45W Single Output Industrial DIN Rail Power Supply DR-45 series



Features :

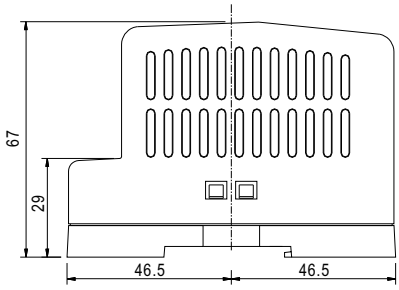
- Universal AC input/Full range
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- UL 508(industrial control equipment)approved
- LED indicator for power on
- 100% full load burn-in test
- Fix switching frequency at 100KHz
- 3 years warranty

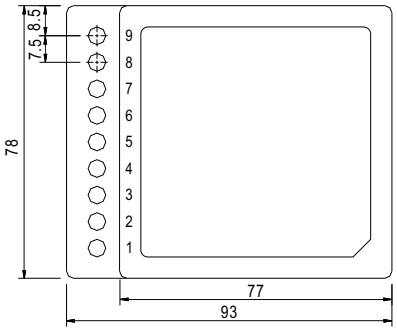
SPECIFICATION

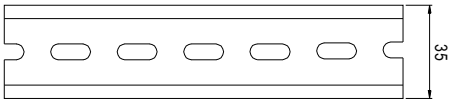
MODEL		DR-4505	DR-4512	DR-4515	DR-4524
OUTPUT	DC VOLTAGE	5V	12V	15V	24V
	RATED CURRENT	5A	3.5A	2.8A	2A
	CURRENT RANGE	0 ~ 5A	0 ~3. 5A	0 ~ 2.8A	0 ~ 2A
	RATED POWER	25W	42W	42W	48W
	RIPPLE & NOISE (max.) Note.2	100mVp-p	200mVp-p	240mVp-p	480mVp-p
	VOLTAGE ADJ. RANGE	4.75 ~ 5.5V	10.8 ~ 13.2V	13.5 ~ 16.5V	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	800ms, 60ms/230VAC at full load			
	HOLD UP TIME (Typ.)	100ms/230VAC at full load			
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC			
	FREQUENCY RANGE	47 ~ 63Hz			
	EFFICIENCY (Typ.)	72%	77%	77%	80%
	AC CURRENT (Typ.)	1.5A/115VAC 0.75A/230VAC			
	INRUSH CURRENT (Typ.)	COLD START 28A/115VAC 56A/230VAC			
	LEAKAGE CURRENT	<1mA / 240VAC			
PROTECTION	OVERLOAD	105 ~ 150% 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			
	OVER TEMPERATURE	Tj 135℃ typically (U1) detect on heat sink of power transistor			
		Protection type : Shut down o/p voltage, re-power on to recover			
ENVIRONMENT	WORKING TEMP.	-10 ~ +50℃ (Refer to output load 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, period for 60min. each along X, Y, Z axes; Mounting: Compliance to IEC60068-2-6			
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL508, TUV EN60950-1 approved			
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC 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 EN55011,EN55022 (CISPR22) Class B			
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3			
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, ENV50204, EN55024, EN61000-6-2 (EN50082-2), heavy industry level, criteria A			
OTHERS	MTBF	364.6K hrs min. MIL-HDBK-217F (25℃)			
	DIMENSION	93*78*67mm (L*W*H)			
	PACKING	0.31Kg; 48pcs/16.1Kg/1.3CUFT			
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.				

■ Mechanical Specification

Case No. 918A Unit:mm







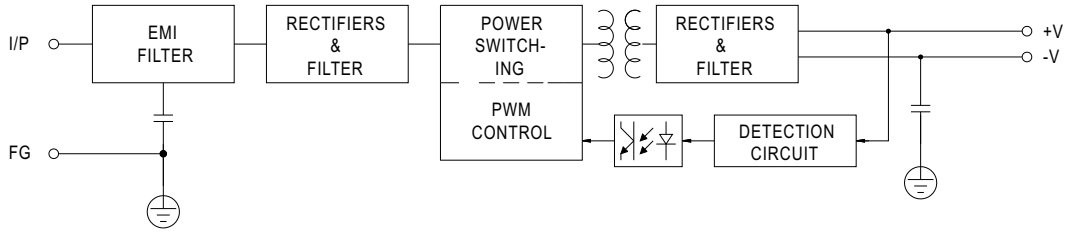
Install DIN rail TS35/7.5 or TS35/15

Terminal Pin No. Assignment

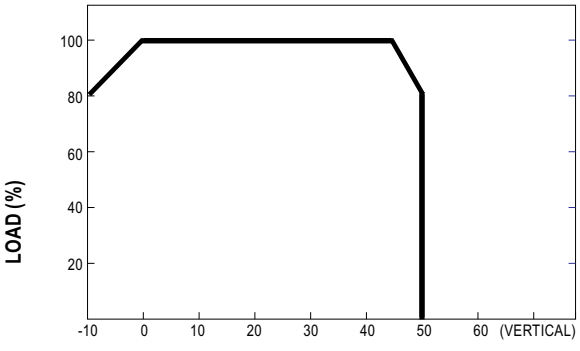
Pin No.	Assignment	Pin No.	Assignment
1	AC/L	6,7	DC OUTPUT+V
2	AC/N	8	LED
3	FG ⏚	9	+V ADJ.
4,5	DC OUTPUT -V		

