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Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
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RE:	**Response to FCC Requests**	
	Correspondence Reference Numbers:	**14814**
	FCC IDs:	**HZB-U5358-100**
	Form 731 Confirmation Numbers:	**EA97698**

Attn: Joe Dichoso

Dear Mr. Dichoso:

This is in response to your request 14814.

1. Please find separately uploaded product schematics. There must have been a technical problem somewhere when the application materials were submitted at the beginning.

2. Please find in attachment 1 additional plot showing compliance of the HZB-U5358-100 equipment to 15.407 a (6).

3. The HZB-U5358-100 radio was designed with networking capability, which demands the radio to carry networking traffic (polling, reporting) on a constant basis. Therefore, the radio is designed to transmit all the time (when operational). We designed the product in such a way that whenever a radio hardware failure is detected, the system firmware turns off the radio transmitter.

4. Please find in the attachment 2 a list of antennas we recommend to be used with the HZB-U5358-100 product. Since there are numerous antenna manufacturers and product models in the market, it is only a partial list but is representative of all the types of antennas that will be used. We have also included instructions in our manual on how to correctly calculate the transmit power to comply with the EIRP limits.

   In the original submission, the antenna list we used was what we used in our previous application, which is of the 5.725-5.825GHz band only. With a higher EIRP limit set for the 5.725-5.825 GHz band, there is a chance of using 8' antennas. With the HZB-U5358-100 product however, since it transmits and receives through the same antenna, at both 5.25-5.35GHz and 5.725-5.825GHz bands, the antenna gain will not go as high as 41dB, even when there are considerable RF cable losses.

   The product test report shows under the tested condition of Pout=23dBm, the equipment can transmit up to the EIRP limit of 30dBm at 5.25-5.35 GHz. At 5.725-5.825 GHz, under the tested condition of Pout = 22 dBm, the equipment can transmit at 52.9 dBm EIRP. (The maximum EIRP for the equipment is derived from the lesser of EIRP limit set for the band and the sum of Pout, the maximum allowable antenna gain without reducing output power and power density limits, and the tested PSD compliance margin). When a higher gain antenna is used, the equipment output power will be reduced in accordance with the transmit power adjustment instruction we provide in the product manual (refer to attachment 2 of this response). With the reduction of transmit power, the power density will be reduced on a dB for dB basis. Therefore, even though a higher gain antenna may result in lower power and power density limits, the compliance situation does not change. That is why we did not give a calculation on each antenna size to show compliance. The following paragraph gives a more detailed analysis.

From Page 6 and 8 of the test report, it can be seen that the tested output power of the equipment is 23dBm (5.25-5.35 GHz) and 22dBm (5.725-5.825 GHz); the PSD is 9.6 dBm/MHz (5.25-5.35 GHz) and 9.1 dBm/MHz (5.725-5.825 GHz). When the equipment is used with an antenna less than 6dBi/23dBi in gain at 5.25-5.35/5.725-5.825 GHz band, the peak output power and PDS are obviously in compliance with the rule. When a higher gain antenna is used, for every additional dB higher than 6dBi at 5.250-5.350 GHz and 23dBi at 5.725-5.825 GHz, the output power will need to be reduced on a dB for dB basis from 24dBm/30dBm, and the PSD limits are reduced on a dB for dB basis from 11/17 dBm/MHz.. For example, when a 7dBi antenna is used for the 5.25-5.35 GHz band, the output power limit is 23dBm and the PDS limit is 10 dBm/MHz; when a 31dBi antenna is used for the 5.725-5.825 GHz band, the output power limit is 22 dBm and the PDS limit is 9 dBm/MHz. Since the actual PSD of the product is 0.1dB higher than the limit, the output power needs to be reduced by 0.1dB to 21.9dBm so that the PDS will go down by 0.1dB. This makes the overall EIRP limit for the 5.725-5.825 band 52.9 dBm. When antennas of even higher gains need to be used, the output power will have to be reduced from 23dBm (5.25-5.35 GHz) and 21.9dBm (5..725-5.825 GHz) for every dB exceeding 7dBi (5.25-5.35GHz) and 31dBi (5.725-5.825 GHz). When the output power is reduced, the PDS is reduced on a dB for dB basis as a result. Therefore, as long as the EIRP limits are observed, the peak output and PDS of the equipment are always in compliance with the rules.

