CMP60N68K/CMB60N68K

N-Channel Enhancement Mode Field Effect Transistor

General Description

The 60N68K uses advanced trench technology to provide excellent $R_{DS(ON)}$. Therefore, it is suitable for high-efficiency switching applications.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
68V	12mΩ	60A

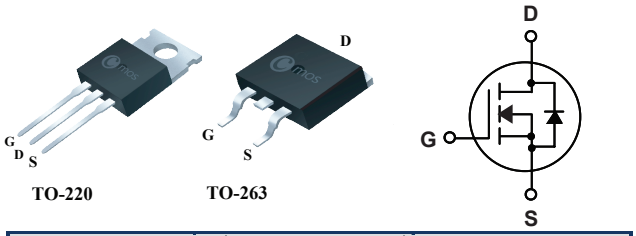
Applications

- Motor Control
- DC-DC converters
- Switching applications

Features

- Low On-Resistance
- 100% Avalanche Tested
- RoHS Compliant

TO-220/263 Pin Configuration



Type	Package	Marking
CMP60N68K	TO-220	CMP60N68K
CMB60N68K	TO-263	CMB60N68K

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	68	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current	60	A
I_D@T_C=100℃	Continuous Drain Current	42	A
I_{DM}	Pulsed Drain Current [1]	240	A
EAS	Single Pulse Avalanche Energy[2]	270	mJ
P_D@T_C=25℃	Total Power Dissipation	150	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	---	51	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.83	℃/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	68	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=25A	---	---	12	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=68V, V_{GS}=0V	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS} = ±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=5V , I_D=20A	---	21	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.2	---	Ω
Q_g	Total Gate Charge	I_D=30A V_{DD}=54V V_{GS}=10V (note 3,4)	---	47	---	nC
Q_{gs}	Gate-Source Charge		---	10	---	
Q_{gd}	Gate-Drain Charge		---	20	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=34V I_D=30A R_G=4.7Ω V_{GS}=10V (note 3,4)	---	15	---	ns
T_r	Rise Time		---	45	---	
$T_{d(off)}$	Turn-Off Delay Time		---	35	---	
T_f	Fall Time		---	15	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	3000	---	pF
C_{oss}	Output Capacitance		---	200	---	
C_{rss}	Reverse Transfer Capacitance		---	150	---	

Diode Characteristics

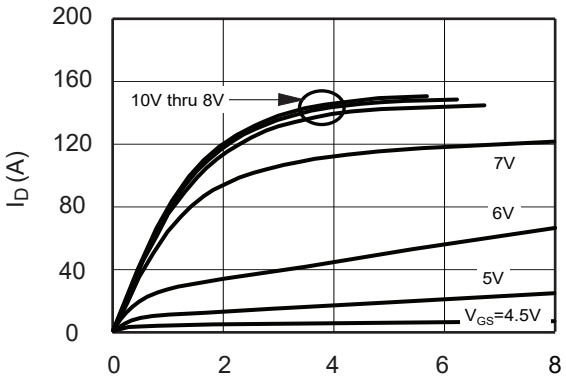
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	60	A
I_{SM}	Pulsed Source Current		---	---	240	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=20A ,T_J=25℃	---	0.87	1.2	V
t_{rr}	Reverse Recovery Time	di/dt = 100A/μs V_{GS} = 0V , I_S =30A	---	13	---	ns
Q_{rr}	Reverse Recovery Charge		---	4	---	nC

Note :

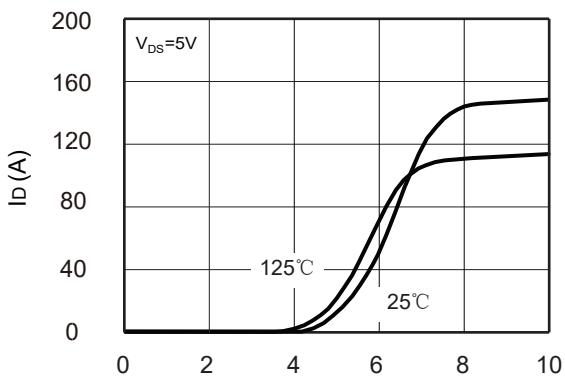
1. Repeatitive rating : pulse width limited by junction temperature.
2. The EAS data shows Max. rating . The test condition is V_{DD}=20V , V_{GS}=10V , L=1mH , I_{AS}=24.5A.
3. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

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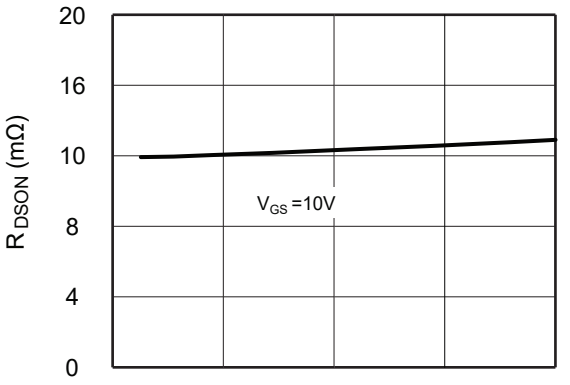
Typical Characteristics



