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

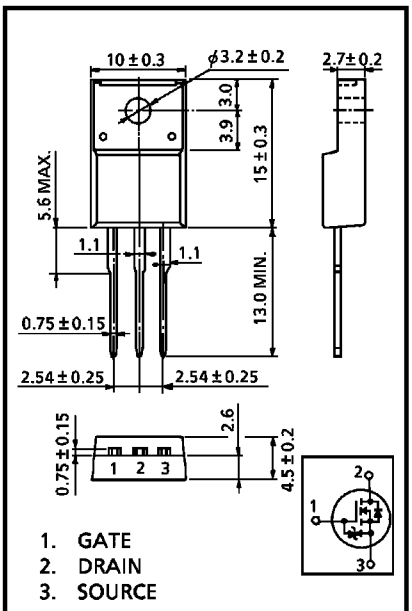
2SK2972

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

SWITCHING REGULATOR APPLICATIONS

INDUSTRIAL APPLICATIONS

Unit in mm



JEDEC	—
EIAJ	SC-67
TOSHIBA	2-10R1B

- Low Drain-Source ON Resistance : $R_{DS\,(ON)} = 0.75\ \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 7.0$ S (Typ.)
- Low Leakage Current : $I_{DSS} = 100\ \mu$A (Max.) ($V_{DS} = 500$ V)
- Enhancement-Mode : $V_{th} = 2.5 \sim 4.5$ V ($V_{DS} = 10$ V, $I_D = 1$ mA)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	500	V
Drain-Gate Voltage ($R_{GS} = 20\ k\Omega$)		V_{DGR}	500	V
Gate-Source Voltage		V_{GSS}	±30	V
Drain Current	DC	I_D	10	A
	Pulse	I_{DP}	32	A
Drain Power Dissipation (Tc = 25°C)		P_D	40	W
Single Pulse Avalanche Energy**		E_{AS}	312	mJ
Avalanche Current		I_{AR}	8	A
Repetitive Avalanche Energy*		E_{AR}	4	mJ
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	−55~150	°C

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th\,(ch\text{-}c)}$	3.125	°C/W
Thermal Resistance, Channel to Ambient	$R_{th\,(ch\text{-}a)}$	62.5	°C/W

Note ;

* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

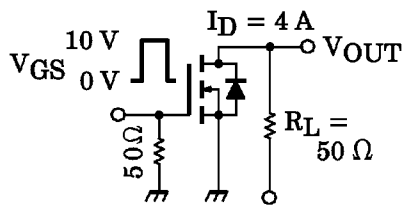
** $V_{DD} = 90$ V, Starting $T_{ch} = 25$°C, L = 8.3 mH, $R_G = 25\ \Omega$, $I_{AR} = 8$ A

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} = ±25 V, V_{DS} = 0 V	—	—	±10	μA
Gate-Source Breakdown Voltage		$V_{(BR)\,GSS}$	I_G = ±10 μA, V_{DS} = 0 V	±30	—	—	V
Drain Cut-off Current		I_{DSS}	V_{DS} = 500 V, V_{GS} = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)\,DSS}$	I_D = 10 mA, V_{GS} = 0 V	500	—	—	V
Gate Threshold Voltage		V_{th}	V_{DS} = 10 V, I_D = 1 mA	2.5	—	4.5	V
Drain-Source ON Resistance		$R_{DS\,(ON)}$	V_{GS} = 10 V, I_D = 5 A	—	0.75	0.85	Ω
Forward Transfer Admittance		$\|Y_{fs}\|$	V_{DS} = 10 V, I_D = 5 A	3.5	7.0	—	S
Input Capacitance		C_{iss}	V_{DS} = 10 V, V_{GS} = 0 V, f = 1 MHz	—	1300	—	pF
Reverse Transfer Capacitance		C_{rss}		—	120	—	
Output Capacitance		C_{oss}		—	400	—	
Switching Time	Rise Time	t_r	 V_{IN} : t_r, t_f < 5 ns, Duty ≦ 1%, t_w = 10 μs	—	26	—	ns
	Turn-on Time	t_{on}		—	45	—	
	Fall Time	t_f		—	40	—	
	Turn-off Time	t_{off}		—	160	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	V_{DD} ≒ 400 V, V_{GS} = 10 V, I_D = 8 A	—	30	—	nC
Gate-Source Charge		Q_{gs}		—	17	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	13	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	10	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	32	A
Diode Forward Voltage	V_{DSF}	I_{DR} = 8 A, V_{GS} = 0 V	—	—	−1.7	V
Reverse Recovery Time	t_{rr}	I_{DR} = 8 A, V_{GS} = 0 V	—	1200	—	ns
Reverse Recovery Charge	Q_{rr}	dI_{DR} / dt = 100 A / μs	—	10	—	μC

MARKING

