

FIELD STRENGTH OF FUNDAMENTAL



PSA-ESCI 2019.05.10

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

FM full power on Low ch. (72.1 MHz), Mid ch. (74.7 MHz), and High ch. (75.9 MHz); 400 Hz sine wave tone at -11 modulation

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

WILM0050 - 6

WILM0050 - 7

WILM0050 - 8

WILM0050 - 9

FREQUENCY RANGE INVESTIGATED

Start Frequency	72 MHz	Stop Frequency	76 MHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	Fairview Microwave	SA18E-10	TYA	24-Sep-2018	12 mo
Cable	ESM Cable Corp.	Bilog Cables	MNH	2-Nov-2018	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYD	25-Jan-2018	24 mo
Receiver	Rohde & Schwarz	ESR7	ARI	8-Jul-2019	12 mo

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT and EUT antenna in 3 orthogonal planes.

FIELD STRENGTH OF FUNDAMENTAL

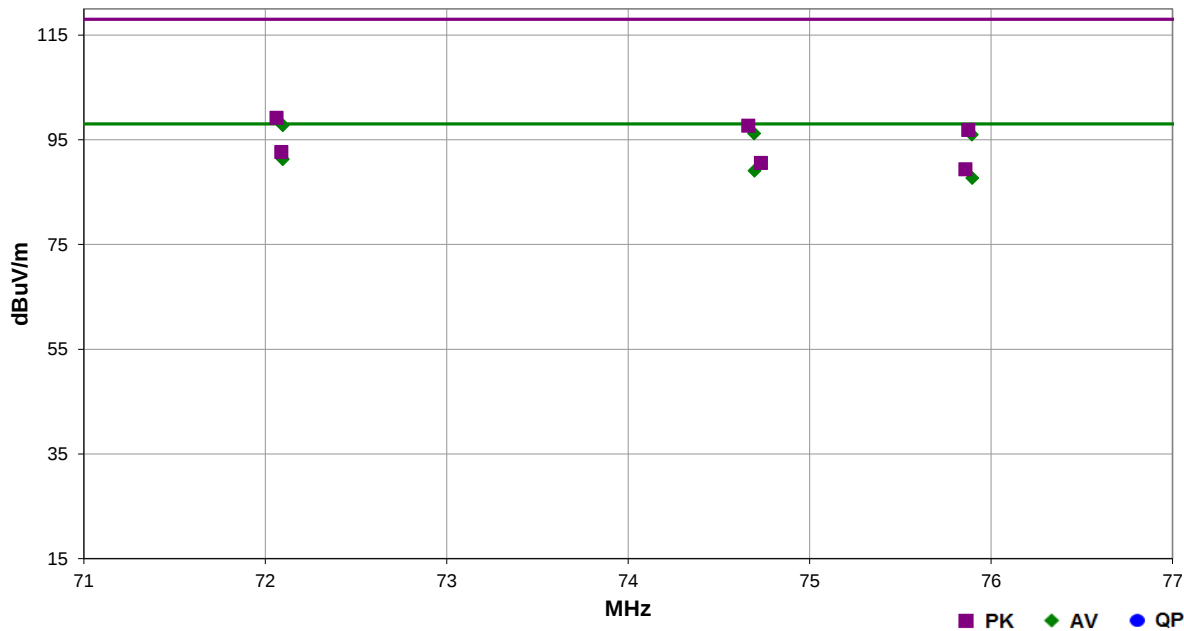


EmiRS 2019.08.01 PSA-ESCI 2019.05.10

Work Order:	WILM0050	Date:	28-Aug-2019	
Project:	None	Temperature:	21.5 °C	
Job Site:	MN05	Humidity:	56.6% RH	
Serial Number:	Tom 2	Barometric Pres.:	1014 mbar	
Tested by: Andrew Rogstad				
EUT:	FM T55			
Configuration:	9			
Customer:	Williams Sound, LLC			
Attendees:	Lawrence Herrington			
EUT Power:	110VAC/60Hz			
Operating Mode:	FM full power on Low ch. (72.1 MHz), Mid ch. (74.7 MHz), and High ch. (75.9 MHz); 400 Hz sine wave tone at -11 modulation			
Deviations:	None			
Comments:	Tom 2, PCA 293 #3, ANT005; Per manufacturer, EUT antenna will always be mounted in vertical position. Coax port is only populated when external antenna is used.			

