

N-Channel Super Junction Power MOSFET

General Description

The series of devices use advanced super junction technology and design to provide excellent RDS(ON) with low gate charge.

This super junction MOSFET fits the industry's AC-DC SMPS requirements for PFC, AC/DC power conversion, and industrial power applications.

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 | 650 | V |
| V_{GS} | Gate-Source Voltage | ± 30 | V |
| $I_D@T_C=25^\circ C$ | Continuous Drain Current | 11 | A |
| $I_D@T_C=100^\circ C$ | Continuous Drain Current | 9 | A |
| I_{DM} | Pulsed Drain Current | 44 | A |
| EAS | Single Pulse Avalanche Energy ¹ | 202 | mJ |
| $P_D@T_C=25^\circ C$ | Total Power Dissipation | 83 | W |
| T_{STG} | Storage Temperature Range | -55 to 150 | $^\circ C$ |
| T_J | Operating Junction Temperature Range | -55 to 150 | $^\circ C$ |

Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|-----------------|-------------------------------------|------|------|--------------|
| $R_{\theta JA}$ | Thermal Resistance Junction-ambient | --- | 62 | $^\circ C/W$ |
| $R_{\theta JC}$ | Thermal Resistance Junction -Case | --- | 1.5 | $^\circ C/W$ |

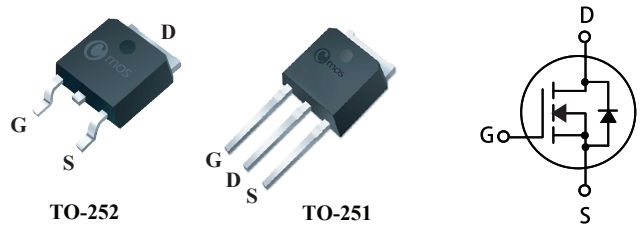
Product Summary

| BVDSS | $R_{DS(on)}$ max. | ID |
|-------|-------------------|-----|
| 650V | 0.38 Ω | 11A |

Applications

- Power factor correction (PFC)
- Switched mode power supplies(SMPS)
- Uninterruptible Power Supply (UPS)

TO-252/TO-251 Pin Configuration



| Type | Package | Marking |
|------------|---------|------------|
| CMD65R380Q | TO-252 | CMD65R380Q |
| CMU65R380Q | TO-251 | CMU65R380Q |

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

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|--------------|-----------------------------------|--|------|------|-----------|----------|
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_D=250\mu A$ | 650 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | $V_{GS}=10V, I_D=5.5A$ | --- | --- | 0.38 | Ω |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_D=250\mu A$ | 2 | --- | 4 | V |
| I_{DSS} | Drain-Source Leakage Current | $V_{DS}=650V, V_{GS}=0V, T_J=25^\circ\text{C}$ | --- | --- | 1 | μA |
| I_{GSS} | Gate-Source Leakage Current | $V_{GS}=\pm 30V, V_{DS}=0V$ | --- | --- | ± 100 | nA |
| gfs | Forward Transconductance | $V_{DS}=30V, I_D=4A$ | --- | 8 | --- | S |
| R_g | Gate Resistance | $V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$ | --- | 23 | --- | Ω |
| Q_g | Total Gate Charge | $V_{DS}=520V, V_{GS}=10V, I_D=10.6A$ | --- | 21 | --- | nC |
| Q_{gs} | Gate-Source Charge | | --- | 5.3 | --- | |
| Q_{gd} | Gate-Drain Charge | | --- | 7.5 | --- | |
| $T_{d(on)}$ | Turn-On Delay Time | $V_{DS}=325V, R_G=25\Omega$ $I_D=10.6A$ $V_{GS}=10V$ | --- | 20 | --- | ns |
| T_r | Rise Time | | --- | 39 | --- | |
| $T_{d(off)}$ | Turn-Off Delay Time | | --- | 109 | --- | |
| T_f | Fall Time | | --- | 37 | --- | |
| C_{iss} | Input Capacitance | $V_{DS}=100V, V_{GS}=0V, f=1\text{MHz}$ | --- | 750 | --- | pF |
| C_{oss} | Output Capacitance | | --- | 42 | --- | |
| C_{rss} | Reverse Transfer Capacitance | | --- | 3.1 | --- | |

Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|----------|---------------------------|--|------|------|------|---------|
| I_S | Continuous Source Current | $V_G=V_D=0V$, Force Current | --- | --- | 11 | A |
| I_{SM} | Pulsed Source Current | | --- | --- | 44 | A |
| V_{SD} | Diode Forward Voltage | $V_{GS}=0V, I_S=11A, T_J=25^\circ\text{C}$ | --- | --- | 1.4 | V |
| t_{rr} | Reverse Recovery Time | $di/dt=100A/\mu s$ | --- | 324 | --- | ns |
| Q_{rr} | Reverse Recovery Charge | $V_{DD}=100V, I_F=10.6A$ | --- | 3.8 | --- | μC |

