



LIVE
DEMO

Efficiency differences with power inductor core material variations

PSMA YAGEO Table

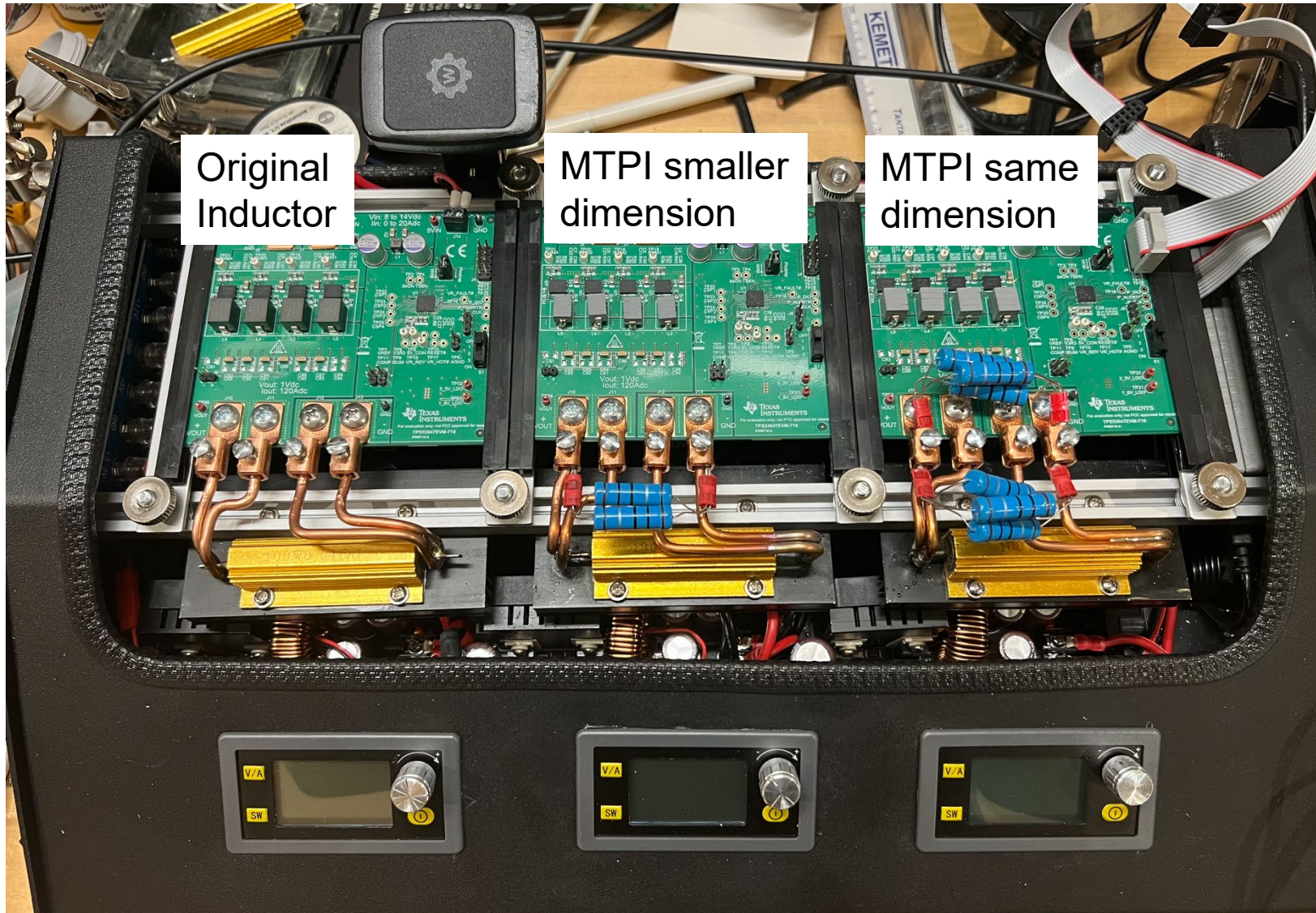
MSA PBU

March 2025



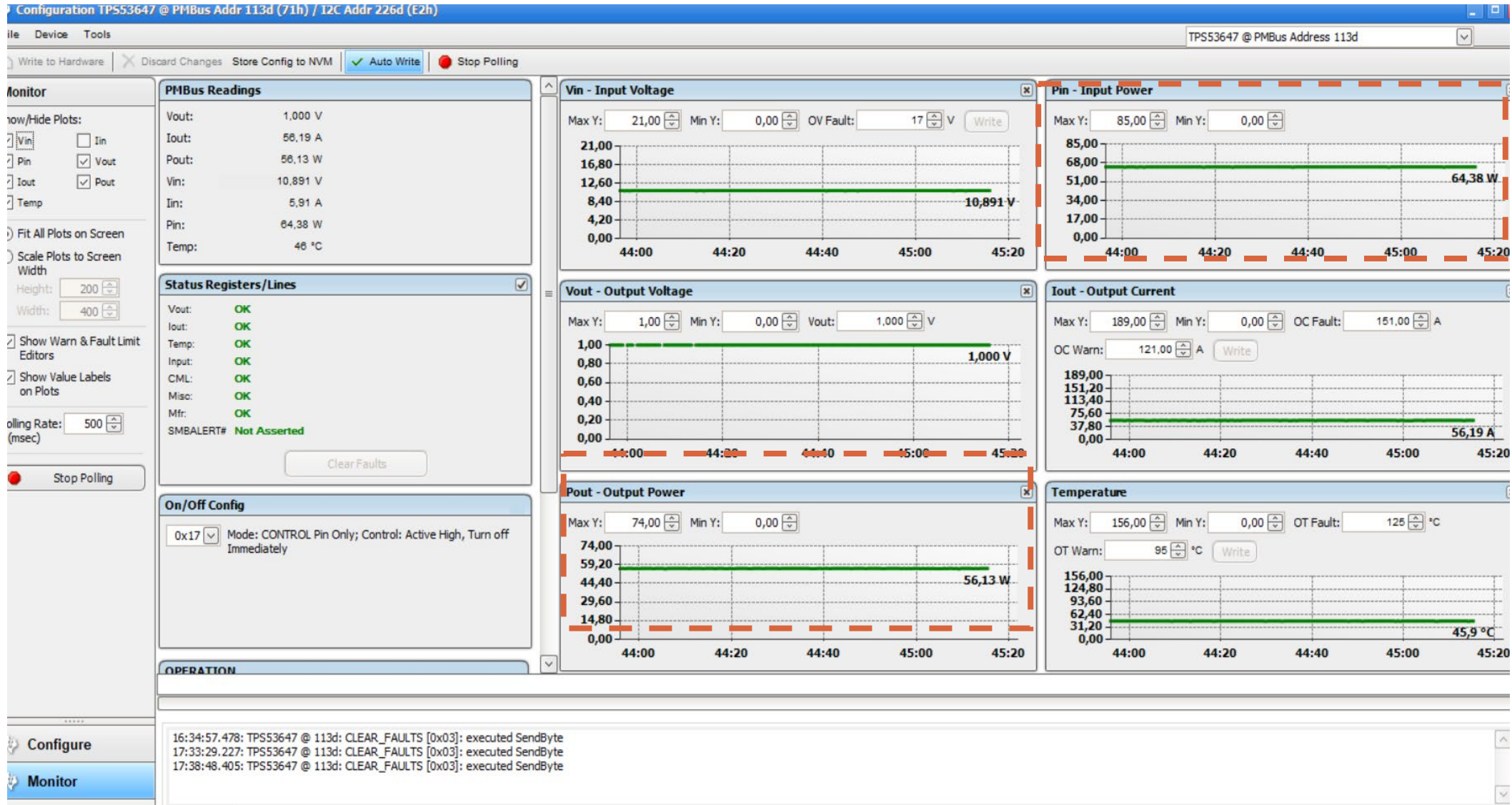
What can you expect to see ?

Setup



- ATX Power supply 12V 62A Thermaltake 750W
- 3x TPS53647EVM-710 (600kHz / 4 channel / 11V input / 1V output)
- 3x 10mΩ 100W resistor
- TI PMBus interface
- PicoScope 2208B
- Infrared Camera

TI Fusion Digital Power Designer



Monitored in- and output power for efficiency measurement

Power measurement results

- Typically it is needed to measure the voltage at below test points to avoid measuring the voltage drop on the PCB

