

Exhibit 9 – Measured Data Index

Motorola Head-end Transceiver (HUB)

FCC ID: MIJMILHUB-USA-01

Millitech Part No. 9031291001

9.0 Measured Data Index

9.1 *RF Output Measured Data*

9.1.1 Transmitter Output Power

The Hub Data transmitter output power is +24dBm typical at room temperature. The Hub Pilot transmitter output power is also +24dBm typical at room temperature. The specified minimum output power is +22dBm minimum from -30° to $+50^{\circ}$ C. The HUB Data transmitter is operated at a nominal output power of +18dBm. The HUB Pilot transmitter is operated at its saturated power output (nominal +28dBm). The frequency range that the HUB Data transmitter operates in is 28.05 to 28.35 GHz. The frequency that the HUB Pilot transmitter operates at is 27.644 GHz

9.1.2 Effective Isotropic Radiated Power

The calculated EIRP based on the saturated output power of the HUB Data is:

Power (nominal) = +18dBm = -12 dBW
Antenna Gain = 15 dBi
EIRP = -12 + 15 = 3 dBW

The calculated EIRP based on the saturated output power of the HUB Pilot is:

Power (sat.) = +28dBm = -2 dBW
Antenna Gain = 15 dBi
EIRP = -2 + 15 = 13 dBW

9.2 Occupied Bandwidth Tables

The occupied bandwidth measurements were performed in a radiated mode. The 99% occupied bandwidth measurement is an automated measurement performed by the spectrum analyzer. See Tables 9.2-1 and 9.2-2 below for the Data and Pilot occupied bandwidth measurements, respectively.

RF Transmit Frequency (GHz)	Modulation Scheme	Occupied Bandwidth (MHz)
28.05	64 QAM – 5.056941 MSmpl/sec	6.36
28.20	64 QAM – 5.056941 MSmpl/sec	6.46
28.3434	64 QAM – 5.056941 MSmpl/sec	6.36
28.05	QPSK – 5 MSmpl/sec	6.46
28.20	QPSK – 5 MSmpl/sec	6.56
28.3434	QPSK – 5 MSmpl/sec	6.46

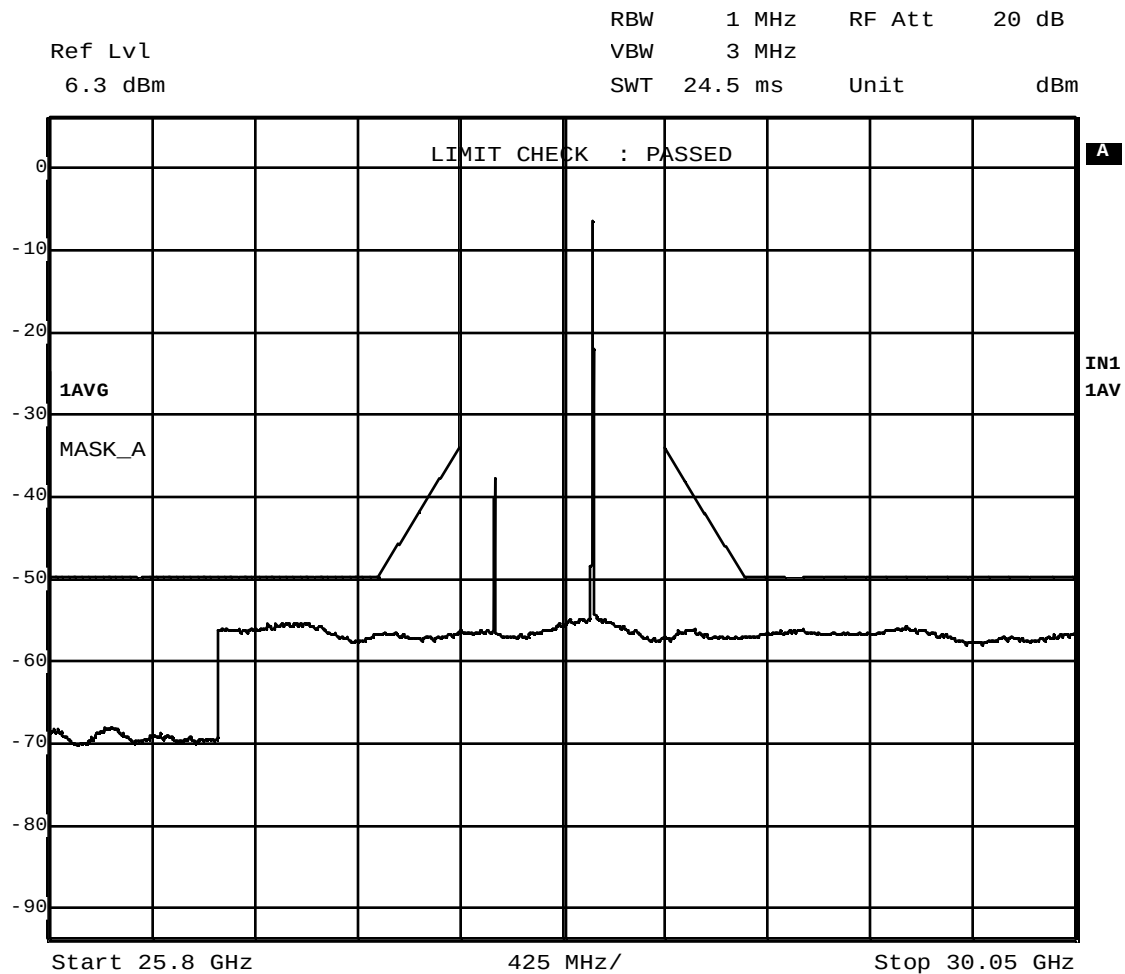
Table 9.2-1 Occupied Bandwidth for the Data transmit frequencies

RF Transmit Frequency (GHz)	Modulation Scheme	Occupied Bandwidth (MHz)
27.644	FM 24.414 kHz Mod Freq, 10 MHz Deviation	10.9

Table 9.2-2 Occupied Bandwidth for the Pilot Tone

9.3 FCC Radiated Spurious Emissions Graphs

Below are the measurement plots of the +/- 250% scans for spurious emissions. Scans were made from 10 GHz to 40 GHz, but no spurious emissions were detected. All measurements were made using a 1 MHz resolution bandwidth. The following figures show the scans that were made over the range covering +/- 250% of the allocated band.



