

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3279

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
750	41.9	0.89	6.58	6.58	6.58	0.80	1.19	± 12.0 %
835	41.5	0.90	6.38	6.38	6.38	0.80	1.21	± 12.0 %
1750	40.1	1.37	5.59	5.59	5.59	0.64	1.37	± 12.0 %
1900	40.0	1.40	5.35	5.35	5.35	0.57	1.45	± 12.0 %
2000	40.0	1.40	5.25	5.25	5.25	0.80	1.22	± 12.0 %
2300	39.5	1.67	5.02	5.02	5.02	0.78	1.30	± 12.0 %
2450	39.2	1.80	4.77	4.77	4.77	0.67	1.44	± 12.0 %
2600	39.0	1.96	4.58	4.58	4.58	0.73	1.39	± 12.0 %

^C Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3279

Calibration Parameter Determined in Body Tissue Simulating Media

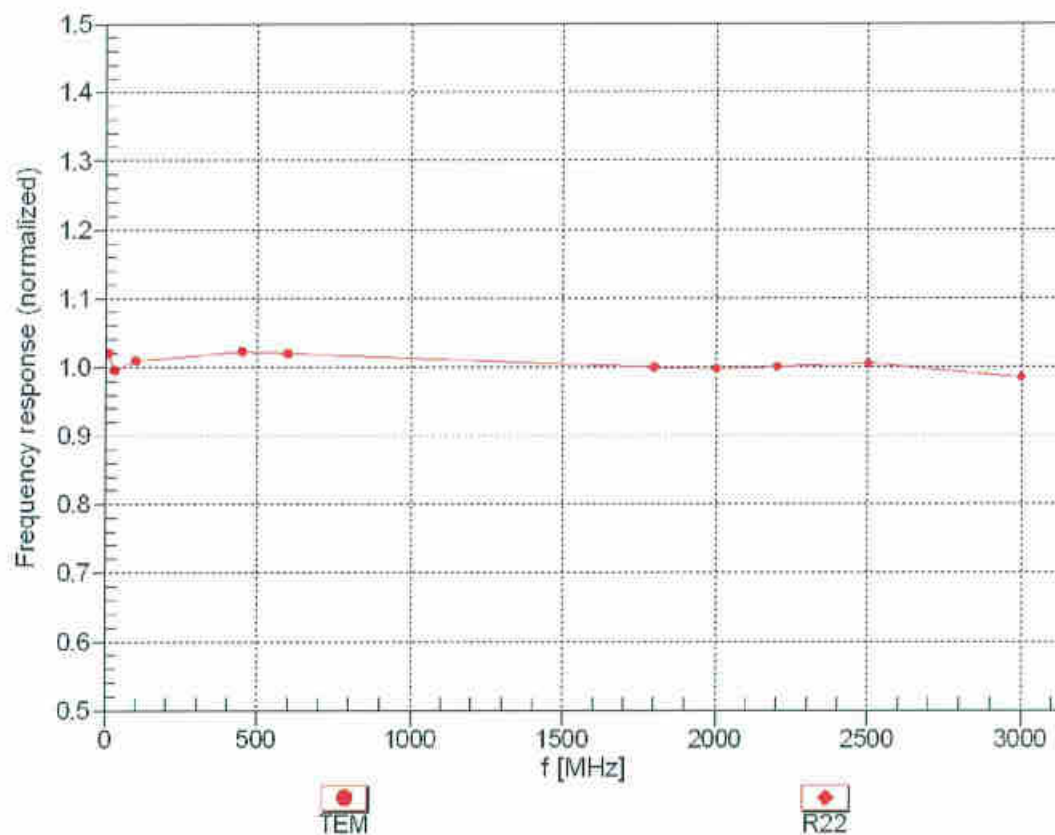
f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
750	55.5	0.96	6.40	6.40	6.40	0.68	1.25	± 12.0 %
835	55.2	0.97	6.23	6.23	6.23	0.70	1.22	± 12.0 %
1750	53.4	1.49	5.08	5.08	5.08	0.61	1.42	± 12.0 %
1900	53.3	1.52	4.85	4.85	4.85	0.41	1.84	± 12.0 %
2300	52.9	1.81	4.66	4.66	4.66	0.80	1.24	± 12.0 %
2450	52.7	1.95	4.50	4.50	4.50	0.80	1.25	± 12.0 %
2600	52.5	2.16	4.34	4.34	4.34	0.80	1.25	± 12.0 %

^C Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

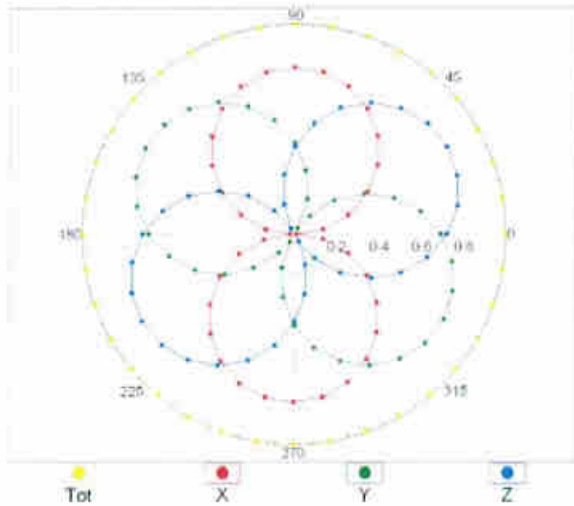
Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



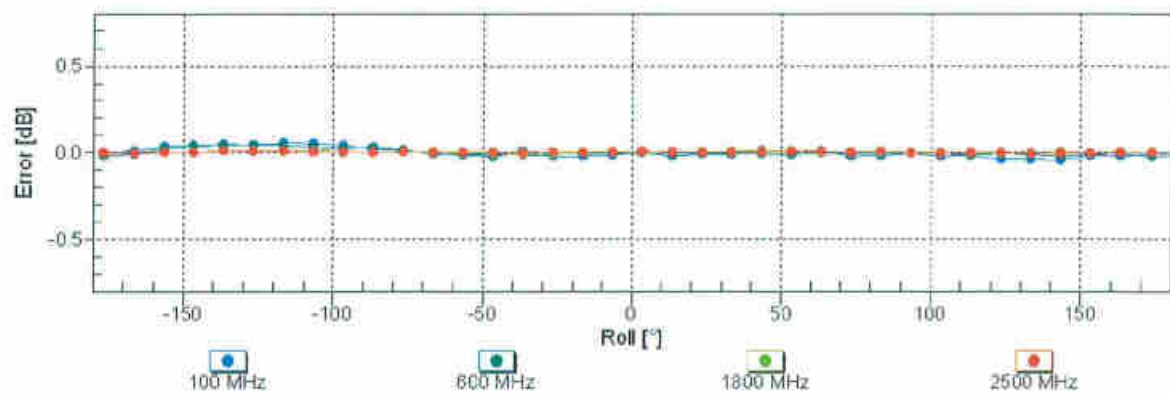
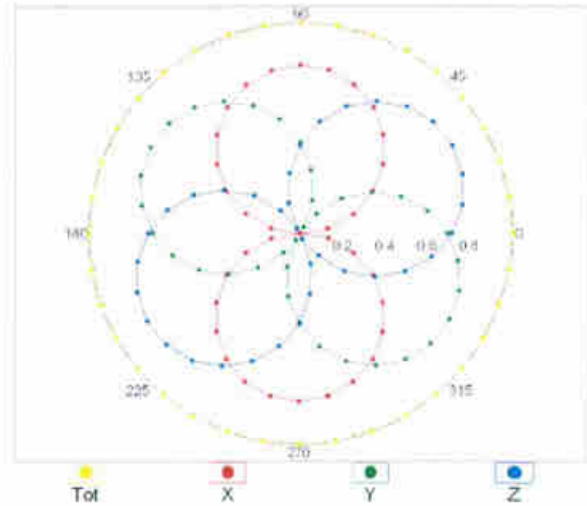
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

