

**SOP-8 N+P Dual Enhancement 互补双沟道增强型
MOS Field Effect Transistor 场效应管**

■ **Features 特点**

Low on-resistance 低导通电阻

N: $R_{DS(ON)}=21m\Omega(\text{Type})@V_{GS}=10V$

$R_{DS(ON)}=25m\Omega(\text{Type})@V_{GS}=4.5V$

P: $R_{DS(ON)}=33m\Omega(\text{Type})@V_{GS}= -10V$

$R_{DS(ON)}=43m\Omega@(\text{Type})V_{GS}= -4.5V$

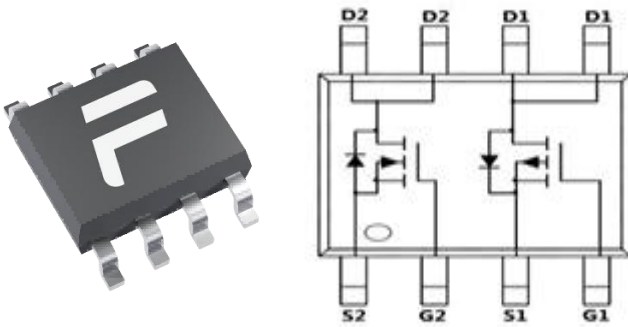
■ **Applications 应用**

Motor Control 马达控制

Synchronous Rectification 同步整流

Fan Pre-drive H-bridge 风扇预驱动半桥

■ **Internal Schematic Diagram 内部结构**



■ **Absolute Maximum Ratings 最大额定值**

Characteristic 特性参数	Symbol 符号	N	P	Unit 单位
Drain-Source Voltage 漏极-源极电压	BV_{DSS}	40	-40	V
Gate- Source Voltage 栅极-源极电压	V_{GS}	± 20	± 20	V
Drain Current (continuous)漏极电流-连续	I_D (at $T_A = 25^\circ C$ at $T_A = 70^\circ C$)	7.5 6	-5.5 -4.5	A
Drain Current (pulsed)漏极电流-脉冲	I_{DM}	30	-22	A
Total Device Dissipation 总耗散功率	$P_{TOT}(\text{at } T_A = 25^\circ C$ at $T_A = 70^\circ C)$	2 1.3		W
Thermal Resistance Junction-Ambient 热阻	$R_{\theta JA}$	62.5		$^\circ C/W$
Avalanche Energy Single Pulse 雪崩能量	E_{AS}	25		mJ
Junction/Storage Temperature 结温/储存温度	T_J, T_{stg}	-55~150		$^\circ C$

■ N 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}	40	—	—	V
Gate Threshold Voltage 栅极开启电压(I _D =250uA, V _{GS} =V _{DS})	V _{GS(th)}	1.0	1.5	2.0	V
Zero Gate Voltage Drain Current 零栅压漏极电流(V _{GS} =0V, V _{DS} =32V)	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)}	—	21 25	25 35	mΩ
Diode Forward Voltage Drop 内附二极管正向压降(I _{SD} =1A, V _{GS} =0V)	V _{SD}	—	0.75	1.1	V
Input Capacitance 输入电容 (V _{GS} =0V, V _{DS} =20V, f=1MHz)	C _{ISS}	—	815	—	pF
Common Source Output Capacitance 共源输出电容(V _{GS} =0V, V _{DS} =20V, f=1MHz)	C _{OSS}	—	95	—	pF
Reverse Transfer Capacitance 反馈电容 (V _{GS} =0V, V _{DS} =20V, f=1MHz)	C _{RSS}	—	60	—	pF
Total Gate Charge 栅极电荷密度 (V _{DS} =20V, I _D =6A, V _{GS} =4.5V)	Q _g	—	8	—	nC
Gate Source Charge 栅源电荷密度 (V _{DS} =20V, I _D =6A, V _{GS} =4.5V)	Q _{gs}	—	3	—	nC
Gate Drain Charge 栅漏电荷密度 (V _{DS} =20V, I _D =6A, V _{GS} =4.5V)	Q _{gd}	—	3	—	nC
Turn-ON Delay Time 开启延迟时间 (V _{DS} =20V I _D =1A, R _{GEN} =6Ω, V _{GS} =10V)	t _{d(on)}	—	8	—	ns
Turn-ON Rise Time 开启上升时间 (V _{DS} =20V I _D =1A, R _{GEN} =6Ω, V _{GS} =10V)	t _r	—	7	—	ns
Turn-OFF Delay Time 关断延迟时间 (V _{DS} =20V I _D =1A, R _{GEN} =6Ω, V _{GS} =10V)	t _{d(off)}	—	22	—	ns
Turn-OFF Fall Time 关断下降时间 (V _{DS} =20V I _D =1A, R _{GEN} =6Ω, V _{GS} =10V)	t _f	—	5	—	ns