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Figure 9.3-1 HUB Radiated Spurious emissions at 28.05 GHz and 64 QAM Modulation

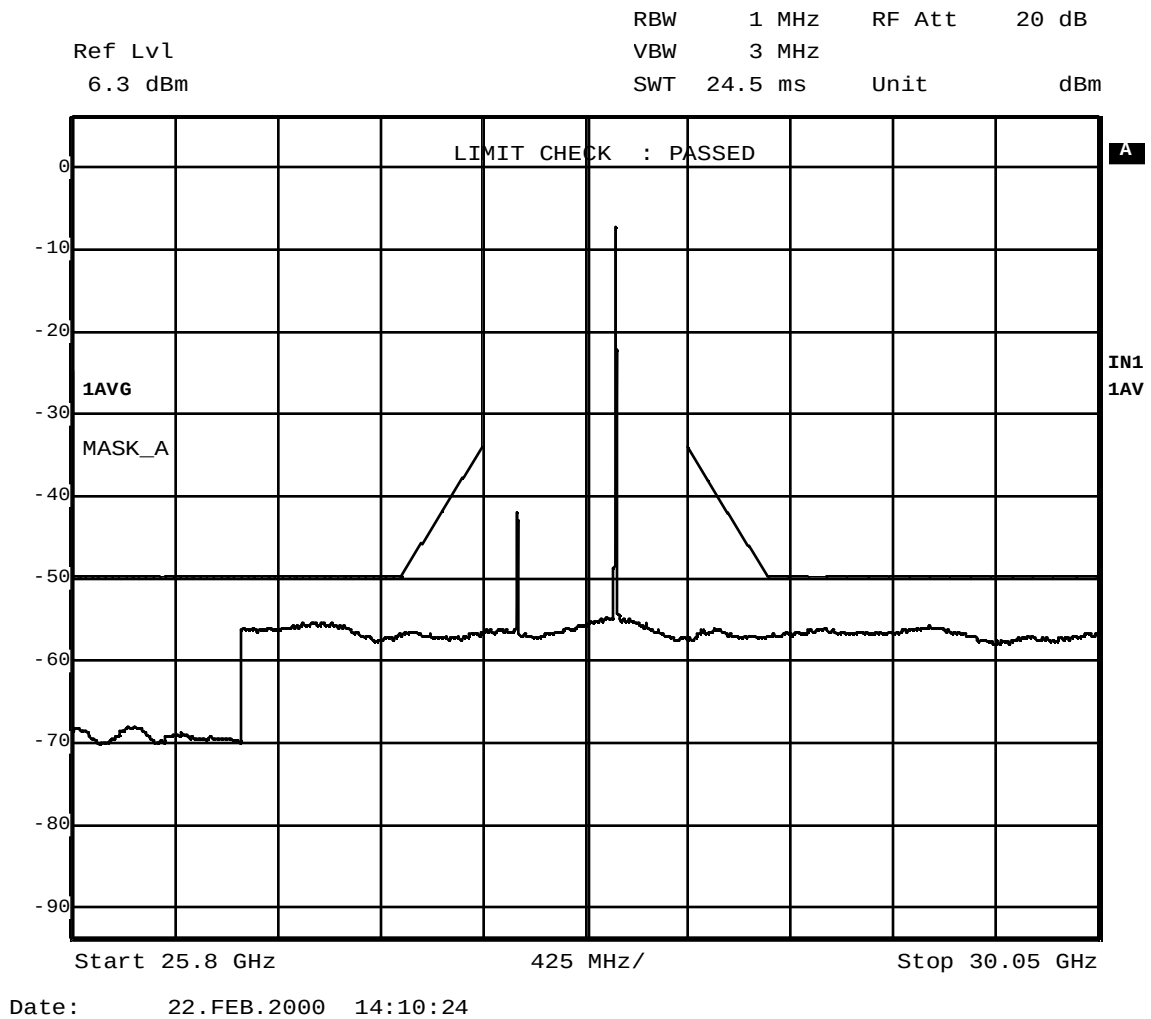


