

## 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

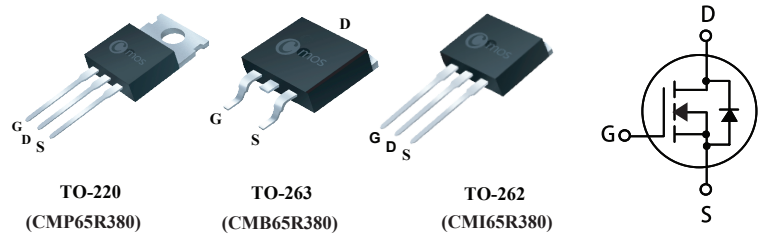
### Product Summary

BVDSS	R <sub>DS(on)</sub> max.	ID
650V	0.38Ω	11A

### Applications

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

### TO-220/263/262 Pin Configuration



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	650	V
V <sub>GS</sub>	Gate-Source Voltage	±30	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current	11	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current	9	A
I <sub>DM</sub>	Pulsed Drain Current	44	A
EAS	Single Pulse Avalanche Energy <sup>1</sup>	202	mJ
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	83	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	150	°C

### Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient	---	62.5	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction -Case	---	1.5	°C/W

### 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	$V_{GS}=10V, I_D=4.5A$	---	---	0.38	$\Omega$
$V_{GS(th)}$	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	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	$\pm 100$	nA
$g_{fs}$	Forward Transconductance	$V_{DS}=10V, I_D=4.5A$	---	8	---	S
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	23	---	$\Omega$
$Q_g$	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	$V_{GS}=V_{DS}=0V$ , Force Current	---	---	11	A
$I_{SM}$	Pulsed Source Current		---	---	44	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_F=9A, T_J=25^\circ\text{C}$	---	0.87	1.4	V
$t_{rr}$	Reverse Recovery Time	$V_{GS}=0V, V_{DD}=100V,$ $I_S=10.6A, dF/dt=100A/\mu s$	---	324	---	ns
$Q_{rr}$	Reverse Recovery Charge		---	3.8	---	$\mu C$

Notes:

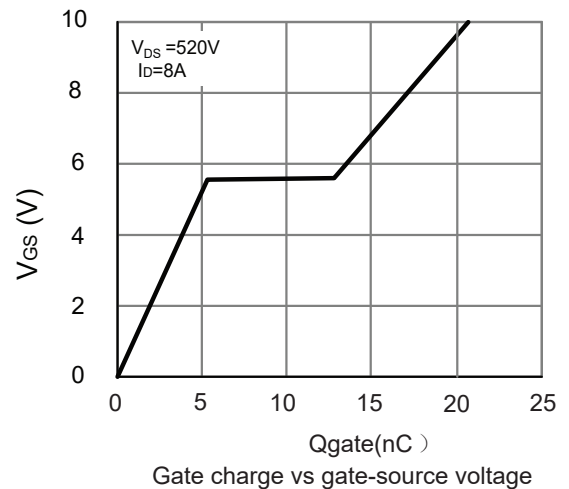
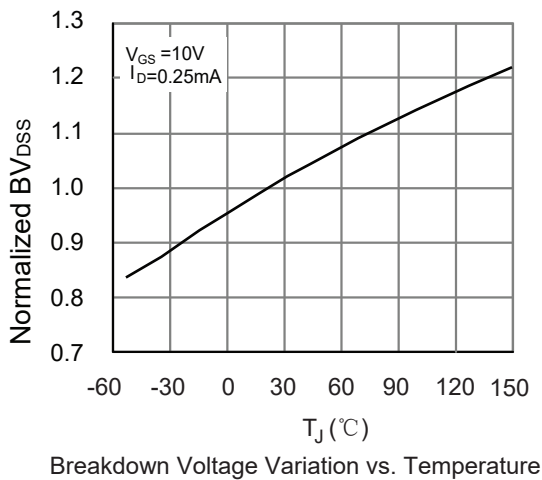
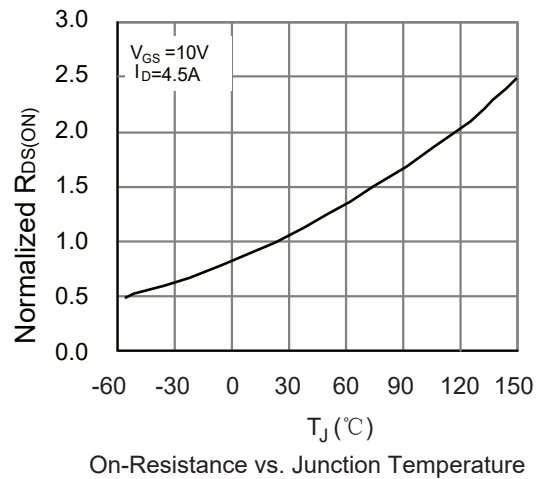
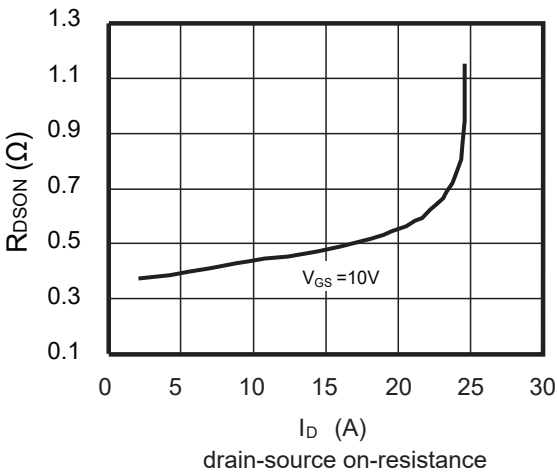
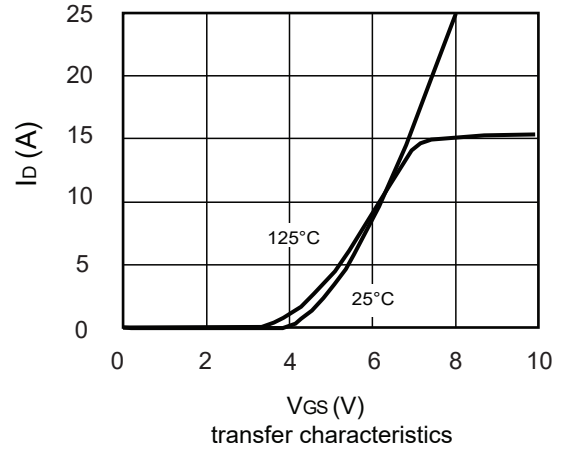
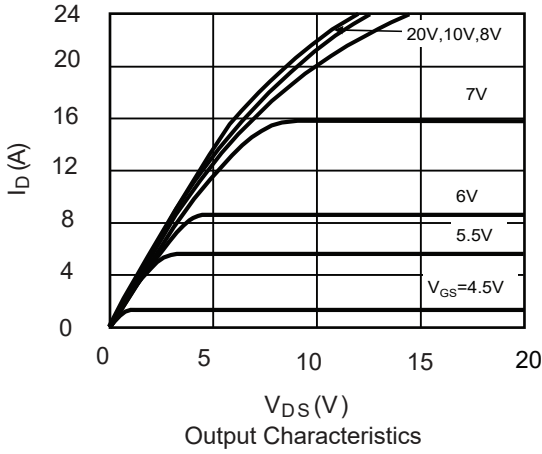
1.The EAS data shows Max. rating .The test condition is  $V_{DS}=80V, V_{GS}=10V, L=20mH, I_{AS}=4.5A$ .