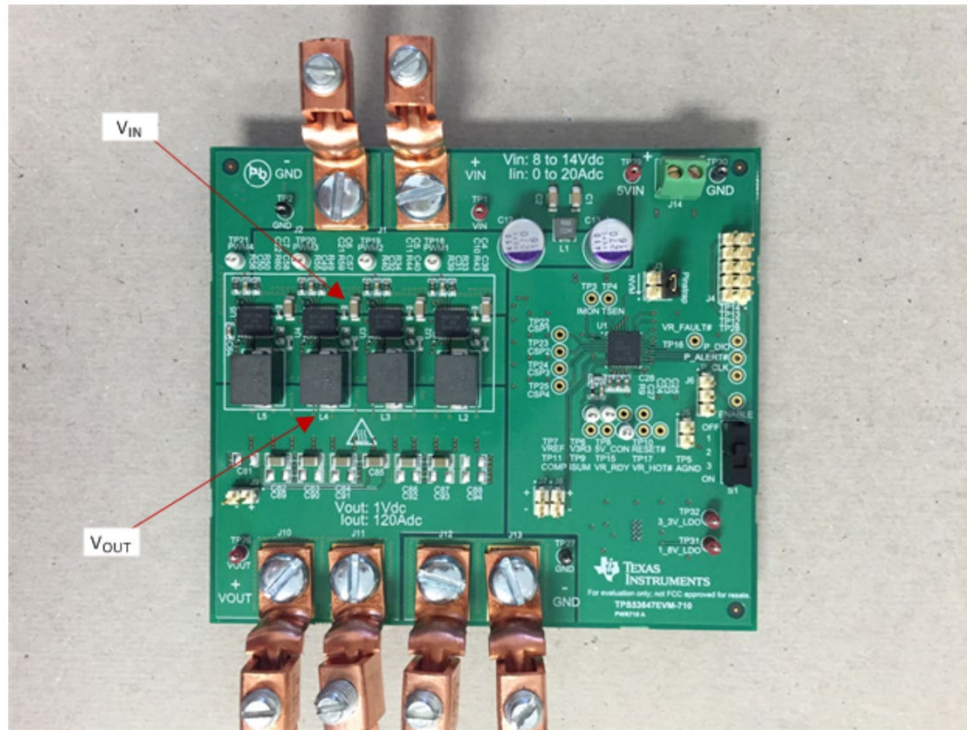
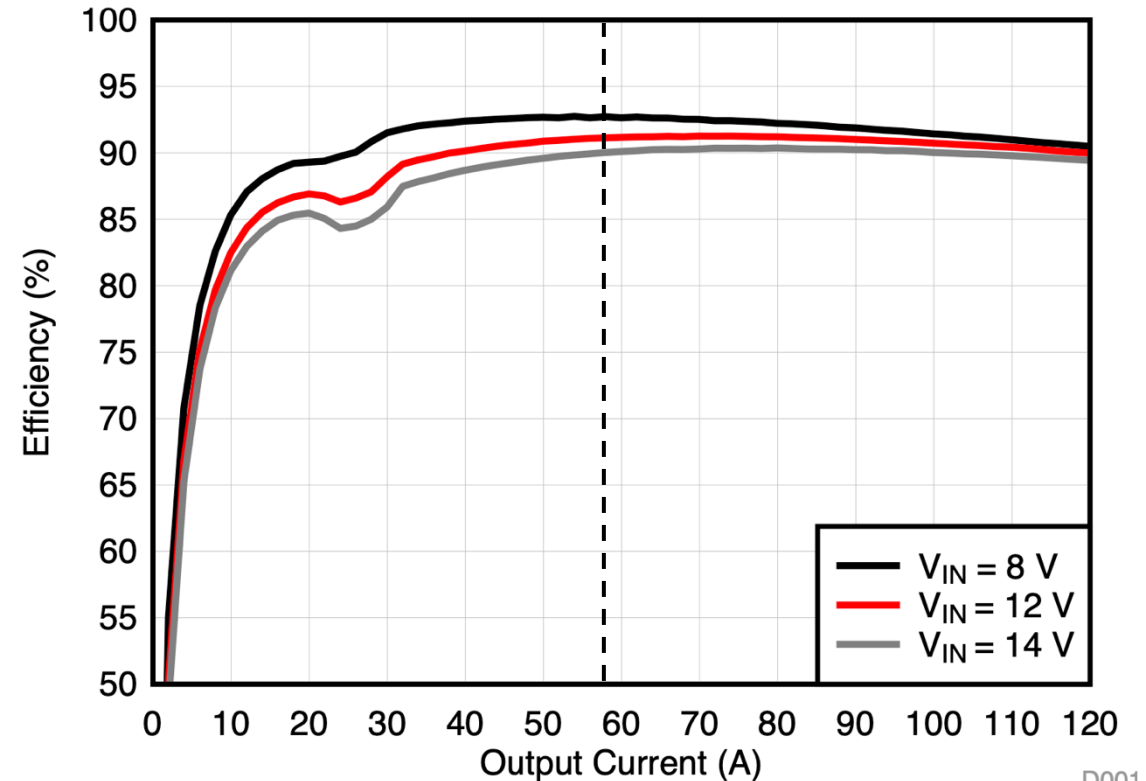


