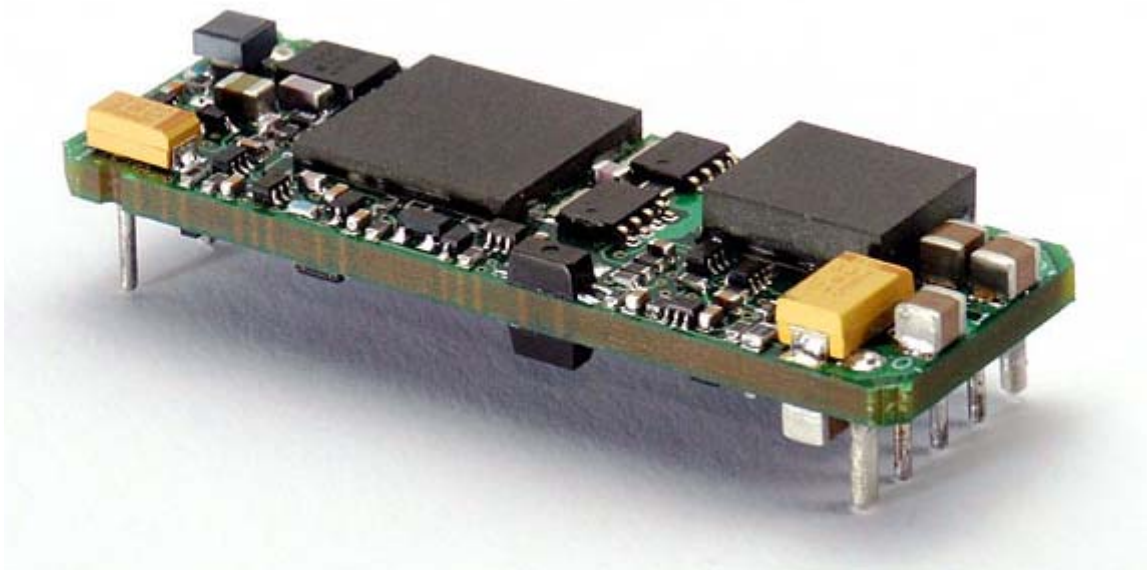


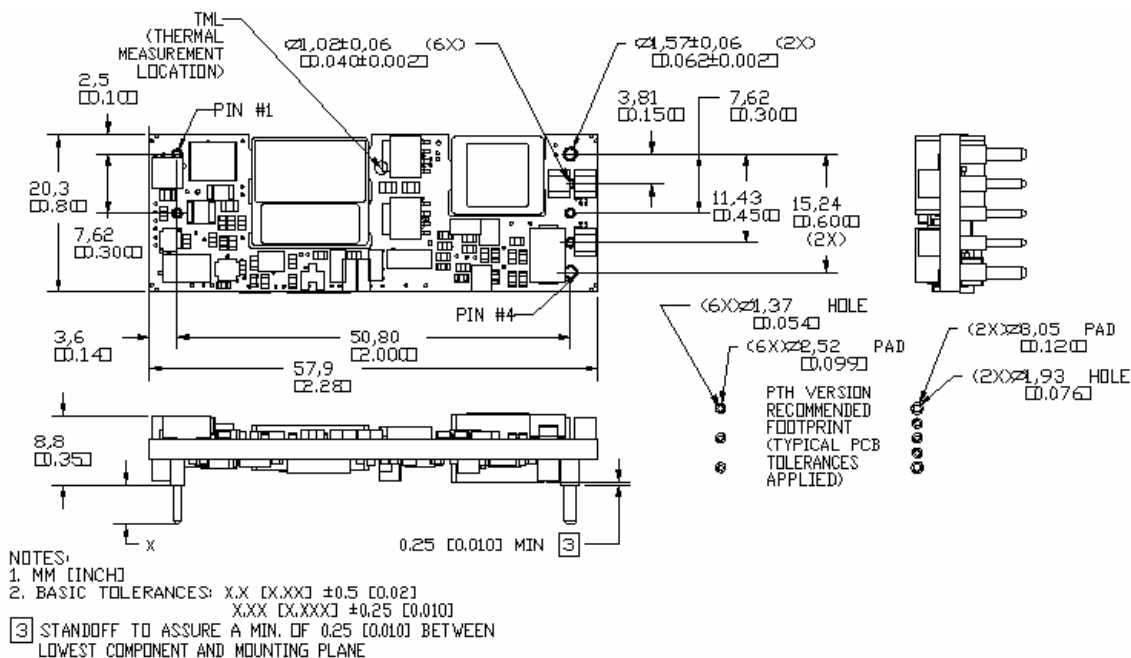


| Model                                  |     | 1.5V           | Units   |
|----------------------------------------|-----|----------------|---------|
| Parameter                              |     |                |         |
| Output Voltage Setpoint                |     | 1.48 – 1.52    | Vdc     |
| Line/Load Regulation                   | Max | 0.1% / 0.2%    | % Vo    |
| Output total regulation                |     | 1.45 – 1.55    | 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                         |     | 0-20           | A       |
| Efficiency (48V, Full load, 25C)       | Typ | 86%            | %       |
| External Capacitance                   |     | 1,000 – 10,000 | μF      |
| Transient Response (typ) (note 3)      | ΔVo | 150            | mV      |
| 25% step, 1A/μs                        | Ts  | 400            | μs      |
| Over-voltage trip point (latching)     |     | 1.80 – 2.03    | V       |
| Over-current trip point (non-latching) | Typ | 25             | A       |

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



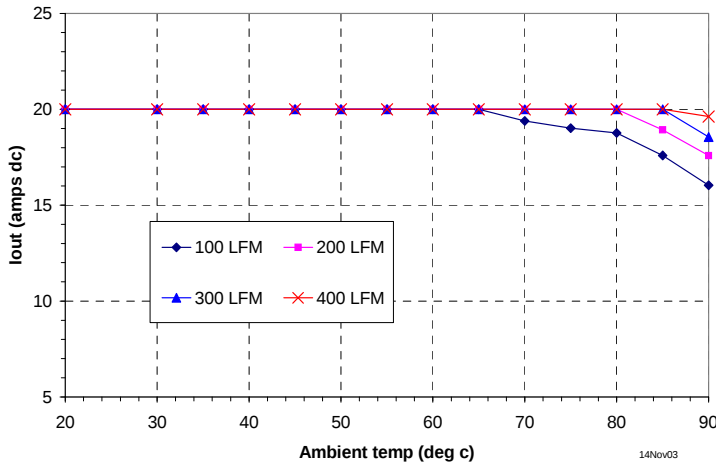
| Parameter            | Conditions                                                                                                                                 | Min.                          | Typ.                   | Max. | Units            |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------------------------|------|------------------|
| Input                | Input Voltage (Vin)                                                                                                                        | 36                            | 48                     | 75   | Vdc              |
|                      | Reflected Ripple Current                                                                                                                   | See note (1)                  | 25                     |      | mA p-p           |
|                      | Inrush Transient                                                                                                                           |                               |                        | 0.2  | A <sup>2</sup> 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 | 125                    |      | °C               |
| Physical Information | Dimensions                                                                                                                                 | 2.30"L x 0.82" W x 0.36"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). |                               |                        |      |                  |



