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MF25D Project Antenna Specifications

Total 15 pages

(including cover)

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Table of contents

1 Overview	4
2 Antenna Specifications	4
3 Machine Status	5
4 Antenna Test Environment	5
5 Antenna Test Results	6
5.1 Reflection Loss and Smith Chart.....	6
5.2 Efficiency and Gain	9
5.3 Active Results	13
5.3.1 TRP&TIS.....	13
6 Antenna Structure Diagram	15



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1 Overview

This document is the MF25D antenna

specification. This machine is a wireless network card, supporting frequency bands G850/P900/DCS/PCS/W1/W2/W4/W5/W8/

LTE 1 /LTE2/LTE4/LTE5/LTE7/LTE8/LTE12/LTE 38.

2 Antenna Specifications

	Band	Frequency(MHz)	Return Loss(dB)		Band	Frequency(MHz)	Return Loss(dB)
Tx Frequency	WCDMA band 1	1922.4-1977.6	<-10	Rx Frequency	WCDMA band 1	2110-2170	<-10
	WCDMA band 2	1850-1910	<-10		WCDMA band 2	1930-1990	<-10
	WCDMA band 4	1712.6-1752.4	<-10		WCDMA band 4	2112.6-2152.4	<-10
	WCDMA band 5	826.6-846.4	<-10		WCDMA band 5	871.6-891.4	<-10
	WCDMA band 8	882.6-912.4	<-10		WCDMA band 8	927.6-957.4	<-10
	GSM850	824.2-848.8	<-10		GSM850	824.2-848.8	<-10
	E-GSM	880.2-914.8	<-10		E-GSM	880.2-914.8	<-10
	DCS	1710.2-1784.8	<-10		DCS	1710.2-1784.8	<-10
	PCS	1850.2-1909.8	<-10		PCS	1850.2-1909.8	<-10
	LTE 1	1920-1980	<-10		LTE 1	2110-2170	<-10
	LTE 2	1850-1910	<-10		LTE 2	1930-1990	<-10
	LTE 4	1710-1755	<-10		LTE 4	2110-2155	<-10
	LTE 5	824-849	<-10		LTE 5	869-894	<-10
	LTE 7	2500-2570	<-10		LTE 7	2620-2690	<-10
	LTE 8	880-915	<-10		LTE 8	925-960	<-10
	LTE 12	698-716	<-10		LTE 12	728-746	<-10
	LTE 38	2570-2620	<-10		LTE 38	2570-2620	<-10



