CMP250N03B/CMB250N03B/CMI250N03B/CMF250N03B

30V, 2.5mΩ typ., 250A N-Channel MOSFET

General Description

The 250N03B uses advanced trench technology to provide excellent $R_{DS(ON)}$. This is suitable device forhigh current switching applications.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
30V	3mΩ	250A

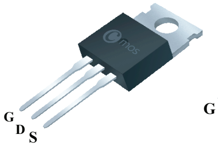
Applications

- DC/DC converters
- Motor control and drive
- High current, High speed switching

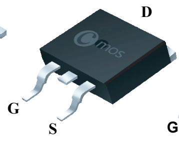
Features

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

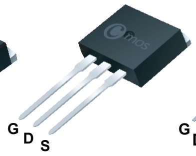
TO-220/263/262/220F Pin Configuration



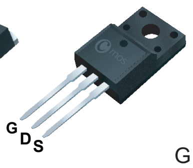
TO-220
(CMP250N03B)



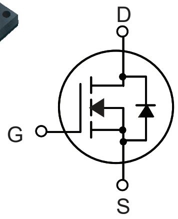
TO-263
(CMB250N03B)



TO-262
(CMI250N03B)



TO-220F
(CMF250N03B)



Absolute Maximum Ratings

Symbol	Parameter	220/263/262	220F	Units
V_{DS}	Drain-Source Voltage	30		V
V_{GS}	Gate-Source Voltage	±20		V
I_D@T_C=25℃	Continuous Drain Current	250	250*	A
I_D@T_C=100℃	Continuous Drain Current	180	180*	A
I_{DM}	Pulsed Drain Current	1000	1000*	A
EAS	Single Pulse Avalanche Energy (Note 1)	3042		mJ
P_D@T_C=25℃	Total Power Dissipation	200	45	W
T_{STG}	Storage Temperature Range	-55 to 150		℃
T_J	Operating Junction Temperature Range	-55 to 150		℃

* Drain current limited by maximum junction temperature.

Thermal Data

Symbol	Parameter	220/263/262	220F	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient Max	62	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case Max.	0.63	2.78	℃/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	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=30A	---	2.5	3	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}=30V , V_{GS}=0V	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V, I_D =30A	---	42	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	4.5	---	Ω
Q_g	Total Gate Charge	V_{DS}=24V , I_D=80A V_{GS}=0 to 10V (Note 2)	---	110	---	nC
Q_{gs}	Gate-Source Charge		---	26	---	
Q_{gd}	Gate-Drain Charge		---	45	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DS}=15V , V_{GS}=10V R_G =2.2Ω , I_D =80A (Note 2)	---	22	---	ns
T_r	Rise Time		---	325	---	
$T_{d(off)}$	Turn-Off Delay Time		---	90	---	
T_f	Fall Time		---	110	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	5050	---	pF
C_{oss}	Output Capacitance		---	1300	---	
C_{rss}	Reverse Transfer Capacitance		---	570	---	

Diode Characteristics

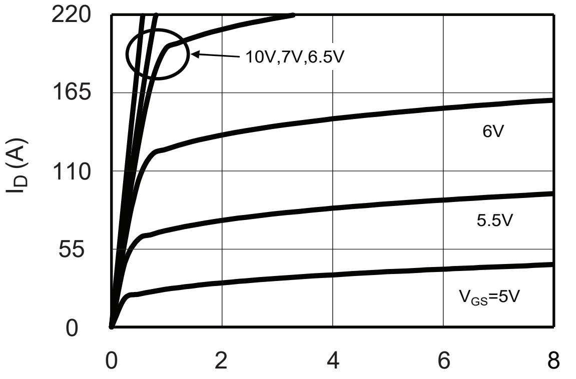
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	250	A
I_{SM}	Pulsed Source Current		---	---	1000	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=30A ,T_J=25℃	---	0.80	1.4	V

Note :

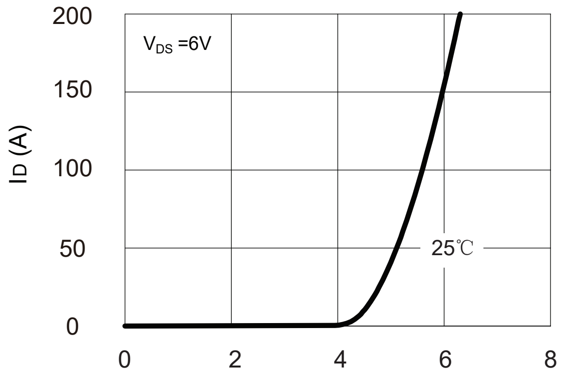
1.The EAS data shows Max. rating .The test condition is V_{DS}=55V , V_{GS}=10V , L=1mH , I_{AS}=78A.

