

# 2SK3046

## Silicon N-Channel Power F-MOS FET

### ■ Features

- Avalanche energy capacity guaranteed: EAS > 130mJ
- $V_{GSS} = \pm 30V$  guaranteed
- High-speed switching:  $t_f = 60ns$
- No secondary breakdown

### ■ Applications

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

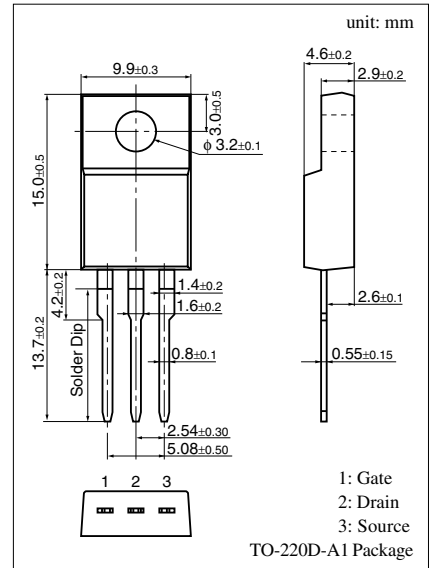
### ■ Absolute Maximum Ratings ( $T_C = 25^\circ C$ )

Parameter	Symbol	Ratings	Unit
Drain to Source breakdown voltage	$V_{DSS}$	500	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*	130	mJ
Allowable power dissipation	$T_C = 25^\circ C$	$P_D$	40
	$T_a = 25^\circ C$		2
Channel temperature	$T_{ch}$	150	$^\circ C$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ C$

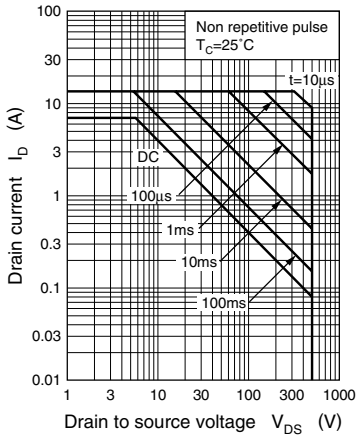
\*  $L = 5.4mH$ ,  $I_L = 7A$ , 1 pulse

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

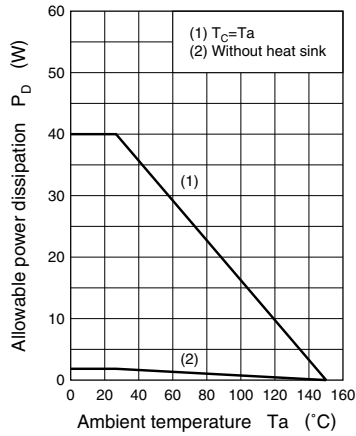
Parameter	Symbol	Conditions	min	typ	max	Unit	
Drain to Source cut-off current	$I_{DSS}$	$V_{DS} = 400V$ , $V_{GS} = 0$			0.1	mA	
Gate to Source leakage current	$I_{GSS}$	$V_{GS} = \pm 30V$ , $V_{DS} = 0$			$\pm 1$	$\mu A$	
Drain to Source breakdown voltage	$V_{DSS}$	$I_D = 1mA$ , $V_{GS} = 0$	500			V	
Gate threshold voltage	$V_{th}$	$V_{DS} = 25V$ , $I_D = 1mA$	2		5	V	
Drain to Source ON-resistance	$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 4A$		0.7	1	$\Omega$	
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 25V$ , $I_D = 4A$	3	5		S	
Diode forward voltage	$V_{DSF}$	$I_{DR} = 7A$ , $V_{GS} = 0$			-1.6	V	
Input capacitance (Common Source)	$C_{iss}$	$V_{DS} = 20V$ , $V_{GS} = 0$ , $f = 1MHz$		1200		pF	
Output capacitance (Common Source)	$C_{oss}$			160		pF	
Reverse transfer capacitance (Common Source)	$C_{rss}$			70		pF	
Turn-on time (delay time)	$t_{d(on)}$	$V_{GS} = 10V$ , $I_D = 5A$		30		ns	
Rise time	$t_r$			70		ns	
Turn-off time (delay time)	$t_{d(off)}$		$V_{DD} = 150V$ , $R_L = 30\Omega$		140		ns
Fall time	$t_f$				60		ns



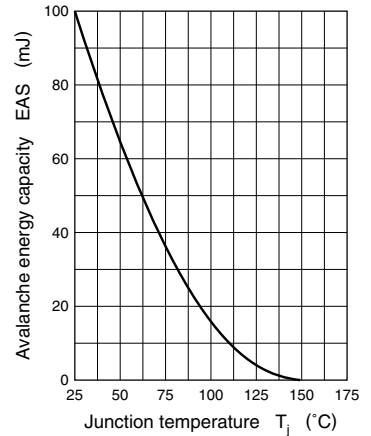
Area of safe operation (ASO)



