

CMP60R360D/CMB60R360D/CMI60R360D/CMF60R360D

600V, 315mΩ typ., 11A N-Channel Super Junction Power MOSFET

General Description

The 60R360D 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.

Product Summary

BVDSS	R _{DS(on)} max.	ID
600V	0.36Ω	11A

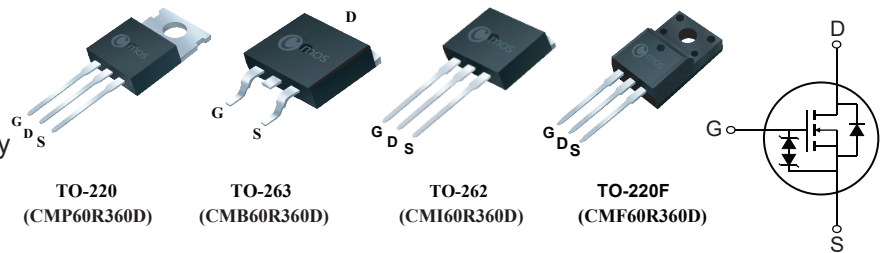
Applications

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

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

Features

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



Absolute Maximum Ratings

Symbol	Parameter	220/263/262	220F	Units
V _{DS}	Drain-Source Voltage	600		V
V _{GS}	Gate-Source Voltage	±30		V
I _D @T _C =25°C	Continuous Drain Current	11	11*	A
I _D @T _C =100°C	Continuous Drain Current	6.7	6.7*	A
I _{DM}	Pulsed Drain Current	44	44*	A
EAS	Single Pulse Avalanche Energy (Note 1)	303		mJ
P _D @T _C =25°C	Total Power Dissipation	90	35	W
T _{STG}	Storage Temperature Range	-55 to 150		°C
T _J	Operating Junction Temperature Range	-55 to 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.	133	133	°C/W
R _{θJC}	Thermal Resistance Junction-case Max.	1.39	3.57	°C/W

Electrical Characteristics (T_J=25°C , unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250μA	600	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V , I _D =4.5A	---	315	360	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	2.0	---	4.0	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =600V , V _{GS} =0V	---	---	1	μA
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±30V , V _{DS} =0V	---	---	±10	μA
g _{fs}	Forward Transconductance	V _{DS} =20V , I _D =4.5A	---	5.6	---	S
R _g	Gate Resistance	V _{DS} =0V , V _{GS} =0V , f=1MHz	---	16	---	Ω
Q _g	Total Gate Charge	I _D =4.5A	---	17	---	nC
Q _{gs}	Gate-Source Charge	V _{DD} =480V	---	4.1	---	
Q _{gd}	Gate-Drain Charge	V _{GS} =10V	---	8	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =400V V _{GS} =10V R _G =10Ω , I _D =4.5A	---	11	---	ns
T _r	Rise Time		---	24	---	
T _{d(off)}	Turn-Off Delay Time		---	51	---	
T _f	Fall Time		---	25	---	
C _{iss}	Input Capacitance	V _{DS} =100V , V _{GS} =0V , f=1MHz	---	500	---	pF
C _{oss}	Output Capacitance		---	32	---	
C _{rss}	Reverse Transfer Capacitance		---	2.3	---	

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 =9A , T _J =25°C	---	0.87	1.4	V
t _{rr}	Reverse Recovery Time	di/dt = 100A/μs	---	206	---	ns
Q _{rr}	Reverse Recovery Charge	V _{DS} =400V , I _{SD} =4.5A	---	1.7	---	μC

Note :

