

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

2SK2845

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

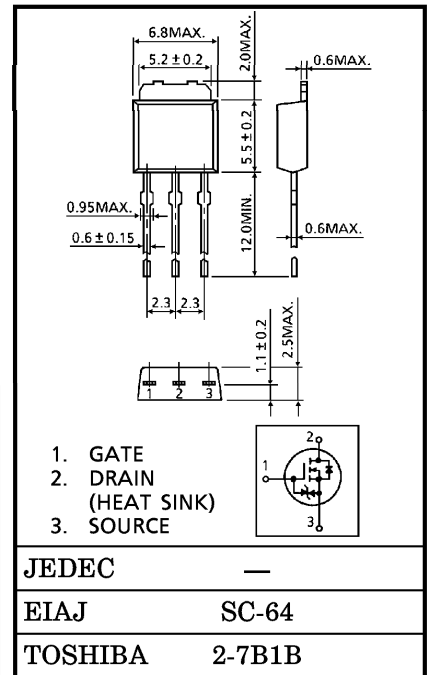
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 8.0 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 0.9 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu A$ (Max.) ($V_{DS} = 720 V$)
- Enhancement-Mode : $V_{th} = 2.0 \sim 4.0 V$ ($V_{DS} = 10 V, I_D = 1 mA$)

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	900	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)	V_{DGR}	900	V
Gate-Source Voltage	V_{GSS}	± 30	V
Drain Current	DC	I_D	1
	Pulse	I_{DP}	3
Drain Power Dissipation ($T_c = 25^\circ C$)	P_D	40	W
Single Pulse Avalanche Energy**	E_{AS}	324	mJ
Avalanche Current	I_{AR}	1	A
Repetitive Avalanche Energy*	E_{AR}	4.0	mJ
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature Range	T_{stg}	$-55 \sim 150$	$^\circ C$



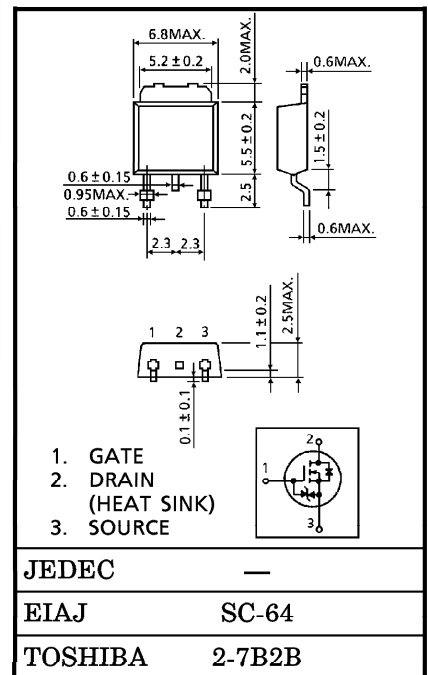
THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	3.125	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	125	$^\circ C/W$

Note ;

- * Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- ** $V_{DD} = 90 V, T_{ch} = 25^\circ C$ (initial), $L = 594 mH, R_G = 25 \Omega, I_{AR} = 1 A$

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



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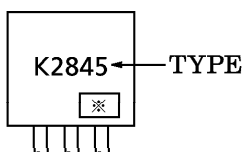
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 30\text{ V}, V_{DS} = 0\text{ V}$	—	—	± 10	μA	
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	$I_G = \pm 10\ \mu\text{A}, V_{DS} = 0\text{ V}$	± 30	—	—	V	
Drain Cut-off Current	I_{DSS}	$V_{DS} = 720\text{ V}, V_{GS} = 0\text{ V}$	—	—	100	μA	
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	900	—	—	V	
Gate Threshold Voltage	V_{th}	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	2.0	—	4.0	V	
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 0.5\text{ A}$	—	8.0	9.0	Ω	
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 20\text{ V}, I_D = 0.5\text{ A}$	0.45	0.9	—	S	
Input Capacitance	C_{iss}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1\text{ MHz}$	—	350	—	pF	
Reverse Transfer Capacitance	C_{rss}		—	8	—		
Output Capacitance	C_{oss}		—	40	—		
Switching Time	Rise Time	t_r		—	20	—	ns
	Turn-on Time	t_{on}		—	70	—	
	Fall Time	t_f		—	30	—	
	Turn-off Time	t_{off}		$V_{IN} : t_r, t_f < 5\text{ ns},$ $Duty \leq 1\%, t_w = 10\ \mu\text{s}$	—	95	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q_g	$V_{DD} \doteq 400\text{ V}, V_{GS} = 10\text{ V},$ $I_D = 1\text{ A}$	—	15	—	nC	
Gate-Source Charge	Q_{gs}		—	6	—		
Gate-Drain (“Miller”) Charge	Q_{gd}		—	9	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	1	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	3	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 1\text{ A}, V_{GS} = 0\text{ V}$	—	—	-1.9	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 1\text{ A}, V_{GS} = 0\text{ V}$ $dI_{DR}/dt = 100\text{ A}/\mu\text{s}$	—	750	—	ns
Reverse Recovery Charge	Q_{rr}		—	3	—	μC