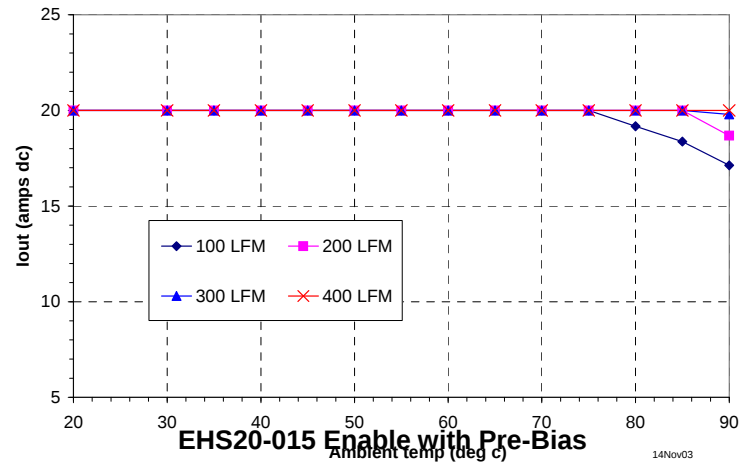
## Pin Assignments

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

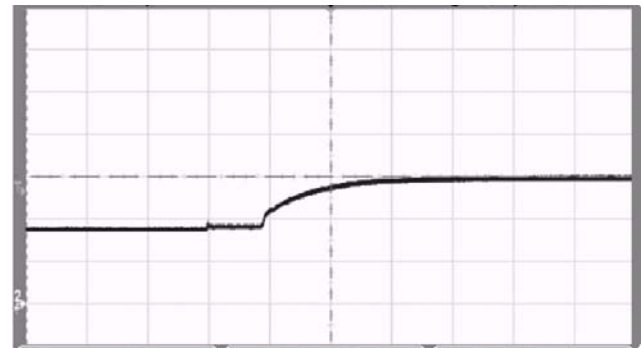
**EHS20-015 TEMPERATURE DERATING**  
Airflow from Input to Output, Tj=120C



**EHS20-015 TEMPERATURE DERATING**  
Airflow from Vin(-) to Vin(+), Tj=120C

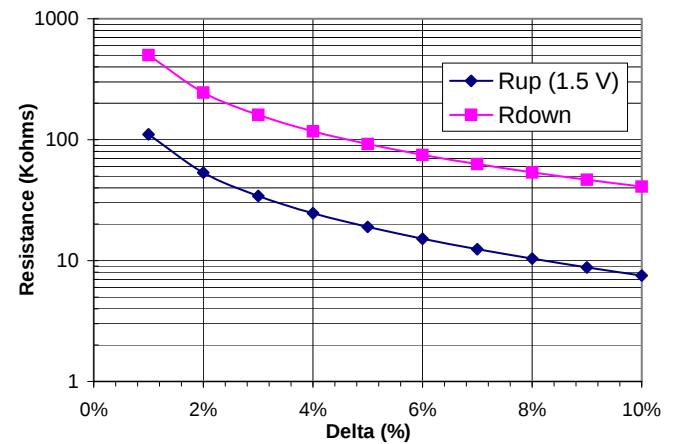


**EHS20-015 Enable with Pre-Bias**

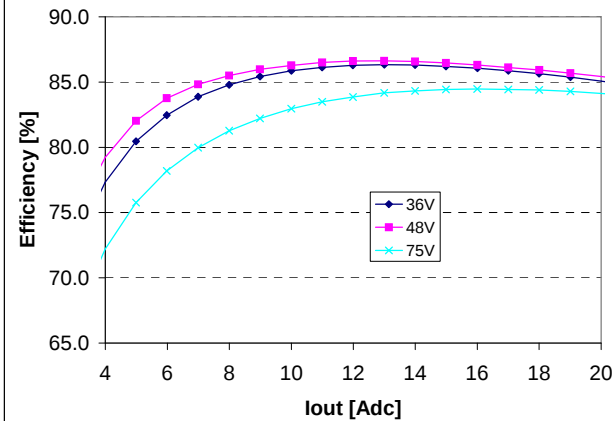


Output Voltage @ 0.5 V/div., 2 ms/div.  
Prebias voltage = 0.9 Vdc. Input Voltage 48 V  
Load current = 0, Load capacitance = 2,200 uF.

