

CMP/CMB/CMI/CMF60R180S6ZD

600V, 155mΩ typ., 20A N-Channel Super Junction Power MOSFET

General Description

The 60R180S6ZD 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

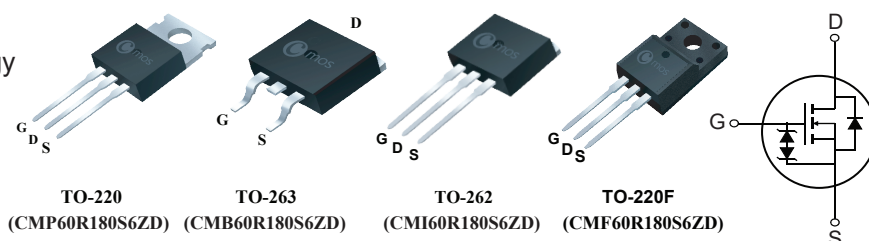
Product Summary

BVDSS	R _{DS(on)} max.	ID
600V	180mΩ	20A

Applications

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

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



Absolute Maximum Ratings

Symbol	Parameter	220/263/262	220F	Units
V _{DS}	Drain-Source Voltage	600		V
V _{GS}	Gate-Source Voltage	±25		V
I _D @T _C =25°C	Continuous Drain Current	20	20*	A
I _D @T _C =100°C	Continuous Drain Current	14	14*	A
I _{DM}	Pulsed Drain Current	80	80*	A
EAS	Single Pulse Avalanche Energy (Note 1)	320		mJ
P _D @T _C =25°C	Total Power Dissipation	200	40	W
T _{STG}	Storage Temperature Range	-55 to 150		°C
T _J	Operating Junction Temperature Range	150		°C

* Drain current limited by maximum junction temperature.

Thermal Data

Symbol	Parameter	220/263/262	220F	Unit
R _{θJA}	Thermal Resistance Junction-ambient Max.	65	65	°C/W
R _{θJC}	Thermal Resistance Junction-case Max.	0.63	3.13	°C/W

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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	$V_{GS}=10V$, $I_D=10A$	---	155	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	$V_{DS}=15V$, $I_D=10A$	---	13	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	10	---	Ω
Q_g	Total Gate Charge	$I_D=5.6A$	---	32.5	---	nC
Q_{gs}	Gate-Source Charge	$V_{DD}=400V$	---	7	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$	---	14.1	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=300V$ $V_{GS}=10V$ $R_G=25\Omega$, $I_D=18A$	---	29	---	ns
T_r	Rise Time		---	62	---	
$T_{d(off)}$	Turn-Off Delay Time		---	104	---	
T_f	Fall Time		---	32	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1400	---	pF
C_{oss}	Output Capacitance		---	180	---	
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	$V_{GS}=0V$, $I_S=20A$, $T_J=25^{\circ}\text{C}$	---	0.9	1.4	V
t_{rr}	Reverse Recovery Time	$di/dt = 100A/\mu s$	---	234	---	ns
Q_{rr}	Reverse Recovery Charge	$V_{DD}=400V$, $I_{SD}=5.6A$	---	2.2	---	μC

Note :

