

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

2SK2445

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

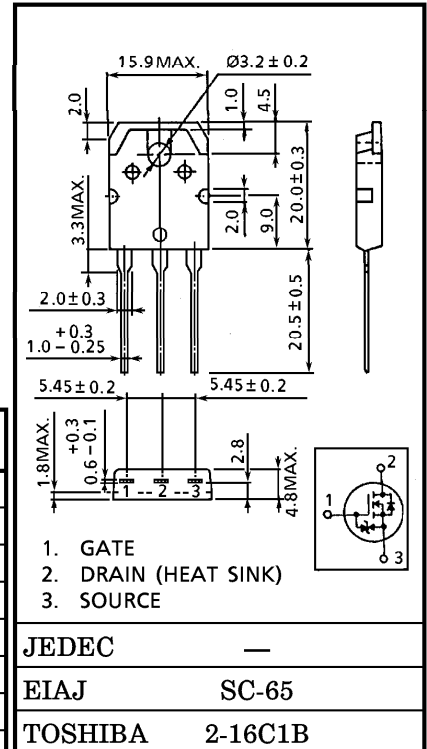
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 14 \text{ m}\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 40 \text{ S}$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu\text{A}$ (Max.) ($V_{DS} = 60 \text{ V}$)
- Enhancement-Mode : $V_{th} = 1.5 \sim 3.0 \text{ V}$
($V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$)

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	60	V
Drain-Gate Voltage ($R_{GS} = 20 \text{ k}\Omega$)	V_{DGR}	60	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	50
	Pulse	I_{DP}	200
Drain Power Dissipation ($T_c = 25^\circ\text{C}$)	P_D	125	W
Single Pulse Avalanche Energy**	E_{AS}	683	mJ
Avalanche Current	I_{AR}	50	A
Repetitive Avalanche Energy*	E_{AR}	12.5	mJ
Channel Temperature	T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	$-55 \sim 150$	$^\circ\text{C}$



Weight : 4.6 g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	1.0	$^\circ\text{C/W}$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	50	$^\circ\text{C/W}$

Note ;

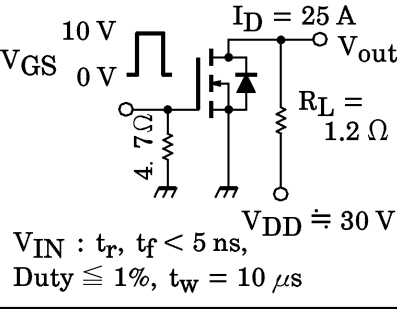
- * Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- ** $V_{DD} = 25 \text{ V}, T_{ch} = 25^\circ\text{C}$ (initial), $L = 371 \mu\text{H}, R_G = 25 \Omega, I_{AR} = 50 \text{ A}$

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

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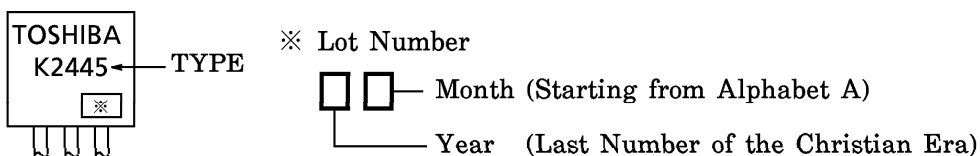
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

