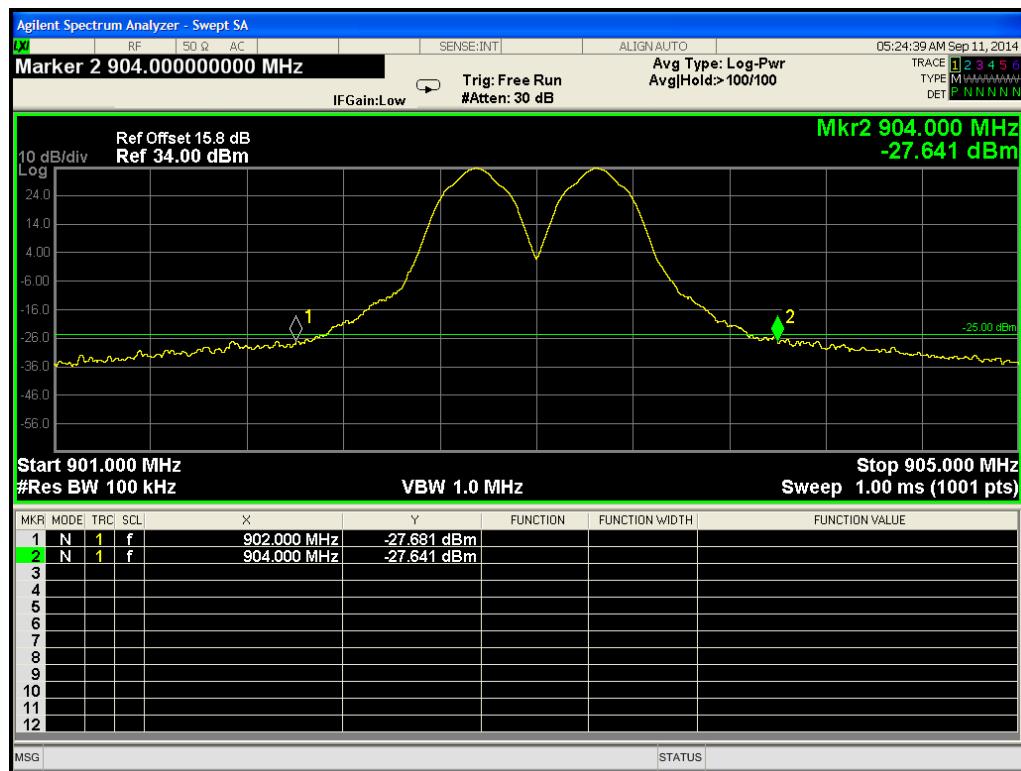
**Occupied Bandwidth – FCC 90 ISOC**



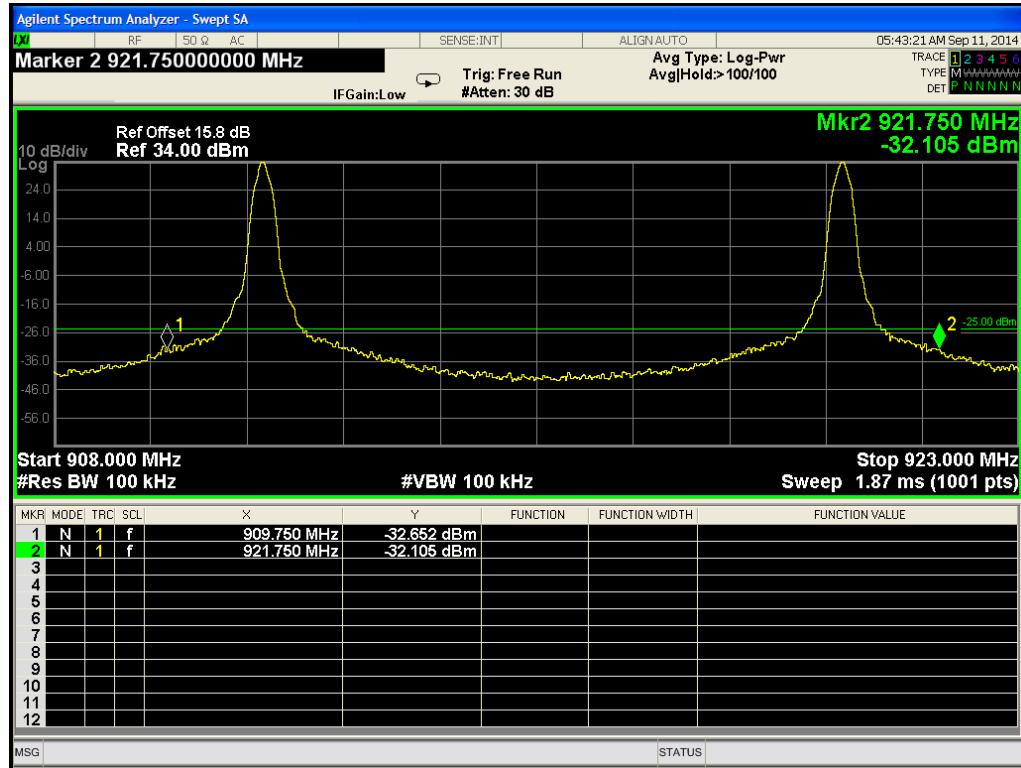
4.5 Spurious Emissions at Antenna Terminals		
Method: The measurements were made with transmitter set to transmit continuously with modulated. The marker delta method was used to determine band-edge compliance.		
Laboratory Ambient Temperature		23°C
Relative Humidity		45%
Reference Standard:	<input type="checkbox"/> FCC Part 90.210/RSS 137 <input checked="" type="checkbox"/> FCC Part 2.1051	Measurement