■ P 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}	-40	—	—	V
Gate Threshold Voltage 栅极开启电压(I _D = -250uA, V _{GS} = V _{DS})	V _{GS(th)}	-1.0	-1.65	-2.5	V
Zero Gate Voltage Drain Current 零栅压漏极电流(V _{GS} =0V, V _{DS} = -32V)	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 = -5.5A, V _{GS} = -10V) (I _D = -3.5A, V _{GS} = -4.5V)	R _{DS(ON)}	—	33 43	38 52	mΩ
Diode Forward Voltage Drop 内附二极管正向压降(I _{SD} = -1A, V _{GS} =0V)	V _{SD}	—	-0.75	-1.0	V
Input Capacitance 输入电容 (V _{GS} =0V, V _{DS} = -20V, f=1MHz)	C _{ISS}	—	1068	—	pF
Common Source Output Capacitance 共源输出电容(V _{GS} =0V, V _{DS} = -20V, f=1MHz)	C _{OSS}	—	98	—	pF
Reverse Transfer Capacitance 反馈电容 (V _{GS} =0V, V _{DS} = -20V, f=1MHz)	C _{RSS}	—	72	—	pF
Total Gate Charge 栅极电荷密度 (V _{DS} = -20V, I _D = -5.5A, V _{GS} = -4.5V)	Q _g	—	8	—	nC
Gate Source Charge 栅源电荷密度 (V _{DS} = -20V, I _D = -5.5A, V _{GS} = -4.5V)	Q _{gs}	—	2	—	nC
Gate Drain Charge 栅漏电荷密度 (V _{DS} = -20V, I _D = -5.5A, V _{GS} = -4.5V)	Q _{gd}	—	3	—	nC
Turn-ON Delay Time 开启延迟时间 (V _{DS} = -20V I _D = -1A, R _{GEN} =6Ω, V _{GS} = -10V)	t _{d(on)}	—	9	—	ns
Turn-ON Rise Time 开启上升时间 (V _{DS} = -20V I _D = -1A, R _{GEN} =6Ω, V _{GS} = -10V)	t _r	—	8	—	ns
Turn-OFF Delay Time 关断延迟时间 (V _{DS} = -20V I _D = -1A, R _{GEN} =6Ω, V _{GS} = -10V)	t _{d(off)}	—	31	—	ns
Turn-OFF Fall Time 关断下降时间 (V _{DS} = -20V I _D = -1A, R _{GEN} =6Ω, V _{GS} = -10V)	t _f	—	18	—	ns

