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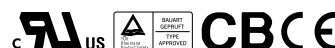
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Jameco Part Number 373238



■ 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
- UL 508(industrial control equipment)approved
- Isolation class II
- LED indicator for power on
- 100% full load burn-in test
- 3 years warranty



SPECIFICATION

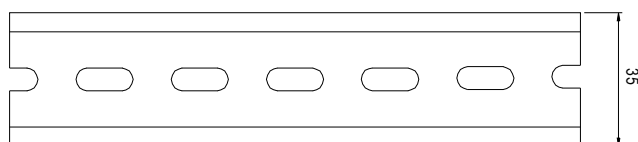
MODEL		DR-60-5	DR-60-12	DR-60-15	DR-60-24
OUTPUT	DC VOLTAGE	5V	12V	15V	24V
	RATED CURRENT	6.5A	4.5A	4A	2.5A
	CURRENT RANGE	0 ~ 6.5A	0 ~ 4.5A	0 ~ 4A	0 ~ 2.5A
	RATED POWER	32.5W	54W	60W	60W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	120mVp-p	120mVp-p	150mVp-p
	VOLTAGE ADJ. RANGE	4.75 ~ 5.5V	11.1 ~ 13.2V	13.5 ~ 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	100ms, 30ms/230VAC 200ms, 30ms/115VAC at full load			
HOLD UP TIME (Typ.)	100ms/230VAC 23ms/115VAC at full load				
INPUT	VOLTAGE RANGE	88 ~ 264VAC 124 ~ 370VDC			
	FREQUENCY RANGE	47 ~ 63Hz			
	EFFICIENCY (Typ.)	76%	82%	83%	84%
	AC CURRENT (Typ.)	1.2A/115VAC 0.8A/230VAC			
	INRUSH CURRENT (Typ.)	COLD START 18A/115VAC 36A/230VAC			
PROTECTION	OVERLOAD	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 down o/p voltage, re-power on to recover			
ENVIRONMENT	WORKING TEMP.	-20 ~ +60℃ (Refer to output load 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			
	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, EN61204-3, heavy industry level, criteria A			
OTHERS	MTBF	216.2K hrs min. MIL-HDBK-217F (25℃)			
	DIMENSION	78*93*56mm (W*H*D)			
	PACKING	0.3Kg; 48pcs/15.4Kg/1.02CUFT			
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

