2SK1868

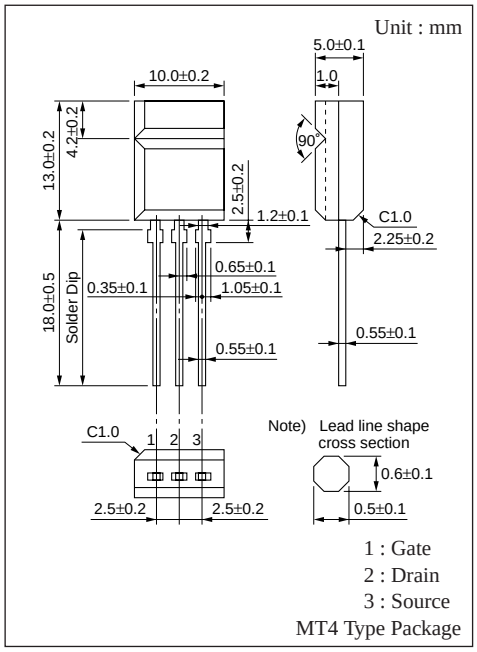
Silicon N-Channel Power F-MOS

■ Features

- Avalanche energy capability guaranteed : EAS > 62.5mJ
- Low ON-resistance $R_{DS(on)}$: $R_{DS(on)}1$= 0.135Ω
- High-speed switching : t_f= 53ns
- No secondary breakdown
- Low-voltage drive possible(V_{GS}= 4V)
- Radial taping possible

■ Applications

- Non-contact relay
- Solenoid drive
- Motor drive
- Control equipment
- Switching mode regulator



■ Absolute Maximum Ratings (Tc = 25˚C)

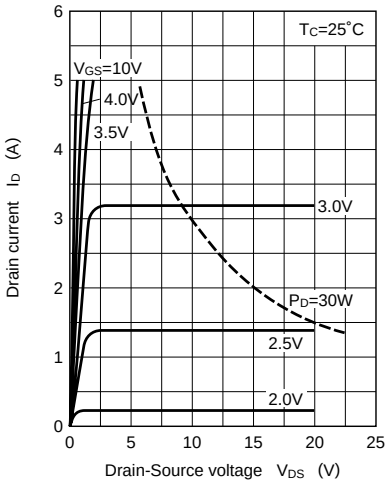
Parameter		Symbol	Rating	Unit
Drain-Source breakdown voltage		V_{DSS}	60	V
Gate-Source voltage		V_{GSS}	±20	V
Drain current	DC	I_D *	±3	A
		I_D	±5	A
	Pulse	I_{DP}	±10	A
Avalanche energy capability		EAS *2	62.5	mJ
Allowable power dissipation	T_C=25˚C	P_D	15	W
	Ta=25˚C		2	
Channel temperature		T_{ch}	150	˚C
Storage temperature		T_{stg}	–55 to +150	˚C

* 1 Max I_D value at 4V drive * 2 L= 5mH, I_L= 5A, V_{DD}=10V, 1 pulse

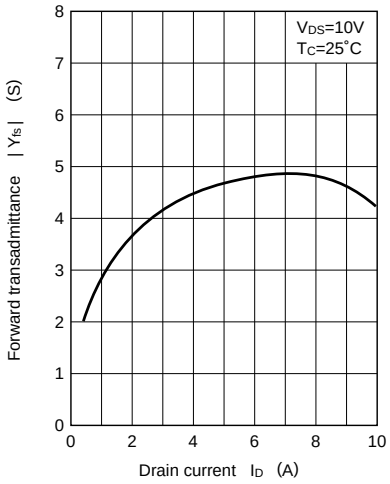
■ Electrical Characteristics (Tc = 25˚C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source cut-off current	I_{DSS}	V_{DS}= 60V, V_{GS}= 0			0.1	μ A
Gate-Source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}= 0			±1	μ A
Drain-Source breakdown voltage	V_{DSS}	I_D=1mA, V_{GS}= 0	60			V
Gate threshold voltage	V_{th}	V_{DS}=10V, I_D=1mA	1		2.5	V
Drain-Source ON-resistance	$R_{DS(on)}1$	V_{GS}=10V, I_D= 3A		135	200	mΩ
	$R_{DS(on)}2$	V_{GS}= 4V, I_D= 2A		200	300	mΩ
Forward transadmittance	$\|Y_{fs}\|$	V_{DS}=10V, I_D= 3A	2.4	4		S
Diode forward voltage	V_{DSF}	I_{DR}= 5A, V_{GS}= 0			–1.7	V
Input capacitance	C_{iss}	V_{DS}=10V, V_{GS}= 0, f=1MHz		400		pF
Output capacitance	C_{oss}			210		pF
Feedback capacitance	C_{rss}			80		pF
Turn-on time	t_{on}	V_{GS}=10V, I_D=3A V_{DD}= 30V, R_L=10Ω		29		ns
Fall time	t_f			53		ns
Turn-off time (delay time)	$t_{d(off)}$			97		ns
Channel-Case heat resistance	$R_{th(ch-c)}$				8.33	˚C/W

