



# Test Report : GEM12I48

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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    | 100mVp-p (Max)  | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C            | 40mVp-p         | P       |
| 2  | VOLTAGE TOLERANCE | -2% ~ +2% (Max) | I/P:90VAC~264VAC<br>O/P:FULL~MIN. LOAD<br>Ta:25°C | -0.12% ~ +0.13% | P       |
| 3  | LINE REGULATION   | -1% ~ +1% (Max) | I/P:90VAC ~264VAC<br>O/P:FULL LOAD<br>Ta:25°C     | +0.03% ~ -0.02% | P       |
| 4  | LOAD REGULATION   | -2% ~ +2% (Max) | I/P:230VAC<br>O/P:FULL ~MIN LOAD<br>Ta:25°C       | -0.12% ~ +0.13% | P       |
| 5  | SET UP TIME       | 500 mS          | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C            | 925.154mS       | P       |
| 6  | RISE TIME         | 30 mS           | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C            | 51.493mS        | P       |
| 7  | HOLD UP TIME      | 16 mS (Min)     | I/P:115VAC<br>O/P:FULL LOAD<br>Ta:25°C            | 23.597mS        | P       |

### INPUT FUNCTION TEST

| NO | TEST ITEM                 | SPECICATION                                    | TEST CONDITION   | RESULT                            | VERDICT |
|----|---------------------------|--|--|-----------------------------------|---------|
| 1  | VOLTAGE RANGE             | 80VAC ~ 264VAC                                 | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25°C                | 43.7V ~ 264V                      | P       |
| 2  | FREQUENCY RANGE           | 50HZ - 60HZ (Typ)<br>NO DAMAGE OSC             | I/P: 100VAC ~ 240VAC<br>O/P:FULL~MIN LOAD<br>Ta:25°C   | TEST: OK                          | P       |
| 3  | EFFICIENCY                | 87%  | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C                 | 87.96%                            | P       |
| 4  | AVERAGE EFFICIENCY        | 82.96%( DoE LEVEL VI)<br>83.26%(CoC Version 5) | I/P:115/230VAC<br>O/P:25%、50%、75%、100% LOAD<br>Ta:25°C | 88.76%(115VAC)<br>86.21% (230VAC) | P       |
| 5  | AC CURRENT                | 0.4A (Max)                                     | I/P: 100VAC<br>O/P:FULL LOAD<br>Ta:25°C                | 0.245A                            | P       |
| 6  | NO LOAD POWER CONSUMPTION | < 0.1W (Max)                                   | I/P:230VAC<br>O/P: NO LOAD<br>Ta:25°C                  | 0.0796W                           | P       |

|   |                 |                     |  |                          |   |
|---|-----------------|---------------------|--|--------------------------|---|
| 7 | INRUSH CURRENT  | < 60A<br>COLD START | I/P:230VAC<br>O/P:FULL LOAD<br>Ta:25°C | 43.671A                  | P |
| 8 | LEAKAGE CURRENT | <100μA              | I/P:264VAC<br>O/P:Min LOAD<br>Ta:25°C  | L-FG: 20μA<br>N-FG: 20μA | P |

## PROTECTION FUNCTION TEST

| NO | TEST ITEM               | SPECICATION                      | TEST CONDITION                         | RESULT   | VERDICT |
|----|-------------------------|----------------------------------|--|--|---------|
| 1  | OVER LOAD PROTECTION    | 110% ~ 200%                      | I/P:230VAC<br>O/P:TESTING<br>Ta:25°C   | 148.0%<br>HICCUP MODE<br>RESET : AUTO RECOVER    | P       |
| 2  | OVER VOLTAGE PROTECTION | 110% ~ 140%                      | I/P:230VAC<br>O/P:MIN LOAD<br>Ta:25°C  | 117%<br>Clamp by ZENER diode<br>MMSZ5263BF (56V) | P       |
| 3  | SHORT PROTECTION        | SHORT OUTPUT<br>1 HOUR NO DAMAGE | I/P:264VAC<br>O/P:FULL LOAD<br>Ta:25°C | NO DAMAGE<br>HICCUP MODE<br>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<br>Ta:25°C | I/P-O/P: 0.02uA<br>NO DAMAGE | P       |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ | I/P-O/P:500 VDC<br>Ta:25°C      | I/P-O/P>100MΩ<br>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<br>I/P:230VAC O/P:100% LOAD Ta=25°C<br>2. HI AMBIENT BURN-IN : 4HRS<br>I/P:230VAC O/P:100% LOAD Ta=40°C<br>3. HI AMBIENT BURN-IN : 4HRS<br>I/P:230VAC O/P:50% LOAD Ta=70°C |  |           | P       |
|    |                              |   |  |           |         |
|    |                              |   |  |           |         |
|    |                              |   |  |           |         |
|    |                              |   |  |           |         |
|    |                              |   |  |           |         |
|    |                              |   |  |           |         |
|    |                              |   |  |           |         |
| 2  | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 2 HOURS   | I/P : 230VAC<br>O/P : 100% LOAD<br>Ta= -20°C | TEST : OK | P       |

### OTHER

| NO | TEST ITEM            | SPECICATION  | TEST CONDITION | RESULT | VERDICT |
|----|----------------------|--|----------------|--------|---------|
| 1  | CAPACITOR LIFE CYCLE | SUPPOSE C11 IS THE MOST CRITICAL COMPONENT<br>I/P:230 VAC O/P:100% LOAD Ta=25°C LIFE TIME= 73892HRS<br>I/P:230 VAC O/P:100% LOAD Ta=40°C LIFE TIME= 27234HRS<br>I/P:230 VAC O/P:50% LOAD Ta=70°C LIFE TIME= 27422HRS (12hours/day) |                |        | P       |
| 2  | MTBF                 | MIL-KDBK-217F NOTICES 2 PARTS COUNT<br>TOTAL FAILURE RATE : 1.510475<br>M.T.B.F : 662043 HRS   |                |        | P       |

| TEST RESULT | TESTER | APPROVAL     |
|-------------|--------|--------------|
| PASS        | ARCHEN | VINCENT ZENG |