2. Defined by design, not subject to production.

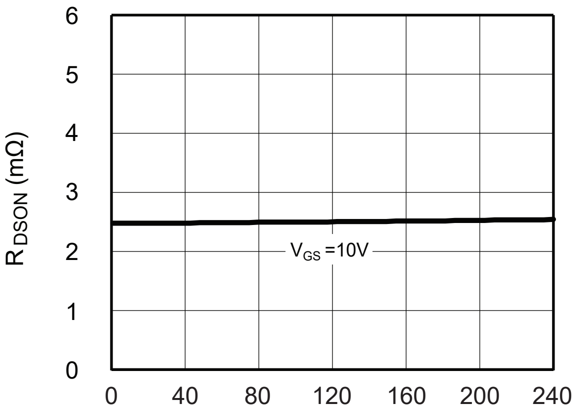
Typical Characteristics



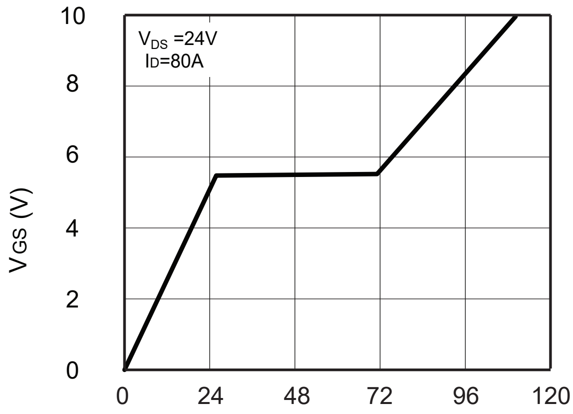
VDS (V)
Output Characteristics



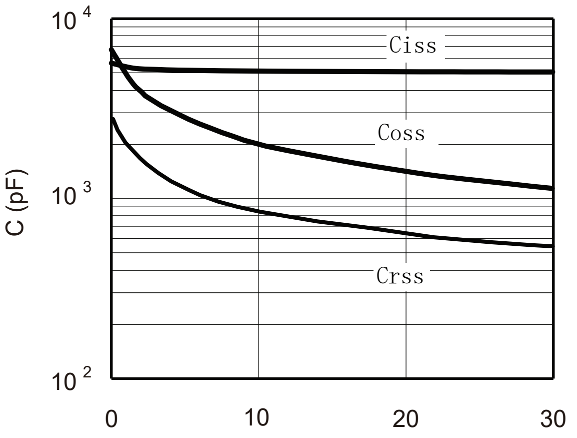
VGS (V)
transfer characteristics



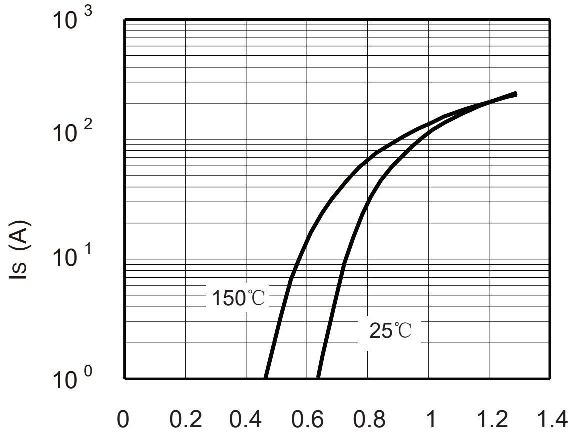
ID (A)
