

规格书

SPECIFICATION FOR APPROVAL

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DATE:	2023-06-1	

Product Number: DF5DBI82564/5-40

Product Name: Antenna

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Product Number: DF5DBI82564/5-40

Product Name: Antenna

1. Revision History

Revision	Date	Change Notification	Description
1.0	2023-06-1	1.0	

Product Number: DF5DBI82564/5-30

Product Name: Antenna

2. Specification

主要技术指标		Main technical specifications	
频率范围 (MHZ)	690~960MHz 1710~2690MHz	Frequency Range (MHZ)	690~960MHz 1710~2690MHz
特性阻抗(Ω)	50	Impedance(Ω)	50
增益(dBi)	3dBi	Peak Gain(dBi)	3dBi
输出电压 驻波比	≤ 4.5	VSWR	≤ 4.5
最大功率	50W	Admitted Power	50W
极化方式	垂直极化	Polarization	vertical polarization
方向性	全向	Radiation	Omni-directional
连接方式	I-pex	Connector Type	I-pex
物理性能		Physical Properties	
天线線材	1.13mm Cable	Antenna cable	1.13mm Cable
工作温度	-40℃~+60℃	Operating Temp	-40℃~+60℃

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Product Name: Antenna

3. Characteristics and Reliability Test

Test Items 測試項目		Test Condition and Procedure 測試方法	Requirement 要求	Result 結果
C1 V	.S.W.R. 電壓駐波比	Set DUT on Network Analyzer; make individual calibration to test 設置網路分析儀參數進行測試	Directive DUT specification 符合待測物規範	PASS
C2 Insertion	Loss 插入損失	Set DUT on Network Analyzer; make individual calibration to test 設置網路分析儀參數進行測試	Directive DUT specification 符合待測物規範	N/A
C3 Antenna	Gain 天線增益	Set DUT on Antenna Chamber; make individual calibration to test 設置天線暗室參數進行測試	Directive DUT specification 符合待測物規範	PASS
C4 Voltage Breakdown	耐電壓	Test voltage should be applied between insulated portions, or between ground as specified. 在绝缘部分测试电压,或指定接地面之间	Max Voltage ≥ 500 V or directive material specification 最大電壓 ≥ 500 V 或符合材料規範	N/A
C5 Insulation	Resistance 絕緣阻抗	Set Voltage: 500 ± 50 V; between the insulated portions, or between ground as specified. 設置電壓 500 ± 50 V,在绝缘部份測試或指定接地面之间	Resistance ≥ 500 M ohm or directive material specification 阻抗 ≥ 500 M ohm 或符合材料規範	N/A
C6 Contact	Resistance 接觸阻抗	Air Temp: 26°C ; measured with test equipment 室溫 26°C · 指定量測設備	Directive material specification 符合材料規範	N/A
M1 Vibration	震動	GB / T2423.48-2008 Amplitude: 0.03 inch (1.5mm); Freq: 20 to 80 to 20 Hz 3 directions; 2 hours for each direction 振幅 1.5mm ; 頻率 20~80~20Hz ; 3 個方向各 2H	1. No Visual Damage 2. Frequency Tol. $\leq 5\%$ 無明顯外觀不良; 頻率偏移 $\leq 5\%$	PASS
M2 Random Drop	跌落	GB / T2423.8-1995 Single : Height: 1.0 Meter; 3 directions; 1 time for each direction 單支天線 · 高 1m ; 3 個方向各 1 次	1. No parts separated 、 fracture 2. Frequency Tol. $\leq 5\%$ 產品無脫落、斷裂; 頻率偏移 $\leq 5\%$	PASS
		Packing : Height: 0.76 Meter; 1 corner, 3 edges, 6 surface 包裝 : 高 0.76m · 一角、三棱、六面各一次		PASS
		Antenna+Machine: Height: 0.76 Meter; 1 corner, 3 edges, 6 surface. 整機 : 高 0.76m · 一角、三棱、六面各一次		N/A

