

### General Description

The CMSV60R180S6ZD is power MOSFET using Cmos's advanced super junction technology that can realize very low on resistance , gate charge and reduced tendency for ringing.As a result, its switching loss is very low, making it optimized for switching applications. Moreover, these user friendly devices offer the advantages of improved ruggedness and remarkable ESD capability by integrated Zener diode, making it an ideal choice for designers.

### Features

- Multi-layer Epitaxial Chip Technology
- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant

### Absolute Maximum Ratings

| Symbol                 | Parameter                                  | Rating     | Units |
|------------------------|--------------------------------------------|------------|-------|
| $V_{DS}$               | Drain-Source Voltage                       | 600        | V     |
| $V_{GS}$               | Gate-Source Voltage                        | ±25        | V     |
| $I_D@T_C=25^{\circ}C$  | Continuous Drain Current                   | 20         | A     |
| $I_D@T_C=100^{\circ}C$ | Continuous Drain Current                   | 14         | A     |
| $I_{DM}$               | Pulsed Drain Current                       | 80         | A     |
| EAS                    | Single Pulse Avalanche Energy <sup>1</sup> | 240        | mJ    |
| $P_D@T_C=25^{\circ}C$  | Total Power Dissipation                    | 180        | W     |
| $T_{STG}$              | Storage Temperature Range                  | -55 to 150 | °C    |
| $T_J$                  | Operating Junction Temperature Range       | 150        | °C    |

### Thermal Data

| Symbol          | Parameter                           | Typ. | Max. | Unit |
|-----------------|-------------------------------------|------|------|------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient | ---  | 62   | °C/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-case    | ---  | 0.69 | °C/W |

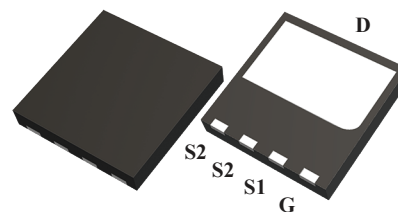
### Product Summary

| BVDSS | $R_{DS(on)}$ max. | ID  |
|-------|-------------------|-----|
| 600V  | 0.18Ω             | 20A |

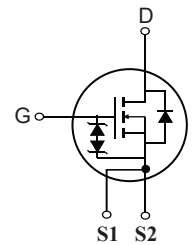
### Applications

- Adapter
- PFC power supply stages
- DC-DC converters

### DFN-8 8x8 Pin Configuration



DFN-8 8x8  
CMSV60R180S6ZD



S1: Driver Source  
S2: Power Source

## 600V, 0.165Ω typ., 20A N-Channel Super Junction Power MOSFET

Electrical Characteristics( $T_J=25^{\circ}\text{C}$ , unless otherwise noted)

