

RFB300/350 Series

24Vin and 48Vin single output

ARTESYN
TECHNOLOGIES

DC/DC CONVERTERS 308W and 350W Half brick

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NEW Product

- **High efficiency topology**
- **Wide temperature range, -40°C to +100°C @ full power**
- **High power density (160W/in³ in 0.4" tall version)**
- **Input voltage range: 18V to 36V or 36V to 75V**
- **Output voltage range: 7.2V to 13.2V or 16.8V to 29.4V**
- **Remote ON/OFF**
- **Operational insulation system**



2 YEAR WARRANTY

RFB300/350 series is a high efficiency, enclosed, isolated DC/DC converter series in an industry standard half brick package that provides up to 350W of output power. The series delivers very high usable output power for today's high performance RF power amplifier and similar applications. The four models in the series feature an input voltage range of 18 to 36VDC and 36 to 75VDC and an output voltage of 12V and 28V. The output voltage is adjustable from 7.2V to 13.2V or 16.8V to 29.4V (not to exceed 308W for the RFB300 and 350W for the RFB350). The series also has a remote ON/OFF capability. Over current, over voltage and over temperature protection features are included as standard. Negative logic remote ON/OFF and other options are also available. Full international safety approval including EN/IEC60950 VDE and UL/cUL60950 reduces compliance costs and time to market.

All specifications are typical at nominal input, full load at 25°C unless otherwise stated. External output capacitance required (See Note 4)

SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS

Input voltage - peak (100ms max., 1% duty cycle max.)	24Vin 48Vin	-0.5V to 50V -0.5V to 100V
Input voltage continuous	24Vin 48Vin	-0.5V to 40V -0.5V to 80V
Adjust pin voltage (with respect to -sense pin)		-0.5V to 12V

OUTPUT SPECIFICATIONS

Voltage adjustability	12V 28V	7.2V to 13.2V 16.8V to 29.4V
Min./max. load	12V 28V	0/29.2A 0/11A, 0/12.5A
Output load capacitance (See Note 10)	12V 28V	470µF to 4,700µF 330µF to 3,300µF
Rise time	(See Note 12)	5ms typ.

INPUT SPECIFICATIONS

Input current (See Note 3)	24Vin 48Vin RFB300 48Vin RFB350	23.3A max. @ Io max. 11.2A max. @ Io max. 13.0A max. @ Io max.
Input reflected ripple (See Note 4)	24Vin 48Vin 12V model 48Vin 28V model	12mA (pk-pk) 42mA (pk-pk) 28mA (pk-pk)
Input capacitance - Internal filter	24Vin 48Vin	30µF 6.6µF
Inrush current (See Note 11)		2A ² sec.

EMC CHARACTERISTICS

Conducted emissions	EN55022	See Application Note 167
Radiated emissions	EN55022	See Application Note 167

GENERAL SPECIFICATIONS

Efficiency Vin=Vin(nom), Iout (max.)	24Vin 48Vin 12V model 48Vin 28V model	90% 88% 91%
Approvals and standards		VDE IEC60950, IECEE CB, UL/cUL60950
Material Flammability		UL94V-0
Weight	0.5" tall version	110g (3.88 oz.)
MTBF @ 55°C	Telcordia SR-332, Issue 1	2,000,000 hours

ENVIRONMENTAL SPECIFICATIONS

Thermal performance	Operating baseplate, temperature	-40°C to +100°C
	Non-operating	-40°C to +100°C

RC PIN ELECTRICAL INTERFACE

Open collector compatible	(See AN 167 for remote ON/OFF)	
RC:		
ON voltage	(See Note 13)	5.0V min.
Open circuit voltage		5V min, 11V typ, 13V max.
High level leakage current	(See Note 14)	-25.0µA max.
OFF voltage	(See Note 15)	1.2V max.
Low level input current	(See Note 16)	-250µA max.

