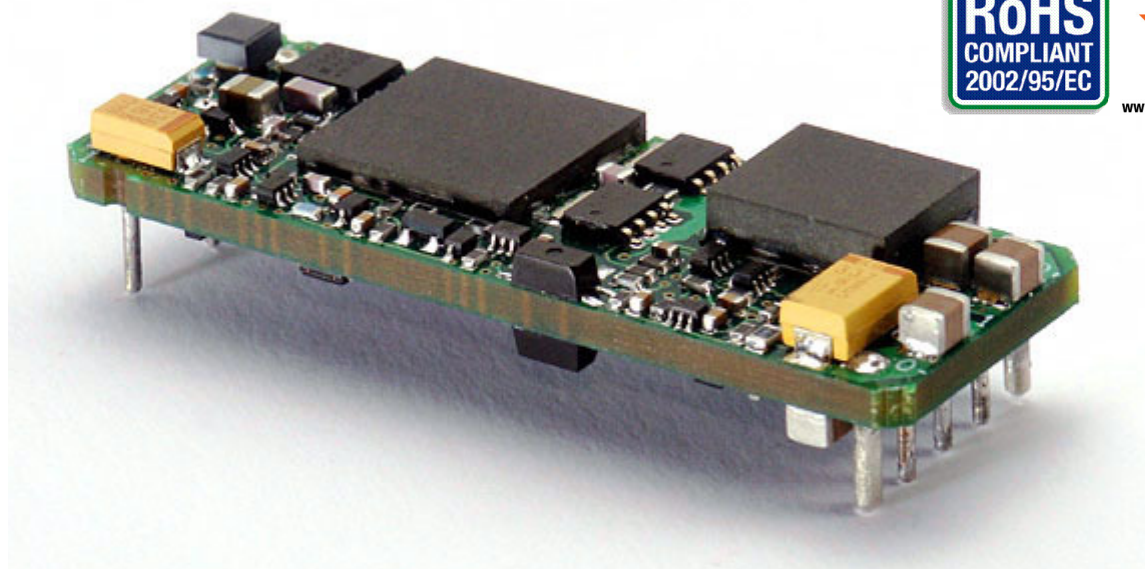


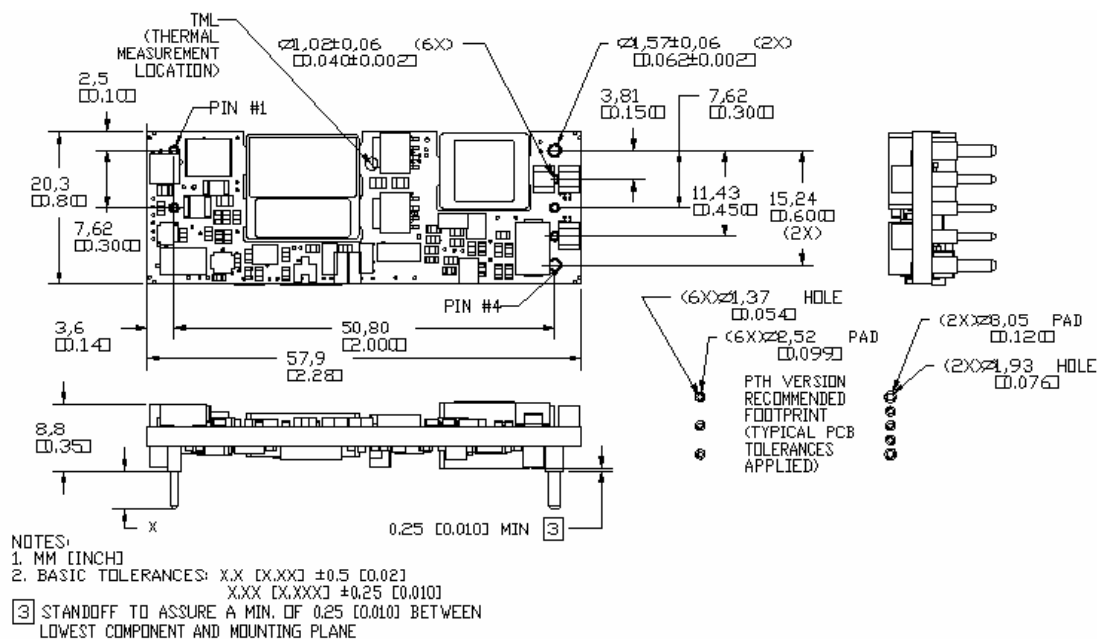


For full details go to
www.cd4power.com/rohs

Model		3.3V	Units
Parameter			
Output Voltage Setpoint		3.25 – 3.35	Vdc
Line/Load Regulation	Max	0.1% / 0.2%	% Vo
Output total regulation		3.2 - 3.4	Vdc
Output adjust (note 4)		90-110	%Vo,nom
Remote-sense Comp.		10%	V
Output Ripple & Noise (note 2)	Max	100	mVp-p
Output Current		0 - 15	A
Efficiency (48V, Full load, 25C)	Typ	90%	%
External Capacitance		1,000 - 10,000	μF
Transient Response (typ) (note 3)	ΔVo	165	mV
25% step, 1A/μs	Ts	400	μs
Over-voltage trip point (latching)		4.0-4.6	V
Over-current trip point (non-latching)	Typ	20	A

All specifications, waveforms, charts at Ta=25C, Vin=48V, unless otherwise specified

Parameter	Conditions		Min.	Typ.	Max.	Units
Input	Input Voltage (Vin)		36	48	75	Vdc
	Reflected Ripple Current	See note (1)		10		'mA p-p
	Inrush Transient				0.2	A ² s
	Input Voltage Transient	100mS 10% duty cycle			100	V
	Undervoltage Lockout	Turn-on	32		35	Vdc
	(non-latching)	Turn-off	31		34	Vdc
	Over-voltage lockout (non-latching)	Turn-off	77		81	Vdc
Isolation	Input-Output		1500			Vdc
	Resistance; input-output		10			Mohm
Temperature	Operating Ambient		-40		90	°C
	Storage		-40		125	°C
Protection	Over-Temperature (non-latching)	Measured on PCB		130		°C
Physical Information	Dimensions (max)	2.30"L x 0.82" W x 0.37"H (58.4 x 20.8 x 9.3 mm)				
MTBF	Calculated at 40C ambient, (Bellcore)		1,000,000 Hrs		EHS15/20 Series	
	Demonstrated at 40C ambient with 90% confidence:		2,800,000 Hrs			
Safety	Complies with IEC/EN/CSA/UL 60950, provides basic insulation, input to output. c-UL-us (US and Canada) recognized, TUV certified (Bauart).					