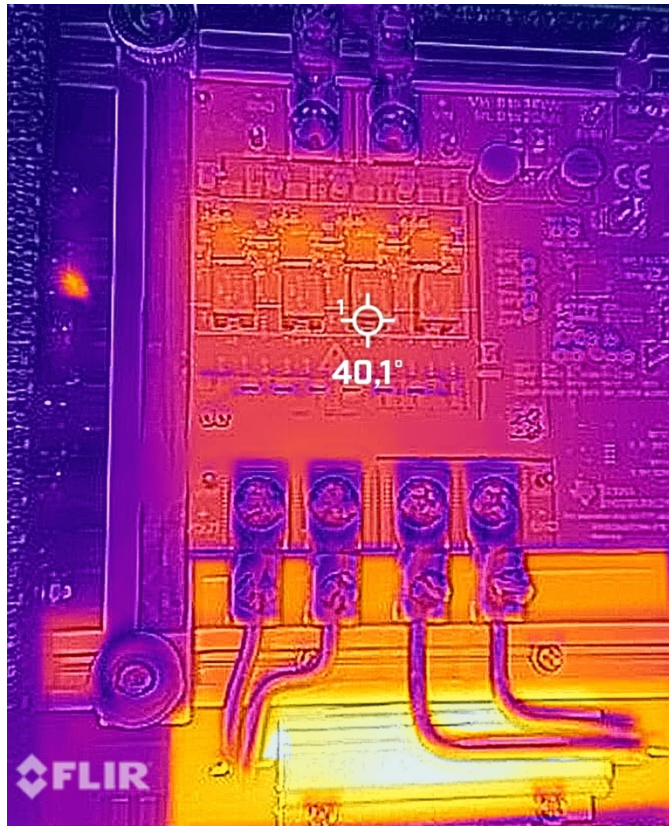
Figure 10. Test Setup for Efficiency Measurement



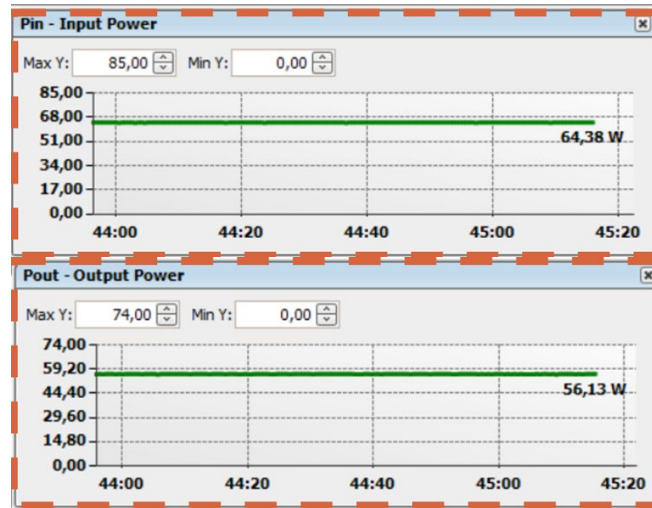
D001

- As the setup is the same for all 3 PCB's the absolute value may change but the efficiency differences remain equally undervalued

