

INDEX OF SUBMITTED MEASURED DATA

This exhibit contains the measured data for this equipment as follows:

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- 6B-2 – 459.650 MHz, 12.5 kHz Channel Spacing, Transmit Audio Frequency Response

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- 6C-1 – 481.0125 MHz, 12.5 kHz Channel Spacing, Transmit Audio Low Pass Filter Response
- 6C-2 – 459.650 MHz, 12.5 kHz Channel Spacing, Transmit Audio Low Pass Filter Response

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- 6D-1 – 481.0125 MHz, 12.5 kHz Channel Spacing, Modulation Limiting
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- 6F-3 – 2.4W Harmonic of Carrier 511.9875 MHz, 12.5 kHz Channel Spacing
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- 6I-3 – 481.0125 MHz, 12.5 kHz Channel Spacing Key-Up Attack Time
- 6I-4 – 481.0125 MHz, 12.5 kHz Channel Spacing De-Key Decay Time

**** Please note that the above data were taken following the procedures and limits outlined in TIA 603-D and RSS 119 during the month of October 2013. See Table 2 in Ex07_test_procedures**

Radio model tested: AAH81TCN9NA2AN

Important Note: The data in this test report meets or exceeds the technical requirements of FCC Rule Parts 90.

EXHIBIT 6A – RF POWER OUTPUT

HIGH POWER SETTING, FREQUENCY 450.0125 MHz

Measured RF Output Power:	2.39 Watts
Measured DC Voltage:	3.70 Volts
Measured DC Input Current:	1.86 Amperes

LOW POWER SETTING, FREQUENCY 450.0125 MHz

Measured RF Output Power:	1.19 Watts
Measured DC Voltage:	3.70 Volts
Measured DC Input Current:	1.27 Amperes

HIGH POWER SETTING, FREQUENCY 459.650 MHz

Measured RF Output Power:	2.39 Watts
Measured DC Voltage:	3.70 Volts
Measured DC Input Current:	1.84 Amperes

LOW POWER SETTING, FREQUENCY 459.650 MHz

Measured RF Output Power:	1.17 Watts
Measured DC Voltage:	3.70 Volts
Measured DC Input Current:	1.27Amperes

HIGH POWER SETTING, FREQUENCY 469.9875 MHz

Measured RF Output Power:	2.38 Watts
Measured DC Voltage:	3.70 Volts
Measured DC Input Current:	1.85Amperes

LOW POWER SETTING, FREQUENCY 469.9875 MHz

Measured RF Output Power:	1.18 Watts
Measured DC Voltage:	3.70 Volts
Measured DC Input Current:	1.24 Amperes

HIGH POWER SETTING, FREQUENCY 481.0125 MHz

Measured RF Output Power:	2.37 Watts
Measured DC Voltage:	3.70 Volts
Measured DC Input Current:	1.88 Amperes

LOW POWER SETTING, FREQUENCY 481.0125 MHz

Measured RF Output Power:	1.18 Watts
Measured DC Voltage:	3.70 Volts
Measured DC Input Current:	1.27 Amperes

HIGH POWER SETTING, FREQUENCY 511.9875 MHz

Measured RF Output Power:	2.39 Watts
Measured DC Voltage:	3.70 Volts
Measured DC Input Current:	1.93 Amperes

LOW POWER SETTING, FREQUENCY 511.9875 MHz

Measured RF Output Power:	1.19 Watts
Measured DC Voltage:	3.70 Volts
Measured DC Input Current:	1.33 Amperes

EXHIBIT 6B – Transmit Audio Response

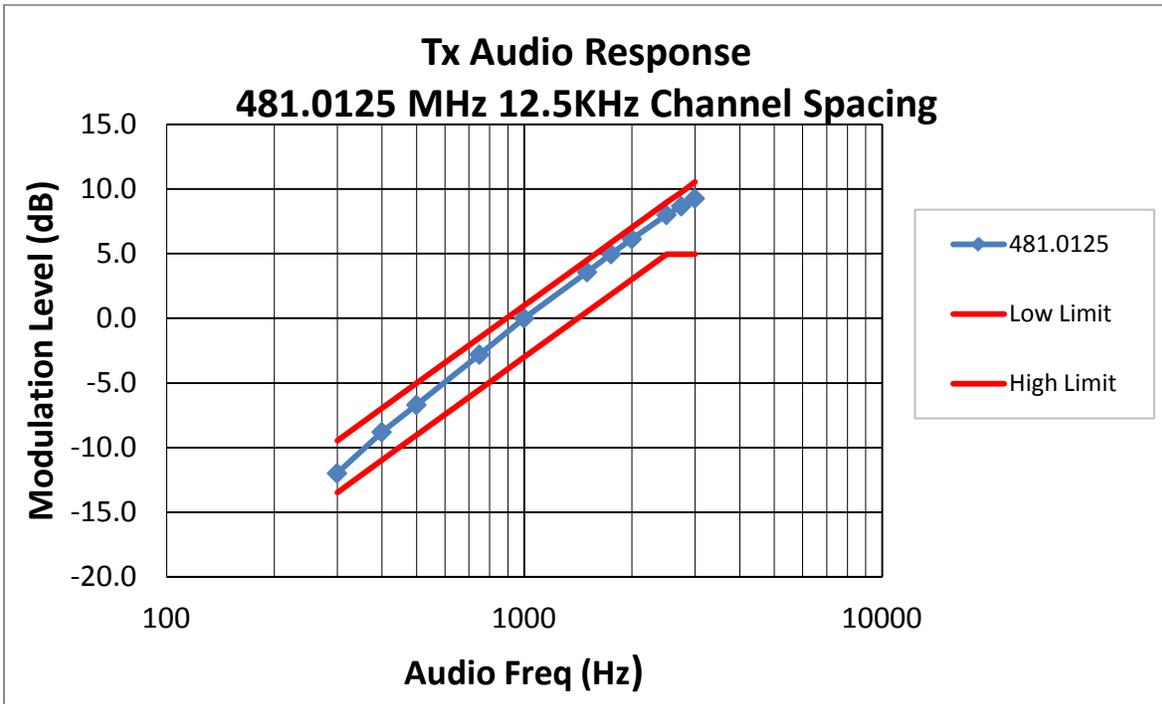


Figure 6B-1: 481.0125 MHz, 12.5 kHz Channel Spacing, Transmit Audio Frequency Response

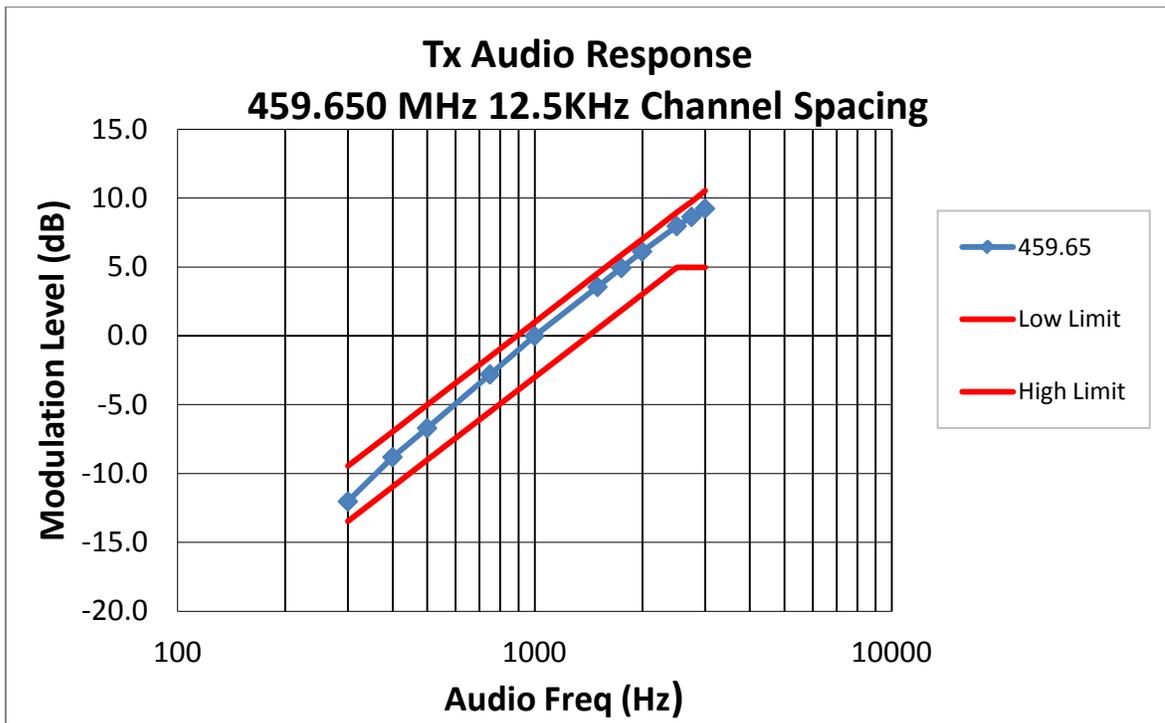


Figure 6B-2: 459.650 MHz, 12.5 kHz Channel Spacing, Transmit Audio Frequency Response

