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Jameco Part Number 1953971



■ Features :

- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage / Over temperature
- 1500VDC I/O isolation
- Forced air cooling by built-in DC Fan
- 100% full load burn-in test
- 24V and 48V input voltage design refer to LVD
- 2 years warranty

CB (for D type only) **CE**

SPECIFICATION

| MODEL | | SD-350B | | | | SD-350C | | | | |
|-----------------------|--|--|------------|--------------|------------|---------------|------------|--------------|------------|--|
| OUTPUT | DC VOLTAGE | 5V | 12V | 24V | 48V | 5V | 12V | 24V | 48V | |
| | RATED CURRENT | 57A | 27.5A | 14.6A | 7.3A | 60A | 27.5A | 14.6A | 7.3A | |
| | CURRENT RANGE | 0 ~ 57A | 0 ~ 27.5A | 0 ~ 14.6A | 0 ~ 7.3A | 0 ~ 60A | 0 ~ 27.5A | 0 ~ 14.6A | 0 ~ 7.3A | |
| | RATED POWER | 285W | 330W | 350.4W | 350.4W | 300W | 330W | 350.4W | 350.4W | |
| | RIPPLE & NOISE (max.) Note.2 | 100mVp-p | 120mVp-p | 150mVp-p | 200mVp-p | 100mVp-p | 120mVp-p | 150mVp-p | 200mVp-p | |
| | VOLTAGE ADJ. RANGE | 4.5 ~ 5.5VDC | 11 ~ 16VDC | 23 ~ 30VDC | 43 ~ 53VDC | 4.5 ~ 5.5VDC | 11 ~ 16VDC | 23 ~ 30VDC | 43 ~ 53VDC | |
| | VOLTAGE TOLERANCE Note.3 | 2.0% | 1.0% | 1.0% | 1.0% | 2.0% | 1.0% | 1.0% | 1.0% | |
| | LINE REGULATION | 0.5% | 0.3% | 0.2% | 0.2% | 0.5% | 0.3% | 0.2% | 0.2% | |
| | LOAD REGULATION | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | |
| SETUP, RISE TIME | 300ms, 50ms at full load | | | | | | | | | |
| INPUT | VOLTAGE RANGE | B:19 ~ 36VDC | | C:36 ~ 72VDC | | D:72 ~ 144VDC | | | | |
| | EFFICIENCY (Typ.) | 74% | 80% | 80% | 84% | 76% | 81% | 81% | 82% | |
| | DC CURRENT (Typ.) | 14.4A/24V | 16A/24V | 17.6A/24V | 17.6A/24V | 7.6A/48V | 8.8A/48V | 9.0A/48V | 9.0A/48V | |
| | INRUSH CURRENT (Typ.) | C:45A/48VDC | | D:45A/96VDC | | | | | | |
| PROTECTION | OVERLOAD | 105 ~ 135% rated output power Protection type : Shut down o/p voltage, re-power on to recover | | | | | | | | |
| | OVER VOLTAGE | 5.75 ~ 6.75V | 16.8 ~ 20V | 31.5 ~ 37.5V | 53 ~ 65V | 5.75 ~ 6.75V | 16.8 ~ 20V | 31.5 ~ 37.5V | 53 ~ 65V | |
| | OVER TEMPERATURE | 95°C 5°C (TSW1) detect on main power transistor Protection type : Shut down o/p voltage, recovers automatically after temperature goes down | | | | | | | | |
| ENVIRONMENT | WORKING TEMP. | -20 ~ +60°C (Refer to output load derating curve) | | | | | | | | |
| | WORKING HUMIDITY | 20 ~ 90% RH non-condensing | | | | | | | | |
| | STORAGE TEMP., HUMIDITY | -40 ~ +85°C, 10 ~ 95% RH | | | | | | | | |
| | TEMP. COEFFICIENT | 0.03%/°C (0 ~ 50°C) | | | | | | | | |
| | VIBRATION | 10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes | | | | | | | | |
| SAFETY & EMC (Note 4) | SAFETY STANDARDS | IEC60950-1 CB approved by TUV (for D type only) | | | | | | | | |
| | WITHSTAND VOLTAGE | I/P-O/P:1.5KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC | | | | | | | | |
| | ISOLATION RESISTANCE | I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC | | | | | | | | |
| | EMI CONDUCTION & RADIATION | Compliance to EN55022 (CISPR22) Class B | | | | | | | | |
| | EMS IMMUNITY | Compliance to EN61000-4-2,3,4,6,8; ENV50204, light industry level, criteria A | | | | | | | | |
| OTHERS | MTBF | 209.4K hrs min. MIL-HDBK-217F (25°C) | | | | | | | | |
| | DIMENSION | 215*115*50mm (L*W*H) | | | | | | | | |
| | PACKING | 1.1Kg; 12pcs/14.4Kg/0.92CUFT | | | | | | | | |
| NOTE | <ol style="list-style-type: none"> 1. All parameters NOT specially mentioned are measured at 24,48,96VDC input, rated load and 25°C of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. | | | | | | | | | |



