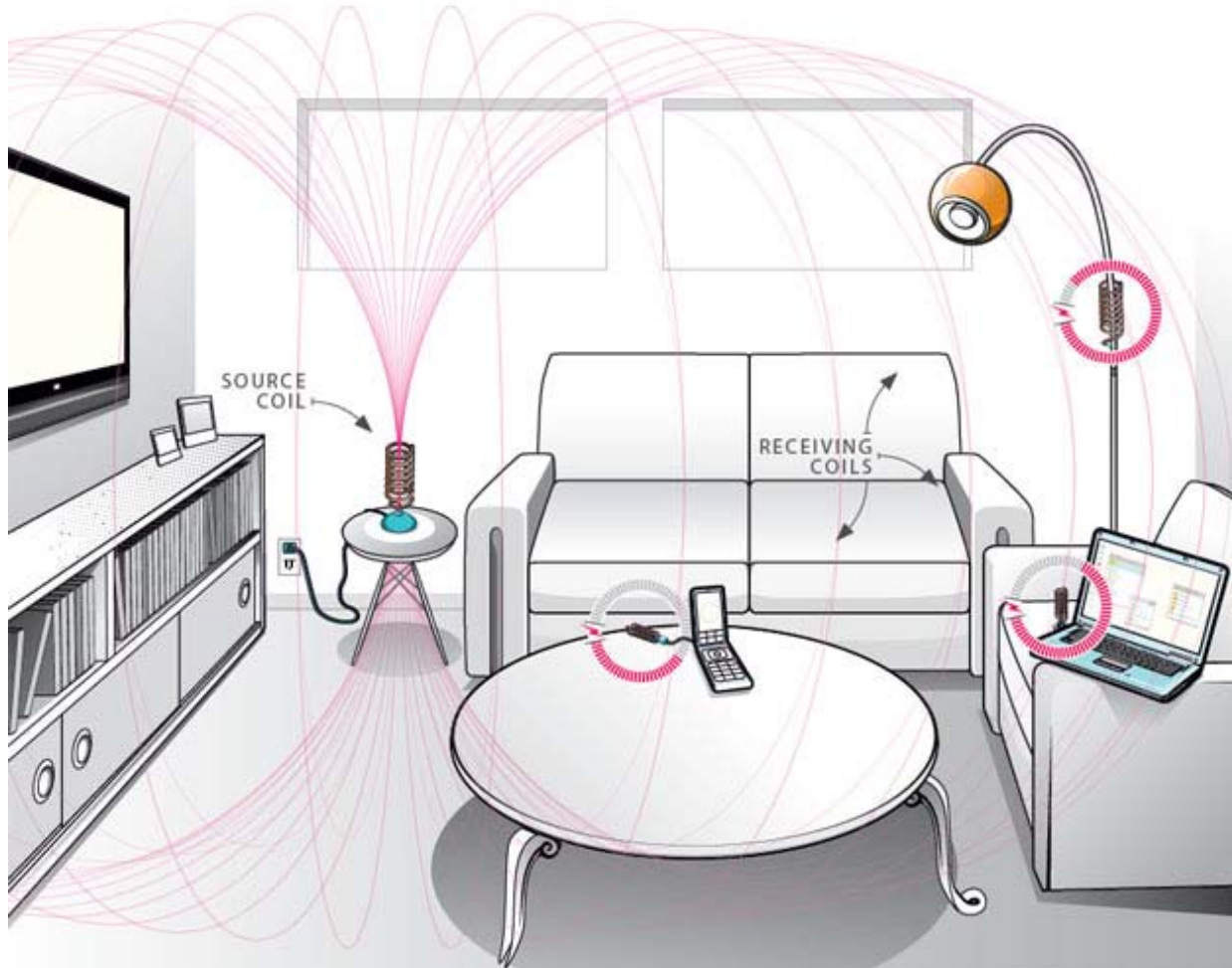


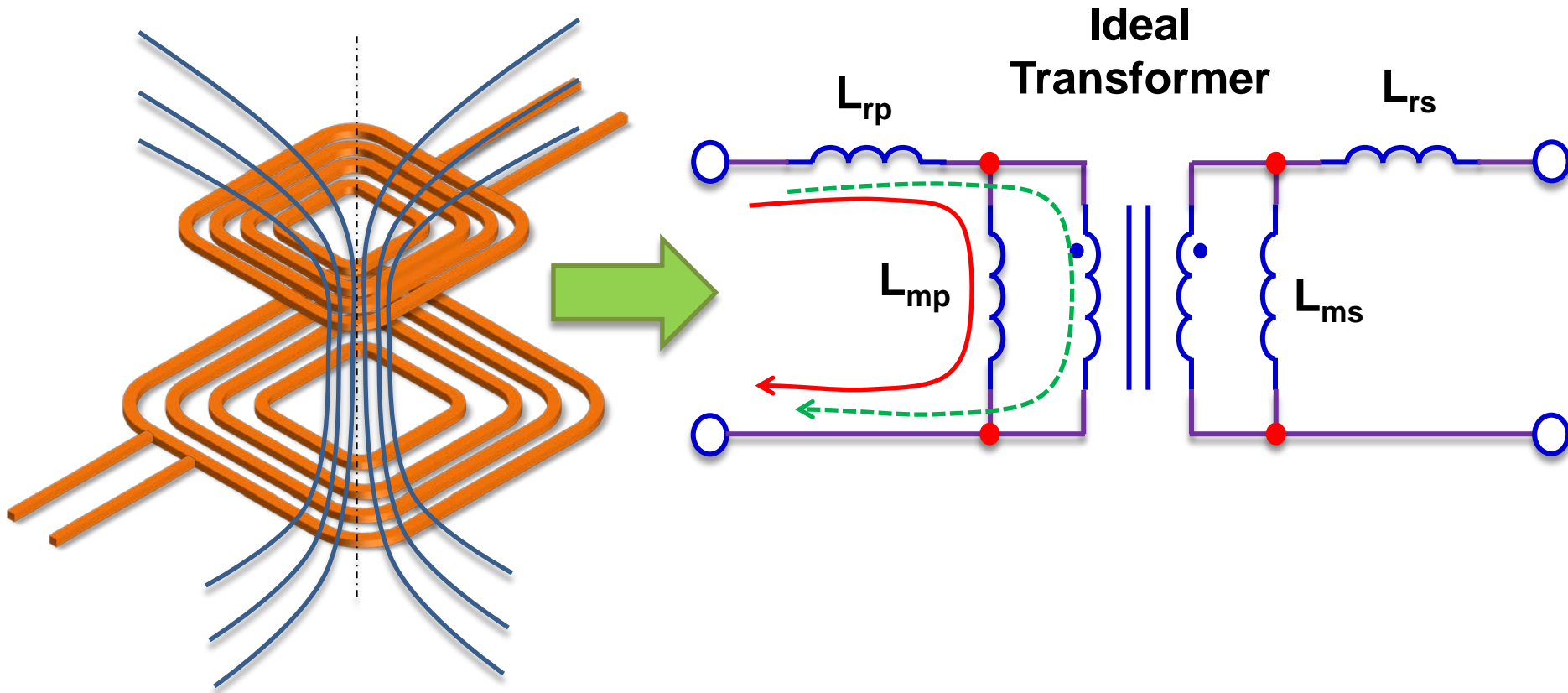
A green rectangular road sign with rounded corners is mounted on a wooden post. The sign contains the text "The eGaN® FET Journey Continues" in white. The background is a desert landscape with a road leading towards a city skyline under a bright, cloudy sky.

