Radiated Spurious Emission
(WLAN)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 27, 2022
Temperature / Humidity	22 deg. C / 36 % RH
Engineer	Nachi Konegawa
	(1 GHz - 10 GHz)
Mode	Tx 11ax-20 OFDMA 2462 MHz (106-tone RU)

RU Index 54

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	2483.5	52.3	41.1	27.4	5.6	32.5	0.3	52.7	41.8	73.9	53.9	21.2	12.1	*1)
Vert.	2483.5	51.5	40.2	27.4	5.6	32.5	0.3	52.0	41.0	73.9	53.9	22.0	12.9	*1)

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

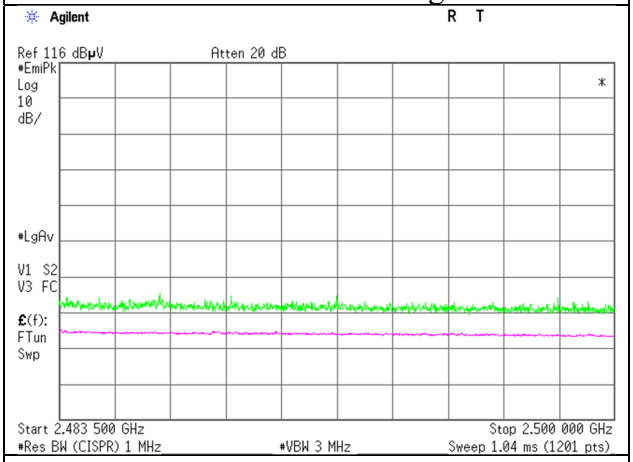
Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(WLAN)

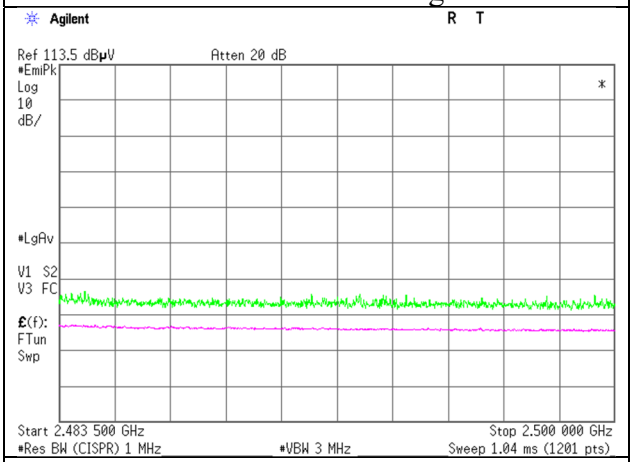
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 27, 2022
Temperature / Humidity	22 deg. C / 36 % RH
Engineer	Nachi Konegawa
	(1 GHz - 10 GHz)
Mode	Tx 11ax-20 OFDMA 2462 MHz (106-tone RU)

RU Index 54
Horizontal
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

RU Index 54
Vertical
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(WLAN)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 27, 2022
Temperature / Humidity	22 deg. C / 36 % RH
Engineer	Nachi Konegawa
	(1 GHz - 10 GHz)
Mode	Tx 11ax-20 OFDMA 2462 MHz (242-tone RU)

RU Index 61

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	2483.5	57.2	45.3	27.4	5.6	32.5	0.4	57.6	46.1	73.9	53.9	16.3	7.8	*1)
Vert.	2483.5	57.1	44.9	27.4	5.6	32.5	0.4	57.5	45.7	73.9	53.9	16.4	8.2	*1)

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

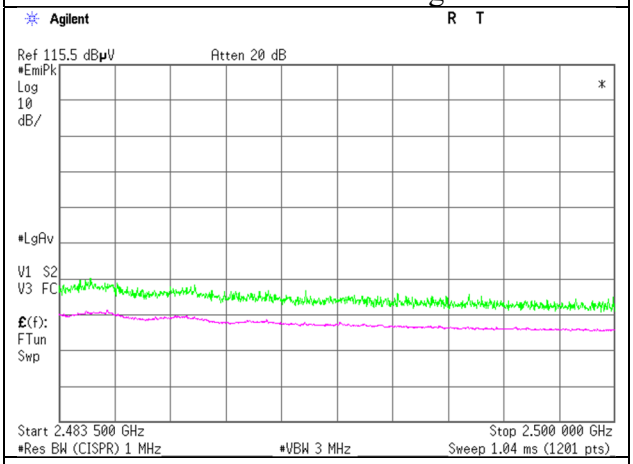
Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(WLAN)

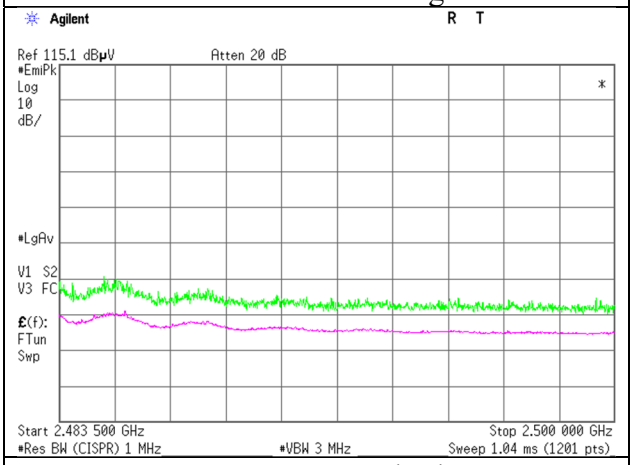
Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 27, 2022
Temperature / Humidity	22 deg. C / 36 % RH
Engineer	Nachi Konegawa
	(1 GHz - 10 GHz)
Mode	Tx 11ax-20 OFDMA 2462 MHz (242-tone RU)

RU Index 61
Horizontal
Restricted-band band-edge Plot



Trace Green : Peak Plot Trace Purple : Average Plot

RU Index 61
Vertical
Restricted-band band-edge Plot

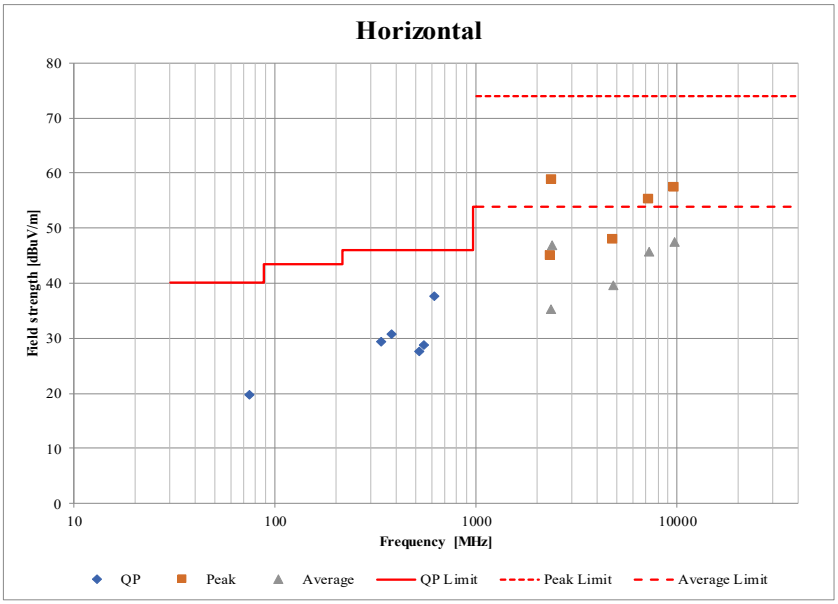


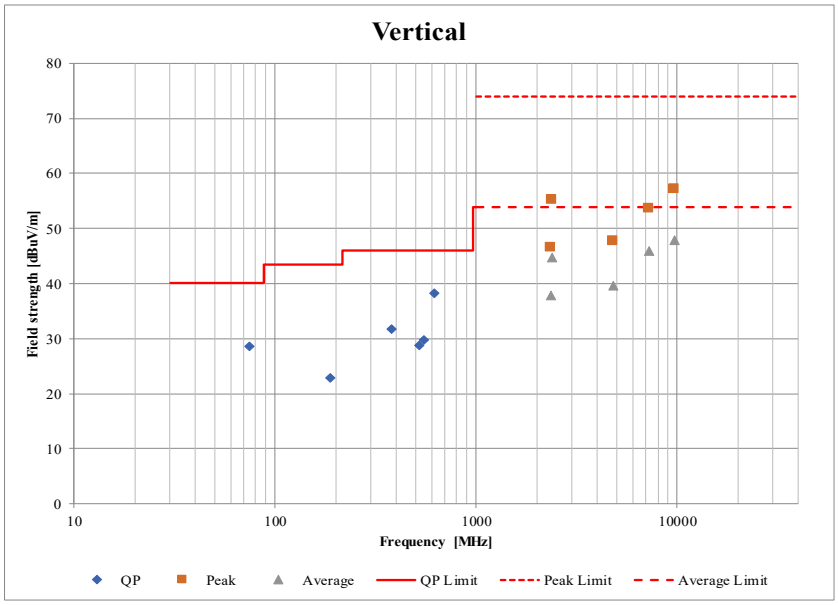
Trace Green : Peak Plot Trace Purple : Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case mode for Maximum Peak Output Power)
(WLAN)

Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	January 27, 2022	February 2, 2022	February 3, 2022	February 9, 2022
Temperature / Humidity	20 deg. C / 37 % RH	20 deg. C / 35 % RH	22 deg. C / 35 % RH	20 deg. C / 42 % RH
Engineer	Takeshi Hiyaji	Yuta Moriya	Yuta Moriya	Junki Nagatomi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx 11ax-20 OFDM 2412 MHz			





*These plots data contains sufficient number to show the trend of characteristic features for EUT.

Radiated Spurious Emission
(BT1)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 26, 2022	February 3, 2022	February 4, 2022
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH
Engineer	Hiroki Numata	Hiroki Numata	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx BT LE 2402 MHz 1M-PHY		

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	2344.9	45.3	33.5	27.8	5.5	32.6	-	45.9	34.1	73.9	53.9	28.0	19.8	
Hori.	2390.0	50.0	35.4	27.6	5.5	32.6	0.7	50.5	36.6	73.9	53.9	23.4	17.3	*1)
Hori.	4804.0	40.6	32.2	31.5	7.8	31.7	-	48.3	39.9	73.9	53.9	25.7	14.0	Floor noise
Hori.	7206.0	42.1	33.8	35.7	9.4	32.6	-	54.6	46.3	73.9	53.9	19.3	7.6	Floor noise
Hori.	9608.0	41.8	32.2	38.7	9.8	33.0	-	57.3	47.7	73.9	53.9	16.6	6.2	Floor noise
Vert.	2344.9	52.9	36.3	27.8	5.5	32.6	-	53.5	36.9	73.9	53.9	20.4	17.0	
Vert.	2390.0	53.5	36.9	27.6	5.5	32.6	0.7	54.0	38.1	73.9	53.9	19.9	15.8	*1)
Vert.	4804.0	41.1	32.0	31.5	7.8	31.7	-	48.7	39.6	73.9	53.9	25.2	14.3	Floor noise
Vert.	7206.0	42.4	33.5	35.7	9.4	32.6	-	54.8	45.9	73.9	53.9	19.1	8.0	Floor noise
Vert.	9608.0	42.1	32.3	38.7	9.8	33.0	-	57.6	47.8	73.9	53.9	16.3	6.1	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity [Hori/Vert]	Frequency [MHz]	Reading (PK) [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.0	95.7	27.5	5.5	32.6	96.1	-	-	Carrier
Hori.	2400.0	37.5	27.5	5.5	32.6	37.9	76.1	38.2	
Vert.	2402.0	95.2	27.5	5.5	32.6	95.7	-	-	Carrier
Vert.	2400.0	39.7	27.5	5.5	32.6	40.2	75.7	35.5	

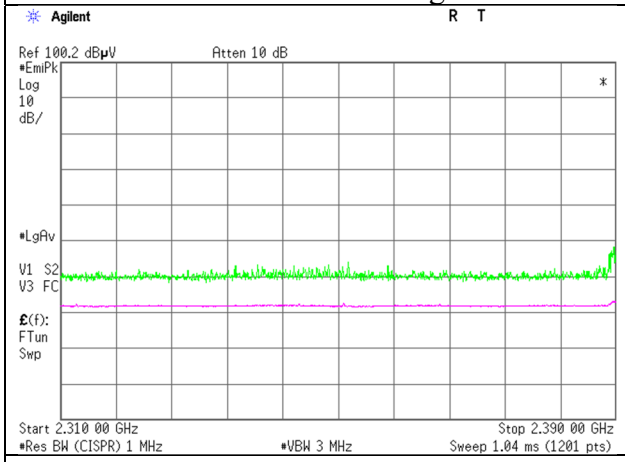
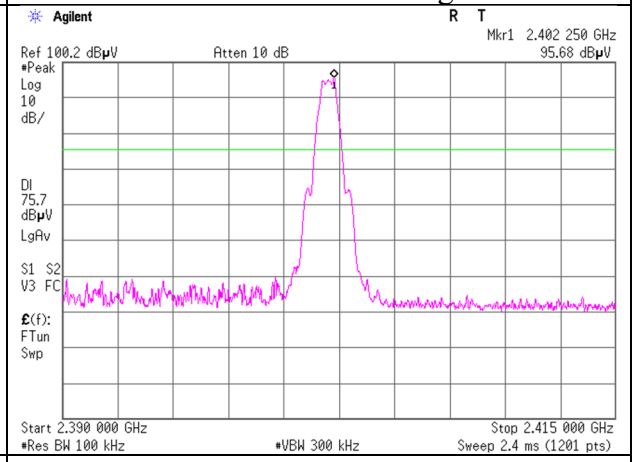
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

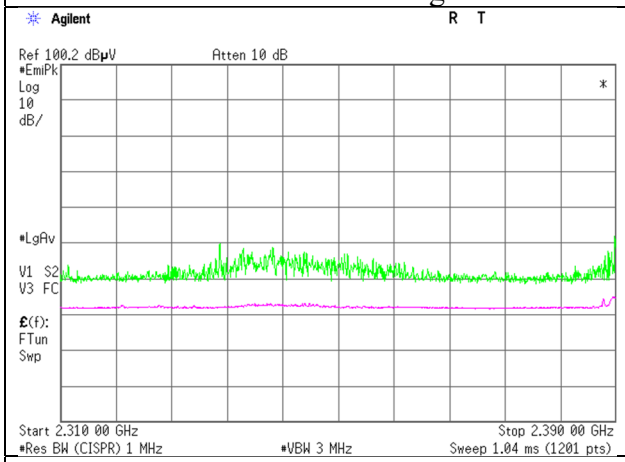
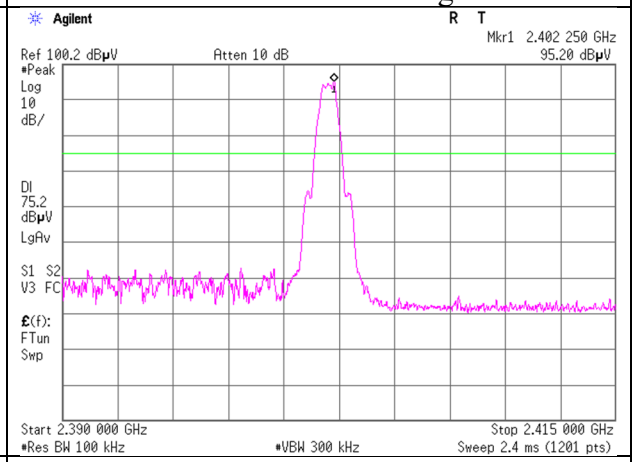
Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(BT1)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 26, 2022
Temperature / Humidity	21 deg. C / 35 % RH
Engineer	Hiroki Numata
	(1 GHz - 10 GHz)
Mode	Tx BT LE 2402 MHz 1M-PHY

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(BT1)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 26, 2022	February 3, 2022	February 4, 2022
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH
Engineer	Hiroki Numata	Hiroki Numata	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx BT LE 2440 MHz 1M-PHY		

Polarity	Frequency	Reading (QP / PK)	Reading (AV)	Ant. Factor	Loss	Gain	Duty Factor	Result (QP / PK)	Result (AV)	Limit (QP / PK)	Limit (AV)	Margin (QP / PK)	Margin (AV)	Remark
[Hori/Vert]	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	2294.1	46.7	33.7	28.0	5.4	32.6	0.7	47.5	35.2	73.9	53.9	26.4	18.8	*2)
Hori.	4880.0	39.9	31.7	31.6	7.8	31.6	-	47.6	39.5	73.9	53.9	26.3	14.4	Floor noise
Hori.	7320.0	41.9	33.3	35.9	9.4	32.7	-	54.5	45.9	73.9	53.9	19.4	8.0	Floor noise
Hori.	9760.0	41.7	31.8	39.2	9.9	33.1	-	57.6	47.7	73.9	53.9	16.3	6.2	Floor noise
Vert.	2294.1	52.5	36.6	28.0	5.4	32.6	0.7	53.4	38.1	73.9	53.9	20.5	15.8	*2)
Vert.	4880.0	40.2	31.8	31.6	7.0	31.6	-	47.1	38.7	73.9	53.9	26.8	15.2	Floor noise
Vert.	7320.0	41.3	33.2	35.9	8.3	32.7	-	52.8	44.6	73.9	53.9	21.1	9.3	Floor noise
Vert.	9760.0	42.8	31.3	39.2	9.2	33.1	-	58.1	46.6	73.9	53.9	15.8	7.3	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*2) Noise synchronized with duty of carrier frequency

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(BT1)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 26, 2022	February 3, 2022	February 4, 2022
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH
Engineer	Hiroki Numata	Hiroki Numata	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx BT LE 2480 MHz 1M-PHY		

Polarity	Frequency	Reading (QP / PK)	Reading (AV)	Ant. Factor	Loss	Gain	Duty Factor	Result (QP / PK)	Result (AV)	Limit (QP / PK)	Limit (AV)	Margin (QP / PK)	Margin (AV)	Remark
[Hori/Vert]	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	2295.0	49.2	34.0	28.0	5.4	32.6	0.7	50.0	35.5	73.9	53.9	23.9	18.4	*2)
Hori.	2483.5	43.0	33.8	27.4	5.6	32.5	0.7	43.4	34.9	73.9	53.9	30.5	19.0	*1)
Hori.	2491.2	42.7	33.5	27.5	5.6	32.5	0.7	43.2	34.7	73.9	53.9	30.8	19.2	*2)
Hori.	4960.0	40.0	32.1	31.7	7.8	31.6	-	47.9	40.1	73.9	53.9	26.0	13.8	Floor noise
Hori.	7440.0	41.7	33.7	36.1	9.3	32.7	-	54.5	46.4	73.9	53.9	19.5	7.5	Floor noise
Hori.	9920.0	42.0	31.8	39.1	9.9	33.2	-	57.9	47.7	73.9	53.9	16.0	6.2	Floor noise
Vert.	2295.0	50.6	35.2	28.0	5.4	32.6	0.7	51.5	36.7	73.9	53.9	22.4	17.2	*2)
Vert.	2483.5	41.8	34.4	27.4	5.6	32.5	0.7	42.2	35.6	73.9	53.9	31.7	18.4	*1)
Vert.	2491.2	49.0	34.9	27.5	5.6	32.5	0.7	49.5	36.1	73.9	53.9	24.4	17.8	*2)
Vert.	4960.0	40.0	31.7	31.7	7.8	31.6	-	47.9	39.7	73.9	53.9	26.0	14.2	Floor noise
Vert.	7440.0	42.3	33.3	36.1	9.3	32.7	-	55.1	46.0	73.9	53.9	18.9	7.9	Floor noise
Vert.	9920.0	41.3	31.5	39.1	9.9	33.2	-	57.2	47.4	73.9	53.9	16.7	6.5	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

*2) Noise synchronized with duty of carrier frequency

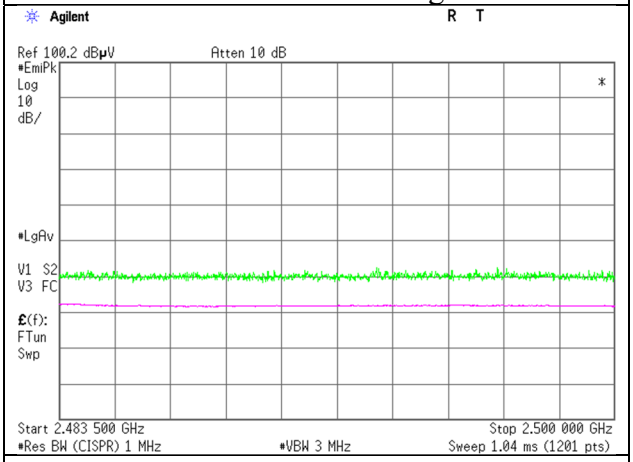
Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(BT1)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 26, 2022
Temperature / Humidity	21 deg. C / 35 % RH
Engineer	Hiroki Numata
	(1 GHz - 10 GHz)
Mode	Tx BT LE 2480 MHz 1M-PHY

Horizontal

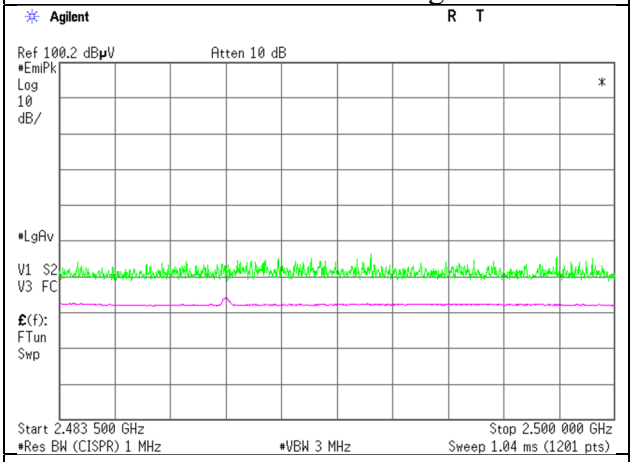
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(BT1)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 26, 2022	February 3, 2022	February 4, 2022
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH
Engineer	Hiroki Numata	Hiroki Numata	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx BT LE 2402 MHz 2M-PHY		

Polarity	Frequency	Reading (QP / PK)	Reading (AV)	Ant. Factor	Loss	Gain	Duty Factor	Result (QP / PK)	Result (AV)	Limit (QP / PK)	Limit (AV)	Margin (QP / PK)	Margin (AV)	Remark
[Hori/Vert]	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	2341.9	50.0	34.2	27.8	5.5	32.6	-	50.7	34.8	73.9	53.9	23.3	19.1	
Hori.	2390.0	51.6	36.0	27.6	5.5	32.6	2.4	52.1	38.9	73.9	53.9	21.8	15.0	*1)
Hori.	4804.0	40.9	32.2	31.5	7.8	31.7	-	48.5	39.8	73.9	53.9	25.4	14.1	Floor noise
Hori.	7206.0	42.0	33.8	35.7	9.4	32.6	-	54.4	46.2	73.9	53.9	19.5	7.7	Floor noise
Hori.	9608.0	41.8	32.0	38.7	9.8	33.0	-	57.3	47.5	73.9	53.9	16.6	6.4	Floor noise
Vert.	2341.9	53.7	37.5	27.8	5.5	32.6	-	54.3	38.1	73.9	53.9	19.6	15.8	
Vert.	2390.0	52.9	37.2	27.6	5.5	32.6	2.4	53.4	40.1	73.9	53.9	20.5	13.8	*1)
Vert.	4804.0	40.1	31.8	31.5	7.8	31.7	-	47.7	39.4	73.9	53.9	26.2	14.5	Floor noise
Vert.	7206.0	42.6	33.7	35.7	9.4	32.6	-	55.1	46.2	73.9	53.9	18.8	7.7	Floor noise
Vert.	9608.0	41.2	32.2	38.7	9.8	33.0	-	56.7	47.7	73.9	53.9	17.2	6.2	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

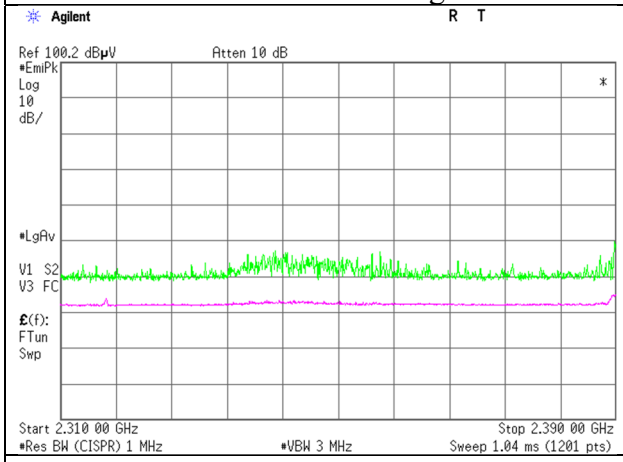
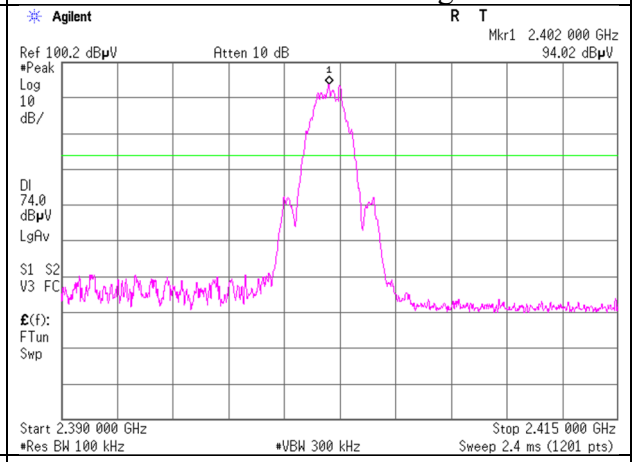
Polarity	Frequency	Reading (PK)	Ant Factor	Loss	Gain	Result	Limit	Margin	Remark
[Hori/Vert]	[MHz]	[dBuV]	[dB/m]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	
Hori.	2402.0	94.0	27.5	5.5	32.6	94.5	-	-	Carrier
Hori.	2400.0	62.6	27.5	5.5	32.6	63.0	74.5	11.5	
Vert.	2402.0	93.8	27.5	5.5	32.6	94.3	-	-	Carrier
Vert.	2400.0	62.4	27.5	5.5	32.6	62.9	74.3	11.4	

