



# Test Report : MDS20B-15

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20W 2"x1" Package Medical Grade DC-DC Converter

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

## ■ SAFETY TEST

Safety Test

## ■ RELIABILITY TEST

Environment Test

Other

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

| NO | TEST ITEM        | SPECICATION          | TEST CONDITION                                | RESULT          | VERDICT |
|----|------------------|----------------------|---|-----------------|---------|
| 1  | VOLTAGE ACCURACY | -1.0% ~ +1.0 % (Max) | I/P:24VDC<br>O/P:FULL LOAD<br>Ta:25°C         | -0.03%          | P       |
| 2  | RIPPLE & NOISE   | 60 mVp-p (Max)       | I/P:24VDC<br>O/P:FULL LOAD<br>Ta:25°C         | 7 mV            | P       |
| 3  | LINE REGULATION  | -0.5% ~ +0.5% (Max)  | I/P:18VDC~36VDC<br>O/P:FULL LOAD<br>Ta:25°C   | +0.01% ~ +0.01% | P       |
| 4  | LOAD REGULATION  | -0.5% ~ +0.5% (Max)  | I/P:24VDC<br>O/P:5% LOAD~FULL LOAD<br>Ta:25°C | -0.03% ~ +0.03% | P       |

### INPUT FUNCTION TEST

| NO | TEST ITEM           | SPECICATION                           | TEST CONDITION                             | RESULT                                    | VERDICT |
|----|---------------------|---------------------------------------|--|---|---------|
| 1  | INPUT VOLTAGE RANGE | 18 VDC ~ 36 VDC                       | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25°C    | 16.82 VDC ~ 36.0 VDC                      | P       |
| 2  | EFFICIENCY          | 88% (Typ)                             | I/P:24VDC<br>O/P:FULL LOAD<br>Ta:25°C      | 91.14%                                    | P       |
| 3  | DC CURRENT          | 1000 mA / FULL LOAD<br>7 mA / NO LOAD | I/P:24VDC<br>O/P:NO / FULL LOAD<br>Ta:25°C | 908.9 mA / FULL LOAD<br>5.17 mA / NO LOAD | P       |

### PROTECTION FUNCTION TEST

| NO | TEST ITEM            | SPECICATION       | TEST CONDITION                        | RESULT                                | VERDICT |
|----|----------------------|-------------------|---------------------------------------|---------------------------------------|---------|
| 1  | SHORT PROTECTION     | CONTINUOUS        | I/P:36VDC<br>O/P:FULL LOAD<br>Ta:25°C | HICCUP MODE<br>AUTO-RECOVER           | P       |
| 2  | OVER LOAD PROTECTION | 110% ~ 180% (Typ) | I/P:24VDC<br>O/P:TESTING<br>Ta:25°C   | 150.8%<br>HICCUP MODE<br>AUTO-RECOVER | P       |

## SAFETY TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECICATION          | TEST CONDITION                  | RESULT                        | VERDICT |
|----|----------------------|----------------------|---------------------------------|-------------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P:4.0K VAC/min | I/P-O/P:4.0K VAC/min<br>Ta:25°C | I/P-O/P: 0.002mA<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 : 8HRS<br>I/P:24VDC O/P:FULL LOAD Ta=25°C<br>2. HIGH AMBIENT BURN-IN : 8HRS<br>I/P:24VDC O/P:FULL LOAD Ta=60°C<br>3. HIGH AMBIENT BURN-IN : 8HRS<br>I/P:24VDC O/P:50% LOAD Ta=80°C                  |  |           | P       |   |   |   |   |      |        |        |        |  |
|    |                              | <table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CASE</td> <td>54.5°C</td> <td>90.1°C</td> <td>98.0°C</td> </tr> </tbody> </table> | NO                                       | Position  |         | 1 | 2 | 3 | 1 | CASE | 54.5°C | 90.1°C | 98.0°C |  |
| NO | Position                     | 1   | 2  | 3         |         |   |   |   |   |      |        |        |        |  |
| 1  | CASE                         | 54.5°C  | 90.1°C                                   | 98.0°C    |         |   |   |   |   |      |        |        |        |  |
| 2  | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 4 HOURS   | I/P:24VDC<br>O/P: FULL LOAD<br>Ta= -40°C | TEST : OK | P       |   |   |   |   |      |        |        |        |  |

### OTHER

| NO | TEST ITEM | SPECICATION   | TEST CONDITION | RESULT | VERDICT |
|----|-----------|---|----------------|--------|---------|
| 1  | MTBF      | MIL-HDBK-217F,GB,25°C<br>TOTAL FAILURE RATE : 0.984251<br>M.T.B.F : 1016 KHRS |                |        | P       |

| TEST RESULT | TESTER       | APPROVAL    |
|-------------|--------------|-------------|
| PASS        | ARCHEN HSIAO | PETER CHENG |