The eGaN® FET
Journey Continues

eGaN® FETs Enable Low Power High Frequency Wireless Energy Converters

M. A. de Rooij & J. T. Strydom
Efficient Power Conversion

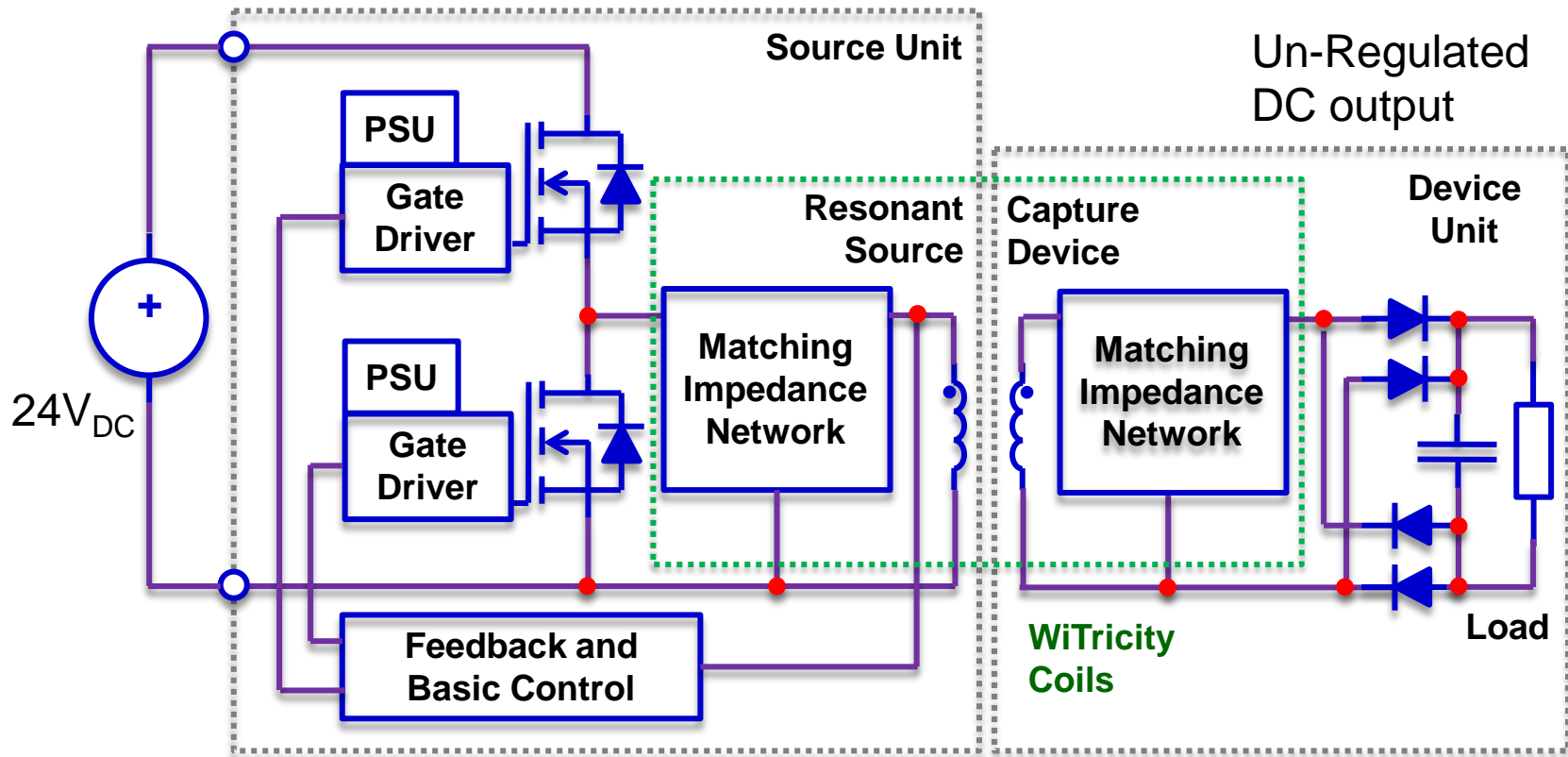


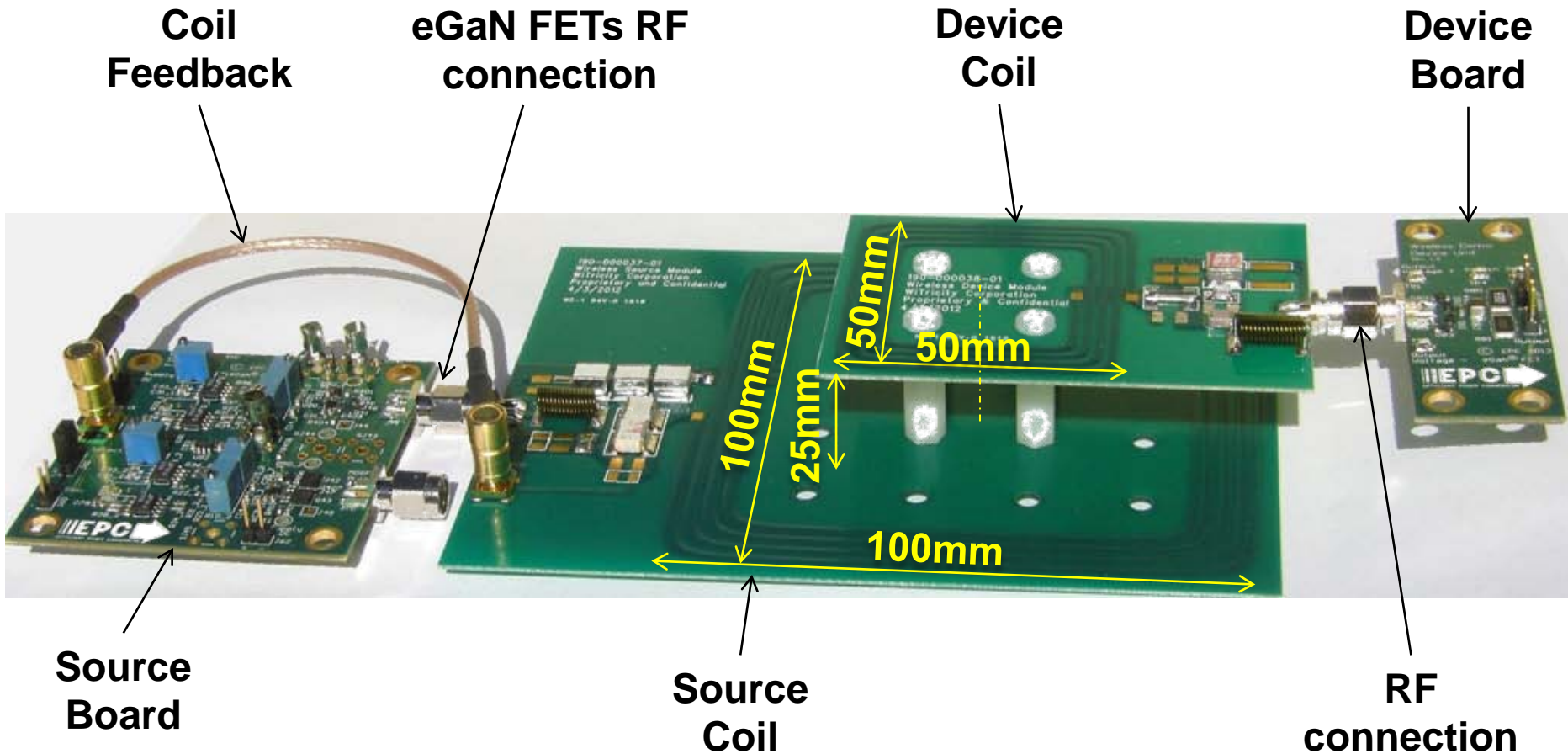