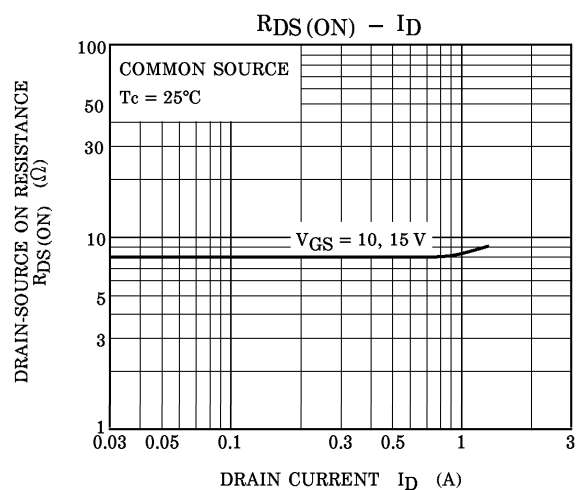
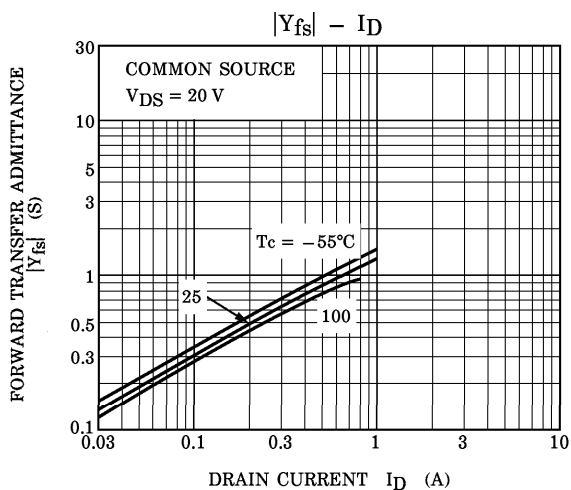
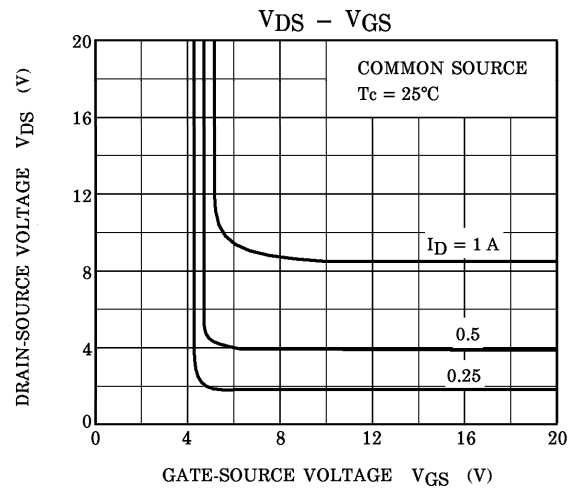
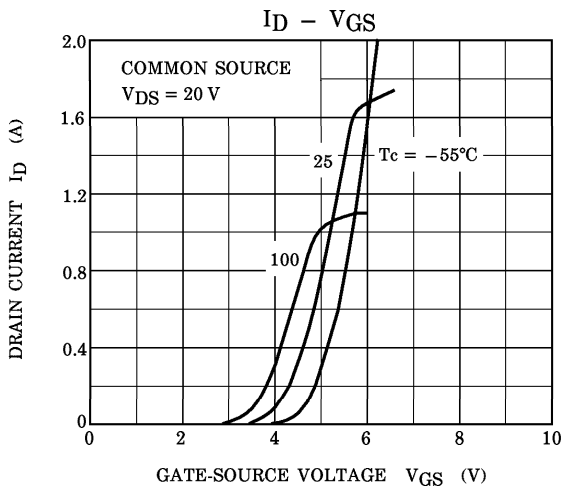
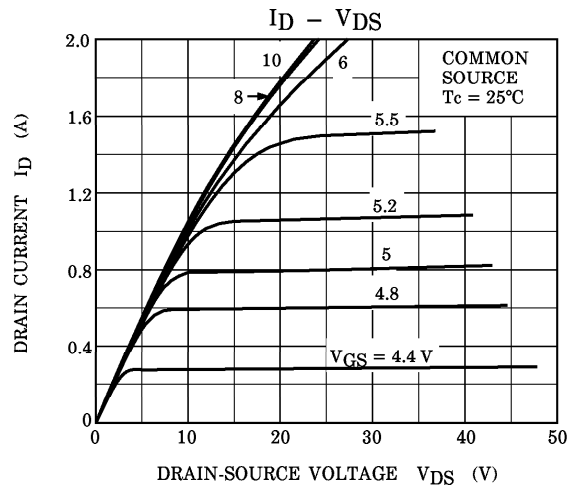
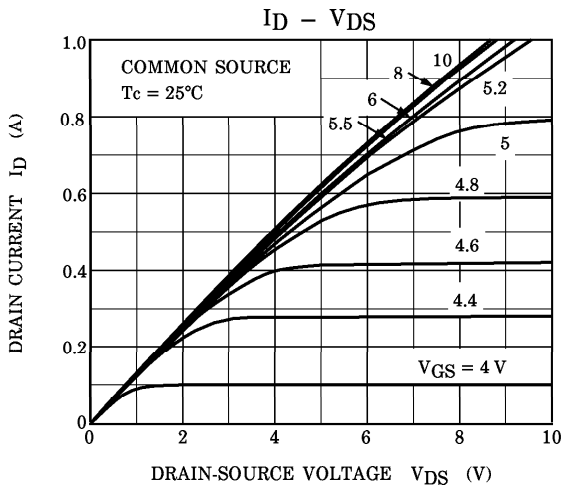
MARKING

