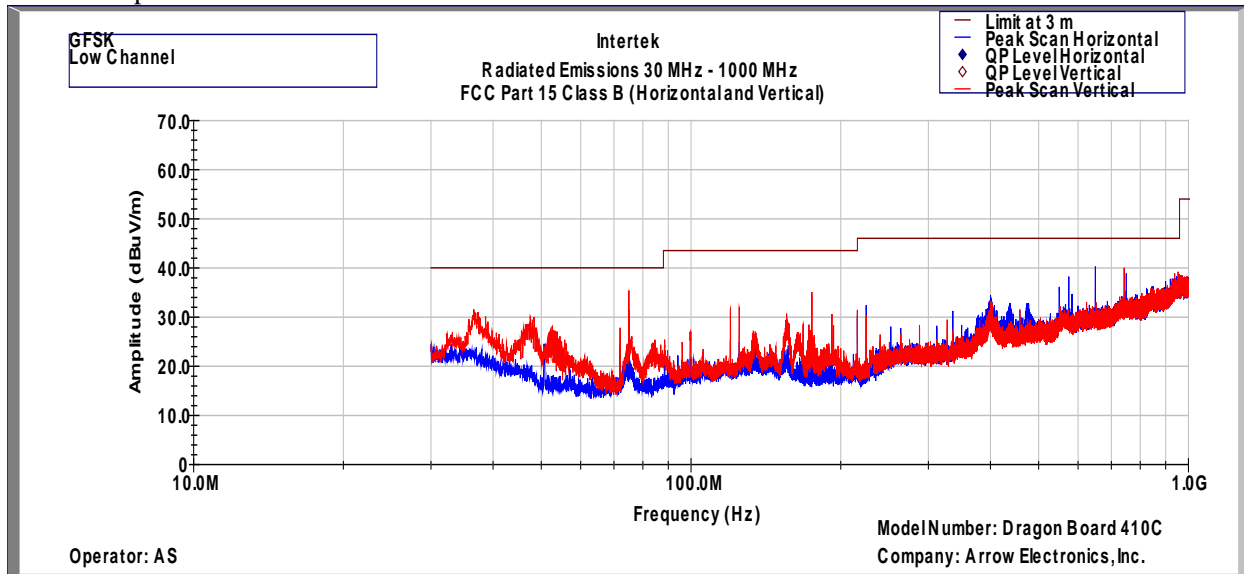




### Out-of-Band Radiated Spurious Emissions GFSK

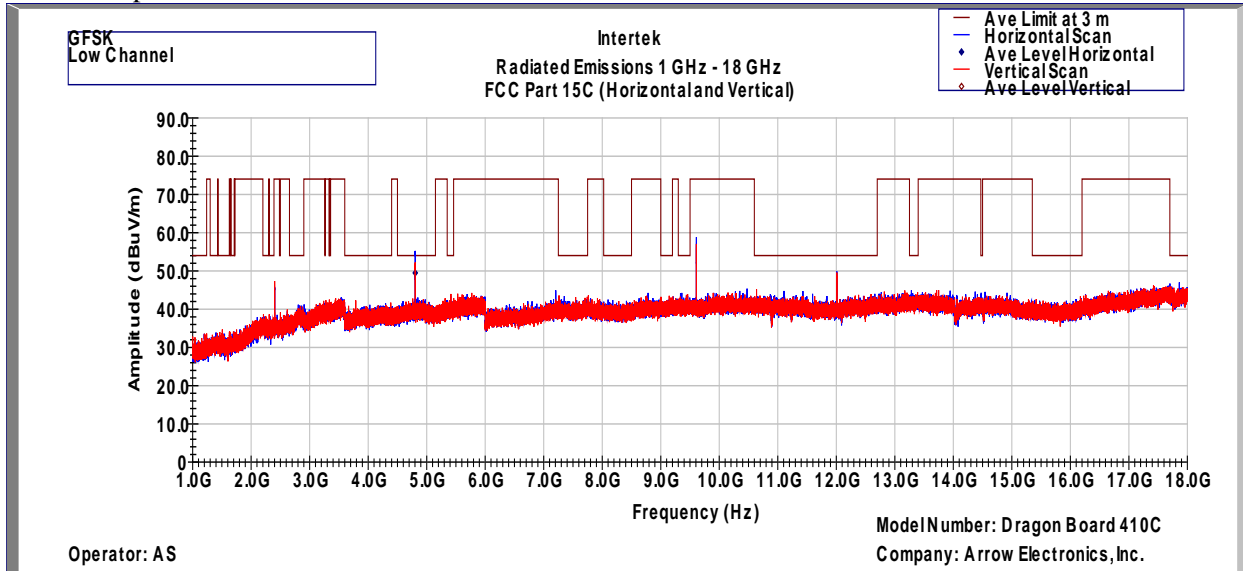
Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 2402MHz

Radiated Spurious Emissions 30 MHz - 1000 MHz





Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan



Frequency	Ave Level	Limit@3m	Av Margin	Raw	Cable	Preamp	AF
MHz	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(dB)	(dB)	dB(1/m)
4804	49.5	54	-4.5	48.1	2.6	33.7	32.5

Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

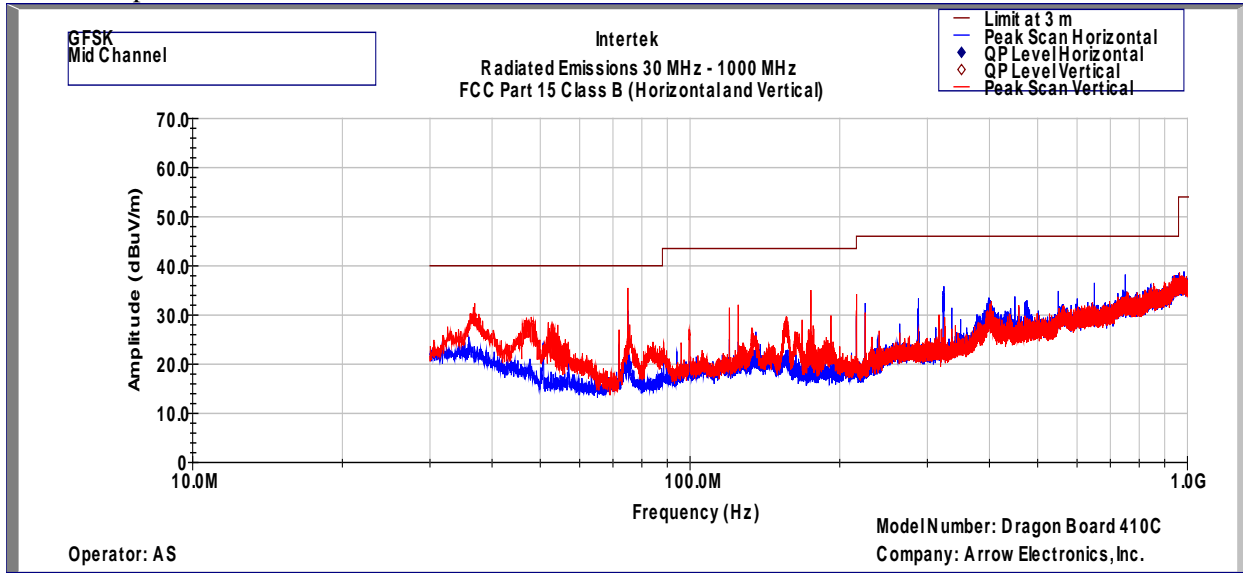
Note: FS@3m = RA + AF + CF - Preamp, (Peak)

If corrected Peak Scan is not under Average Limit of 54 then Average measurements were performed per FCC Publication DA 00-705.



