

# 2SK3046

## Silicon N-channel power MOSFET

### ■ Features

- Avalanche energy capability guaranteed: EAS > 130 mJ
- Gate-source surrender voltage  $V_{GSS}$  :  $\pm 30$  V guaranteed
- High-speed switching
- No secondary breakdown

### ■ Applications

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

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

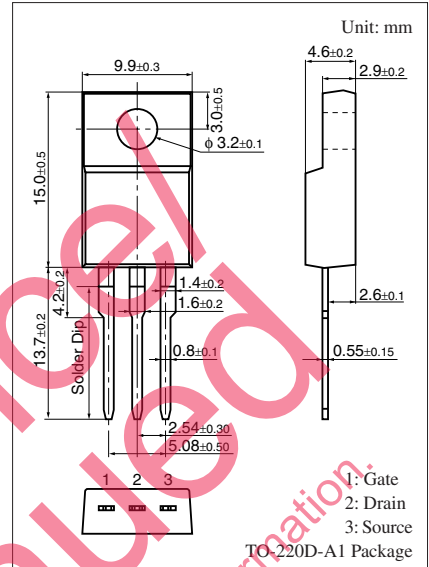
Parameter	Symbol	Rating	Unit
Drain-source surrender voltage	$V_{DSS}$	500	V
Gate-source surrender voltage	$V_{GSS}$	$\pm 30$	V
Drain current	$I_D$	$\pm 7$	A
Peak drain current	$I_{DP}$	$\pm 14$	A
Avalanche energy capability *	EAS	130	mJ
Power dissipation	$P_D$	40	W
	$T_a = 25^\circ\text{C}$	2	
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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

### ■ Electrical Characteristics $T_C = 25^\circ\text{C} \pm 3^\circ\text{C}$

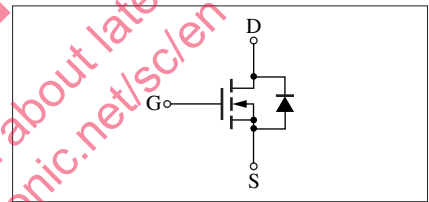
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-source surrender voltage	$V_{DSS}$	$I_D = 1$ mA, $V_{GS} = 0$	500			V
Drain-source cutoff current	$I_{DSS}$	$V_{DS} = 400$ V, $V_{GS} = 0$			100	$\mu\text{A}$
Gate-source cutoff current	$I_{GSS}$	$V_{GS} = \pm 30$ V, $V_{DS} = 0$			$\pm 1$	$\mu\text{A}$
Gate threshold voltage	$V_{th}$	$V_{DS} = 25$ V, $I_D = 1$ mA	2.0		5.0	V
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 25$ V, $I_D = 4$ A	3.0	5.0		S
Drain-source ON resistance	$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 4$ A		0.7	1.0	$\Omega$
Diode forward voltage	$V_{DF}$	$I_{DR} = 7$ A, $V_{GS} = 0$			-1.6	V
Short-circuit forward transfer capacitance (Common source)	$C_{iss}$	$V_{DS} = 20$ V, $V_{GS} = 0$ , $f = 1$ MHz		1200		pF
Short-circuit output capacitance (Common source)	$C_{oss}$			160		pF
Reverse transfer capacitance (Common source)	$C_{rss}$			70		pF
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 150$ V, $I_D = 5$ A, $R_L = 30$ $\Omega$		30		ns
Rise time	$t_r$	$V_{GS} = 10$ V		70		ns
Fall time	$t_f$			60		ns
Turn-off delay time	$t_{d(off)}$			140		ns
Thermal resistance (ch-c)	$R_{th(ch-c)}$				3.1	$^\circ\text{C/W}$
Thermal resistance (ch-a)	$R_{th(ch-a)}$				62.5	$^\circ\text{C/W}$

Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

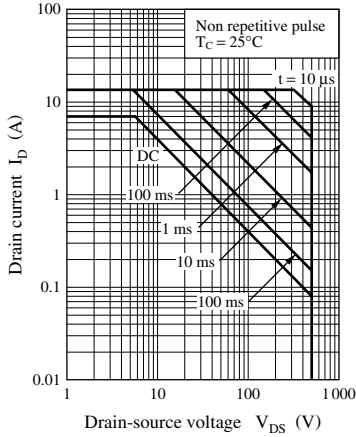


Marking Symbol: K3046

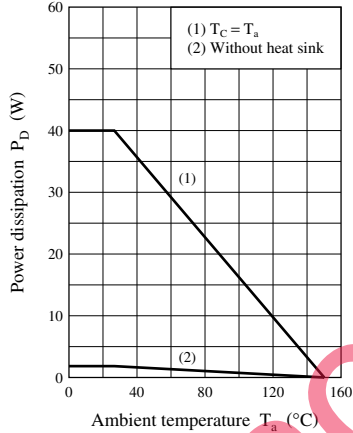
Internal Connection



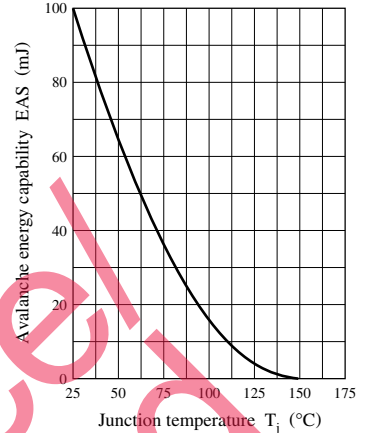
Safe operation area



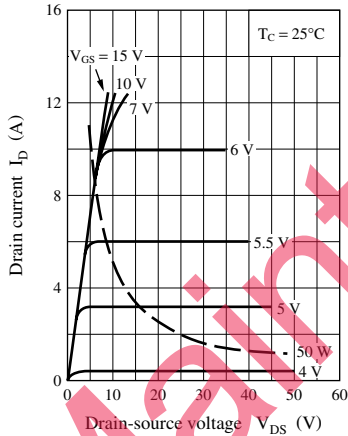
$P_D - T_a$



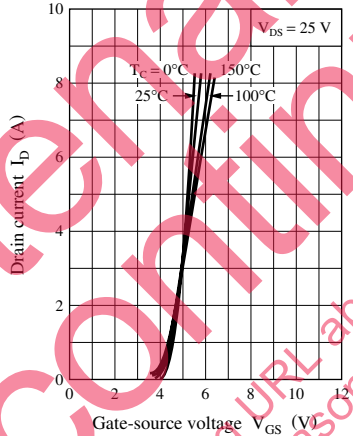
EAS —  $T_j$



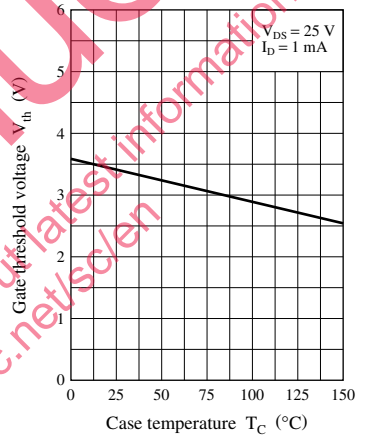
$I_D - V_{DS}$