EXHIBIT 6C – Transmit Audio Low Pass Filter Response

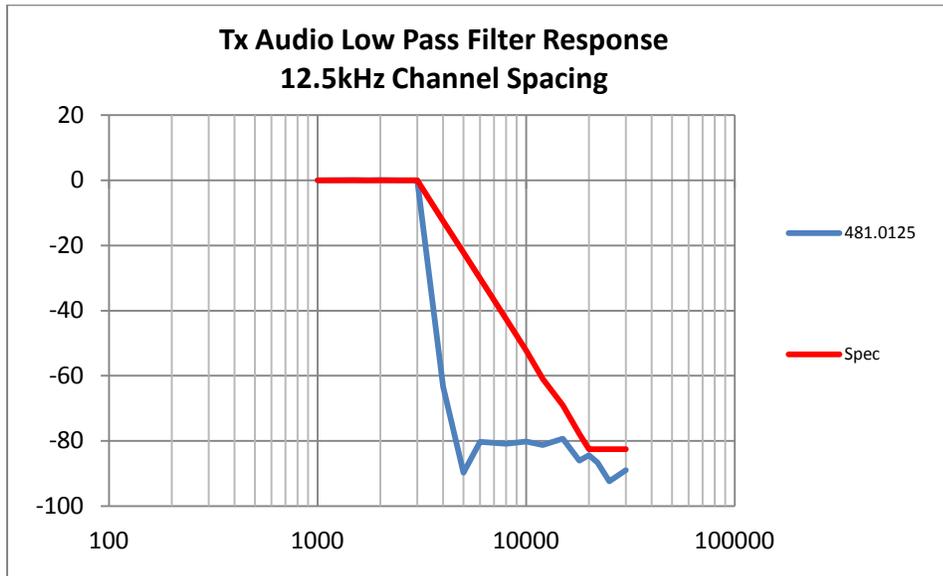


Figure 6C-1: 481.0125 MHz, 12.5 kHz Channel Spacing, Transmit Audio Low Pass Filter Response

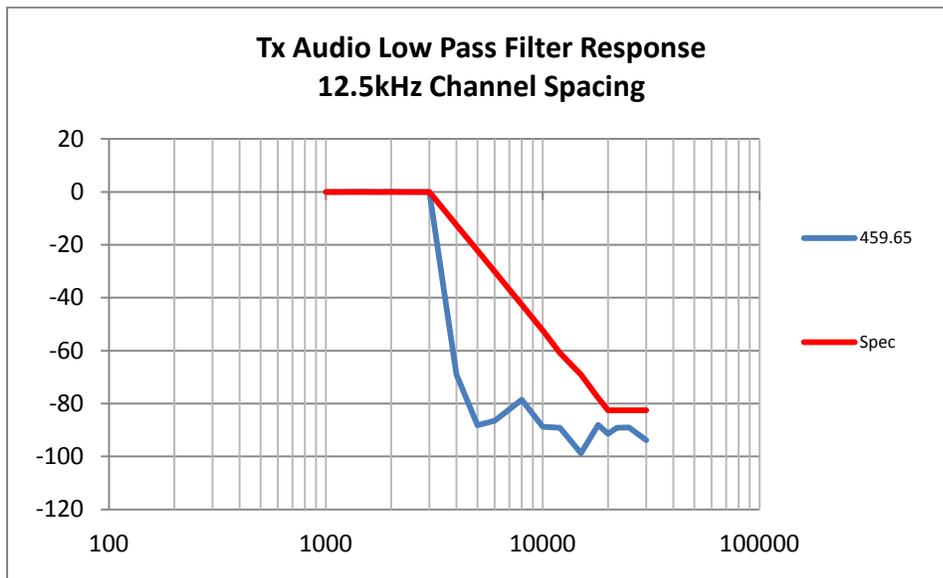


Figure 6C-2: 459.650 MHz, 12.5 kHz Channel Spacing, Transmit Audio Low Pass Filter Response

EXHIBIT 6D – Modulation Limiting Characteristic

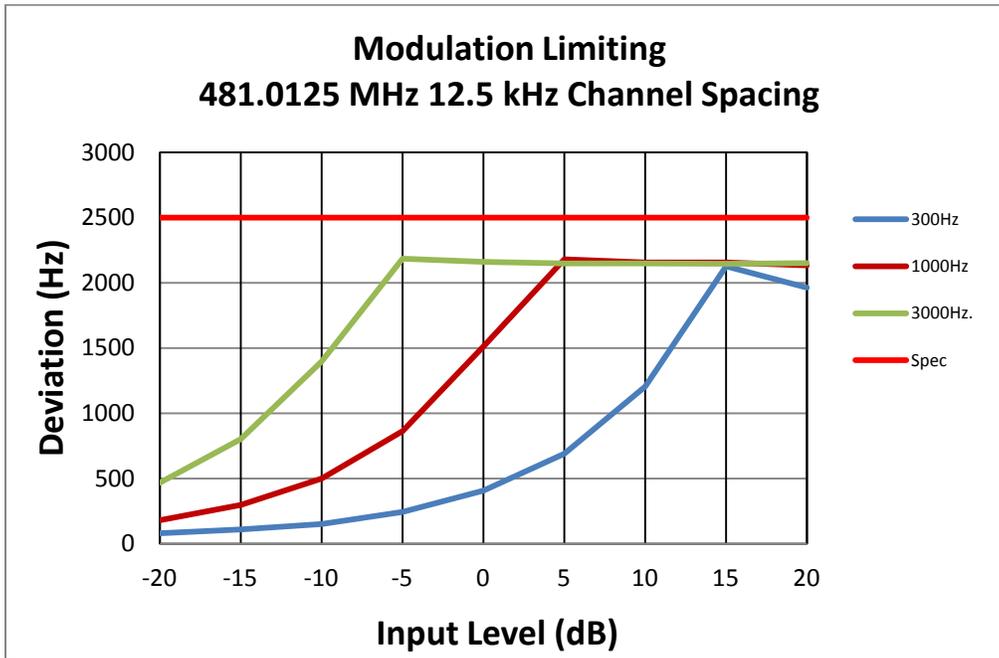


Figure 6D-1: 481.0125 MHz, 12.5 kHz Channel Spacing, Modulation Limiting

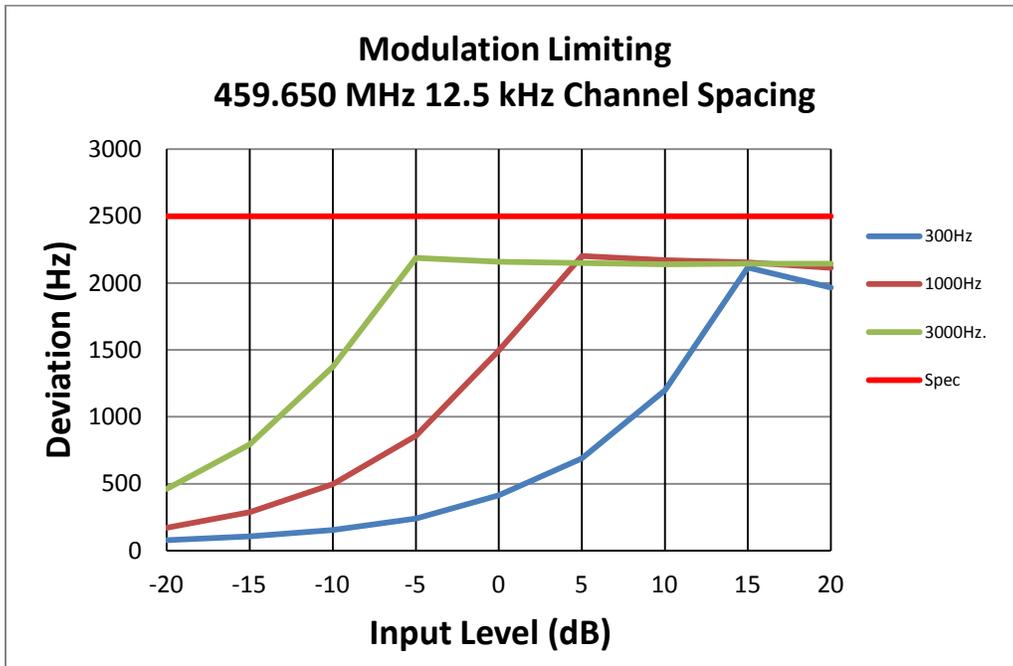


Figure 6D-2: 459.650 MHz, 12.5 kHz Channel Spacing, Modulation Limiting

EXHIBIT 6E – Modulation Techniques

The transmitter is capable of the following types of modulation:

- i) Modulation of PL (Private Line) – Direct FM tone modulation of 67 Hz to 250.3 Hz at 15% of full system deviation. Also referred to as TPL (Tone Private Line).
- ii) Modulation of DPL (Digital Private Line) – Direct FM modulation at 134 bps at 15% of full system deviation.
- iii) Modulation of 2000/3000 Hz FSK Data – FM modulation at nominally 60% of full system deviation.
- iv) Modulation of DTMF (Dual Tone Multi Frequency) – FM modulation at nominally 60% of full system deviation
- v) Modulation of 9600 bps 4 level FSK Data

4 Level FSK Digital Modulation Techniques

The modulation sends 4800 symbols/sec with each symbol conveying 2 bits of information for a data rate of 9600 bps in a 12.5 kHz channel, which is equivalent to 4800 bps per 6.25kHz. The maximum deviation D , of the symbol is defined as:

$$D = 3h / 2T$$

where:

h is the deviation index defined for the modulation

T is the symbol time (1/4800) in seconds

The deviation index, h , is 0.27. This yields a symbol deviation of 1.944 kHz at the symbol center. The mapping between symbols and bits is shown below:

Information Bits		Symbol	4FSK Deviation
Bit 1	Bit 0		
0	1	+3	+1.944 kHz
0	0	+1	+0.648 kHz
1	0	-1	-0.648 kHz
1	1	-3	-1.944 kHz

A Square Root Raised Cosine Filter is implemented for the modulation low pass filter. The input to the modulation low pass filter consists of a series of impulses separated in time by 208.33 microseconds (1/4800 sec). The group delay of the filter is flat over the passband for $|f| < 2880$ Hz. The magnitude response of the filter is given by the following formula.

$|F(f)|$ = magnitude response of the Square Root Raised Cosine Filter

$$|F(f)| = 1 \text{ for } |f| \leq 1920 \text{ Hz}$$

$$|F(f)| = |\cos(\pi f / 1920)| \text{ for } 1920 \text{ Hz} < |f| \leq 2880 \text{ Hz}$$

$$|F(f)| = 0 \text{ for } |f| > 2880 \text{ Hz}$$

where f = frequency in hertz.