| Symbol       | Parameter                         | Conditions                                                  | Min. | Typ. | Max. | Unit |
|--------------|-----------------------------------|-------------------------------------------------------------|------|------|------|------|
| $BV_{DSS}$   | Drain-Source Breakdown Voltage    | $V_{GS}=0V$ , $I_D=250\mu A$                                | 600  | ---  | ---  | V    |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10V$ , $I_D=5.6A$                                   | ---  | 165  | 180  | mΩ   |
| $V_{GS(th)}$ | Gate Threshold Voltage            | $V_{GS}=V_{DS}$ , $I_D=250\mu A$                            | 2.5  | ---  | 4.5  | V    |
| $I_{DSS}$    | Drain-Source Leakage Current      | $V_{DS}=600V$ , $V_{GS}=0V$                                 | ---  | ---  | 1    | μA   |
| $I_{GSS}$    | Gate-Source Leakage Current       | $V_{GS}=\pm 25V$ , $V_{DS}=0V$                              | ---  | ---  | 10   | μA   |
| $g_{fs}$     | Forward Transconductance          | $V_{DS}=10V$ , $I_D=5.6A$                                   | ---  | 11   | ---  | S    |
| $R_g$        | Gate Resistance                   | $V_{DS}=0V$ , $V_{GS}=0V$ , $f=1\text{MHz}$                 | ---  | 10   | ---  | Ω    |
| $Q_g$        | Total Gate Charge                 | $I_D=5.6A$                                                  | ---  | 28.6 | ---  | nC   |
| $Q_{gs}$     | Gate-Source Charge                | $V_{DD}=400V$                                               | ---  | 7.1  | ---  |      |
| $Q_{gd}$     | Gate-Drain Charge                 | $V_{GS}=10V$                                                | ---  | 8.9  | ---  |      |
| $T_{d(on)}$  | Turn-On Delay Time                | $V_{DD}=300V$<br>$V_{GS}=10V$<br>$R_G=25\Omega$ , $I_D=18A$ | ---  | 28   | ---  | ns   |
| $T_r$        | Rise Time                         |                                                             | ---  | 35   | ---  |      |
| $T_{d(off)}$ | Turn-Off Delay Time               |                                                             | ---  | 93   | ---  |      |
| $T_f$        | Fall Time                         |                                                             | ---  | 5.6  | ---  |      |
| $C_{iss}$    | Input Capacitance                 | $V_{DS}=100V$ , $V_{GS}=0V$ , $f=1\text{MHz}$               | ---  | 1400 | ---  | pF   |
| $C_{oss}$    | Output Capacitance                |                                                             | ---  | 40   | ---  |      |
| $C_{rss}$    | Reverse Transfer Capacitance      |                                                             | ---  | 2    | ---  |      |

## Diode Characteristics

| Symbol   | Parameter                 | Conditions                                          | Min. | Typ. | Max. | Unit |
|----------|---------------------------|-----------------------------------------------------|------|------|------|------|
| $I_S$    | Continuous Source Current | $V_G=V_D=0V$ , Force Current                        | ---  | ---  | 20   | A    |
| $I_{SM}$ | Pulsed Source Current     |                                                     | ---  | ---  | 80   | A    |
| $V_{SD}$ | Diode Forward Voltage     | $V_{GS}=0V$ , $I_S=5.6A$ , $T_J=25^{\circ}\text{C}$ | ---  | 0.8  | 1.4  | V    |
| $t_{rr}$ | Reverse Recovery Time     | $di/dt = 100A/\mu s$                                | ---  | 203  | ---  | ns   |
| $Q_{rr}$ | Reverse Recovery Charge   | $V_{DD}=400V$ , $I_{SD}=5.6A$                       | ---  | 1.6  | ---  | μC   |

Note :

