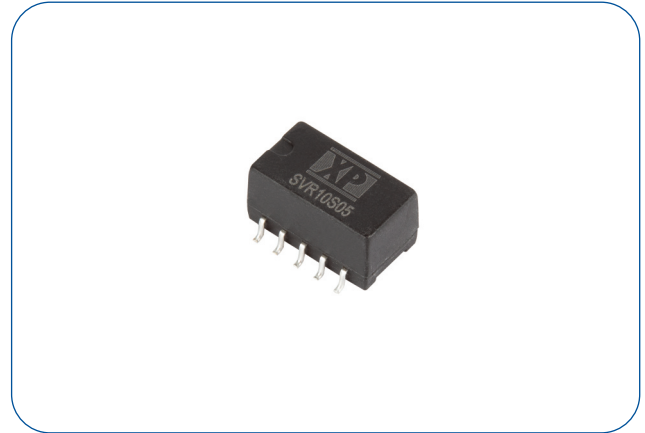


### 1 Amp

- Non Isolated 1.0A Switching Regulator
- Regulated Single Outputs from 1.5 to 12VDC
- Output Voltage Adjustment
- Wide Input Range to 36V
- SMD Package
- High Efficiency to 95%
- Class B Conducted & Radiated Emissions
- Short Circuit Protection
- Remote On/Off Control
- -40°C to +85°C Operation
- MTBF >2Mhrs
- 3 Year Warranty



#### Dimensions:

#### SVR10:

0.6 × 0.335 × 0.315" (15.24 × 8.5 × 8.25mm)

The SVR10 provides a cost effective switching regulator solution operating from a wide range DC input range with adjustable output voltages from 1.5V to 12V DC. The SVR10 is designed with size and efficiency in mind with features such as low stand by current of less than 1mA with remote on/off control. Applications can include embedded computing, instrumentation and process control systems.

### Models & Ratings

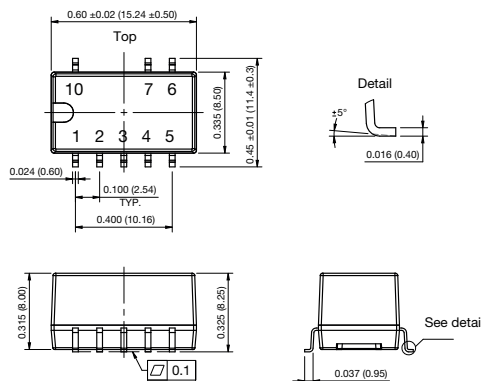
Input Voltage	Output Voltage	Output Current	Input Current <sup>(1)</sup>		Max. Capacitive Load	Efficiency <sup>(2)</sup>		Model Number
			No Load	Full Load		Vin Min.	Vin Max.	
4.75-32V	1.5V	1A	1mA	423mA	680µF	76%	66%	SVR10S1V5
4.75-32V	1.8V	1A	1mA	494mA	680µF	79%	69%	SVR10S1V8
4.75-32V	2.5V	1A	1mA	663mA	680µF	86%	74%	SVR10S2V5
6.5-36V	3.3V	1A	0.2mA	609mA	680µF	90%	80%	SVR10S3V3
8-36V	5.0V	1A	0.2mA	718mA	680µF	93%	85%	SVR10S05
10-36V	6.5V	1A	0.2mA	741mA	680µF	93%	86%	SVR10S6V5
13-36V	9.0V	1A	0.2mA	768mA	680µF	94%	89%	SVR10S09
16-36V	12V	1A	0.2mA	810mA	680µF	95%	92%	SVR10S12

### Notes

1. Input current measured at minimum input voltage.
2. Efficiency measured at full load.

3. Standard tube quantity 32 pcs.
4. Optional tape and reel packaging. Pack size 300pcs. Add suffix "-TR"

### Mechanical Details



Pin-Out	
Pin	Function
1	+Vin
2	+Vin
3	GND
4	+Vout
5	+Vout
6	Trim
7	GND
10	Remote On/Off

### Notes

1. All dimensions are in inches (mm)
2. Weight: 0.0037lbs (1.7g) approx.

3. Pin tolerance: ±0.004 (±0.1)
4. Case tolerance: ±0.010 (±0.25)

### Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	4.75		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.
Remote On/Off	Module on if pin 10 is open circuit or logic high. See application notes.				
Standby input current		0.2	1	mA	If using remote on/off control.

### Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	1.5		12	VDC	See Models and Ratings table.
Trim Range		±10		%	See Application Notes.
Initial Set Accuracy		±2.0	±4.0/±3.0	%	3.3V output or below/others. (At full load).
Minimum Load	0			mA	No minimum load required.
Line Regulation		±0.3/±0.2	±0.4/±0.6	%	Full load over input voltage range. Up to 2.5V/others.
Load Regulation		±0.8/±0.3	±1.5/±0.6	%	Maximum variation applies to 2.5V output models and below.
Transient Response		±50	±150	mV	For 50% load change. Recovery in 200µs typically.
Ripple & Noise		30	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				%	See models and ratings table.
Isolation: Input to Output	0			VDC	Non isolated.
Switching Frequency		370		kHz	SVR10S1V5, 1V8, 2V5.
		520			SVR1005S3V3, 05, 6V5.
		700			SVR10S09, 12.
Mean Time Between Failure	2			MHrs	MIL-HDBK-217F.
Weight		0.0037 (1.7)		lb (g)	
Case Material	Non-conductive black plastic UL94V-0, unpotted.				
Pin Material	Solder coated phosphor bronze C5191R-1/2H.				
Water Wash	Not suitable for water washing.				
Solder Profile	IPC/JEDEC J-STD-020D.1. Peak temperature ≤245°C, duration ≤60s max. over 217°C.				

### 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	±4kV	B	Contact discharge.
Radiated Immunity	EN61000-4-3	10V/m	A	
EFT/Burst	EN61000-4-4	±1.0kV	B	
Surges	EN61000-4-5	±1.0kV	B	See Application Notes
Conducted Immunity	EN61000-4-6	3Vrms	A	

### Safety Approvals

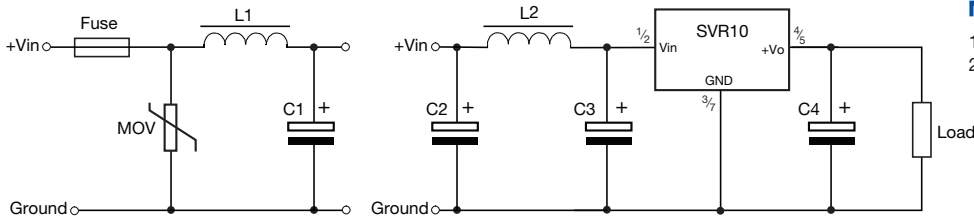
Safety Agency	Safety Standard	Notes & Conditions
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

### Application Notes

#### Input Filter

#### Immunity Compliance Filter

#### Class B Conducted Emission Filter

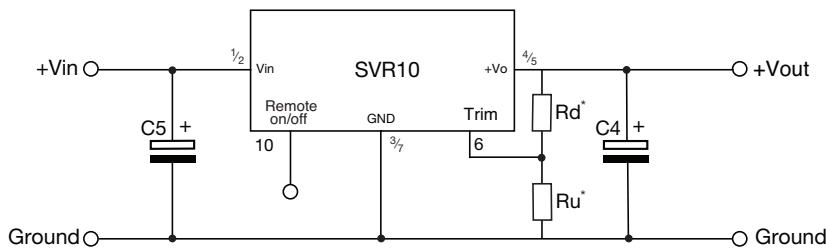


-MOV	L1	L2	C4	C2/C3	C1
S20K30	82µH	68µH	Refer to table below	4.7µF /50V	680µF /50V

#### Notes

- Select fuse rating based on application input current.
- MOV, L1 and C1 apply to immunity compliance.

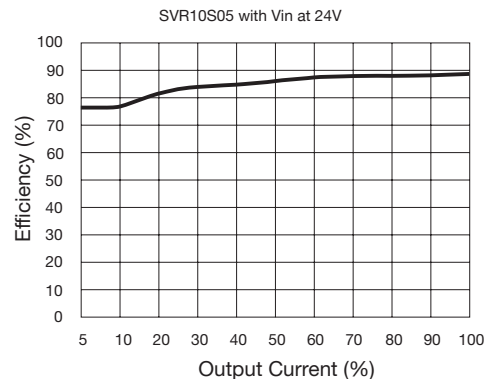
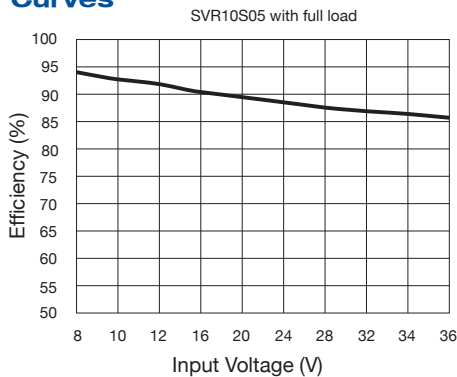
#### Typical Application



Remote On / Off - Output on if pin 10 is open circuit or logic high of 3.2 to 5.5VDC. Output off if pin 10 is connected to ground or logic low of 0 to 0.8VDC.