The 4FSK modulator consists of a Square Root Raised Cosine Filter, cascaded with a frequency modulator.



4 Level FSK Digital Modulation (12.5 kHz Channelization, Digital Data)

Measurement's per Rule Part 2.202(c)(4) where employed because Part 2.202(g) Table III A formulation produces an excessive result using the value of K recommended in the Table. Therefore, the 99% energy rule (Title 47 CFR 2.989) was used for digital mode and is more accurate than Carson's rule. It states that 99% of the modulation energy falls within X kHz, which in this case is 7.6 kHz (**7K60** designator).

Per CFR Title 47, Part 2, Section 2.201:

Frequency Modulation	F
A single channel containing quantized or digital information without the use of a modulating sub-carrier, excluding time-division multiplex	1
Data Transmission, telemetry, telecommand	D

Note: This product utilizes a Time Division Multiple Access (TDMA) protocol.

The complete emissions designator for this transmitter is **7K60F1D**.

4 Level FSK Digital Modulation (12.5 kHz Channelization, Digital Voice and Data)

Measurement's per Rule Part 2.202(c)(4) where employed because Part 2.202(g) Table III A formulation produces an excessive result using the value of K recommended in the Table. Therefore the 99% energy rule (title 47CFR2.989) was used for digital mode and is more accurate than Carson's rule. It states that 99% of the modulation energy falls within X kHz, which in this case is 7.6 kHz (**7K60** designator).

Per CFR Title 47, Part 2, Section 2.201:

Frequency Modulation	F
A single channel containing quantized or digital information without the use of a modulating sub-carrier, excluding time-division multiplex	1
Telephony (including sound broadcasting)	E

Note: This product utilizes a Time Division Multiple Access (TDMA) protocol.

The complete emissions designator for this transmitter is **7K60F1E**.

Digital (12.5 kHz Channelization, Digital TDMA)

Measurement's per Rule Part 2.202(c)(4) where employed because Part 2.202(g) Table III A formulation produces an excessive result using the value of K recommended in the Table. Therefore the 99% energy rule (title 47CFR2.989) was used for digital mode and is more accurate than Carson's rule. It states that 99% of the modulation energy falls within X kHz, which in this case is 7.6 kHz (**7K60** designator).

Per CFR Title 47, Part 2, Section 2.201:

Frequency Modulation	F
A single channel containing quantized or digital information without the use of a modulating sub-carrier, excluding time-division multiplex	1
Combination of Data Transmission, telemetry, telecommand (D), and Telephony (E)... W	

Note: This product utilizes a Time Division Multiple Access (TDMA) protocol.

The complete emissions designator for this transmitter is **7K60F1W**.

4 Level FSK Digital Modulation (12.5 kHz Channelization, Digital Data)

Measurement's per Rule Part 2.202(c)(4) where employed because Part 2.202(g) Table III A formulation produces an excessive result using the value of K recommended in the Table. Therefore, the 99% energy rule (Title 47 CFR 2.989) was used for digital mode and is more accurate than Carson's rule. It states that 99% of the modulation energy falls within X kHz, which in this case is 7.6 kHz (**7K60** designator).

Per CFR Title 47, Part 2, Section 2.201:

Frequency Modulation	F
Case not otherwise covered	X
Data Transmission, telemetry, telecommand	D

Note: This product utilizes a Time Division Multiple Access (TDMA) protocol.

The complete emissions designator for this transmitter is **7K60FXD**.

4 Level FSK Digital Modulation (12.5 kHz Channelization, Digital Voice and Data)

Measurement's per Rule Part 2.202(c)(4) where employed because Part 2.202(g) Table III A formulation produces an excessive result using the value of K recommended in the Table. Therefore the 99% energy rule (title 47CFR2.989) was used for digital mode and is more accurate than Carson's rule. It states that 99% of the modulation energy falls within X kHz, which in this case is 7.6 kHz (**7K60** designator).

Per CFR Title 47, Part 2, Section 2.201:

Frequency Modulation	F
Case not otherwise covered	X
Telephony (including sound broadcasting)	E

Note: This product utilizes a Time Division Multiple Access (TDMA) protocol.

The complete emissions designator for this transmitter is **7K60FXE**.

OCCUPIED BANDWIDTH MEASUREMENT

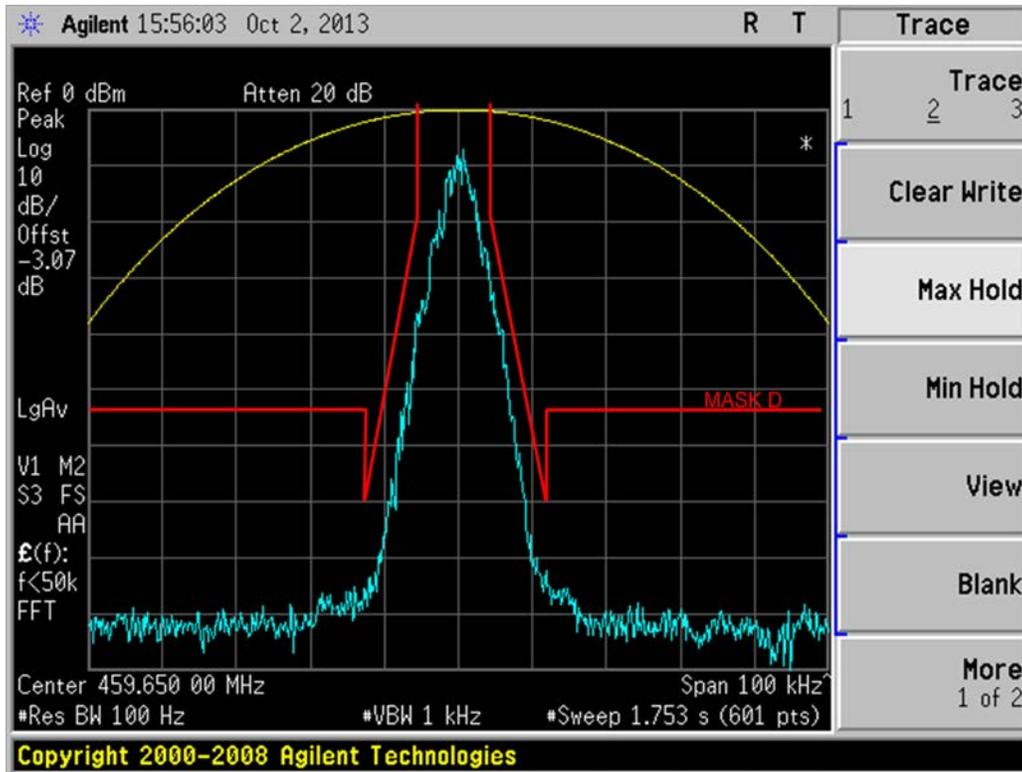


Figure 6E-1: 459.650 MHz, O.153 Test Pattern 4FSK Data Modulation only, 7K60F1D Mask D

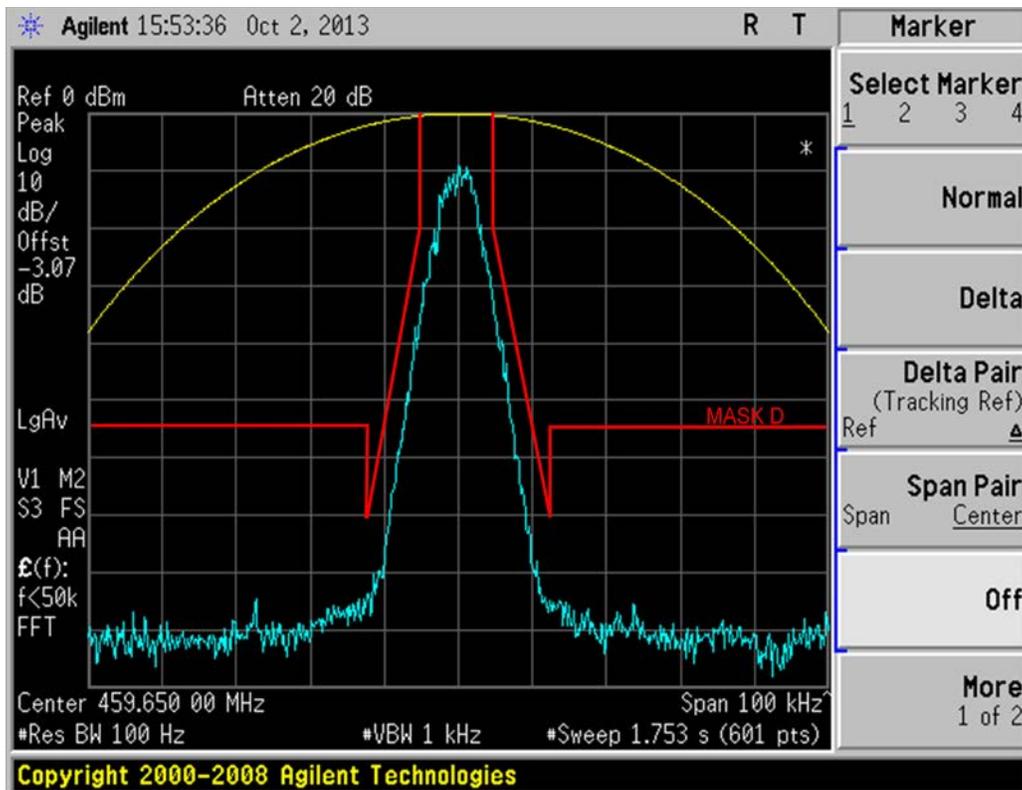


Figure 6E-2: 459.650 MHz, O.153 Test Pattern 4FSK Voice Modulation only, 7K60F1E Mask D