Point <input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/> [redacted]
Frequency Range:	<input checked="" type="checkbox"/> 902.75-920.45MHz	
Limit	Emission Mask "K"(RSS137 EM "C") <input checked="" type="checkbox"/> 55+10log(Pmax)dB <input checked="" type="checkbox"/> >60dBc	Results pass
Nominal Voltage:	<input checked="" type="checkbox"/> 120VAC <input type="checkbox"/> VDC	
Tested By:	Yuriy Litvinov	Date:

Note:





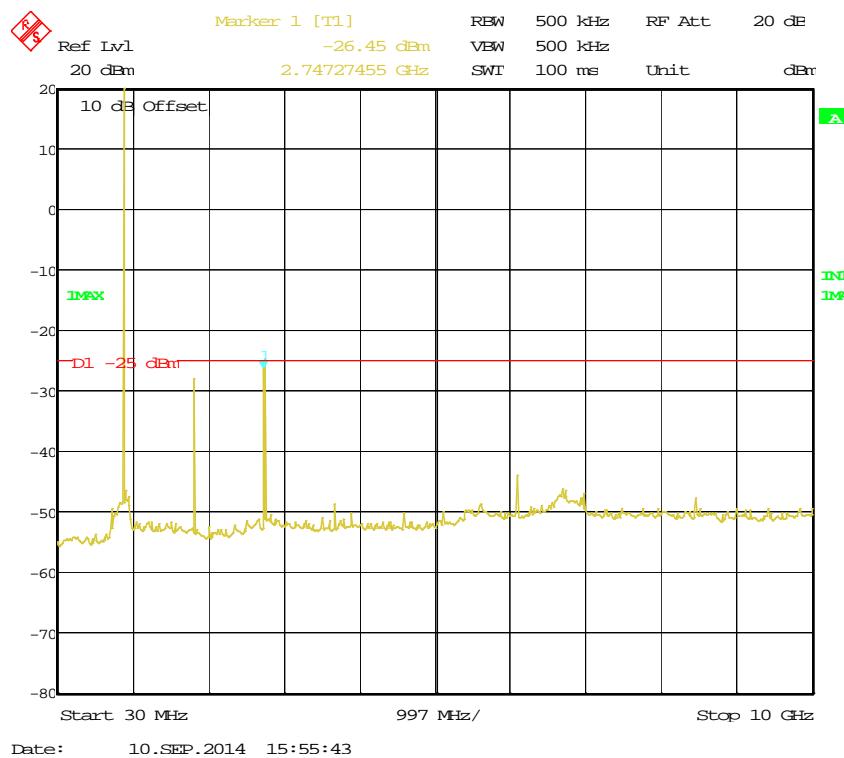
Lower and Upper Band Edge - Low Band –ISO18000-6C