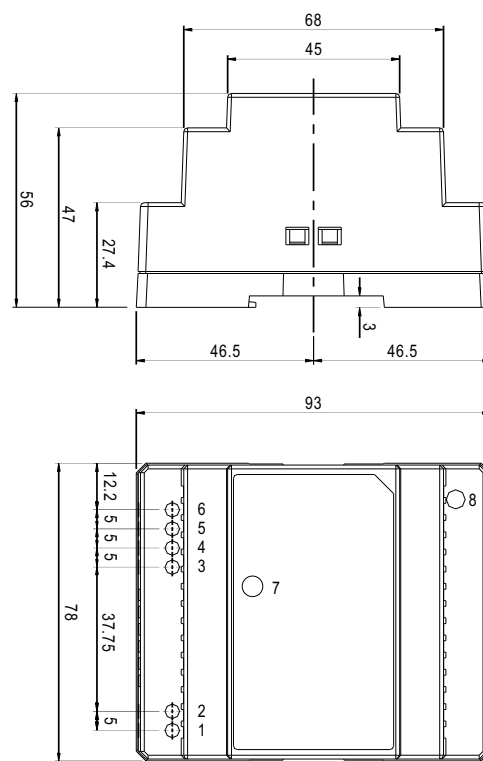
Case No.918B Unit:mm

Terminal Pin No. Assignment

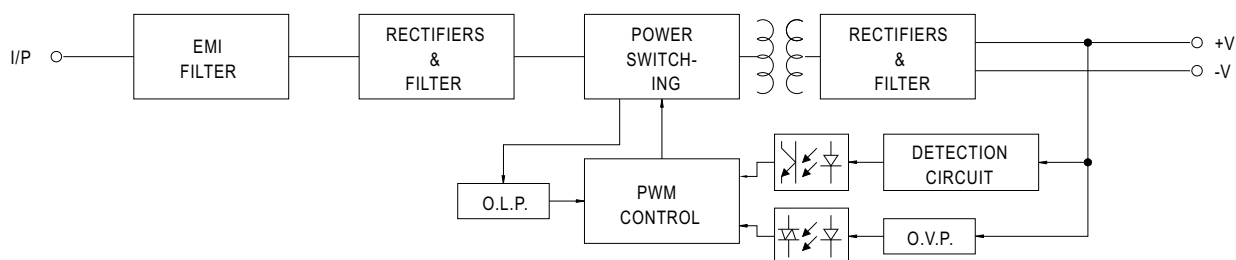
Pin No.	Assignment	Pin No.	Assignment
1	AC/N	5,6	-V
2	AC/L	7	LED
3,4	+V	8	+V ADJ.



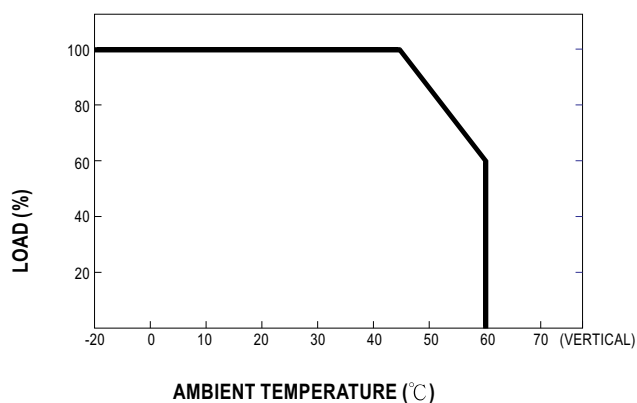
ADMISSIBLE DIN-RAIL: TS35/7.5 OR TS35/15



Block Diagram



Derating Curve



MODEL : DR-60-15

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 120 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25℃	V1: 10 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 13.5V~ 16.5V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	13.37 V~ 16.78 V/ 230 VAC 13.37 V~ 16.78 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 1 %~ -1 % (Max)	I/P: 85 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25℃	V1: 0.4 %~ -0.4 %	P
4	LINE REGULATION	V1: 1 %~ -1 % (Max)	I/P: 85VAC ~ 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: 0.3 %~ -0.3 %	P
6	SET UP TIME	230VAC: 100 ms (Max) 115 VAC: 200 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 56 ms 115VAC/ 83 ms	P
7	RISE TIME	230VAC: 30 ms (Max) 115VAC: 30 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 21 ms 115VAC/ 21 ms	P
8	HOLD UP TIME	230VAC: 50 ms (TYP) 115VAC: 18 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 117 ms 115VAC/ 26 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: <5 %	P
10	DYNAMIC LOAD	V1: 1500 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	198 mVp-p	P