International Safety Standard Approvals



VDE0805/EN60950/IEC950 File No. 10401-3336-0198
Licence No. 40005395



UL/cUL CAN/CSA 22.2 No. 60950
UL 60950 File No. E135734

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NEW Product

OUTPUT POWER (MAX.)	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT (MIN.)	OUTPUT CURRENT (MAX.)	EFFICIENCY (TYP.)	REGULATION		MODEL NUMBER ⁽⁷⁾
						LINE	LOAD	
308W	18 - 36VDC	16.8V - 29.4V	0A	11.0A	90%	±0.15%	±0.2%	RFB300-24S28
308W	36 - 75VDC	16.8V - 29.4V	0A	11.0A	91%	±0.15%	±0.2%	RFB300-48S28
350W	36 - 75VDC	7.2V - 13.2V	0A	29.2A	88%	±0.15%	±0.2%	RFB350-48S12 ⁽¹⁷⁾
350W	36 - 75VDC	16.8V - 29.4V	0A	12.5A	91%	±0.15%	±0.2%	RFB350-48S28

Part Number System with Options

RFB300-24S28-R5T

Product Family
RFB = Half-Brick

Rated Output Current
300 = 308W
350 = 350W

Input Voltage
24 = 18 to 36V
48 = 36 to 75V

Number of Outputs
S = Single

Threaded Inserts
T = Threaded Inserts
Blank = Clearance Inserts

Height Option ⁽¹⁷⁾
5 = 0.50in (12.70mm)
4 = 0.40in (10.16mm)

Remote ON/OFF Polarity
R = Negative Logic Option
Blank = Positive Logic Option

Output Voltage
12 = 7.2 to 13.2V
28 = 16.8 to 29.4V

Notes

- 1 Measurement Bandwidth: 20MHz; Measured with 1μF ceramic and a 330μF (470μF for 12V output model) aluminum or solid tantalum capacitor across the output terminals.
- 2 $di/dt = 1A/\mu s$; $\Delta I_{out} = \pm 25\%$ I_{out} (max); $V_{in} = V_{nom}$; $I_{out} = I_{nom}$. Tested with a 1μF ceramic and a 330μF (470μF for 12V output model) aluminum electrolytic capacitor across the output.
- 3 External input fusing required. Use a fast acting fuse: 40A (24V model), 15A (48V, 350W model).
- 4 $I_{out} = I_{out}$ (max) Measured with the input capacitor, $C_{bypass} = 330\mu F$, and 6μH inductor in series with the power source. Frequencies >100kHz.
- 5 Signal line assumed <3m in length.
- 6 This product is only for inclusion by professional installers within other equipment and must not be operated as a stand-alone product.
- 7 Negative remote ON/OFF option also available. Add suffix '-R' to part number, for example see part numbering system.
- 8 With the enable signal asserted, this is the time from when the input current reaches 10% of the final steady state value until the output voltage reaches 10% of the nominal output value. Start-up into resistive load.
- 9 With $V_{in} > V_{in}$ (min) applied for a minimum of 1 second, this is the time from when the primary ON/OFF signal is activated until the output voltage reaches 10% of the nominal output voltage.

Notes Contd.

- 10 Minimum effective ESR is 1mΩ. Minimum phase margin is 35°.
- 11 Measured per ETSI 300 132-2 Section 4.7.2.
- 12 From 10% to 90% of $V_{out}(nom)$. Full resistive load. 1μF ceramic and 330μF (470μF for 12V model) electrolytic capacitors across the output.
- 13 Converter guaranteed ON for positive option.
- 14 Maximum driver leakage to insure converter is ON.
- 15 Converter guaranteed OFF for positive option.
- 16 Driver sink current @ $V_{rc} \leq 1.2V$.
- 17 0.40in height option is not available on the 12V output model.

