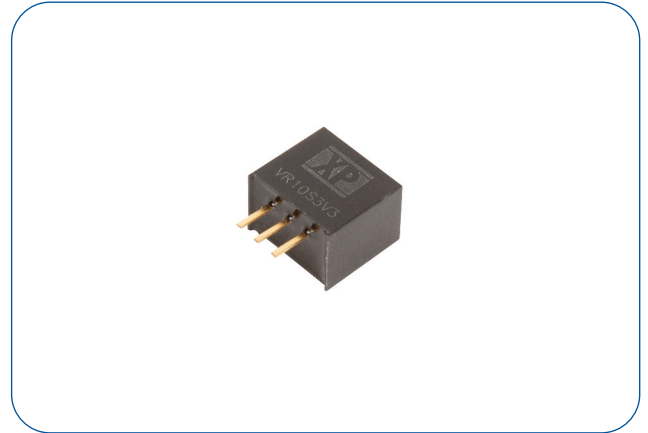


1.0 Amp

- Non Isolated 1.0A Switching Regulator
- Regulated Single Outputs from 3.3 to 15VDC
- Wide Input Range to 36V
- SIP3 Package
- High Efficiency to 96%
- Class B Conducted & Radiated Emissions
- Short Circuit Protection
- Low 0.3mA Standby Input Current
- -40°C to +85°C Operation
- MTBF >2Mhrs
- 3 Year Warranty



Dimensions:

VR10:
0.457 x 0.409 x 0.315" (11.6 x 10.4 x 8.0mm)

The VR10 provides a cost effective compact efficient switching regulator solution operating from a wide range DC input. Output voltages start from 3.3V and the VR10 consumes as little as 0.3mA when idle.

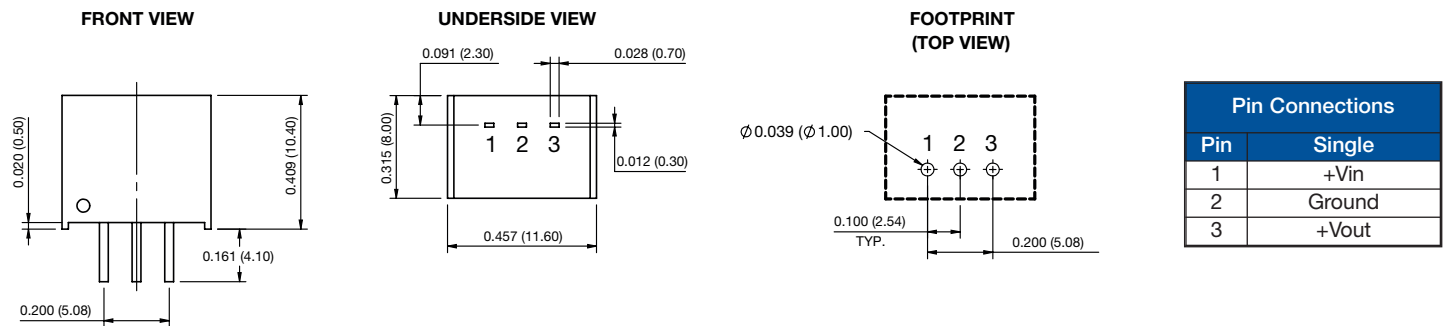
Models & Ratings

Input Voltage	Output Voltage	Output Current	Input Current ⁽¹⁾		Max. Capacitive Load	Efficiency ⁽²⁾		Model Number
			No Load	Full Load		Vin, Min.	Vin, Max.	
6-36V	3.3V	1.0A	1.0mA	660mA	680µF	90%	80%	VR10S3V3
8-36V	5.0V	1.0A	0.3mA	720mA	680µF	93%	85%	VR10S05
10-36V	6.5V	1.0A	0.3mA	740mA	680µF	93%	85%	VR10S6V5
13-36V	9.0V	1.0A	0.3mA	760mA	680µF	94%	89%	VR10S09
16-36V	12.0V	1.0A	0.3mA	810mA	680µF	95%	92%	VR10S12
20-36V	15.0V	1.0A	0.3mA	802mA	680µF	96%	93%	VR10S15

Notes

1. Full load input current measured at minimum input voltage.
2. Efficiency measured at full load.
3. Standard tube quantity 43 pcs.

Mechanical Details



Notes

1. All dimensions are in inches (mm)
2. Weight: 0.0041lbs (1.9g) approx.
3. Pin diameter: 0.02±0.004 (0.7±0.1)
4. Case & pin tolerance: ±0.02 (±0.5)

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	6		36	VDC	See Models and Ratings table.
Input Filter	Internal capacitor				
Input Reflected Ripple			20	mA pk-pk	
Input Surge			45	VDC	For max. 100ms.

