



Test Report: GSM120B12

120W AC-DC Reliable Green 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 : 14.6 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1 : -5 %~ +5 % (Max)	I/P : 80 VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : -0.876 %~ 0.876 %	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 : -5 %~ +5 % (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : -0.876 %~ 0.876 %	P
5	SET UP TIME	230VAC : 1500 ms (Max) 115VAC : 2000 ms(Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 426.126 ms 115VAC/ 479.891 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/ 15.775 ms 115VAC/ 16.666 ms	P
7	HOLD UP TIME	230VAC : 40 ms (TYP) 115VAC : 24 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 42.781 ms 115VAC/ 30.514 ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : <5 %	P
9	DYNAMIC LOAD	V1 : 1200 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) 744 mVp-p (2) 682 mVp-p (3) 658 mVp-p (4) 740 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)	62.737 V~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	POWER FACTOR	0.93/230 VAC(TYP) 0.97/ 115 VAC(TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	PF= 0.947 230VAC PF= 0.987 115VAC	P
4	EFFICIENCY	88 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	89.90 %	P
5	INPUT CURRENT	230V/ 0.7 A (TYP) 115V/ 1.4 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.517 A/ 230 VAC I = 0.990 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 70 A (TYP) 115V 35 A(TYP) COLD START	I/P : 230 VAC I/P: 115VAC O/P : FULL LOAD Ta : 25°C	I = 46.125 A/ 230 VAC I= 25.346 A/115VAC	P
7	LEAKAGE CURRENT	< 100 uA / 264VAC For Touch	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L/N-V+: 58.0 μA L/N-V-: 57.6 μA	P
8	NO LOAD CONSUMPTION	< 0.15 W	I/P : 240VAC O/P : NO LOAD Ta : 25°C	< 0.0929 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	135.5 %/ 230 VAC 129.4 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1 : 12.6 V ~16.2V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	14.87 V/ 230 VAC 14.88 V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	NO DAMAGE Shut down o/p voltage, re-power on to recover	I/P : 230 VAC O/P : FULL LOAD	O.T.P. Active Shut down o/p voltage, re-power on to recover	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
---	------------------	--	---	--------------------------	---

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	ERP STEP2 COMPLIANT	LEVEL V ≥89%	I/P: 230 VAC/115VAC O/P:100/75/50/25/% Ta:25°C	230V 89.707 % 115V 89.457 %	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q32 Rated : 700 V 11 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) 602 V/A (2) 524 V/A (3) 558 V/A	P
2	Diode Peak Voltage	Q102 Rated : 75 V 80 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) 67.2 V (2) 51.2 V (3) 66.0 V	P
3	Input Capacitor Voltage	C 5 Rated : 120u /420V/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) 408 V (2) 408 V (3) 408 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) 19.0 V (2) 17.3 V (3) 19.2 V	P
5	CLAMP DIODE	D 30 Rated : 800 V 3 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) 546 V (2) 446 V (3) 544 V	P
6	Power Transistor (D to S) or (C to E) Peak Voltage	Q31 Rated : 600V 15.8 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) 430 V/A (2) 418 V/A (3) 420 V/A	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 : 1.699 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