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

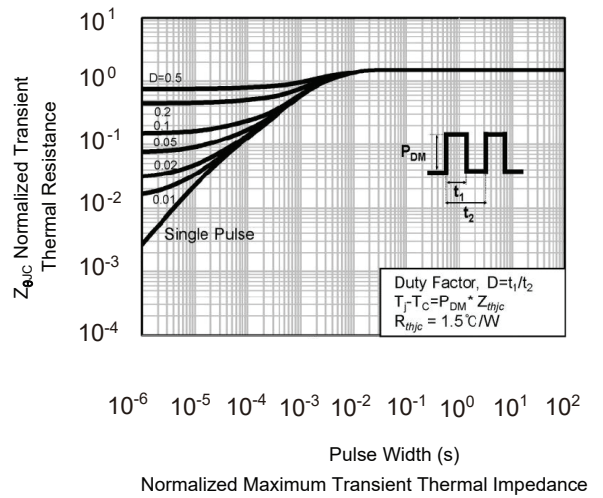
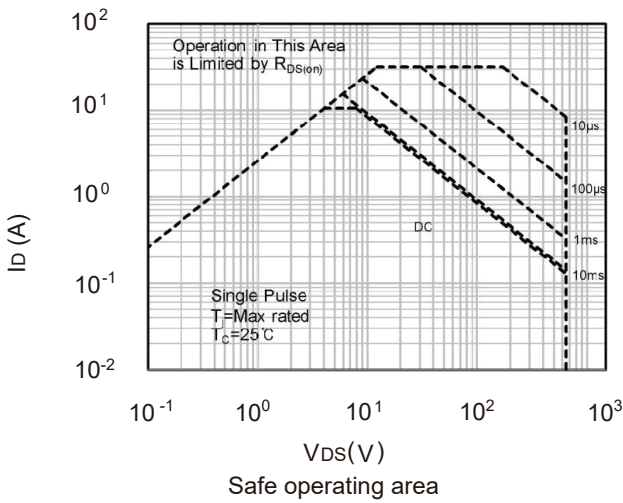
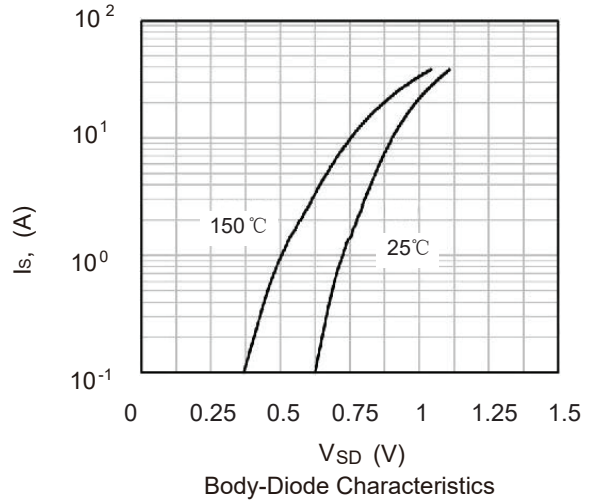
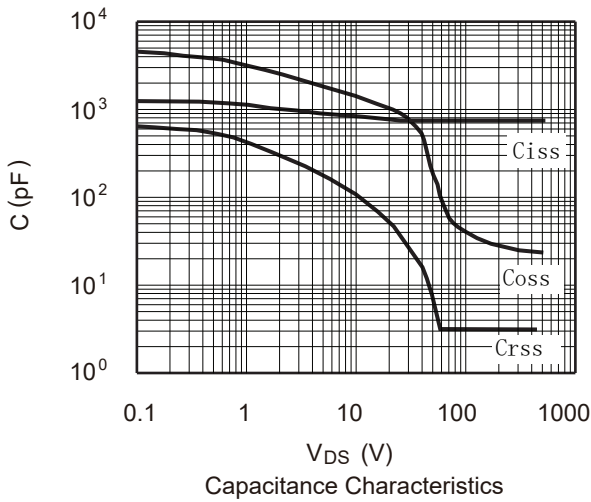
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Cmos reserves the right to improve product design, functions and reliability without notice. Please refer to the latest version of specification.