■ Block Diagram

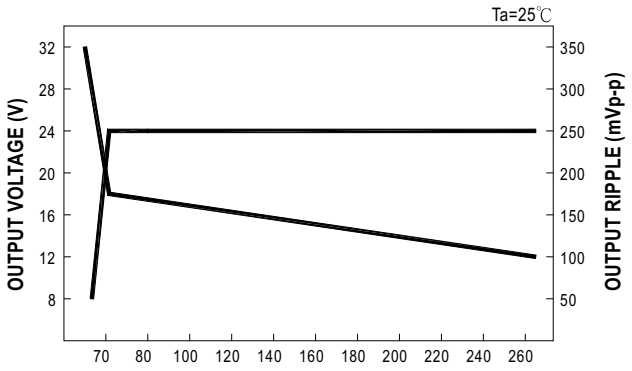
fosc : 100KHz



■ Derating Curve



■ Static Characteristics (24V)



Quality Engineering Test Report

SERIES: DR-45 45W AC-DC SINGLE OUTPUT SWITCHING POWER SUPPLY

SAMPLE: A. DR-4505 5V / 5A
B. DR-4512 12V / 3.5A
C. DR-4515 15V / 2.8A
D. DR-4524 24V / 2A

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
1	AC INPUT VOLTAGE RANGE	I/P:TESTING SPEC:85~264VAC O/P:FULL LOAD	B : 54.8VAC~264VAC	P
2	LINE REGULATION	I/P:85~264VAC SPEC: A: ±1% B: ±1% O/P:FULL LOAD C: ±1% D: ±1%	A: +0% +0% B: +0.0% +0.149% C: +0.0% +0.12% D: +0.074% +0.074%	P
3	LOAD REGULATION	I/P:230VAC SPEC: A: ±1% B: ±1% O/P:MIN. TO FULL LOAD C: ±1% D: ±1%	A: -0.118% +0.237% B: +0.099% -0.0497% C: +0.12% +0.08% D: -0.388% +0.024%	P
4	OUTPUT VOLTAGE TOLERANCE	I/P:85~264VAC SPEC: A: ±2% B: ±1% O/P:MIN TO FULL LOAD C: ±1% D: ±1%	A: +0.118% +0.49% B: -0.0497% +0.0497% C: +0.0% -0.2% D: +0.05% +1.03%	P
5	RIPPLE&NOISE	I/P:230VAC SPEC: A: 100mV B: 200mV O/P:FULL LOAD C: 240mV D: 480mV	A:15mV B:.15mV C:27mV D:24mV	P
6	AC INPUT CURRENT	I/P:230VAC SPEC: 0.75A O/P:FULL LOAD	B :0.507A	P
7	MAX. INRUSH CURREN	I/P:230VAC SPEC: 60A O/P: FULL LOAD	B:: 36.062A	P
8	O/P VOLTAGE ADJ.RANGE	I/P:230VAC SPEC: A: -5%~+10% O/P:MIN. LOAD B: ±10% C: ±10% D: ±10%	A:4.49V~6.3V B:10.256V~13.939V C:12.26V~17.28V D:20.3V~28.4V	P
9	SET UP TIME	I/P:230VAC SPEC:800mS O/P:FULL LOAD	B: 139.68mS	P
10	HOLD UP TIME	I/P:230VAC SPEC:50mS O/P:FULL LOAD	B: 98.839mS	P
11	EFFICIENCY	I/P:230VAC SPEC: A:72% B:77% O/P:FULL LOAD C:77% D:80%	A:73.7% B:78.355% C:77.8% D:81%	P
12	OVER LOAD PROTECTION	I/P:230VAC SPEC: 105%~150% O/P:TESTING	A:117% B:116.4% C:122% D:120%	P
13	GROUND LEAKAGE CURRENT	I/P:240VAC SPEC: L-FG--<1mA N-FG--<1mA	B: L-FG:0.21mA N-FG:0.21mA	P
14	INSULATION RESISTANCE	SPEC: I/P-O/P: 500VDC/100M Ohms MIN. I/P-FG : 500VDC/100M Ohms MIN. O/P-FG: 500VDC/100M Ohms MIN.	B: O/P-FG >100M Ohms I/P-O/P >100M Ohms I/P-FG >100M Ohms	P
15	DIELECTRIC / WITHSTAND VOLTAGE	SPEC: I/P- O/P: 3KVAC/ 1 min. (10mA CUT-OFF) I/P - FG: 1.5KVAC/ 1 min. (10mA CUT-OFF) O/P -FG: 0.5KVAC/ 1 min. (10mA CUT-OFF)	B: I/P-O/P :3.33mA I/P-FG :2.172mA O/P-FG :3.56mA	P
16	BURN-IN TEST	I/P: 230VAC O/P: FULL LOAD TA:26.8ºC BURN-IN DURATION : 2 hrs	A : NON BREAK	P