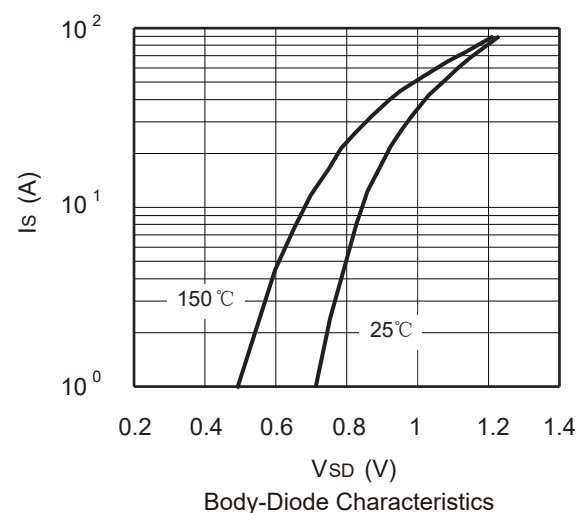
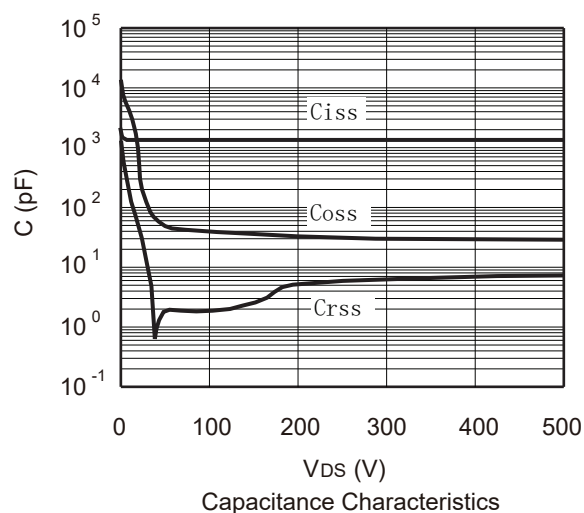
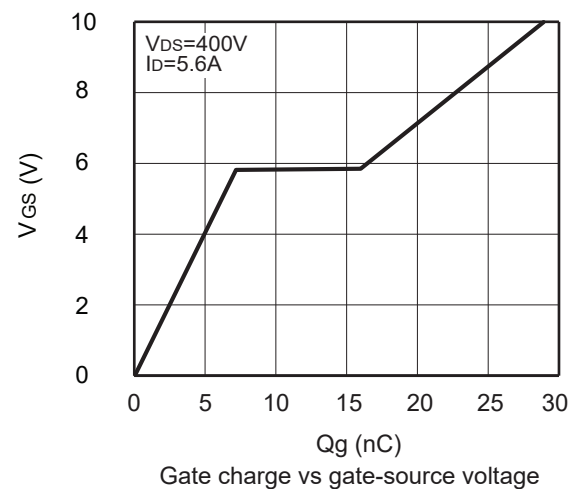
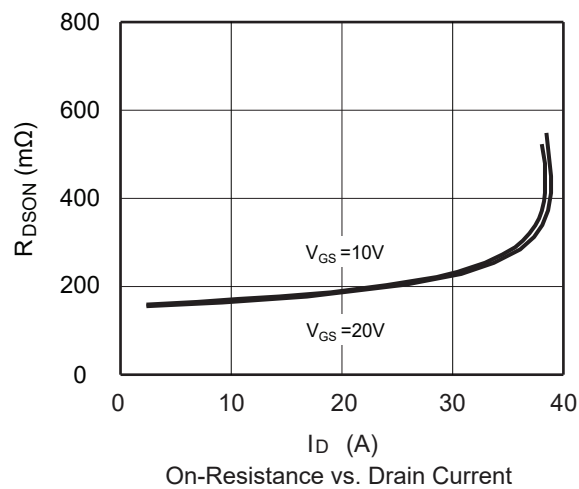
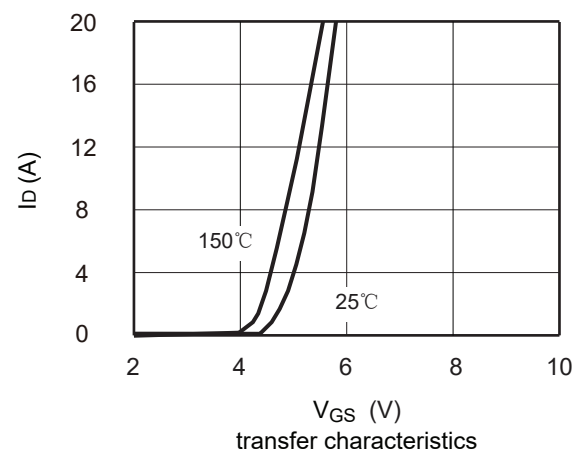
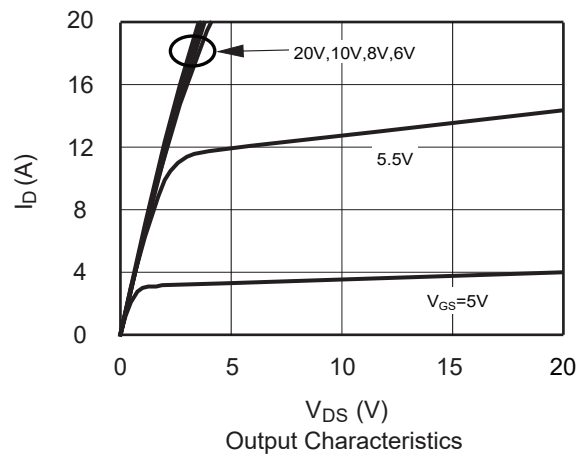
1.The EAS data shows Max. rating . The test condition is  $V_{DD}=100V$ ,  $V_{GS}=10V$ ,  $L=30\text{mH}$ ,  $I_{AS}=4A$ .