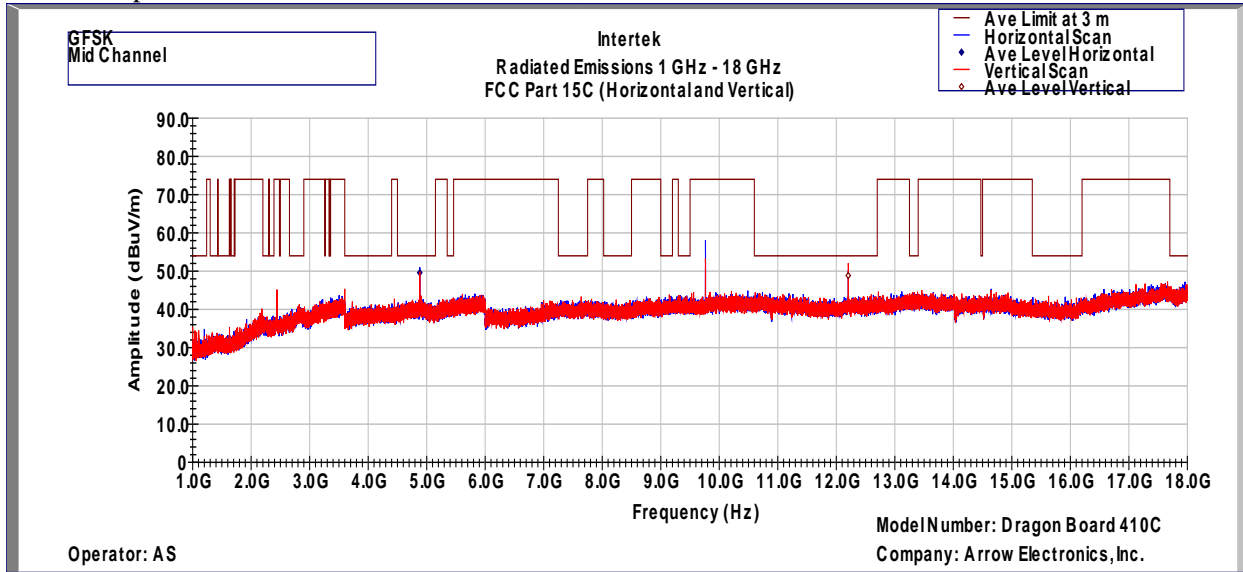
Test Results: 15.209 Radiated Spurious Emissions Mid Channel, Tx at 2441MHz

### Radiated Spurious Emissions 30 MHz - 1000 MHz





Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan



Frequency MHz	Ave Level (dBuV/m)	Limit@3m (dBuV/m)	Av Margin (dB)	Raw (dBuV)	Cable (dB)	Preamp (dB)	AF dB(1/m)
4882.0	49.6	54	-4.4	47.7	2.6	33.7	33
12205.0	48.8	54	-5.2	40.1	4.5	34.2	38.4

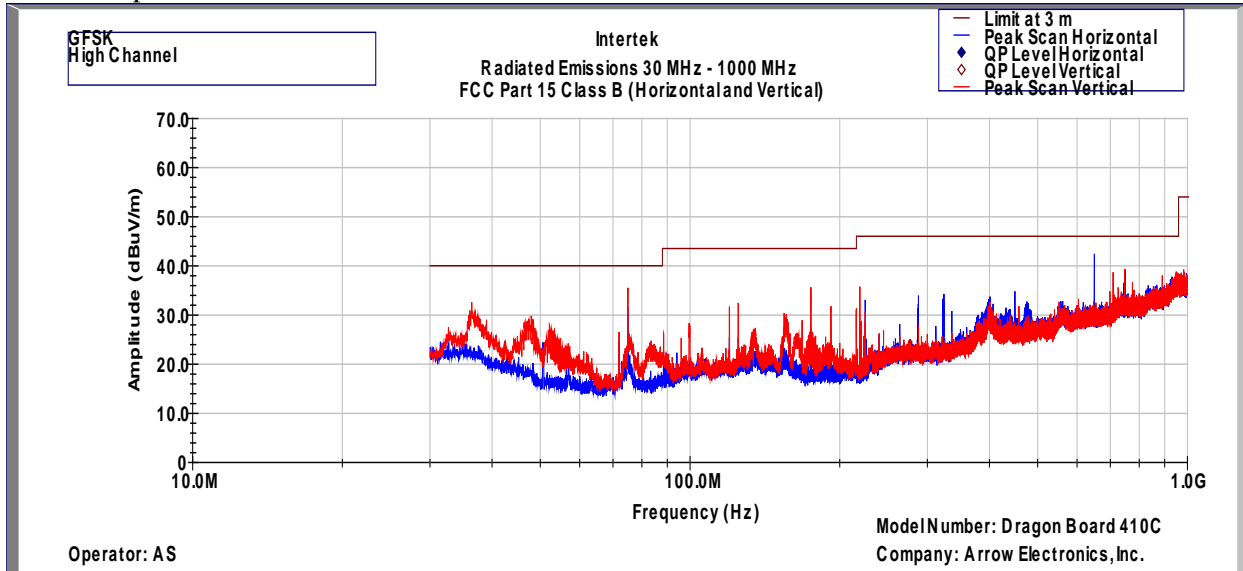
Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

Note: FS@3m = RA + AF + CF - Preamp, (Peak)