**EHS20-015 Trim-up and Trim-down Resistance**



**EHS20-015 Efficiency**



**Trim Up/Down Formula : 1.5V model**

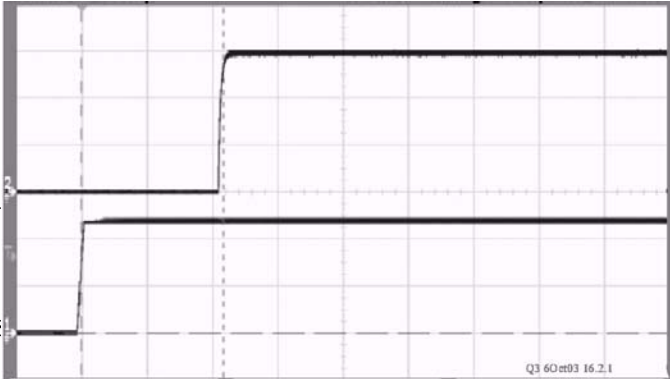
$$R_{up} := \left[ \frac{5.10 V_{nom} (100 + \%)}{1.225 \%} - \frac{510}{\%} - 10.2 \right] K$$

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

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

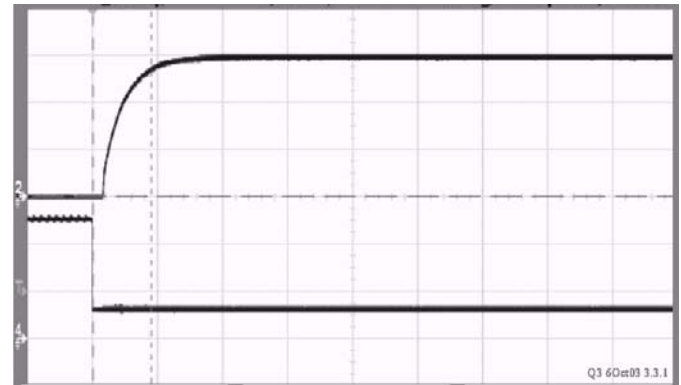
Where  $\% := \frac{(V_{nom} - V_{out}) 100}{V_{nom}}$

**EHS20-015 Startup Sequence from Vin**



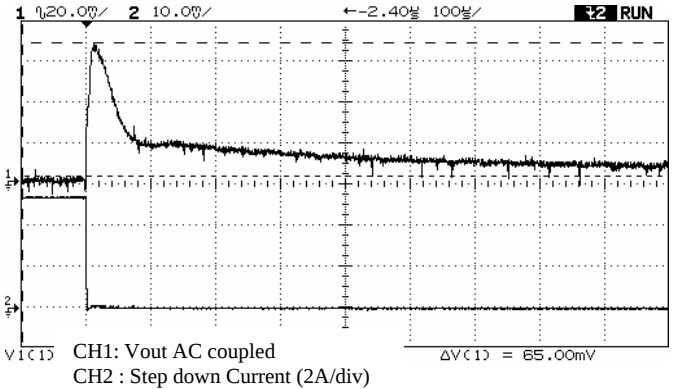
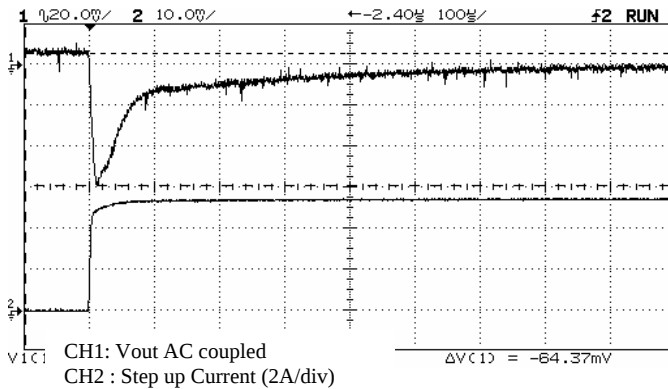
Top Trace: Vout @ 0.5 V/div.  
Bot. Trace: Vin @ 20V/div. (48Vdc)  
Horiz. @ 50 ms/div.  
Load: 20 A, Turn-on delay: 110ms

