



The eGaN[®] FET
Journey Continues

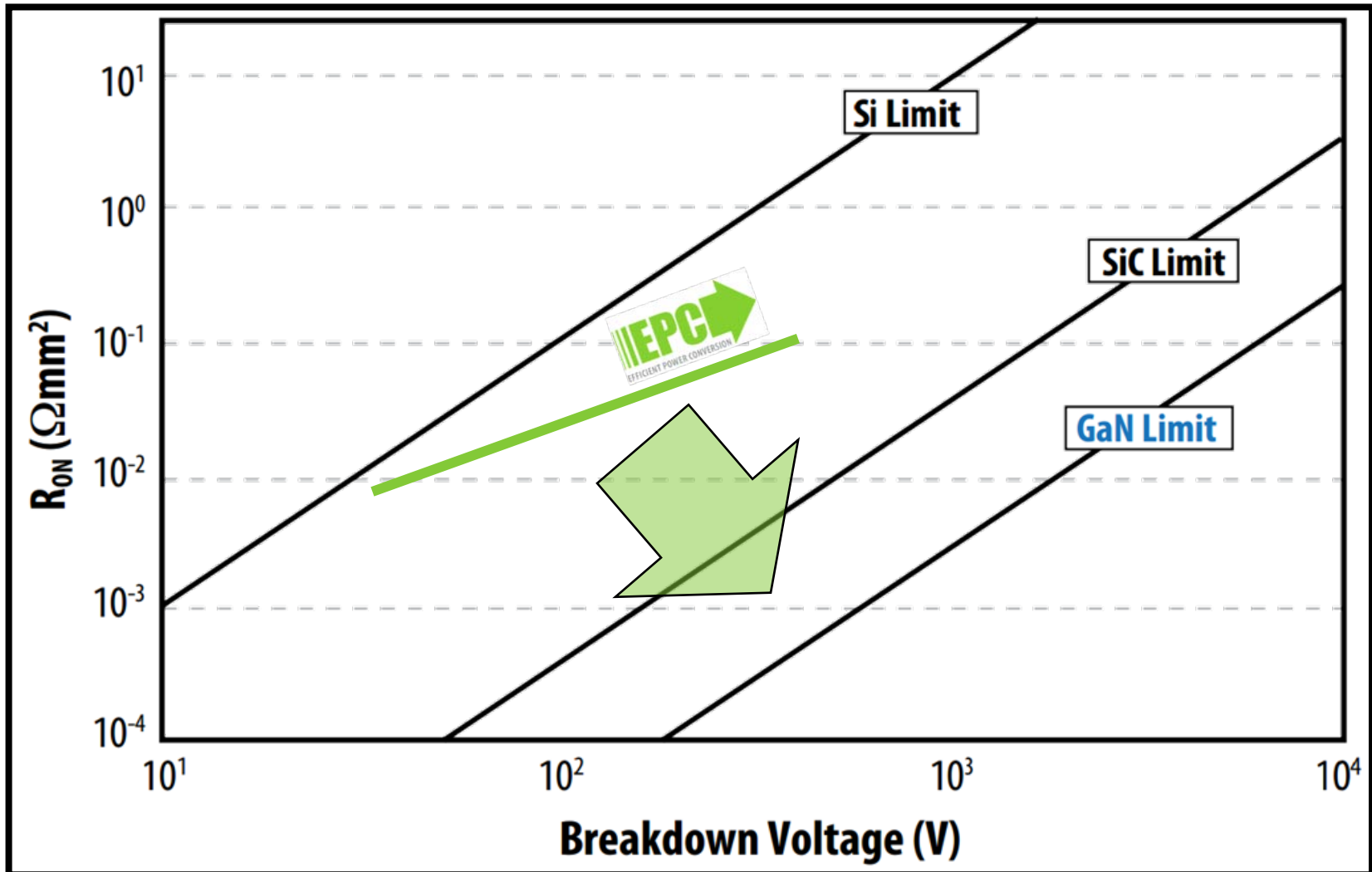
Emerging Applications for GaN Transistors

David Reusch

Alex Lidow, Johan Strydom, and Michael de Rooij

Efficient Power Conversion Corporation

Why Gallium Nitride?

