



EF3DV3 – SN:4048

January 9, 2018

10427-AAB	IEEE 802.11n (HT Greenfield, 150 Mbps, 64-QAM)	X	5.52	68.75	17.46	0.00	150.0	± 9.6 %
		Y	5.81	68.83	17.49		150.0	
		Z	5.81	69.28	17.86		150.0	
10430-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	X	4.32	72.89	18.89	0.00	150.0	± 9.6 %
		Y	4.46	71.28	18.79		150.0	
		Z	4.32	71.84	18.79		150.0	
10431-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	X	4.20	68.56	16.90	0.00	150.0	± 9.6 %
		Y	4.54	68.28	17.05		150.0	
		Z	4.35	68.37	17.05		150.0	
10432-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	X	4.51	68.30	17.01	0.00	150.0	± 9.6 %
		Y	4.83	68.11	17.07		150.0	
		Z	4.65	68.13	17.12		150.0	
10433-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	X	4.77	68.19	17.09	0.00	150.0	± 9.6 %
		Y	5.07	68.08	17.11		150.0	
		Z	4.90	68.05	17.18		150.0	
10434-AAA	W-CDMA (BS Test Model 1, 64 DPCH)	X	4.43	73.79	18.70	0.00	150.0	± 9.6 %
		Y	4.56	72.04	18.76		150.0	
		Z	4.41	72.68	18.67		150.0	
10435-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.14	81.90	18.21	3.23	80.0	± 9.6 %
		Y	100.00	117.32	28.33		80.0	
		Z	100.00	143.13	39.08		80.0	
10447-AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.46	68.62	15.88	0.00	150.0	± 9.6 %
		Y	3.85	68.50	16.60		150.0	
		Z	3.63	68.53	16.29		150.0	
10448-AAB	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	4.06	68.35	16.77	0.00	150.0	± 9.6 %
		Y	4.35	68.04	16.91		150.0	
		Z	4.18	68.13	16.91		150.0	
10449-AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	4.34	68.12	16.91	0.00	150.0	± 9.6 %
		Y	4.61	67.91	16.96		150.0	
		Z	4.46	67.94	17.01		150.0	
10450-AAB	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.55	67.94	16.94	0.00	150.0	± 9.6 %
		Y	4.79	67.80	16.95		150.0	
		Z	4.66	67.79	17.02		150.0	
10451-AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	X	3.30	68.56	15.21	0.00	150.0	± 9.6 %
		Y	3.79	68.84	16.34		150.0	
		Z	3.53	68.71	15.83		150.0	
10456-AAB	IEEE 802.11ac WiFi (160MHz, 64-QAM, 99pc duty cycle)	X	6.66	69.85	17.92	0.00	150.0	± 9.6 %
		Y	6.71	69.45	17.67		150.0	
		Z	6.84	70.06	18.14		150.0	
10457-AAA	UMTS-FDD (DC-HSDPA)	X	3.85	66.45	16.66	0.00	150.0	± 9.6 %
		Y	3.96	66.18	16.69		150.0	
		Z	3.89	66.20	16.74		150.0	
10458-AAA	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	X	3.94	72.42	17.52	0.00	150.0	± 9.6 %
		Y	4.14	71.12	18.17		150.0	
		Z	4.05	71.94	17.97		150.0	
10459-AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	X	4.97	69.66	18.34	0.00	150.0	± 9.6 %
		Y	5.21	68.22	18.41		150.0	
		Z	5.08	68.98	18.50		150.0	

Certificate No: EF3-4048_Jan18

Page 26 of 39



EF3DV3 – SN:4048

January 9, 2018

10460-AAA	UMTS-FDD (WCDMA, AMR)	X	1.48	78.99	21.39	0.00	150.0	± 9.6 %
		Y	1.45	77.90	21.28		150.0	
		Z	1.59	80.39	22.09		150.0	
10461-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	7.79	91.54	22.09	3.29	80.0	± 9.6 %
		Y	100.00	120.65	29.97		80.0	
		Z	100.00	146.64	40.89		80.0	
10462-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.67	60.00	6.21	3.23	80.0	± 9.6 %
		Y	2.70	68.44	11.89		80.0	
		Z	100.00	116.38	26.63		80.0	
10463-AAA	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.65	3.23	80.0	± 9.6 %
		Y	1.89	64.43	9.76		80.0	
		Z	100.00	108.57	23.12		80.0	
10464-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.71	81.04	18.02	3.23	80.0	± 9.6 %
		Y	100.00	117.86	28.53		80.0	
		Z	100.00	143.96	39.41		80.0	
10465-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.67	60.00	6.15	3.23	80.0	± 9.6 %
		Y	2.42	67.33	11.38		80.0	
		Z	100.00	115.28	26.13		80.0	
10466-AAA	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.62	3.23	80.0	± 9.6 %
		Y	1.79	63.92	9.48		80.0	
		Z	100.00	107.69	22.73		80.0	
10467-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.27	82.80	18.62	3.23	80.0	± 9.6 %
		Y	100.00	118.08	28.62		80.0	
		Z	100.00	144.42	39.61		80.0	
10468-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.66	60.00	6.16	3.23	80.0	± 9.6 %
		Y	2.47	67.58	11.50		80.0	
		Z	100.00	115.66	26.29		80.0	
10469-AAC	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.61	3.23	80.0	± 9.6 %
		Y	1.79	63.93	9.48		80.0	
		Z	100.00	107.73	22.74		80.0	
10470-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.29	82.84	18.62	3.23	80.0	± 9.6 %
		Y	100.00	118.09	28.62		80.0	
		Z	100.00	144.54	39.65		80.0	
10471-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.66	60.00	6.15	3.23	80.0	± 9.6 %
		Y	2.46	67.51	11.45		80.0	
		Z	100.00	115.53	26.23		80.0	
10472-AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.59	3.23	80.0	± 9.6 %
		Y	1.78	63.87	9.45		80.0	
		Z	100.00	107.56	22.66		80.0	
10473-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.26	82.74	18.58	3.23	80.0	± 9.6 %
		Y	100.00	118.05	28.60		80.0	
		Z	100.00	144.48	39.62		80.0	
10474-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.66	60.00	6.14	3.23	80.0	± 9.6 %
		Y	2.45	67.47	11.44		80.0	
		Z	100.00	115.55	26.24		80.0	
10475-AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.60	3.23	80.0	± 9.6 %
		Y	1.78	63.86	9.44		80.0	
		Z	100.00	107.61	22.68		80.0	



