



Test Report: GSM60B7-P1J

60W 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 : 80 mVp-p (Max)	I/P : 230VAC O/P : FULL LOAD Ta : 25°C	V1 : 70.8 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 : -1.4 %~ 1.48 %	P
3	LINE REGULATION	V1 : -1 %~ +1 % (Max)	I/P : 100 VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C	V1 : -0.080 %~ 0 %	P
4	LOAD REGULATION	V1 : -5 %~ +5 % (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : -1.4 %~ 1.48 %	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/ 563.785 ms 115VAC/ 1135.142 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/ 6.586 ms 115VAC/ 7.803 ms	P
7	HOLD UP TIME	230VAC : 50 ms (TYP) 115VAC : 16 ms (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 60.473 ms 115VAC/ 21.684 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) 704 mVp-p (2) 700 mVp-p (3) 690 mVp-p (4) 676 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	59.806 V~264V TEST : OK	P
			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)		
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	86% (TYP)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	89.29 %	P
4	INPUT CURRENT	230V/ 1 A (TYP) 115V/ 1.4 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 0.416 A/ 230 VAC I = 0.796 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 60 A (TYP) 115V/ 30 A (TYP) COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 42.171 A/ 230 VAC I = 20.468 A/ 230 VAC	P
6	LEAKAGE CURRENT	< 50 μ A / 264VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	FOR PATIENT 38.5 μ A	P
7	NO LOAD CONSUMPTION PS-ON SHORT	< 0.1 W	I/P : 240VAC O/P : NO LOAD Ta : 25°C	< 0.0595 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	134.3 %/ 230 VAC 132.4 %/ 115 VAC Protection type : Hiccup mode, recovers automatically after fault condition is removed	P
2	OVER VOLTAGE PROTECTION	CH1 : 7.8 V ~ 10.2 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	9.20 V/ 230 VAC 9.22 V/ 115 VAC Protection type : Shut down o/p voltage, re-power on to recover	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 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 $V \geq 86.1\%$	I/P: 230 VAC/115VAC O/P:100/75/50/25/0% LOAD Ta:25°C	230V 86.748% 115V 86.126%	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) 612 V (2) 552 V (3) 570 V	P
2	Diode Peak Voltage	D100 Rated : 45 V 40 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) 43.4 V (2) 36.6 V (3) 42.4 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) 364 V (2) 364 V (3) 364 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) 17.4 V (2) 16.7 V (3) 16.1 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) 514 V (4) 456 V (3) 482 V	P

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
----	-----------	---------------	----------------	--------	---------