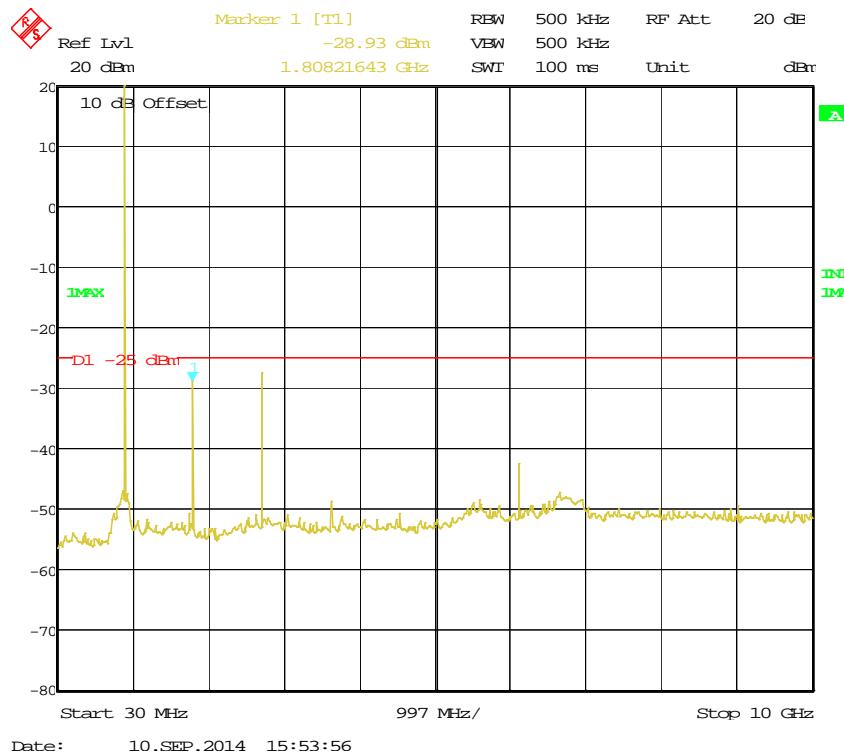
Lower and Upper Band Edge FCC_90-910.95-920.45MHz – ISO18000-6C



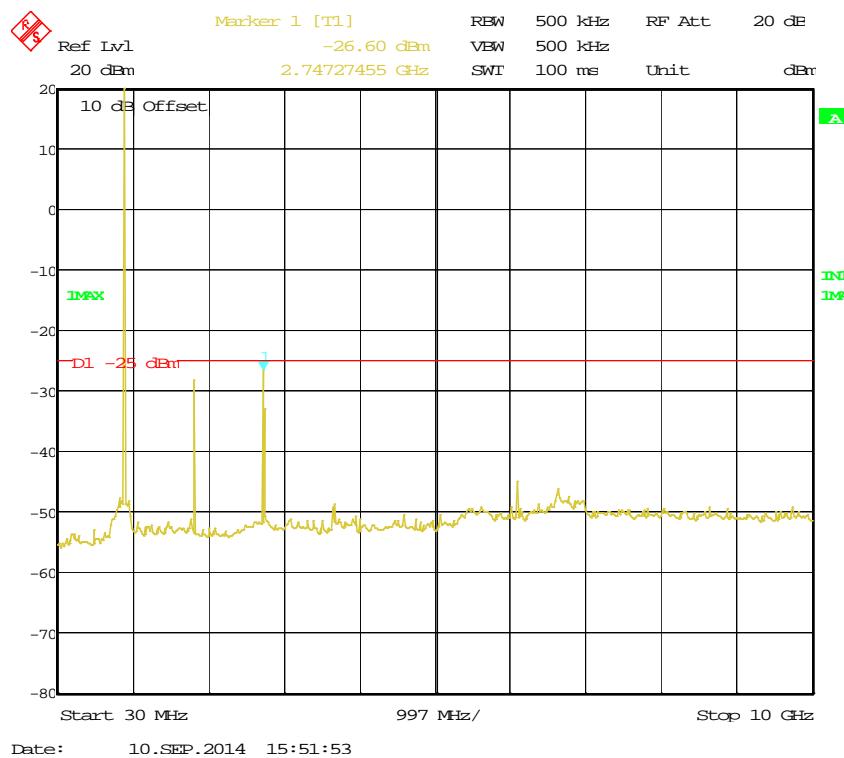
Lower and Upper Band Edge - FCC 90_dense 911.75-919.25MHz – T21