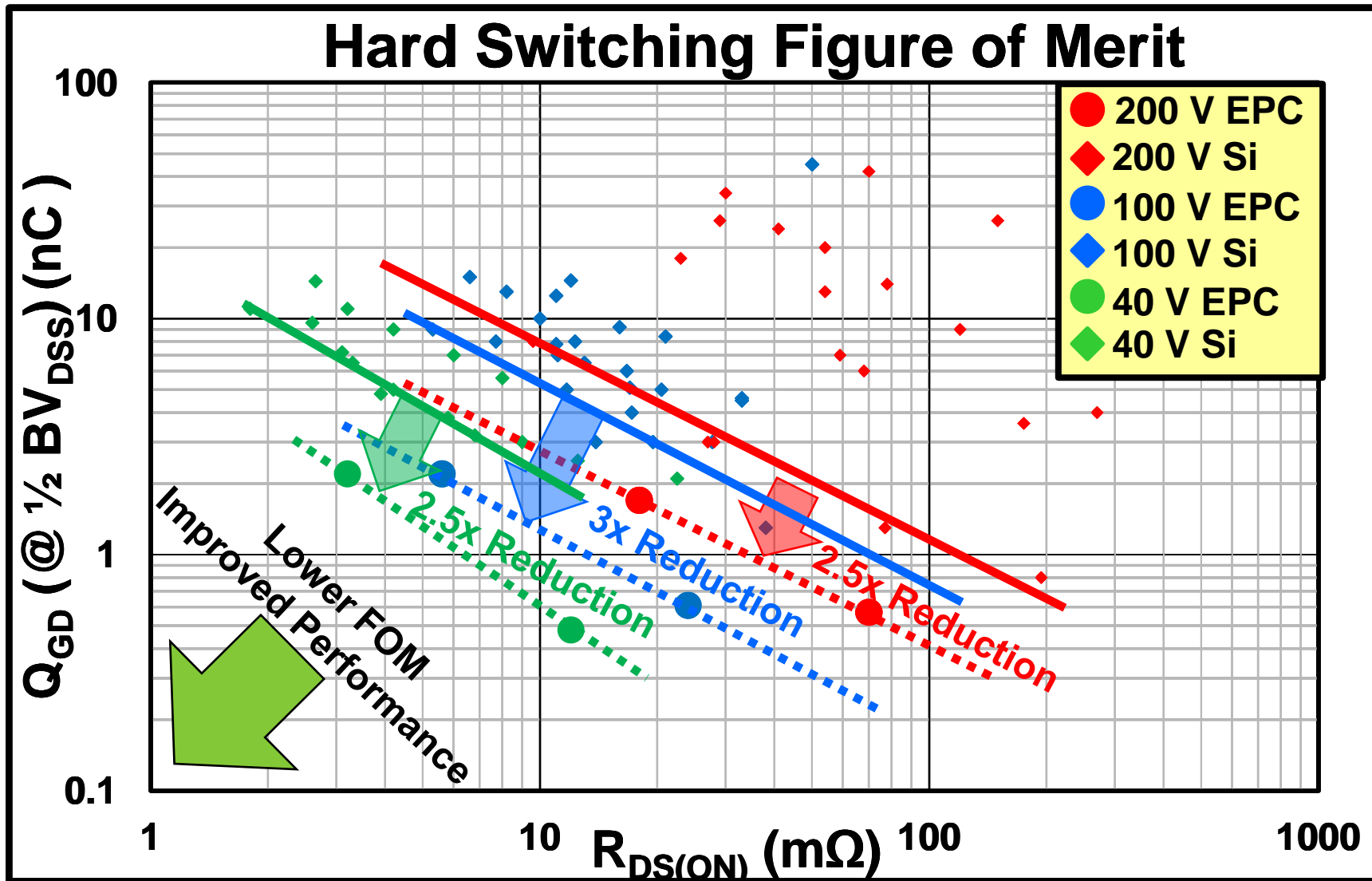


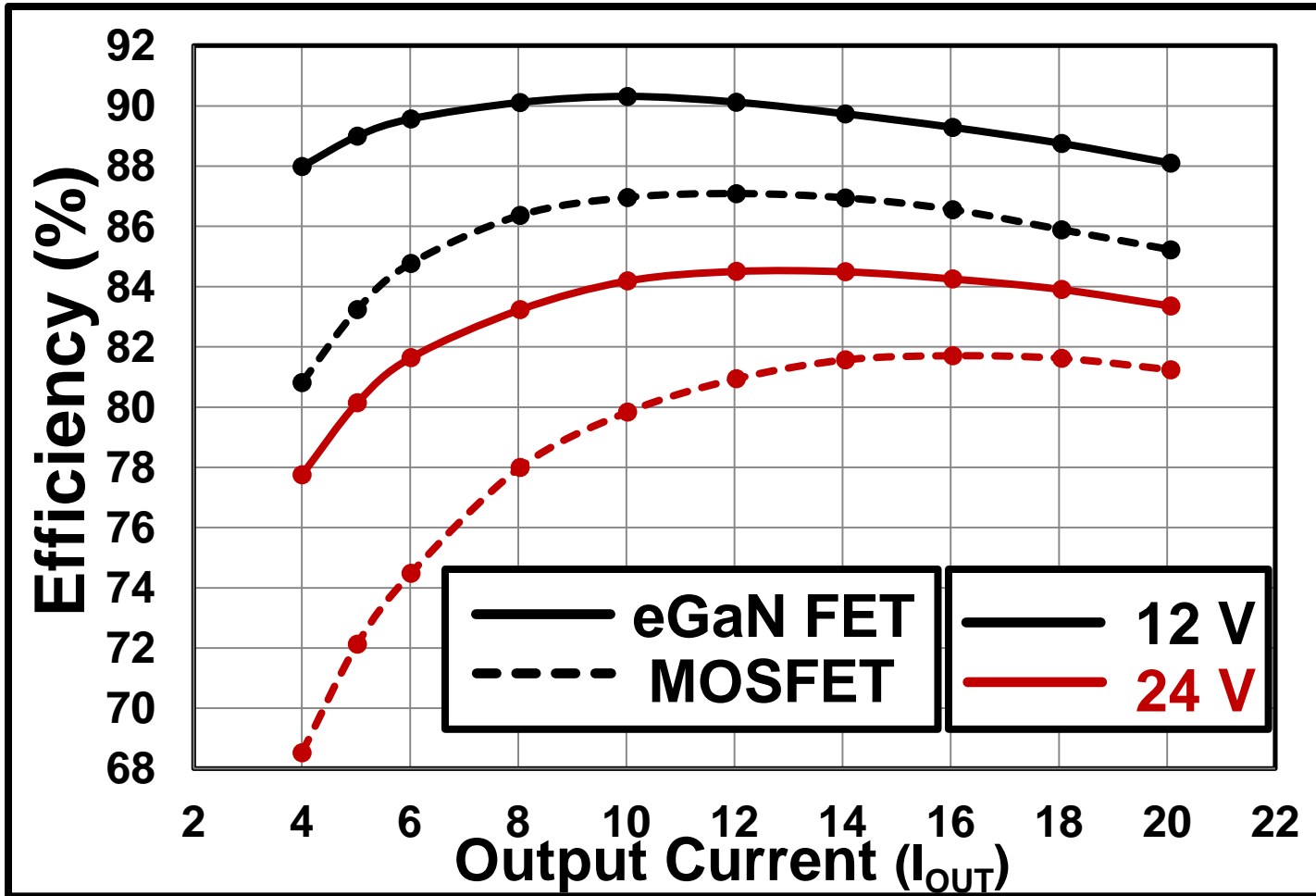


Key Applications

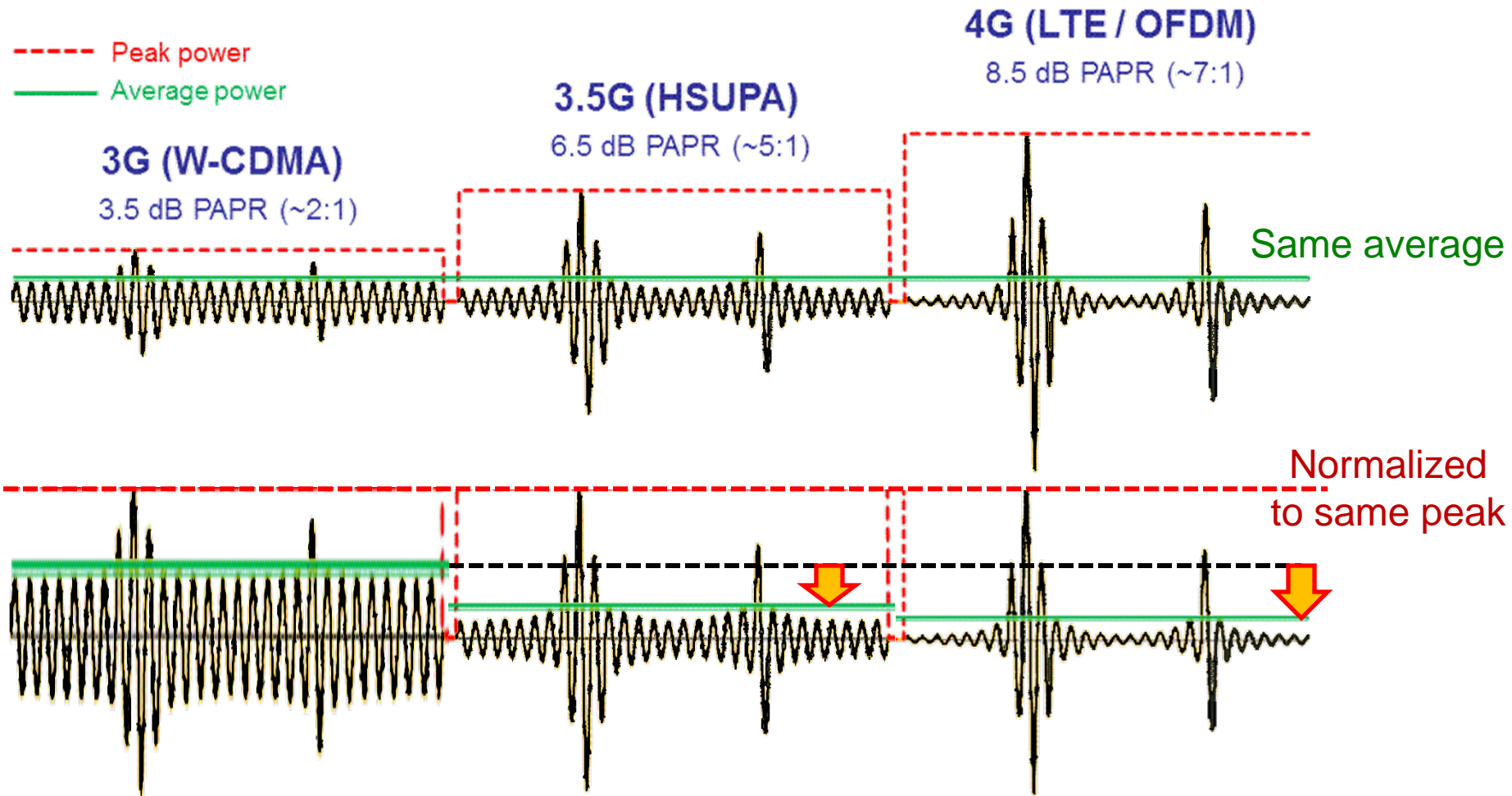


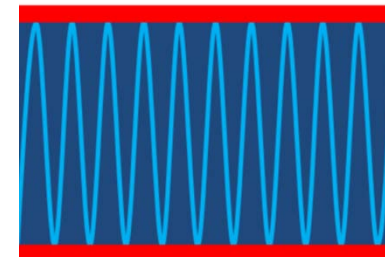