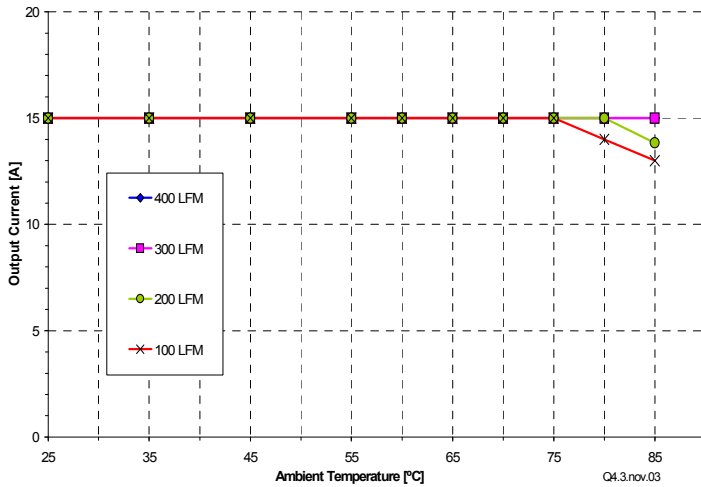


Pin Assignments

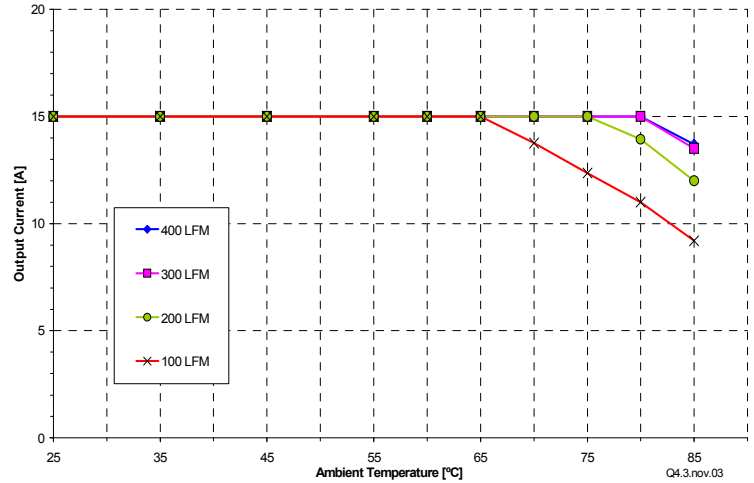
Pin #	Description	Pin #	Description	Pin #	Description
1	Vin (+)	4	Vout(-)	7	Sense +
2	Enable	5	Sense -	8	Vo (+)
3	Vin(-)	6	Vo adj		

EHS15 – 3.3V Model

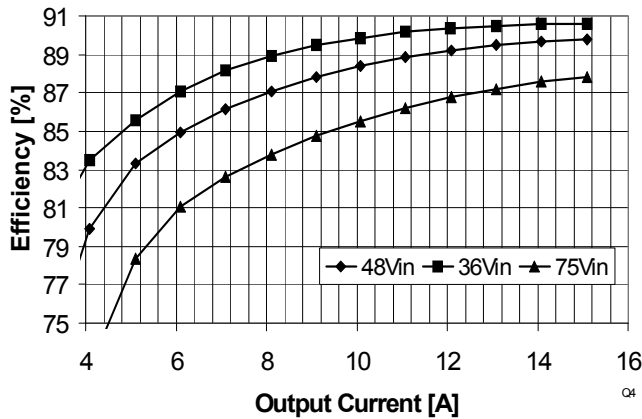
EHS15-033 Thermal Derating
Airflow from Vo(-) to Vo(+), Tj = 120°C



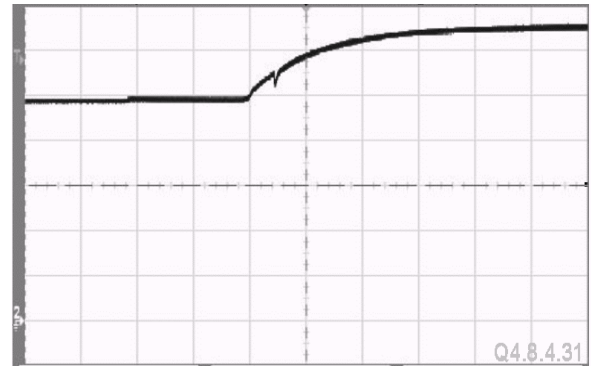
EHS15-033 Thermal Derating
Airflow from Vin to Vo, Tj = 120°C



Efficiency of EHS15-033 @ 25°C Ambient



EHS15-033 Enable with Pre-Bias



Output Voltage @ 0.5 V/div., 2 ms/div.
Prebias voltage = 2.5 Vdc. Input Voltage 48 V
Load current = 0, Load capacitance = 1000 uF.

