

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

# 2SK2995

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

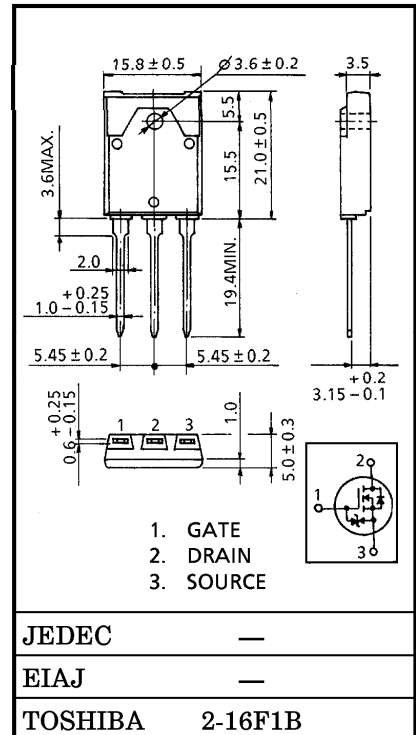
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 48m\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 30S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100\mu A$  ( $V_{DS} = 250V$ )
- 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	$I_D$	30 A
	Pulse	$I_{DP}$	120 A
Drain Power Dissipation ( $T_c = 25^\circ C$ )	$P_D$	90	W
Single Pulse Avalanche Energy**	$E_{AS}$	925	mJ
Avalanche Current	$I_{AR}$	30	A
Repetitive Avalanche Energy*	$E_{AR}$	9	mJ
Channel Temperature	$T_{ch}$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	$-55 \sim 150$	$^\circ C$



Weight : 5.8g (Typ.)

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	1.39	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	41.6	$^\circ C / W$

Note ;

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

\*\*  $V_{DD} = 50V$ , Starting  $T_{ch} = 25^\circ C$ ,  $L = 1.74mH$ ,  $I_{AR} = 30A$ ,  $R_G = 25\Omega$

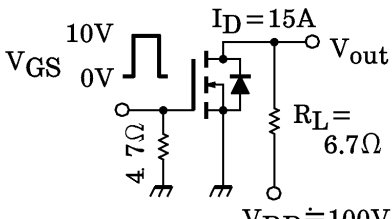
**This transistor is an electrostatic sensitive device.**

**Please handle with caution.**

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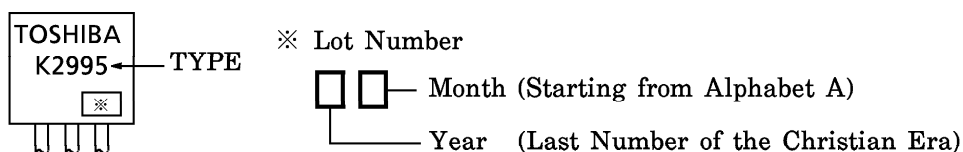
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