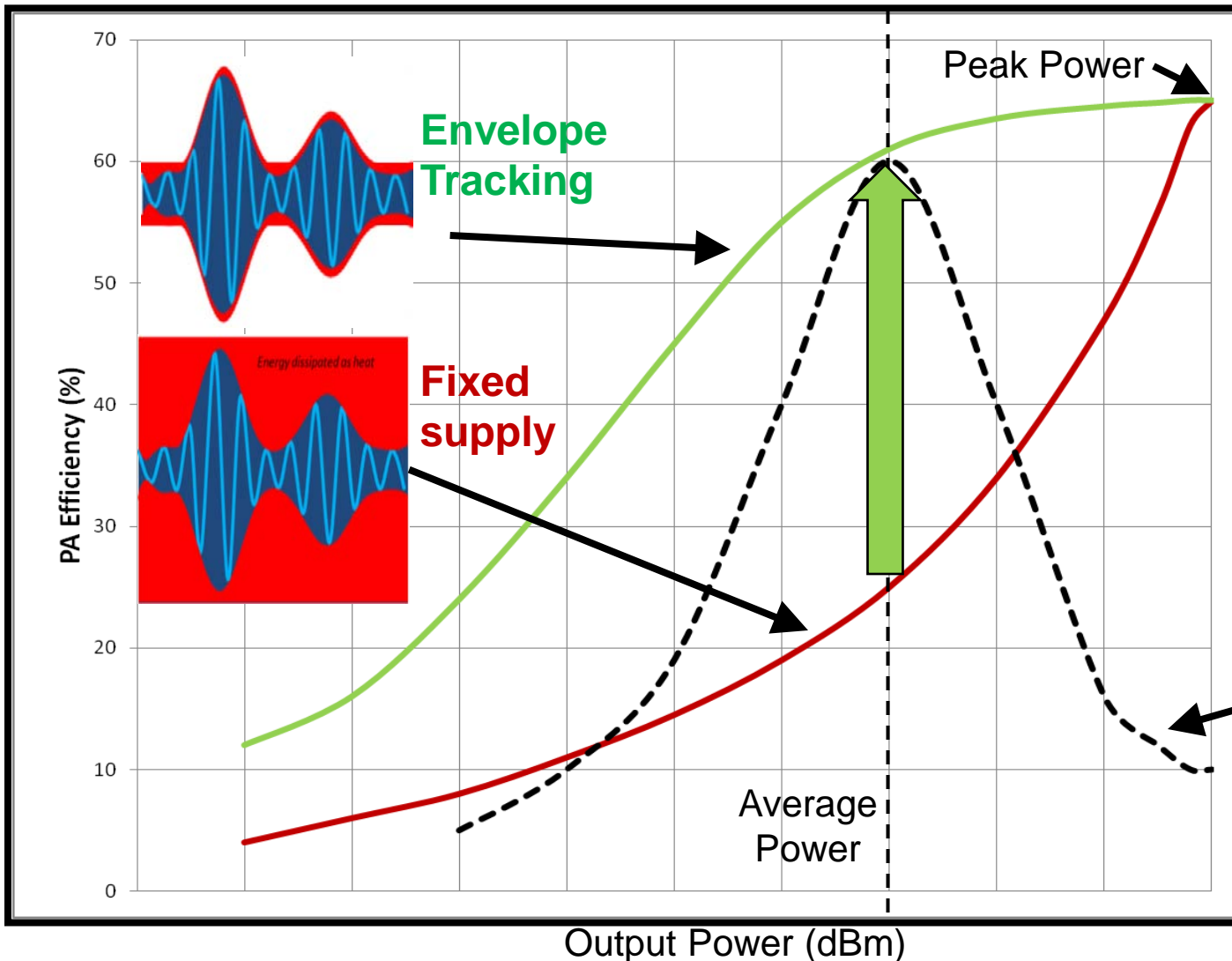
- **RF DC-DC “Envelope Tracking”**
- **Wireless Power Transmission**
- **Point of Load Modules**
- **Network and Server Power Supplies**
- **RadHard**
- **Power Over Ethernet**
- **RF Transmission**
- **Solar Micro-inverters**
- **Energy Efficient Lighting**
- **Class D Audio**