350W Single Output DC-DC Converter

SD-350 series



■ Features :

- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage / Over temperature
- 1500VDC I/O isolation
- Forced air cooling by built-in DC Fan
- 100% full load burn-in test
- 24V(B) and 48V(C) input voltage design refer to LVD
- 2 years warranty

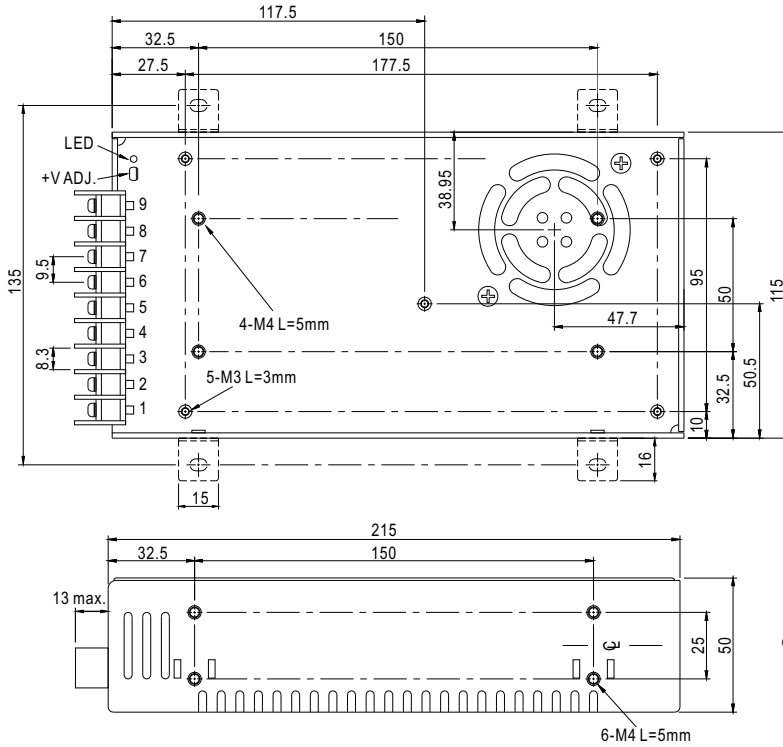
CB (for D type only) **CE**

SPECIFICATION

| MODEL | | SD-350D | | | |
|-----------------------|--|--|------------|--------------|------------|
| OUTPUT | DC VOLTAGE | 5V | 12V | 24V | 48V |
| | RATED CURRENT | 60A | 29.2A | 14.6A | 7.3A |
| | CURRENT RANGE | 0 ~ 60A | 0 ~ 29.2A | 0 ~ 14.6A | 0 ~ 7.3A |
| | RATED POWER | 300W | 350.4W | 350.4W | 350.4W |
| | RIPPLE & NOISE (max.) Note.2 | 100mVp-p | 120mVp-p | 150mVp-p | 200mVp-p |
| | VOLTAGE ADJ. RANGE | 4.5 ~ 5.5VDC | 11 ~ 16VDC | 23 ~ 30VDC | 43 ~ 53VDC |
| | VOLTAGE TOLERANCE Note.3 | 2.0% | 1.0% | 1.0% | 1.0% |
| | LINE REGULATION | 0.5% | 0.3% | 0.2% | 0.2% |
| | LOAD REGULATION | 1.0% | 1.0% | 1.0% | 1.0% |
| SETUP, RISE TIME | 300ms, 50ms at full load | | | | |
| INPUT | VOLTAGE RANGE | B:19 ~ 36VDC C:36 ~ 72VDC D:72 ~ 144VDC | | | |
| | EFFICIENCY (Typ.) | 78% | 83% | 87% | 89% |
| | DC CURRENT (Typ.) | 6A/96V | 6A/96V | 6A/96V | 6A/96V |
| | INRUSH CURRENT (Typ.) | C:45A/48VDC D:45A/96VDC | | | |
| PROTECTION | OVERLOAD | 105 ~ 135% rated output power Protection type : Shut down o/p voltage, re-power on to recover | | | |