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	3.3		15	VDC	See Models and Ratings table.
Initial Set Accuracy		±2.0	±4.0/±3.0	%	3.3V/others (At full load).
Minimum Load	0			mA	No minimum load required.
Line Regulation		±0.2	±0.4	%	Full load over input voltage range.
Load Regulation		±0.4	±0.6	%	Maximum variation applies to 3.3V output models.
Transient Response			±1	%	For 50% load change. Recovery in 100µs.
Ripple & Noise			75	mV pk-pk	20 MHz bandwidth.
Short Circuit Protection	Continuous, with auto recovery.				
Maximum Capacitive Load	See Models and Ratings table.				
Temperature Coefficient			0.03	%/°C	
Overload Protection		2.2		A	
Start-up Time		20		ms	

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		93		%	See models and ratings table.
Isolation: Input to Output	0			VDC	Non isolated.
Switching Frequency		520		kHz	At full load.
Mean Time Between Failure	2			MHrs	MIL-HDBK-217F.
Weight		0.0041 (1.9)		lb (g)	
Case Material	Non-conductive black plastic UL94V-0.				
Pin Material	Solder coated phosphor bronze C5191R-1/2H.				
Potting Material	Polyurethane type L780 UL94V-0 rated.				
Water Wash	Use de-ionised water only, dry thoroughly.				
Soldering Temperature			260	°C	Wave solder peak, 1.5mm from case 10s max. Not suitable for vapour phase soldering. For further details contact XP Power applications team.

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+85	°C	See derating curves.
Storage Temperature	-55		+125	°C	
Case Temperature			+120	°C	
Humidity			95	%RH	Non-condensing.
Cooling	Natural convection.				

EMC: Emissions

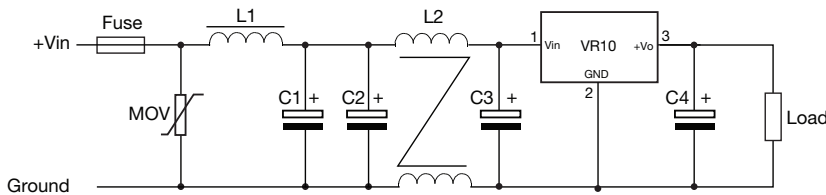
Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class B	See Application Notes
Radiated	EN55032	Class B	

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	±6kV	B	Contact discharge.
Radiated Immunity	EN61000-4-3	10V/m	A	
EFT/Burst	EN61000-4-4	±1.0kV	B	See Application Notes
Surges	EN61000-4-5	±1.0kV	B	
Conducted Immunity	EN61000-4-6	3Vrms	A	

Application Notes

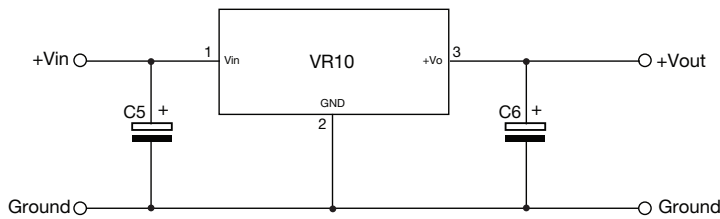
Input Filter to meet Class B Conducted Emissions



MOV	L1	L2	C1	C2/C3	C4
S20K30	82µH	4.7mH	680µF/50V	4.7µF/50V	see C6

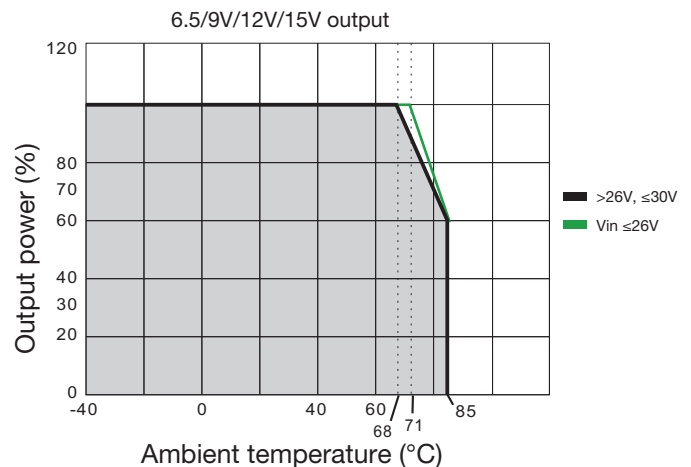
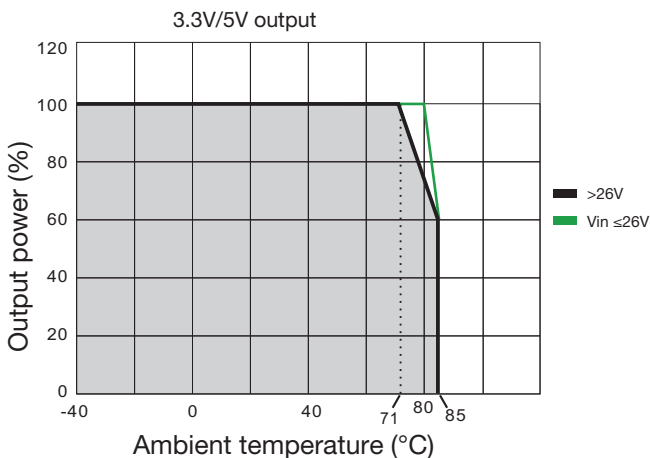
Select fuse rating based on application input current.

Typical Application



Part Number	C5	C6
VR10S3V3	10µF/50V	22µF/10V
VR10S05		22µF/10V
VR10S6V5		22µF/16V
VR10S09		22µF/16V
VR10S12		22µF/25V
VR10S15		22µF/25V

Derating Curves



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[VR10S05](#) [VR10S12](#) [VR10S3V3](#) [VR10S15](#) [VR10S09](#)