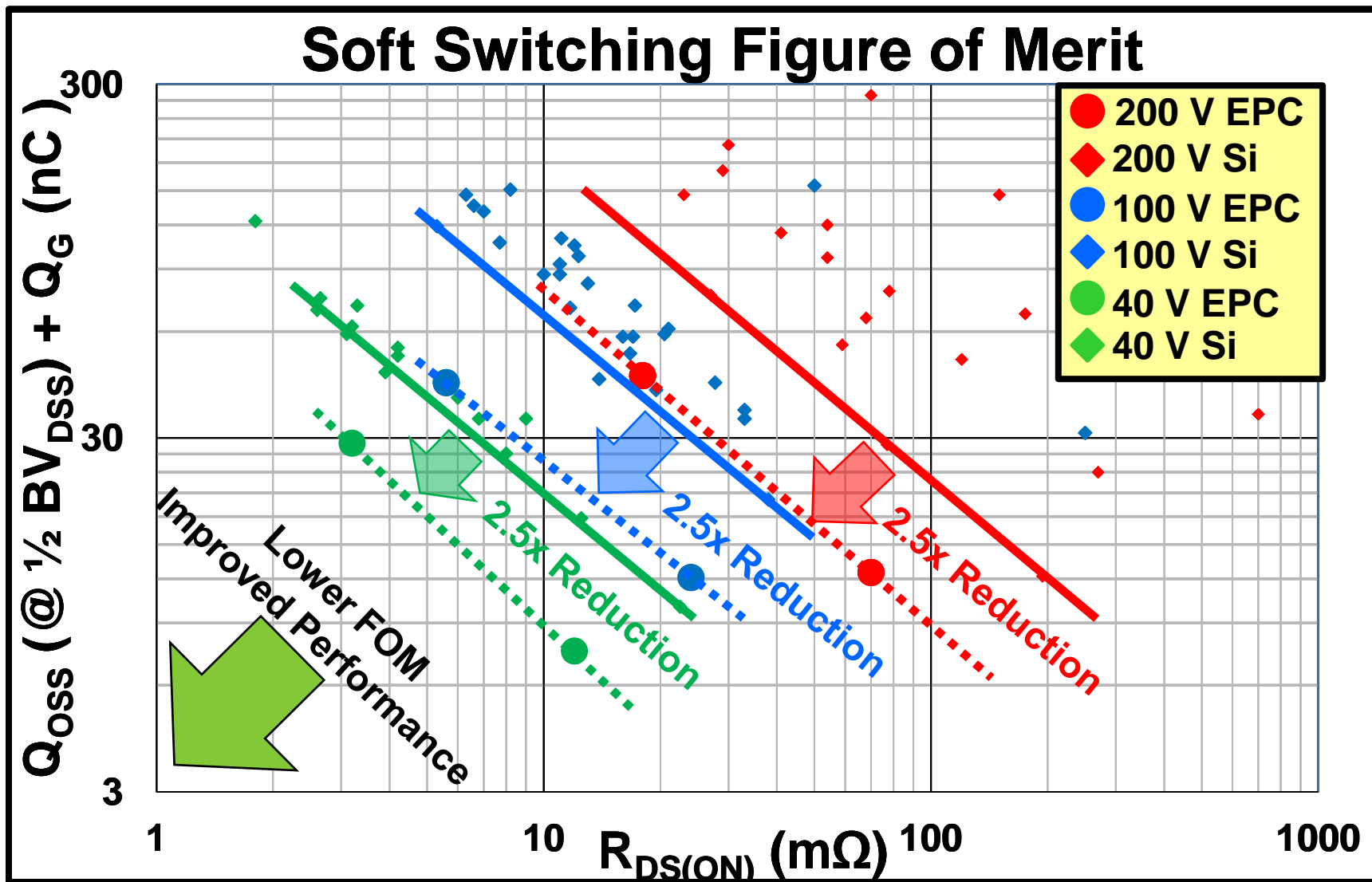
$V_{OUT}=1.2\text{ V}$ $F_s=1\text{ MHz}$ $L=300\text{ nH}$
T/SR: EPC2015 Driver LM5113



