TM50N06NF

N-Channel Enhancement Mosfet

General Description

• Low $R_{DS(ON)}$
• RoHS and Halogen-Free Compliant

Applications

• Load switch
• PWM

General Features

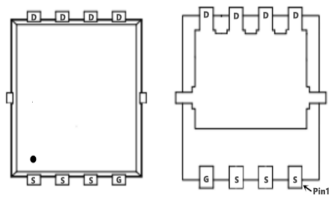
V_{DS} = 60V I_D = 50A

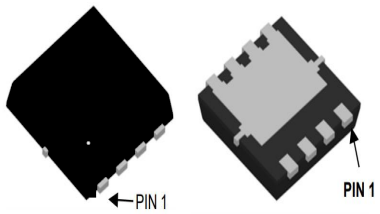
$R_{DS(ON)}$= 12 mΩ(typ.) @ V_{GS}= 10V

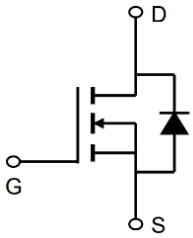
100% UIS Tested
100% R_g Tested

Green Product

NF:DFN5x6-8L







Marking:50N06

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

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current-T_C=25℃(2)	50	A
	Continuous Drain Current-T_C=100℃(2)	32	A
E_{AS}	Avalanche energy, single pulse(6)	98	mJ
P_D	Power Dissipation	62.5	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Data

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	2	℃/W
$R_{\theta JA}$	Thermal Resistance Junction to mbient	62	℃/W

TM50N06NF

N-Channel Enhancement Mosfet

Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=60V,T_J=25℃	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	Drain-to-Source Leakage Current	V_{DS} = V_{GS} , I_D = 250μA	1.2	1.8	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=20A	---	12	17	mΩ
		V_{GS}=4.5V,I_D=20A	---	16	21	
R_G	Gate Resistance	f = 1.0MHz open drain	---	1.4	---	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=30V, V_{GS}=0V, f=1MHz	---	1880	---	pF
C_{oss}	Output Capacitance		---	110	---	
C_{rss}	Reverse Transfer Capacitance		---	88	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DS}=30V , V_{GS}=10V , R_G=3Ω ,I_D=20A	---	10	---	ns
t_r	Rise Time		---	23	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	58	---	ns
t_f	Fall Time		---	8	---	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=30V, I_D=20A	---	37	---	nC
Q_{gs}	Gate-Source Charge		---	7.5	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	8	---	nC
Drain-Source Diode Characteristics						
Symbol	**Parameter**	**Conditions**	**Min**	**Typ**	**Max**	**Units**
V_{SD}	Forward Voltage	V_{GS}=0V,I_S=20A,,T_J=25℃	---	1.2	---	V
Is	Continuous Diode Forward Current		---	---	50	A
trr	Continuous Source Current	V_{GS} = 0V, I_F= 20A, dIS/dt = 100A/μs,	---	29	---	ns
qrr	Pulsed Source Current		---	21	---	nC

Notes:

1.L=0.5mH, V_{DD}=30V, Start T_J=25℃.

2.Limited by maximum junction temperature.