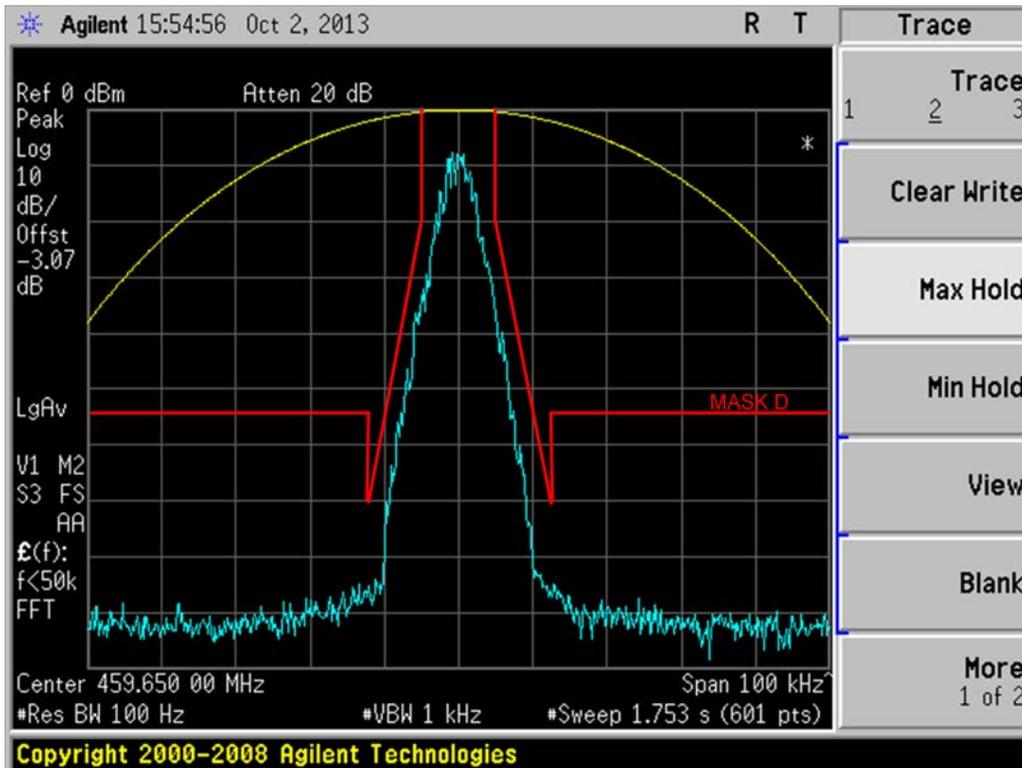


Figure 6E-3: 459.650 MHz, O.153 Test Pattern 4FSK Voice and Data Modulation, 7K60F1W Mask D

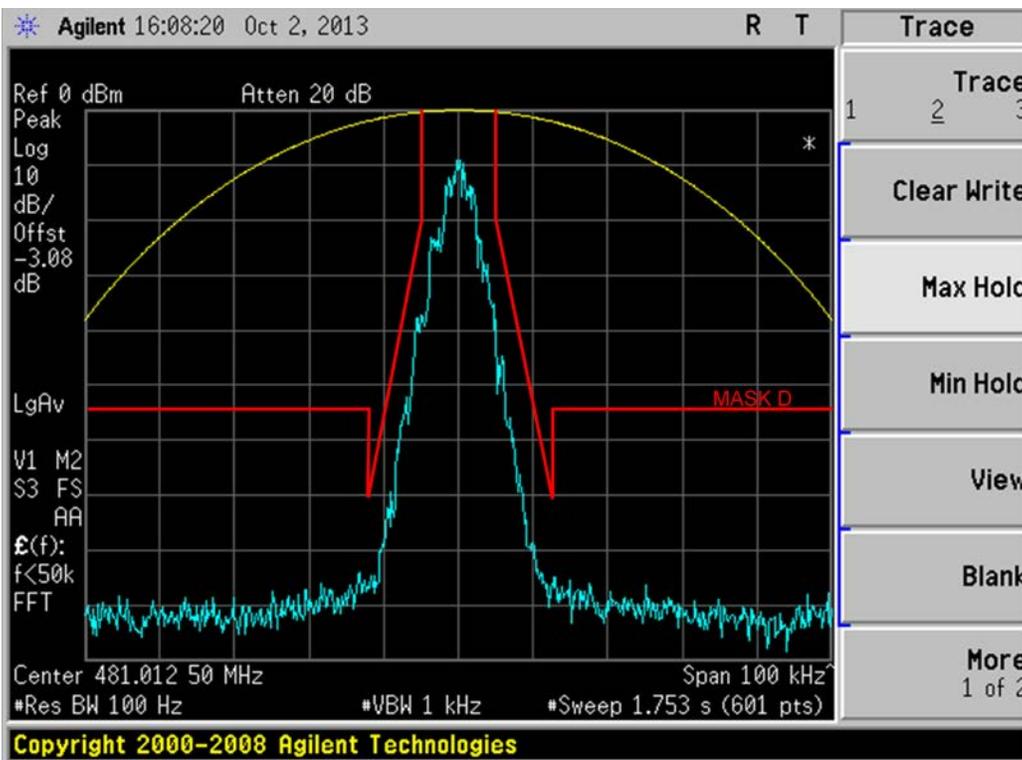


Figure 6E-4: 481.0125 MHz, O.153 Test Pattern 4FSK Data Modulation only, 7K60FXD Mask D

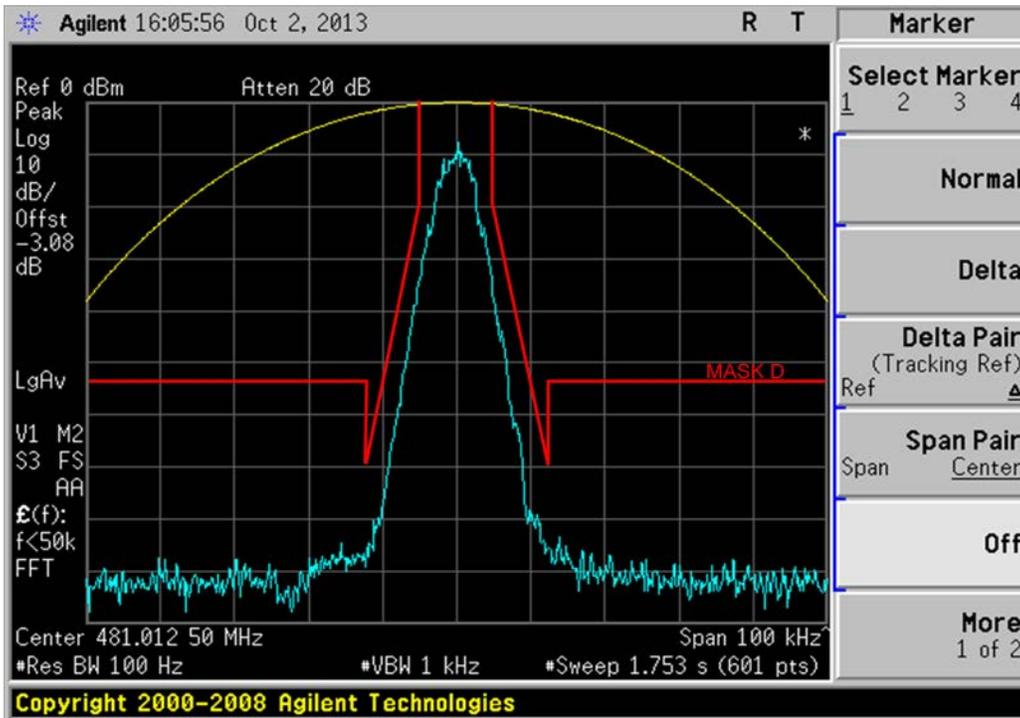


Figure 6E-5: 481.0125 MHz, O.153 Test Pattern 4FSK Voice Modulation only, 7K60FXE Mask D

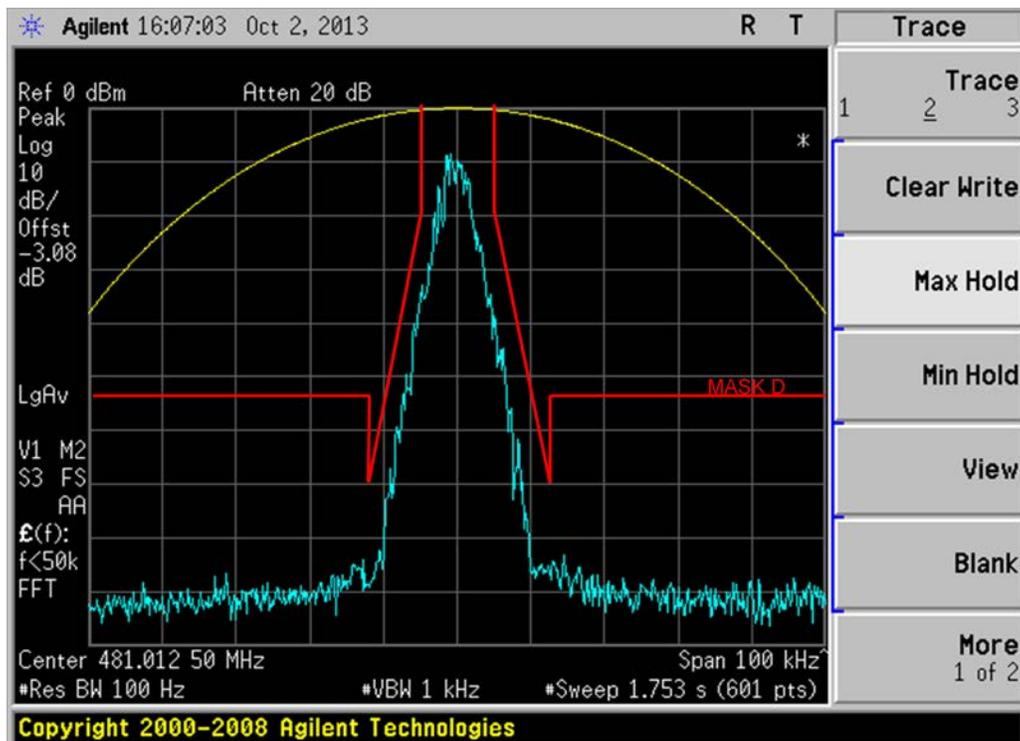


Figure 6E-6: 481.0125 MHz, O.153 Test Pattern 4FSK Voice and Data Modulation, 7K60F1W Mask D

****NOTE:-**

- **All measurements of Occupied Bandwidth which are shown on the above plots are measured using a Spectrum Analyzer**
- **Measurement using a Spectrum Analyzer must use a 30dB attenuation in order to avoid damage to it**
- **Therefore the reference power level (Ref) shown on each plot refers to its true power level**

EXHIBIT 6F – Transmitter Conducted Spurious Emissions

Note: Display lines on graphs correspond to the FCC limit of -20dBm (12.5 kHz).

