

# CMP12N65B/CMB12N65B/CMI12N65B/CMF12N65B

650V, 625mΩ typ., 12A N-Channel MOSFET

## General Description

These Power MOSFETs are produced using Cmos's proprietary, planar stripe, DMOS technology. These devices are well suited for active power factor correction and switching mode power supplies.

## Features

- 100% avalanche tested
- Improved dv/dt capability
- RoHS Compliant

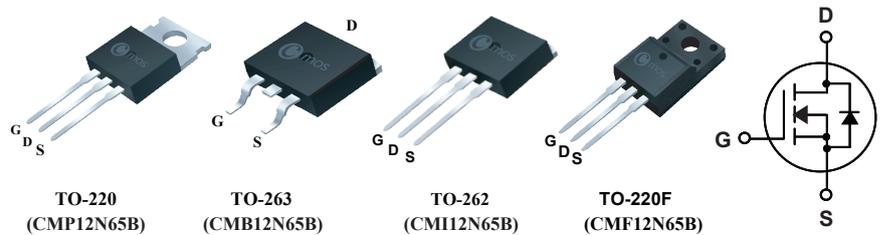
## Product Summary

BVDSS	R <sub>DS(on)</sub> max.	ID
650V	700mΩ	12A

## Applications

- PFC
- Power Supply

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



## Absolute Maximum Ratings

Symbol	Parameter	220/263/262	220F	Units
V <sub>DS</sub>	Drain-Source Voltage	650		V
V <sub>GS</sub>	Gate-Source Voltage	±30		V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current	12	12*	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current	7.4	7.4*	A
I <sub>DM</sub>	Pulsed Drain Current	48	48*	A
EAS	Single Pulse Avalanche Energy (Note 1)	781		mJ
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	230	54	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150		°C
T <sub>J</sub>	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 <sub>θJA</sub>	Thermal Resistance Junction-ambient Max.	62.5	62.5	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-case Max.	0.54	2.31	°C/W

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	650	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=6A$	---	625	700	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	---	4.0	V
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=650V, V_{GS}=0V$	---	---	1	μA
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	±100	nA
gfs	Forward Transconductance	$V_{DS}=15V, I_D=6A$	---	11	---	S
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	---	4.0	---	Ω
$Q_g$	Total Gate Charge	$I_D=12A$	---	38	---	nC
$Q_{gs}$	Gate-Source Charge	$V_{DD}=520V$	---	8.5	---	
$Q_{gd}$	Gate-Drain Charge	$V_{GS}=10V$ (Note 2)	---	14	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=325V$	---	27	---	ns
$T_r$	Rise Time	$I_D=12A$	---	52	---	
$T_{d(off)}$	Turn-Off Delay Time	$R_{GEN}=25\Omega$ (Note 2)	---	135	---	
$T_f$	Fall Time	$V_{GS}=10V$	---	48	---	
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	1980	---	pF
$C_{oss}$	Output Capacitance		---	150	---	
$C_{rss}$	Reverse Transfer Capacitance		---	8	---	

