

# 2SK3044

## Silicon N-Channel Power F-MOS FET

### ■ Features

- Avalanche energy capacity guaranteed: EAS > 130mJ
- $V_{GSS} = \pm 30V$  guaranteed
- High-speed switching:  $t_f = 50ns$
- No secondary breakdown

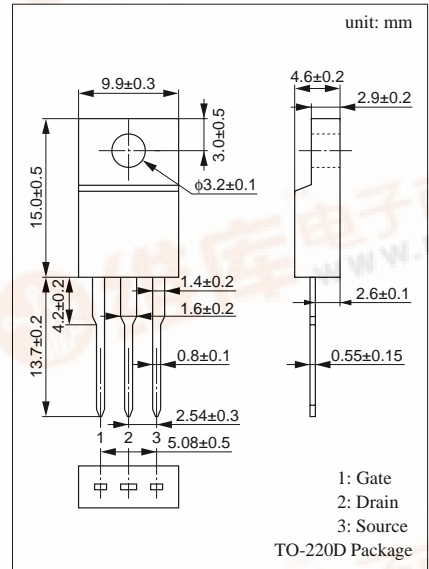
### ■ Applications

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

### ■ Absolute Maximum Ratings ( $T_C = 25^\circ C$ )

Parameter	Symbol	Rated	Unit	
Drain to Source breakdown voltage	$V_{DSS}$	450	V	
Gate to Source voltage	$V_{GSS}$	$\pm 30$	V	
Drain current	DC	$I_D$	$\pm 7$	A
	Pulse	$I_{DP}$	$\pm 14$	A
Avalanche energy capacity	EAS*	100	mJ	
Allowable power dissipation	$T_C = 25^\circ C$	$P_D$	40	W
	$T_a = 25^\circ C$		2	
Channel temperature	$T_{ch}$	150	$^\circ C$	
Storage temperature	$T_{stg}$	-55 to +150	$^\circ C$	

\*  $L = 4.1mH, I_L = 8A, V_{DD} = 50V, 1 \text{ pulse}$

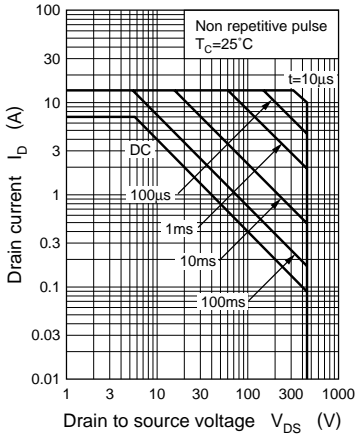


### ■ Electrical Characteristics ( $T_C = 25^\circ C$ )

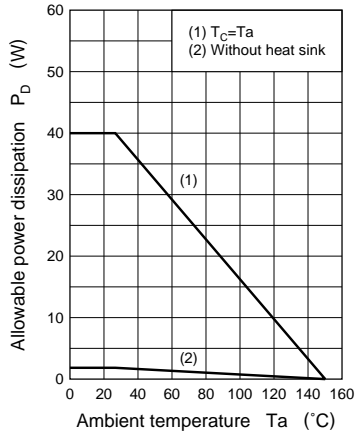
Parameter	Symbol	Conditions	min	typ	max	Unit	
Drain to Source cut-off current	$I_{DSS}$	$V_{DS} = 360V, V_{GS} = 0$			0.1	mA	
Gate to Source leakage current	$I_{GSS}$	$V_{GS} = \pm 30V, V_{DS} = 0$			$\pm 1$	$\mu A$	
Drain to Source breakdown voltage	$V_{DSS}$	$I_D = 1mA, V_{GS} = 0$	450			V	
Gate threshold voltage	$V_{th}$	$V_{DS} = 25V, I_D = 1mA$	2		5	V	
Drain to Source ON-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 4A$		0.56	0.75	$\Omega$	
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 25V, I_D = 4A$	3	5		S	
Diode forward voltage	$V_{DSF}$	$I_{DR} = 8A, V_{GS} = 0$			-1.7	V	
Input capacitance (Common Source)	$C_{iss}$	$V_{DS} = 20V, V_{GS} = 0, f = 1MHz$		1300		pF	
Output capacitance (Common Source)	$C_{oss}$				160		pF
Reverse transfer capacitance (Common Source)	$C_{rss}$				70		pF
Turn-on time (delay time)	$t_{d(on)}$	$V_{GS} = 10V, I_D = 4A$ $V_{DD} = 150V, R_L = 37.5\Omega$		25		ns	
Rise time	$t_r$			45		ns	
Turn-off time (delay time)	$t_{d(off)}$			150		ns	
Fall time	$t_f$			50		ns	



