

CMP40N20P/CMB40N20P

200V, 58mΩ typ., 40A N-Channel MOSFET

General Description

The 40N20P uses advanced planar stripe DMOS technology and design to provide excellent RDS(ON).

These devices are well suited for high efficiency switched mode power supplies, active power factor correction based on half bridge topology.

Features

- Fast switching
- Low On-Resistance
- 100% avalanche tested
- RoHS Compliant

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	40	A
$I_D@T_C=100^\circ C$	Continuous Drain Current	26	A
I_{DM}	Pulsed Drain Current	160	A
EAS	Single Pulse Avalanche Energy ¹	1000	mJ
$P_D@T_C=25^\circ C$	Total Power Dissipation	160	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	---	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.78	°C/W

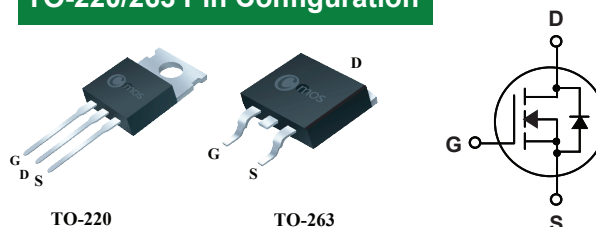
Product Summary

BVDSS	R _{DS(on)} max.	ID
200V	65mΩ	40A

Applications

- LED power controller
- DC-DC & DC-AC converters
- High current, high speed switching
- Solenoid and relay drivers
- Motor control, Audio amplifiers

TO-220/263 Pin Configuration



Type	Package	Marking
CMP40N20P	TO-220	CMP40N20P
CMB40N20P	TO-263	CMB40N20P

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	200	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=20A$	---	58	65	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=200V, V_{GS}=0V$	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	±100	nA
gfs	Forward Transconductance	$V_{DS}=10V, I_D=20A$	---	25	---	S
Q_g	Total Gate Charge	$I_D=20A$	---	63	---	nC
Q_{gs}	Gate-Source Charge	$V_{DD}=100V$	---	17	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$ (Note 2,3)	---	19	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=100V$ $R_G=25\Omega$ $I_D=20A$ (Note 2,3)	---	43	---	ns
T_r	Rise Time		---	27	---	
$T_{d(off)}$	Turn-Off Delay Time		---	156	---	
T_f	Fall Time		---	33	---	
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	2700	---	pF
C_{oss}	Output Capacitance		---	382	---	
C_{rss}	Reverse Transfer Capacitance		---	50	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	40	A
I_{SM}	Pulsed Source Current		---	---	160	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_F=40A, T_J=25^\circ\text{C}$	---	---	1.4	V
t_{rr}	Reverse Recovery Time	$V_{GS}=0V, I_F=20A$	---	185	---	ns
Q_{rr}	Reverse Recovery Charge	$dI_F/dt=100A/\mu s$ (Note 2,3)	---	1.2	---	μC

Note :

