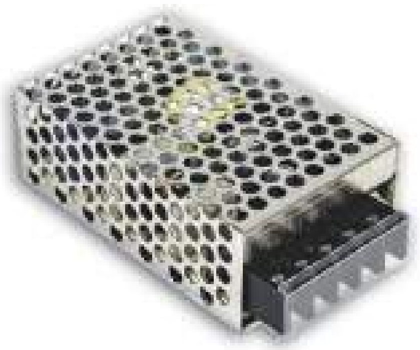
SD-15 series

MEAN WELL

15W Single Output DC-DC Converter



■ Features :

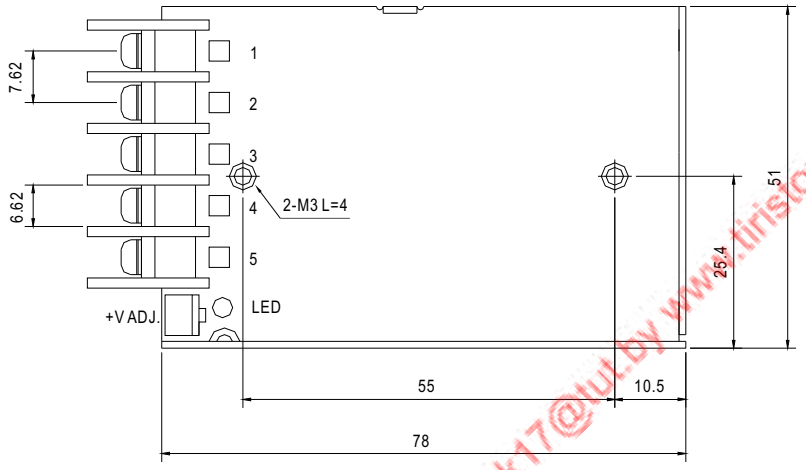
- 2:1 wide input range
- Protections:Short circuit/Over load /voltage
- Built-in EMI filter, low ripple noise
- 100% full load burn-in test
- Low cost
- High reliability
- 2 years warranty