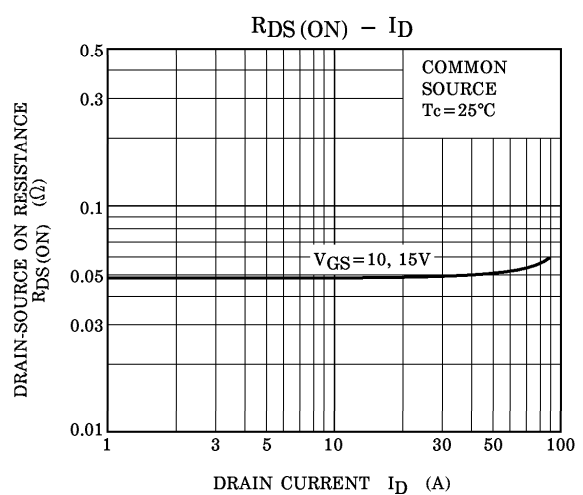
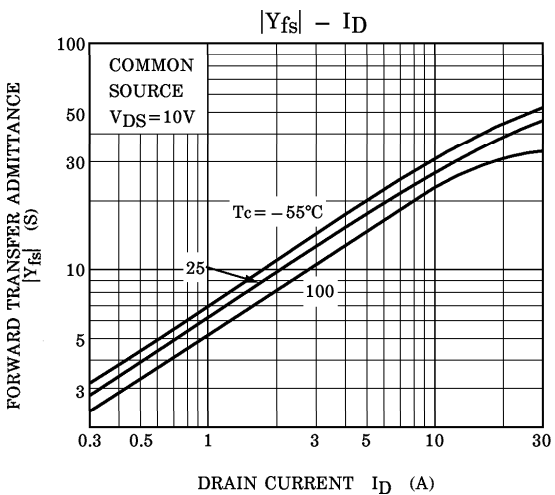
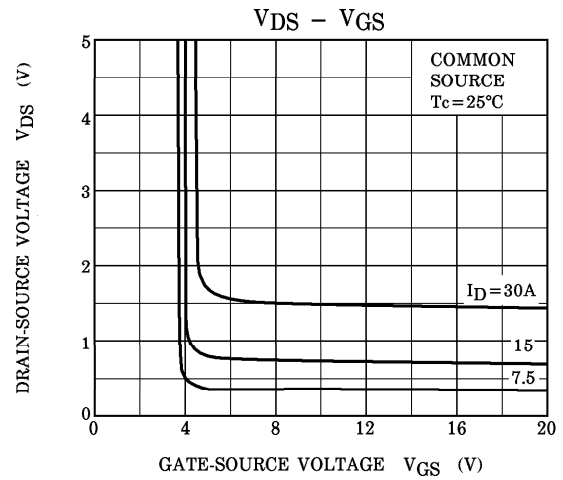
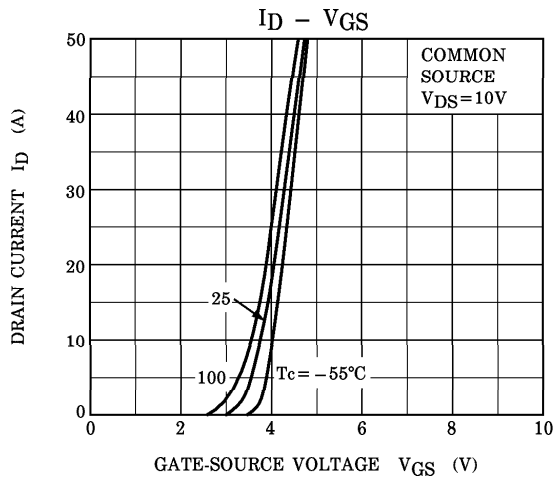
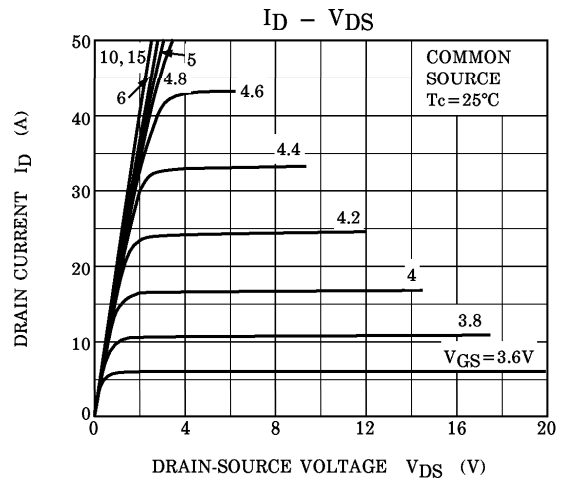
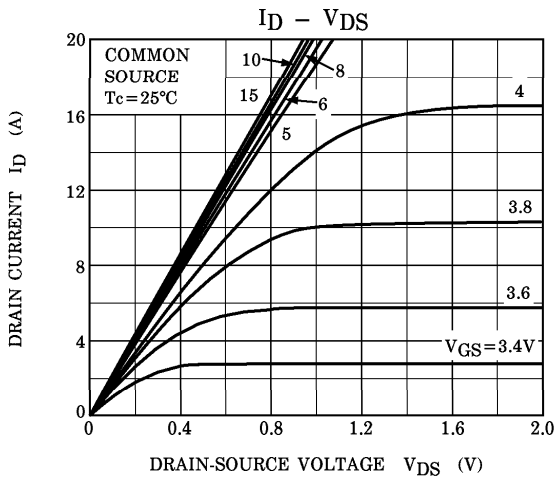
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 250V, VGS = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10mA, VGS = 0V	250	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 15A	1.5	—	3.5	V
Drain-Source ON Resistance		RDS(ON)	VGS = 10V, ID = 15A	—	48	0.8	mΩ
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 15A	15	30	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V f = 1MHz	—	5400	—	pF
Reverse Transfer Capacitance		Crss		—	580	—	
Output Capacitance		Coss		—	1900	—	
Switching Time	Rise Time	tr		—	20	—	ns
	Turn-on Time	ton		—	50	—	
	Fall Time	tf		—	35	—	
	Turn-off Time	toff		VIN : tr, tf < 5ns, Duty ≤ 1%, tw = 10μs	—	200	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≐ 200V, VGS = 10V ID = 30A	—	132	—	nC
Gate-Source Charge		Qgs		—	80	—	
Gate-Drain ("Miller") Charge		Qgd		—	52	—	

