

**TOSHIBA**

**2SK2992**

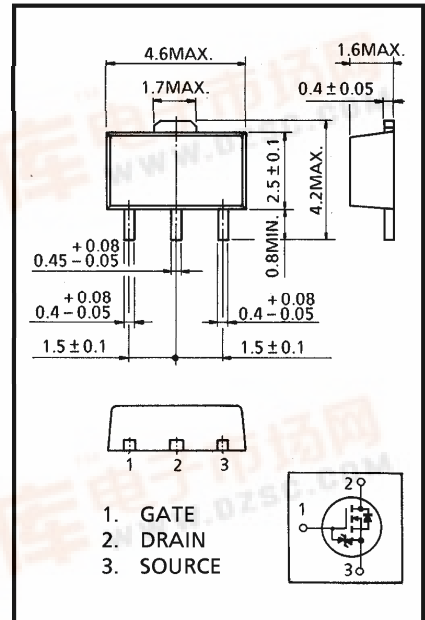
TENTATIVE TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE ( $\pi$ -MOSV)

# 2SK2992

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 :  $R_{DS(ON)} = 2.2 \Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 0.9 S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100 \mu A$  (Max.) ( $V_{DS} = 200 V$ )
- Enhancement-Mode :  $V_{th} = 2.0 \sim 3.5 V$   
 ( $V_{DS} = 10 V, I_D = 1 mA$ )



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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DSS}$	200	V
Drain-Gate Voltage ( $R_{GS} = 20 k\Omega$ )	$V_{DGR}$	200	V
Gate-Source Voltage	$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	1 A
	Pulse	$I_{DP}$	3 A
Drain Power Dissipation ( $T_a = 25^\circ C$ )	$P_D$	0.5	W
Drain Power Dissipation***	$P_D$	1.5	W
Single Pulse Avalanche Energy**	$E_{AS}$	36	mJ
Avalanche Current	$I_{AR}$	1	A
Repetitive Avalanche Energy*	$E_{AR}$	0.05	mJ
Channel Temperature	$T_{ch}$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	$-55 \sim 150$	$^\circ C$

JEDEC	—
EIAJ	SC-62
TOSHIBA	2-5K1B

Weight : 0.05 g (Typ.)

MARKING



THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	250	$^\circ C/W$

Note ;

- \* Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- \*\*  $V_{DD} = 50 V, T_{ch} = 25^\circ C$  (initial),  $L = 56.7 mH, R_G = 25 \Omega, I_{AR} = 1 A$
- \*\*\* Mounted on ceramic substrate ( $1 inch^2 \times 0.8 t$ )

