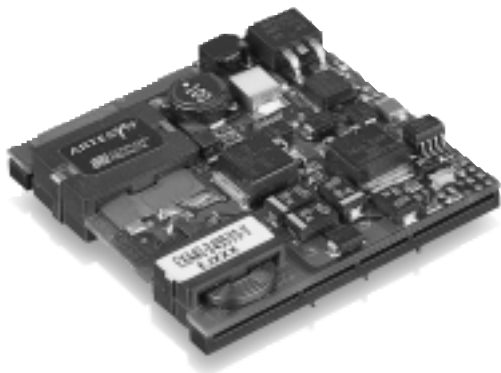


## EXA40 SERIES

Single output



[ 2 YEAR WARRANTY ]

- **High efficiency topology, 91% typical at 5V**
- **Approved to EN60950, UL1950, CSA C22.2 No. 234/950**
- **Operating ambient temperature of -40°C to +70°C (natural convection)**
- **Complies with ETS 300 019-1-3/2-3**
- **Complies with ETS 300 132-2 input voltage and current requirements**
- **Fully compliant with ETS 300 386-1**

The EXA40 Series, comprising 8 different models is targeted specifically at the telecommunications, industrial electronics, mobile Telecommunications and distributed power markets. The series offers two wide input voltage ranges of 18-36VDC and 36-75VDC. Typical efficiencies are 91% for the 5V output, 88% for the 3.3V, 86% for the 2.75V and 84% for the 1.8V. The series has been designed primarily for Telecommunications applications and complies with ETS 300 386-1 immunity and emission standards for high priority of service class. In addition the series complies with ETS 300 019-1-3 environmental standards (all classes) including shock, vibration, humidity and thermal performance. A high level of reliability has been designed into all models through the extensive use of conservative derating criteria. Remote enable and overtemperature shutdown are included as standard while true latching OVP is available as an option.

## SPECIFICATION All specifications are typical at nominal input, full load at 25°C unless otherwise stated

OUTPUT SPECIFICATIONS		MINIMUM	TYPICAL	MAXIMUM
Voltage adjustability	2V75, 3V3, 5V outputs 1V8 output	±10% +12/-17%	±11% +13/-18%	±12% +14/-19%
Line regulation	Low line to high line		+0.05%	+0.4%
Load regulation	Full load to no load		+0.20%	+0.4%
Output current range		0A		8A
Ripple and noise	20MHz bandwidth 20MHz bandwidth		50mV pk-pk 10mV rms	100mV pk-pk 20mV rms
Temperature coefficient	See Figure No. 4		±0.01%/°C	±0.02%/°C
OVP transient (See Note 6)	5V output 3V3/2V75 outputs 1V8 output		6.8V TVS 4.1V TVS 4.1V TVS	
OVP latching (See Notes 1,3) (optional)	5V output 3V3 output 2V75 output 1V8 output	6.0V 4.0V 3.4V 2.4V	6.2V 4.2V 3.6V 2.5V	6.4V 4.4V 3.8V 2.6V
Short circuit protection (Note 5)	Continuous			
Short circuit current (Note 5)	Rshort <20mΩ		10A rms	12A rms
Transient response Peak deviation Settling time	50% to 75% and back To 1.0%, no external cap		100mV 250μs	150mV 400μs
Current limit	Low line to high line	100%	140%	180%
Voltage accuracy			±1.0%	±1.5%
INPUT SPECIFICATIONS		MINIMUM	TYPICAL	MAXIMUM
Input voltage range	24Vin nominal 48Vin nominal	18VDC 36VDC	24VDC 48VDC	36VDC 75VDC
Input current	No load Remote OFF, UVLO		50mA 2.5mA	100mA 4mA
Inrush current	ETS 300 132-2			
UVLO turn ON voltage (Note 4)	All inputs	88%	94%	100%
UVLO turn OFF voltage (Note 4)	All inputs	77%	86%	94%
Start-up time	Nominal line		50ms	100ms

# 40 Watt High efficiency DC/DC converters

INPUT SPECIFICATIONS	MINIMUM	TYPICAL	MAXIMUM
Remote ON/OFF	Active low, control to -Vin, open collector input Open circuit voltage		
ON	1.0V	4.5V	5.5V
OFF		2.5V	
Remote ON/OFF source current		-70µA	-100µA

