

EP 20-30W Series - Wide Input Range DC-DC Converter

Features

20~30W DIL PACKAGE
 INDUSTRY STANDARD PACKAGE
 9-18V,18-36V,36-75V,9-36V,18-75V
 WIDE INPUT RANGE
 REGULATED OUTPUT
 INPUT UVLO & OVLO
 HIGH EFFICIENCY
 UL 94V-0 PACKAGE MATERIAL
 CUSTOM SOLUTIONS AVAILABLE



Specification

Output Specification

Voltage Set-point Accuracy	+/-2% max.
Temperature Coefficient	+/-0.05%/°C
Ripple & Noise(20MHz BW) ¹	150mVp-p max.
Line Regulation ²	+/-0.3% max.
Load Regulation ³	+/-0.5% max.
Minimum Load ⁴	10% of Full Load
Short Circuit Protection	Continuous
Short Circuit Restart	Automatic
Over Load Protection	130%~180%
Transient Response ⁵	500uS max.
External Trim Adj. Range	Vout:5V +/-10%
External Trim Adj. Range	Vout:12V,15V -20%~+10%

Input Specification

Input Voltage Range	2:1 or 4:1 Input Range
Input Filter	Pi Network
Protection	Fuse Recommended
OVLO(Over Voltage Lockout)	See Page 6
UVLO(Under Voltage Lockout)	See Page 6
OVLO & UVLO Circuit Restart	Automatic
Operating Temperature (20W)	-40°C to +75°C
Operating Temperature (30W)	-40°C to +55°C
Case Temperature	+100°C max.
Storage Temperature	-55°C to +125°C
Humidity	95% max.
Cooling	Free-Air Convection

Environmental Specifications

General Specifications

Efficiency	88% typ.
Isolation Voltage ⁶	1500VDC min.
Isolation Resistance	109 ohms min.
Isolation Capacitance	3000pF max.
Switching Frequency	300 KHz typ.
MTBF ⁷	>300,000 Hours
Weight	31.2g typ.
Case Material	Six-Side Shielded Case
Case Size	50.8mm*25.4mm*11.2mm
Radiated Emissions	EN55022 Class A

ALL SPECIFICATIONS TYPICAL AT NOMINAL LINE, FULL LOAD, AND 25 °C UNLESS OTHERWISE NOTED.

¹ Measured with 1uF ceramic capacitor connect to the output pins.

² High Line to Low Line

³ Load Regulation is for output load current change from 10% to 100%.

⁴ EP20-30Watt Series Minimum load 20% of full load.

⁵ 25% Step Load Change.

⁶ For 10 seconds

⁷ MIL-HDBK-217F @25°C, Ground Benign.

Selection Guide 2:1 20W Output

MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT ⁸ CURRENT(mA)		EFF (%) ⁹	CAPACITOR LOAD (Max)	PACKAGE
				FULL LOAD	NO LOAD			
EP9-18-3.3S5000	9-18	3.3	5000	1617	65	85	1000uF	
EP9-18-05S4000	9-18	5	4000	1893	65	88	1000uF	
EP9-18-12S1666	9-18	12	1666	1893	20	88	220uF	
EP9-18-15S1333	9-18	15	1333	1872	20	89	100uF	
EP9-18-12D833	9-18	+/-12	+/-833	1893	20	88	+/-100uF	
EP9-18-15D667	9-18	+/-15	+/-667	1872	20	89	+/-47uF	
EP18-36-3.3S5000	18-36	3.3	5000	809	45	85	1000uF	
EP18-36-05S4000	18-36	5	4000	947	45	88	1000uF	
EP18-36-12S1666	18-36	12	1666	936	20	89	220uF	
EP18-36-15S1333	18-36	15	1333	926	20	90	100uF	A
EP18-36-12D833	18-36	+/-12	+/-833	936	20	89	+/-100uF	
EP18-36-15D667	18-36	+/-15	+/-667	926	20	89	+/-47uF	
EP36-75-3.3S5000	36-75	3.3	5000	404	40	85	1000uF	
EP36-75-05S4000	36-75	5	4000	473	40	88	1000uF	
EP36-75-12S1666	36-75	12	1666	473	10	88	220uF	
EP36-75-15S1333	36-75	15	1333	468	10	89	100uF	
EP36-75-12D833	36-75	+/-12	+/-833	473	10	88	+/-100uF	
EP36-75-15D667	36-75	+/-15	+/-667	473	10	88	+/-47uF	

