CMB20N50B

500V, 280mΩ typ., 20A N-Channel MOSFET

General Description

The CMB20N50B uses advanced planar stripe DMOS technology and design to provide excellent $R_{DS(ON)}$.These devices are well suited for high efficient switched mode power supplies and active power factor correction.

Product Summary

BVDSS	$R_{DS(on)}$ max.	ID
500V	320mΩ	20A

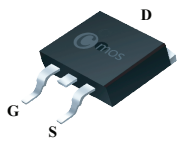
Applications

- DC−DC Converters
- Power Management Functions

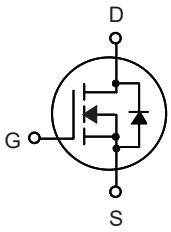
Features

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

TO-263 Pin Configuration



TO-263
(CMB20N50B)



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	±30	V
I_D@T_C=25℃	Continuous Drain Current	20	A
I_D@T_C=100℃	Continuous Drain Current	12	A
I_{DM}	Pulsed Drain Current	80	A
EAS	Single Pulse Avalanche Energy[1]	1805	mJ
P_D@T_C=25℃	Total Power Dissipation	250	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	---	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.5	℃/W

500V, 280mΩ typ., 20A N-Channel MOSFET

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	500	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=10A	---	280	320	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	---	4.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=500V , V_{GS} =0V	---	---	1	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±30V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V , I_D=10A	---	32	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	0.8	---	Ω
Q_g	Total Gate Charge	I_D=20A V_{DD}=400V V_{GS}=10V (Note 2)	---	60	---	nC
Q_{gs}	Gate-Source Charge		---	17	---	
Q_{gd}	Gate-Drain Charge		---	18	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=250V R_G =25Ω I_D=20A (Note 2)	---	45	---	ns
T_r	Rise Time		---	180	---	
$T_{d(off)}$	Turn-Off Delay Time		---	130	---	
T_f	Fall Time		---	100	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	3900	---	pF
C_{oss}	Output Capacitance		---	260	---	
C_{rss}	Reverse Transfer Capacitance		---	30	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	V_G=V_D=0V , Force Current	---	---	20	A
I_{SM}	Pulsed Source Current		---	---	80	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=20A ,T_J=25℃	---	0.85	1.4	V
t_{rr}	Reverse Recovery Time	di/dt = 100A/μs	---	500	---	ns
Q_{rr}	Reverse Recovery Charge	I_S=20A , V_{GS}=0V (Note 2)	---	5.4	---	μC

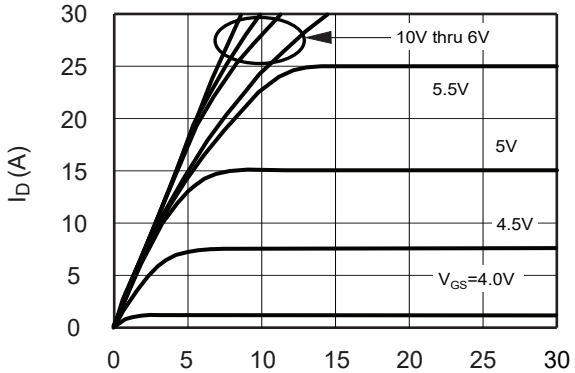
Note :

1.The EAS data shows Max. rating . The test condition is V_{DD}=100V , V_{GS}=10V , L=1mH , I_{AS}=19A.

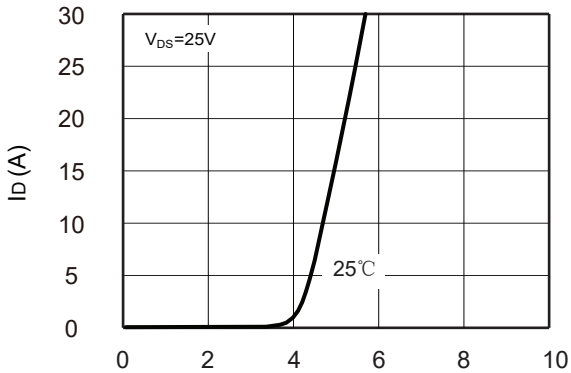
2. Essentially Independent of Operating Temperature Typical Characteristics

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Cmos assumes no liability for customers' product design or applications.
Cmos reserver the right to improve product design ,functions and reliability wihtout notice.Please refer to the latest version of specification.