3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Characteristics

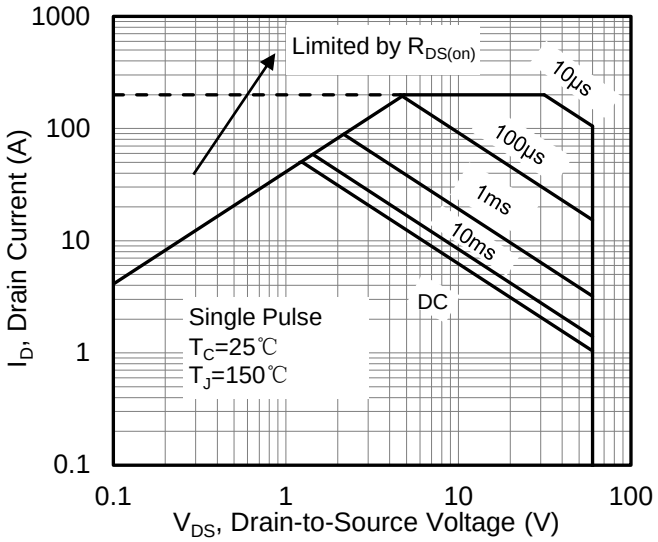


Figure 1. Maximum Safe Operating Area

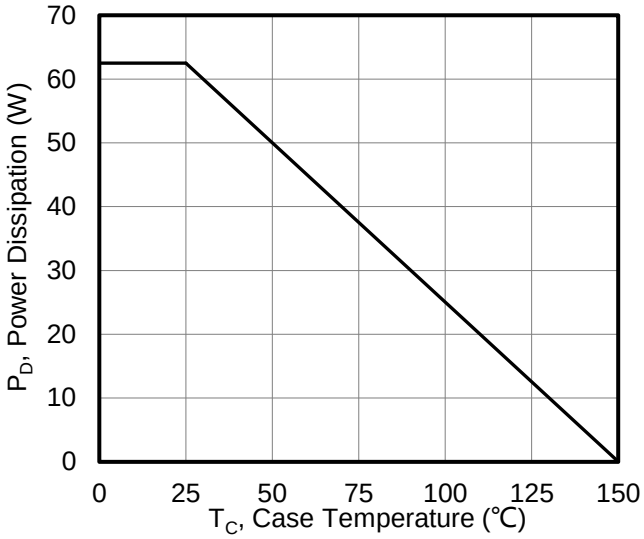


Figure 2. Maximum Power Dissipation vs Case Temperature

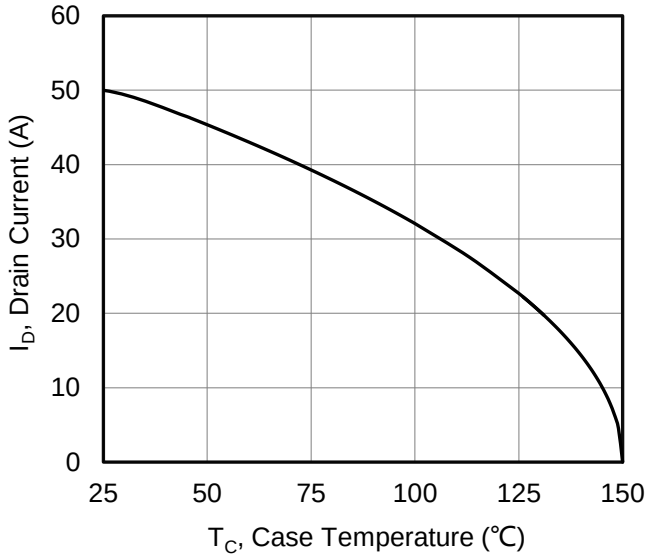


Figure 3. Maximum Continuous Drain Current vs

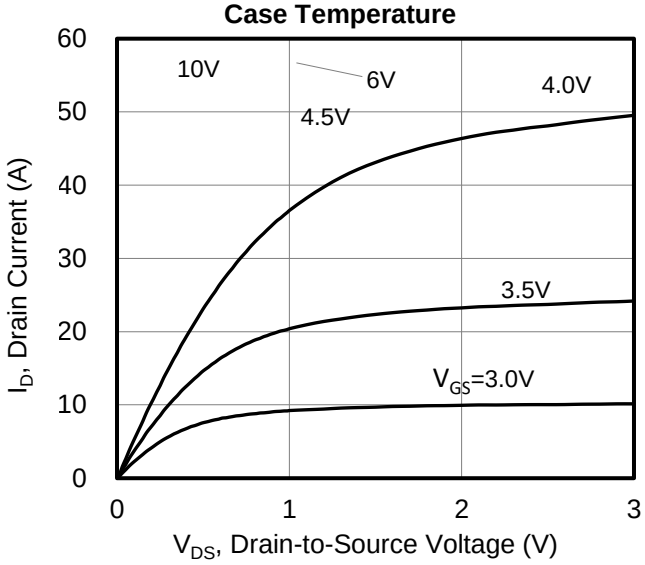