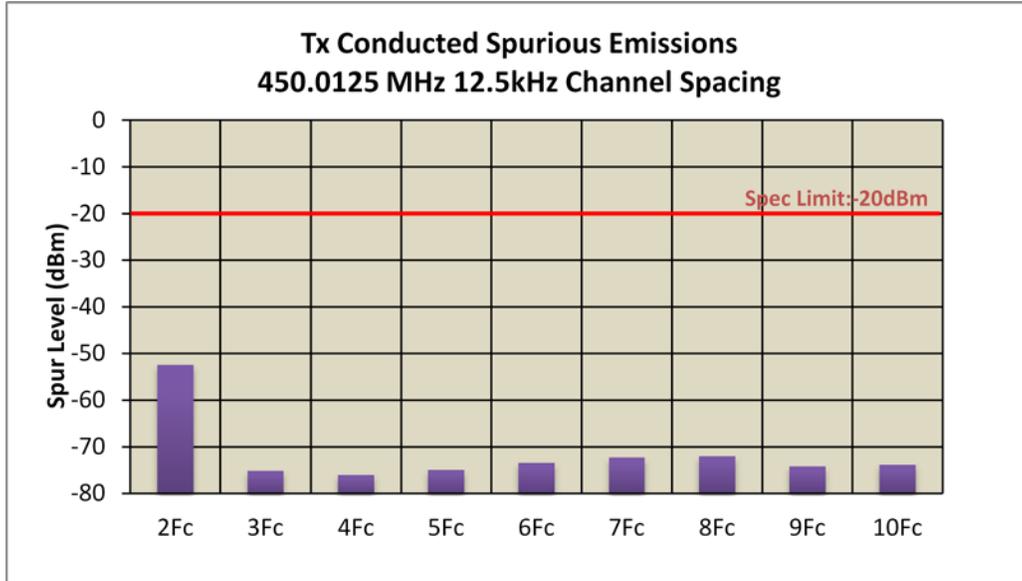


Figure 6F-1: 2.4W Harmonic of Carrier 450.0125 MHz, 12.5 kHz Channel Spacing

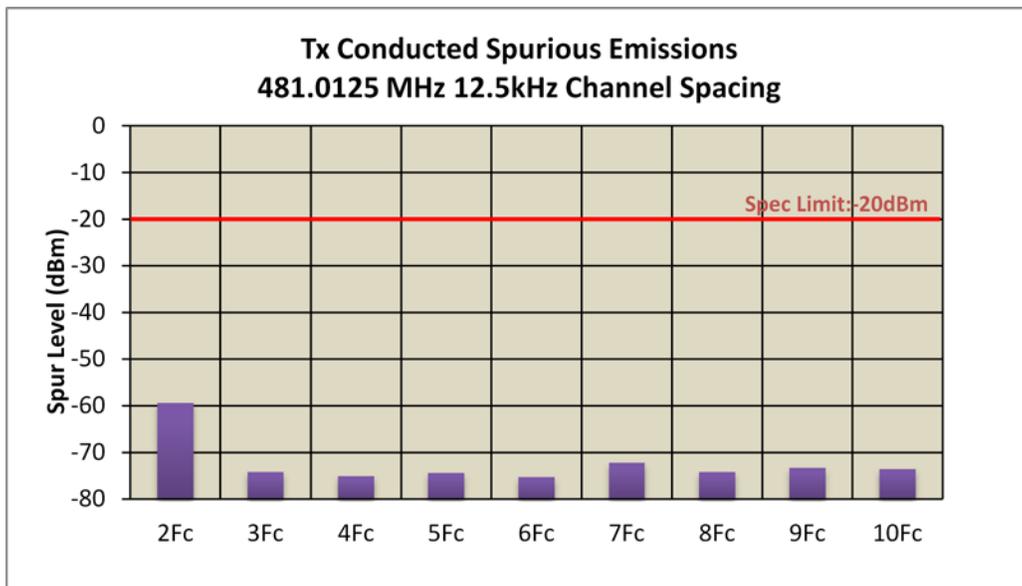


Figure 6F-2: 2.4W Harmonic of Carrier 481.0125 MHz, 12.5 kHz Channel Spacing

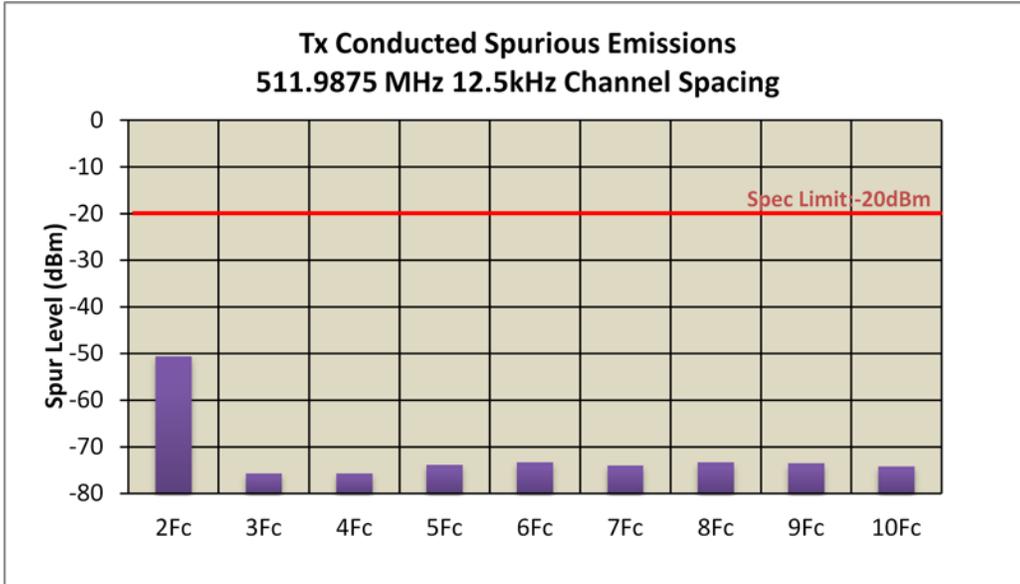


Figure 6F-3: 2.4W Harmonic of Carrier 511.9875 MHz, 12.5 kHz Channel Spacing

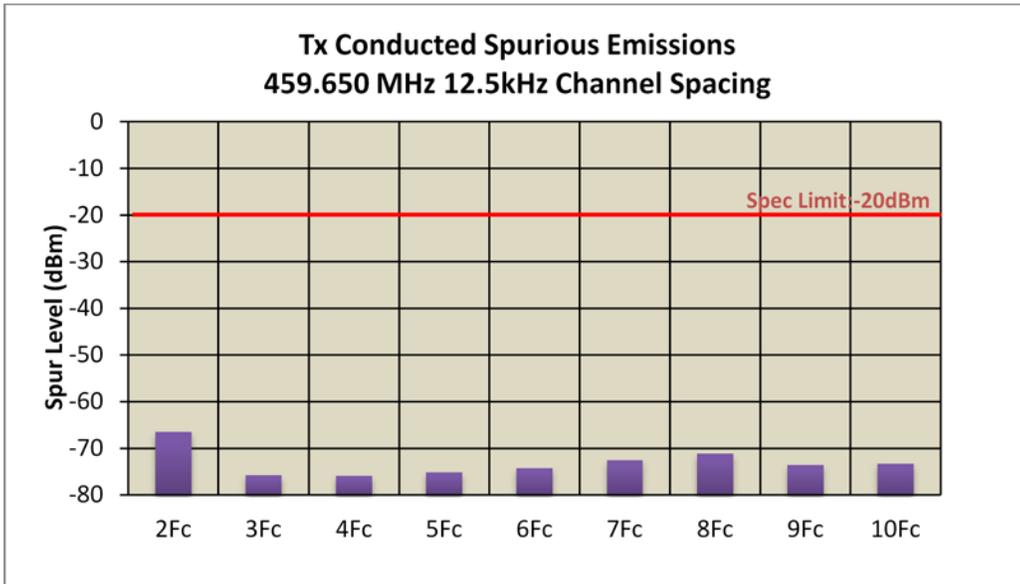


Figure 6F-4: 2.4W Harmonic of Carrier 459.650 MHz, 12.5 kHz Channel Spacing

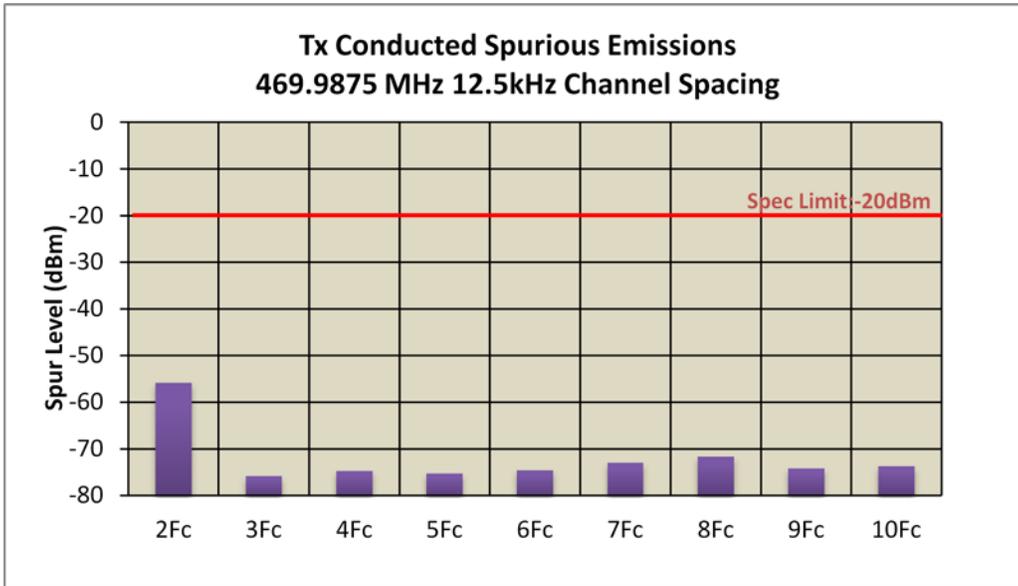


Figure 6F-5: 2.4W Harmonic of Carrier 469.9875 MHz, 12.5 kHz Channel Spacing

EXHIBIT 6G

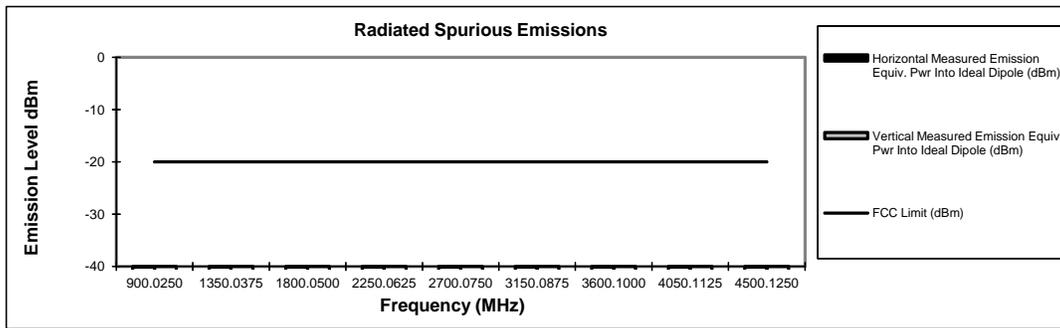
Transmitter Radiated Spurious Emissions
Motorola Solutions

FCC ID:AZ489FT4918

Transmit Radiated Spurious Emissions: PMUE4402ABCNAG
Tx Power: 2.4 Watts

450.0125 MHz Channel Spacing 12.5kHz | S/N 682TPT0174

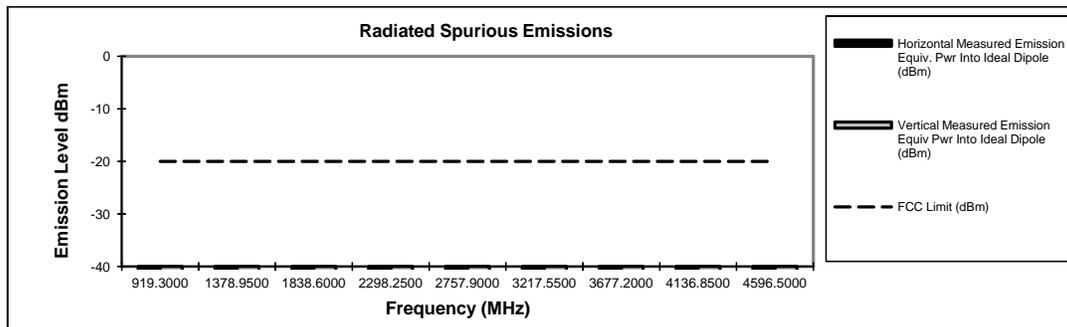
Frequency (MHz)	FCC Limit (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
900.0250	-20	*	*
1350.0375	-20	*	*
1800.0500	-20	*	*
2250.0625	-20	*	*
2700.0750	-20	*	*
3150.0875	-20	*	*
3600.1000	-20	*	*
4050.1125	-20	*	*
4500.1250	-20	*	*



Transmit Radiated Spurious Emissions: PMUE4402ABCNAG
Tx Power: 2.4 Watts

459.65 MHz Channel Spacing 12.5kHz | S/N 682TPT0174

Frequency (MHz)	FCC Limit (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
919.3000	-20	*	*
1378.9500	-20	*	*
1838.6000	-20	*	*
2298.2500	-20	*	*
2757.9000	-20	*	*
3217.5500	-20	*	*
3677.2000	-20	*	*
4136.8500	-20	*	*
4596.5000	-20	*	*



* Indicates the spurious emission could not be detected due to noise limitations or ambients.