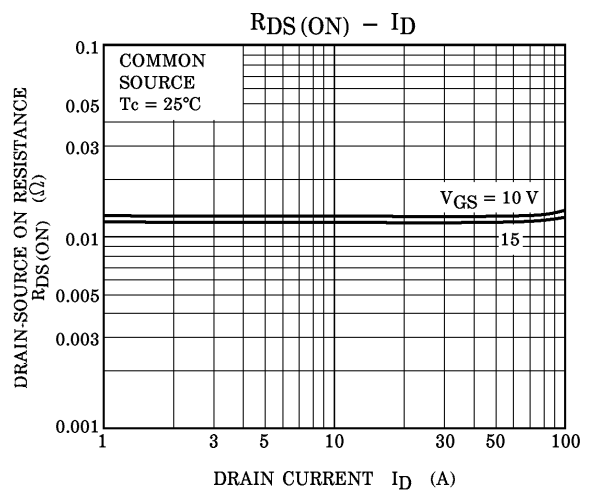
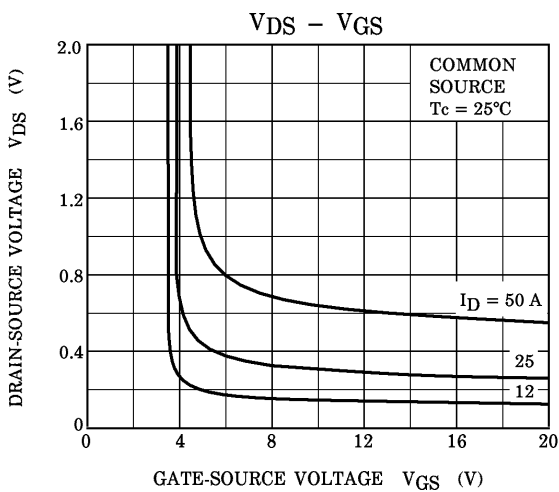
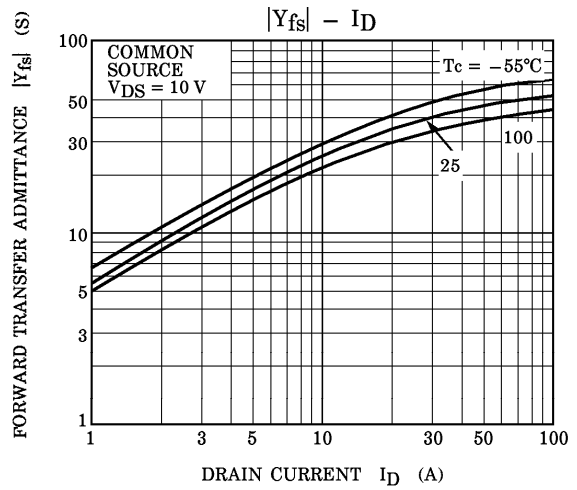
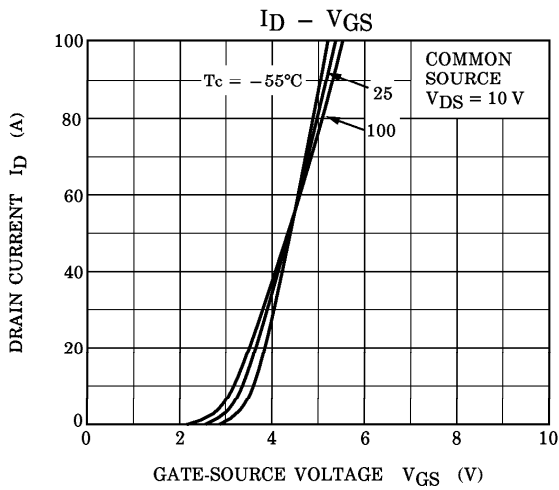
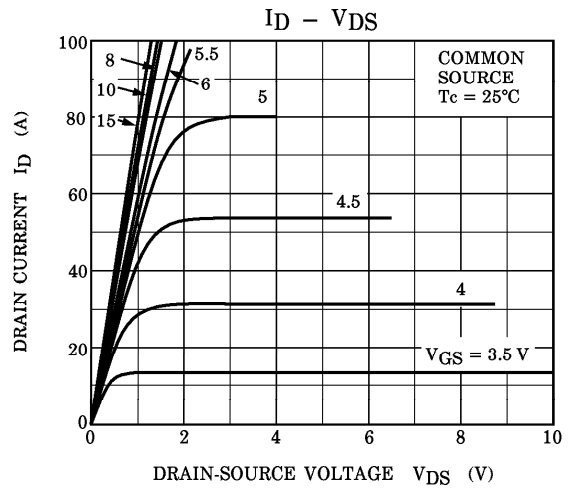
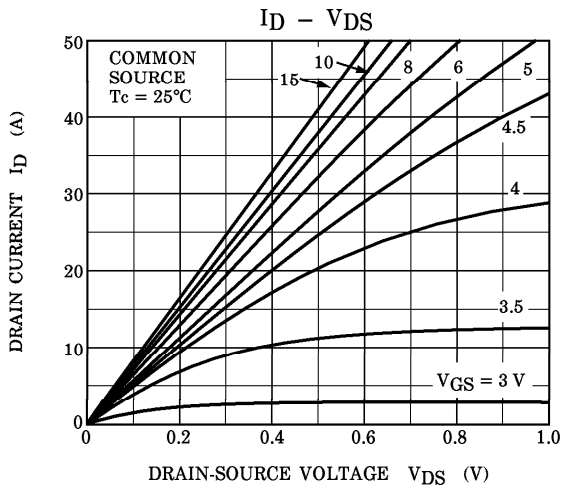
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16 V, VDS = 0 V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 60 V, VGS = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		V (BR) DSS	ID = 10 mA, VGS = 0 V	60	—	—	V
Gate Threshold Voltage		Vth	VDS = 10 V, ID = 1 mA	1.5	—	3.0	V
Drain-Source ON Resistance		RDS (ON)	VGS = 10 V, ID = 25 A	—	14	18	mΩ
Forward Transfer Admittance		Yfs	VDS = 15 V, ID = 25 A	28	40	—	S
Input Capacitance		Ciss	VDS = 10 V, VGS = 0 V, f = 1 MHz	—	3350	—	pF
Reverse Transfer Capacitance		Crss		—	550	—	
Output Capacitance		Coss		—	1600	—	
Switching Time	Rise Time	tr	 <p> V_{GS} 10 V 0 V $I_D = 25$ A $R_L = 1.2$ Ω $V_{DD} \cong 30$ V $V_{IN} : t_r, t_f < 5$ ns, Duty $\leq 1\%$, $t_w = 10$ μs </p>	—	25	—	ns
	Turn-on Time	ton		—	55	—	
	Fall Time	tf		—	60	—	
	Turn-off Time	toff		—	180	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≅ 48 V, VGS = 10 V, ID = 50 A	—	110	—	nC
Gate-Source Charge		Qgs		—	70	—	
Gate-Drain ("Miller") Charge		Qgd		—	40	—	

