

300W Railway Single Output DC-DC Converter

RSD-300 series



Features :

- Compliance to EN50155 and EN45545-2 railway standard
- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage / Over temperature / Input reverse polarity
- 4000VDC I/O isolation
- * Cooling by free air convection
- Half encapsulated
- * Built-in constant current limiting circuit
- 1U low profile 40mm
- * All using 105 $^\circ\!{\rm C}$ long life electrolytic capacitors
- LED indicator for power on
- 100% full load burn-in test
- 3 years warranty

CE

SPECIFICATION

MODEL		RSD-300B-5	RSD-300B-12	RSD-300B-24	RSD-300B-48	RSD-300C-5	RSD-300C-12	RSD-300C-24	RSD-300C-48	
	DC VOLTAGE		5V	12V	24V	48V	5V	12V	24V	48V
OUTPUT	RATED CURRENT		42A	22.5A	11.3A	5.7A	42A	25A	12.5A	6.3A
	CURRENT RANGE		0~42A	0~22.5A	0~11.3A	0~5.7A	0~42A	0~25A	0~12.5A	0~6.3A
	RATED POWER		210W	270W	271.2W	273.6W	210W	300W	300W	302.4W
	RIPPLE & NOISE (max.) Note.2		100mVp-p	120mVp-p	150mVp-p	180mVp-p	100mVp-p	120mVp-p	150mVp-p	180mVp-p
	VOLTAGE TOLERANCE Note.3		$\pm 2.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION		$\pm 0.5\%$	$\pm 0.3\%$	$\pm 0.2\%$	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 0.3\%$	±0.2%	$\pm 0.5\%$
	LOAD REGULATION		±1.0%	$\pm 1.0\%$	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	SETUP, RISE TIME		800ms, 50ms at full load							
	HOLD UP TIME (Typ.)		B/C- type comply with S1 level @ full load, comply with S2 level @ 70% load							
	VOLTAGE	CONTINUOUS	16.8 ~ 31.2VDC				33.6 ~ 62.4VDC			
	RANGE	1 SEC.	14.4 ~ 33.6VDC				28.8 ~ 67.2VDC			
INPUT	EFFICIENCY	′ (Тур.)	89%	89.5%	90%	91.5%	90.5%	91%	91.5%	92%
	DC CURREN	Т (Тур.)	9.7A/24V	14.6A/24V	14.6A/24V	14.6A/24V	4.8A/48V	7.2A/48V	7.2A/48V	7.2A/48V
	INRUSH CURRENT (Typ.)		45A/24VDC 45A/48VDC							
			105 ~ 135% rated output power							
	OVERLOAD		Protection type : Constant current limiting, recovers automatically after fault condition is removed							
PROTECTION	OVER VOLTAGE		5.75 ~ 7V	13.8~16.2V	27.6~32.4V	55.2~64.8V	5.75~7V	13.8~16.2V	27.6~32.4V	55.2~64.8V
			Protection type : Shut down o/p voltage, re-power on to recover							
	OVER TEMPERATURE		Shut down o/p voltage, recovers automatically after temperature goes down							
	WORKING T	EMP.	-40 ~ +55°C (no derating) ; +70°C @ 60% load by free air convection ; +70°C no derating with external base plate, TX class compliance							
	WORKING HUMIDITY		5 ~ 95% RH non-condensing							
ENVIRONMENT	STORAGE TEMP., HUMIDITY		-40 ~ +85°C , 5 ~ 95% RH							
	TEMP. COEFFICIENT		±0.03%/°C (0~55°C)							
VIBRATION			10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes ; Mounting : compliance to IEC61373							
	SAFETY STANDARDS		Meet IEC60950-1(LVD)							
SAFFTY &	WITHSTAND VOLTAGE		I/P-O/P:4KVDC I/P-FG:2.5KVDC 0/P-FG:2.5KVDC							
EMC	ISOLATION RESISTANCE		I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH							
(Note 4)	EMC EMISSION		Compliance to EN55022 (CISPR22) Conduction Emission: Class A, Radiation Emission: Class B							
	EMC IMMUNITY		Compliance to EN61000-4-2,3,4,5,6,8, light industry level, criteria A							
	RAILWAY STANDARD		Meet EN50155 / IEC60571 including IEC61373 for shock & vibration, EN50121-3-2 for EMC ; EN45545-2 for fire protection							
	MTBF		130.7K hrs min. MIL-HDBK-217F (25°C)							
OTHERS	DIMENSION		216*97*40mm (L*W*H)							
	PACKING		1.19Kg; 12pcs/15.3Kg/1.12CUFT							
NOTE	 All parameters NOT specially mentioned are measured at 24,48VDC input, rated load and 25 C of ambient temperature. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. Tolerance : includes set up tolerance, line regulation and load regulation. 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. 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) Strongly recommended that external output capacitance should not exceed 5000uF. 									