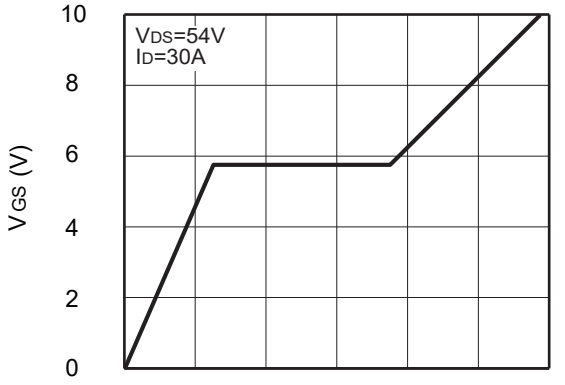
Output Characteristics



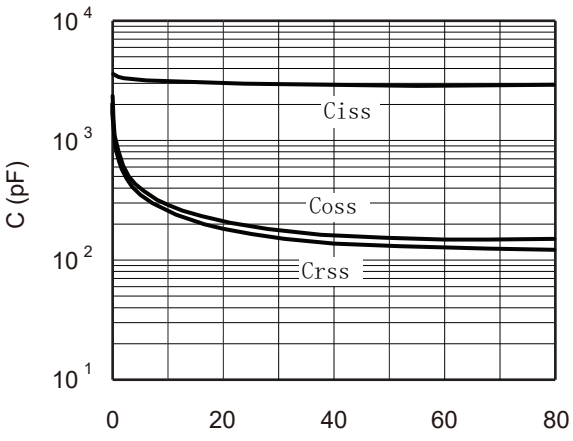
transfer characteristics



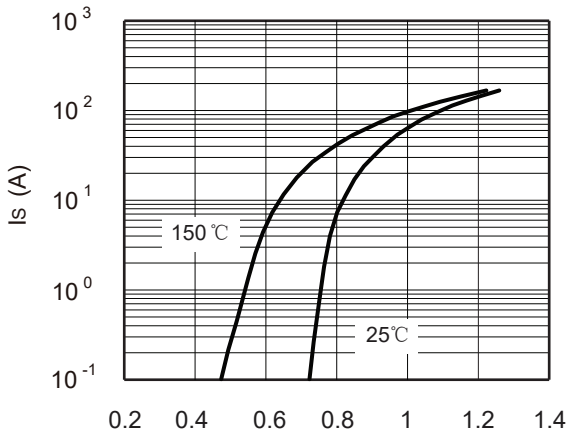
On-Resistance vs. Drain Current



Gate charge vs gate-source voltage

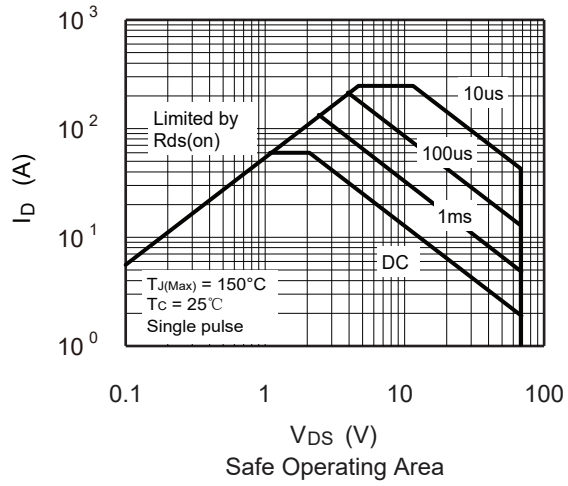


Capacitance Characteristics

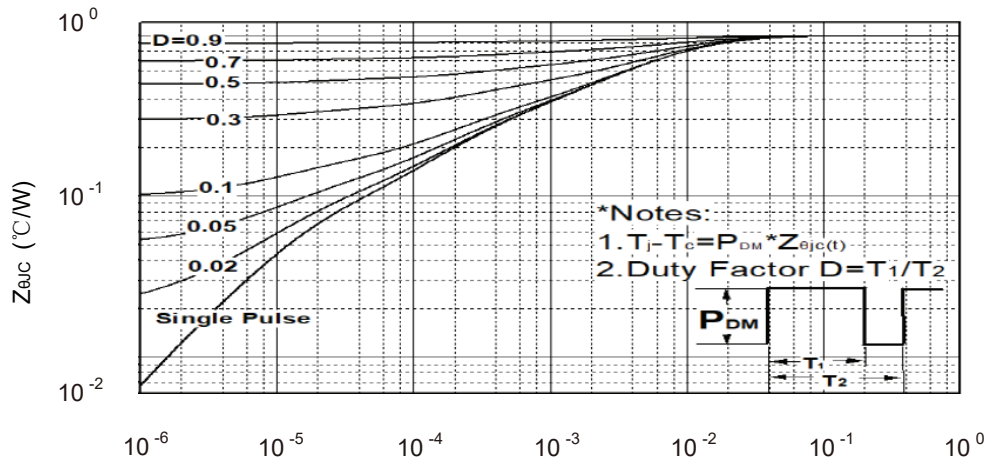