E.M.C TEST

c	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 : GSM120B20-R7B 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta=24.2℃ 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta=37.6℃ <table><thead><tr><th>NO</th><th>Position</th><th>ROOM AMBIENT Ta=24.2℃</th><th>HIGH AMBIENT Ta=37.6℃</th></tr></thead><tbody><tr><td>1</td><td>LF1</td><td>60.6℃</td><td>71.1℃</td></tr><tr><td>2</td><td>C11</td><td>62.7℃</td><td>73.5℃</td></tr><tr><td>3</td><td>LF2</td><td>60.4℃</td><td>71.2℃</td></tr><tr><td>4</td><td>LF3</td><td>61.3℃</td><td>72.2℃</td></tr><tr><td>5</td><td>L2</td><td>63.0℃</td><td>73.9℃</td></tr><tr><td>6</td><td>D6</td><td>63.5℃</td><td>74.3℃</td></tr><tr><td>7</td><td>C5</td><td>65.4℃</td><td>76.1℃</td></tr><tr><td>8</td><td>D30</td><td>72.3℃</td><td>83.2℃</td></tr><tr><td>9</td><td>C52</td><td>72.0℃</td><td>82.7℃</td></tr><tr><td>10</td><td>Q32</td><td>70.5℃</td><td>81.5℃</td></tr><tr><td>11</td><td>Q102</td><td>74.9℃</td><td>86.1℃</td></tr><tr><td>12</td><td>T1</td><td>75.9℃</td><td>86.4℃</td></tr><tr><td>13</td><td>RTH30</td><td>65.5℃</td><td>76.4℃</td></tr><tr><td>14</td><td>C110</td><td>64.9℃</td><td>75.7℃</td></tr><tr><td>15</td><td>BD1</td><td>63.2℃</td><td>74.0℃</td></tr><tr><td>16</td><td>Q31</td><td>65.0℃</td><td>76.0℃</td></tr><tr><td>17</td><td>D1</td><td>65.1℃</td><td>76.1℃</td></tr><tr><td>18</td><td>U2</td><td>67.7℃</td><td>78.4℃</td></tr><tr><td>19</td><td>C1</td><td>59.9℃</td><td>70.7℃</td></tr><tr><td>20</td><td>C2</td><td>60.1℃</td><td>71.1℃</td></tr></tbody></table>			NO	Position	ROOM AMBIENT Ta=24.2℃	HIGH AMBIENT Ta=37.6℃	1	LF1	60.6℃	71.1℃	2	C11	62.7℃	73.5℃	3	LF2	60.4℃	71.2℃	4	LF3	61.3℃	72.2℃	5	L2	63.0℃	73.9℃	6	D6	63.5℃	74.3℃	7	C5	65.4℃	76.1℃	8	D30	72.3℃	83.2℃	9	C52	72.0℃	82.7℃	10	Q32	70.5℃	81.5℃	11	Q102	74.9℃	86.1℃	12	T1	75.9℃	86.4℃	13	RTH30	65.5℃	76.4℃	14	C110	64.9℃	75.7℃	15	BD1	63.2℃	74.0℃	16	Q31	65.0℃	76.0℃	17	D1	65.1℃	76.1℃	18	U2	67.7℃	78.4℃	19	C1	59.9℃	70.7℃	20	C2	60.1℃	71.1℃	P
NO	Position	ROOM AMBIENT Ta=24.2℃	HIGH AMBIENT Ta=37.6℃																																																																																						
1	LF1	60.6℃	71.1℃																																																																																						
2	C11	62.7℃	73.5℃																																																																																						
3	LF2	60.4℃	71.2℃																																																																																						
4	LF3	61.3℃	72.2℃																																																																																						
5	L2	63.0℃	73.9℃																																																																																						
6	D6	63.5℃	74.3℃																																																																																						
7	C5	65.4℃	76.1℃																																																																																						
8	D30	72.3℃	83.2℃																																																																																						
9	C52	72.0℃	82.7℃																																																																																						
10	Q32	70.5℃	81.5℃																																																																																						
11	Q102	74.9℃	86.1℃																																																																																						
12	T1	75.9℃	86.4℃																																																																																						
13	RTH30	65.5℃	76.4℃																																																																																						
14	C110	64.9℃	75.7℃																																																																																						
15	BD1	63.2℃	74.0℃																																																																																						
16	Q31	65.0℃	76.0℃																																																																																						
17	D1	65.1℃	76.1℃																																																																																						
18	U2	67.7℃	78.4℃																																																																																						
19	C1	59.9℃	70.7℃																																																																																						
20	C2	60.1℃	71.1℃																																																																																						
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 132% 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 40℃ NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta=40.4℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																																				
5	TEMPERATURE COEFFICIENT	± 0.03%/℃ (0~50℃)	I/P : 230 VAC O/P : FULL LOAD	± 0.012%/℃ (0~50℃)	P																																																																																				
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -40℃~ +85℃ 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℃~ +60℃ 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 C110 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=40℃ LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 40 ℃ LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta=40℃ LIFE TIME	(1) 174650HRS (2) 73917HRS (3) 129612HRS (4) 192528HRS	P
10	MTBF	MIL-HDBK-217F NOTICE S2 PARTS COUNT TOTAL FAILURE RATE : 372KHRS		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	Frank	WangDZ