AM50E-VZ

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2” x 1”

This new AM50E-VZ series in a 50W DC/DC converter that provides a 2:1 input voltage range. The input/output isolation voltage up to 1500VDC ensures it meets the standard DC operating environment and EN62368 standard requirements.

The converters offer an ultra-wide operating temperature range of -40℃ to +105℃. A variety of protections with input UVP, OSC, OCP, OVP are included. Housed in a 2x1” common industrial standard package, this AM50E-VZ series is available with an optional heat sink with the standard PCB mount, chassis mount and DIN rail mount, offering flexibility to the designer of the end-product.

This series is designed for applications in industrial instrumentation, telecom, lighting equipment, information display and other industrial related equipment.

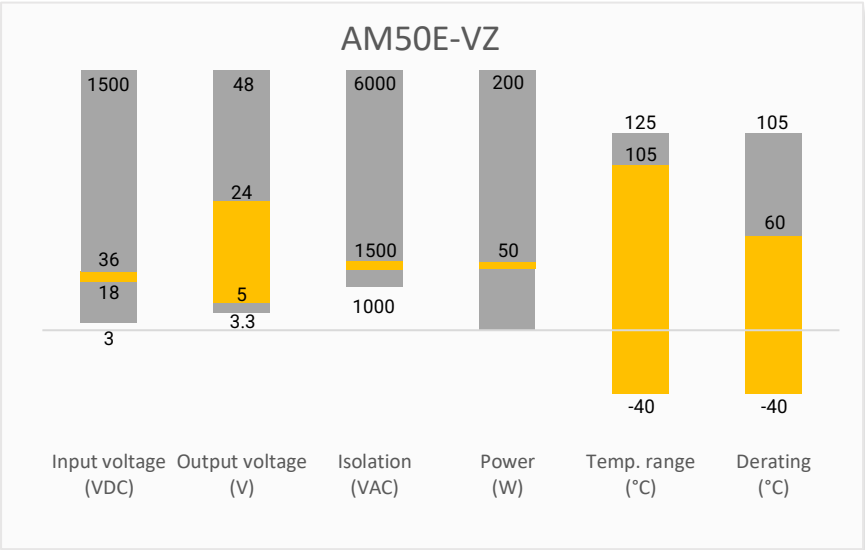
Features

- Operating Temp: -40 °C to +105 °C
- Isolation voltage: 1500VDC
- High efficiency: 91% typ.
- Regulated single output
- Output short circuit, over-current, over-voltage, input under-voltage protection

RoHS

3yr Warranty

Summary



Training

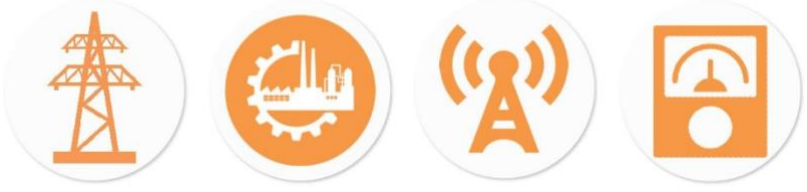
Product Training Video (click to open)

Press Release

Coming Soon!

Application Notes

Applications



Power Grid | Industrial | Telecom | Instrumentation

Models & Specifications

Single Output

Model	Input Voltage (VDC)	Output Voltage (VDC)	Input Current (mA)		Output Current (mA)		Maximum Capacitive Load (µF)	Efficiency (%) Full Load Typ.
			No Load typ.	Full Load Max.	Max	Min		
AM50E-2403SVZ	24 (18-36)	3.3	2	1580	10000	500	27000	90
AM50E-2405SVZ	24 (18-36)	5	3	2367	10000	500	18900	90
AM50E-2412SVZ	24 (18-36)	12	5	2341	4167	208	3700	91
AM50E-2415SVZ	24 (18-36)	15	11	2341	3333	167	2000	91
AM50E-2424SVZ	24 (18-36)	24	4	2341	2083	104	1000	91

Add suffix "-ST" for optional screw terminal bottom plate and input reverse polarity protection.
Add suffix "-STD" for optional DIN Rail screw terminal bottom plate and input reverse polarity protection.
Add suffix "-K" for optional heat sink.
Due to the input reverse polarity protection, models with "-ST" and "-STD" option will have their minimum input and start-up voltage increased by 1VDC and efficiency decreased by 2%.