Test Specifications	Test Method
FCC 15.237:2019	ANSI C63.10:2013

Run #	25	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
72.097	76.1	11.7	2.9	1.9	3.0	10.0	Vert	AV	0.0	97.8	98.1	-0.3	Low ch.
74.695	74.5	11.7	3.8	44.0	3.0	10.0	Vert	AV	0.0	96.2	98.1	-1.9	Mid ch.
75.895	74.3	11.7	3.1	51.0	3.0	10.0	Vert	AV	0.0	96.0	98.1	-2.1	High ch.
72.097	69.6	11.7	1.6	289.0	3.0	10.0	Horz	AV	0.0	91.3	98.1	-6.8	Low ch.
74.697	67.4	11.7	1.6	299.0	3.0	10.0	Horz	AV	0.0	89.1	98.1	-9.0	Mid ch.
75.897	66.0	11.7	1.5	77.9	3.0	10.0	Horz	AV	0.0	87.7	98.1	-10.4	High ch.
72.062	77.5	11.7	2.9	1.9	3.0	10.0	Vert	PK	0.0	99.2	118.1	-18.9	Low ch.
74.662	76.0	11.7	3.8	44.0	3.0	10.0	Vert	PK	0.0	97.7	118.1	-20.4	Mid ch.
75.875	75.2	11.7	3.1	51.0	3.0	10.0	Vert	PK	0.0	96.9	118.1	-21.2	High ch.
72.088	71.0	11.7	1.6	289.0	3.0	10.0	Horz	PK	0.0	92.7	118.1	-25.4	Low ch.
74.732	68.9	11.7	1.6	299.0	3.0	10.0	Horz	PK	0.0	90.6	118.1	-27.5	Mid ch.
75.858	67.7	11.7	1.5	77.9	3.0	10.0	Horz	PK	0.0	89.4	118.1	-28.7	High ch.