Receiving Pattern (ϕ), $\vartheta = 0^\circ$

f=600 MHz,TEM

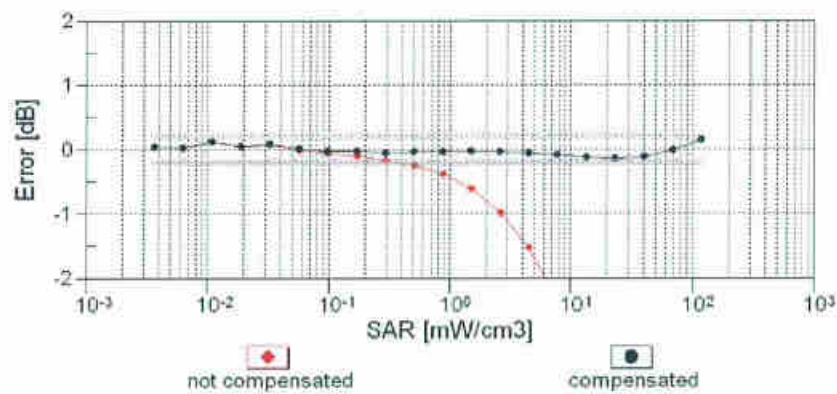
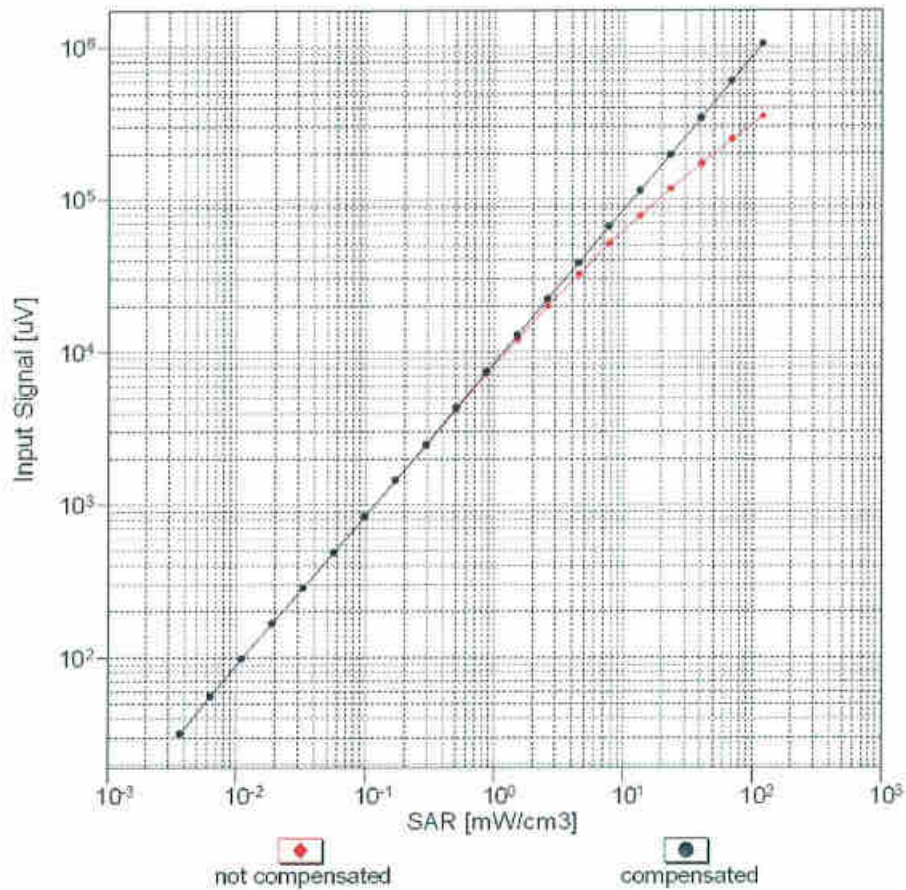


f=1800 MHz,R22



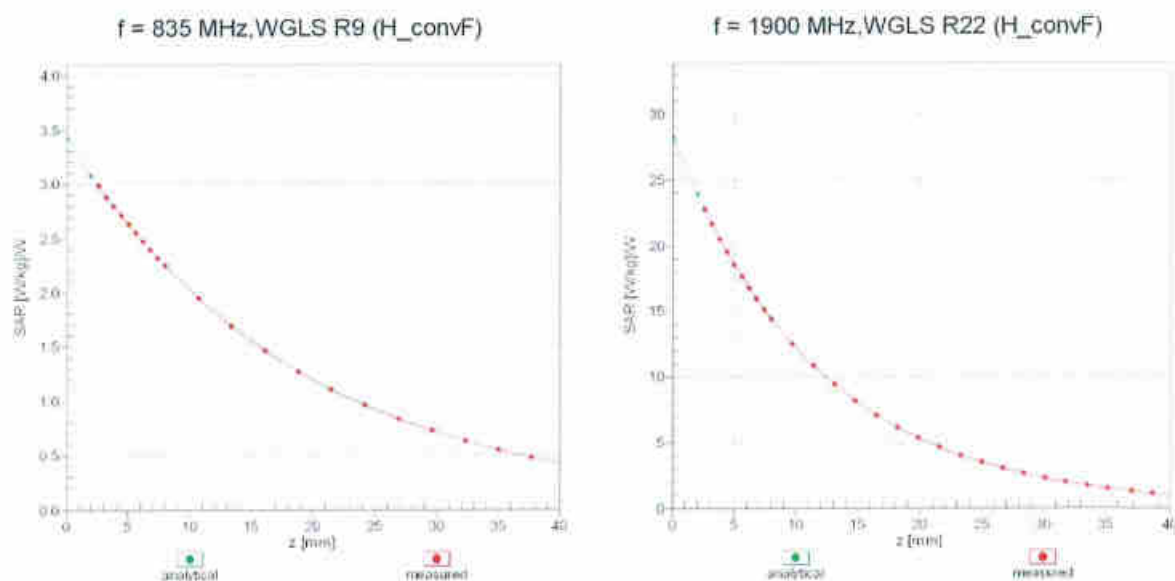
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell, $f_{\text{eval}} = 1900 \text{ MHz}$)