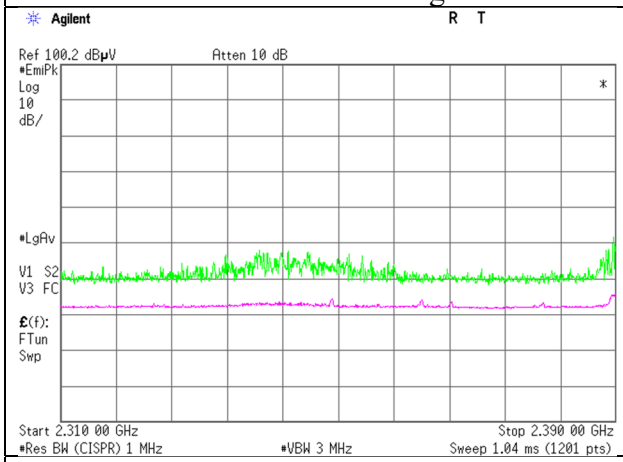
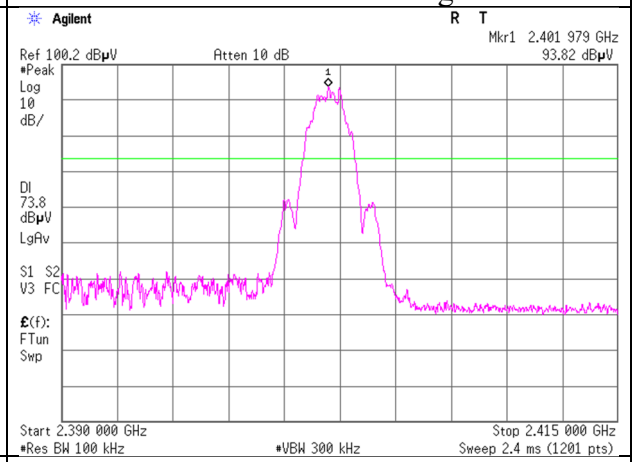
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(BT1)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 26, 2022
Temperature / Humidity	21 deg. C / 35 % RH
Engineer	Hiroki Numata
	(1 GHz - 10 GHz)
Mode	Tx BT LE 2402 MHz 2M-PHY

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

(BT1)

Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	January 26, 2022	February 3, 2022	February 4, 2022	February 9, 2022
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH	20 deg. C / 42 % RH
Engineer	Hiroki Numata	Hiroki Numata	Hiroki Numata	Junki Nagatomi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2440 MHz 2M-PHY			

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	32.0	22.4	-	18.0	7.1	32.3	-	15.3	-	40.0	-	24.7	-	
Hori.	64.5	22.6	-	6.9	7.7	32.3	-	4.9	-	40.0	-	35.1	-	
Hori.	75.4	27.0	-	6.5	7.8	32.3	-	9.1	-	40.0	-	30.9	-	
Hori.	86.2	22.8	-	7.9	8.0	32.3	-	6.4	-	40.0	-	33.6	-	
Hori.	377.2	29.9	-	15.3	10.6	32.1	-	23.7	-	46.0	-	22.3	-	
Hori.	615.5	27.3	-	19.5	12.1	32.1	-	26.8	-	46.0	-	19.2	-	
Hori.	2352.8	43.9	34.2	27.7	5.5	32.6	-	44.5	34.8	73.9	53.9	29.4	19.1	
Hori.	4880.0	40.2	31.8	31.6	7.8	31.6	-	47.9	39.5	73.9	53.9	26.0	14.4	Floor noise
Hori.	7320.0	41.8	33.5	35.9	9.4	32.7	-	54.4	46.1	73.9	53.9	19.5	7.8	Floor noise
Hori.	9760.0	41.6	31.7	39.2	9.9	33.1	-	57.6	47.7	73.9	53.9	16.3	6.3	Floor noise
Vert.	32.0	22.4	-	18.0	7.1	32.3	-	15.3	-	40.0	-	24.7	-	
Vert.	63.6	25.0	-	7.1	7.6	32.3	-	7.5	-	40.0	-	32.5	-	
Vert.	75.3	35.1	-	6.5	7.8	32.3	-	17.2	-	40.0	-	22.8	-	
Vert.	86.8	25.4	-	8.0	8.0	32.3	-	9.1	-	40.0	-	30.9	-	
Vert.	379.4	25.2	-	15.4	10.6	32.1	-	19.0	-	46.0	-	27.0	-	
Vert.	617.5	27.1	-	19.5	12.1	32.1	-	26.6	-	46.0	-	19.4	-	
Vert.	2352.8	52.0	35.8	27.7	5.5	32.6	-	52.6	36.4	73.9	53.9	21.3	17.5	
Vert.	4880.0	40.7	31.8	31.6	7.8	31.6	-	48.5	39.6	73.9	53.9	25.4	14.3	Floor noise
Vert.	7320.0	41.0	33.0	35.9	9.4	32.7	-	53.6	45.6	73.9	53.9	20.3	8.3	Floor noise
Vert.	9760.0	42.8	31.7	39.2	9.9	33.1	-	58.8	47.7	73.9	53.9	15.1	6.2	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

Radiated Spurious Emission
(BT1)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 26, 2022	February 3, 2022	February 4, 2022
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH
Engineer	Hiroki Numata	Hiroki Numata	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx BT LE 2480 MHz 2M-PHY		

Polarity	Frequency	Reading (QP / PK)	Reading (AV)	Ant. Factor	Loss	Gain	Duty Factor	Result (QP / PK)	Result (AV)	Limit (QP / PK)	Limit (AV)	Margin (QP / PK)	Margin (AV)	Remark
[Hori/Vert]	[MHz]	[dBuV]	[dBuV]	[dB/m]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dBuV/m]	[dB]	[dB]	
Hori.	2295.0	49.3	34.0	28.0	5.4	32.6	2.4	50.1	37.2	73.9	53.9	23.8	16.7	*2)
Hori.	2483.5	46.1	38.6	27.4	5.6	32.5	2.4	46.6	41.5	73.9	53.9	27.3	12.4	*1)
Hori.	2494.8	47.0	33.6	27.5	5.6	32.5	2.4	47.5	36.5	73.9	53.9	26.5	17.4	*2)
Hori.	4960.0	39.8	32.6	31.7	7.8	31.6	-	47.8	40.6	73.9	53.9	26.2	13.4	Floor noise
Hori.	7440.0	41.8	33.8	36.1	9.3	32.7	-	54.6	46.6	73.9	53.9	19.3	7.3	Floor noise
Hori.	9920.0	42.0	31.7	39.1	9.9	33.2	-	57.9	47.6	73.9	53.9	16.0	6.3	Floor noise
Vert.	2295.0	50.3	35.7	28.0	5.4	32.6	2.4	51.1	38.9	73.9	53.9	22.8	15.0	*2)
Vert.	2483.5	46.2	37.6	27.4	5.6	32.5	2.4	46.7	40.4	73.9	53.9	27.2	13.5	*1)
Vert.	2494.8	50.9	35.2	27.5	5.6	32.5	2.4	51.4	38.1	73.9	53.9	22.5	15.8	*2)
Vert.	4960.0	40.0	31.8	31.7	7.8	31.6	-	47.9	39.7	73.9	53.9	26.0	14.2	Floor noise
Vert.	7440.0	42.6	33.4	36.1	9.3	32.7	-	55.4	46.1	73.9	53.9	18.6	7.8	Floor noise
Vert.	9920.0	41.7	31.7	39.1	9.9	33.2	-	57.6	47.6	73.9	53.9	16.3	6.3	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

*2) Noise synchronized with duty of carrier frequency

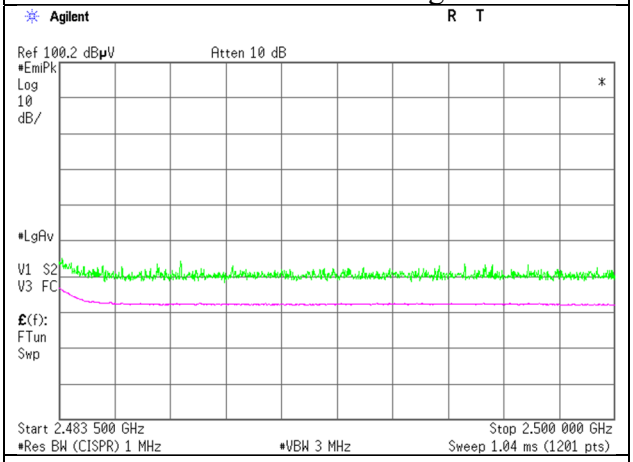
Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(BT1)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 26, 2022
Temperature / Humidity	21 deg. C / 35 % RH
Engineer	Hiroki Numata
	(1 GHz - 10 GHz)
Mode	Tx BT LE 2480 MHz 2M-PHY

Horizontal

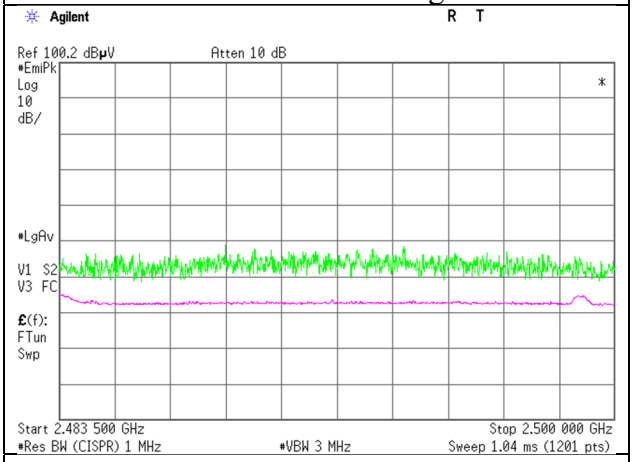
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(BT2)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 25, 2022	February 3, 2022	February 4, 2022
Temperature / Humidity	22 deg. C / 32 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH
Engineer	Nachi Konegawa	Hiroki Numata	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx BT LE 2402 MHz 1M-PHY		

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	2331.7	45.1	33.8	27.8	5.4	32.6	-	45.7	34.5	73.9	53.9	28.2	19.4	
Hori.	2390.0	44.8	33.7	27.6	5.5	32.6	0.7	45.3	34.9	73.9	53.9	28.6	19.0	*1)
Hori.	4804.0	41.5	32.4	31.5	7.8	31.7	-	49.1	40.0	73.9	53.9	24.8	13.9	Floor noise
Hori.	7206.0	43.2	34.1	35.7	9.4	32.6	-	55.6	46.5	73.9	53.9	18.3	7.4	Floor noise
Hori.	9608.0	42.8	32.3	38.7	9.8	33.0	-	58.3	47.8	73.9	53.9	15.6	6.1	Floor noise
Vert.	2331.7	50.5	35.2	27.8	5.4	32.6	-	51.2	35.8	73.9	53.9	22.7	18.1	
Vert.	2390.0	57.8	38.1	27.6	5.5	32.6	0.7	58.3	39.3	73.9	53.9	15.6	14.6	*1)
Vert.	4804.0	41.1	32.4	31.5	7.8	31.7	-	48.7	40.0	73.9	53.9	25.2	13.9	Floor noise
Vert.	7206.0	42.5	33.9	35.7	9.4	32.6	-	54.9	46.3	73.9	53.9	19.0	7.6	Floor noise
Vert.	9608.0	42.6	32.3	38.7	9.8	33.0	-	58.1	47.8	73.9	53.9	15.8	6.1	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity [Hori/Vert]	Frequency [MHz]	Reading (PK) [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.0	94.9	27.5	5.5	32.6	95.4	-	-	Carrier
Hori.	2400.0	36.6	27.5	5.5	32.6	37.1	75.4	38.4	
Vert.	2402.0	94.9	27.5	5.5	32.6	95.3	-	-	Carrier
Vert.	2400.0	41.7	27.5	5.5	32.6	42.2	75.3	33.1	

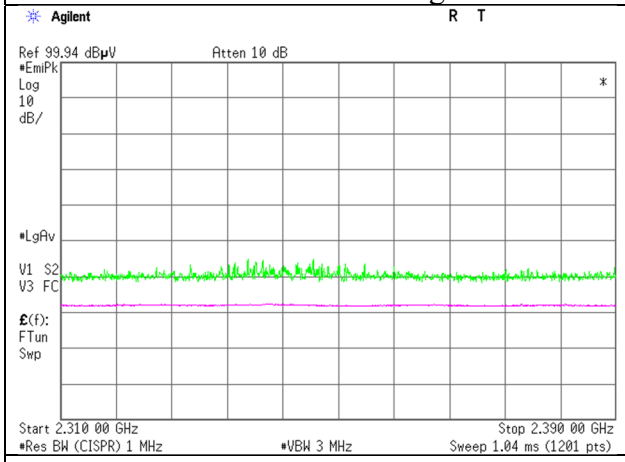
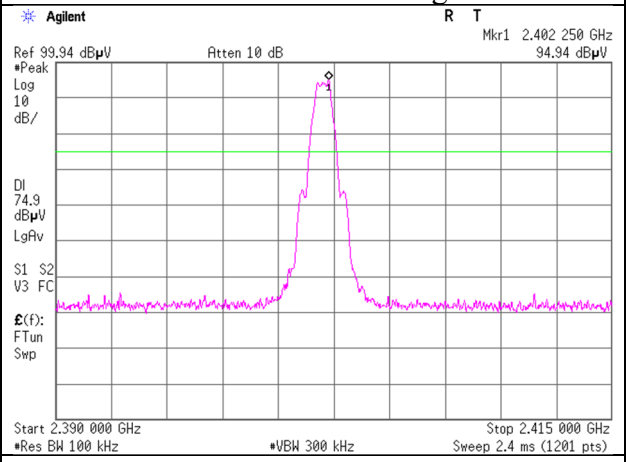
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

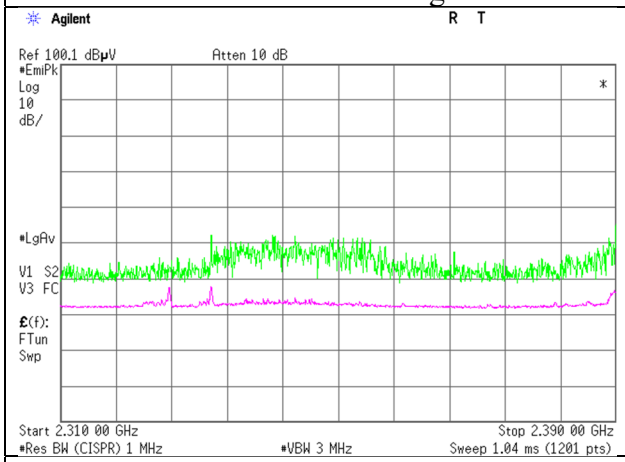
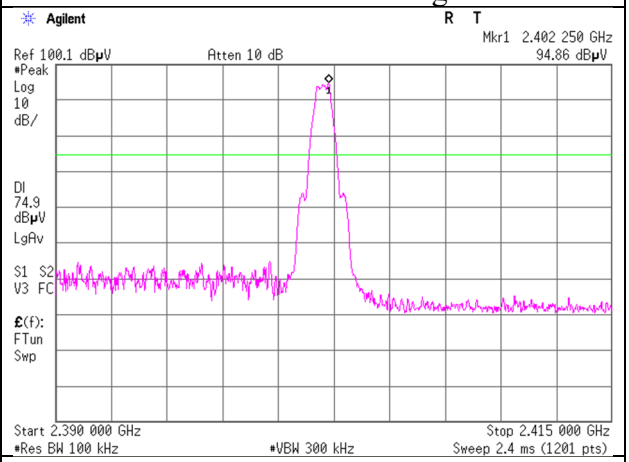
Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(BT2)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 25, 2022
Temperature / Humidity	22 deg. C / 32 % RH
Engineer	Nachi Konegawa
	(1 GHz - 10 GHz)
Mode	Tx BT LE 2402 MHz 1M-PHY

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

(BT2)

Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	January 25, 2022	February 3, 2022	February 4, 2022	February 9, 2022
Temperature / Humidity	22 deg. C / 32 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH	20 deg. C / 42 % RH
Engineer	Nachi Konegawa	Hiroki Numata	Hiroki Numata	Junki Nagatomi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2440 MHz 1M-PHY			

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	32.1	22.5	-	18.0	7.1	32.3	-	15.4	-	40.0	-	24.6	-	
Hori.	64.2	22.6	-	7.0	7.6	32.3	-	5.0	-	40.0	-	35.0	-	
Hori.	75.2	29.0	-	6.5	7.8	32.3	-	11.1	-	40.0	-	29.0	-	
Hori.	86.2	22.8	-	7.9	8.0	32.3	-	6.4	-	40.0	-	33.6	-	
Hori.	378.4	30.9	-	15.3	10.6	32.1	-	24.7	-	46.0	-	21.3	-	
Hori.	616.7	26.9	-	19.5	12.1	32.1	-	26.4	-	46.0	-	19.6	-	
Hori.	4880.0	41.1	32.4	31.6	7.8	31.6	-	48.8	40.2	73.9	53.9	25.1	13.7	Floor noise
Hori.	7320.0	42.1	33.8	35.9	9.4	32.7	-	54.6	46.3	73.9	53.9	19.3	7.6	Floor noise
Hori.	9760.0	41.8	31.5	39.2	9.9	33.1	-	57.7	47.4	73.9	53.9	16.2	6.5	Floor noise
Vert.	32.1	22.6	-	18.0	7.1	32.3	-	15.5	-	40.0	-	24.5	-	
Vert.	64.2	24.6	-	7.0	7.6	32.3	-	7.0	-	40.0	-	33.0	-	
Vert.	75.2	34.0	-	6.5	7.8	32.3	-	16.1	-	40.0	-	24.0	-	
Vert.	86.2	24.7	-	7.9	8.0	32.3	-	8.3	-	40.0	-	31.7	-	
Vert.	380.9	24.9	-	15.4	10.6	32.1	-	18.8	-	46.0	-	27.2	-	
Vert.	615.3	27.7	-	19.5	12.1	32.1	-	27.2	-	46.0	-	18.8	-	
Vert.	4880.0	40.8	32.4	31.6	7.8	31.6	-	48.6	40.2	73.9	53.9	25.4	13.8	Floor noise
Vert.	7320.0	42.1	33.7	35.9	9.4	32.7	-	54.6	46.3	73.9	53.9	19.3	7.6	Floor noise
Vert.	9760.0	42.2	31.4	39.2	9.9	33.1	-	58.2	47.3	73.9	53.9	15.7	6.6	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(BT2)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 25, 2022	February 3, 2022	February 4, 2022
Temperature / Humidity	22 deg. C / 32 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH
Engineer	Nachi Konegawa	Hiroki Numata	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx BT LE 2480 MHz 1M-PHY		

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	2483.5	43.2	33.9	27.4	5.6	32.5	0.7	43.7	35.0	73.9	53.9	30.2	18.9	*1)
Hori.	4960.0	40.4	32.1	31.7	7.8	31.6	-	48.3	40.0	73.9	53.9	25.6	13.9	Floor noise
Hori.	7440.0	42.1	32.7	36.1	9.3	32.7	-	54.8	45.5	73.9	53.9	19.1	8.4	Floor noise
Hori.	9920.0	41.9	31.9	39.1	9.9	33.2	-	57.8	47.8	73.9	53.9	16.1	6.2	Floor noise
Vert.	2483.5	42.4	33.9	27.4	5.6	32.5	0.7	42.8	35.1	73.9	53.9	31.1	18.8	*1)
Vert.	4960.0	41.1	32.6	31.7	7.8	31.6	-	49.0	40.5	73.9	53.9	24.9	13.4	Floor noise
Vert.	7440.0	42.4	33.7	36.1	9.3	32.7	-	55.1	46.4	73.9	53.9	18.8	7.5	Floor noise
Vert.	9920.0	41.6	31.8	39.1	9.9	33.2	-	57.5	47.7	73.9	53.9	16.4	6.2	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

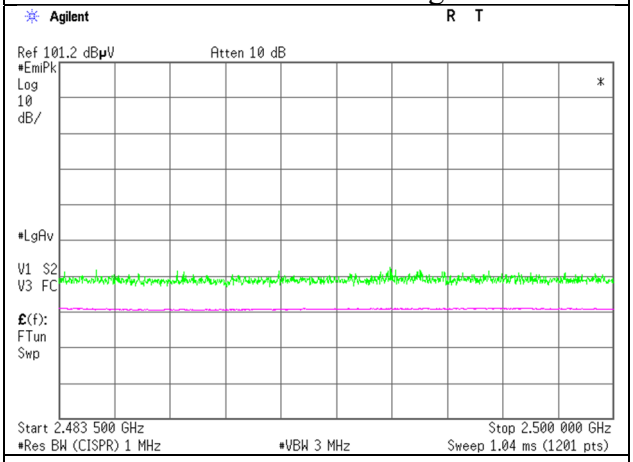
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(BT2)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 25, 2022
Temperature / Humidity	22 deg. C / 32 % RH
Engineer	Nachi Konegawa
	(1 GHz - 10 GHz)
Mode	Tx BT LE 2480 MHz 1M-PHY

Horizontal

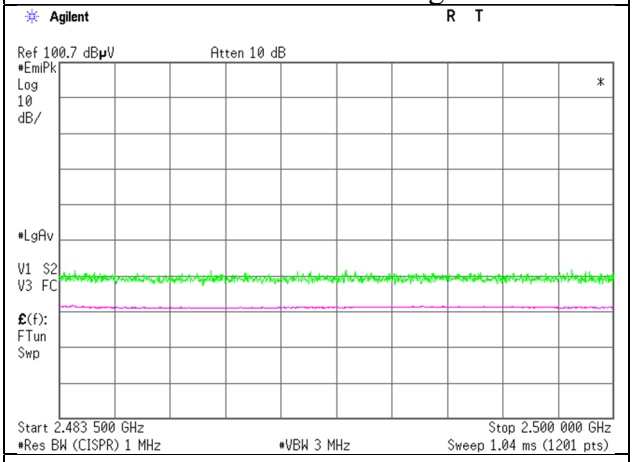
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(BT2)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 25, 2022	February 3, 2022	February 4, 2022
Temperature / Humidity	22 deg. C / 32 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH
Engineer	Nachi Konegawa	Hiroki Numata	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx BT LE 2402 MHz 2M-PHY		

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	2340.9	43.1	34.0	27.8	5.5	32.6	-	43.7	34.7	73.9	53.9	30.2	19.2	
Hori.	2390.0	47.8	34.1	27.6	5.5	32.6	2.4	48.3	37.0	73.9	53.9	25.6	17.0	*1)
Hori.	4804.0	40.8	32.3	31.5	7.8	31.7	-	48.4	39.9	73.9	53.9	25.5	14.0	Floor noise
Hori.	7206.0	42.2	33.9	35.7	9.4	32.6	-	54.7	46.4	73.9	53.9	19.2	7.5	Floor noise
Hori.	9608.0	42.4	32.3	38.7	9.8	33.0	-	57.9	47.8	73.9	53.9	16.0	6.1	Floor noise
Vert.	2340.9	53.1	36.8	27.8	5.5	32.6	-	53.7	37.4	73.9	53.9	20.2	16.5	
Vert.	2390.0	56.0	38.0	27.6	5.5	32.6	2.4	56.4	40.9	73.9	53.9	17.5	13.0	*1)
Vert.	4804.0	40.8	32.5	31.5	7.8	31.7	-	48.5	40.1	73.9	53.9	25.5	13.8	Floor noise
Vert.	7206.0	42.2	34.1	35.7	9.4	32.6	-	54.7	46.6	73.9	53.9	19.3	7.3	Floor noise
Vert.	9608.0	42.3	32.3	38.7	9.8	33.0	-	57.8	47.8	73.9	53.9	16.2	6.1	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity [Hori/Vert]	Frequency [MHz]	Reading (PK) [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.0	94.3	27.5	5.5	32.6	94.7	-	-	Carrier
Hori.	2400.0	62.9	27.5	5.5	32.6	63.3	74.7	11.4	
Vert.	2402.0	94.9	27.5	5.5	32.6	95.4	-	-	Carrier
Vert.	2400.0	63.3	27.5	5.5	32.6	63.8	75.4	11.6	

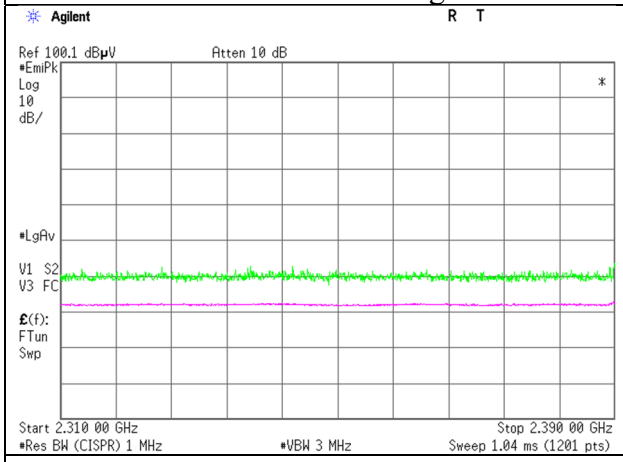
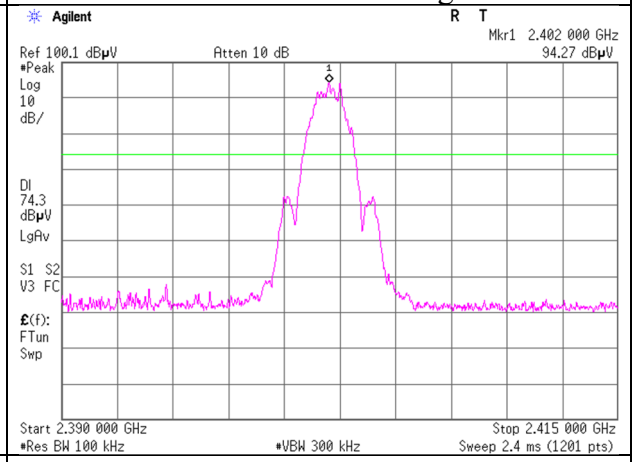
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