Input Specification

Parameters	Conditions	Typical	Maximum	Units
Input voltage	Nominal 24V	18 - 36	40	VDC
Absolute maximum rating	1s max.	≥-0.7	50	VDC
Start-up voltage			18	VDC
Shut down voltage		13		VDC
Start-up time	Nominal input, Constant resistance load	10	120	ms
On/Off control	On	Control pin open or 3.5-12VDC		
	Off	Control pin short to –Vin or 0-1.2VDC		
	Idle current	6	12	mA
Input filter	Pi filter			

Isolation Specification

Parameters	Conditions	Typical	Maximum	Units
Tested isolation voltage	Input / output 60 sec, ≤ 1mA	≥1500		VDC
	Input, output / case 60 sec, ≤ 1mA	≥1000		VDC
Resistance	500VDC	≥100		MΩ
Capacitance	100KHz / 0.1V	2200		pF

Output Specification

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy	5% -100% load	±1	±3	%
Line regulation	LL – HL 100% load	±0.2	±0.5	%
Load regulation	5% - 100% load	±0.5	±1	%
Short circuit protection	Continues, Auto recovery			
Over current protection		140	200	% Io
Over voltage protection		140	160	% Vo
Transient Recovery Time	Nominal input, 25% load step change	250	500	µs
Transient Response Deviation	Nominal input, 25% load step change, 3.3/5V output	±3	±8	%
	Nominal input, 25% load step change, others	±3	±5	%

Ripple & Noise	20MHz bandwidth, 5% -100% load, 3.3/5V output	120	200	mV pk-pk
	20MHz bandwidth, 5% -100% load, 12/15V output	180	250	mV pk-pk
	20MHz bandwidth, 5% -100% load, 24V output	240	300	mV pk-pk
Trim			±10	%

General Specifications

Parameters	Conditions	Typical	Maximum	Units
Switching frequency*		300		KHz
Operating temperature	With derating	-40 to +105		°C
Storage temperature		-55 to +125		°C
Soldering temperature	1.5mm distance ≤ 10s		300	°C
Temperature coefficient	100% Load		± 0.03	%/ °C
Cooling	Free air convection			
Humidity	Non-condensing		95	% RH
Weight	Pin mountable	39		g
	With optional -ST mounting plate	62		g
	With optional -STD mounting plate	82		g
	With optional -K Pin mountable	47		g
	With optional -ST-K mounting plate	70		g
	With optional -STD-K mounting plate	90		g
Dimensions (L x W x H)	Pin mountable	2.00 x 1.00 x 0.46inches (50.80 x 25.40 x 11.80mm)		
	With optional -ST mounting plate	2.99 x 1.24 x 0.83inches (76.00 x 31.50 x 21.20mm)		
	With optional -STD mounting plate	2.99 x 1.24 x 1.02inches (76.00 x 31.50 x 25.80mm)		
	With optional -K Pin mountable	2.02 x 1.03 x 0.65inches (51.40 x 26.20 x 16.50mm)		
	With optional -ST-K mounting plate	2.99 x 1.24 x 1.00inches (76.00 x 31.50 x 25.30mm)		
	With optional -STD-K mounting plate	2.99 x 1.24 x 1.18inches (76.00 x 31.50 x 29.90mm)		
Case material	Aluminum Alloy			
Vibration	10 – 150Hz, 5G, 0.75mm, along all axels			
MTBF	> 1 000 000 hrs (MIL-HDBK -217F, t=+25°C)			

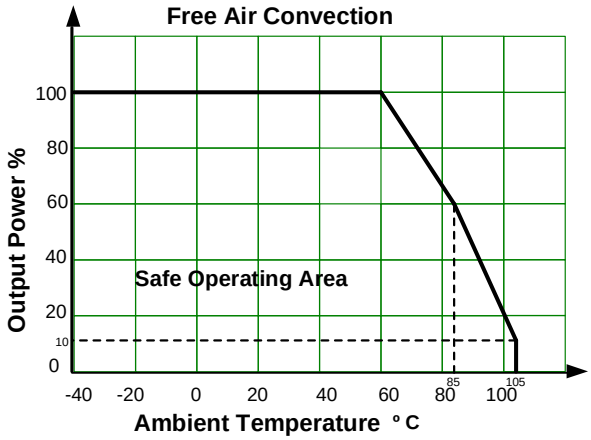
***Switching frequency reduces when load under 50%.**
NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.