FIELD STRENGTH OF FUNDAMENTAL

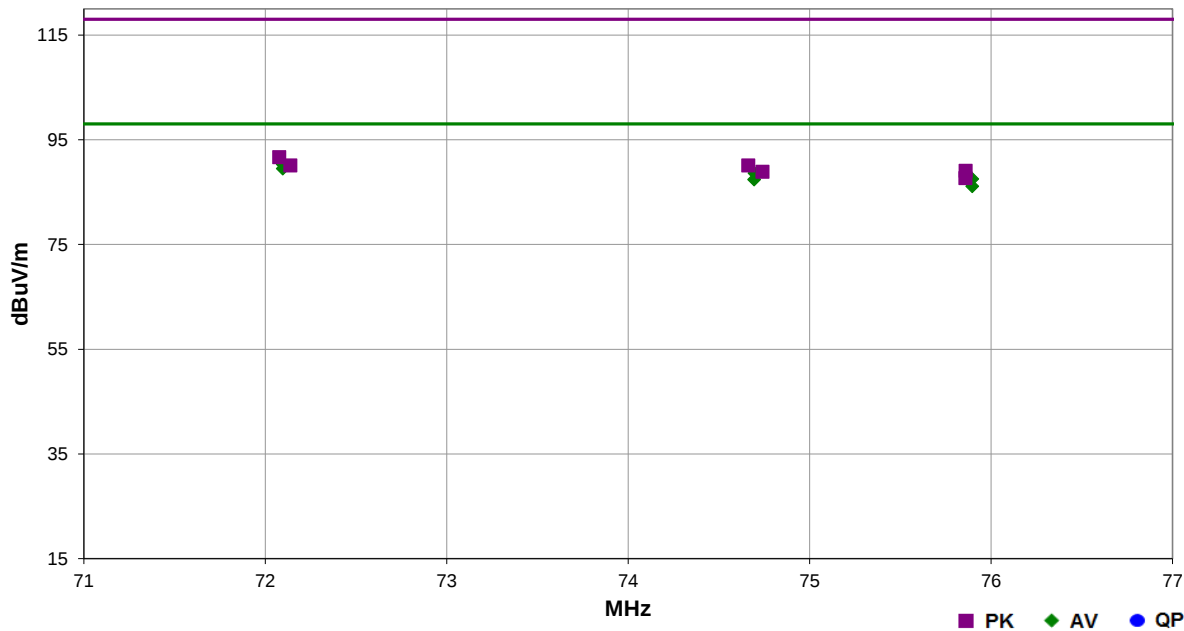


EmiRS 2019.08.01 PSA-ESCI 2019.05.10

Work Order:	WILM0050	Date:	28-Aug-2019		
Project:	None	Temperature:	21.5 °C		
Job Site:	MN05	Humidity:	56.6% RH		
Serial Number:	Tom 2	Barometric Pres.:	1014 mbar	Tested by:	Andrew Rogstad
EUT:	FM T55				
Configuration:	8				
Customer:	Williams Sound, LLC				
Attendees:	Lawrence Herrington				
EUT Power:	110VAC/60Hz				
Operating Mode:	FM full power on Low ch. (72.1 MHz), Mid ch. (74.7 MHz), and High ch. (75.9 MHz); 400 Hz sine wave tone at -11 modulation				
Deviations:	None				
Comments:	Tom 2, PCA 293 #3, ANT021; Per manufacturer, EUT antenna will always be mounted in vertical position. Coax port is only populated when external antenna is used.				

Test Specifications	Test Method
FCC 15.237:2019	ANSI C63.10:2013

Run #	35	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
72.097	68.6	11.7	4.0	250.0	3.0	10.0	Horz	AV	0.0	90.3	98.1	-7.8	Low ch.
72.097	67.8	11.7	2.1	167.9	3.0	10.0	Vert	AV	0.0	89.5	98.1	-8.6	Low ch.
74.697	66.9	11.7	4.0	246.0	3.0	10.0	Horz	AV	0.0	88.6	98.1	-9.5	Mid ch.
75.897	65.8	11.7	4.0	239.9	3.0	10.0	Horz	AV	0.0	87.5	98.1	-10.6	High ch.
74.695	65.7	11.7	1.7	160.0	3.0	10.0	Vert	AV	0.0	87.4	98.1	-10.7	Mid ch.
75.897	64.4	11.7	1.3	131.9	3.0	10.0	Vert	AV	0.0	86.1	98.1	-12.0	High ch.
72.077	70.0	11.7	4.0	250.0	3.0	10.0	Horz	PK	0.0	91.7	118.1	-26.4	Low ch.
74.662	68.4	11.7	4.0	246.0	3.0	10.0	Horz	PK	0.0	90.1	118.1	-28.0	Mid ch.
72.138	68.4	11.7	2.1	167.9	3.0	10.0	Vert	PK	0.0	90.1	118.1	-28.0	Low ch.
75.860	67.4	11.7	4.0	239.9	3.0	10.0	Horz	PK	0.0	89.1	118.1	-29.0	High ch.
74.740	67.2	11.7	1.7	160.0	3.0	10.0	Vert	PK	0.0	88.9	118.1	-29.2	Mid ch.
75.858	66.0	11.7	1.3	131.9	3.0	10.0	Vert	PK	0.0	87.7	118.1	-30.4	High ch.