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3 Machine Status



Antenna Pictures

4 Antenna Test Environment

OTA test system SATIMO

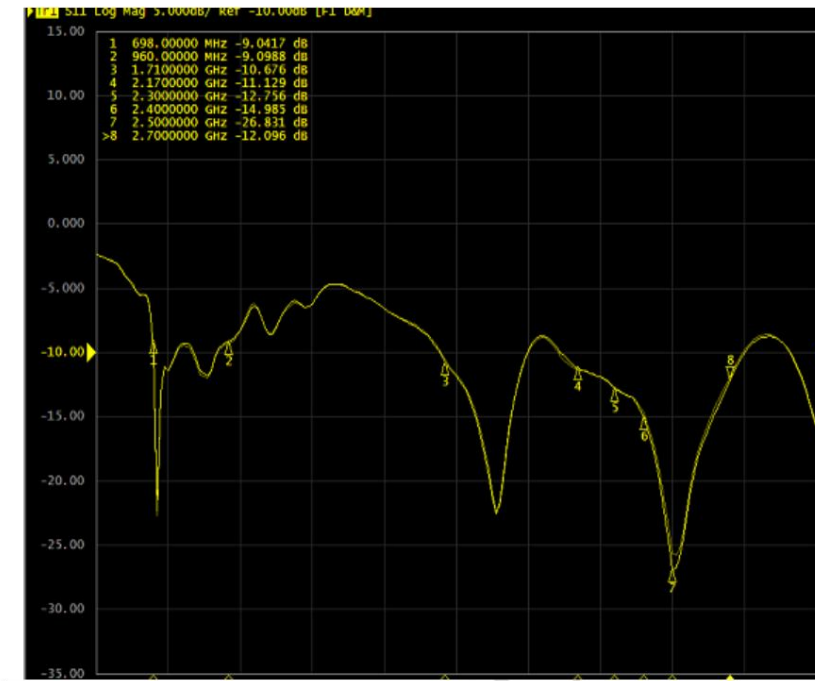




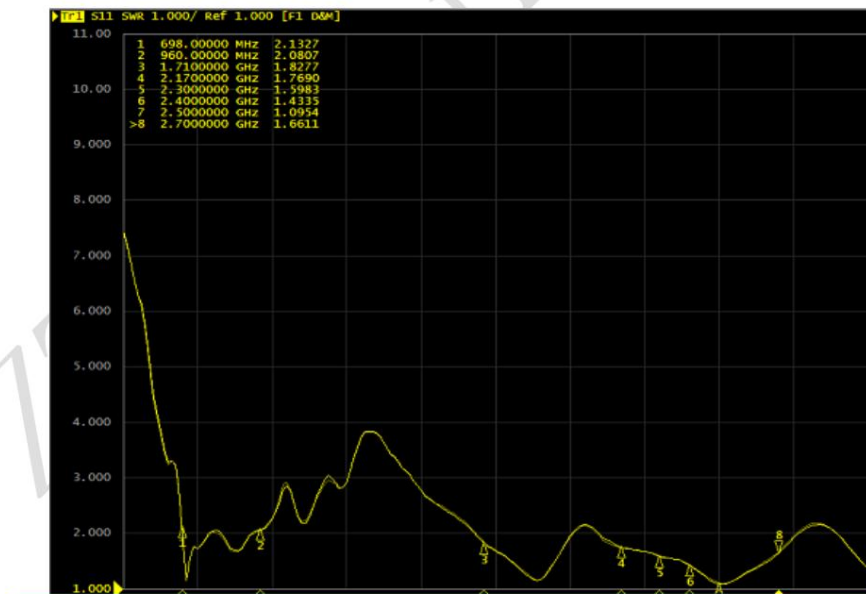
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5 Antenna Test Results