■ N Typical Characteristic Curve 典型特性曲线

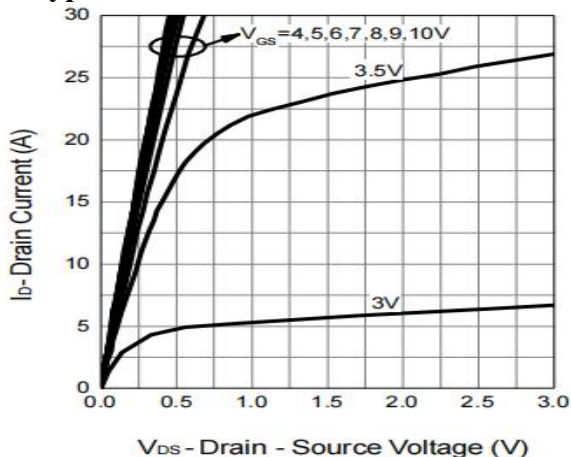


Figure 1: Output Characteristics

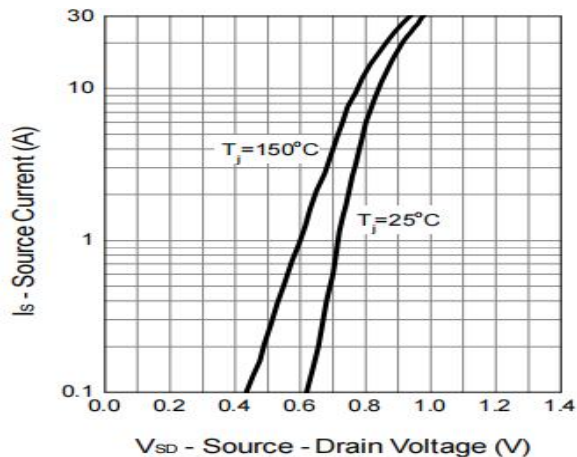


Figure 2: Diode Forward Characteristics

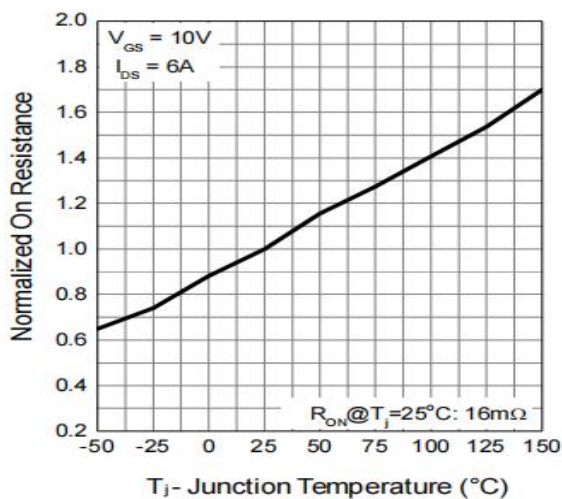


Figure 3: On-Resistance vs. T_j

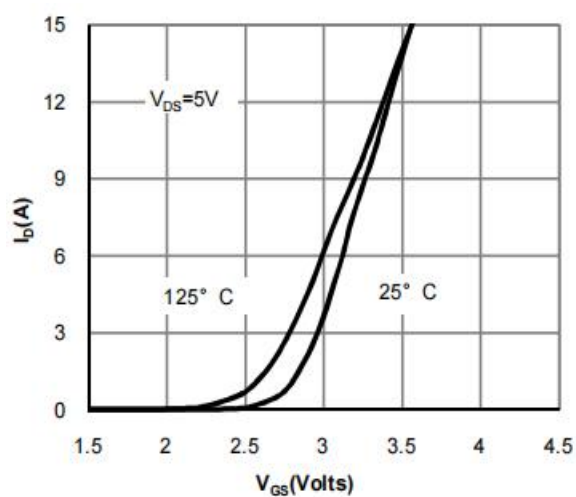