PROTECTION

Short-circuit (Brickwall current limiting)	12V model	39.4A
	28V model RFB300	14.3A
	28V model RFB350	16.3A
Over-voltage protection (Output shutdown)	12V model	15.0V
	28V model	33.2V
Over-temperature shutdown	(midpoint of baseplate)	110°C

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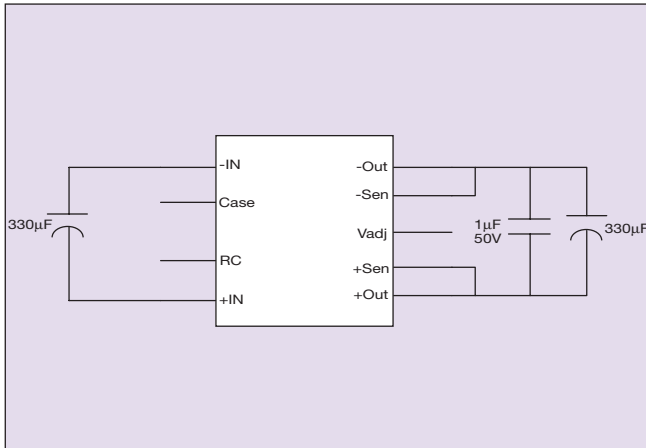