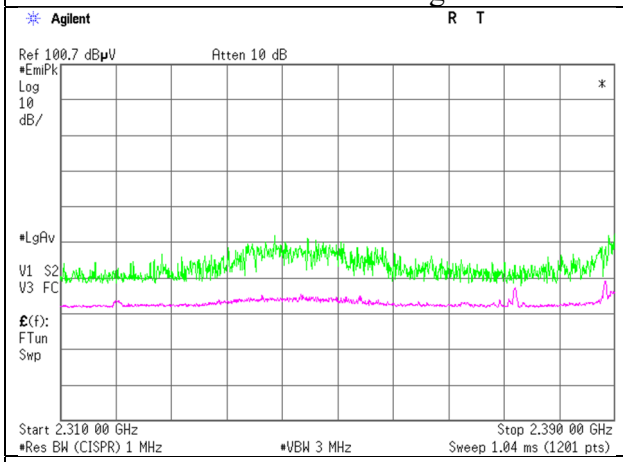
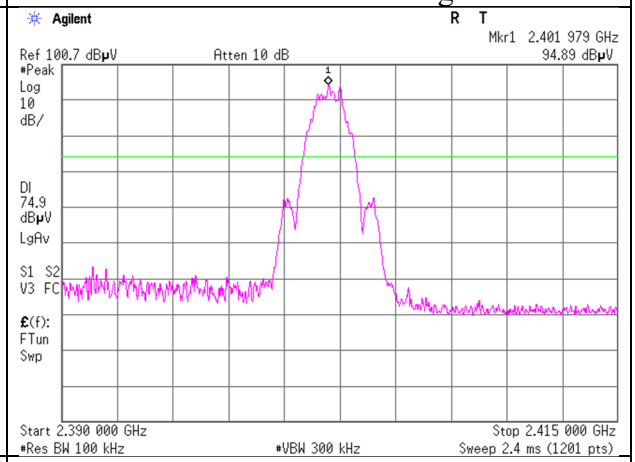
Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(BT2)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 25, 2022
Temperature / Humidity	22 deg. C / 32 % RH
Engineer	Nachi Konegawa
	(1 GHz - 10 GHz)
Mode	Tx BT LE 2402 MHz 2M-PHY

Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(BT2)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 25, 2022	February 3, 2022	February 4, 2022
Temperature / Humidity	22 deg. C / 32 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH
Engineer	Nachi Konegawa	Hiroki Numata	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx BT LE 2440 MHz 2M-PHY		

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	4880.0	40.9	32.2	31.6	7.8	31.6	-	48.6	39.9	73.9	53.9	25.3	14.0	Floor noise
Hori.	7320.0	42.7	33.8	35.9	9.4	32.7	-	55.2	46.4	73.9	53.9	18.7	7.5	Floor noise
Hori.	9760.0	42.1	31.5	39.2	9.9	33.1	-	58.0	47.4	73.9	53.9	15.9	6.5	Floor noise
Vert.	4880.0	40.9	32.5	31.6	7.8	31.6	-	48.6	40.2	73.9	53.9	25.3	13.7	Floor noise
Vert.	7320.0	42.9	33.9	35.9	9.4	32.7	-	55.5	46.5	73.9	53.9	18.4	7.5	Floor noise
Vert.	9760.0	41.9	31.3	39.2	9.9	33.1	-	57.8	47.2	73.9	53.9	16.1	6.7	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(BT2)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	January 25, 2022	February 3, 2022	February 4, 2022
Temperature / Humidity	22 deg. C / 32 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH
Engineer	Nachi Konegawa	Hiroki Numata	Hiroki Numata
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)
Mode	Tx BT LE 2480 MHz 2M-PHY		

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	2483.5	44.7	36.9	27.4	5.6	32.5	2.4	45.1	39.7	73.9	53.9	28.8	14.2	*1)
Hori.	4960.0	40.7	32.4	31.7	7.8	31.6	-	48.6	40.3	73.9	53.9	25.3	13.6	Floor noise
Hori.	7440.0	42.7	33.7	36.1	9.3	32.7	-	55.5	46.4	73.9	53.9	18.4	7.5	Floor noise
Hori.	9920.0	42.2	31.9	39.1	9.9	33.2	-	58.1	47.8	73.9	53.9	15.9	6.1	Floor noise
Vert.	2483.5	46.7	38.4	27.4	5.6	32.5	2.4	47.2	41.3	73.9	53.9	26.7	12.7	*1)
Vert.	4960.0	40.8	32.3	31.7	7.8	31.6	-	48.8	40.2	73.9	53.9	25.2	13.7	Floor noise
Vert.	7440.0	42.8	33.8	36.1	9.3	32.7	-	55.6	46.5	73.9	53.9	18.3	7.4	Floor noise
Vert.	9920.0	42.2	31.8	39.1	9.9	33.2	-	58.1	47.7	73.9	53.9	15.8	6.2	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

Distance factor: 1 GHz - 10 GHz 20log (3.95 m / 3.0 m) = 2.39 dB

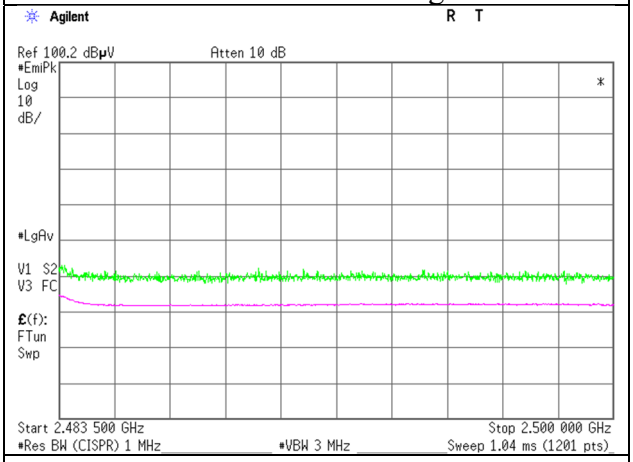
10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(BT2)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	January 25, 2022
Temperature / Humidity	22 deg. C / 32 % RH
Engineer	Nachi Konegawa
	(1 GHz - 10 GHz)
Mode	Tx BT LE 2480 MHz 2M-PHY

Horizontal

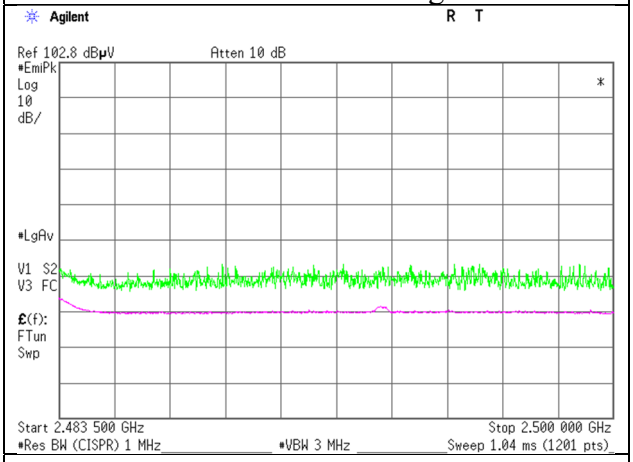
Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

Vertical

Restricted-band band-edge Plot



Trace Green : Peak Plot
Trace Purple : Average Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions. Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission

(BT1)

Test place	Ise EMC Lab.		
Semi Anechoic Chamber	No.3	No.3	No.3
Date	February 7, 2022	February 8, 2022	February 10, 2022
Temperature / Humidity	19 deg. C / 30 % RH	20 deg. C / 32 % RH	18 deg. C / 37 % RH
Engineer	Yuichiro Yamazaki	Yuichiro Yamazaki	Yuichiro Yamazaki
	(1 GHz - 10 GHz)	(Above 10 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2M-PHY 2402 MHz + 11ax-20 OFDM 5500 MHz		

Polarity [Hori/Vert]	Frequency [MHz]	Reading (QP / PK) [dBuV]	Reading (AV) [dBuV]	Ant. Factor [dB/m]	Loss [dB]	Gain [dB]	Duty Factor [dB]	Result (QP / PK) [dBuV/m]	Result (AV) [dBuV/m]	Limit (QP / PK) [dBuV/m]	Limit (AV) [dBuV/m]	Margin (QP / PK) [dB]	Margin (AV) [dB]	Remark
Hori.	74.9	40.6	-	6.5	7.8	32.3	-	22.6	-	40.0	-	17.4	-	
Hori.	331.5	34.4	-	15.0	10.2	32.1	-	27.6	-	46.0	-	18.4	-	
Hori.	373.3	40.5	-	15.2	10.5	32.1	-	34.2	-	46.0	-	11.8	-	
Hori.	615.7	36.1	-	19.5	12.1	32.1	-	35.6	-	46.0	-	10.4	-	
Hori.	806.3	32.9	-	21.0	13.1	31.5	-	35.5	-	46.0	-	10.5	-	
Hori.	960.0	31.3	-	22.2	13.9	30.7	-	36.7	-	46.0	-	9.3	-	
Hori.	2342.7	48.6	34.5	27.8	5.3	32.6	-	49.1	35.0	73.9	53.9	24.8	18.9	
Hori.	2390.0	52.3	37.1	27.6	5.4	32.6	2.4	52.6	39.8	73.9	53.9	21.3	14.1	*1)
Hori.	4804.0	40.2	32.5	31.5	7.7	31.7	-	47.7	40.0	73.9	53.9	26.2	13.9	Floor noise
Hori.	7206.0	41.7	34.0	35.7	9.3	32.6	-	54.0	46.3	73.9	53.9	19.9	7.6	Floor noise
Hori.	9608.0	42.7	32.5	38.7	9.7	33.0	-	58.1	47.9	73.9	53.9	15.8	6.0	Floor noise
Vert.	74.9	51.1	-	6.5	7.8	32.3	-	33.1	-	40.0	-	6.9	-	
Vert.	179.2	32.9	-	16.1	9.0	32.2	-	25.7	-	43.5	-	17.8	-	
Vert.	375.5	35.9	-	15.3	10.6	32.1	-	29.6	-	46.0	-	16.4	-	
Vert.	617.4	39.6	-	19.5	12.1	32.1	-	39.1	-	46.0	-	6.9	-	
Vert.	806.3	36.6	-	21.0	13.1	31.5	-	39.2	-	46.0	-	6.8	-	
Vert.	958.2	29.7	-	22.2	13.9	30.7	-	35.1	-	46.0	-	10.9	-	
Vert.	2341.9	52.7	35.2	27.8	5.3	32.6	-	53.2	35.7	73.9	53.9	20.7	18.2	
Vert.	2390.0	51.6	36.2	27.6	5.4	32.6	2.4	52.0	39.0	73.9	53.9	21.9	14.9	*1)
Vert.	4804.0	40.7	32.2	31.5	7.7	31.7	-	48.2	39.7	73.9	53.9	25.7	14.2	Floor noise
Vert.	7206.0	41.6	33.9	35.7	9.3	32.6	-	53.9	46.2	73.9	53.9	20.0	7.7	Floor noise
Vert.	9608.0	42.4	32.5	38.7	9.7	33.0	-	57.8	47.9	73.9	53.9	16.1	6.0	Floor noise

Result (QP / PK) = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier)

Result (AV)= Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amplifier) + Duty factor

*Other frequency noises omitted in this report were not seen or had enough margin (more than 20 dB).

*QP detector was used up to 1GHz.

*1) Not Out of Band emission(Leakage Power)

20dBc Data Sheet

Polarity [Hori/Vert]	Frequency [MHz]	Reading (PK) [dBuV]	Ant Factor [dB/m]	Loss [dB]	Gain [dB]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
Hori.	2402.0	93.1	27.5	5.4	32.6	93.5	-	-	Carrier
Hori.	2400.0	61.4	27.5	5.4	32.6	61.8	73.5	11.7	
Vert.	2402.0	95.4	27.5	5.4	32.6	95.7	-	-	Carrier
Vert.	2400.0	63.2	27.5	5.4	32.6	63.5	75.7	12.2	

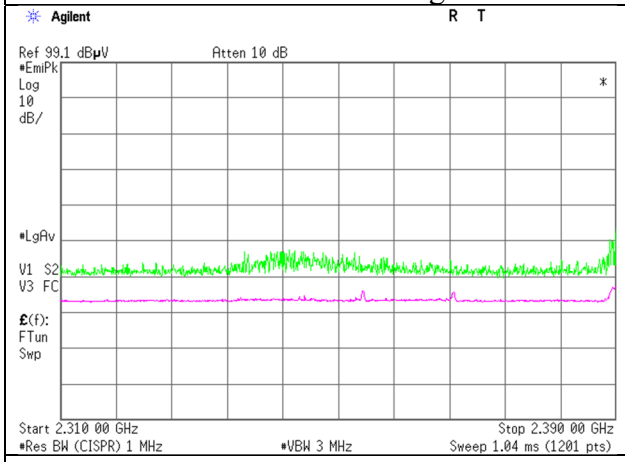
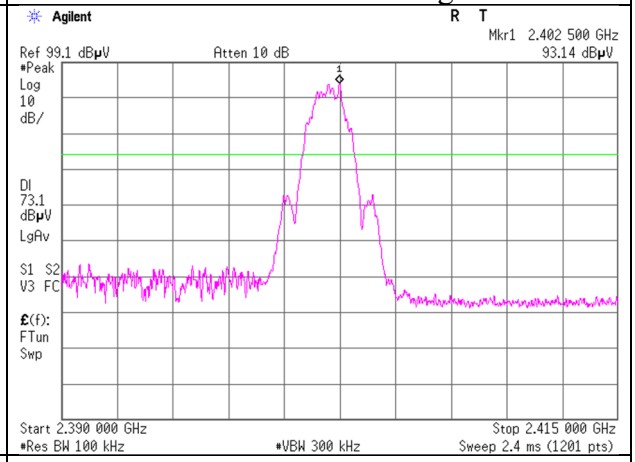
Result = Reading + Ant Factor + Loss (Cable+Attenuator+Filter+Distance factor(above 1 GHz)) - Gain(Amprifier)

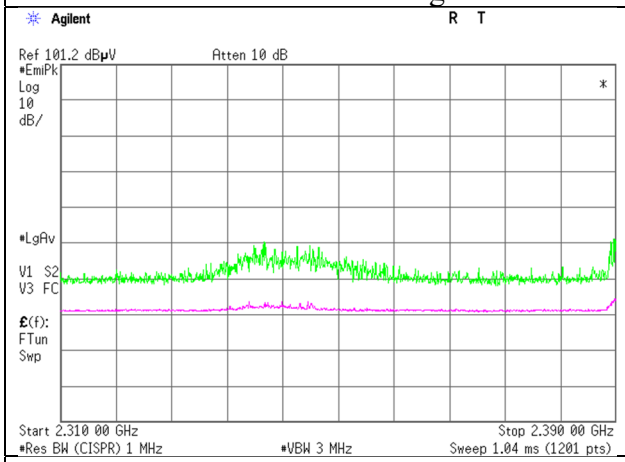
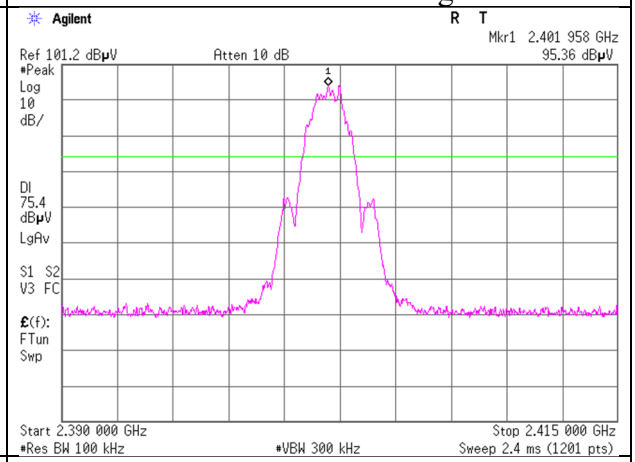
Distance factor: 1 GHz - 10 GHz 20log (3.9 m / 3.0 m) = 2.28 dB

10 GHz - 26.5 GHz 20log (1.0 m / 3.0 m) = -9.5 dB

Radiated Spurious Emission
(Reference Plot for band-edge)
(BT1)

Test place	Ise EMC Lab.
Semi Anechoic Chamber	No.3
Date	February 7, 2022
Temperature / Humidity	19 deg. C / 30 % RH
Engineer	Yuichiro Yamazaki
	(1 GHz - 10 GHz)
Mode	Tx BT LE 2M-PHY 2402 MHz + 11ax-20 OFDM 5500 MHz

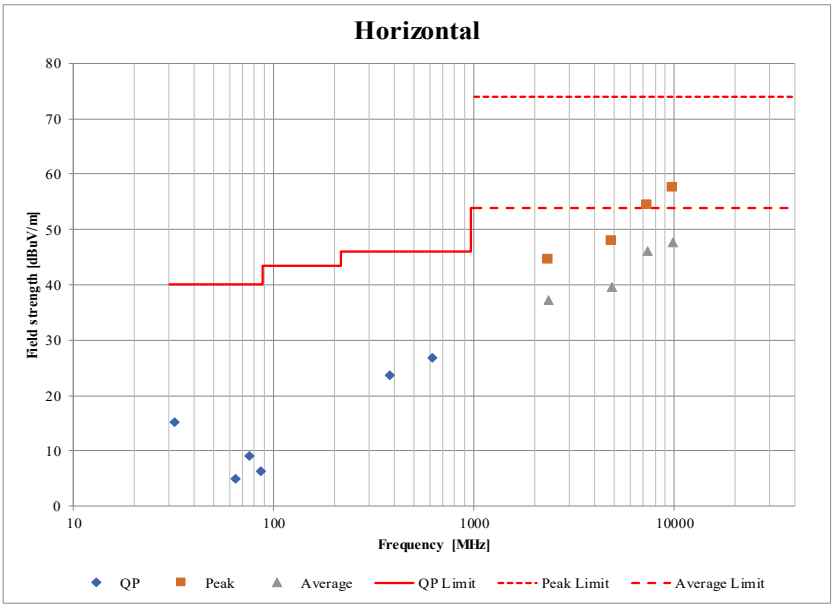
Horizontal	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

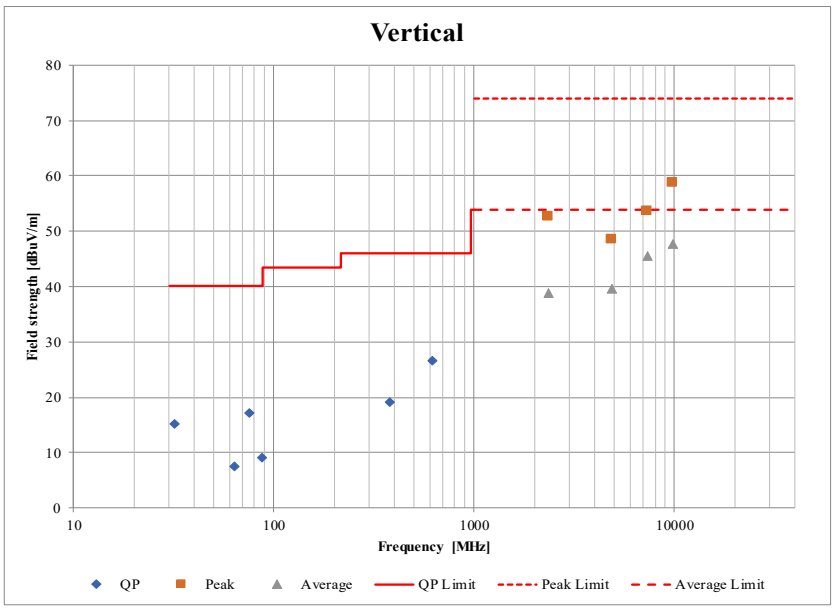
Vertical	
Restricted-band band-edge Plot	Authorized-band band-edge Plot
	
Trace Green : Peak Plot Trace Purple : Average Plot	20dBc Plot

* The measurement was conducted for a sufficiently long enough time to detect any possible spurious emissions.
Final result of restricted band edge was shown in tabular data.

Radiated Spurious Emission
(Plot data, Worst case mode for Maximum Peak Output Power)
(BT1)

Test place	Ise EMC Lab.			
Semi Anechoic Chamber	No.3	No.3	No.3	No.3
Date	January 26, 2022	February 3, 2022	February 4, 2022	February 9, 2022
Temperature / Humidity	21 deg. C / 35 % RH	21 deg. C / 33 % RH	21 deg. C / 36 % RH	20 deg. C / 42 % RH
Engineer	Hiroki Numata	Hiroki Numata	Hiroki Numata	Junki Nagatomi
	(1 GHz - 10 GHz)	(10 GHz - 18 GHz)	(18 GHz - 26.5 GHz)	(Below 1 GHz)
Mode	Tx BT LE 2440 MHz 2M-PHY			



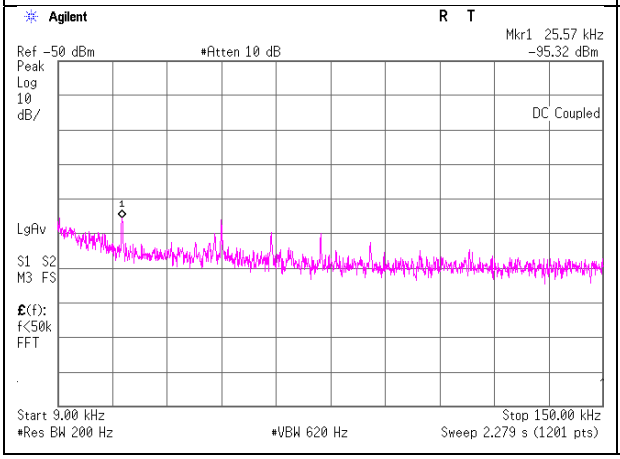


*These plots data contains sufficient number to show the trend of characteristic features for EUT.

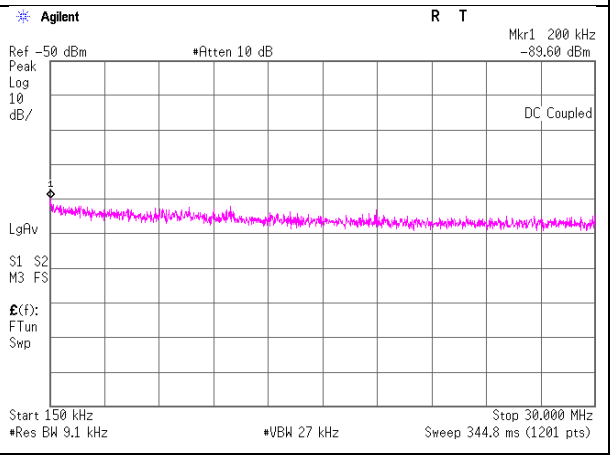
Conducted Spurious Emission
(WLAN)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx 11ax-20 OFDM 2412 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain * [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-95.3	0.52	9.7	8.0	2	-74.1	300	6.0	-12.8	39.4	52.2	
200.00	-89.6	0.52	9.7	8.0	2	-68.3	300	6.0	-7.1	21.5	28.6	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

N: Number of output

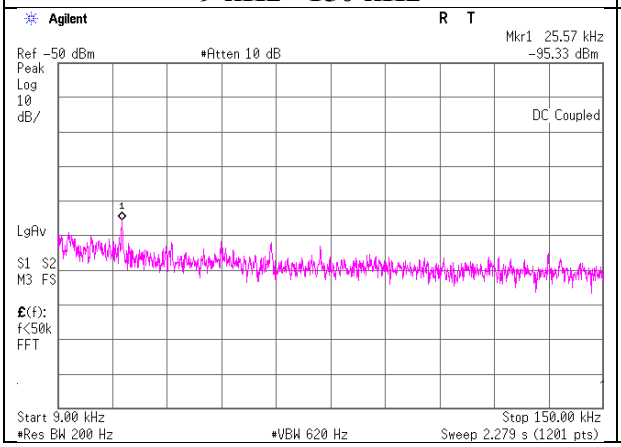
*The worst antenna gain was applied.