Figure 9.3-2 HUB Radiated Spurious emissions at 28.05 GHz and QPSK Modulation

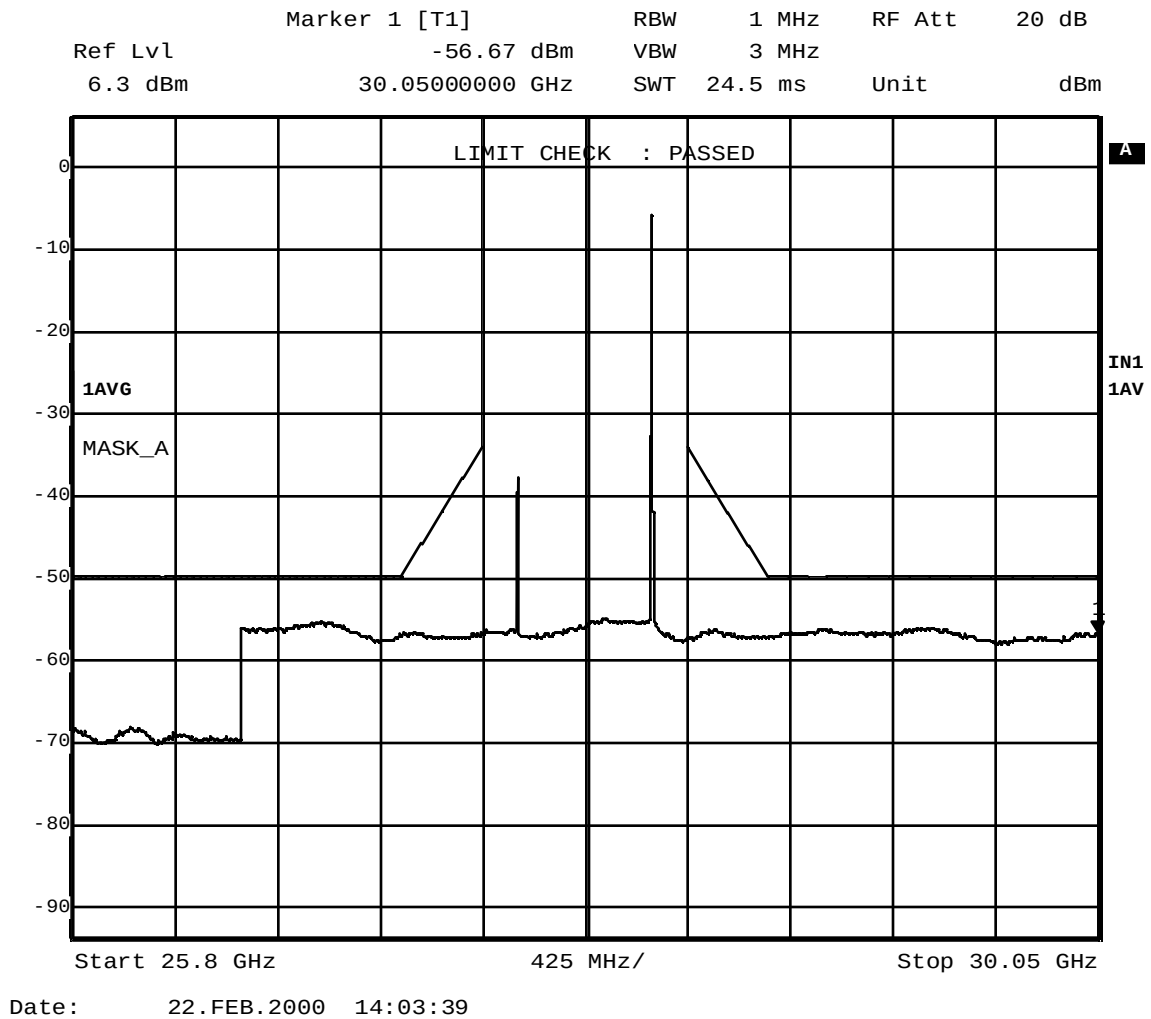


Figure 9.3-3 HUB Radiated Spurious