# EMC Test Data

Client:	Vivint, Inc.	Job Number:	PR079234
Model:	CEOA	T-Log Number: TL079234-	TL079234-RA
wouer.	UE04	Project Manager:	Deepa Shetty
Contact:	Greg Hansen	Project Coordinator:	David Bare
Standard:	FCC 15.255	Class:	N/A

## Maximum Permissible Exposure

### Test Specific Details

NTS

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Test Engineer: David Bare

#### General Test Configuration

Calculation uses the free space transmission formula:

$$S = (PG)/(4 \pi d^2)$$

Where: S is power density (W/m<sup>2</sup>), P is output power (W), G is antenna gain relative to isotropic, d is separation distance from the transmitting antenna (m).

#### Summary of Results

Device complies with Power Density requirements at 20cm separation:	No
If not, required separation distance (in cm):	27.3

#### Modifications Made During Testing

No modifications were made to the EUT during testing

#### Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Vivint, Inc.						Job Number: F	PR079234
	0504						T-Log Number: T	FL079234-RA
Model:	CE04						Project Manager: [	
Contact:	Greg Hansen						Project Coordinator: [	
	FCC 15.255						Class: N	
Stanuaru.	100 10.200						01033.	
/IPE Calcu	lation for 60	GHz Wi-Fi	radio (Worst	case of FC	C and ISED	C limits)		
Jse:	General		Listed EUT p	owers are a	average			
ntenna:	Integral 23 c	lBi						
	FI	JT	Cable Loss	Ant	Dowor	<u> </u>	Power Density (S)	MPE Limit
Freq.		wer	Loss	Ant Gain	Power at Ant	EIRP	at 30 cm	at 30 cm
MHz	dBm	mW*	dB	dBi	dBm	mW	mW/cm <sup>2</sup>	mW/cm^2
58,320	7.4	5.5	0	23	7.4	1096.48	0.097	1.000
60,480	16.4	43.7	0	23	16.4	8709.64	0.770	1.000
62,640	16.7	46.8	0	23	16.7	9332.54	0.825	1.000
	S @ 30 cm mW/cm^2		MPE Limit mW/cm^2					
Freq. MHz						e where PE Limit	Ratio of PD to limit	
Freq. MHz 58320		cm^2		:m^2	S <= M	e where PE Limit 3cm	Ratio of PD to limit 9.7%	
MHz 58320 60480	mW/0.0 0.0 0.7	cm^2 )97 770	mW/c 1.00 1.00	200 00 00	S <= M 9.3 26.	PE Limit 3cm 3cm	9.7% 77.0%	
MHz 58320 60480 62640	mW/0 0.0 0.7 0.8	cm^2 097 770 325	mW/c 1.00 1.00 1.00	:m^2 00 00 00 00	S <= M 9.3 26. 27.	PE Limit 3cm 3cm 3cm	9.7%	
MH2 58320 60480 62640 MPE Calcu Jse:	mW/ 0.0 0.7 0.8 ation for 2.4 General Integral	cm^2 197 170 1225 I GHz Wi-Fi	mW/c 1.00 1.00 1.00	rm^2 00 00 00 t case of F0	S <= M 9.3 26. 27. CC and ISEE	PE Limit 3cm 3cm 3cm	9.7% 77.0% 82.5%	MPE Limit
MHz 58320 60480 62640 IPE Calcu Jse: Intenna:	mW/ 0.0 0.7 0.8 lation for 2.4 General Integral	cm^2 097 770 325	mW/c 1.00 1.00 1.00 radio (Worst	200 00 00 t case of F( Ant	S <= M 9.3 26. 27. CC and ISEE	PE Limit 3cm 3cm 3cm 0C limits)	9.7% 77.0%	MPE Limit at 30 cm
MHz 58320 60480 62640 IPE Calcu Ise: Intenna: Freq.	mW/ 0.0 0.7 0.8 lation for 2.4 General Integral EL	cm^2 097 70 225 I GHz Wi-Fi JT	mW/c 1.00 1.00 radio (Worst Cable Loss Loss	m^2 00 00 t case of F( Ant Gain	S <= M 9.3 26. 27. CC and ISEE Power at Ant	PE Limit 3cm 3cm 3cm 0C limits) EIRP	9.7% 77.0% 82.5% Power Density (S)	MPE Limit at 30 cm mW/cm^2
MHz 58320 60480 62640 IPE Calcu Jse: Intenna:	mW/ 0.0 0.7 0.8 lation for 2.4 General Integral	cm^2 097 170 1225 I GHz Wi-Fi JT	mW/c 1.00 1.00 1.00 radio (Worst	200 00 00 t case of F( Ant	S <= M 9.3 26. 27. CC and ISEE	PE Limit 3cm 3cm 3cm 0C limits)	9.7% 77.0% 82.5% Power Density (S) at 30 cm mW/cm^2 0.012	at 30 cm mW/cm^2 0.537