| | OVER VOLTAGE | 5.75 ~ 6.75V | 16.8 ~ 20V | 31.5 ~ 37.5V | 53 ~ 65V |
| | OVER TEMPERATURE | 75°C 5°C (TSW1) detect on main power transistor Protection type : Shut down o/p voltage, recovers automatically after temperature goes down | | | |
| ENVIRONMENT | WORKING TEMP. | -20 ~ +60°C (Refer to output load derating curve) | | | |
| | WORKING HUMIDITY | 20 ~ 90% RH non-condensing | | | |
| | STORAGE TEMP., HUMIDITY | -40 ~ +85°C, 10 ~ 95% RH | | | |
| | TEMP. COEFFICIENT | 0.03%/°C (0 ~ 50°C) | | | |
| | VIBRATION | 10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes | | | |
| SAFETY & EMC (Note 4) | SAFETY STANDARDS | IEC60950-1 CB approved by TUV (for D type only) | | | |
| | WITHSTAND VOLTAGE | I/P-O/P:1.5KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC | | | |
| | ISOLATION RESISTANCE | I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC | | | |
| | EMI CONDUCTION & RADIATION | Compliance to EN55022 (CISPR22) Class B | | | |
| | EMS IMMUNITY | Compliance to EN61000-4-2,3,4,6,8; ENV50204, light industry level, criteria A | | | |
| OTHERS | MTBF | 209.4K hrs min. MIL-HDBK-217F (25°C) | | | |
| | DIMENSION | 215*115*50mm (L*W*H) | | | |
| | PACKING | 1.1Kg; 12pcs/14.4Kg/0.92CUFT | | | |
| NOTE | <ol style="list-style-type: none"> 1. All parameters NOT specially mentioned are measured at 24,48,96VDC input, rated load and 25°C of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. | | | | |

