

Appendix A

Volume Control Test Data and Graph for Report No.: SUES251100231671

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 B41		NR n77	
		2N	8N	2N	8N	2N	8N
AMR-NB	4.75	8.08	12.26	8.01	12.18	7.95	12.18
	5.15	8.14	12.35	8.05	12.19	7.97	12.37
	5.9	8.15	12.41	8.07	12.22	8.02	12.42
	6.7	8.37	12.55	8.12	12.23	8.03	12.43
	7.4	8.41	12.58	8.26	12.35	8.06	12.53
	7.95	8.47	12.63	8.28	12.51	8.23	12.77
	10.2	8.68	12.65	8.36	12.58	8.35	12.79
	12.2	8.70	12.66	8.46	12.66	8.37	12.89
AMR-WB	6.6	7.91	12.02	8.01	12.00	7.80	11.89
	8.85	7.92	12.03	8.02	12.01	7.85	11.93
	12.65	7.97	12.19	8.04	12.05	7.92	11.94
	14.25	8.00	12.25	8.06	12.06	7.99	12.02
	15.85	8.02	12.26	8.09	12.25	8.07	12.03
	18.25	8.05	12.32	8.12	12.36	8.11	12.11
	19.85	8.06	12.37	8.14	12.44	8.14	12.12
	23.05	8.10	12.47	8.17	12.49	8.15	12.15
	23.85	8.16	12.56	8.18	12.59	8.25	12.19

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)	
			2N	8N	2N	8N
WCDMA	B2	6	8.08	12.26	7.91	12.02
	B4	6	8.24	12.29	7.99	11.93
	B5	6	8.18	12.16	7.72	12.03
LTE	B2	6	8.16	12.30	8.29	12.08
	B5	6	8.38	12.72	8.09	12.01
	B7	6	8.15	12.24	8.19	12.23
	B12	6	8.17	12.18	8.23	12.05
	B14	6	8.55	12.37	8.34	12.18
	B17	6	8.14	12.50	8.09	12.05
	B30	6	8.44	12.29	8.14	12.14
	B42	6	8.04	12.99	8.16	12.03
	B43	6	8.17	12.24	8.04	12.01
	B48	6	8.14	12.49	8.09	12.09
	B41(38)	6	8.01	12.18	8.01	12.00
	B66(4)	6	8.40	12.36	8.05	12.00
NR	n2	6	7.91	11.97	7.93	11.78
	n5	6	7.87	12.01	7.94	11.54
	n7	6	8.11	12.16	7.71	11.86
	n14	6	8.17	12.12	8.03	11.91
	n30	6	8.14	12.18	8.04	11.81
	n66	6	8.22	12.24	7.87	11.93
	n77	6	7.95	12.18	7.80	11.89

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-1, LRP: FF

Verdict: Pass

2.1 Distortion Test Result and Frequency Response for AMR-NB 12.2 kbps and WCDMA

Air Interface	Band	Limit (dB)	Mounting Force	Minimum PN-SDNR (dB)	Receive Acoustic Frequency Response Performance
WCDMA	B2	20	2N	22.21	2.39
	B2	20	8N	21.46	1.38
	B4	20	2N	21.68	2.37
	B4	20	8N	21.93	1.53
	B5	20	2N	22.16	2.34
	B5	20	8N	21.53	1.58

2.2 Distortion Test Result and Frequency Response for AMR-NB 12.2 kbps and LTE

Air Interface	Band	Limit (dB)	Mounting Force	Minimum PN-SDNR (dB)	Receive Acoustic Frequency Response Performance
LTE	B2	20	2N	20.55	2.27
	B2	20	8N	21.87	1.19
	B5	20	2N	21.03	2.43
	B5	20	8N	21.45	1.43
	B7	20	2N	21.40	2.72
	B7	20	8N	21.22	1.61
	B12	20	2N	21.32	2.38
	B12	20	8N	20.43	1.28
	B14	20	2N	21.82	2.57
	B14	20	8N	21.43	1.74
	B17	20	2N	21.72	2.61
	B17	20	8N	21.24	1.67
	B30	20	2N	21.26	2.71
	B30	20	8N	21.29	1.71
	B42	20	2N	22.01	2.48
	B42	20	8N	21.57	1.70
	B43	20	2N	20.06	2.65
	B43	20	8N	21.56	1.64
	B48	20	2N	21.72	2.42
	B48	20	8N	20.20	1.56
	B41(38)	20	2N	21.99	2.49
	B41(38)	20	8N	21.30	1.61