drain-source on-resistance



Qg (nC)
Gate charge vs gate-source voltage



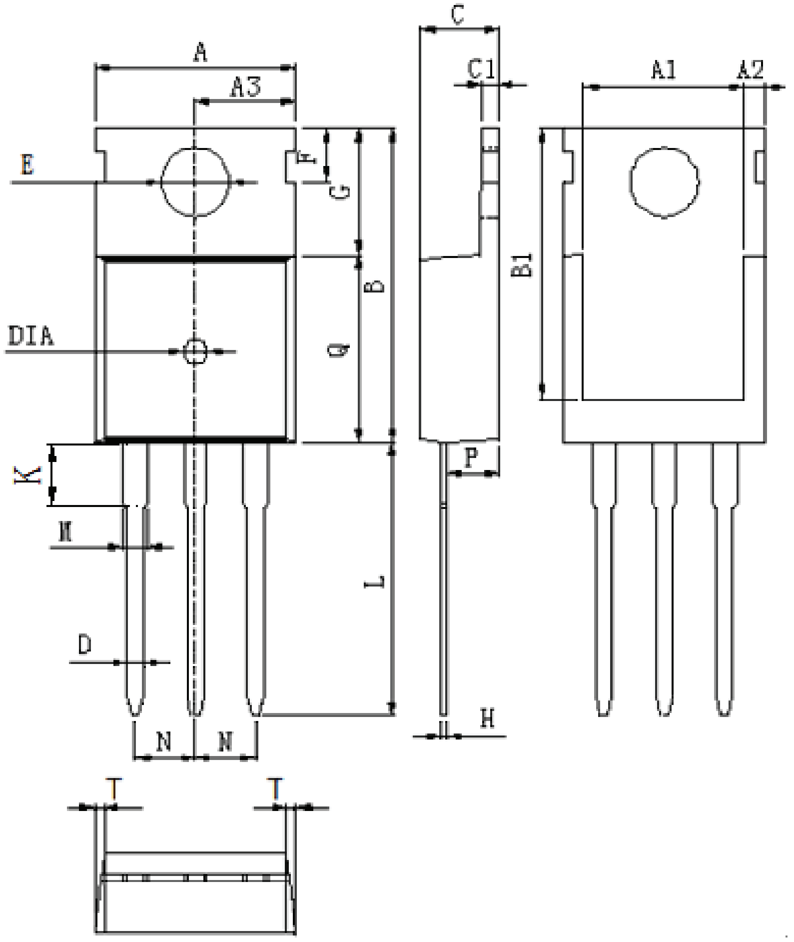
VDS (V)
Capacitance Characteristics



VSD (V)
Body-Diode Characteristics

Package Dimension

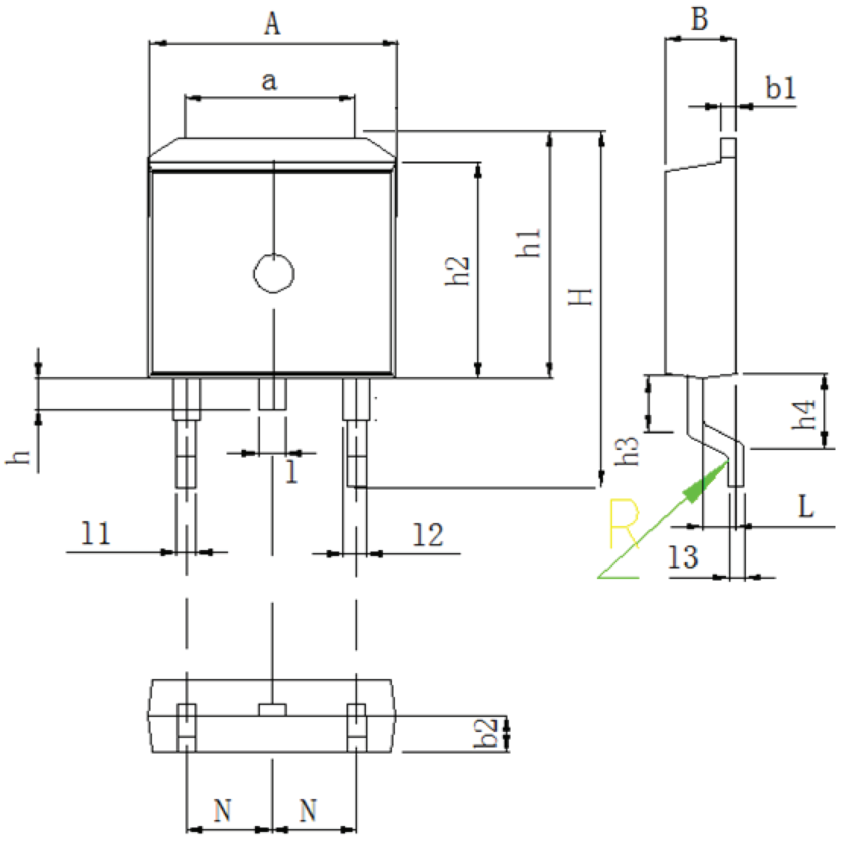
TO-220 Unit :mm



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