Figure 4. Typical output Characteristics

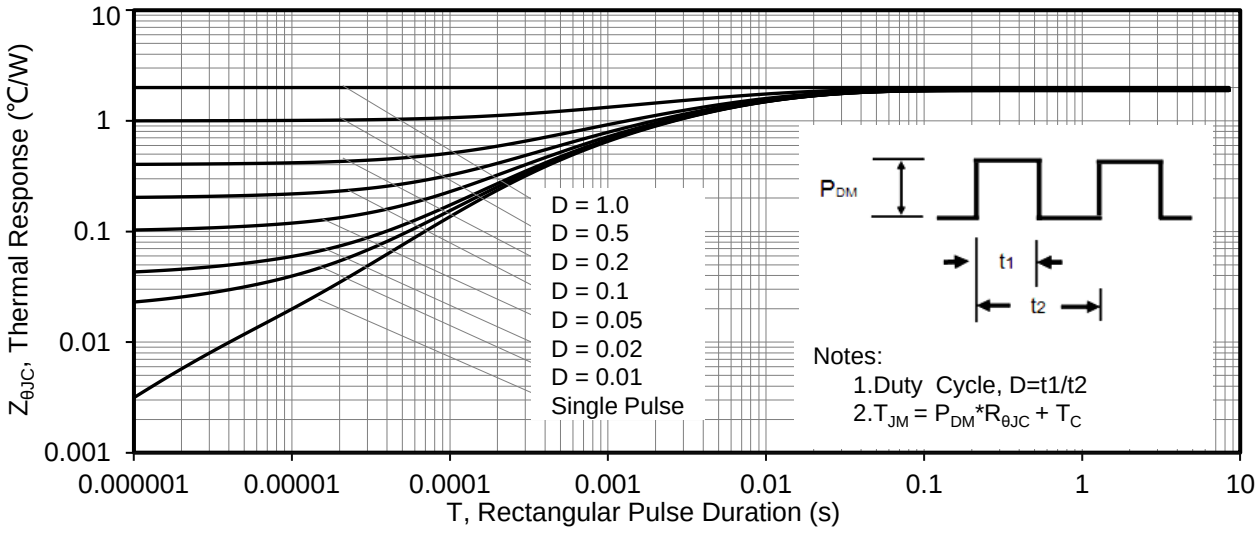


Figure 5. Maximum Effective Thermal Impedance, Junction to Case

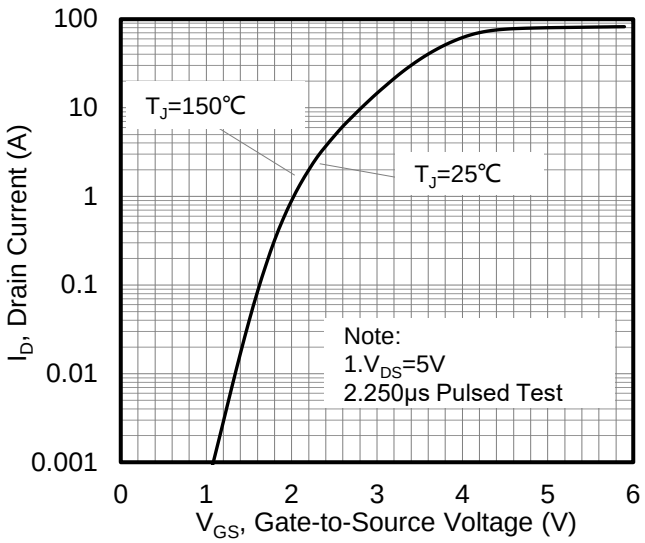


Figure 6. Typical Transfer Characteristics

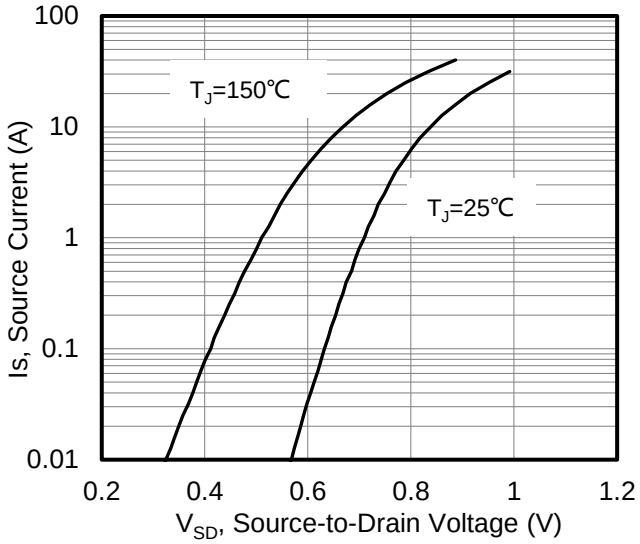


Figure 7. Typical Body Diode Transfer Characteristics