MHz 58320 60480 62640 //PE Calcu Jse: Antenna: Freq. MHz 2,412 2,437	mW/ 0.0 0.7 0.8 Jation for 2.4 General Integral EL Poy dBm 18.0 19.0	cm^2 097 70 325 I GHz Wi-Fi wer mW* 63.1 79.4	mW/c 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	m^2 00 00 00 t case of F( Ant Gain dBi 3.2 3.2	S <= M 9.3 26. 27. CC and ISEE Power at Ant dBm 18.0 19.0	PE Limit 3cm 3cm 3cm 0C limits) EIRP mW 131.83 165.96	9.7% 77.0% 82.5% Power Density (S) at 30 cm mW/cm^2 0.012 0.015	at 30 cm mW/cm^2 0.537 0.540
MHz 58320 60480 62640 MPE Calcu Jse: Antenna: Freq. MHz 2,412	mW/ 0.0 0.7 0.8 lation for 2.4 General Integral EL Poy dBm 18.0	cm^2 097 70 325 I GHz Wi-Fi JT wer mW* 63.1	mW/c 1.00 1.00 radio (Worst Cable Loss Loss dB 0	m^2 00 00 t case of F( Ant Gain dBi 3.2	S <= M 9.3 26. 27. CC and ISEE Power at Ant dBm 18.0	PE Limit 3cm 3cm 3cm 0C limits) EIRP mW 131.83	9.7% 77.0% 82.5% Power Density (S) at 30 cm mW/cm^2 0.012	at 30 cm mW/cm^2 0.537
MHz 58320 60480 62640 MPE Calcu Jse: Antenna: Freq. MHz 2,412 2,437 2,462	mW/ 0.0 0.7 0.8 lation for 2.4 General Integral EL Pov dBm 18.0 19.0 18.0	cm^2 097 70 225 CHZ Wi-Fi Wer MW* 63.1 79.4 63.1 the MPE Li	mW/c           1.00           0           0           0           0           0           0           0           0	m^2 00 00 00 t case of F( Ant Gain dBi 3.2 3.2 3.2	S <= M 9.3 26. 27. CC and ISEE Power at Ant dBm 18.0 19.0 18.0	PE Limit 3cm 3cm 3cm 0C limits) 0C limits) EIRP mW 131.83 165.96 131.83	9.7% 77.0% 82.5% Power Density (S) at 30 cm mW/cm^2 0.012 0.015 0.012	at 30 cm mW/cm^2 0.537 0.540
MHz           58320           60480           62640           //PE Calcul           Jse:           Antenna:           Freq.           MHz           2,412           2,462           For the case	mW/ 0.0 0.7 0.8 lation for 2.4 General Integral EL Poo dBm 18.0 19.0 18.0 28 where S >	cm^2 097 70 325 4 GHz Wi-Fi wer <u>mW*</u> 63.1 79.4 63.1 the MPE Li ensity (S)	mW/c           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           0           0           0           0           0           0           0           0           0	m^2 00 00 00 t case of F( Ant Gain dBi 3.2 3.2 3.2 Limit	S <= M 9.3 26. 27. CC and ISEC Power at Ant dBm 18.0 19.0 18.0 Distance	PE Limit 3cm 3cm 3cm 0C limits) EIRP mW 131.83 165.96 131.83 26.96 131.83	9.7% 77.0% 82.5% Power Density (S) at 30 cm mW/cm^2 0.012 0.015	at 30 cm mW/cm^2 0.537 0.540
MHz           58320           60480           62640           IPE Calcul           Jse:           Intenna:           Freq.           MHz           2,412           2,462           for the case           Freq.	mW/ 0.0 0.7 0.8 lation for 2.4 General Integral Et Pov dBm 18.0 19.0 18.0 28 where S > Power Do at 30	cm^2 097 70 325 4 GHz Wi-Fi JT wer <u>mW*</u> 63.1 79.4 63.1 the MPE Li ensity (S) 0 cm	mW/c           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           0           0           0           0           0           0           0           0           0           0           0           0           0           0           0           0	m^2 00 00 00 t case of F( Ant Gain dBi 3.2 3.2 3.2 3.2 3.2	S <= M 9.3 26. 27. CC and ISEC Power at Ant dBm 18.0 19.0 18.0 Distance	PE Limit 3cm 3cm 3cm 0C limits) 0C limits) EIRP mW 131.83 165.96 131.83	9.7% 77.0% 82.5% Power Density (S) at 30 cm mW/cm^2 0.012 0.015 0.012	at 30 cm mW/cm^2 0.537 0.540