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

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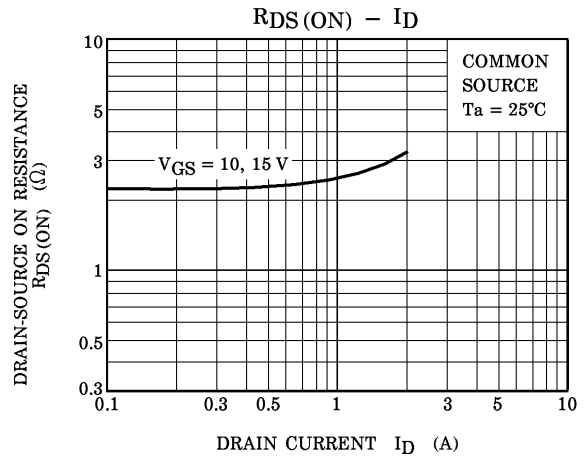
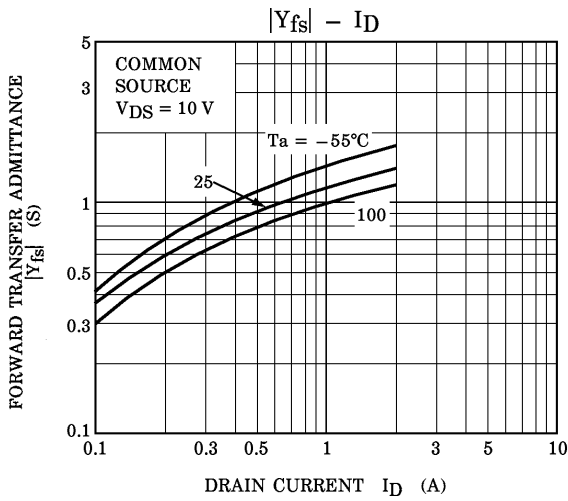
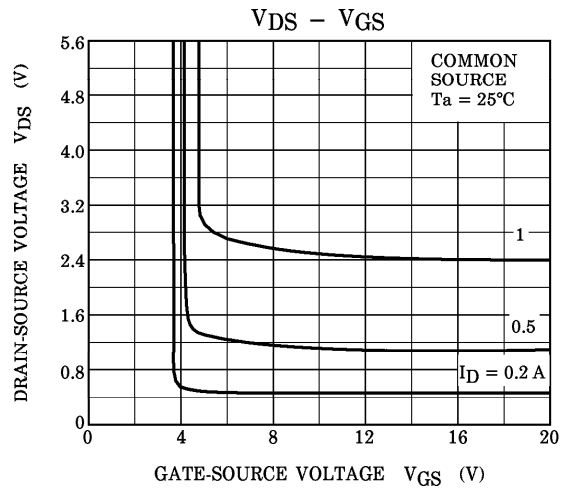
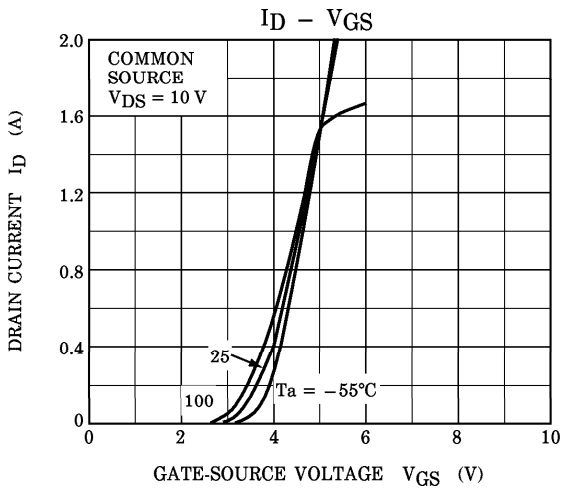
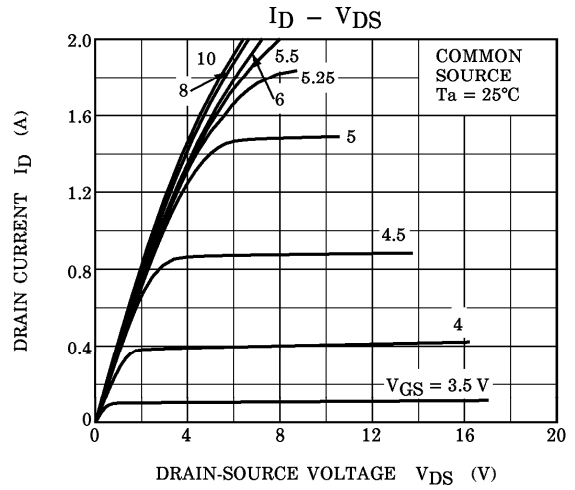
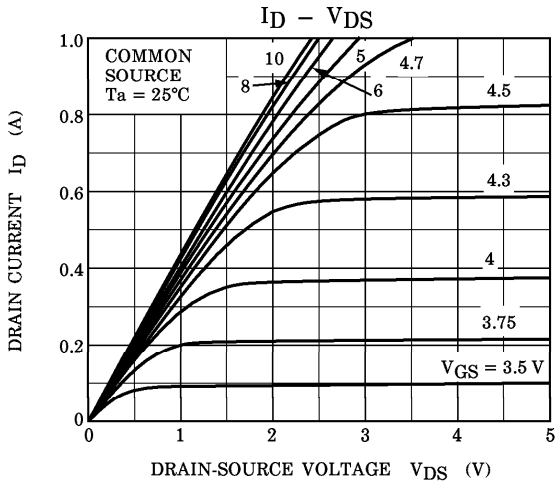


