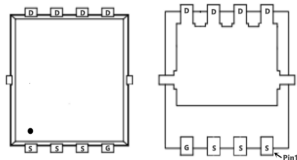


TMG90N06NF

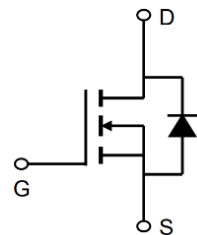
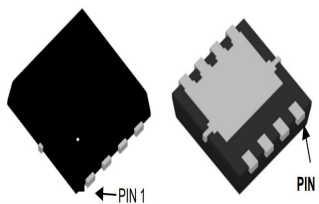
N-Channel Enhancement Mosfet

General Description • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant Applications • Load switch • PWM	General Features $V_{DS} = 60V$ $I_D = 90A$ $R_{DS(ON)} = 4.3 m\Omega (typ.) @ V_{GS} = 10V$ 100% UIS Tested 100% R_g Tested 
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NF:DFN5x6-8L



Marking: G90N06



Absolute Maximum Ratings: ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C = 25^\circ C$ ¹	90	A
I_{DM}	Pulsed Drain Current ²	310	
I_{sp}	Pulsed source current	210	A
E_{AS}	Single Pulse Avalanche Energy	66	mJ
P_D	Power Dissipation ³	87	W
I_S	Diode Forward Current	90	A
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.44	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to ambient ⁴	62	$^\circ C/W$

TMG90N06NF
N-Channel Enhancement Mosfet
Electrical Characteristics: ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourtce Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =60V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.7	2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V, I _D =20A	---	4.3	5	m Ω
		V _{GS} =4.5V, I _D =10A	---	5.1	7	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	2136		pF
C _{OSS}	Output Capacitance		---	331.5		
C _{rss}	Reverse Transfer Capacitance		---	10.6		
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{GS} =10 V, V _{DS} =50 V, R _G =2 Ω, I _D =25 A	---	22.9		ns
t _r	Rise Time		---	6.5		ns
t _{d(off)}	Turn-Off Delay Time		---	45.7		ns
t _f	Fall Time		---	20.4		ns
Q _g	Total Gate Charge	I _D =25 A, V _{DS} =50 V, V _{GS} =10 V	---	30		nC
Q _{gs}	Gate-Source Charge		---	5.8		nC
Q _{gd}	Gate-Drain “Miller” Charge		---	6.1		nC
Drain-Source Diode Characteristics						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =20A	---		1.3	V
trr	Continuous Source Current	I _S =25 A, di/dt=100 A/μs	---	50.3		ns
qrr	Pulsed Source Current		---	45.1		nC

Notes:

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) Pd is based on max. junction temperature, using junction-case thermal resistance.
- 4) $V_{DD}=30V, R_G=25\Omega, L=0.3mH$, starting $T_j=25^\circ\text{C}$.
- 5) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25^\circ\text{C}$.