Selection Guide 4:1 20W Output

MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT ¹⁰ CURRENT (mA)		EFF (%) ¹¹	CAPACITOR LOAD (Max)	PACKAGE
				FULL LOAD	NO LOAD			
EP9-36-3.3S5000	9-36	3.3	5000	1617	80	85	1000uF	
EP9-36-05S4000	9-36	5	4000	1915	80	87	1000uF	
EP9-36-12S1666	9-36	12	1666	1914	20	87	220uF	
EP9-36-15S1333	9-36	15	1333	1915	20	87	100uF	
EP18-75-3.3S5000	18-75	3.3	5000	808	60	85	1000uF	A
EP18-75-05S4000	18-75	5	4000	957	60	87	1000uF	
EP18-75-12S1666	18-75	12	1666	957	20	87	220uF	
EP18-75-15S1333	18-75	15	1333	957	20	87	100uF	

Note: Other input to output voltages may be available. Please contact factory.

⁸ NOMINAL INPUT VOLTAGE.

⁹ NOMINAL INPUT VOLTAGE, FULL LOAD.

¹⁰ NOMINAL INPUT VOLTAGE.

¹¹ NOMINAL INPUT VOLTAGE, FULL LOAD.

Selection Guide 2:1 30W Output

MODEL NUMBER	INPUT VOLTAGE (VDC)	OUTPUT VOLTAGE (VDC)	OUTPUT CURRENT (mA)	INPUT ¹²			CAPACITOR LOAD (Max)	PACKAGE
				CURRENT(mA)		EFF (%) ¹³		
				FULL LOAD	NO LOAD			
EP9-18-3.3S7000	9-18	3.3	7000	2292	180	85	1000uF	
EP9-18-05S6000	9-18	5	6000	2841	165	88	1000uF	
EP9-18-12S2500	9-18	12	2500	2793	140	89.5	220uF	
EP9-18-15S2000	9-18	15	2000	2793	120	89.5	100uF	
EP18-75-3.3S7000	18-36	3.3	7000	1119	120	86	1000uF	
EP18-36-05S6000	18-36	5	6000	1412	95	88.5	1000uF	
EP18-36-12S2500	18-36	12	2500	1404	40	89	220uF	B
EP18-36-15S2000	18-36	15	2000	1389	40	90	100uF	
EP36-75-3.3S7000	36-75	3.3	7000	566	85	85	1000uF	
EP36-75-05S6000	36-75	5	6000	710	60	88	1000uF	
EP36-75-12S2500	36-75	12	2500	702	55	89	220uF	
EP36-75-15S2000	36-75	15	2000	694	30	90	100uF	

Part Numbers Structure

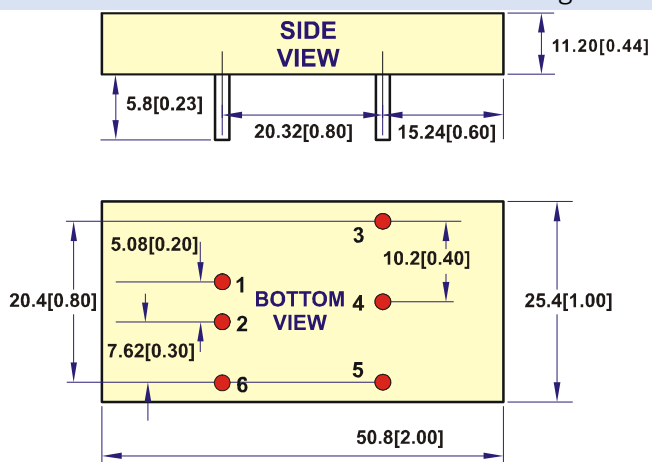
Model Name Difference
 EPx1-x2-v-x3 EP=Series Name
 x1=12V (9~18V ; 9~36V Input voltage)
 24V (18~36V ; 18~75V Input voltage)
 48V (36~75V Input voltage)
 x2=Output voltage(3.3V ; 5V ; 12V ; 15V)
 v=Type of output voltage (S=Single output ; D=Dual output)
 x3=Output Current

¹² NOMINAL INPUT VOLTAGE.