EF3DV3 – SN:4048

January 9, 2018

10477-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	0.66	60.00	6.12	3.23	80.0	± 9.6 %
		Y	2.39	67.24	11.32		80.0	
		Z	100.00	115.18	26.07		80.0	
10478-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	0.68	60.00	5.58	3.23	80.0	± 9.6 %
		Y	1.77	63.82	9.41		80.0	
		Z	100.00	107.46	22.61		80.0	
10479-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	6.67	85.59	21.53	3.23	80.0	± 9.6 %
		Y	7.57	85.20	22.75		80.0	
		Z	100.00	134.96	37.67		80.0	
10480-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.55	68.74	13.04	3.23	80.0	± 9.6 %
		Y	7.10	79.46	19.05		80.0	
		Z	100.00	122.22	31.55		80.0	
10481-AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.97	65.53	11.23	3.23	80.0	± 9.6 %
		Y	6.00	76.58	17.69		80.0	
		Z	100.00	119.54	30.23		80.0	
10482-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.92	67.27	13.28	2.23	80.0	± 9.6 %
		Y	4.18	76.13	18.67		80.0	
		Z	5.15	80.78	20.05		80.0	
10483-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.84	63.51	10.57	2.23	80.0	± 9.6 %
		Y	4.96	74.64	17.64		80.0	
		Z	12.06	90.00	23.06		80.0	
10484-AAA	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.83	63.19	10.41	2.23	80.0	± 9.6 %
		Y	4.81	73.95	17.39		80.0	
		Z	9.18	85.84	21.74		80.0	
10485-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	2.87	72.75	17.16	2.23	80.0	± 9.6 %
		Y	4.55	77.45	19.99		80.0	
		Z	5.58	82.88	22.13		80.0	
10486-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.49	67.19	13.98	2.23	80.0	± 9.6 %
		Y	3.85	71.60	17.36		80.0	
		Z	3.82	73.05	17.72		80.0	
10487-AAC	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.49	66.79	13.77	2.23	80.0	± 9.6 %
		Y	3.85	71.21	17.19		80.0	
		Z	3.74	72.30	17.39		80.0	
10488-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.35	73.28	18.73	2.23	80.0	± 9.6 %
		Y	4.67	76.04	20.03		80.0	
		Z	4.82	78.84	21.64		80.0	
10489-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.21	69.34	16.94	2.23	80.0	± 9.6 %
		Y	4.09	71.15	18.25		80.0	
		Z	3.93	72.12	18.91		80.0	
10490-AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.30	69.19	16.87	2.23	80.0	± 9.6 %
		Y	4.18	70.90	18.17		80.0	
		Z	4.00	71.79	18.77		80.0	
10491-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.56	71.57	18.33	2.23	80.0	± 9.6 %
		Y	4.63	73.64	19.22		80.0	
		Z	4.53	75.06	20.33		80.0	
10492-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.60	68.77	17.23	2.23	80.0	± 9.6 %
		Y	4.41	70.23	18.14		80.0	
		Z	4.17	70.67	18.66		80.0	



EF3DV3 – SN:4048

January 9, 2018

10493-AAC	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.66	68.65	17.18	2.23	80.0	± 9.6 %
		Y	4.48	70.07	18.09		80.0	
		Z	4.22	70.47	18.57		80.0	
10494-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.82	72.82	18.73	2.23	80.0	± 9.6 %
		Y	5.10	75.31	19.68		80.0	
		Z	5.05	77.01	20.93		80.0	
10495-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.62	69.06	17.46	2.23	80.0	± 9.6 %
		Y	4.47	70.76	18.36		80.0	
		Z	4.22	71.12	18.90		80.0	
10496-AAC	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.71	68.83	17.40	2.23	80.0	± 9.6 %
		Y	4.54	70.40	18.25		80.0	
		Z	4.27	70.70	18.75		80.0	
10497-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	1.13	61.32	8.92	2.23	80.0	± 9.6 %
		Y	3.06	71.77	16.13		80.0	
		Z	2.72	71.33	15.18		80.0	
10498-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	1.16	60.00	7.12	2.23	80.0	± 9.6 %
		Y	2.43	65.85	12.60		80.0	
		Z	1.66	62.55	9.94		80.0	
10499-AAA	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	1.17	60.00	6.98	2.23	80.0	± 9.6 %
		Y	2.39	65.36	12.23		80.0	
		Z	1.61	61.96	9.47		80.0	
10500-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.08	73.02	17.82	2.23	80.0	± 9.6 %
		Y	4.46	76.36	19.85		80.0	
		Z	5.03	80.54	21.72		80.0	
10501-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	2.85	68.44	15.30	2.23	80.0	± 9.6 %
		Y	3.96	71.38	17.69		80.0	
		Z	3.90	72.79	18.22		80.0	
10502-AAA	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	2.88	68.20	15.11	2.23	80.0	± 9.6 %
		Y	4.01	71.16	17.55		80.0	
		Z	3.93	72.44	18.00		80.0	
10503-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.31	73.08	18.63	2.23	80.0	± 9.6 %
		Y	4.61	75.84	19.94		80.0	
		Z	4.75	78.59	21.53		80.0	
10504-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.20	69.24	16.88	2.23	80.0	± 9.6 %
		Y	4.08	71.08	18.20		80.0	
		Z	3.92	72.03	18.85		80.0	
10505-AAC	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.28	69.10	16.82	2.23	80.0	± 9.6 %
		Y	4.16	70.82	18.12		80.0	
		Z	3.98	71.70	18.71		80.0	
10506-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	3.79	72.69	18.66	2.23	80.0	± 9.6 %
		Y	5.06	75.18	19.61		80.0	
		Z	5.00	76.85	20.85		80.0	
10507-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.61	69.01	17.42	2.23	80.0	± 9.6 %
		Y	4.46	70.70	18.32		80.0	
		Z	4.21	71.07	18.87		80.0	