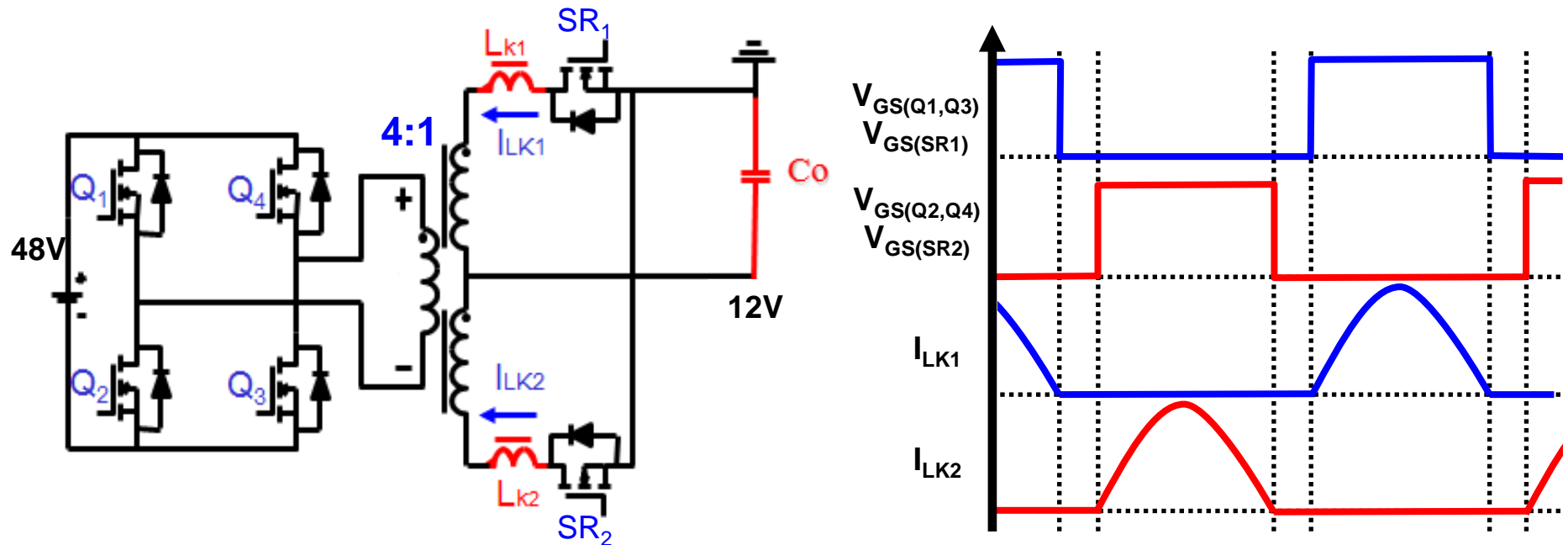


PAPR = 0dB
Peak efficiency up to 65%

Output Probability

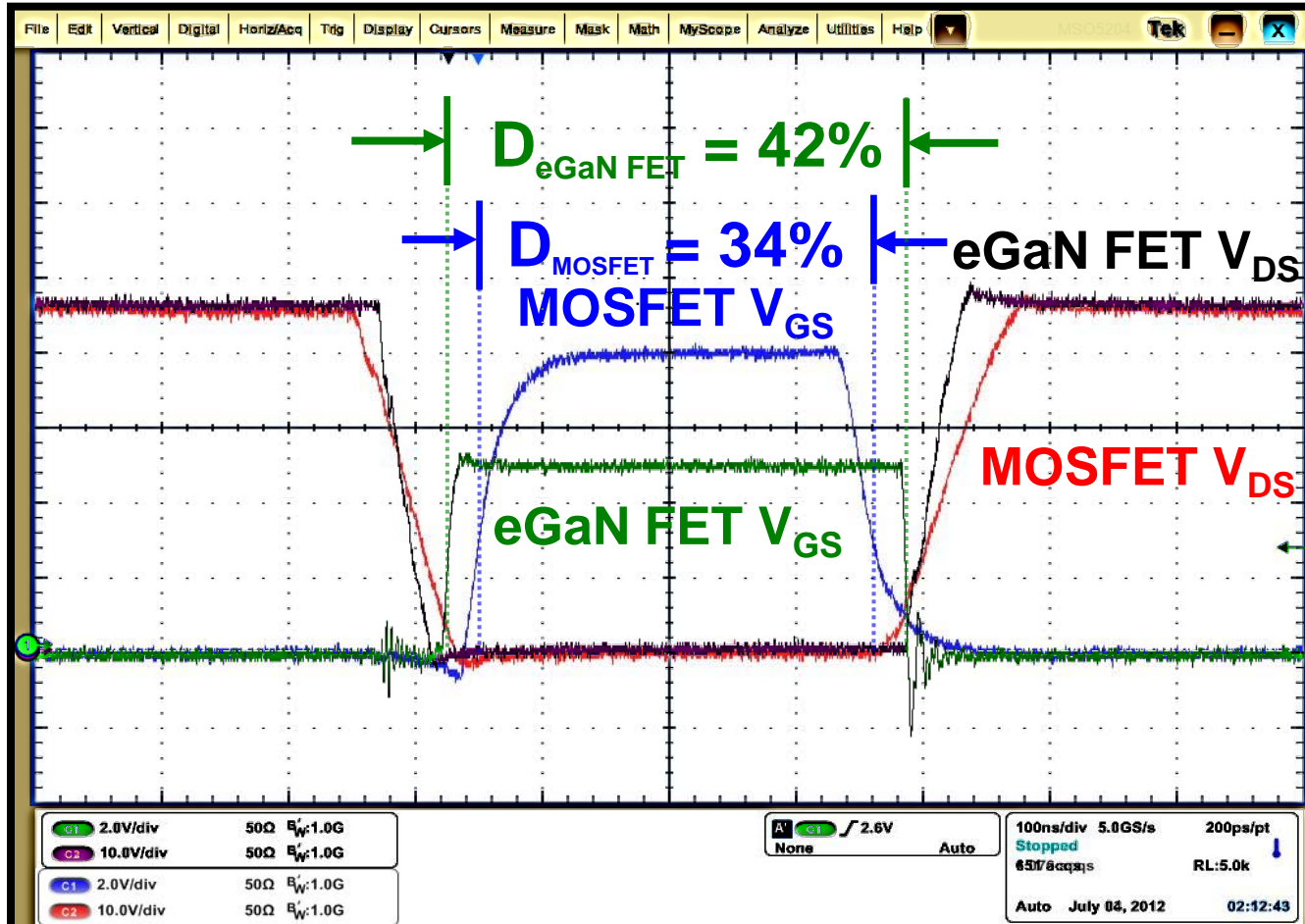


High Frequency DC/DC Transformer

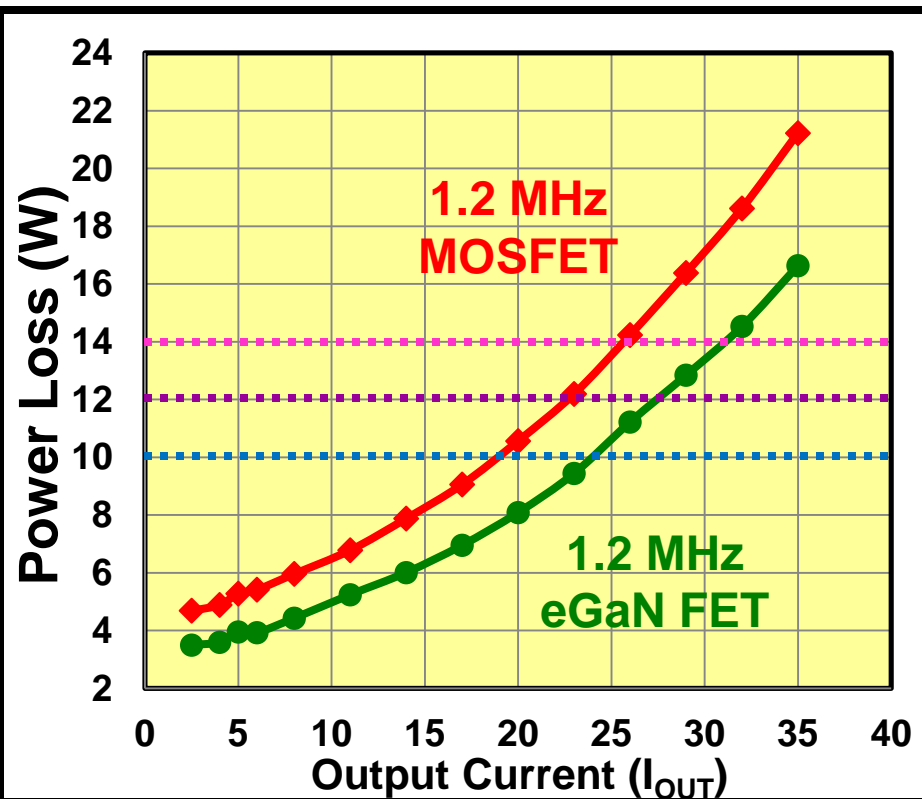