Notes:

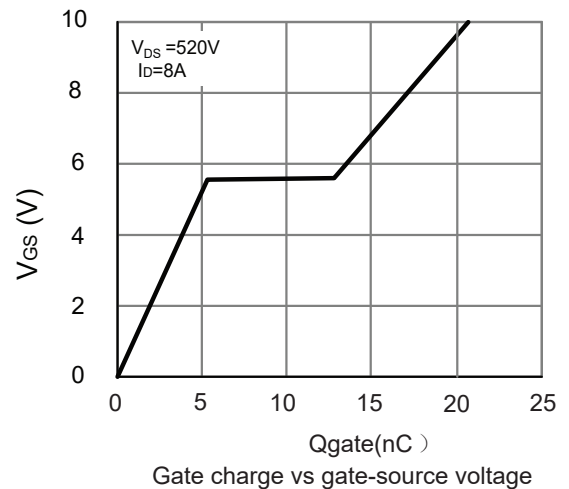
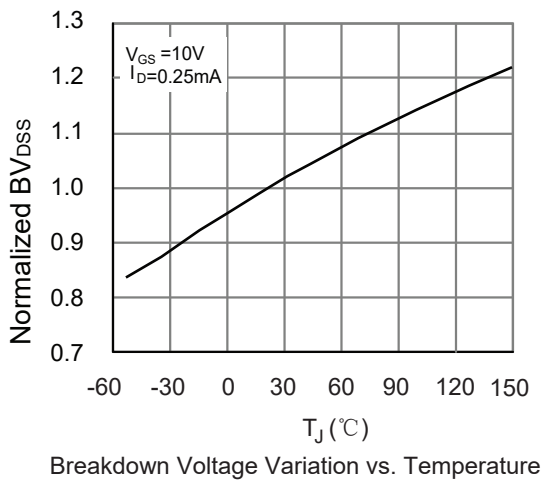
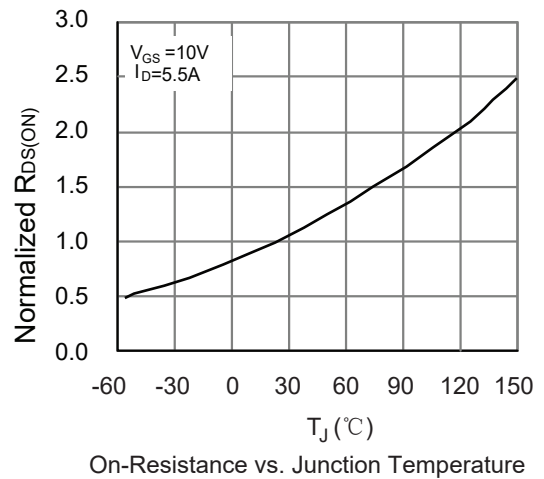
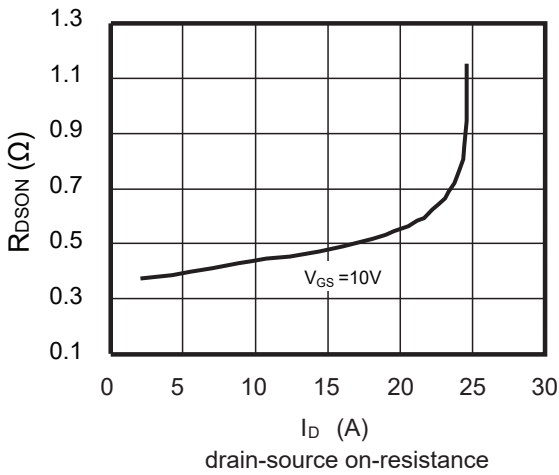
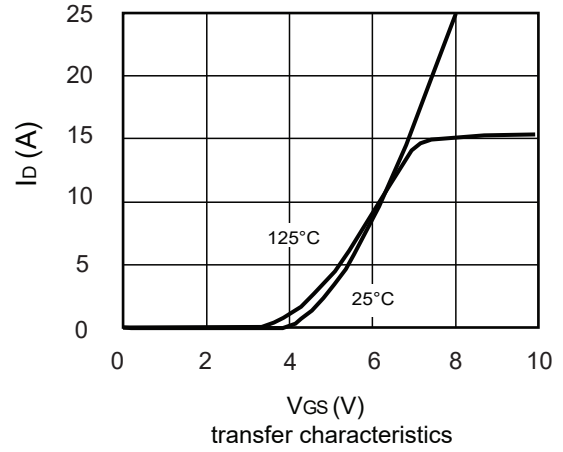
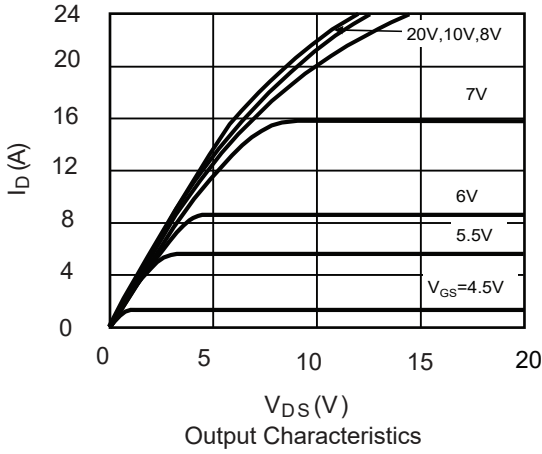
1. The EAS data shows Max. rating. The test condition is $V_{DS}=80V, V_{GS}=10V, L=20mH, I_{AS}=4.5A$.