EF3DV3 – SN:4048

January 9, 2018

10508-AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	3.69	68.77	17.35	2.23	80.0	± 9.6 %
		Y	4.53	70.34	18.22		80.0	
		Z	4.26	70.64	18.71		80.0	
10509-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.10	71.17	18.11	2.23	80.0	± 9.6 %
		Y	5.13	73.07	18.80		80.0	
		Z	4.94	73.85	19.66		80.0	
10510-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	4.09	68.66	17.48	2.23	80.0	± 9.6 %
		Y	4.93	70.22	18.21		80.0	
		Z	4.62	70.25	18.62		80.0	
10511-AAC	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.16	68.45	17.43	2.23	80.0	± 9.6 %
		Y	4.96	69.90	18.12		80.0	
		Z	4.66	69.89	18.51		80.0	
10512-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	X	4.21	72.40	18.45	2.23	80.0	± 9.6 %
		Y	5.47	74.86	19.33		80.0	
		Z	5.33	75.95	20.33		80.0	
10513-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	X	3.98	68.82	17.56	2.23	80.0	± 9.6 %
		Y	4.84	70.66	18.36		80.0	
		Z	4.53	70.63	18.79		80.0	
10514-AAC	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	X	4.02	68.46	17.46	2.23	80.0	± 9.6 %
		Y	4.82	70.14	18.22		80.0	
		Z	4.53	70.08	18.61		80.0	
10515-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	X	1.03	65.64	16.57	0.00	150.0	± 9.6 %
		Y	1.04	65.40	16.62		150.0	
		Z	1.02	65.55	16.73		150.0	
10516-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	X	6.80	117.18	34.20	0.00	150.0	± 9.6 %
		Y	6.88	117.54	34.51		150.0	
		Z	100.00	165.60	44.98		150.0	
10517-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	X	0.97	70.02	18.51	0.00	150.0	± 9.6 %
		Y	1.00	69.97	18.62		150.0	
		Z	0.98	70.59	18.94		150.0	
10518-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	X	4.55	67.92	16.93	0.00	150.0	± 9.6 %
		Y	4.80	67.68	16.94		150.0	
		Z	4.66	67.72	17.01		150.0	
10519-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	X	4.71	68.12	17.04	0.00	150.0	± 9.6 %
		Y	5.03	68.00	17.09		150.0	
		Z	4.85	67.98	17.14		150.0	
10520-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	X	4.57	68.07	16.96	0.00	150.0	± 9.6 %
		Y	4.87	67.99	17.02		150.0	
		Z	4.70	67.95	17.07		150.0	
10521-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	X	4.50	68.03	16.94	0.00	150.0	± 9.6 %
		Y	4.80	67.99	17.00		150.0	
		Z	4.63	67.93	17.05		150.0	
10522-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	X	4.56	68.21	17.07	0.00	150.0	± 9.6 %
		Y	4.85	67.97	17.04		150.0	
		Z	4.70	68.06	17.16		150.0	