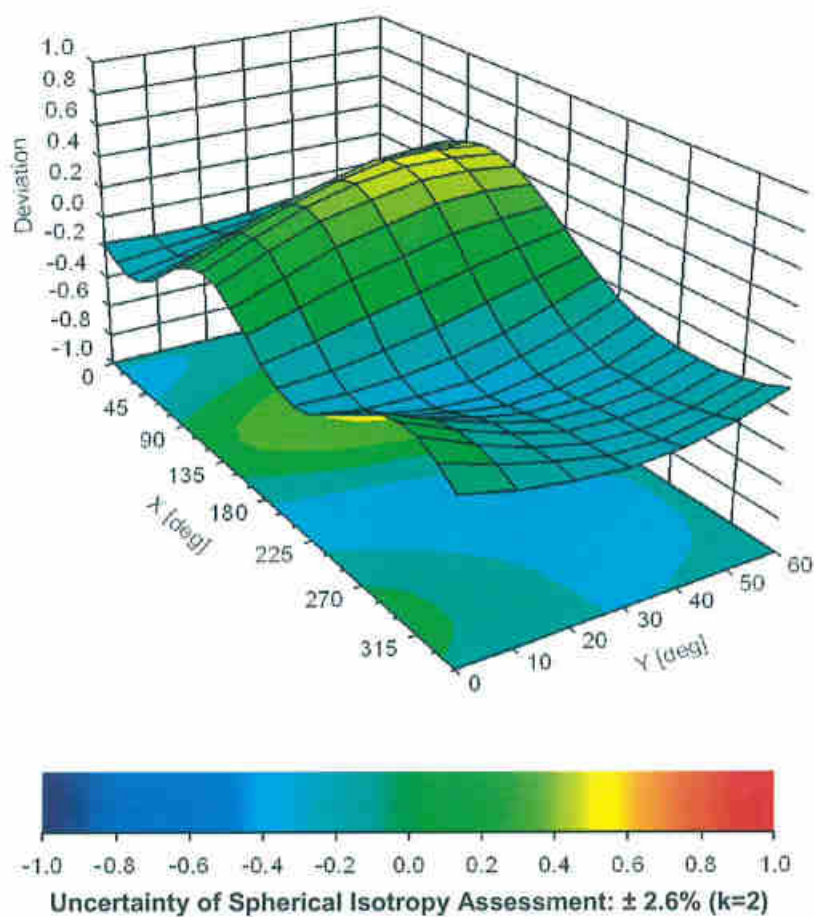
Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, θ), $f = 900 \text{ MHz}$





Appendix E. Conducted RF Output Power Table

The detailed power table are shown as follows.

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
	125	169	251		125	169	251	
TX Channel	824.2	836.4	848.8	Limit	824.2	836.4	848.8	Limit
Frequency (MHz)								
GSM 1 Tx slot	32.99	32.89	32.96	34.00	23.99	23.89	23.96	25.00
GPRS 1 Tx slot	32.96	32.88	32.94	34.00	23.96	23.88	23.94	25.00
GPRS 2 Tx slots	31.68	31.58	31.65	32.50	25.68	25.58	25.65	26.50
GPRS 3 Tx slots	30.26	30.15	30.22	30.70	26.00	25.89	25.96	26.44
GPRS 4 Tx slots	28.76	28.63	28.67	29.50	25.76	25.63	25.67	26.50
EDGE 1 Tx slot	26.36	26.28	26.31	28.00	17.36	17.28	17.31	19.00
EDGE 2 Tx slots	25.28	25.19	25.21	26.50	19.28	19.19	19.21	20.50
EDGE 3 Tx slots	24.15	24.08	24.08	24.70	19.89	19.82	19.82	20.44
EDGE 4 Tx slots	23.07	23.16	23.01	23.50	20.07	20.16	20.01	20.50

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
	512	661	810		512	661	810	
TX Channel	1527.2	1680	1800.8	Limit	1527.2	1680	1800.8	Limit
Frequency (MHz)								
GSM 1 Tx slot	29.53	29.57	29.93	31.00	20.53	20.57	20.93	22.00
GPRS 1 Tx slot	29.48	29.55	29.92	31.00	20.48	20.55	20.92	22.00
GPRS 2 Tx slots	28.07	28.10	28.48	29.50	22.07	22.10	22.48	23.50
GPRS 3 Tx slots	26.58	26.62	27.02	27.70	22.32	22.36	22.76	23.44
GPRS 4 Tx slots	25.05	25.12	25.51	26.50	22.05	22.12	22.51	23.50
EDGE 1 Tx slot	25.95	25.70	25.74	27.00	16.95	16.70	16.74	18.00
EDGE 2 Tx slots	24.10	23.82	23.91	25.50	18.10	17.82	17.91	19.50
EDGE 3 Tx slots	23.21	22.88	23.01	23.70	18.95	18.62	18.75	19.44
EDGE 4 Tx slots	22.25	22.14	22.11	22.50	19.25	19.14	19.11	19.50

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA IV			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9682	9406	8538		1312	1413	1513		4132	4162	4233	
Rx Channel		9682	9800	9938		1537	1638	1738		4367	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		1712.4	1732.6	1752.6		828.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	23.31	23.31	23.43	24.50	23.36	23.42	23.45	24.50	24.22	24.29	24.43	25.00
3GPP Rel 99	RMK 12.2Kbps	23.33	23.32	23.45	24.50	23.38	23.44	23.46	24.50	24.23	24.31	24.45	25.00
3GPP Rel 6	HSDPA Subtest-1	23.16	23.16	23.12	24.50	23.24	23.26	23.36	24.50	24.09	24.15	24.21	25.00
3GPP Rel 6	HSDPA Subtest-2	23.16	23.11	23.07	24.50	23.18	23.26	23.30	24.50	24.12	24.09	24.23	25.00
3GPP Rel 6	HSDPA Subtest-3	22.69	22.64	22.61	24.00	22.67	22.75	22.83	24.00	23.60	23.64	23.74	24.50
3GPP Rel 6	HSDPA Subtest-4	22.68	22.64	22.61	24.00	22.70	22.74	22.84	24.00	23.61	23.57	23.62	24.50
3GPP Rel 8	DC-HSDPA Subtest-1	23.11	23.15	23.13	24.50	23.22	23.21	23.33	24.50	24.02	24.11	24.21	25.00
3GPP Rel 8	DC-HSDPA Subtest-2	23.13	23.14	23.11	24.50	23.19	23.24	23.31	24.50	24.05	24.09	24.21	25.00
3GPP Rel 8	DC-HSDPA Subtest-3	22.66	22.64	22.60	24.00	22.63	22.71	22.83	24.00	23.61	23.61	23.73	24.50
3GPP Rel 8	DC-HSDPA Subtest-4	22.67	22.62	22.61	24.00	22.67	22.69	22.81	24.00	23.60	23.65	23.71	24.50
3GPP Rel 6	HSUPA Subtest-1	22.65	22.73	22.84	24.50	22.70	22.80	22.84	24.50	23.06	23.01	23.02	25.00
3GPP Rel 6	HSUPA Subtest-2	21.25	21.15	21.14	22.50	21.26	21.31	21.34	22.50	21.93	22.00	22.03	23.00
3GPP Rel 6	HSUPA Subtest-3	22.15	22.12	22.12	23.50	22.22	22.33	22.38	23.50	22.92	22.89	23.01	24.00
3GPP Rel 6	HSUPA Subtest-4	20.76	20.65	20.66	22.50	20.78	20.80	20.84	22.50	21.51	21.38	21.53	23.00
3GPP Rel 6	HSUPA Subtest-5	22.70	22.60	22.60	24.50	22.70	22.80	22.80	24.50	23.40	23.50	23.50	25.00

