



# Test Report : GEM40I24

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AC-DC High Reliability Interchangeable Medical Adaptor

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

## ■ SAFETY TEST

Safety Test

## ■ RELIABILITY TEST

Environment Test

Other test

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	120 mVp-p (Max)	I/P:230VAC O/P:FULL LOAD Ta:25°C	64 mVp-p	P
2	VOLTAGE TOLERANCE	-2% ~ +2% (Max)	I/P:90VAC~264VAC O/P:FULL~MIN. LOAD Ta:25°C	-0.40% ~ +1.07%	P
3	LINE REGULATION	-1% ~ +1% (Max)	I/P:90VAC ~264VAC O/P:FULL LOAD Ta:25°C	-0.03% ~ +0.16%	P
4	LOAD REGULATION	-2% ~ +2% (Max)	I/P:230VAC O/P:FULL ~MIN LOAD Ta:25°C	-0.67% ~ +0.76%	P
5	SET UP TIME	500 mS	I/P:230VAC O/P:FULL LOAD Ta:25°C	163.2 mS	P
6	RISE TIME	30 mS	I/P:230VAC O/P:FULL LOAD Ta:25°C	59.4 mS	P
7	HOLD UP TIME	16 mS (Min)	I/P:115VAC O/P:FULL LOAD Ta:25°C	17.1 mS	P

### INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	VOLTAGE RANGE	80VAC ~ 264VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	60V ~ 264V	P
2	FREQUENCY RANGE	47HZ - 63HZ (Typ) NO DAMAGE OSC	I/P: 100VAC ~ 240VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK	P
3	EFFICIENCY	89%	I/P:230VAC O/P:FULL LOAD Ta:25°C	89.69%	P
4	AVERAGE EFFICIENCY	87.59%( DoE Level VI ) 88.60% ( CoC Version 5 )	I/P:115/230VAC O/P:25% 、 50% 、 75% 、 100% LOAD Ta:25°C	88.45% (115VAC) 88.88% (230VAC)	P
5	AC CURRENT	1.0 A (Max)	I/P: 100VAC O/P:FULL LOAD Ta:25°C	0.862A	P
6	NO LOAD POWER CONSUMPTION	< 0.1W (Max)	I/P:230VAC O/P: NO LOAD Ta:25°C	0.0769W	P

7	INRUSH CURRENT	< 65A COLD START	I/P:230VAC O/P:FULL LOAD Ta:25°C	62.2 A	P
8	LEAKAGE CURRENT	< 100μA	I/P:264VAC O/P:Min LOAD Ta:25°C	L-FG: 20μA N-FG: 20μA	P

## PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~160%	I/P:230VAC O/P:TESTING Ta:25°C	132% HICCUP MODE RESET : AUTO RECOVER	P
2	OVER VOLTAGE PROTECTION	110%~140%	I/P:230VAC O/P:MIN LOAD Ta:25°C	136% (1N4736A) Clamp by ZENER diode	P
3	SHORT PROTECTION	SHORT OUTPUT 1 HOUR NO DAMAGE	I/P:264VAC O/P:FULL LOAD Ta:25°C	NO DAMAGE HICCUP MODE RESET AUTO RECOVER	P

## ■ SAFETY TEST

### SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P:5656 VDC/min	I/P-O/P:5656 VDC/min Ta:25°C	I/P-O/P: 0.03uA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P:500 VDC Ta:25°C	I/P-O/P>100MΩ NO DAMAGE	P

## ■ RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT																																								
1	TEMPERATURE RISE TEST	1. ROOM AMBIENT BURN-IN : 4HRS I/P:230VAC O/P:100% LOAD Ta=25°C 2. HI AMBIENT BURN-IN : 4HRS I/P:230VAC O/P:100% LOAD Ta=40°C			P																																								
		<table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr style="background-color: #cccccc;"> <th style="width: 5%;">NO</th> <th style="width: 15%;">Position</th> <th style="width: 30%;"></th> <th style="width: 10%;">1</th> <th style="width: 10%;">2</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">BD1</td> <td style="text-align: center;">820u/400V</td> <td style="text-align: center;">76.9°C</td> <td style="text-align: center;">91.4°C</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">C2</td> <td style="text-align: center;">2A / 800V</td> <td style="text-align: center;">74.5°C</td> <td style="text-align: center;">89.6°C</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">Q2</td> <td style="text-align: center;">10A /600V</td> <td style="text-align: center;">85.1°C</td> <td style="text-align: center;">100.5°C</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">T1</td> <td style="text-align: center;">2820</td> <td style="text-align: center;">87.5°C</td> <td style="text-align: center;">103.9°C</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">D1</td> <td style="text-align: center;">30A / 100V</td> <td style="text-align: center;">77.1°C</td> <td style="text-align: center;">92.9°C</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">C5</td> <td style="text-align: center;">220u/35V</td> <td style="text-align: center;">73.1°C</td> <td style="text-align: center;">88.5°C</td> </tr> <tr> <td style="text-align: center;">7</td> <td style="text-align: center;">CASE</td> <td style="text-align: center;">CENTER</td> <td style="text-align: center;">58.2°C</td> <td style="text-align: center;">71.8°C</td> </tr> </tbody> </table>				NO	Position		1	2	1	BD1	820u/400V	76.9°C	91.4°C	2	C2	2A / 800V	74.5°C	89.6°C	3	Q2	10A /600V	85.1°C	100.5°C	4	T1	2820	87.5°C	103.9°C	5	D1	30A / 100V	77.1°C	92.9°C	6	C5	220u/35V	73.1°C	88.5°C	7	CASE	CENTER	58.2°C	71.8°C
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOURS	I/P : 230VAC O/P : 100% LOAD Ta= -25°C	TEST : OK	P																																								

### OTHER

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C5 IS THE MOST CRITICAL COMPONENT (4000hrs) I/P:230 VAC O/P:100% LOAD Ta=25°C LIFE TIME= 36504 HRS I/P:230 VAC O/P:100% LOAD Ta=40°C LIFE TIME= 12553 HRS			P
2	MTBF	MIL-KDBK-217F NOTICES 2 PARTS COUNT TOTAL FAILURE RATE : 2.122442 M.T.B.F : 471155 HRS			P

TEST RESULT	TESTER	APPROVAL
PASS	PETER CHENG	VINCENT TSENG