Conducted Spurious Emission

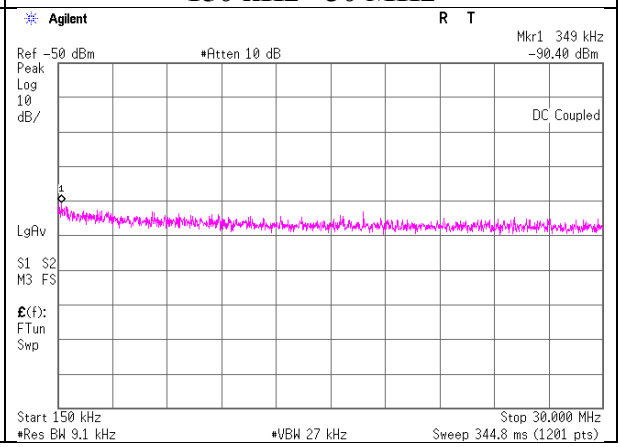
(BT1)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 1M-PHY 2402 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-95.3	0.65	9.7	5.8	1	-79.2	300	6.0	-17.9	39.4	57.3	
349.00	-90.4	0.65	9.7	5.8	1	-74.2	300	6.0	-13.0	16.7	29.7	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

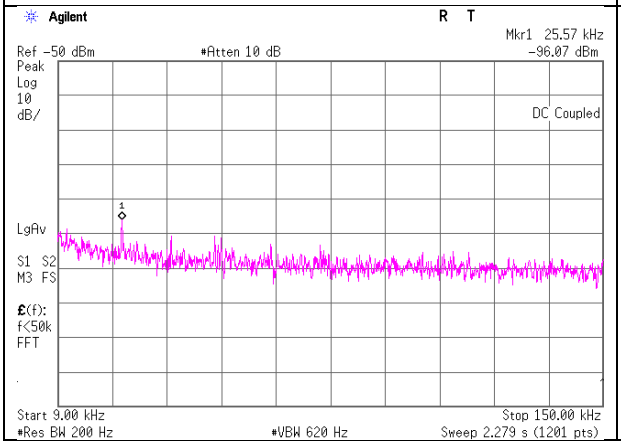
N: Number of output

Conducted Spurious Emission

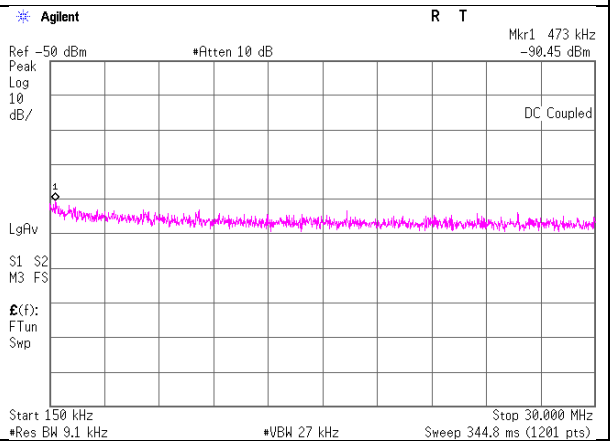
(BT1)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 1M-PHY 2440 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-96.1	0.65	9.7	5.8	1	-79.9	300	6.0	-18.7	39.4	58.1	
473.00	-90.5	0.65	9.8	5.8	1	-74.2	300	6.0	-13.0	14.1	27.1	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

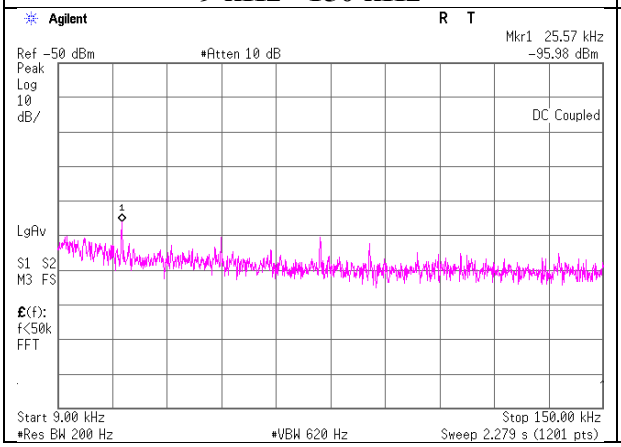
N: Number of output

Conducted Spurious Emission

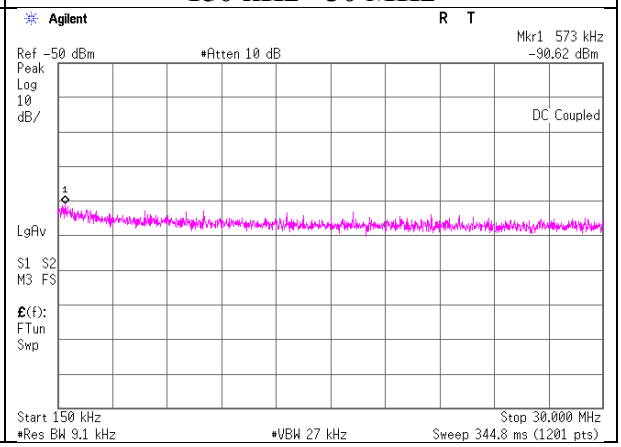
(BT1)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 1M-PHY 2480 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-96.0	0.65	9.7	5.8	1	-79.8	300	6.0	-18.6	39.4	58.0	
573.00	-90.6	0.65	9.8	5.8	1	-74.4	30	6.0	6.8	32.4	25.6	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

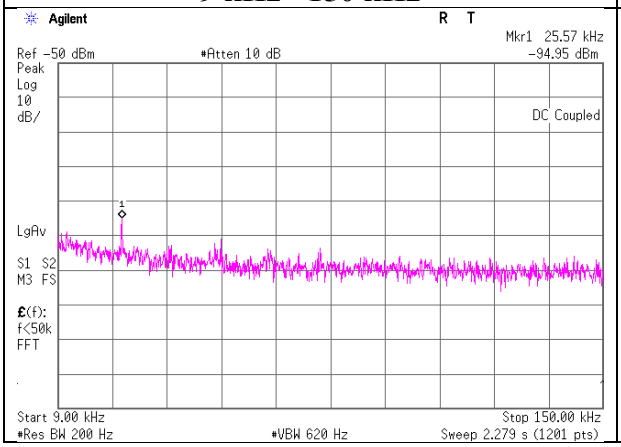
N: Number of output

Conducted Spurious Emission

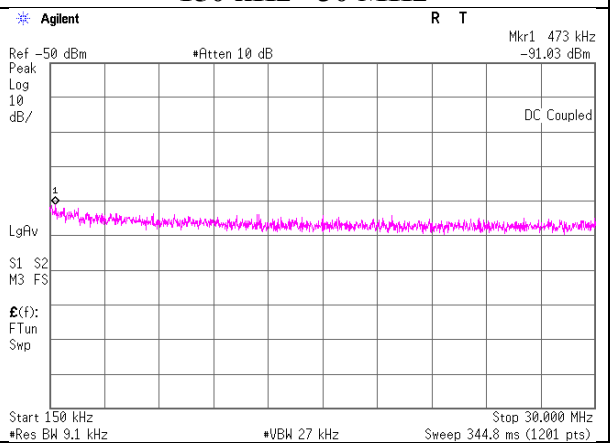
(BT1)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 2M-PHY 2402 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-95.0	0.65	9.7	5.8	1	-78.8	300	6.0	-17.6	39.4	57.0	
473.00	-91.0	0.65	9.8	5.8	1	-74.8	300	6.0	-13.6	14.1	27.7	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

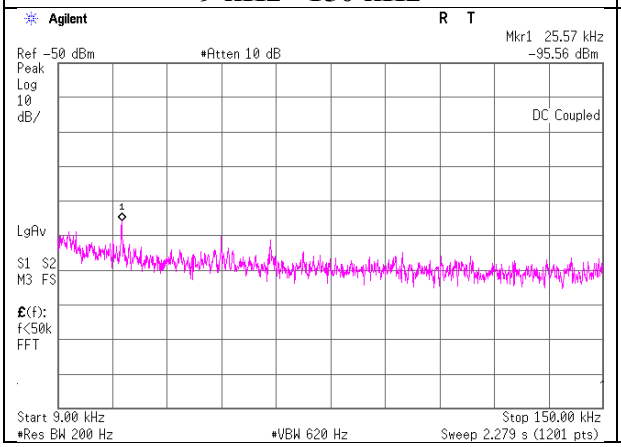
N: Number of output

Conducted Spurious Emission

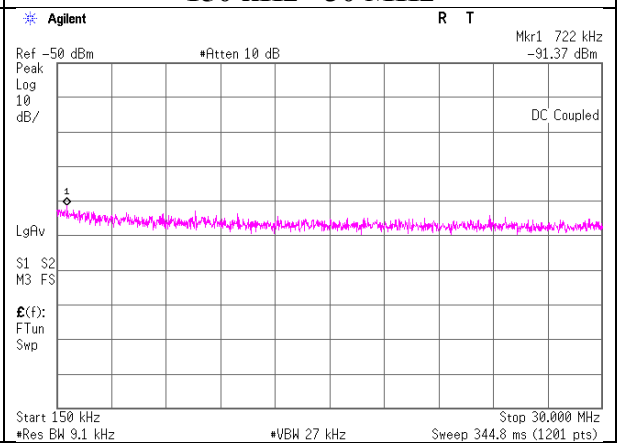
(BT1)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 2M-PHY 2440 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-95.6	0.65	9.7	5.8	1	-79.4	300	6.0	-18.2	39.4	57.6	
722.00	-91.4	0.65	9.8	5.8	1	-75.2	30	6.0	6.1	30.4	24.3	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

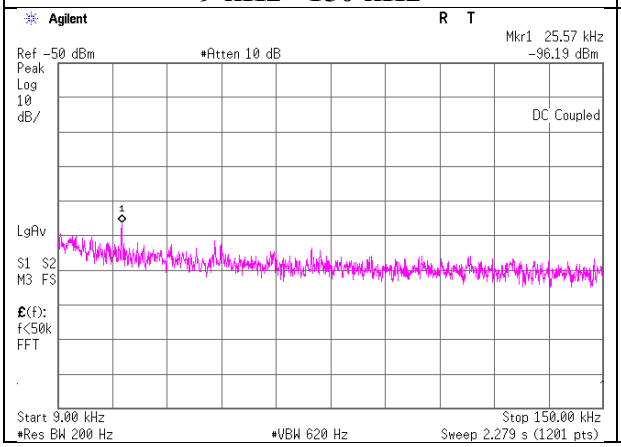
N: Number of output

Conducted Spurious Emission

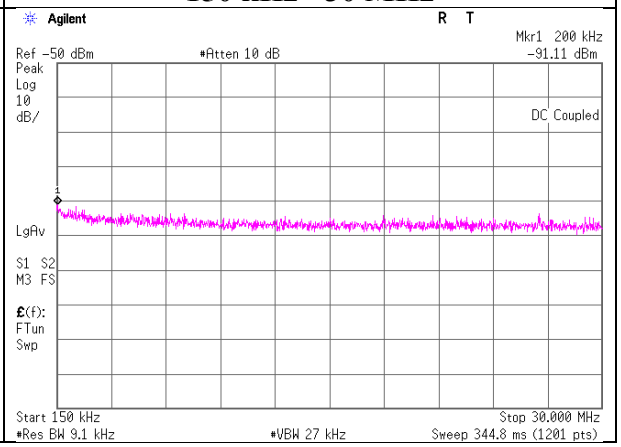
(BT1)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 2M-PHY 2480 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-96.2	0.65	9.7	5.8	1	-80.1	300	6.0	-18.8	39.4	58.2	
200.00	-91.1	0.65	9.7	5.8	1	-74.9	300	6.0	-13.7	21.5	35.2	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

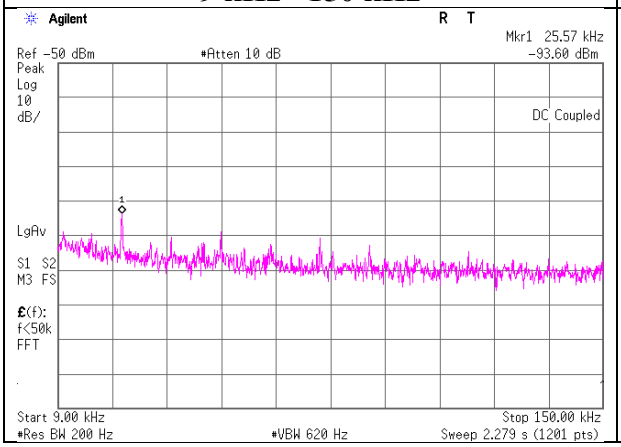
EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

N: Number of output

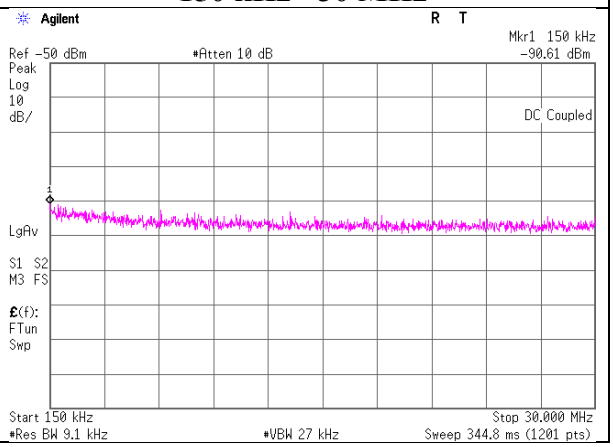
Conducted Spurious Emission
(BT2)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 1M-PHY 2402 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-93.6	0.60	9.7	5.8	1	-77.5	300	6.0	-16.3	39.4	55.7	
150.00	-90.6	0.60	9.7	5.8	1	-74.5	300	6.0	-13.2	24.0	37.2	

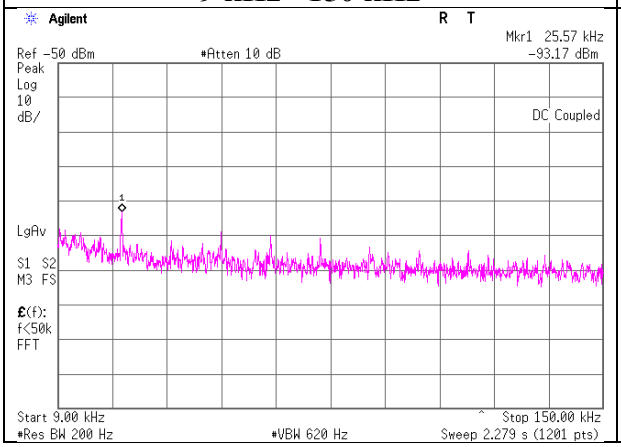
E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]
EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)
N: Number of output

Conducted Spurious Emission

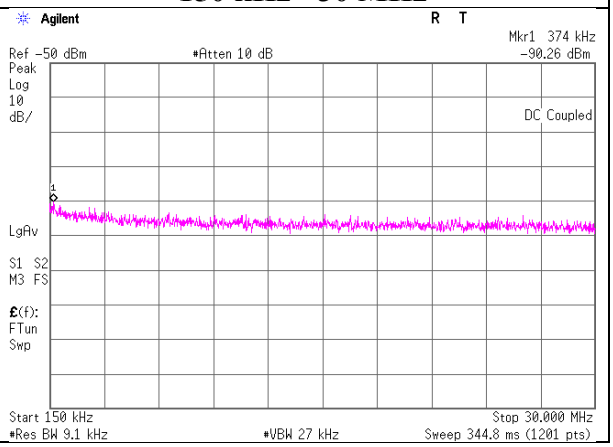
(BT2)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 1M-PHY 2440 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-93.2	0.60	9.7	5.8	1	-77.1	300	6.0	-15.8	39.4	55.2	
374.00	-90.3	0.60	9.8	5.8	1	-74.1	300	6.0	-12.9	16.1	29.0	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

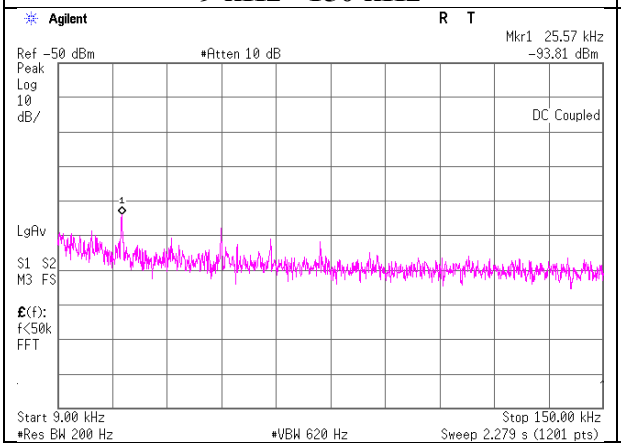
N: Number of output

Conducted Spurious Emission

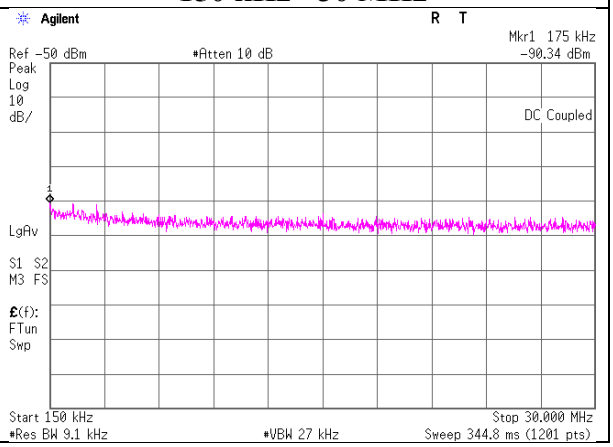
(BT2)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 1M-PHY 2480 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-93.8	0.60	9.7	5.8	1	-77.7	300	6.0	-16.5	39.4	55.9	
175.00	-90.3	0.60	9.7	5.8	1	-74.2	300	6.0	-13.0	22.7	35.7	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

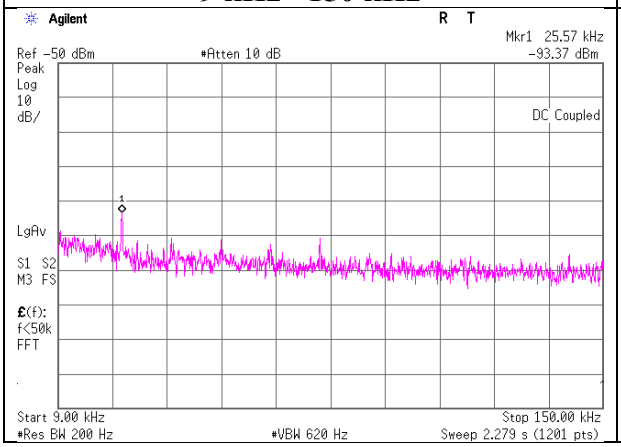
N: Number of output

Conducted Spurious Emission

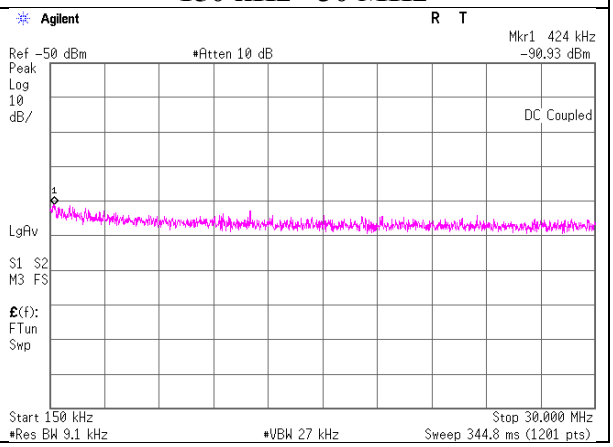
(BT2)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 2M-PHY 2402 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-93.4	0.60	9.7	5.8	1	-77.3	300	6.0	-16.0	39.4	55.4	
424.00	-90.9	0.60	9.8	5.8	1	-74.8	300	6.0	-13.5	15.0	28.5	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

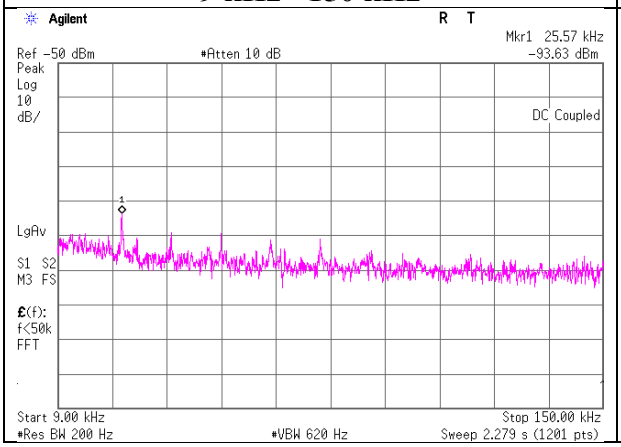
EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

N: Number of output

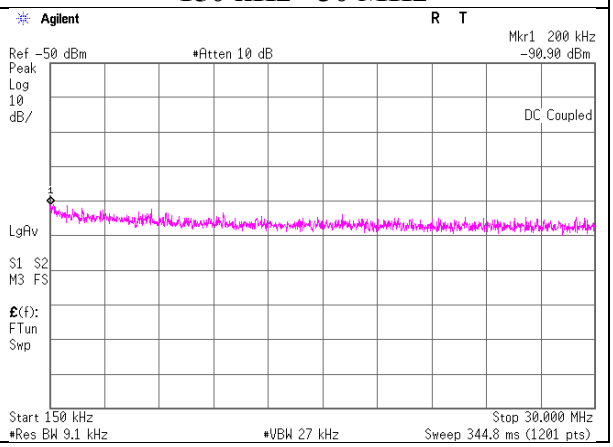
Conducted Spurious Emission
(BT2)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 2M-PHY 2440 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-93.6	0.60	9.7	5.8	1	-77.5	300	6.0	-16.3	39.4	55.7	
200.00	-90.9	0.60	9.7	5.8	1	-74.8	300	6.0	-13.5	21.5	35.0	

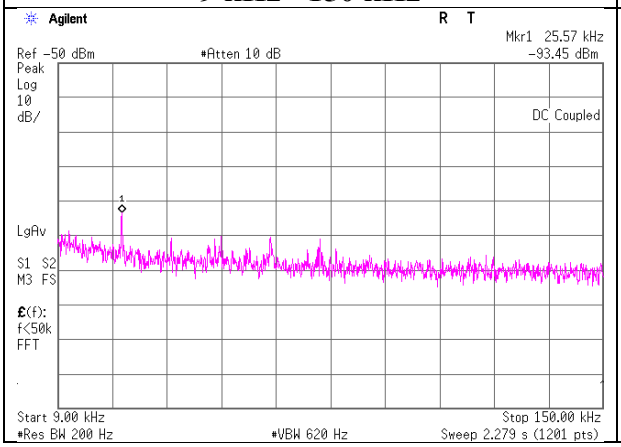
E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]
EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)
N: Number of output

Conducted Spurious Emission

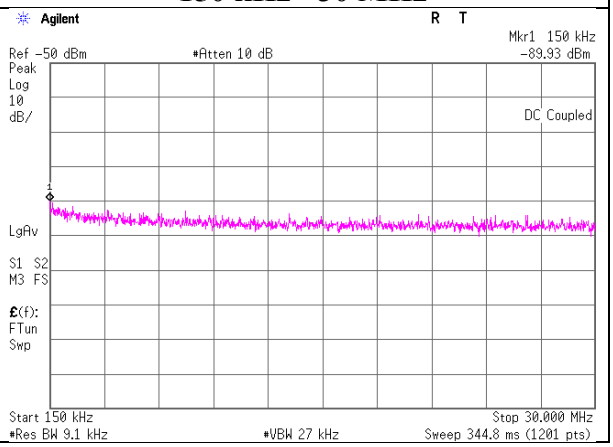
(BT2)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 10, 2022
Temperature / Humidity	23 deg. C / 31 % RH
Engineer	Ken Fujita
Mode	Tx BT LE 2M-PHY 2480 MHz

9 kHz - 150 kHz



150 kHz - 30 MHz



Frequency [kHz]	Reading [dBm]	Cable Loss [dB]	Attenuator Loss [dB]	Antenna Gain [dBi]	N (Number of Output)	EIRP [dBm]	Distance [m]	Ground bounce [dB]	E (field strength) [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Remark
25.57	-93.5	0.60	9.7	5.8	1	-77.4	300	6.0	-16.1	39.4	55.5	
150.00	-89.9	0.60	9.7	5.8	1	-73.8	300	6.0	-12.6	24.0	36.6	

E [dBuV/m] = EIRP [dBm] - 20 log (Distance [m]) + Ground bounce [dB] + 104.8 [dBuV/m]

EIRP[dBm] = Reading [dBm] + Cable loss [dB] + Attenuator Loss [dB] + Antenna gain [dBi] + 10 * log (N)

N: Number of output

Power Density
(WLAN)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	January 31, 2022
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11b

Antenna 1 + Antenna 2

Freq. [MHz]	Antenna 1 Result [mW]	Antenna 2 Result [mW]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	0.044	0.040	-10.73	0.085	8.00	18.73
2437	0.045	0.039	-10.71	0.085	8.00	18.71
2462	0.045	0.042	-10.62	0.087	8.00	18.62

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	-23.68	0.60	9.53	-13.55	0.044	8.00	21.55
2437	-23.55	0.60	9.53	-13.42	0.045	8.00	21.42
2462	-23.61	0.60	9.53	-13.48	0.045	8.00	21.48

Antenna 2

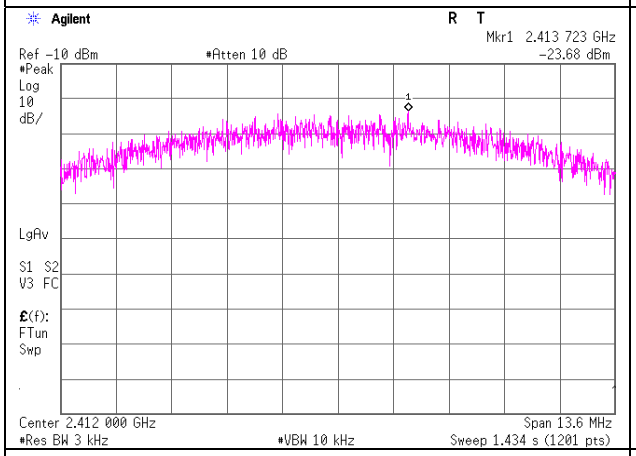
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	-23.99	0.52	9.53	-13.94	0.040	8.00	21.94
2437	-24.10	0.52	9.53	-14.05	0.039	8.00	22.05
2462	-23.83	0.52	9.53	-13.78	0.042	8.00	21.78

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

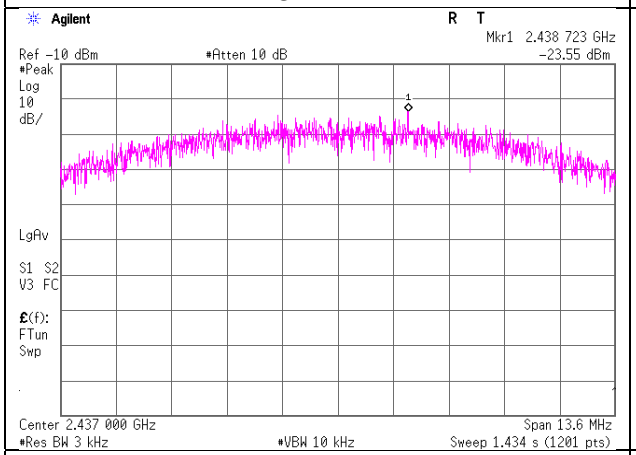
Power Density
(WLAN)