Band 2 (1900MHz Band)									
Part 24E									
SW (MHz)	Modulation	RB Size	RB Offset	Power Max Ch./Freq.	Power Min Ch./Freq.	Power Avg Ch./Freq.	Turn-up Time (sec)	MFR (dB)	
Channel									
Frequency (MHz)									
20	QPSK	1	0	23.23	23.10	23.16			
20	QPSK	1	40	23.30	23.16	23.23	24.5	0	
20	QPSK	1	80	23.37	23.23	23.30			
20	QPSK	50	0	23.19	23.05	23.12			
20	QPSK	50	24	23.19	23.05	23.12			
20	QPSK	50	50	23.18	23.03	23.10	23.5	1	
20	QPSK	100	0	23.16	23.02	23.09			
20	QPSK	100	40	23.21	23.07	23.14			
20	QPSK	1	40	23.36	23.24	23.30	23.5	1	
20	QPSK	1	80	23.23	23.10	23.16			
20	QPSK	50	0	21.17	21.08	21.12			
20	QPSK	50	24	21.22	21.09	21.15	22.5	2	
20	QPSK	50	50	21.18	21.03	21.10			
20	QPSK	100	0	21.17	21.07	21.12			
20	QPSK	1	0	21.52	21.54	21.43			
20	QPSK	1	40	21.70	21.70	21.63	23.5	2	
20	QPSK	1	80	21.52	21.50	21.41			
20	QPSK	50	0	20.44	20.40	20.42			
20	QPSK	50	24	20.53	20.50	20.51	21.5	3	
20	QPSK	50	50	20.63	20.47	20.45			
20	QPSK	100	0	20.59	20.40	20.49			
Channel									
Frequency (MHz)									
15	QPSK	1	0	19.67	19.66	19.66	Turn-up Time (sec)	MFR (dB)	
15	QPSK	1	37	19.36	19.32	19.34	24.5	0	
15	QPSK	1	74	19.62	19.58	19.60			
15	QPSK	36	0	19.18	19.13	19.15			
15	QPSK	36	20	19.21	19.18	19.14	23.5	1	
15	QPSK	36	50	19.18	19.15	19.16			
15	QPSK	72	0	19.18	19.13	19.15			
15	QPSK	72	20	19.23	19.18	19.20	23.5	1	
15	QPSK	1	37	19.34	19.30	19.32			
15	QPSK	14	0	19.38	19.37	19.38			
15	QPSK	36	0	21.21	21.19	21.13			
15	QPSK	36	20	21.22	21.19	21.21	22.5	2	
15	QPSK	72	0	21.17	21.11	21.14			
15	QPSK	75	0	21.21	21.18	21.11			
15	QPSK	1	37	21.62	21.60	21.61	22.5	2	
15	QPSK	1	74	21.59	21.57	21.44			
15	QPSK	36	0	20.53	20.50	20.51			
15	QPSK	36	20	20.52	20.50	20.44	21.5	3	
15	QPSK	36	50	20.54	20.46	20.43			
15	QPSK	75	0	20.54	20.48	20.47			
Channel									
Frequency (MHz)									
10	QPSK	1	0	23.17	23.00	23.03			
10	QPSK	1	25	23.25	23.19	23.14	24.5	0	
10	QPSK	40	0	23.09	23.04	23.02			
10	QPSK	25	0	23.18	23.14	23.14			
10	QPSK	25	12	23.20	23.17	23.15	23.5	1	
10	QPSK	25	24	23.20	23.17	23.15			
10	QPSK	50	0	23.20	23.15	23.17			
10	QPSK	1	0	22.44	22.30	22.26			
10	QPSK	1	40	22.56	22.42	22.49	23.5	1	
10	QPSK	1	80	22.44	22.32	22.35			
10	QPSK	25	0	21.21	21.15	21.09			
10	QPSK	25	12	21.21	21.15	21.13	22.5	2	
10	QPSK	25	24	21.26	21.20	21.13			
10	QPSK	50	0	21.21	21.16	21.11			
10	QPSK	50	14	21.34	21.30	21.24			
10	QPSK	1	25	22.05	21.95	21.85	22.5	2	
10	QPSK	1	40	22.18	22.02	22.07			
10	QPSK	25	0	20.88	20.78	20.73	21.5	3	
10	QPSK	25	12	20.87	20.77	20.69			
Channel									
Frequency (MHz)									
5	QPSK	1	0	23.00	22.97	22.97			
5	QPSK	1	12	23.24	23.24	23.24	24.5	0	
5	QPSK	1	24	23.07	23.06	23.06			
5	QPSK	12	0	22.18	22.09	22.09			
5	QPSK	12	7	22.26	22.17	22.15	23.5	1	
5	QPSK	12	13	22.26	22.15	22.07			
5	QPSK	25	0	22.22	22.14	22.10			
5	QPSK	25	0	22.39	22.31	22.35	23.5	1	
5	QPSK	1	0	22.39	22.30	22.34			
5	QPSK	1	24	22.36	22.24	22.27			
5	QPSK	12	0	21.19	21.18	21.14	22.5	2	
5	QPSK	12	13	21.28	21.18	21.11			
5	QPSK	25	0	21.22	21.16	21.14			
5	QPSK	1	0	21.62	21.54	21.41	22.5	2	
5	QPSK	1	12	21.79	21.70	21.66			
5	QPSK	12	0	20.48	20.38	20.36	21.5	3	
5	QPSK	12	7	20.54	20.36	20.47			
5	QPSK	25	0	20.55	20.50	20.49			
Channel									
Frequency (MHz)									
3	QPSK	1	0	23.19	23.10	23.05			
3	QPSK	1	4	23.20	23.08	23.05	24.5	0	
3	QPSK	1	14	23.18	23.07	23.03			
3	QPSK	8	0	22.21	22.10	22.10			
3	QPSK	8	4	22.27	22.16	22.13	23.5	1	
3	QPSK	8	7	22.25	22.11	22.07			
3	QPSK	16	0	22.24	22.14	22.11			
3	QPSK	1	8	22.46	22.34	22.28	23.5	1	
3	QPSK	1	8	22.47	22.30	22.24			
3	QPSK	1	14	22.50	22.30	22.28			
3	QPSK	8	0	21.52	21.40	21.31	22.5	2	
3	QPSK	8	4	21.50	21.36	21.33			
3	QPSK	8	7	21.51	21.35	21.33			
3	QPSK	16	0	21.49	21.34	21.29	22.5	2	
3	QPSK	1	8	21.73	21.60	21.42			
3	QPSK	1	14	21.74	21.63	21.52			
3	QPSK	8	0	20.55	20.50	20.43	21.5	3	
3	QPSK	8	4	20.59	20.50	20.48			
3	QPSK	8	7	20.54	20.51	20.41			
3	QPSK	16	0	20.57	20.47	20.41			
Channel									
Frequency (MHz)									
1.4	QPSK	1	0	23.07	22.98	22.91			
1.4	QPSK	1	0	23.18	23.08	23.03	24.5	0	
1.4	QPSK	1	5	23.07	22.96	22.91			
1.4	QPSK	3	0	23.16	23.06	23.02			
1.4	QPSK	3	3	23.17	23.07	23.03	23.5	1	
1.4	QPSK	6	0	22.19	22.06	22.02			
1.4	QPSK	6	3	22.31	22.20	22.14	23.5	1	
1.4	QPSK	1	5	22.45	22.30	22.20			
1.4	QPSK	3	0	21.58	21.46	21.39	22.5	2	
1.4	QPSK	3	3	21.59	21.48	21.41			
1.4	QPSK	6	0	21.55	21.50	21.27			
1.4	QPSK	6	3	21.70	21.60	21.46	22.5	2	
1.4	QPSK	1	5	21.60	21.47	21.44			
1.4	QPSK	3	0	21.49	21.51	21.53			
1.4	QPSK	3	3	21.69	21.58	21.42			
1.4	QPSK	6	0	20.59	20.44	20.40	21.5	3	

