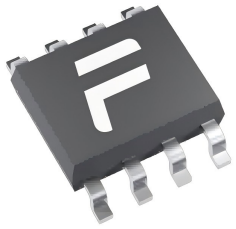
FS4421

SOP-8　P Channel Enhancement 沟道增强型
MOS Field Effect Transistor 场效应管



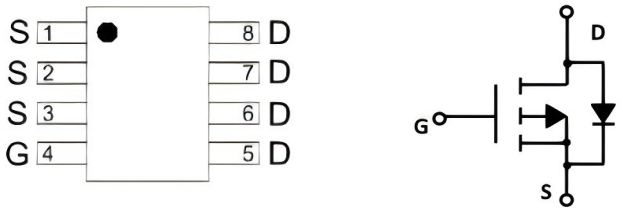
▪Features 特点

Low on-resistance 低导通电阻
$R_{DS(ON)}$=26mΩ(Type)@V_{GS}= -10V
$R_{DS(ON)}$=32mΩ(Type)@V_{GS}= -4.5V

▪Applications 应用

Motor Drive 马达驱动
Load Switch 负载开关
DC/DC Converter 电源转换
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}	±20	V
Drain Current (continuous)漏极电流-连续	I_D（at T_A = 25°C）	-7.5	A
Drain Current (pulsed)漏极电流-脉冲	I_{DM}	-20	A
Total Device Dissipation 总耗散功率	P_D(at T_A = 25°C)	6.1	W
Thermal Resistance Junction-Ambient 热阻	$R_{\Theta JA}$	36	℃/W
Avalanche Energy Single Pulse 雪崩能量	E_{AS}	69.7	mJ
Junction/Storage Temperature 结温/储存温度	T_J,T_{stg}	-55~150	℃

■ Electrical Characteristics 电特性

(T_A=25℃unless otherwise noted 如无特殊说明，温度为25℃)

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 = -250uA,V_{GS}=0V)	BV_{DSS}	-60	—	—	V
Gate Threshold Voltage 栅极开启电压(I_D = -250uA,V_{GS}= V_{DS})	$V_{GS(th)}$	-1.2	—	-2.5	V
Zero Gate Voltage Drain Current 零栅压漏极电流 (V_{GS}=0V, V_{DS}= -48V)	I_{DSS}	—	—	-1	uA
Gate Body Leakage 栅极漏电流(V_{GS}=±20V, V_{DS}=0V)	I_{GSS}	—	—	±100	nA
Static Drain-Source On-State Resistance 静态漏源导通电阻(I_D= -6A,V_{GS}= -10V) (I_D= -3A,V_{GS}= -4.5V)	$R_{DS(ON)}$	—	26 32	33 43	mΩ
Diode Forward Voltage Drop 内附二极管正向压降(I_{SD}= -1A,V_{GS}=0V)	V_{SD}	—	—	-1.2	V
Input Capacitance 输入电容 (V_{GS}=0V, V_{DS}= -15V,f=1MHz)	C_{ISS}	—	2171	—	pF
Common Source Output Capacitance 共源输出电容(V_{GS}=0V, V_{DS}= -15V,f=1MHz)	C_{OSS}	—	149	—	pF
Reverse Transfer Capacitance 反馈电容 (V_{GS}=0V, V_{DS}= -15V,f=1MHz)	C_{RSS}	—	96	—	pF
Total Gate Charge 栅极电荷密度 (V_{DS}= -48V, I_D= -3A, V_{GS}= -4.5V)	Qg	—	11.8	—	nC
Gate Source Charge 栅源电荷密度 (V_{DS}= -48V, I_D= -3A, V_{GS}= -4.5V)	Qgs	—	1.9	—	nC
Gate Drain Charge 栅漏电荷密度 (V_{DS}= -48V, I_D= -3A, V_{GS}= -4.5V)	Qgd	—	6.5	—	nC
Turn-ON Delay Time 开启延迟时间 (V_{DD}= -15V I_D= -1A, R_{GEN}=3.3Ω,V_{GS}= -10V)	$t_{d(on)}$	—	8.8	—	ns
Turn-ON Rise Time 开启上升时间 (V_{DD}= -15V I_D= -1A, R_{GEN}=3.3Ω,V_{GS}= -10V)	t_r	—	19.6	—	ns
Turn-OFF Delay Time 关断延迟时间 (V_{DD}= -15V I_D= -1A, R_{GEN}=3.3Ω,V_{GS}= -10V)	$t_{d(off)}$	—	47.2	—	ns
Turn-OFF Fall Time 关断下降时间 (V_{DD}= -15V I_D= -1A, R_{GEN}=3.3Ω,V_{GS}= -10V)	t_f	—	9.6	—	ns