Safety Specifications

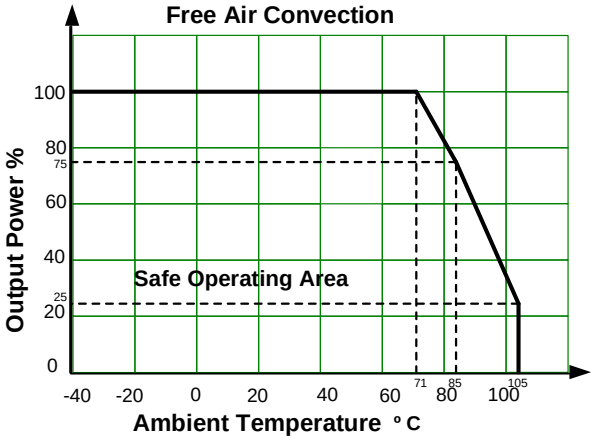
Parameters		
Standards	Design to meet IEC/EN/UL62368	
	EMI - Conducted and radiated emission	CISPR32/EN55032 Class B with the recommended EMC circuit part B
	Electrostatic Discharge Immunity	IEC/EN 61000-4-2, Contact ±4KV, Criteria B
	RF, Electromagnetic Field Immunity	IEC/EN 61000-4-3, 10V/m, Criteria A
	Electrical Fast Transient/Burst Immunity	IEC/EN 61000-4-4, ±2KV, Criteria B with the recommended EMC circuit part A
	Surge Immunity	IEC/EN 61000-4-5, L-L ±2KV, Criteria B with the recommended EMC circuit part A
	RF, Conducted Disturbance Immunity	IEC/EN 61000-4-6, 10Vr.m.s, Criteria A

Derating

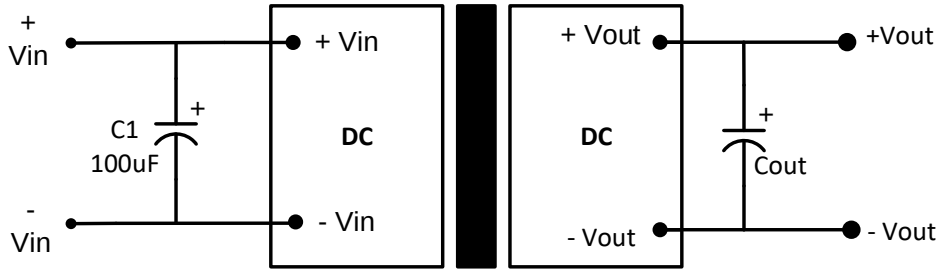
Without -K heatsink option
Free Air Convection