Certificate No: EF3-4048_Jan18

Page 30 of 39



EF3DV3 – SN:4048

January 9, 2018

10523-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	X	4.47	68.11	16.93	0.00	150.0	± 9.6 %
		Y	4.71	67.84	16.89		150.0	
		Z	4.57	67.88	16.98		150.0	
10524-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	X	4.50	68.14	17.05	0.00	150.0	± 9.6 %
		Y	4.80	67.94	17.04		150.0	
		Z	4.64	67.99	17.13		150.0	
10525-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	X	4.53	67.16	16.62	0.00	150.0	± 9.6 %
		Y	4.76	66.91	16.59		150.0	
		Z	4.63	66.95	16.67		150.0	
10526-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	X	4.67	67.49	16.75	0.00	150.0	± 9.6 %
		Y	4.97	67.34	16.74		150.0	
		Z	4.80	67.35	16.83		150.0	
10527-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 99pc duty cycle)	X	4.60	67.46	16.69	0.00	150.0	± 9.6 %
		Y	4.88	67.31	16.69		150.0	
		Z	4.72	67.30	16.77		150.0	
10528-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 99pc duty cycle)	X	4.61	67.47	16.72	0.00	150.0	± 9.6 %
		Y	4.90	67.34	16.73		150.0	
		Z	4.74	67.32	16.80		150.0	
10529-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 99pc duty cycle)	X	4.61	67.47	16.72	0.00	150.0	± 9.6 %
		Y	4.90	67.34	16.73		150.0	
		Z	4.74	67.32	16.80		150.0	
10531-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 99pc duty cycle)	X	4.59	67.54	16.72	0.00	150.0	± 9.6 %
		Y	4.92	67.51	16.77		150.0	
		Z	4.73	67.45	16.83		150.0	
10532-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 99pc duty cycle)	X	4.46	67.39	16.65	0.00	150.0	± 9.6 %
		Y	4.76	67.37	16.71		150.0	
		Z	4.59	67.28	16.75		150.0	
10533-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 99pc duty cycle)	X	4.62	67.56	16.73	0.00	150.0	± 9.6 %
		Y	4.91	67.36	16.71		150.0	
		Z	4.75	67.38	16.79		150.0	
10534-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 99pc duty cycle)	X	5.23	67.58	16.84	0.00	150.0	± 9.6 %
		Y	5.47	67.57	16.83		150.0	
		Z	5.36	67.55	16.95		150.0	
10535-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 99pc duty cycle)	X	5.33	67.93	17.02	0.00	150.0	± 9.6 %
		Y	5.55	67.74	16.90		150.0	
		Z	5.53	68.11	17.23		150.0	
10536-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 99pc duty cycle)	X	5.19	67.81	16.93	0.00	150.0	± 9.6 %
		Y	5.42	67.73	16.88		150.0	
		Z	5.33	67.81	17.05		150.0	
10537-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 99pc duty cycle)	X	5.27	67.86	16.97	0.00	150.0	± 9.6 %
		Y	5.49	67.71	16.87		150.0	
		Z	5.39	67.79	17.04		150.0	
10538-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 99pc duty cycle)	X	5.34	67.83	16.99	0.00	150.0	± 9.6 %
		Y	5.60	67.80	16.96		150.0	
		Z	5.47	67.75	17.07		150.0	
10540-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 99pc duty cycle)	X	5.22	67.62	16.90	0.00	150.0	± 9.6 %
		Y	5.52	67.79	16.97		150.0	
		Z	5.43	67.88	17.15		150.0	



EF3DV3 – SN:4048

January 9, 2018

10541-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 99pc duty cycle)	X	5.17	67.41	16.78	0.00	150.0	± 9.6 %
		Y	5.45	67.52	16.82		150.0	
		Z	5.36	67.60	17.00		150.0	
10542-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 99pc duty cycle)	X	5.37	67.64	16.91	0.00	150.0	± 9.6 %
		Y	5.65	67.72	16.94		150.0	
		Z	5.53	67.71	17.07		150.0	
10543-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 99pc duty cycle)	X	5.46	67.79	17.01	0.00	150.0	± 9.6 %
		Y	5.75	67.79	16.99		150.0	
		Z	5.64	67.86	17.17		150.0	
10544-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 99pc duty cycle)	X	5.56	67.54	16.77	0.00	150.0	± 9.6 %
		Y	5.74	67.54	16.74		150.0	
		Z	5.68	67.54	16.88		150.0	
10545-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	X	5.92	68.56	17.25	0.00	150.0	± 9.6 %
		Y	6.10	68.43	17.13		150.0	
		Z	6.09	68.70	17.42		150.0	
10546-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	X	5.62	67.75	16.85	0.00	150.0	± 9.6 %
		Y	5.88	67.97	16.91		150.0	
		Z	5.79	67.91	17.04		150.0	
10547-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	X	5.81	68.20	17.07	0.00	150.0	± 9.6 %
		Y	5.97	68.06	16.95		150.0	
		Z	5.90	68.08	17.12		150.0	
10548-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	X	6.38	70.11	17.98	0.00	150.0	± 9.6 %
		Y	7.05	71.33	18.52		150.0	
		Z	6.92	71.26	18.64		150.0	
10550-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	X	5.87	68.56	17.27	0.00	150.0	± 9.6 %
		Y	5.93	68.04	16.96		150.0	
		Z	5.98	68.49	17.35		150.0	
10551-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	X	5.63	67.75	16.83	0.00	150.0	± 9.6 %
		Y	5.91	68.00	16.90		150.0	
		Z	5.73	67.69	16.89		150.0	
10552-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	X	5.55	67.58	16.73	0.00	150.0	± 9.6 %
		Y	5.76	67.58	16.70		150.0	
		Z	5.66	67.50	16.80		150.0	
10553-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	X	5.61	67.53	16.74	0.00	150.0	± 9.6 %
		Y	5.85	67.63	16.75		150.0	
		Z	5.72	67.49	16.83		150.0	
10554-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	X	6.04	67.97	16.90	0.00	150.0	± 9.6 %
		Y	6.20	68.05	16.90		150.0	
		Z	6.16	68.03	17.03		150.0	
10555-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	X	6.23	68.52	17.15	0.00	150.0	± 9.6 %
		Y	6.42	68.60	17.14		150.0	
		Z	6.43	68.79	17.40		150.0	
10556-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	X	6.27	68.61	17.19	0.00	150.0	± 9.6 %
		Y	6.44	68.63	17.16		150.0	
		Z	6.43	68.76	17.37		150.0	
10557-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	X	6.14	68.21	17.01	0.00	150.0	± 9.6 %
		Y	6.37	68.41	17.06		150.0	
		Z	6.28	68.30	17.16		150.0	