Body-Diode Characteristics

Typical Characteristics



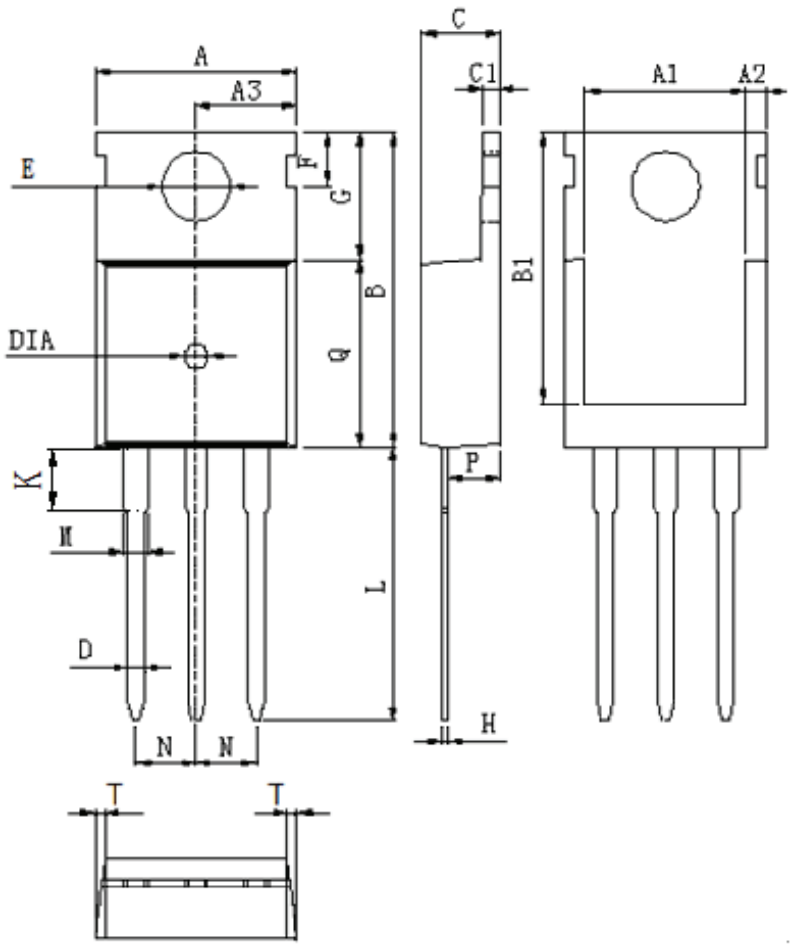
Safe Operating Area



Transient thermal impedance

Package Dimension

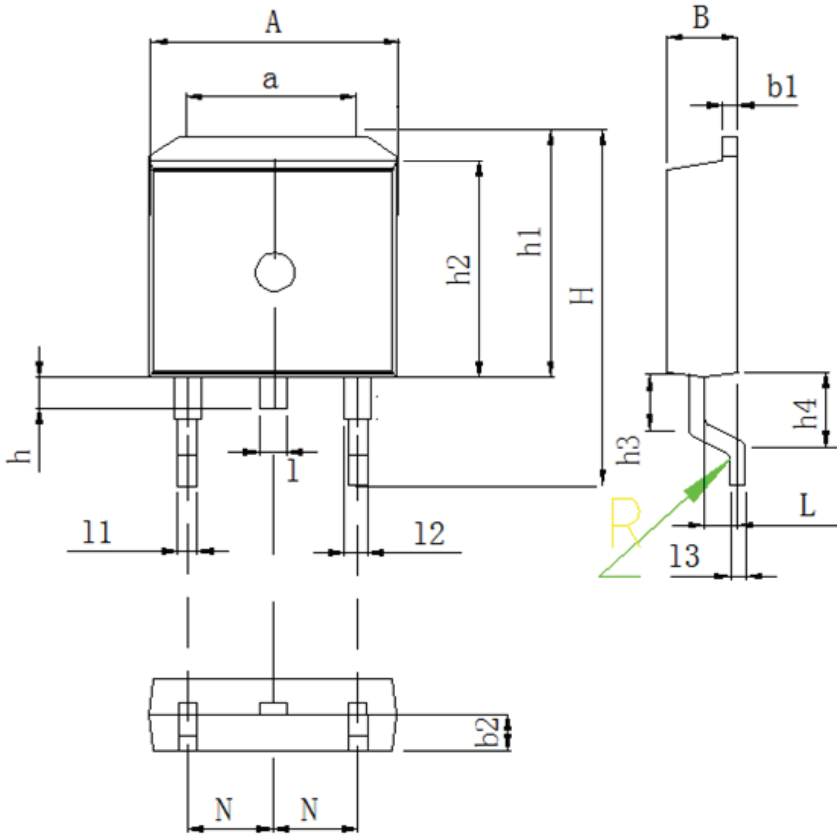
TO-220 Unit :mm



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
l	1.3±0.1
l1	0.8±0.1
l2	1.3±0.1
l3	0.5±0.1
N	2.54±0.1
R	0.5R±0.05