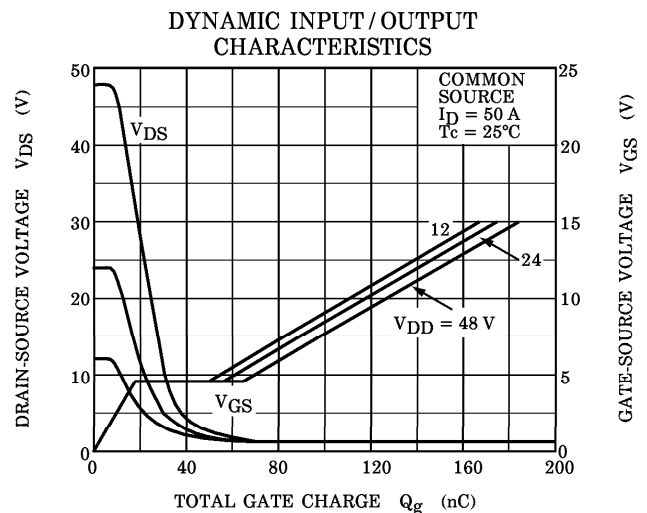
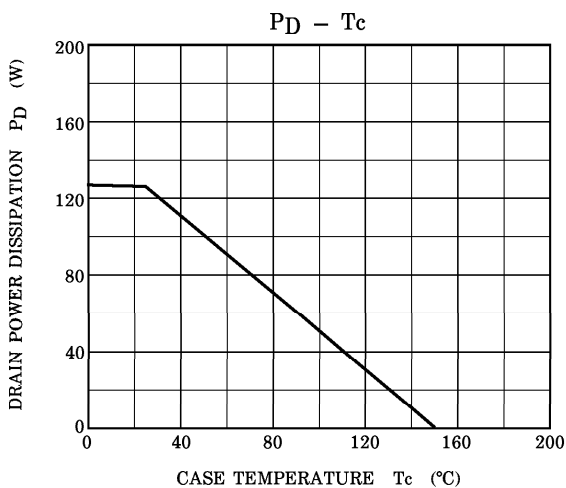
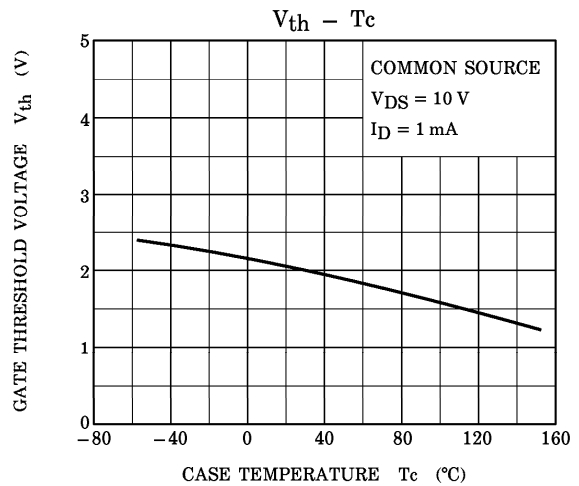
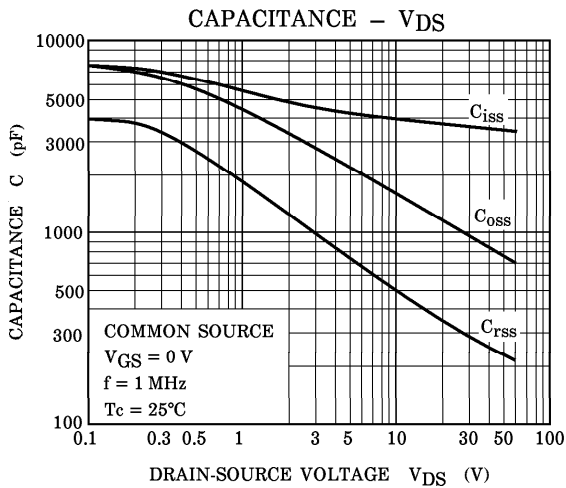
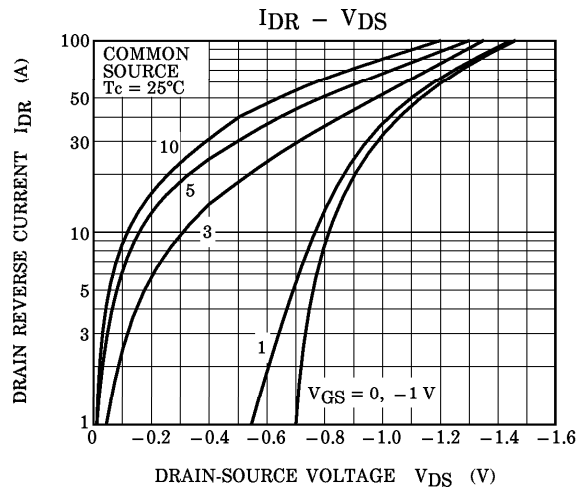
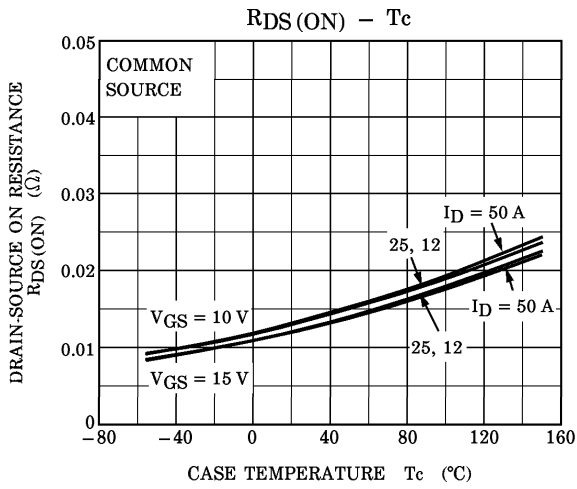
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (Ta = 25°C)

