



DID YOU KNOW? INDUCTOR SATURATION CURRENT

Saturation current is usually listed on all power inductor datasheets. It is defined as the applied DC current at which the inductance value drops a specified amount below its measured value with no DC current.

Not all published saturation currents are based on the same parameters. It is important to compare the manufacturer's test conditions and the percentage drop of inductance at which saturation is specified. Vishay rates the saturation current of the IHLP® series for a 20 % drop in inductance. Some manufacturers will rate their parts for a 30 % drop in inductance. This makes the inductor appear to have better saturation, but in many cases the 20 % saturation is actually worse than the Vishay IHLP inductors.

Below is a typical graph supplied by Vishay for power inductors. The blue line represents the saturation current of an IHLP inductor. The IHLP series has an almost linear, "soft" saturation curve. The red line represents a typical saturation curve for a ferrite drum core power inductor. Note how the inductor reaches a current where the inductance drops sharply. This is called the saturation "knee" and is an example of "hard" saturation. Operating an inductor beyond the saturation knee is dangerous because the inductive impedance drops significantly and an uncontrolled rise in current can occur. With the soft saturation characteristics of the IHLP inductors, a saturation knee does not exist and reactive impedance is provided well beyond the rated current.

SATURATION COMPARISON