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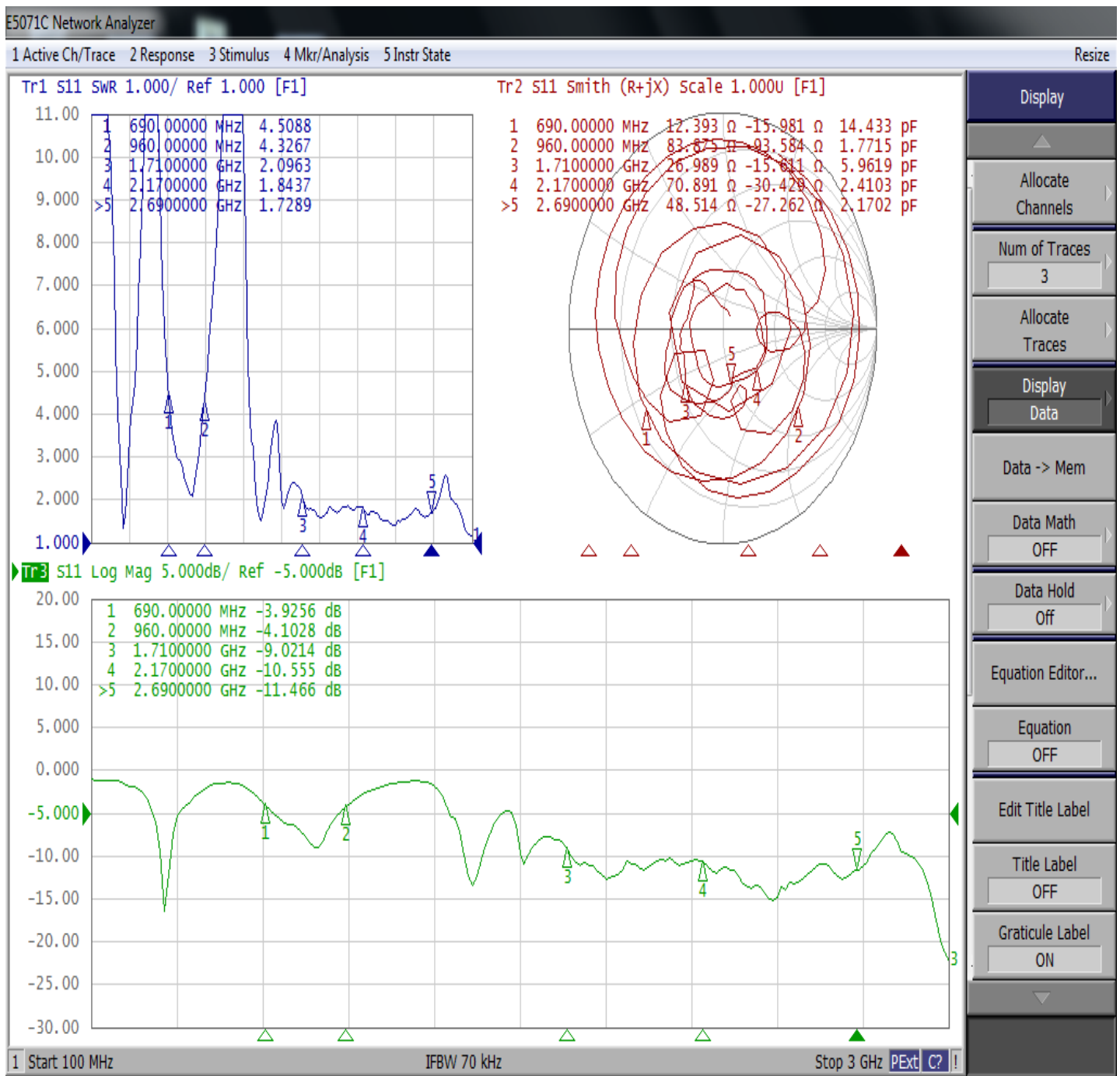
Product Name: Antenna