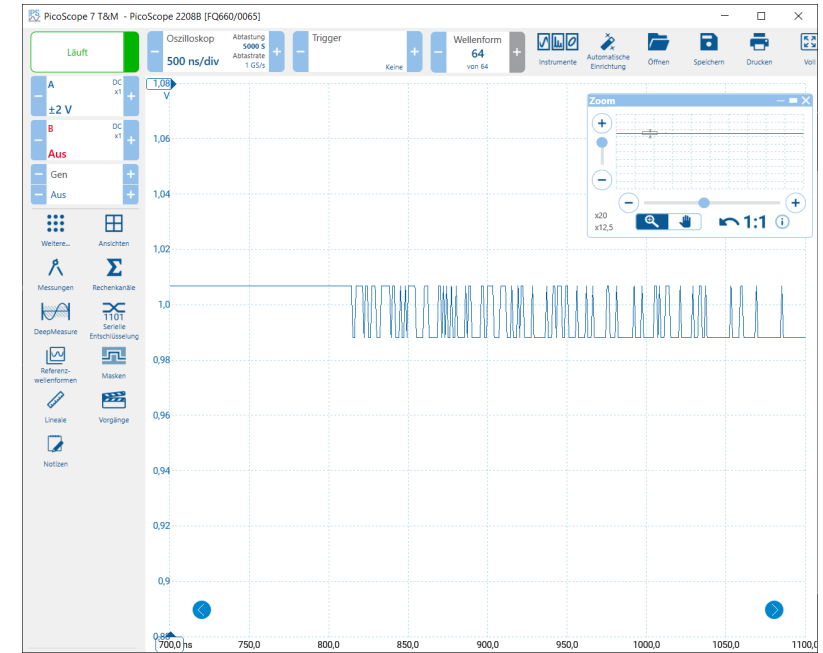
Measurements at the demo table



Thermal imaging



Efficiency Pout/Pin
(TI FDPD)



Output Ripple

Setup of inductor

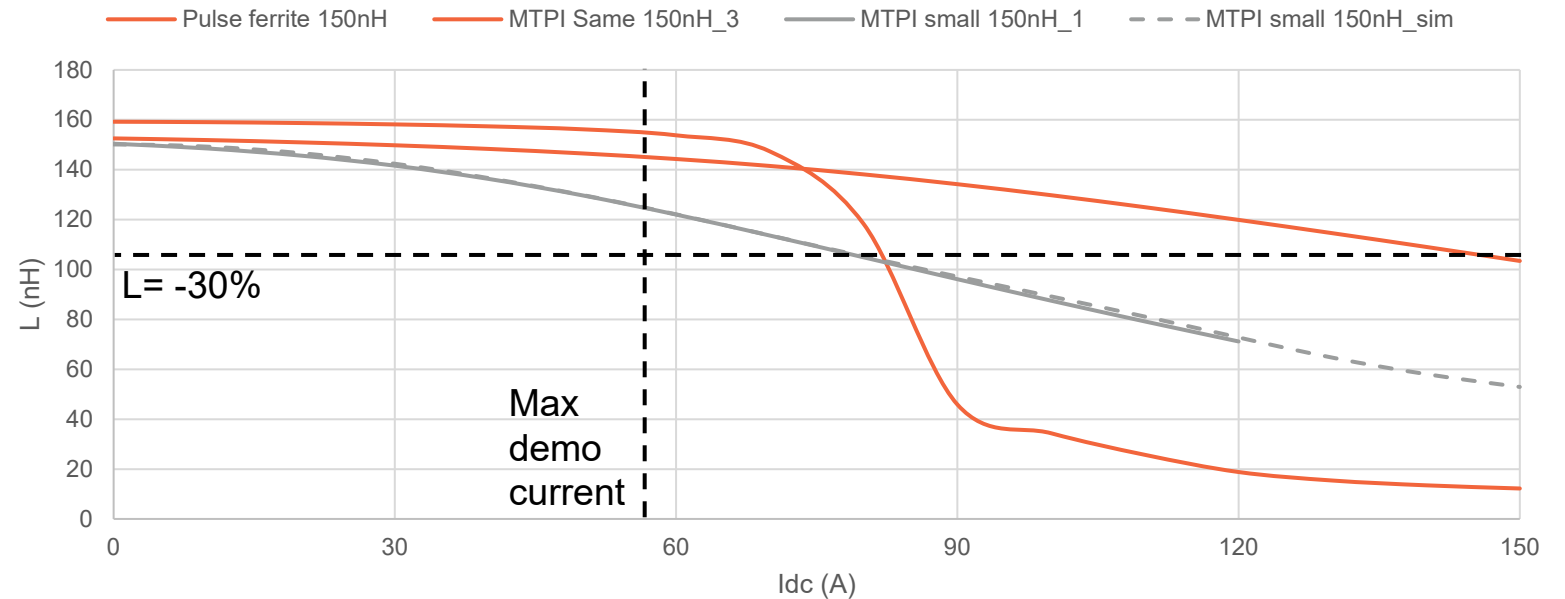
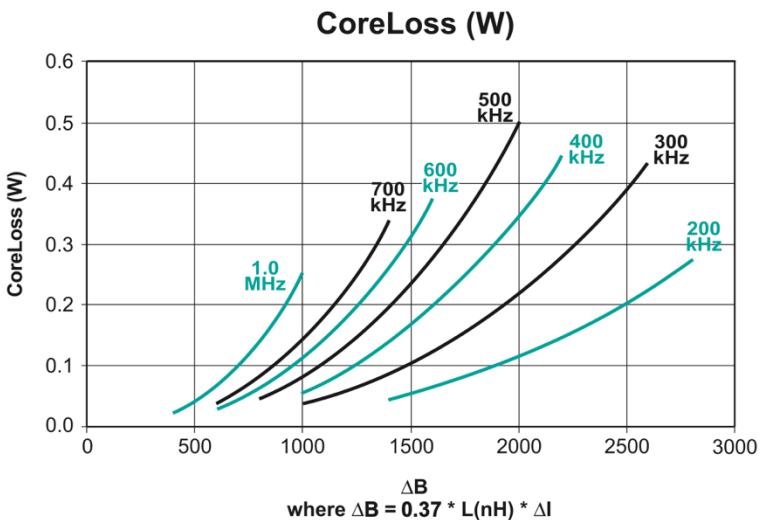
- Original: PA2607.151NLT P-Company, Ferrite, SMD, 150 nH, 41 A rated, 0.29 mΩ, 10.4mm x 7.9mm Max 7.4mm height
- Saturation 72A (@25°C) 61A (@100°C)