emissions at 28.2 GHz and 64 QAM Modulation

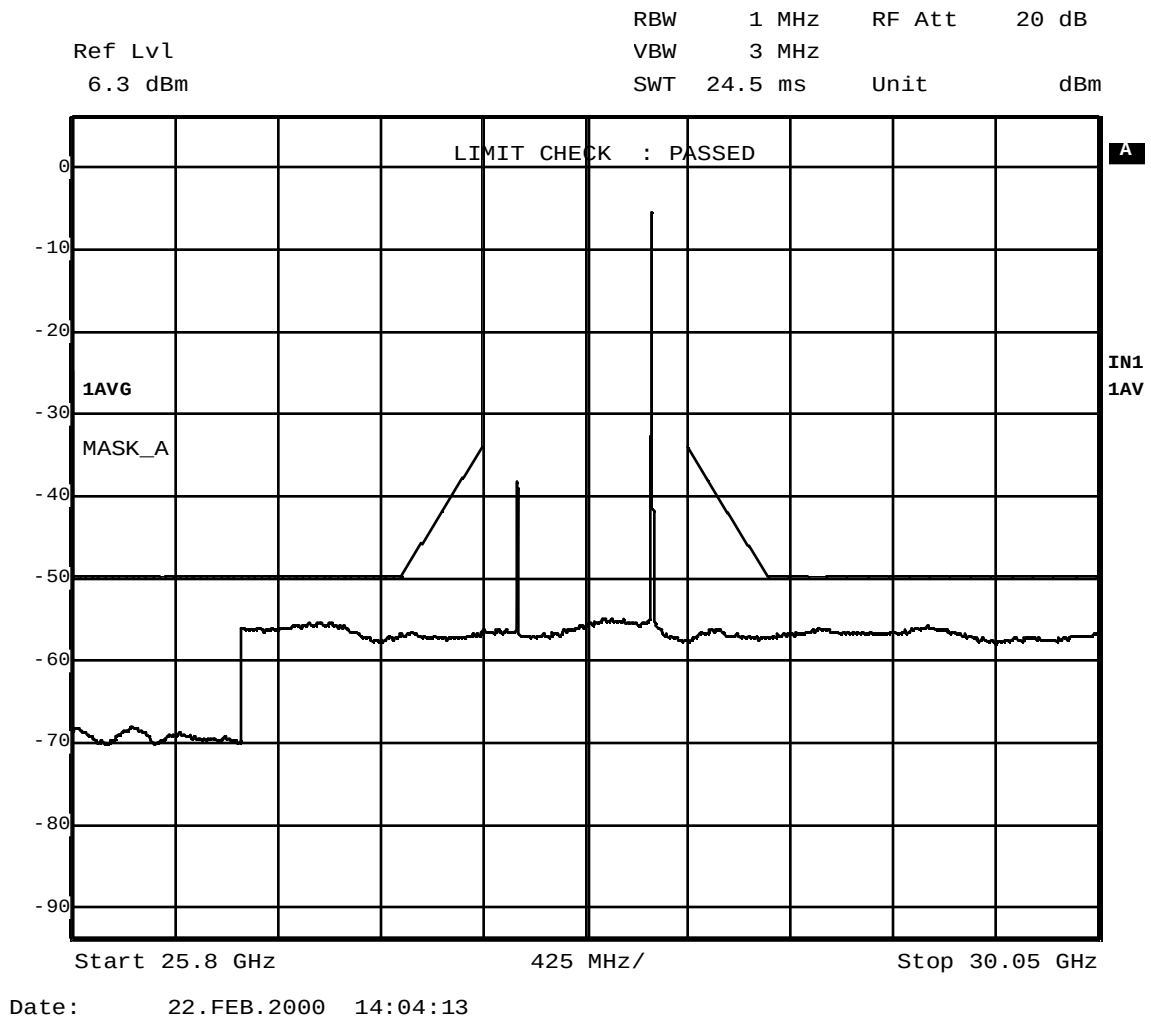
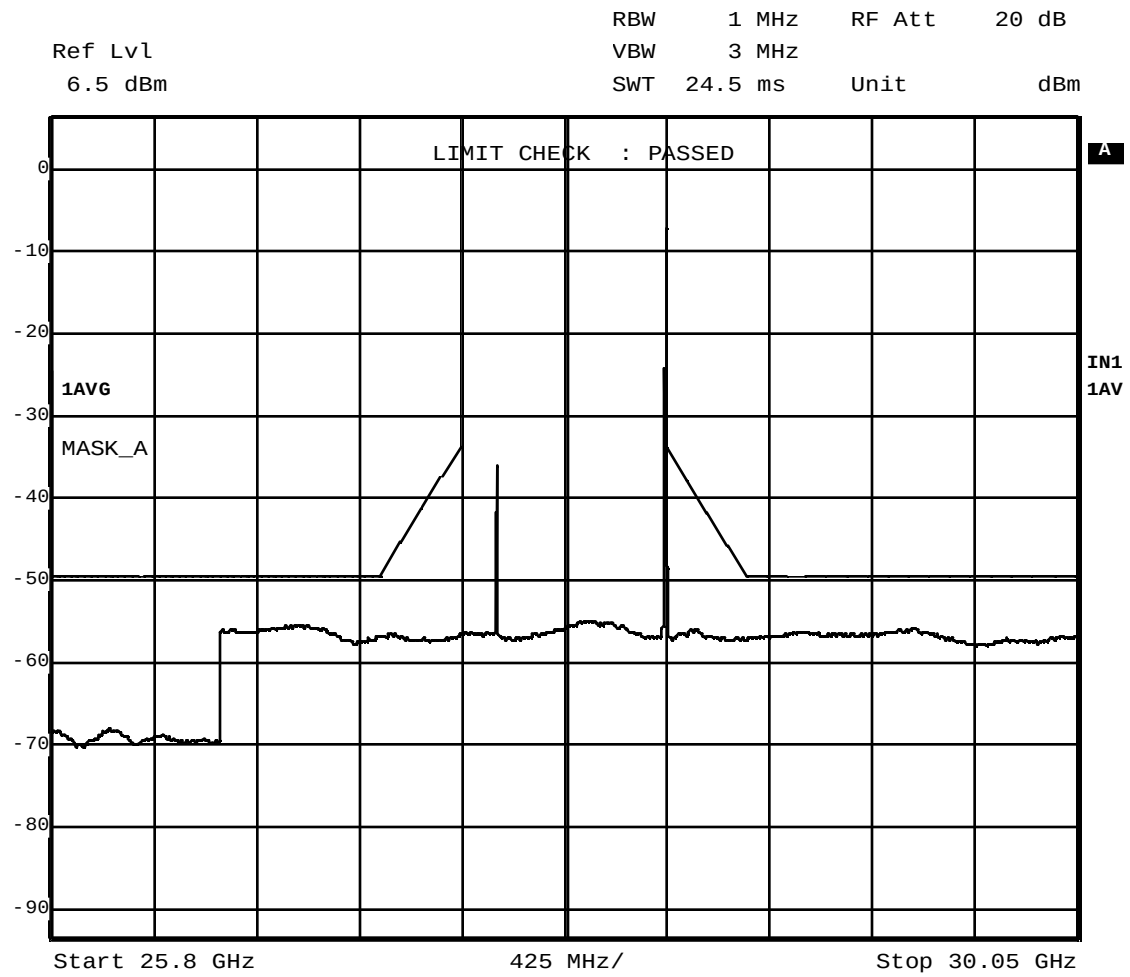
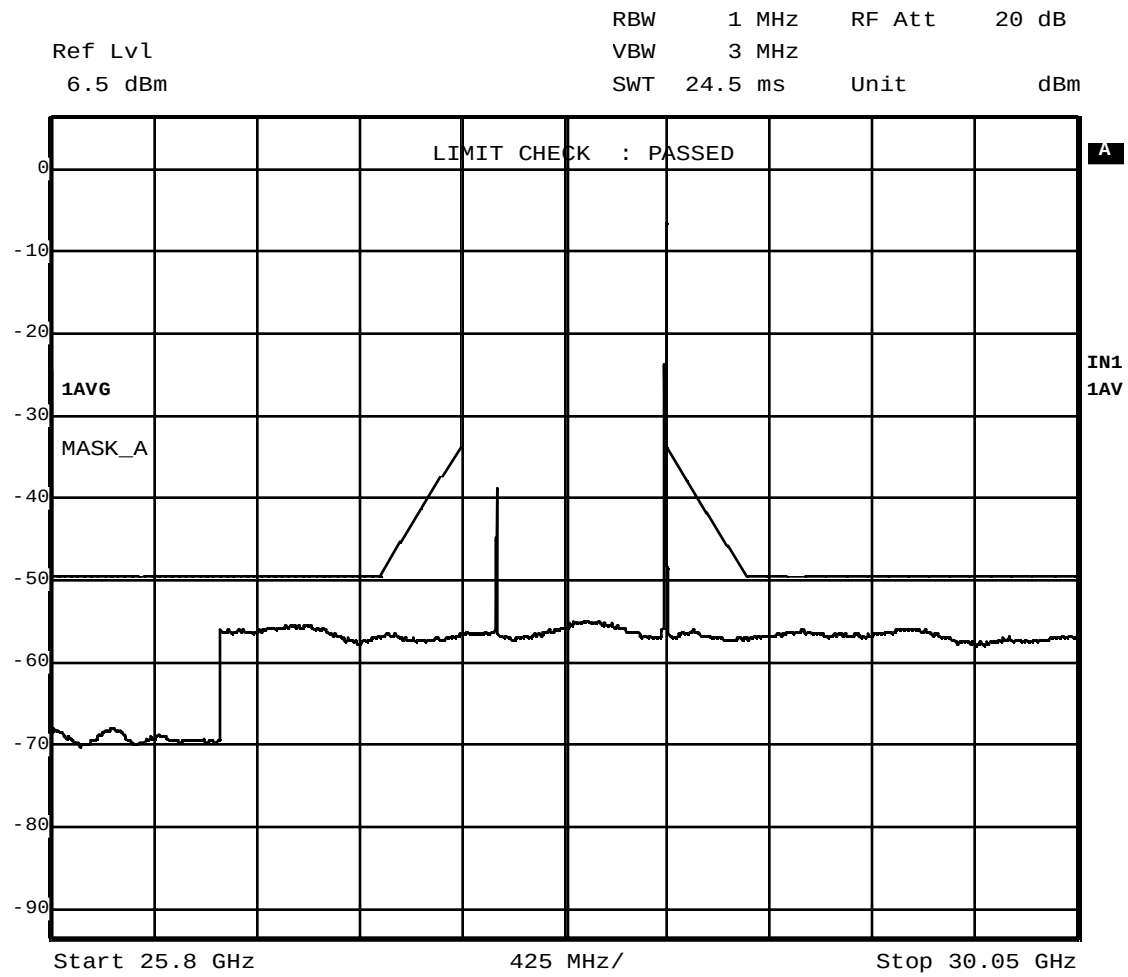