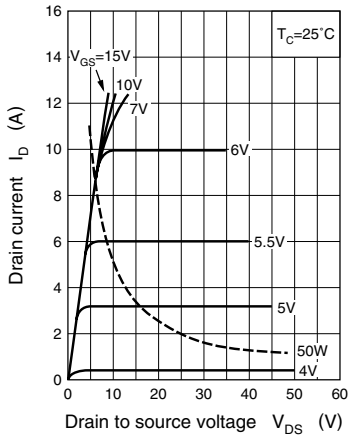
$P_D - T_a$



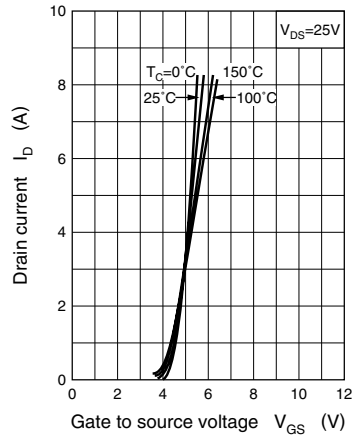
EAS —  $T_j$



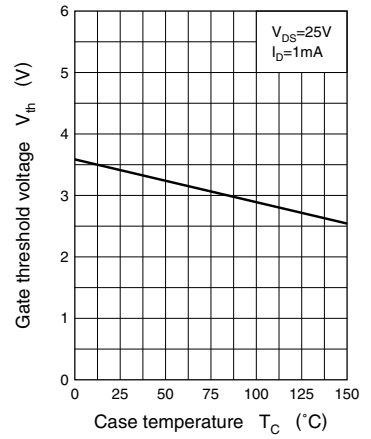
$I_D - V_{DS}$



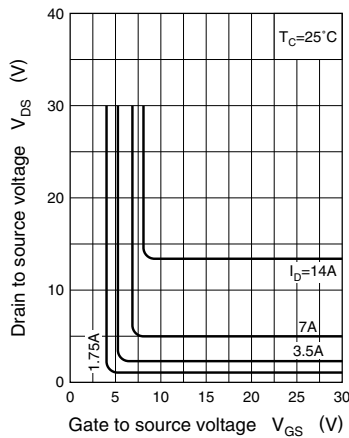
$I_D - V_{GS}$



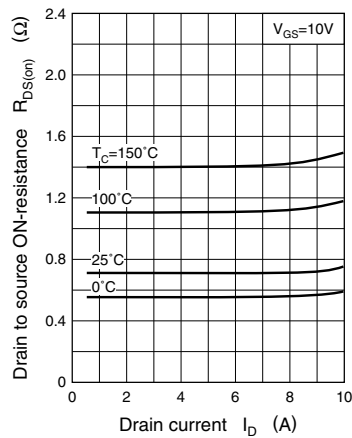
$V_{th} - T_C$



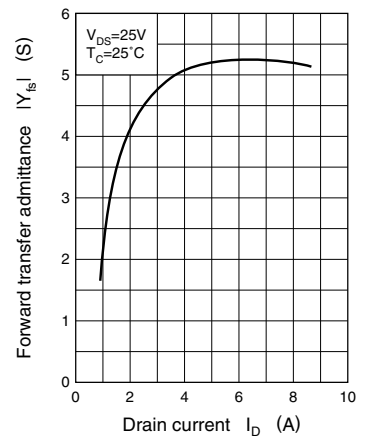
$V_{DS} - V_{GS}$

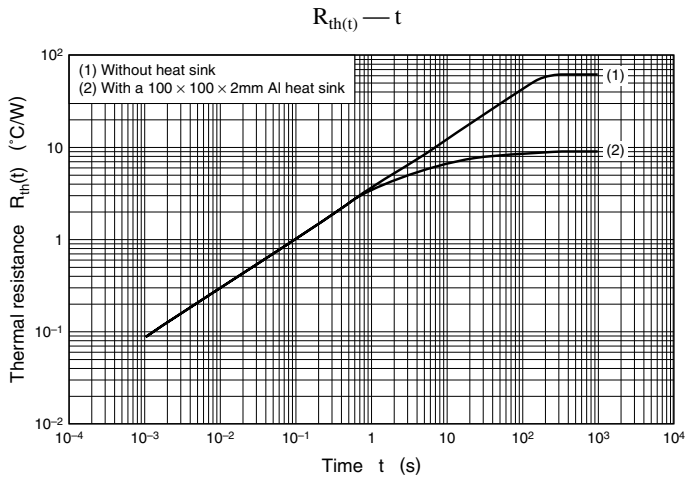
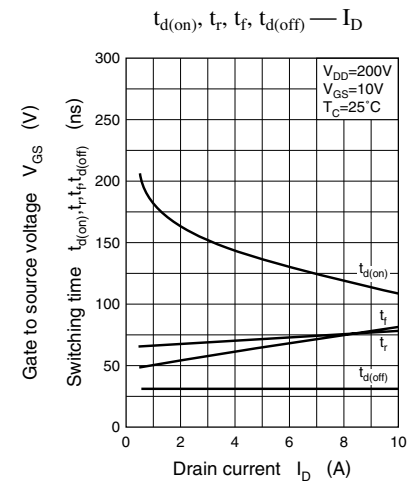
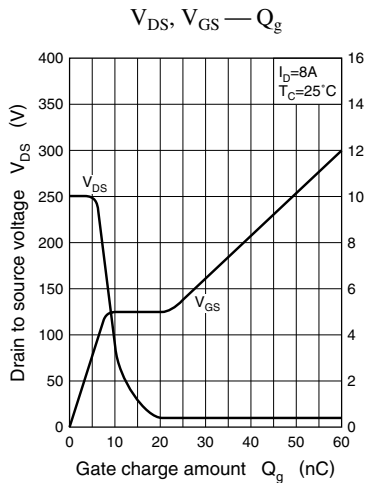
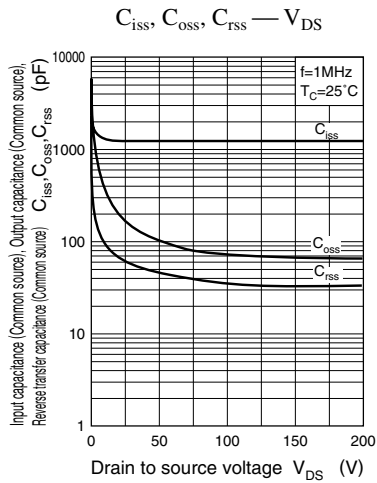


$R_{DS(on)} - I_D$



$|Y_{fs}| - I_D$





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