	B66(4)	20	2N	21.65	2.65
	B66(4)	20	8N	21.40	1.88

2.3 Distortion Test Result and Frequency Response for AMR-NB 12.2 kbps and FR1

Air Interface	Band	Limit (dB)	Mounting Force	Minimum PN-SDNR (dB)	Receive Acoustic Frequency Response Performance
FR1	n2	20	2N	21.99	2.36
	n2	20	8N	21.08	1.62
	n5	20	2N	21.87	2.24
	n5	20	8N	21.71	1.59
	n7	20	2N	21.42	2.68
	n7	20	8N	20.95	1.74
	n14	20	2N	22.19	2.56
	n14	20	8N	21.54	1.67
	n30	20	2N	21.93	2.60
	n30	20	8N	21.37	1.72
	n66	20	2N	21.49	2.65
	n66	20	8N	21.37	1.60
	n77	20	2N	21.55	2.60
	n77	20	8N	21.65	1.57

2.4 Distortion Test Result and Frequency Response for AMR-WB 23.85 kbps and WCDMA

Air Interface	Band	Limit (dB)	Mounting Force	Minimum PN-SDNR (dB)	Receive Acoustic Frequency Response Performance
WCDMA	B2	20	2N	20.71	1.39
	B2	20	8N	21.27	1.02
	B4	20	2N	20.93	1.30
	B4	20	8N	20.64	0.76
	B5	20	2N	21.31	1.28
	B5	20	8N	20.96	1.03

2.5 Distortion Test Result and Frequency Response for AMR-WB 23.85 kbps and LTE

Air Interface	Band	Limit (dB)	Mounting Force	Minimum PN-SDNR (dB)	Receive Acoustic Frequency Response Performance
LTE	B2	20	2N	20.36	1.45
	B2	20	8N	21.43	1.00
	B5	20	2N	20.81	1.08
	B5	20	8N	21.11	1.27
	B7	20	2N	20.70	1.11
	B7	20	8N	20.98	1.29
	B12	20	2N	21.14	1.36
	B12	20	8N	20.81	1.10
	B14	20	2N	21.03	1.41
	B14	20	8N	21.27	1.18
	B17	20	2N	20.77	1.26
	B17	20	8N	20.90	1.26
	B30	20	2N	21.27	1.41
	B30	20	8N	20.91	1.23
	B42	20	2N	20.56	0.84
	B42	20	8N	21.05	1.26
	B43	20	2N	20.62	1.32
	B43	20	8N	20.98	1.71
	B48	20	2N	20.99	0.57
	B48	20	8N	21.17	0.98
	B41(38)	20	2N	21.19	0.91
	B41(38)	20	8N	21.06	1.11
	B66(4)	20	2N	20.70	1.32
	B66(4)	20	8N	20.86	1.06

2.6 Distortion Test Result and Frequency Response for AMR-WB 23.85 kbps and NR

Air Interface	Band	Limit (dB)	Mounting Force	Minimum PN-SDNR (dB)	Receive Acoustic Frequency Response Performance
FR1	n2	20	2N	20.95	1.34
	n2	20	8N	20.95	1.36
	n5	20	2N	20.91	1.42
	n5	20	8N	20.94	1.07
	n7	20	2N	20.57	1.52
	n7	20	8N	20.87	1.39
	n14	20	2N	20.79	1.41
	n14	20	8N	20.76	1.22
	n30	20	2N	20.61	1.49
	n30	20	8N	21.20	1.13
	n66	20	2N	20.41	1.43
	n66	20	8N	20.63	1.36
	n77	20	2N	20.42	1.37
	n77	20	8N	20.87	1.12