GOODWORK

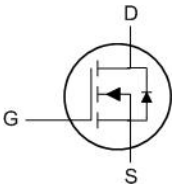
50N06

N-Ch 60V Fast Switching MOSFETs

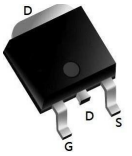
Description

The 50N06 is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The 50N06 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.



100% EAS Guaranteed
Green Device Available
Super Low Gate Charge
Excellent CdV/dt effect decline
Advanced high cell density Trench technology

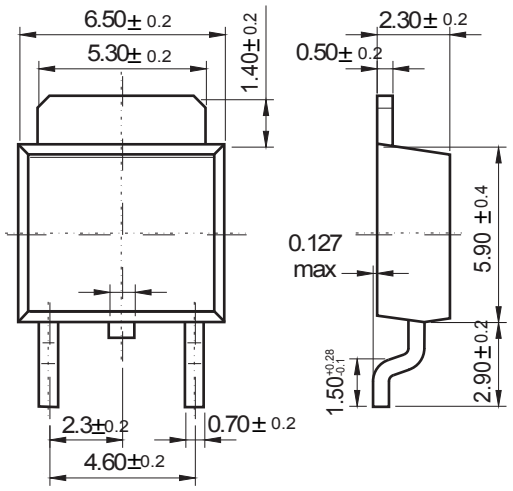


Product Summary

BVDSS	RDSON	ID
60V	11mΩ	50A

TO-252

Unit: mm



Dimensions in inches and (millimeters)

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	45	A
		T_C = 100℃	29	A
I_{DM}	Pulsed Drain Current note1		180	A
E_{AS}	Single Pulsed Avalanche Energy note2		36	mJ
P_D	Power Dissipation	T_C = 25℃	60	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		2.5	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	℃

50N06

Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.0	1.6	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=20A	-	11	14	mΩ
		V_{GS}=4.5V, I_D=10A	-	14	20	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	930	-	pF
C_{oss}	Output Capacitance		-	230	-	pF
C_{rss}	Reverse Transfer Capacitance		-	8	-	pF
Q_g	Total Gate Charge	V_{DS}=30V, I_D=20A, V_{GS}=10V	-	22	-	nC
Q_{gs}	Gate-Source Charge		-	4.5	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	3.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V, I_D=20A, R_G=1.6Ω, V_{GS}=10V	-	4.5	-	ns
t_r	Turn-on Rise Time		-	2.7	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	13.8	-	ns
t_f	Turn-off Fall Time		-	2.7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	45	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	180	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=30A	-	-	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	T_J=25℃, I_F=20A,dI/dt=100A/μs	-	18	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	12	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25℃, V_{DD}=30V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=12A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

RATING AND CHARACTERISTIC CURVES (50N06)