M3	Solderability 可焊性	GB / T 2423.28-2005 Temp: 260±5 °C, Duration: 5 seconds 溫度 260±5 °C, 持續 5 秒	Time on full 上錫時間滿	N/A
M4	Pull Test 拉力	Holding with individual specification; force applied to axis of terminal .單獨定義產品端子拉力	Directive DUT specification Frequency Tol.≤5% 符合待測物規範;頻率偏移≤5%	PASS
M5	Torque Test 扭力	Holding with individual specification; applied clockwise and counterclockwise to the axis of terminal 單獨定義產品端子之順時針及逆時針扭力	Directive DUT specification Frequency Tol.≤ 5% 符合待測物規範;頻率偏移≤5%	N/A
M6	Dimension 尺寸	Inspection of dimension, color, material, package, surface process.检查尺寸,颜色,材料,包装,表面處理	Directive DUT specification 符合待測物規範	PASS
E1	Waterproof 防水	With Reference to IEC 60529 // IP Code Definition 參考 IEC60529 IP 定義	Directive DUT specification 符合待測物規範	N/A
E2	Salt Spray 鹽霧	GB / T 2423.17-2008 Temp: 35°C; RH: ≥ 95%; NaCl solution: ≥ 5%; Time: 24H 溫度35°C; 濕度≥95%;鹽水濃度≥5%; 測試 24H	No Visual Damage Frequency Tol.≤5% 無明顯外觀不良;頻率偏移≤5%	PASS
E3	Temperature and Humidity Chamber 恒溫恒濕	GB / T 2423.3-2006 Temp: 80°C / 12 H; -40°C / 12H RH: ≥ 90 %; Time: 24H 溫度80°C 測試 12H 轉-40°C 測試 12H; 濕度≥ 90 % ; 時間 24H	After 2 Hours Recovery No Visual Damage Frequency Tol.≤5% 恢復 2H 后, 無明顯外觀不良;頻率偏移≤5%	PASS
E4	Thermal Shock 冷熱衝擊	GB / T 2423.22 - 2008 40° C (30 minutes) to + 80° C (30 minutes); Cycles: 24 40° C 測試 30 分轉 80° C 測試 30 分為一個週期; 共 24 週期	After 2 Hours Recovery No Visual Damage Frequency Tol.≤5% 恢復 2H 后, 無明顯外觀不良;頻率偏移≤5%	PASS
E5	Aging test 老化	GB / T 2423.2 - 2008 Temp: 80°C; Time: 24 hours 溫度80° C, 測試 24H	After 2 Hours Recovery No Visual Damage Frequency Tol.≤5% 無明顯外觀不良;頻率偏移≤5%	PASS
E6	High Temp. 高溫	Temp. 270±10° C; Times: 120 seconds 溫度270±10° C, 測試時間 120 秒	No Visual Damage 無明顯外觀不良	N/A
R1	RoHS	With Reference to IEC 62321:2008 with flow chart 參考 IEC 62321 測試流程	Directive RoHS 2011/65/EU 符合 RoHS 2011/65/EU 標準	PASS
R2	PFOS	With Reference to USA EPA 3550C:1996 by LC/MS 參考 USA EPA 3550C 測試流程	Directive RoHS 2006/122/EC 符合 RoHS 2011/65/EU 標準	PASS

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4. Antenna - S Parameter Test Data



