

**TOSHIBA**

**2SK2400**

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE (L<sup>2</sup>-π-MOSV)

# 2SK2400

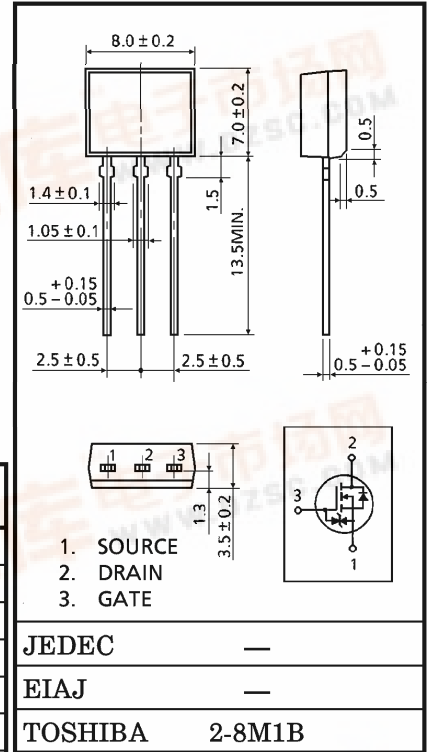
HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS  
 CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS  
 Unit in mm

- 4 V Gate Drive
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 0.17 \Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 4.5 S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100 \mu A$  (Max.) ( $V_{DS} = 100 V$ )
- Enhancement-Mode :  $V_{th} = 0.8 \sim 2.0V$   
 ( $V_{DS} = 10 V, I_D = 1 mA$ )

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DSS}$	100	V
Drain-Gate Voltage ( $R_{GS} = 20 k\Omega$ )	$V_{DGR}$	100	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	5 A
	Pulse	$I_{DP}$	20 A
Drain Power Dissipation ( $T_c = 25^\circ C$ )	$P_D$	1.3	W
Single Pulse Avalanche Energy**	$E_{AS}$	180	mJ
Avalanche Current	$I_{AR}$	5	A
Repetitive Avalanche Energy*	$E_{AR}$	0.13	mJ
Channel Temperature	$T_{ch}$	150	°C
Storage Temperature Range	$T_{stg}$	-55~150	°C



Weight : 0.55 g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	96.1	°C/W

Note ;

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

\*\*  $V_{DD} = 25 V, T_{ch} = 25^\circ C$  (initial),  $L = 11.6 mH, R_G = 25 \Omega, I_{AR} = 5 A$

**This transistor is an electrostatic sensitive device.**

**Please handle with caution.**

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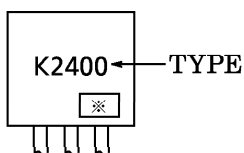
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GSS}$	$V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$	—	—	$\pm 10$	$\mu\text{A}$
Drain Cut-off Current		$I_{DSS}$	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$	—	—	100	$\mu\text{A}$
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	100	—	—	V
Gate Threshold Voltage		$V_{th}$	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	0.8	—	2.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 4\text{ V}, I_D = 2.5\text{ A}$	—	0.22	0.30	$\Omega$
			$V_{GS} = 10\text{ V}, I_D = 2.5\text{ A}$	—	0.17	0.23	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10\text{ V}, I_D = 2.5\text{ A}$	2.0	4.5	—	S
Input Capacitance		$C_{iss}$	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	500	—	pF
Reverse Transfer Capacitance		$C_{rss}$		—	80	—	
Output Capacitance		$C_{oss}$		—	190	—	
Switching Time	Rise Time	$t_r$	<p><math>V_{IN} : t_r, t_f &lt; 5\text{ ns},</math> <math>Duty \leq 1\%, t_w = 10\text{ }\mu\text{s}</math></p>	—	17	—	ns
	Turn-on Time	$t_{on}$		—	25	—	
	Fall Time	$t_f$		—	50	—	
	Turn-off Time	$t_{off}$		—	195	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		$Q_g$	$V_{DD} \cong 80\text{ V}, V_{GS} = 10\text{ V}, I_D = 5\text{ A}$	—	22	—	nC
Gate-Source Charge		$Q_{gs}$		—	15	—	
Gate-Drain ("Miller") Charge		$Q_{gd}$		—	7	—	