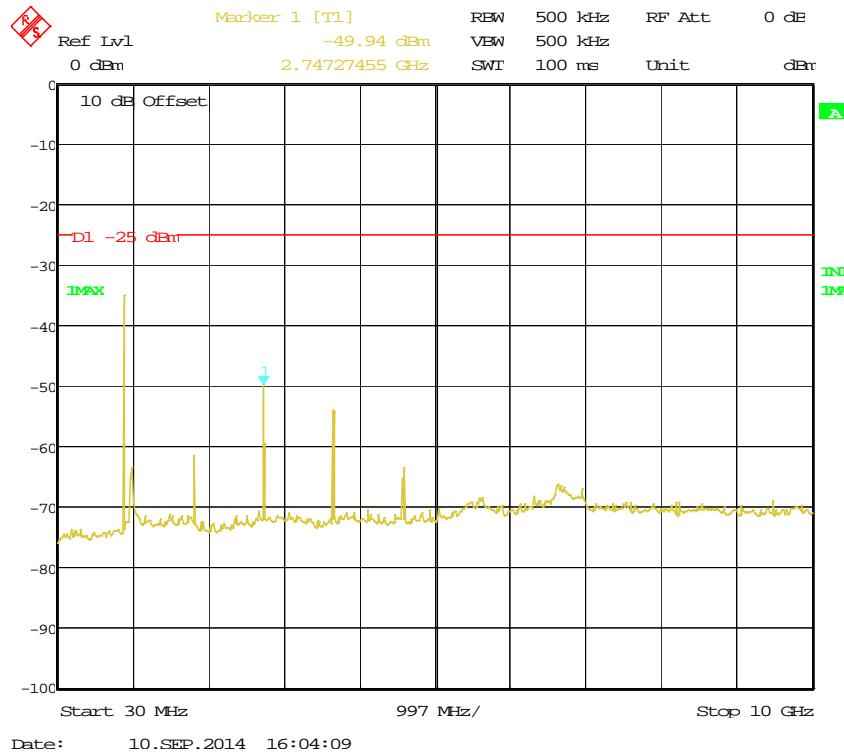
Low Band -ISO18000-6C



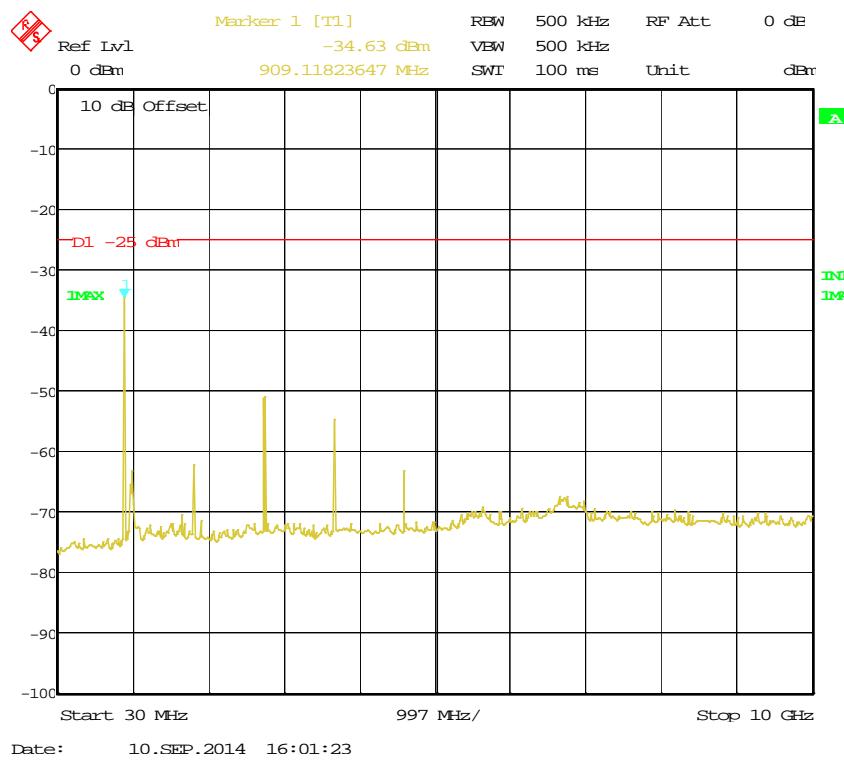
FCC_90-910.95-920.45MHz – ISO18000-6C