INPUT FUNCTION TEST

N O	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	85VAC~264 VAC)	I/P:TESTING O/P:FULL LOAD Ta:25°C	59 V~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: 85 VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK	P
3	EFFICIENCY	83.5 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	83.5 %	P
4	INPUT CURRENT	230V/ 1 A (TYP) 115V/ 1.8 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 0.63 A/ 230 VAC I = 0.96 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 40 A (TYP) 115V/ 30 A (TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 27 A/ 230 VAC I = 14 A/ 115 VAC	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 %~ 160 %	I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25°C	135 %/ 230 VAC 136 %/ 115 VAC Foldback Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1: 17.25 V~ 20.25 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	19 V/ 230 VAC 19 V/ 115 VAC Shunt down Re- power ON	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P:FULL LOAD Ta:25°C	NO DAMAGE Foldback Current Limiting	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																
1	TEMPERATURE RISE TEST	MODEL : DR-60-24 1. ROOM AMBIENT BURN-IN : 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 27.6 °C 2. HIGH AMBIENT BURN-IN : 2.5 HRS I/P: 230VAC O/P: FULL LOAD Ta= 44.5 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 27.6 °C</th><th>HIGH AMBIENT Ta= 44.5 °C</th></tr><tr><td>1</td><td>LF1</td><td>LF155</td><td>74.9℃</td><td>90.5℃</td></tr><tr><td>2</td><td>D1</td><td>HER206 2A/600V REC</td><td>90.3℃</td><td>104.3℃</td></tr><tr><td>3</td><td>ZD1</td><td>1.5KE440A</td><td>91.9℃</td><td>106.9℃</td></tr><tr><td>4</td><td>BD1</td><td>D3SB60 4A/600V SHI</td><td>71.6℃</td><td>86.8℃</td></tr><tr><td>5</td><td>C5</td><td>180U/400V NCC 105℃ PT</td><td>68.6℃</td><td>83.8℃</td></tr><tr><td>6</td><td>Q1</td><td>K3673 10A/700V FUJI</td><td>89.9℃</td><td>105.8℃</td></tr><tr><td>7</td><td>Q2</td><td>TIP122 5A/100V FAIR</td><td>71.2℃</td><td>88.4℃</td></tr><tr><td>8</td><td>T1 COIL</td><td>TF-1210</td><td>92.5℃</td><td>107.8℃</td></tr><tr><td>9</td><td>D100</td><td>BYQ28X-200 10A/200V PH</td><td>81.5℃</td><td>96.2℃</td></tr><tr><td>10</td><td>C107</td><td>560U/35V NCC 105℃ KY</td><td>81.1℃</td><td>96.3℃</td></tr><tr><td>11</td><td>U1</td><td>TI3842</td><td>64.7℃</td><td>80.8℃</td></tr><tr><td>12</td><td>C51</td><td>4.7U/50V CAPX 105℃ KM</td><td>46.3℃</td><td>62.0℃</td></tr><tr><td>13</td><td></td><td></td><td>℃</td><td>℃</td></tr><tr><td>14</td><td></td><td></td><td>℃</td><td>℃</td></tr><tr><td>15</td><td></td><td></td><td>℃</td><td>℃</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 27.6 °C	HIGH AMBIENT Ta= 44.5 °C	1	LF1	LF155	74.9℃	90.5℃	2	D1	HER206 2A/600V REC	90.3℃	104.3℃	3	ZD1	1.5KE440A	91.9℃	106.9℃	4	BD1	D3SB60 4A/600V SHI	71.6℃	86.8℃	5	C5	180U/400V NCC 105℃ PT	68.6℃	83.8℃	6	Q1	K3673 10A/700V FUJI	89.9℃	105.8℃	7	Q2	TIP122 5A/100V FAIR	71.2℃	88.4℃	8	T1 COIL	TF-1210	92.5℃	107.8℃	9	D100	BYQ28X-200 10A/200V PH	81.5℃	96.2℃	10	C107	560U/35V NCC 105℃ KY	81.1℃	96.3℃	11	U1	TI3842	64.7℃	80.8℃	12	C51	4.7U/50V CAPX 105℃ KM	46.3℃	62.0℃	13			℃	℃	14			℃	℃	15			℃	℃	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 140 % LOAD Ta:25℃	TEST : OK	P																																																																																
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC 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 45 °C NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 45 °C HUMIDITY= 95 %R.H	TEST : OK	P																																																																																
5	TEMPERATURE COEFFICIENT	± 0.03 %(0~50℃)	I/P: 230 VAC O/P:FULL LOAD	± 0.01 %(0~50℃)	P																																																																																
6	VIBRATION TEST	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℃		TEST : OK	P																																																																																

SAFETY TEST

NO	TEST ITEM	SPECICATION	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: 2.59 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: 168 MΩ NO DAMAGE	P
3	APPROVAL	TUV: Certificate NO : R50058736 UL: File NO : E183223			P

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230 VAC/50HZ O/P:FULL 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	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	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C 107 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 75925 HRS I/P: 230VAC O/P:FULL LOAD Ta= 45 °C LIFE TIME= 21399 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 216.2K 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 2SK3673 : 700 V 10A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 692 V (2) 690 V (3) 604 V	P
2	Diode Peak Voltage	D100 Rated YG805C10 : 100 V 10 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25℃	(1) 66 V (2) 87 V (3) 63 V	P
3	Clamp Diode Peak Voltage	D1 Rated HER206 : 600V 2A	I/P:High-Line +3V = 267 V O/P: (1)Full Load (2) Dynamic Load 90%Duty/1KHz Ta:25℃	(1) 378 V (2) 378 V	P
4	Input Capacitor Voltage	C 5 Rated : 180u / 400 V/ 105℃	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) 380 V (2) 382 V (3) 382 V	P
5	Control IC Voltage Test	U1 Rated TL3842 : 30 V	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) 16 V (2) 16 V (30) 16 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2005/1/7	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2005/4/26	PRODUCT SAMPLE W0503C02	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023