

F9N MATERIAL FOR TI TRANSFORMERS

Two major applications for ferrite core materials in Telecom circuits are DSL and TI transformers. Material requirements are different for these two applications. For DSL, the design goals for a transformer include stable, tightly controlled inductance, very low total harmonic distortion (THD) and the ability to withstand DC current in many instances. This requires a gapped structure, and the use of a high permeability, low loss material. For TI transformers, DC current is not present, therefore gapped structures are not a requirement, and toroids will work very well. The primary demand on the ferrite material is to maintain as high a permeability as possible over the Telecom operating temperature range of -40 to $+85^{\circ}\text{C}$. MMG's F9N material is ideal for TI transformer applications. Shown below is the permeability versus temperature behavior for F9N material. Note that at -40 and at $+85^{\circ}\text{C}$, the permeability of this material is well above its room temperature value of 4000. This achieves overall better performance than a 10,000 permeability material. Since the minimum permeability of this unique material occurs at room temperature, the designer can be assured that if the minimum inductance requirement is met at room temperature, it will be met over the entire temperature range.