■Typical Characteristic Curve 典型特性曲线

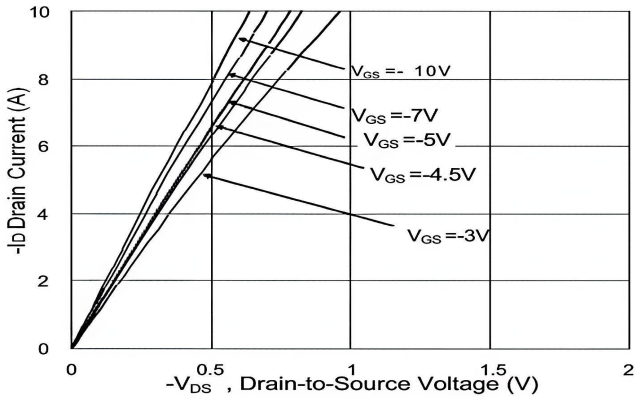


Fig.1 Typical Output Characteristics

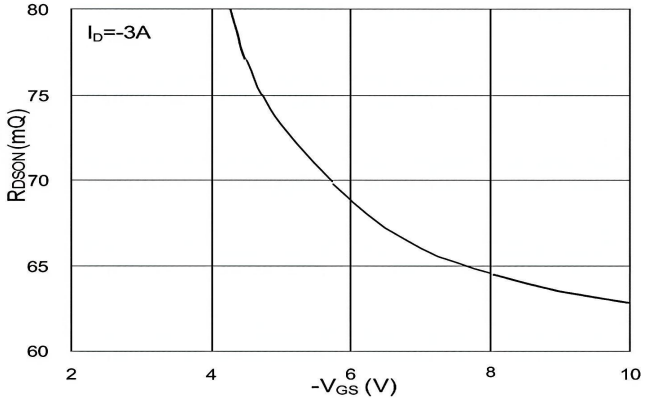


Fig.2 On-Resistance v.s Gate-Source

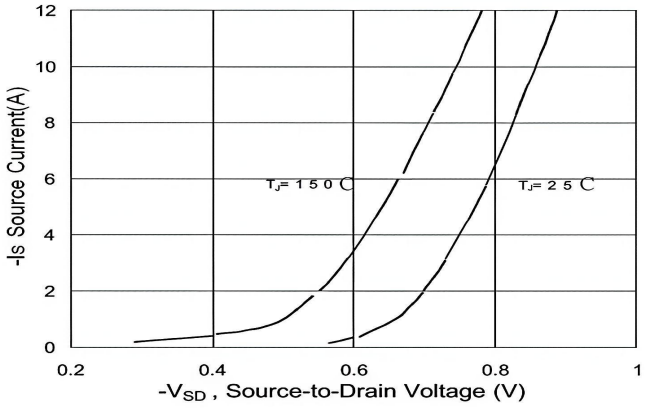


Fig.3 Forward Characteristics of Reverse