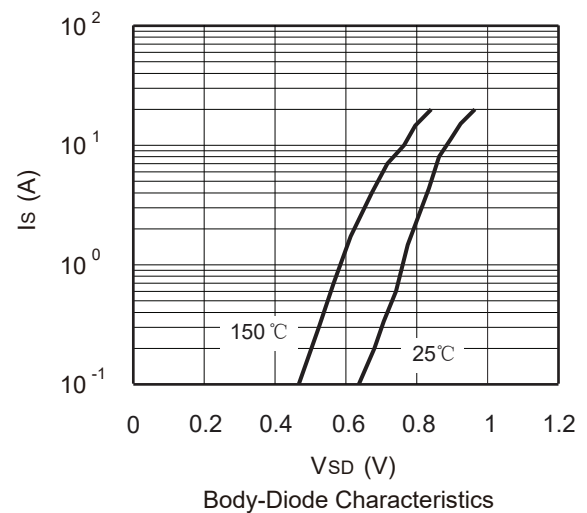
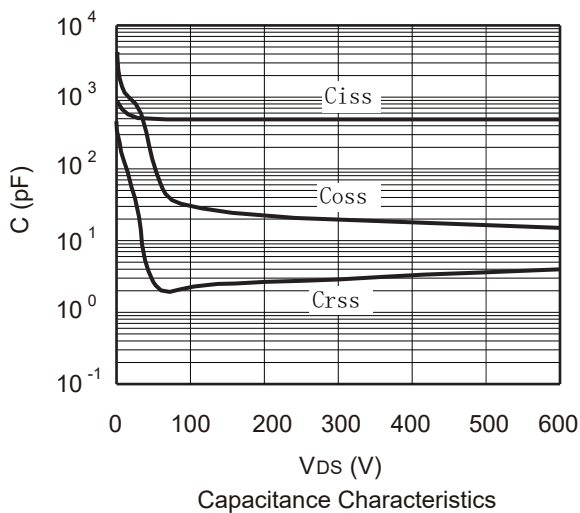
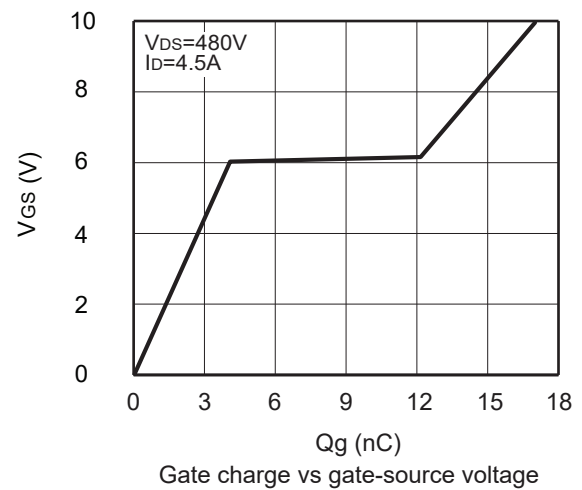
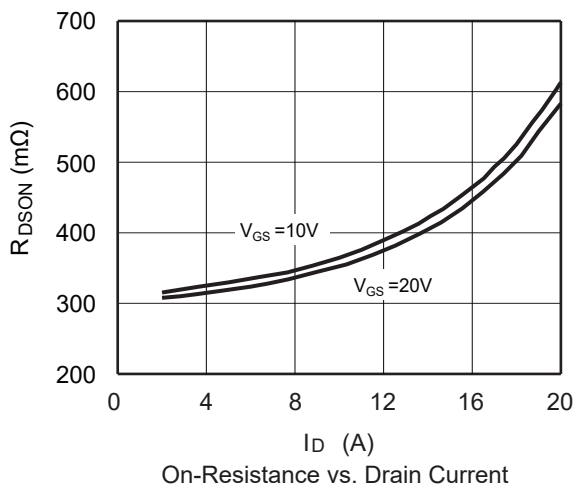
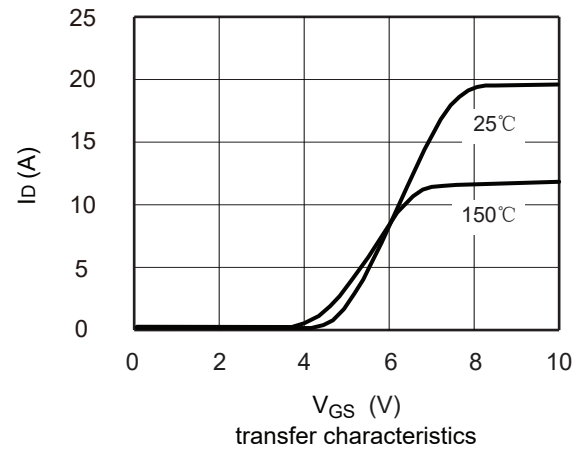
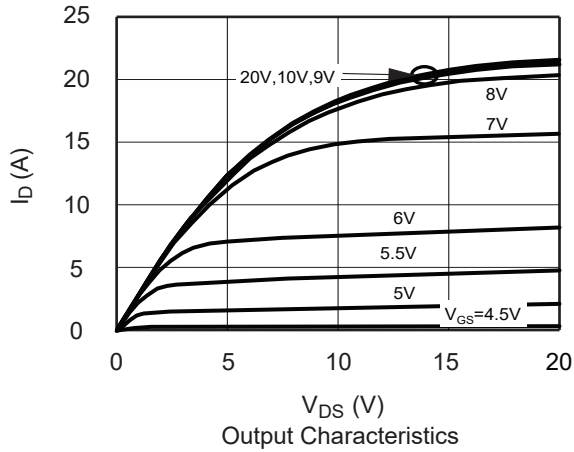
1.The EAS data shows Max. rating . The test condition is V_{DD}=100V , V_{GS}=10V , L=30mH , I_{AS}=4.5A.