Figure 4: Transfer Characteristics

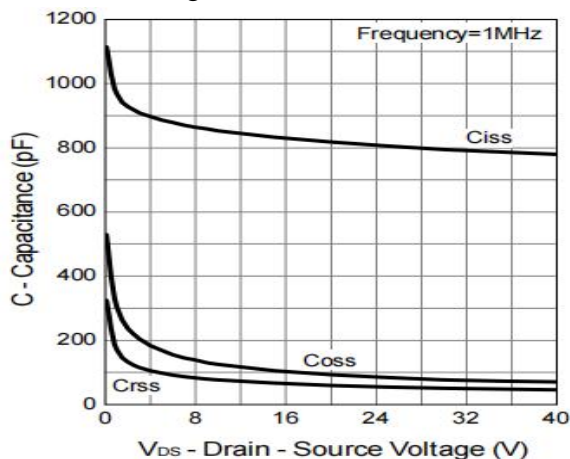


Figure 5: Capacitance Characteristics

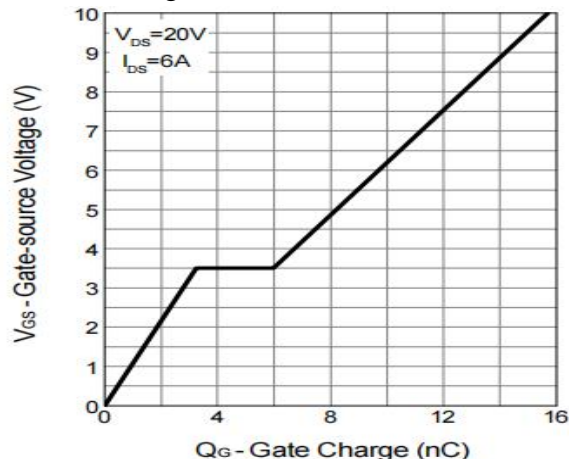


Figure 6: Gate-Charge Characteristics

■ N Typical Characteristic Curve 典型特性曲线

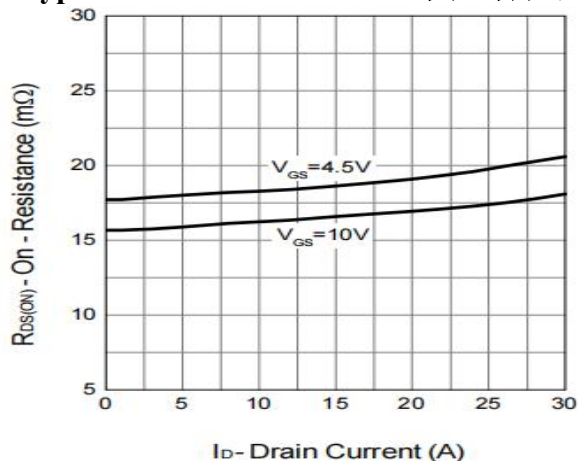


Figure 7: On-Resistance vs. Drain Current

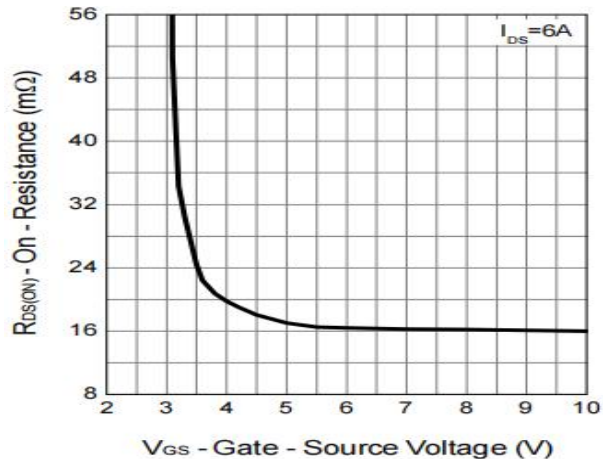