1. The EAS data shows Max. rating .The test condition is $V_{DS}=100V$, $V_{GS}=10V$, $L=40\text{mH}$, $I_{AS}=4A$.

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

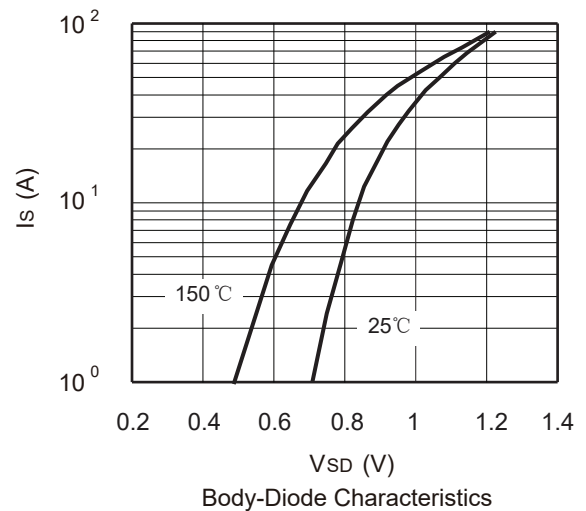
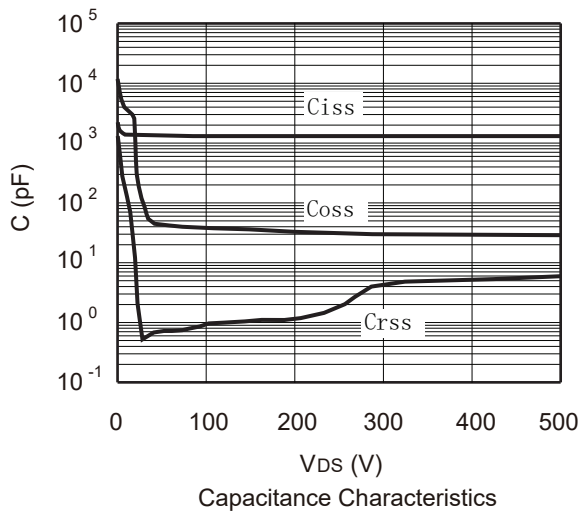
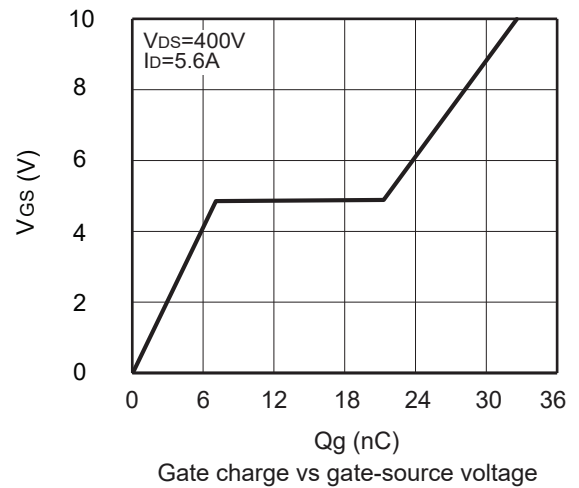
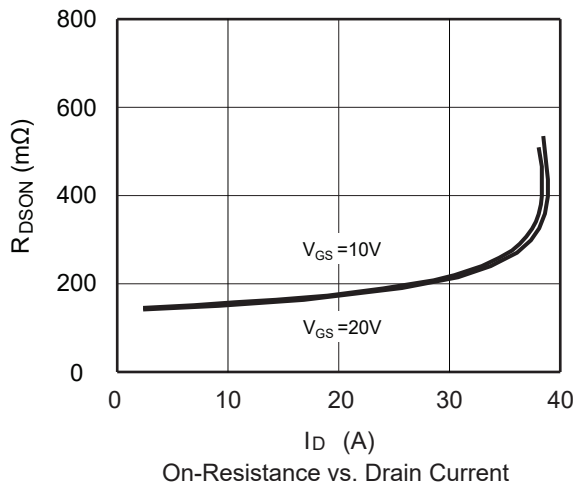
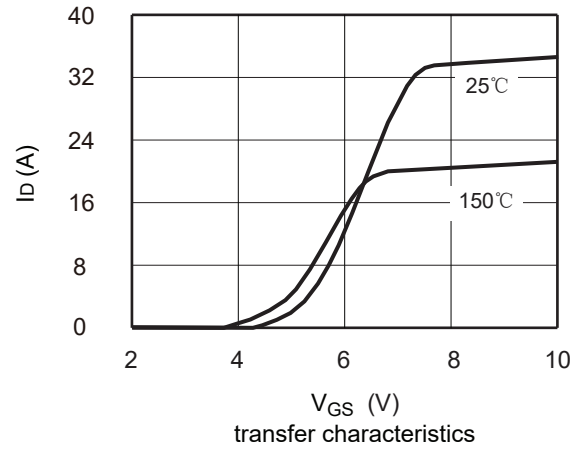
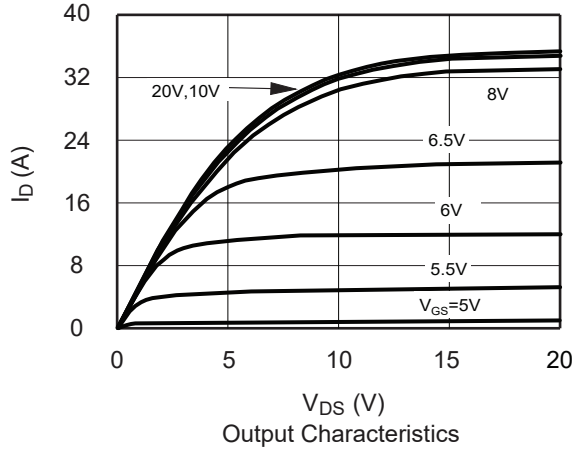
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Cmos reserves the right to improve product design ,functions and reliability without notice.Please refer to the latest version of specification.