Case No. 912A Unit:mm

Mechanical Specification

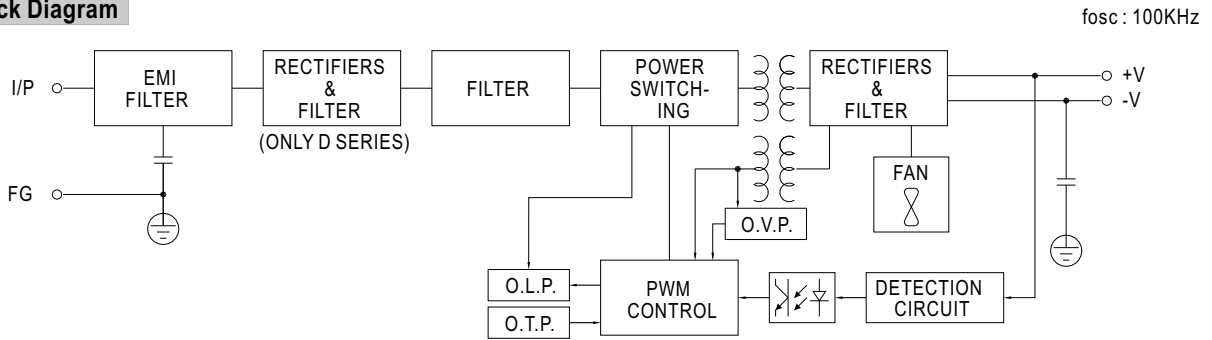


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Air flow
direction

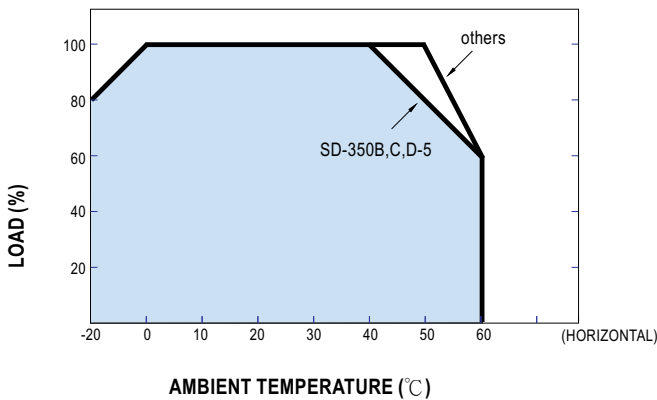
Terminal pin number assignment :

| Pin No. | Assignment | Pin No. | Assignment |
|---------|-------------|---------|--------------|
| 1 | DC INPUT V+ | 4,5,6 | DC OUTPUT V- |
| 2 | DC INPUT V- | 7,8,9 | DC OUTPUT V+ |
| 3 | FG \perp | | |

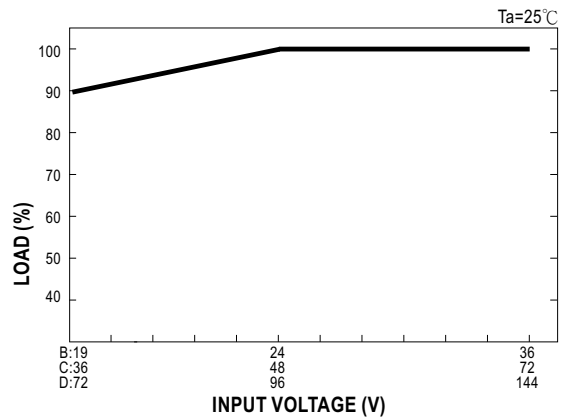
Block Diagram



Derating Curve



Static Characteristics





MODEL : SD-350B-24

OUTPUT FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|--------------------------------|-------------------------|--|---------------------|---------|
| 1 | RIPPLE & NOISE | V1: 150 mVp-p (Max) | I/P: 24 VDC O/P:FULL LOAD Ta:25°C | V1 : 15 mVp-p (Max) | P |
| 2 | OUTPUT VOLTAGE ADJUST RANGE | CH1: 23 V- 30 V | I/P: 24 VDC O/P:MIN LOAD Ta:25°C | 22.02V ~ 33.04 V | P |
| 3 | OUTPUT VOLTAGE TOLERANCE | V1: 1 %- -1 % (Max) | I/P:24VDC / 36 VDC O/P:FULL/ MIN LOAD Ta:25°C | V1: 0.06 %- -0.06 % | P |
| 4 | LINE REGULATION | V1: 0.2 %- -0.2 % (Max) | I/P:24 VDC / 36 VDC O/P:FULL LOAD Ta:25°C | V1: 0.03 %- -0.03 % | P |
| 5 | LOAD REGULATION | V1: 1 %- -1 % (Max) | I/P: 24 VDC O/P:FULL -MIN LOAD Ta:25°C | V1: 0.03 %- -0.03 % | P |
| 6 | SET UP TIME | 300 ms (Max) | I/P: 24 VDC O/P:FULL LOAD Ta:25°C | 47 ms | P |
| 7 | RISE TIME | 50 ms (Max) | I/P: 24 VDC O/P:FULL LOAD Ta:25°C | 19 ms | P |
| 8 | OVER/UNDERSHOOT TEST | < ±5% | I/P: 24 VDC O/P:FULL LOAD Ta:25°C | TEST: <5 % | P |
| 9 | DYNAMIC LOAD | V1: 2400 mVp-p | I/P: 24 VDC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C | 204 mVp-p | P |