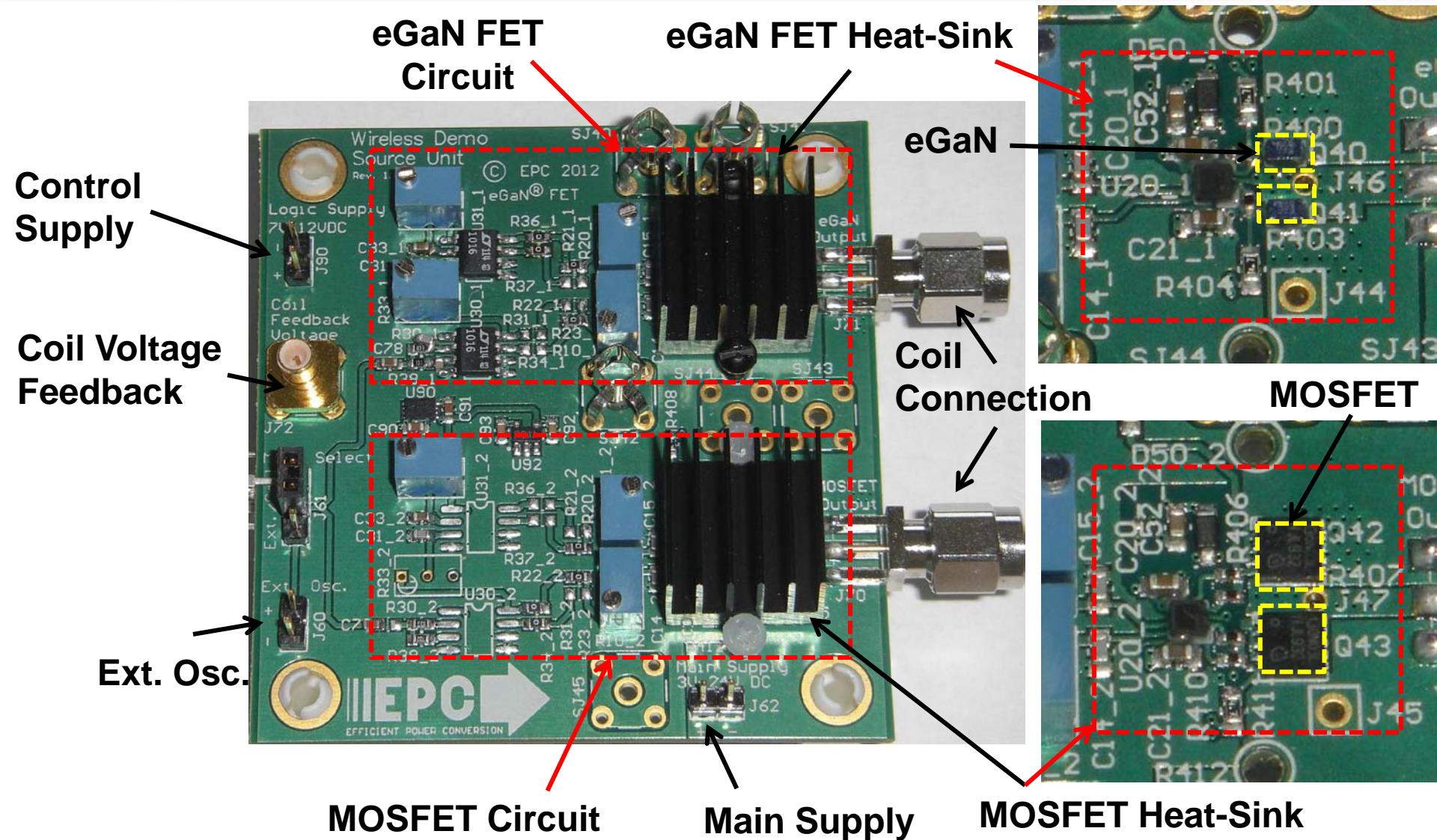
Comprises 4 main sections:

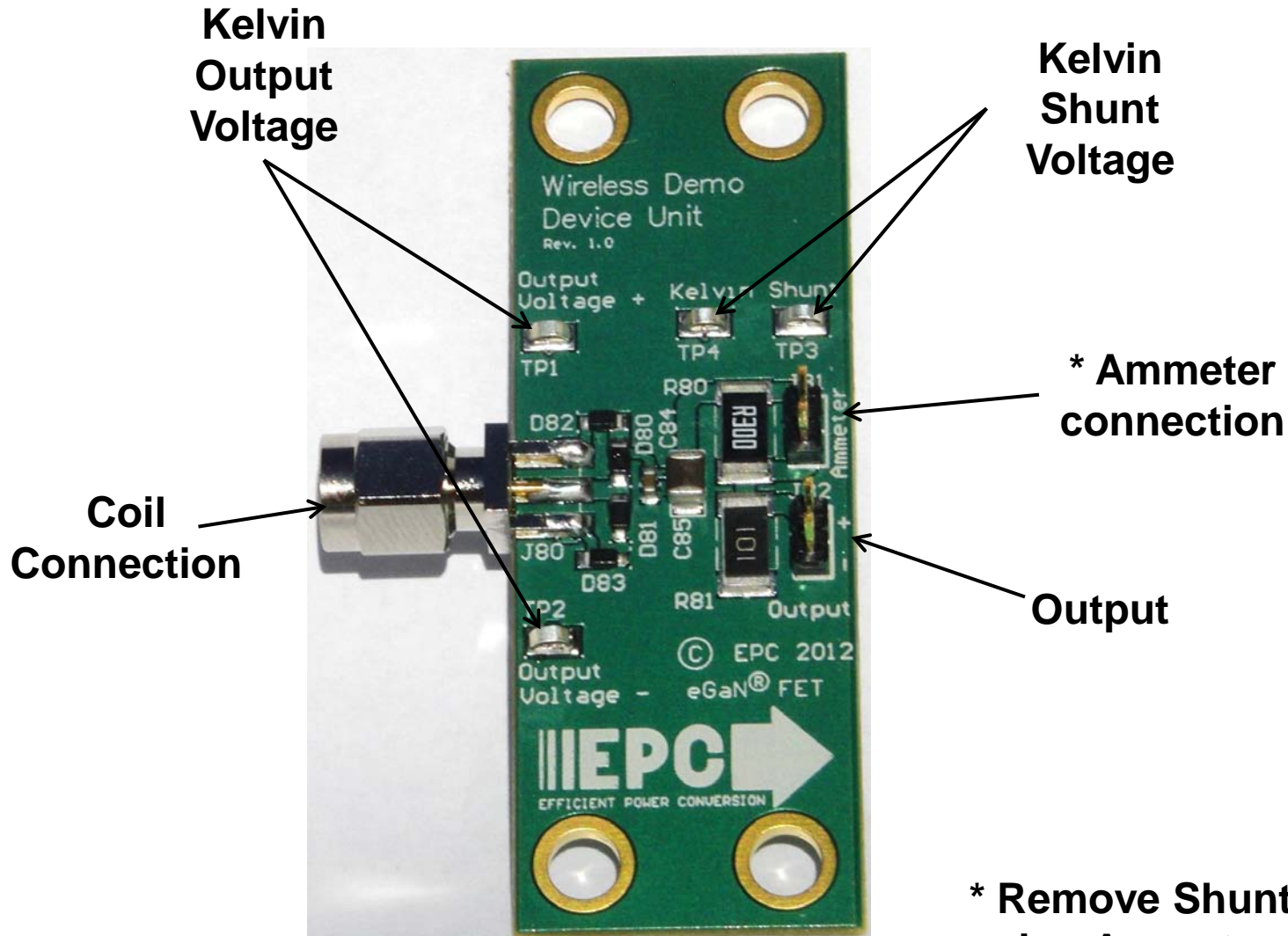
1. An amplifier (a.k.a. a power converter).
2. A transmit coil including matching network.
3. A receive coil including matching network.
4. A rectifier with high frequency filtering

*Reference: Highly resonant wireless power transfer is the subject of many WiTricity US and foreign patents. Please refer to <http://www.witricity.com/pages/intellectual-property.html> for a partial listing of WiTricity patents.