Pursuant to CFR 47 Part 2.1057(c), emissions attenuated more than 20 dB below the permissible limit are not reported.

The data presented here was taken using the substitution method as found in the TIA/EIA-603 document.

Motorola Plantation EMC Lab – Test Performed by: Alberto Cordero
FCC Registration: 91932 / Industry Canada: IC109U-1

October 12, 2013

Figure 6G-1, 2: 2.4 Watts, 450.0125 MHz & 459.650 MHz, 12.5 kHz Channel Spacing

Motorola Solutions

FCC ID:AZ489FT4918

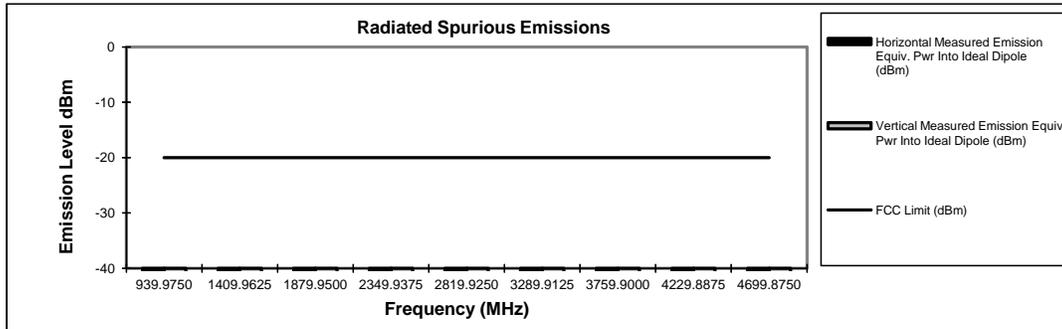
Transmit Radiated Spurious Emissions: PMUE4402ABCNAG

Tx Power: 2.4 Watts

469.9875 MHz

Channel Spacing 12.5kHz | S/N 682TPT0174

Frequency (MHz)	FCC Limit (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
939.9750	-20	*	*
1409.9625	-20	*	*
1879.9500	-20	*	*
2349.9375	-20	*	*
2819.9250	-20	*	*
3289.9125	-20	*	*
3759.9000	-20	*	*
4229.8875	-20	*	*
4699.8750	-20	*	*



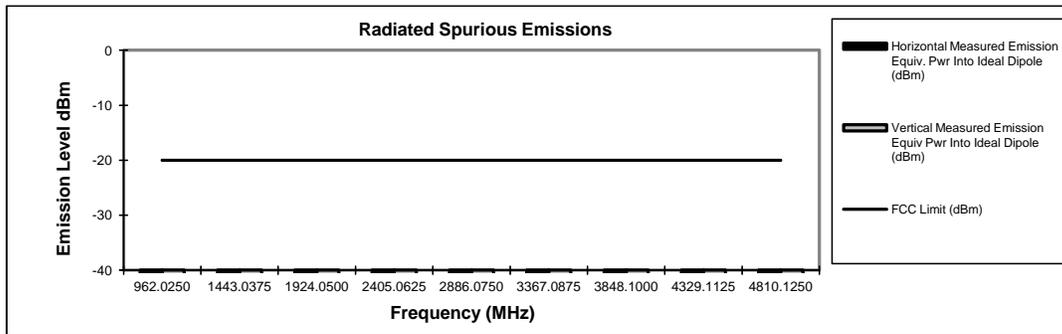
Transmit Radiated Spurious Emissions: PMUE4402ABCNAG

Tx Power: 2.4 Watts

481.0125 MHz

Channel Spacing 12.5kHz | S/N 682TPT0174

Frequency (MHz)	FCC Limit (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
962.0250	-20	*	*
1443.0375	-20	*	*
1924.0500	-20	*	*
2405.0625	-20	*	*
2886.0750	-20	*	*
3367.0875	-20	*	*
3848.1000	-20	*	*
4329.1125	-20	*	*
4810.1250	-20	*	*



* Indicates the spurious emission could not be detected due to noise limitations or ambients.

Pursuant to CFR 47 Part 2.1057(c), emissions attenuated more than 20 dB below the permissible limit are not reported.

The data presented here was taken using the substitution method as found in the TIA/EIA-603 document.

