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.

Product Summary

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

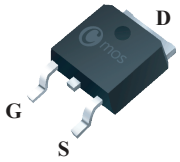
Applications

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

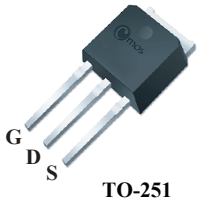
Features

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

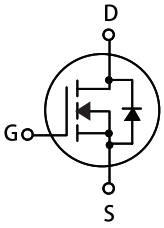
TO-252/TO-251 Pin Configuration



TO-252



TO-251



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

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°C	Continuous Drain Current	11	A
I_D@T_C=100°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°C	Total Power Dissipation	83	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 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	---	1.5	°C/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	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 = 250μA	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=650V , V_{GS}=0V , T_J=25℃	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±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=1MHz	---	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=25Ω 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=1MHz	---	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℃	---	---	1.4	V
t_{rr}	Reverse Recovery Time	di/dt = 100A/μs V_{DD} =100V , I_F =10.6A	---	324	---	ns
Q_{rr}	Reverse Recovery Charge		---	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.

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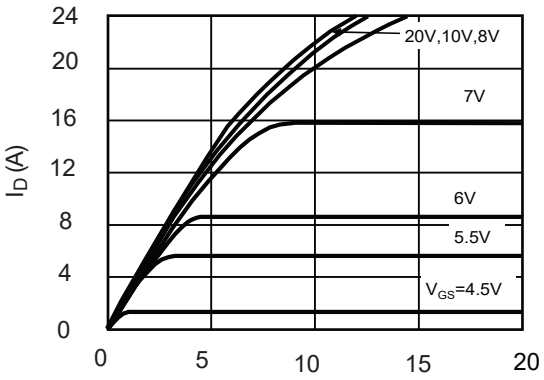
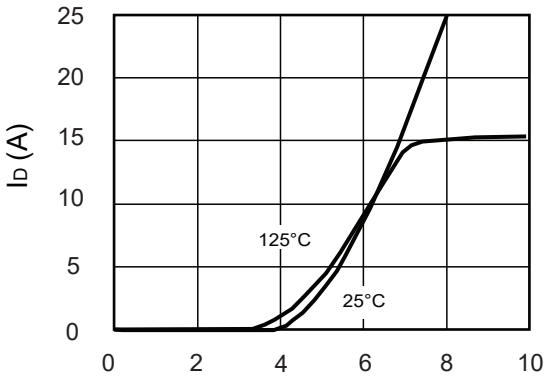
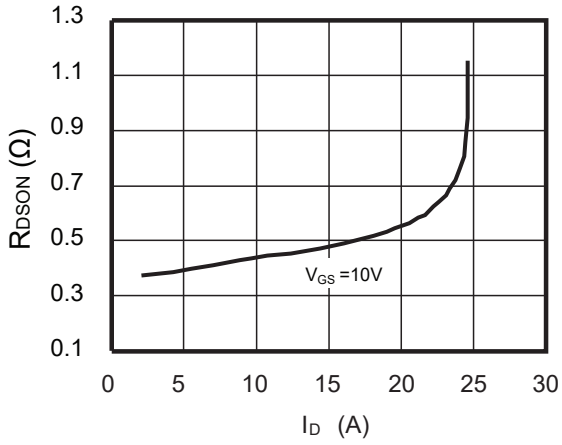
Typical Characteristics