FIELD STRENGTH OF FUNDAMENTAL

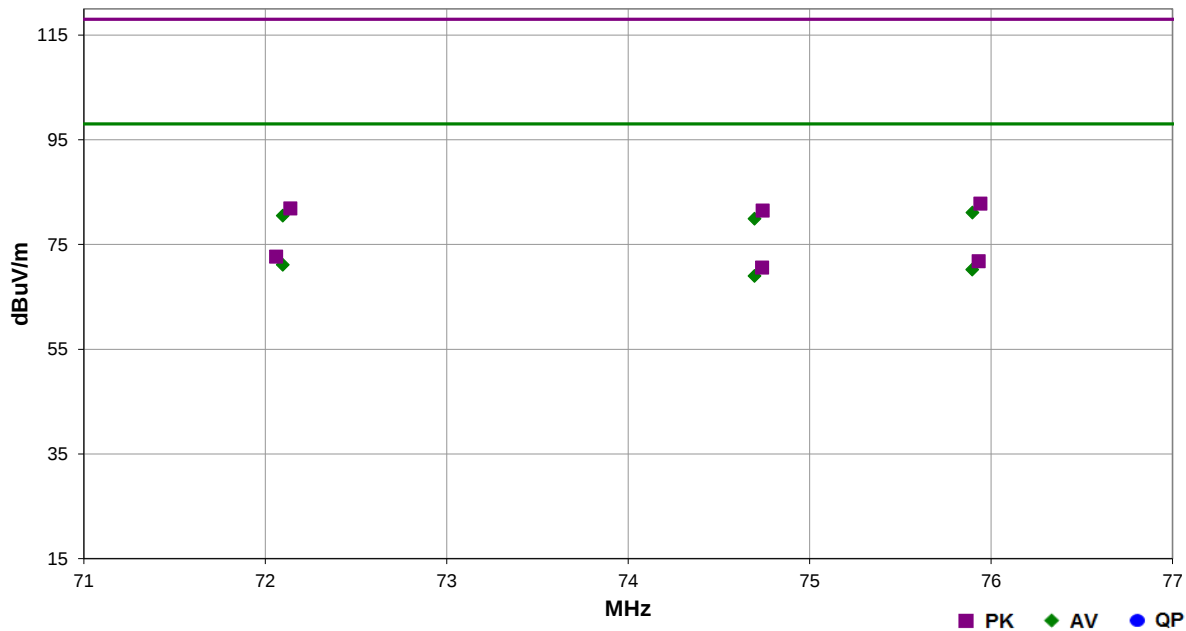


EmiRS 2019.08.01 PSA-ESCI 2019.05.10

Work Order:	WILM0050	Date:	28-Aug-2019		
Project:	None	Temperature:	21.5 °C		
Job Site:	MN05	Humidity:	56.6% RH		
Serial Number:	Tom 2	Barometric Pres.:	1014 mbar	Tested by:	Andrew Rogstad
EUT:	FM T55				
Configuration:	7				
Customer:	Williams Sound, LLC				
Attendees:	Lawrence Herrington				
EUT Power:	110VAC/60Hz				
Operating Mode:	FM full power on Low ch. (72.1 MHz), Mid ch. (74.7 MHz), and High ch. (75.9 MHz); 400 Hz sine wave tone at -11 modulation				
Deviations:	None				
Comments:	Tom 2, PCA 293 #3, ANT024; Per manufacturer, EUT antenna will always be mounted in vertical position. Coax port is only populated when external antenna is used.				

Test Specifications	Test Method
FCC 15.237:2019	ANSI C63.10:2013

Run #	40	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
75.898	59.4	11.7	1.0	44.0	3.0	10.0	Vert	AV	0.0	81.1	98.1	-17.0	High ch.
72.097	58.8	11.7	1.9	351.0	3.0	10.0	Vert	AV	0.0	80.5	98.1	-17.6	Low ch.
74.697	58.2	11.7	1.2	311.0	3.0	10.0	Vert	AV	0.0	79.9	98.1	-18.2	Mid ch.
72.097	49.4	11.7	3.8	246.0	3.0	10.0	Horz	AV	0.0	71.1	98.1	-27.0	Low ch.
75.897	48.5	11.7	1.3	69.0	3.0	10.0	Horz	AV	0.0	70.2	98.1	-27.9	High ch.
74.697	47.3	11.7	1.6	91.0	3.0	10.0	Horz	AV	0.0	69.0	98.1	-29.1	Mid ch.
75.942	61.1	11.7	1.0	44.0	3.0	10.0	Vert	PK	0.0	82.8	118.1	-35.3	High ch.
72.138	60.2	11.7	1.9	351.0	3.0	10.0	Vert	PK	0.0	81.9	118.1	-36.2	Low ch.
74.742	59.8	11.7	1.2	311.0	3.0	10.0	Vert	PK	0.0	81.5	118.1	-36.6	Mid ch.
72.060	51.0	11.7	3.8	246.0	3.0	10.0	Horz	PK	0.0	72.7	118.1	-45.4	Low ch.
75.932	50.1	11.7	1.3	69.0	3.0	10.0	Horz	PK	0.0	71.8	118.1	-46.3	High ch.
74.738	48.9	11.7	1.6	91.0	3.0	10.0	Horz	PK	0.0	70.6	118.1	-47.5	Mid ch.

