

General Description

The CMF15N50B uses advanced trench technology DMOS technology to provide excellent $R_{DS(ON)}$ and superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switched mode power supplies, active power factor correction based on half bridge topology.

Features

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

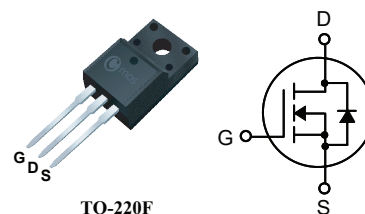
Product Summary

BVDSS	$R_{DS(ON)}$	ID
500V	0.39 Ω	15A

Applications

- Automotive、DC Motor Control and Class D Amplifier.

TO-220F Pin Configuration



Type	Package	Marking
CMF15N50B	TO-220F	CMF15N50B

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	500	V
V_{GS}	Gate-Source Voltage	± 30	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current	15	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current	9.5	A
I_{DM}	Pulsed Drain Current ¹	45	A
EAS	Single Pulse Avalanche Energy ²	450	mJ
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	70	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient	62.5	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-case	1.78	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	500	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V$, $I_D=8A$	---	---	0.39	Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	2	---	4	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=500V$, $V_{GS}=0V$	---	---	1	μA
		$V_{DS}=400V$, $V_{GS}=0V$, $T_a=125^{\circ}\text{C}$	---	---	10	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 30V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_D=1.6A$	---	8	---	S
Q_g	Total Gate Charge	$I_D=15A$	---	48	---	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=250V$	---	12	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=10V$ (Note 3, 4)	---	20	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=250V$	---	12	---	ns
T_r	Rise Time	$I_D=15A$	---	30	---	
$T_{d(off)}$	Turn-Off Delay Time	$R_G=6.1\Omega$	---	50	---	
T_f	Fall Time	$V_{GS}=10V$ (Note 3, 4)	---	40	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	830	---	pF
C_{oss}	Output Capacitance		---	240	---	
C_{rss}	Reverse Transfer Capacitance		---	25	---	

Diode Characteristics

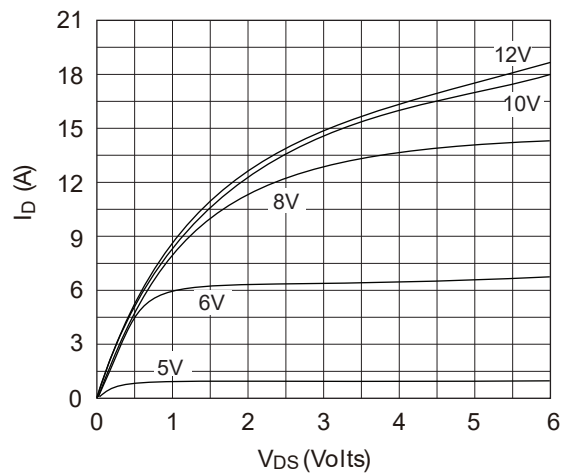
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	15	A
I_{SM}	Pulsed Source Current		---	---	45	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=15A$, $T_J=25^{\circ}\text{C}$	---	---	1.2	V

Note :

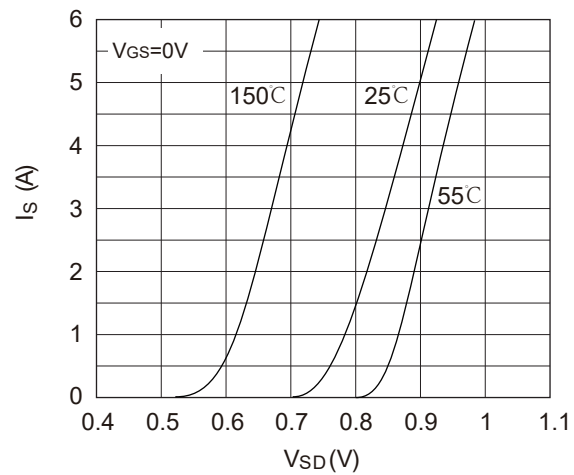
- 1.Repetitive Rating: Pulse width limited by maximum junction temperature
- 2.L = 5mH , $I_{AS}=13.5A$, $V_{DD}=80V$, Starting $T_J=25^{\circ}\text{C}$
- 3.Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 4.Essentially Independent of Operating Temperature Typical Characteristics

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.