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

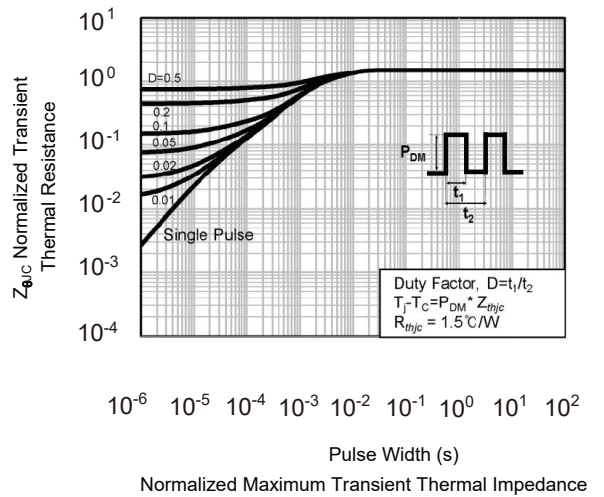
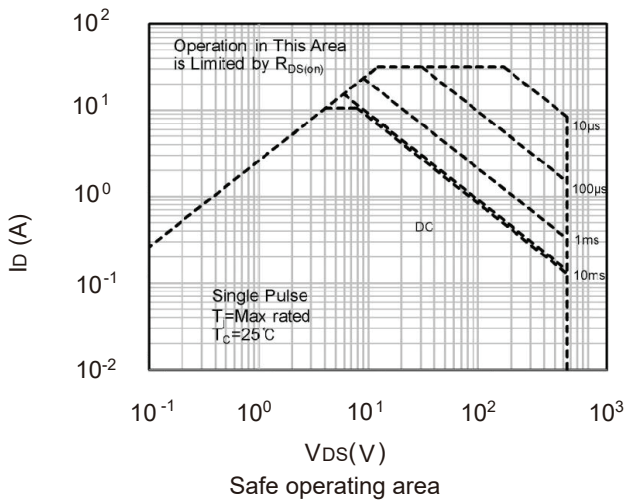
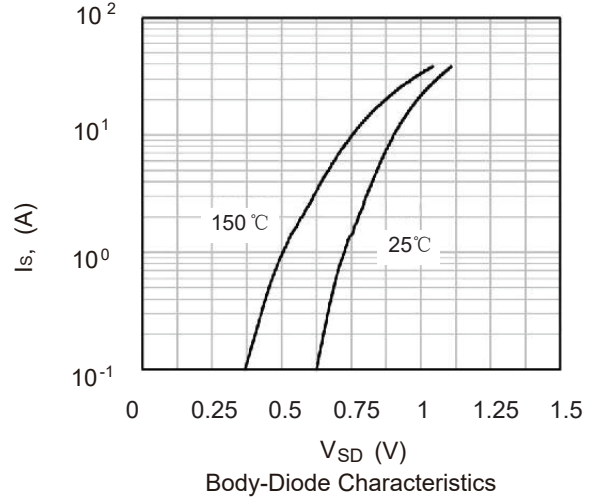
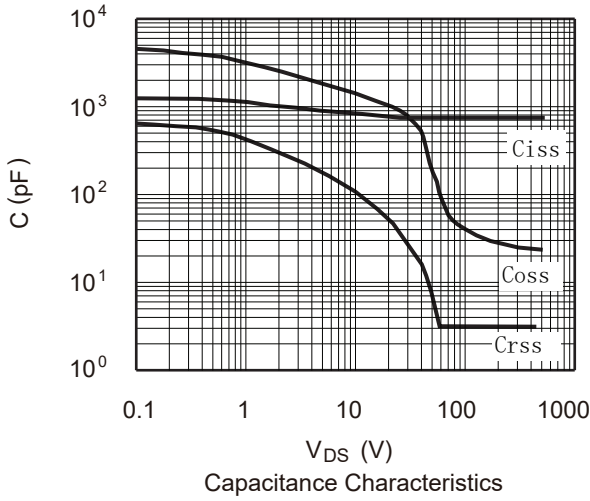
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Cmos reserves the right to improve product design, functions and reliability without notice. Please refer to the latest version of specification.