Band 4 (AWS Band)									
Part 27L (only on channel required)									
SW (MHz)	Modulation	RB Size	RB Offset	Power / Ch./Freq.	Power / Ch./Freq.	Power / Ch./Freq.	Turn-up Time (sec)	MFR (dB)	
Channel									
Frequency (MHz)									
20	QPSK	1	0	23.12	23.04	23.08			
20	QPSK	1	40	23.11	23.13	23.13	24.5	0	
20	QPSK	1	80	22.83	22.83	22.85			
20	QPSK	50	0	22.12	22.21	22.19			
20	QPSK	50	24	22.08	22.12	22.14			
20	QPSK	50	50	22.03	22.06	22.03	23.5	1	
20	QPSK	100	0	22.03	22.03	22.04			
20	QPSK	1	0	22.44	22.47	22.52			
20	QPSK	1	40	22.15	22.22	22.23			
20	QPSK	1	80	22.15	22.15	22.15			
20	QPSK	50	0	21.07	21.10	21.13	22.5	2	
20	QPSK	50	24	21.07	21.10	21.13			
20	QPSK	50	50	21.10	21.12	21.15			
20	QPSK	100	0	21.10	21.12	21.15			
20	QPSK	1	0	21.33	21.42	21.42			
20	QPSK	1	40	21.59	21.58	21.70	22.5	2	
20	QPSK	1	80	21.39	21.49	21.51			
20	QPSK	50	0	20.28	20.46	20.47			
20	QPSK	50	24	20.34	20.43	20.43			
20	QPSK	100	0	20.38	20.38	20.44	Turn-up time	MFR (dB)	
Channel									
Frequency (MHz)									
15	QPSK	1	0	17.17	17.22	17.47			
15	QPSK	1	40	22.84	23.01	23.05			
15	QPSK	1	80	22.13	22.13	22.13	24.5	0	
15	QPSK	1	24	22.86	22.90	22.85			
15	QPSK	50	0	22.12	22.11	22.14			
15	QPSK	50	24	22.11	22.11	22.11			
15	QPSK	50	50	22.06	22.09	22.12	23.5	1	
15	QPSK	100	0	22.07	22.10	22.13			
15	QPSK	1	0	22.29	22.31	22.39			
15	QPSK	1	40	22.43	22.43	22.43			
15	QPSK	1	80	22.07	22.03	22.03	23.5	1	
15	QPSK	50	0	21.15	21.14	21.19			
15	QPSK	50	24	21.14	21.18	21.18			
15	QPSK	50	50	21.18	21.18	21.18	22.5	2	
15	QPSK	100	0	21.18	21.18	21.18			
15	QPSK	1	0	21.36	21.46	21.49			
15	QPSK	1	40	21.60	21.68	21.73	22.5	2	
15	QPSK	1	80	21.40	21.50	21.60			
15	QPSK	50	0	20.43	20.43	20.43			
15	QPSK	50	24	20.43	20.43	20.43	21.5	3	
15	QPSK	100	0	20.38	20.44	20.45			
Channel									
Frequency (MHz)									
10	QPSK	1	0	17.16	17.22	17.50	Turn-up time	MFR (dB)	
10	QPSK	1	40	22.82	22.96	23.00			
10	QPSK	1	80	22.13	22.13	22.13	24.5	0	
10	QPSK	50	0	22.07	22.08	22.10			
10	QPSK	50	24	22.02	22.02	22.10	23.5	1	
10	QPSK	100	0	22.06	22.06	22.37			
10	QPSK	1	0	22.43	22.44	22.54			
10	QPSK	1	40	22.25	22.25	22.25	23.5	1	
10	QPSK	1	80	21.12	21.16	21.20			
10	QPSK	50	0	21.12	21.12	21.12			
10	QPSK	50	24	21.11	21.14	21.15			
10	QPSK	50	50	21.17	21.14	21.23			
10	QPSK	100	0	21.16	21.15	21.21			
10	QPSK	1	0	21.36	21.42	21.43			
10	QPSK	1	40	21.54	21.57	21.71	22.5	2	
10	QPSK	1	80	21.43	21.58	21.63			
10	QPSK	50	0	20.43	20.43	20.43			
10	QPSK	50	24	20.46	20.47	20.47	21.5	3	
10	QPSK	100	0	20.47	20.43	20.53			
Channel									
Frequency (MHz)									
5	QPSK	1	0	16.93	16.97	16.98	Turn-up time	MFR (dB)	
5	QPSK	1	40	22.81	22.88	22.92			
5	QPSK	1	80	22.13	22.13	22.13	24.5	0	
5	QPSK	50	0	22.07	22.07	22.07			
5	QPSK	12	0	21.96	21.96	22.08			
5	QPSK	12	4	22.03	22.06	22.14	23.5	1	
5	QPSK	12	8	22.08	22.08	22.08			
5	QPSK	1	0	21.97	22.00	22.08			
5	QPSK	1	40	21.93	22.01	22.02			
5	QPSK	1	80	21.98	22.01	22.01	23.5	1	
5	QPSK	12	0	21.98	22.01	22.01			
5	QPSK	12	4	21.98	22.01	22.01			
5	QPSK	12	8	21.98	22.01	22.01	22.5	2	
5	QPSK	1	0	21.97	22.04	22.04			
5	QPSK	1	40	21.97	22.02	22.02	21.5	3	
5	QPSK	1	80	21.97	22.01	22.01			
5	QPSK	12	0	21.97	22.04	22.04			
5	QPSK	12	4	21.97	22.04	22.04			
5	QPSK	12	8	21.97	22.04	22.04	21.5	3	
5	QPSK	1	0	21.97	22.02	22.02			
Channel									
Frequency (MHz)									
3	QPSK	1	0	17.13	17.22	17.53	Turn-up time	MFR (dB)	
3	QPSK	1	40	22.89	22.93	22.99			
3	QPSK	1	80	22.84	22.94	23.04	24.5	0	
3	QPSK	1	24	22.82	22.86	22.92			
3	QPSK	8	0	21.64	21.96	22.08			
3	QPSK	8	24	21.64	21.96	22.08	23.5	1	
3	QPSK	8	7	21.96	22.03	22.05			
3	QPSK	16	0	21.97	22.16	22.27			
3	QPSK	16	24	22.02	22.02	22.02			
3	QPSK	1	0	21.96	22.08	22.08	23.5	1	
3	QPSK	1	40	21.96	22.08	22.08			
3	QPSK	1	80	21.96	22.08	22.08	22.5	2	
3	QPSK	1	24	21.96	22.08	22.08			
3	QPSK	1	48	21.96	22.08	22.08			
3	QPSK	1	72	21.96	22.08	22.08	22.5	2	
3	QPSK	1	96	21.96	22.08	22.08			
3	QPSK	1	120	21.96	22.08	22.08			
3	QPSK	1	144	21.96	22.08	22.08	21.5	3	
3	QPSK	1	168	21.96	22.08	22.08			
3	QPSK	1	192	21.96	22.08	22.08			
3	QPSK	1	216	21.96	22.08	22.08	21.5	3	
3	QPSK	1	240	21.96	22.08	22.08			
3	QPSK	1	264	21.96	22.08	22.08			
3	QPSK	1	288	21.96	22.08	22.08	21.5	3	
3	QPSK	1	312	21.96	22.08	22.08			
3	QPSK	1	336	21.96	22.08	22.08			
3	QPSK	1	360	21.96	22.08	22.08	21.5	3	
3	QPSK	1	384	21.96	22.08	22.08			
3	QPSK	1	408	21.96	22.08	22.08			
3	QPSK	1	432	21.96	22.08	22.08	21.5	3	
3	QPSK	1	456	21.96	22.08	22.08			
3	QPSK	1	480	21.96	22.08	22.08			
3	QPSK	1	504	21.96	22.08	22.08	21.5	3	
3	QPSK	1	528	21.96	22.08	22.08			
3	QPSK	1	552	21.96	22.08	22.08			
3	QPSK	1	576	21.96	22.08	22.08	21.5	3	
3	QPSK	1	600	21.96	22.08	22.08			
3	QPSK	1	624	21.96	22.08	22.08			
3	QPSK	1	648	21.96	22.08	22.08	21.5	3	
3	QPSK	1	672	21.96	22.08	22.08			
3	QPSK	1	696	21.96	22.08	22.08			
3	QPSK	1	720	21.96	22.08	22.08	21.5	3	
3	QPSK	1	744	21.96	22.08	22.08			
3	QPSK	1	768	21.96	22.08	22.08			
3	QPSK	1	792	21.96	22.08	22.08	21.5	3	
3	QPSK	1	816	21.96	22.08	22.08			
3	QPSK	1	840	21.96	22.08	22.08			
3	QPSK	1	864	21.96	22.08	22.08	21.5	3	
3	QPSK	1	888	21.96	22.08	22.08			
3	QPSK	1	912	21.96	22.08	22.08			
3	QPSK	1	936	21.96	22.08	22.08	21.5	3	
3	QPSK	1	960	21.96	22.08	22.08			
3	QPSK	1	984	21.96	22.08	22.08			
3	QPSK	1	1008	21.96	22.08	22.08	21.5	3	
3	QPSK	1	1032	21.96	22.08	22.08			
3	QPSK	1	1056	21.96	22.08	22.08			
3	QPSK	1	1080	21.96	22.08	22.08	21.5	3	
3	QPSK	1	1104	21.96	22.08	22.08			
3	QPSK	1	1128	21.96	22.08	22.08			
3	QPSK	1	1152	21.96	22.08	22.08	21.5	3	
3	QPSK	1	1176	21.96	22.08	22.08			
3	QPSK	1	1200	21.96	22.08	22.08			
3	QPSK	1	1224	21.96	22.08	22.08	21.5	3	
3	QPSK	1	1248	21.96	22.08	22.08			
3	QPSK	1	1272	21.96	22.08	22.08			
3	QPSK	1	1296	21.96	22.08	22.08	21.5	3	
3	QPSK	1	1320	21.96	22.08	22.08			
3	QPSK	1	1344	21.96	22.08	22.08			
3	QPSK	1	1368	21.96	22.08	22.08	21.5	3	
3	QPSK	1	1392	21.96	22.08	22.08			
3	QPSK	1	1416	21.96	22.08	22.08			
3	QPSK	1	1440	21.96	22.08	22.08	21.5	3	
3	QPSK	1	1464	21.96	22.08	22.08			
3	QPSK	1	1488	21.96	22.08	22.08			
3	QPSK	1	1512	21.96	22.08	22.08	21.5	3	
3	QPSK	1	1536	21.96	22.08	22.08			
3	QPSK	1	1560	21.96	22.08	22.08			
3	QPSK	1	1584	21.96	22.08	22.08	21.5	3	
3	QPSK	1	1608	21.96					

