

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE ( $\pi$ -MOSVI)**2SK2989**

## HIGH SPEED SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

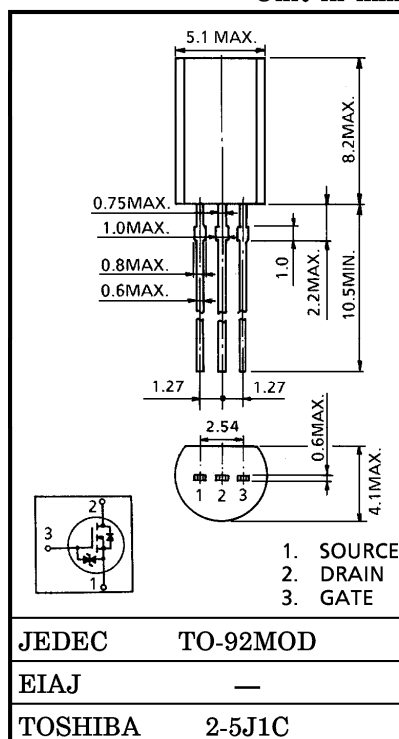
## INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 120\text{ m}\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 2.6\text{ S}$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100\text{ }\mu\text{A}$  ( $V_{DS} = 50\text{ V}$ )
- Enhancement-Mode :  $V_{th} = 1.0\sim 2.2\text{ V}$  ( $V_{DS} = 10\text{ V}$ ,  $I_D = 1\text{ mA}$ )

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DSS}$	50	V
Drain-Gate Voltage ( $R_{GS} = 20\text{ k}\Omega$ )		$V_{DGR}$	50	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	5	A
	Pulse	$I_{DP}$	15	
Drain Power Dissipation ( $T_a = 25^\circ\text{C}$ )		$P_D$	0.9	W
Channel Temperature		$T_{ch}$	150	$^\circ\text{C}$
Storage Temperature Range		$T_{stg}$	$-55\sim 150$	$^\circ\text{C}$



## THERMAL CHARACTERISTICS

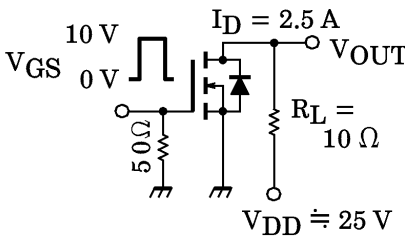
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	138	$^\circ\text{C/W}$

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

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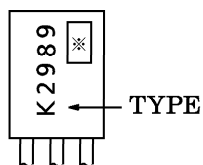
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GSS}$	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0 \text{ V}$	—	—	$\pm 10$	$\mu\text{A}$
Drain Cut-off Current		$I_{DSS}$	$V_{DS} = 50 \text{ V}, V_{GS} = 0 \text{ V}$	—	—	100	$\mu\text{A}$
Drain-Source Breakdown Voltage		$V_{(BR) DSS}$	$I_D = 10 \text{ mA}, V_{GS} = 0 \text{ V}$	50	—	—	V
Gate Threshold Voltage		$V_{th}$	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$	0.8	—	2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 4 \text{ V}, I_D = 1.3 \text{ A}$	—	240	330	m $\Omega$
			$V_{GS} = 10 \text{ V}, I_D = 2.5 \text{ A}$	—	120	150	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10 \text{ V}, I_D = 2.5 \text{ A}$	1.3	2.6	—	S
Input Capacitance		$C_{iss}$	$V_{DS} = 10 \text{ V}, V_{GS} = 0 \text{ V}$ $f = 1 \text{ MHz}$	—	145	—	pF
Reverse Transfer Capacitance		$C_{rss}$		—	25	—	
Output Capacitance		$C_{oss}$		—	75	—	
Switching Time	Rise Time	$t_r$		—	16	—	ns
	Turn-on Time	$t_{on}$		—	23	—	
	Fall Time	$t_f$		—	27	—	
	Turn-off Time	$t_{off}$		—	110	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		$Q_g$	$V_{DD} \doteq 40 \text{ V}, V_{GS} = 10 \text{ V}$ $I_D = 5 \text{ A}$	—	6.5	—	nC
Gate-Source Charge		$Q_{gs}$		—	5	—	
Gate-Drain ("Miller") Charge		$Q_{gd}$		—	1.5	—	


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


CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	$I_{DR}$	—	—	—	5	A
Pulse Drain Reverse Current	$I_{DRP}$	—	—	—	15	A
Diode Forward Voltage	$V_{DSF}$	$I_{DR} = 5 \text{ A}, V_{GS} = 0 \text{ V}$	—	—	−1.5	V

## MARKING



※ Lot Number


 Month (Starting from Alphabet A)


 Year (Last Number of the Christian Era)