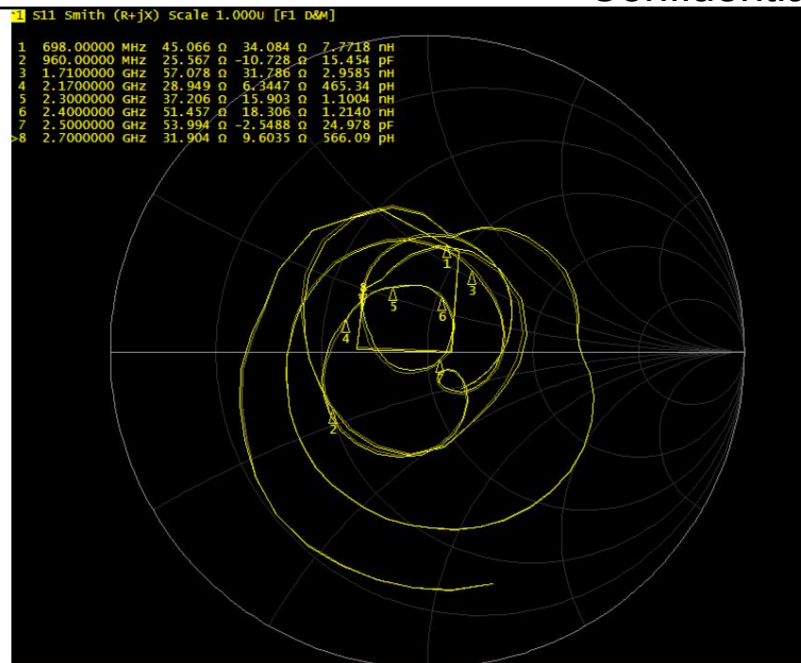
5.1 Reflection Loss and Smith Chart



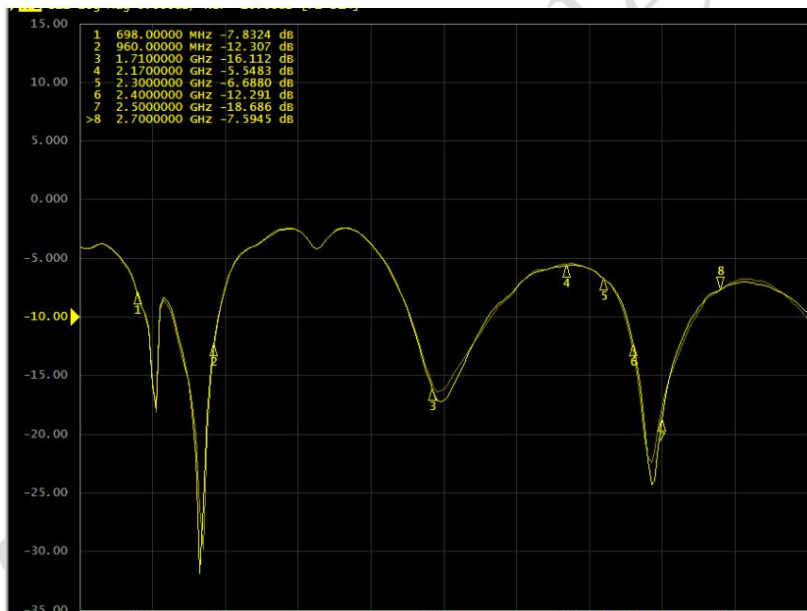
S11 of Main antenna



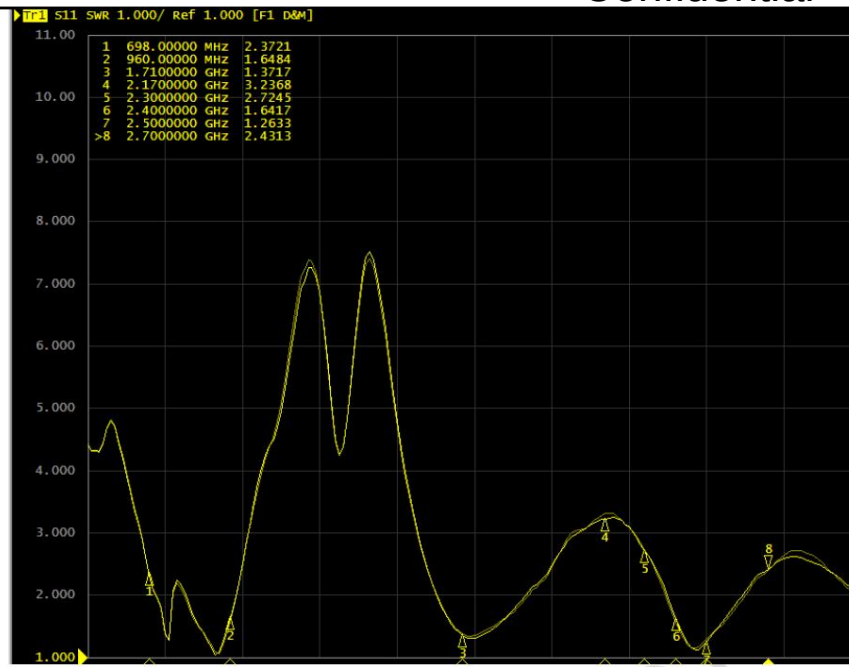
VSWR of Main antenna



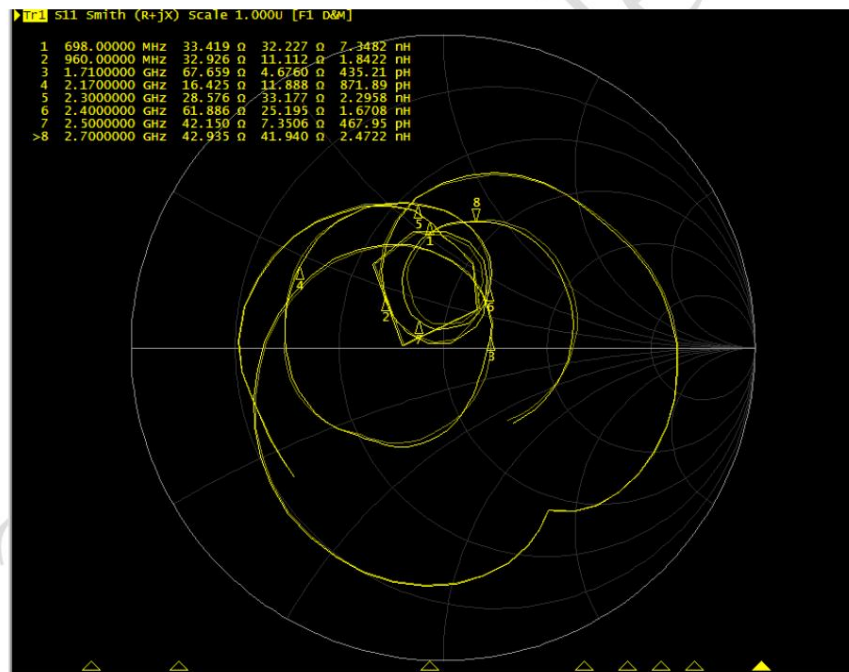
Smith of Main antenna



S11 of Aux antenna



VSWR of Aux antenna



Smith Chart of Aux antenna



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5.2 Efficiency and Gain

Main antenna

Frequency (MHz)	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)
690	35%	-4.50	-0.48
700	36%	-4.38	0.22
710	38%	-4.25	0.95
720	40%	-3.95	1.57
730	44%	-3.54	1.25
740	48%	-3.16	1.28
750	48%	-3.14	1.20
760	57%	-2.48	1.34
770	62%	-2.06	1.90
780	65%	-1.90	2.23
790	63%	-1.98	2.18
800	64%	-1.97	2.02
810	59%	-2.29	1.40
820	57%	-2.45	0.91
830	55%	-2.57	0.64
840	55%	-2.62	0.62
850	54%	-2.69	0.47
860	53%	-2.73	0.33
870	53%	-2.77	0.26