Figure1: Output Characteristics

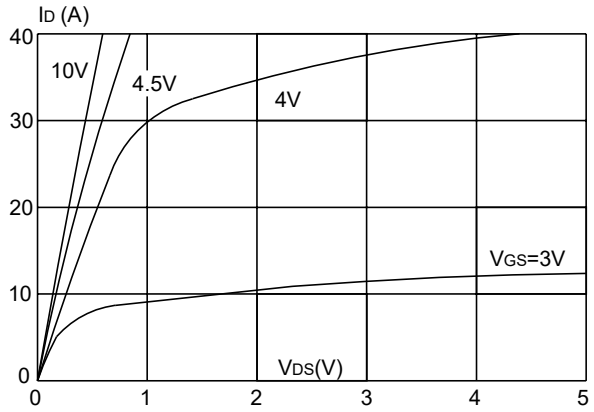


Figure 2: Typical Transfer Characteristics

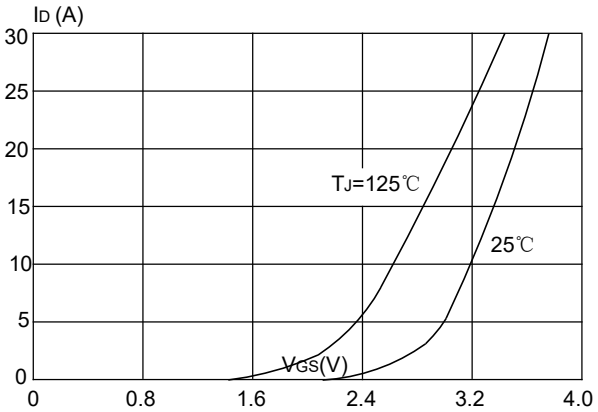


Figure 3: On-resistance vs. Drain Current

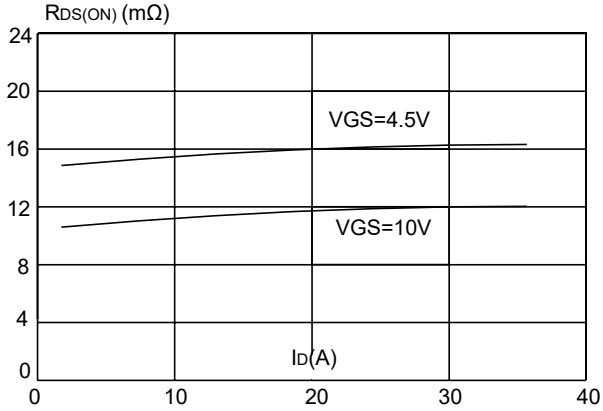


Figure 4: Body Diode Characteristics

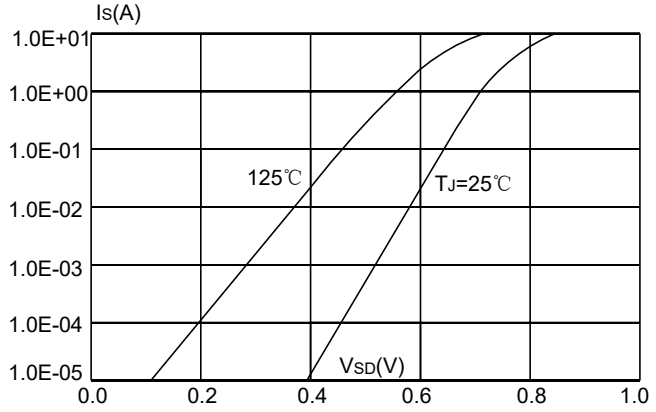


Figure 5: Gate Charge Characteristics

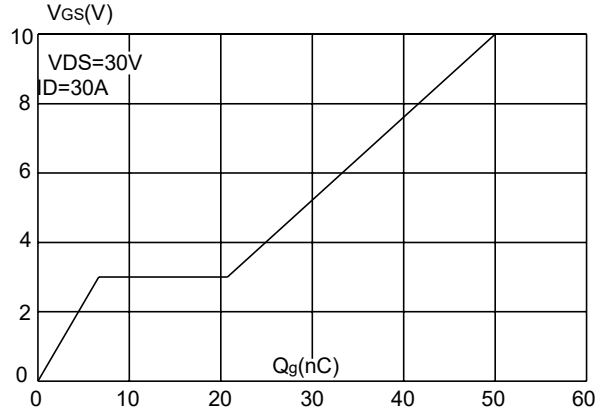
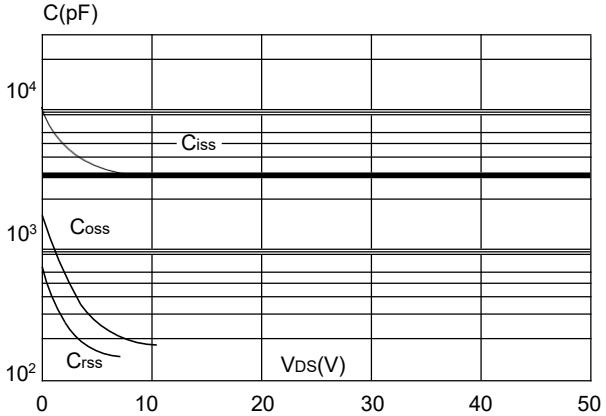