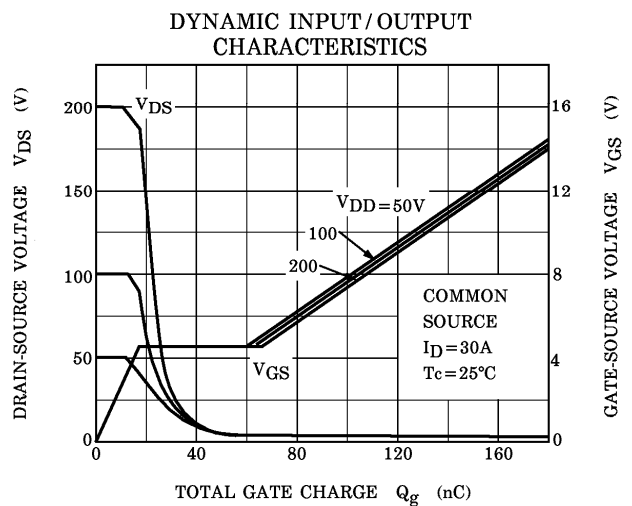
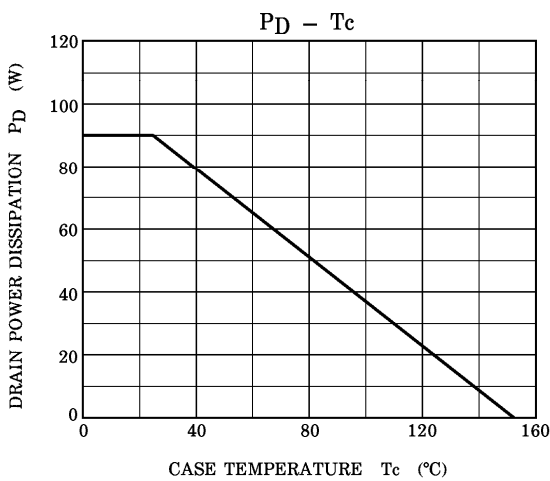
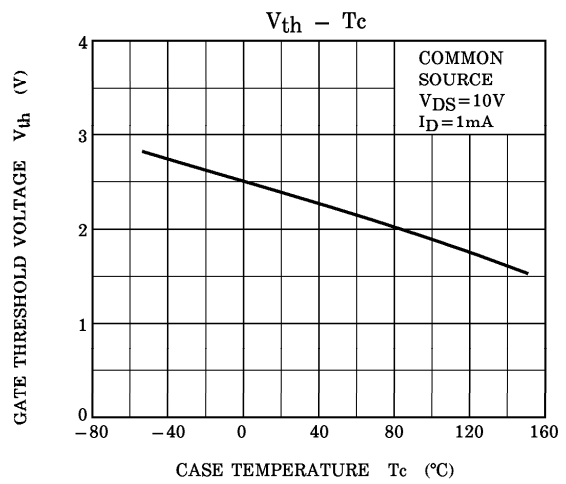
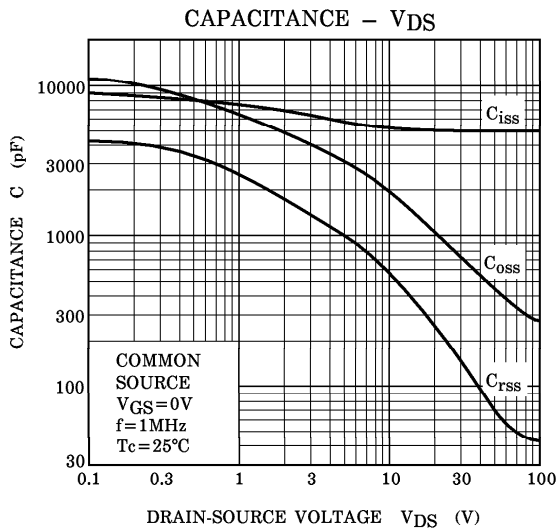
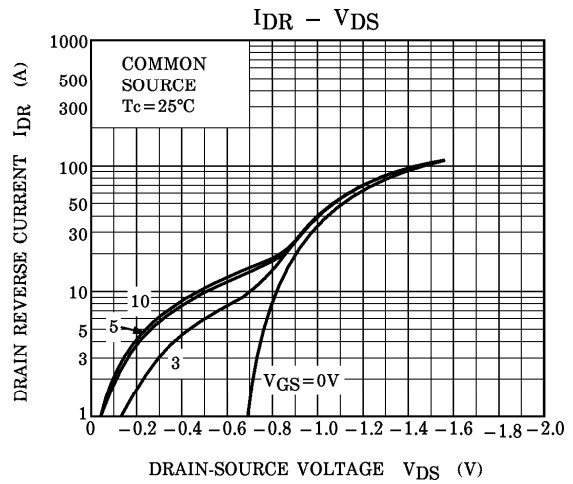
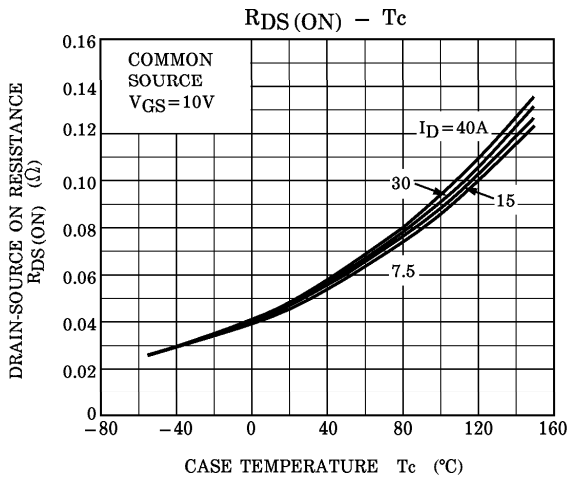
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