**Diode Characteristics**

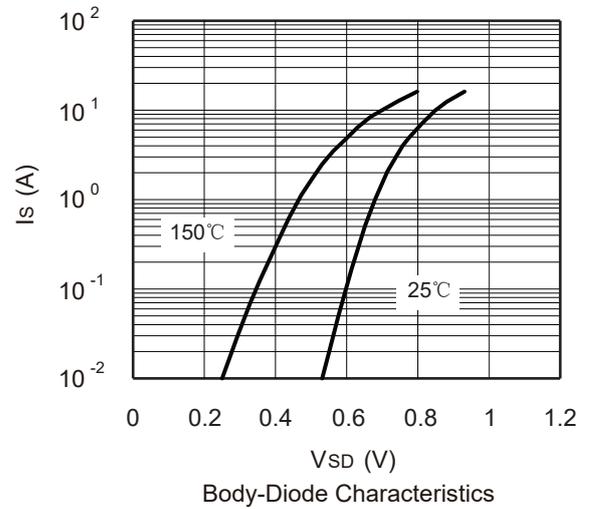
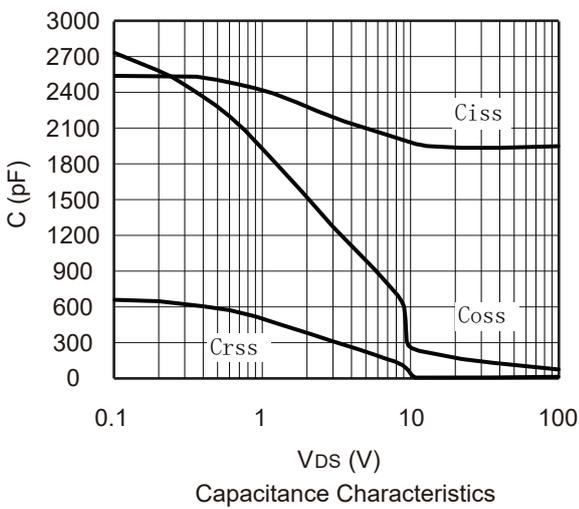
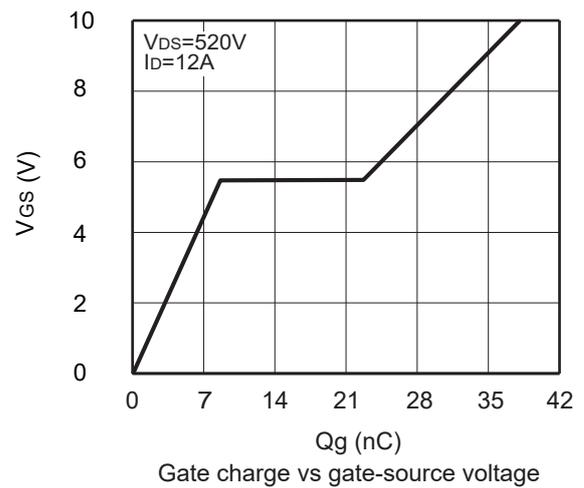
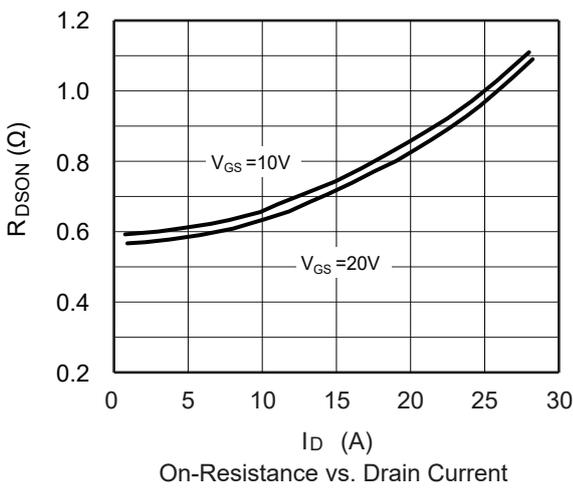
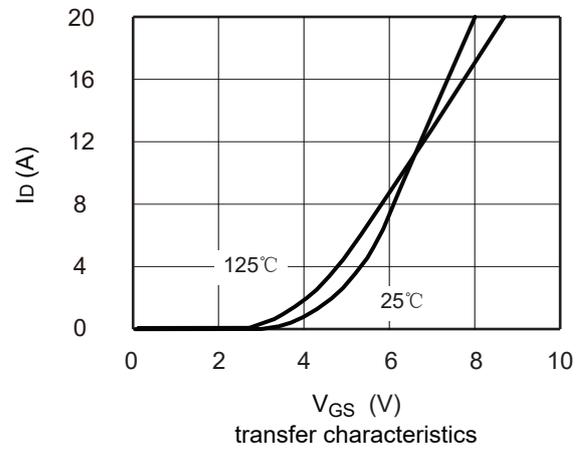
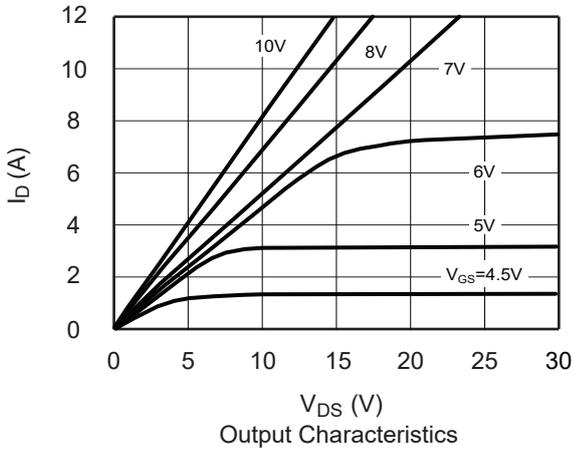
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V$ , Force Current	---	---	12	A
$I_{SM}$	Pulsed Source Current		---	---	48	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=12A, T_J=25^\circ\text{C}$	---	0.87	1.4	V

