Evaluation of Reduced Eddy Current Loss Sendust in 1.5 MHz Switching Application

-and-

Evaluation of Optimized Inductor Designs from 150 kHz to 3 MHz

Using Distributed Gap Core materials

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Power Magnetics @ High Frequency Workshop prior to APEC 2019

Sponsored by PSMA and IEEE Pels

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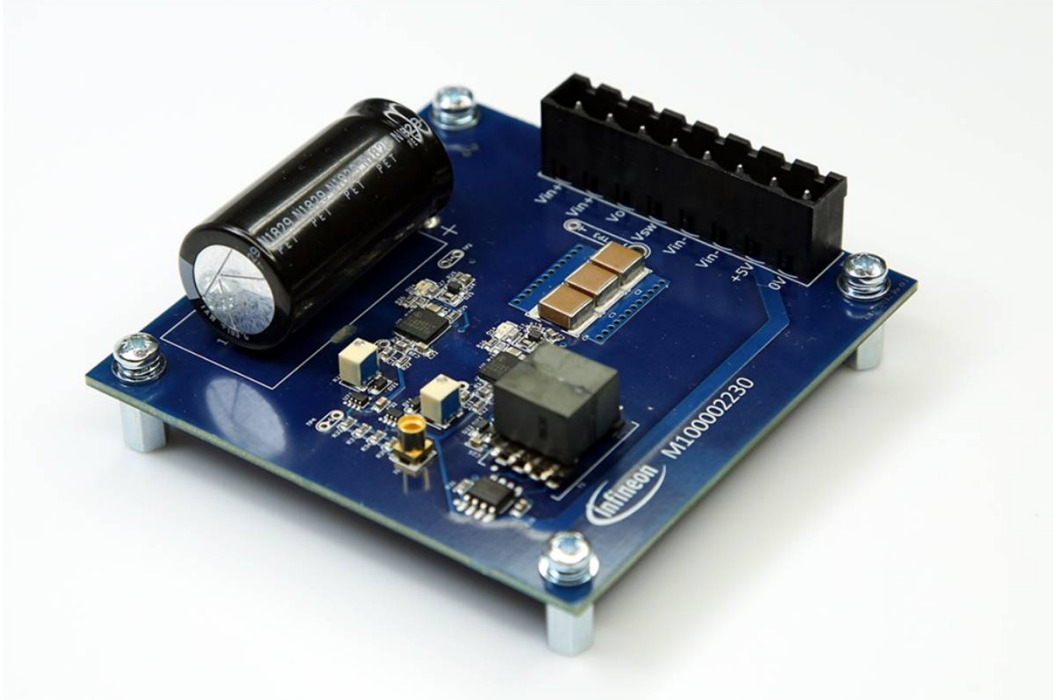
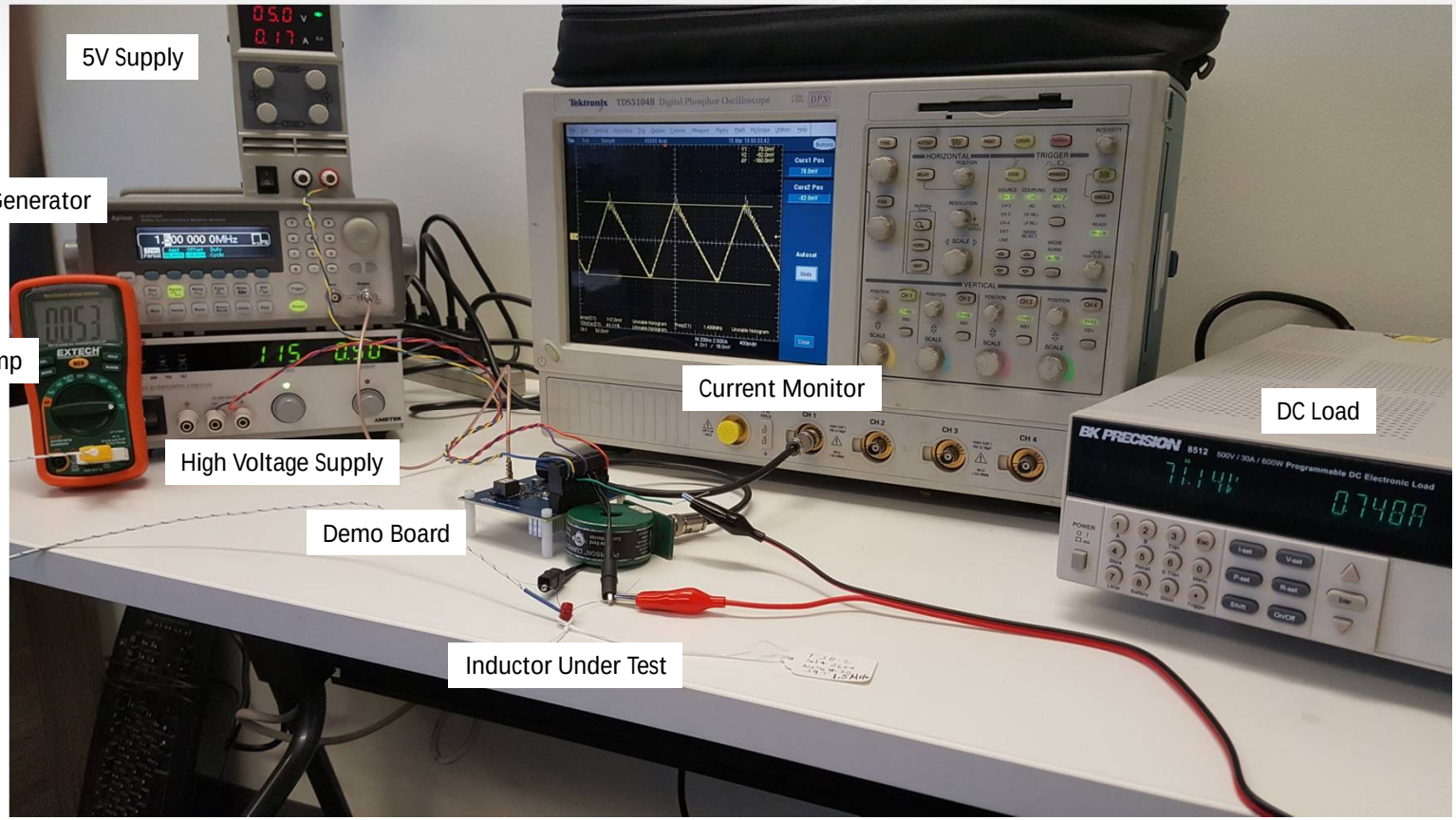
GaN Demo Board:
Infineon CoolGaN™ 600V e-mode HEMT half-bridge evaluation platform featuring GaN EiceDRIVER™