Typical Characteristics

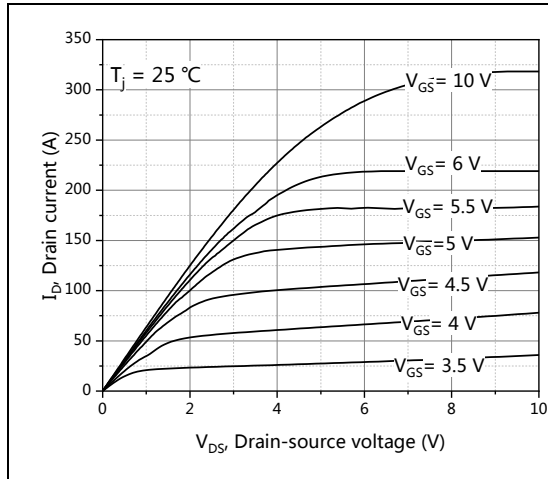


Figure 1, Typ. output characteristics

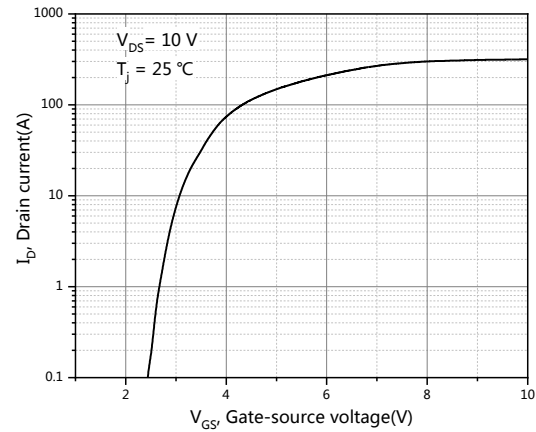


Figure 2, Typ. transfer characteristics

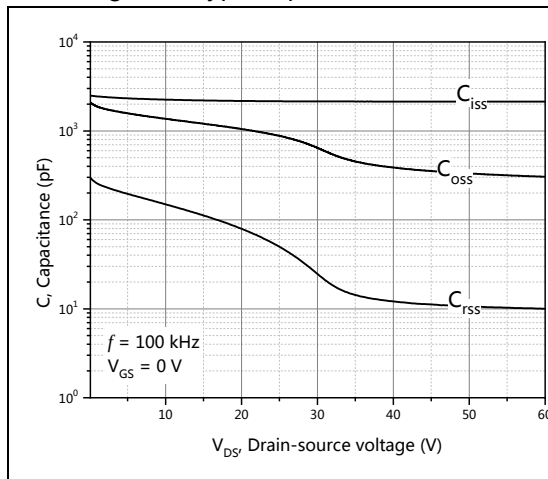


Figure 3, Typ. capacitances

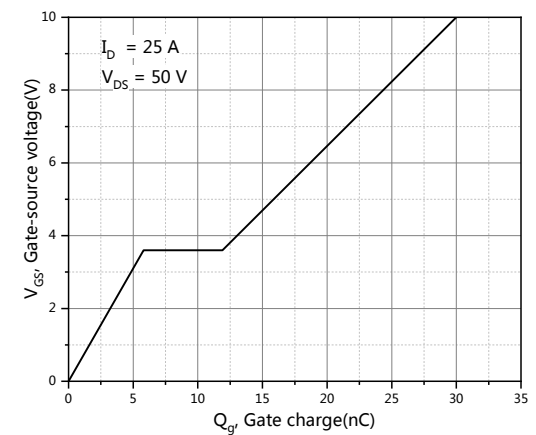


Figure 4, Typ. gate charge

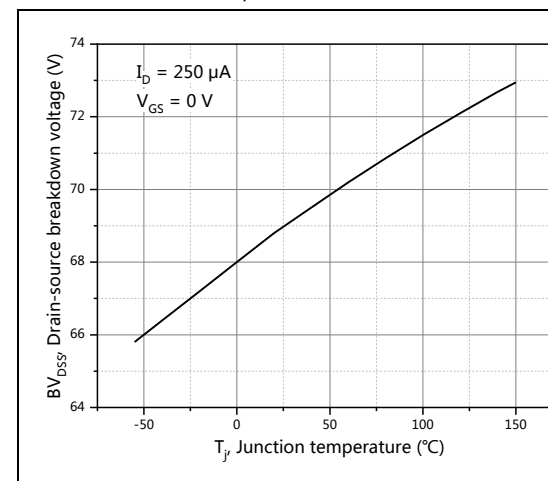


Figure 5, Drain-source breakdown voltage

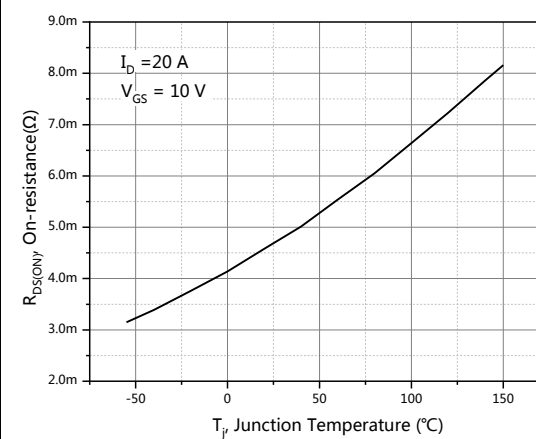


Figure 6, Drain-source on-state resistance