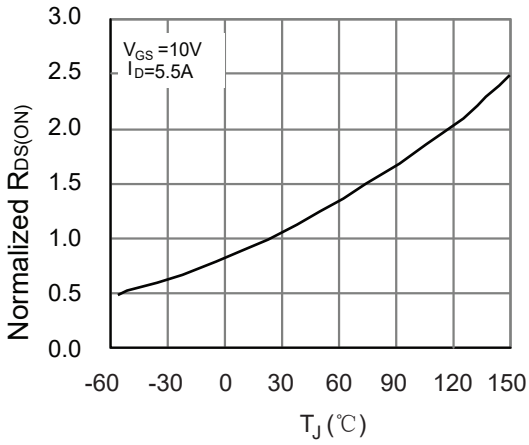
Output Characteristics



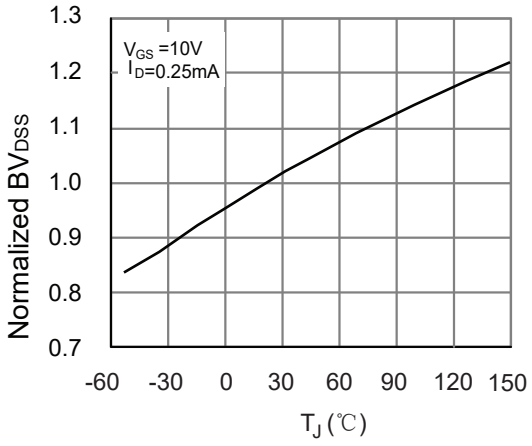
transfer characteristics



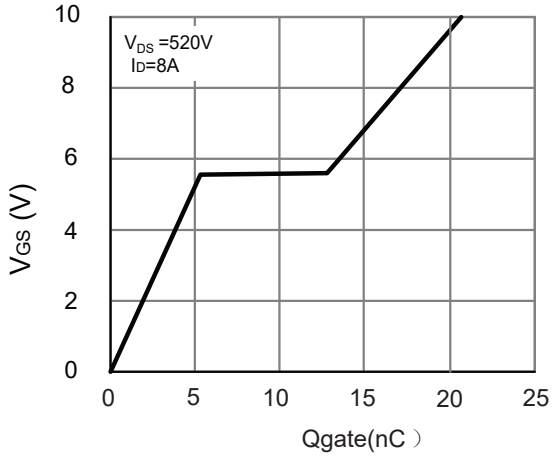
drain-source on-resistance



On-Resistance vs. Junction Temperature

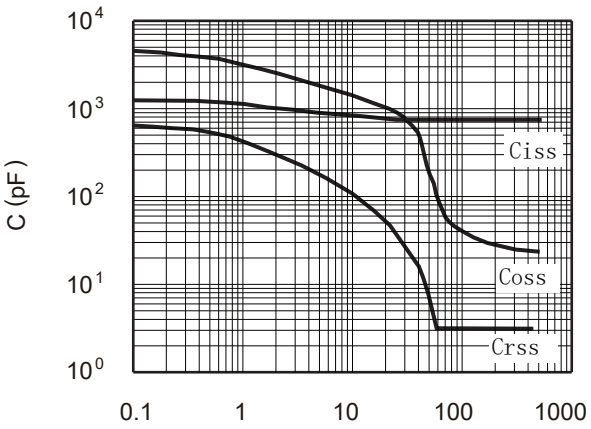


Breakdown Voltage Variation vs. Temperature

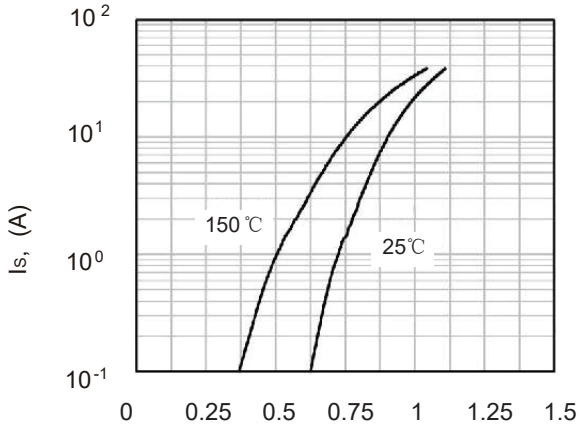


Gate charge vs gate-source voltage

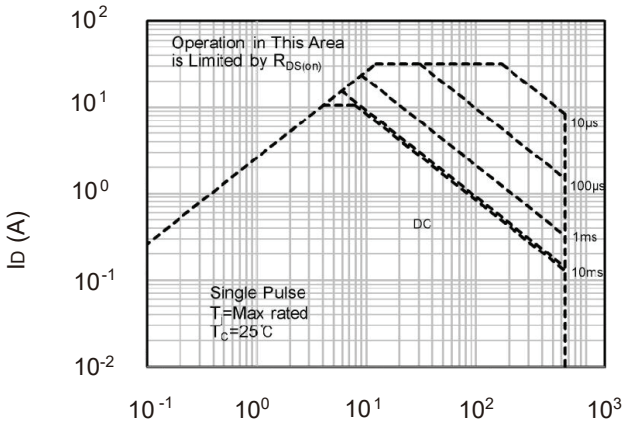