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	$V_{DSF}$	$I_{DR} = 5\text{ A}, V_{GS} = 0\text{ V}$	—	—	-1.7	V
Reverse Recovery Time	$t_{rr}$	$I_{DR} = 5\text{ A}, V_{GS} = 0\text{ V}$	—	160	—	ns
Reverse Recovery Charge	$Q_{rr}$	$dI_{DR} / dt = 50\text{ A} / \mu\text{s}$	—	0.28	—	$\mu\text{C}$

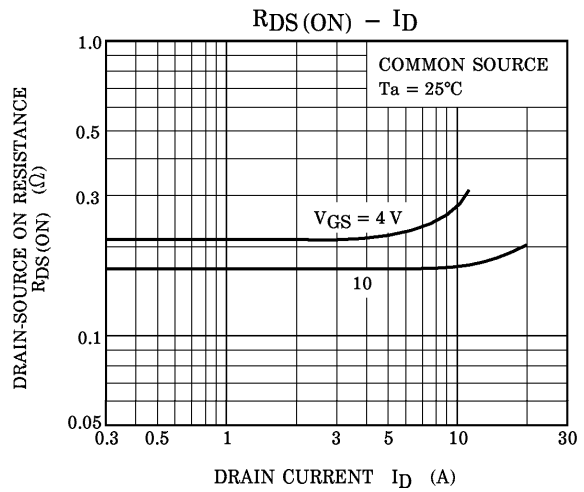
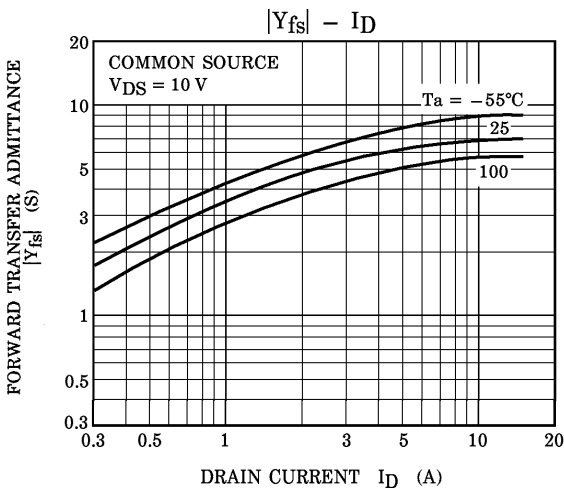
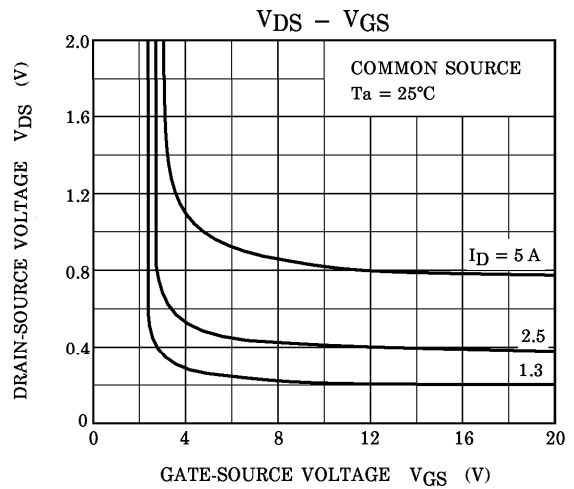
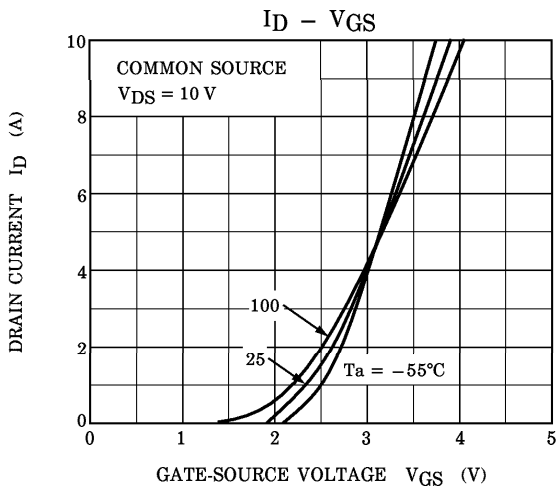
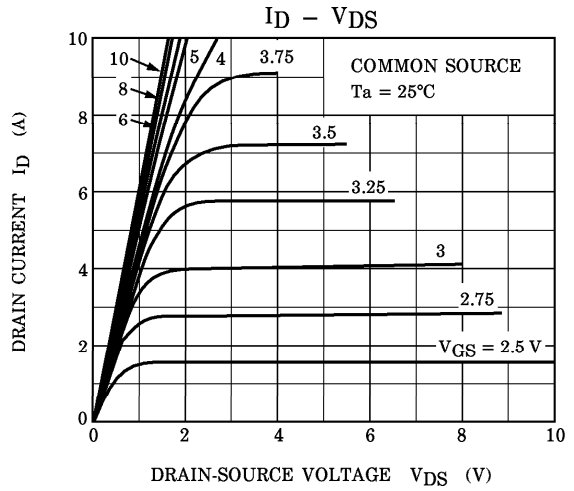
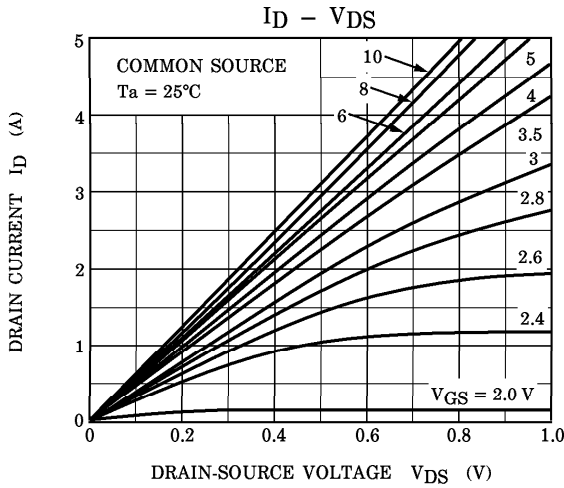