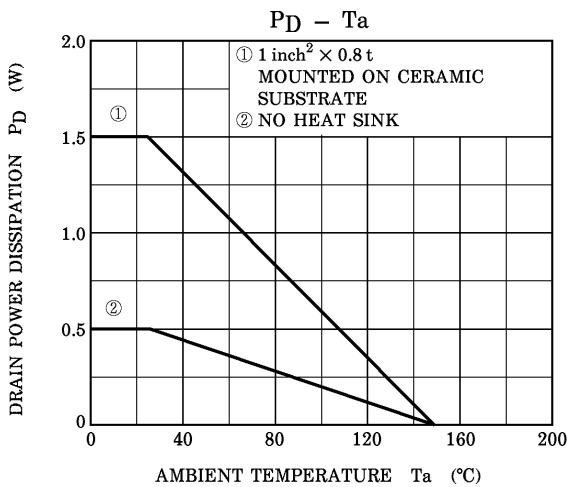
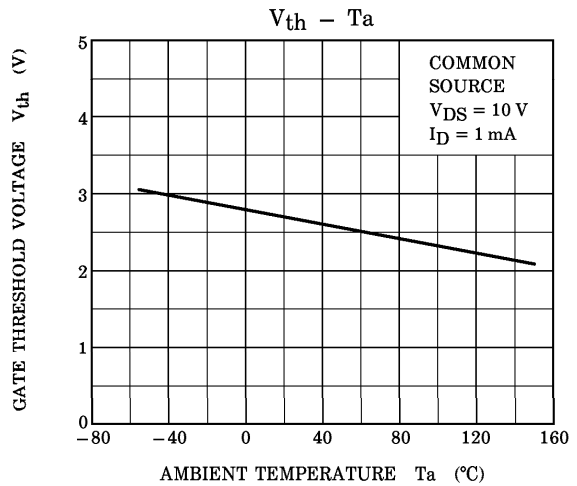
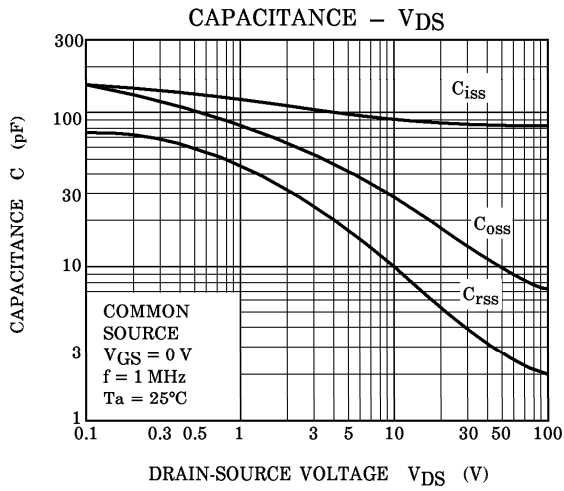
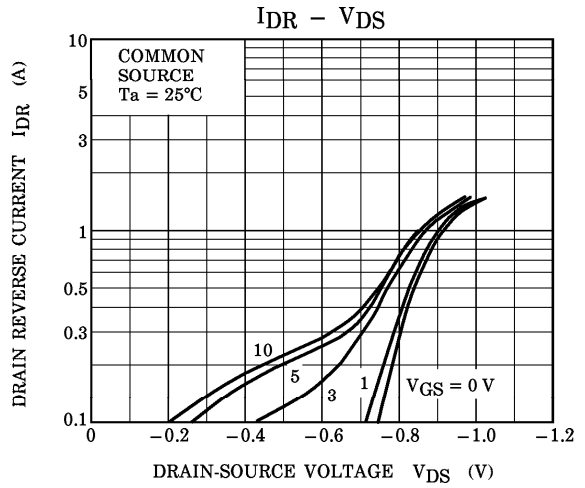
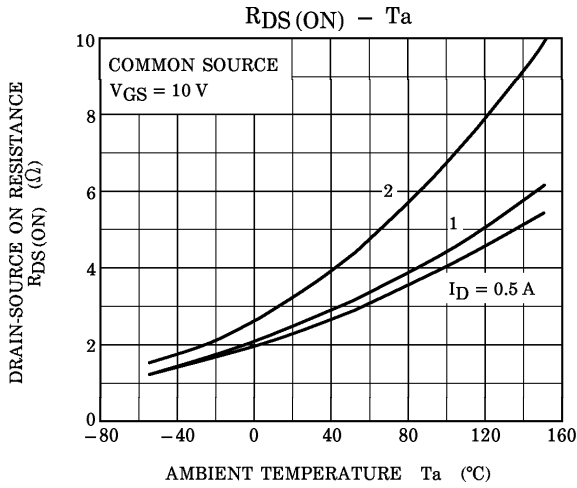
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