EHS15-033 Trim Up/Down Formula

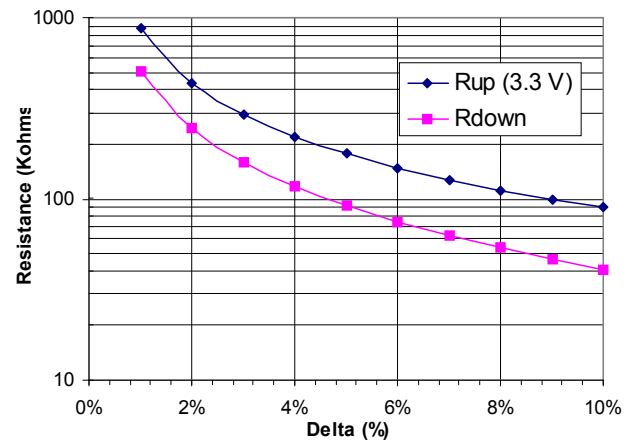
$$R_{up} := \left[\frac{5.10 \cdot V_{nom} \cdot (100 + \Delta\%)}{1.225 \cdot \Delta\%} - \frac{510}{\Delta\%} - 10.2 \right] K\Omega$$

Where $\Delta\% := \frac{(V_{out} - V_{nom}) \cdot 100}{V_{nom}}$ and, V_{out} = Target output voltage

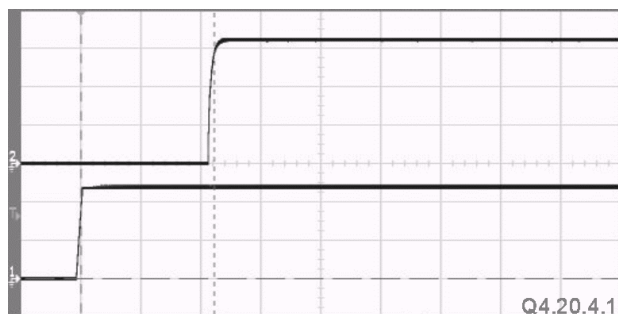
$$R_{down}(\Delta\%) := \left(\frac{510}{\Delta\%} - 10.2 \right) K\Omega$$

Where $\Delta\% := \frac{(V_{nom} - V_{out}) \cdot 100}{V_{nom}}$

EHS15-033 Trim-up and Trim-down Resistance

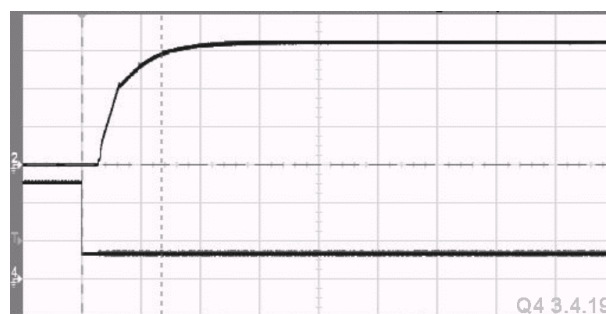


EHS15-033 Startup Sequence from Vin



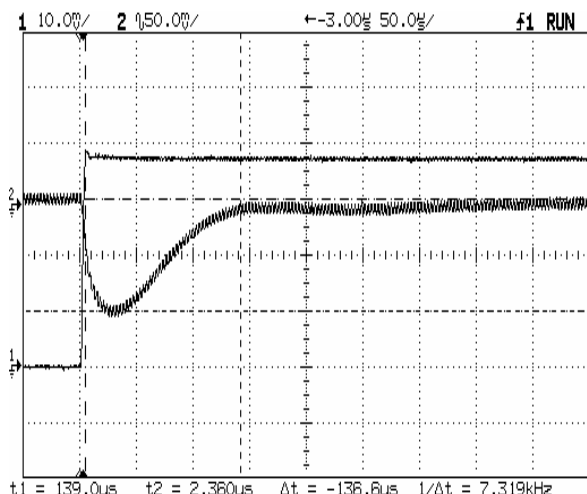
Top Trace: Vout @ 0.5 V/div.
Bot. Trace: Vin @ 20V/div. (48Vdc)
Horiz. @ 50 ms/div.
Load: 15 A, 0 uF, Turn-on delay: 110mS