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>TEST CONDITION / SPECIFICATION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td rowspan="3">17</td><td rowspan="3">ENVIRONMENT TEST</td><td>1.LOW TEMPERATURE TEST
I/P:230 VAC O/P:100% LOAD
AMBIENT TEMPERATURE:-9.9ºC</td><td>D :
AFTER 14 hrs POWER ON OK</td><td rowspan="3">P</td></tr>
<tr><td>2.HIGH AMBIENT TEMPERATURE FULL LOAD TEST
I/P:230VAC O/P:FULL LOAD
AMBIENT TEMPERATURE:50.1ºC</td><td>D :
AFTER 3 hrs NON BREAK</td></tr>
<tr><td>3.HIGH HUMIDITY HIGH VOLTAGE ON/OFF TEST
I/P:264VAC O/P:FULL LOAD
AMBIENT TEMPERATURE：25ºC
AMBIENT HUMIDITY：95%</td><td>D :
AFTER18 hrs POWER
ON/OFFNON BREAK</td></tr>
<tr><td>18</td><td>TEMPERATURE RISE
TEST T rise OF PARTS</td><td colspan="2">D: I/P :230VAC AFTER 2 hr BURN-IN
O/P :FULL LOAD TA:26.8ºC
<table>
<tr><th></th><th>POSITION</th><th>P/N</th><th>TEMP</th><th>T rise</th></tr>
<tr><td></td><td>BD1</td><td>BRIDGE DIODE</td><td>56.6ºC</td><td>29.8ºC</td></tr>
<tr><td></td><td>U1</td><td>MAIN TRANSISTOR</td><td>64.7ºC</td><td>37.9ºC</td></tr>
<tr><td></td><td>T1</td><td>MAIN TRANSFORMER WIRE</td><td>75.7ºC</td><td>48.9ºC</td></tr>
<tr><td></td><td>D20</td><td>O/P DIODE</td><td>78.9ºC</td><td>52.1ºC</td></tr>
<tr><td></td><td>C25</td><td>O/P FILTER CAPACITOR</td><td>74.8ºC</td><td>48.0ºC</td></tr>
<tr><td></td><td>C5</td><td>I/P FILTER CAPACITOR</td><td>54.8ºC</td><td>28.0ºC</td></tr>
<tr><td></td><td>LF1</td><td>LINE FILTER TRANSFORMER</td><td>61.0ºC</td><td>34.2ºC</td></tr>
</table></td><td>P</td></tr>
<tr><td>19</td><td>LIFE CYCLE</td><td colspan="2">D: SUPPOSE C25 IS THE MOST CRITICAL COMPONENT
I/P:230VAC O/P:FULL LOAD Ta:25ºC Tc25:74.8ºC Life: 32615.3 hrs
I/P:230VAC O/P:FULL LOAD Ta:45ºC Tc45:92.2ºC Life:12279.5 hrs</td><td>P</td></tr>
<tr><td>20</td><td>CRITICAL COMPONENT RECORD
(FOR QC INSPECTION REFERENCE ONLY)</td><td colspan="3">D: FUSE : 3AL/250V
BRIDGE DIODE : D3SB60 4A/800V
LINE FILTER : TF-484
TRANSFOMER : TF659
POWER SWITCHER : TOP-227
OUTPUT DIODE : BYQ-28X-200
OUTPUT CAPACITOR : 330uF/35V(v) 105ºC ELNA LXJ
INPUT CAPACITOR : RUBYCON 100uF/400V 105ºC
P.C.B : DR-45-R2 CEM-3 20 OZ SS</td></tr>
</table>

DATE	SAMPLE	TEST RESULT	TEST	APPROVAL
20000704	RD SAMPLE	PASS	VINCENT	MAX.LIN
20000822	PRODUCT SAMPLE A007C25 DR4505 DR4512 DR4515 DR4524	PASS	VINCENT	MAX.LIN

20001019	**PRODUCT SAMPLE A0010A12 DR4505 DR4512 DR4515 DR4524**	PASS	**VINCENT**	**MAX.LIN**
20001205	**PRODUCT SAMPLE A011D19 DR4524**	PASS	**VINCENT**	**MAX.LIN**
20010110	**PRODUCT SAMPLE A101A09 DR4505**	PASS	**VINCENT**	**MAX.LIN**
20010219	**PRODUCT SAMPLE A102b17 DR4512**	PASS	**SAM**	**MAX.LIN**