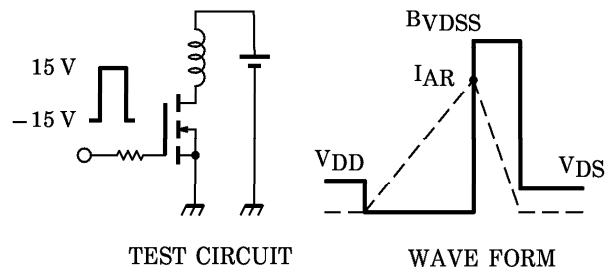
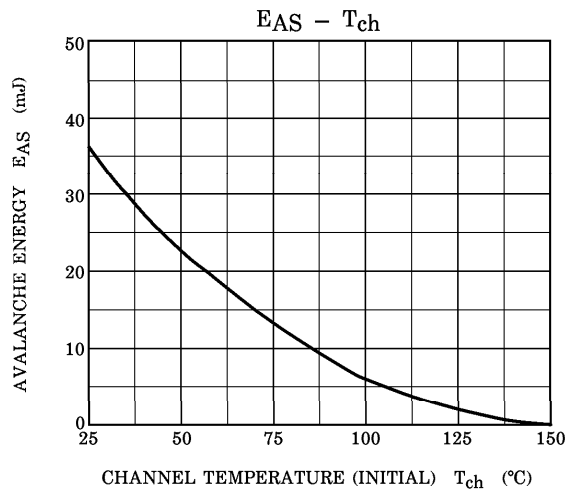
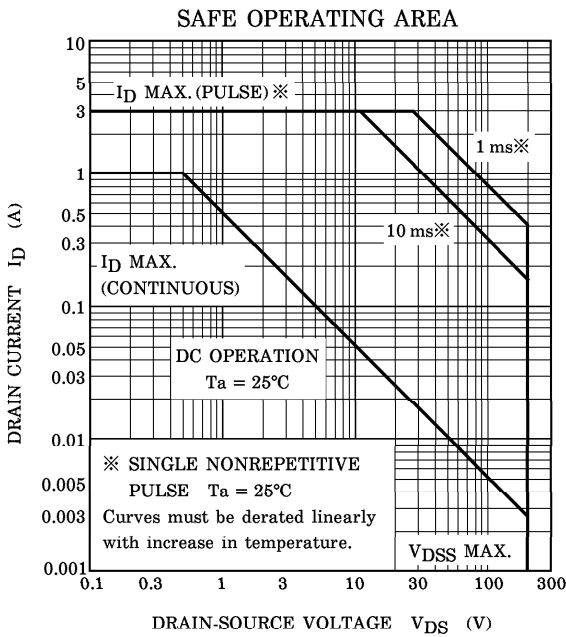
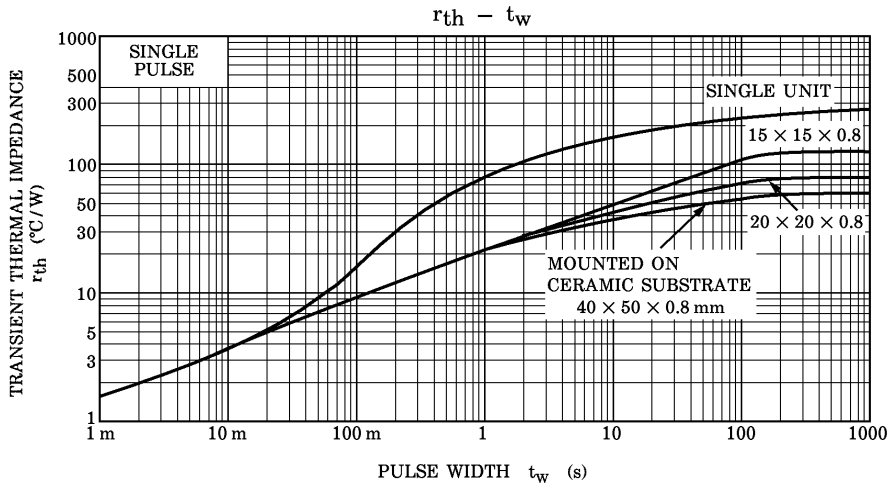
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16 V, VDS = 0 V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 200 V, VGS = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		V (BR) DSS	ID = 10 mA, VGS = 0 V	200	—	—	V
Gate Threshold Voltage		Vth	VDS = 10 V, ID = 1 mA	2.0	—	3.5	V
Drain-Source ON Resistance		RDS (ON)	VGS = 10 V, ID = 0.5 A	—	2.2	3.5	Ω
Forward Transfer Admittance		Yfs	VDS = 10 V, ID = 0.5 A	0.5	0.9	—	S
Input Capacitance		Ciss	VDS = 10 V, VGS = 0 V f = 1 MHz	—	90	—	pF
Reverse Transfer Capacitance		Crss		—	10	—	
Output Capacitance		Coss		—	30	—	
Switching Time	Rise Time	tr	<p> <math>I_D = 0.5 \text{ A}</math>  <math>V_{GS} = 10 \text{ V}</math>  <math>V_{GS} = 0 \text{ V}</math>  <math>50 \Omega</math>  <math>R_L = 200 \Omega</math>  <math>V_{out}</math>  <math>V_{DD} \cong 100 \text{ V}</math> </p>	—	9	—	ns
	Turn-on Time	ton		—	17	—	
	Fall Time	tf		—	16	—	
	Turn-off Time	toff		$V_{IN} : t_r, t_f < 5 \text{ ns},$ $\text{Duty} \leq 1\%, t_w = 10 \mu\text{s}$	—	45	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≅ 160 V, VGS = 10 V ID = 1 A	—	3.0	—	nC
Gate-Source Charge		Qgs		—	1.8	—	
Gate-Drain ("Miller") Charge		Qgd		—	1.2	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	1	A
Pulse Drain Reverse Current	IDRP	—	—	—	3	A
Diode Forward Voltage	VDSF	IDR = 1 A, VGS = 0 V	—	—	-1.5	V
Reverse Recovery Time	trr	IDR = 1 A, VGS = 0 V	—	85	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 100 A / μs	—	190	—	nC







Peak  $I_{AR} = 1 \text{ A}$ ,  $R_G = 25 \Omega$   
 $V_{DD} = 50 \text{ V}$ ,  $L = 56.7 \text{ mH}$        $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left( \frac{BV_{DSS}}{BV_{DSS} - V_{DD}} \right)$