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Typical Characteristics



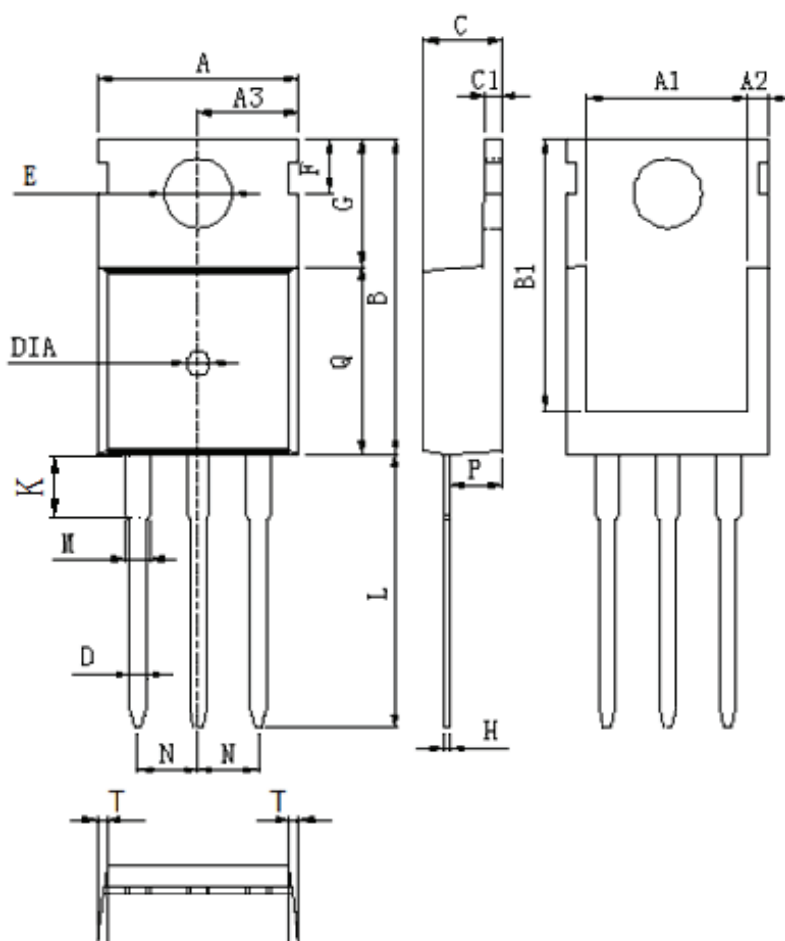
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Package Dimension

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)