INPUT VOLTAGE	OUTPUT VOLTAGE <sup>(2)</sup>	NOMINAL OUTPUT VOLTAGE	OUTPUT CURRENT (MAX.)	TYPICAL EFFICIENCY	MODEL NUMBER <sup>(1)</sup>
18-36VDC	1.5 to 2.0V	1.8V	8.0A	84%	EXA40-24S1V8
18-36VDC	2.5 to 3.0V	2.75A	8.0A	87%	EXA40-24S2V75
18-36VDC	3.0 to 3.6V	3.3V	8.0A	88%	EXA40-24S3V3
18-36VDC	4.5 to 5.5V	5.0V	8.0A	90%	EXA40-24S05
36-75VDC	1.5 to 2.0V	1.8V	8.0A	84%	EXA40-48S1V8
36-75VDC	2.5 to 3.0V	2.75V	8.0A	86%	EXA40-48S2V75
36-75VDC	3.0 to 3.6V	3.3V	8.0A	88%	EXA40-48S3V3
36-75VDC	4.5 to 5.5V	5.0V	8.0A	91%	EXA40-48S05

## ELECTROMAGNETIC COMPATIBILITY SPECIFICATIONS

ETS 300 386-1 table 5		
Conducted emissions (See Design Note 101)	EN55022, internal filter and 4.7µF film cap	Level A
	EN55022, external filter,	Level B
Radiated emissions	EN55022 (See Design Note)	Level B
ESD air	EN61000-4-2, level 3	
ESD contact	EN61000-4-2, level 4	
Surge (500V)	EN61000-4-5, level 3,4	
Fast transients	EN61000-4-4, level 3,4	
Radiated immunity	EN61000-4-3, level 3	
Conducted immunity	EN61000-4-6, level 3	

## GENERAL SPECIFICATIONS

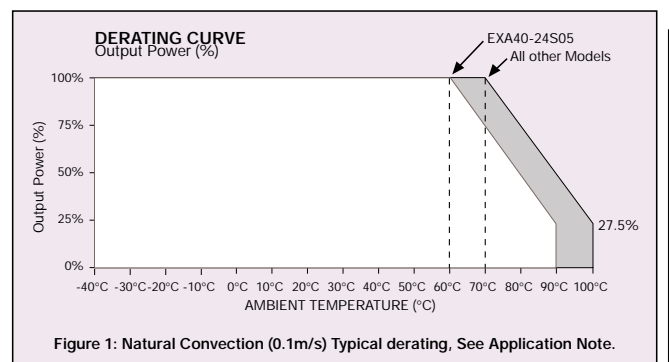
Efficiency	See table	
Basic insulation	Input/output	1500VDC
Input fuse 24V	(See Note 8)	3.5A slow blow
Input fuse 48V		2.0A slow blow
Switching frequency	Fixed	300kHz
Approvals and standards (See Notes 1,7,8,9)	(See Notes 1,7,8,9)	EN60950 Bi-national UL1950 CSA C22.2 No. 234/950
Weight	25g (0.88 oz)	
MTBF, See Design Note	MIL-HDBK-217	250,000 hours

## ENVIRONMENTAL SPECIFICATIONS

Thermal performance	Operating ambient temperature	-40°C to +70°C, See curves
	Non-operating	-55°C to +105°C
Over temperature shutdown	Loss of Function Self-Recovery (LFS)	75°C to +85°C
ETS 300 019-2-3	Classes T3.1 to T3.5	
Air temperature	Low: IEC 68-2-1	-40°C
	High: IEC 68-2-2	+70°C
	Change: IEC 68-2-1	-40°C to +70°C
Relative humidity	IEC 68-2-56	10% to 100% RH
	IEC 68-2-30	Condensation
Vibration, Class 3M5	IEC68-2-6	2 to 9 Hz, 3mm disp. 9 to 200Hz 1g
	MIL-STD-202F	Method 204 cond. A
Shock, Class 3M5	IEC-68-2-29	
	MIL-STD-202F	Method 213B cond. A