Figure 8: On-Resistance vs. V_{GS}

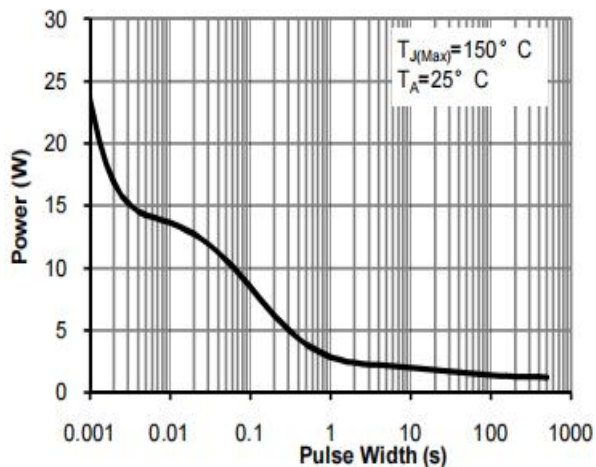


Figure 9: Power Rating Curve

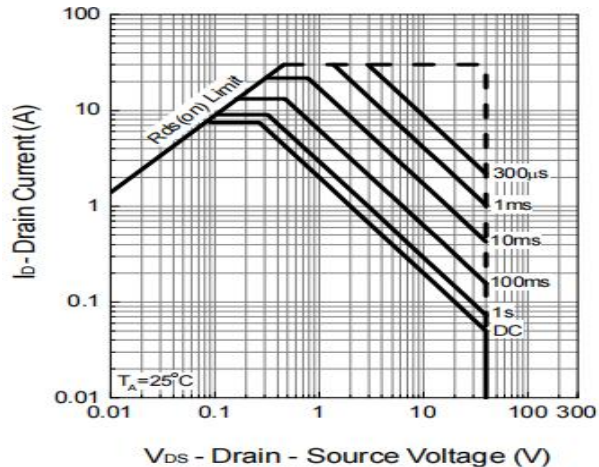


Figure 10: Safe Operating Area

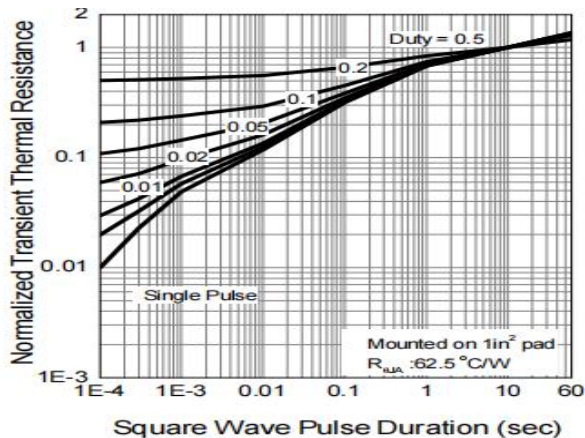


Figure 11: Transient Thermal Response Curve

■ P Typical Characteristic Curve 典型特性曲线

