

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

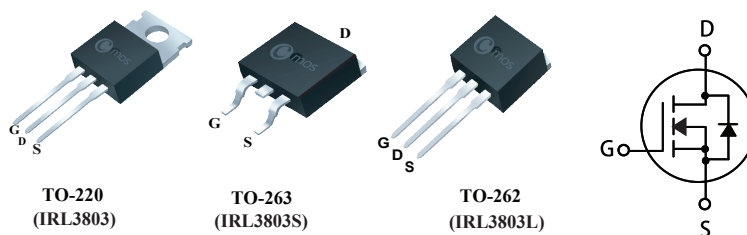
Product Summary

BVDSS	RDSON	ID
30V	2.8mΩ	160A

Applications

- high current, high speed switching
- DC-DC & DC-AC converters
- motor control, audio amplifiers
- automotive environment

TO-220/ 263/262 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 16	V
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current ¹	160	A
I_{DM}	Pulsed Drain Current ²	640	A
EAS	Single Pulse Avalanche Energy ³	506	mJ
P_D	Total Power Dissipation	210	W
T_{STG}	Storage Temperature Range	-65 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-65 to 175	$^\circ\text{C}$

Thermal Data

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

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=40A$	---	---	2.8	$m\Omega$
		$V_{GS}=4.5V$, $I_D=20A$	---	---	5.5	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=24V$, $V_{GS}=0V$	---	---	1	μA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_C=125^\circ\text{C}$	---	---	10	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 16V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_D=20A$	---	33	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	9	---	Ω
Q_g	Total Gate Charge	$I_D=100A$	---	85	---	nC
Q_{gs}	Gate-Source Charge	$V_{DD}=24V$	---	25	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=4.5V$	---	40	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V$	---	35	---	ns
T_r	Rise Time	$I_D=40A$	---	120	---	
$T_{d(off)}$	Turn-Off Delay Time	$R_G=4.7\Omega$	---	140	---	
T_f	Fall Time	$V_{GS}=4.5V$	---	80	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	6200	---	pF
C_{oss}	Output Capacitance		---	680	---	
C_{rss}	Reverse Transfer Capacitance		---	580	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ¹	$V_G=V_D=0V$, Force Current	---	---	160	A
I_{SM}	Pulsed Source Current ²		---	---	640	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=20A$, $T_J=25^\circ\text{C}$	---	0.78	1.5	V

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.

2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

3.The EAS data shows Max. rating . The test condition is $V_{DD}=25V$, $V_{GS}=10V$, $L=0.5mH$, $I_{AS}=45A$

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Cmos reserves the right to improve product design ,functions and reliability without notice.

Typical Characteristics