5. In a previous submission of a U-NII device, Greg Czumak provided a peak power density testing procedure and he gave us specific measuring instructions (on a recorded voice message). We provided the test instructions to ITS and they did the in-band power density test in accordance to this instruction. ITS did the out of band conducted emission tests using the same principle so that parallels could be drawn.

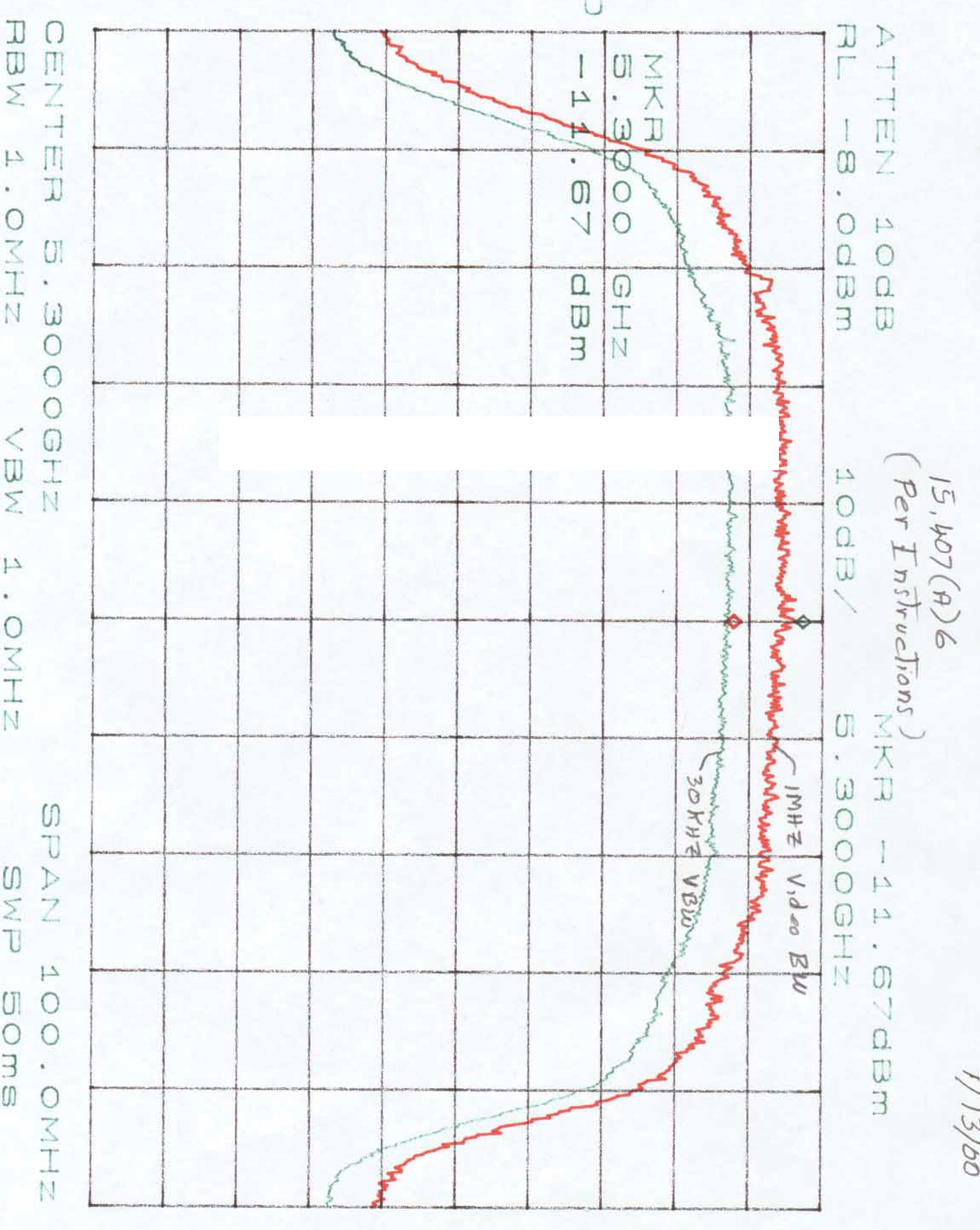
   The testing is done from conducted measurements when the equipment transmits at the maximum transmit power. The margin indicates the allowable antenna gain under the maximum output power. As long as the equipment operates within the tested output power plus the allowable antenna gain (when radio transmit power is reduced from maximum, the allowable antenna gain will increase on the same scale), the out of band emission EIRP limit is met. Please refer to page 10 of test report.

