

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

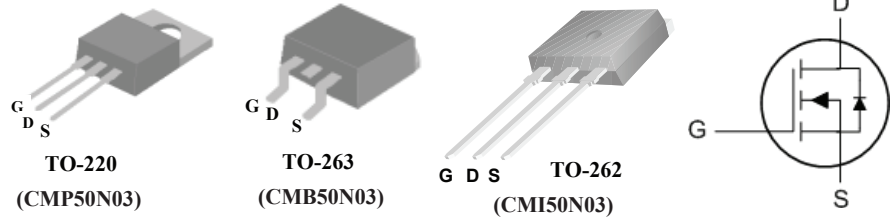
Product Summary

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

TO220 / TO263/TO262 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current ¹	50	A
$I_D@T_C=100^\circ C$	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
$P_D@T_C=25^\circ C$	Total Power Dissipation	64	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ C$

Thermal Data

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

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	---	---	V
ΔBV _{DSS} /ΔT _J	BVDSS Temperature Coefficient	Reference to 25 °C, I _D =1mA	---	0.025	---	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =25A	---	10.5	12	mΩ
		V _{GS} =4.5V, I _D =25A	---	16	20	
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1	---	3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =24V, V _{GS} =0V	---	---	1	uA
		V _{DS} =24V, V _{GS} =0V, T _C =125 °C	---	---	25	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±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 V _{DS} =15V V _{GS} =4.5V	---	23	---	nC
Q _{gs}	Gate-Source Charge		---	8.6	---	
Q _{gd}	Gate-Drain Charge		---	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 =6Ω	---	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 °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 ≤ 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_D=12A