Note :

- 1.The EAS data shows Max. rating . The test condition is  $V_{DD}=100V, V_{GS}=10V, L=10\text{mH}, I_{AS}=12.5A$ .
- 2.Guaranteed by design, not subject to production testing.

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.

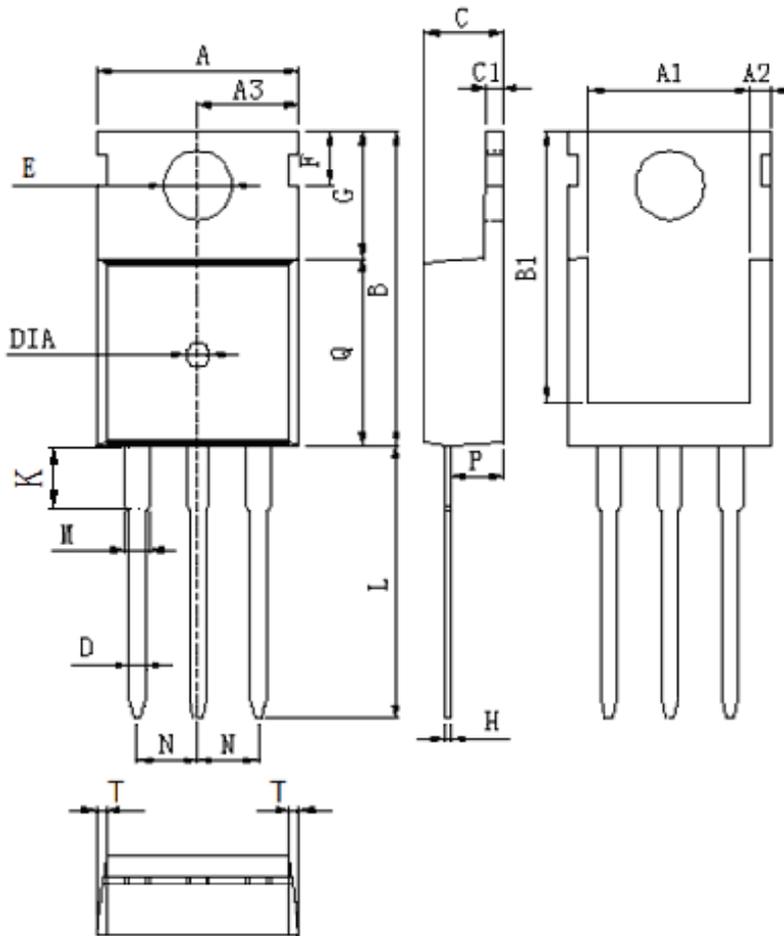
Typical Characteristics



**Package Dimension**

TO-220

Unit :mm

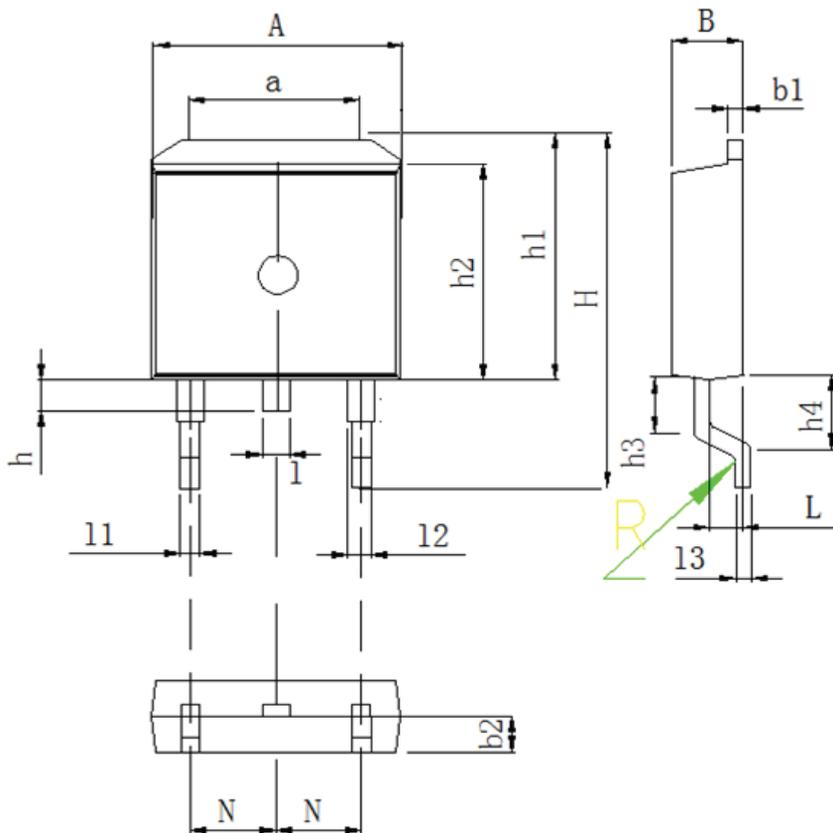


DIM	MILLIMETERS
A	10.0±0.3
A1	8.64±0.2
A2	1.15±0.1
A3	5.0±0.2
B	15.8±0.4
B1	13.2±0.3
C	4.56±0.1
C1	1.3±0.2
D	0.8±0.2
E	3.6±0.2
F	2.95±0.3
G	6.5±0.3
H	0.5±0.1
K	3.1±0.2
L	13.2±0.4
M	1.25±0.1
N	2.54±0.1
P	2.4±0.3
Q	9.0±0.3
T	W:0.35
DIA	⊙1.5(deep 0.2)