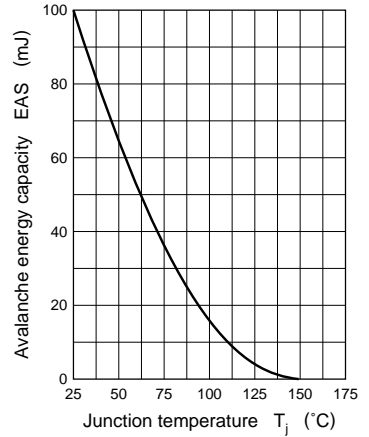
Area of safe operation (ASO)



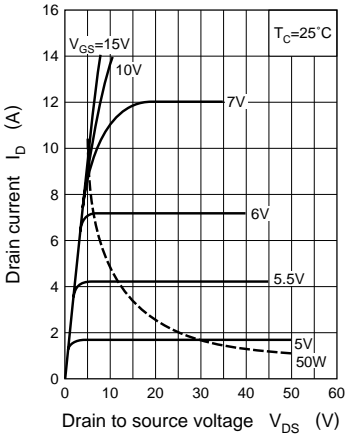
$P_D - T_a$



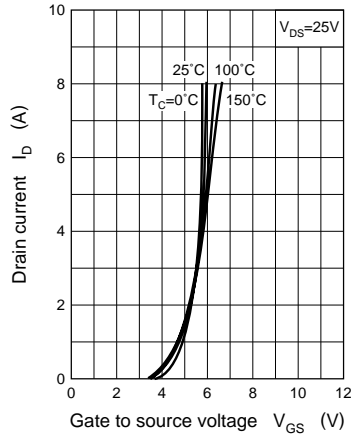
EAS —  $T_j$



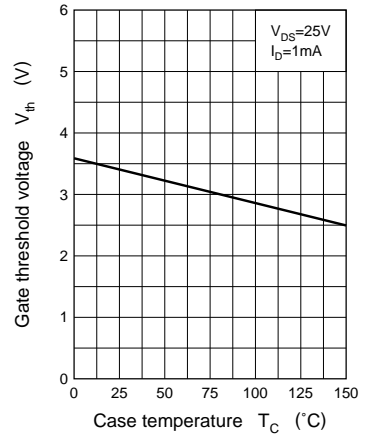
$I_D - V_{DS}$



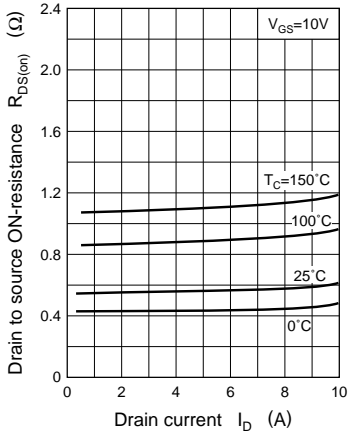
$I_D - V_{GS}$



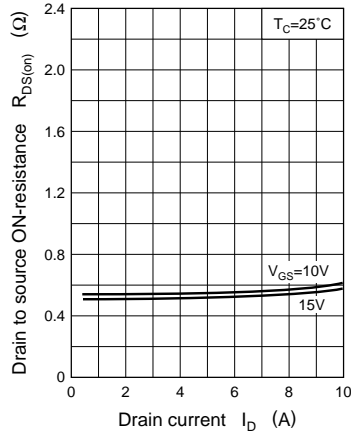
$V_{th} - T_C$



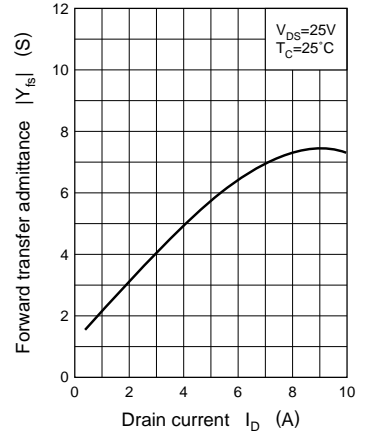