TOA数据

	A	B	C	D	E	F	G
1	Item	Measurement	Standard	Band	Channel	Freq(MHz)	Total(dBm)
2	1	TRP	FDD_LTE	FDD_B1	18050	1925	18.84
3	2	TRP	FDD_LTE	FDD_B1	18300	1950	19.22
4	3	TRP	FDD_LTE	FDD_B1	18550	1975	18.41
5	4	TRP	FDD_LTE	FDD_B3	19250	1715	20.17
6	5	TRP	FDD_LTE	FDD_B3	19575	1747.5	20.39
7	6	TRP	FDD_LTE	FDD_B3	19900	1780	18.55
8	7	TRP	FDD_LTE	FDD_B5	20450	829	18.35
9	8	TRP	FDD_LTE	FDD_B5	20525	836.5	16.61
10	9	TRP	FDD_LTE	FDD_B5	20600	844	18.66
11	10	TRP	FDD_LTE	FDD_B8	21500	885	19.18
12	11	TRP	FDD_LTE	FDD_B8	21625	897.5	18.54
13	12	TRP	FDD_LTE	FDD_B8	21750	910	18.46
14	13	TRP	TDD_LTE	TDD_B34	36250	2015	19.12
15	14	TRP	TDD_LTE	TDD_B34	36275	2017.5	19.1
16	15	TRP	TDD_LTE	TDD_B34	36300	2020	19.44
17	16	TRP	TDD_LTE	TDD_B38	37850	2580	19.12
18	17	TRP	TDD_LTE	TDD_B38	38000	2595	19.53
19	18	TRP	TDD_LTE	TDD_B38	38150	2610	19.32
20	19	TRP	TDD_LTE	TDD_B39	38350	1890	21.15
21	20	TRP	TDD_LTE	TDD_B39	38450	1900	20.69
22	21	TRP	TDD_LTE	TDD_B39	38550	1910	20.4
23	22	TRP	TDD_LTE	TDD_B40	38750	2310	20.37
24	23	TRP	TDD_LTE	TDD_B40	39150	2350	20.81
25	24	TRP	TDD_LTE	TDD_B40	39550	2390	19.45
26	25	TRP	TDD_LTE	TDD_B41	40340	2565	21.21
27	26	TRP	TDD_LTE	TDD_B41	40470	2578	19.29

