15W Single Output Industrial DIN Rail Power Supply DR-15 series

■ Features :

- Universal AC input/Full range
- Protections: Short circuit / Overload / Over voltage
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- Isolation classII
- LED indicator for power on
- No load power consumption<0.5W
- 100% full load burn-in test
- 3 years warranty

SPECIFICATION

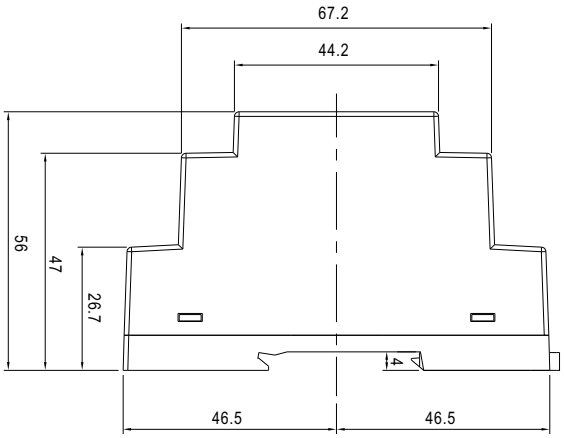
MODEL		DR-15-5	DR-15-12	DR-15-15	DR-15-24
OUTPUT	DC VOLTAGE	5V	12V	15V	24V
	RATED CURRENT	2.4A	1.25A	1A	0.63A
	CURRENT RANGE	0 ~ 2.4A	0 ~ 1.25A	0 ~ 1A	0 ~ 0.63A
	RATED POWER	12W	15W	15W	15.2W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	120mVp-p	120mVp-p	150mVp-p
	VOLTAGE ADJ. RANGE	4.75 ~ 5.5V	10.8 ~ 13.2V	13.5 ~ 16.5V	21.6 ~ 26.4V
	VOLTAGE TOLERANCE Note.3	±2.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION	±1.0%	±1.0%	±1.0%	±1.0%
	LOAD REGULATION	±1.0%	±1.0%	±1.0%	±1.0%
	SETUP, RISE TIME	1000ms, 50ms/230VAC 1000ms, 50ms/115VAC at full load			
	HOLD UP TIME (Typ.)	70ms/230VAC 16ms/115VAC at full load			
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC			
	FREQUENCY RANGE	47 ~ 63Hz			
	EFFICIENCY (Typ.)	77%	84%	83.5%	85%
	AC CURRENT (Typ.)	0.88A/115VAC 0.48A/230VAC			
	INRUSH CURRENT (Typ.)	COLD START 35A/115VAC 65A/230VAC			
PROTECTION	OVERLOAD Note.5	105 ~ 160% rated output power			
		Protection type : Constant current limiting, recovers automatically after fault condition is removed			
	OVER VOLTAGE	5.75 ~ 6.75V	13.8 ~ 16.2V	17.25 ~ 20.25V	27.6 ~ 32.4V
		Protection type : Shut off o/p voltage, clamping by zener diode			
ENVIRONMENT	WORKING TEMP.	-20 ~ +60℃ (Refer to "Derating Curve")			
	WORKING HUMIDITY	20 ~ 90% RH non-condensing			
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH			
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)			
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes; Mounting: Compliance to IEC60068-2-6			
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved, design refer to EN50178			
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC			
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25℃/ 70% RH			
	EMC EMISSION	Compliance to EN55032 (CISPR32), EN61204-3 Class B, EN61000-3-2,-3			
	EMC IMMUNITY	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55024, EN61000-6-2, EN61204-3, heavy industry level, criteria A			
OTHERS	MTBF	1172.3K hrs min. MIL-HDBK-217F (25℃)			
	DIMENSION	25*93*56mm (W*H*D)			
	PACKING	0.1Kg; 140pcs/15Kg/0.92CUFT			

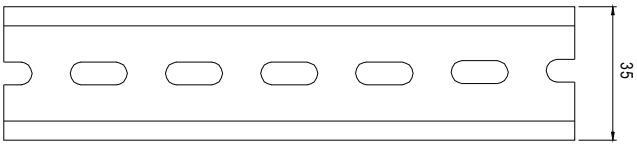
NOTE

1. All parameters NOT specially mentioned are measured at 230VAC 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. The final equipment must be re-confirmed that it still meets EMC directives.
5. Constant current operation region is within 60% ~100% rated output voltage. Protection type for short circuit is hiccup mode and will recover automatically after fault condition is removed.