¹³ NOMINAL INPUT VOLTAGE, FULL LOAD.

Mechanical Dimensions

Package "A"

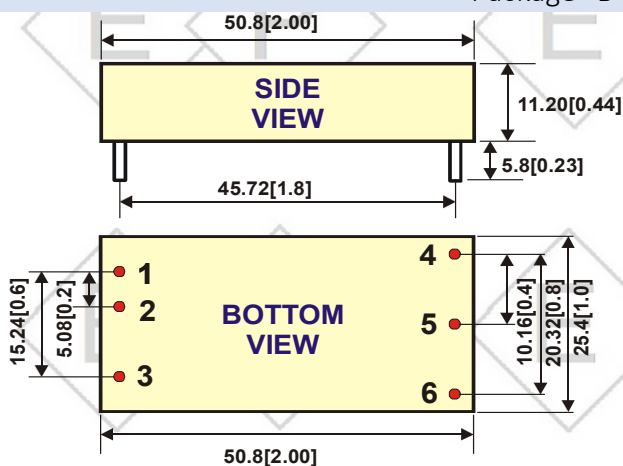


PIN	SINGLE	DUAL
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	Trim	Common
5	-Vout	-Vout
6	Remote On/Off	Remote On/Off

NOTE:
 All dimensions are in millimeters [inches]
 Pin Size is Tolerance 1.0Φ ±0.10mm
 Tolerance .X or .XX= ±0.80mm

All dimensions are in millimeters[inches]

Package "B"



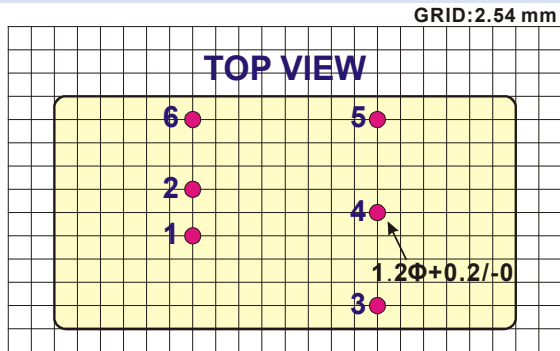
PIN	SINGLE
1	+Vin
2	-Vin
3	Remote On/Off
4	+Vout
5	-Vout
6	Trim

NOTE:
 All dimensions are in millimeters [inches]
 Pin Size is Tolerance 1.0Φ ±0.10mm
 Tolerance .X or .XX= ±0.80mm

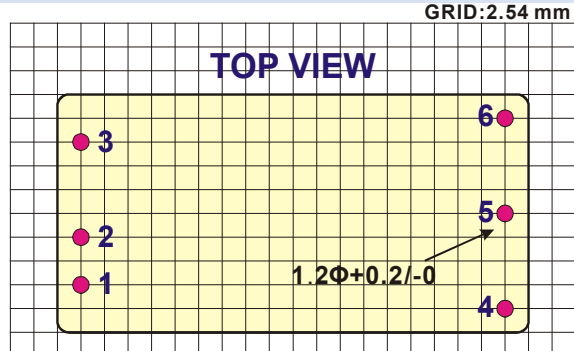
All dimensions are in millimeters [inches]

Recommended Footprint Details

Package "A"



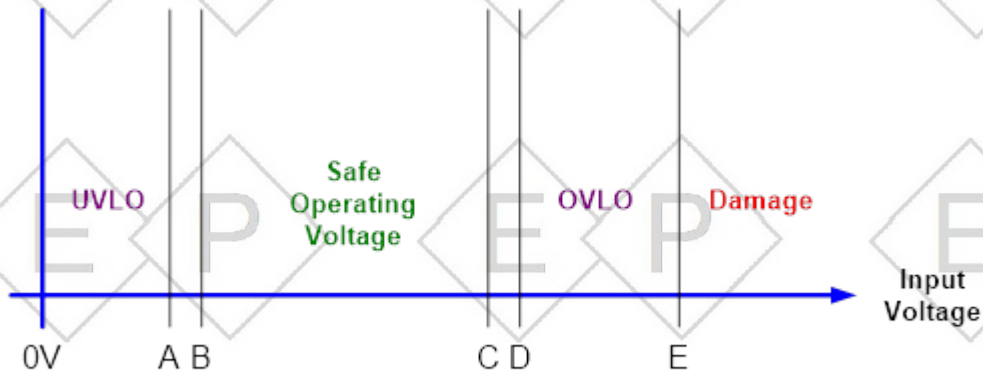
Package "B"



