



# Test Report: GSM120B15-R7B

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120W 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 : 120 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 12.2 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 : -0.906 %~ 0.906 %	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 : -0.906 %~ 0.906 %	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/ 394.766 ms 115VAC/ 483.279 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/ 11.547 ms 115VAC/ 11.280 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/ 41.013 ms 115VAC/ 27.604 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 : 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) 1180 mVp-p (2) 1135 mVp-p (3) 1153 mVp-p (4) 1278 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 )	58.687 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= 0.988 115VAC	P
4	EFFICIENCY	89 % (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	90.28 %	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 = 0.441 A/ 230 VAC I = 1.021 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 = 44.638 A/ 230 VAC I = 26.397 A/115VAC	P
7	LEAKAGE CURRENT	< 100 uA / 264VAC For Touch	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L-V: 59.6 μA N-V: 59.8 μA	P
8	NO LOAD CONSUMPTION	< 0.15 W	I/P : 240VAC O/P : NO LOAD Ta : 25°C	< 0.0746 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	129.7 %/ 230 VAC 123.8 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1 : 15.75 V ~20.25V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	19.35 V/ 230 VAC 19.37 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



# 120W AC-DC Single Output Medical Adaptor

# GSM120B series

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 ≥89%	I/P: 230 VAC/115VAC O/P:100/75/50/25/% Ta:25°C	230V 89.963 % 115V 89.017 %	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) 586 V (2) 496 V (3) 576 V	P
2	Diode Peak Voltage	Q102 Rated : 100 V 65 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) 90.0 V (2) 85.2 V (3) 88.0 V	P
3	Input Capacitor Voltage	C 5 Rated : 120u /420V	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) 410 V (2) 402 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) 19.3 V (2) 16.8 V (3) 19.4 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) 536 V (2) 440 V (3) 528 V	P
6	Power Transistor ( D to S) or (C to E) Peak Voltage	Q31 Rated : 600V	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) 426 V (2) 420 V (3) 420 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 : 1.710 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**

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 MEDICAL AIR:8KV / Contact:6KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 MEDICAL INPUT: 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 MEDICAL L-N :1KV L,N-PE:2KV	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°C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta=37.6°C	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=24.2°C</th> <th>HIGH AMBIENT Ta=37.6°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>60.6°C</td><td>71.1°C</td></tr> <tr><td>2</td><td>C11</td><td>62.7°C</td><td>73.5°C</td></tr> <tr><td>3</td><td>LF2</td><td>60.4°C</td><td>71.2°C</td></tr> <tr><td>4</td><td>LF3</td><td>61.3°C</td><td>72.2°C</td></tr> <tr><td>5</td><td>L2</td><td>63.0°C</td><td>73.9°C</td></tr> <tr><td>6</td><td>D6</td><td>63.5°C</td><td>74.3°C</td></tr> <tr><td>7</td><td>C5</td><td>65.4°C</td><td>76.1°C</td></tr> <tr><td>8</td><td>D30</td><td>72.3°C</td><td>83.2°C</td></tr> <tr><td>9</td><td>C52</td><td>72.0°C</td><td>82.7°C</td></tr> <tr><td>10</td><td>Q32</td><td>70.5°C</td><td>81.5°C</td></tr> <tr><td>11</td><td>Q102</td><td>74.9°C</td><td>86.1°C</td></tr> <tr><td>12</td><td>T1</td><td>75.9°C</td><td>86.4°C</td></tr> <tr><td>13</td><td>RTH30</td><td>65.5°C</td><td>76.4°C</td></tr> <tr><td>14</td><td>C110</td><td>64.9°C</td><td>75.7°C</td></tr> <tr><td>15</td><td>BD1</td><td>63.2°C</td><td>74.0°C</td></tr> <tr><td>16</td><td>Q31</td><td>65.0°C</td><td>76.0°C</td></tr> <tr><td>17</td><td>D1</td><td>65.1°C</td><td>76.1°C</td></tr> <tr><td>18</td><td>U2</td><td>67.7°C</td><td>78.4°C</td></tr> <tr><td>19</td><td>C1</td><td>59.9°C</td><td>70.7°C</td></tr> <tr><td>20</td><td>C2</td><td>60.1°C</td><td>71.1°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta=24.2°C	HIGH AMBIENT Ta=37.6°C	1	LF1	60.6°C	71.1°C	2	C11	62.7°C	73.5°C	3	LF2	60.4°C	71.2°C	4	LF3	61.3°C	72.2°C	5	L2	63.0°C	73.9°C	6	D6	63.5°C	74.3°C	7	C5	65.4°C	76.1°C	8	D30	72.3°C	83.2°C	9	C52	72.0°C	82.7°C	10	Q32	70.5°C	81.5°C	11	Q102	74.9°C	86.1°C	12	T1	75.9°C	86.4°C	13	RTH30	65.5°C	76.4°C	14	C110	64.9°C	75.7°C	15	BD1	63.2°C	74.0°C	16	Q31	65.0°C	76.0°C	17	D1	65.1°C	76.1°C	18	U2	67.7°C	78.4°C	19	C1	59.9°C	70.7°C	20	C2	60.1°C	71.1°C		P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 132% LOAD Ta : 25°C	TEST : OK	P																																																																																				
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264VAC/100VAC O/P : 100 % LOAD Ta= -30°C	TEST : OK	P																																																																																				
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40°C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta=40.4°C HUMIDITY= 95 %R.H	TEST : OK	P																																																																																				
5	TEMPERATURE COEFFICIENT	± 0.03%/°C (0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.012%/°C (0~50°C)	P																																																																																				
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -40°C~ +85°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC		OK	P																																																																																				



# 120W AC-DC Single Output Medical Adaptor

# GSM120B series

7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -30°C ~ +60°C 2. Temperature change rate : 25°C / 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°C	TEST : OK	P
9	CAPACITOR LIFE CYCLE	SUPPOSE C110 IS THE MOST CRITICAL COMPONENT (1) I/P : 230VAC O/P : FULL LOAD Ta=25°C LIFE TIME (2) I/P : 230VAC O/P : FULL LOAD Ta=40°C LIFE TIME (3) I/P : 230VAC O/P : 75% LOAD Ta= 40 °C LIFE TIME (4) I/P : 230VAC O/P : 50% LOAD Ta=40°C 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°C		P

SAMPLE	TEST RESULT	TESTER	APPROVAL
PRODUCT SAMPLE	PASS	Frank	WangDZ