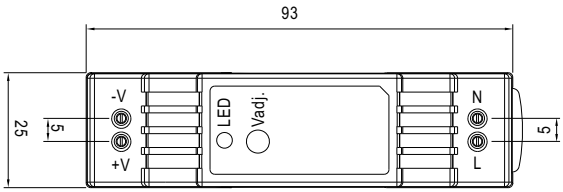
■ Mechanical Specification

Case No.985A Unit:mm

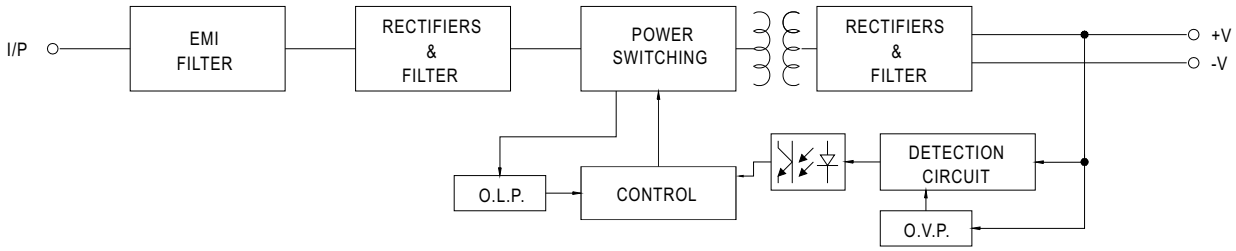




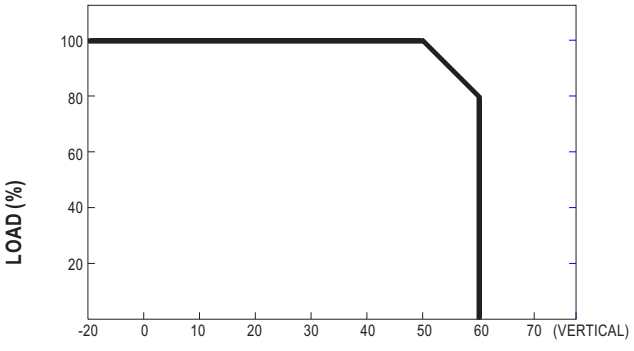
ADMISSIBLE DIN-RAIL:TS35/7.5 OR TS35/15



■ Block Diagram

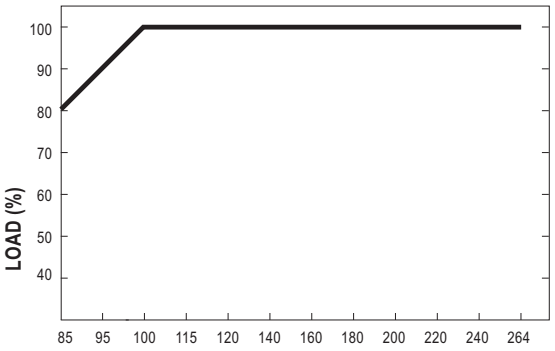


■ Derating Curve



AMBIENT TEMPERATURE (℃)

■ Output Derating VS Input Voltage



INPUT VOLTAGE (VAC) 60Hz

Declaration of Conformity

For the following equipment：

Product Name: Din-Rail Switching Power Supply

Model Designation: DR-15-X (X=5,12,15,24)

is herewith confirmed to comply with the requirements set out in the Council Directive, the following standards were applied：

RoHS Directive (2011/65/EU)、(EU)2015/863

Low Voltage Directive (2014/35/EU)：

EN60950-1:2006+A11+A1+A12+A2 TUV certificate No：R50147188

Electromagnetic Compatibility Directive (2014/30/EU)：

EMI (Electro-Magnetic Interference)

Conducted emission / Radiated emission

	EN55032:2015		Class B
Harmonic current	EN61000-3-2:2014		
Voltage flicker	EN61000-3-3:2013		

EMS (Electro-Magnetic Susceptibility)

EN55024:2010+A1:2015

ESD air	EN61000-4-2:2009	Level 3	8KV
ESD contact	EN61000-4-2:2009	Level 2	4KV
RF field susceptibility	EN61000-4-3:2006+A1:2008+A2:2010	Level 3	10V/m
EFT bursts	EN61000-4-4:2012	Level 3	2KV/5KHz
Surge susceptibility	EN61000-4-5:2014	Level 4	2KV/Line-Line
Conducted susceptibility	EN61000-4-6:2014	Level 3	10V
Magnetic field immunity	EN61000-4-8:2010	Level 4	30A/m
Voltage dip, interruption	EN61000-4-11:2004	>95% dip 0.5 periods	30% dip 25 periods　>95% interruptions 250 periods

Note:
The power supply is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC Directive on the complete installation again.
For guidance on how to perform these EMC tests, please refer to TDF (Technical Documentation File).

