

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE ( $\pi$ -MOSII)

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# 2SK944

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS.  
CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS.

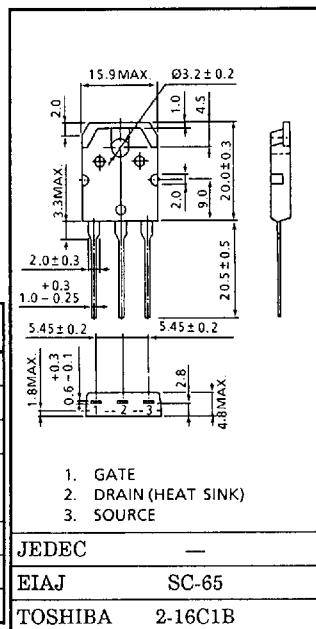
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 0.12\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 11S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 300\mu A$  (Max.) @  $V_{DS} = 250V$
- Enhancement-Mode :  $V_{th} = 1.5 \sim 3.5V$  @  $V_{DS} = 10V, I_D = 1mA$

MAXIMUM RATINGS ( $T_a = 25^\circ C$ )

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DSS}$	250	V
Drain-Gate Voltage ( $R_{GS} = 20k\Omega$ )		$V_{DGR}$	250	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	22	A
	Pulse	$I_{DP}$	88	
Drain Power Dissipation ( $T_c = 25^\circ C$ )		$P_D$	150	W
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	$-55 \sim 150$	$^\circ C$



Weight : 4.6g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	0.833	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	50	$^\circ C / W$

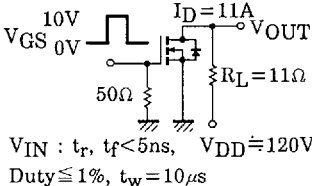
THIS TRANSISTOR IS AN ELECTROSTATIC SENSITIVE DEVICE.  
PLEASE HANDLE WITH CAUTION.

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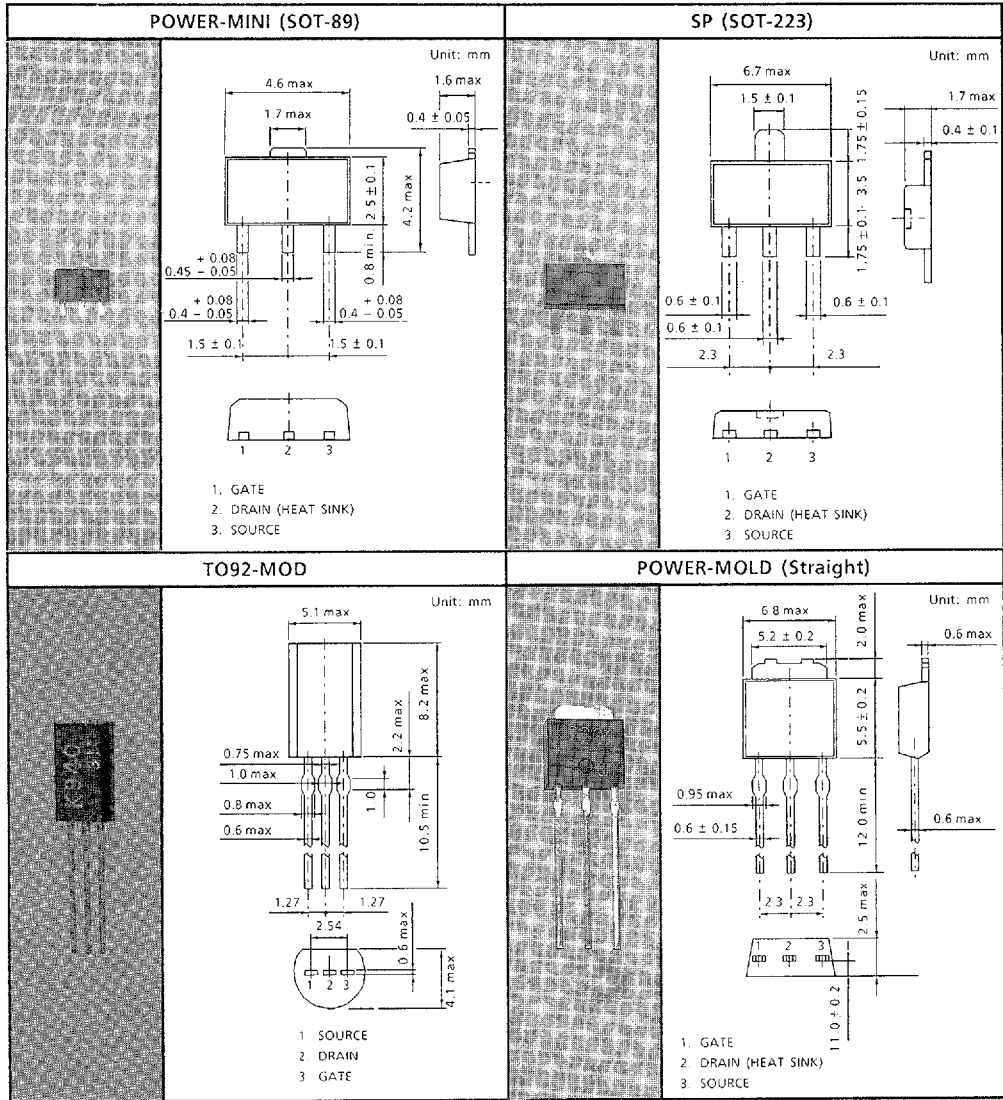
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	—	—	$\pm 100$	nA
Drain Cut-off Current		$I_{DSS}$	$V_{DS} = 250V, V_{GS} = 0V$	—	—	300	$\mu A$
Drain-Source Breakdown Voltage		$V(BR)_{DSS}$	$I_D = 10mA, V_{GS} = 0V$	250	—	—	V
Gate Threshold Voltage		$V_{th}$	$V_{DS} = 10V, I_D = 1mA$	1.5	—	3.5	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$I_D = 11A, V_{DS} = 10V$	—	0.12	0.15	$\Omega$
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10V, I_D = 11A$	7.0	11	—	S
Input Capacitance		$C_{iss}$	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$	—	2400	3100	pF
Reverse Transfer Capacitance		$C_{rss}$		—	400	600	
Output Capacitance		$C_{oss}$		—	800	1200	
Switching Time	Rise Time	$t_r$		—	25	50	ns
	Turn-on Time	$t_{on}$		—	70	140	
	Fall Time	$t_f$		—	45	90	
	Turn-off Time	$t_{off}$		—	165	330	
Total Gate Charge (Gate-Source Plus Gate-Drain)		$Q_g$	$V_{DD} = 200V, V_{GS} = 10V, I_D = 22A$	—	95	140	nC
Gate-Source Charge		$Q_{gs}$		—	45	—	
Gate-Drain ("Miller") Charge		$Q_{gd}$		—	50	—	