Figure 1 - Standard Application - 28V Output Models

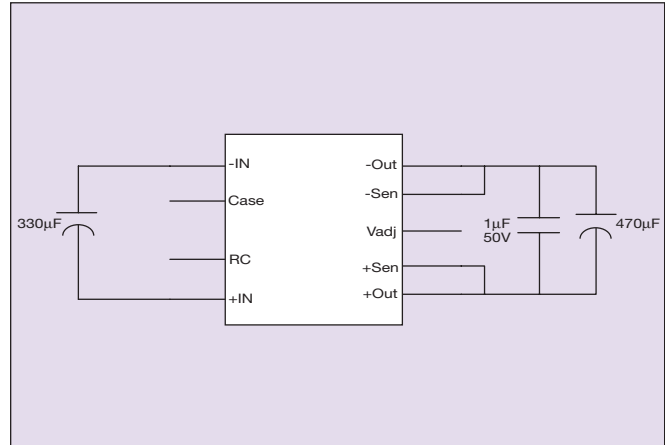


Figure 2 - Standard Application - 12V Output Model

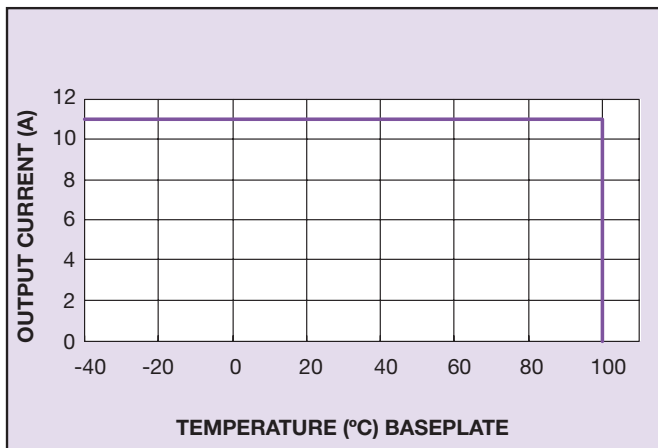


Figure 3 - De-rating Curve - RFB300 - 28V Models

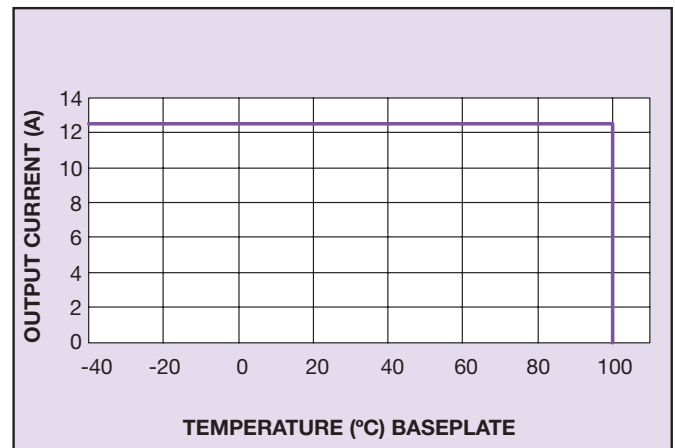


Figure 4 - De-rating Curve - RFB350 - 28V Model

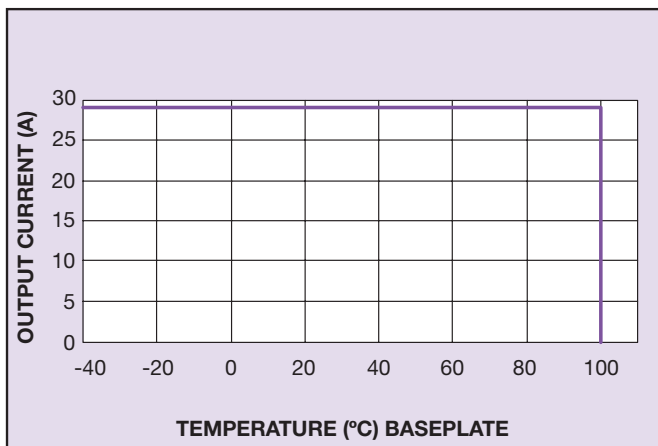


Figure 5 - De-rating Curve - RFB350 - 12V Model

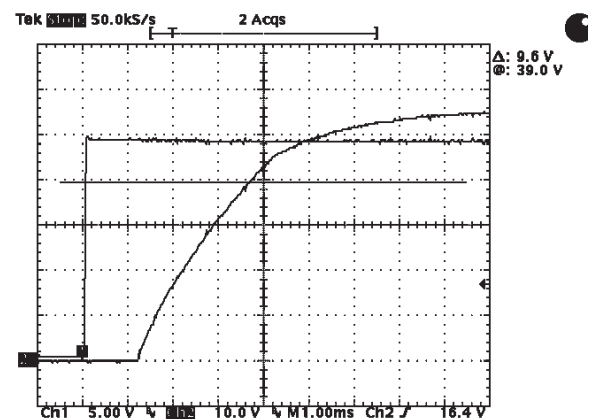


Figure 6 - Typical Turn-on Delay and Risetime RFB350-48S28
Channel 1: Input Voltage, Channel 2: Output Voltage

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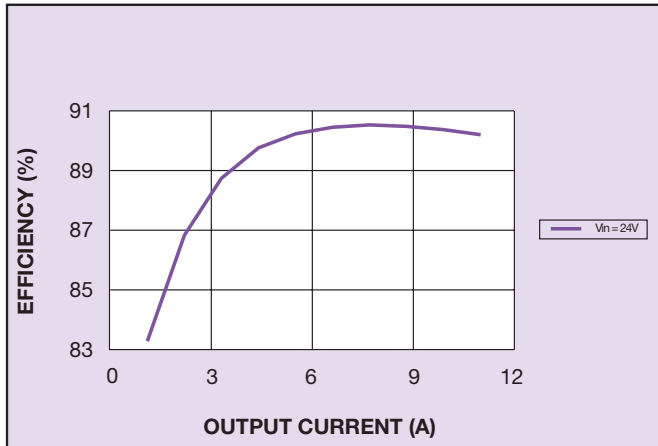