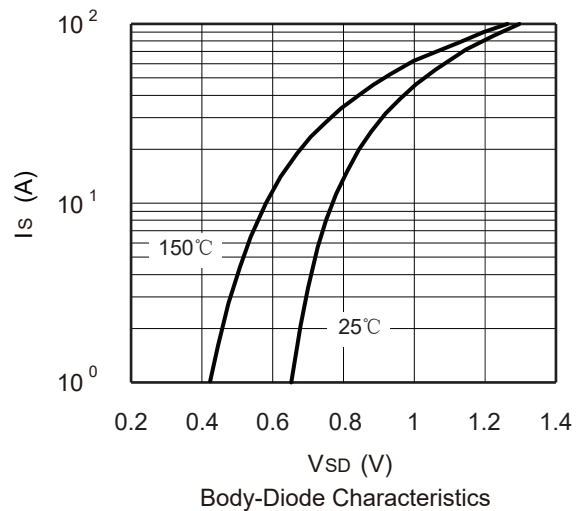
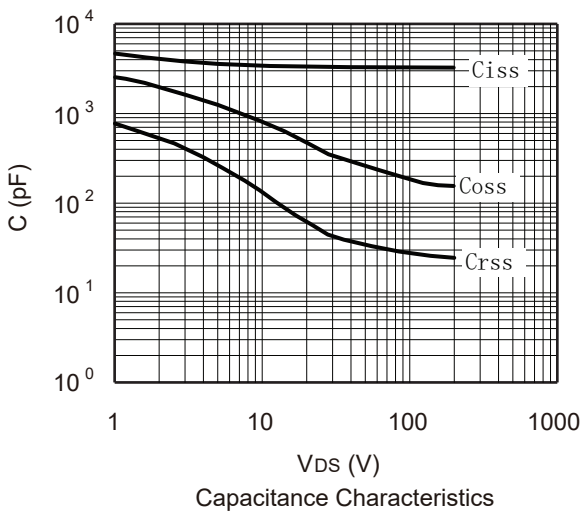
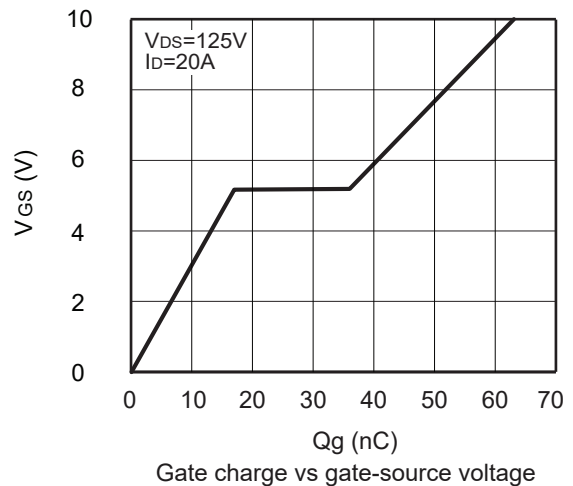
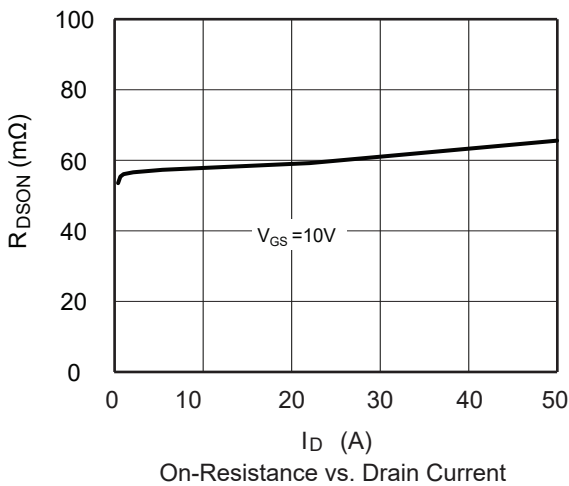
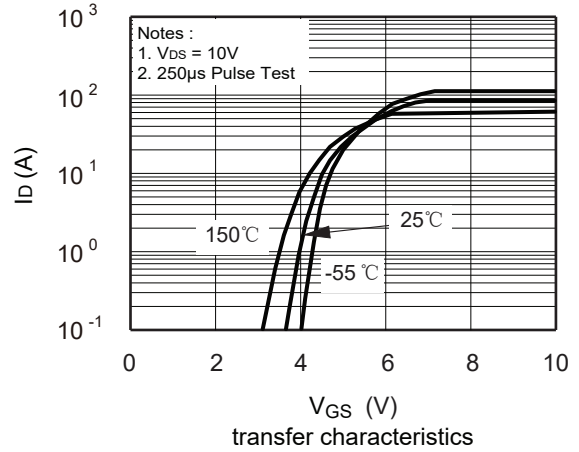
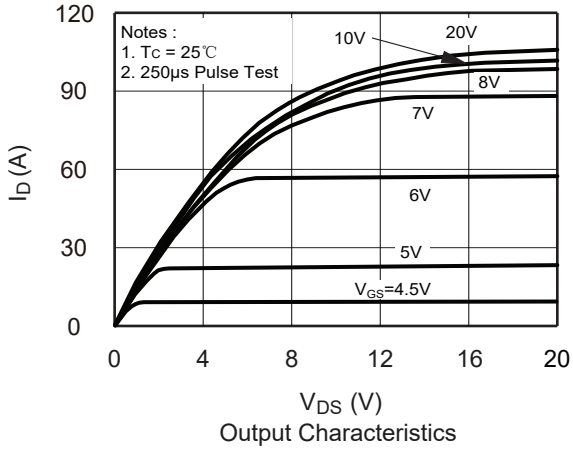
- 1.The EAS data shows Max. rating . The test condition is $V_{DD}=80V, V_{GS}=10V, L=5\text{mH}, I_{AS}=20A$.
- 2.Pulse test: Pulse width≤300us, Duty cycles≤2%.
- 3.Essentially independent of operating temperature typical characteristics.

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.