Figure 6: Capacitance Characteristics



RATING AND CHARACTERISTIC CURVES (50N06)

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

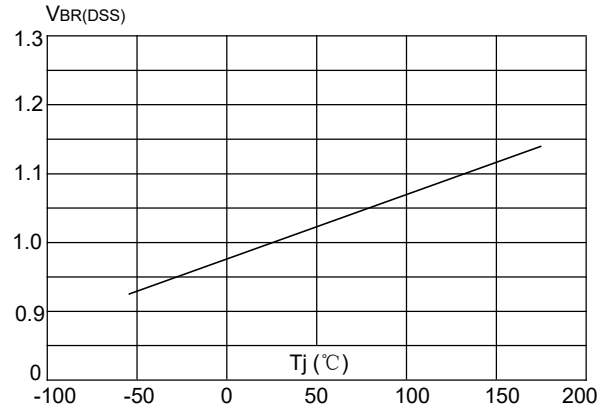


Figure 8: Normalized on Resistance vs. Junction Temperature

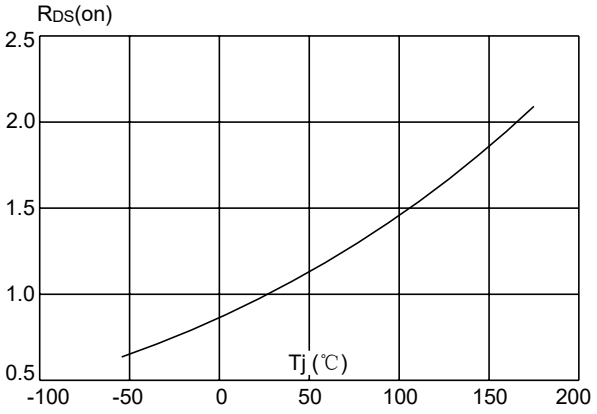


Figure 9: Maximum Safe Operating Area

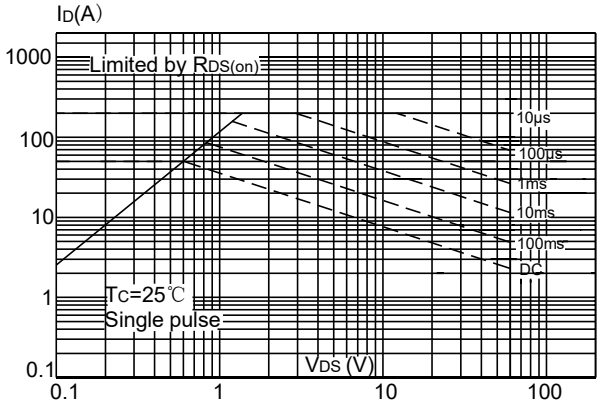


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

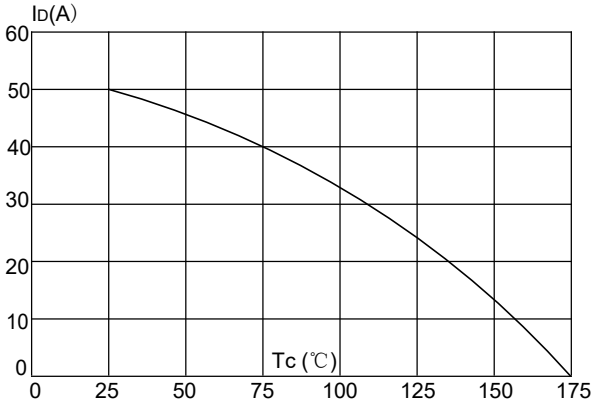


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case