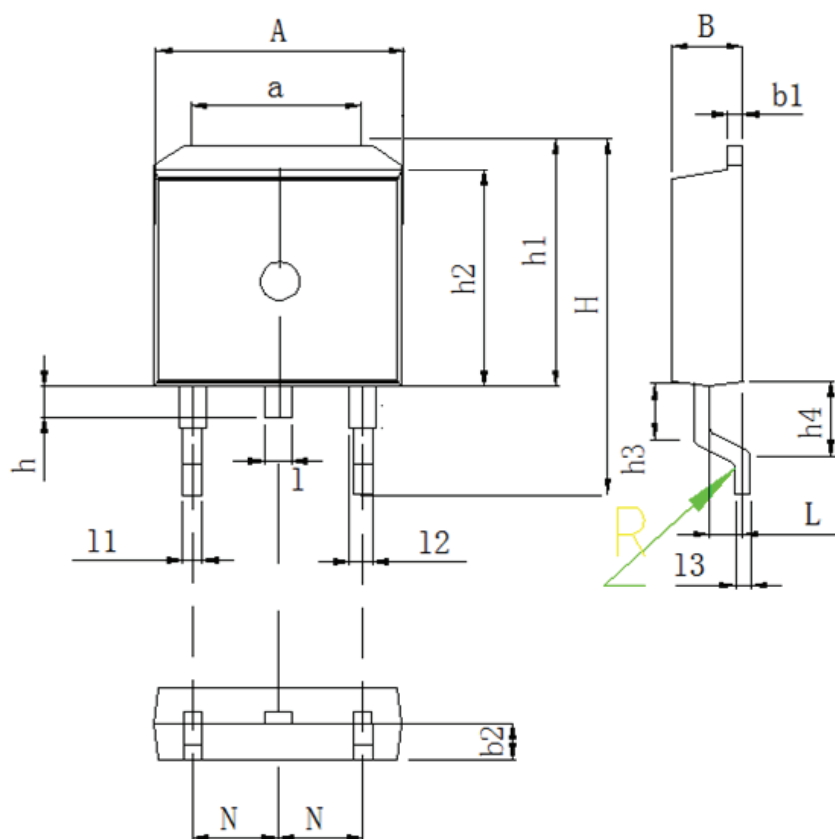
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Package Dimension

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	$0.5R \pm 0.05$

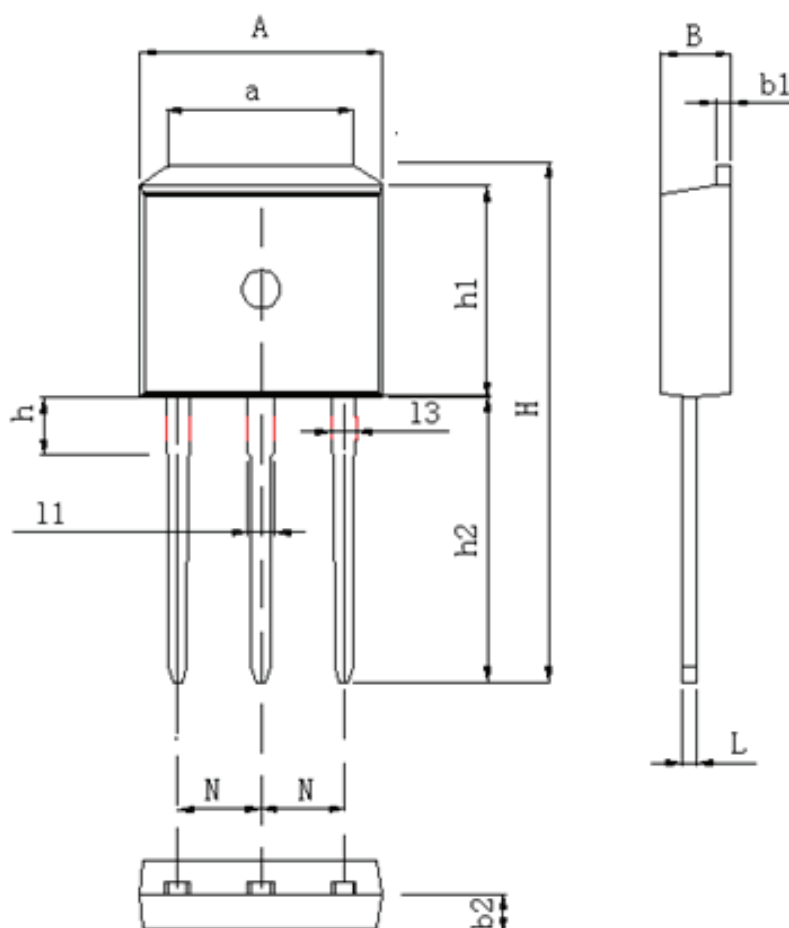
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Package Dimension