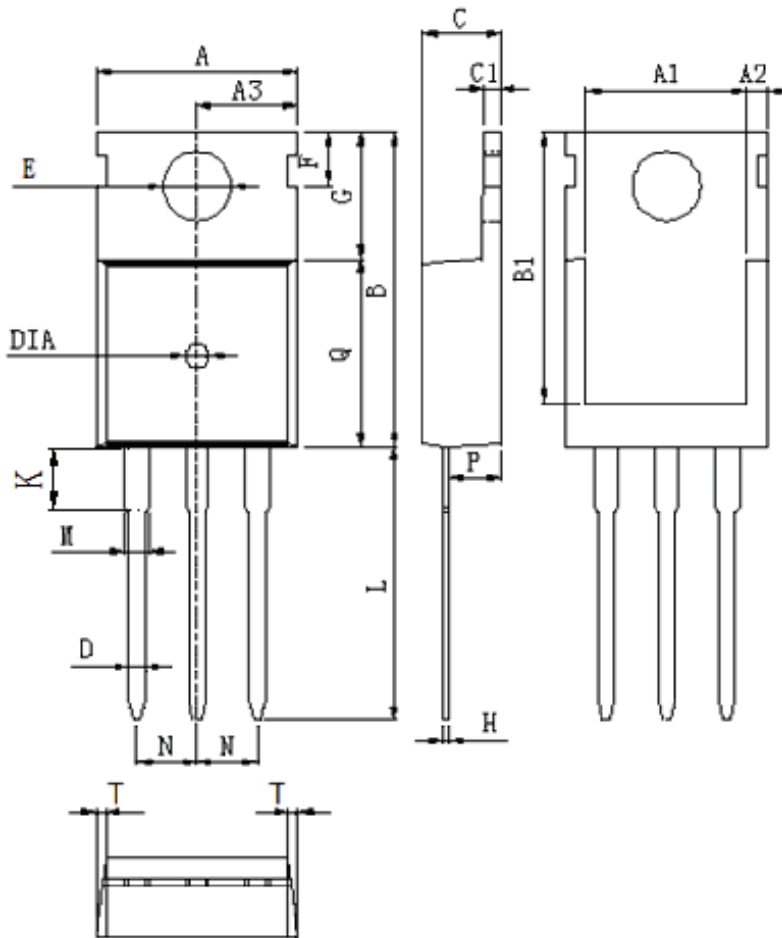
Typical Characteristics



Package Dimension

TO-220

Unit :mm

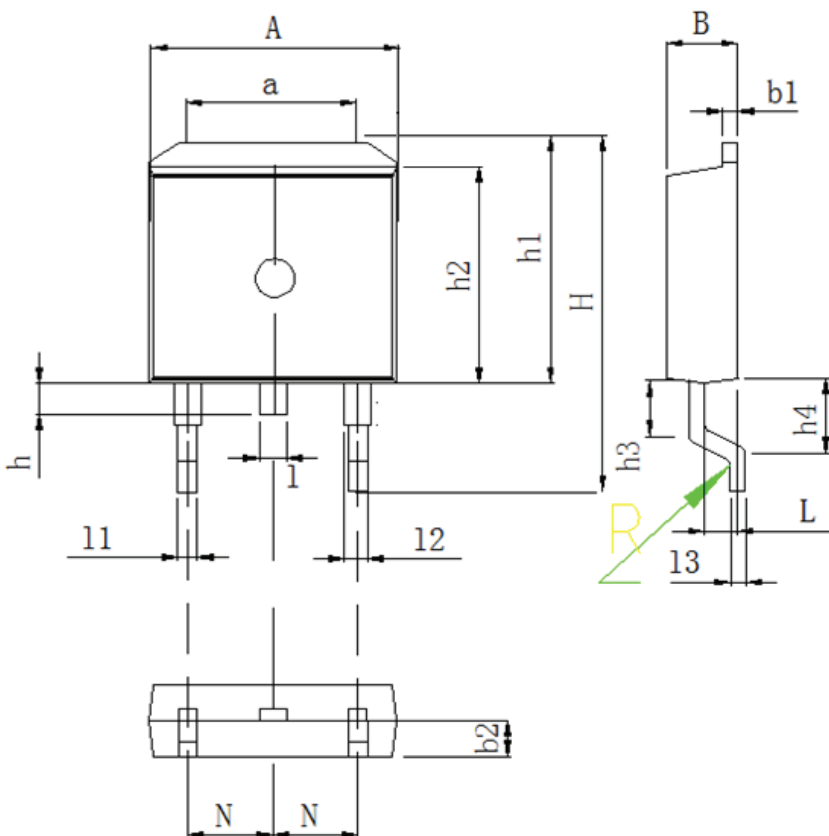


DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.56±0.1
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	6.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
M	1.25±0.1
N	2.54±0.1
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	⊙1.5 (deep 0.2)

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	$0.5R \pm 0.05$