

# 2SK3892

## Silicon N-channel power MOSFET

For contactless relay, diving circuit for a solenoid, driving circuit for a motor, control equipment and switching power supply

### ■ Features

- Gate-source surrender voltage  $V_{GSS}$  :  $\pm 30$  guaranteed
- Avalanche energy capacity guaranteed: EAS > 986 mJ
- High-speed switching:  $t_f = 39$  ns

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

Parameter	Symbol	Rating	Unit
Drain-source surrender voltage	$V_{DSS}$	200	V
Gate-source surrender voltage	$V_{GSS}$	$\pm 30$	V
Drain current	$I_D$	22	A
Peak drain current	$I_{DP}$	88	A
Avalanche energy capability *	EAS	986	mJ
Drain power dissipation	$P_D$	40	W
$T_a = 25^\circ\text{C}$		2.0	W
Junction temperature	$T_j$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

Note) \*:  $L = 2.67$  mH,  $I_L = 22$  A,  $V_{DD} = 50$  V, 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, $V_{GS} = 0$	200			V
Drain-source cutoff current	$I_{DSS}$	$V_{DS} = 160$ V, $V_{GS} = 0$			10	$\mu\text{A}$
Gate-source cutoff current	$I_{GSS}$	$V_{GS} = \pm 30$ V, $V_{DS} = 0$			$\pm 1.0$	$\mu\text{A}$
Gate threshold voltage	$V_{th}$	$V_{DS} = 10$ V, $I_D = 1.0$ mA	2.5		4.5	V
Drain-source ON resistance	$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 11.0$ A		48	62	$\text{m}\Omega$
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 10$ V, $I_D = 11.0$ A	7	15		S
Short-circuit input capacitance (Common source)	$C_{iss}$	$V_{DS} = 25$ V, $V_{GS} = 0$ , $f = 1$ MHz		3177		pF
Short-circuit output capacitance (Common source)	$C_{oss}$			456		pF
Reverse transfer capacitance (Common source)	$C_{rss}$			41		pF
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 100$ V, $I_D = 11.0$ A $R_L = 9.1 \Omega$ , $V_{GS} = 10$ V		54		ns
Rise time	$t_r$			60		ns
Turn-off delay time	$t_{d(off)}$			194		ns
Fall time	$t_f$			39		ns

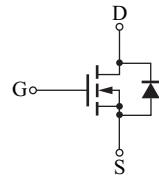
Note) Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

### ■ Package

- Code TO-220D-A1
- Pin Name
  - 1: Gate
  - 2: Drain
  - 3: Source

### ■ Marking Symbol: K3892

### ■ Internal Connection



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

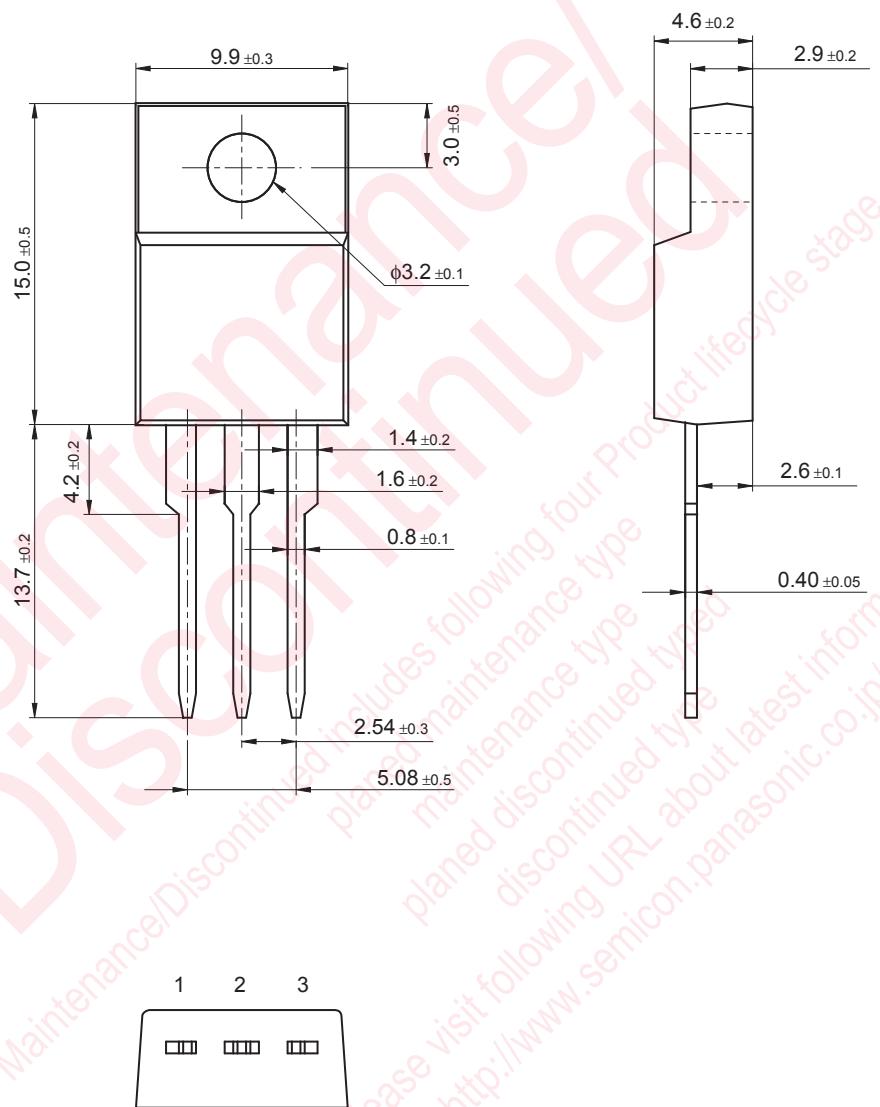
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode forward voltage	$V_{DSF}$	$I_{DR} = 22 \text{ A}, V_{GS} = 0$			-1.5	V
Reverse recovery time	$t_{rr}$	$L = 230 \mu\text{H}, V_{DD} = 100 \text{ V}$		127		ns
Reverse recovery charge	$Q_{rr}$	$I_{DR} = 11.0 \text{ A}, d_i/d_t = 100 \text{ A}/\mu\text{s}$		756		nC
Gate charge load	$Q_g$	$V_{DD} = 100 \text{ V}, I_D = 11.0 \text{ A}, V_{GS} = 10 \text{ V}$		50		nC
Gate-source charge	$Q_{gs}$			12		nC
Gate-drain charge	$Q_{gd}$			18		nC
Thermal resistance (ch-c)	$R_{th(ch-c)}$				3.13	°C/W
Thermal resistance (ch-a)	$R_{th(ch-a)}$				62.5	°C/W

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

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**TO-220D-A1**

Unit: mm



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