Remote On/Off Control

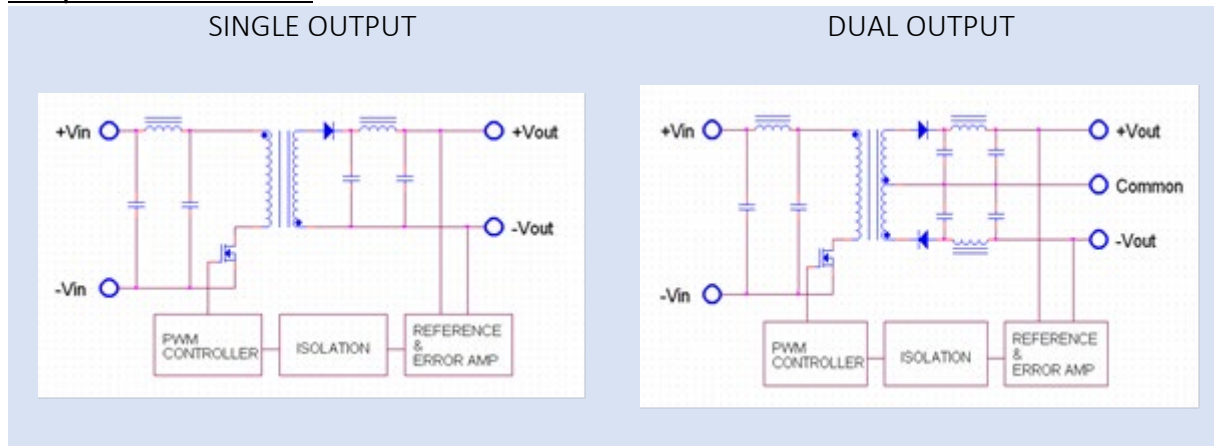
Control Input	Package A : PIN6	Package B : PIN3	Control Common	PIN2
Control Voltage	Converter Shutdown Idle Current			10mA
ON	>+2.5VDC or Open Circuit			CMOS or Open
OFF	<+0.8VDC or Jumper to PIN2			Collector TTL
Logic Compatibility				