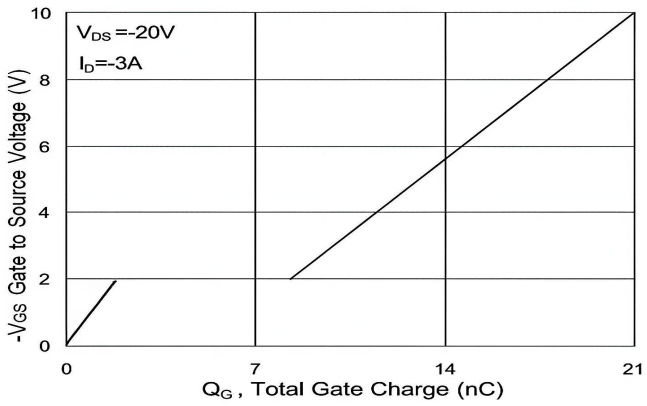


Fig.4 Gate-Charge Characteristics

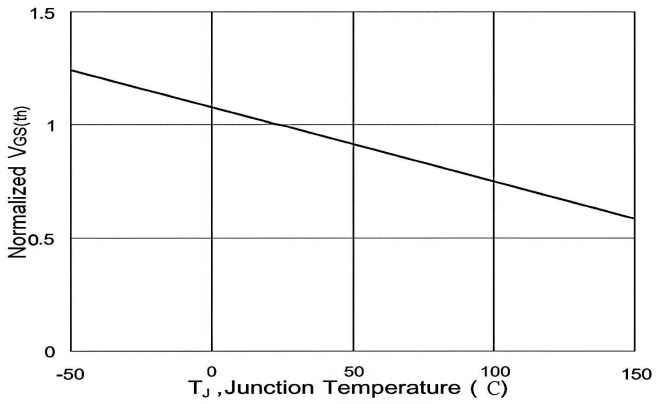


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

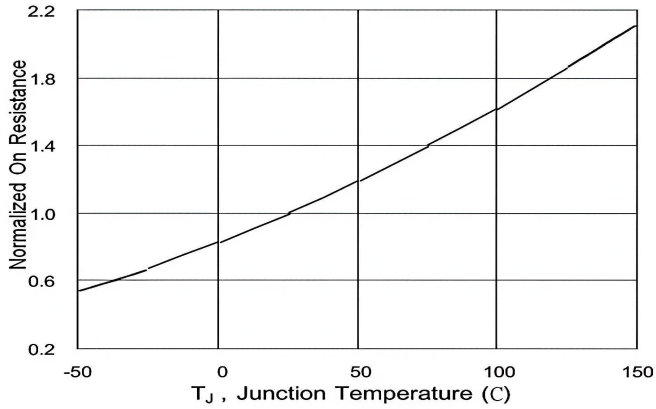


Fig.6 Normalized R_{DSON} vs. T_J