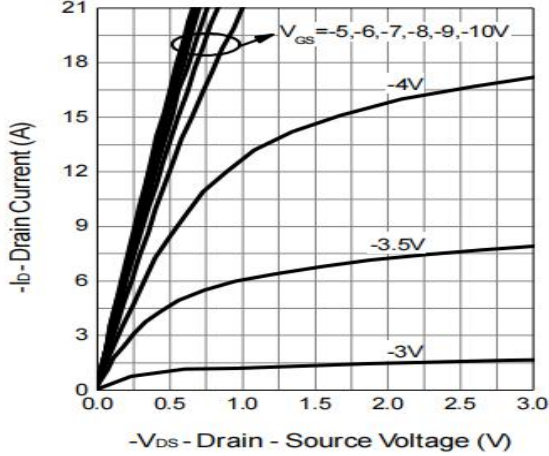


Figure 1: Output Characteristics

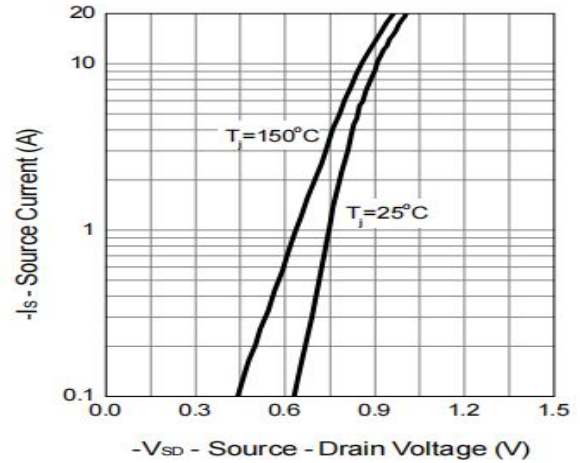


Figure 2: Diode Forward Characteristics

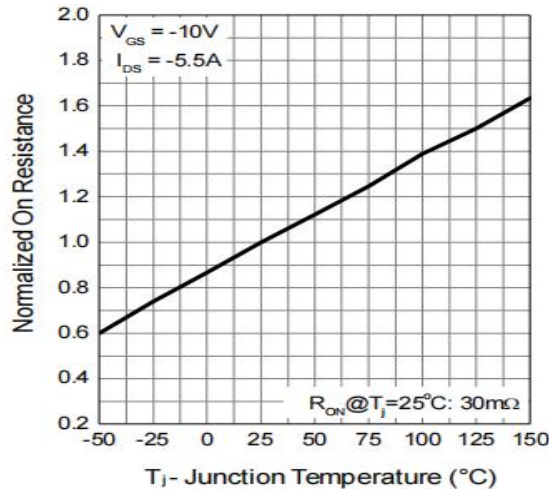


Figure 3: On-Resistance vs. T_J

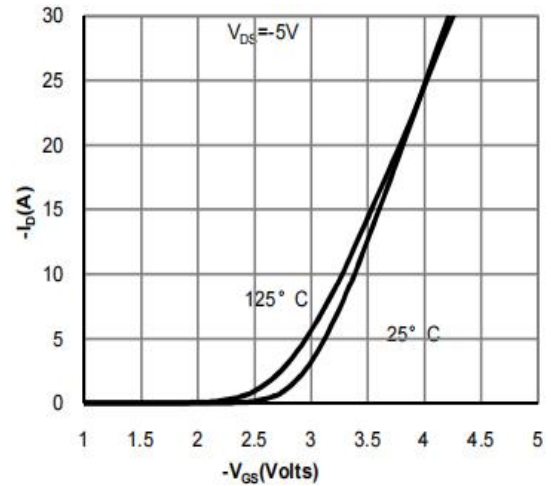


Figure 4: Gate Threshold Voltage

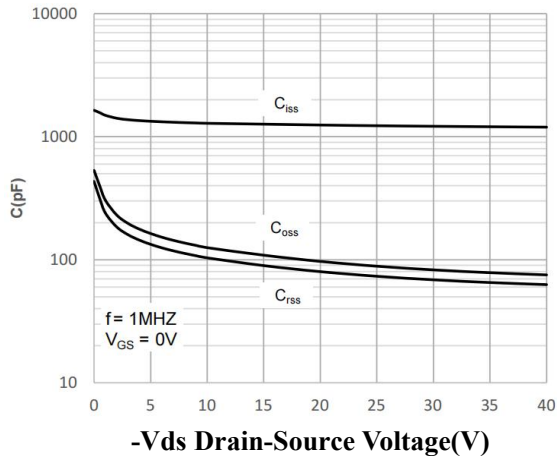


