

## 2SK1093

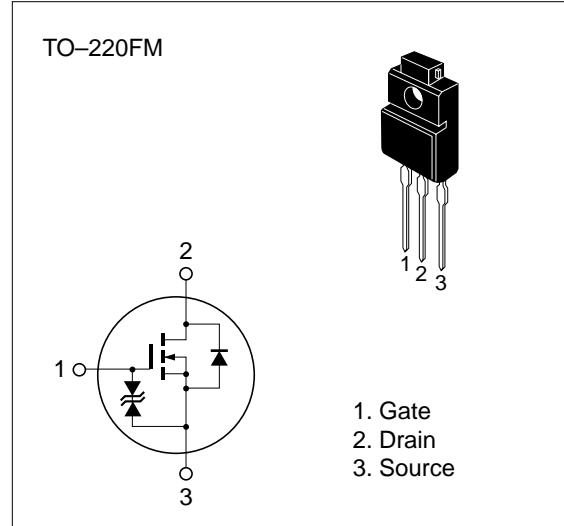
### Silicon N-Channel MOS FET

#### Application

High speed power switching

#### Features

- Low on-resistance
- High speed switching
- Low drive current
- 4 V gate drive device  
– Can be driven from 5 V source
- Suitable for motor drive, DC-DC converter, power switch and solenoid drive



**Table 1 Absolute Maximum Ratings** ( $T_a = 25^\circ\text{C}$ )

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	60	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	V
Drain current	$I_D$	10	A
Drain peak current	$I_{D(\text{pulse})}^*$	40	A
Body to drain diode reverse drain current	$I_{DR}$	10	A
Channel dissipation	$P_{ch}^{**}$	20	W
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*  $PW \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$

\*\* Value at  $T_C = 25^\circ\text{C}$

**Table 2 Electrical Characteristics** (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	$I_G = \pm 100 \mu\text{A}, V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	250	μA	$V_{DS} = 50 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	$I_D = 1 \text{ mA}, V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.12	0.15	Ω	$I_D = 5 \text{ A}, V_{GS} = 10 \text{ V}^*$
			0.17	0.22		$I_D = 5 \text{ A}, V_{GS} = 4 \text{ V}^*$
Forward transfer admittance	$ y_{fs} $	3.5	6.0	—	S	$I_D = 5 \text{ A}, V_{DS} = 10 \text{ V}^*$
Input capacitance	$C_{iss}$	—	400	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$
Output capacitance	$C_{oss}$	—	220	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance	$C_{rss}$	—	60	—	pF	
Turn-on delay time	$t_{d(on)}$	—	5	—	ns	$I_D = 5 \text{ A}, V_{GS} = 10 \text{ V},$
Rise time	$t_r$	—	55	—	ns	$R_L = 6 \Omega$
Turn-off delay time	$t_{d(off)}$	—	140	—	ns	
Fall time	$t_f$	—	90	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	1.2	—	V	$I_F = 10 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	125	—	ns	$I_F = 10 \text{ A}, V_{GS} = 0,$ $di_F/dt = 50 \text{ A}/\mu\text{s}$

\* Pulse Test

See characteristic curves of 2SK970.