880	51%	-2.90	0.03
890	50%	-3.02	-0.15
900	49%	-3.08	-0.25
910	46%	-3.36	-0.62
920	43%	-3.62	-0.88
930	41%	-3.85	-1.14
940	38%	-4.26	-1.71
950	35%	-4.50	-2.09
960	43%	-3.70	-2.34



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Frequency (MHz)	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)
1710	54%	-2.66	2.80
1730	60%	-2.25	2.95
1750	69%	-1.63	3.12
1770	69%	-1.61	3.10
1790	56%	-2.51	2.67
1810	55%	-2.57	2.33
1830	68%	-1.69	2.12
1850	68%	-1.70	1.87
1870	69%	-1.62	1.85
1890	71%	-1.51	1.71
1910	73%	-1.36	1.63
1930	60%	-2.19	1.92
1950	67%	-1.77	2.02
1970	67%	-1.75	2.12
1990	65%	-1.90	2.17
2010	58%	-2.37	2.02
2030	53%	-2.77	1.79
2050	51%	-2.95	1.44
2070	62%	-2.11	1.25
2090	60%	-2.19	1.21
2110	55%	-2.57	0.87
2130	53%	-2.78	0.54
2150	57%	-2.48	1.14
2170	56%	-2.55	1.69
2190	49%	-3.08	1.83
2210	49%	-3.06	1.70
2230	57%	-2.48	2.04
2250	67%	-1.76	2.58