This Declaration is effective from serial number EB9xxxxxxx

Person responsible for marking this declaration：

MEAN WELL Enterprises Co., Ltd.
(Manufacturer Name)

No.28, Wuquan 3rd Rd., Wugu Dist., New Taipei City 24891, Taiwan
(Manufacturer Address)

Johnny Huang/Manager, Certification Center：
(Name / Position)

(Signature)

Alex Tsai/Director, Marketing Department：
(Name / Position)

(Signature)

Taiwan
(Place)

Jul. 22nd, 2019
(Date)

MODEL：DR-15-5

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1： 80 mVp-p (Max)	I/P： 230VAC O/P：FULL LOAD Ta：25℃	V1： 28.4 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1： 4.75 V~ 5.5V	I/P： 230 VAC I/P： 115 VAC O/P：MIN LOAD Ta：25℃	4.533 V~ 6.082 V/ 230 VAC 4.532 V~ 6.082 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1： 2 %~ -2 % (Max)	I/P： 100VAC / 264 VAC O/P：FULL/ MIN LOAD Ta：25℃	V1： 0.5 %~ -0.5 %	P
4	LINE REGULATION	V1： 1 %~ -1 % (Max)	I/P： 100 VAC ~ 264 VAC O/P：FULL LOAD Ta：25℃	V1： 0 %~ 0 %	P
5	LOAD REGULATION	V1： 1 %~ -1 % (Max)	I/P： 230 VAC O/P：FULL ~MIN LOAD Ta：25℃	V1： 0.4 %~ -0.4 %	P
6	SET UP TIME	230VAC： 1000 ms (Max) 115 VAC： 1000 ms (Max)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 101 ms 115VAC/ 202 ms	P
7	RISE TIME	230VAC： 50 ms (Max) 115VAC： 50 ms (Max)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 24 ms 115VAC/ 23 ms	P
8	HOLD UP TIME	230VAC： 70 ms (TYP) 115VAC： 16 ms (TYP)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 99 ms 115VAC/ 19 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	TEST： < 5 %	P
10	DYNAMIC LOAD	V1： 1000 mVp-p	I/P： 230 VAC O/P：FULL /Min LOAD 90%DUTY/ 1KHZ Ta：25℃	266 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	85VAC~264 VAC	I/P：TESTING O/P：FULL LOAD Ta：25℃	60V~264V	P
			I/P： LOW-LINE-3V= 82 V HIGH-LINE+15%=300 V O/P：FULL/MIN LOAD ON： 30 Sec . OFF： 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST： OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P： 100VAC ~ 264 VAC O/P：FULL~MIN LOAD Ta：25℃	TEST： OK	P
3	EFFICIENCY	77 % (TYP)	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	78.1%	P
4	INPUT CURRENT	230V/ 0.48 A(TYP) 115V/ 0.88 A (TYP)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I = 0.15 A/ 230 VAC I = 0.24 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 65 A(TYP) 115V/ 35 A(TYP) COLD START	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I = 37 A/ 230 VAC I = 19 A/ 115 VAC	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 %~ 160 %	I/P： 230 VAC I/P： 115 VAC O/P：TESTING Ta：25℃	138%/ 230 VAC 135%/ 115 VAC Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1： 5.75 V~ 6.75 V	I/P： 230 VAC I/P： 115 VAC O/P：MIN LOAD Ta：25℃	6.1V/ 230 VAC 6.1V/ 115 VAC Shut off o/p voltage,clamping by zener diode	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P： 264 VAC O/P：FULL LOAD Ta：25℃	NO DAMAGE Hiccup Mode	P

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL：DR-15-12
1. ROOM AMBIENT BURN-IN：2.5 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 28 ℃
2. HIGH AMBIENT BURN-IN： 1.5 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 50.2 ℃