## Notes

- 1 True latching OVP is available as an option. Please add the suffix '-V' to the model number, e.g. EXA40-24S1V8-V. Additional alphanumeric suffixes may be added to indicate minor modifications not affecting the safety approvals.
- 2 Guaranteed minimum output voltage range.
- 3 Latching OVP response time is 1ms (typical). OVP latch is reset by toggling remote ON/OFF or by recycling the input voltage.
- 4 Figures are percentage of minimum input voltage.
- 5 Rshort ≤20mΩ.
- 6 TVS spec : 6V8 @ 10mA, 10V5 @ 57A  
4V1 @ 1mA, 7V3 @ 50A
- 7 Maximum continuous output power.  
40 Watts for S05 models  
26.4 Watts for S3V3 models  
22 Watts for S2V75 models  
14.4 Watts for S1V8 models.
- 8 User must provide recommended fuses in order to comply with safety approvals.
- 9 Maximum temperature on components Q100, Q102 and Q103 not to exceed 120°C. See Application Note for details.

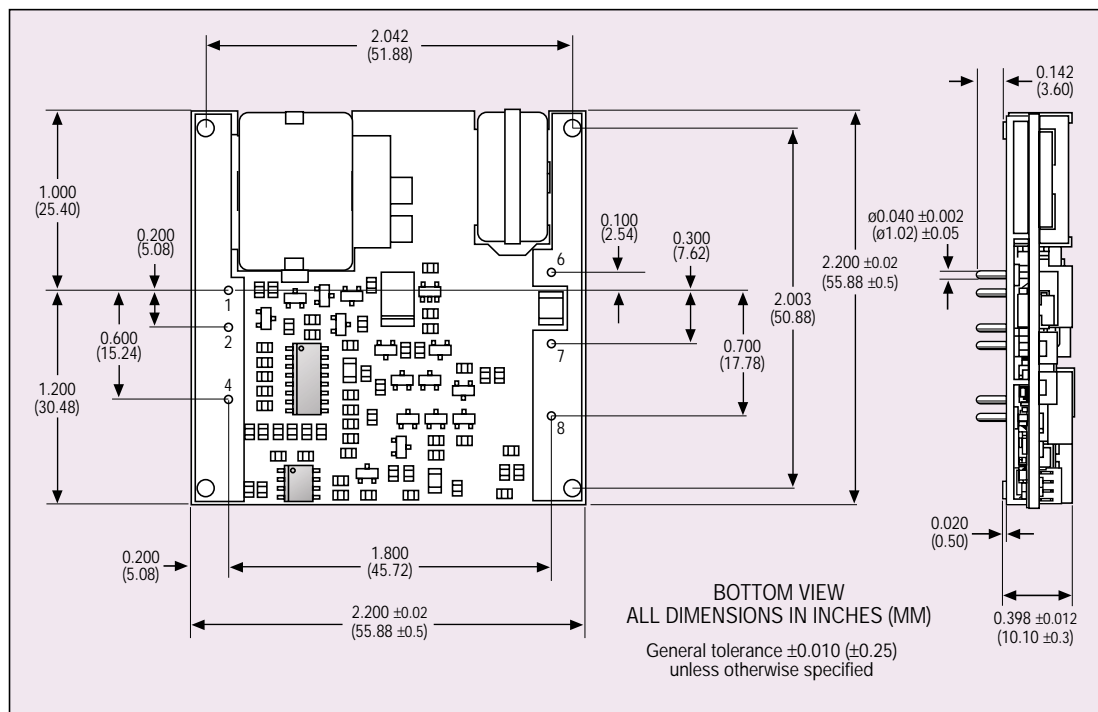


**CAUTION: Hazardous internal voltages and high temperatures. Ensure that unit is not user accessible.**

## EXTERNAL OUTPUT TRIMMING

Single output models can be externally trimmed by  $\pm 10\%$  using either method shown below.

The left diagram shows a trimmer potentiometer (RTD) connected between pins 6, 8, and 7. Pin 6 is connected to the top wiper, pin 8 to the bottom wiper, and pin 7 to the center wiper. The right diagram shows a 10K trimmer potentiometer connected between pins 6, 8, and 7. Pin 6 is connected to the top wiper, pin 8 to the bottom wiper, and pin 7 to the center wiper.



