

# 2SK1379

FIELD EFFECT TRANSISTOR

SILICON N CHANNEL MOS TYPE (L<sup>2</sup>-π-MOSIII)

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.  
RELAY DRIVE, MOTOR DRIVE AND DC-DC CONVERTER APPLICATIONS.

INDUSTRIAL APPLICATIONS

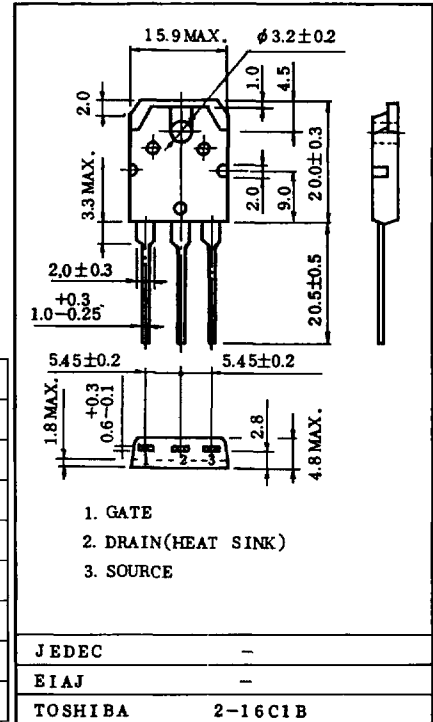
Unit in mm

**FEATURES:**

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance :  $R_{DS(ON)}=11m\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 35S$  (Typ.)
- Low Leakage Current :  $I_{DSS}= 100\mu A$  (Max.) @  $V_{DS}=60V$
- Enhancement-Mode :  $V_{th}=0.8\sim 2.0V$  @  $V_{DS}=10V, I_D = 1mA$

**MAXIMUM RATINGS (Ta =25 °C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DSS}$	60	V
Drain-Gate Voltage (RGS=20kΩ)	$V_{DGR}$	60	V
Gate-Source Voltage	$V_{GSS}$	±20	V
Drain Current	DC	$I_D$	50 A
	Pulse	$I_{DP}$	200 A
Drain Power Dissipation (Tc=25°C)	PD	150	W
Channel Temperature	Tch	150	°C
Storage Temperature Range	Tstg	-55~150	°C



Weight : 4.6g

**THERMAL CHARACTERISTICS**

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Impedance, Channel to Case	$R_{th(ch-c)}$	0.833	°C/W
Thermal Impedance, Channel To Ambient	$R_{th(ch-a)}$	50	°C/W

ELECTRICAL CHARACTERISTICS (Ta=25 °C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current		I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> =0V	—	—	±100	nA	
Drain Cut-off Current		I <sub>DSS</sub>	V <sub>DS</sub> = 60V, V <sub>GS</sub> =0V	—	—	100	μA	
Drain-Source Breakdown Voltage		V(BR)DSS	I <sub>D</sub> =10mA, V <sub>GS</sub> =0V	60	—	—	V	
Gate Threshold Voltage		V <sub>th</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	0.8	—	2.0	V	
Drain-Source ON Resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> = 4V, I <sub>D</sub> =25A	—	16	25	mΩ	
			V <sub>GS</sub> =10V, I <sub>D</sub> =25A	—	11	17		
Forward Transfer Admittance		Y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =25A	25	35	—	S	
Input Capacitance		C <sub>iss</sub>	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, f=1MHz	—	3600	4500	pF	
Reverse Transfer Capacitance		C <sub>rss</sub>		—	1000	1400		
Output Capacitance		C <sub>oss</sub>		—	2800	3600		
Switching Time	Rise Time	t <sub>r</sub>	<p>V<sub>GS</sub> 10V 0V 4.7Ω I<sub>D</sub>=25A V<sub>OUT</sub> R<sub>L</sub>= 1.2Ω V<sub>IN</sub>: tr, tf &lt; 5ns, Duty ≤ 1%, tw=10μs V<sub>DD</sub>≅ 30V</p>	—	24	48	ns	
	Turn-on Time	t <sub>on</sub>		—	54	100		
	Fall Time	t <sub>f</sub>		—	—	170		340
	Turn-off Time	t <sub>off</sub>		—	—	470		800
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q <sub>g</sub>	V <sub>DD</sub> ≅ 48V, V <sub>GS</sub> =10V, I <sub>D</sub> =50A	—	170	340	nC	
Gate-Source Charge		Q <sub>gs</sub>		—	104	—		
Gate-Drain( " Miller" )Charge		Q <sub>gd</sub>		—	66	—		

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS(Ta=25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I <sub>DR</sub>	----	—	—	50	A
Pulse Drain Reverse Current	I <sub>DRP</sub>	----	—	—	200	A
Diode Forward Voltage	V <sub>DSF</sub>	I <sub>DR</sub> =50A, V <sub>GS</sub> =0V	—	-1.0	-1.6	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>DR</sub> =50A, V <sub>GS</sub> =0V	—	250	—	ns
Reverse Recovered Charge	Q <sub>rr</sub>	d I <sub>DR</sub> /dt = 50A/μs	—	0.5	—	μC