11b Antenna 1

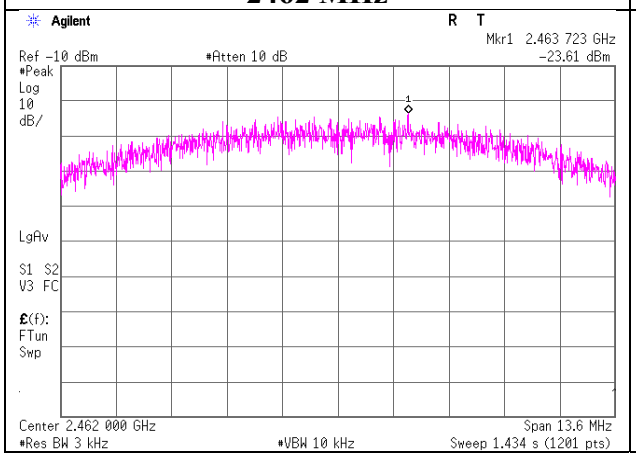
2412 MHz



2437 MHz

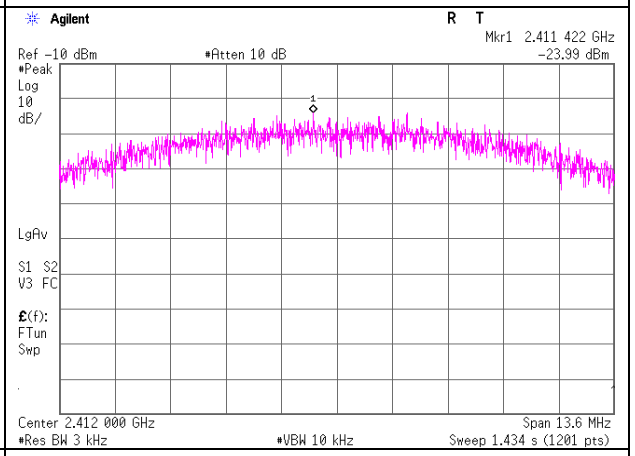


2462 MHz

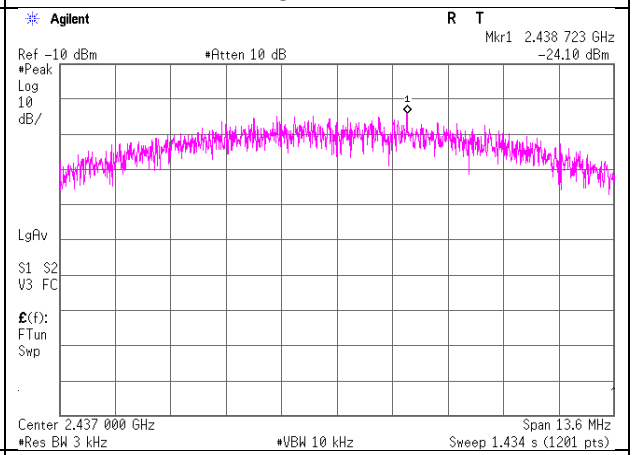


11b Antenna 2

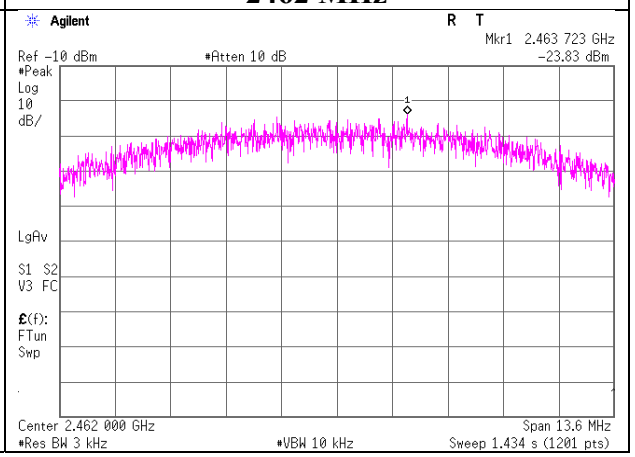
2412 MHz



2437 MHz



2462 MHz



Power Density
(WLAN)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	January 31, 2022
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11g

Antenna 1 + Antenna 2

Freq. [MHz]	Antenna 1 Result [mW]	Antenna 2 Result [mW]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	0.016	0.014	-15.21	0.030	8.00	23.21
2437	0.016	0.019	-14.58	0.035	8.00	22.58
2462	0.015	0.017	-14.94	0.032	8.00	22.94

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	-28.15	0.60	9.53	-18.02	0.016	8.00	26.02
2437	-28.12	0.60	9.53	-17.99	0.016	8.00	25.99
2462	-28.41	0.60	9.53	-18.28	0.015	8.00	26.28

Antenna 2

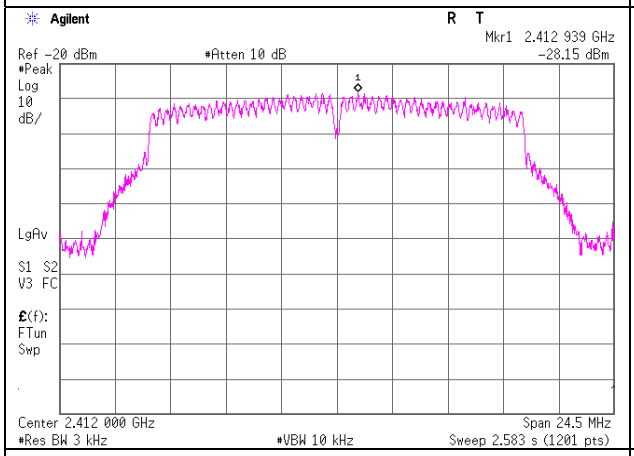
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	-28.47	0.52	9.53	-18.42	0.014	8.00	26.42
2437	-27.27	0.52	9.53	-17.22	0.019	8.00	25.22
2462	-27.69	0.52	9.53	-17.64	0.017	8.00	25.64

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

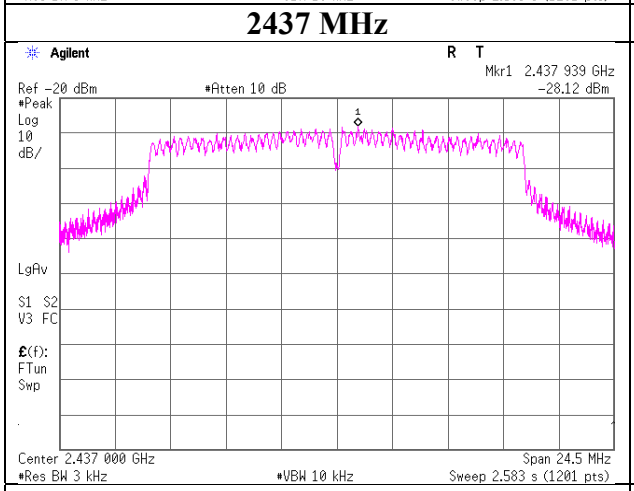
Power Density
(WLAN)

11g Antenna 1

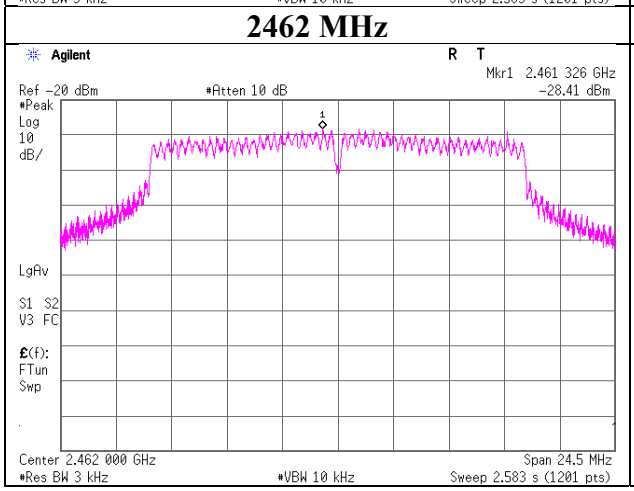
2412 MHz



2437 MHz

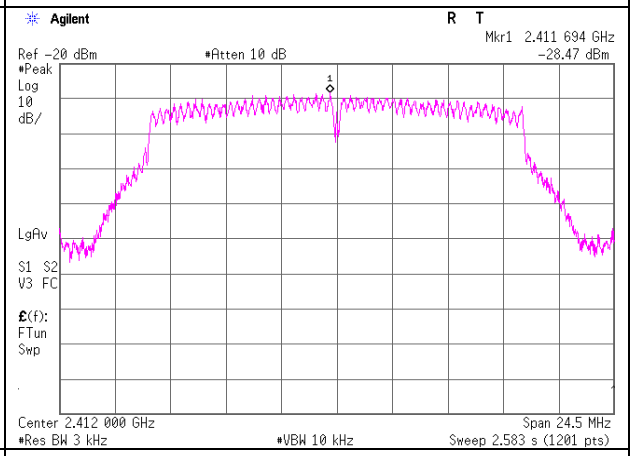


2462 MHz

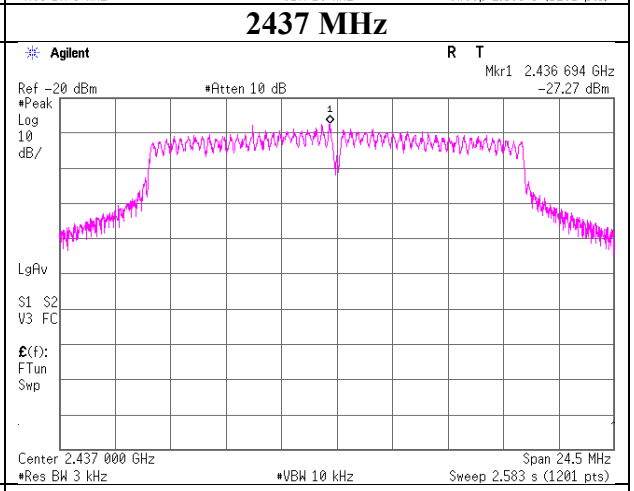


11g Antenna 2

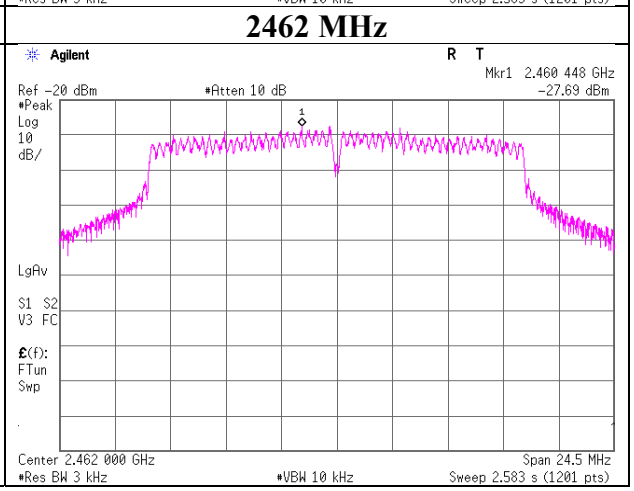
2412 MHz



2437 MHz



2462 MHz



Power Density
(WLAN)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	January 31, 2022
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11n-20

Antenna 1 + Antenna 2

Freq. [MHz]	Antenna 1 Result [mW]	Antenna 2 Result [mW]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	0.057	0.144	-6.97	0.201	8.00	14.97
2437	0.046	0.133	-7.47	0.179	8.00	15.47
2462	0.055	0.144	-7.01	0.199	8.00	15.01

Antenna 1

Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	-22.59	0.60	9.53	-12.46	0.057	8.00	20.46
2437	-23.47	0.60	9.53	-13.34	0.046	8.00	21.34
2462	-22.72	0.60	9.53	-12.59	0.055	8.00	20.59

Antenna 2

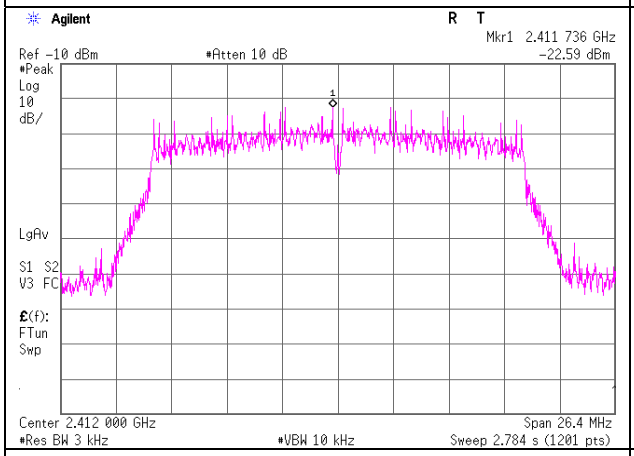
Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
2412	-18.46	0.52	9.53	-8.41	0.144	8.00	16.41
2437	-18.82	0.52	9.53	-8.77	0.133	8.00	16.77
2462	-18.47	0.52	9.53	-8.42	0.144	8.00	16.42

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

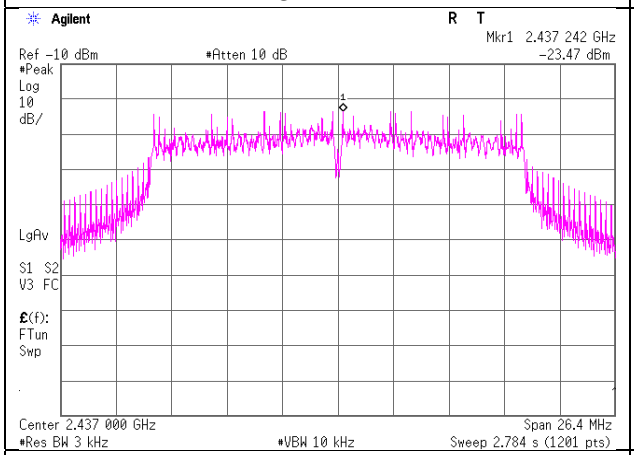
Power Density
(WLAN)

11n-20 Antenna 1

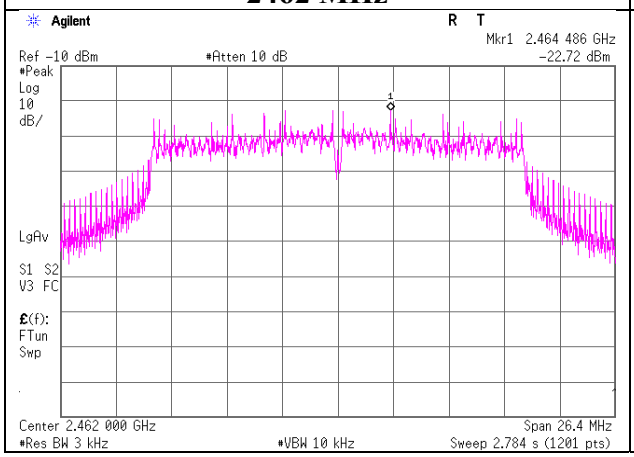
2412 MHz



2437 MHz

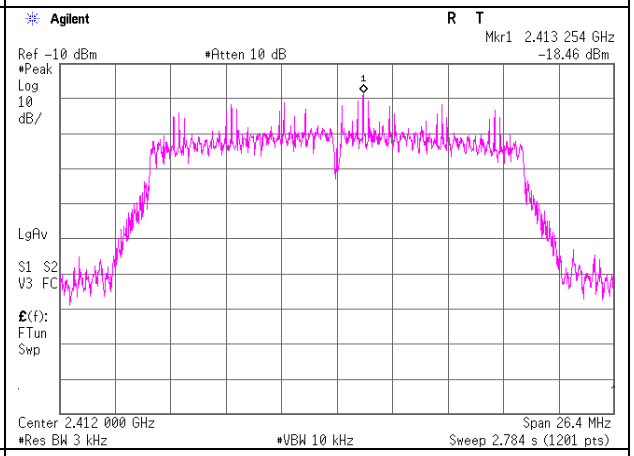


2462 MHz

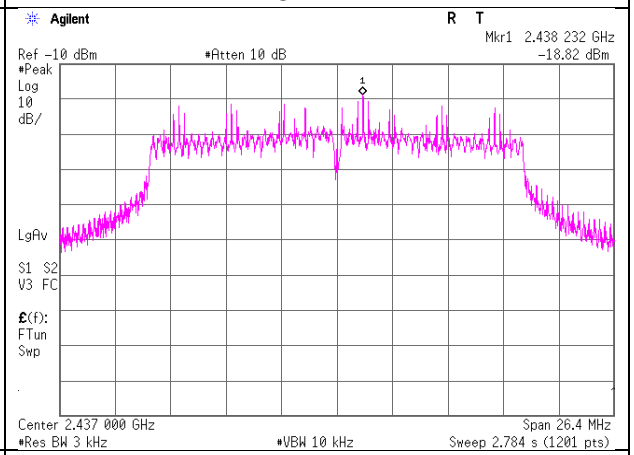


11n-20 Antenna 2

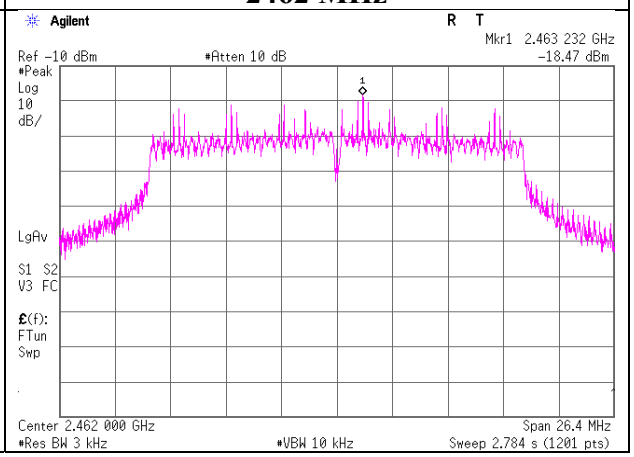
2412 MHz



2437 MHz



2462 MHz



Power Density
(WLAN)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	January 31, 2022
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx 11ax-20 (OFDM)

Antenna 1 + Antenna 2

Freq.	Antenna 1 Result	Antenna 2 Result	Result		Limit	Margin
[MHz]	[mW]	[mW]	[dBm / 3 kHz]	[mW / 3 kHz]	[dBm / 3 kHz]	[dB]
2412	0.022	0.020	-13.80	0.042	8.00	21.80
2437	0.019	0.021	-13.99	0.040	8.00	21.99
2462	0.019	0.019	-14.23	0.038	8.00	22.23

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm / 3 kHz]	[mW / 3 kHz]	[dBm / 3 kHz]	[dB]
2412	-26.76	0.60	9.53	-16.63	0.022	8.00	24.63
2437	-27.41	0.60	9.53	-17.28	0.019	8.00	25.28
2462	-27.44	0.60	9.53	-17.31	0.019	8.00	25.31

Antenna 2

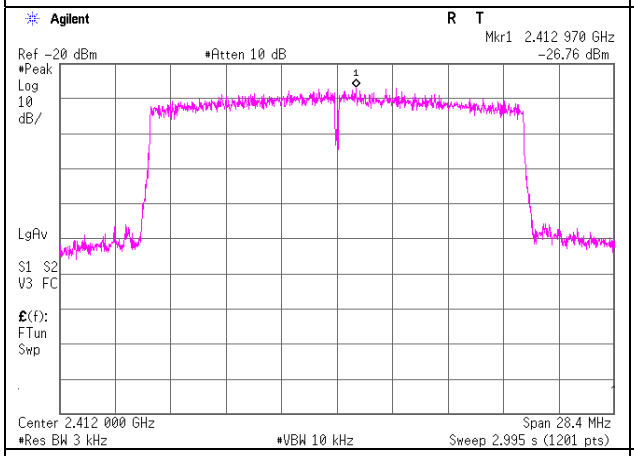
Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm / 3 kHz]	[mW / 3 kHz]	[dBm / 3 kHz]	[dB]
2412	-27.05	0.52	9.53	-17.00	0.020	8.00	25.00
2437	-26.79	0.52	9.53	-16.74	0.021	8.00	24.74
2462	-27.23	0.52	9.53	-17.18	0.019	8.00	25.18

Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

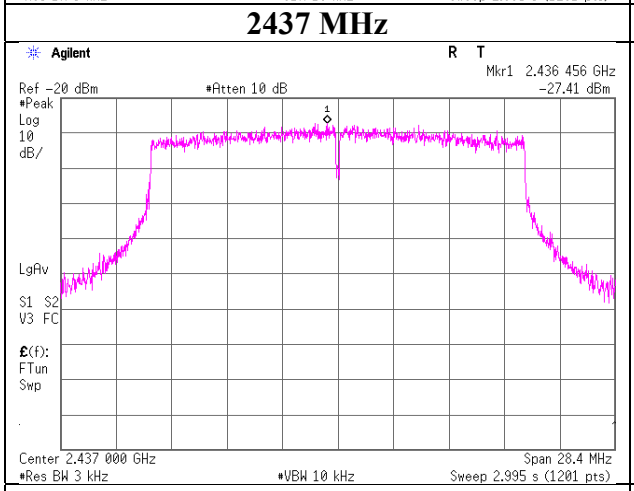
Power Density
(WLAN)

11ax-20 (OFDM) Antenna 1

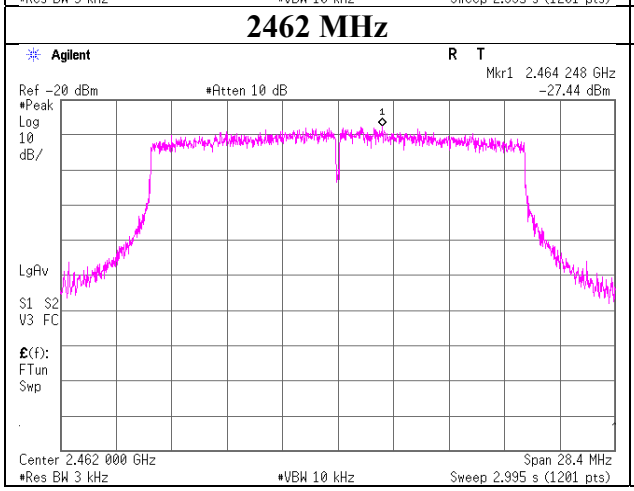
2412 MHz



2437 MHz

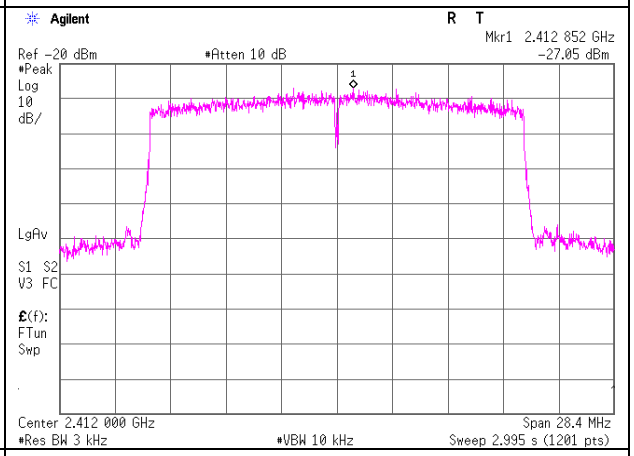


2462 MHz

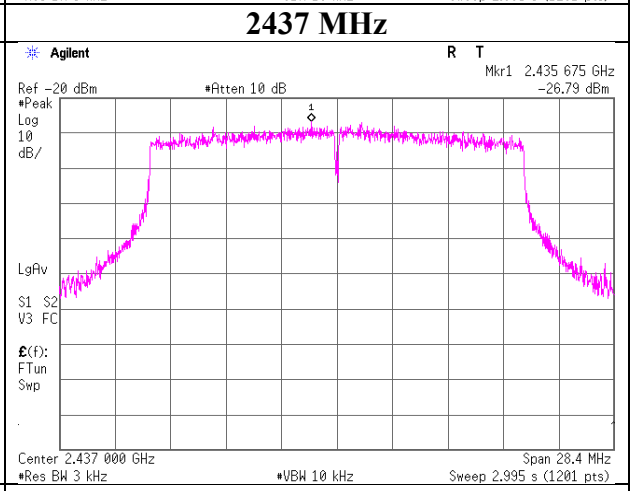


11ax-20 (OFDM) Antenna 2

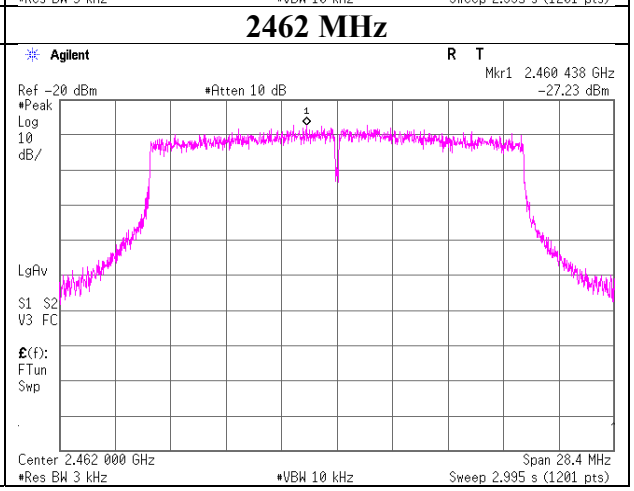
2412 MHz



2437 MHz



2462 MHz



Power Density
(WLAN)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 1, 2022
Temperature / Humidity	24 deg. C / 35 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ax-20 (26-tone RU)

Antenna 1 + Antenna 2

RU Type	Freq. [MHz]	RU Index	Antenna 1 Result [mW]	Antenna 2 Result [mW]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
26-tone RU	2412	0	0.022	0.018	-14.04	0.039	8.00	22.04
		4	0.019	0.018	-14.28	0.037	8.00	22.28
		8	0.024	0.018	-13.83	0.041	8.00	21.83
	2437	0	0.028	0.021	-13.09	0.049	8.00	21.09
		4	0.021	0.019	-14.02	0.040	8.00	22.02
		8	0.022	0.017	-14.14	0.039	8.00	22.14
	2462	0	0.019	0.019	-14.17	0.038	8.00	22.17
		4	0.022	0.016	-14.25	0.038	8.00	22.25
		8	0.021	0.020	-13.92	0.041	8.00	21.92

Sample Calculation:
Result = Antenna 1 + Antenna 2

Antenna 1

RU Type	Freq. [MHz]	RU Index	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
26-tone RU	2412	0	-26.73	0.60	9.53	-16.60	0.022	8.00	24.60
		4	-27.38	0.60	9.53	-17.25	0.019	8.00	25.25
		8	-26.36	0.60	9.53	-16.23	0.024	8.00	24.23
	2437	0	-25.72	0.60	9.53	-15.59	0.028	8.00	23.59
		4	-26.96	0.60	9.53	-16.83	0.021	8.00	24.83
		8	-26.75	0.60	9.53	-16.62	0.022	8.00	24.62
	2462	0	-27.24	0.60	9.53	-17.11	0.019	8.00	25.11
		4	-26.78	0.60	9.53	-16.65	0.022	8.00	24.65
		8	-26.93	0.60	9.53	-16.80	0.021	8.00	24.80

Antenna 2

RU Type	Freq. [MHz]	RU Index	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
26-tone RU	2412	0	-27.60	0.52	9.53	-17.55	0.018	8.00	25.55
		4	-27.39	0.52	9.53	-17.34	0.018	8.00	25.34
		8	-27.59	0.52	9.53	-17.54	0.018	8.00	25.54
	2437	0	-26.73	0.52	9.53	-16.68	0.021	8.00	24.68
		4	-27.30	0.52	9.53	-17.25	0.019	8.00	25.25
		8	-27.81	0.52	9.53	-17.76	0.017	8.00	25.76
	2462	0	-27.31	0.52	9.53	-17.26	0.019	8.00	25.26
		4	-28.02	0.52	9.53	-17.97	0.016	8.00	25.97
		8	-27.11	0.52	9.53	-17.06	0.020	8.00	25.06

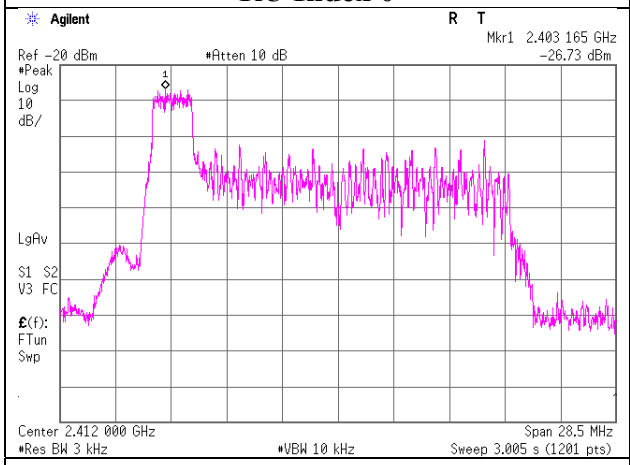
Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