Typical Characteristics



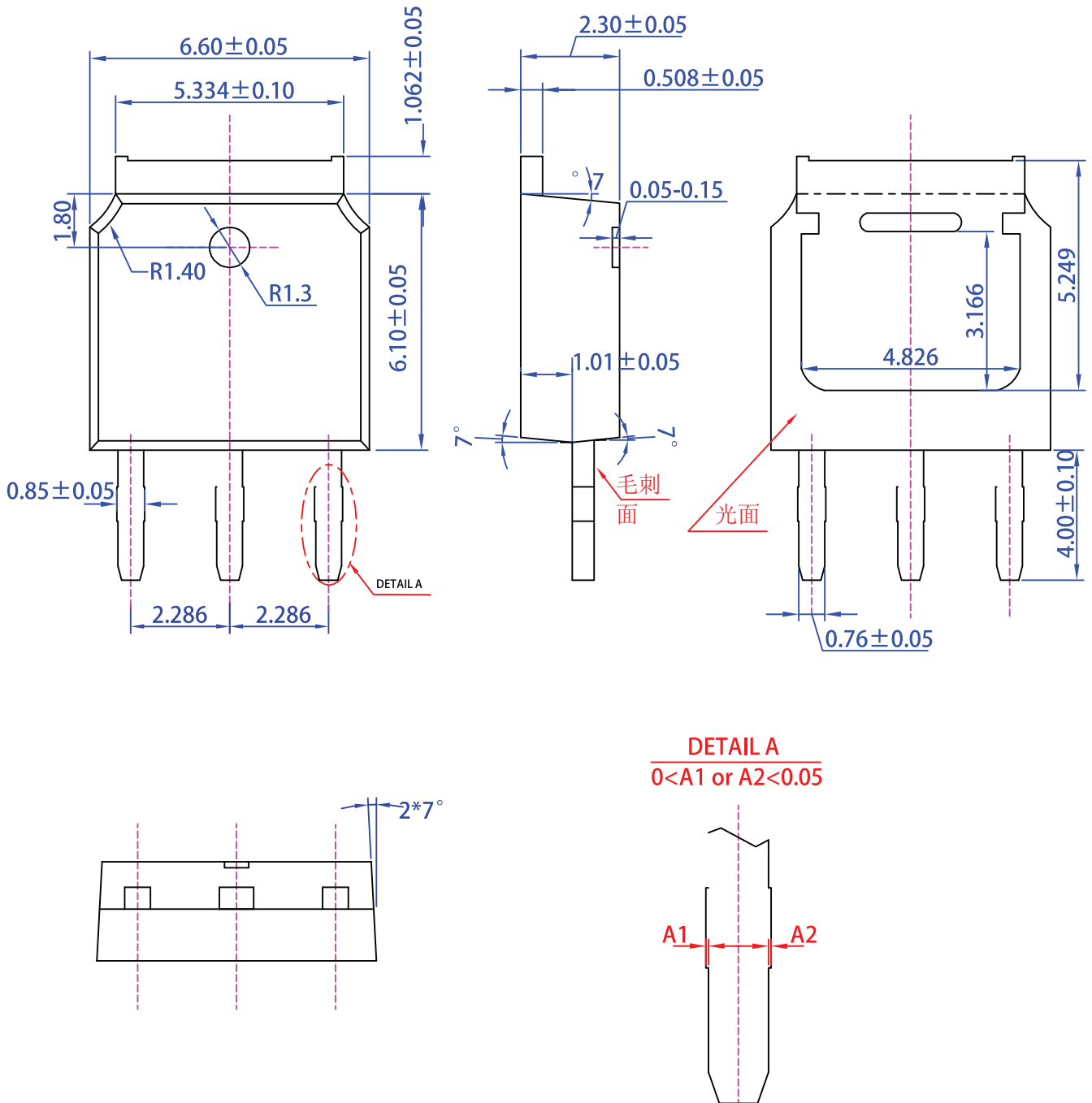
Typical Characteristics



Package Dimension

TO-251A

Unit :mm



Part Marking Information

