

TITLE:

EXPANDING VOLTAGE GAIN RANGE OF CLLC RESONANT CONVERTERS VIA
SOFT-MORPHING TECHNIQUE

5

ABSTRACT

CLLC resonant converters using full-bridge (FB) and half-bridge (HB) soft-morphing techniques are disclosed. Two forms of soft-morphing are provided: type1, steady-state rotational soft-morphing, which ensures balanced power loss and thermal stress
10 across all power switches, and type2, dynamic soft-morphing, which facilitates smooth transitions between FB-FB, FB-HB, and HB-FB modes. Consequently, the FB CLLC resonant converter can achieve a $16\times$ ultra-wide voltage gain range.

FIG. 12