With -K heatsink option
Free Air Convection

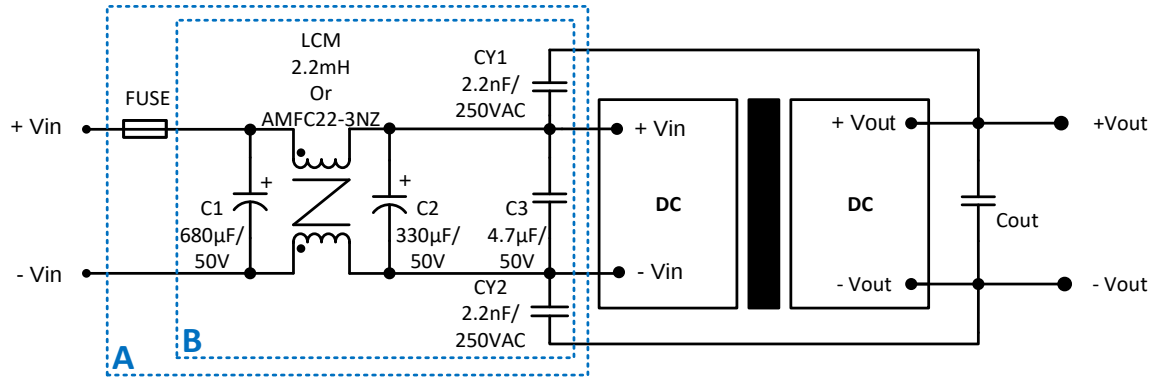


Typical application circuit



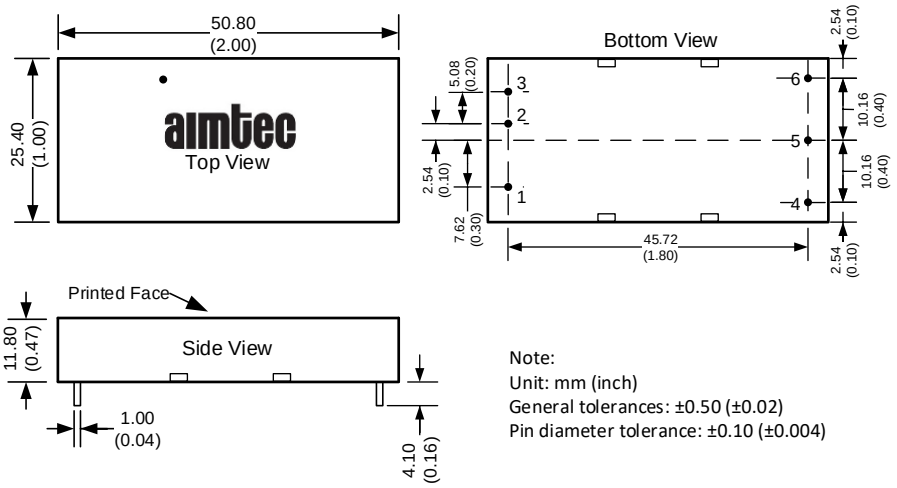
Vout	Cout
3.3/5	470µF
12/15	100µF
24	47µF

Recommended EMC circuit



Note: Part A for EMS, part B for EMI.

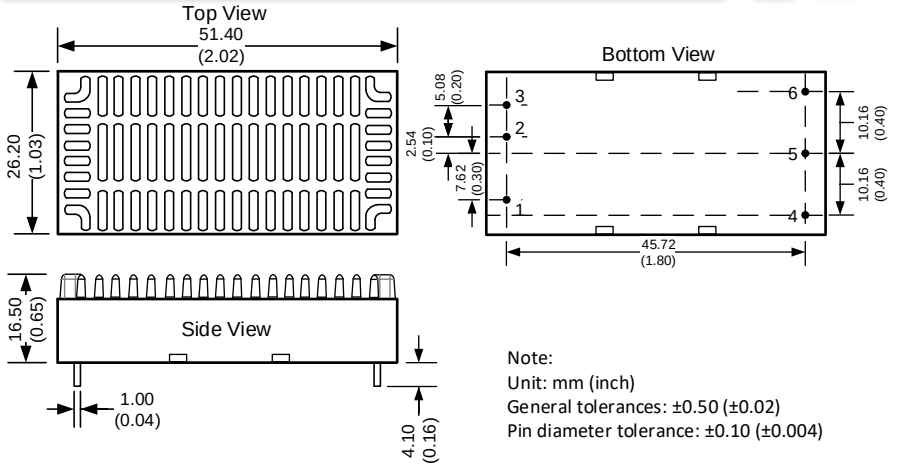
Dimension



Pin Out Specifications	
Pin	Single
1	On/Off Control
2	-Vin
3	+Vin
4	Trim
5	-Vout
6	+Vout

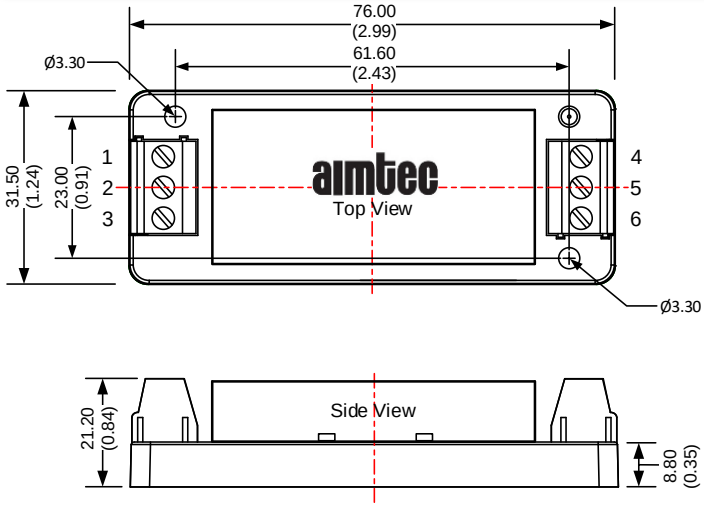
Note:
Unit: mm (inch)
General tolerances: ±0.50 (±0.02)
Pin diameter tolerance: ±0.10 (±0.004)