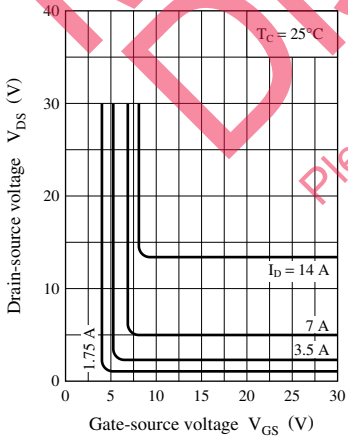
$I_D - V_{GS}$



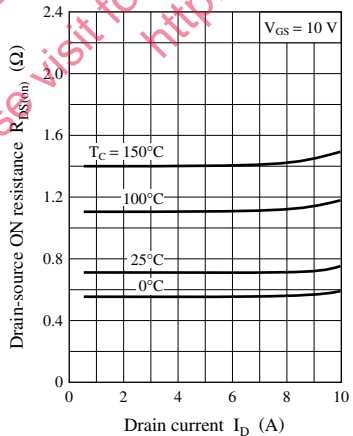
$V_{th} - T_C$



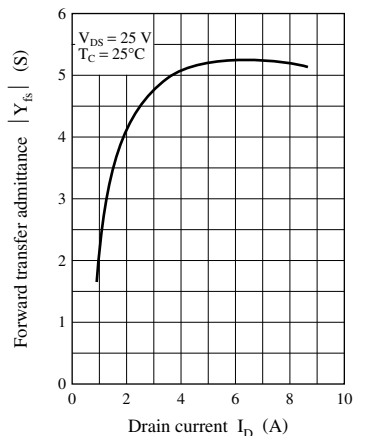
$V_{DS} - V_{GS}$

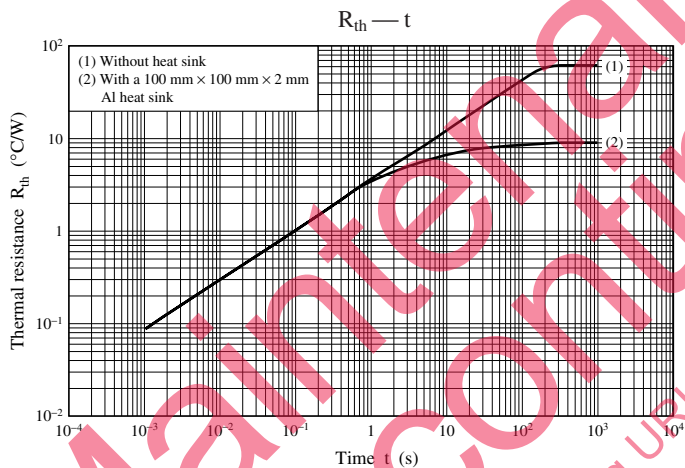
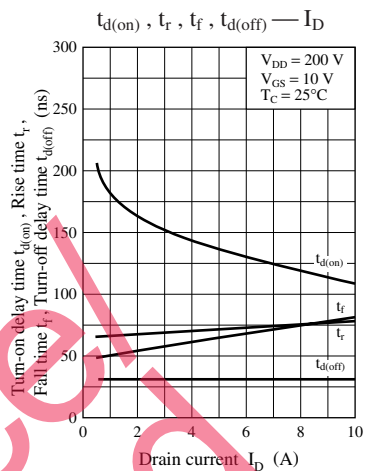
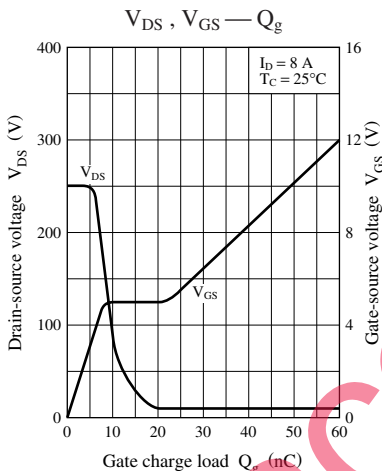
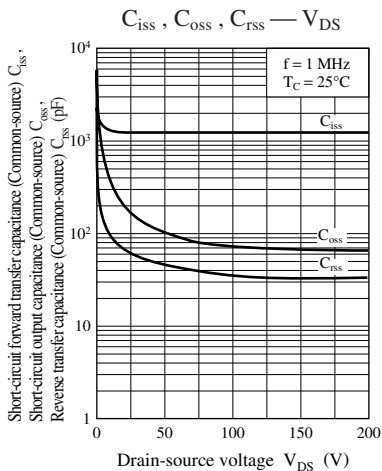


$R_{DS(on)} - I_D$



$|Y_{fs}| - I_D$





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