



Test Report: GSM40B15-P1J

40W AC-DC Single Output Medical Adaptor

■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Control Function Test

Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 100 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 63.2 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1 : -3 %~ +3 % (Max)	I/P : 80 VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : -0.583 %~ 0.623 %	P
3	LINE REGULATION	V1 : -1 %~ +1 % (Max)	I/P : 100 VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : 0 %~ 0 %	P
4	LOAD REGULATION	V1 : -3 %~ +3 % (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : -0.583 %~ 0.623 %	P
5	SET UP TIME	230VAC : 1000 ms (Max) 115VAC : 1500 ms(Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 424.550 ms 115VAC/ 1144.246 ms	P
6	RISE TIME	230VAC : 30 ms (Max) 115VAC : 30 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 8.294 ms 115VAC/ 8.923 ms	P
7	HOLD UP TIME	230VAC : 50 ms (TYP) 115VAC : 15 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 52.268 ms 115VAC/ 27.617 ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : 0 %	P
9	DYNAMIC LOAD	V1 : 1500 mVp-p	I/P : 230 VAC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 90%DUTY/ 3KHZ (3).O/P : FULL /Min LOAD 90%DUTY/ 5KHZ (4).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1) 380 mVp-p (2) 324 mVp-p (3) 292 mVp-p (4) 268 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	80VAC~264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C I/P : LOW-LINE-3V= 77 V HIGH-LINE+15%=300 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	55.743V~264V TEST : OK	P
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P : 80 VAC ~ 264 VAC O/P : FULL~MIN LOAD Ta : 25°C	TEST : OK	P
3	EFFICIENCY	88.5 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	90.54 %	P
4	INPUT CURRENT	230V/ 0.5 A (TYP) 115V/ 1 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.341 A/ 230 VAC I = 0.730 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 60 A (TYP) 115V/ 30 A (TYP) COLD START	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I = 41.812 A/ 230 VAC I = 21.358 A/115VAC	P
6	LEAKAGE CURRENT	< 50 uA / 264VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	FOR PATIENT 37.6 μA -	P
7	NO LOAD CONSUMPTION PS-ON SHORT	< 0.1 W	I/P : 240VAC O/P : NO LOAD Ta : 25°C	< 0.0653 W	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~160 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	128.1 %/ 230 VAC 135.2 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1 : 15.75 V ~ 20.25 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	17.7 V/ 230 VAC 17.9 V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC : RTH2>70°C NO DAMAGE	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active Shut down Re-power ON	P

4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 264 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Hiccup Mode	P
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CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	ERP STEP2 COMPLIANT	LEVEL $V \geq 87.6\%$	I/P: 230 VAC/115VAC O/P:100/75/50/25/0% LOAD Ta:25°C	230V 88.443% 115V 87.687%	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 700 V 10 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 618 V (2) 502 V (3) 610 V	P
2	Diode Peak Voltage	D100 Rated : 100 V 20 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 56.6 V (2) 45.4 V (3) 56.6 V	P
3	Input Capacitor Voltage	C 5 Rated : 120u /400V/105°C	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 368 V (2) 370 V (3) 374 V	P
4	Control IC Voltage Test	U 1 Rated : 28 V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 17.2 V (2) 17.1 V (3) 15.6 V	P
5	CLAMP DIODE	D 1 Rated : 800 V 2 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(3) 532 V (4) 440 V (3) 520 V	P

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 4 KVAC/min	I/P-O/P : 4.2KVAC/min Ta : 25°C	I/P-O/P : 1.697 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100MΩ	I/P-O/P : 500 VDC Ta : 25°C / 70%RH	I/P-O/P : 9999 MΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C / 70%RH	11 mΩ	P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	PASS	P
2	CONDUCTION	EN55011 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	EN55011 CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 AIR : 15KV / Contact : 8KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 INPUT : 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	EN61000-4-5 L-N : 1KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																	
1	TEMPERATURE RISE TEST	MODEL : GSM40B24-P1J 1. ROOM AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : FULL LOAD Ta=21.8℃ 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=47.4℃ <table><tr><td>NO</td><td>Position</td><td>ROOM AMBIENT Ta=21.8℃</td><td>HIGH AMBIENT Ta=47.4℃</td></tr><tr><td>1</td><td>LF1</td><td>41.9℃</td><td>66.1℃</td></tr><tr><td>2</td><td>LF2</td><td>49.0℃</td><td>72.3℃</td></tr><tr><td>3</td><td>BD1</td><td>52.4℃</td><td>75.3℃</td></tr><tr><td>4</td><td>C5</td><td>46.9℃</td><td>70.8℃</td></tr><tr><td>5</td><td>D1</td><td>51.9℃</td><td>75.7℃</td></tr><tr><td>6</td><td>D40</td><td>49.0℃</td><td>73.0℃</td></tr><tr><td>7</td><td>C40</td><td>49.5℃</td><td>73.4℃</td></tr><tr><td>8</td><td>T1coil</td><td>52.9℃</td><td>76.5℃</td></tr><tr><td>9</td><td>T1core</td><td>49.2℃</td><td>72.8℃</td></tr><tr><td>10</td><td>C105</td><td>45.3℃</td><td>69.3℃</td></tr><tr><td>11</td><td>D100</td><td>60.3℃</td><td>82.6℃</td></tr><tr><td>12</td><td>U1</td><td>45.5℃</td><td>69.3℃</td></tr><tr><td>13</td><td>CASE</td><td>41.4℃</td><td>64.8℃</td></tr><tr><td>14</td><td>Q1</td><td>48.6℃</td><td>72.3℃</td></tr><tr><td>15</td><td></td><td></td><td></td></tr></table>			NO	Position	ROOM AMBIENT Ta=21.8℃	HIGH AMBIENT Ta=47.4℃	1	LF1	41.9℃	66.1℃	2	LF2	49.0℃	72.3℃	3	BD1	52.4℃	75.3℃	4	C5	46.9℃	70.8℃	5	D1	51.9℃	75.7℃	6	D40	49.0℃	73.0℃	7	C40	49.5℃	73.4℃	8	T1coil	52.9℃	76.5℃	9	T1core	49.2℃	72.8℃	10	C105	45.3℃	69.3℃	11	D100	60.3℃	82.6℃	12	U1	45.5℃	69.3℃	13	CASE	41.4℃	64.8℃	14	Q1	48.6℃	72.3℃	15					P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 120% LOAD Ta : 25℃	TEST : OK	P																																																																	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -30℃	TEST : OK	P																																																																	
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50℃ NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta=50℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																	
5	TEMPERATURE COEFFICIENT	±0.03%/℃ (0~50℃)	I/P : 230 VAC O/P : FULL LOAD	±0.01%/℃ (0~50℃)	P																																																																	
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45℃~ +90℃ 2. Temperature change rate : 25℃ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P																																																																	
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -30℃~ +50℃ 2. Temperature change rate : 25℃ / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P																																																																	

8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25℃	TEST : OK	P
9	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta= 25℃ LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta= 50℃ LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 50℃ LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta= 50℃ LIFE TIME	(1) 425630HRS (2) 84091HRS (3) 93247HRS (4) 144363HRS	P
10	MTBF	MIL-HDBK-217F NOTICE S2 PARTS COUNT TOTAL FAILURE RATE : 740 KHRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 50,000 hours @ TA 50℃		P

SAMPLE	TEST RESULT	TESTER	APPROVAL
PRODUCT SAMPLE	PASS	XUJ	WANGDZ