

EPC Wireless Demonstration Circuit Addendum

Issue:

During the initial design and testing of the circuitry for the EPC Wireless Demonstration circuit detailed in *Power Electronics Technology's* Shootout article "[eGaN® FET-Silicon Shoot-Out Vol. 9:Wireless Power Converters](#)"[1] and the subsequent wireless demonstration boards [announced in August of 2012](#) it was established that the LM5113 was unable to operate above 5.2 MHz, as per the datasheet prescribed manner, without external high side power supply augmentation. Subsequently it was decided to add this external circuit for the LM5113 to all the Wireless Energy Transfer system demonstration circuits for testing and evaluation and shown enclosed by the red box in the figure below.

Amendment:

In an ongoing commitment by EPC to ensure ease of adoption of eGaN FET technology and with the assistance from Texas Instruments, further tests and were performed on the Wireless demonstration circuits to determine if the LM5113 IC can operate at high frequency without the need for external circuit augmentation for the high side supply. It was found that if the bootstrap capacitor was changed from 100 nF to 22 nF[2], the LM5113 circuit was able to operate at significantly higher frequencies. This was attributed to the reduction in energy required for the circuit in conjunction with the shorter charge time. Tests were performed on the Wireless Demonstration circuits that successfully validated the solution.

References:

[1] [eGaN® FET- Silicon Power Shoot-Out Volume 9: Wireless Power Converters](#)", Michael de Rooij, Johan Strydom, Power Electronics Technology, June 2012.

[2] [LM5113 datasheet](#), Texas Instruments