Dimension for models with -K option



Note:
Unit: mm (inch)
General tolerances: ±0.50 (±0.02)
Pin diameter tolerance: ±0.10 (±0.004)

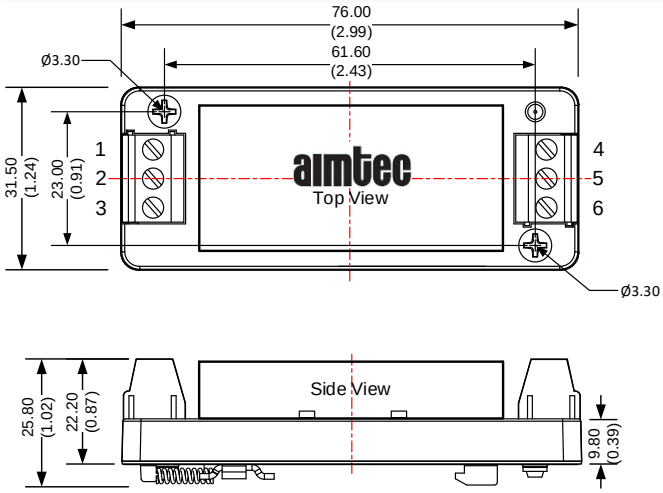
Dimension for models with -ST option



Pin Out Specifications	
Pin	Single
1	On/Off Control
2	-Vin
3	+Vin
4	Trim
5	-Vout
6	+Vout

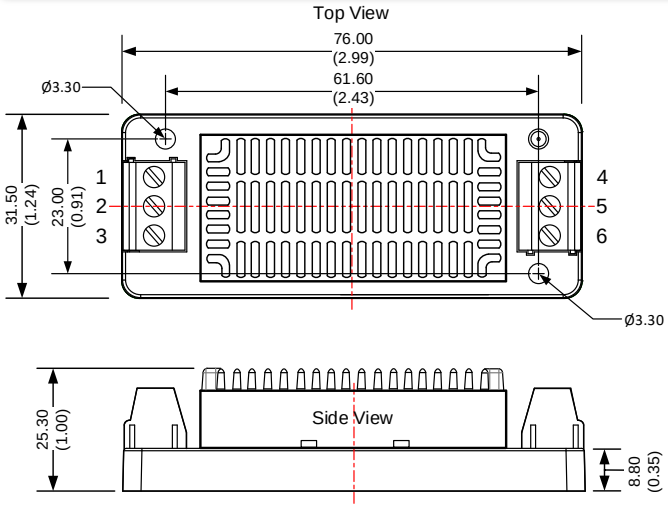
Note:
Unit: mm (inch)
Wire gauge: 24-12 AWG
Tightening torque: 0.4 N·m max.
General tolerances: ±1.00 (±0.04)

Dimension for models with -STD option



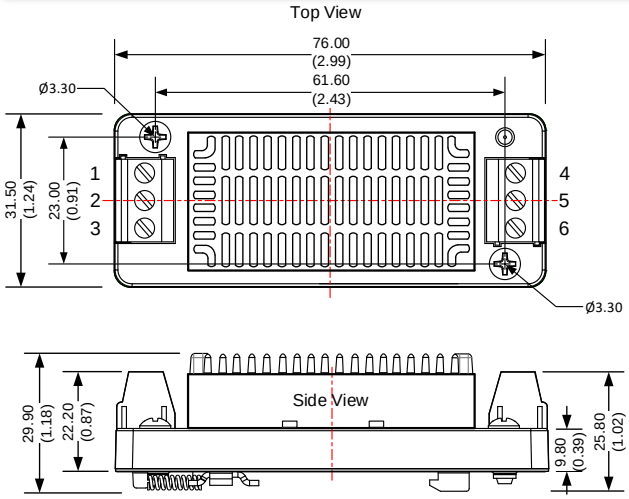
Note:
Unit: mm (inch)
Wire gauge: 24-12 AWG
Mounting rail: TS35
Tightening torque: 0.4 N·m max.
General tolerances: ±1.00 (±0.04)