Passive Test For LTE低频										
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHIS (%)	Max (dB)	Min (dB)	Attenut Hor	Attenut Ver
700	41.64	-5	-2.4	-4.55	14.735	16.901	-2.4	-22.69	41.16	41.49
710	45.63	-4.48	-2.14	-4.29	16.19	19.44	-2.14	-20.29	40.78	40.94
720	42.16	-4.18	-2	-4.15	17.277	20.881	-2	-17.41	40.24	40.19
730	41.69	-4.35	-2.24	-4.39	16.667	20.023	-2.24	-15.55	40.1	39.92
740	40.7	-3.9	-1.56	-3.71	18.495	22.206	-1.56	-13.55	39.63	39.35
750	42.03	-3.76	-1.08	-3.23	18.775	23.253	-1.08	-12.47	39.53	39.16
760	47.33	-3.25	-0.24	-2.39	20.416	26.909	-0.24	-11.76	39.75	39.31
770	42.49	-3.72	-0.38	-2.53	17.331	25.156	-0.38	-12.55	38.83	38.35
780	43.81	-3.58	0.09	-2.06	16.911	26.899	0.09	-12.96	38.88	38.28
790	44.63	-3.5	0.49	-1.66	16.444	28.184	0.49	-12.82	38.87	38.31
800	48.29	-3.16	1.14	-1.01	17.266	31.024	1.14	-11.28	39.38	38.88
810	47.14	-3.27	1.34	-0.81	16.326	30.816	1.34	-9.9	39.33	38.9
820	44.55	-3.51	1.25	-0.9	14.916	29.635	1.25	-9.17	39.07	38.77
830	51.22	-2.91	1.82	-0.33	16.447	34.773	1.82	-8.7	39.78	39.58
840	53.84	-2.69	1.76	-0.39	17.09	36.753	1.76	-8.99	39.85	39.65
850	53.08	-2.75	1.23	-0.92	17.356	35.729	1.23	-10.09	40.17	40.1
860	48.43	-3.15	0.42	-1.73	16.825	31.601	0.42	-11.23	39.98	39.86
870	47.66	-3.22	0.03	-2.12	17.717	29.94	0.03	-11.01	40.06	40.03
880	43.6	-3.61	-0.51	-2.66	17.32	26.28	-0.51	-10.84	40.41	40.54
890	44.17	-3.55	-0.58	-2.73	18.777	25.398	-0.58	-10.35	40.35	40.57
900	38.91	-4.1	-1.31	-3.46	17.586	21.328	-1.31	-11.06	40.4	40.83
910	42.56	-3.71	-1.24	-3.39	20.349	22.209	-1.24	-11.35	40.53	41.08
920	41.04	-3.87	-1.44	-3.59	20.726	20.312	-1.44	-12.72	40.67	41.24
930	48.23	-3.17	-0.67	-2.82	25.651	22.581	-0.67	-12.88	41.15	41.73
940	42.82	-3.79	-1.31	-3.46	23.356	18.463	-1.31	-14.15	41.17	41.74
950	46.84	-3.48	-1.08	-3.23	25.894	18.948	-1.08	-13.99	41.22	41.63
960	42.99	-3.98	-1.28	-3.43	23.356	16.637	-1.28	-14.29	41.49	41.78
Passive Test For LTE高频										
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)	Gain (dBd)	UHS (%)	DHIS (%)	Max (dB)	Min (dB)	Attenut Hor	Attenut Ver
1710	59.16	-2.66	1.55	-0.6	27.955	26.208	1.55	-16.91	46.31	46.26
1720	65.55	-1.97	1.89	-0.26	32.621	30.925	1.89	-17.73	46.53	46.54
1730	55.68	-2.54	0.9	-1.25	28.452	27.23	0.9	-22.24	46.53	46.45
1740	64.29	-2.06	1.13	-1.02	31.756	30.536	1.13	-23.61	46.47	46.32
1750	56.11	-3	-0.04	-2.19	25.503	24.603	-0.04	-21.83	46.35	46.2
1760	63.07	-2.14	0.77	-1.38	30.65	30.42	0.77	-21.46	46.81	46.54
1770	59.16	-2.51	0.28	-1.87	27.565	28.599	0.28	-21.82	45.97	45.72
1780	64.31	-1.92	0.83	-1.32	30.47	33.842	0.83	-22.32	46.69	46.42
1790	53.53	-2.71	0.15	-2	24.243	29.286	0.15	-21.38	45.88	45.38
1800	57.84	-2.38	0.69	-1.46	24.613	33.224	0.69	-19.24	45.96	45.53
1810	53.41	-2.72	0.54	-1.61	21.334	32.079	0.54	-18.37	46.61	46.21
1820	59.53	-2.25	1.24	-0.91	22.511	37.015	1.24	-16.61	46.18	45.65
1830	54.87	-2.61	1	-1.15	19.732	35.142	1	-15.84	45.92	45.53
1840	57.77	-2.38	1.3	-0.85	20.045	37.725	1.3	-14.78	47.09	46.73
1850	56.3	-2.49	1.16	-0.99	19.086	37.215	1.16	-15.36	46.38	45.97
1860	56.76	-2.46	1.31	-0.84	18.676	38.083	1.31	-16.74	46.63	46.43
1870	56.85	-2.45	1.51	-0.64	18.026	38.827	1.51	-16.88	46.48	46.18