EHS15-033 Startup Sequence from Enable



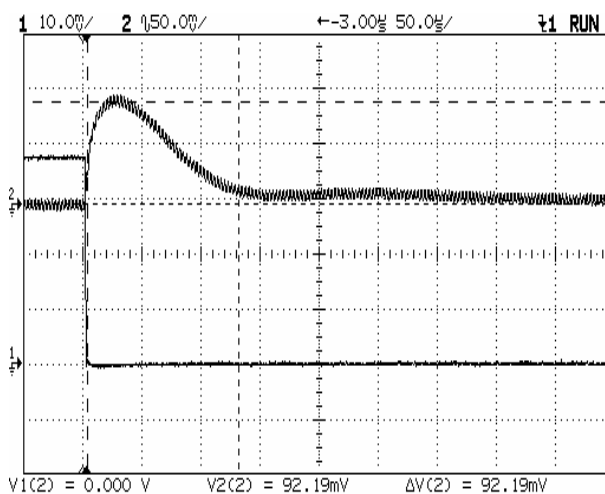
Top Trace: Vout @ 0.5 V/div.
Bot. Trace: Venable @ 2 V/div.
Horiz. @ 5 ms/div.
Load: 15 A, 0 uF, Turn-on delay: 6.7 ms

EHS15-033 Transient Response 50-75% step, 1A/μs



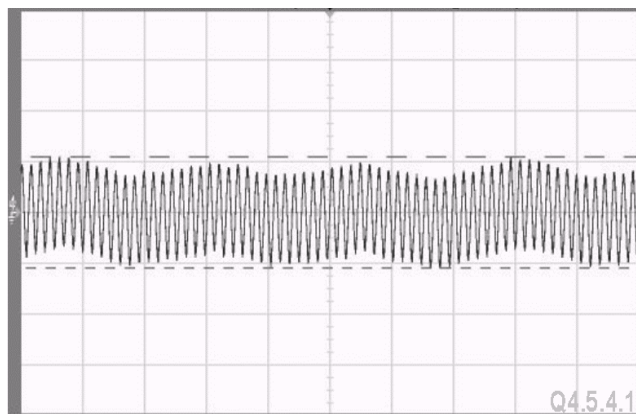
t1 = 139.0us t2 = 2.360us Δt = -136.6us 1/Δt = 7.319kHz

EHS15-033 Transient Response 50- 25% step, 1A/μs



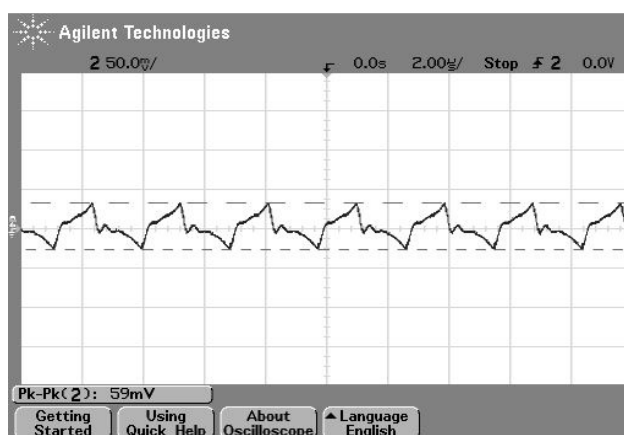
V1(2) = 0.000 V V2(2) = 92.19mV ΔV(2) = 92.19mV

EHS15-033 Input Reflected Ripple Current



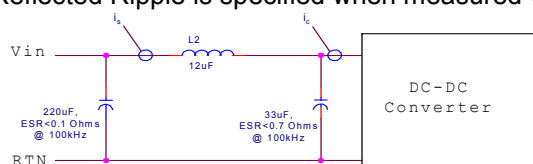
Input Current @ 50 mA/div., 20 us/div. (11 mApp)
Input Voltage: 48 V, Load Current: 15 A
Note: see test circuit on following page.