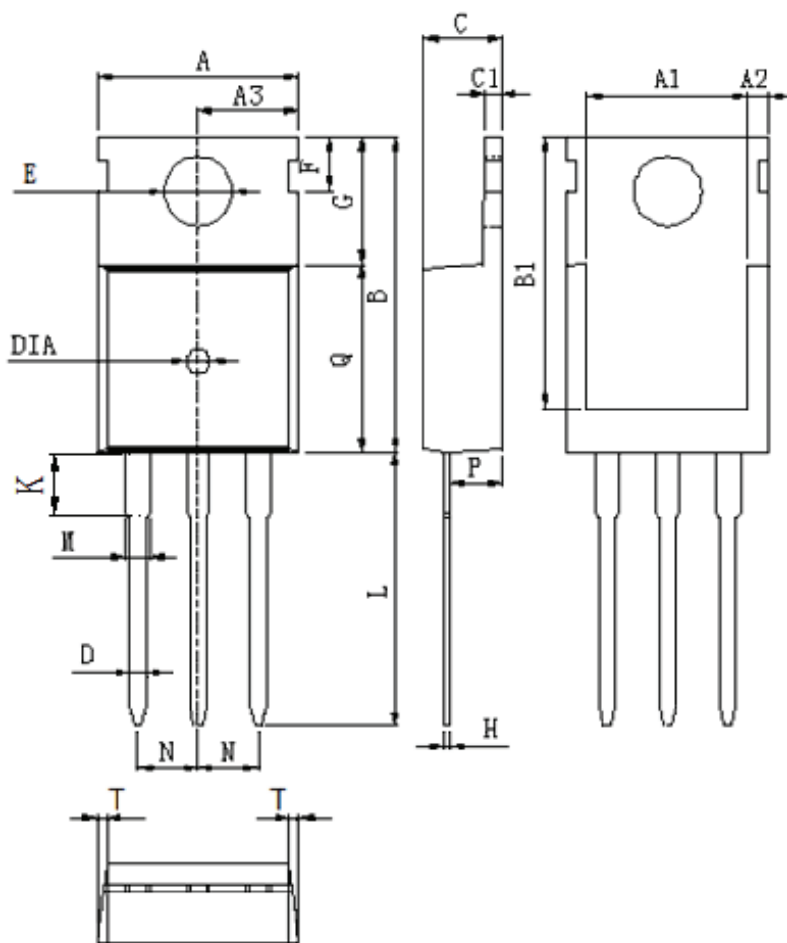
This product has been designed and qualified for the consumer market.