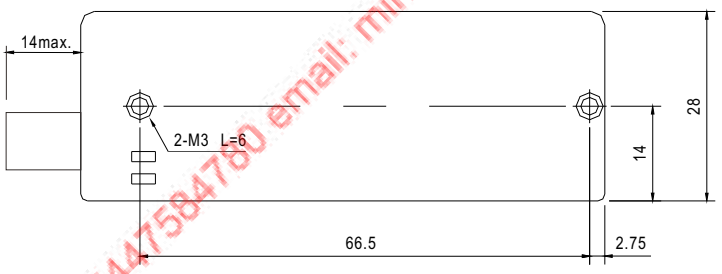
SPECIFICATION

MODEL		SD-15A-05	SD-15B-05	SD-15C-05	SD-15A-12	SD-15B-12	SD-15C-12	SD-15A-24	SD-15B-24	SD-15C-24
OUTPUT	DC VOLTAGE	5V			12V			24V		
	RATED CURRENT	3A			1.25A			0.625A		
	CURRENT RANGE	0 ~ 3A			0 ~ 1.25A			0 ~ 0.625A		
	RATED POWER	15W			15W			15W		
	RIPPLE & NOISE (max.) Note.2	100mVp-p			120mVp-p			150mVp-p		
	VOLTAGE ADJ.RANGE	4.75~5.5VDC			10.8~13.2VDC			21.6~26.4VDC		
	VOLTAGE TOLERANCE Note.3	±2.0%			±1.0%			±1.0%		
	LINE REGULATION	±0.5%			±0.3%			±0.2%		
	LOAD REGULATION	±0.5%			±0.3%			±0.2%		
	SETUP, RISE ,HOLD UP TIME	2.5s, 25ms,--- 12VDC/24VDC/48VDC at full load								
INPUT	VOLTAGE RANGE	A: 9.2 ~18VDC B:18 ~ 36VDC C:36~72VDC								
	EFFICIENCY(Typ.)	68%	76%	75%	72%	76%	79%	70%	77%	78%
	DC CURRENT(Typ.)	1.9A/12VDC 0.9A/24VDC 0.45A/48VDC								
PROTECTION	OVER LOAD	105 ~160% rated output power								
		Protection type : Hiccup mode, recovers automatically after fault condition is removed								
	OVER VOLTAGE	5.75 ~ 6.75V			13.8~ 16.2V			27.6 ~ 32.4V		
		Protection type : Shut off o/p voltage, clamping by zener diode								
ENVIRONMENT	WORKING TEMP.	-10 ~ +60℃ (Refer to "Derating Curve")								
	WORKING HUMIDITY	20 ~ 90% RH non-condensing								
	STORAGE TEMP., HUMIDITY	-20 ~ +85℃, 10 ~ 95% RH								
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)								
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min.each along X, Y, Z axes								
SAFETY & EMC (Note 4)	SAFETY STANDARDS	EAC TP TC 004 approved								
	WITHSTAND VOLTAGE	I/P-O/P:1.5KVAC I/P-FG:1KVAC O/P-FG:0.5KVAC								
	ISOLATION RESISTANCE	I/P-O/P,I/P-FG,O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH								
	EMC EMISSION	Compliance to EN55032(CISPR32), EAC TP TC 020								
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,6,8, EN55024, light industry level, criteria A, EAC TP TC 020								
OTHERS	MTBF	644.2K hrs min.(SD-15A) 652.5K hrs min.(SD-15B) 653.5K Hrs min.(SD-15C) MIL-HDBK-217F (25℃)								
	DIMENSION	78*51*28mm (L*W*H)								
	PACKING	0.18Kg,60 PCS/11.8Kg								
NOTE	1. All parameters NOT specially mentioned are measured at normal input, rated load and 25℃ 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. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com) 5. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).									

■ Mechanical Specification

Case No. 931A Unit:mm



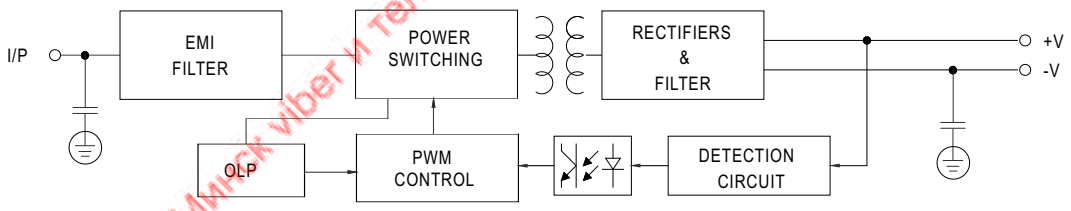


Terminal Pin No. Assignment

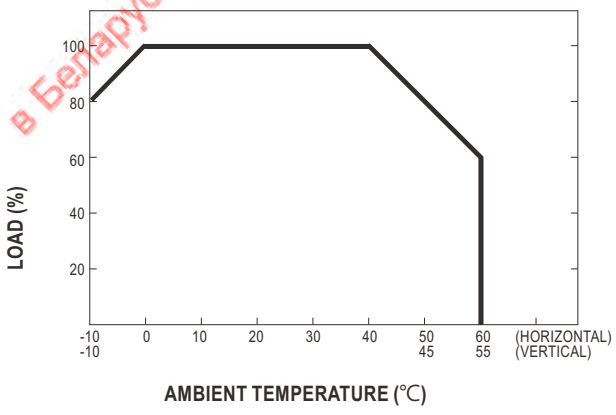
Pin No.	Assignment	Pin No.	Assignment
1	DC INPUT V+	4	DC OUTPUT +V
2	DC INPUT V-	5	DC OUTPUT -V
3	FG ⏚		

■ Block Diagram

fosc : 96KHz



■ Derating Curve



Test Report: SD-15B-5

15W DC-DC Single Output Switching Power Supply

■ DESIGN VERIFY TEST

Output Function Test
Input Function Test
Protection Function Test
Component Stress Test