Figure 5: Capacitance Characteristics

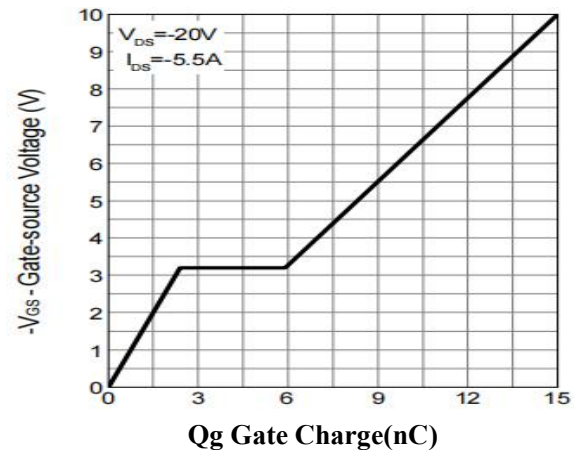


Figure 6: Gate-Charge Characteristics

■ P Typical Characteristic Curve 典型特性曲线

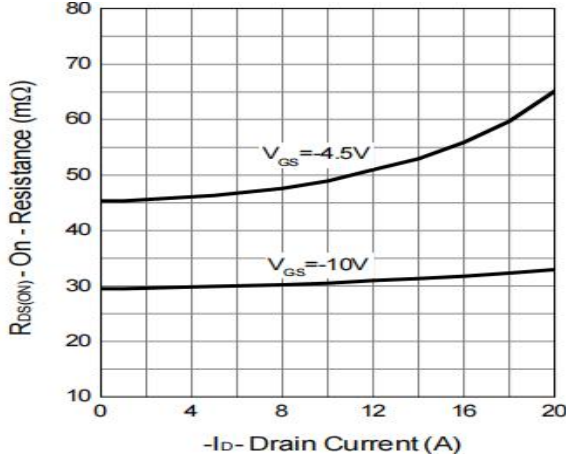


Figure 7: On-Resistance vs. Drain Current

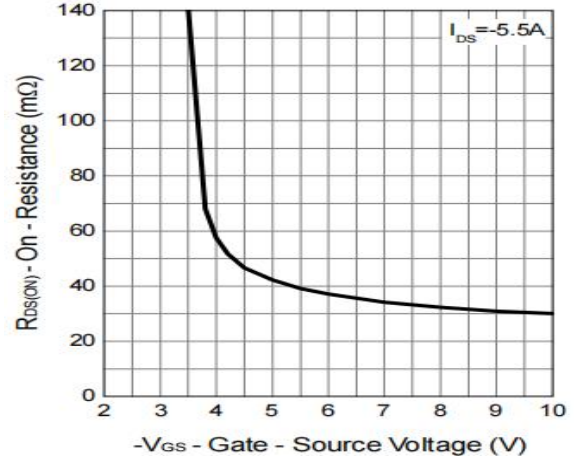


Figure 8: On-Resistance vs. V_{GS}