FCC 90_dense 911.75-919.25MHz – T21



FCC 90_dense 911.75-919.25MHz – T21 (notched)



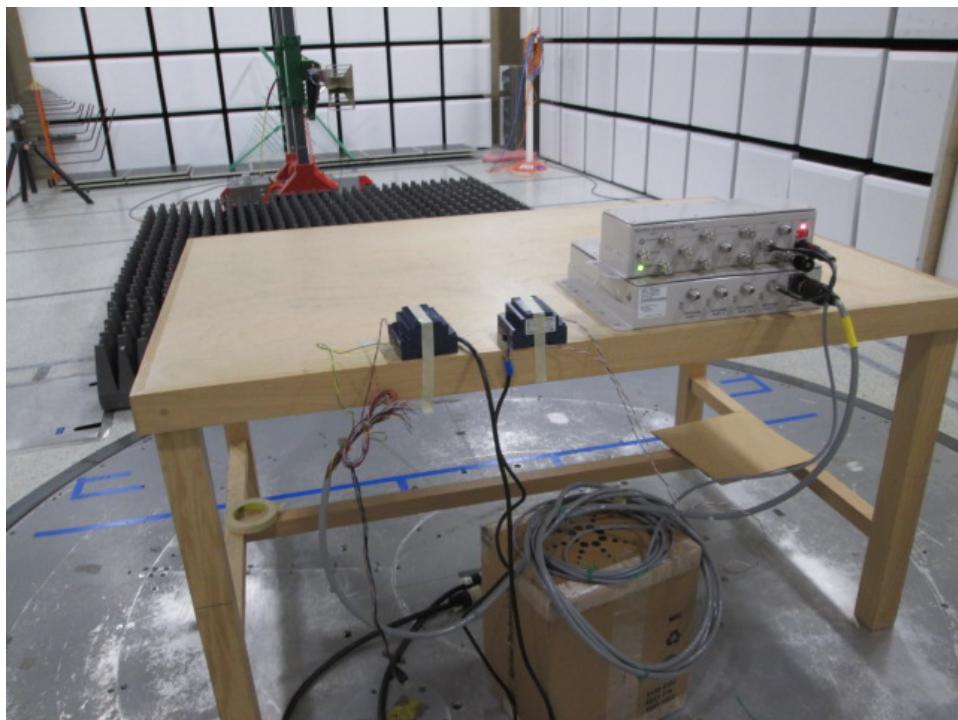
FCC_90-910.95-920.45MHz – ISO18000-6C (notched)