Frequency (MHz)	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)
2270	66%	-1.79	3.26
2290	65%	-1.84	3.63
2310	64%	-1.96	3.52
2330	57%	-2.48	3.32
2350	54%	-2.71	3.32
2370	56%	-2.48	3.47
2390	56%	-2.55	3.37
2410	55%	-2.60	3.36
2430	56%	-2.48	3.51
2450	62%	-2.06	3.62
2470	63%	-2.00	3.56
2490	58%	-2.39	3.20
2510	55%	-2.59	2.90
2530	48%	-3.23	2.55
2550	53%	-2.79	2.10
2570	53%	-2.76	1.64
2590	52%	-2.85	1.21
2610	52%	-2.80	1.15
2630	52%	-2.83	1.23
2650	51%	-2.89	1.25
2670	50%	-2.97	1.13
2690	50%	-3.03	1.13
2700	50%	-3.02	1.06

To the antenna

Frequency (MHz)	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)
690	34%	-4.67	-1.46
700	32%	-4.99	-1.76
710	31%	-5.09	-1.98
720	34%	-4.75	-0.79
730	38%	-4.24	0.34
740	43%	-3.68	1.65
750	53%	-2.74	2.59
760	62%	-2.08	2.81
770	63%	-2.00	2.44
780	59%	-2.27	1.82
790	52%	-2.83	1.00
800	46%	-3.40	0.09
810	41%	-3.82	-0.14
820	39%	-4.05	-0.29
830	38%	-4.18	-0.30
840	40%	-4.01	-0.10
850	40%	-3.95	0.02
860	41%	-3.92	0.03
870	40%	-4.03	-1.00
880	39%	-4.09	-0.20
890	36%	-4.42	-0.60
900	34%	-4.68	-0.86
910	33%	-4.86	-0.96
920	32%	-5.00	-0.99
930	32%	-4.89	-0.79
940	33%	-4.81	-0.62
950	33%	-4.85	-0.58
960	31%	-5.05	-0.73



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Frequency (MHz)	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)
1710	50%	-3.03	3.49
1730	55%	-2.58	3.36
1750	61%	-2.15	3.04
1770	62%	-2.06	3.04
1790	58%	-2.36	2.68
1810	53%	-2.73	2.32
1830	49%	-3.06	1.90
1850	45%	-3.43	1.36
1870	48%	-3.21	1.25
1890	51%	-2.97	1.21
1910	52%	-2.87	1.59
1930	55%	-2.57	2.16
1950	60%	-2.23	2.76
1970	63%	-1.99	3.33
1990	61%	-2.16	3.65
2010	57%	-2.41	3.62
2030	57%	-2.42	3.48
2050	55%	-2.60	3.20
2070	53%	-2.78	3.11
2090	50%	-3.02	2.96
2110	44%	-3.53	2.66
2130	42%	-3.75	2.72
2150	43%	-3.62	2.98
2170	46%	-3.35	3.27
2190	47%	-3.26	3.27
2210	45%	-3.47	3.01
2230	49%	-3.09	3.06
2250	57%	-2.46	3.24

Frequency (MHz)	Efficiency (%)	Efficiency (dB)	Peak Gain (dBi)
2270	61%	-2.13	3.43
2290	61%	-2.15	3.43
2310	54%	-2.67	3.11
2330	49%	-3.11	3.01
2350	48%	-3.23	3.20
2370	51%	-2.89	3.64
2390	49%	-3.12	3.63
2410	45%	-3.51	3.39
2430	42%	-3.75	3.20
2450	51%	-2.94	2.84
2470	47%	-3.24	2.48
2490	45%	-3.45	1.63
2510	46%	-3.34	1.20
2530	47%	-3.28	1.15
2550	49%	-3.05	1.55
2570	48%	-3.21	1.50
2590	46%	-3.36	1.23
2610	46%	-3.38	1.14
2630	45%	-3.51	0.98
2650	43%	-3.63	0.94
2670	43%	-3.68	1.02
2690	43%	-3.65	1.16
2700	44%	-3.56	1.29