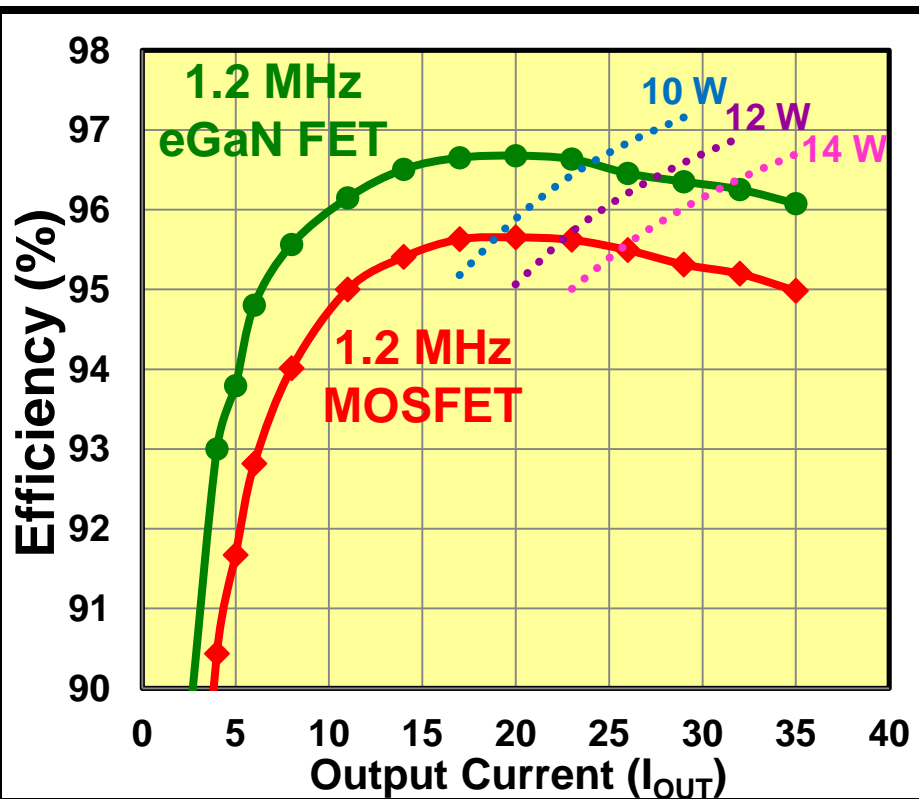


Ref: Y. Ren, M. Xu, J. Sun, and F. C. Lee, "A family of high power density unregulated bus converters," IEEE Trans. Power Electron., vol. 20, no. 5, pp. 1045–1054, Sep. 2005.