INPUT FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|---------------------|---------------|--|--------------|---------|
| 1 | INPUT VOLTAGE RANGE | 19VDC- 36 VDC | I/P: TESTING O/P: FULL LOAD Ta: 25°C | 16.6 V- 36 V | P |
| | | | I/P: LOW-LINE-0.2V= 18.8 V HIGH-LINE+5%= 37.8 V O/P: FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE) | TEST: OK | |
| 2 | EFFICIENCY | 80 % (TYP) | I/P: 24 VDC O/P: FULL LOAD Ta: 25°C | 81 % | P |
| 3 | INPUT CURRENT | 17.6A (TYP) | I/P: 24 VDC O/P: FULL LOAD Ta: 25°C | I = 17.2 A | P |

PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-----------------------------|--|---|--|---------|
| 1 | OVER LOAD PROTECTION | 105 %- 135 % | I/P: 24 VDC O/P: TESTING Ta: 25°C | 120% Shunt down Re-power ON | P |
| 2 | OVER VOLTAGE PROTECTION | CH1: 16 31.5V- 37.5 V | I/P: 24 VDC O/P: MIN LOAD Ta: 25°C | 35 V Shunt down Re- power ON | P |
| 3 | OVER TEMPERATURE PROTECTION | SPEC: 95 ± 5 °C O.T.P. NO DAMAGE | I/P: 24 VDC O/P: FULL LOAD | O.T.P. Active Shut down o/p volotage , recovers automatically after temperature goes down | P |
| 4 | SHORT PROTECTION | SHORT EVERY OUTPUT 1 HOUR NO DAMAGE | I/P: 24 VDC O/P: FULL LOAD Ta: 25°C | NO DAMAGE Shunt down Re-power ON | P |

CONTROL FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-------------------|-------------|---|----------------------|---------|
| 1 | FAN SPEED CONTROL | ----- | I/P: 24 VDC O/P: FULL LOAD Ta: 25°C | Fan Voltage= 11.96 V | P |

ENVIRONMENT TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|---|---|---|------------------|---------|
| 1 | TEMPERATURE RISE TEST | MODEL : SD-350B-12 1. ROOM AMBIENT BURN-IN : 1.5 HRS I/P: 24 VDC O/P: FULL LOAD Ta= 30.2 °C 2. HIGH AMBIENT BURN-IN : 3 HRS I/P: 24 VDC O/P: FULL LOAD Ta= 52.4 °C | | | P |
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| 2 | OVER LOAD BURN-IN TEST | NO DAMAGE 1 HOUR (MIN) | I/P: 24 VDC O/P: 116 % LOAD Ta:25°C | TEST : OK | P |
| 3 | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 2 HOUR | I/P: 24 VDC O/P: 100 % LOAD Ta= -20 °C | TEST : OK | P |
| 4 | HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST | AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE | I/P: 36VDC O/P:FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H | TEST : OK | P |
| 5 | TEMPERATURE COEFFICIENT | ± 0.03 %(0-50°C) | I/P: 24 VDC O/P:FULL LOAD | ± 0.01 %(0-50°C) | P |
| 6 | VIBRATION TEST | 1 Carton & 1 Set Operating at I/P: 24 VDC NO LOAD (1) Waveform: Sine Wave (2) Frequency:10-500Hz (3) Sweep Time:10min/sweep cycle (4) Acceleration:2G (5) Test Time:1 hour in each axis (X.Y.Z) (6) Ta:25°C | | TEST : OK | P |