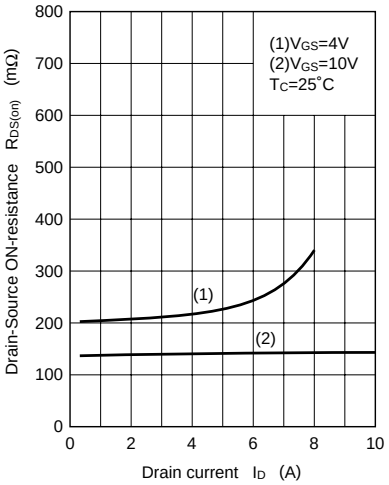
$I_D - V_{DS}$



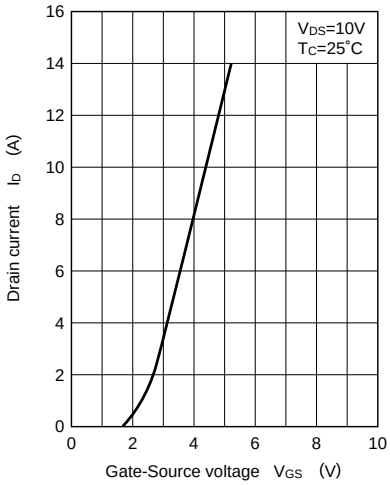
$|Y_{fs}| - I_D$



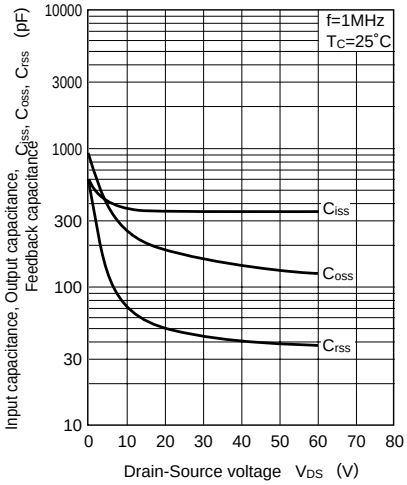
$R_{DS\,(on)} - I_D$



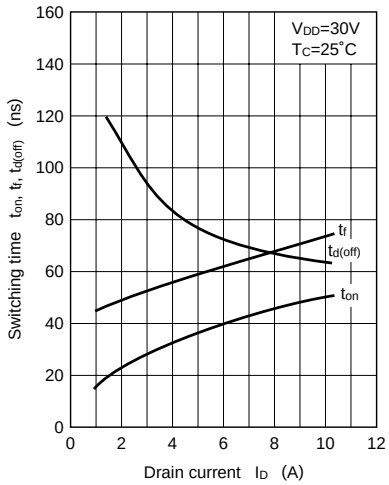
$I_D - V_{GS}$



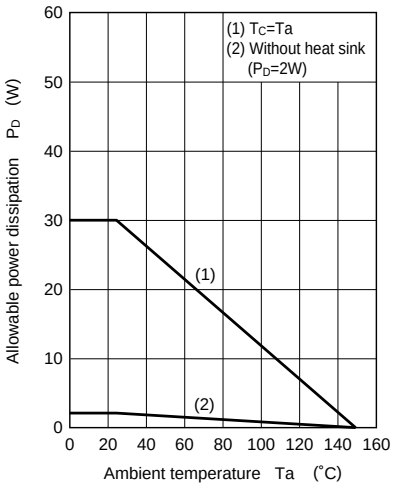
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$



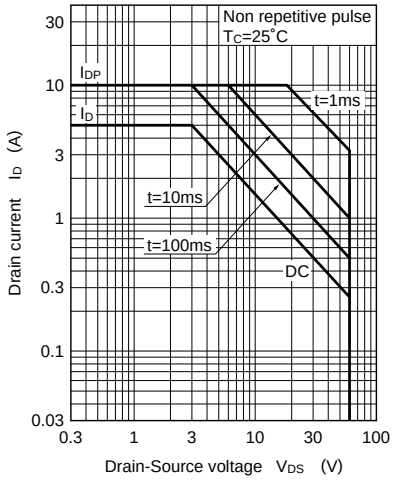
$t_{on}, t_f, t_{d\,(off)} - I_D$



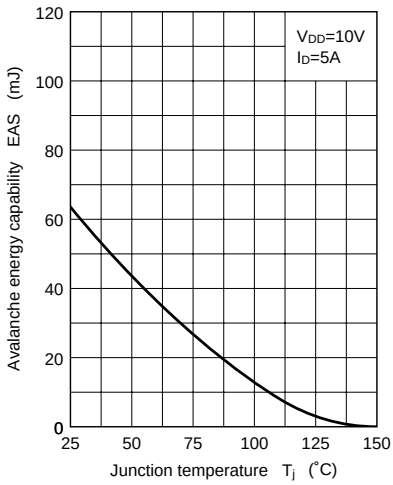
$P_D - Ta$



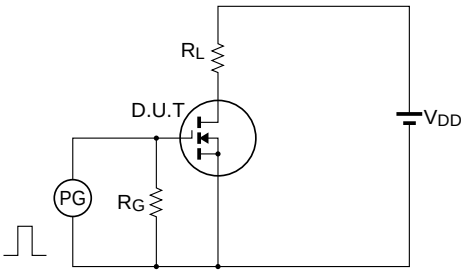
Area of safe operation (ASO)



$EAS - T_j$



Switching measurement circuit



Avalanche capability test circuit