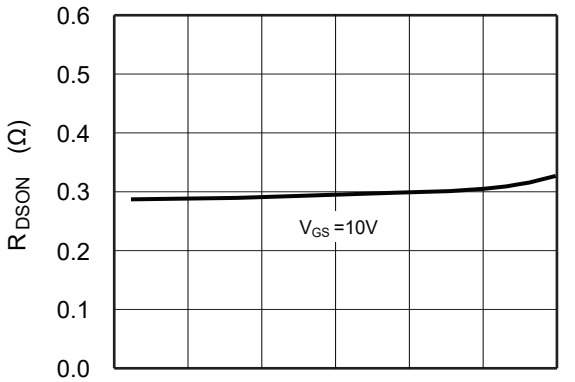
Typical Characteristics



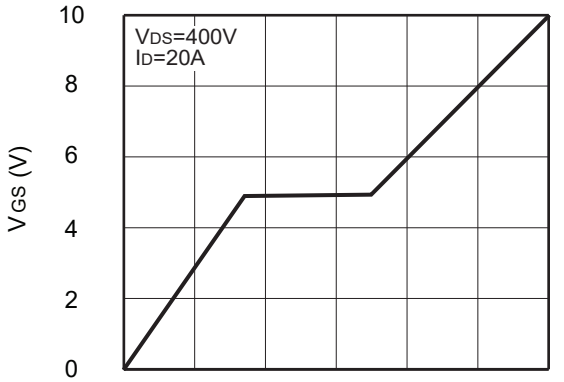
Output Characteristics



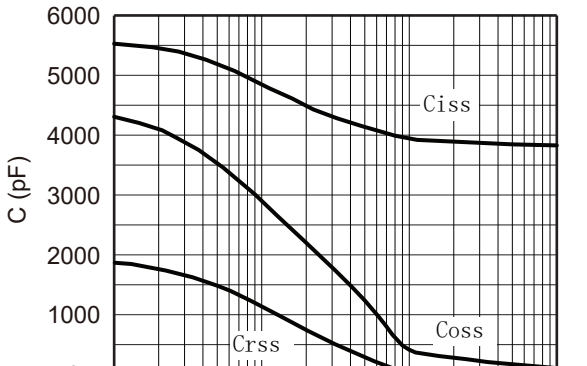
transfer characteristics



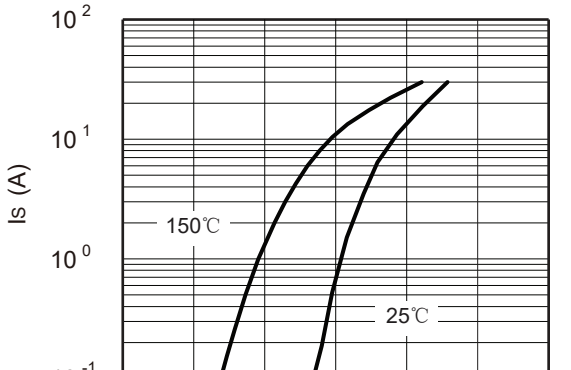
On-Resistance vs. Drain Current



Gate charge vs gate-source voltage