EF3DV3 – SN:4048

January 9, 2018

10558-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	X	6.17	68.34	17.09	0.00	150.0	± 9.6 %
		Y	6.48	68.78	17.26		150.0	
		Z	6.34	68.51	17.28		150.0	
10560-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 99pc duty cycle)	X	6.18	68.22	17.07	0.00	150.0	± 9.6 %
		Y	6.39	68.36	17.09		150.0	
		Z	6.33	68.35	17.24		150.0	
10561-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	X	6.13	68.30	17.14	0.00	150.0	± 9.6 %
		Y	6.33	68.40	17.15		150.0	
		Z	6.29	68.45	17.33		150.0	
10562-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	X	6.17	68.40	17.19	0.00	150.0	± 9.6 %
		Y	6.65	69.34	17.63		150.0	
		Z	6.40	68.79	17.49		150.0	
10563-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	X	7.10	70.79	18.35	0.00	150.0	± 9.6 %
		Y	7.19	70.42	18.11		150.0	
		Z	6.90	69.90	18.03		150.0	
10564-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc duty cycle)	X	4.87	67.92	17.05	0.46	150.0	± 9.6 %
		Y	5.14	67.78	17.09		150.0	
		Z	5.00	67.79	17.17		150.0	
10565-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc duty cycle)	X	5.08	68.33	17.36	0.46	150.0	± 9.6 %
		Y	5.40	68.27	17.42		150.0	
		Z	5.23	68.24	17.49		150.0	
10566-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc duty cycle)	X	4.92	68.17	17.18	0.46	150.0	± 9.6 %
		Y	5.23	68.14	17.25		150.0	
		Z	5.06	68.10	17.32		150.0	
10567-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc duty cycle)	X	4.93	68.51	17.52	0.46	150.0	± 9.6 %
		Y	5.25	68.48	17.56		150.0	
		Z	5.08	68.42	17.63		150.0	
10568-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 99pc duty cycle)	X	4.83	67.98	16.96	0.46	150.0	± 9.6 %
		Y	5.14	67.90	17.01		150.0	
		Z	4.99	67.95	17.13		150.0	
10569-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc duty cycle)	X	4.91	68.68	17.61	0.46	150.0	± 9.6 %
		Y	5.17	68.45	17.55		150.0	
		Z	5.03	68.49	17.68		150.0	
10570-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc duty cycle)	X	4.93	68.56	17.56	0.46	150.0	± 9.6 %
		Y	5.23	68.37	17.54		150.0	
		Z	5.07	68.42	17.66		150.0	
10571-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	X	1.19	66.27	16.86	0.46	130.0	± 9.6 %
		Y	1.29	67.09	17.42		130.0	
		Z	1.24	67.09	17.68		130.0	
10572-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	X	1.21	66.99	17.30	0.46	130.0	± 9.6 %
		Y	1.32	67.88	17.87		130.0	
		Z	1.26	67.93	18.17		130.0	
10573-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	X	100.00	155.53	41.87	0.46	130.0	± 9.6 %
		Y	100.00	152.55	41.01		130.0	
		Z	100.00	157.67	42.87		130.0	
10574-AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	X	1.50	75.85	21.66	0.46	130.0	± 9.6 %
		Y	1.79	77.89	22.51		130.0	
		Z	1.76	79.14	23.42		130.0	



EF3DV3 – SN:4048

January 9, 2018

10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.62	67.61	17.00	0.46	130.0	± 9.6 %
		Y	4.90	67.51	17.09		130.0	
		Z	4.77	67.59	17.23		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.65	67.80	17.07	0.46	130.0	± 9.6 %
		Y	4.92	67.66	17.14		130.0	
		Z	4.79	67.75	17.28		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	4.83	68.06	17.23	0.46	130.0	± 9.6 %
		Y	5.17	68.03	17.34		130.0	
		Z	5.00	68.06	17.47		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	4.73	68.19	17.33	0.46	130.0	± 9.6 %
		Y	5.05	68.17	17.43		130.0	
		Z	4.89	68.19	17.55		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.49	67.46	16.63	0.46	130.0	± 9.6 %
		Y	4.84	67.59	16.82		130.0	
		Z	4.67	67.56	16.92		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.54	67.57	16.68	0.46	130.0	± 9.6 %
		Y	4.89	67.60	16.84		130.0	
		Z	4.73	67.67	16.97		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	4.63	68.26	17.29	0.46	130.0	± 9.6 %
		Y	4.95	68.23	17.37		130.0	
		Z	4.79	68.24	17.50		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.43	67.30	16.45	0.46	130.0	± 9.6 %
		Y	4.80	67.41	16.66		130.0	
		Z	4.62	67.42	16.76		130.0	
10583-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.62	67.61	17.00	0.46	130.0	± 9.6 %
		Y	4.90	67.51	17.09		130.0	
		Z	4.77	67.59	17.23		130.0	
10584-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.65	67.80	17.07	0.46	130.0	± 9.6 %
		Y	4.92	67.66	17.14		130.0	
		Z	4.79	67.75	17.28		130.0	
10585-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	4.83	68.06	17.23	0.46	130.0	± 9.6 %
		Y	5.17	68.03	17.34		130.0	
		Z	5.00	68.06	17.47		130.0	
10586-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.73	68.19	17.33	0.46	130.0	± 9.6 %
		Y	5.05	68.17	17.43		130.0	
		Z	4.89	68.19	17.55		130.0	
10587-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.49	67.46	16.63	0.46	130.0	± 9.6 %
		Y	4.84	67.59	16.82		130.0	
		Z	4.67	67.56	16.92		130.0	
10588-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.54	67.57	16.68	0.46	130.0	± 9.6 %
		Y	4.89	67.60	16.84		130.0	
		Z	4.73	67.67	16.97		130.0	
10589-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.63	68.26	17.29	0.46	130.0	± 9.6 %
		Y	4.95	68.23	17.37		130.0	
		Z	4.79	68.24	17.50		130.0	
10590-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.43	67.30	16.45	0.46	130.0	± 9.6 %
		Y	4.80	67.41	16.66		130.0	
		Z	4.62	67.42	16.76		130.0	