■ SAFETY & E.M.C. TEST

Safety Test
E.M.C. Test

■ RELIABILITY TEST

ENVIRONMENT TEST

■ DESIGN VERIFY TEST

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1：100 mVp-p (Max)	I/P： 24VDC O/P：FULL LOAD Ta：25℃	V1： 38 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1： 4.75 V ~ 5.5 V	I/P： 24 VDC O/P：MIN LOAD Ta：25℃	4.519 V ~ 5.813 V/ 24 VDC	P
3	OUTPUT VOLTAGE TOLERANCE	V1： 2 %~ -2 % (Max)	I/P：18 VDC ~ 36 VDC O/P：FULL/ MIN LOAD Ta：25℃	V1： 0.38 %~ -0.14 %	P
4	LINE REGULATION	V1： 0.5 %~ -0.5 % (Max)	I/P：18 VDC ~ 36 VDC O/P：FULL LOAD Ta：25℃	V1： 0 %~ -0.12 %	P
5	LOAD REGULATION	V1：0.5 %~ -0.5 % (Max)	I/P： 24 VDC O/P：FULL ~ MIN LOAD Ta：25℃	V1： 0.12 %~ -0.12 %	P
6	SET UP TIME	24VDC： 2500 ms (Max)	I/P： 24 VDC O/P：FULL LOAD Ta：25℃	24VDC/ 1674 ms	P
7	RISE TIME	24VDC： 25 ms (Max)	I/P： 24 VDC O/P：FULL LOAD Ta：25℃	24VDC/ 3 ms	P
8	OVER/UNDERSHOOT TEST	< ± 10 %	I/P： 24 VDC O/P：FULL LOAD Ta：25℃	TEST： < 10 %	P
9	DYNAMIC LOAD	V1： 1000 mVp-p	I/P： 24 VDC (1).O/P：FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P：FULL /Min LOAD 50%DUTY/ 120HZ Ta：25℃	(1) 151 mVp-p (2) 630 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	18VDC~36VDC	I/P：TESTING O/P：FULL LOAD Ta：25℃	17.8 V~36V	P
			I/P： LOW-LINE-0.2V=17.8 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	76 % (TYP)	I/P： 24 VDC O/P：FULL LOAD Ta：25℃	78.35 %	P
3	INPUT CURRENT	24VDC/ 0.9 A (TYP)	I/P： 24 VDC O/P：FULL LOAD Ta：25℃	I = 0.811 A/ 24 VDC	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~ 160 %	I/P： 24 VDC O/P：TESTING Ta：25℃	135.18 %/ 24 VDC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1： 5.75 V ~ 6.75 V	I/P： 24 VDC O/P：10% LOAD Ta：25℃	6.23 V/ 24 VDC Shut off o/p voltage, clamping by zener diode	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P： 36 VDC O/P：FULL LOAD Ta：25℃	NO DAMAGE Hiccup Mode	P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated： IRF640 : 200 V/ 18 A	I/P：High-Line +3V = 39 V O/P： (1)Full Load Turn on (2) Output Short (3)Full load continue Ta：25℃	(1) 145 V (2) 132 V (3) 142 V	P
2	Diode Peak Voltage	D10 Rated： YG865C10R :100V/ 20 A	I/P：High-Line +3V = 39 V O/P： (1)Full Load Turn on (2)Output Short (3)Full load continue Ta：25℃	(1) 81.5 V (2) 76.1 V (3) 81.6 V	P
3	Input Capacitor Voltage	C5 Rated： 220u/63V 105℃ 10*20 GL	I/P：High-Line +3V = 39 V O/P： (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta：25℃	(1) 41.9 V (2) 41.9 V (3) 41.1 V	P
4	Control IC Voltage Test	U 1 Rated： TL3845P: 30V (MAX)	I/P：High-Line +3V = 39 V O/P： (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta：25℃	(1) 13.8 V (2) 12.5 V (3) 13.7 V	P