Figure 7 - Typical Efficiency vs. Output Current – RFB300-24S28

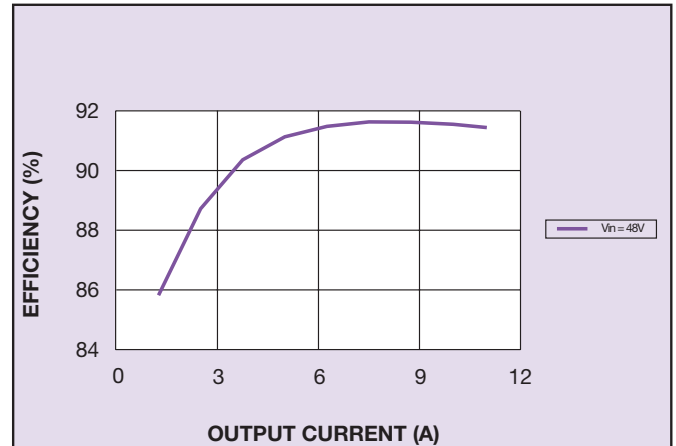


Figure 8 - Typical Efficiency vs. Output Current – RFB300-48S28

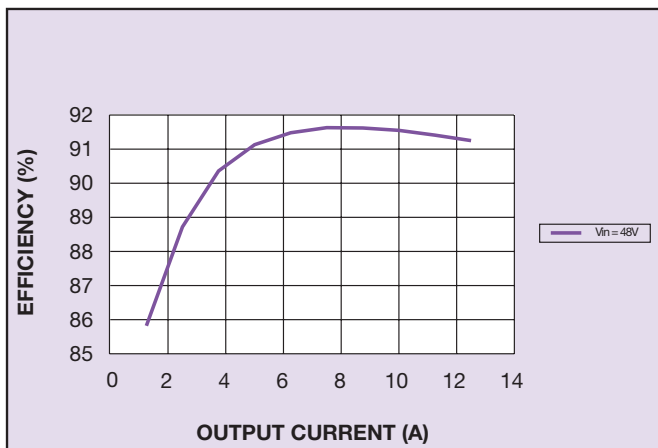


Figure 9 - Typical Efficiency vs. Output Current – RFB350-48S28

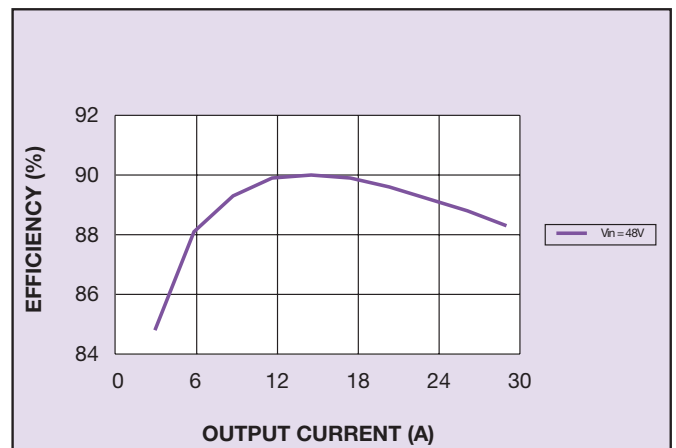


Figure 10 - Typical Efficiency vs. Output Current – RFB350-48S12

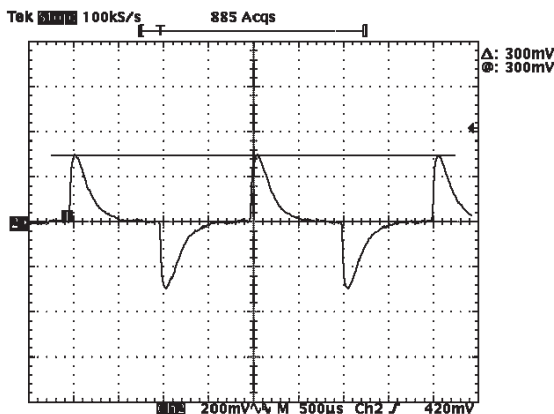


Figure 11 - RFB350-48S28 Transient Response
Load 6.25A to 9.38A

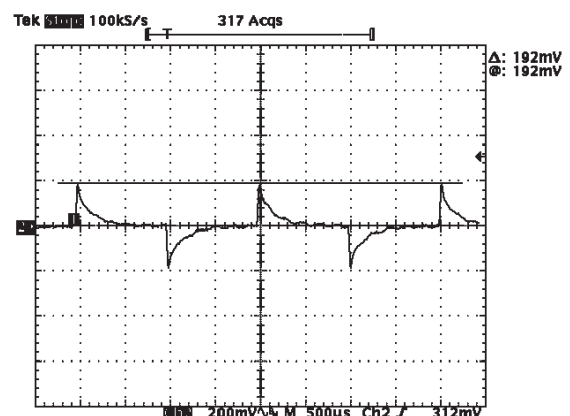
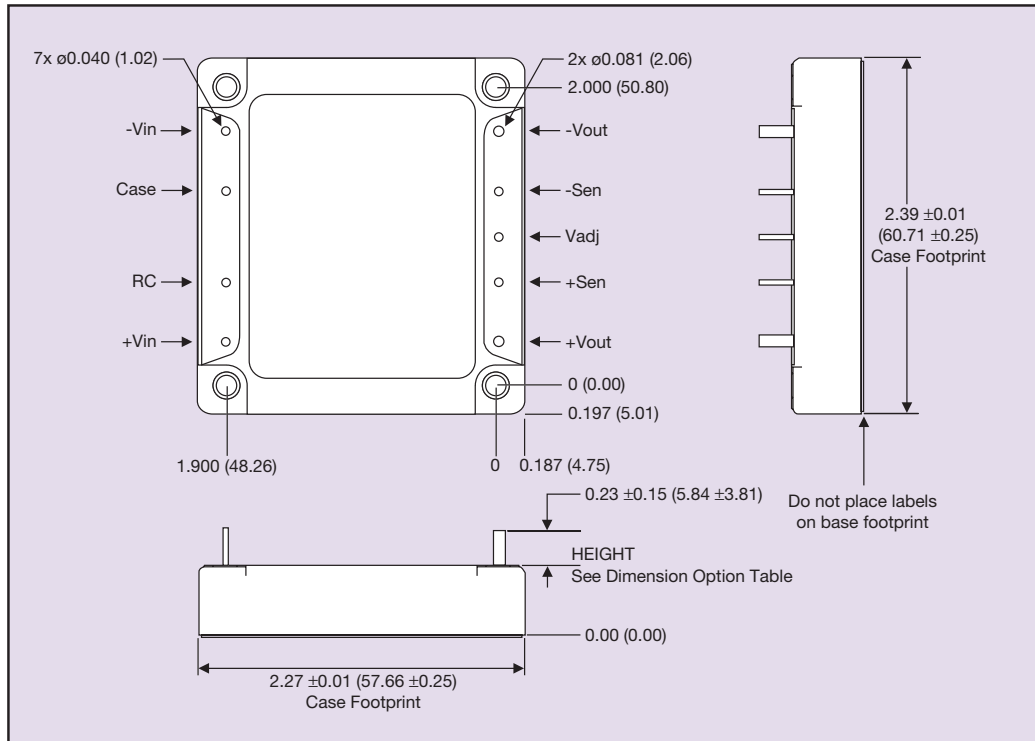


Figure 12 - RFB350-48S12 Transient Response
Load 14.5A to 21.75A

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DIMENSION OPTIONS	
OPTION	HEIGHT
5	0.50 +0.05, - 0.15 (12.70 +1.27, -3.81)
4	0.40 +0.05, -0.15 (10.16 +1.27, -3.81)

PIN CONNECTIONS	
PIN NUMBER	FUNCTION
-Vin	Negative Input Terminal
Case	
RC	ON/OFF Control Terminal
+Vin	Positive Input Terminal
+Vout	Positive Output Terminal
+Sen	Positive Remote Sense
Vadj	Output Adjustment Trim Pin
-Sen	Negative Remote Sense
-Vout	Negative Output Terminal

Figure 13 - Mechanical Drawing, Dimension Options and Pin-Out Table