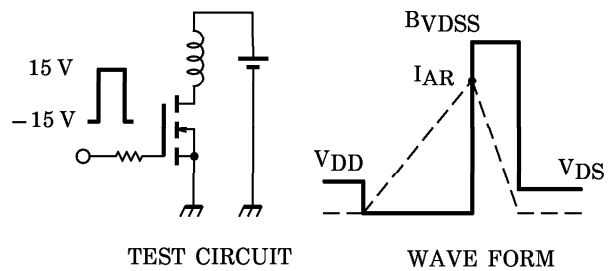
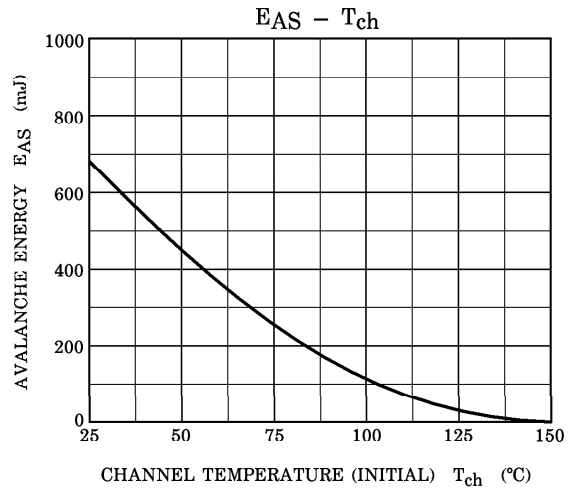
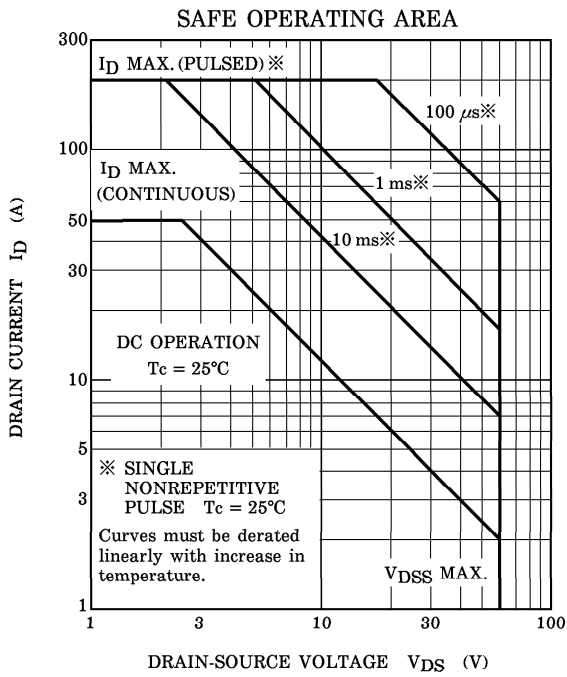
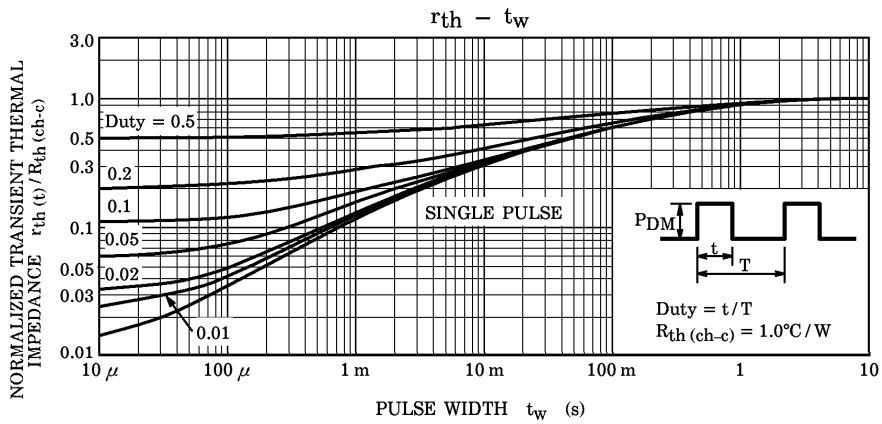
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	50	A
Pulse Drain Reverse Current	IDRP	—	—	—	200	A
Diode Forward Voltage	VDSF	IDR = 50 A, VGS = 0 V	—	—	-1.7	V
Reverse Recovery Time	trr	IDR = 50 A, VGS = 0 V	—	120	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 50 A / μs	—	0.2	—	μC

MARKING









Peak $I_{AR} = 50$ A, $R_G = 25 \Omega$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BVDSS}{BVDSS - V_{DD}} \right)$
 $V_{DD} = 25$ V, $L = 371 \mu H$