Certificate No: EF3-4048_Jan18

Page 34 of 39



EF3DV3 – SN:4048

January 9, 2018

10591-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.78	67.66	17.10	0.46	130.0	± 9.6 %
		Y	5.05	67.55	17.18		130.0	
		Z	4.92	67.61	17.31		130.0	
10592-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	4.91	67.98	17.24	0.46	130.0	± 9.6 %
		Y	5.23	67.91	17.30		130.0	
		Z	5.07	67.97	17.45		130.0	
10593-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	4.83	67.87	17.10	0.46	130.0	± 9.6 %
		Y	5.16	67.88	17.22		130.0	
		Z	5.00	67.89	17.34		130.0	
10594-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	4.88	68.03	17.26	0.46	130.0	± 9.6 %
		Y	5.21	68.00	17.35		130.0	
		Z	5.05	68.04	17.48		130.0	
10595-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	4.85	68.02	17.17	0.46	130.0	± 9.6 %
		Y	5.19	68.00	17.26		130.0	
		Z	5.02	68.02	17.39		130.0	
10596-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	4.78	68.01	17.18	0.46	130.0	± 9.6 %
		Y	5.12	67.99	17.27		130.0	
		Z	4.96	68.04	17.41		130.0	
10597-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	4.73	67.88	17.03	0.46	130.0	± 9.6 %
		Y	5.07	67.94	17.17		130.0	
		Z	4.91	67.93	17.29		130.0	
10598-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.71	68.07	17.28	0.46	130.0	± 9.6 %
		Y	5.05	68.15	17.42		130.0	
		Z	4.88	68.11	17.52		130.0	
10599-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.71	68.97	17.81	0.46	130.0	± 9.6 %
		Y	5.84	68.51	17.57		130.0	
		Z	5.81	68.83	17.91		130.0	
10600-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	6.12	70.36	18.47	0.46	130.0	± 9.6 %
		Y	6.49	70.59	18.61		130.0	
		Z	6.57	71.34	19.15		130.0	
10601-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.70	69.05	17.83	0.46	130.0	± 9.6 %
		Y	6.06	69.32	17.98		130.0	
		Z	5.98	69.54	18.27		130.0	
10602-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.87	69.32	17.89	0.46	130.0	± 9.6 %
		Y	6.11	69.18	17.83		130.0	
		Z	6.12	69.69	18.26		130.0	
10603-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	6.00	69.82	18.27	0.46	130.0	± 9.6 %
		Y	6.16	69.32	18.01		130.0	
		Z	6.12	69.71	18.39		130.0	
10604-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.81	69.25	17.97	0.46	130.0	± 9.6 %
		Y	5.88	68.60	17.65		130.0	
		Z	5.78	68.63	17.83		130.0	
10605-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.95	69.72	18.21	0.46	130.0	± 9.6 %
		Y	6.12	69.34	18.03		130.0	
		Z	6.28	70.35	18.72		130.0	
10606-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.59	68.67	17.53	0.46	130.0	± 9.6 %
		Y	5.70	68.15	17.28		130.0	
		Z	5.60	68.23	17.49		130.0	

Certificate No: EF3-4048_Jan18

Page 35 of 39



EF3DV3 -- SN:4048

January 9, 2018

10607-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.63	67.00	16.74	0.46	130.0	± 9.6 %
		Y	4.89	66.84	16.77		130.0	
		Z	4.77	66.94	16.93		130.0	
10608-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	4.79	67.38	16.90	0.46	130.0	± 9.6 %
		Y	5.11	67.29	16.94		130.0	
		Z	4.96	67.37	17.11		130.0	
10609-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.68	67.22	16.73	0.46	130.0	± 9.6 %
		Y	5.00	67.17	16.81		130.0	
		Z	4.85	67.23	16.95		130.0	
10610-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.73	67.37	16.89	0.46	130.0	± 9.6 %
		Y	5.05	67.32	16.96		130.0	
		Z	4.89	67.37	17.10		130.0	
10611-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.64	67.18	16.74	0.46	130.0	± 9.6 %
		Y	4.97	67.18	16.83		130.0	
		Z	4.81	67.20	16.97		130.0	
10612-AAB	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.65	67.36	16.80	0.46	130.0	± 9.6 %
		Y	4.99	67.35	16.88		130.0	
		Z	4.83	67.41	17.04		130.0	
10613-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.64	67.19	16.65	0.46	130.0	± 9.6 %
		Y	5.01	67.27	16.79		130.0	
		Z	4.83	67.28	16.92		130.0	
10614-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.59	67.35	16.87	0.46	130.0	± 9.6 %
		Y	4.92	67.40	16.99		130.0	
		Z	4.76	67.39	17.11		130.0	
10615-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.64	67.05	16.52	0.46	130.0	± 9.6 %
		Y	4.98	67.01	16.62		130.0	
		Z	4.82	67.07	16.76		130.0	
10616-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.37	67.60	17.07	0.46	130.0	± 9.6 %
		Y	5.63	67.63	17.10		130.0	
		Z	5.54	67.70	17.30		130.0	
10617-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.53	68.12	17.31	0.46	130.0	± 9.6 %
		Y	5.71	67.81	17.16		130.0	
		Z	5.77	68.45	17.66		130.0	
10618-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	5.37	67.94	17.23	0.46	130.0	± 9.6 %
		Y	5.59	67.83	17.18		130.0	
		Z	5.54	68.05	17.46		130.0	
10619-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.42	67.89	17.15	0.46	130.0	± 9.6 %
		Y	5.63	67.70	17.06		130.0	
		Z	5.57	67.91	17.33		130.0	
10620-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.47	67.80	17.15	0.46	130.0	± 9.6 %
		Y	5.74	67.77	17.14		130.0	
		Z	5.63	67.87	17.36		130.0	
10621-AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.43	67.73	17.23	0.46	130.0	± 9.6 %
		Y	5.66	67.66	17.19		130.0	
		Z	5.58	67.77	17.42		130.0	
10622-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.40	67.76	17.24	0.46	130.0	± 9.6 %
		Y	5.72	67.99	17.35		130.0	
		Z	5.68	68.28	17.67		130.0	