Band 12 (700MHz Low Band)											
Part 27F(only on channel required)											
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch / Freq.	Power High Ch / Freq.	Power Mid Ch / Freq.	Power High Ch / Freq.	Turn-up (mW)	MFR (dB)		
Channel											
Frequency (MHz)											
10 QPSK	1	0		23.77	23.75	23.77		25	0		
10 QPSK	1	25		23.90	23.90	24.24					
10 QPSK	1	40		23.78	23.78	24.02					
10 QPSK	25	0		23.97	22.98	23.98					
10 QPSK	25	12		23.90	23.91	22.98		24	1		
10 QPSK	25	25		23.95	22.89	22.83					
10 QPSK	50	0		23.90	22.92	22.96					
10 QPSK	50	1		23.94	23.05	22.15					
10 HQAM	1	6		23.04	23.05	23.15		24	1		
10 HQAM	1	25		23.30	23.17	23.28					
10 HQAM	1	40		23.08	23.02	23.15					
10 HQAM	25	0		22.90	21.90	21.86					
10 HQAM	25	12		21.96	21.95	21.90		23	2		
10 HQAM	25	25		21.90	21.92	21.84					
10 HQAM	50	0		22.01	21.82	21.85					
10 HQAM	50	1		22.06	21.85	22.03					
10 HQAM	1	25	12	22.14	22.08	22.14		23	2		
10 HQAM	1	40		21.98	21.95	22.22					
10 HQAM	25	12		20.94	20.92	20.87					
10 HQAM	25	25		20.91	20.89	20.83					
10 HQAM	50	0		20.94	20.92	20.84		22	3		
Channel											
Frequency (MHz)											
5 QPSK	1	0		23.76	23.74	23.74		25	0		
5 QPSK	1	12		23.89	23.83	23.85					
5 QPSK	1	24		23.88	23.85	23.98					
5 QPSK	12	0		23.97	22.98	22.97					
5 QPSK	12	7		22.91	22.88	22.87		24	1		
5 QPSK	12	13		22.82	22.85	22.84					
5 QPSK	25	0		22.97	22.97	22.97					
5 HQAM	1	0		22.87	23.13	22.82					
5 HQAM	1	12		23.26	23.26	23.19		24	1		
5 HQAM	1	24		23.96	23.98	23.94					
5 HQAM	12	0		21.87	21.88	21.88					
5 HQAM	12	7		21.91	21.89	21.93					
5 HQAM	12	13		21.82	21.85	21.88		23	2		
5 HQAM	25	0		21.86	21.88	21.92					
5 HQAM	25	1		21.80	21.81	21.86					
5 HQAM	1	12		22.21	22.15	22.11					
5 HQAM	1	24		21.90	21.93	22.28		22	3		
5 HQAM	12	0		20.91	20.89	20.90					
5 HQAM	12	7		20.90	20.89	20.90					
5 HQAM	12	13		20.84	20.81	20.80					
5 HQAM	25	0		20.84	20.86	20.87		22	3		
Channel											
Frequency (MHz)											
3 QPSK	1	0		23.76	23.76	23.76		25	0		
3 QPSK	1	8		23.78	23.74	23.78					
3 QPSK	1	16		23.77	23.92	24.00					
3 QPSK	8	0		22.81	22.84	22.88					
3 QPSK	8	4		22.87	22.84	22.92		24	1		
3 HQAM	1	0		22.83	22.82	22.90					
3 HQAM	1	0		23.86	23.80	23.98					
3 HQAM	1	16		23.11	23.09	23.25					
3 HQAM	8	0		21.90	21.93	21.89		23	2		
3 HQAM	8	7		21.80	21.81	22.16					
3 HQAM	15	0		21.88	21.84	22.00					
3 HQAM	1	0		22.01	22.01	21.91					
3 HQAM	1	8		22.01	22.03	21.96		23	2		
3 HQAM	1	16		22.00	21.99	22.27					
3 HQAM	8	0		20.86	20.87	20.90					
3 HQAM	8	4		20.88	20.90	20.87					
3 HQAM	8	7		20.90	20.88	21.17		22	3		
3 HQAM	15	0		20.77	20.77	20.84					
Channel											
Frequency (MHz)											
1.4 QPSK	1	0		23.85	23.75	23.89		25	0		
1.4 QPSK	1	3		23.84	23.82	24.13					
1.4 QPSK	5	0		23.90	23.88	24.00					
1.4 QPSK	3	0		23.80	23.79	23.95					
1.4 QPSK	3	1		23.84	23.85	24.09		24	1		
1.4 QPSK	3	3		23.82	23.85	24.02					
1.4 QPSK	6	0		22.80	22.85	23.10					
1.4 HQAM	1	0		22.96	22.97	22.99		24	1		
1.4 HQAM	1	0		23.18	23.14	23.40					
1.4 HQAM	1	6		22.94	22.99	23.02					
1.4 HQAM	3	1		22.90	22.91	23.03					
1.4 HQAM	3	3		22.86	22.80	23.14		20	2		
1.4 HQAM	6	0		21.90	21.91	21.96					
1.4 HQAM	1	3		22.94	22.92	22.18					
1.4 HQAM	1	5		21.92	21.90	22.21					
1.4 HQAM	3	1		21.88	21.89	22.11		23	2		
1.4 HQAM	3	1		21.97	21.93	22.19					
1.4 HQAM	3	3		21.90	21.89	22.37					
1.4 HQAM	6	0		20.76	20.82	21.06					