1880	60.59	-2.18	1.98	-0.17	18.298	42.29	1.98	-16.13	46.27	46.02
1890	61.02	-2.15	2.31	0.16	17.433	43.586	2.31	-16.46	46.61	46.51
1900	60.44	-2.19	2.5	0.35	16.318	44.124	2.5	-17.73	46.99	46.84
1910	62.58	-2.04	2.86	0.71	16.364	46.216	2.86	-18.06	46.44	46.28
1920	63.98	-1.94	3.01	0.86	16.713	47.266	3.01	-16.44	46.95	46.84
1930	69.32	-1.59	3.29	1.14	18.544	50.778	3.29	-13.96	47.27	47.02
1940	67.21	-1.73	3.04	0.89	18.792	48.421	3.04	-11.36	47.26	47.1
1950	73	-1.37	3.2	1.05	21.606	51.397	3.2	-11.43	47.62	47.51
1960	72.57	-1.39	2.9	0.75	22.65	49.919	2.9	-12.43	47.49	47.35
1970	76.63	-1.16	2.93	0.78	24.964	51.661	2.93	-14.14	47.54	47.5
1980	76.53	-1.16	2.72	0.57	25.847	50.683	2.72	-15.55	48.16	48.21
1990	83.44	-0.79	3.38	1.23	28.89	54.548	3.38	-16.87	48.3	48.32
2000	72.6	-1.39	2.86	0.71	25.58	47.015	2.86	-19.62	47.73	47.79
2010	78.58	-1.05	3.27	1.12	28.027	50.551	3.27	-24.04	48.25	48.22
2020	80.04	-0.97	3.32	1.17	28.78	51.264	3.32	-24.4	48.55	48.4
2030	82.59	-0.83	3.34	1.19	30.028	52.565	3.34	-16.8	48.4	48.33
2040	82.86	-0.82	3.13	0.98	30.614	52.249	3.13	-15.44	48.16	48.11
2050	78.49	-1.05	2.67	0.52	29.659	48.829	2.67	-14.94	48.42	48.31
2060	79.04	-1.02	2.42	0.27	30.756	48.282	2.42	-15.42	48.65	48.53
2070	76.58	-1.16	2.06	-0.09	30.969	45.616	2.06	-17.26	48.14	48
2080	78.74	-1.04	2.04	-0.11	33.323	45.42	2.04	-18.29	48.48	48.38
2090	72.97	-1.37	1.81	-0.34	32.168	40.8	1.81	-18.61	48.28	48.24
2100	82.57	-0.83	2.34	0.19	37.644	44.93	2.34	-16	48.8	48.68
2110	70.83	-1.5	1.71	-0.44	33.293	37.534	1.71	-14.44	47.87	47.66
2120	61.67	-2.1	1.1	-1.05	29.633	32.039	1.1	-14.76	47.12	46.94
2130	66.43	-1.78	1.36	-0.79	32.553	33.874	1.36	-15.57	47.34	47.06
2140	58.95	-2.3	0.73	-1.42	29.496	29.453	0.73	-16.81	47.33	47.08
2150	64.27	-1.92	1.08	-1.07	32.868	31.405	1.08	-16.94	47.63	47.4
2160	63.16	-2	0.93	-1.22	33.073	30.085	0.93	-16.24	47.32	46.96
2170	69.06	-1.61	1.2	-0.95	36.868	32.187	1.2	-15.76	48.01	47.7
2180	61.84	-2.09	0.85	-1.3	33.696	28.147	0.85	-15.83	48.12	47.92
2190	65.94	-1.81	1.22	-0.93	36.646	29.299	1.22	-16.65	47.91	47.53
2200	66.72	-1.76	1.28	-0.87	37.913	28.804	1.28	-17.84	48.13	47.88
2210	70.13	-1.54	1.56	-0.59	40.66	29.475	1.56	-19.19	48.3	47.94
2220	67.25	-1.72	1.32	-0.83	39.719	27.533	1.32	-19.44	48.01	47.65
2230	67.34	-1.72	1.15	-1	40.563	26.776	1.15	-18.64	49.08	48.93
2240	70.3	-1.53	1.47	-0.68	43.137	27.16	1.47	-17.65	49.18	48.91
2250	72.01	-1.43	1.8	-0.35	44.921	27.092	1.8	-16.04	48.98	48.73
2260	69.89	-1.56	1.97	-0.18	44.31	25.583	1.97	-15.04	49.43	49.43
2270	68.75	-1.63	2.05	-0.1	44.283	24.466	2.05	-15.5	49.9	49.77
2280	65.89	-1.81	1.99	-0.16	43.055	22.83	1.99	-16.2	49.68	49.68
2290	62.53	-2.04	1.78	-0.37	41.223	21.307	1.78	-16.64	49.75	49.8
2300	62.33	-2.05	1.56	-0.59	41.236	21.096	1.56	-16.55	49.45	49.33
2310	61.91	-2.08	1.54	-0.61	40.782	21.124	1.54	-17.41	50.16	50.07
2320	62.44	-2.05	1.65	-0.5	40.749	21.693	1.65	-16.61	50.16	50.11
2330	64.9	-1.88	1.98	-0.17	41.69	23.212	1.98	-17.03	50.7	50.61
2340	66.76	-1.75	2.25	0.1	42.055	24.704	2.25	-16.38	51.15	50.94
2350	68.01	-1.67	2.49	0.34	42.106	25.905	2.49	-16.83	50.99	50.84
2360	68.97	-1.61	2.7	0.55	42.15	26.816	2.7	-15.98	50.83	50.52
2370	67.56	-1.7	2.82	0.67	41.028	26.528	2.82	-16.29	50.65	50.49
2380	68.66	-1.63	3.01	0.86	41.614	27.047	3.01	-15.27	50.6	50.38