<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 28 ℃</th><th>HIGH AMBIENT Ta=50.2 ℃</th></tr>
<tr><td>1</td><td>LF1</td><td>LF510-R1</td><td>51.2℃</td><td>72.4℃</td></tr>
<tr><td>2</td><td>BD1</td><td>2A/800V KBP208G</td><td>52.1℃</td><td>74.1℃</td></tr>
<tr><td>3</td><td>C5</td><td>33u/400V 105℃ KMG</td><td>48.2℃</td><td>70.1℃</td></tr>
<tr><td>4</td><td>D1</td><td>2A/800V GP20K T-52mm</td><td>54.9℃</td><td>76.9℃</td></tr>
<tr><td>5</td><td>T1</td><td>TF1908-R1</td><td>64.3℃</td><td>86.1℃</td></tr>
<tr><td>6</td><td>D100</td><td>SB340 3A/40V DO-201</td><td>74.2℃</td><td>96.5℃</td></tr>
<tr><td>7</td><td>C110</td><td>220U/25V 7KH KY</td><td>58.5℃</td><td>81.0℃</td></tr>
<tr><td>8</td><td>C105</td><td>470U/25V 7KH KY</td><td>63.9℃</td><td>86.4℃</td></tr>
<tr><td>9</td><td>C36</td><td>22U/50V 5KH KY</td><td>53.4℃</td><td>75.8℃</td></tr>
<tr><td>10</td><td>C40</td><td>47U/25V 5KH KY</td><td>53.9℃</td><td>76.4℃</td></tr>
<tr><td>11</td><td>U1</td><td>TOP254EN</td><td>58.4℃</td><td>80.7℃</td></tr>
</table>
</td><td>P</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P： 230 VAC
O/P：112 % LOAD
Ta：25℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P：230 VAC
O/P：100 % LOAD
Ta= -25 ℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 50℃
NO DAMAGE</td><td>I/P： 272 VAC
O/P：FULL LOAD
Ta= 50℃
HUMIDITY= 95 %R.H</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.03 %(0~50℃)</td><td>I/P： 230 VAC
O/P：FULL LOAD</td><td>± 0.001 %(0~50℃)</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">1 Carton & 1 Set
(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℃</td><td>TEST：OK</td><td>P</td></tr>
</table>

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P： 3 KVAC/min	I/P-O/P： 3.6 KVAC/min Ta：25℃	I/P-O/P： 1.086 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P：500VDC>100MΩ	I/P-O/P： 500 VDC Ta：25℃	I/P-O/P： 30 GΩ NO DAMAGE	P
3	APPROVAL	TUV： Certificate NO ： R50147188 UL： File NO ：E183223			P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P： 230 /240/220VAC/50HZ O/P：100/75/50/25%LOAD Ta：25℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P： 230 VAC (50HZ) O/P：FULL/50% LOAD Ta：25℃	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P： 230 VAC (50HZ) O/P：FULL LOAD Ta：25℃	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 INDUSTRY AIR：8KV / Contact：4KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 INDUSTRY INPUT： 2KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A	P
6	SURGE	IEC61000-4-5 INDUSTRY L-N ：2KV L.N-PE：4KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	DR-15-12：SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P： 230VAC O/P：FULL LOAD Ta= 25 ℃ LIFE TIME= 164297 HRS I/P： 230VAC O/P：FULL LOAD Ta= 50 ℃ LIFE TIME= 28439 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE： 1172.3K HRS			P
3	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure : Above 30,000 hours @ TA 50℃			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	U1 Rated PWM TOP254EN 700V/2.08A	I/P：High-Line +3V = 267 V O/P：(1)Full Load Turn on (2) Full Load (3)Output Short Ta：25℃	(1) 656 V (2) 632 V (3) 628 V	P
2	Diode Peak Voltage	D100 Rated SB540 5A/40V	I/P：High-Line +3V = 267 V O/P：(1)Full Load Turn on (2) Full Load (3)Output Short Ta：25℃	(1) 31.6 V (2) 30.2 V (3) 26 V	P
3	Clamp Diode Peak Voltage	D1 Rated FRD 1A/1KV	I/P：High-Line +3V = 267 V O/P：(1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta：25℃	(1) 422 V (2) 386 V	P
4	Control IC Voltage Test	U1 Rated PWM TOP254EN :9V	I/P：High-Line +3V = 267 V O/P：(1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta：25℃	(1) 5.876 V (2) 5.897 V (30 5.897 V	P
5	Input Capacitor Voltage	C 5 Rated 33u/400V 105℃KMG	I/P：High-Line +3V = 267 V O/P：(1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta：25℃	(1) 372.5 V (2) 377.2 V (3) 377.4 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008/12/26	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/3/17	PRODUCT SAMPLE W0901B01	PASS	SANFORD SU	VINCENT TSENG
2009/4/10	PRODUCT SAMPLE W0903D01	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023