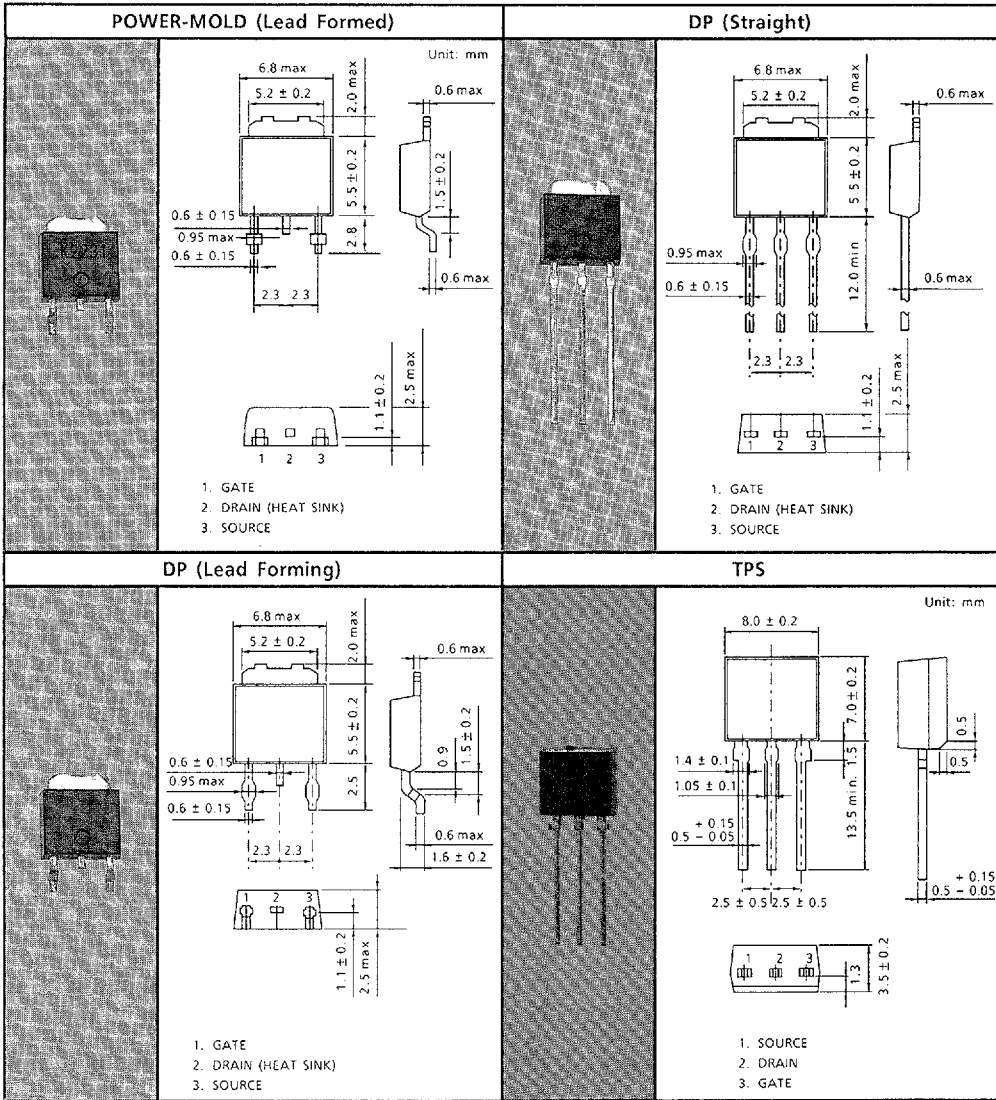
## SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	$I_{DR}$	—	—	—	22	A
Pulse Drain Reverse Current	$I_{DRP}$	—	—	—	88	A
Diode Forward Voltage	$V_{DSF}$	$I_{DR} = 22A, V_{GS} = 0V$	—	—	-1.9	V
Reverse Recovery Time	$t_{rr}$	$I_{DR} = 22A, V_{GS} = 0V$	—	420	—	ns
Reverse Recovered Charge	$Q_{rr}$	$dI_{DR} / dt = 50A / \mu s$	—	2.7	—	$\mu C$