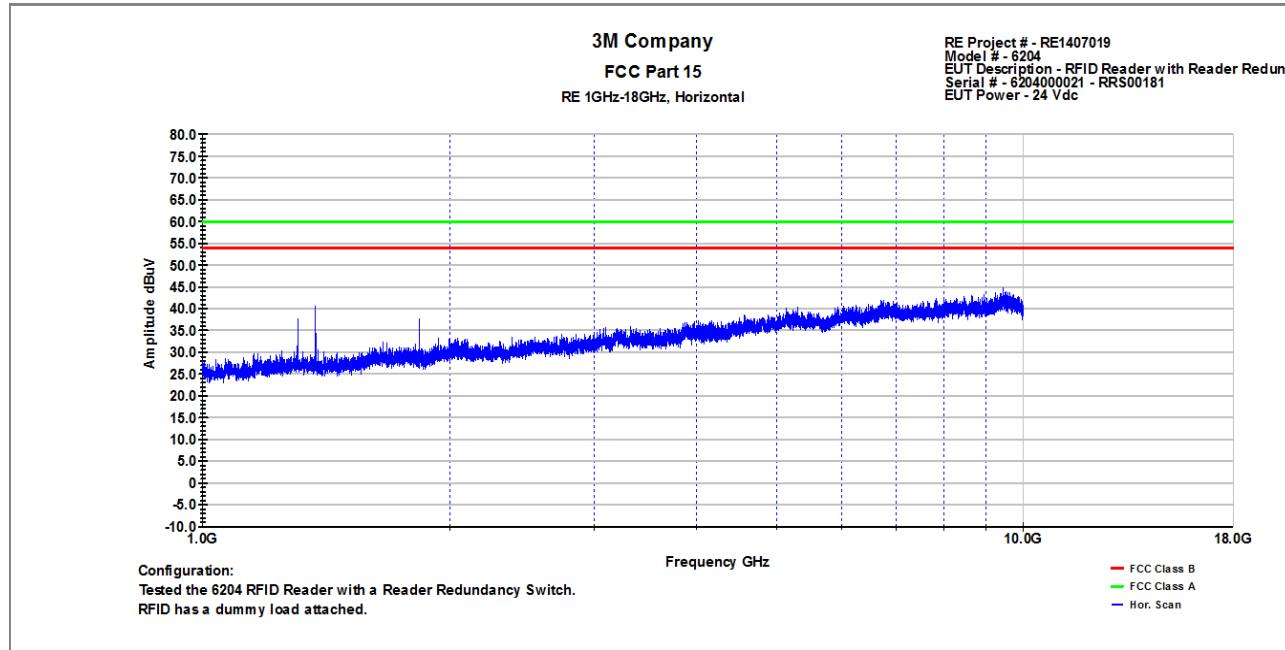
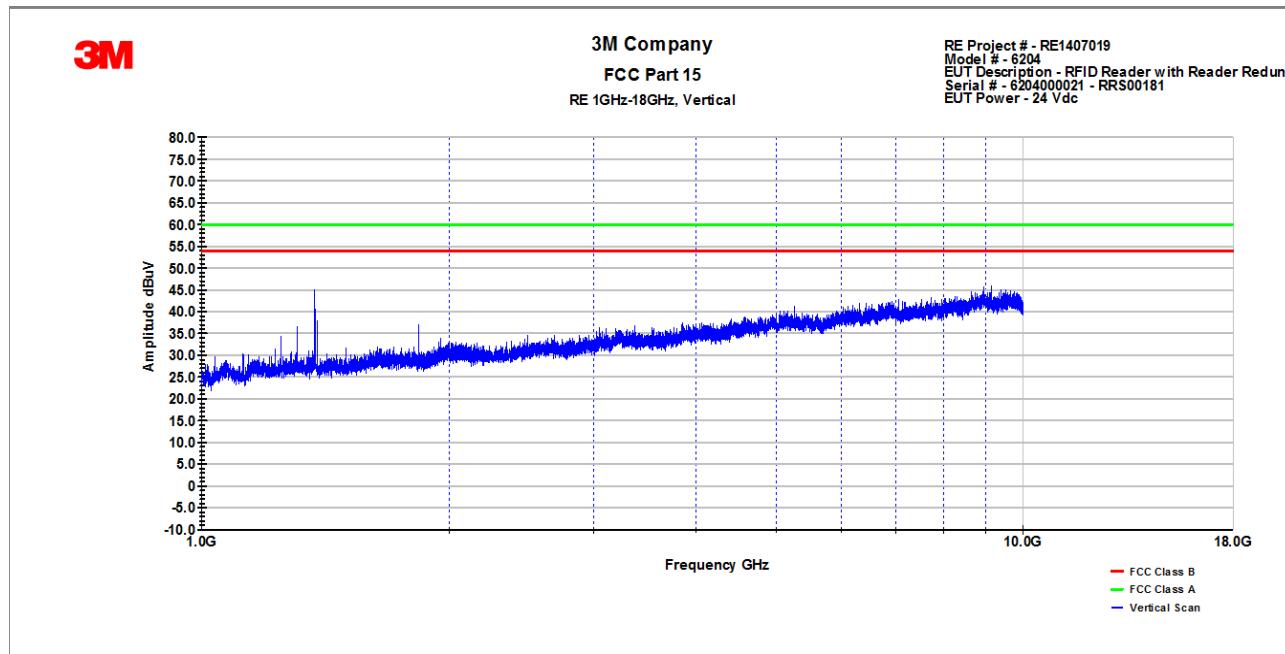