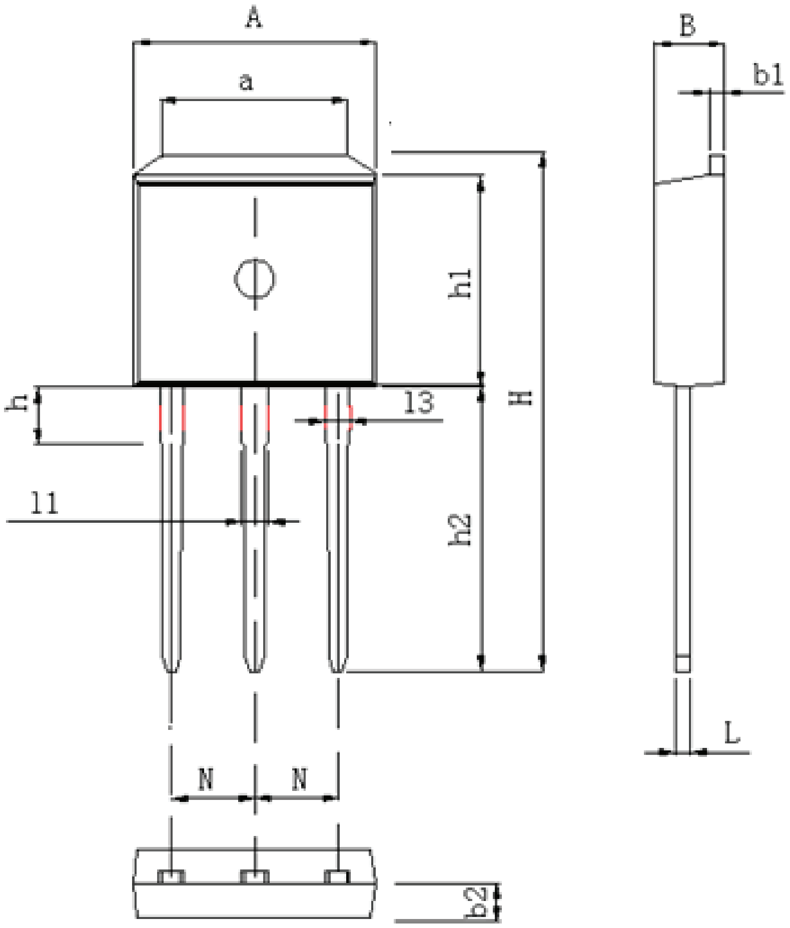
TO-263 Unit :mm



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
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

Package Dimension

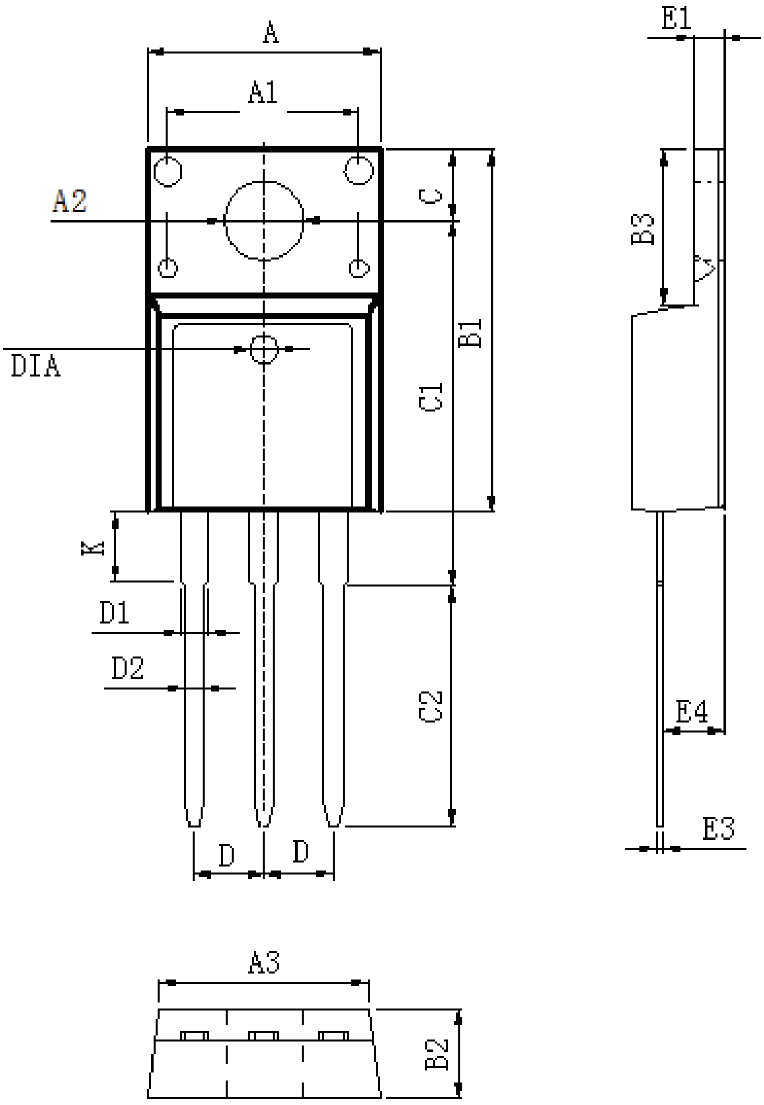
TO-262 Unit :mm



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)