

## **Notes on the PFC Choke for the IR1150 300Watt Demo Board**

The demo board uses a 1.57" MPP toroid core. This core was selected due to its exceptional performance in this demo board application. These characteristics include:

- Very low core loss - low temperature rise
- Excellent inductance stability over current range
- No audible noise under high ripple current conditions
- Achieve high bias inductance with single layer winding
- Material has 80% Nickel - high cost

### **A High Flux core was evaluated with the following results:**

- Excellent inductance stability over current range
- Core loss not as good as MPP but acceptable
- Significant audible noise under high ripple current conditions
- Achieve high bias inductance with single layer winding and same core size as MPP
- 50 % Nickel- high cost but not as high as MPP

### **Kool Mu is expected to produce the following results:**

- Low core loss - low temperature rise
- Larger core size needed to achieve required inductance
- Good magnetostriction characteristics -low audible noise
- May need more than single layer winding to achieve required inductance – SRF could be an issue
- No Nickel- relatively low cost

### **Gapped Ferrite is a possibility. Some comments:**

- Low core loss
- Due to a relatively large gap fringing losses could be a problem
- This large gap produces good inductance stability under high current conditions
- Magnetostriction could be a problem
- Many options for part form factor due to large variety of shapes available
- Low saturation flux density and abrupt saturation
- Reasonable cost

Precision, Inc. has the ability to work with our customers to optimize a PFC solution for any specific application. In many cases, audible noise is not a problem. For example when the power supply is housed in an enclosure with forced air the PFC choke noise would not be detectable and would then allow a lower cost solution. Also, many options are possible if size was not of the highest priority.

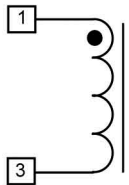
Precision, Inc. can provide an additional winding on the PFC Choke to supply power for the PFC control circuitry. Using a voltage doubler circuit with this bias winding can provide a semi-regulated output that is quite stable over the entire duty cycle range.

- Designed for the International Rectifier IR1150 PFC Demo Board
- 100 kHz Switching Frequency / 300 Watt Output
- 6.2A Peak Current / 3.8A Max. RMS Current
- High Performance Core – Low Loss, Small and Quiet
- Low SRF
- Lower Cost or Bias Winding options available upon request.

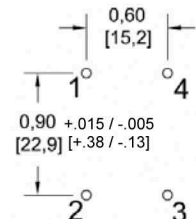
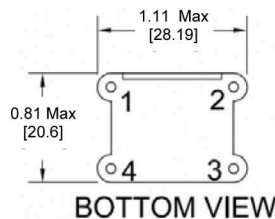
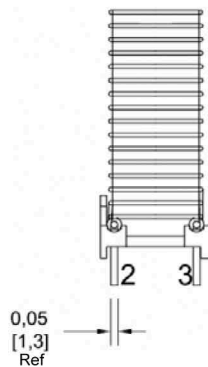
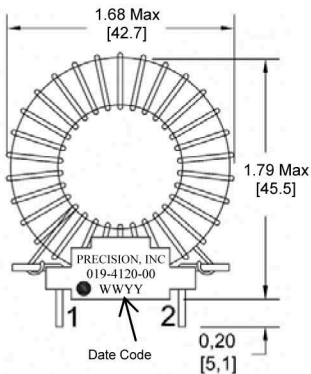
### Electrical Specifications at +20°C unless noted otherwise

Parameters	Value	Notes
Inductance ( $\mu\text{H}$ )	$810 \pm 8\%$	1-3 @ 100 KHz, 0.1V, 0A
Inductance ( $\mu\text{H}$ )	469 Min.	1-3 @ 100 KHz, 0.1V, 6A
DCR ( $\Omega$ )	0.29 Max	1-3

### Schematics



### Mechanicals



Unless otherwise stated, all tolerances are  $\pm 0.010$  / [0.25]