Duty Cycle Comparison

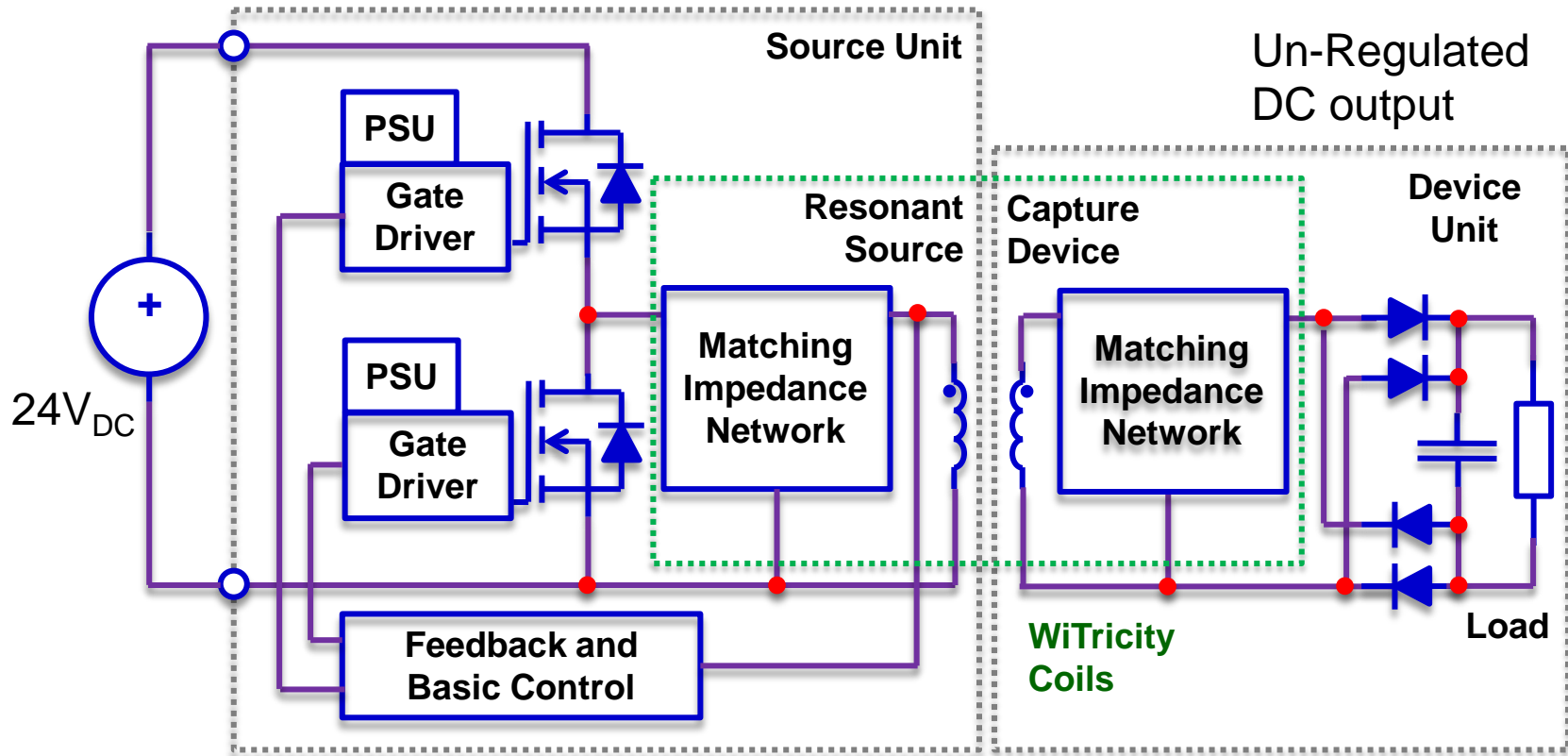


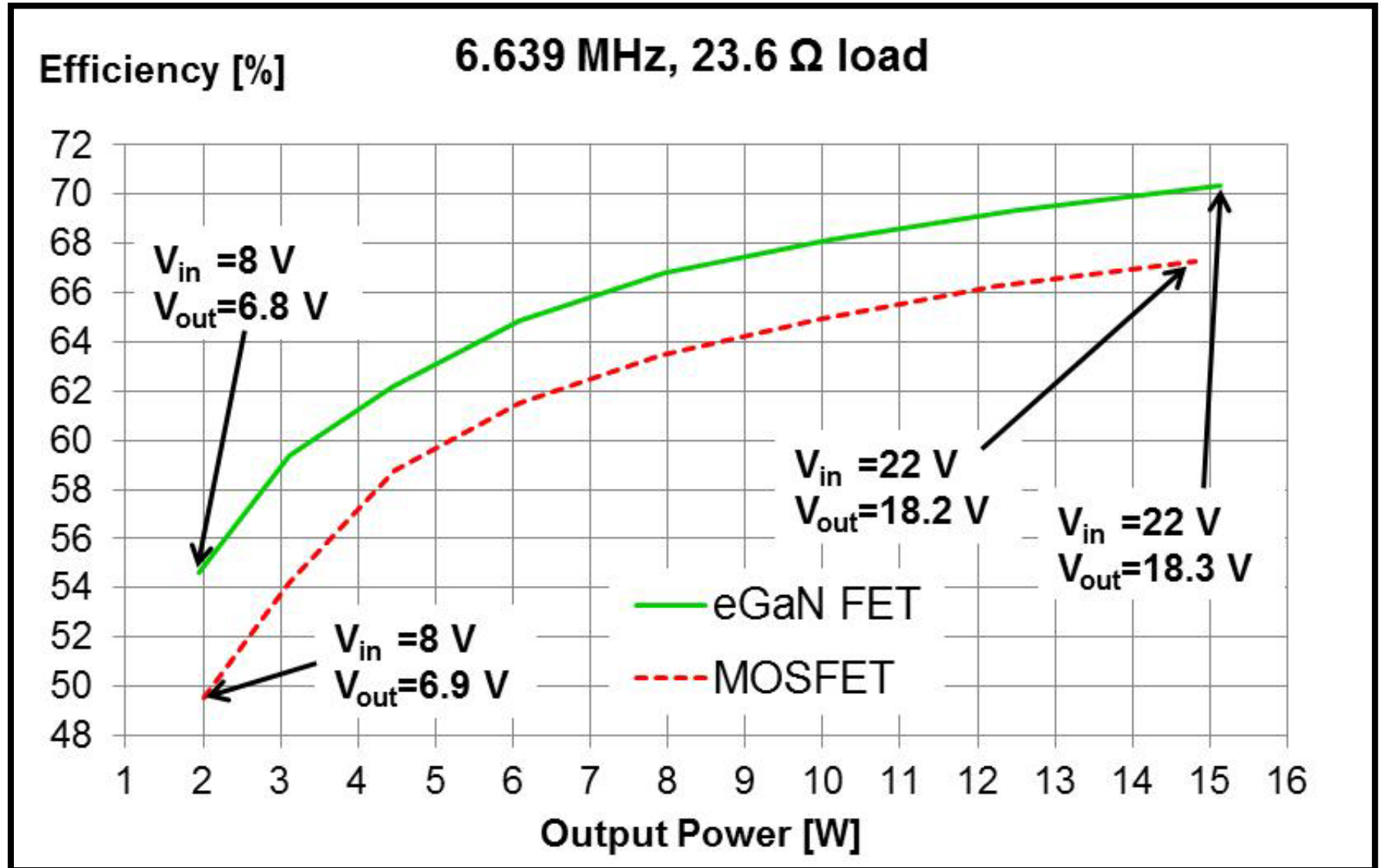
$F_S = 1.2 \text{ MHz}$, $V_{\text{IN}} = 48 \text{ V}$, and $V_{\text{OUT}} \approx 12 \text{ V}$



$F_S = 1.2 \text{ MHz}$, $V_{IN} = 48 \text{ V}$, and $V_{OUT} \approx 12 \text{ V}$

Wireless Power





- eGaN FETs improve high frequency performance in both hard and soft switching applications
- **Lower specific on resistance**
- **Lower switching charge**
- **Lower output charge**
- **Lower gate charge**

Thank you for your time! Questions?



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

*is the beginning of
the eGaN FET
journey!*