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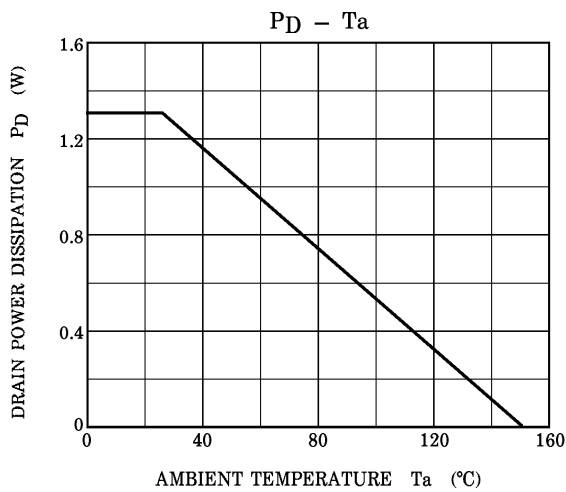
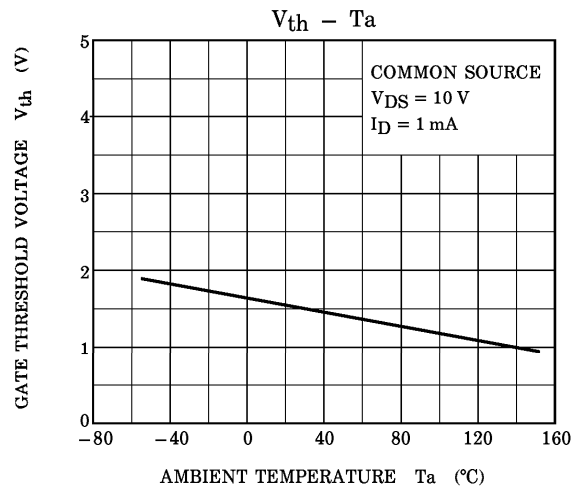
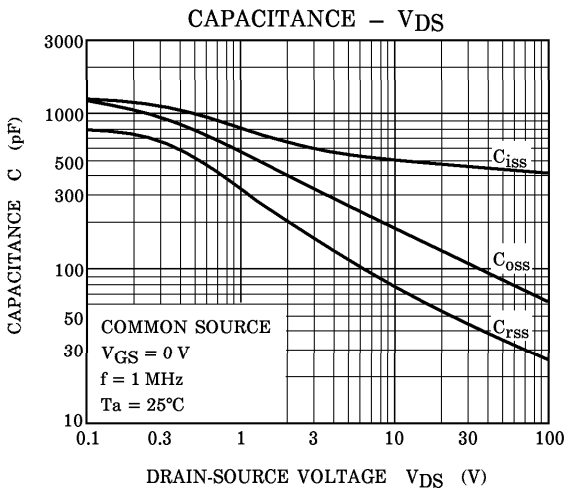
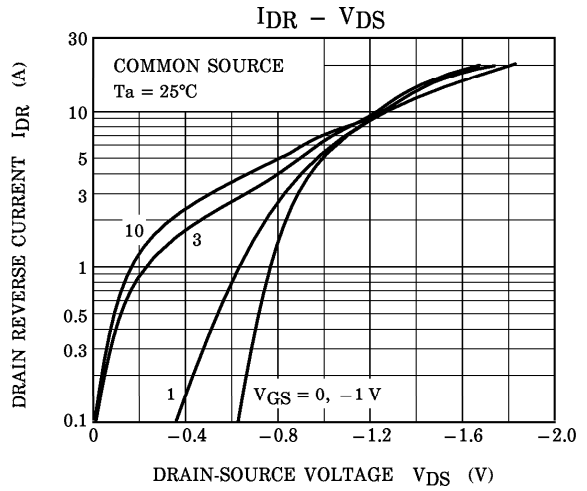
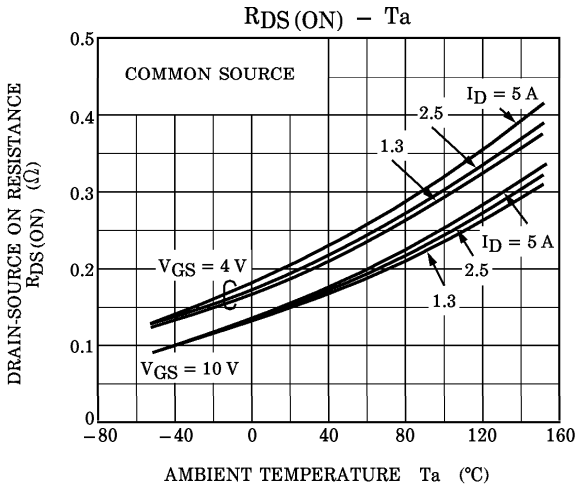