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-FG: 1.5 KVAC/min I/P-O/P: 1.5 KVAC/min O/P-FG: 0.5 KVAC/min EN 60950	I/P-FG: 1.8 KVAC/min I/P-O/P: 1.8 KVAC/min O/P-FG: 0.6 KVAC/min Ta:25℃	I/P-FG： 3.17 mA I/P-O/P： 0.64 mA O/P-FG： 0.29 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-FG: 500VDC>100MΩ I/P-O/P:500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-FG: 500 VDC I/P-O/P: 500 VDC O/P-FG: 500 VDC Ta：25℃/70%RH	I/P-FG： >9999 MΩ I/P-O/P： >9999 MΩ O/P-FG： >9999 MΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ EN 60950	40 A / 1min Ta:25℃	6 mΩ	P

E.M.C TEST

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

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL： SD-15B-5 1. ROOM AMBIENT BURN-IN：2.5 HRS I/P： 24VDC O/P： FULL LOAD Ta=25.7 ℃ 2. HIGH AMBIENT BURN-IN：3.5 HRS I/P： 24VDC O/P： FULL LOAD Ta=40.9 ℃ (see table below)			P
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P： 24 VDC O/P： 135.18 ％ LOAD Ta：25℃	TEST：OK	P
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 36VDC/ 18VDC O/P：FULL LOAD Ta= -5℃	TEST：OK	P

NO	Position	P/N	ROOM AMBIENT Ta= 25.7 ℃	HIGH AMBIENT Ta= 40.9 ℃
1	LF1	TF-6003	55.8℃	76.3℃
2	R2	2W 10Ω 5%	75.9℃	93.4℃
3	C11	2200uF/10V 13*20 GL	62.6℃	83.8℃
4	C5	220uF/63V 10*20 GL	57.9℃	78.1℃
5	U1	TL3845	58.8℃	80.8℃
6	D2	HER203 2A/200V	83.8℃	105.9℃
7	Q1	IRF640 18A/200V	82.8℃	103.2℃
8	T1	TF-6041	77.5℃	98.9℃
9	T2	TF-6040	59.3℃	78.9℃
10	C33	330uF/35V 10*16 GL	55.4℃	75.5℃
11	D10	YG865C10R 20A/100V	79.4℃	99.8℃
12	R11	1W 82Ω 5%	73.3℃	91.5℃

4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 ℃ NO DAMAGE	I/P： 36 VDC O/P：FULL LOAD Ta= 40 ℃ HUMIDITY= 95 %R.H	TEST：OK	P
5	TEMPERATURE COEFFICIENT	± 0.05 %(0~50℃)	I/P： 24 VDC O/P：FULL LOAD	± 0.004 %(0~50℃)	P
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature： -25℃~ +90℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：5 CYCLE 5. Input/Output condition： STATIC		OK	P
7	THERMAL SHOCK TEST	1. Thermal shock Temperature： -5℃~ +45℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：10 CYCLE 5. Input/Output condition： 24VDC/Full Load AC ON/OFF TEST turn on 58sec；turn off 2sec		OK	P
8	VIBRATION TEST	1 Carton & 1 Set (1) Waveform： Sine Wave (2) Frequency：10~500Hz (3) Sweep Time：12min/sweep cycle (4) Acceleration：2G (5) Test Time：72min in each axis (X.Y.Z) (6) Ta：25℃		TEST：OK	P
9	CAPACITOR LIFE CYCLE	SD-15B-5 :SUPPOSE C11 IS THE MOST CRITICAL COMPONENT (1) I/P： 24VDC O/P：FULL LOAD Ta=25 ℃ LIFE TIME (2) I/P： 24VDC O/P：FULL LOAD Ta=40 ℃ LIFE TIME (3) I/P： 24VDC O/P：75% LOAD Ta=40 ℃ LIFE TIME		(1) 145585.9 HRS (2) 33974.9 HRS (3) 50045.2 HRS	P
10	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE：652.5KHRS			P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2005/09/03	PRODUCT SAMPLE	PASS	LIUWY	WANGDZ

2003/08/04 A50-G058