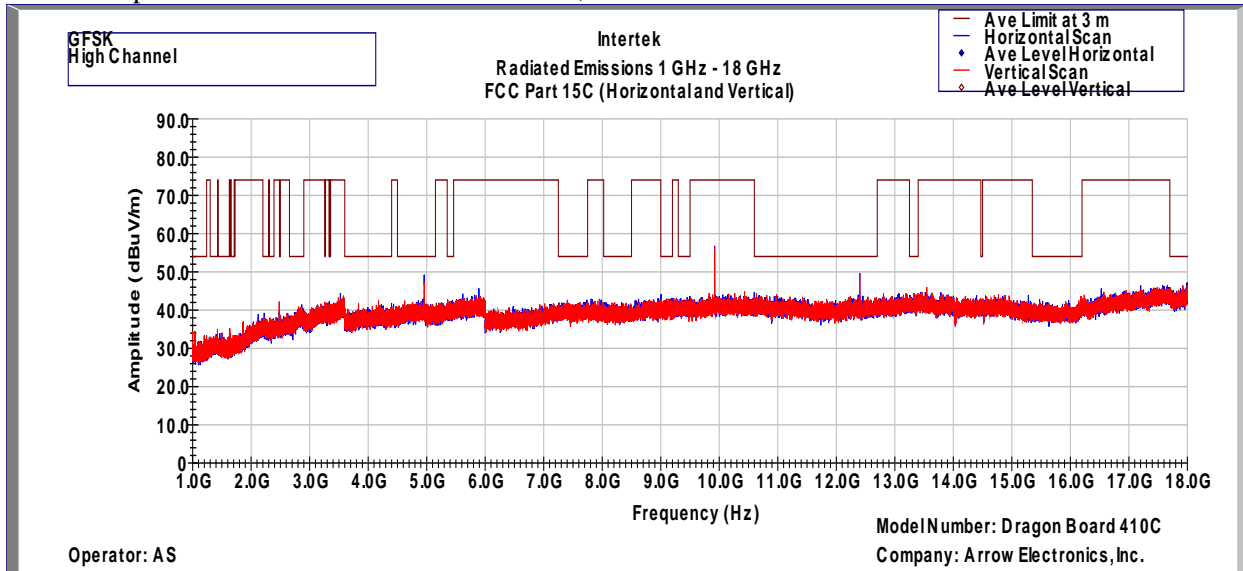
If corrected Peak Scan is not under Average Limit of 54 then Average measurements were performed per FCC Publication DA 00-705.

Test Results: 15.209 Radiated Spurious Emissions High Channel, Tx at 2480MHz

Radiated Spurious Emissions 30 MHz - 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

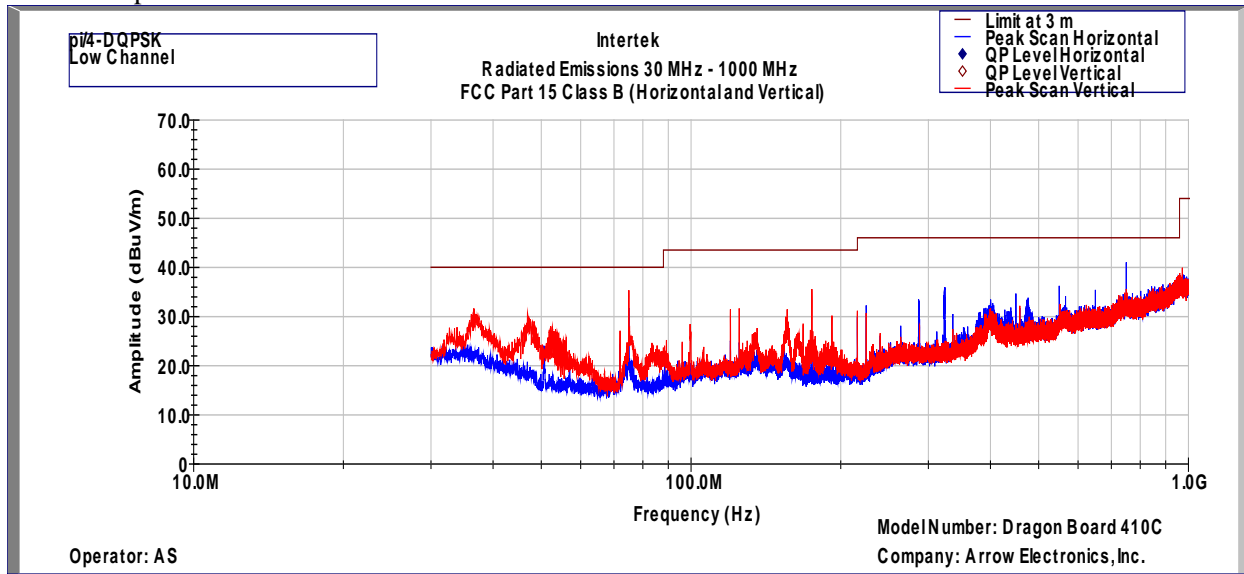
Note: FS@3m = RA + AF + CF - Preamp, (Peak)  
Corrected Peak Scans are under the Average Limit of 54.

<b>Results</b>	<b>Complies</b>
----------------	-----------------

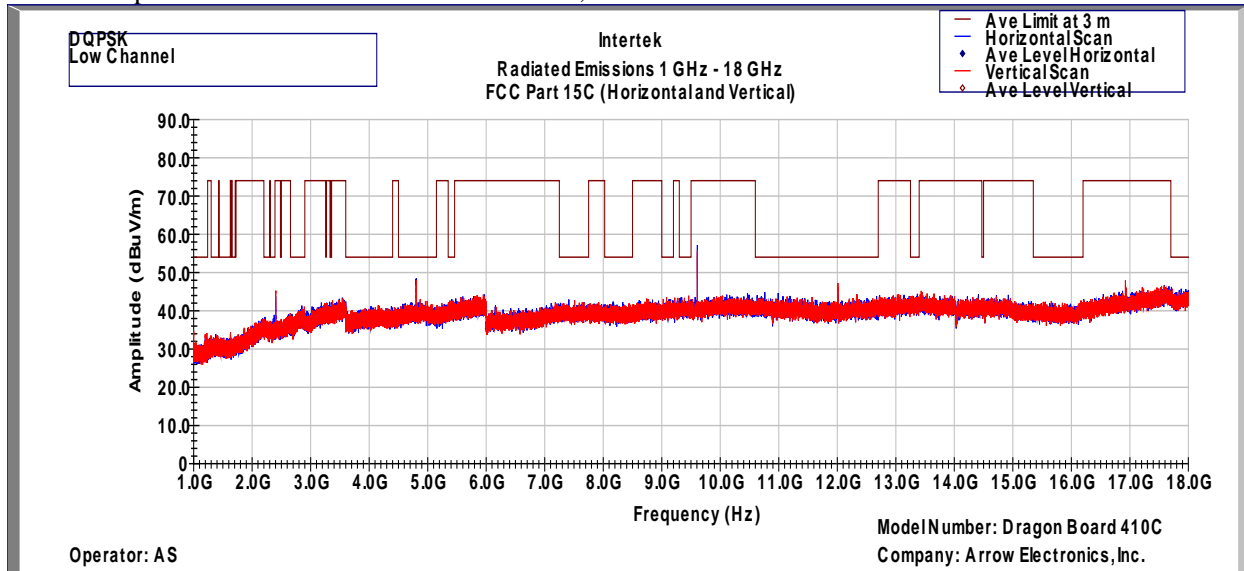
**Out-of-Band Radiated Spurious Emissions PIE**