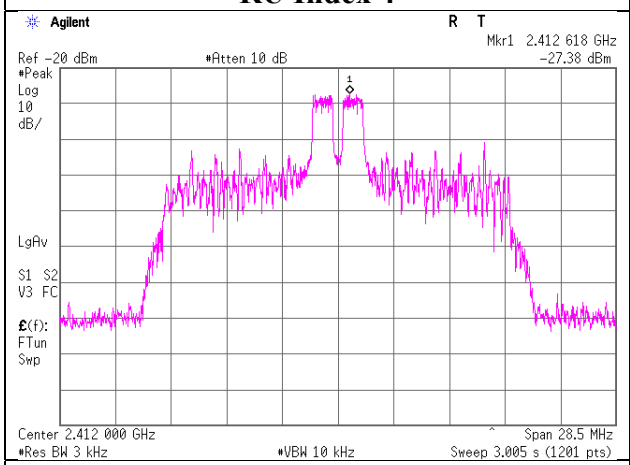
Power Density
(WLAN)

11ax-20 26-tone RU 2412 MHz Antenna 1

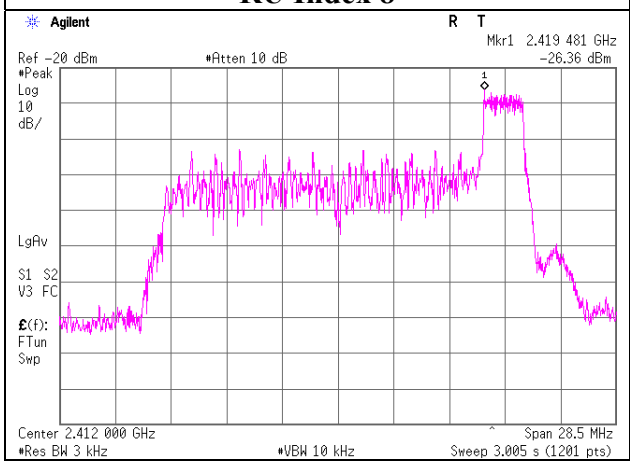
RU Index 0



RU Index 4

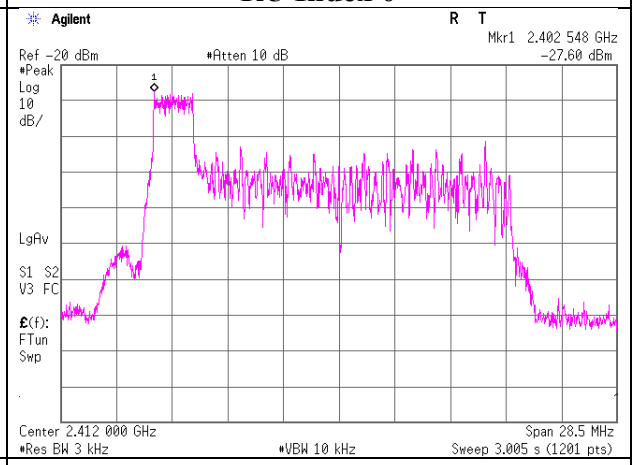


RU Index 8

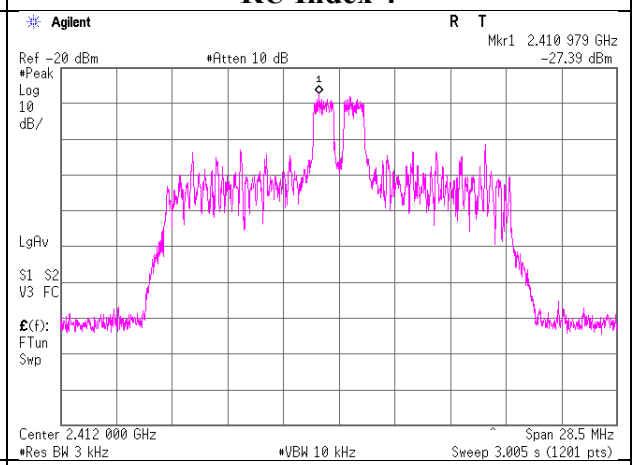


11ax-20 26-tone RU 2412 MHz Antenna 2

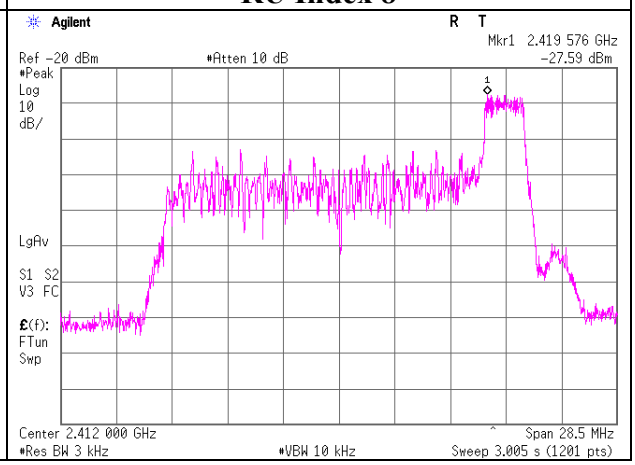
RU Index 0



RU Index 4



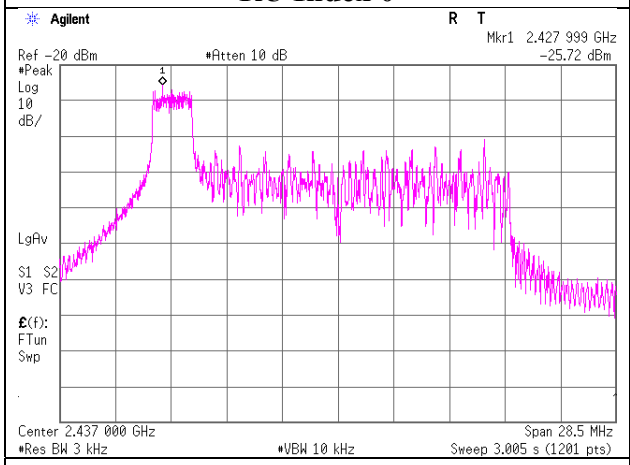
RU Index 8



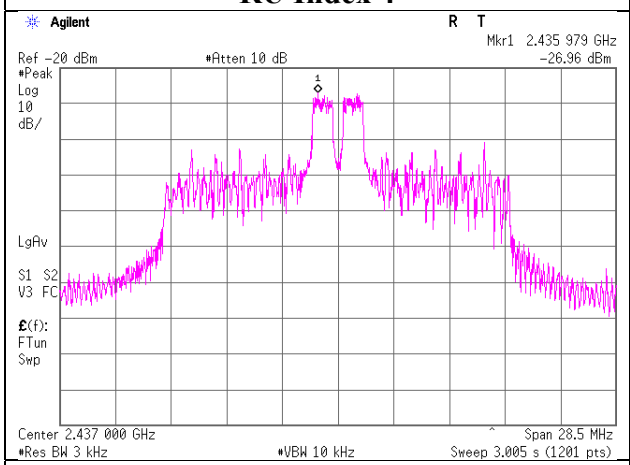
Power Density
(WLAN)

11ax-20 26-tone RU 2437 MHz Antenna 1

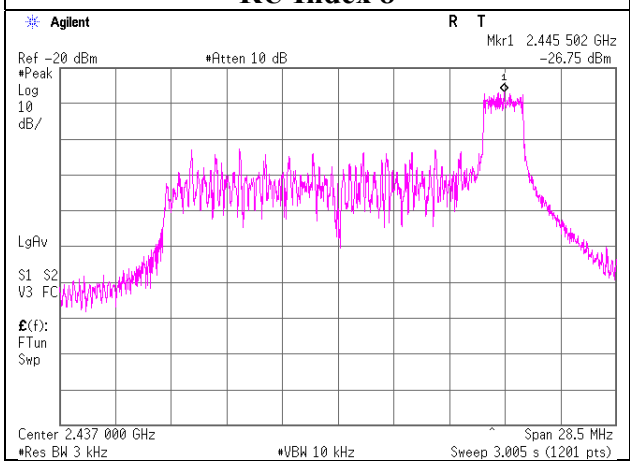
RU Index 0



RU Index 4

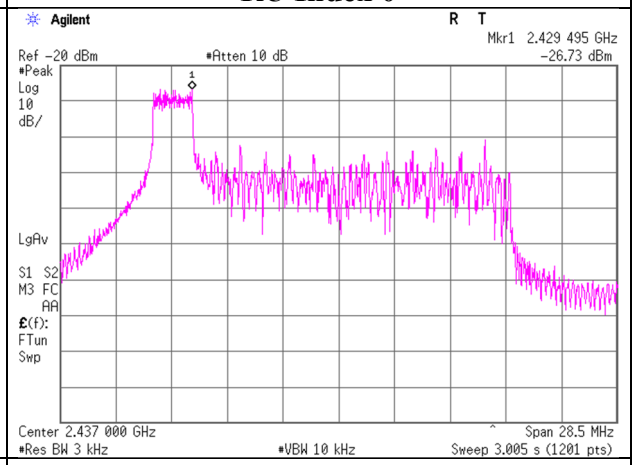


RU Index 8

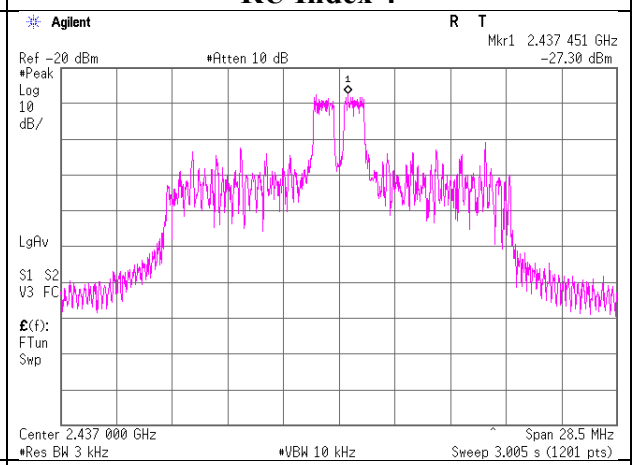


11ax-20 26-tone RU 2437 MHz Antenna 2

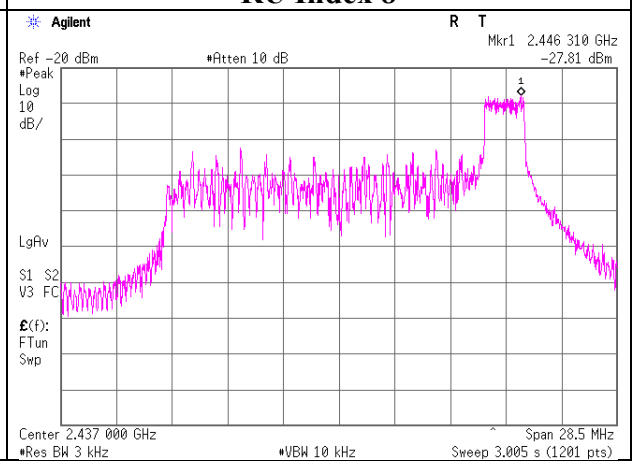
RU Index 0



RU Index 4



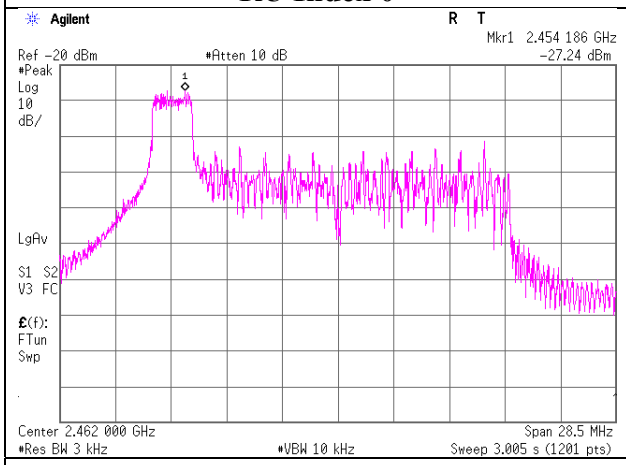
RU Index 8



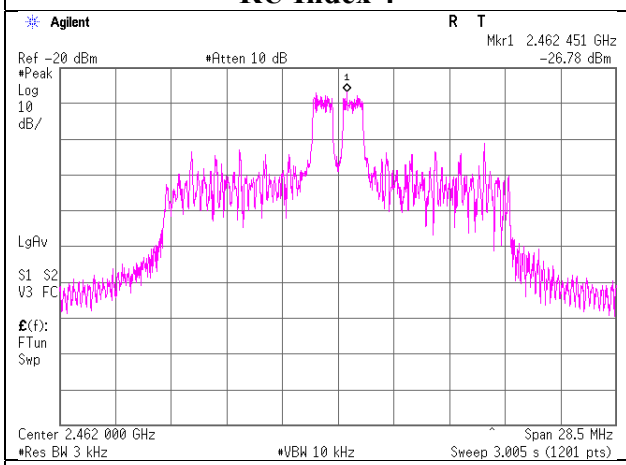
Power Density
(WLAN)

11ax-20 26-tone RU 2462 MHz Antenna 1

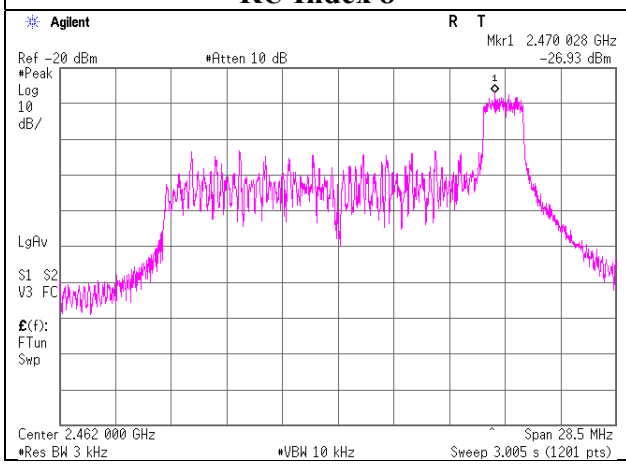
RU Index 0



RU Index 4

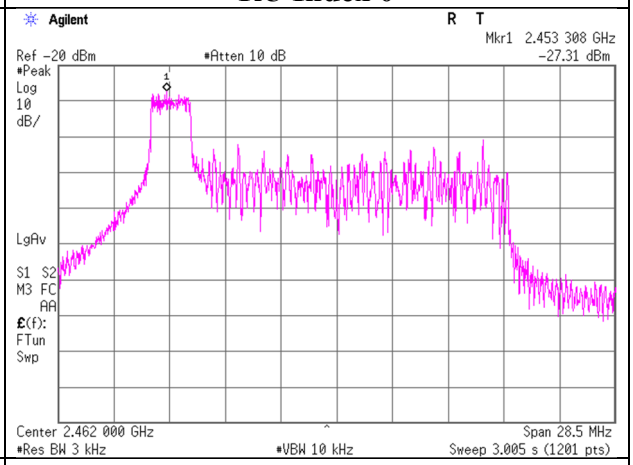


RU Index 8

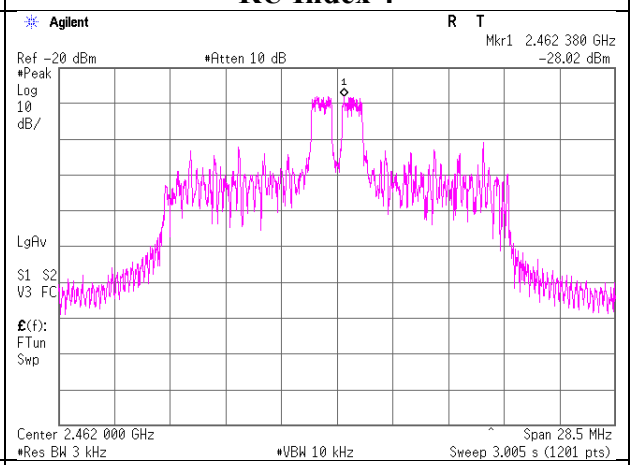


11ax-20 26-tone RU 2462 MHz Antenna 2

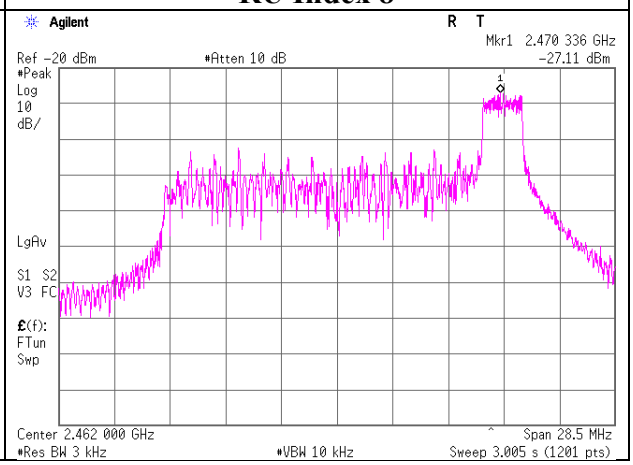
RU Index 0



RU Index 4



RU Index 8



Power Density
(WLAN)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 1, 2022
Temperature / Humidity	24 deg. C / 35 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ax-20 (52-tone RU)

Antenna 1 + Antenna 2

RU Type	Freq. [MHz]	RU Index	Antenna 1 Result [mW]	Antenna 2 Result [mW]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
52-tone RU	2412	37	0.025	0.019	-13.58	0.044	8.00	21.58
		38	0.025	0.018	-13.63	0.043	8.00	21.63
		40	0.025	0.020	-13.51	0.045	8.00	21.51
	2437	37	0.023	0.020	-13.62	0.043	8.00	21.62
		38	0.022	0.020	-13.85	0.041	8.00	21.85
		40	0.024	0.021	-13.40	0.046	8.00	21.40
	2462	37	0.022	0.021	-13.57	0.044	8.00	21.57
		38	0.025	0.020	-13.49	0.045	8.00	21.49
		40	0.023	0.023	-13.38	0.046	8.00	21.38

Sample Calculation:
Result = Antenna 1 + Antenna 2

Antenna 1

RU Type	Freq. [MHz]	RU Index	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
52-tone RU	2412	37	-26.11	0.60	9.53	-15.98	0.025	8.00	23.98
		38	-26.08	0.60	9.53	-15.95	0.025	8.00	23.95
		40	-26.21	0.60	9.53	-16.08	0.025	8.00	24.08
	2437	37	-26.43	0.60	9.53	-16.30	0.023	8.00	24.30
		38	-26.77	0.60	9.53	-16.64	0.022	8.00	24.64
		40	-26.24	0.60	9.53	-16.11	0.024	8.00	24.11
	2462	37	-26.62	0.60	9.53	-16.49	0.022	8.00	24.49
		38	-26.15	0.60	9.53	-16.02	0.025	8.00	24.02
		40	-26.47	0.60	9.53	-16.34	0.023	8.00	24.34

Antenna 2

RU Type	Freq. [MHz]	RU Index	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
52-tone RU	2412	37	-27.36	0.52	9.53	-17.31	0.019	8.00	25.31
		38	-27.52	0.52	9.53	-17.47	0.018	8.00	25.47
		40	-27.06	0.52	9.53	-17.01	0.020	8.00	25.01
	2437	37	-27.04	0.52	9.53	-16.99	0.020	8.00	24.99
		38	-27.14	0.52	9.53	-17.09	0.020	8.00	25.09
		40	-26.79	0.52	9.53	-16.74	0.021	8.00	24.74
	2462	37	-26.73	0.52	9.53	-16.68	0.021	8.00	24.68
		38	-27.09	0.52	9.53	-17.04	0.020	8.00	25.04
		40	-26.50	0.52	9.53	-16.45	0.023	8.00	24.45

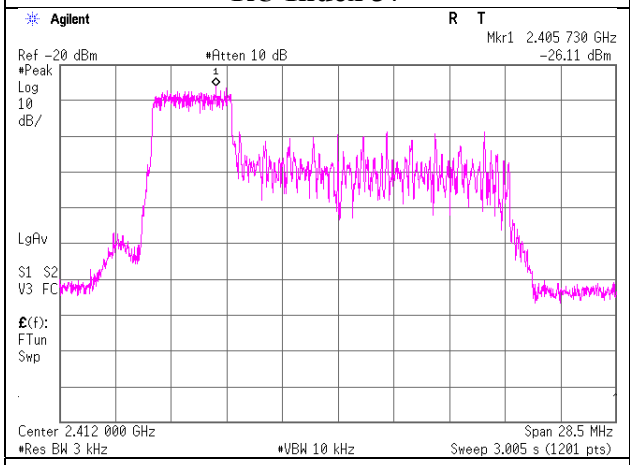
Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

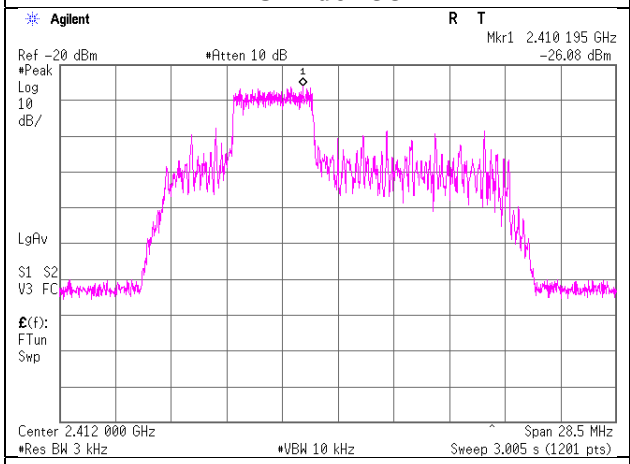
Power Density
(WLAN)

11ax-20 52-tone RU 2412 MHz Antenna 1

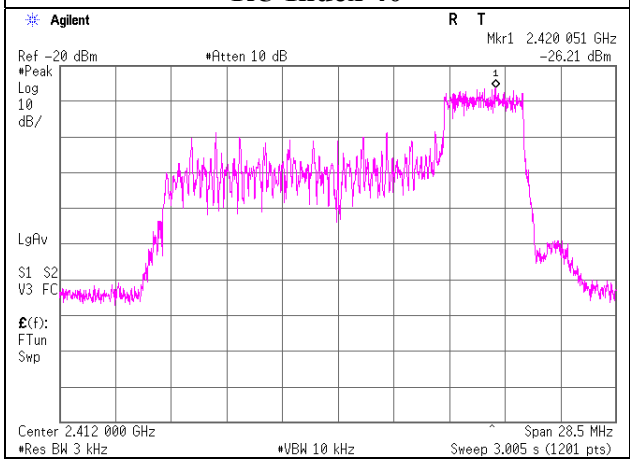
RU Index 37



RU Index 38

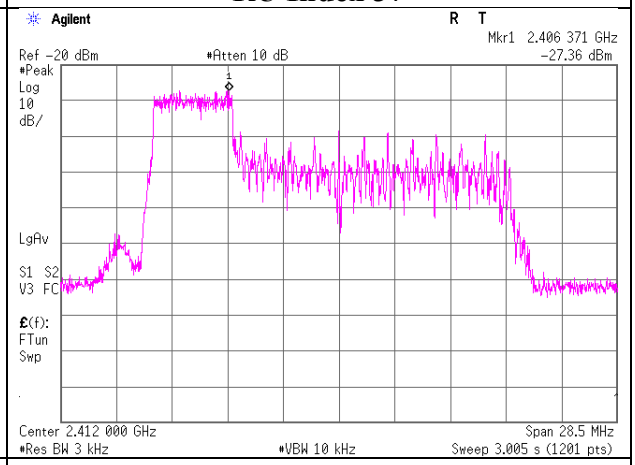


RU Index 40

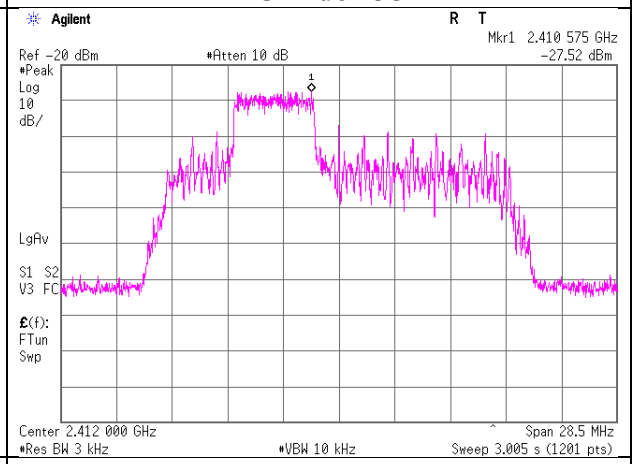


11ax-20 52-tone RU 2412 MHz Antenna 2

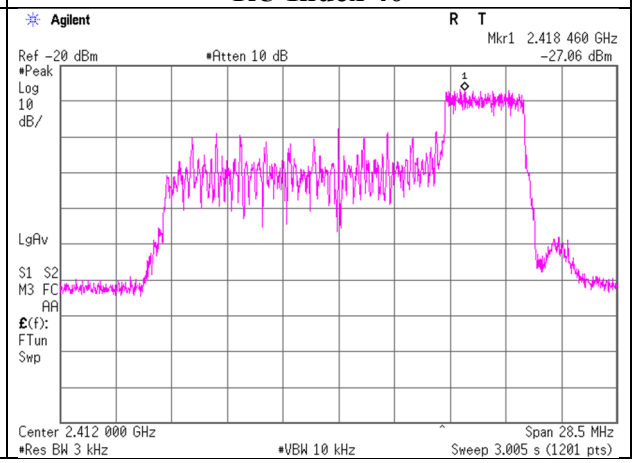
RU Index 37



RU Index 38



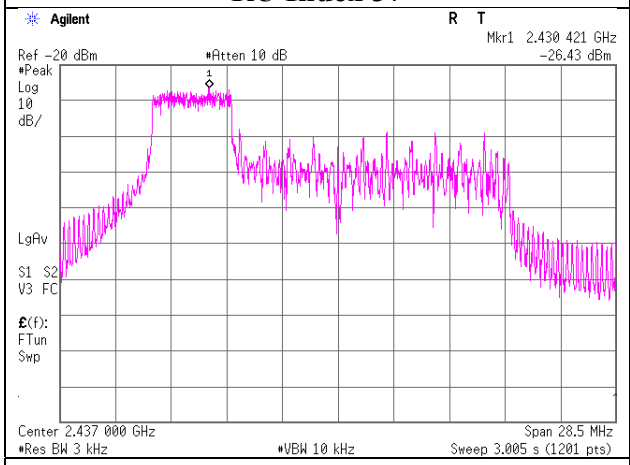
RU Index 40



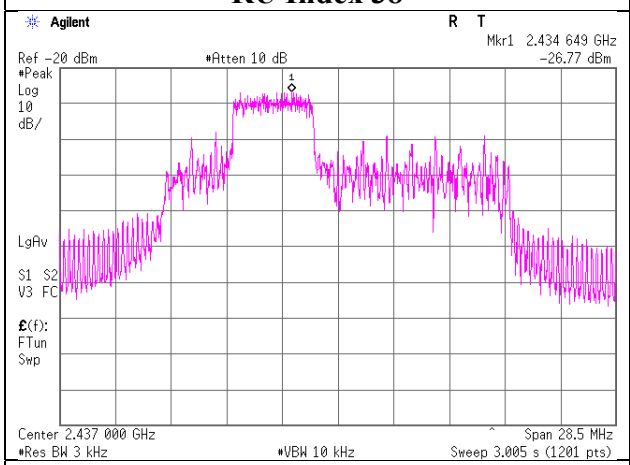
Power Density
(WLAN)

