

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L<sup>2</sup>-π-MOS V)

# 2SK2961

HIGH SPEED SWITCHING APPLICATIONS

RELAY DRIVE, MOTOR DRIVE AND DC-DC CONVERTER APPLICATION

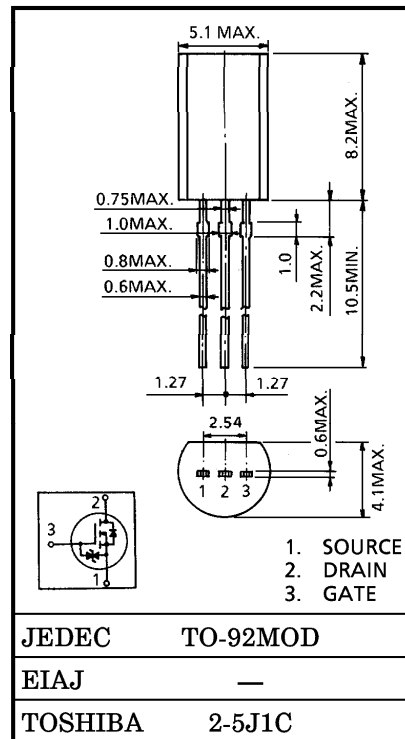
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 0.2\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 2.0S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100\mu A$  ( $V_{DS} = 60V$ )
- 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 ( $R_{GS} = 20k\Omega$ )		$V_{DGR}$	60	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	2.0	A
	Pulse	$I_{DP}$	6.0	
Drain Power Dissipation		$P_D$	0.9	W
Channel Temperature		$T_{ch}$	150	°C
Storage Temperature Range		$T_{stg}$	-55~150	°C



THERMAL CHARACTERISTICS

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

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

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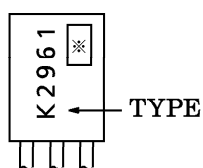
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 60V, VGS = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10mA, VGS = 0V	60	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	0.8	—	2.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = 4V, ID = 1.0A	—	0.26	0.38	Ω
			VGS = 10V, ID = 1.0A	—	0.20	0.27	
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 1.0A	1.0	2.0	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V f = 1MHz	—	170	—	pF
Reverse Transfer Capacitance		Crss		—	25	—	
Output Capacitance		Coss		—	75	—	
Switching Time	Rise Time	tr	<p> <math>I_D = 1A</math>  <math>V_{GS} = 10V, 0V</math>  <math>R_L = 30\Omega</math>  <math>V_{DD} = 30V</math> </p>	—	10	—	ns
	Turn-on Time	ton		—	15	—	
	Fall Time	tf		—	50	—	
	Turn-off Time	t <sub>off</sub>		$V_{IN} : t_r, t_f < 5ns,$ $Duty \leq 1\%, t_w = 10\mu s$	—	170	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD = 48V, VGS = 10V	—	5.8	—	nC
Gate-Source Charge		Qgs	ID = 2A	—	4.1	—	
Gate-Drain ("Miller") Charge		Qgd		—	1.7	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	2.0	A
Pulse Drain Reverse Current	IDRP	—	—	—	6.0	A
Diode Forward Voltage	VDSF	IDR = 2A, VGS = 0V	—	—	-1.5	V
Reverse Recovery Time	t <sub>rr</sub>	IDR = 2A, VGS = 0V	—	45	—	ns
Reverse Recovery Charge	Q <sub>rr</sub>	dIDR / dt = 50A / μs	—	40.5	—	nC

MARKING



※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)

