

# 800V MDmesh™ K6 STPOWER MOSFET



ST's latest very high voltage  
super-junction technology



## MDmesh\* K6 technology featuring industry's best on-resistance per area enables higher power density and more compact solutions

The STPOWER 800V MDmesh K6 series sets a benchmark for the 800V super-junction technology combining best-in-class performance with remarkable ease of use.

Thanks to its excellent  $R_{DS(on)} \times \text{area}$ , the new series enables higher power density for more compact system solutions. Furthermore, the lower threshold voltage  $V_{GS(th)}$  allows to reduce the driving voltage for even lower power losses. This new very high voltage family is suitable for lighting applications as LED drivers as well as for SMPS like adapters and chargers, based on the flyback topology.

### KEY FEATURES & BENEFITS

- Industry's best  $R_{DS(on)}$  for 800V voltage range
- High switching speed
- Lowest  $Q_g$
- Increased power density and compactness
- High efficiency and easier design
- Lower power losses

### KEY APPLICATIONS

- LED drivers
- HID lamps
- Adapters
- Chargers

\* is a registered and/or unregistered trademark of STMicroelectronics International NV or its affiliates in the EU and/or elsewhere

## MDmesh K6 analysis

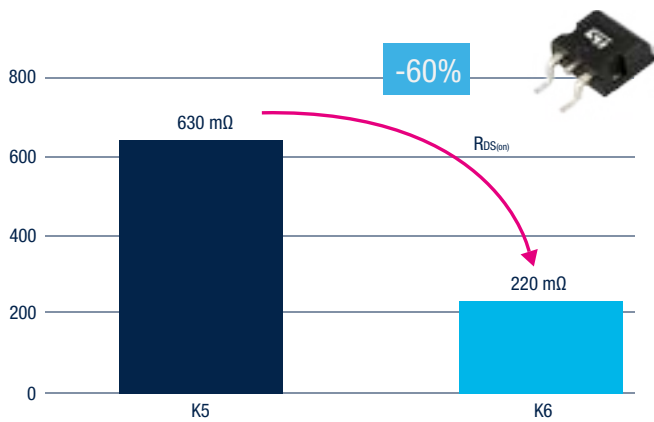
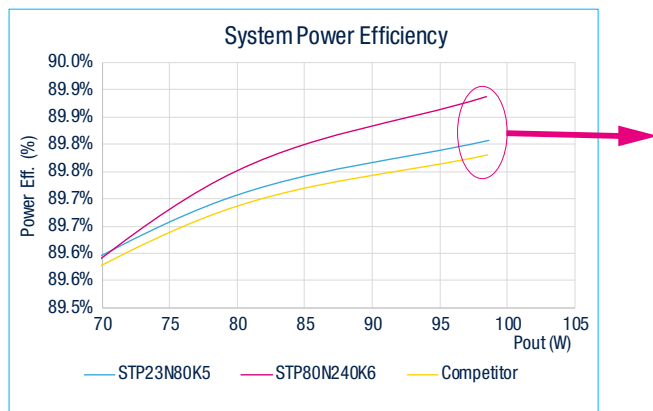


Fig 1: RDS(on) comparison between MDmesh K6 and MDmesh K5

One of the most significant features of the MDmesh K6 is the best-in-class RDS(on) in the DPAK package. This allows to switch from a through-hole package solution to an SMD one obtaining a more compact design and reducing the board height. As shown in Figure 1, with this new series we have obtained a lower RDS(on) of about 60% with the respect to the previous technology in the same package solution.

The efficiency comparison between MDmesh K6, the previous technology K5 and the best competitor has been performed on an 100W LED driver based on flyback topology. Figure 2 shows how MDmesh K6 presents a better efficiency compared to the two other evaluated devices.

This result is consistent with the energy during switching off (Eoff) and the case temperature (Tc) values reported in Table 1, referring to maximum load level of 100W.



| DEVICE      | Eoff [μJ] | Tc [°C] |
|-------------|-----------|---------|
| STP80N240K6 | 10.18     | 91      |
| Competitor  | 11.32     | 97.6    |
| STP23N80K5  | 10.42     | 97      |

Table 1: Results at maximum load

Fig 2: Efficiency comparison

## 800V MDmesh K6 Product Plan

| BVdss[V] | RDS(on) [Ω] | Id max [A] | Qg [nC] | Part Numbers    | Package   |
|----------|-------------|------------|---------|-----------------|-----------|
| 800      | 0.22        | 16         | 25.9    | STP80N240K6     | TO-220    |
|          | 0.34        | 12         | 17.8    | STP80N340K6     |           |
|          | 0.45        | 10         | 17.3    | STP80N450K6     |           |
|          | 0.22        | 16         | 25.9    | STD80N240K6     | DPAK      |
|          | 0.34        | 12         | 17.8    | STD80N340K6     |           |
|          | 0.45        | 10         | 17.3    | STD80N450K6     |           |
|          | 0.6         | 7          | TBD     | STN80N600K6 (*) | SOT223-2L |
|          | 0.9         | 6          | TBD     | STN80N900K6 (*) |           |

Note\* Under development



© STMicroelectronics - October 2021 - Printed in the United Kingdom - All rights reserved  
 ST and the ST logo are registered and/or unregistered trademarks of STMicroelectronics International NV or its affiliates in the EU and/or elsewhere. In particular, ST and the ST logo are Registered in the US Patent and Trademark Office.  
 For additional information about ST trademarks, please refer to [www.st.com/trademarks](http://www.st.com/trademarks).  
 All other product or service names are the property of their respective owners.

