

2SK3123

Silicon N-Channel Power F-MOS FET

■ Features

- Avalanche energy capacity guaranteed
- High-speed switching
- Low ON-resistance
- No secondary breakdown
- Low-voltage drive
- High electrostatic breakdown voltage

■ Applications

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

■ Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$)

Parameter	Symbol	Ratings	Unit
Drain to Source breakdown voltage	V_{DS}	60	V
Gate to Source voltage	V_{GS}	± 20	V
Drain current	DC	I_D	A
	Pulse	I_{DP}	A
Avalanche energy capacity	EAS*	11.25	mJ
Allowable power dissipation	$T_C = 25^\circ\text{C}$	P_D	15
	$T_a = 25^\circ\text{C}$		2
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

* $L = 0.1\text{mH}$, $I_L = 15\text{A}$, 1 pulse

■ Electrical Characteristics ($T_C = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Drain to Source cut-off current	I_{DSS}	$V_{DS} = 50\text{V}$, $V_{GS} = 0$			10	μA
Gate to Source leakage current	I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0$			± 10	μA
Drain to Source breakdown voltage	V_{DSS}	$I_D = 1\text{mA}$, $V_{GS} = 0$	60			V
Gate threshold voltage	V_{th}	$V_{DS} = 10\text{V}$, $I_D = 1\text{mA}$	1		2.5	V
Drain to Source ON-resistance	$R_{DS(on)1}$	$V_{GS} = 10\text{V}$, $I_D = 10\text{A}$		32	60	$\text{m}\Omega$
	$R_{DS(on)2}$	$V_{GS} = 4\text{V}$, $I_D = 6\text{A}$		42	80	$\text{m}\Omega$
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 10\text{V}$, $I_D = 10\text{A}$	7	13		S
Diode forward voltage	V_{DSF}	$I_{DR} = 10\text{A}$, $V_{GS} = 0$			-1.3	V
Input capacitance (Common Source)	C_{iss}	$V_{DS} = 10\text{V}$, $V_{GS} = 0$, $f = 1\text{MHz}$		330		pF
Output capacitance (Common Source)	C_{oss}			290		pF
Reverse transfer capacitance (Common Source)	C_{rss}			70		pF
Turn-on time (delay time)	$t_{d(on)}$	$V_{DD} = 30\text{V}$, $I_D = 10\text{A}$ $V_{GS} = 10\text{V}$, $R_L = 3\Omega$		20		ns
Rise time	t_r			150		ns
Fall time	t_f			500		ns
Turn-off time (delay time)	$t_{d(off)}$			1350		ns
Thermal resistance between channel and case	$R_{th(ch-c)}$				8.33	$^\circ\text{C/W}$
Thermal resistance between channel and atmosphere	$R_{th(ch-a)}$				62.5	$^\circ\text{C/W}$