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 2402MHz

**Radiated Spurious Emissions 30 MHz - 1000 MHz**



**Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan**



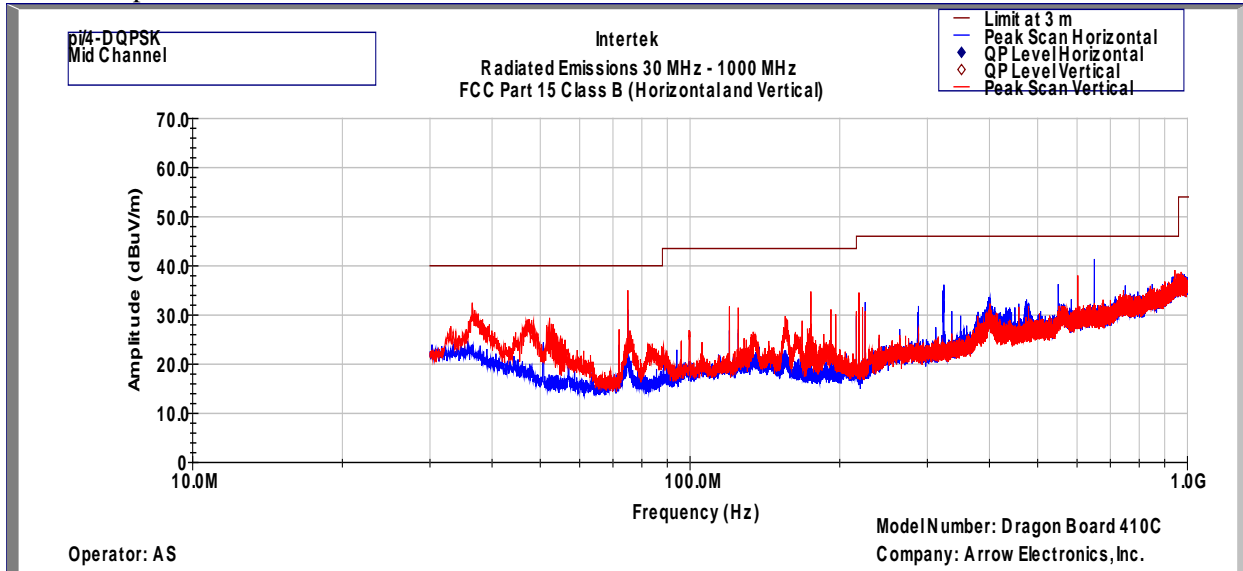
Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

Note: FS@3m = RA + AF + CF - Preamp, (Peak)

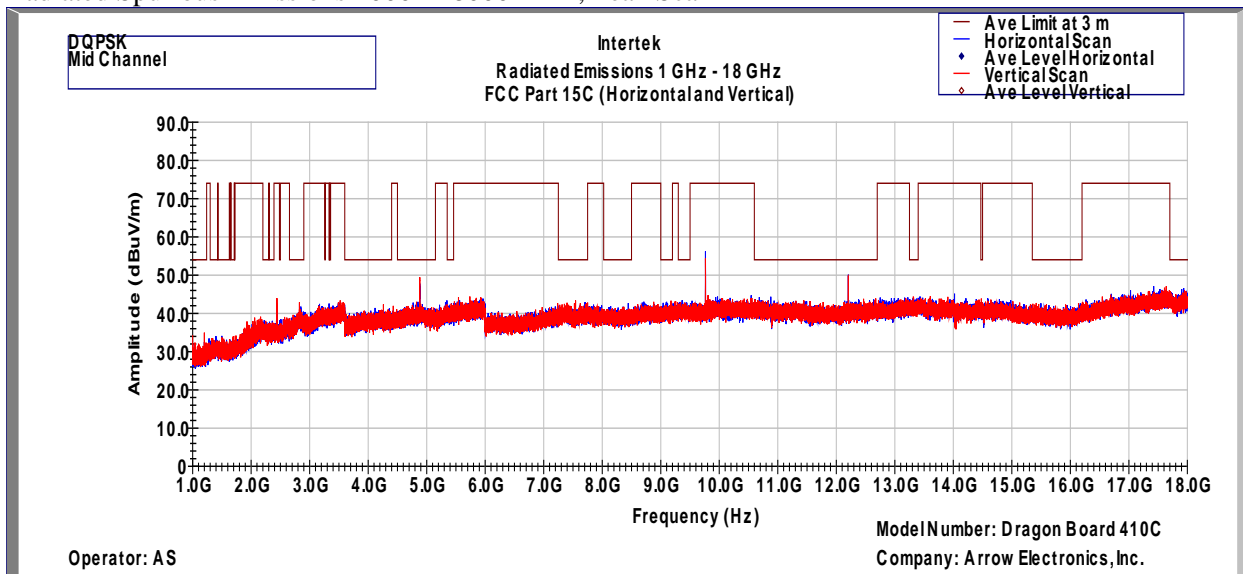
Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions Mid Channel, Tx at 2441MHz

Radiated Spurious Emissions 30 MHz - 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan



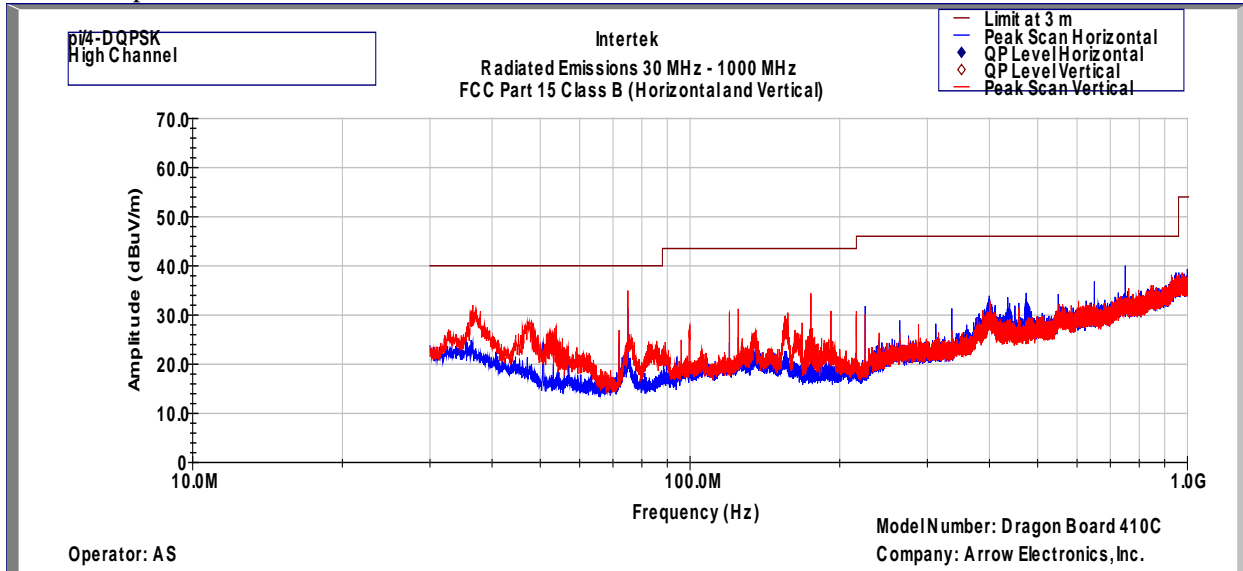
Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

Note: FS@3m = RA + AF + CF - Preamp, (Peak)