FIELD STRENGTH OF FUNDAMENTAL

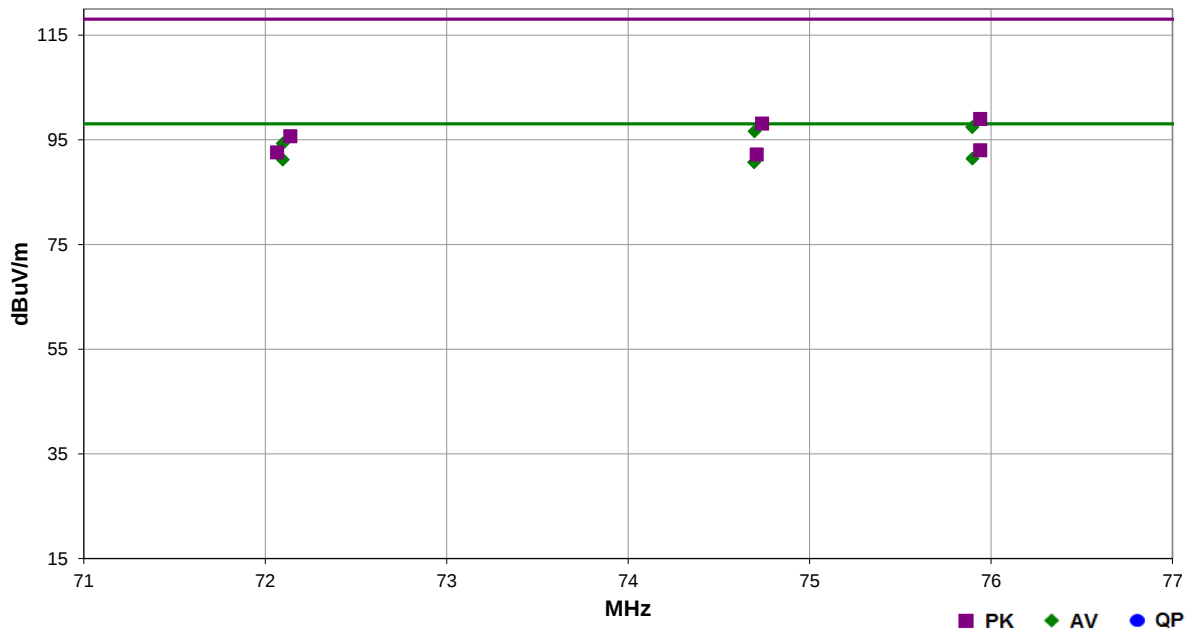


EmiRS 2019.08.01 PSA-ESCI 2019.05.10

Work Order:	WILM0050	Date:	28-Aug-2019	
Project:	None	Temperature:	21.5 °C	
Job Site:	MN05	Humidity:	56.6% RH	
Serial Number:	Tom 2	Barometric Pres.:	1014 mbar	
		Tested by: Andrew Rogstad		
EUT:	FM T55			
Configuration:	6			
Customer:	Williams Sound, LLC			
Attendees:	Lawrence Herrington			
EUT Power:	110VAC/60Hz			
Operating Mode:	FM full power on Low ch. (72.1 MHz), Mid ch. (74.7 MHz), and High ch. (75.9 MHz); 400 Hz sine wave tone at -11 modulation			
Deviations:	None			
Comments:	Tom 2, PCA 293 #3, ANT025; Per manufacturer, EUT antenna will always be mounted in vertical position. Coax port is only populated when external antenna is used.			