**Package Dimension**

TO-263

Unit :mm

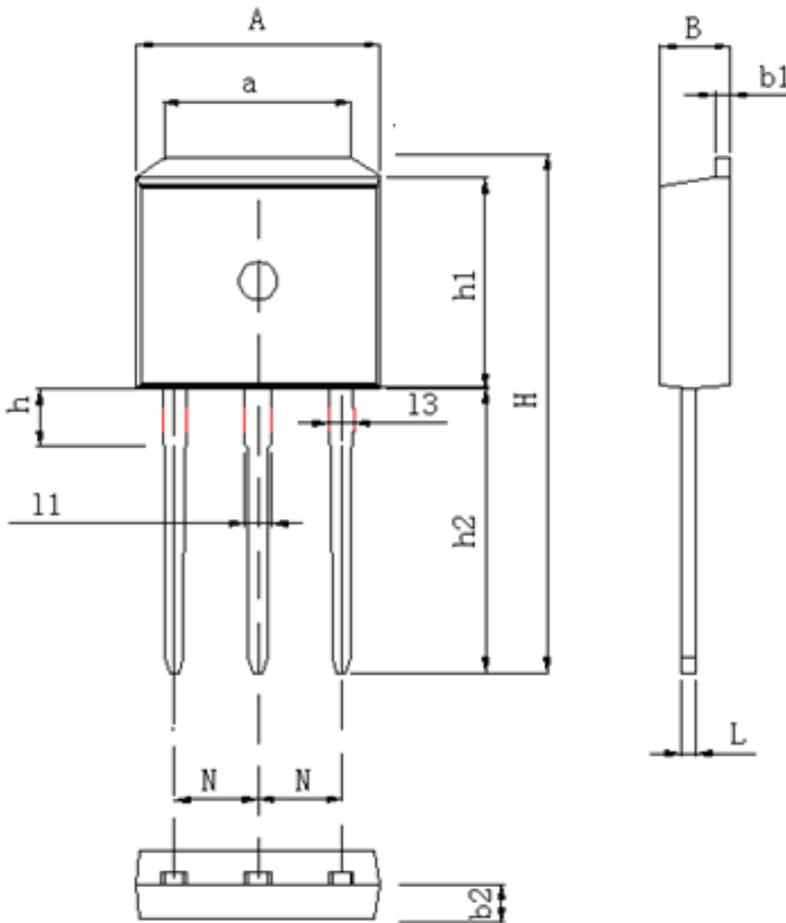


DIM	MILLIMETERS
A	$9.8 \pm 0.2$
a	$7.4 \pm 0.4$
B	$4.5 \pm 0.2$
b1	$1.3 \pm 0.05$
b2	$2.4 \pm 0.2$
H	$15.5 \pm 0.3$
h	$1.54 \pm 0.2$
h1	$10.5 \pm 0.2$
h2	$9.2 \pm 0.1$
h3	$1.54 \pm 0.2$
h4	$2.7 \pm 0.2$
L	$2.4 \pm 0.2$
1	$1.3 \pm 0.1$
11	$0.8 \pm 0.1$
12	$1.3 \pm 0.1$