Band 13(700MHz Band)											
Part 27F											
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch / Freq.	Power Mid Ch / Freq.	Power High Ch / Freq.	Turn-up (dBm)	MPE (dB)			
Channel											
Frequency (MHz)											
10 QPSK	1	0		23.84			25				
10 QPSK	1	25		23.97							
10 QPSK	1	40		23.78							
10 QPSK	25	0		22.85							
10 QPSK	25	12		22.81			24	1			
10 QPSK	25	25		22.84							
10 QPSK	50	0		22.86							
10 HQAM	1	0		23.17							
10 HQAM	1	25		23.12			24	1			
10 HQAM	1	40		22.96							
10 HQAM	25	0		21.88							
10 HQAM	25	12		21.92			23	2			
10 HQAM	25	25		21.84							
10 HQAM	50	0		21.85							
10 HQAM	1	0		22.02							
10 HQAM	1	25		22.10			23	2			
10 HQAM	1	40		21.94							
10 HQAM	25	0		21.85							
10 HQAM	25	12		20.91							
10 HQAM	25	25		20.83			22	3			
10 HQAM	50	0		20.84							
Channel											
Frequency (MHz)											
5 QPSK	1	0		23.89	23.88	23.95	25	0			
5 QPSK	1	12		23.95	23.95	23.90					
5 QPSK	1	24		23.88	23.85	23.81					
5 QPSK	12	0		22.92	22.80	22.79					
5 QPSK	12	7		22.84	22.88	22.85	24	1			
5 QPSK	12	13		22.86	22.83	22.79					
5 QPSK	25	0		22.90	22.79	22.78					
5 HQAM	1	0		22.95	22.81	22.84					
5 HQAM	1	12		23.30	23.10	23.10	24	1			
5 HQAM	1	24		22.84	22.75	22.85					
5 HQAM	12	0		21.84	21.77	21.79					
5 HQAM	12	7		21.87	21.88	21.89					
5 HQAM	12	13		21.75	21.88	21.81	23	2			
5 HQAM	25	0		21.84	21.84	21.80					
5 HQAM	1	0		21.89	21.82	21.84					
5 HQAM	1	12		22.12	22.10	22.05					
5 HQAM	1	24		21.81	21.80	21.77	22	3			
5 HQAM	12	0		20.81	20.81	20.82					
5 HQAM	12	7		20.82	20.87	20.87					
5 HQAM	12	13		20.87	20.80	20.81					
5 HQAM	25	0		20.90	20.79	20.79	22	3			

