

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L²-π-MOSIII)

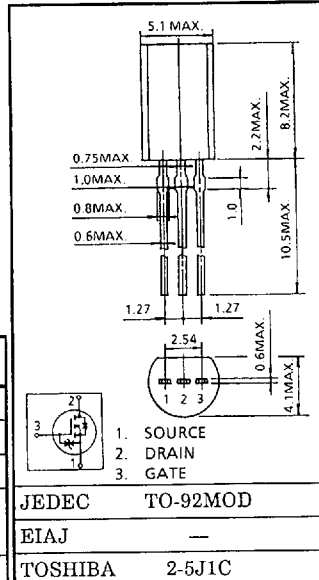
2SK940

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

INDUSTRIAL APPLICATIONS

Unit in mm

- 4-Volt Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.4\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 0.75S$ (Typ.)
- Low Leakage Current : $I_{GSS} = \pm 3\mu A$ (Max.) @ $V_{GS} = \pm 16V$
 $I_{DSS} = 100\mu A$ (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 ($R_{GS} = 20k\Omega$)		V_{DGR}	60	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC	I_D	0.8	A
	Pulse	I_{DP}	2.4	
Drain Power Dissipation (Ta = 25°C)		P_D	0.9	W
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{slg}	-55 ~ 150	°C

JEDEC TO-92MOD

EIAJ --

TOSHIBA 2-5J1C

Weight : 0.36g

THERMAL CHARACTERISTICS

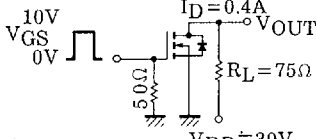
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	138	°C/W

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		I_{GSS}	$V_{GS} = \pm 16V, V_{DS} = 0V$	—	—	± 3	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V$	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0V$	60	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10V, I_D = 1mA$	0.8	—	2.0	V
ON State Drain Current		$I_{D(ON)}$	$V_{DS} = 4V, V_{GS} = 4V$	0.8	—	—	A
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 4V, I_D = 0.4A$	—	0.75	1.1	Ω
			$V_{GS} = 10V, I_D = 0.4A$	—	0.40	0.55	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10V, I_D = 0.4A$	0.50	0.75	—	S
Input Capacitance		C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$	—	95	140	pF
Reverse Transfer Capacitance		C_{rss}		—	25	50	
Output Capacitance		C_{oss}		—	65	110	
Switching Time	Rise Time	t_r	 <p>$V_{GS} = 10V, V_{DS} = 0V, I_D = 0.4A, R_L = 75\Omega, V_{DD} = 30V$ $V_{IN} : t_r, t_f < 5ns, Duty \leq 1\%, t_w = 10\mu s$</p>	—	4	15	ns
	Turn-on Time	t_{on}		—	9	25	
	Fall Time	t_f		—	25	60	
	Turn-off Time	t_{off}		—	55	120	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \approx 48V, V_{GS} = 10V, I_D = 0.8A$	—	5.2	10	nC
Gate-Source Charge		Q_{gs}		—	3.5	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	1.7	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	0.8	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	2.4	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 0.8A, V_{GS} = 0V$	—	-0.9	-1.5	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 0.8A, V_{GS} = 0V$	—	90	—	ns
Reverse Recovered Charge	Q_{rr}	$dI_{DR}/dt = 20A/\mu s$	—	35	—	nC