▪Typical Characteristic Curve 典型特性曲线

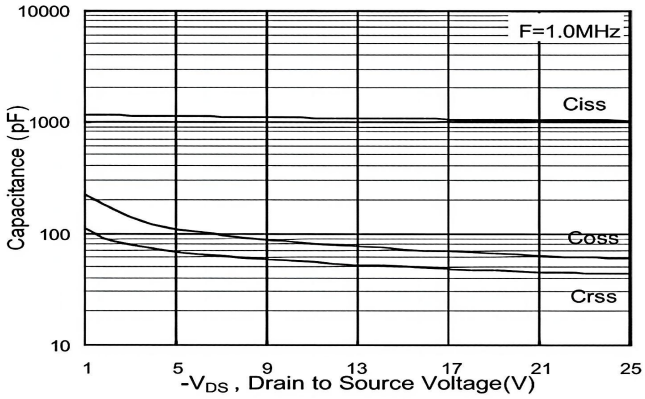


Fig.7 Capacitance

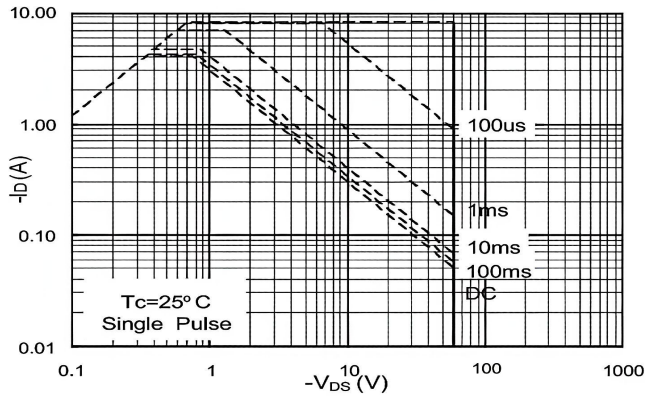


Fig.8 Safe Operating Area

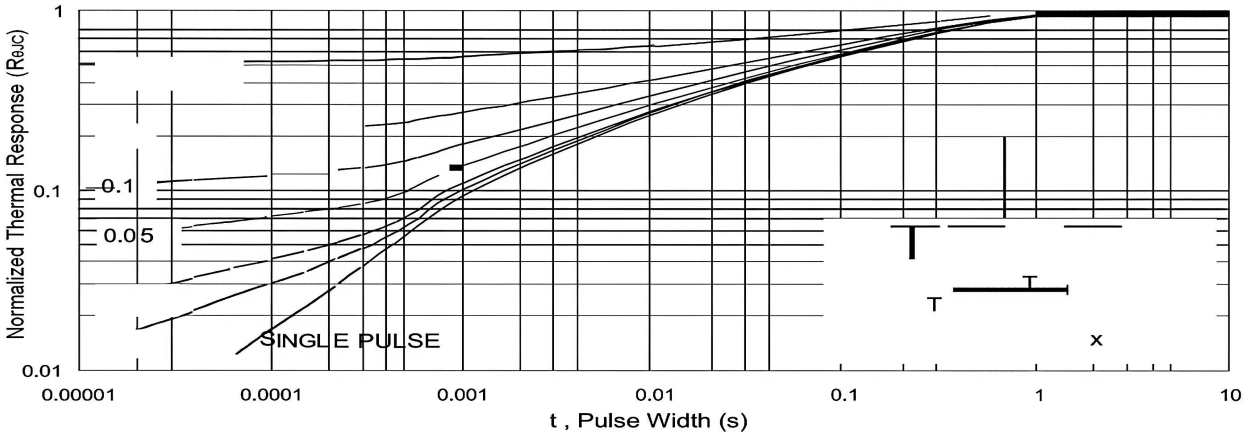


Fig. 9 Normalized Maximum Transient Thermal Impedance