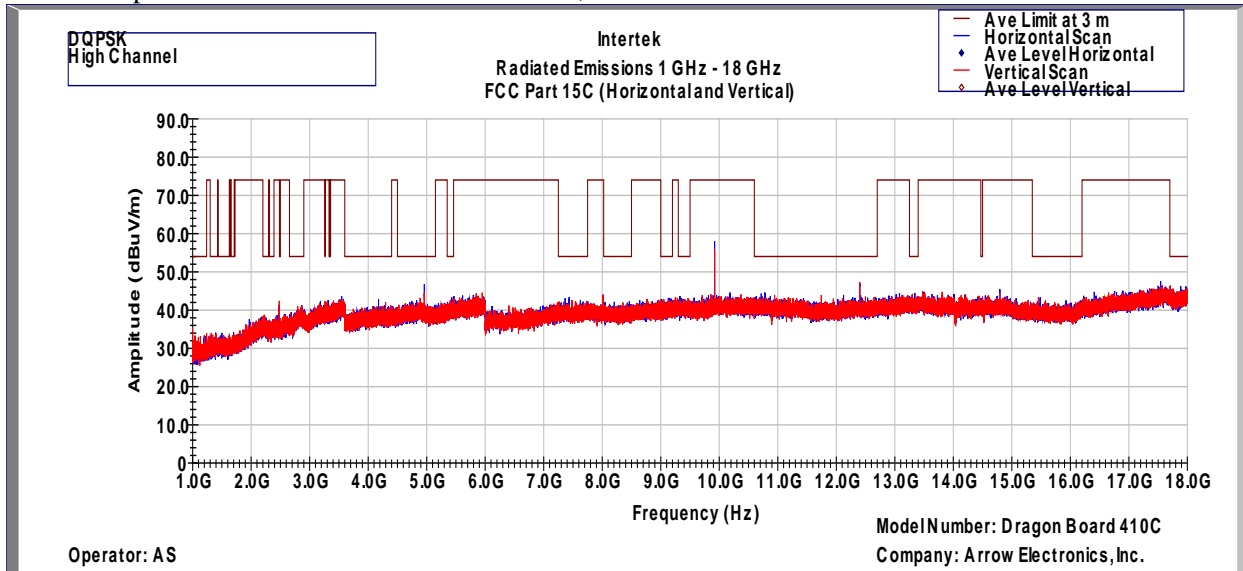
Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions High Channel, Tx at 2480MHz

Radiated Spurious Emissions 30 MHz - 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

Note: FS@3m = RA + AF + CF - Preamp, (Peak)  
Corrected Peak Scans are under the Average Limit of 54.

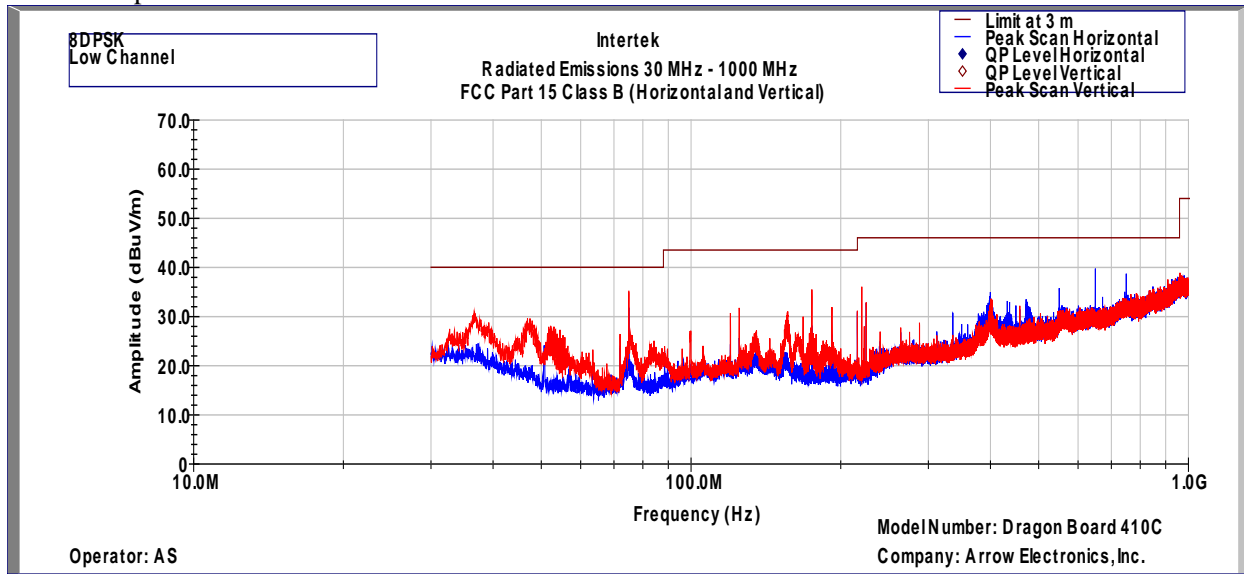
**Results**  **Complies**



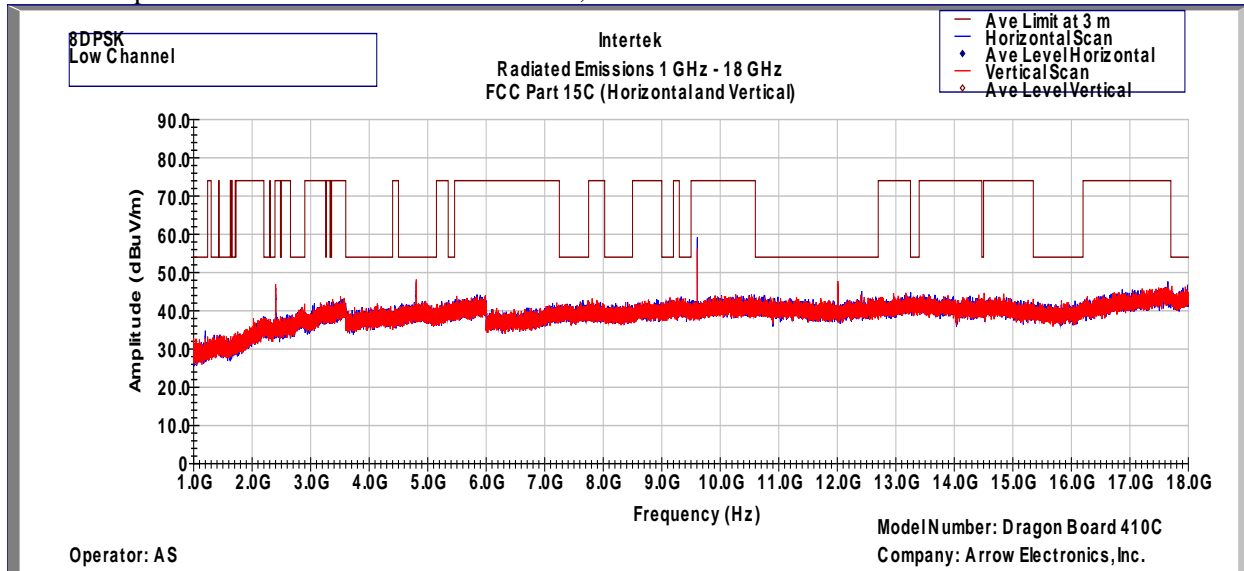
## Out-of-Band Radiated Spurious Emissions 8DPSK