Dimension for models with -K-ST option



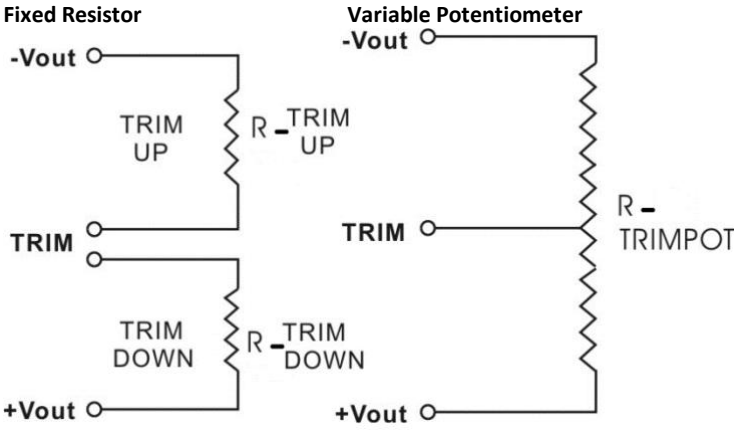
Note:
Unit: mm (inch)
Wire gauge: 24-12 AWG
Tightening torque: 0.4 N·m max.
General tolerances: ±1.00 (±0.04)

Dimension for models with -K-STD option



Note:
Unit: mm (inch)
Wire gauge: 24-12 AWG
Mounting rail: TS35
Tightening torque: 0.4 N·m max.
General tolerances: ±1.00 (±0.04)

Trim



Vout = 3.3V

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	3.267	3.234	3.201	3.168	3.135	3.102	3.069	3.036	3.003	2.97
Rt down (KΩ)	158.939	99.05	70.574	53.931	43.014	35.301	29.563	25.127	21.596	18.717
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	3.333	3.366	3.399	3.432	3.465	3.498	3.531	3.564	3.597	3.63
Rt up (KΩ)	965.882	148.2	78.287	52.247	38.646	30.29	24.634	20.553	17.468	15.055

Vout = 5V

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	4.95	4.9	4.85	4.8	4.75	4.7	4.65	4.6	4.55	4.5
Rt down (KΩ)	48.371	33.396	24.736	19.092	15.123	12.179	9.909	8.104	6.636	5.417
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	5.05	5.1	5.15	5.2	5.25	5.3	5.35	5.4	5.45	5.5
Rt up (KΩ)	-204.792	571.239	113.36	61.071	40.882	30.177	23.544	19.03	15.761	13.283

Vout = 12V

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	11.88	11.76	11.64	11.52	11.4	11.28	11.16	11.04	10.92	10.8
Rt down (KΩ)	875.815	414.921	265.816	192.084	148.104	118.891	98.077	82.495	70.393	60.721
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	12.12	12.24	12.36	12.48	12.6	12.72	12.84	12.96	13.08	13.2
Rt up (KΩ)	202.606	96.122	59.611	41.159	30.024	22.574	17.24	13.232	10.11	7.61

Vout = 15V

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	14.85	14.7	14.55	14.4	14.25	14.1	13.95	13.8	13.65	13.5
Rt down (KΩ)	1166.483	568.567	369.261	269.608	209.817	169.956	141.483	120.129	103.52	90.233
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	15.15	15.3	15.45	15.6	15.75	15.9	16.05	16.2	16.35	16.5
Rt up (KΩ)	224.167	104.583	64.722	44.792	32.833	24.861	19.167	14.896	11.574	8.917

Vout = 24V

Trim down %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	23.76	23.52	23.28	23.04	22.8	22.56	22.32	22.08	21.84	21.6
Rt down (KΩ)	1657.941	930.247	641.002	485.686	388.766	322.52	274.375	237.805	209.082	185.927
Trim up %	1	2	3	4	5	6	7	8	9	10
Vout (VDC)	24.24	24.48	24.72	24.96	25.2	25.44	25.68	25.92	26.16	26.4
Rt up (KΩ)	374.006	148.429	91.155	65.003	50.026	40.321	33.522	28.494	24.624	21.553

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