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5.3 Active Results

5.3.1 TRP&TIS

TRP/TIS

	Chn	Cables power	TRP	Chn	Main cable sensitive	Main TIS	Diversity cable smart Agility	separation TIS
W900	2712 23.20		19.62	2937	-110.0		-110.0	
	2788 23.00		19.67	3012	-110.0		-110.5	
	2863 22.60		18.76	3088	-110.0	-105.2	-110.0	
AWS	1312 23.10		21.66	1537	-109.5		-109.0	
	1413 23.30		21.27	1637	-109.0		-108.5	
	1513 23.20		21.35	1738	-109.0	-105.2	-109.0	
W1900	9262 22.90		20.37	9662	-109.0		-109.5	
	9400 22.80		20.82	9800	-108.5		-109.5	
	9538 22.80		20.96	9938	-108.0	-105.7	-109.5	
LTE band 8	21500 23.10		19.00	3500	-98.9		-98.1	
	21625 22.90		19.09	3625	-98.8		-97.7	
	21750 23.00		18.68	3750	-98.3	-93.9	-97.3	-93.5
LTE band 38	37800 22.50		20.21	37800	-95.6		-94.8	
	38000 21.40		19.28	38000	-95.6		-93.1	
	38200 21.60		19.69	38200	-95.8	-93.5	-94.8	-94.2
LTE band 2	18650 22.10		20.91	650	-96.7		-97.7	
	18900 21.80		20.26	900	-96.7		-98.4	
	19150 21.60		20.08	1150	-96.0	-94.5	-98.0	-95.6
LTE band 4	20000 22.20		20.53	2000	-96.5		97.9	
	20175 22.30		20.98	2175	-96.5		-97.8	
	20350 22.20		20.42	2350	-96.2	-93.4	-98.0	-97.2
LTE band 12	23050 23.00		20.56	5050	-99.6		-100.2	
	23090 22.60		20.45	5090	-99.6		-100.1	
	23130 22.40		20.14	5130	-99.5	-95.4	-100.1	-93.7
W850	4132 23.60		21.02	4357	-110.5		-110.5	
	4175 23.50		21.27	4407	-111.0		-110.5	
	4233 23.50		20.42	4457	-111.0	-108.6	-110.0	



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W2100	9612 23.60	21.33	10562	-109.0	-107.0	
	9750 23.40	21.38	10700	-109.0	-107.5	
	9888 23.60	21.65	10838	-108.5	-106.3	-107.5
GSM 850	128	33.30	29.97	128	-109.5	
	190	32.90	29.65	190	-109.5	
	251	32.80	29.65	251	-109.5	-105.5
GSM 900	1	32.50	28.35	1	-108.5	
	62	32.70	27.95	62	-108.5	
	124 28.90	27.94	124	-107.5	-104.0	
DCS 1800	512	29.20	27.10	512	-108.0	
	698	29.00	27.01	698	-108.5	
	885 28.90	27.05	885	-107.5	-104.6	
PCS 1900	512	29.30	27.81	512	-107.5	
	661	29.20	27.84	661	-107.5	
	810	29.20	27.93	810	-107.5	-104.5
LTE band 1	18050 22.40	20.14	50	-96.6	-98.6	
	18300 21.90	20.68	300	-96.8	-98.6	
	18550 21.90	20.09	550	-96.5	-94.1	-98.7
LTE band 7	20800 22.70	20.95	2800	-94.5	-95.1	
	21100 22.50	20.45	3100	-94.8	-94.1	
	21400 22.50	20.35	3400	-92.8	-90.3	-93.3
LTE band 5	20450 23.40	19.82	2450	-99.5	-99.8	
	20525 23.30	19.70	2525	-99.6	-99.4	
	20600 23.10	19.42	2600	-99.3	-94.4	-99.6



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6 Antenna structure diagram

