

**SOT-89-3L N Channel Enhancement 沟道增强型  
MOS Field Effect Transistor 场效应管**

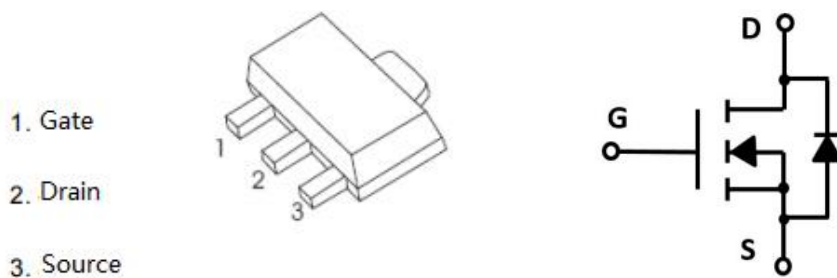
**■ Features 特点**

Low on-resistance 低导通电阻  
 $R_{DS(ON)}=21m\Omega(\text{Type})@V_{GS}=10V$   
 $R_{DS(ON)}=28m\Omega(\text{Type})@V_{GS}=4.5V$

**■ Applications 应用**

Motor Drive 马达驱动  
 DC-DC Conversion 升压转换  
 Power Management 电源管理

**■ Internal Schematic Diagram 内部结构**



**■ Absolute Maximum Ratings 最大额定值**

Characteristic 特性参数	Symbol 符号	Rat 额定值	Unit 单位
Drain-Source Voltage 漏极-源极电压	$BV_{DSS}$	60	V
Gate- Source Voltage 栅极-源极电压	$V_{GS}$	$\pm 20$	V
Drain Current (continuous)漏极电流-连续	$I_D$ (at $T_A = 25^\circ C$ at $T_A = 100^\circ C$ )	20 12	A
Drain Current (pulsed)漏极电流-脉冲	$I_{DM}$	40	A
Total Device Dissipation 总耗散功率	$P_{TOT}(\text{at } T_A = 25^\circ C)$	4	W
Thermal Resistance Junction-Ambient 热阻	$R_{\theta JA}$	30	$^\circ C/W$
Junction/Storage Temperature 结温/储存温度	$T_J, T_{stg}$	-55~150	$^\circ C$

■ Electrical Characteristics 电特性

( $T_A=25^{\circ}\text{C}$  unless otherwise noted 如无特殊说明, 温度为  $25^{\circ}\text{C}$ )

Characteristic 特性参数	Symbol 符号	Min 最小值	Typ 典型值	Max 最大值	Unit 单位
Drain-Source Breakdown Voltage 漏极-源极击穿电压( $I_D=250\mu\text{A}, V_{GS}=0\text{V}$ )	$BV_{DSS}$	60	—	—	V
Gate Threshold Voltage 栅极开启电压( $I_D=250\mu\text{A}, V_{GS}=V_{DS}$ )	$V_{GS(th)}$	1.2	1.7	2.3	V
Zero Gate Voltage Drain Current 零栅压漏极电流( $V_{GS}=0\text{V}, V_{DS}=60\text{V}$ )	$I_{DSS}$	—	—	100	nA
Gate Body Leakage 栅极漏电流( $V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$ )	$I_{GSS}$	—	—	$\pm 100$	nA
Static Drain-Source On-State Resistance 静态漏源导通电阻( $I_D=7\text{A}, V_{GS}=10\text{V}$ ) ( $I_D=5\text{A}, V_{GS}=4.5\text{V}$ )	$R_{DS(ON)}$	—	21 28	29 40	$\text{m}\Omega$
Diode Forward Voltage Drop 内附二极管正向压降( $I_{SD}=10\text{A}, V_{GS}=0\text{V}$ )	$V_{SD}$	—	0.8	1.2	V
Input Capacitance 输入电容 ( $V_{GS}=0\text{V}, V_{DS}=30\text{V}, f=1\text{MHz}$ )	$C_{ISS}$	—	1920	—	pF
Common Source Output Capacitance 共源输出电容( $V_{GS}=0\text{V}, V_{DS}=30\text{V}, f=1\text{MHz}$ )	$C_{OSS}$	—	150	—	pF
Reverse Transfer Capacitance 反馈电容( $V_{GS}=0\text{V}, V_{DS}=30\text{V}, f=1\text{MHz}$ )	$C_{RSS}$	—	110	—	pF
Total Gate Charge 栅极电荷密度 ( $V_{DS}=30\text{V}, I_D=7\text{A}, V_{GS}=10\text{V}$ )	$Q_g$	—	50	—	nC
Gate Source Charge 栅源电荷密度 ( $V_{DS}=30\text{V}, I_D=7\text{A}, V_{GS}=10\text{V}$ )	$Q_{gs}$	—	8	—	nC
Gate Drain Charge 栅漏电荷密度 ( $V_{DS}=30\text{V}, I_D=7\text{A}, V_{GS}=10\text{V}$ )	$Q_{gd}$	—	16	—	nC
Turn-ON Delay Time 开启延迟时间 ( $V_{DS}=30\text{V}, I_D=7\text{A}, R_{GEN}=3\Omega, V_{GS}=10\text{V}$ )	$t_{d(on)}$	—	8	—	ns
Turn-ON Rise Time 开启上升时间 ( $V_{DS}=30\text{V}, I_D=7\text{A}, R_{GEN}=3\Omega, V_{GS}=10\text{V}$ )	$t_r$	—	5	—	ns
Turn-OFF Delay Time 关断延迟时间 ( $V_{DS}=30\text{V}, I_D=7\text{A}, R_{GEN}=3\Omega, V_{GS}=10\text{V}$ )	$t_{d(off)}$	—	29	—	ns
Turn-OFF Fall Time 关断下降时间 ( $V_{DS}=30\text{V}, I_D=7\text{A}, R_{GEN}=3\Omega, V_{GS}=10\text{V}$ )	$t_f$	—	6	—	ns