SAFETY TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|----------------------|---|--|--|---------|
| 1 | WITHSTAND VOLTAGE | I/P-O/P: 1.5 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 0.5 KVAC/min | I/P-O/P: 1.8 KVAC/min I/P-FG: 1.8 KVAC/min O/P-FG: 0.6 KVAC/min Ta:25°C | I/P-O/P: 4.72 mA I/P-FG: 4.9 mA O/P-FG: 7.56 mA NO DAMAGE | P |
| 2 | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ | I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C | I/P-O/P: 8 G Ω I/P-FG: 6 G Ω O/P-FG: 5 G Ω NO DAMAGE | P |
| 3 | GROUNDING CONTINUITY | FG(PE) TO CHASSIS OR TRACE < 100 mΩ | 40 A / 2min Ta:25°C | 10 mΩ | P |
| 4 | APPROVAL | TUV: Certificate NO : UL: File NO : | | | N/A |

E.M.C TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|---|--|---|-------------------------------|---------|
| 1 | RADIATION | EN55022 CLASS B | I/P: 24 VDC O/P:FULL LOAD Ta:25°C | PASS Test by certified Lab | P |
| 2 | E.S.D | EN61000-4-2 INDUSTRY AIR:8KV / Contact:4KV | I/P: 24 VDC O/P:FULL LOAD Ta:25°C | CRITERIA A | P |
| 3 | E.F.T | EN61000-4-4 INDUSTRY INPUT: 2KV | I/P: 24 VDC O/P:FULL LOAD Ta:25°C | CRITERIA A | P |
| 4 | Test by certified Lab & Test Report Prepare | | | | |



M.T.B.F & LIFE CYCLE CALCULATION

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-------------------------|--|----------------|--------|---------|
| 1 | CAPACITOR LIFE CYCLE | SUPPOSE C 113 IS THE MOST CRITICAL COMPONENT I/P: 24VDC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 1515165 HRS I/P: 24VDC O/P:FULL LOAD Ta= 50 °C LIFE TIME= 80687 HRS | | | P |
| 2 | MTBF | MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 209.4K HRS | | | P |

COMPONENT STRESS TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|--|---------------------------------------|---|--|---------|
| 1 | Power Transistor (D to S) or (C to E) Peak Voltage | Q 1 Rated PSWN009 100W : 100V 100A | I/P:High-Line +3V = 39 VDC O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C | (1) 43.6 V (2) 86 V (3) 38.8 V | P |
| 2 | Diode Peak Voltage | D 101 Rated S20LC20U : 200 V 20 A | I/P:High-Line +3V = 39 VDC O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C | (1) 61.2 V (2) 189 V (3) 0 V | P |
| 3 | Input Capacitor Voltage | C 8 Rated : 3300 u / 50V /105°C | I/P:High-Line +3V = 39 VDC O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change (4)Burn-IN Hour Ta:25°C | (1) 38.2 V (2) 39.6 V (3) 39 V | P |
| 4 | Control IC Voltage Test | U 1 Rated SG3525 : 35 V | I/P:High-Line +3V = 39 VDC O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change (4) Output Short Ta:25°C | (1) 14.2 V (2) 14.2 V (3) 14.2 V | P |

| DATE | SAMPLE | TEST RESULT | TESTER | APPROVAL |
|------------|----------------------------|-------------|---------------|----------|
| 2004/6/7 | RD SMAPLE | PASS | VINCENT TSENG | MAX LIN |
| 2004/8/19 | PRODUCT SMAPLE A407A23 | PASS | VINCENT TSENG | MAX LIN |
| 2004/9/2 | PRODUCT SMAPLE A408B24 | PASS | VINCENT TSENG | MAX LIN |
| 2004/11/25 | PRODUCT SMAPLE W0411A25 | PASS | VINCENT TSENG | MAX LIN |

2003/12/12

A50-F023

