TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L^2-π-MOSV)

2SK3205

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

SWITCHING REGULATOR APPLICATIONS, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS

- 4 V Gate Drive
- Low Drain-Sorce ON Resistance : $R_{DS\,(ON)} = 0.36\ \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 4.5$ S (Typ.)
- Low Leakage Current : $I_{DSS} = 100\ \mu$A (Max.) ($V_{DS} = 150$ V)
- Enhancement-Mode : $V_{th} = 0.8 \sim 2.0$ V ($V_{DS} = 10$ V, $I_D = 1$mA)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	150	V
Drain-Gate Voltage ($R_{GS} = 20\ k\Omega$)		V_{DGR}	150	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	DC	I_D	5	A
	Pulse	I_{DP}	20	
Drain Power Dissipation (Tc = 25°C)		P_D	20	W
Single Pulse Avalanche Energy*		E_{AS}	71	mJ
Avalanche Current		I_{AR}	5	A
Repetitive Avalanche Energy**		E_{AR}	2	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	$R_{th\,(ch\text{-}c)}$	6.25	°C / W
Thermal Resistance, Channel to Ambient	$R_{th\,(ch\text{-}a)}$	125	°C / W

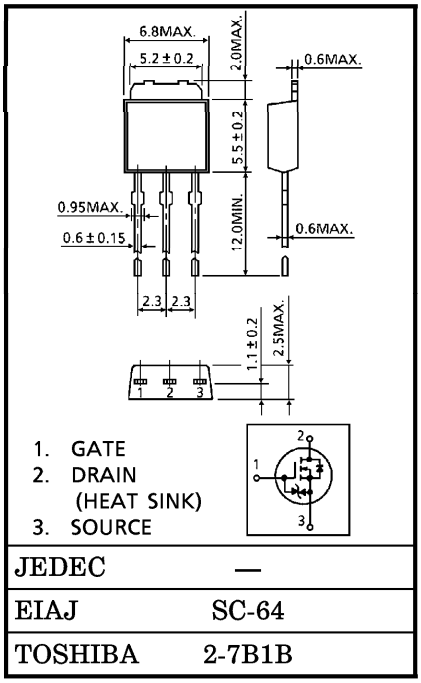
Note ;

* $V_{DD} = 50$ V, $T_{ch} = 25$°C (initial), L = 4.2 mH, $I_{AR} = 5$ A, $R_G = 25\ \Omega$

** Repetitive rating ; Pulse Width Limited by Max.

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

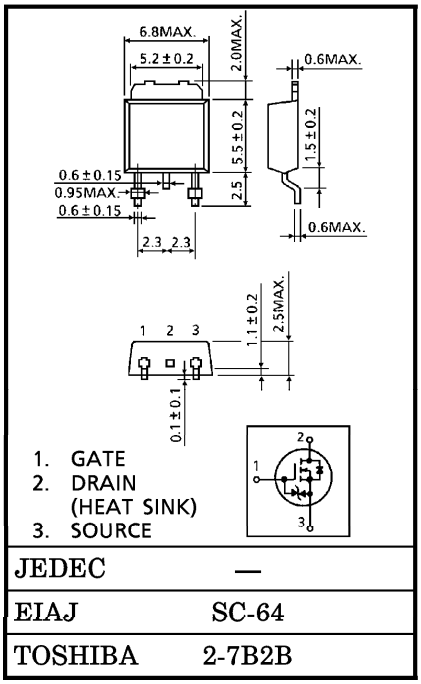
Unit in mm



1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

JEDEC	—
EIAJ	SC-64
TOSHIBA	2-7B1B

Unit in mm



1. GATE
2. DRAIN (HEAT SINK)
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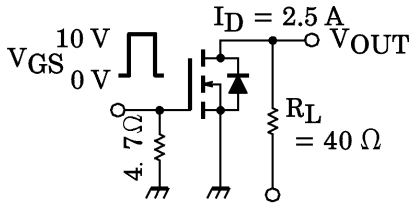
JEDEC	—
EIAJ	SC-64
TOSHIBA	2-7B2B

961001EAA2

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16$ V, $V_{DS} = 0$ V	—	—	±10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 150$ V, $V_{GS} = 0$ V	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)\,DSS}$	$I_D = 10$ mA, $V_{GS} = 0$ V	150	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10$ V, $I_D = 1$ mA	0.8	—	2.0	V
Drain-Source ON Resistance		$R_{DS\,(ON)}$	$V_{GS} = 4$ V, $I_D = 2.5$ A	—	0.54	0.75	Ω
		$R_{DS\,(ON)}$	$V_{GS} = 10$ V, $I_D = 2.5$ A	—	0.36	0.5	
Forward Transfer Admittance		$\|Y_{fs}\|$	$V_{DS} = 10$ V, $I_D = 2.5$ A	2.0	4.5	—	S
Input Capacitance		C_{iss}	$V_{DS} = 10$ V, $V_{GS} = 0$ V, f = 1 MHz	—	330	—	pF
Reverse Transfer Capacitance		C_{rss}		—	50	—	
Output Capacitance		C_{oss}		—	145	—	
Switching Time	Rise Time	t_r		—	10	—	ns
	Turn-on Time	t_{on}		—	15	—	
	Fall Time	t_f		—	10	—	
	Turn-off Time	t_{off}	V_{IN} : t_r, $t_f < 5$ ns, Duty ≦ 1%, $t_w = 10$ μs	—	60	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \fallingdotseq 120$ V, $V_{GS} = 10$ V, $I_D = 5$ A	—	12	—	nC
Gate-Source Charge		Q_{gs}		—	8	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	4	—	

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}	—	—	—	20	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 5$ A, $V_{GS} = 0$ V	—	—	−1.7	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 5$ A, $V_{GS} = 0$ V, $dI_{DR}/dt = 100$ A/μs	—	110	—	ns
Reverse Recovery Charge	Q_{rr}		—	0.47	—	nC