MHz           58320           60480           62640           IPE Calcul           Jse:           Intenna:           Freq.           MHz           2,412           2,462           for the case           Freq.           MHz	mW/ 0.0 0.7 0.8 lation for 2.4 General Integral EL Pov dBm 18.0 19.0 18.0 19.0 28 where S > Power Do at 30 mW/	cm^2 097 70 325 GHz Wi-Fi JT wer 63.1 79.4 63.1 the MPE Li ensity (S) 0 cm cm^2	mW/c           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           0	m^2 00 00 00 t case of F( Ant Gain dBi 3.2 3.2 3.2 3.2 3.2 Ulimit cm m^2	S <= M           9.3           26.           27.           CC and ISEE           Power           at Ant           dBm           18.0           19.0           18.0           S <= M	PE Limit 3cm 3cm 3cm 0C limits) EIRP mW 131.83 165.96 131.83 ee where PE Limit	9.7% 77.0% 82.5% Power Density (S) at 30 cm mW/cm^2 0.012 0.012 0.015 0.012 0.012	at 30 cm mW/cm^2 0.537 0.540
MHz           58320           60480           62640           //PE Calcu           Jse:           Antenna:           Freq.           MHz           2,412           2,462           For the case           Freq.           MHz           2,462           For the case           Freq.           MHz           2,412	mW/ 0.0 0.7 0.8 ation for 2.4 General Integral EL Pov dBm 18.0 19.0 18.0 19.0 18.0 28 where S > Power Do at 30 mW/ 0.0	cm^2 097 70 325 I GHz Wi-Fi wer <u>mW*</u> 63.1 79.4 63.1 the MPE Li ensity (S) 0 cm cm^2 112	mW/c           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           0	m^2 00 00 t case of F( Ant Gain dBi 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2	S <= M           9.3           26.           27.           CC and ISEE           Power           at Ant           dBm           18.0           19.0           18.0           S <= M	PE Limit 3cm 3cm 3cm 0C limits) 0C limits) EIRP mW 131.83 165.96 131.83 165.96 131.83 EXAMPLE TRANSING TO TRANSIT TRANSIT TO TRANSIT TRANSI TRANSIT TRANSI TRANSI TRANSIT TRANSI TRANSI TRANSI TRANSI TRA	9.7% 77.0% 82.5% Power Density (S) at 30 cm mW/cm^2 0.012 0.012 0.015 0.012 0.012 0.012	at 30 cm mW/cm^2 0.537 0.540
MHz           58320           60480           62640           MPE Calcul           Jse:           Antenna:           Freq.           MHz           2,412           2,437           2,462           For the case           Freq.           MHz	mW/ 0.0 0.7 0.8 ation for 2.4 General Integral EU Pov dBm 18.0 19.0 18.0 19.0 18.0 28 where S > Power Do at 30 mW/ 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	cm^2 097 70 325 GHz Wi-Fi JT wer 63.1 79.4 63.1 the MPE Li ensity (S) 0 cm cm^2	mW/c           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           1.00           0	m^2 00 00 00 t case of F( Ant Gain dBi 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2 3.2	S <= M           9.3           26.           27.           CC and ISEE           Power           at Ant           dBm           18.0           19.0           18.0           S <= M	PE Limit 3cm 3cm 3cm 0C limits) EIRP mW 131.83 165.96 131.83 ee where PE Limit	9.7% 77.0% 82.5% Power Density (S) at 30 cm mW/cm^2 0.012 0.012 0.015 0.012 0.012	at 30 cm mW/cm^2 0.537 0.540