Input Operating Voltage

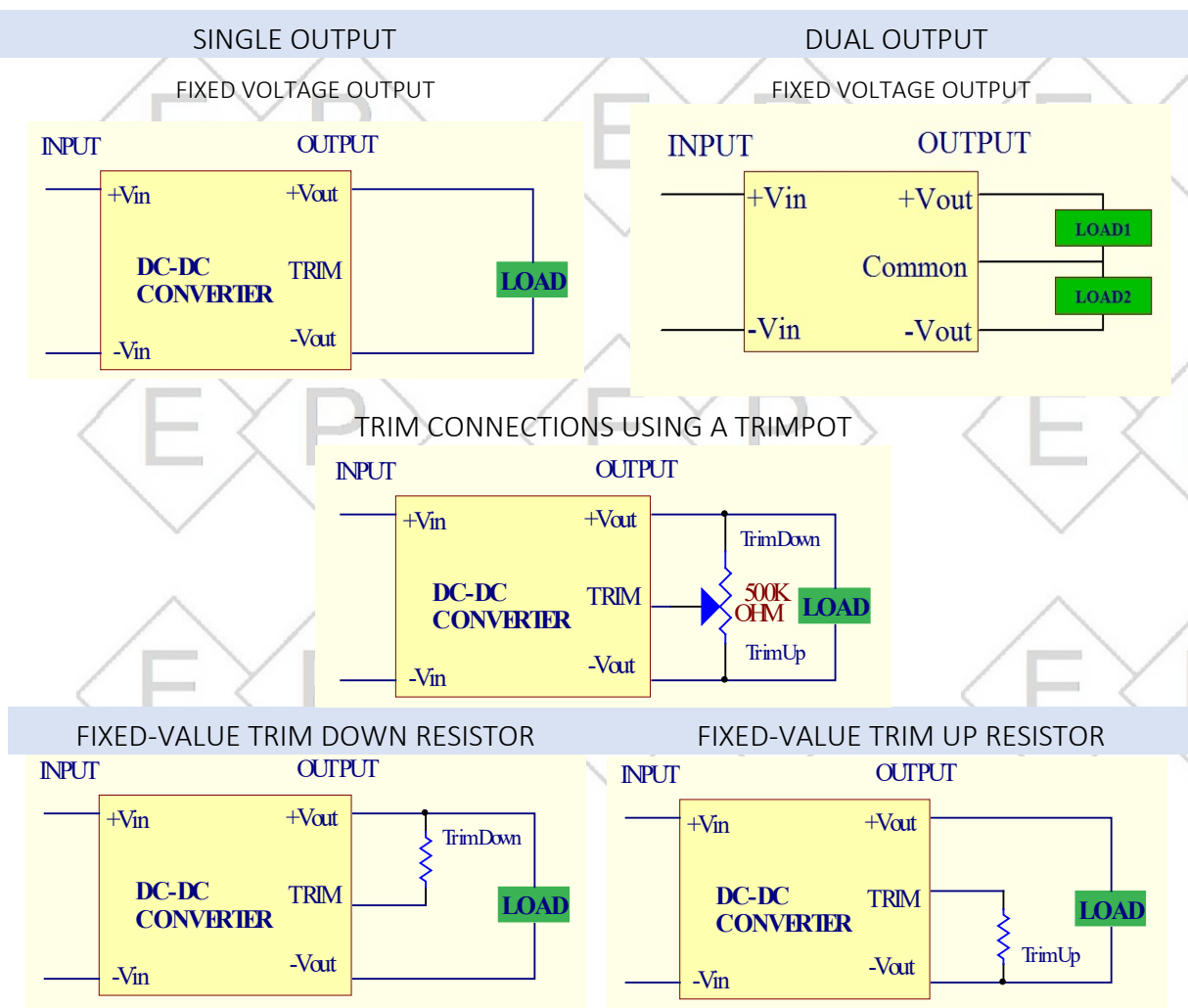


	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
EP9-18-*****	8V typ.	9V	18V	20V typ.	25V
EP9-36*****	8V typ.	9V	36V	40V typ.	50V
EP18-36*****	16V typ.	18V	36V	40V typ.	50V
EP18-75*****	16V typ.	18V	75V	80V typ.	100V
EP36-75*****	32V typ.	36V	75V	80V typ.	100V

Simplified Schematic



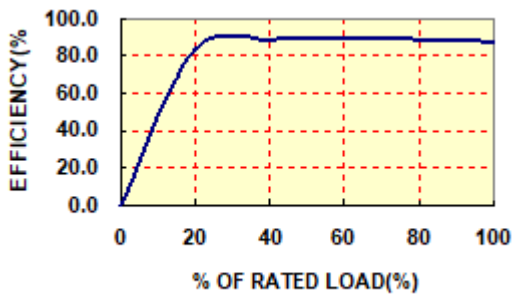
Typical Applications



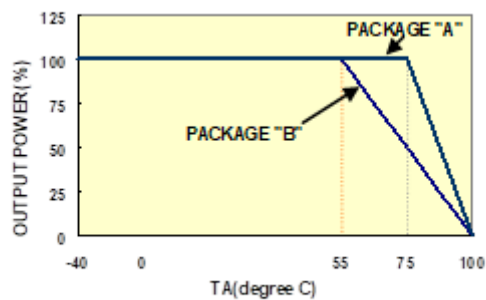
Typical Performance Curves

Specifications typical at Ta=25 °C, nominal input voltage, rated output current unless otherwise specified.

