



# Test Report : DDRH-15-05

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15W High Reliable 150~1500Vdc Ultra Wide Input DC-DC Converter

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

## ■ SAFETY TEST

Safety Test

## ■ RELIABILITY TEST

Environment Test

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

| NO | TEST ITEM        | SPECICATION    | TEST CONDITION                                  | RESULT          | VERDITC |
|----|------------------|----------------|---|-----------------|---------|
| 1  | VOLTAGE ACCURACY | -2.0% ~ +2.0 % | I/P:800VDC<br>O/P:FULL LOAD<br>Ta:25°C          | -0.68%          | P       |
| 2  | RIPPLE & NOISE   | 100 mVp-p      | I/P:800VDC<br>O/P:FULL LOAD<br>Ta:25°C          | 38mV            | P       |
| 3  | LINE REGULATION  | -1.0% ~ +1.0%  | I/P:150VDC~1500VDC<br>O/P: FULL LOAD<br>Ta:25°C | +0.08% ~ -0.07% | P       |
| 4  | LOAD REGULATION  | -1.0% ~ +1.0%  | I/P:800VDC<br>O/P:10% LOAD~FULL LOAD<br>Ta:25°C | -0.49% ~ +0.81% | P       |
| 5  | HOLD UP TIME     | 16ms min.      | I/P:800VDC<br>O/P:FULL LOAD<br>Ta:25°C          | 54.4ms          | P       |
| 6  | SETUP TIME       | 1s max.        | I/P:800VDC<br>O/P: FULL LOAD<br>Ta:25°C         | 162ms           | P       |

### INPUT FUNCTION TEST

| NO | TEST ITEM           | SPECICATION                         | TEST CONDITION                              | RESULT                                    | VERDITC |
|----|---------------------|-------------------------------------|---|---|---------|
| 1  | INPUT VOLTAGE RANGE | 150 VDC ~1500 VDC                   | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25°C     | 126.8VDC ~1500 VDC                        | P       |
| 2  | EFFICIENCY          | 78%                                 | I/P:800VDC<br>O/P:FULL LOAD<br>Ta:25°C      | 86.49%                                    | P       |
| 3  | DC CURRENT          | 25mA / FULL LOAD<br>0.2mA / NO LOAD | I/P:800VDC<br>O/P:NO / FULL LOAD<br>Ta:25°C | 15.25mA / FULL LOAD<br>0.165 mA / NO LOAD | P       |

### PROTECTION FUNCTION TEST

| NO | TEST ITEM               | SPECICATION | TEST CONDITION                          | RESULT                                | VERDITC |
|----|-------------------------|-------------|---|---------------------------------------|---------|
| 1  | SHORT PROTECTION        | CONTINUOUS  | I/P:1500VDC<br>O/P:FULL LOAD<br>Ta:25°C | HICCUP MODE<br>AUTO-RECOVER           | P       |
| 2  | OVER LOAD PROTECTION    | 110% ~ 300% | I/P:800VDC<br>O/P:TESTING<br>Ta:25°C    | 187.5%<br>HICCUP MODE<br>AUTO-RECOVER | P       |
| 3  | OVER VOLTAGE PROTECTION | YES         | I/P:800VDC<br>O/P: MIN LOAD<br>Ta:25°C  | HICCUP MODE<br>AUTO-RECOVER           | P       |

|   |                           |  |   |                      |   |
|---|---------------------------|--|---|----------------------|---|
| 4 | DC INPUT REVERSE POLARITY | NO DAMAGE  | I/P:800VDC<br>O/P: FULL LOAD<br>Ta:25°C   | NO DAMAGE            | P |
| 5 | UNDER VOLTAGE LOCKOUT     | START-UP VOLTAGE<br>147Vdc<br>SHUTDOWN VOLTAGE<br>137Vdc | I/P: TESTING<br>O/P: FULL LOAD<br>Ta:25°C | 137.5VDC<br>126.8VDC | P |

## ■ SAFETY TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECICATION           | TEST CONDITION                 | RESULT                        | VERDITC |
|----|----------------------|-----------------------|--------------------------------|-------------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P:4.0KVAC/min   | I/P-O/P:4.0KVAC/min<br>Ta:25°C | I/P-O/P: 0.002mA<br>NO DAMAGE | P       |
| 2  | ISOLATION RESISTANCE | I/P-O/P:500VDC>1000MΩ | I/P-O/P:500 VDC<br>Ta:25°C     | I/P-O/P>1000MΩ<br>NO DAMAGE   | P       |

## ■ RELIABILITY TEST

### ENVIRONMENT TEST

| NO | TEST ITEM                    | SPECICATION   | TEST CONDITION                            | RESULT    | VERDITC |
|----|------------------------------|---|---|-----------|---------|
| 1  | TEMPERATURE RISE TEST        | 1. ROOM AMBIENT BURN-IN : 4HRS<br>I/P:800VDC O/P:FULL LOAD Ta=25°C<br>2. HIGH AMBIENT BURN-IN : 4HRS<br>I/P:800VDC O/P:FULL LOAD Ta=50°C<br>3. HIGH AMBIENT BURN-IN : 4HRS<br>I/P:800VDC O/P:50% LOAD Ta=70°C |   |           | P       |
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|    |                              |   |   |           |         |
| 2  | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 4 HOURS   | I/P:800VDC<br>O/P: FULL LOAD<br>Ta= -40°C | TEST : OK | P       |

## OTHER

| NO | TEST ITEM | SPECICATION   | TEST CONDITION | RESULT | VERDITC |
|----|-----------|---|----------------|--------|---------|
| 1  | MTBF      | MIL-HDBK-217F,GB,25°C<br>TOTAL FAILURE RATE :<br>M.T.B.F : 388K HRS |                |        | P       |

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