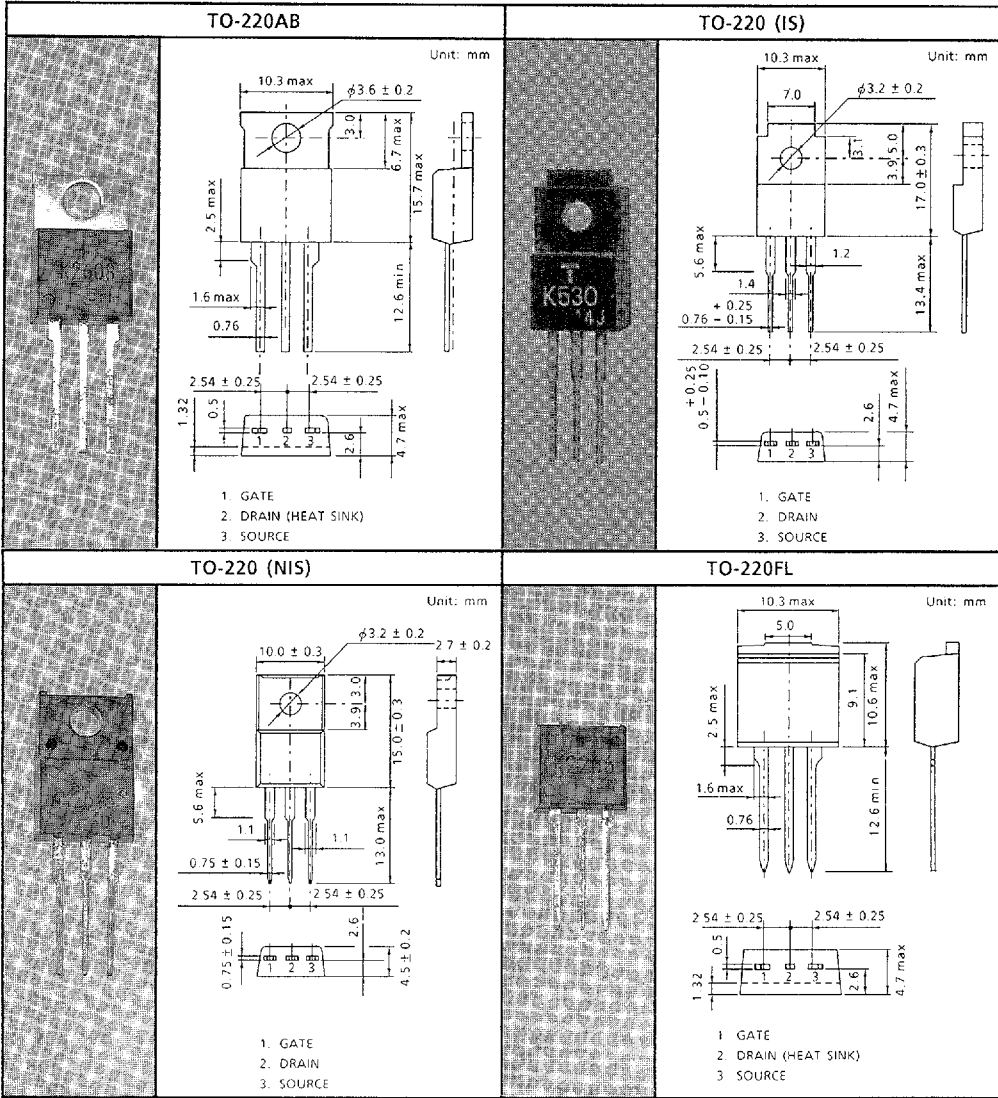
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