Test Results: 15.209 Radiated Spurious Emissions Low Channel, Tx at 2402MHz

### Radiated Spurious Emissions 30 MHz - 1000 MHz



### Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan



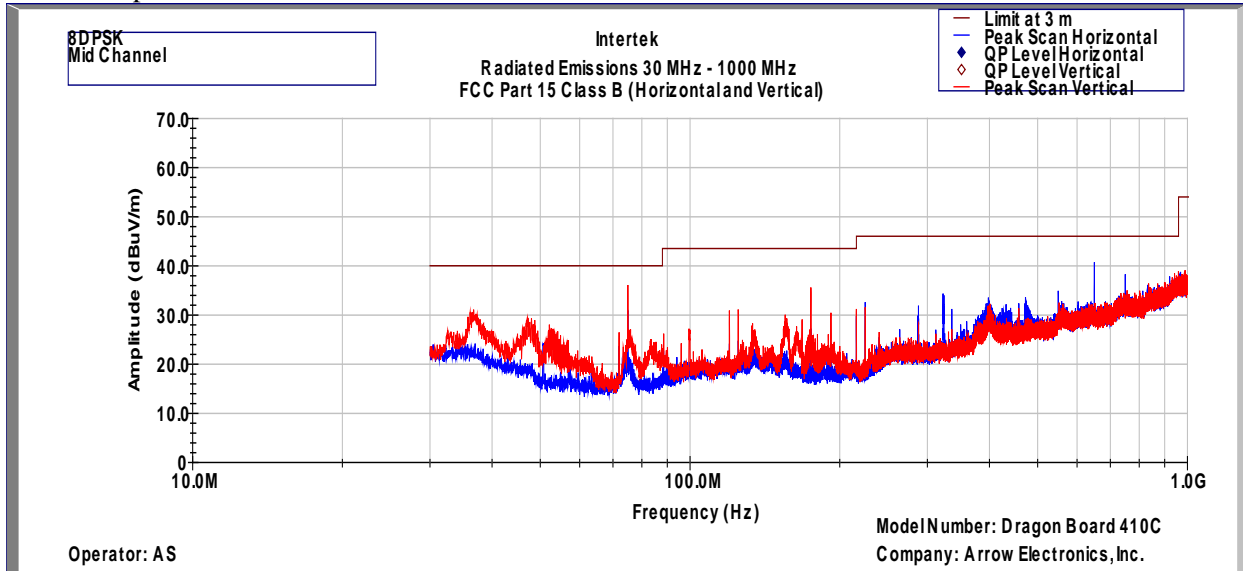
Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

Note: FS@3m = RA + AF + CF - Preamp, (Peak)

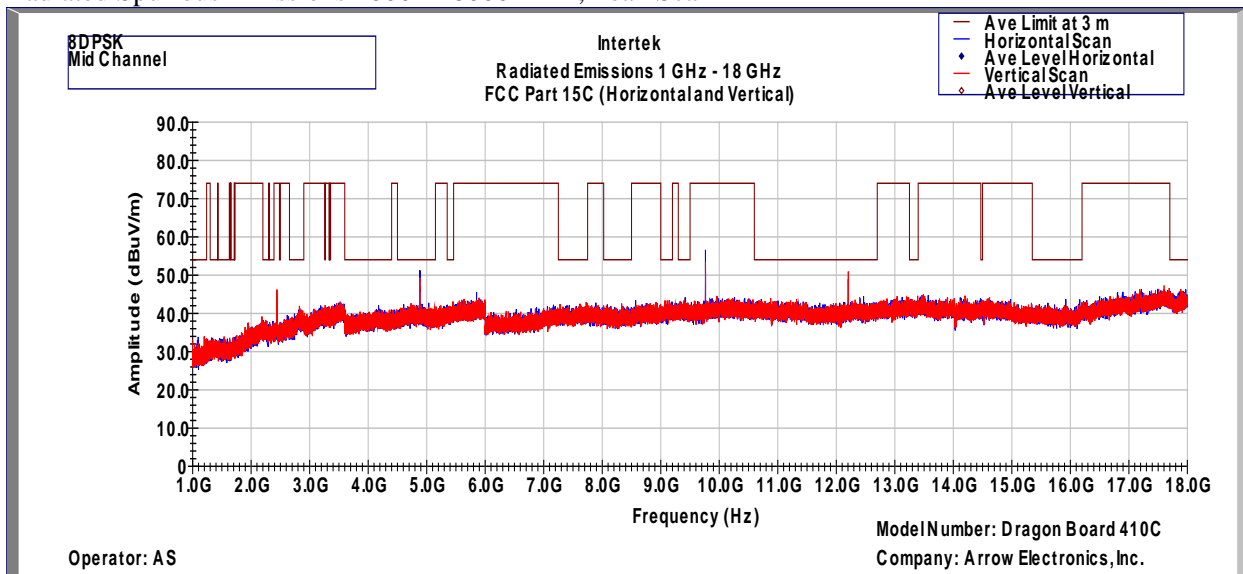
Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions Mid Channel, Tx at 2441MHz

Radiated Spurious Emissions 30 MHz - 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan



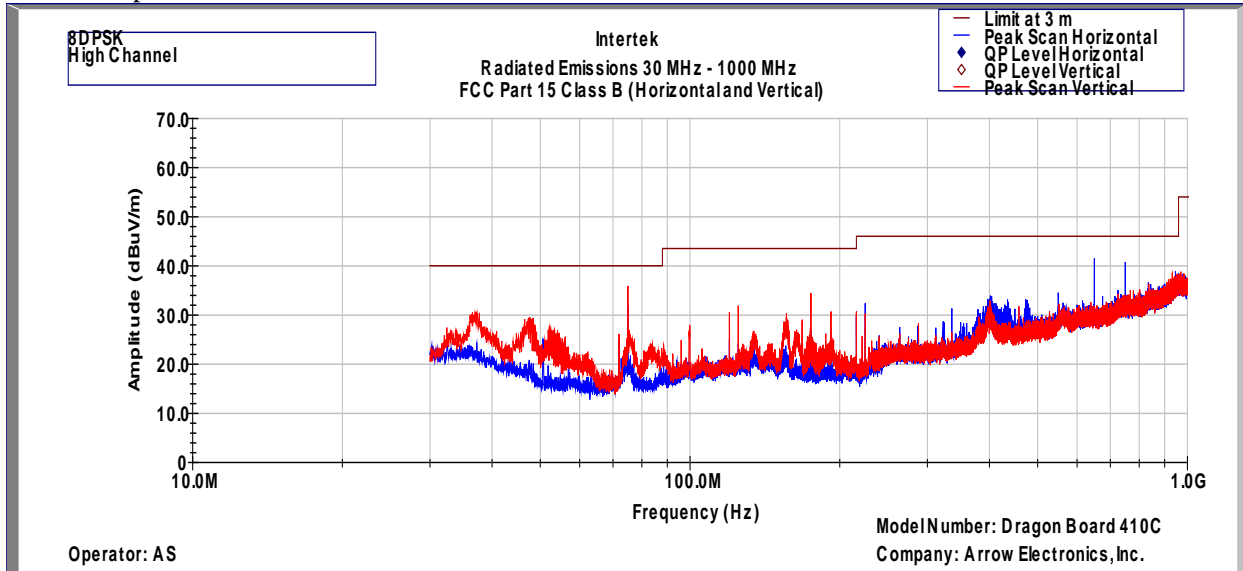
Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