Motorola Plantation EMC Lab – Test Performed by: Alberto Cordero

October 12, 2013

FCC Registration: 91932 / Industry Canada: IC109U-1

Figure 6G-3, 4: 2.4 Watts, 469.9875 MHz & 481.0125 MHz, 12.5 kHz Channel Spacing

Motorola Solutions

FCC ID:AZ489FT4918

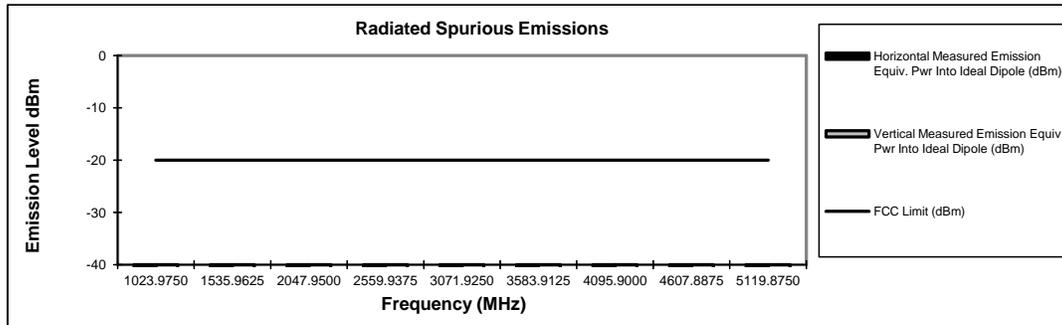
Transmit Radiated Spurious Emissions: **PMUE4402ABCNAG**

Tx Power: **2.4 Watts**

511.9875 MHz

Channel Spacing 12.5kHz | S/N 682TPT0174

Frequency (MHz)	FCC Limit (dBm)	Horizontal Measured Emission Equiv. Pwr Into Ideal Dipole (dBm)	Vertical Measured Emission Equiv Pwr Into Ideal Dipole (dBm)
1023.9750	-20	*	*
1535.9625	-20	*	*
2047.9500	-20	*	*
2559.9375	-20	*	*
3071.9250	-20	*	*
3583.9125	-20	*	*
4095.9000	-20	*	*
4607.8875	-20	*	*
5119.8750	-20	*	*



* Indicates the spurious emission could not be detected due to noise limitations or ambients.

Pursuant to CFR 47 Part 2.1057(c), emissions attenuated more than 20 dB below the permissible limit are not reported.

The data presented here was taken using the substitution method as found in the TIA/EIA-603 document.

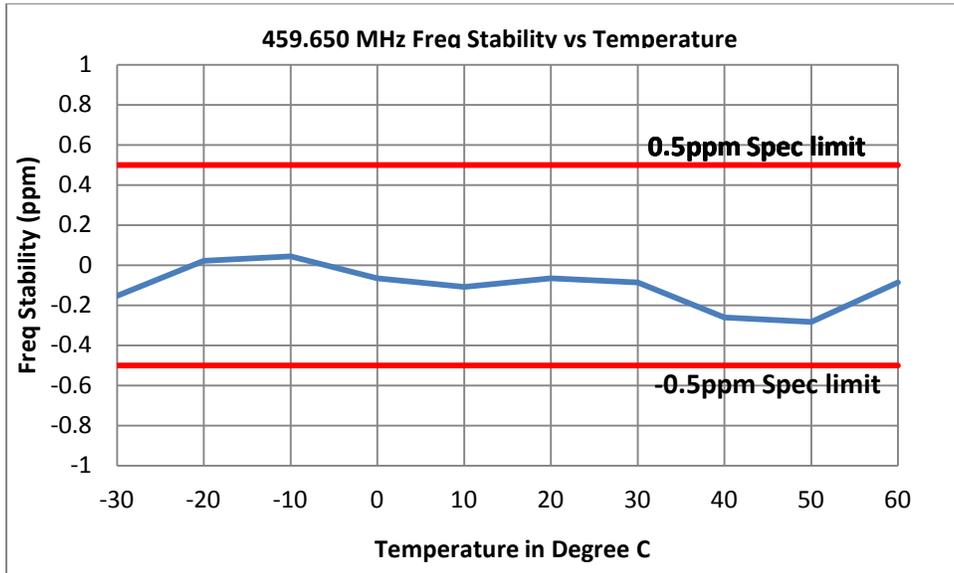
Motorola Plantation EMC Lab – Test Performed by: **Alberto Cordero**

October 12, 2013

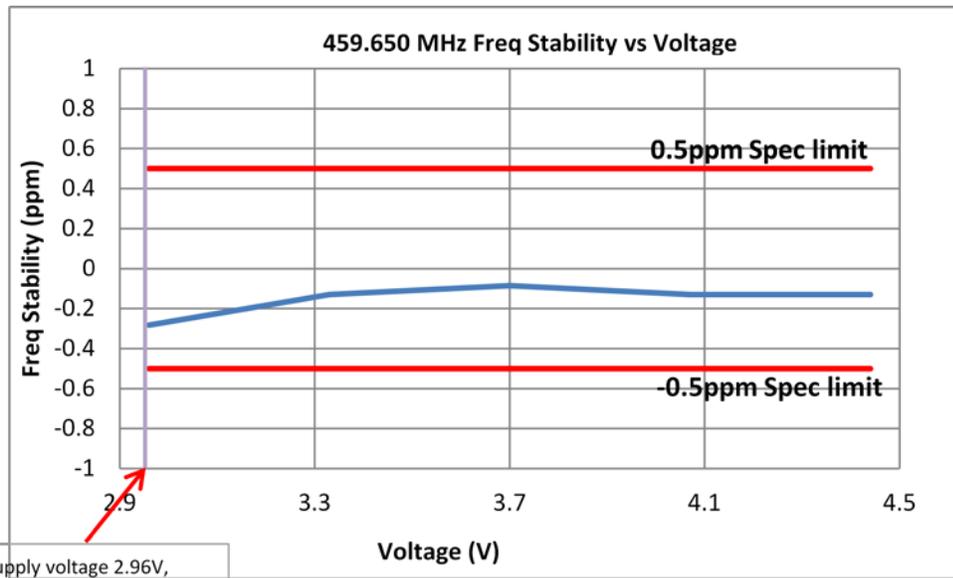
FCC Registration: **91932 / Industry Canada: IC109U-1**

Figure 6G-5: 2.4 Watts, 511.9875 MHz, 12.5 kHz Channel Spacing

EXHIBIT 6H – Frequency Stability

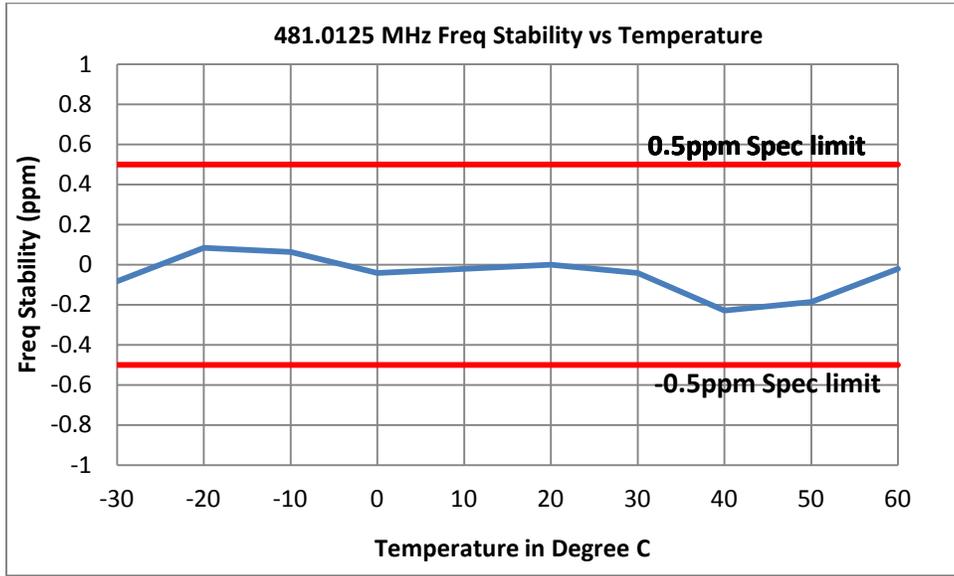


6H-1 – 459.650 MHz Frequency Stability vs. Temperature

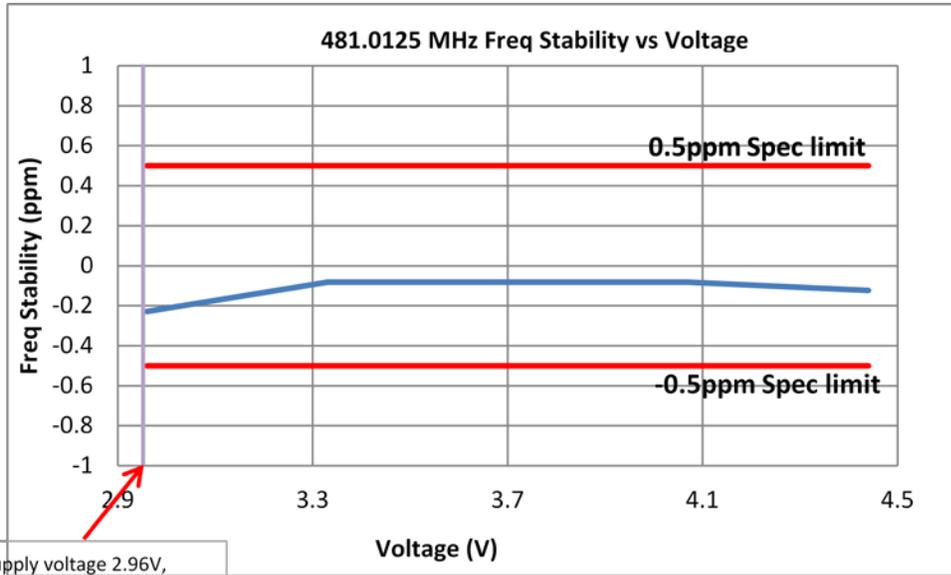


Minimum supply voltage 2.96V,
20% below nominal supply voltage.
Transmitter cannot function below
this point.