13	$0.5 \pm 0.1$
N	$2.54 \pm 0.1$
R	$0.5R \pm 0.05$

Package Dimension

TO-262

Unit :mm

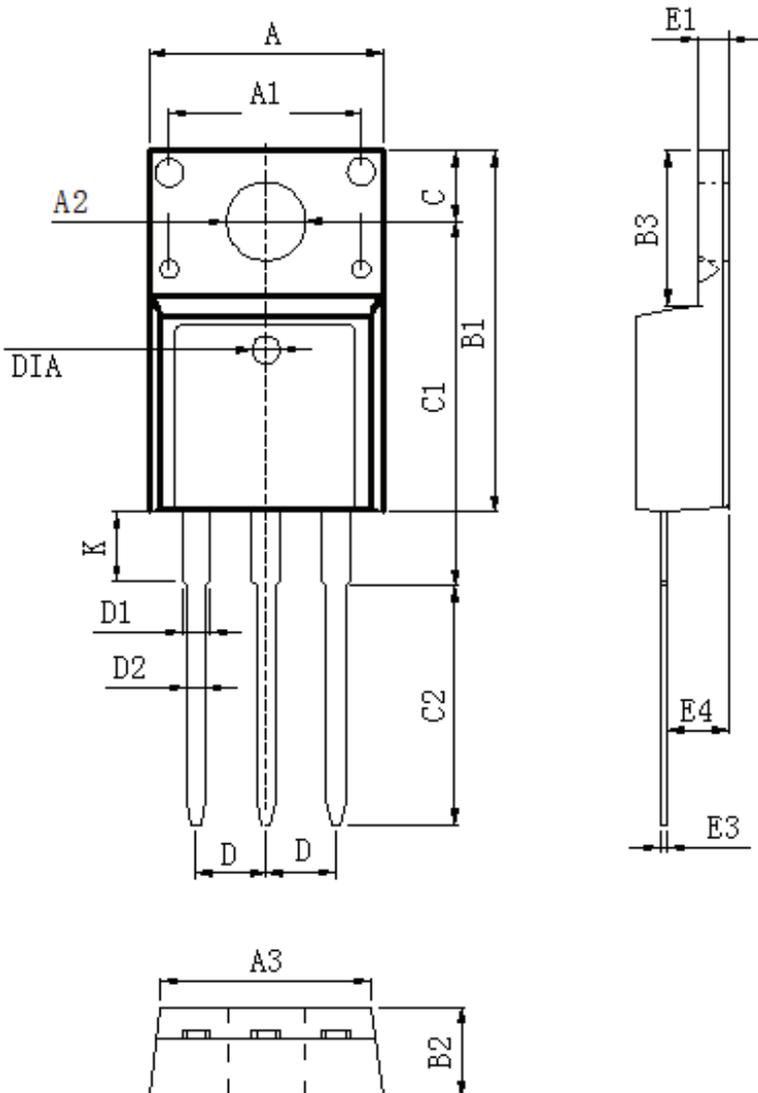


DIM	MILLIMETERS
A	9.98±0.2
a	7.4±0.4
B	4.5±0.2
b1	1.3±0.05
b2	2.4±0.2
H	23.9±0.3
h	3.1±0.2
h1	9.16±0.2
h2	13.2±0.2
L	0.5±0.1
l1	1.3±0.1
l2	0.8±0.1
N	2.45±0.1

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)