■ Typical Characteristic Curve 典型特性曲线

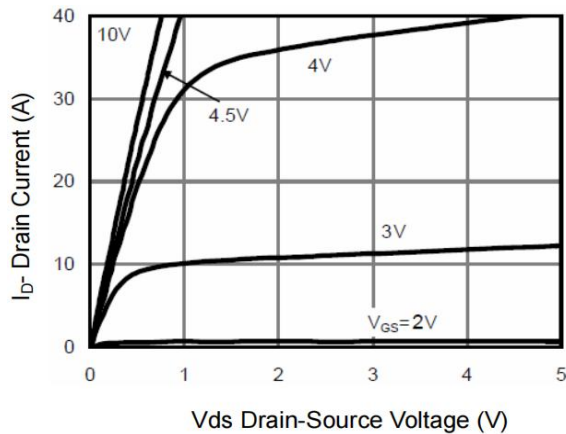


Figure 1: Output Characteristics

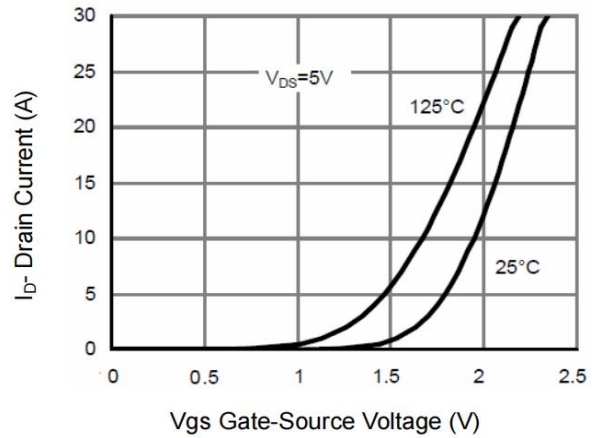


Figure 2: Transfer Characteristics

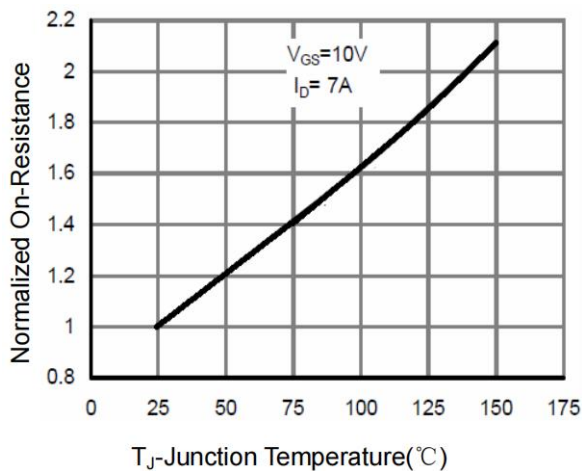


Figure 3: On-Resistance vs.  $T_J$

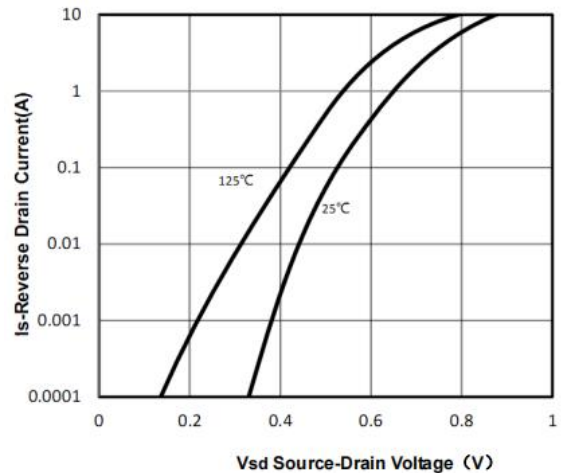


Figure 4: Diode Characteristics

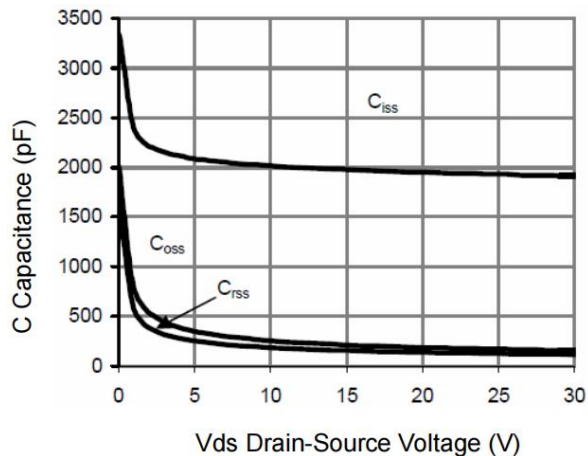