Band 17 (700MHz Band)									
Part 27F(only on channel required)									
BW (MHz)	Modulation	RB Size	RB Offset	Power Low Ch / Freq.	Power Mid Ch / Freq.	Power High Ch / Freq.	Turn-up (mW)	MFR (dB)	
Channel									
Frequency (MHz)									
10 QPSK	1	0		23.78	23.78	23.25		25	
10 QPSK	1	25	0.03	23.82	23.84				
10 QPSK	1	50	0.07	23.86	23.88				
10 QPSK	2	0		23.84	22.85	22.31			
10 QPSK	2	12	0.28	23.84	23.85			24	
10 QPSK	2	25	0.52	23.78	23.79				
10 QPSK	5	0		22.82	22.75	22.30			
10 HQAM	1	0		22.99	23.02	23.04			
10 HQAM	1	25	0.08	23.06	23.08			24	
10 HQAM	1	49	0.02	23.04	23.04				
10 HQAM	2	0		21.85	21.84	21.80			
10 HQAM	2	12	0.87	21.85	21.87			23	
10 HQAM	2	25	1.83	21.80	21.83				
10 HQAM	5	0		21.62	21.77	21.71			
10 HQAM	5	12	0.95	21.96	22.02			23	
10 HQAM	5	25	2.01	22.01	22.07				
10 HQAM	1	0		20.96	20.97	20.75			
10 HQAM	1	25	0.77	20.94	20.94			23	
10 HQAM	2	0		20.83	20.81	20.82			
10 HQAM	2	12	0.83	20.81	20.81			23	
10 HQAM	2	25	1.80	20.76	20.77				
10 HQAM	5	0		20.75	20.76	20.75			
10 HQAM	5	12	0.97	20.75	20.75			23	
10 HQAM	5	25	2.01	20.75	20.75				
Channel									
Frequency (MHz)									
5 QPSK	1	0		23.84	23.84	23.63			
5 QPSK	1	12	0.10	23.85	23.91			25	
5 QPSK	1	24	0.21	23.83	23.85				
5 QPSK	1	36	0.37	23.85	23.88				
5 QPSK	1	48	0.47	23.83	23.84			24	
5 QPSK	1	60	0.53	23.78	23.79				
5 QPSK	2	0		22.75	22.77	22.75			
5 HQAM	1	0		22.92	22.95	22.87			
5 HQAM	1	12	0.08	23.24	23.25			24	
5 HQAM	1	24	0.28	22.91	22.97				
5 HQAM	1	36	0.47	22.77	22.76	21.86			
5 HQAM	1	48	0.62	21.86	21.87			23	
5 HQAM	1	60	0.71	21.83	21.78				
5 HQAM	2	0		21.81	21.77	21.75			
5 HQAM	2	12	0.88	21.83	21.87			24	
5 HQAM	2	24	1.82	22.13	22.12				
5 HQAM	5	0		21.86	21.82	21.71			
5 HQAM	5	12	0.94	22.77	22.78			23	
5 HQAM	5	24	2.02	22.81	22.80				
5 HQAM	1	0		20.79	20.78	20.74			
5 HQAM	1	12	0.74	20.75	20.75			23	

2.4GHz WLAN	Ant 1					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	15.92	16.50	100.00
		6	2437	15.63	16.50	
		11	2462	15.86	16.50	
	802.11g 6Mbps	1	2412	13.92	14.50	96.94
		6	2437	14.44	14.50	
		11	2462	12.65	14.50	
	802.11n-HT20 MCS0	1	2412	13.76	15.00	96.17
		6	2437	14.52	15.00	
		11	2462	13.09	15.00	

5GHz WLAN	Ant 1					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	12.72	14.50	96.94
		40	5200	13.34	14.50	
		44	5220	13.64	14.50	
		48	5240	14.02	14.50	
	802.11n-HT20 MCS0	36	5180	12.62	14.00	96.72
		40	5200	12.73	14.00	
		44	5220	12.92	14.00	
		48	5240	13.31	14.00	
	802.11n-HT40 MCS0	38	5190	10.71	12.00	87.84
		46	5230	11.90	12.00	
	802.11ac-VHT20 MCS0	36	5180	12.07	13.50	96.63
		40	5200	12.48	13.50	
		44	5220	12.94	13.50	
		48	5240	13.24	13.50	
	802.11ac-VHT40 MCS0	38	5190	10.95	12.00	87.89
		46	5230	11.48	12.00	
	802.11ac-VHT80 MCS0	42	5210	9.92	11.00	78.32

5GHz WLAN	Ant 1					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	14.79	15.50	96.94
		56	5280	14.42	15.50	
		60	5300	14.88	15.50	
		64	5320	13.76	15.50	
	802.11n-HT20 MCS0	52	5260	13.73	15.00	96.72
		56	5280	13.70	15.00	
		60	5300	13.45	15.00	
		64	5320	13.79	15.00	
	802.11n-HT40 MCS0	54	5270	11.68	12.00	87.84
		62	5310	10.57	12.00	
	802.11ac-VHT20 MCS0	52	5260	14.21	15.00	96.63
		56	5280	13.50	15.00	
		60	5300	13.93	15.00	
		64	5320	12.06	13.00	
	802.11ac-VHT40 MCS0	54	5270	11.22	12.00	87.89
		62	5310	11.45	12.00	
	802.11ac-VHT80 MCS0	58	5290	7.94	9.00	78.32

5GHz WLAN	Ant 1					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	15.09	15.50	96.94
		116	5580	15.36	15.50	
		132	5660	15.34	15.50	
		140	5700	12.88	14.00	
	802.11n-HT20 MCS0	100	5500	14.61	15.50	96.72
		116	5580	14.37	15.50	
		132	5660	14.41	15.50	
		140	5700	14.17	15.50	
	802.11n-HT40 MCS0	102	5510	9.98	11.00	87.84
		110	5550	13.05	14.00	
		134	5670	12.13	14.00	
	802.11ac-VHT20 MCS0	100	5500	13.84	15.50	96.63
		116	5580	14.44	15.50	
		132	5660	14.56	15.50	
		140	5700	11.78	13.00	
	802.11ac-VHT40 MCS0	102	5510	12.51	14.00	87.89
		110	5550	12.60	14.00	
		134	5670	12.02	14.00	
	802.11ac-VHT80 MCS0	106	5530	11.24	13.00	78.32

5GHz WLAN	Ant 1					
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	15.30	15.50	96.94
		157	5785	15.35	15.50	
		165	5825	14.97	15.50	
	802.11n-HT20 MCS0	149	5745	14.37	15.50	96.72
		157	5785	14.60	15.50	
		165	5825	14.28	15.50	
	802.11n-HT40 MCS0	151	5755	12.31	14.00	87.84
		159	5795	12.60	14.00	
	802.11ac-VHT20 MCS0	149	5745	14.38	15.50	96.63
		157	5785	14.54	15.50	
		165	5825	14.11	15.50	
	802.11ac-VHT40 MCS0	151	5755	12.33	13.00	87.89
		159	5795	12.58	13.00	
	802.11ac-VHT80 MCS0	155	5775	11.75	13.00	78.32

Bluetooth BR/EDR

Mode	Channel	Frequency (MHz)	Average power (dBm)		
			1Mbps	2Mbps	3Mbps
BR / EDR	CH 00	2402	10.32	8.73	8.83
	CH 39	2441	10.15	8.39	8.42
	CH 78	2480	10.49	8.59	8.63
Tune-up Limit			11	11	11

Bluetooth LE v4.0

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
LE	CH 00	2402	4.66
	CH 19	2440	5.37
	CH 39	2480	4.81
Tune-up Limit			6.5

Bluetooth LE v5.0

Mode	Channel	Frequency (MHz)	Average power (dBm)
LE	CH 00	2402	4.83
	CH 19	2440	5.06
	CH 39	2480	4.66
Tune-up Limit			6.5