



# Test Report : SPB09W8-15

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9W SIP Package 8:1 Ultra-Wide Input DC-DC Regulated 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        | SPECIFICATION        | TEST CONDITION                                | RESULT          | VERDICT |
|----|------------------|----------------------|-----------------------------------------------|-----------------|---------|
| 1  | VOLTAGE ACCURACY | -2.0% ~ +2.0 % (Max) | I/P:24VDC<br>O/P:FULL LOAD<br>Ta:25°C         | -0.69%          | P       |
| 2  | RIPPLE & NOISE   | 150 mVp-p (Max)      | I/P:24VDC<br>O/P:FULL LOAD<br>Ta:25°C         | 27 mV           | P       |
| 3  | LINE REGULATION  | -0.5% ~ +0.5 %       | I/P:9VDC~75VDC<br>O/P:FULL LOAD<br>Ta:25°C    | -0.05% ~ -0.10% | P       |
| 4  | LOAD REGULATION  | -0.5% ~ +0.5%        | I/P:24VDC<br>O/P:0% LOAD~FULL LOAD<br>Ta:25°C | -0.04% ~ +0.07% | P       |

### INPUT FUNCTION TEST

| NO | TEST ITEM             | SPECIFICATION                          | TEST CONDITION                             | RESULT                                 | VERDICT |
|----|-----------------------|----------------------------------------|--------------------------------------------|----------------------------------------|---------|
| 1  | EFFICIENCY            | 86%                                    | I/P:24VDC<br>O/P:FULL LOAD<br>Ta:25°C      | 87.05%                                 | P       |
| 2  | DC CURRENT            | 431mA / FULL LOAD<br>10 mA / NO LOAD   | I/P:24VDC<br>O/P:NO / FULL LOAD<br>Ta:25°C | 426 mA / FULL LOAD<br>4.2 mA / NO LOAD | P       |
| 3  | UNDER VOLTAGE LOCKOUT | START-UP 8.8V<br>SHUTDOWN VOLTAGE 8.0V | I/P:TESTING<br>O/P:FULL LOAD<br>Ta:25°C    | 8.53 VDC<br>7.94 VDC                   | P       |

### PROTECTION FUNCTION TEST

| NO | TEST ITEM            | SPECIFICATION | TEST CONDITION                          | RESULT                                | VERDICT |
|----|----------------------|---------------|-----------------------------------------|---------------------------------------|---------|
| 1  | SHORT PROTECTION     | CONTINUOUS    | I/P:75VDC<br>O/P:FULL LOAD<br>Ta:25°C   | CONTINUOUS,<br>AUTOMATIC RECOVERY     | P       |
| 2  | OVER LOAD PROTECTION | 120~230%      | I/P:24VDC<br>O/P:TESTING<br>Ta:25°C     | 182.5%<br>HICCUP MODE<br>AUTO-RECOVER | P       |
| 3  | CASE TEMPERATURE     | +115°C max    | I/P:24VDC<br>O/P:TESTING<br>Ta: TESTING | OK<br>AUTOMATIC RECOVERY              | P       |

### CONTROL FUNCTION TEST

| NO | TEST ITEM      | SPECIFICATION                                                                                          | TEST CONDITION                        | RESULT                                                                     | VERDICT |
|----|----------------|--------------------------------------------------------------------------------------------------------|---------------------------------------|----------------------------------------------------------------------------|---------|
| 1  | REMOTE CONTROL | POWER ON :<br>R.C. ~ -VIN >2.5~30VDC<br>OR OPEN CIRCUIT<br>POWER OFF :<br>R.C. ~ -VIN <1.0VDC OR SHORT | I/P:24VDC<br>O/P:100% LOAD<br>Ta:25°C | POWER ON :<br>R.C.>1.83VDC OR OPEN<br>POWER OFF :<br>R.C.<1.77VDC OR SHORT | P       |

## SAFETY TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECICATION           | TEST CONDITION                  | RESULT                        | VERDICT |
|----|----------------------|-----------------------|---------------------------------|-------------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P:1500 VDC/min  | I/P-O/P:1500 VDC/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                    | SPECIFICATION                                                                                                                        | TEST CONDITION                                                                                                                        | RESULT    |          |   |   |   |      |       |        |  |
|----|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|---|---|---|------|-------|--------|--|
| 1  | TEMPERATURE RISE TEST        | 1. ROOM AMBIENT BURN-IN : 4HRS<br>I/P:24VDC O/P:FULL LOAD Ta=25℃<br>2. HIGH AMBIENT BURN-IN : 4HRS<br>I/P:24VDC O/P:FULL LOAD Ta=60℃ | <table><tr><th>NO</th><th>Position</th><th>1</th><th>2</th></tr><tr><td>1</td><td>CASE</td><td>76.9℃</td><td>111.9℃</td></tr></table> | NO        | Position | 1 | 2 | 1 | CASE | 76.9℃ | 111.9℃ |  |
| NO | Position                     | 1                                                                                                                                    | 2                                                                                                                                     |           |          |   |   |   |      |       |        |  |
| 1  | CASE                         | 76.9℃                                                                                                                                | 111.9℃                                                                                                                                |           |          |   |   |   |      |       |        |  |
| 2  | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 4 HOURS                                                                                                                | I/P:24VDC<br>O/P: FULL LOAD<br>Ta= -40℃                                                                                               | TEST : OK |          |   |   |   |      |       |        |  |

### OTHER

| NO | TEST ITEM | SPECICATION                                                               | TEST CONDITION | RESULT |
|----|-----------|---------------------------------------------------------------------------|----------------|--------|
| 1  | MTBF      | MIL-HDBK-217F,GB,25°C<br>TOTAL FAILURE RATE : 3.333<br>M.T.B.F : >300KHRS |                |        |

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