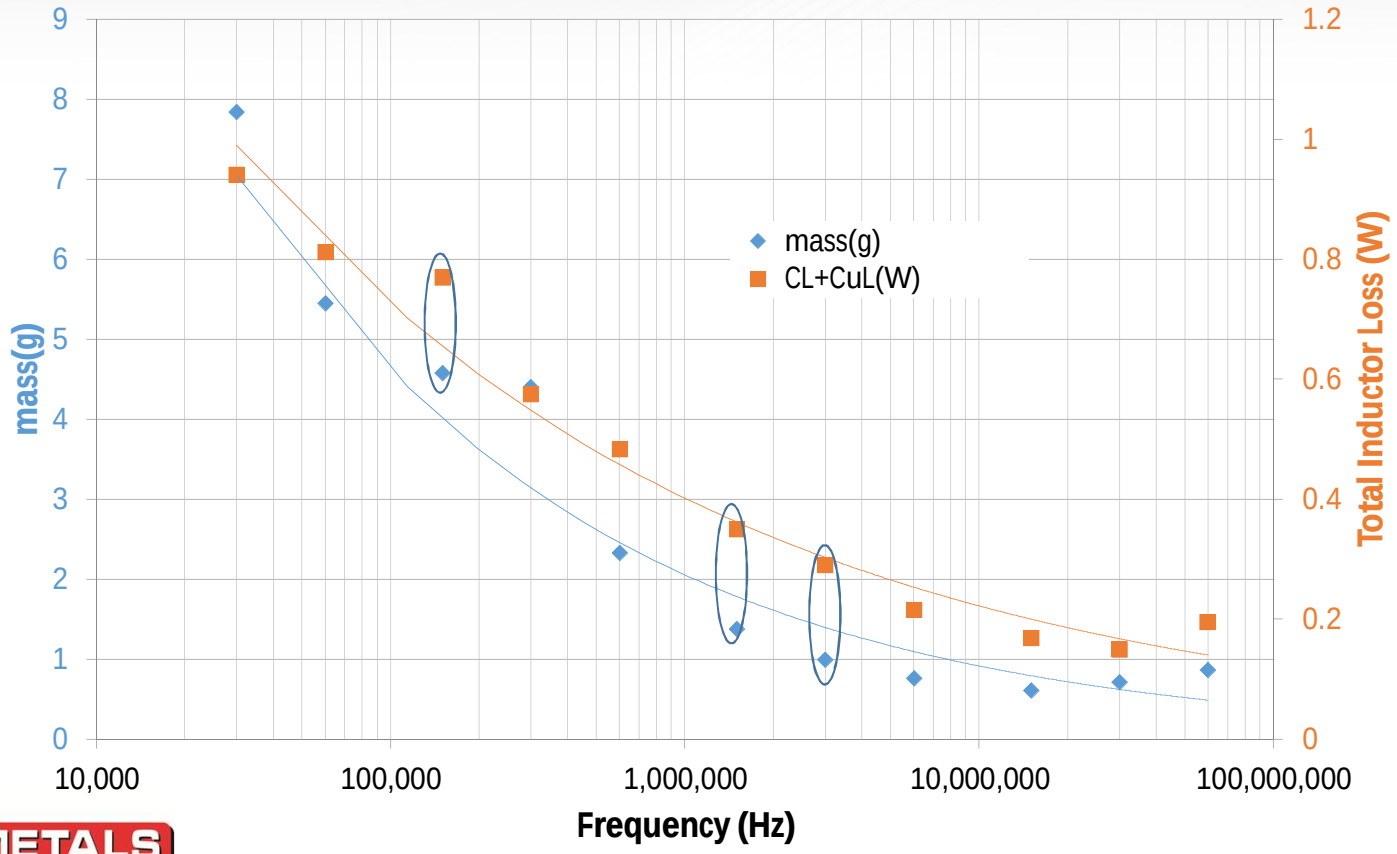
Test Set-up


5V Supply
Pulse Generator
Inductor Temp
High Voltage Supply
Demo Board
Current Monitor
DC Load
Inductor Under Test
Tektronix TDS5104B Digital Phosphor Oscilloscope
BK PRECISION 8512 500V / 30A / 600W Programmable DC Electronic Load

Test Specimens:

- For Evaluation of Sendust vs. Reduced Eddy Current Sendust
  - Test Samples
    - Sendust: P/N MS-080060-2, 17turns 2x#20-AWG, L = 10µH
    - Reduced EC Sendust: P/N SH-080060-2, 17 turns 2x#20-AWG, L = 10µH
  - Test Conditions: f = 1.5 MHz, Vin = 100V, Vout = 65V, Iout = 0.75A, Iripple = 1.5App
- For Evaluation of Optimized Distributed Gap Inductor Designs
  - 150kHz, P/N MS-065040-2, 66turns #28-AWG, L = 100µH, Vin = 100V, Vout = 65V Iout = 0.75A, Iripple = 1.5App
  - 1.5MHz, P/N T38-2, 39turns #30-AWG, L = 10µH, Vin = 100V, Vout = 65V Iout = 0.75A, Iripple = 1.5App
  - 3.0MHz, P/N T37-2, 38turns #28-AWG, L = 5µH, Vin = 100V, Vout = 65V Iout = 0.75A, Iripple = 1.5App

Design Optimization:
Inductor Mass and Inductor Losses vs Frequency for lowest mass Powder Core Solution



MICROMETALS
POWDER CORE SOLUTIONS