TO-262

Unit :mm



DIM	MILLIMETERS
A	9.98 ± 0.2
a	7.4 ± 0.4
B	4.5 ± 0.2
b1	1.3 ± 0.05
b2	2.4 ± 0.2
H	23.9 ± 0.3
h	3.1 ± 0.2
h1	9.16 ± 0.2
h2	13.2 ± 0.2
L	0.5 ± 0.1
l1	1.3 ± 0.1
l2	0.8 ± 0.1
N	2.45 ± 0.1

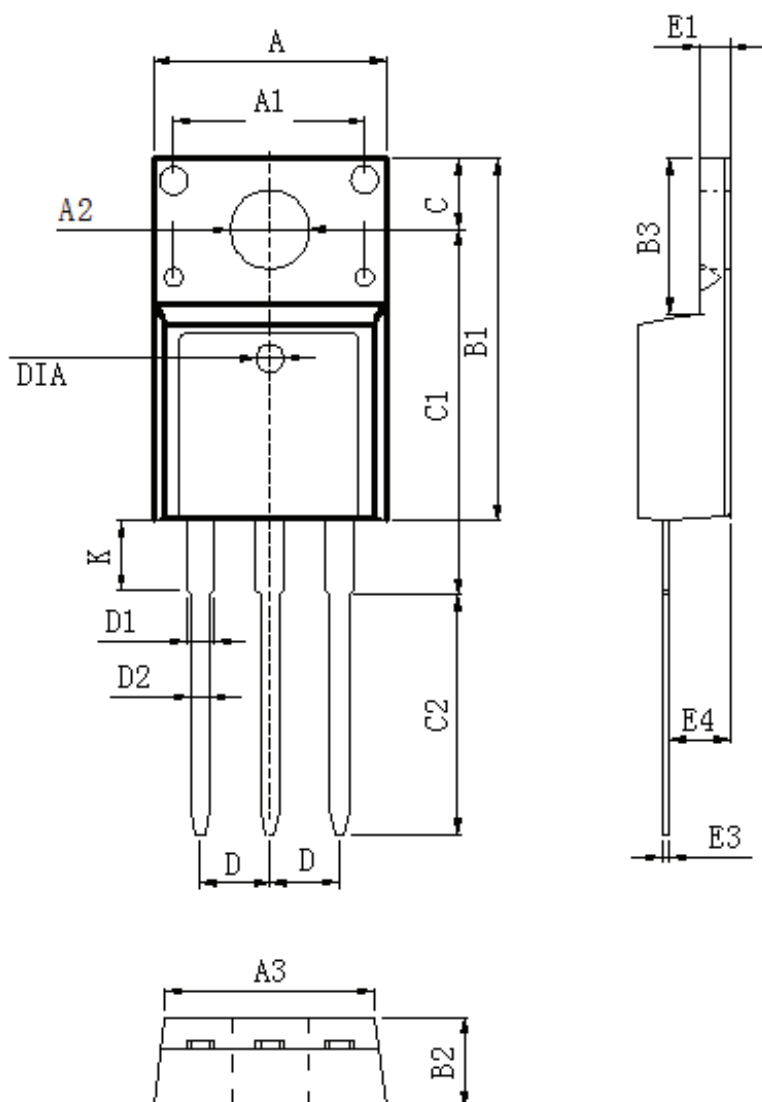
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Package Dimension

TO-220F

Unit :mm



DIM	MILLIMETERS
A	10.16±0.3
A1	7.00±0.1
A2	3.3±0.2
A3	9.5±0.2
B1	15.87±0.3
B2	4.7±0.2
B3	6.68±0.4
C	3.3±0.2
C1	12.57±0.3
C2	10.02±0.5
D	2.54±0.05
D1	1.28±0.2
D2	0.8±0.1
K	3.1±0.3
E1	2.54±0.1
E3	0.5±0.1
E4	2.76±0.2
DIA	⌀1.5 (deep 0.2)