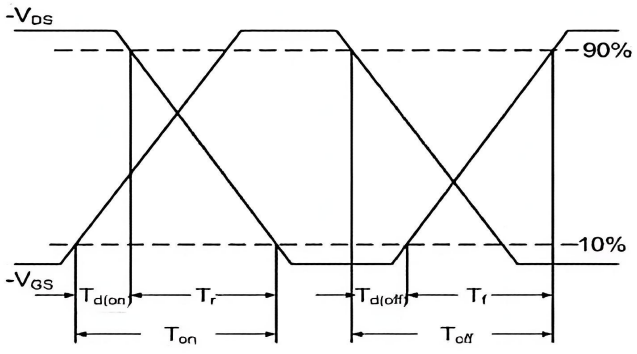


Fig.10 Switching Time Waveform

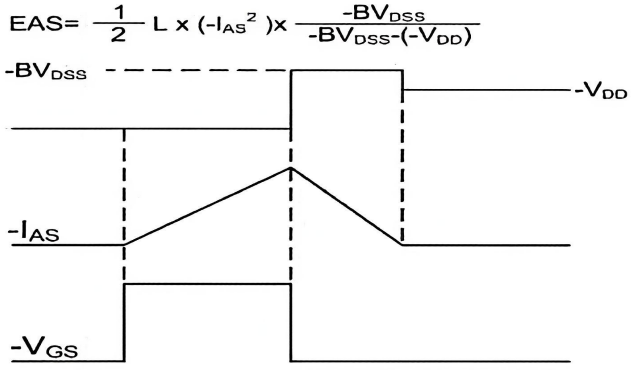
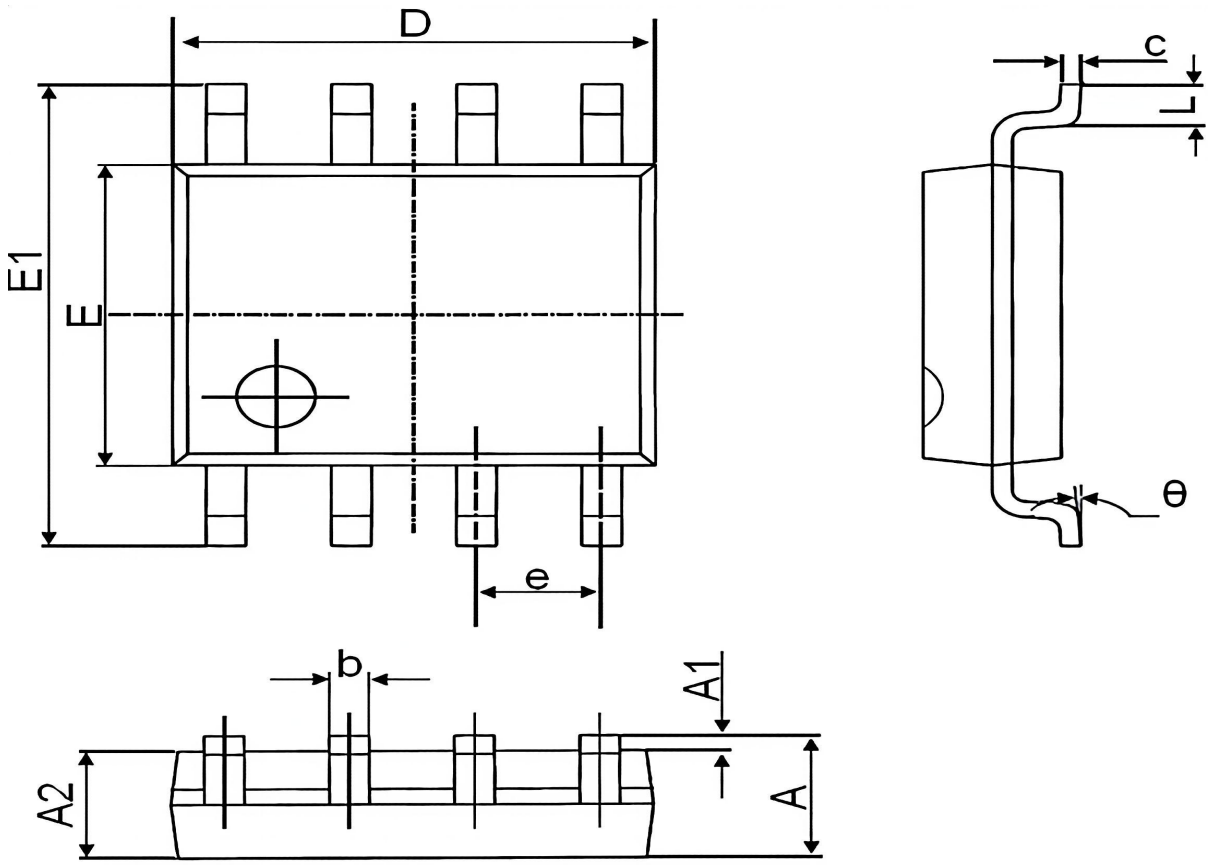


Fig.11 Unclamped Inductive Waveform

▪Dimension 外形封装尺寸



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°