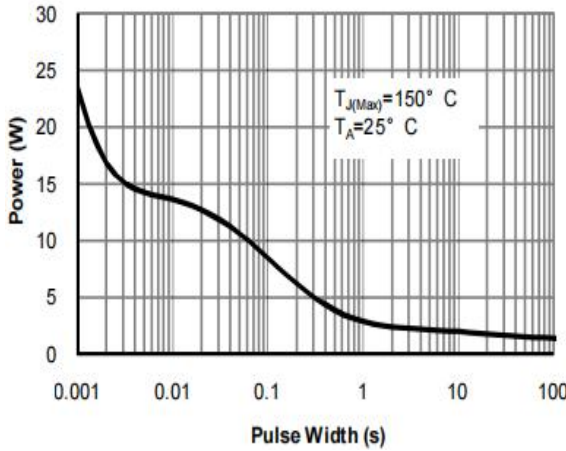


Figure 9: Power Rating Curve

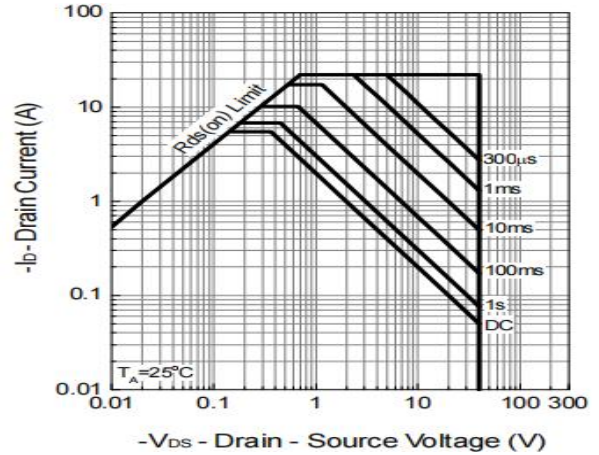


Figure 10: Safe Operating Area

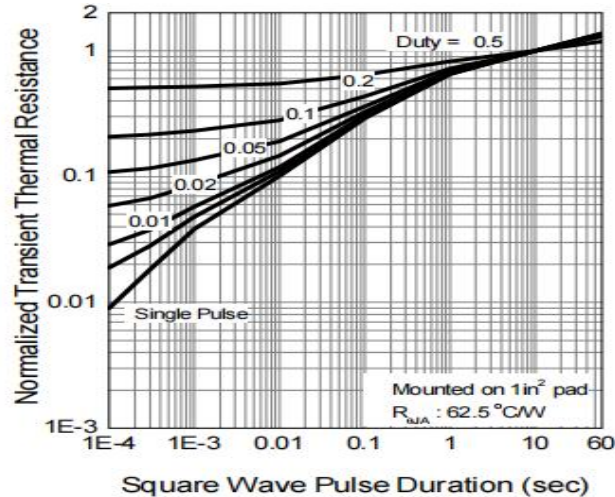
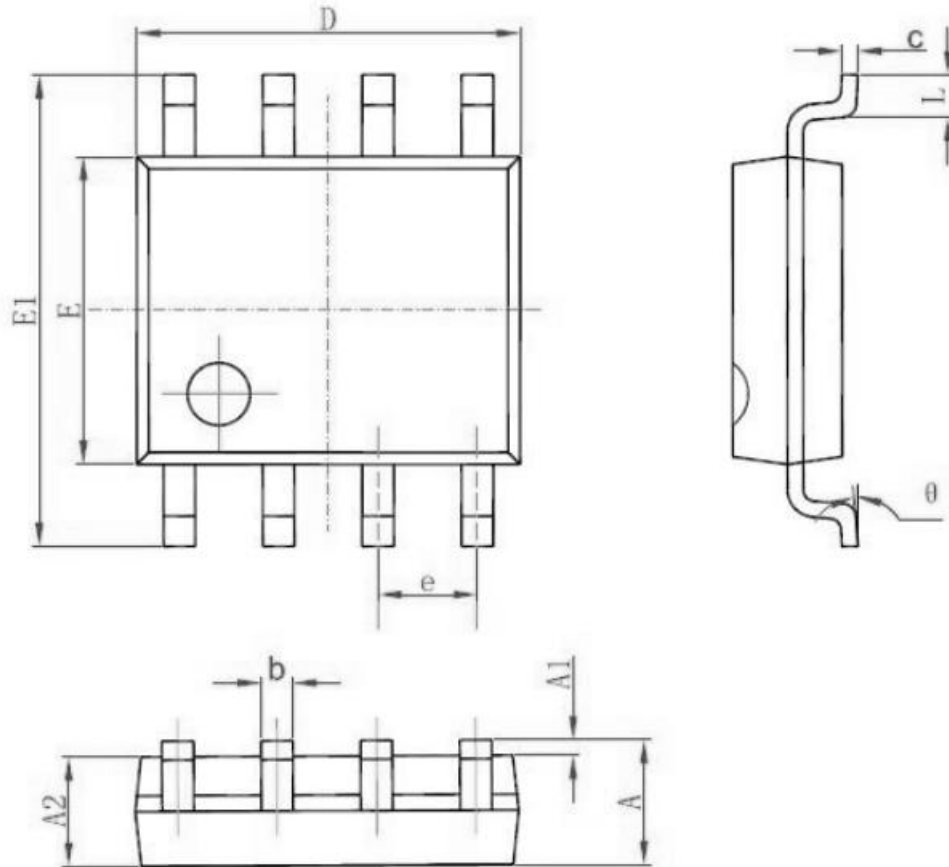


Figure 11: Transient Thermal Response Curve

■ **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°