4.6 Field Strength of Spurious Emissions		
Method: The measurements were made with transmitter set to transmit continuously with modulated signal. The level of spurious emissions was measured by their effective radiated power when radiated by the cabinet and structure of the device.		
	Laboratory Ambient Temperature	23°C
	Relative Humidity	45%
Reference Standard:	<input type="checkbox"/> FCC Part 90.210/RSS 137 <input checked="" type="checkbox"/> FCC Part 2.1051	Measurement Point <input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/>
Frequency Range:	<input checked="" type="checkbox"/> 902.75-920.45MHz	
Limit	Emission Mask "K"(RSS137 EM "C")	Results
	<input checked="" type="checkbox"/> 55+10log(Pmax)dB <input checked="" type="checkbox"/> >60dBc	pass
Nominal Voltage:	<input checked="" type="checkbox"/> 120VAC <input type="checkbox"/> VDC	
Tested By:	Mike Schultz	Date: 09/18/2014

Note:	Worst case modulation T21
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Pol.	Frequency (MHz)	SA Reading (dBm)	SG Reading (dBm)	Total CF (dB)	ERP Level (dBm)	EIRP Limit (dBm)	Margin (dB)
V	1248.0	57.2	-63.4	6.8	-56.6	-25	-31.6
V	1305.6	58.2	-63.4	7.1	-56.3	-25	-31.3
V	1372.9	64.0	-65.6	7.5	-58.1	-25	-33.1
H	1838.6	55.0	-68.0	10.5	-57.5	-25	-32.5
V	3513.5	46.2	-70.6	11.0	-59.6	-25	-34.6
V	5235.0	43.2	-70.6	11.3	-59.3	-25	-34.3
Notes		ERP = SG Reading (dBm) - Cable Loss(dBm) + Antenna Gain (dBi)					

**Test Set Up Photo**





4.7 Frequency Stability		
Method: The measurements was made with the device set to transmit a continuous un-modulated carrier and performed at each of the applicable frequencies.		
	Laboratory Ambient Temperature	21°C
	Relative Humidity	45%
Reference Standard:	<input checked="" type="checkbox"/> FCC Part 90.213/RSS 137 <input type="checkbox"/> [redacted]	Measurement Point <input checked="" type="checkbox"/> Conducted <input type="checkbox"/> Radiated <input type="checkbox"/> [redacted]
	<input checked="" type="checkbox"/> 902-928MHz	
Limit	Frequency Drift	Output Power
	<input checked="" type="checkbox"/> ±2.5ppm <input type="checkbox"/> [redacted]	<input type="checkbox"/> [redacted] <input checked="" type="checkbox"/> [redacted] <input type="checkbox"/> [redacted]
Nominal Voltage:	<input type="checkbox"/> 230VAC <input checked="" type="checkbox"/> 120VAC	
Tested By:		Date:

Note:	Part 90.213(a) Note 13. Fixed non-multilateration transmitters with an authorized bandwidth that is more than 40 kHz from the band edge, intermittently operated hand-held readers, and mobile transponders are not subject to frequency tolerance restrictions.
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4.8 RF Exposure Compliance	
Reference Standard:	<input checked="" type="checkbox"/> IEEE Std 1528a <input checked="" type="checkbox"/> RSS 102, Issue 4 <input checked="" type="checkbox"/> KDB 447498 <input type="checkbox"/> KDB [REDACTED] <input checked="" type="checkbox"/> FCC Parts 2.1091 and 2.1093 <input type="checkbox"/> OET 65
Frequency Range:	<input checked="" type="checkbox"/> 902-928MHz
Antenna Separation Distance	>120cm
Antenna Type	LINEAR 30 ⁰ , 15DBI
Antenna Gain (maximum)	31.6 (numeric)
Maximum Output Power at antenna terminal	35dBm (3162mW)
Power Density	0.552 mW/cm ²
GENERAL POPULATION/UNCONTROLLED LIMIT	
FCC/RSS102	0.610 mW/cm ²

