

**TOSHIBA**

**2SJ439**

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE ( $\pi$ -MOS V)

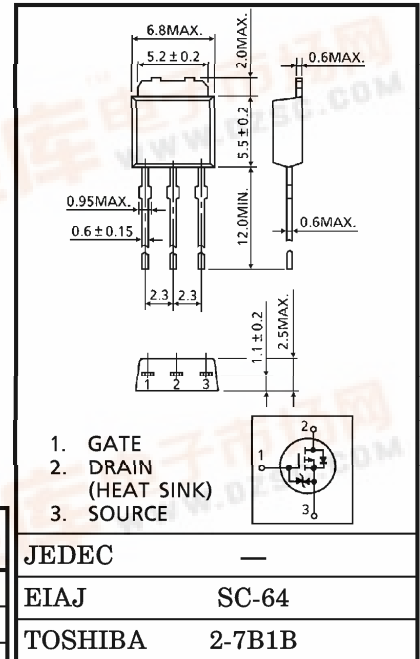
# 2SJ439

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

INDUSTRIAL APPLICATIONS

Unit in mm

- 2.5V Gate Drive
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 0.18\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 6.0S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = -100\mu A$  (Max.) ( $V_{DS} = -16V$ )
- Enhancement-Mode :  $V_{th} = -0.5 \sim -1.1V$   
( $V_{DS} = -10V, I_D = -1mA$ )



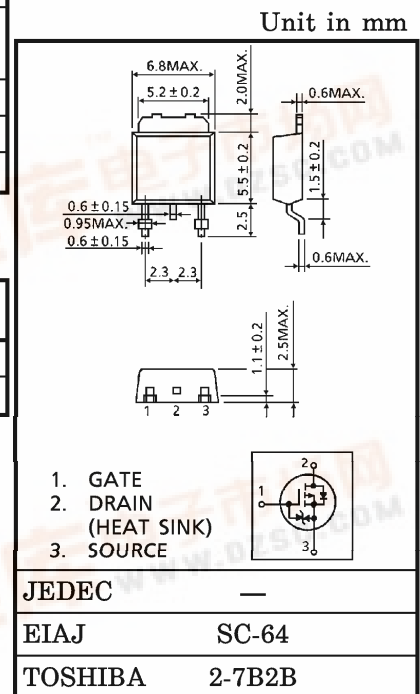
MAXIMUM RATINGS ( $T_a = 25^\circ C$ )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DSS}$	-16	V
Drain-Gate Voltage ( $R_{GS} = 20k\Omega$ )	$V_{DGR}$	-16	V
Gate-Source Voltage	$V_{GSS}$	$\pm 8$	V
Drain Current	DC	$I_D$	-5
	Pulse	$I_{DP}$	-20
Drain Power Dissipation ( $T_c = 25^\circ C$ )	$P_D$	20	W
Channel Temperature	$T_{ch}$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55~150	$^\circ C$

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	6.25	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	125	$^\circ C/W$

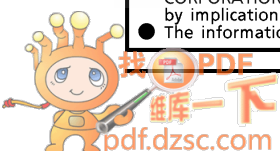
This transistor is an electrostatic sensitive device.  
Please handle with caution.



Weight : 0.36g

961001EAA2

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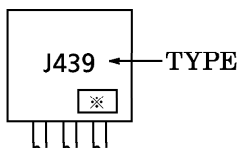
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I <sub>GSS</sub>	V <sub>GS</sub> = ±6.5V, V <sub>DS</sub> = 0V	—	—	±10	μA
Drain Cut-off Current		I <sub>DSS</sub>	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V	—	—	-100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	I <sub>D</sub> = -10mA, V <sub>GS</sub> = 0V	-16	—	—	V
Gate Threshold Voltage		V <sub>th</sub>	V <sub>DS</sub> = -10V, I <sub>D</sub> = -1mA	-0.5	—	-1.1	V
Drain-Source ON Resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2.5A	—	0.18	0.28	Ω
			V <sub>GS</sub> = -4V, I <sub>D</sub> = -2.5A	—	0.14	0.2	
Forward Transfer Admittance		Y <sub>fs</sub>	V <sub>DS</sub> = -10V, I <sub>D</sub> = -2.5A	3.0	6.0	—	S
Input Capacitance		C <sub>iss</sub>	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V, f = 1MHz	—	1050	—	pF
Reverse Transfer Capacitance		C <sub>rss</sub>		—	120	—	
Output Capacitance		C <sub>oss</sub>		—	460	—	
Switching Time	Rise Time	t <sub>r</sub>	<p>V<sub>GS</sub> 0V, -5V I<sub>D</sub> = -2.5A R<sub>L</sub> = 3.2Ω V<sub>DD</sub> ≐ -8V</p>	—	80	—	ns
	Turn-on Time	t <sub>on</sub>		—	100	—	
	Fall Time	t <sub>f</sub>		—	250	—	
	Turn-off Time	t <sub>off</sub>		V <sub>IN</sub> : t <sub>r</sub> , t <sub>f</sub> < 5ns, Duty ≤ 1%, t <sub>w</sub> = 10μs	—	550	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q <sub>g</sub>	V <sub>DD</sub> ≐ -16V, V <sub>GS</sub> = -5V, I <sub>D</sub> = -5A	—	24	—	nC
Gate-Source Charge		Q <sub>gs</sub>		—	16	—	
Gate-Drain ("Miller") Charge		Q <sub>gd</sub>		—	8	—	

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>	—	—	—	-5	A
Pulse Drain Reverse Current	I <sub>DRP</sub>	—	—	—	-20	A
Diode Forward Voltage	V <sub>DSF</sub>	I <sub>DR</sub> = -5A, V <sub>GS</sub> = 0V	—	—	1.7	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>DR</sub> = -5A, V <sub>GS</sub> = 0V	—	120	—	ns
Reverse Recovered Charge	Q <sub>rr</sub>	dI <sub>DR</sub> / dt = 50A / μs	—	0.12	—	μC

MARKING



※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)