Typical Characteristics



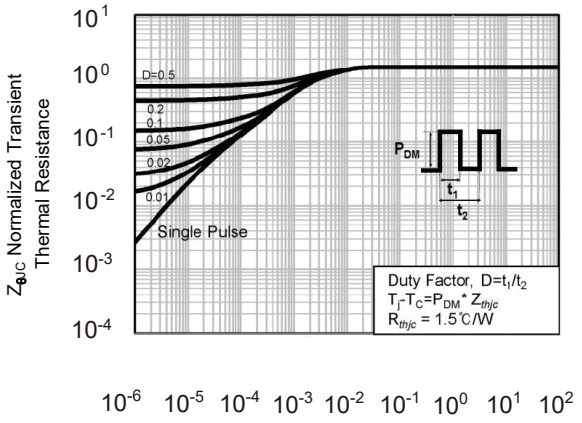
Capacitance Characteristics



Body-Diode Characteristics



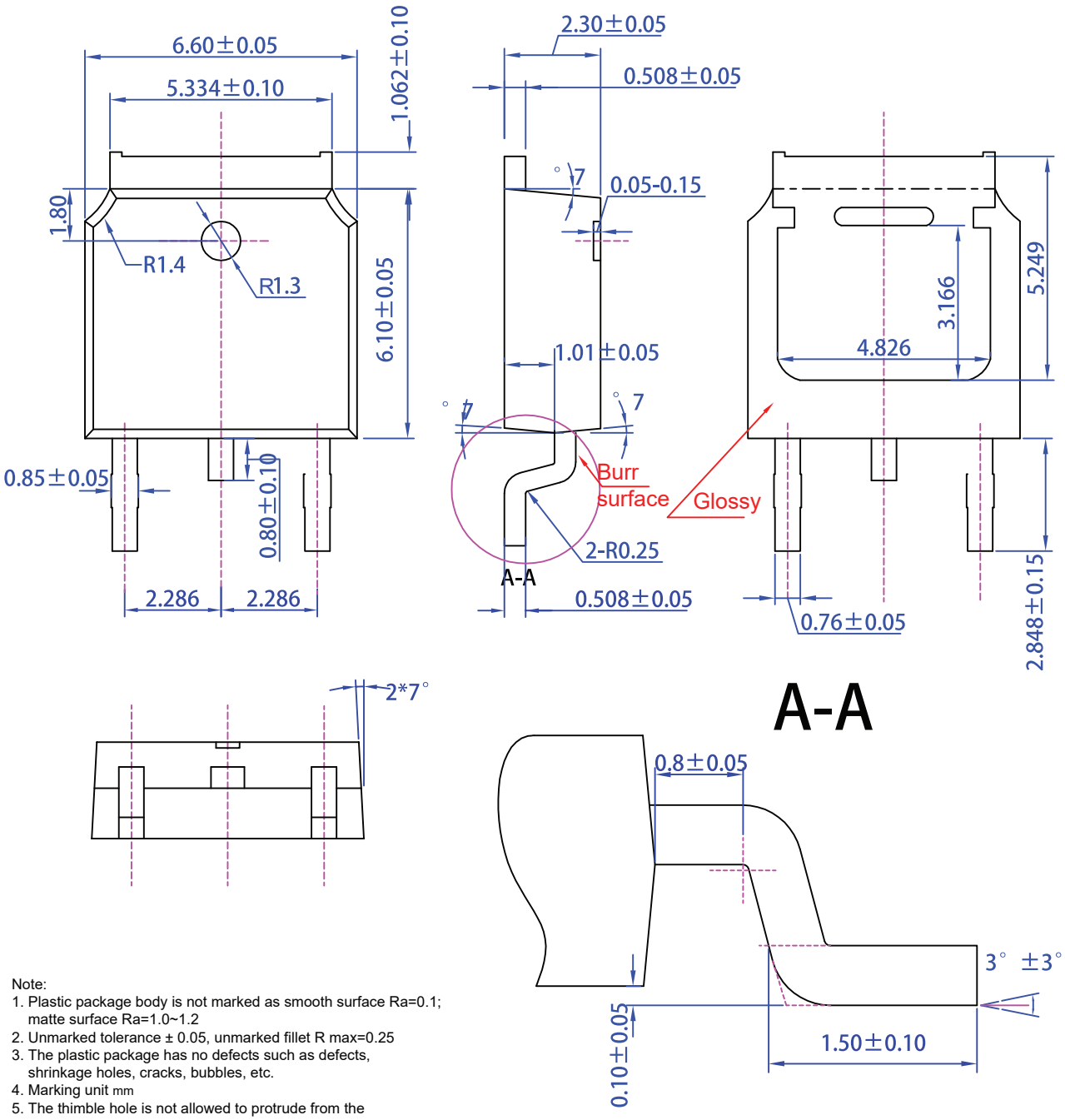
Safe operating area



Normalized Maximum Transient Thermal Impedance

Package Dimension

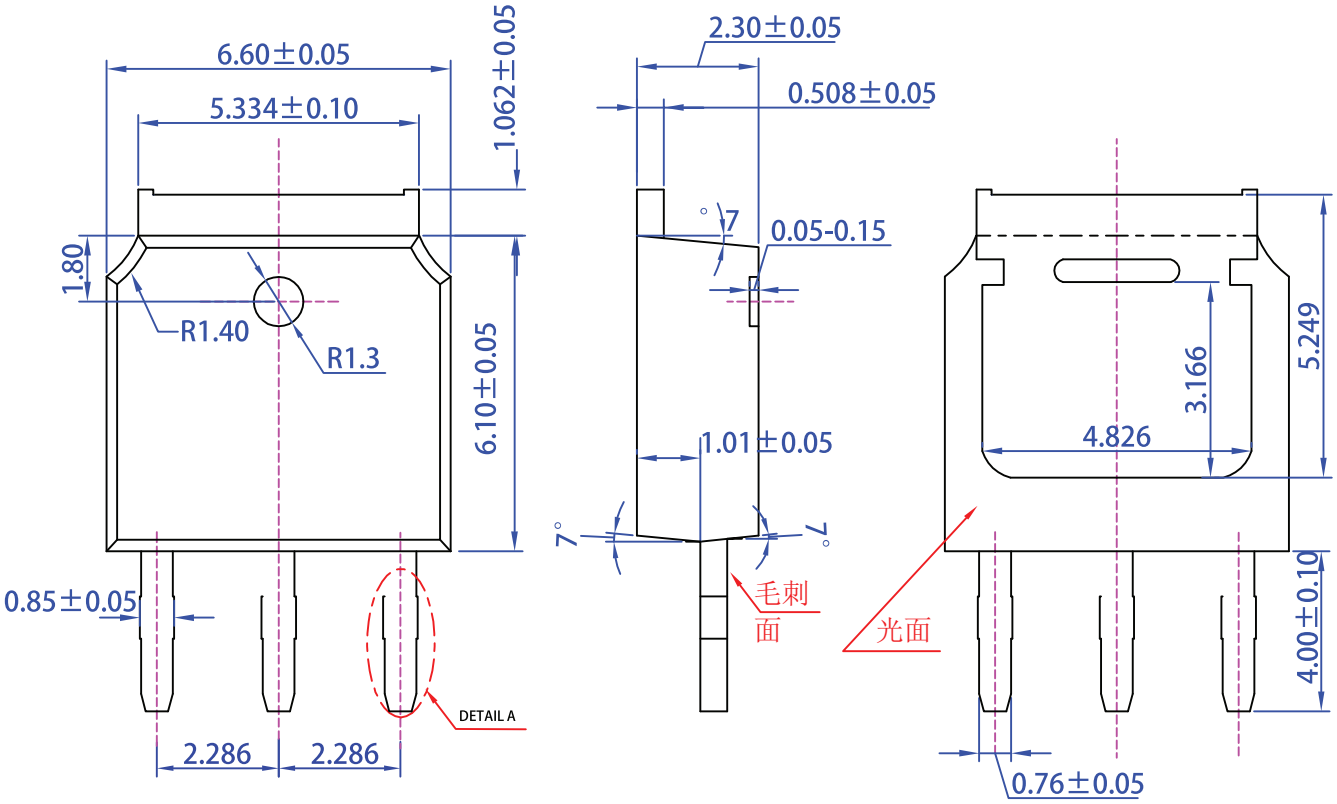
TO-252

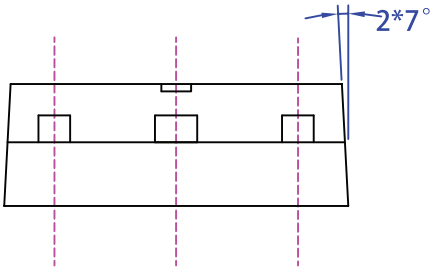


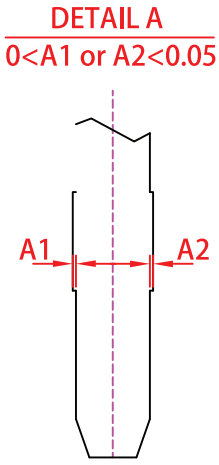
Note:
1. Plastic package body is not marked as smooth surface Ra=0.1; matte surface Ra=1.0~1.2
2. Unmarked tolerance ± 0.05, unmarked fillet R max=0.25
3. The plastic package has no defects such as defects, shrinkage holes, cracks, bubbles, etc.
4. Marking unit mm
5. The thimble hole is not allowed to protrude from the surface of the plastic package
6. Dislocation of upper and lower plastic package ≤0.05; plastic package center and lead Center misalignment of wire frame≤0.05

Package Dimension

TO-251A Unit :mm







Part Marking Information