# 40 Watt High efficiency DC/DC converters

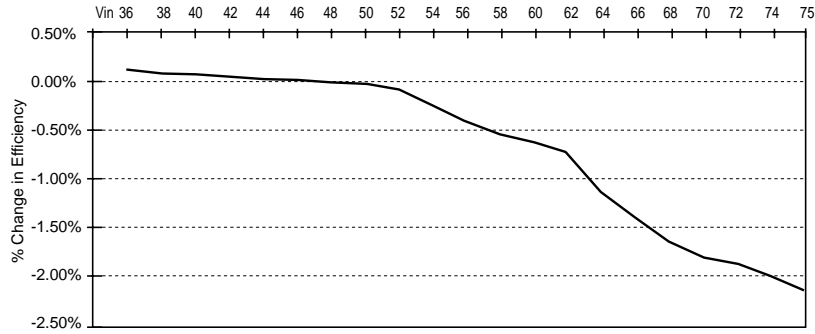


Figure 2: Efficiency Change Vs. Input Voltage

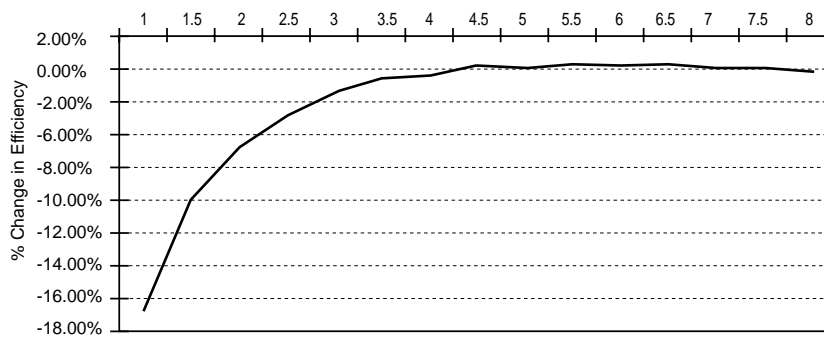


Figure 3: Efficiency Change Vs. Load Current

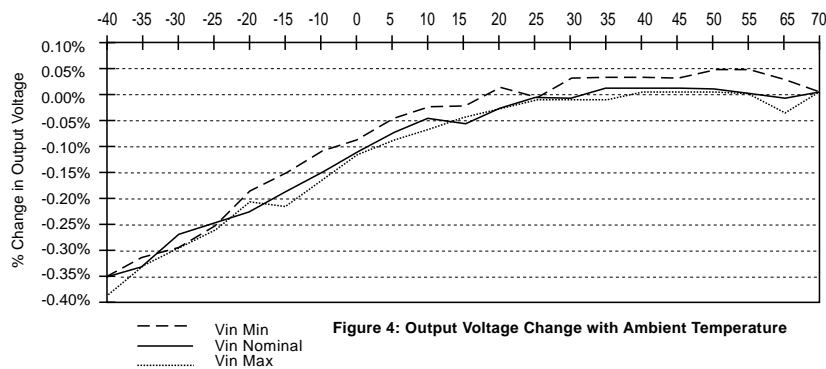


Figure 4: Output Voltage Change with Ambient Temperature

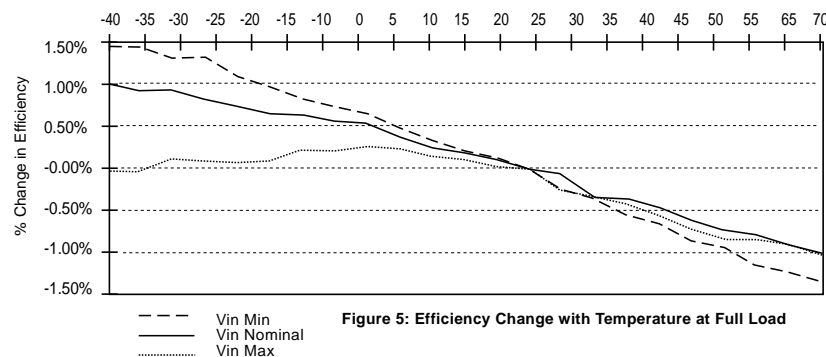


Figure 5: Efficiency Change with Temperature at Full Load