

General Description

The 50N03 is N-ch MOSFETs with extreme high cell density, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications.

Features

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

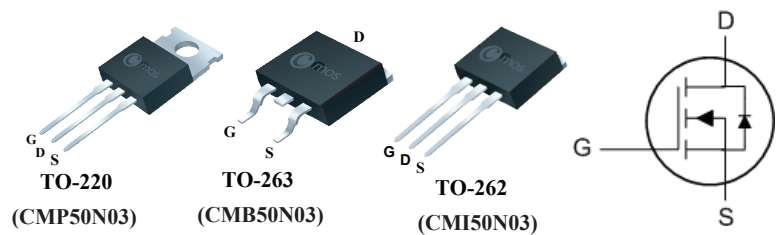
Product Summary

BVDSS	RDS(on)	ID
30V	12mΩ	50A

Applications

- LED POWER CONTROLLER
- DC-DC & DC-AC CONVERTERS
- HIGH CURRENT, HIGH SPEED SWITCHING
- SOLENOID AND RELAY DRIVERS
- MOTOR CONTROL, AUDIO AMPLIFIERS

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	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current ¹	50	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current ¹	40	A
I_{DM}	Pulsed Drain Current ²	150	A
EAS	Single Pulse Avalanche Energy ³	45	mJ
I_{AS}	Avalanche Current	50	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	64	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-case	---	1.5	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	30	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	0.025	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=25A$	---	10.5	12	$m\Omega$
		$V_{GS}=4.5V$, $I_D=25A$	---	16	20	
$V_{GS(th)}$	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
		$V_{DS}=24V$, $V_{GS}=0V$, $T_C=125^\circ\text{C}$	---	---	25	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=25A$	---	50	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1MHz$	---	1.3	---	Ω
Q_g	Total Gate Charge	$I_D=25A$	---	23	---	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=15V$	---	8.6	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=4.5V$	---	7.3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V$	---	12.2	---	ns
T_r	Rise Time	$I_D=1A$	---	10	---	
$T_{d(off)}$	Turn-Off Delay Time	$R_G=6\Omega$	---	45	---	
T_f	Fall Time	$V_{GS}=10V$	---	15.5	---	
C_{iss}	Input Capacitance	$V_{DS}=15V$, $V_{GS}=0V$, $f=1MHz$	---	2050	---	pF
C_{oss}	Output Capacitance		---	389	---	
C_{rss}	Reverse Transfer Capacitance		---	153	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ¹	$V_G=V_D=0V$, Force Current	---	---	50	A
I_{SM}	Pulsed Source Current ²		---	---	150	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=25A$, $T_J=25^\circ\text{C}$	---	---	1.3	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 $V_{DD}=25V$, $V_{GS}=10V$, $L=0.1mH$, $I_D=12A$

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