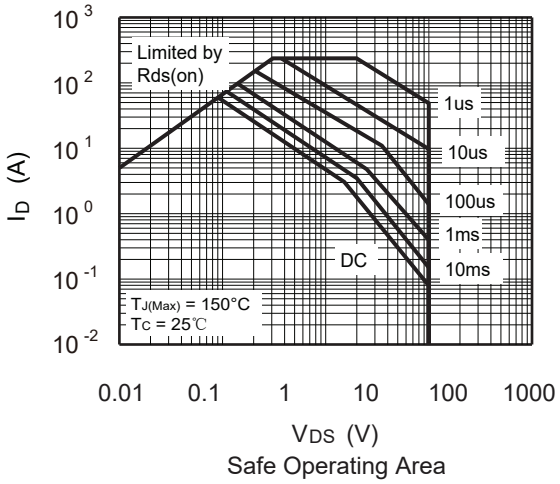


Capacitance Characteristics

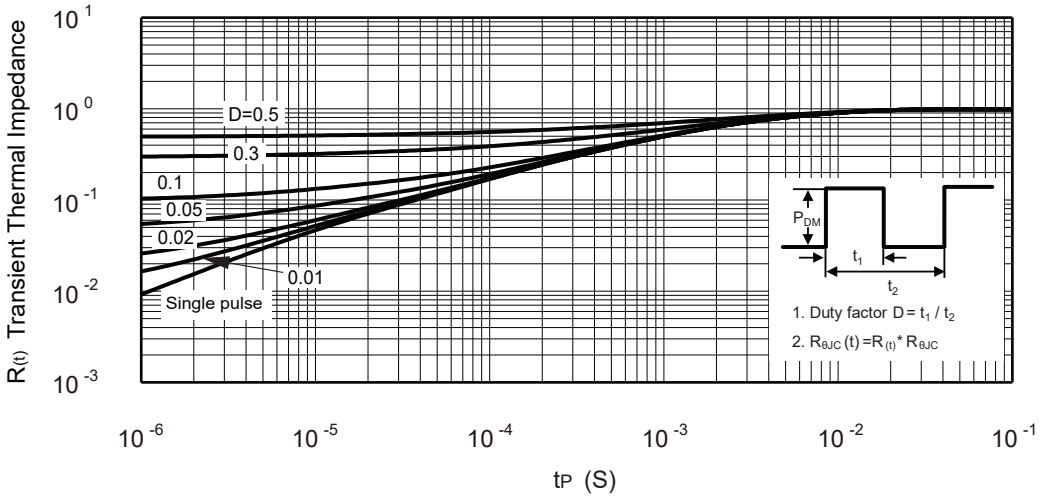


Body-Diode Characteristics

Typical Characteristics



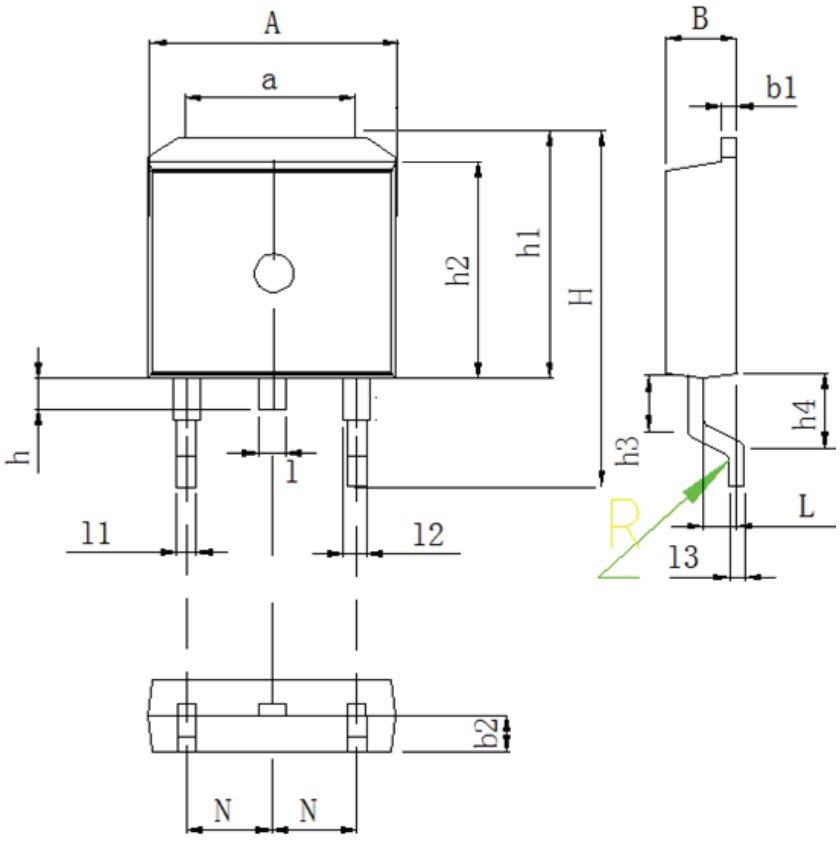
Safe Operating Area



Normalized Maximum Transient Thermal Impedance

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