$R_{DS(on)} - I_D$



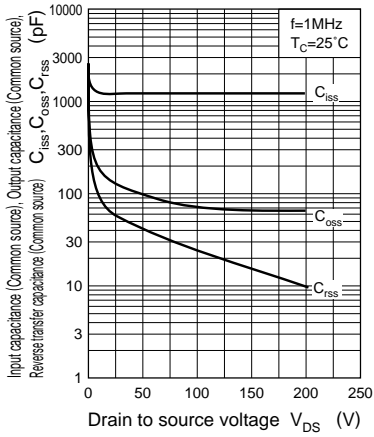
$R_{DS(on)} - I_D$



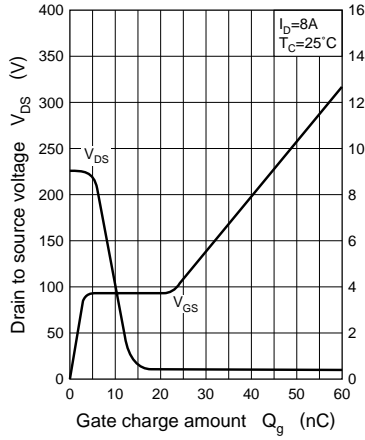
$|Y_{fs}| - I_D$



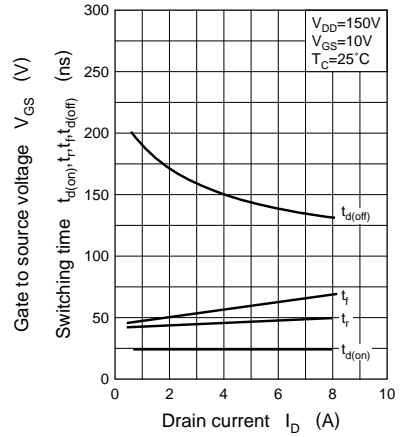
$C_{iss}, C_{oss}, C_{rss} - V_{DS}$



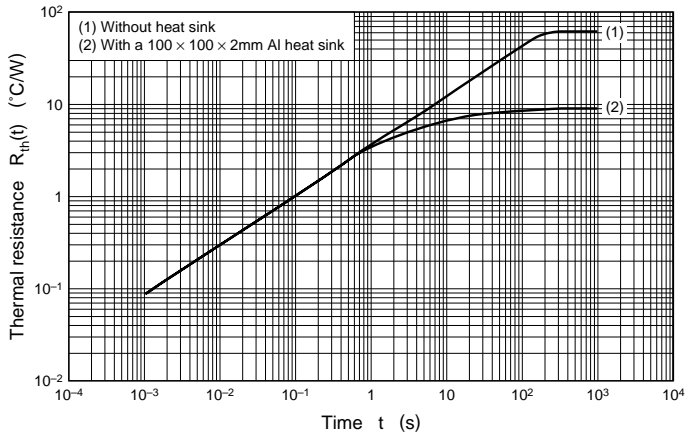
$V_{DS}, V_{GS} - Q_g$



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



$R_{th(t)} - t$



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