

General Description

The 50N06 is extremely high-density N-channel MOSFET, which provides the best RDS(on) and gate charge for the synchronous buck converter applications.

Features

- 45A, 60V. RDS(ON)=0.028Ω@VGS=10V
- Fast Switching
- N-channel-Enhancement mode
- Low Threshold Drive
- 100% Avalanche Tested

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current ¹	45	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current ¹	30	A
I_{DM}	Pulsed Drain Current ²	145	A
EAS	Single Pulse Avalanche Energy ³	160	mJ
I_{AS}	Avalanche Current	30	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation	90	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	---	65	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-case	---	1.4	$^\circ\text{C/W}$

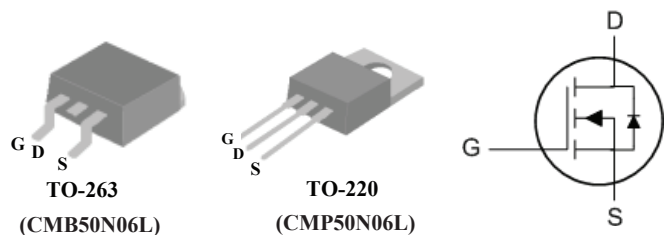
Product Summary

BVDSS	RDS(on)	ID
60V	<28mΩ	45A

Applications

- Power Supplies
- DC-DC & DC-AC Converters
- Motor Control, Audio Amplifiers
- High Current, High Speed Switching
- Solenoid And Relay Drivers

TO263 / TO220 Pin Configuration



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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	60	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C	---	0.065	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=22.5A$	11	20	28	$m\Omega$
		$V_{GS}=4.5V$, $I_D=22.5A$	---	30	40	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1	---	3	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=60V$, $V_{GS}=0V$	---	---	1	μA
		$V_{DS}=60V$, $V_{GS}=0V$, $T_C=125^\circ\text{C}$	---	---	10	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_D=22.5A$	---	28	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	---	6.9	Ω
Q_g	Total Gate Charge	$I_D=45A$	---	30	44	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=48V$	---	8.6	---	
Q_{gd}	Gate-Drain Charge	$V_{GS}=5V$	---	16	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DS}=30V$	---	17	---	ns
T_r	Rise Time	$I_D=22.5A$	---	159	---	
$T_{d(off)}$	Turn-Off Delay Time	$R_G=6.9\Omega$	---	68	---	
T_f	Fall Time	$V_{GS}=10V$	---	89	---	
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	2300	---	pF
C_{oss}	Output Capacitance		---	580	---	
C_{rss}	Reverse Transfer Capacitance		---	120	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ¹	$V_G=V_D=0V$, Force Current	---	---	45	A
I_{SM}	Pulsed Source Current ²		---	---	145	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=45A$, $T_J=25^\circ\text{C}$	---	---	1.32	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 $V_{DD}=25V$, $V_{GS}=10V$, $L=0.1mH$, $I_{AS}=30A$