Figure 9.3-4 HUB Radiated Spurious emissions at 28.2 GHz and QPSK Modulation



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Figure 9.3-5 HUB Radiated Spurious emissions at 28.3434 GHz and 64 QAM Modulation

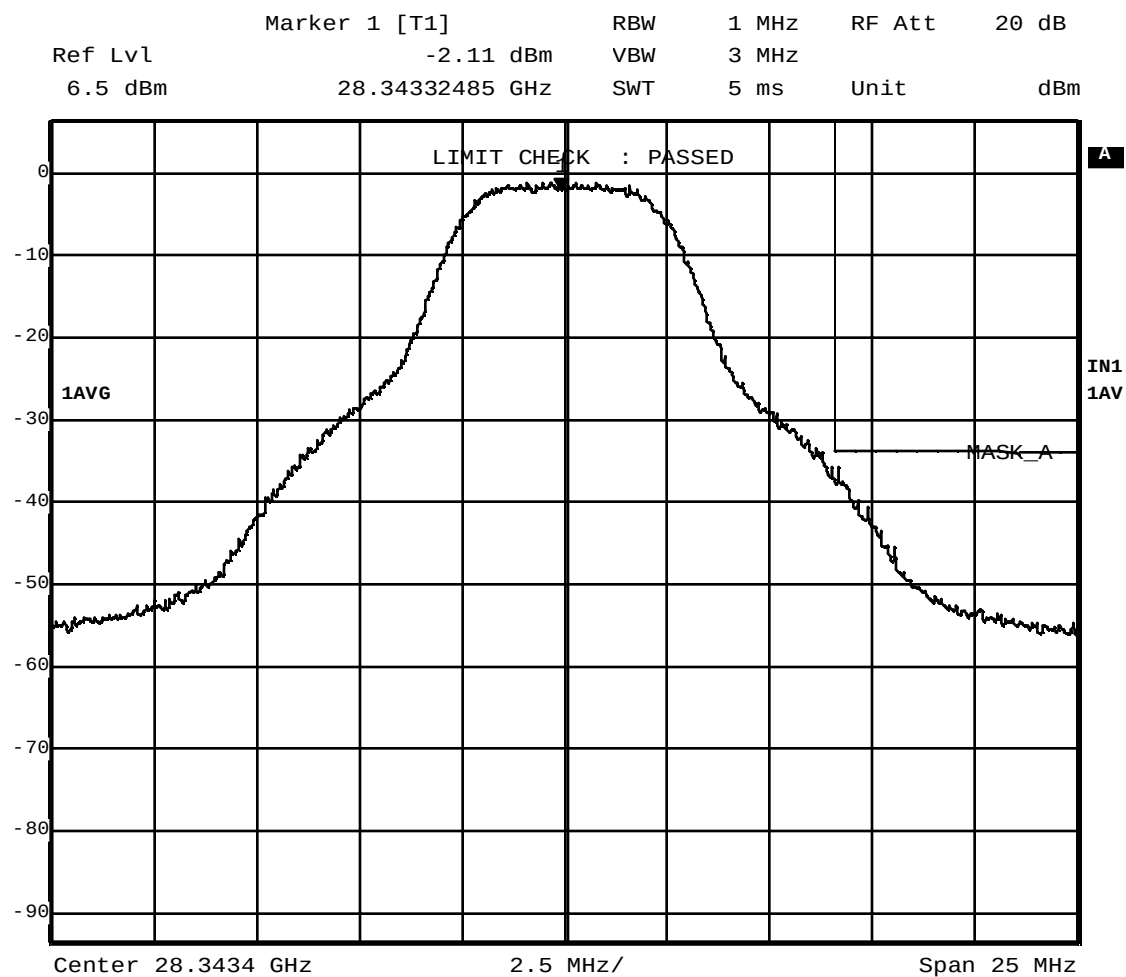


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Figure 9.3-6 HUB Radiated Spurious emissions at 28.3434 GHz and QPSK Modulation

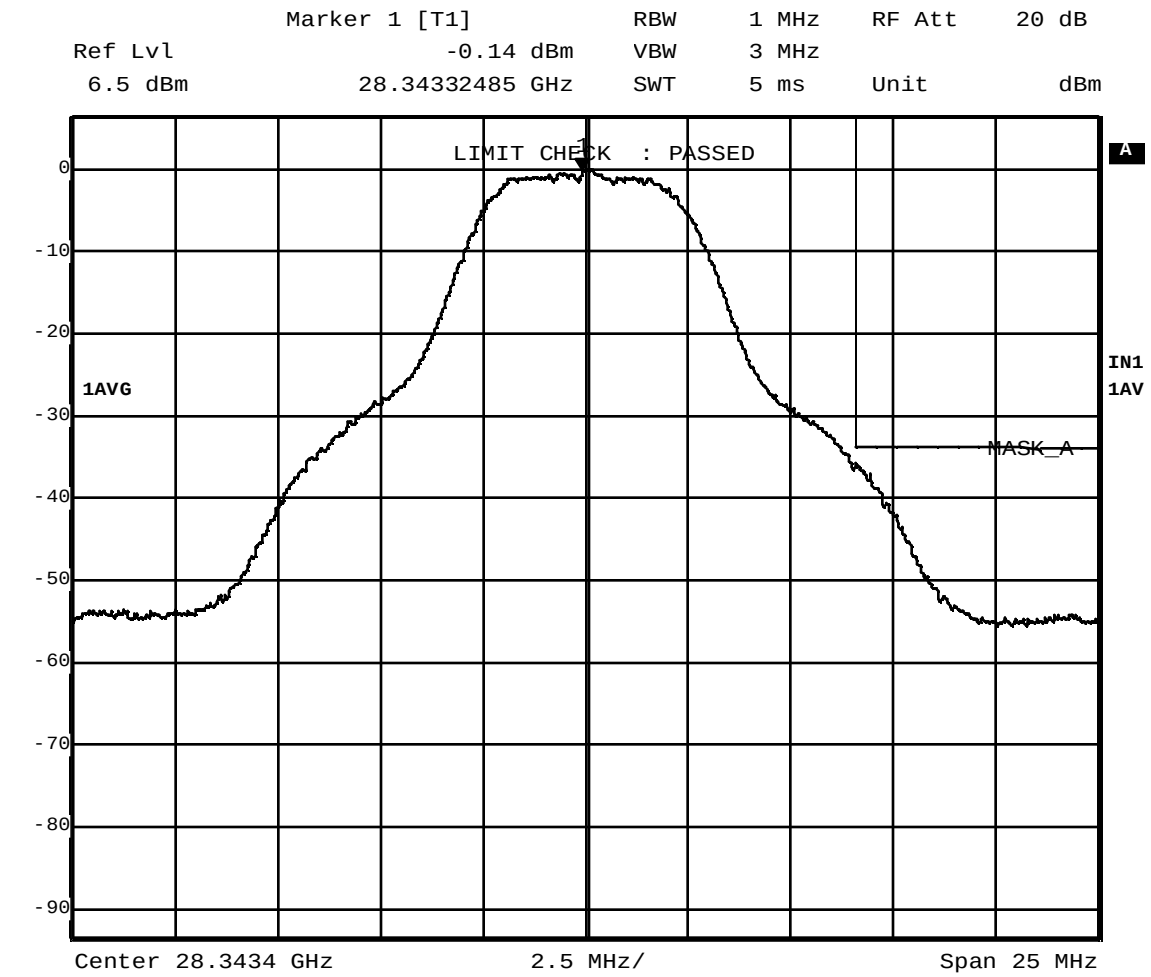
9.4 Emission Mask

Below are the measurement plots showing the Data carrier as compared to the emissions mask for the selected band.