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
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)

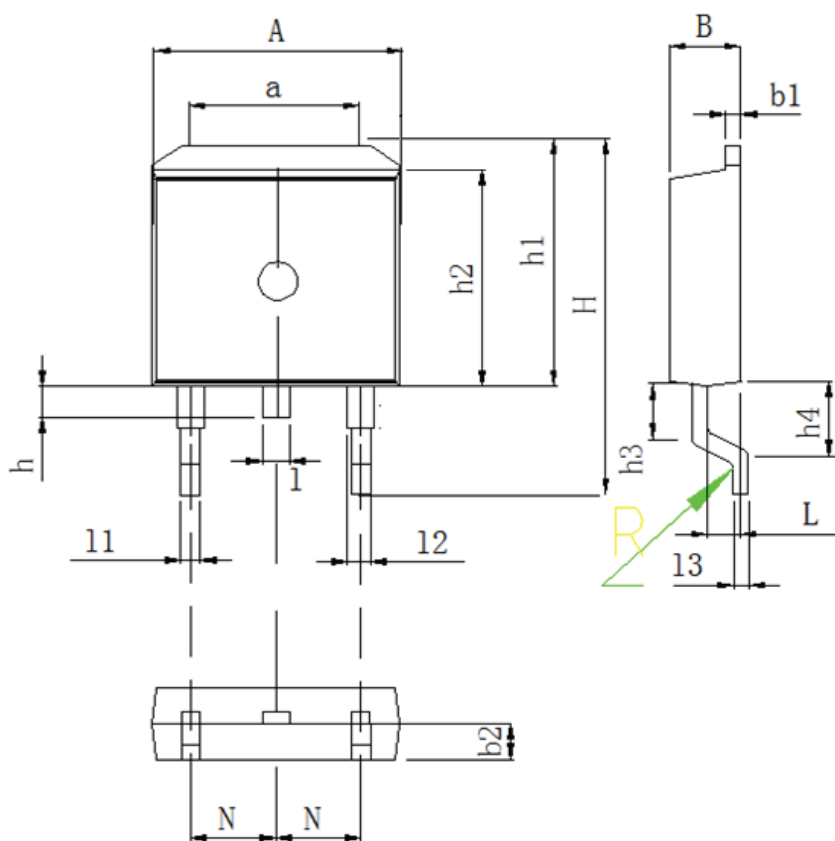
CMP60R360D/CMB60R360D/CMI60R360D/CMF60R360D

600V, 315mΩ typ., 11A N-Channel Super Junction Power MOSFET

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	$0.5R \pm 0.05$

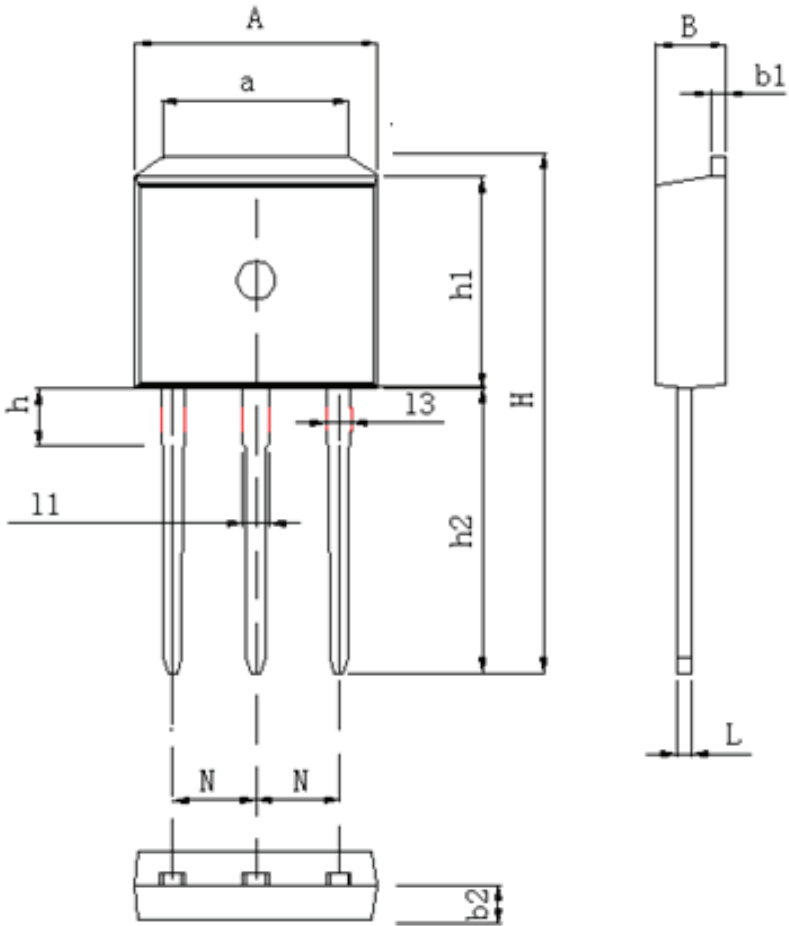
CMP60R360D/CMB60R360D/CMI60R360D/CMF60R360D

