

Appendix A

Volume Control Test Data and Graph for Report No.: SUES251100241071

The DUT shall have at least one volume control setting that will produce a conversational gain of ≥ 6 .

Verdict: Pass.

1.1 For codecs with bit rate, check the bit rate with the worst conversational gain

Codec	Codec Bitrate (kbps)	Conv. Gain(dB)					
		WCDMA B2		LTE B66		NR n77	
		2N	8N	2N	8N	2N	8N
AMR-NB	4.75	7.02	13.50	7.12	13.58	7.21	13.33
	5.15	7.06	13.54	7.39	13.70	7.26	13.42
	5.9	7.11	13.60	7.47	13.72	7.45	13.46
	6.7	7.28	13.62	7.61	13.98	7.49	13.62
	7.4	7.31	13.65	7.62	14.00	7.55	13.74
	7.95	7.55	13.73	7.70	14.06	7.60	13.86
	10.2	7.73	13.74	7.73	14.09	7.65	13.87
	12.2	7.76	13.89	7.81	14.18	7.72	13.88
AMR-WB	6.6	8.25	14.41	7.93	13.94	7.87	14.09
	8.85	8.26	14.45	8.03	13.97	7.88	14.10
	12.65	8.31	14.53	8.04	14.03	7.89	14.11
	14.25	8.32	14.57	8.06	14.04	7.99	14.13
	15.85	8.39	14.68	8.16	14.19	8.02	14.19
	18.25	8.41	14.73	8.19	14.24	8.03	14.21
	19.85	8.42	14.79	8.20	14.25	8.10	14.22
	23.05	8.46	14.80	8.22	14.26	8.11	14.23
	23.85	8.60	15.01	8.24	14.27	8.18	14.26
EVS-NB	5.9	N/A		7.26	13.61	7.21	13.52
	7.2			7.32	13.64	7.32	13.53
	8			7.41	13.77	7.39	13.59
	9.6			7.46	13.80	7.45	13.65
	13.2			7.51	13.81	7.47	13.70
	16.4			7.58	13.83	7.64	13.71
	24.4			7.69	13.88	7.72	13.73
EVS-WB	5.9			7.50	14.10	7.42	13.66
	7.2			7.57	14.24	7.61	13.76
	8			7.61	14.30	7.85	14.17
	9.6			7.81	14.59	8.03	14.40
	13.2			7.92	14.61	8.12	14.44
	16.4			7.98	14.67	8.17	14.74
	24.4			8.47	14.69	8.59	14.77

1.2 For codecs with bit rate, tested only bit rate with the worst conversational gain

Air Interface	Band	Limit (dB)	Conv. Gain(dB)							
			AMR NB (4.75kbps)		AMR WB (6.6kbps)		EVS NB (5.9kbps)		EVS WB (5.9kbps)	
			2N	8N	2N	8N	2N	8N	2N	8N
WCDMA	B2	6	7.02	13.50	8.25	14.41	N/A			
	B4	6	7.37	13.10	8.54	14.20				
	B5	6	7.00	13.29	8.12	14.31				
LTE	B2	6	7.19	13.41	8.24	14.52	6.91	13.43	7.55	13.77
	B2	6	N/A				7.67	N/A		
	B5	6	7.07	13.76	7.82	14.61	6.92	13.59	7.83	13.83
	B7	6	8.06	13.71	8.83	14.15	7.83	13.14	8.62	13.70
	B12	6	7.20	13.43	8.11	14.09	7.23	13.38	7.80	14.09
	B14	6	8.08	13.73	8.83	14.02	7.42	13.27	7.39	14.08
	B66(4)	6	7.12	13.58	7.93	13.94	7.26	13.61	7.50	14.10
NR	n2	6	7.28	13.28	7.95	14.21	7.34	13.75	7.55	13.68
	n5	6	7.30	13.54	7.93	14.19	7.30	13.61	7.62	13.82
	n14	6	7.95	13.92	8.57	13.92	7.50	13.23	8.71	13.93
	n66	6	7.40	13.67	8.00	14.15	7.38	13.53	7.76	13.79
	n77	6	7.21	13.33	7.87	14.09	7.21	13.52	7.42	13.66

The noise power shall ≥ 20 when tested over the range of 1/3 octave band center frequencies. The receive frequency response shall be measured at the DRP in 1/12 octave bands. After translation to the FF, it shall fall between the applicable upper and lower limits.

Volume Control: Max-2, LRP: FF

Verdict: Pass

2.1 Distortion Test Result and Frequency Response for EVS-NB 24.4 kbps and LTE

Air Interface	Band	Limit (dB)	Mounting Force	Minimum PN-SDNR (dB)	Receive Acoustic Frequency Response Performance
LTE	B2	20	2N	26.43	2.42
	B2	20	8N	22.13	1.08
	B5	20	2N	28.68	2.18
	B5	20	8N	22.70	1.22
	B7	20	2N	26.05	0.95
	B7	20	8N	29.63	0.16
	B12	20	2N	28.19	2.10
	B12	20	8N	22.95	1.26
	B14	20	2N	26.59	1.01
	B14	20	8N	32.42	0.88
	B66(4)	20	2N	25.92	2.67
	B66(4)	20	8N	26.30	0.98

2.2 Distortion Test Result and Frequency Response for EVS-NB 24.4 kbps and FR1

Air Interface	Band	Limit (dB)	Mounting Force	Minimum PN-SDNR (dB)	Receive Acoustic Frequency Response Performance
FR1	N2	20	2N	27.20	2.71
	N2	20	8N	23.49	0.85
	N5	20	2N	25.98	2.74
	N5	20	8N	24.29	1.02
	N66	20	2N	26.80	2.49
	N66	20	8N	23.57	1.11
	N14	20	2N	22.84	0.87
	N14	20	8N	31.75	0.04
	N77	20	2N	28.54	2.50
	N77	20	8N	23.31	1.17

2.3 Distortion Test Result and Frequency Response for EVB-WB 24.4 kbps and LTE

Air Interface	Band	Limit (dB)	Mounting Force	Minimum PN-SDNR (dB)	Receive Acoustic Frequency Response Performance
LTE	B2	20	2N	25.86	0.19
	B2	20	8N	23.87	0.33
	B5	20	2N	28.32	0.12
	B5	20	8N	24.45	0.37
	B7	20	2N	25.66	0.53
	B7	20	8N	23.63	71.18
	B12	20	2N	24.41	0.32
	B12	20	8N	23.77	0.38
	B14	20	2N	29.23	0.13
	B14	20	8N	23.57	1.39
	B66(4)	20	2N	23.86	0.39
	B66(4)	20	8N	23.59	0.47

2.4 Distortion Test Result and Frequency Response for EVB-WB 24.4 kbps and NR

Air Interface	Band	Limit (dB)	Mounting Force	Minimum PN-SDNR (dB)	Receive Acoustic Frequency Response Performance
FR1	N2	20	2N	27.48	0.20
	N2	20	8N	22.71	0.61
	N5	20	2N	27.26	0.47
	N5	20	8N	22.47	0.34
	N66	20	2N	25.01	0.52
	N66	20	8N	23.91	0.42
	N14	20	2N	30.53	0.66
	N14	20	8N	25.79	0.44
	N77	20	2N	28.04	0.92
	N77	20	8N	23.47	0.09