**EHS20-015 Startup Sequence from Enable**

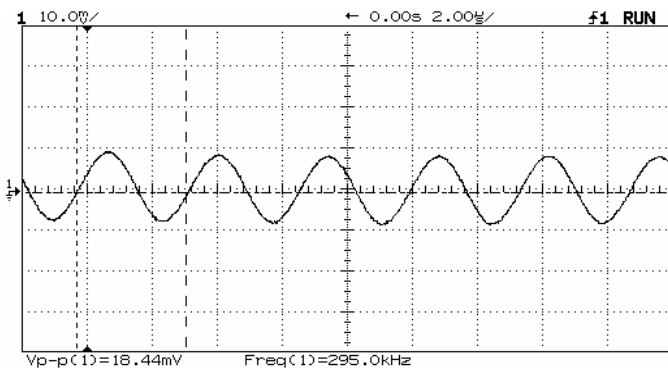


Top Trace: Vout @ 0.5 V/div.  
Bot. Trace: Venable @ 2 V/div.  
Horiz. @ 5 ms/div. Vin= 36Vdc  
Load: 20 A., 10,000 uF, Turn-on delay: 4.8 ms

**EHS20-015 Transient Response, 50-75% step, 1A/μs**

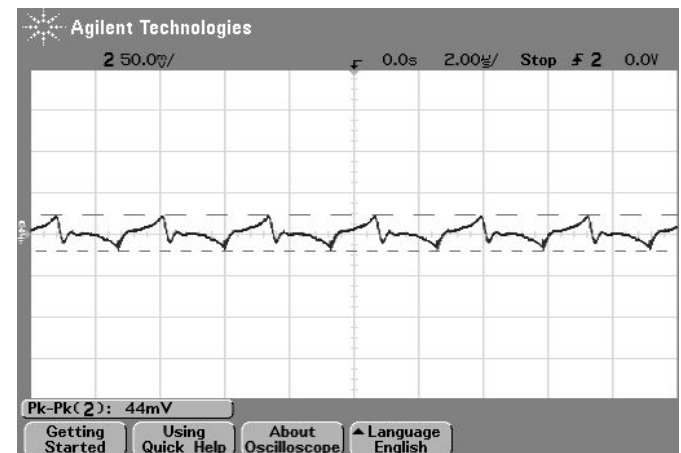


**EHS20-015 Input Reflected Ripple Current, Iout = 20 A**



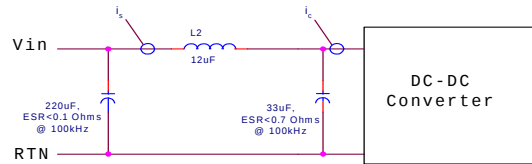
Input Current @ 5.0 mA/div., 20 us/div. (14 mApp)  
Input Voltage: 48 V, Load Current: 20A  
Note: refer to test circuit schematic

**EHS20-015 Output Ripple Voltage, Iout = 20A**



### 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(-).

**EHS20-015 Enable Pin Connection Table**

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

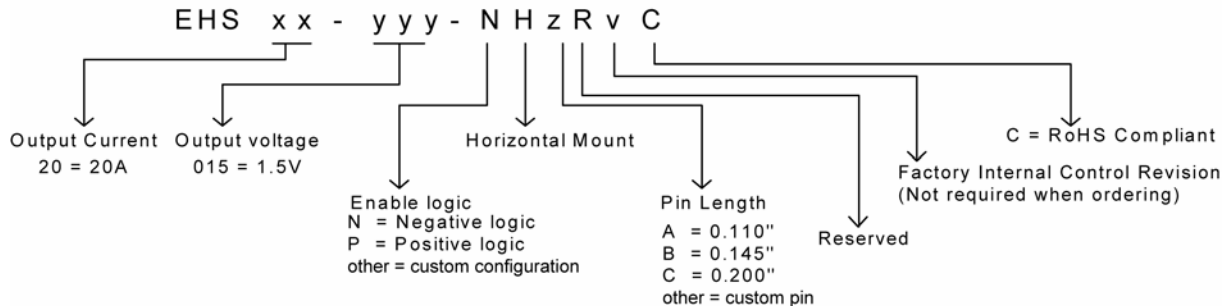
The EHS series of converters are certified to IEC/EN/CSA/UL 60950. If this product is built into information technology equipment, the installation must comply with the above standard.

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).