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SPECIFICATION

MODEL		RSD-300D-5	RSD-300D-12	RSD-300D-24	RSD-300D-48	RSD-300E-5	RSD-300E-12	RSD-300E-24	RSD-300E-48	
DC VOLTAGE		5V	12V	24V	48V	5V	12V	24V	48V	
OUTPUT	RATED CURRENT		42A	25A	12.5A	6.3A	42A	25A	12.5A	6.3A
	CURRENT RANGE		0~42A	0~25A	0~12.5A	0~6.3A	0~42A	0~25A	0~12.5A	0~6.3A
	RATED POWER		210W	300W	300W	302.4W	210W	300W	300W	302.4W
	RIPPLE & NOISE (max.) Note.2		100mVp-p	120mVp-p	150mVp-p	180mVp-p	100mVp-p	120mVp-p	150mVp-p	180mVp-p
	VOLTAGE TOLERANCE Note.3		±2.0%	$\pm 2.0\%$	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION		$\pm 0.5\%$	$\pm 0.2\%$	±0.2%	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 0.3\%$	±0.2%	$\pm 0.5\%$
	LOAD REGULATION		±1.0%	$\pm 1.0\%$	±1.0%	$\pm 1.0\%$	$\pm 1.0\%$	$\pm 1.0\%$	±1.0%	$\pm 1.0\%$
	SETUP, RISE	TIME	800ms, 50ms at full load							
	HOLD UP TIME (Typ.)		D-type and E-5 comply with S2 level @ full load; other E- type comply with S1 level @ full load, comply with S2 level @ 70% load							
	VOLTAGE	CONTINUOUS	67.2 ~ 143VDC				25.2 ~ 46.8VDC			
	RANGE	1 SEC.	57.6 ~ 154VDC 21.6 ~ 50.4VDC							
INPUT	EFFICIENCY	′ (Тур.)	90%	91.5%	91.5%	91.5%	88%	90%	91%	91%
	DC CURREN	Т (Тур.)	2.1A/110V	3.1A/110V	3.1A/110V	3.1A/110V	6.5A/36V	9.2A/36V	9.2A/36V	9.2A/36V
	INRUSH CURRENT (Typ.)		45A/110VDC				45A/36VDC			
			105 ~ 135% rated output power							
	OVERLOAD		Protection type : Constant current limiting, recovers automatically after fault condition is removed							
PROTECTION	OVER VOLTAGE		5.75~7V	13.8~16.2V	27.6~32.4V	55.2~64.8V	5.75~7V	13.8~16.2V	27.6~32.4V	55.2~64.8V
			Protection type : Shut down o/p voltage, re-power on to recover							
	OVER TEMPERATURE		Shut down o/p voltage, recovers automatically after temperature goes down							
	WORKING T	EMP.	-40 ~ +55°C (no derating) ; +70°C @ 60% load by free air convection ; +70°C no derating with external base plate, TX class compliance							
	WORKING HUMIDITY		5 ~ 95% RH non-condensing							
ENVIRONMENT	STORAGE TEMP., HUMIDITY		-40 ~ +85°C , 5 ~ 95% RH							
	TEMP. COEFFICIENT		±0.03%/°C (0~55°C)							
VIBRATION			10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes ; Mounting : compliance to IEC61373							
	SAFETY STANDARDS		Meet IEC60950-1(LVD))							
SAFETY &	WITHSTAND VOLTAGE		I/P-O/P:4KVDC I/P-FG:2.5KVDC 0/P-FG:2.5KVDC							
EMC	ISOLATION RESISTANCE		I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH							
(Note 4)	EMC EMISSION		Compliance to EN55022 (CISPR22) Conduction Emission: Class A, Radiation Emission: Class B							
	EMC IMMUNITY		Compliance to EN61000-4-2,3,4,5,6,8, light industry level, criteria A							
	RAILWAY STANDARD		Meet EN50155 / IEC60571 including IEC61373 for shock & vibration, EN50121-3-2 for EMC ; EN45545-2 for fire protection							
	MTBF		130.7K hrs min. MIL-HDBK-217F (25°C)							
OTHERS	DIMENSION		216*97*40mm	(L*W*H)						
	PACKING		1.19Kg; 12pcs/15.3Kg/1.12CUFT							
NOTE	 All parameters NOT specially mentioned are measured at 36,110VDC input, rated load and 25 C of ambient temperature. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. Tolerance : includes set up tolerance, line regulation and load regulation. 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. 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) Strongly recommended that external output capacitance should not exceed 5000uF. 									