2390	75.17	-1.24	3.37	1.22	45.58	29.593	3.37	-15.47	50.91	50.52
2400	72.13	-1.42	3.16	1.01	43.765	28.363	3.16	-15.68	50.9	50.63
2410	75.13	-1.24	3.34	1.19	45.607	29.519	3.34	-16.51	50.4	50.24
2420	74.95	-1.25	3.15	1	45.485	29.461	3.15	-15.97	51.33	50.94
2430	75.96	-1.19	3.09	0.94	46.009	29.954	3.09	-16.37	51.31	50.99
2440	72.98	-1.37	2.88	0.73	44.181	28.794	2.88	-16.99	51.01	50.72
2450	81.25	-0.9	3.29	1.14	49.257	31.991	3.29	-16.8	50.63	50.29
2460	75.51	-1.22	2.98	0.83	45.918	29.596	2.98	-17.21	50.64	50.39
2470	73.38	-1.34	3.02	0.87	44.91	28.47	3.02	-17.4	50.79	50.63
2480	72.36	-1.4	2.96	0.81	44.386	27.979	2.96	-18.13	51.8	51.37
2490	76.97	-1.14	3.36	1.21	47.274	29.695	3.36	-16.84	50.85	50.62
2500	75.99	-1.19	3.31	1.16	46.76	29.232	3.31	-16.55	50.86	50.75
2510	74.74	-1.26	3.24	1.09	46.114	28.622	3.24	-16.19	50.78	50.39
2520	66.26	-1.79	2.76	0.61	41.102	25.156	2.76	-16.98	51.06	51
2530	71.63	-1.45	3.09	0.94	44.626	27.008	3.09	-15.47	50.78	50.48
2540	70.12	-1.54	3.1	0.95	43.759	26.36	3.1	-15.35	50.33	49.94
2550	66.77	-1.75	2.92	0.77	41.602	25.168	2.92	-15.53	50.66	50.61
2560	74.26	-1.29	3.34	1.19	46.362	27.896	3.34	-15.55	51.45	51.18
2570	72.98	-1.37	3.33	1.18	45.746	27.239	3.33	-16	51.31	50.99
2580	70.42	-1.52	3.23	1.08	44.193	26.226	3.23	-14.58	51.43	51.38
2590	67.59	-1.7	3	0.85	42.891	24.698	3	-14.18	52.01	51.63
2600	71.02	-1.49	3.22	1.07	45.459	25.559	3.22	-13.2	52	51.66
2610	69.18	-1.93	2.76	0.61	41.491	22.693	2.76	-12.99	52.35	52.19
2620	69.71	-1.89	2.74	0.59	42.109	22.599	2.74	-13.13	52.02	51.5
2630	62.7	-2.78	1.73	-0.42	34.249	18.455	1.73	-13.95	52.36	51.97
2640	58.3	-2.65	1.7	-0.45	35.171	19.134	1.7	-14.47	52.39	52.18
2650	58.84	-3.11	1.24	-0.91	31.637	17.201	1.24	-15.16	52.48	52.01
2660	59.5	-3.05	1.24	-0.91	31.835	17.663	1.24	-15.37	52.94	52.6
2670	42.59	-3.71	0.54	-1.61	27.186	15.401	0.54	-16.25	53.47	53.4
2680	54.39	-3.53	0.64	-1.51	28.069	16.324	0.64	-15.86	53.38	52.93
2690	51.67	-4.99	-1.01	-3.16	19.456	12.21	-1.01	-16.89	53.08	52.95
2700	55.21	-4.53	-0.93	-3.08	21.106	14.105	-0.93	-17.12	52.88	52.61

5. Mechanical and Packing Drawing