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Figure 9.4-1 HUB Data transmit frequency of 28.3434 GHz and 64 QAM Modulation



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Figure 9.4-2 HUB Data transmit frequency of 28.3434 GHz and QPSK Modulation

9.5 Frequency Stability vs Temperature and Voltage

The HUB was tested for frequency stability over a temperature range of -30° to $+50^{\circ}$ C while its input supply voltage was varied between $\pm 15\%$ of its rated value. All test were performed with the Hub operating at its nominal rated output power (+18dBm for Data and +28 dBm for Pilot). See Table 9.5-1 for actual test data and Figure 9.5-1 for a graphical presentation of the stability data for the HUB Data carrier. See Table 9.5-2 for actual test data and Figure 9.5-2 for a graphical presentation of the stability data for the HUB Pilot carrier.

f_0	28.070000	GHz	% Error		
$^{\circ}\text{C}$	f @ -15% rated voltage in GHz	f @ +15% rated voltage in GHz	% Error @ - 15% rated voltage	% Error @ +15% rated voltage	FCC Limit
-30	28.07000407	28.07000407	0.000014%	0.000014%	$\pm 0.0005\%$
-20	28.07000403	28.07000407	0.000014%	0.000014%	$\pm 0.0005\%$
-10	28.07000367	28.07000367	0.000013%	0.000013%	$\pm 0.0005\%$
0	28.07000303	28.07000300	0.000011%	0.000011%	$\pm 0.0005\%$
10	28.07000240	28.07000240	0.000009%	0.000009%	$\pm 0.0005\%$
20	28.07000177	28.07000173	0.000006%	0.000006%	$\pm 0.0005\%$
30	28.07000067	28.07000067	0.000002%	0.000002%	$\pm 0.0005\%$
40	28.06999953	28.06999950	-0.000002%	-0.000002%	$\pm 0.0005\%$
50	28.06999807	28.06999800	-0.000007%	-0.000007%	$\pm 0.0005\%$