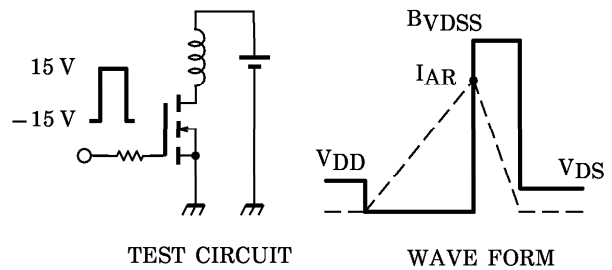
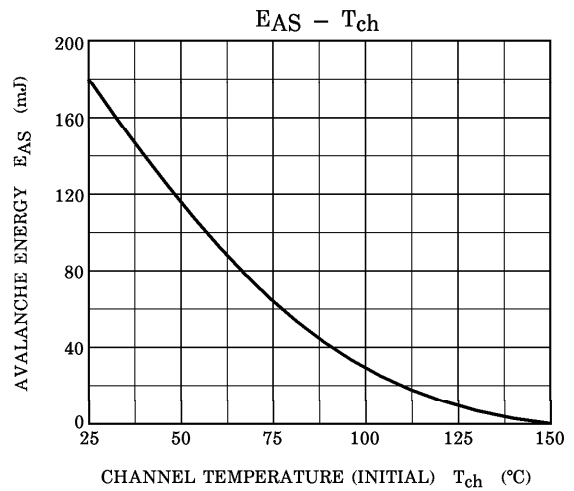
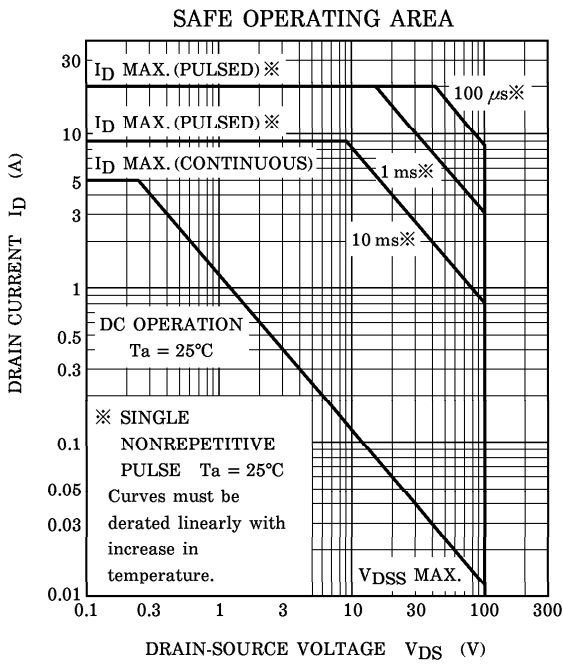
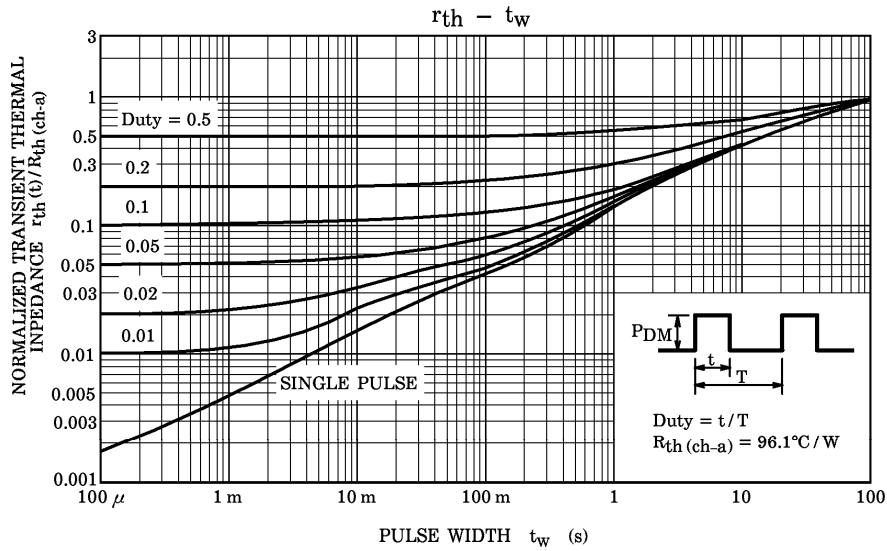
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







$$\text{Peak } I_{AR} = 5 \text{ A, } R_G = 25 \Omega \quad E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left( \frac{BVDSS}{BVDSS - V_{DD}} \right)$$

$$V_{DD} = 25 \text{ V, } L = 11.6 \text{ mH}$$