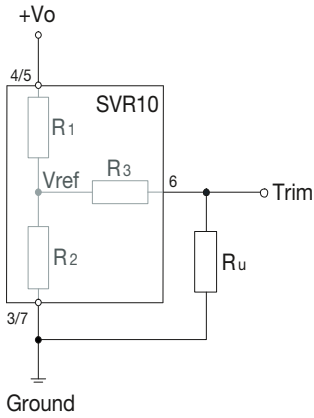
Part Number	C5	C4
SVR10S1V5	10µF/50V	22µF/10V
SVR10S1V8		22µF/10V
SVR10S2V5		22µF/10V
SVR10S3V3		22µF/10V
SVR10S05		22µF/16V
SVR10S6V5		22µF/16V
SVR10S09		22µF/16V
SVR10S12		22µF/25V

#### Efficiency Curves

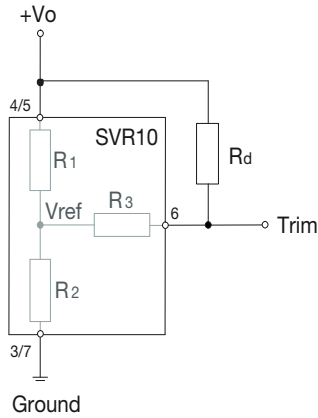


### Output Voltage Adjustment

#### Trim Up



#### Trim Down



Calculating Trim Resistor values:

$$\text{Up: } R_u = \left( \frac{aR_2}{R_2 - a} \right) - R_3 \quad a = \left( \frac{V_{ref}}{V_o - V_{ref}} \right) R_1$$

$$\text{Down: } R_d = \left( \frac{aR_1}{R_1 - a} \right) - R_3 \quad a = \left( \frac{V_o - V_{ref}}{V_{ref}} \right) R_2$$

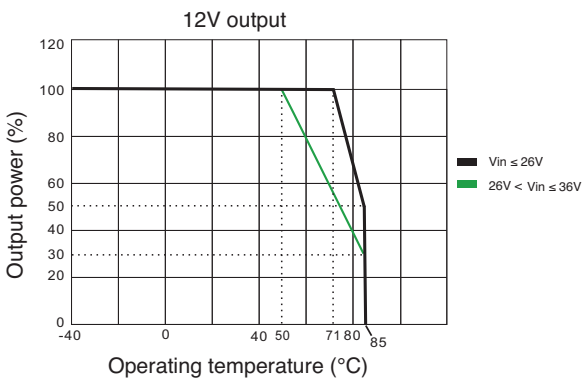
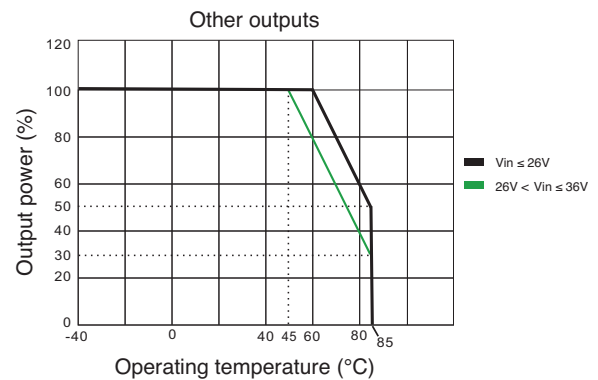
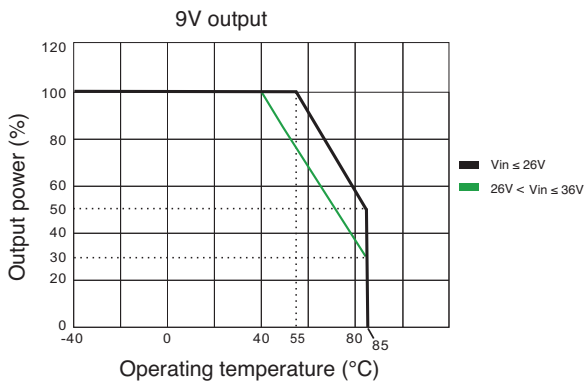
#### Notes

1. R1, R2 and R3 are internal to SVR10.
2. Rd, Ru = Trim Resistor value.
3. Only fit one trim resistor Ru\* or Rd\*.
4. a = calculated parameter.
5. Vo = desired output voltage.
6. SVR10S1V5 model can be trimmed up only.

### Reference Values

Vout (V)	R1 (KΩ)	R2 (KΩ)	R3 (KΩ)	Vref (V)
1.5	7.5	7.5	15	0.75
1.8	4.7	3.3	6.8	0.75
2.5	9.1	3.9	8.2	0.75
3.3	75	22	75	0.75
5	43	7.5	33	0.75
6.5	43	5.6	22	0.75
9	43	3.9	22	0.75
12	36	2.4	10	0.75

### Temperature Derating Curves



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