Note: FS@3m = RA + AF + CF - Preamp, (Peak)

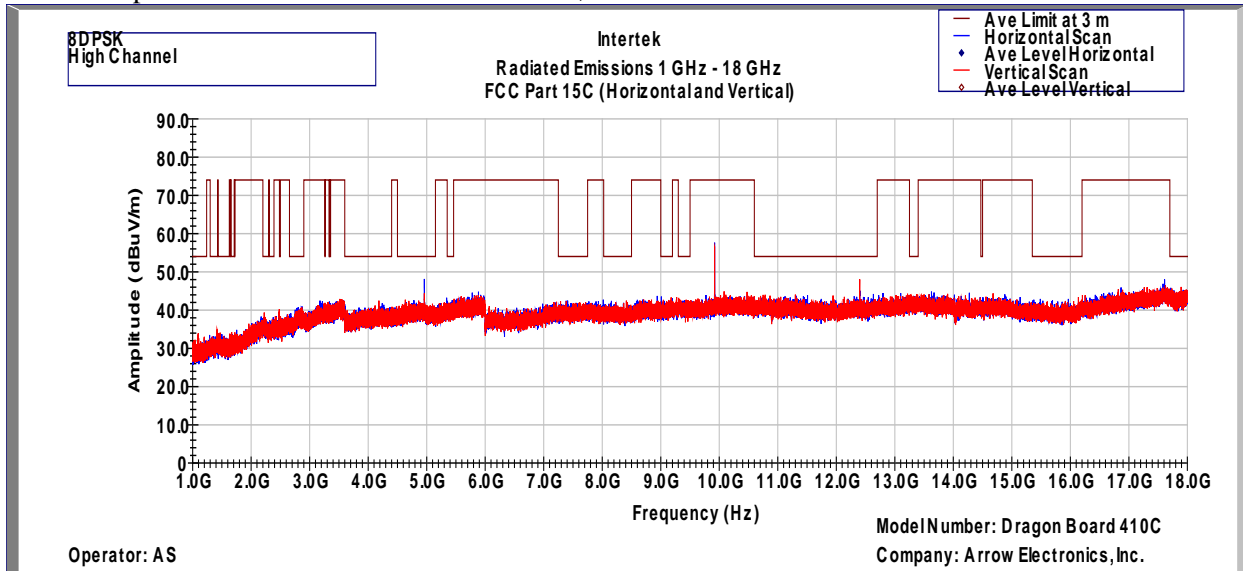
Corrected Peak Scans are under the Average Limit of 54.

Test Results: 15.209 Radiated Spurious Emissions High Channel, Tx at 2480MHz

Radiated Spurious Emissions 30 MHz - 1000 MHz



Radiated Spurious Emissions 1000 - 18000 MHz, Peak Scan



Note: Radiated emission measurements were performed up to 25GHz. No Emissions were identified when scanned from 18-25 GHz

Note: FS@3m = RA + AF + CF - Preamp, (Peak)  
Corrected Peak Scans are under the Average Limit of 54.

**Results** **Complies**

4.7.5 Test Setup Photographs

The following photographs show the testing configurations used.



#### 4.7.5 Test Setup Photographs





#### 4.8 AC Line Conducted Emission FCC 15.207

##### 4.8.1 Requirement

Frequency Band MHz	Class B Limit dB ( $\mu$ V)	
	Quasi-Peak	Average
0.15-0.50	66 to 56 Decreases linearly with the logarithm of the frequency	56 to 46 Decreases linearly with the logarithm of the frequency
0.50-5.00	56	46
5.00-30.00	60	50

*Note: At the transition frequency the lower limit applies.*

##### 4.8.2 Procedure

Measurements are carried out using quasi-peak and average detector receivers in accordance with CISPR 16. An AMN is required to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN as defined in CISPR 16 shall be used.

The EUT is located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

Where a flexible mains cord is provided by the manufacturer, this shall be 1m long or if in excess of 1m, the excess cable is folded back and forth as far as possible so as to form a bundle not exceeding 0.4m in length.

The EUT is arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance is measured between the phase lead and the reference ground, and between the neutral lead and the reference ground. Both measured values are reported.

The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.

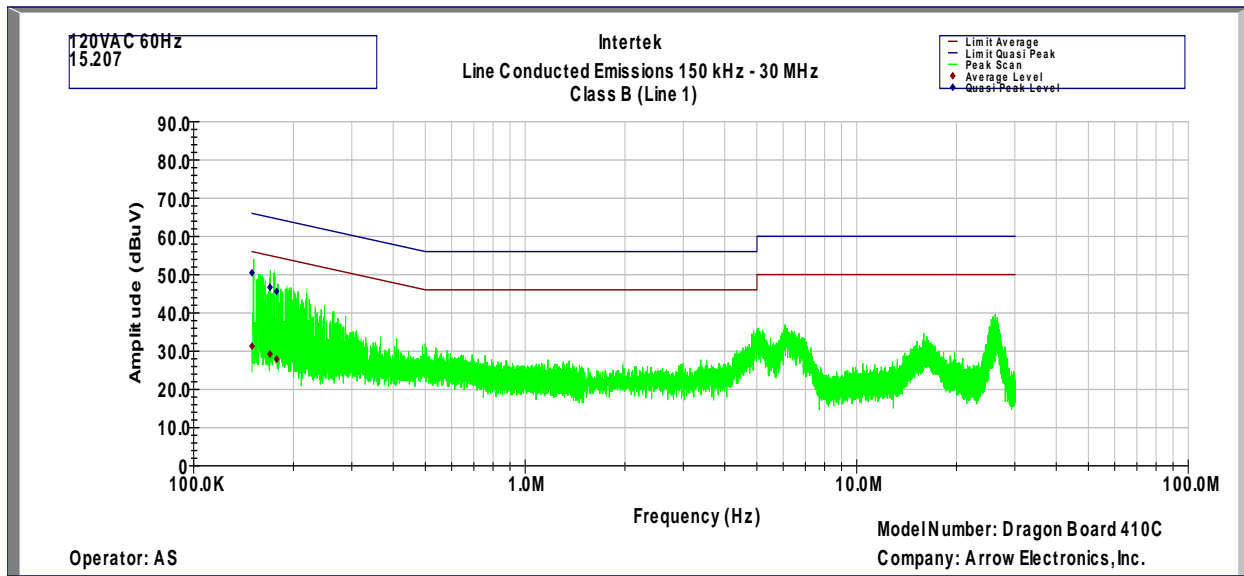
Floor standing EUT are placed on a horizontal metal ground plane and isolated from the ground plane by resting on an insulating material. The metal ground plane extends at least 0.5m beyond the boundaries of the EUT and has minimum dimensions of 2m by 2m.

