2SK2123

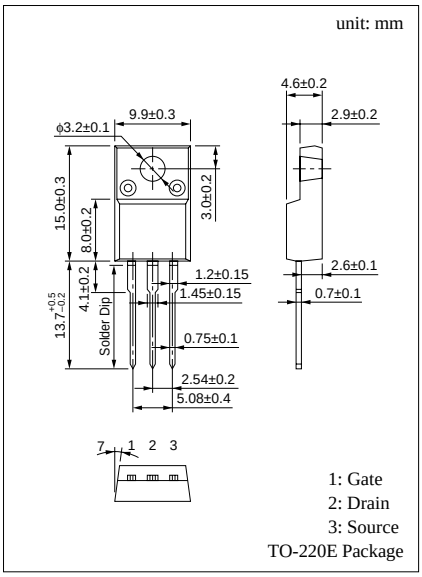
Silicon N-Channel Power F-MOS FET

■ Features

- Avalanche energy capacity guaranteed: EAS > 100mJ
- V_{GSS} = ±30V guaranteed
- High-speed switching: t_f = 35ns
- No secondary breakdown

■ Applications

- Contactless relay
- Diving circuit for a solenoid
- Driving circuit for a motor
- Control equipment
- Switching power supply



■ Absolute Maximum Ratings (T_C = 25°C)

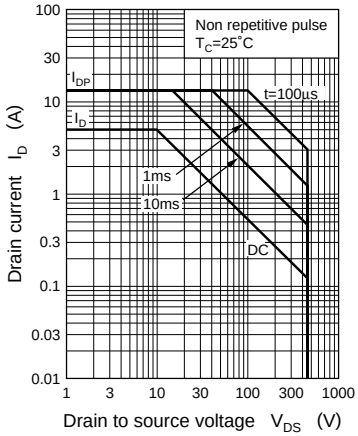
Parameter		Symbol	Ratings	Unit
Drain to Source breakdown voltage		V_{DSS}	450	V
Gate to Source voltage		V_{GSS}	±30	V
Drain current	DC	I_D	±5	A
	Pulse	I_{DP}	±15	A
Avalanche energy capacity		EAS*	100	mJ
Allowable power dissipation	T_C = 25°C	P_D	50	W
	Ta = 25°C		2	
Channel temperature		T_{ch}	150	°C
Storage temperature		T_{stg}	−55 to +150	°C

* L = 8mH, I_L = 5A, V_{DD} = 50V, 1 pulse

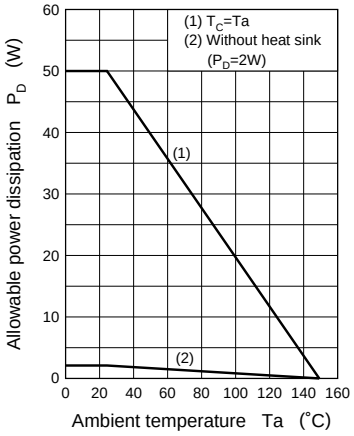
■ Electrical Characteristics (T_C = 25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source cut-off current	I_{DSS}	V_{DS} = 360V, V_{GS} = 0			0.1	mA
Gate to Source leakage current	I_{GSS}	V_{GS} = ±30V, V_{DS} = 0			±1	μA
Drain to Source breakdown voltage	V_{DSS}	I_D = 1mA, V_{GS} = 0	450			V
Gate threshold voltage	V_{th}	V_{DS} = 25V, I_D = 1mA	2		5	V
Drain to Source ON-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 3A		1	1.3	Ω
Forward transfer admittance	$\|Y_{fs}\|$	V_{DS} = 25V, I_D = 3A	2	2.5		S
Diode forward voltage	V_{DSF}	I_{DR} = 5A, V_{GS} = 0			−1.2	V
Input capacitance (Common Source)	C_{iss}	V_{DS} = 20V, V_{GS} = 0, f = 1MHz		700		pF
Output capacitance (Common Source)	C_{oss}			100		pF
Reverse transfer capacitance (Common Source)	C_{rss}			40		pF
Turn-on time (delay time)	$t_{d(on)}$	V_{GS} = 10V, I_D = 3A V_{DD} = 150V, R_L = 50Ω		25		ns
Rise time	t_r			45		ns
Fall time	t_f			35		ns
Turn-off time (delay time)	$t_{d(off)}$			80		ns
Thermal resistance between channel and case	$R_{th(ch-c)}$				2.5	°C/W

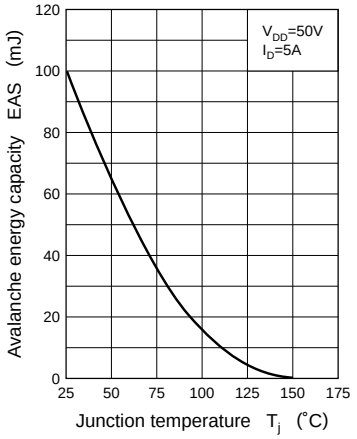
Area of safe operation (ASO)