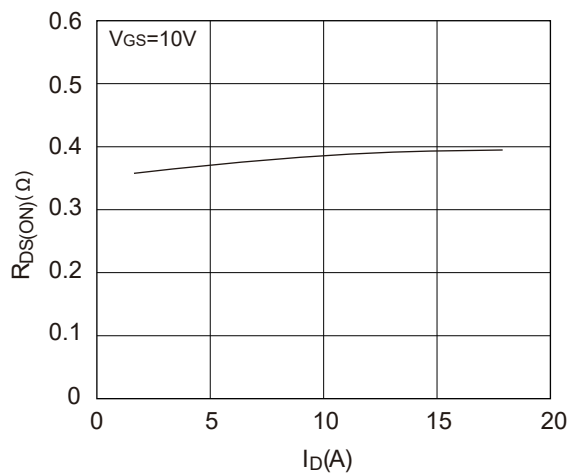
Typical Characteristics



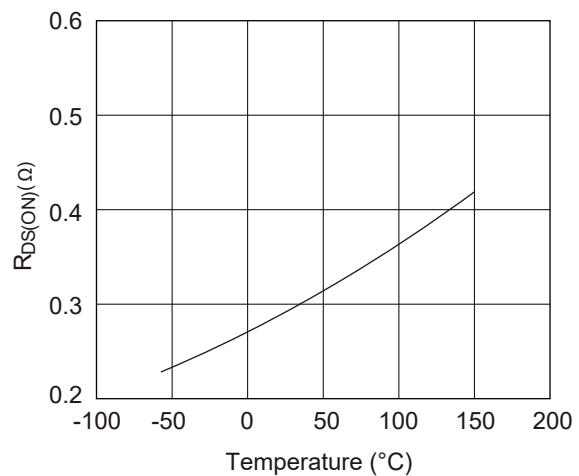
On-Region Characteristics



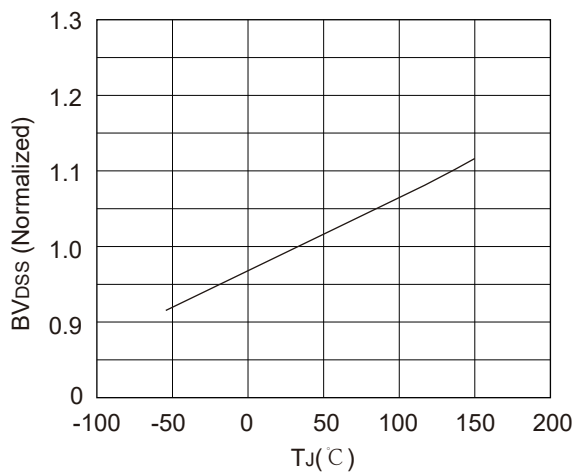
Body-Diode Characteristics



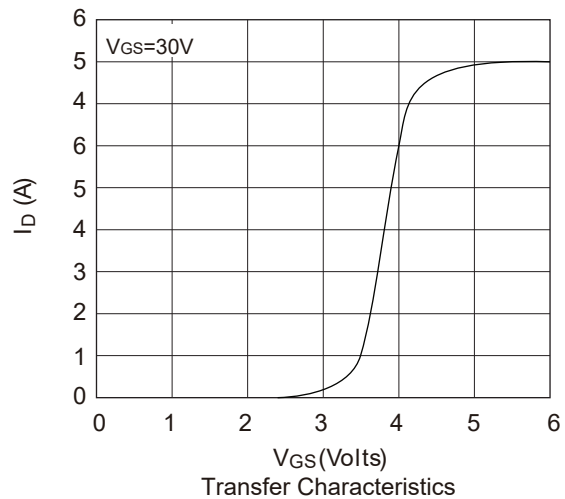
On-Resistance vs. Drain Current and Gate



On-Resistance vs. Junction Temperature



Break Down vs. Junction Temperature



Transfer Characteristics

Typical Characteristics