Certificate No: EF3-4048_Jan18

Page 36 of 39



EF3DV3 – SN:4048

January 9, 2018

10623-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	5.27	67.25	16.85	0.46	130.0	± 9.6 %
		Y	5.56	67.41	16.95		130.0	
		Z	5.51	67.65	17.24		130.0	
10624-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.52	67.67	17.13	0.46	130.0	± 9.6 %
		Y	5.82	67.82	17.22		130.0	
		Z	5.71	67.85	17.40		130.0	
10625-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.65	67.98	17.35	0.46	130.0	± 9.6 %
		Y	6.70	70.31	18.51		130.0	
		Z	6.41	69.92	18.49		130.0	
10626-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.69	67.50	16.96	0.46	130.0	± 9.6 %
		Y	5.86	67.47	16.93		130.0	
		Z	5.83	67.61	17.18		130.0	
10627-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	6.19	68.98	17.68	0.46	130.0	± 9.6 %
		Y	6.32	68.68	17.50		130.0	
		Z	6.43	69.33	18.02		130.0	
10628-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.74	67.66	16.95	0.46	130.0	± 9.6 %
		Y	5.99	67.87	17.03		130.0	
		Z	5.92	67.90	17.23		130.0	
10629-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.94	68.16	17.20	0.46	130.0	± 9.6 %
		Y	6.09	67.97	17.08		130.0	
		Z	6.11	68.31	17.44		130.0	
10630-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	6.77	70.81	18.49	0.46	130.0	± 9.6 %
		Y	8.04	73.47	19.72		130.0	
		Z	7.75	73.08	19.73		130.0	
10631-AAB	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	6.18	69.15	17.87	0.46	130.0	± 9.6 %
		Y	6.78	70.26	18.39		130.0	
		Z	6.44	69.57	18.23		130.0	
10632-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	6.23	69.30	17.98	0.46	130.0	± 9.6 %
		Y	6.24	68.58	17.58		130.0	
		Z	6.37	69.33	18.15		130.0	
10633-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	5.76	67.72	17.01	0.46	130.0	± 9.6 %
		Y	6.09	68.11	17.17		130.0	
		Z	5.89	67.73	17.16		130.0	
10634-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	5.72	67.68	17.04	0.46	130.0	± 9.6 %
		Y	5.99	67.85	17.10		130.0	
		Z	5.88	67.80	17.25		130.0	
10635-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.59	66.99	16.43	0.46	130.0	± 9.6 %
		Y	5.89	67.28	16.57		130.0	
		Z	5.76	67.16	16.69		130.0	
10636-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	6.19	68.00	17.13	0.46	130.0	± 9.6 %
		Y	6.36	68.10	17.15		130.0	
		Z	6.35	68.20	17.38		130.0	
10637-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	6.46	68.76	17.50	0.46	130.0	± 9.6 %
		Y	6.63	68.78	17.47		130.0	
		Z	6.72	69.23	17.89		130.0	
10638-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	6.50	68.87	17.53	0.46	130.0	± 9.6 %
		Y	6.63	68.75	17.44		130.0	
		Z	6.72	69.20	17.85		130.0	



EF3DV3 – SN:4048

January 9, 2018

10639-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	6.31	68.28	17.27	0.46	130.0	± 9.6 %
		Y	6.54	68.48	17.34		130.0	
		Z	6.47	68.46	17.51		130.0	
10640-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	6.30	68.28	17.21	0.46	130.0	± 9.6 %
		Y	6.65	68.83	17.46		130.0	
		Z	6.50	68.54	17.50		130.0	
10641-AAC	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	6.50	68.67	17.44	0.46	130.0	± 9.6 %
		Y	6.58	68.36	17.24		130.0	
		Z	6.63	68.71	17.61		130.0	
10642-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	6.41	68.51	17.52	0.46	130.0	± 9.6 %
		Y	6.62	68.60	17.52		130.0	
		Z	6.61	68.77	17.80		130.0	
10643-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	6.29	68.35	17.34	0.46	130.0	± 9.6 %
		Y	6.48	68.41	17.34		130.0	
		Z	6.46	68.53	17.59		130.0	
10644-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	6.32	68.42	17.38	0.46	130.0	± 9.6 %
		Y	6.90	69.63	17.97		130.0	
		Z	6.59	68.92	17.79		130.0	
10645-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	7.64	71.83	19.05	0.46	130.0	± 9.6 %
		Y	7.39	70.52	18.36		130.0	
		Z	7.46	71.07	18.85		130.0	
10646-AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	25.63	121.16	40.60	9.30	60.0	± 9.6 %
		Y	48.23	126.94	41.13		60.0	
		Z	100.00	158.36	52.52		60.0	
10647-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	19.37	115.59	39.19	9.30	60.0	± 9.6 %
		Y	44.84	126.23	41.10		60.0	
		Z	100.00	159.92	53.21		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	0.66	64.86	10.10	0.00	150.0	± 9.6 %
		Y	1.05	69.33	14.44		150.0	
		Z	0.80	66.62	11.78		150.0	
10652-AAB	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.49	67.66	16.60	2.23	80.0	± 9.6 %
		Y	4.04	68.34	17.41		80.0	
		Z	3.85	68.69	17.66		80.0	
10653-AAB	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	4.05	66.97	16.95	2.23	80.0	± 9.6 %
		Y	4.56	67.69	17.52		80.0	
		Z	4.34	67.66	17.70		80.0	
10654-AAB	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	4.05	66.55	16.99	2.23	80.0	± 9.6 %
		Y	4.50	67.32	17.51		80.0	
		Z	4.31	67.19	17.68		80.0	
10655-AAB	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	4.13	66.48	17.04	2.23	80.0	± 9.6 %
		Y	4.56	67.37	17.57		80.0	
		Z	4.38	67.16	17.72		80.0	
10658-AAA	Pulse Waveform (200Hz, 10%)	X	3.25	67.22	10.58	10.00	50.0	± 9.6 %
		Y	6.71	76.21	16.38		50.0	
		Z	13.06	85.50	19.12		50.0	
10659-AAA	Pulse Waveform (200Hz, 20%)	X	1.94	65.17	8.65	6.99	60.0	± 9.6 %
		Y	8.04	79.80	16.42		60.0	
		Z	100.00	108.13	23.68		60.0	