Typical Characteristics



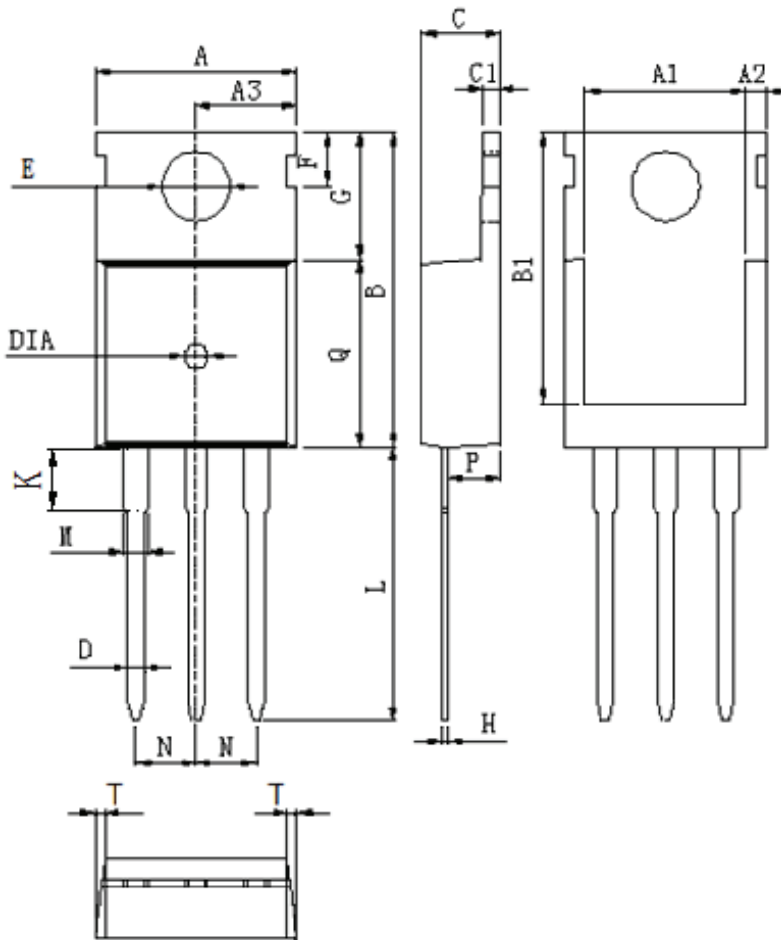
Typical Characteristics



Package Dimension

TO-220

Unit :mm

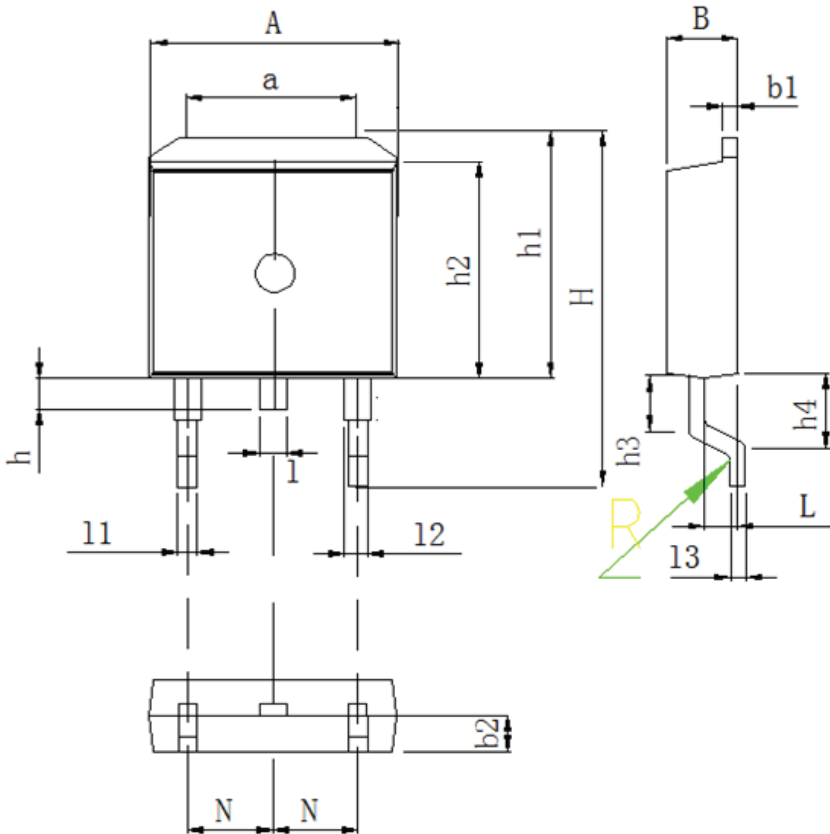


DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.56±0.1
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	6.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
M	1.25±0.1
N	2.54±0.1
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	⊙1.5 (deep 0.2)