Test Specifications	Test Method
FCC 15.237:2019	ANSI C63.10:2013

Run #	30	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
75.897	75.7	11.7	1.0	142.0	3.0	10.0	Vert	AV	0.0	97.4	98.1	-0.7	High ch.
74.697	74.9	11.7	1.6	138.9	3.0	10.0	Vert	AV	0.0	96.6	98.1	-1.5	Mid ch.
72.097	72.6	11.7	1.4	162.0	3.0	10.0	Vert	AV	0.0	94.3	98.1	-3.8	Low ch.
75.898	69.7	11.7	1.8	234.0	3.0	10.0	Horz	AV	0.0	91.4	98.1	-6.7	High ch.
72.097	69.5	11.7	4.0	252.0	3.0	10.0	Horz	AV	0.0	91.2	98.1	-6.9	Low ch.
74.695	69.0	11.7	2.3	247.0	3.0	10.0	Horz	AV	0.0	90.7	98.1	-7.4	Mid ch.
75.940	77.3	11.7	1.0	142.0	3.0	10.0	Vert	PK	0.0	99.0	118.1	-19.1	High ch.
74.738	76.4	11.7	1.6	138.9	3.0	10.0	Vert	PK	0.0	98.1	118.1	-20.0	Mid ch.
72.138	74.0	11.7	1.4	162.0	3.0	10.0	Vert	PK	0.0	95.7	118.1	-22.4	Low ch.
75.940	71.3	11.7	1.8	234.0	3.0	10.0	Horz	PK	0.0	93.0	118.1	-25.1	High ch.
72.065	70.9	11.7	4.0	252.0	3.0	10.0	Horz	PK	0.0	92.6	118.1	-25.5	Low ch.
74.708	70.5	11.7	2.3	247.0	3.0	10.0	Horz	PK	0.0	92.2	118.1	-25.9	Mid ch.

OCCUPIED BANDWIDTH



XMIT 2019.06.11

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	Fairview Microwave	SA18E-10	TYA	24-Sep-2018	12 mo
Cable	ESM Cable Corp.	Bilog Cables	MNH	2-Nov-2018	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYD	25-Jan-2018	24 mo
Receiver	Rohde & Schwarz	ESR7	ARI	8-Jul-2019	12 mo

TEST DESCRIPTION

The 20dB occupied bandwidth was measured using a Peak detector. The resolution bandwidth was set to 1-3% of the measured emissions bandwidth. The EUT was set to low, middle, and high transmit frequencies. The measurement was made in a radiated configuration in a semi-anechoic chamber with the fundamental of the carrier fully maximized for its highest radiated power. The EUT was transmitting at the data rate(s) listed in the datasheet.

OCCUPIED BANDWIDTH



THxTx 2019.08.02 XM 2019.06.11

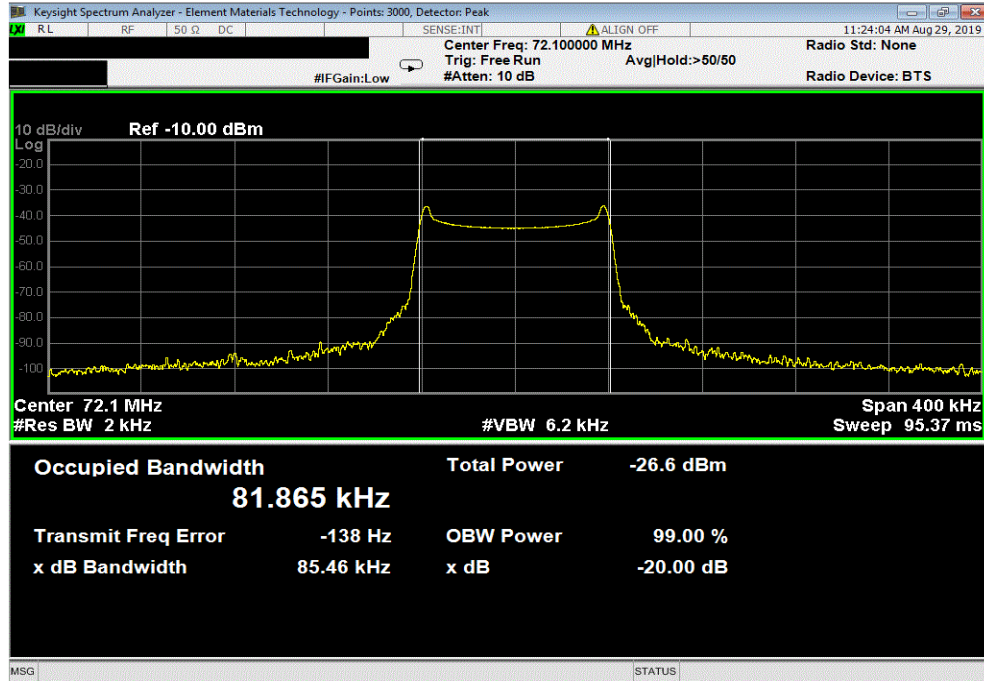
EUT: FM T55		Work Order: WILM0050	
Serial Number: Tom 2		Date: 28-Aug-19	
Customer: Williams Sound, LLC		Temperature: 21.6 °C	
Attendees: Lawrence Herrington		Humidity: 54% RH	
Project: None		Barometric Pres.: 1015 mbar	
Tested by: Andrew Rogstad		Power: 110VAC/60Hz	
		Job Site: MN05	
TEST SPECIFICATIONS		Test Method	
FCC 15.237:2019		ANSI C63.10:2013	
COMMENTS			
Tom 2, PCA 293 #3, ANT 021			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	6	Signature <i>Andrew Rogstad</i>	
		Value	Limit (<) Result
Low channel, 72.1 MHz		85.455 kHz	200 kHz Pass
Mid channel, 74.7 MHz		89.178 kHz	200 kHz Pass
High channel, 75.9 MHz		92.012 kHz	200 kHz Pass