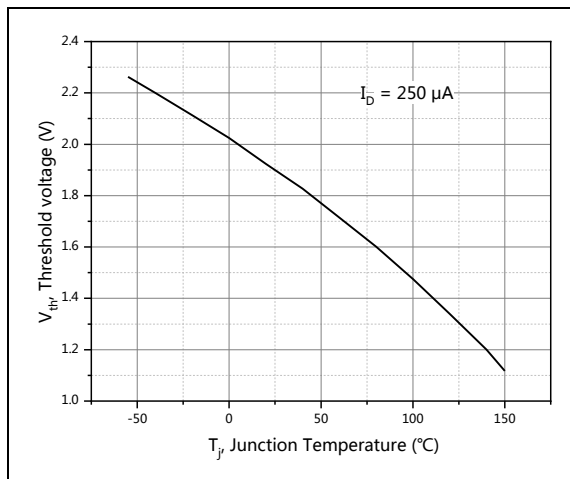


Figure 7, Threshold voltage

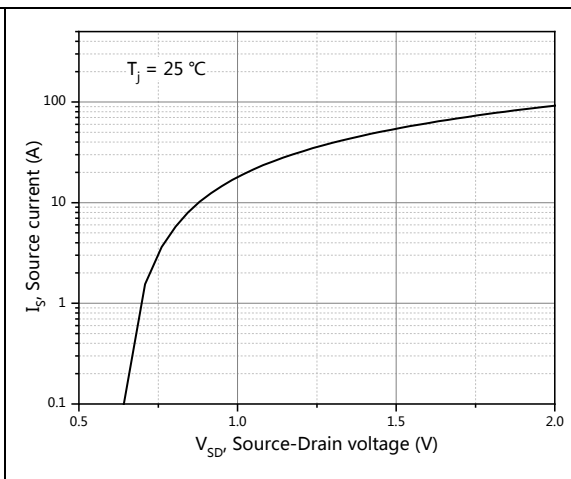


Figure 8, Forward characteristic of body diode

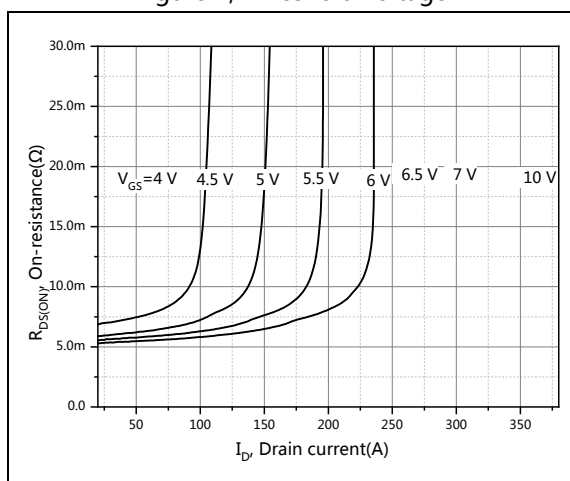


Figure 9, Drain-source on-state resistance

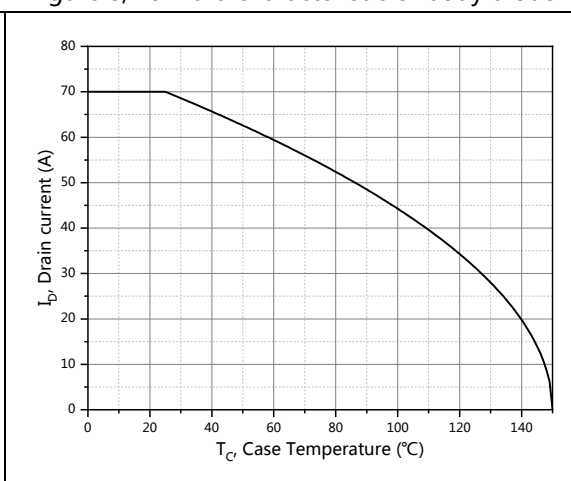


Figure 10, Drain current

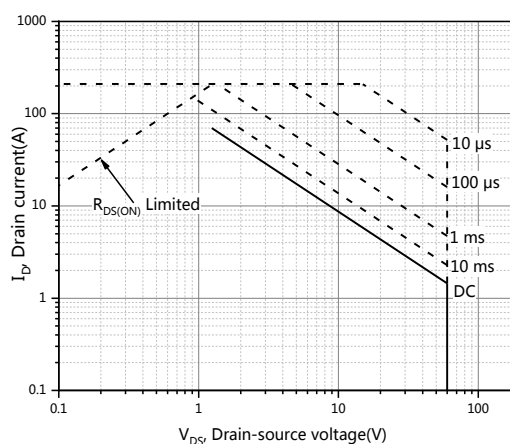
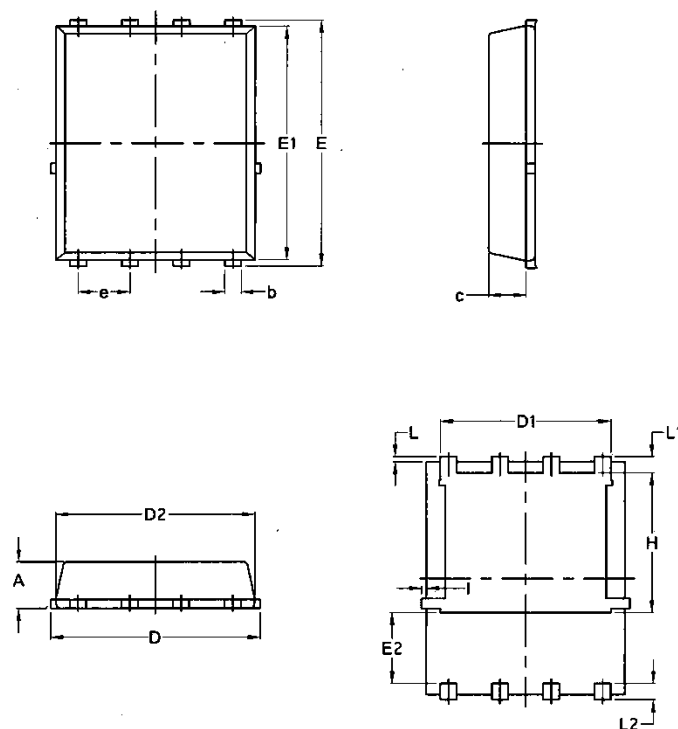


Figure 11, Safe operation area

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