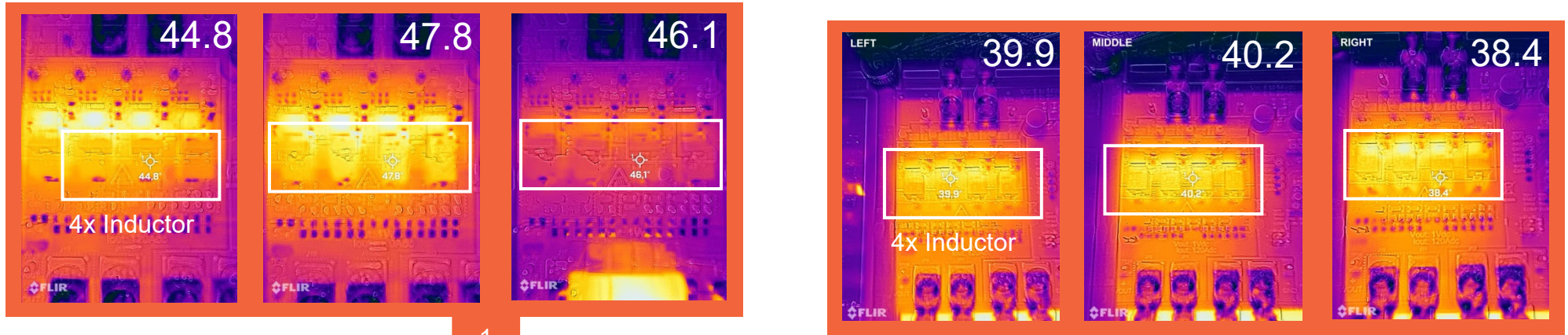
- Small: Sample MTPI - KEMET Nanomet, SMD, 150 nH, **xx**A rated, **xx** mΩ, 10.3mm x 6.1mm 4.5mm height
- Saturation 80A



- Big: Sample MTPI - KEMET Nanomet, SMD, 150 nH, **xx**A rated, **xx** mΩ, 10.3mm x 7.5mm 7.4mm height
- Saturation 144A



Efficiency comparison



To take the values from TI PMBus software is certainly not as accurate as to measure.

I asked in the Forum and got a Brief answer that Vout & IMON have an assigned tolerance and Vin and lin do not have a spec

However for the demotable it would have gained a lot more complexity



Hi Michael,
 You can refer to the datasheet on TI.com for information on VOUT measurement and IMON accuracy: <https://www.ti.com/product/TPS53647>
 Vin and lin do not have a spec available.
 Regards,
 Troy

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Thank you! 謝謝你!



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