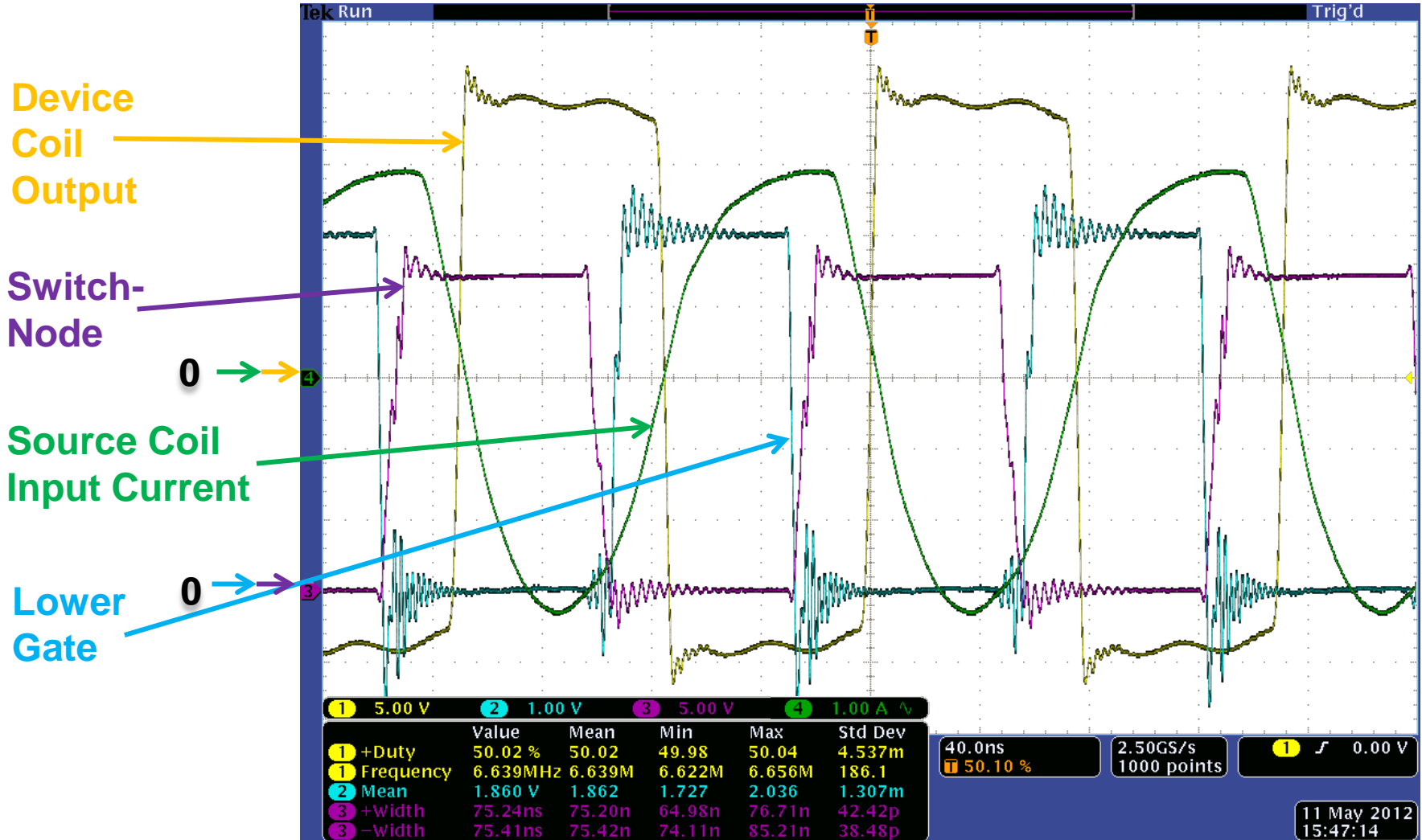


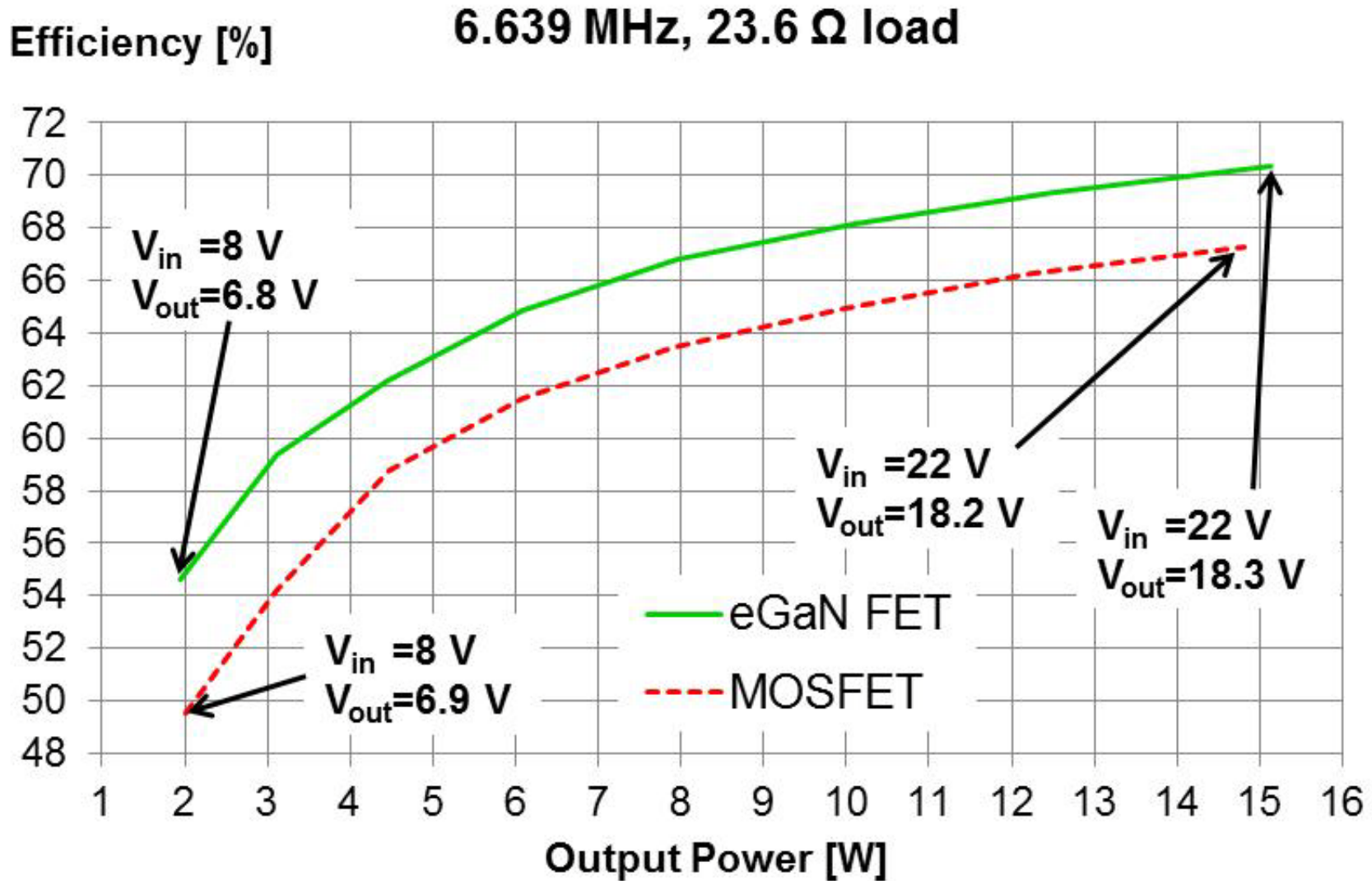




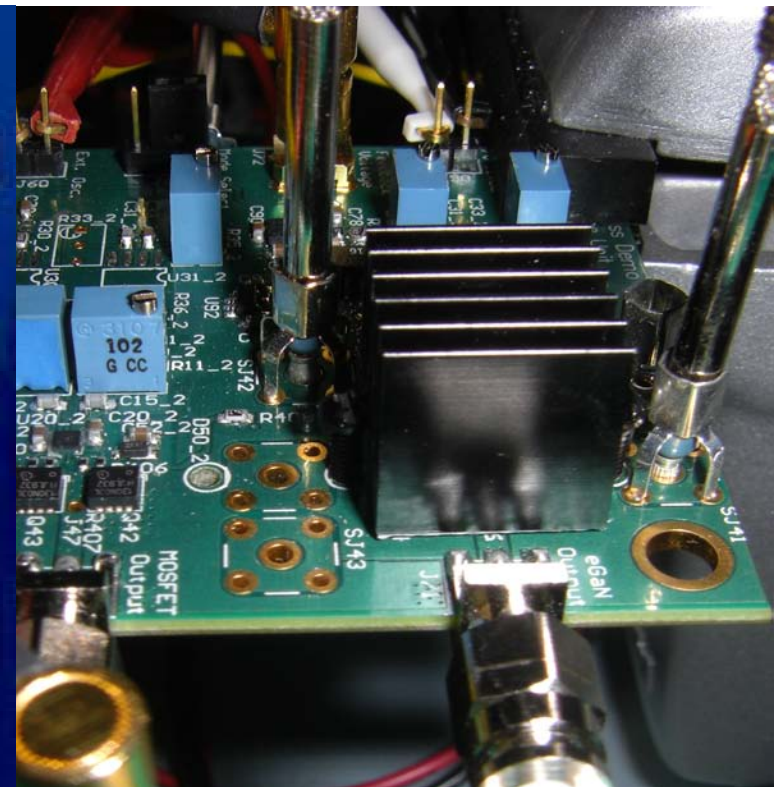
*** Remove Shunt before using Ammeter**

22 V input, 6.639 MHz, 23.6 Ω load (15 W)





28°C ambient, No forced air cooling, 20 V input, 6.639 MHz, 23.6 Ω load (12.5 W)



FET:

- Conduction
- Switching
- *Gate*

Rectifier:

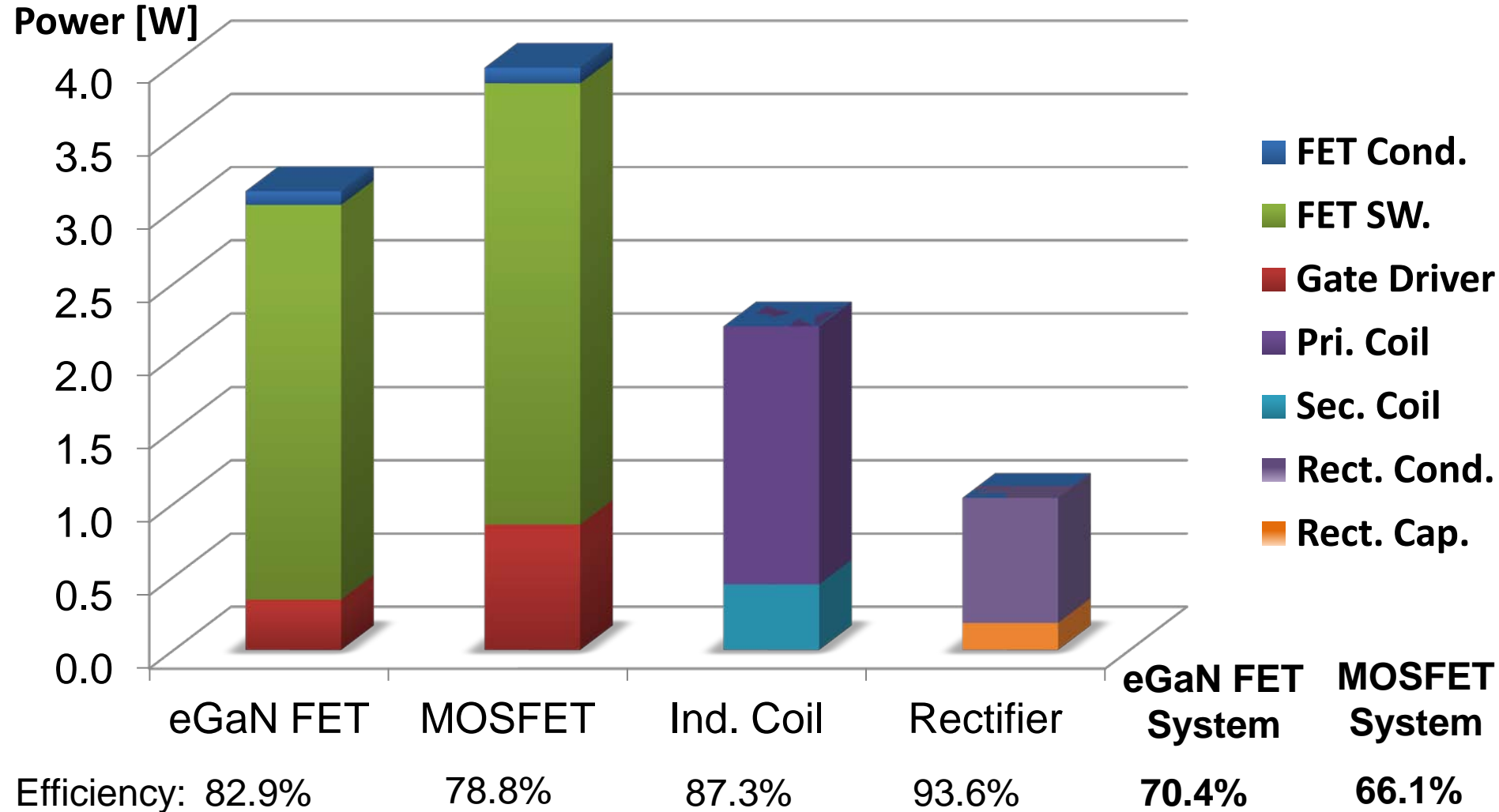
- Conduction losses
- *Capacitive losses*

Coil:

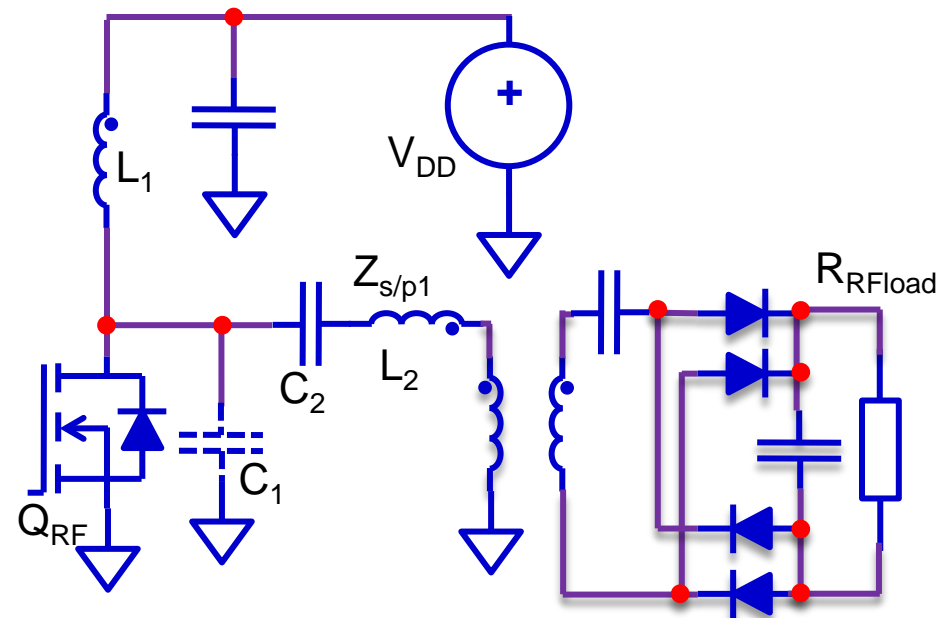
- Conduction losses (skin and proximity effects)

Loss Breakdown of the Wireless System

Power Loss Break Down 22 V supply, 15 W load



- Tight coupling between source and receive coils
- Used EPC1010
- Reported 26.8 W output at 93.6% Drain efficiency