11ax-20 52-tone RU 2437 MHz Antenna 1

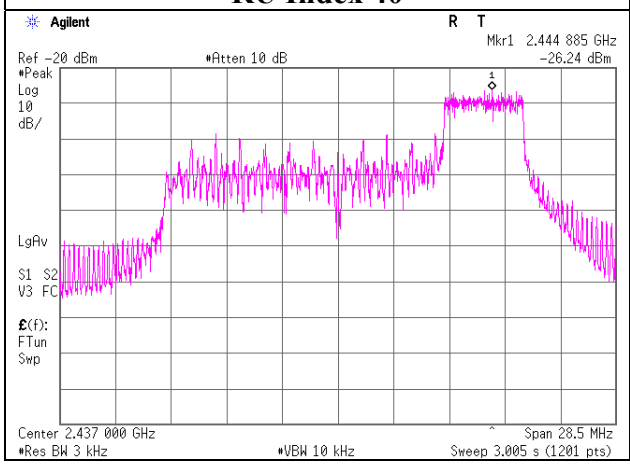
RU Index 37



RU Index 38

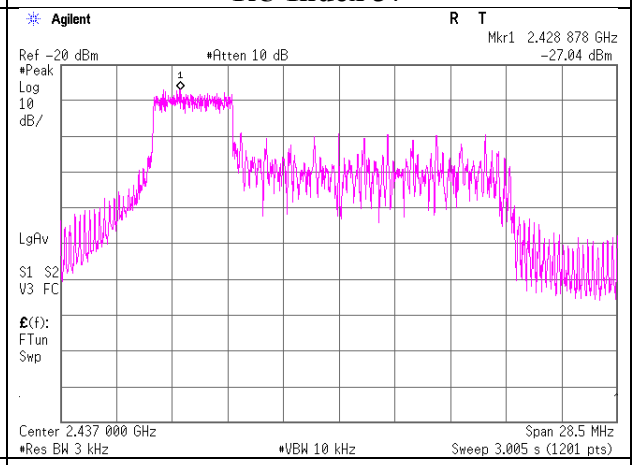


RU Index 40

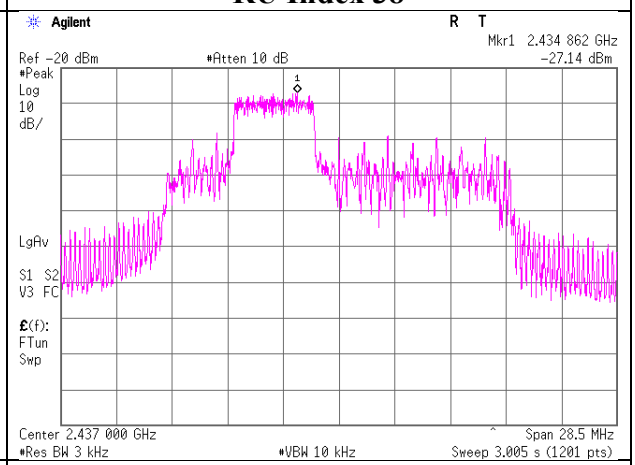


11ax-20 52-tone RU 2437 MHz Antenna 2

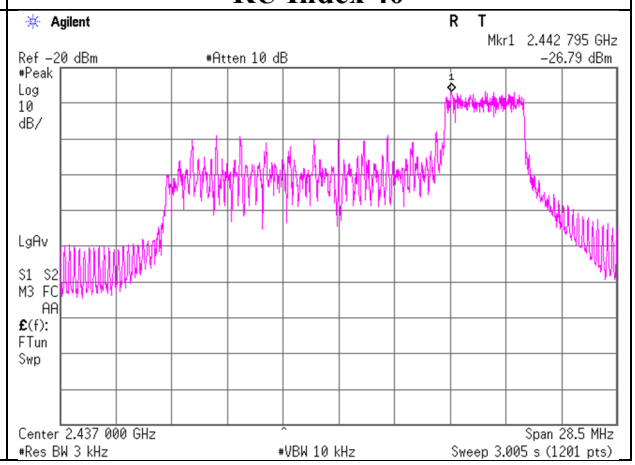
RU Index 37



RU Index 38



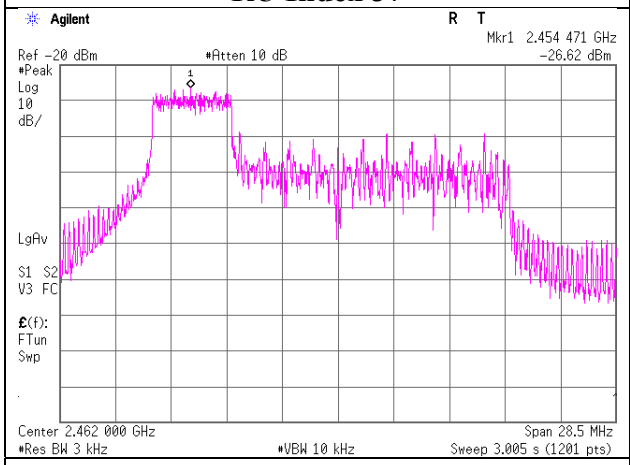
RU Index 40



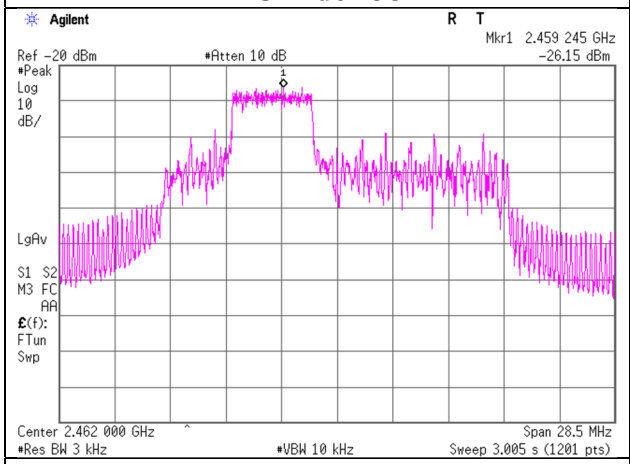
Power Density
(WLAN)

11ax-20 52-tone RU 2462 MHz Antenna 1

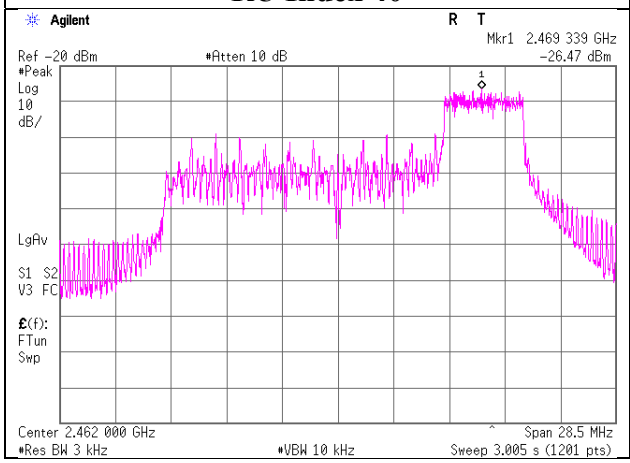
RU Index 37



RU Index 38

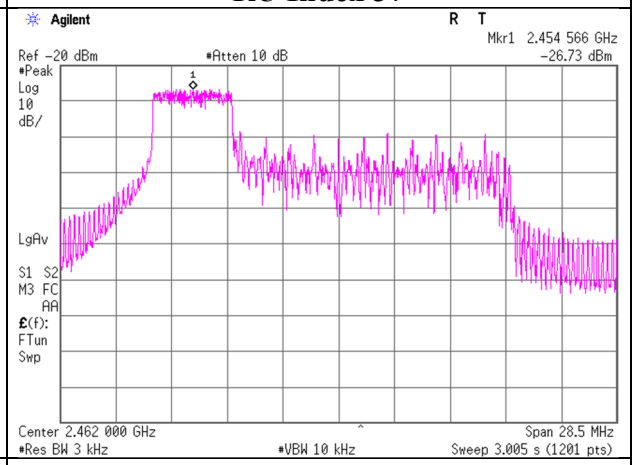


RU Index 40

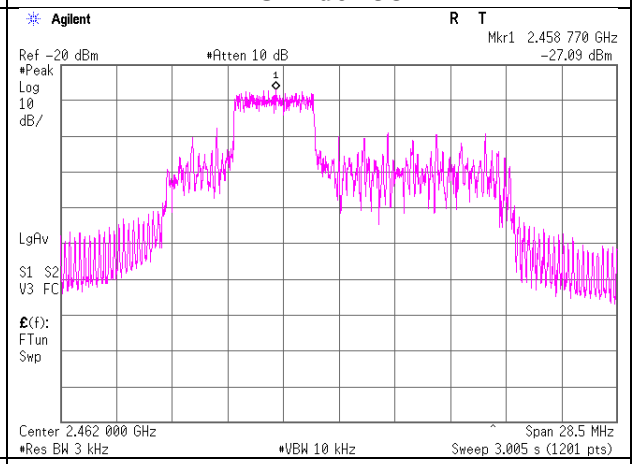


11ax-20 52-tone RU 2462 MHz Antenna 2

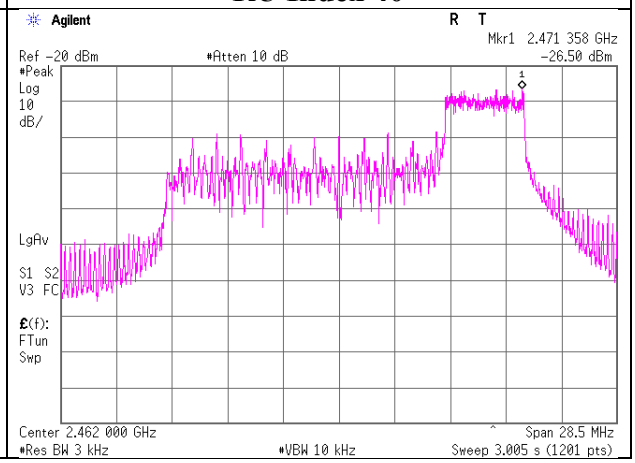
RU Index 37



RU Index 38



RU Index 40



Power Density
(WLAN)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 1, 2022
Temperature / Humidity	24 deg. C / 35 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ax-20 (106-tone RU)

Antenna 1 + Antenna 2

RU Type	Freq. [MHz]	RU Index	Antenna 1 Result [mW]	Antenna 2 Result [mW]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
106-tone RU	2412	53	0.024	0.022	-13.42	0.046	8.00	21.42
		54	0.022	0.022	-13.56	0.044	8.00	21.56
	2437	53	0.021	0.025	-13.46	0.045	8.00	21.46
		54	0.026	0.018	-13.56	0.044	8.00	21.56
	2462	53	0.026	0.023	-13.13	0.049	8.00	21.13
		54	0.026	0.021	-13.26	0.047	8.00	21.26

Sample Calculation:
Result = Antenna 1 + Antenna 2

Antenna 1

RU Type	Freq. [MHz]	RU Index	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
106-tone RU	2412	53	-26.40	0.60	9.53	-16.27	0.024	8.00	24.27
		54	-26.64	0.60	9.53	-16.51	0.022	8.00	24.51
	2437	53	-27.00	0.60	9.53	-16.87	0.021	8.00	24.87
		54	-26.05	0.60	9.53	-15.92	0.026	8.00	23.92
	2462	53	-26.02	0.60	9.53	-15.89	0.026	8.00	23.89
		54	-26.02	0.60	9.53	-15.89	0.026	8.00	23.89

Antenna 2

RU Type	Freq. [MHz]	RU Index	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Result [mW / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
106-tone RU	2412	53	-26.64	0.52	9.53	-16.59	0.022	8.00	24.59
		54	-26.68	0.52	9.53	-16.63	0.022	8.00	24.63
	2437	53	-26.15	0.52	9.53	-16.10	0.025	8.00	24.10
		54	-27.39	0.52	9.53	-17.34	0.018	8.00	25.34
	2462	53	-26.46	0.52	9.53	-16.41	0.023	8.00	24.41
		54	-26.73	0.52	9.53	-16.68	0.021	8.00	24.68

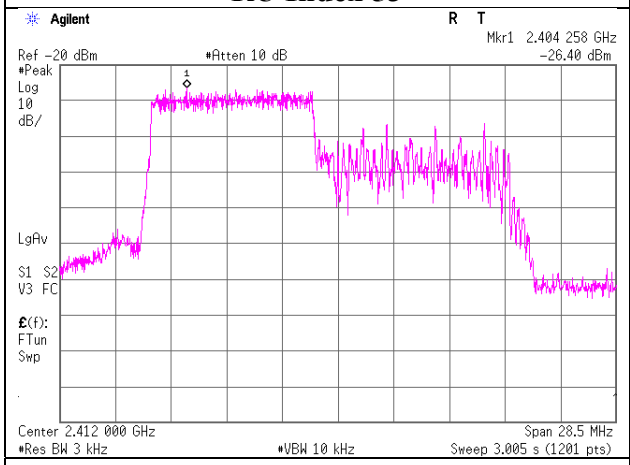
Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

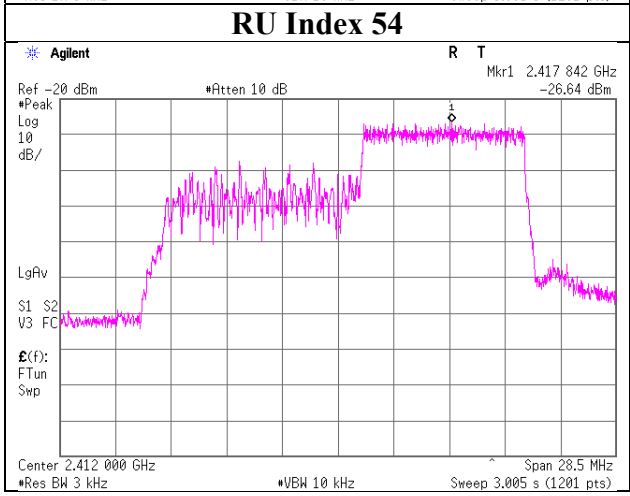
Power Density
(WLAN)

11ax-20 106-tone RU 2412 MHz Antenna 1

RU Index 53

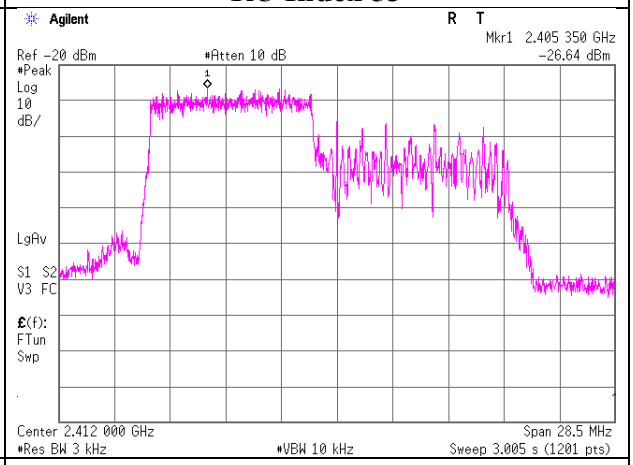


RU Index 54

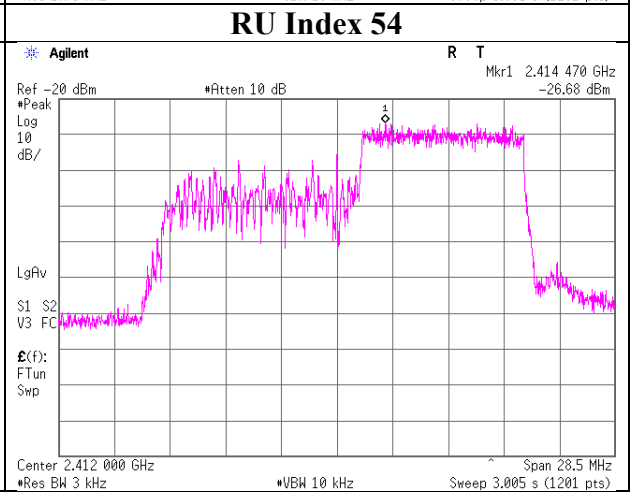


11ax-20 106-tone RU 2412 MHz Antenna 2

RU Index 53



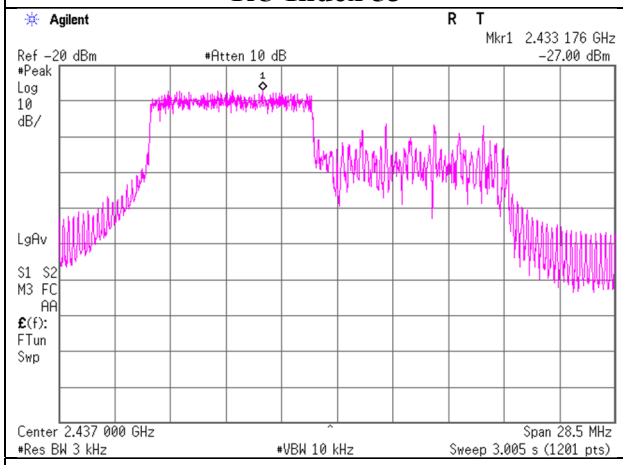
RU Index 54



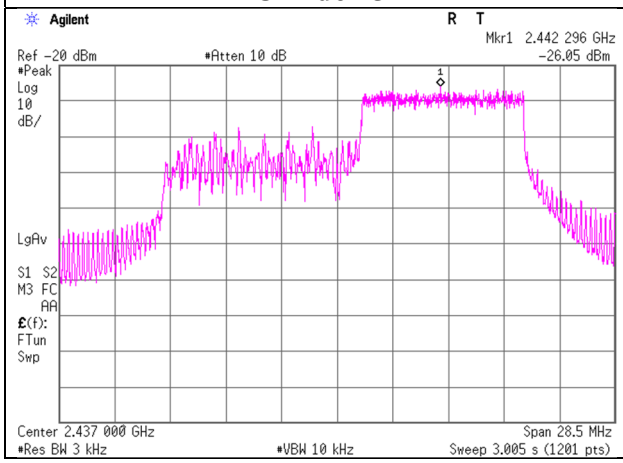
Power Density
(WLAN)

11ax-20 106-tone RU 2437 MHz Antenna 1

RU Index 53

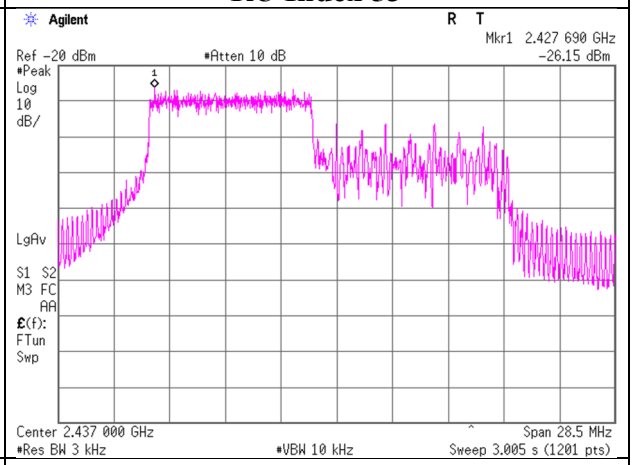


RU Index 54

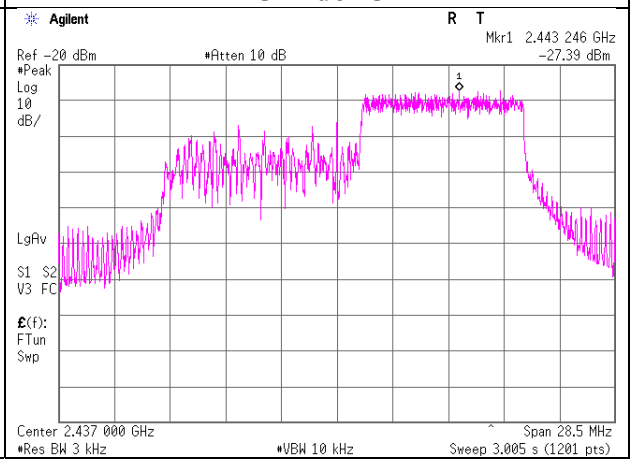


11ax-20 106-tone RU 2437 MHz Antenna 2

RU Index 53



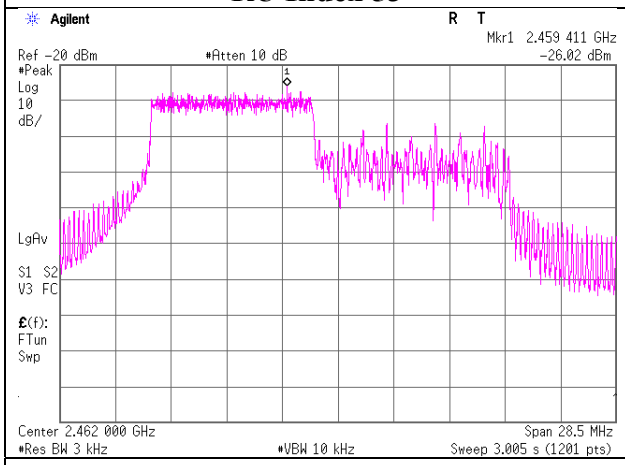
RU Index 54



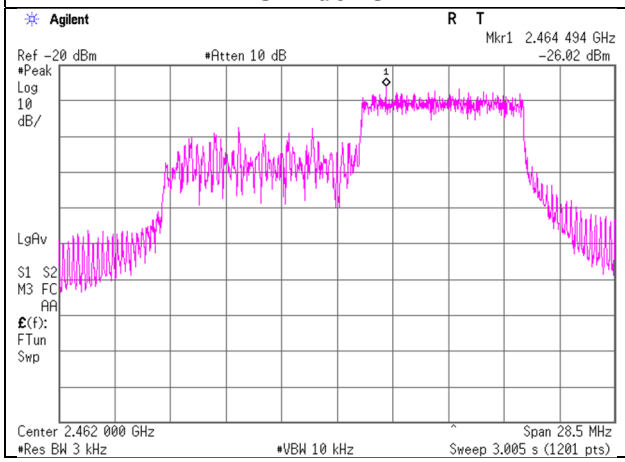
Power Density
(WLAN)

11ax-20 106-tone RU 2462 MHz Antenna 1

RU Index 53

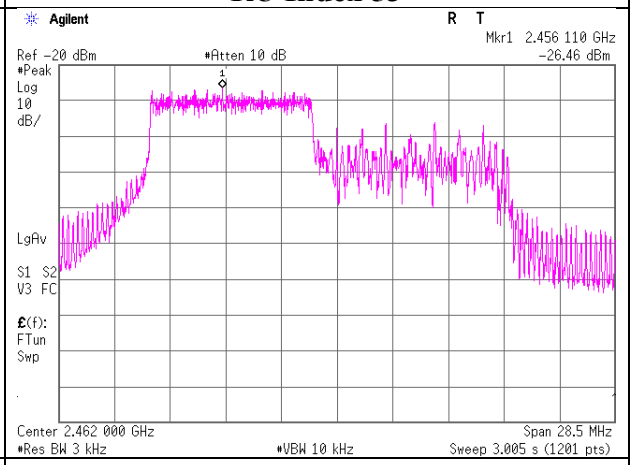


RU Index 54

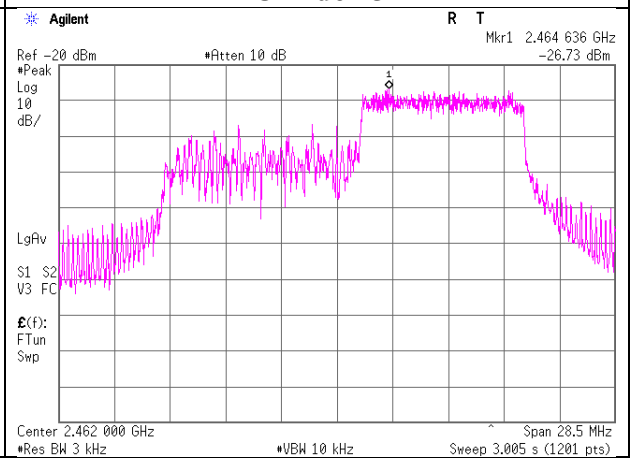


11ax-20 106-tone RU 2462 MHz Antenna 2

RU Index 53



RU Index 54



Power Density
(WLAN)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	February 1, 2022
Temperature / Humidity	24 deg. C / 35 % RH
Engineer	Takafumi Noguchi
Mode	Tx 11ax-20 (242-tone RU)

Antenna 1 + Antenna 2

Freq.	Antenna 1 Result	Antenna 2 Result	Result		Limit	Margin
[MHz]	[mW]	[mW]	[dBm / 3 kHz]	[mW / 3 kHz]	[dBm / 3 kHz]	[dB]
2412	0.030	0.026	-12.51	0.056	8.00	20.51
2437	0.025	0.023	-13.20	0.048	8.00	21.20
2462	0.023	0.020	-13.63	0.043	8.00	21.63