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SPECIFICATION

MODEL		RSD-300F-5	RSD-300F-12	RSD-300F-24	RSD-300F-48				
DC VOLTAGE		5V	12V	24V	48V				
	RATED CURRENT		42A	25A	12.5A	6.3A			
	CURRENT RANGE		0~42A	0~25A	0~12.5A	0~6.3A			
	RATED POWER		210W	300W	300W	302.4W			
0.UTD.UT	RIPPLE & NOISE (max.) Note.2		100mVp-p	120mVp-p	150mVp-p	180mVp-p			
OUTPUT	VOLTAGE TOLERANCE Note.3		±2.0%	±2.0%	±2.0%	±2.0%			
	LINE REGULATION		±0.5%	±0.3%	±0.2%	±0.5%			
	LOAD REGULATION		±1.0%	±1.0%	±1.0%	±1.0%			
	SETUP, RISI	ETIME	800ms, 50ms at full load						
	HOLD UP TI	МЕ (Тур.)	F-type comply with S2 level @ full load						
	VOLTAGE	CONTINUOUS	50.4 ~ 93.6VDC						
	RANGE	1 SEC.	43.2 ~ 100.8VDC						
INPUT	EFFICIENCY	′ (Тур.)	89%	91%	91%	91.5%			
	DC CURREN	IT (Тур.)	3.25A/72V	4.6A/72V	4.6A/72V	4.6A/72V			
	INRUSH CU	RRENT (Typ.)	45A/72VDC						
			105 ~ 135% rated output power						
	OVERLOAD		Protection type : Constant curre	ent limiting, recovers automatically	y after fault condition is removed				
PROTECTION			5.75 ~ 7V	13.8 ~ 16.2V	27.6 ~ 32.4V	55.2~64.8V			
	OVER VOLT	AGE	Protection type : Shut down o/p voltage, re-power on to recover						
	OVER TEMPERATURE		Shut down o/p voltage, recovers automatically after temperature goes down						
	WORKING T	EMP.	-40 ~ +55°C (no derating) ; +70°C	C @ 60% load by free air convection	on ; +70 $^\circ\!\mathrm{C}$ no derating with externa	l base plate, TX class compliance			
	WORKING HUMIDITY		5~95% RH non-condensing						
ENVIRONMENT	STORAGE T	EMP., HUMIDITY	-40 ~ +85°C , 5 ~ 95% RH						
	TEMP. COEFFICIENT		±0.03%/°C (0~55°C)						
	VIBRATION		10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes ; Mounting : compliance to IEC61373						
	SAFETY STANDARDS		Meet IEC60950-1(LVD))						
SAFETY &	WITHSTAND VOLTAGE		I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC						
EMC	ISOLATION RESISTANCE		I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH						
(Note 4)	EMC EMISSION		Compliance to EN55022 (CISPR22) Conduction Emission: Class A, Radiation Emission: Class B						
	EMC IMMUNITY		Compliance to EN61000-4-2,3,4,5,6,8, light industry level, criteria A						
	RAILWAY STANDARD		Meet EN50155 / IEC60571 including IEC61373 for shock & vibration, EN50121-3-2 for EMC ; EN45545-2 for fire protection						
	MTBF		130.7K hrs min. MIL-HDBK-217F (25°C)						
OTHERS	DIMENSION		216*97*40mm (L*W*H)						
	PACKING		1.19Kg; 12pcs/15.3Kg/1.12CUFT						
NOTE	 All parameters NOI specially mentioned are measured at 72VDC input, rated load and 25[°]C of ambient temperature. Ripple & noise are measured at 20MHz of bandwidth by using a 12[°] twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. Tolerance : includes set up tolerance, line regulation and load regulation. 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. 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) Strongly recommended that external output capacitance should not exceed 5000uF. 								