600V, 315mΩ typ., 11A N-Channel Super Junction Power MOSFET

Package Dimension

TO-262

Unit :mm

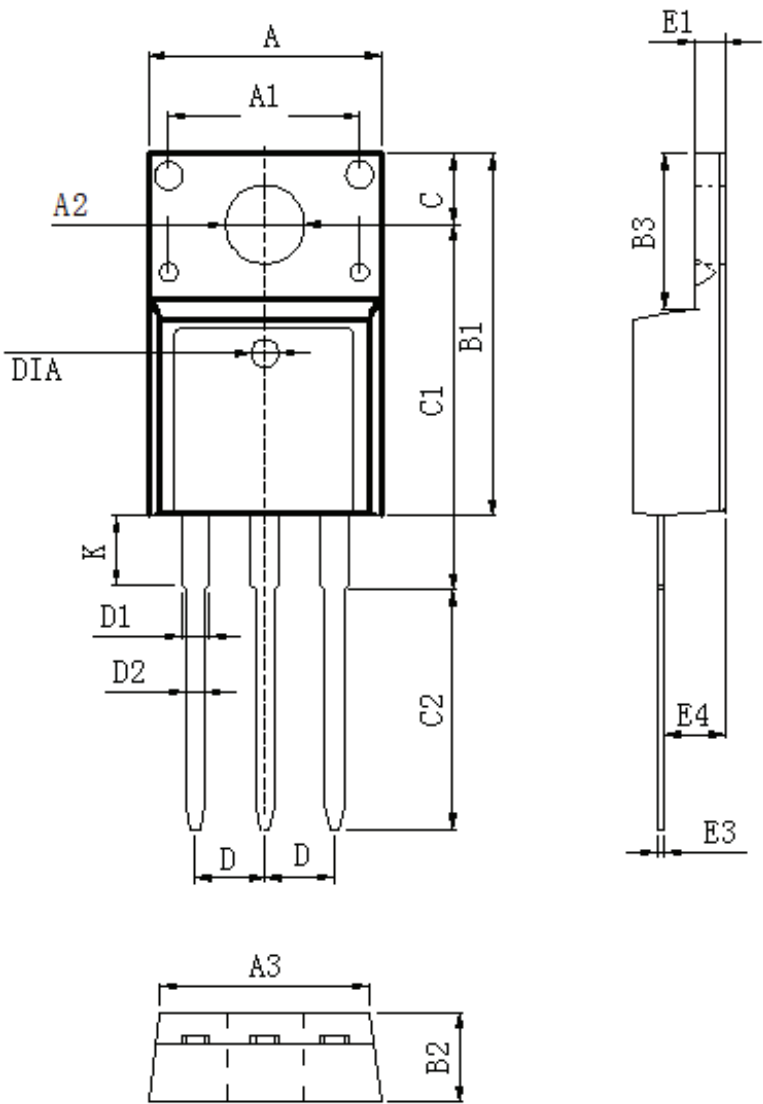


DIM	MILLIMETERS
A	9.98 ± 0.2
a	7.4 ± 0.4
B	4.5 ± 0.2
b1	1.3 ± 0.05
b2	2.4 ± 0.2
H	23.9 ± 0.3
h	3.1 ± 0.2
h1	9.16 ± 0.2
h2	13.2 ± 0.2
L	0.5 ± 0.1
l1	1.3 ± 0.1
l2	0.8 ± 0.1
N	2.45 ± 0.1

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)