CMP3803/CMB3803/CMI3803

N-Ch 30V Fast Switching MOSFETs

General Description

The 3803 is N-ch MOSFETs with extreme high cell density , which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

Features

- Simple Drive Requirement
- Fast Switching
- Low On-Resistance

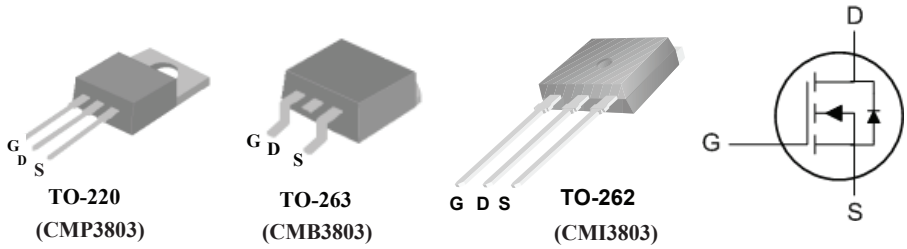
Product Summary

BVDSS	RDSON	ID
30V	< 4mΩ	150A

Applications

- HIGH CURRENT, HIGH SPEED SWITCHING
- DC-DC & DC-AC CONVERTERS
- MOTOR CONTROL, AUDIO AMPLIFIERS
- SOLENOID AND RELAY DRIVERS
- AUTOMOTIVE ENVIRONMENT

TO220 / TO263 / TO262 Pin Configuration



TO-220 (CMP3803) TO-263 (CMB3803) TO-262 (CMI3803)

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current[1]	150	A
I_D@T_C=100°C	Continuous Drain Current[1]	85	A
I_{DM}	Pulsed Drain Current[2]	450	A
EAS	Single Pulse Avalanche Energy[3]	600	mJ
I_{AS}	Avalanche Current	85	A
P_D	Total Power Dissipation	240	W
T_{STG}	Storage Temperature Range	-65 to 175	°C
T_J	Operating Junction Temperature Range	-65 to 175	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient[1]	---	62.5	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-case	---	0.7	°C/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

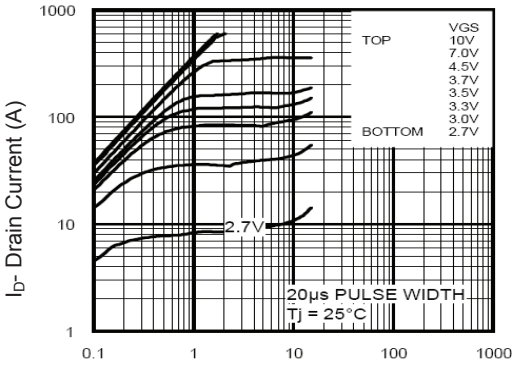
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=40A	---	---	4	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V	---	---	1	uA
		V_{DS}=30V , V_{GS}=0V ,TC=125℃	---	---	10	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}>$I_{D(on)}$ x $R_{DS(on)max}$, I_D=15A	---	50	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	---	4.7	Ω
Q_g	Total Gate Charge	I_D=100A V_{DD}=24V V_{GS}=4.5V	---	85	120	nC
Q_{gs}	Gate-Source Charge		---	26	---	
Q_{gd}	Gate-Drain Charge		---	40	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V I_D=40A R_G=4.7Ω V_{GS}=4.5V	---	42	---	ns
T_r	Rise Time		---	110	---	
$T_{d(off)}$	Turn-Off Delay Time		---	150	---	
T_f	Fall Time		---	80	---	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	4500	---	pF
C_{oss}	Output Capacitance		---	1000	---	
C_{rss}	Reverse Transfer Capacitance		---	420	---	

Diode Characteristics

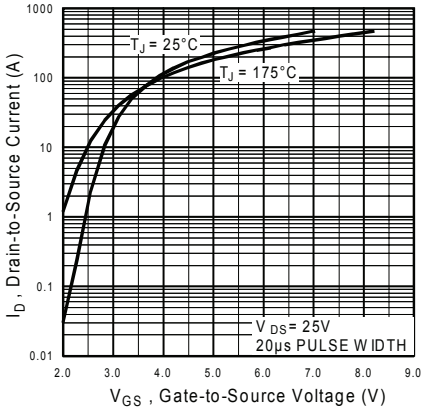
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1]	V_G=V_D=0V , Force Current	---	---	150	A
I_{SM}	Pulsed Source Current[2]		---	---	450	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=100A, T_J=25℃	---	---	1.5	V

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=56A

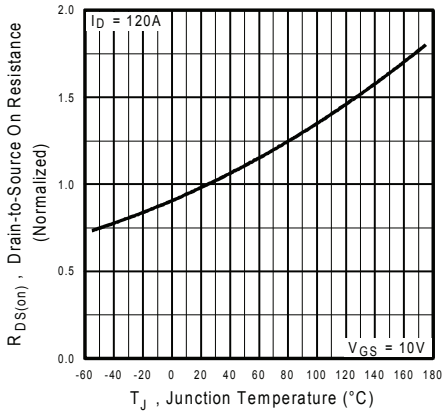
Typical Characteristics



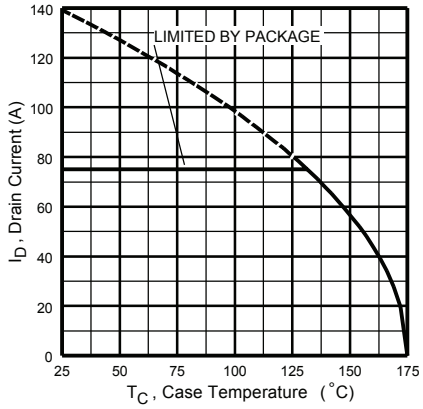
Output Characteristics



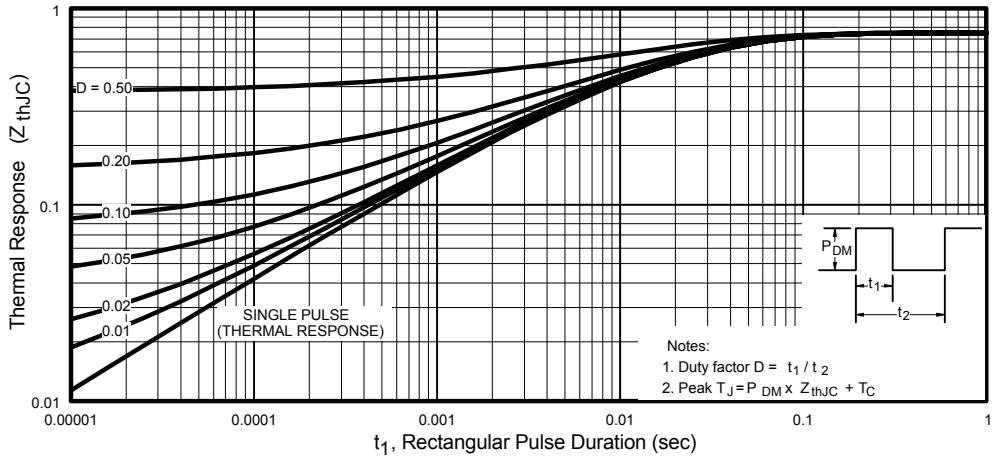
Typical Transfer Characteristics



Normalized On-Resistance
Vs. Temperature



Maximum Drain Current Vs.
Case Temperature



Maximum Effective Transient Thermal Impedance, Junction-to-Case