Vivint, Inc. CE04 Greg Hanser CC 15.255 Ation for 60 ( Controlled ntegral 23 dl EU Pow dBm 7.4 16.4 16.7	GHz Wi-Fi Bi T	radio (Worst o Listed EUT p Cable Loss Loss dB	owers are a Ant Gain		C limits)	Job Number: P T-Log Number: T Project Manager: D Project Coordinator: D Class: N	L079234-RA leepa Shetty lavid Bare /A
Greg Hanser FCC 15.255 Ation for 60 0 Controlled ntegral 23 dl EU Pow dBm 7.4 16.4 16.7	GHz Wi-Fi Bi T ver <u>mW*</u> 5.5	Listed EUT p Cable Loss Loss dB	owers are a Ant Gain	average Power	C limits)	Project Manager: D Project Coordinator: D Class: N	eepa Shetty avid Bare /A
ECC 15.255 Attion for 60 (Controlled Integral 23 dl EU Pow dBm 7.4 16.4 16.7	GHz Wi-Fi Bi T ver <u>mW*</u> 5.5	Listed EUT p Cable Loss Loss dB	owers are a Ant Gain	average Power	C limits)	Project Coordinator: D Class: N	avid Bare /A
ECC 15.255 Attion for 60 (Controlled Integral 23 dl EU Pow dBm 7.4 16.4 16.7	GHz Wi-Fi Bi T ver <u>mW*</u> 5.5	Listed EUT p Cable Loss Loss dB	owers are a Ant Gain	average Power	C limits)	Class: N	/A
tion for 60 Controlled ntegral 23 dl EU Pow dBm 7.4 16.4 16.7	Bi T /er <u>mW*</u> 5.5	Listed EUT p Cable Loss Loss dB	owers are a Ant Gain	average Power	C limits)		
Controlled ntegral 23 dl EU Pow dBm 7.4 16.4 16.7	Bi T /er <u>mW*</u> 5.5	Listed EUT p Cable Loss Loss dB	owers are a Ant Gain	average Power	C limits)	Power Density (S)	
Pow dBm 7.4 16.4 16.7	ver <u>mW*</u> 5.5	Loss dB	Gain			Power Density (S)	MPEIL
dBm 7.4 16.4 16.7	mW* 5.5	dB		of Ant	1	Power Density (S)	MPE Limit
7.4 16.4 16.7	5.5				EIRP	at 15 cm	at 15 cm
16.4 16.7			dBi	dBm	mW	mW/cm^2	mW/cm^2
16.7	40.1	0	23 23	7.4 16.4	1096.48 8709.64	0.388 3.080	<u>5.000</u> 5.000
	46.8	0	23	16.4	9332.54	3.301	5.000
S @ 15 cm mW/cm^2		MPE Limit mW/cm^2		Distance where S <= MPE Limit		Ratio of PD to limit	
0.38		5.00		4.2cm		7.8%	
3.080		5.000		11.8cm		61.6%	
Controlled	GHz Wi-Fi	radio (Worst	case of FC	CC and ISED	OC limits)		
-	т		Ant	Dowor		Power Density (S)	MPE Limit
					FIRP		at 15 cm
						mW/cm^2	mW/cm^2
18.0	63.1	0	3.2	18.0	131.83	0.047	3.170
10.0	79.4	0	3.2	19.0	165.96	0.059	3.187
19.0		0	3.2	18.0	131.83	0.047	3.203
18.0	63.1	•		-			
18.0 s where S > 1	63.1 the MPE Li	mit					
18.0 s where S > 1 Power De	63.1 the MPE Li nsity (S)	mit MPE I	Limit		e where	Ratio of PD to limit	
18.0 s where S > 1 Power De at 15	63.1 the MPE Li nsity (S) cm	mit MPE I at 15	Limit		e where PE Limit	Ratio of PD to limit	
18.0 s where S > 1 Power De at 15 mW/c	63.1 the MPE Li nsity (S) cm m^2	mit MPE I at 15 mW/c	Limit cm m^2	S <= M	PE Limit		
18.0 s where S > 1 Power De at 15	63.1 the MPE Li nsity (S) cm m^2 47	mit MPE I at 15	Limit cm m^2 70	S <= M		Ratio of PD to limit <u> 1.5%</u> 1.8%	
	3.30 Ition for 2.4 Controlled ntegral EU Pow dBm	3.301 Ition for 2.4 GHz Wi-Fi Controlled ntegral EUT Power dBm mW*	3.301 5.00 Ition for 2.4 GHz Wi-Fi radio (Worst Controlled ntegral EUT Cable Loss Power Loss dBm mW* dB	3.301     5.000       tion for 2.4 GHz Wi-Fi radio (Worst case of Fo       Controlled       ntegral       EUT     Cable Loss       Power     Loss       Gain       dBm     mW*	3.301     5.000     12.       Ition for 2.4 GHz Wi-Fi radio (Worst case of FCC and ISED       Controlled       ntegral       EUT     Cable Loss     Ant     Power       Power     Loss     Gain     at Ant       dBm     mW*     dB     dBi     dBm	3.301     5.000     12.2cm       tion for 2.4 GHz Wi-Fi radio (Worst case of FCC and ISEDC limits)       Controlled       ntegral       EUT     Cable Loss     Ant     Power       Power     Loss     Gain     at Ant     EIRP       dBm     mW*     dB     dBi     dBm     mW	3.301     5.000     12.2cm     66.0%       tion for 2.4 GHz Wi-Fi radio     (Worst case of FCC and ISEDC limits)       Controlled       ntegral       EUT     Cable Loss     Ant     Power       Power     Loss     Gain     at Ant     EIRP       dBm     mW*     dB     dBm     mW     mW/cm^22