6H-2 – 459.650 MHz Frequency Stability vs. Supply Voltage



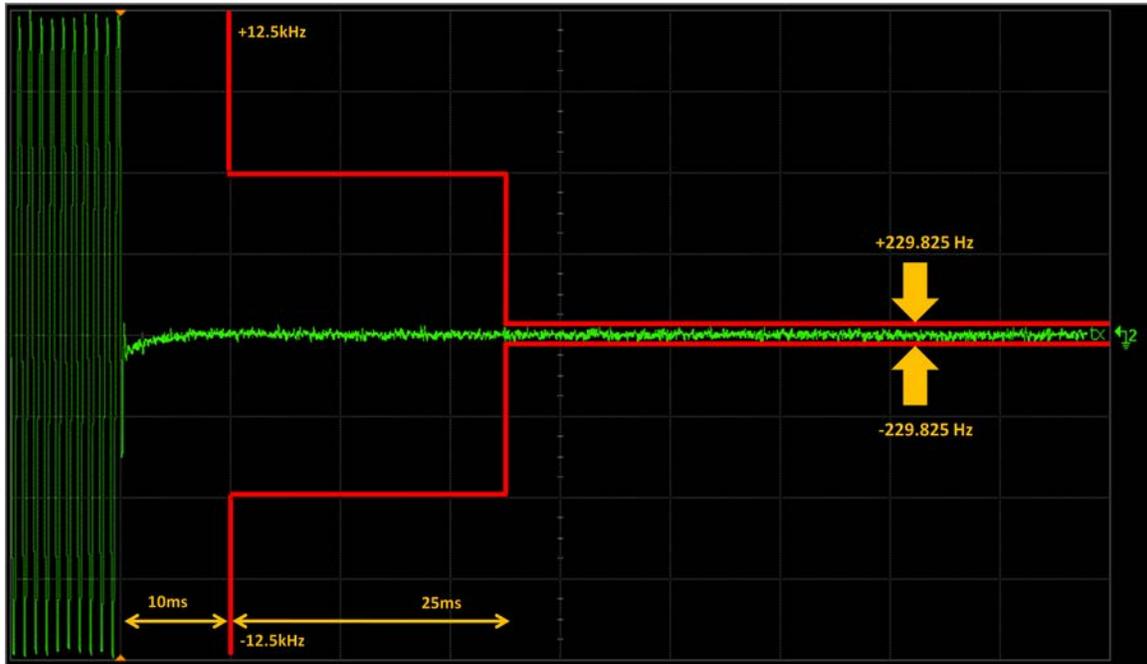
6H-3 – 481.0125 MHz Frequency Stability vs. Temperature



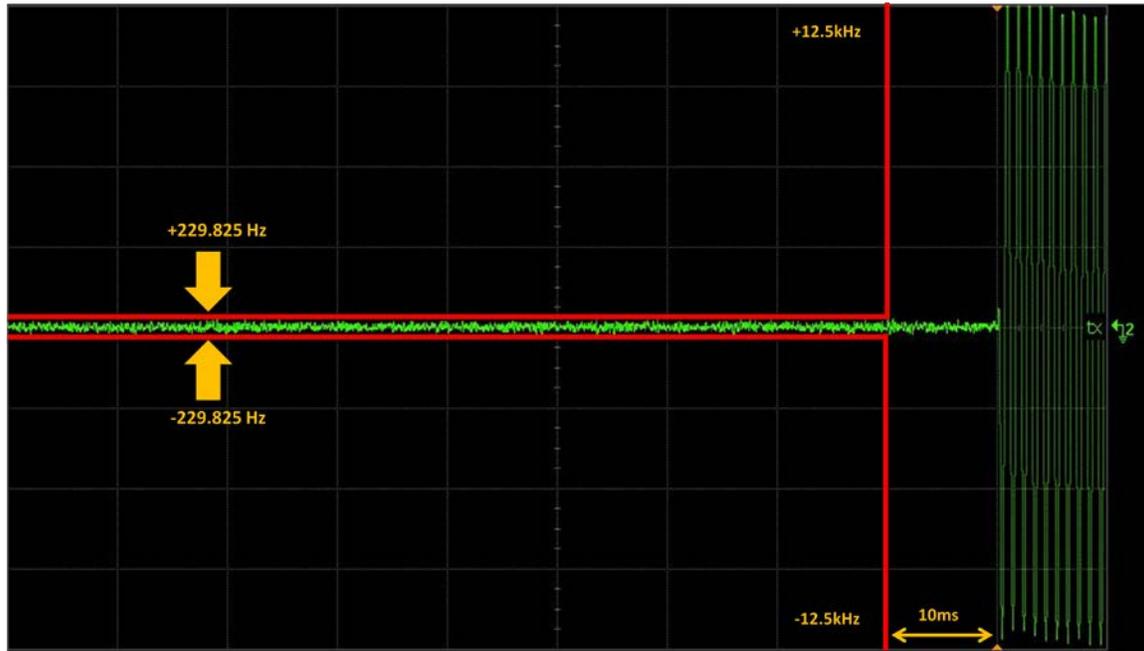
Minimum supply voltage 2.96V,
20% below nominal supply voltage.
Transmitter cannot function below
this point.

6H-4 – 481.0125 MHz Frequency Stability vs. Supply Voltage

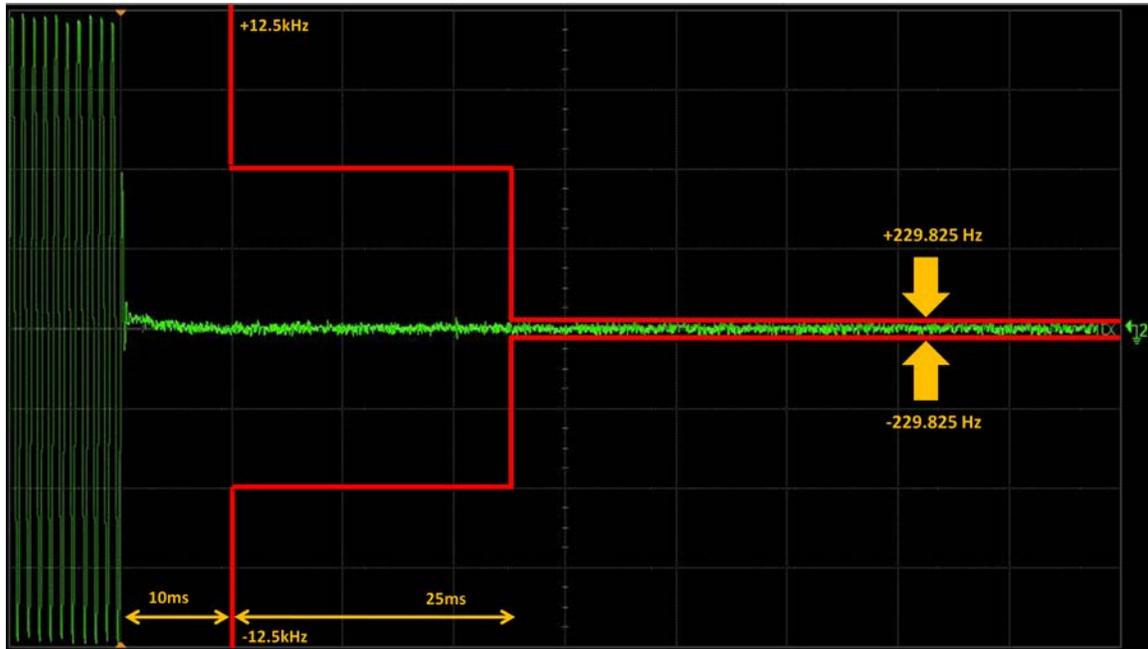
EXHIBIT 6I – Transient Frequency Behavior



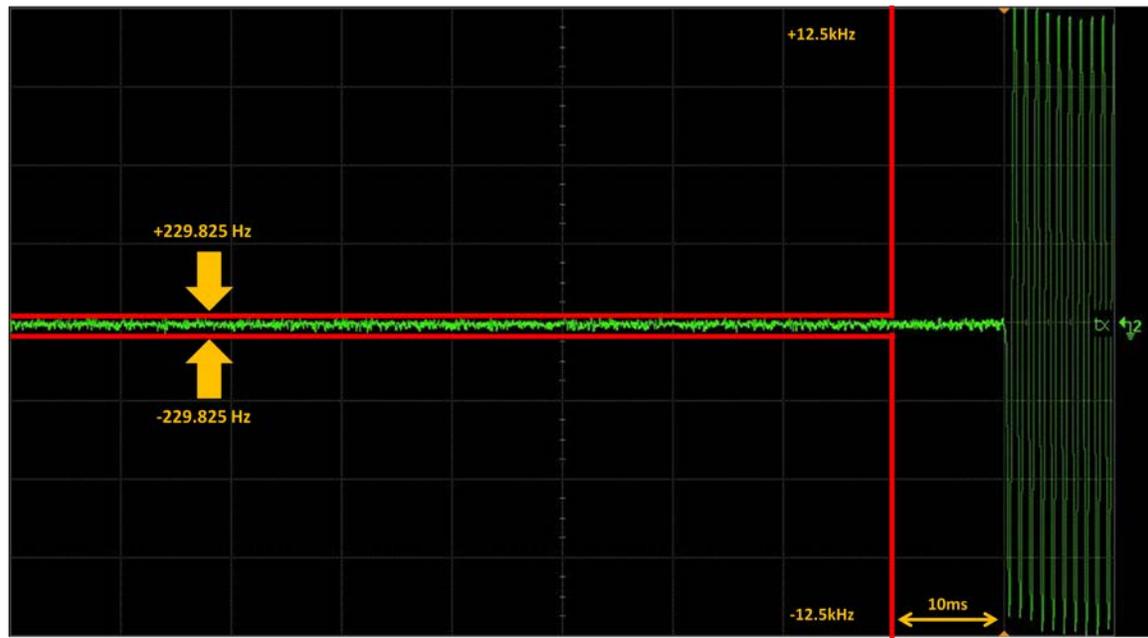
6I-1 – 459.650 MHz, 12.5 kHz Channel Spacing Key-Up Attack Time



6I-2 – 459.650 MHz, 12.5 kHz Channel Spacing De-Key Decay Time



6I-3 – 481.0125 MHz, 12.5 kHz Key-Up Attack Time



6I-4 – 481.0125 MHz, 12.5 kHz De-Key Decay Time