60W AC-DC Reliable Green Medical Adaptor

GSM60B series

1	WITHSTAND VOLTAGE	I/P-O/P : 4 KVAC/min	I/P-O/P : 4.2KVAC/min Ta : 25°C	I/P-O/P : 1.832 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	BS EN/EN61000-3-2 CLASS A	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	PASS	P
2	CONDUCTION	BS EN/EN55011 (CISPR11), FCC PART 15 /CISPR22, CAN ICES-3(B)/NMB-3(B) CLASS B	I/P : 230 VAC (50HZ) O/P : FULL/50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	BS EN/EN55011 (CISPR11), FCC PART 15 /CISPR22, CAN ICES-3(B)/NMB-3(B) CLASS B	I/P : 230 VAC (50HZ) O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab	P
4	E.S.D	BS EN/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	BS EN/EN61000-4-4 INPUT: 2KV	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	BS EN/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 : GSM60B12-P1J			P																																																																
		1. ROOM AMBIENT BURN-IN : 1 HRS																																																																			
		I/P : 230VAC O/P : FULL LOAD Ta=22°C																																																																			
		2. HIGH AMBIENT BURN-IN : 2HRS																																																																			
		I/P : 230VAC O/P : FULL LOAD Ta=42°C																																																																			
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta=22.0°C</th> <th>HIGH AMBIENT Ta=42.0°C</th> </tr> </thead> <tbody> <tr><td>1</td><td>LF1</td><td>52.9°C</td><td>68.7°C</td></tr> <tr><td>2</td><td>LF2</td><td>61.8°C</td><td>76.8°C</td></tr> <tr><td>3</td><td>BD1</td><td>64.6°C</td><td>79.4°C</td></tr> <tr><td>4</td><td>C5</td><td>60.3°C</td><td>75.5°C</td></tr> <tr><td>5</td><td>D1</td><td>72.1°C</td><td>87.0°C</td></tr> <tr><td>6</td><td>D40</td><td>65.6°C</td><td>80.8°C</td></tr> <tr><td>7</td><td>RTH2</td><td>65.7°C</td><td>81.0°C</td></tr> <tr><td>8</td><td>T1</td><td>69.1°C</td><td>84.1°C</td></tr> <tr><td>9</td><td>C105</td><td>65.9°C</td><td>80.9°C</td></tr> <tr><td>10</td><td>D100</td><td>80.7°C</td><td>95.4°C</td></tr> <tr><td>11</td><td>C40</td><td>65.3°C</td><td>80.6°C</td></tr> <tr><td>12</td><td>Q1</td><td>66.9°C</td><td>82.0°C</td></tr> <tr><td>13</td><td>D42</td><td>53.7°C</td><td>70.0°C</td></tr> <tr><td>14</td><td>U1</td><td>56.3°C</td><td>72.3°C</td></tr> <tr><td>15</td><td>L1</td><td>45.1°C</td><td>61.1°C</td></tr> </tbody> </table>				NO	Position	ROOM AMBIENT Ta=22.0°C	HIGH AMBIENT Ta=42.0°C	1	LF1	52.9°C	68.7°C	2	LF2	61.8°C	76.8°C	3	BD1	64.6°C	79.4°C	4	C5	60.3°C	75.5°C	5	D1	72.1°C	87.0°C	6	D40	65.6°C	80.8°C	7	RTH2	65.7°C	81.0°C	8	T1	69.1°C	84.1°C	9	C105	65.9°C	80.9°C	10	D100	80.7°C	95.4°C	11	C40	65.3°C	80.6°C	12	Q1	66.9°C	82.0°C	13	D42	53.7°C	70.0°C	14	U1	56.3°C	72.3°C	15	L1	45.1°C	61.1°C
		NO	Position	ROOM AMBIENT Ta=22.0°C		HIGH AMBIENT Ta=42.0°C																																																															
		1	LF1	52.9°C		68.7°C																																																															
		2	LF2	61.8°C		76.8°C																																																															
		3	BD1	64.6°C		79.4°C																																																															
		4	C5	60.3°C		75.5°C																																																															
		5	D1	72.1°C		87.0°C																																																															
		6	D40	65.6°C		80.8°C																																																															
		7	RTH2	65.7°C		81.0°C																																																															
		8	T1	69.1°C		84.1°C																																																															
		9	C105	65.9°C		80.9°C																																																															
10	D100	80.7°C	95.4°C																																																																		
11	C40	65.3°C	80.6°C																																																																		
12	Q1	66.9°C	82.0°C																																																																		
13	D42	53.7°C	70.0°C																																																																		
14	U1	56.3°C	72.3°C																																																																		
15	L1	45.1°C	61.1°C																																																																		
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 126% 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°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	±0.006%/°C(0~50°C)	P																																																																
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -45°C~ +90°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																																																																
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																																																																



60W AC-DC Reliable Green Medical Adaptor

GSM60B series

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 C105 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) 139682HRS (2) 60746HRS (3) 96096HRS (4) 167252HRS	P
10	MTBF	3491.2K hrs min. Telcordia SR-332 (Bellcore) ; 694.3K hrs min. MIL-HDBK-217F (25°C)		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	XUJ	WANGDZ