Table 9.5-1 Frequency Stability Test Data – HUB Data

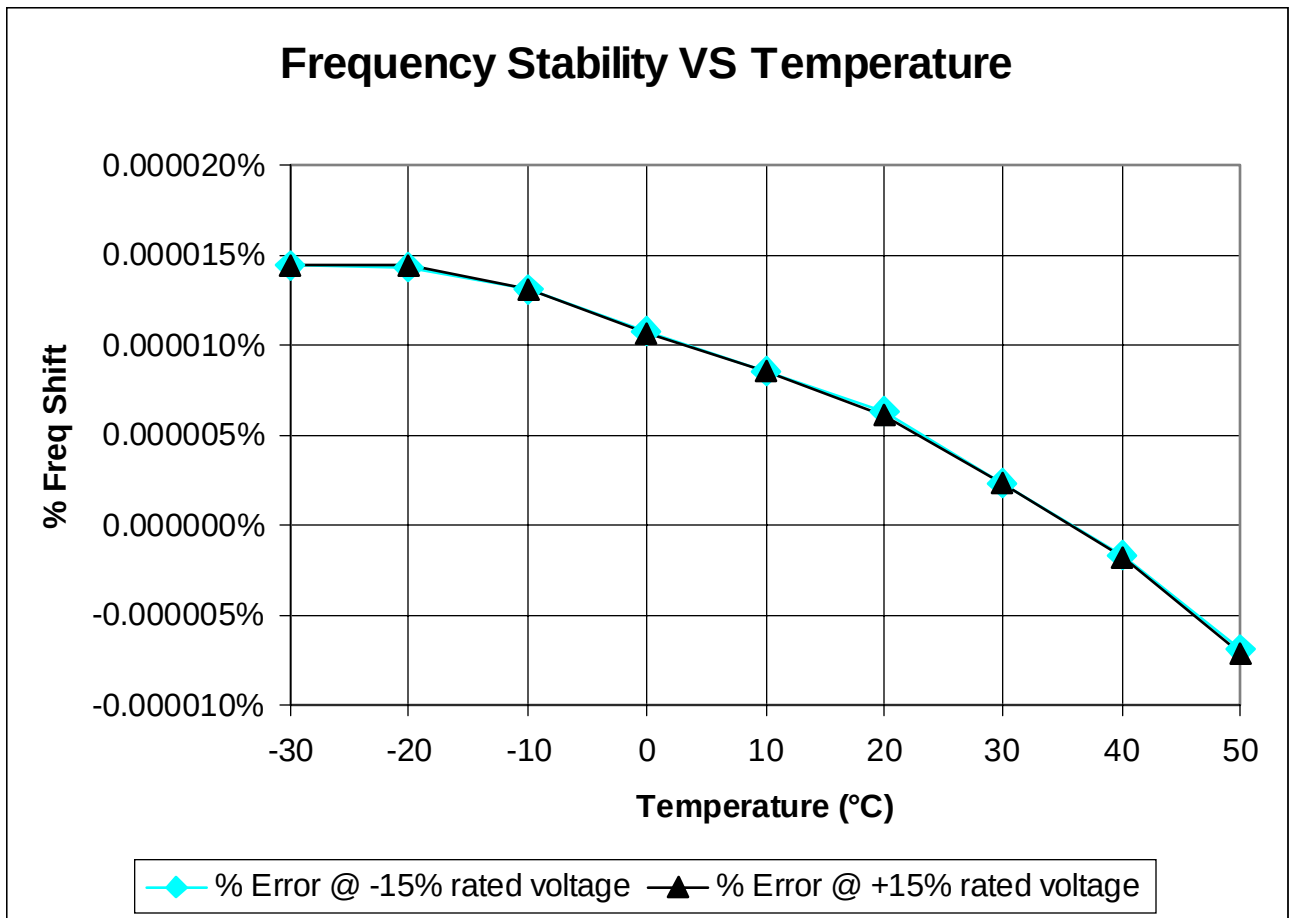


Figure 9.5-1 Frequency Stability Graph – HUB Data

Table 9.4-2 Frequency Stability Test Data – HUB Pilot

	f_0	27.644000	GHz	% Error	
°C	Center Frequency @ -15% rated voltage in GHz	Center Frequency @ +15% rated voltage in GHz	% Error @ -15% rated voltage	% Error @ +15% rated voltage	limit %
-30	27.64392000	27.64392000	0.0003%	0.0003%	+/-0.0005%
-20	27.64386000	27.64386000	0.0001%	0.0001%	+/-0.0005%
-10	27.64377000	27.64377000	-0.0003%	-0.0003%	+/-0.0005%