Note:	The highest RF output power of the unit was measured and recorded. According to §1.1310 of the FCC rules, the power density limit for General population/Uncontrolled Exposure is 0.610 mW/cm ² . The MPE shall be calculated at 20cm to show compliance with the power density limit. The following formula was used to calculate the Power Density: $S=PG/4\pi R^2$
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5.0	Test Equipment					
Test Equipment Used						
Description	Manufacturer	Model	Identifier	Cal. Due	Check	
Biconilog Antenna	Schaffner	CBL6112B	27491	10/2014	<input checked="" type="checkbox"/>	
Horn Antenna	AH Systems	SAS 571	1010	10/2014	<input checked="" type="checkbox"/>	
Loop Antenna	EMCO	ALR25M	1011	10/2014	<input type="checkbox"/>	
EMI Receiver	Rohde & Schwarz	ESIB 40	100235	10/2014	<input type="checkbox"/>	
EMI Receiver	Agilent	E4448A	1530975	09/2014	<input checked="" type="checkbox"/>	
Signal Analyzer	Agilent	N9000A	MY53031040	05/2014	<input checked="" type="checkbox"/>	
LISN	TESEQ	NNB51	1130	10/2014	<input checked="" type="checkbox"/>	
Harmonic/Flicker Source	Cal. Instruments	C4-5001iX	57162	10/2014	<input type="checkbox"/>	
Amplifier	AR	250W1000AM	14354	10/2014	<input type="checkbox"/>	
Amplifier	AR	25S1G4A	4003	10/2014	<input type="checkbox"/>	
Signal Generator	HP	8656A	2326A05125	10/2014	<input type="checkbox"/>	
Signal Generator	Agilent	E8257D	160895	10/2014	<input type="checkbox"/>	
Field Probe	AR	FL7006	25019	10/2014	<input type="checkbox"/>	
Field Monitor	AR	FM2000	14292	10/2014	<input type="checkbox"/>	
AC CDN	Schaffner	M316,	21937	10/2014	<input type="checkbox"/>	
AC CDN	Teseq	M016,	26131	10/2014	<input type="checkbox"/>	
ISN	Teseq	T4	25652	10/2014	<input type="checkbox"/>	
High Pass Filter	WHK	WHK1.1/1.5G	9	10/2014	<input type="checkbox"/>	
EMC Software	ETS-Lindgren	TILE 6		05/2014	<input checked="" type="checkbox"/>	
Oscilloscope	Tektronix	DPO4104	1550	03/2015	<input type="checkbox"/>	

6.0	Report revision history			
Revision Level	Date	Report Number	Notes	
0	10/31/2014	RE1407019-2	Original Issue	



Certificate of Conformity

3M EMC Laboratory

SEMS Global Regulatory Engineering
Building 76-01-01
St. Paul, MN 55144-1000, USA

MANUFACTURER'S NAME	3M COMPANY
NAME OF EQUIPMENT	Toll RFID READER and READER
MODEL NUMBER(S)	REDUNDANCY SWITCH
TEST REPORT NUMBER	6204 and RRS
DATE OF ISSUE	RE1407019-2
	November 13, 2014

Referring to the performance criteria and operating mode during the tests specified in this report the equipment complies with the essential requirements herein specified:

47 CFR Part 90 - Subpart M - LMS
Operations in the 902-928 MHz band

FCC Part 90.353

Location and Monitoring Service in the
Band 902-928 MHz.

RSS 137, Issue 2, 2009

Emissions

47 CFR:2013, FCC Parts 15.107 and 15.109

ICES-003, Issue 5, 2012

Comments:

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NVLAP Lab Code 200033-0