EHS15-033 Output Ripple Voltage, Io=15A



Notes:

1. Input Reflected Ripple is specified when measured with the filter shown below



2. Output Ripple and noise is specified when measured with a 10uF tantalum and a 1uF ceramic capacitor at the converter output pins
3. Transient response is specified with a 470uF tantalum capacitor at the output of the converter
4. Trim resistor connection: Rtrim-up connected from Vo adj to Vo(+), Rtrim –down connected from Vo adj to Vo(-).

EHS15-033 Enable Pin Connection Table

	ENABLE POWER SUPPLY	DISABLE POWER SUPPLY
NEGATIVE LOGIC VERSION	0V < Venable < 0.8V (internal pull-up > 50Kohms @ 5V)	2.5V < Venable < 15V (external pull-up > 1Kohms)
POSITIVE LOGIC VERSION	2.5V < Venable < 15V (external pull-up > 1Kohms)	0V < Venable < 0.8V (internal pull-up > 50Kohms @ 5V)

Note: Power Supply has internal pull-up resistor. Enable pin is in a valid "high" state if left open-circuit.

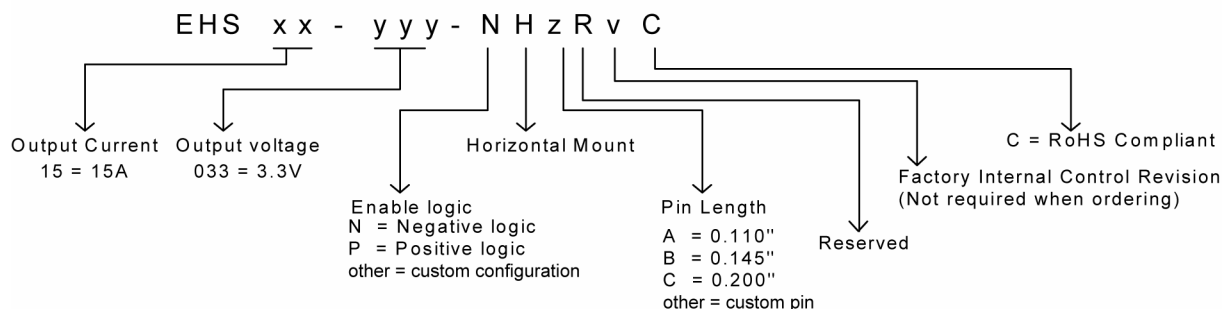
Safety considerations

The EHS series of converters are certified to IEC/EN/CSA/UL 60950. If this product is built into information technology equipment, the installation must comply with the above standard.

An external input fuse (5A to 30A recommended), must be used to meet the above requirements.

The output of the converter [Vo(+)/Vo(-)] is considered to remain within SELV limits when the input to the converter meets SELV or TNV-2 requirements.

The converters and materials meet UL 94V-0 flammability ratings.

Part Number Designations

RoHS Compliant

The EHS series of converters is in compliance with the European Union Directive 2002/95/EC (RoHS) with respect to the following substances: lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE).

C&D Technologies, Inc. reserves the right to alter or improve the specification, internal design or manufacturing process at any time, without notice. Please check with your supplier or visit our website to ensure that you have the current and complete specification for your product before use.

© C&D Technologies, Inc. 2007

No part of this publication may be copied, transmitted, or stored in a retrieval system or reproduced in any way including, but not limited to, photography, photocopy, magnetic or other recording means, without prior written permission from C&D Technologies, Inc.

Instructions for use are available from: www.cd4power.com