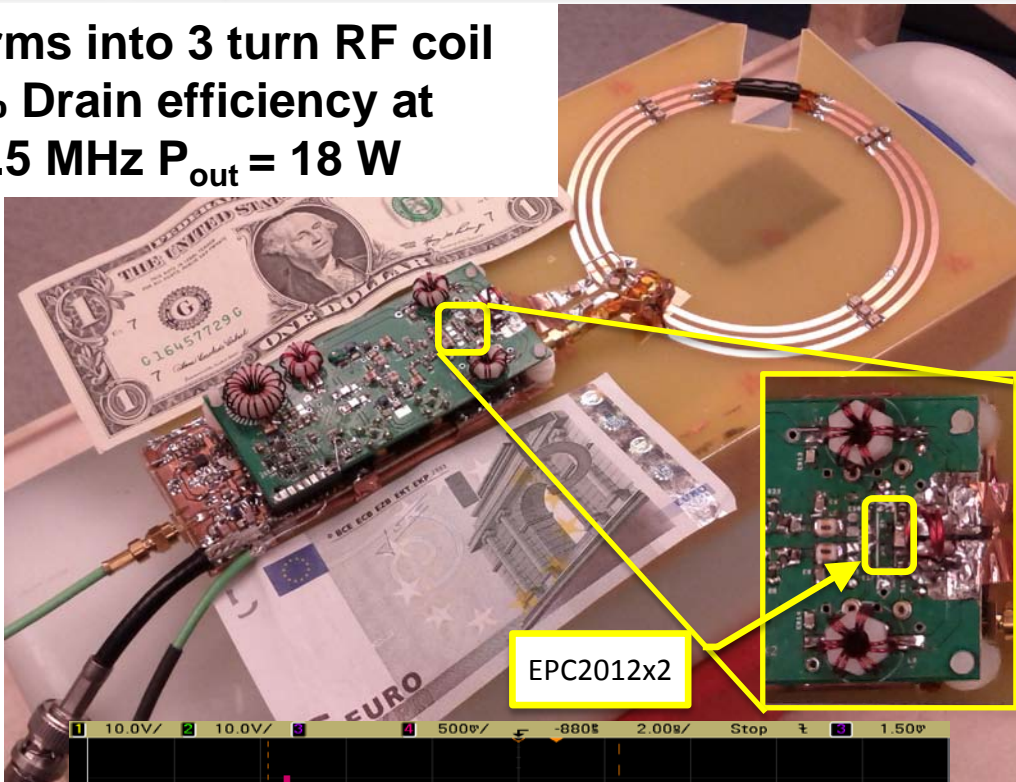


“A 25.6 W 13.56 MHz Wireless Power Transfer System with a 94% Efficiency GaN Class-E Power Amplifier”

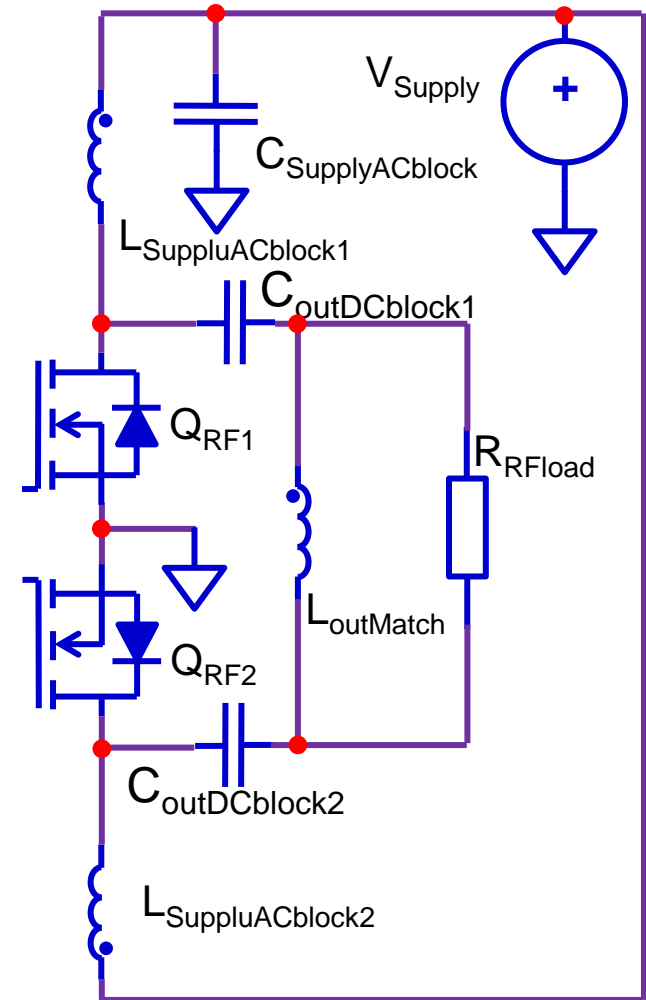
W. Chen, R. A. Chinga, S. Yoshida, J. Lin, C. Chen, W. Lo

IEEE International Microwave Symposium Digest (MTT) Conference, 17-22 June 2012 Page(s): 1 - 3

2A rms into 3 turn RF coil
87% Drain efficiency at
123.5 MHz $P_{out} = 18\text{ W}$



EPC2012x2



“Enhancement Mode GaN (eGaN) FETs for On-Coil MRI Transmit Amplifiers”, M. Twieg, M. J. Riffe, N. Gudino, M. A. Griswold, International Society for Magnetic Resonance in Medicine 21st Annual Meeting, April 2013

High Frequency (> 6.78 MHz) Class-D/CMD/E
Wireless Energy Transfer System enabled using
eGaN FETs.

- Low Losses
- Small Size
- Support circuitry available (Texas Instruments LM5113/4 gate drivers)



*The end of the road
for silicon.....*

*is the beginning of
the eGaN FET
journey!*

