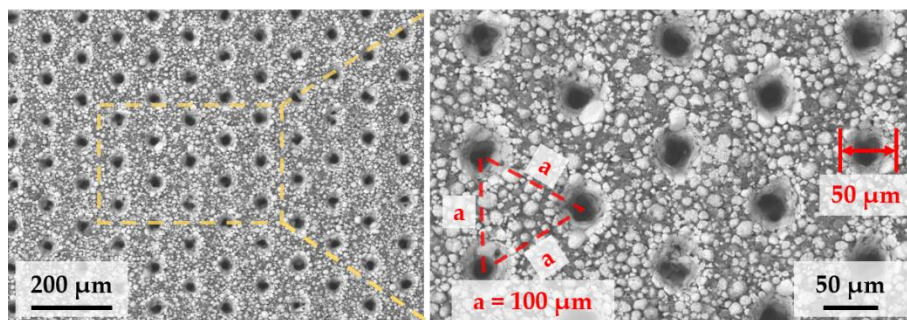
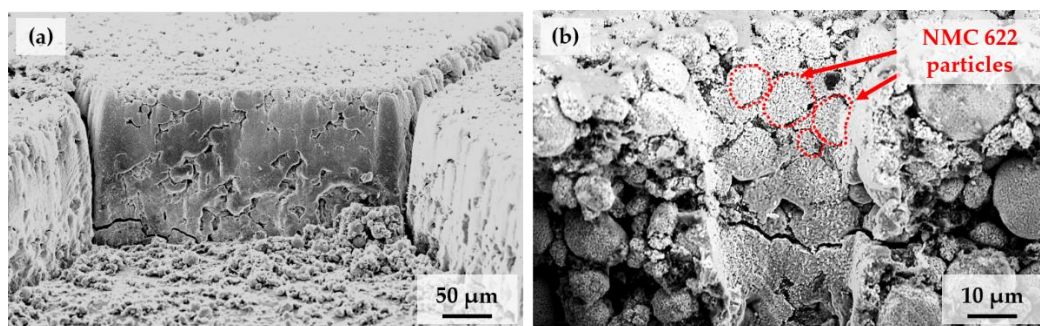


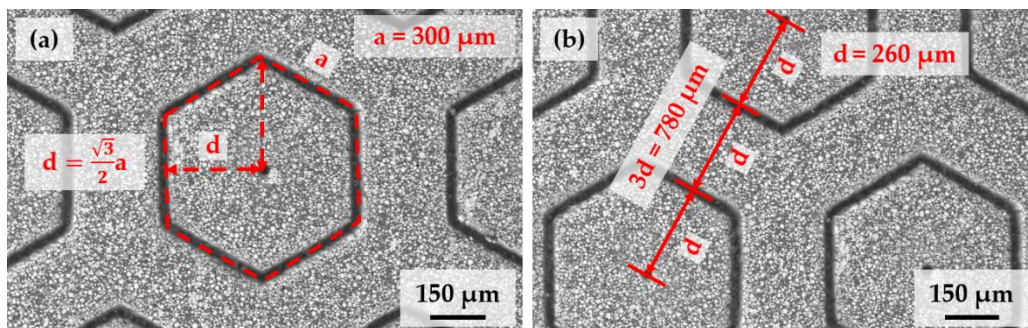
**Figure S1.** Laser ablation depth in calendered and uncalendered NMC 622 electrodes with increasing number of laser scan passes using laser parameters for L2 patterning.



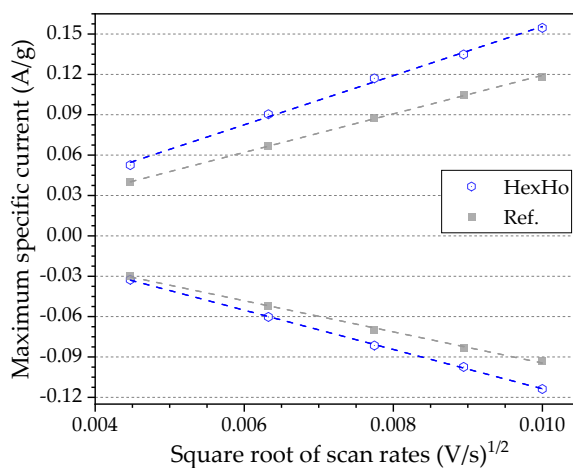
**Figure S2.** SEM images of laser structured electrodes with Ho structure providing a periodicity of  $a = 100 \mu\text{m}$  (equilateral triangle).



**Figure S3.** SEM images of (a) a sidewall of laser patterned NMC 622 electrodes with HexHo structure and (b) the cross-sectional view of a hole in the center of a hexagonal pillar.



**Figure S4.** SEM images of laser structured NMC 622 electrodes with Sep.HexHo structure. (a) A hexagon with central hole and (b) the distance between adjacent hexagons.



**Figure S5.** The maximum specific current versus square root of scan rates for reference cell and those having laser structured NMC 622 cathodes with HexHo pattern type.

**Table S1.** The total surface areas of laser structured electrodes with different pattern types and their surface area increase in contrast to the unstructured electrode.

Pattern types	Total surface area ( $\text{mm}^2$ )	Surface area increase (%)
Unstructured	113	-
L1	260	130
L2	252	123
LiHo	234	107
GHo	193	71
Ho	252	123
Hex	226	100
HexHo	231	104
Sep.HexHo	207	83