

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

2SK3205

HIGH SPEED, HIGH VOLTAGE SWITCHING APPLICATIONS

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

- 4 V Gate Drive
- Low Drain-Source 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 ($T_a = 25^\circ C$)

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 ($T_c = 25^\circ C$)		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	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	6.25	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	125	$^\circ C / W$

Note ;

* $V_{DD} = 50 V, T_{ch} = 25^\circ C$ (initial), $L = 4.2 mH,$

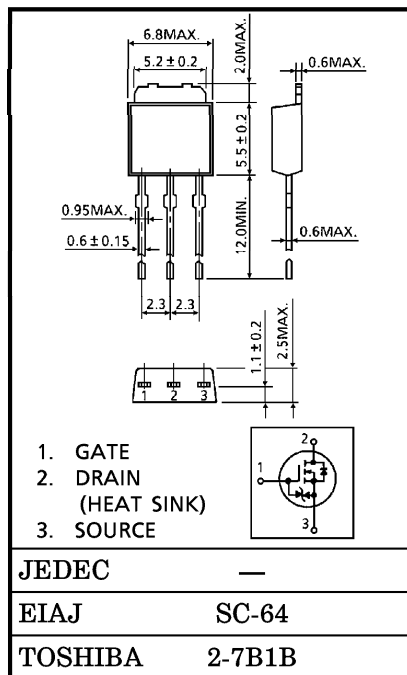
$I_{AR} = 5 A, R_G = 25 \Omega$

** Repetitive rating ; Pulse Width Limited by Max.

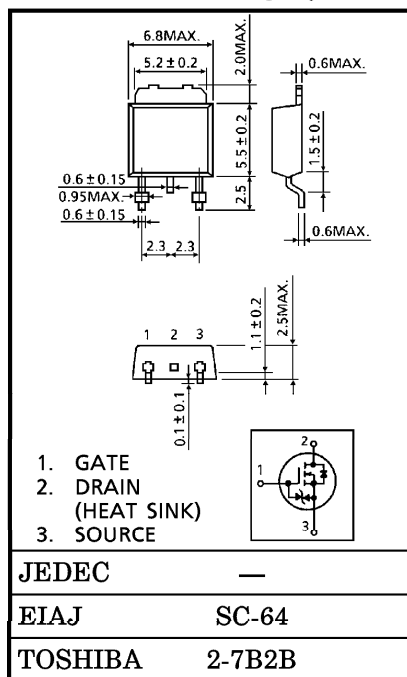
**This transistor is an electrostatic sensitive device.
Please handle with caution.**

INDUSTRIAL APPLICATIONS

Unit in mm



Unit in mm



961001EAA2

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ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I _{GSS}	V _{GS} = ±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} ≐ 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	—	110	—	ns
Reverse Recovery Charge	Q _{rr}	dI _{DR} /dt = 100 A/μs	—	0.47	—	nC