Input Reverse Polarity Protection

There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

Input Range and Transient Ability

The series has a wide range input capability. Within \pm 30% of rated input voltage, it can be executed at full-load operation and operate properly; with \pm 40% of rated input voltage, it can withstand that for 1 second.

Input Under-Voltage Protection

If input voltage drops below Vimin, the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above Vimin, please refer to the cruve below.



Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.

Hold-up Time

D and F and E-5 types are in compliance with S2 level, while B and C and E types are in compliance with S1 level at full load output condition. To fulfil the requirements of S2 level, B and C and E types require de-rating their output load to 70%, please refer to the curve diagrams below.



File Name:RSD-300-SPEC 2014-10-08





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Parallel and Series Connection

A.Operation in Parallel

Since RSD-300 series don't have built-in parallel circuit, it can only use external circuits to achieve the redundant operation but not increase the current rating. 1.Add a diode at the positive-output of each power supply (as shown as below), the current rating of the diode should be larger than the maximum output current rating and attached to a suitable heat sink. This is only for redundant use (increase the reliability of the system) and users have to check suitability of the circuit by themselves.



2.When using S.P.S. in parallel connection, the leakage current will increase at the same time. This could pose as a shock hazard for the user. So please contact the supplier if you have this kind of application.

B.Operation in Series

RSD-300 can be operated in series. Here are the methods of doing it:

1. Positive and negative terminals are connected as shown as below. According to the connection, you can get the positive and negative output voltages for your loads.



2. Increase the output voltage (current does not change). Because RSD-300 series have no reverse blocking diode in the unit, you should add an external blocking diode to prevent the damage of every unit while starting up. The voltage rating of the external diode should be larger than V1+V2 (as shown as below).





Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~140% of its output rating. It must be repowered on to recover.

Over Temperature Protection

The converter shuts off to protect itself when the built-in temperature sensor mounted on the main power transformer senses a high temperature. The output recovers automatically if the temperature drops below the limit.

LED Indicator

Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator. Green : normal operation; No signal: no power or failure.

Derating Curve

a.Single unit operation

If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55°C as operating under full load condition. It requires de-rating output current when ambient temperature is between 55-70°C, please refer to the de-rating curve as below.









Immunity to Environmental Conditions

Test method	Standard	Test conditions	Status
Cooling Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 2 hrs/cycle	No damage
Dry Heat Test	EN 50155 section 12.2.4 (Column 2, Class TX) EN 50155 section 12.2.4 (Column 3, Class TX & Column 4, Class TX) EN 60068-2-2	Temperature: 70°C / 85°C Duration: 6 hrs / 10min	PASS
Damp Heat Test, Cyclic	EN 50155 section 12.2.5 EN 60068-2-30	Temperature: 25°C~55°C Humidity: 90%~100% RH Duration: 48 hrs	PASS
Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 10 mins	PASS
Increased Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19°C Humidity: 65% Duration: 5 hrs	PASS
Shock Test	EN 50155 section 12.2.11 EN 61373	Temperature: $21 \pm 3^{\circ}C$ Humidity: $65 \pm 5\%$ Duration: $30ms^*18$	PASS
Low Temperature Storage Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40°C Dwell Time: 16 hrs	PASS
Salt Mist Test	EN 50155 section 12.2.10 (Class ST4)	Temperature: $35^{\circ}C \pm 2^{\circ}C$ Duration: 96 hrs	PASS

EN45545-2 Fire Test Conditions

Test Ite	ms	Hazard Level			
	Items	Standard	HL1	HL2	HL3
R22	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
	Smoke density test	EN 45545-2:2013 EN ISO 5659-2:2006	PASS	PASS	PASS
	Smoke toxicity test	EN 45545-2:2013 NF X70-100:2006	PASS	PASS	PASS
R24	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R25	Glow-wire test	EN 45545-2:2013 EN 60695-2-11:2000	PASS	PASS	PASS
R26	Vertical flame test	EN 45545-2:2013 EN 60695-11:2003	PASS	PASS	PASS



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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