6. Please refer to response 4. We will include the information in the manual.

Yours truly

Caroline Yu
International Product Manager
Western Multiplex Corporation

Attachment 1



Attachment 2

Antenna Type	Manufacturer	Model Number	Mid-band Gain (dBi)	Notes
1 Foot Flat Panel	Gabriel	DFPD1-52	23.5	
	Andrew	FPA5250D12-N	23.6	
2 Foot Flat Panel	Gabriel	DFPD2-52	28	
	Andrew	FPA5250D24-N	28.2	
2 Foot Parabolic	Gabriel	SSP2-52B	28.5	
	Gabriel	SSD2-52A	28.4	
	Gabriel	HSSP2-52	28.1	
	Radio Waves	SP2-5.2	28.3	
	Radio Waves	SPD2-5.2	28.1	
	Andrew	P2F-52	29.4	
	Andrew	PX2F-52	29.4	
3 Foot Parabolic	Radio Waves	SP3-5.2	31.4	
	Radio Waves	SPD3-5.2	31.1	
	Andrew	P3F-52	33.4	
	Andrew	PX3F-52	33.4	
4 Foot Parabolic	Gabriel	SSP4-52A	34.2	
	Gabriel	SSD4-52	34.1	
	Gabriel	HSSP4-52	33.9	
	Radio Waves	SP4-5.2	34.6	
	Radio Waves	SPD4-5.2	34.4	
6 Foot Parabolic	Gabriel	SSP6-52A	37.5	
	Gabriel	SSD6-52	37.4	
	Gabriel	HSSP6-52	37.2	
	Radio Waves	SP6-5.2	37.7	
	Radio Waves	SPD6-5.2	37.5	
8 Foot Parabolic	Gabriel	SSP8-52	39.8	
	Gabriel	SSD8-52	39.7	
	Gabriel	HSSP8-52	39.6	

Feeder Loss Type	Manufacturer	Model Number	Loss/100'	Notes
1/2" foam coax	Andrew	LDF 4-50	6.6 dB	add ~0.25 dB per connector
5/8" foam coax	Andrew	LDF 4.5-50	4.7 dB	add ~0.25 dB per connector
Waveguide	Andrew	EW-52	1.2 dB	does not include transitions

Formula for determining maximum output power setting for 5.2 GHz U-NII (LE-LAN) Transmitters (@ EIRP=30dBm):

Max Tx (dBm) is the lesser of the rated RF power and 30 - G + FL

where: G = Antenna Gain
FL = Feeder Loss including connectors

Formula for determining maximum output power setting for 5.7 GHz U-NII (LE-LAN) Transmitters (@ EIRP=53dBm):

Max Tx (dBm) is the lesser of the rated RF power and 52.9 - G + FL

where: G = Antenna Gain
FL = Feeder Loss including connectors

Note: All Western Multiplex radios require professional installation.

Note: Western Multiplex U-NII devices have a built-in calibrated Tx Power Output Voltage port to aid in setting the output power correctly, without the use of an RF power meter. The measurement in Volts is multiplied by 10 for a measurement in dBm. e.g. 1.0 V = 10 dBm; 2.0 V = 20 dBm, 1.5 V = 15 dBm; 0.5 V = 5 dBm; etc.