This product has been designed and qualified for the consumer market.

Cmos assumes no liability for customers' product design or applications.

Cmos reserves the right to improve product design ,functions and reliability without notice.Please refer to the latest version of specification.

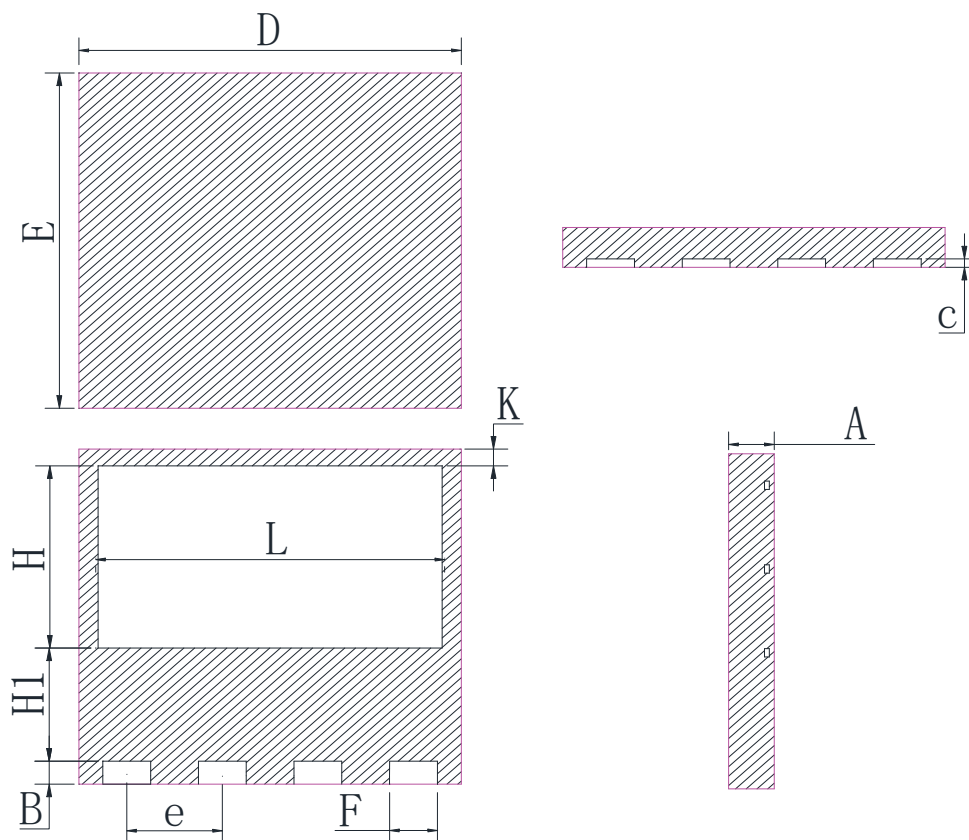
## Typical Characteristics



## Package Dimension

DFN-8 8x8

Unit :mm



| Symbol | Min   | Typ   | Max   |
|--------|-------|-------|-------|
| A      | 0.90  | 0.95  | 1.00  |
| B      | 0.45  | 0.55  | 0.65  |
| C      | 0.153 | 0.203 | 0.253 |
| D      | 7.90  | 8.00  | 8.10  |
| E      | 7.90  | 8.00  | 8.10  |
| e      | 1.90  | 2.00  | 2.10  |
| F      | 0.90  | 1.00  | 1.10  |
| H      | 4.20  | 4.35  | 4.45  |
| H1     | 2.60  | 2.70  | 2.80  |
| K      | 0.30  | 0.40  | 0.50  |
| L      | 7.10  | 7.20  | 7.30  |