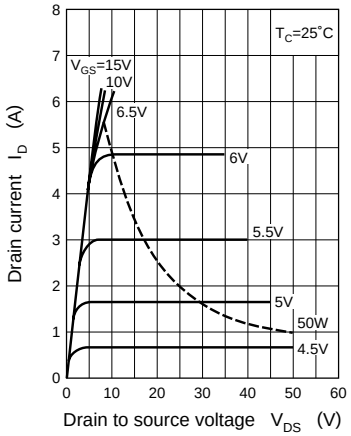
P_D — Ta



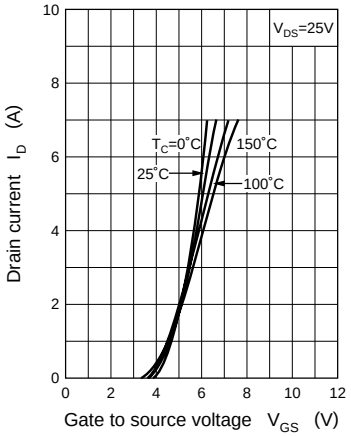
EAS — T_j



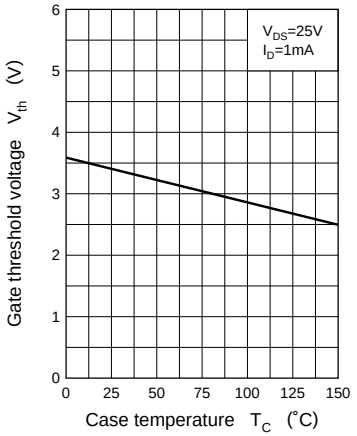
I_D — V_{DS}



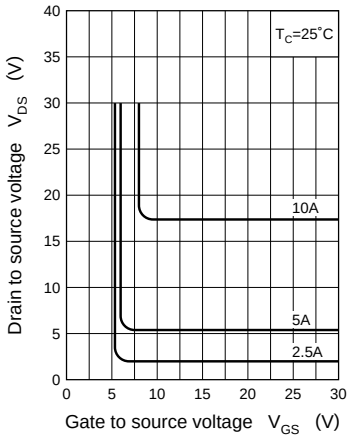
I_D — V_{GS}



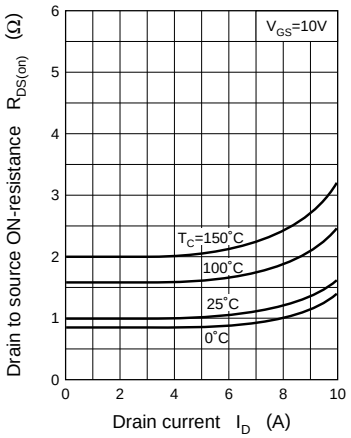
V_{th} — T_C



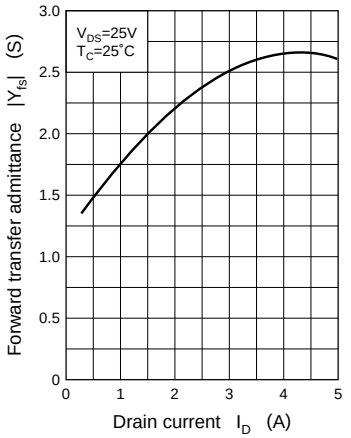
V_{DS} — V_{GS}



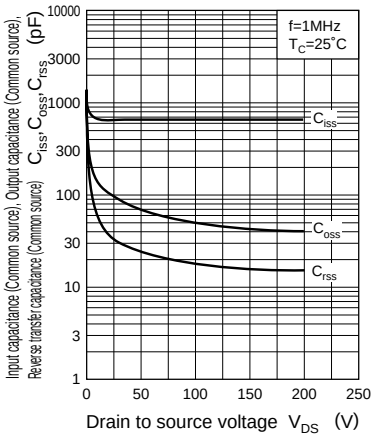
$R_{DS(on)}$ — I_D



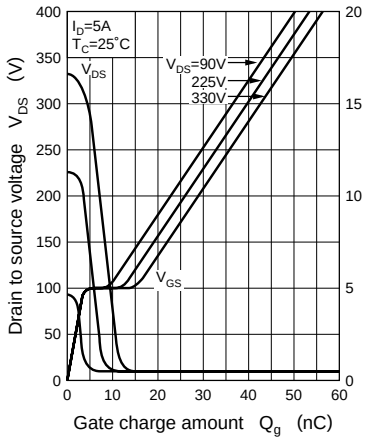
| Y_{fs} | — I_D



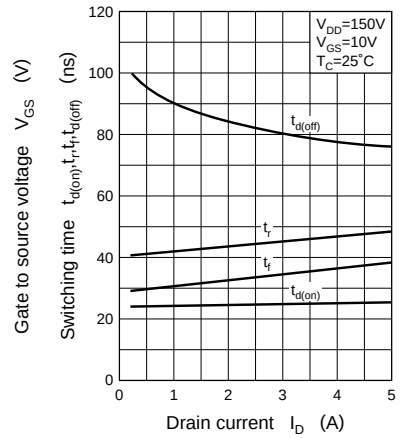
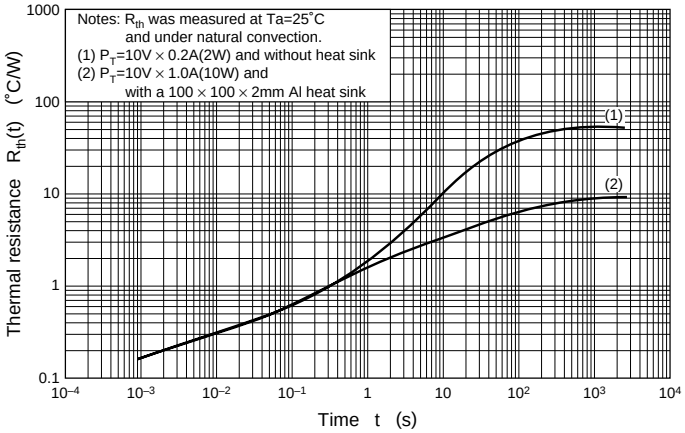
C_{iss}, C_{oss}, C_{rss} — V_{DS}



V_{DS}, V_{GS} — Q_g



$t_{d(on)}$, t_r, t_f, $t_{d(off)}$ — I_D



$R_{th(t)}$ — t