Equipment setup for conducted disturbance tests followed the guidelines of ANSI C63.4.

4.8.3 Test Result

**Date of Test:** September 30, 2015

**AC Line Conducted Emission Data, EUT in transmitting mode**



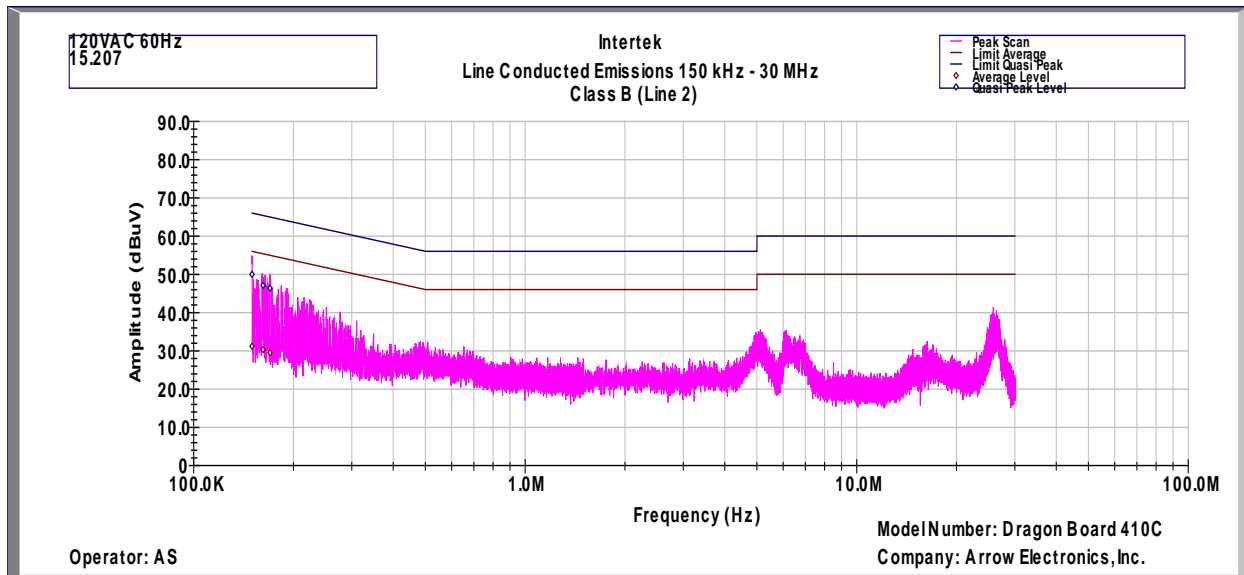
Intertek Testing Services  
 Line Conducted Emissions 150 kHz - 30 MHz  
 FCC Class B (Line 1)  
 Operator: AS

Model Number: DragonBoard  
 Company: Arrow Electronics, Inc.

Frequency	Av Level	QP Level	Av Limit	QP Limit	Av Margin	QP Margin
MHz	dBuV	dBuV	dBuV	dBuV	dB	dB
0.15	31.3	50.5	56	66	-24.7	-15.5
0.17	29.2	46.7	55.4	65.4	-26.2	-18.7
0.178	27.9	45.6	55.2	65.2	-27.3	-19.6
0.15	31.3	50.5	56	66	-24.7	-15.5

Test Mode: Transmitter On  
 Temp.: 23C  
 Humidity: 51.6%

**AC Line Conducted Emission Data, EUT in transmitting mode**



Intertek Testing Services  
 Line Conducted Emissions 150 kHz - 30 MHz  
 FCC Class B (Line 2)  
 Operator: AS

Model Number: DragonBoard  
 Company: Arrow Electronics, Inc.

Frequency MHz	Av Level dBuV	QP Level dBuV	Av Limit dBuV	QP Limit dBuV	Av Margin dB	QP Margin dB
0.15	31.2	50	56	66	-24.8	-16
0.162	30.3	47.1	55.7	65.7	-25.4	-18.6
0.17	29.5	46.4	55.4	65.4	-25.9	-19

Test Mode: Transmitter On  
 Temp.: 23C  
 Humidity: 51.6%

**Results**      **Complies by 15.5 dB**



#### 4.8.4 Test Configuration Photographs

The following photographs show the testing configurations used.



## 6.0 RF Exposure Evaluation

### FCC 2.1091

The EUT is a wireless device used in a mobile application and will be at least 20 cm from any body part of the user or nearby persons.

The maximum conducted power is 3.67 dBm (2.33mW); the antenna 3.6dBi gain; therefore, to comply with the requirements for RF Exposure, the MPE is calculated.

The maximum Peak EIRP calculated is as 3.67 dBm (RF Power) + 3.6 dBi (Antenna Gain) or 5.33mW.

The Power Density can be calculated using the formula

$$S = \text{EIRP} / 4\pi D^2$$

Where: S is Power Density in  $\text{W}/\text{m}^2$   
D is the distance from the antenna.

It is considered that 20 cm is the minimum distance that user can go closest to the EUT.

At 0.2 m,  $S = 0.01062 \text{ W}/\text{m}^2$ , which is below the MPE Limit of  $10 \text{ W}/\text{m}^2$

## 7.0 List of Test Equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list:

Equipment	Manufacturer	Model/Type	Asset #	Cal Int	Cal Due
Spectrum Analyzer	Rohde and Schwarz	FSU	ITS00913	12	12/16/15
EMI Receiver	Rohde and Schwarz	ESU	ITS 00961	12	06/02/16
Spectrum Analyzer	Rohde and Schwarz	FSP	ITS 01200	12	2/09/16
BI-Log Antenna	Teseq	CBL 6111D	ITS 01058	12	11/21/15
Pyramidal Horn Antenna	EMCO	3160-09	ITS00571	#	#
Pre-Amplifier	Sonoma Instrument	310N	ITS 00942	12	11/26/15
Pre-Amplifier (1-18GHz)	Miteq	AMF-4D-001180-24-10P	ITS 00526	12	10/06/16
Pre-Amplifier (18-40GHz)	Miteq	JSD44-18004000-305P	ITS 00921	12	06/18/16
Horn Antenna	ETS Lindgren	3115	ITS 00982	12	11/21/15
LISN	FCC	FCC-LISN-50-50-M-H	ITS 00552	12	05/05/16

# No Calibration required



## 8.0 Document History

<b>Revision/ Job Number</b>	<b>Writer Initials</b>	<b>Reviewers Initials</b>	<b>Date</b>	<b>Change</b>
1.0 / G102289738	AS	KV	October 30, 2015	Original document