Antenna 1

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm / 3 kHz]	[mW / 3 kHz]	[dBm / 3 kHz]	[dB]
2412	-25.33	0.60	9.53	-15.20	0.030	8.00	23.20
2437	-26.14	0.60	9.53	-16.01	0.025	8.00	24.01
2462	-26.54	0.60	9.53	-16.41	0.023	8.00	24.41

Antenna 2

Freq.	Reading	Cable Loss	Atten. Loss	Result		Limit	Margin
[MHz]	[dBm]	[dB]	[dB]	[dBm / 3 kHz]	[mW / 3 kHz]	[dBm / 3 kHz]	[dB]
2412	-25.91	0.52	9.53	-15.86	0.026	8.00	23.86
2437	-26.46	0.52	9.53	-16.41	0.023	8.00	24.41
2462	-26.94	0.52	9.53	-16.89	0.020	8.00	24.89

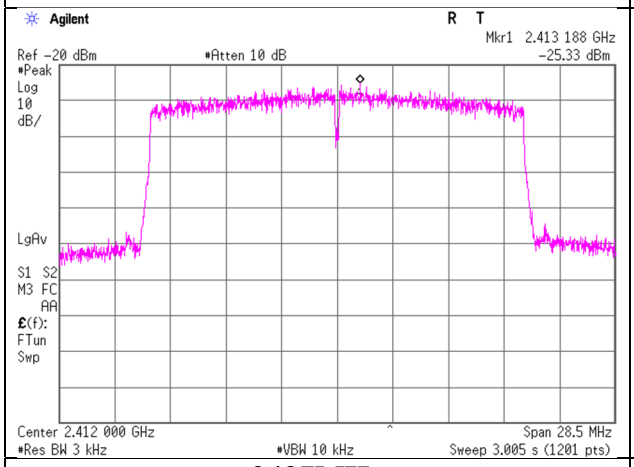
Sample Calculation:

Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

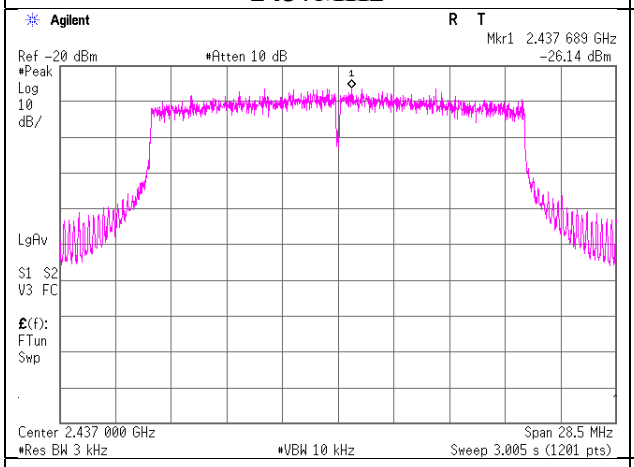
Power Density
(WLAN)

11ax-20 (242-tone RU) Antenna 1

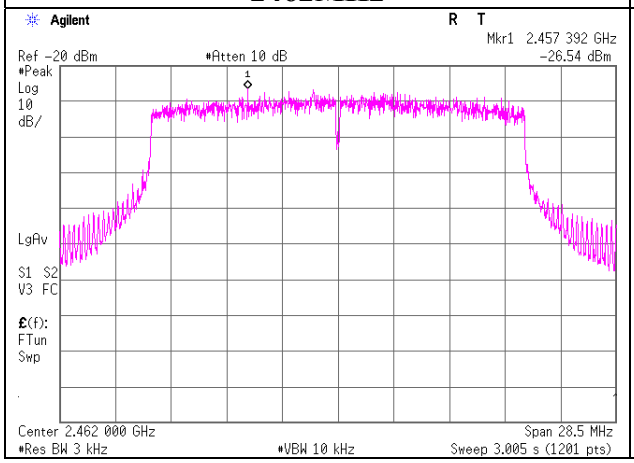
2412MHz



2437MHz

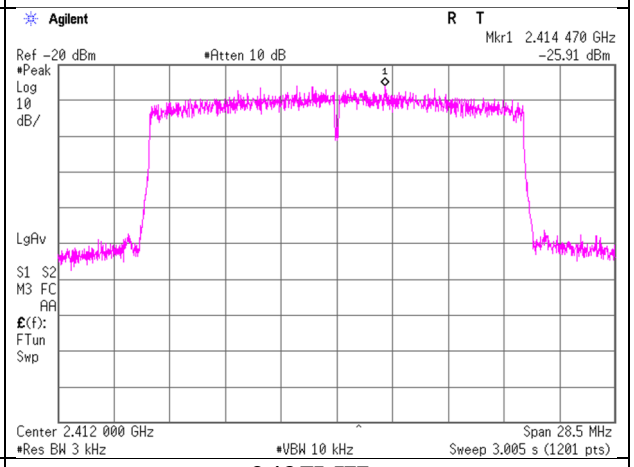


2462MHz

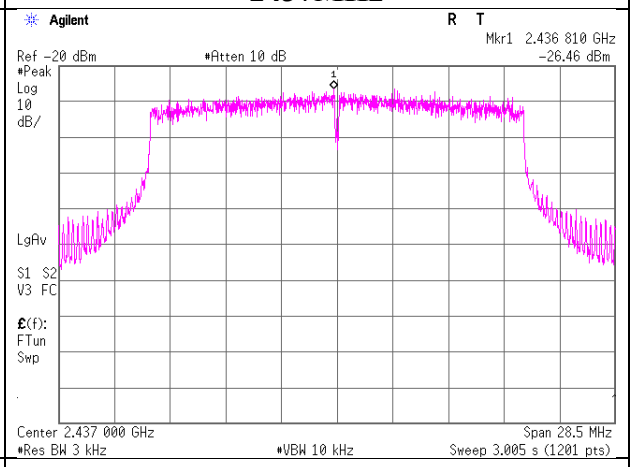


11ax-20 (242-tone RU) Antenna 2

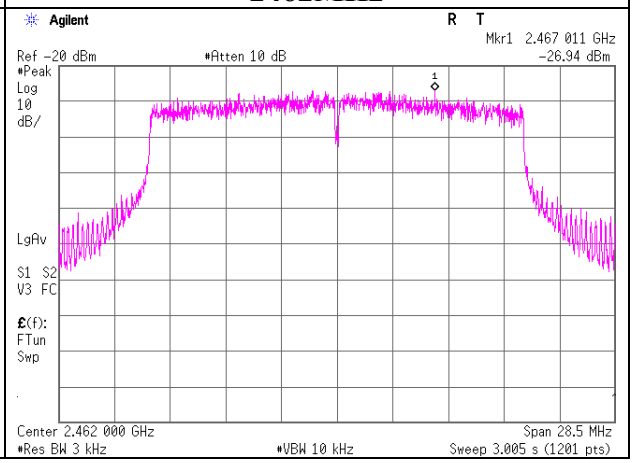
2412MHz



2437MHz



2462MHz



Power Density
(BT1 / BT2)

Test place	Ise EMC Lab. No.8 Measurement Room
Date	January 31, 2022
Temperature / Humidity	24 deg. C / 40 % RH
Engineer	Kiyoshiro Okazaki
Mode	Tx BT LE

BT1

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
1M-PHY	2402	-24.65	0.65	9.53	-14.47	8.00	22.47
	2440	-24.45	0.65	9.53	-14.27	8.00	22.27
	2480	-24.81	0.65	9.54	-14.62	8.00	22.62
2M-PHY	2402	-27.03	0.65	9.53	-16.85	8.00	24.85
	2440	-26.82	0.65	9.53	-16.64	8.00	24.64
	2480	-27.30	0.65	9.54	-17.11	8.00	25.11

BT2

Mode	Freq. [MHz]	Reading [dBm]	Cable Loss [dB]	Atten. Loss [dB]	Result [dBm / 3 kHz]	Limit [dBm / 3 kHz]	Margin [dB]
1M-PHY	2402	-25.01	0.60	9.53	-14.88	8.00	22.88
	2440	-25.23	0.60	9.53	-15.10	8.00	23.10
	2480	-25.11	0.60	9.54	-14.97	8.00	22.97
2M-PHY	2402	-27.63	0.60	9.53	-17.50	8.00	25.50
	2440	-27.36	0.60	9.53	-17.23	8.00	25.23
	2480	-27.41	0.60	9.54	-17.27	8.00	25.27

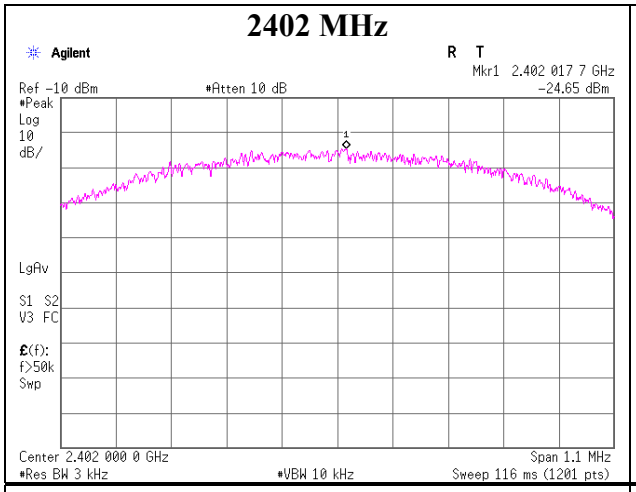
Sample Calculation:
Result = Reading + Cable Loss (including the cable(s) customer supplied) + Attenuator Loss

*The equipment and cables were not used for factor 0 dB of the data sheets.

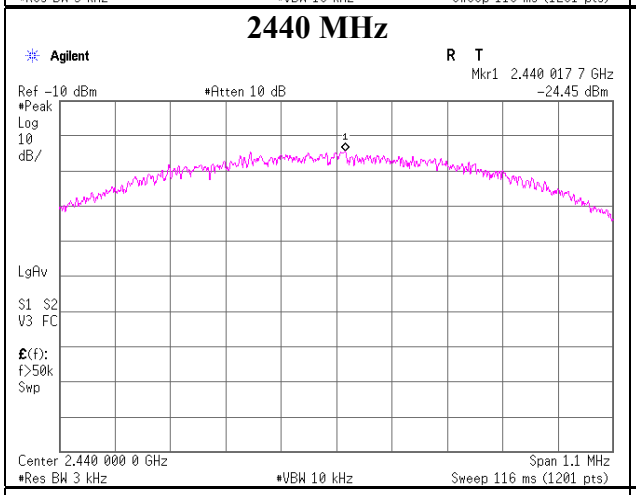
Power Density
(BT1)

BT LE 1M-PHY

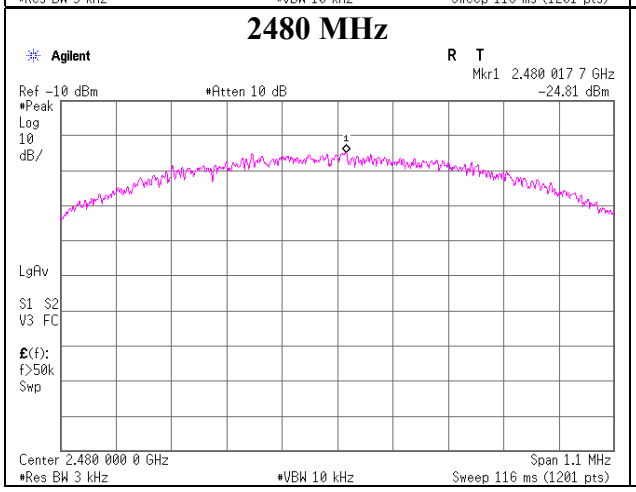
2402 MHz



2440 MHz

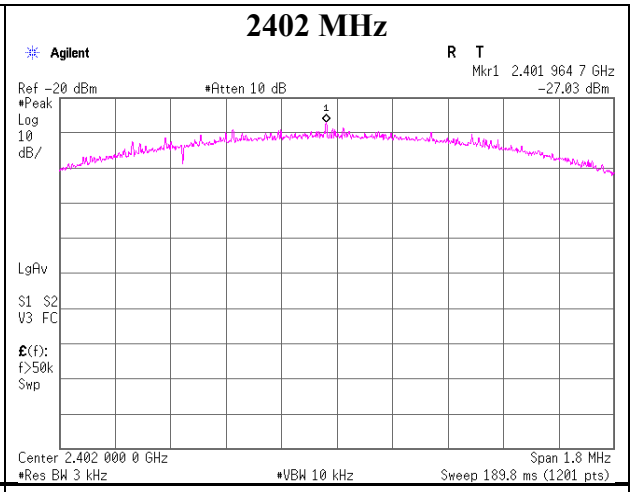


2480 MHz

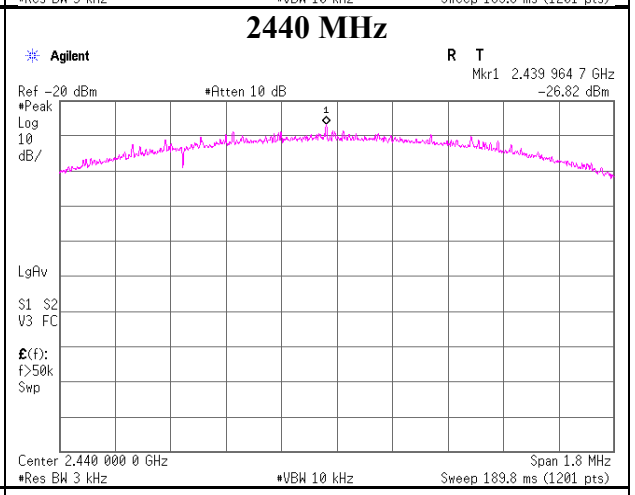


BT LE 2M-PHY

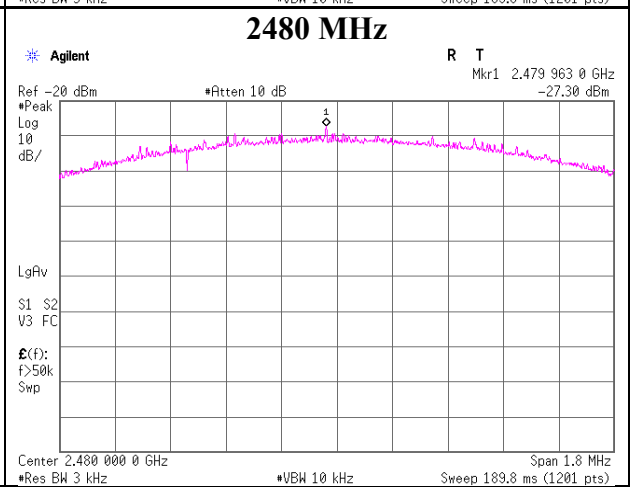
2402 MHz



2440 MHz



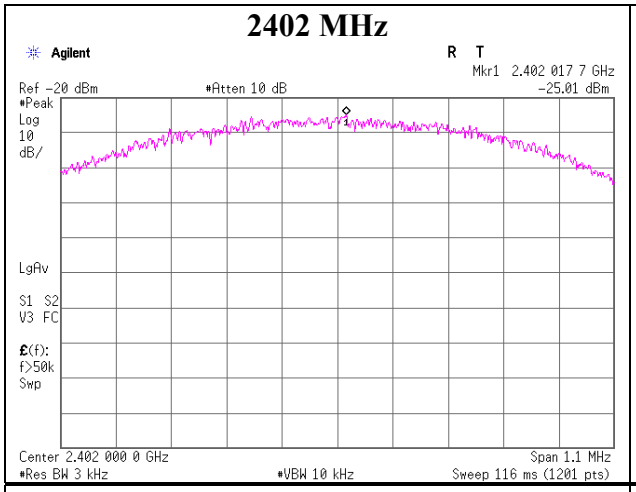
2480 MHz



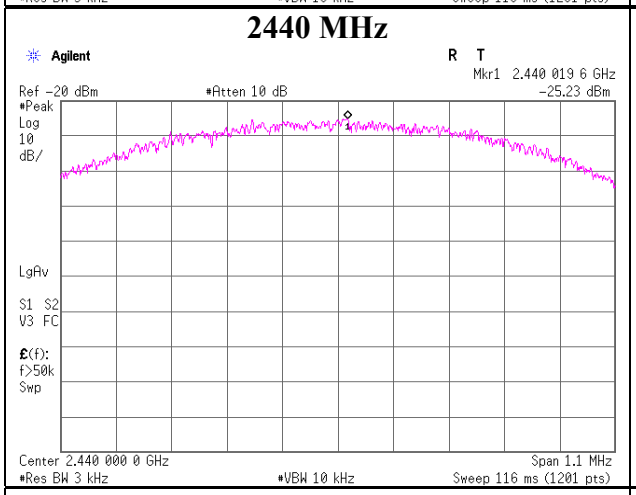
Power Density
(BT2)

BT LE 1M-PHY

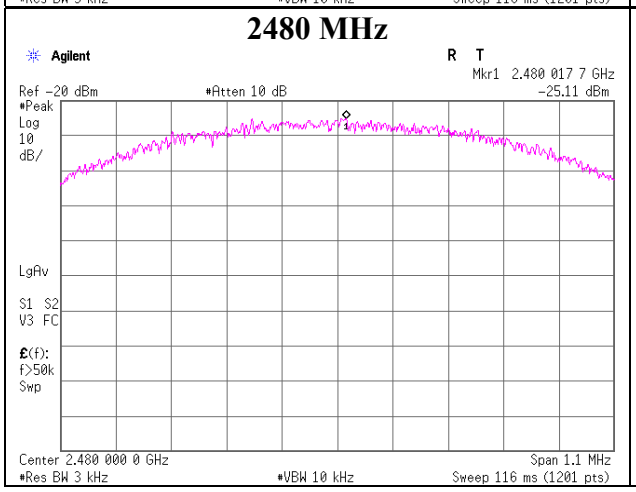
2402 MHz



2440 MHz

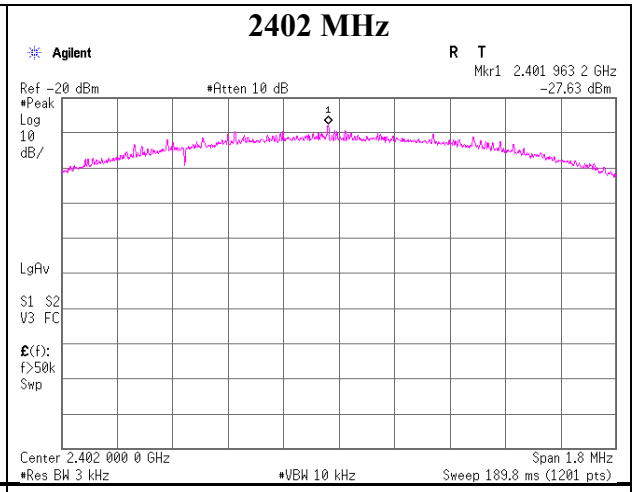


2480 MHz

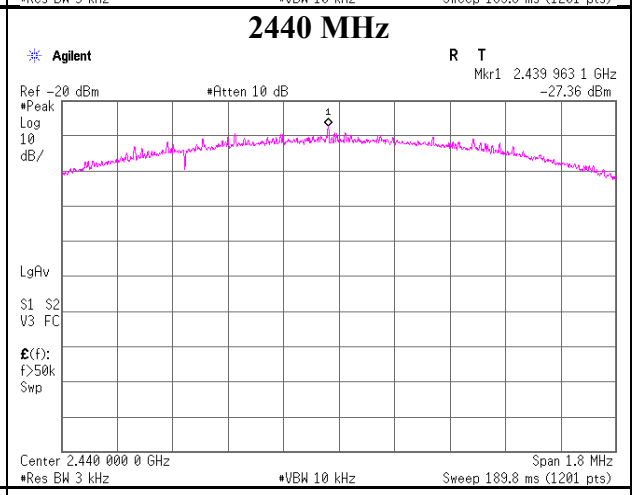


BT LE 2M-PHY

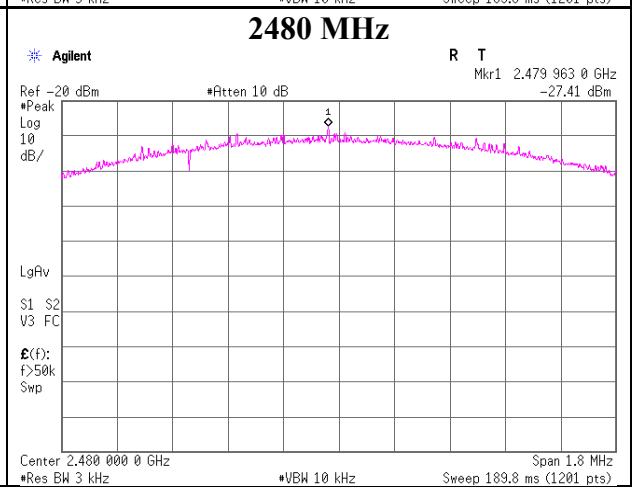
2402 MHz



2440 MHz



2480 MHz



APPENDIX 2: Test Instruments

Test equipment (1/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
CE	MAEC-03	142008	AC3_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	05/22/2020	24
CE	MOS-13	141554	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	1301	01/10/2022	12
CE	MMM-08	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	51201197	01/16/2022	12
CE	MJM-16	142183	Measure	KOMELON	KMC-36	-	-	-
CE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
CE	MLS-24	141358	LISN(AMN)	Schwarzbeck Mess-Elektronik OHG	NSLK8127	8127-730	07/18/2021	12
CE	MTR-03	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	08/05/2021	12
CE	MAT-67	141248	Attenuator	JFW Industries, Inc.	50FP-013H2 N	-	12/17/2021	12
CE	MCC-112	141216	Coaxial cable	Fujikura/Suhner/TSJ	5D-2W/SFM14/ sucoform141-PE/ 421-010/ RFM-E321(SW)	-/00640	07/19/2021	12
CE	MSA-16	141903	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46186390	01/07/2022	12
RE	MAEC-03	142008	AC3_Semi Anechoic Chamber(NSA)	TDK	Semi Anechoic Chamber 3m	DA-10005	05/22/2020	24
RE	MOS-13	141554	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	1301	01/10/2022	12
RE	MMM-08	141532	DIGITAL HiTESTER	HIOKI E.E. CORPORATION	3805	51201197	01/16/2022	12
RE	MJM-16	142183	Measure	KOMELON	KMC-36	-	-	-
RE	COTS-MEMI-02	178648	EMI measurement program	TSJ (Techno Science Japan)	TEPTO-DV	-	-	-
RE	MAEC-03-SVSWR	142013	AC3_Semi Anechoic Chamber(SVSWR)	TDK	Semi Anechoic Chamber 3m	DA-10005	04/01/2021	24
RE	MSA-03	141884	Spectrum Analyzer	Keysight Technologies Inc	E4448A	MY44020357	03/10/2021	12
RE	MHA-20	141507	Horn Antenna 1-18GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9120D	258	11/09/2021	12
RE	MPA-11	141580	MicroWave System Amplifier	Keysight Technologies Inc	83017A	MY39500779	03/03/2021	12
RE	MCC-231	177964	Microwave Cable	Junkosha INC.	MMX221	1901S329(1m)/ 1902S579(5m)	03/04/2021	12
RE	MHF-25	141232	High Pass Filter 3.5-18.0GHz	UL Japan	HPF SELECTOR	001	09/30/2021	12
RE	MHA-16	141513	Horn Antenna 15-40GHz	Schwarzbeck Mess-Elektronik OHG	BBHA9170	BBHA9170306	06/07/2021	12
RE	MHF-22	141293	High Pass Filter 7-20GHz	TOKIMEC	TF37NCCB	602	02/18/2021	12
RE	MCC-177	141226	Microwave Cable	Junkosha	MMX221-00500DMSDMS	1502S304	03/01/2021	12
RE	MTR-03	141942	Test Receiver	Rohde & Schwarz	ESCI	100300	08/05/2021	12
RE	MAT-95	142314	Attenuator	Pasternack Enterprises	PE7390-6	D/C 1504	06/09/2021	12
RE	MBA-08	141427	Biconical Antenna	Schwarzbeck Mess-Elektronik OHG	VHA9103B+ BBA9106	08031	07/10/2021	12
RE	MCC-51	141323	Coaxial cable	UL Japan	-	-	07/19/2021	12
RE	MLA-22	141266	Logperiodic Antenna (200-1000MHz)	Schwarzbeck Mess-Elektronik OHG	VUSLP9111B	9111B-191	08/21/2021	12
RE	MPA-13	141582	Pre Amplifier	SONOMA INSTRUMENT	310	260834	02/18/2021	12

Test equipment (2/2)

Test Item	Local ID	LIMS ID	Description	Manufacturer	Model	Serial	Last Calibration Date	Cal Int
AT	MOS-28	141567	Thermo-Hygrometer	CUSTOM. Inc	CTH-201	0008	01/10/2022	12
AT	MMM-17	141557	DIGIITAL HiTESTER	HIOKI E.E. CORPORATION	3805	70900530	01/16/2022	12
AT	MAT-90	141223	Attenuator	Weinschel Associates	WA56-10	56100306	05/14/2021	12
AT	MSA-13	141900	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46185823	09/30/2021	12
AT	MRENT-130	141855	Spectrum Analyzer	Keysight Technologies Inc	E4440A	MY46187750	11/28/2021	12
AT	MPM-16	141812	Power Meter	Keysight Technologies Inc	8990B	MY51000271	08/11/2021	12
AT	MPSE-23	141835	Power sensor	Keysight Technologies Inc	N1923A	MY54070004	08/11/2021	12
AT	MAT-58	141334	Attenuator(10dB)	Suhner	6810.19.A	-	12/08/2021	12
AT	MAT-23	141361	Attenuator(10dB) 1-18GHz	Orient Microwave	BX10-0476-00	-	04/07/2021	12
AT	MAT-26	141244	Attenuator(10dB)	Weinschel - API Technologies Corp	WA8-10-34	A198	02/24/2021	12
AT	MTA-36	142820	Terminator	Baumer	50ΩSMA	-	-	-
AT	MTA-38	142821	Terminator	OMC	BL01-6118-00 (50Ω SMA)	-	-	-
AT	MTA-39	141929	Terminator	OMC	BL01-6118-00 (50Ω SMA)	-	2021/09/30	12

***Hyphens for Last Calibration Date and Cal Int (month) are instruments that Calibration is not required (e.g. software), or instruments checked in advance before use.**

The expiration date of the calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.

All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

Test item: **CE: Conducted Emission**
RE: Radiated Emission
AT: Antenna Terminal Conducted