0	27.64395000	27.64395000	0.0004%	0.0004%	+/-0.0005%
10	27.64386000	27.64386000	0.0001%	0.0001%	+/-0.0005%
20	27.64385000	27.64385000	0.0000%	0.0000%	+/-0.0005%
30	27.64388000	27.64388000	0.0001%	0.0001%	+/-0.0005%
40	27.64393000	27.64393000	0.0003%	0.0003%	+/-0.0005%
50	27.64378000	27.64378000	-0.0002%	-0.0002%	+/-0.0005%

NOTE: Because the FM modulation could not be defeated, the frequency measurement was made at the upper peak of the FM waveform (27.64384 GHz).

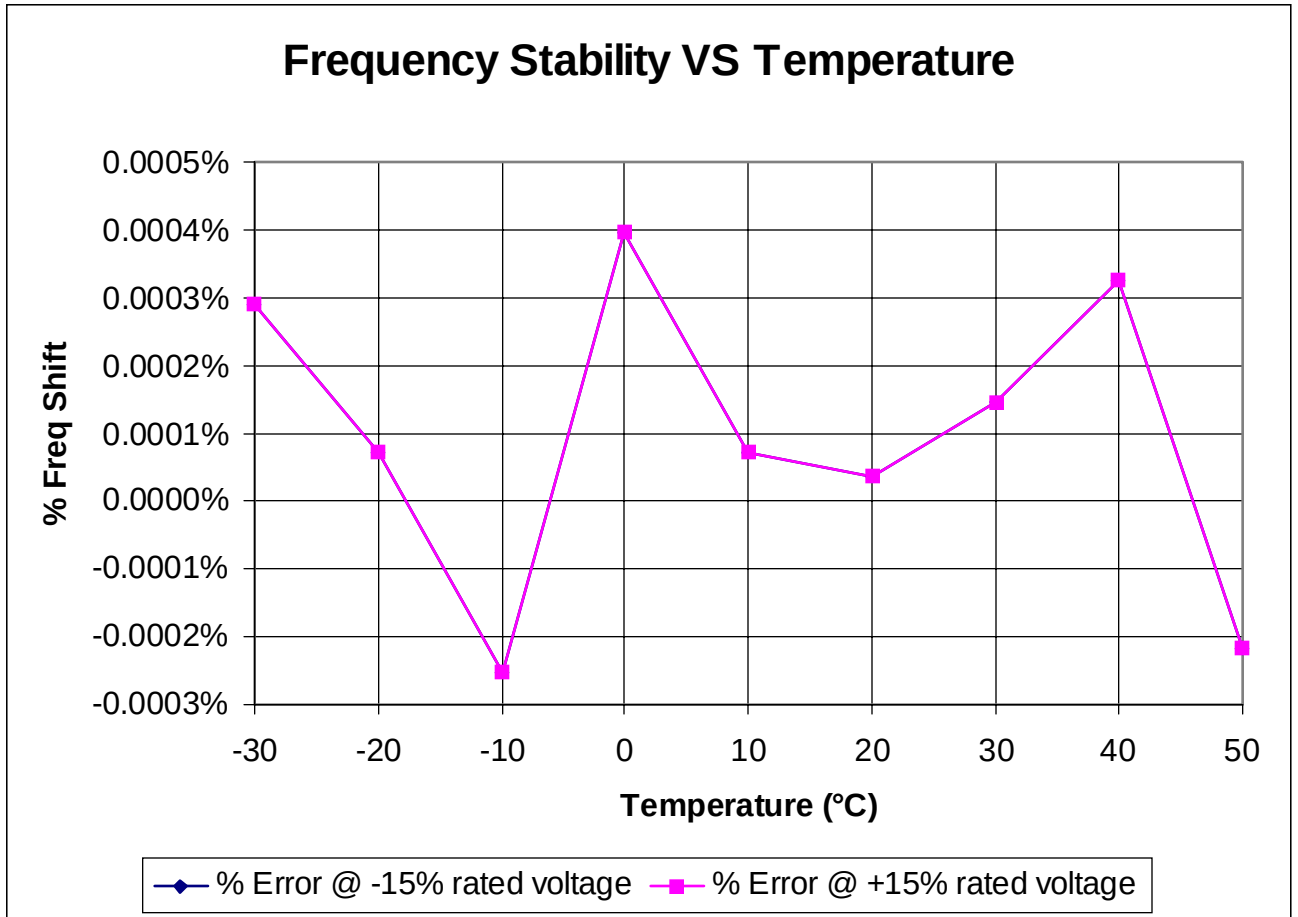


Figure 9.4-2 Frequency Stability Graph – HUB Pilot