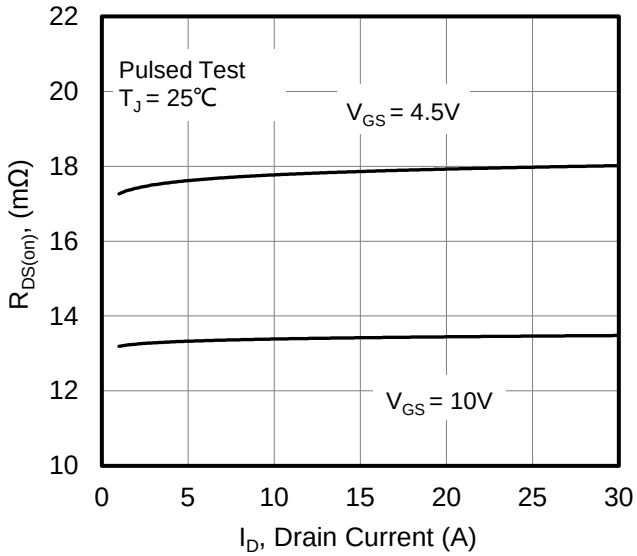


Figure 8. Drain-to-Source On Resistance vs Drain Current

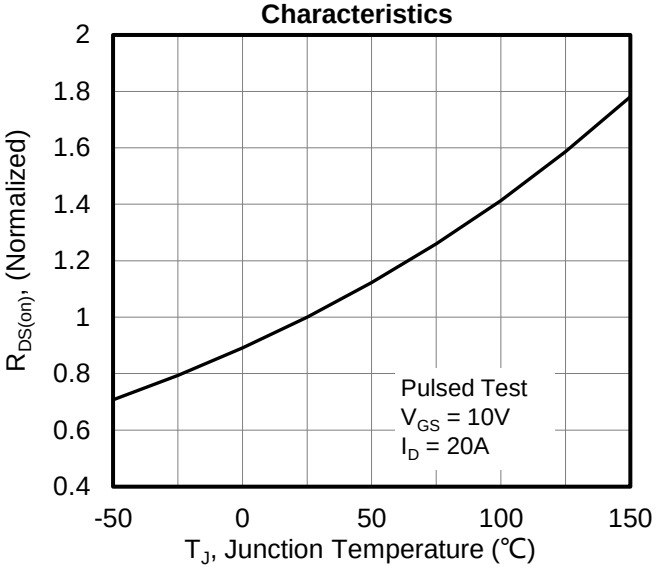


Figure 9. Normalized On Resistance vs Junction Temperature

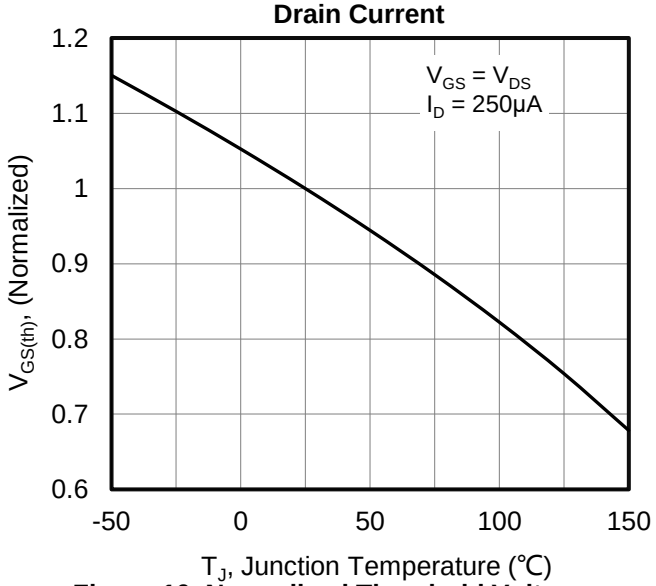


Figure 10. Normalized Threshold Voltage vs Junction Temperature

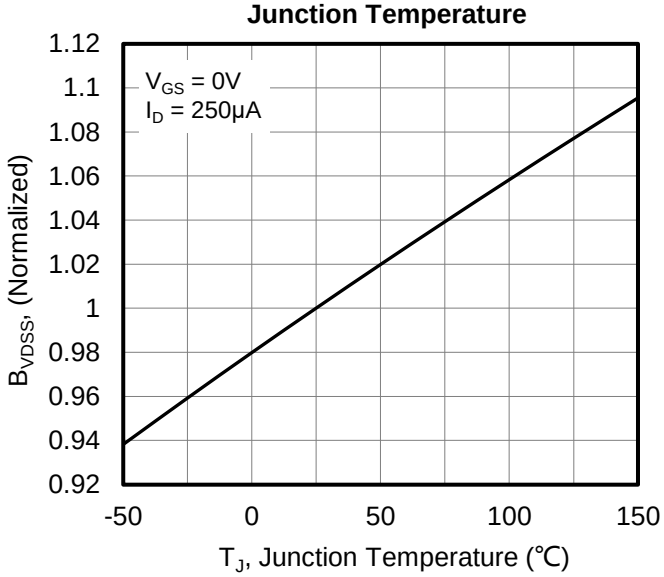