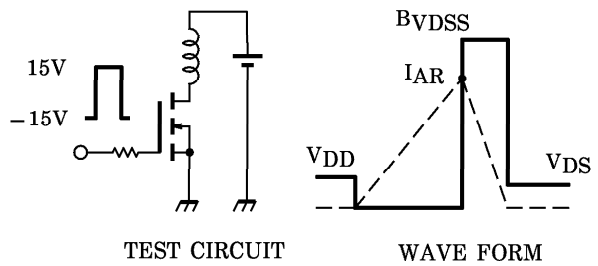
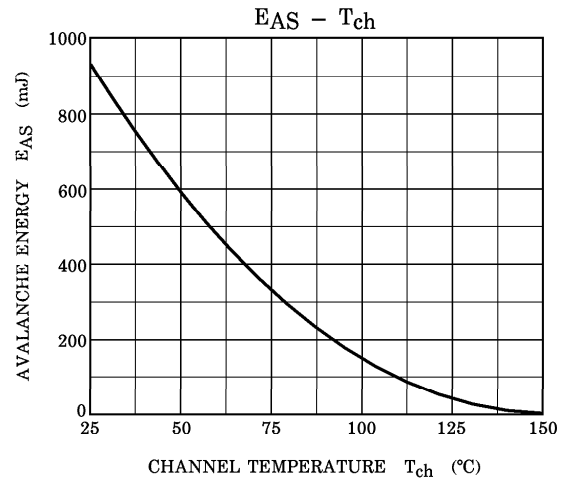
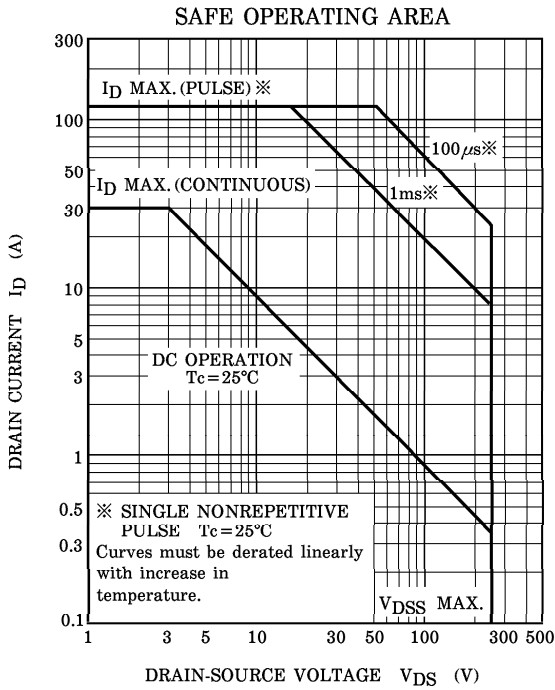
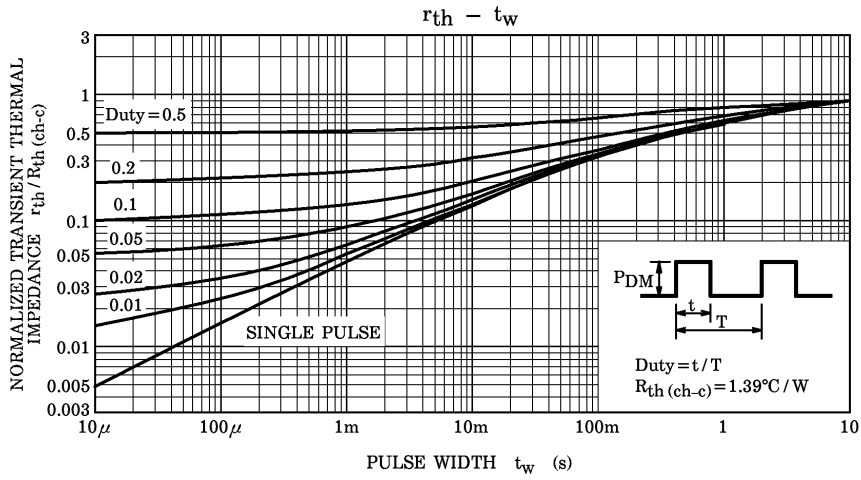
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	30	A
Pulse Drain Reverse Current	IDRP	—	—	—	120	A
Diode Forward Voltage	VDSF	IDR = 30A, VGS = 0V	—	—	-2.0	V
Reverse Recovery Time	trr	IDR = 30A, VGS = 0V	—	270	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 100A / μs	—	3.0	—	μC

MARKING









Peak  $I_{AR} = 30A$ ,  $R_G = 25\Omega$ ,  $V_{DD} = 50V$ ,  $L = 1.74mH$

$$E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left( \frac{BVDSS}{BVDSS - V_{DD}} \right)$$