Most of today's power converters are based on power semiconductors, which are built in vertical power semiconductor processes. These devices result in limited packaging possibilities, which lead to physically long galvanic connections and therefore high external electromagnetic fields. These fields compromise power quality significantly. Therefore this paper examines the possibility to use lateral silicon-on-insulator power MOSFETs and uses the custom-made devices in a 48 V to 12 V synchronous buck converter in continuous conduction mode. The converter is designed based on custom made power transistors, implemented and verified by experimental results. The resulting efficiency of the 1 W converter is around 93 % across a wide load range and its temperature rise is less the 10 °C. This leads to the conclusion, that modern lateral silicon-on-insulator power processes allow high integration of power stages and therefore promise lower emissions, leading to higher power quality.