Package Dimension

TO-263

Unit :mm

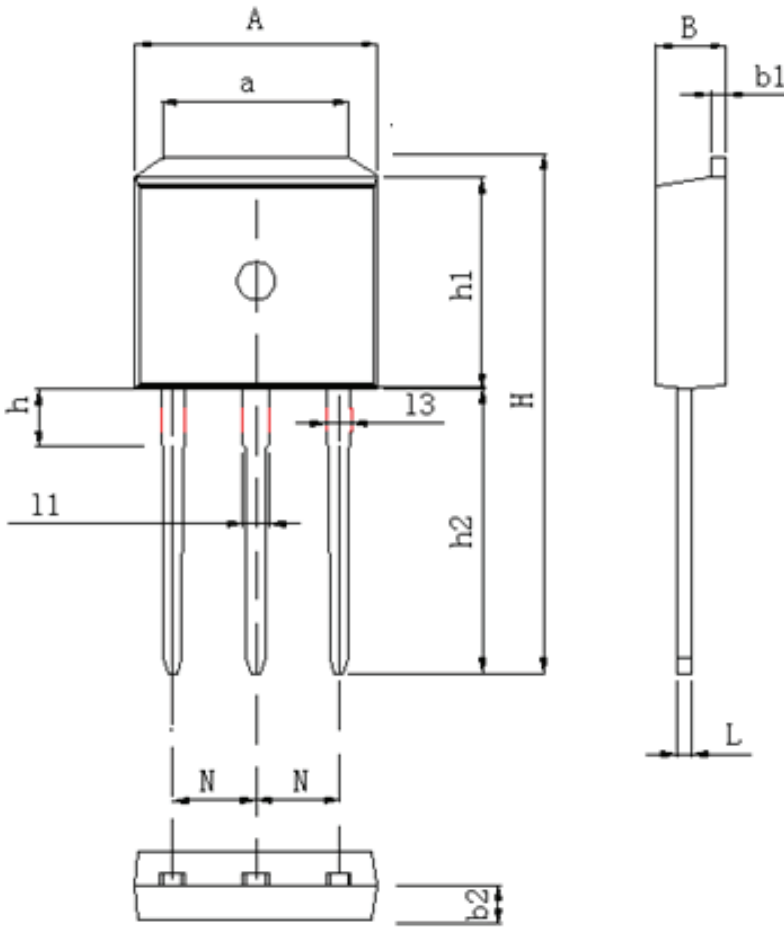


DIM	MILLIMETERS
A	9.8±0.2
a	7.4±0.4
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	15.5±0.3
h	1.54±0.2
h1	10.5±0.2
h2	9.2±0.1
h3	1.54±0.2
h4	2.7±0.2
L	2.4±0.2
1	1.3±0.1
11	0.8±0.1
12	1.3±0.1
13	0.5±0.1
N	2.54±0.1
R	0.5R±0.05

Package Dimension

TO-262

Unit :mm



DIM	MILLIMETERS
A	$9.98 \pm 0.2$
a	$7.4 \pm 0.4$
B	$4.5 \pm 0.2$
b1	$1.3 \pm 0.05$
b2	$2.4 \pm 0.2$
H	$23.9 \pm 0.3$
h	$3.1 \pm 0.2$
h1	$9.16 \pm 0.2$
h2	$13.2 \pm 0.2$
L	$0.5 \pm 0.1$
11	$1.3 \pm 0.1$
12	$0.8 \pm 0.1$
N	$2.45 \pm 0.1$