OUTPUT LOAD VS EFFICIENCY



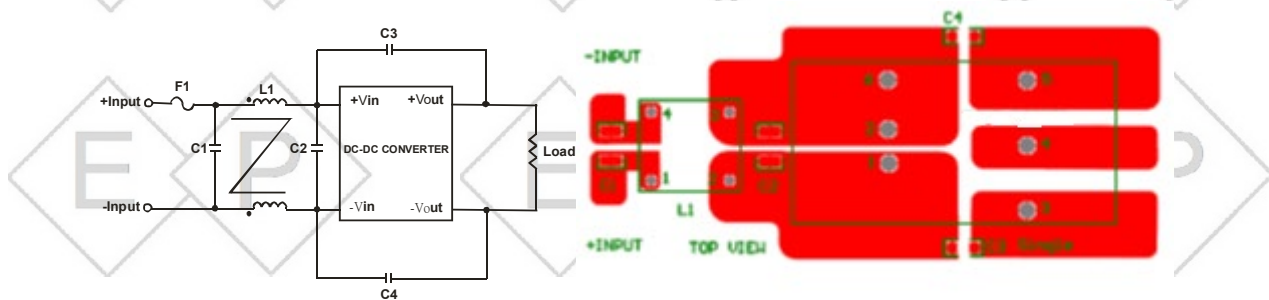
TEMPERATURE DERATING



Recommended Filter For EN55022 Class B

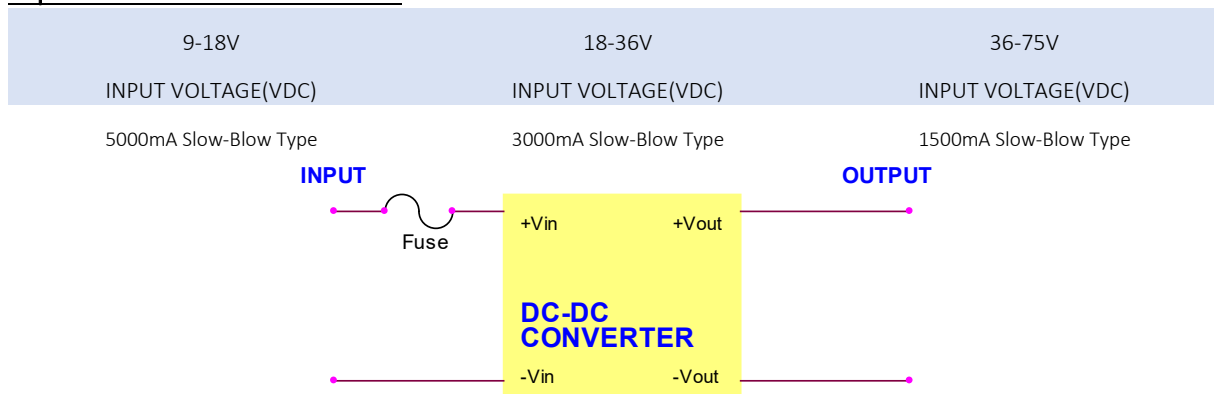
The components used in the above figure, together with the manufacturer's part numbers for these components, are as follows:

	C1	C2	C3	C4	L1
EP9-18*****	3.3uF/50V 1812 MLCC	3.3uF/50V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke
EP18-36*****	3.3uF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke
EP36-75*****	1.5uF/100V 1812 MLCC	1.5uF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325uH Common Choke



RECOMMENDED EN55022 CLASS B FILTER CIRCUIT LAYOUT

Input Fuse Selection Guide



Note: Certain applications may require the installation of external fuse in front of the input.

EP 20-30 W Series Application Notes:

EXTERNAL CAPACITANCE REQUIREMENTS:

No external capacitance is required for operation of the EP 20-30W series.

External output capacitance is not required for operation; however it is recommended that 10uF tantalum and 0.1uF ceramic capacitance be selected for reduced system noise.

We Can Offer EMC-Filter According To EN55011/22 Class B.

Negative Outputs:

A negative output voltage may be obtained by connecting the +OUT to circuit ground and connecting -OUT as the negative output.

Remote ON/OFF:

The remote ON/OFF pin may be left floating if this function is not use. It is recommended to drive this pin with an open collector arrangement or a relay contact. When the ON/OFF pin is pulled low with respect to the -VIN, the converter is placed in a low power drain state.

Output TRIM:

The TRIM pin may be used to adjust the output +10% ~ -20% from the nominal setting .this function allows adjustment for voltage drops in the system wiring. If the TRIM function is not required the pin may be left floating.

Spezifikationen können sich ohne Vorankündigung ändern.

Für etwaige fehlerhafte Angaben oder unvollständige Bezeichnungen kann keine Haftung übernommen werden.