OCCUPIED BANDWIDTH

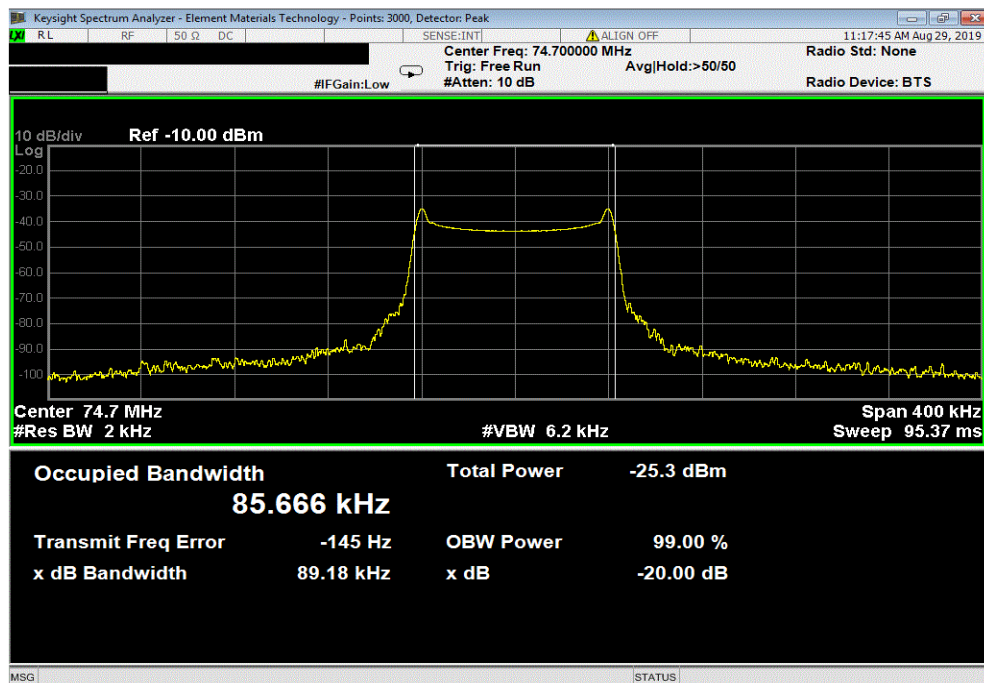


TMTx 2019.08.02 XMt 2019.06.11

Low channel, 72.1 MHz						
				Value	Limit (<)	Result
				85.455 kHz	200 kHz	Pass



Mid channel, 74.7 MHz						
				Value	Limit (<)	Result
				89.178 kHz	200 kHz	Pass



OCCUPIED BANDWIDTH



TMTx 2019.08.02 XMI 2019.06.11

High channel, 75.9 MHz						
Value				Limit	Result	
92.012 kHz				(≤) 200 kHz	Pass	