Certificate No: EF3-4048_Jan18

Page 38 of 39



EF3DV3 – SN:4048

January 9, 2018

10660-AAA	Pulse Waveform (200Hz, 40%)	X	0.98	63.30	6.81	3.98	80.0	± 9.6 %
		Y	100.00	105.15	21.55		80.0	
		Z	100.00	105.96	21.42		80.0	
10661-AAA	Pulse Waveform (200Hz, 60%)	X	0.56	62.24	5.43	2.22	100.0	± 9.6 %
		Y	100.00	103.68	19.83		100.0	
		Z	100.00	100.21	17.94		100.0	
10662-AAA	Pulse Waveform (200Hz, 80%)	X	0.16	60.00	3.38	0.97	120.0	± 9.6 %
		Y	100.00	102.95	18.13		120.0	
		Z	99.98	90.06	12.54		120.0	

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

**ANNEX D: CD835V3 Dipole Calibration Certificate**

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **TA-SH (Auden)**

Certificate No: **CD835V3-1133_Nov17**

CALIBRATION CERTIFICATE

Object **CD835V3 - SN: 1133**

Calibration procedure(s) **QA CAL-20.v6
Calibration procedure for dipoles in air**

Calibration date: **November 22, 2017**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Probe ER3DV6	SN: 2336	30-Dec-16 (No. ER3-2336_Dec16)	Dec-17
DAE4	SN: 781	13-Jul-17 (No. DAE4-781_Jul17)	Jul-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter Agilent 4419B	SN: GB42420191	09-Oct-09 (in house check Oct-17)	In house check: Oct-20
Power sensor HP E4412A	SN: US38485102	05-Jan-10 (in house check Oct-17)	In house check: Oct-20
Power sensor HP 8482A	SN: US37295597	09-Oct-09 (in house check Oct-17)	In house check: Oct-20
RF generator R&S SMT-06	SN: 832283/011	27-Aug-12 (in house check Oct-17)	In house check: Oct-20
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

Calibrated by:	Name Leif Klysner	Function Laboratory Technician	Signature
----------------	-----------------------------	--	---------------

Approved by:	Name Katja Pokovic	Function Technical Manager	Signature
--------------	------------------------------	--------------------------------------	---------------

Issued: November 23, 2017

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

References

- [1] ANSI-C63.19-2011
American National Standard, Methods of Measurement of Compatibility between Wireless Communications
Devices and Hearing Aids.

Methods Applied and Interpretation of Parameters:

- **Coordinate System:** y-axis is in the direction of the dipole arms. z-axis is from the basis of the antenna (mounted on the table) towards its feed point between the two dipole arms. x-axis is normal to the other axes. In coincidence with the standards [1], the measurement planes (probe sensor center) are selected to be at a distance of 15 mm above the top metal edge of the dipole arms.
- **Measurement Conditions:** Further details are available from the hardcopies at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated. The forward power to the dipole connector is set with a calibrated power meter connected and monitored with an auxiliary power meter connected to a directional coupler. While the dipole under test is connected, the forward power is adjusted to the same level.
- **Antenna Positioning:** The dipole is mounted on a HAC Test Arch phantom using the matching dipole positioner with the arms horizontal and the feeding cable coming from the floor. The measurements are performed in a shielded room with absorbers around the setup to reduce the reflections. It is verified before the mounting of the dipole under the Test Arch phantom, that its arms are perfectly in a line. It is installed on the HAC dipole positioner with its arms parallel below the dielectric reference wire and able to move elastically in vertical direction without changing its relative position to the top center of the Test Arch phantom. The vertical distance to the probe is adjusted after dipole mounting with a DASY5 Surface Check job. Before the measurement, the distance between phantom surface and probe tip is verified. The proper measurement distance is selected by choosing the matching section of the HAC Test Arch phantom with the proper device reference point (upper surface of the dipole) and the matching grid reference point (tip of the probe) considering the probe sensor offset. The vertical distance to the probe is essential for the accuracy.
- **Feed Point Impedance and Return Loss:** These parameters are measured using a HP 8753E Vector Network Analyzer. The impedance is specified at the SMA connector of the dipole. The influence of reflections was eliminating by applying the averaging function while moving the dipole in the air, at least 70cm away from any obstacles.
- **E-field distribution:** E field is measured in the x-y-plane with an isotropic ER3D-field probe with 100 mW forward power to the antenna feed point. In accordance with [1], the scan area is 20mm wide, its length exceeds the dipole arm length (180 or 90mm). The sensor center is 15 mm (in z) above the metal top of the dipole arms. Two 3D maxima are available near the end of the dipole arms. Assuming the dipole arms are perfectly in one line, the average of these two maxima (in subgrid 2 and subgrid 8) is determined to compensate for any non-parallelity to the measurement plane as well as the sensor displacement. The E-field value stated as calibration value represents the maximum of the interpolated 3D-E-field, in the plane above the dipole surface.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.