Figure 5: Capacitance Characteristics

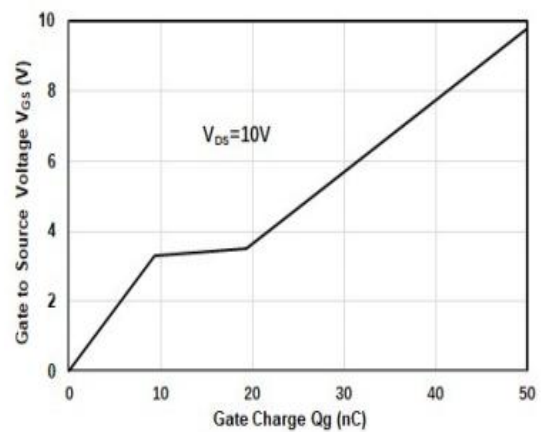


Figure 6: Gate-Charge Characteristics

■ Typical Characteristic Curve 典型特性曲线

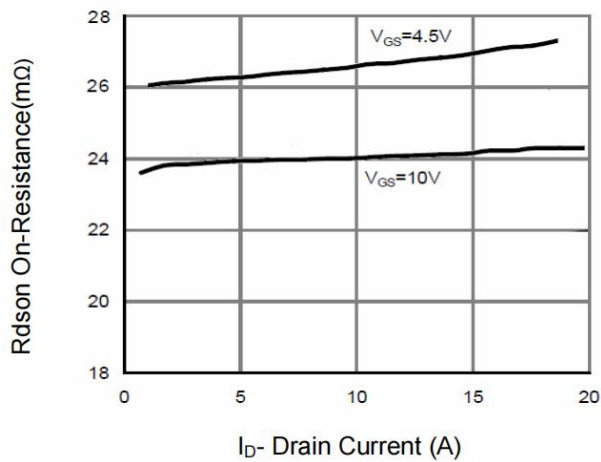


Figure 7: On-Resistance vs. Drain Current

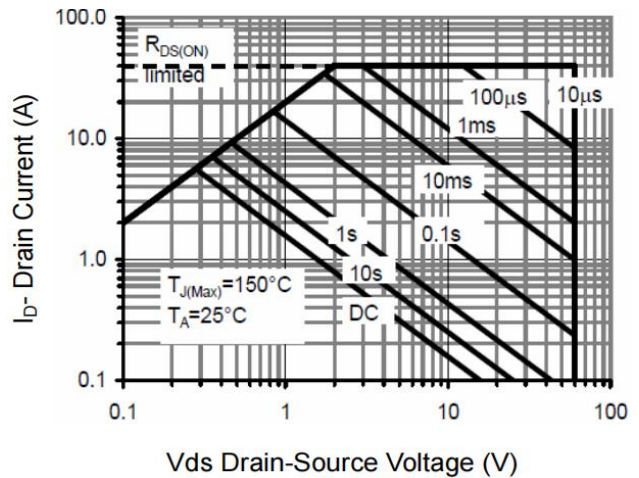


Figure 8: Safe Operating Area

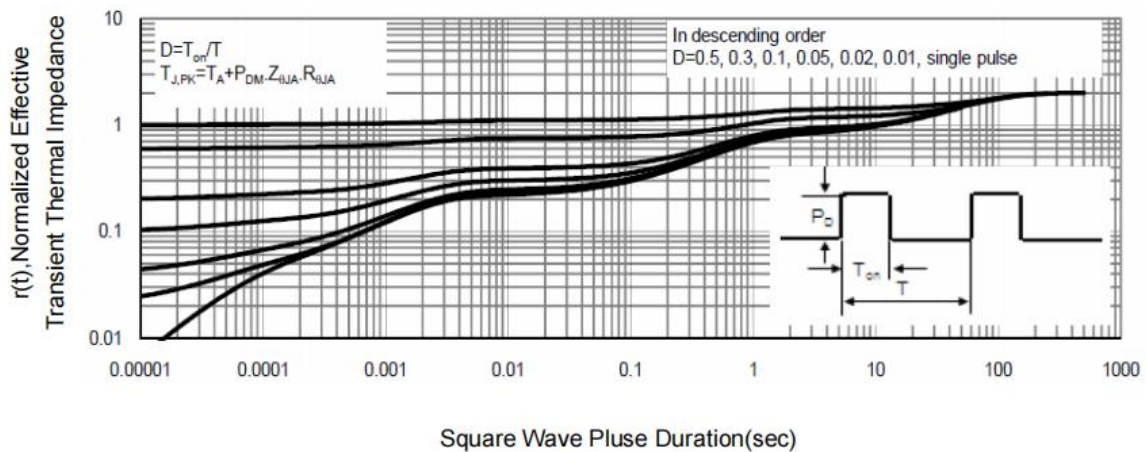
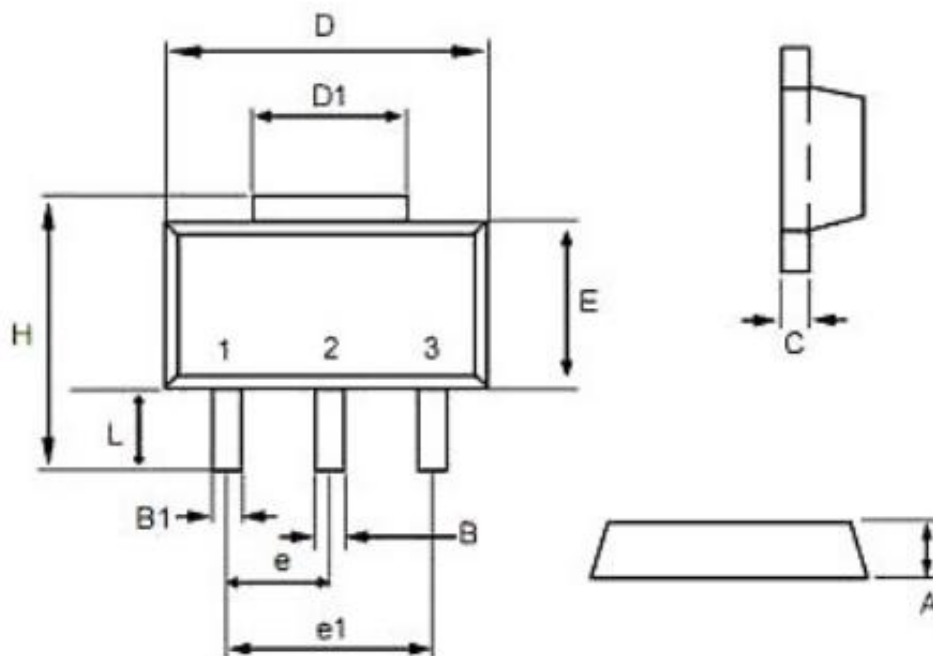


Figure 9: Transient Thermal Response Curve

■ Dimension 外形封装尺寸



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.40	1.60	0.055	0.063
B	0.40	0.56	0.016	0.022
B1	0.35	0.48	0.014	0.019
C	0.35	0.44	0.014	0.017
D	4.40	4.60	0.173	0.181
D1	1.35	1.83	0.053	0.072
e	1.45	1.55	0.057	0.061
e1	2.95	3.05	0.116	0.120
E	2.29	2.60	0.090	0.102
H	3.75	4.25	0.148	0.167
L	0.80	1.20	0.031	0.047