Figure 11. Normalized Breakdown Voltage vs Junction Temperature

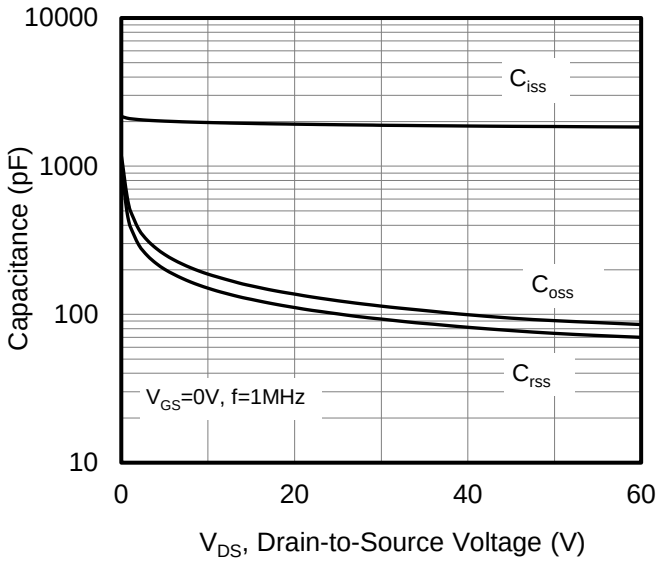


Figure 12. Capacitance Characteristics

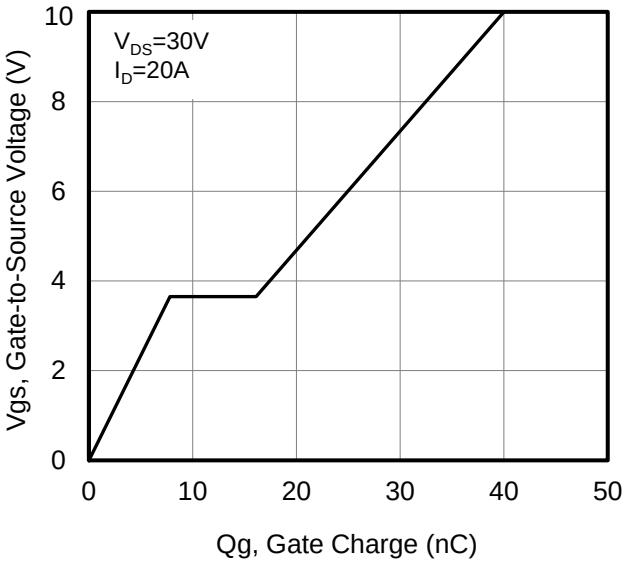
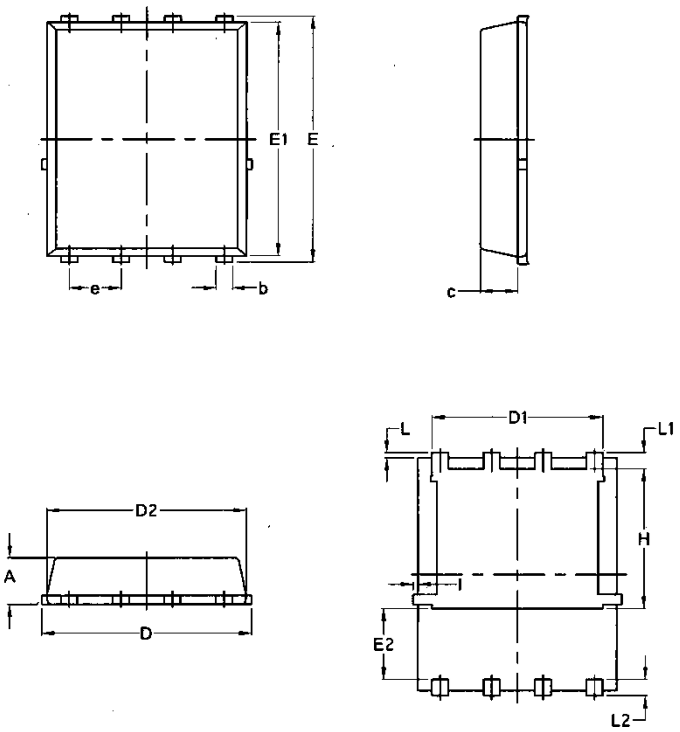


Figure 13. Typical Gate Charge vs Gate to Source Voltage

Package Mechanical Data:DFN5x6-8L



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070