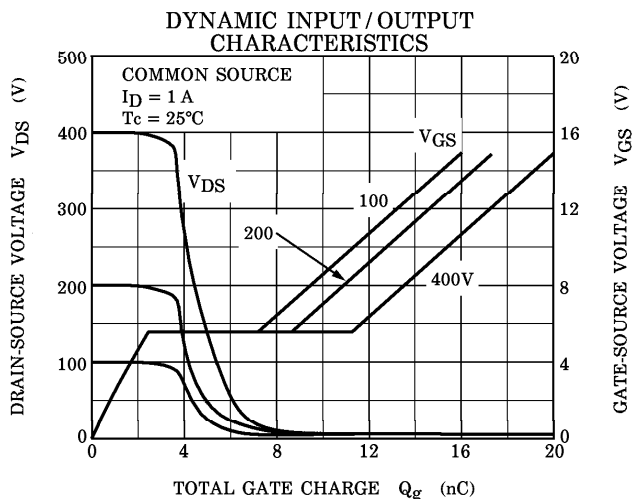
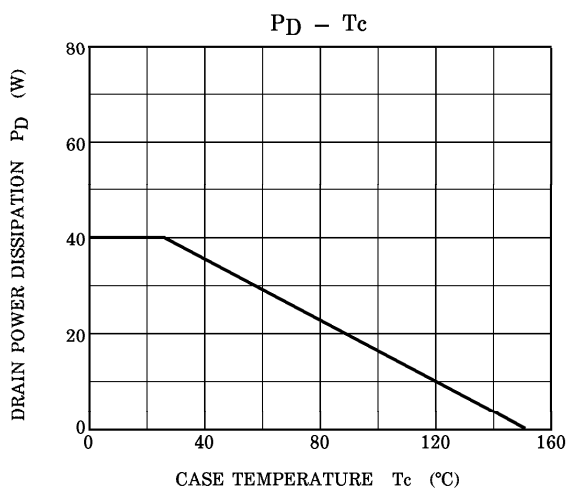
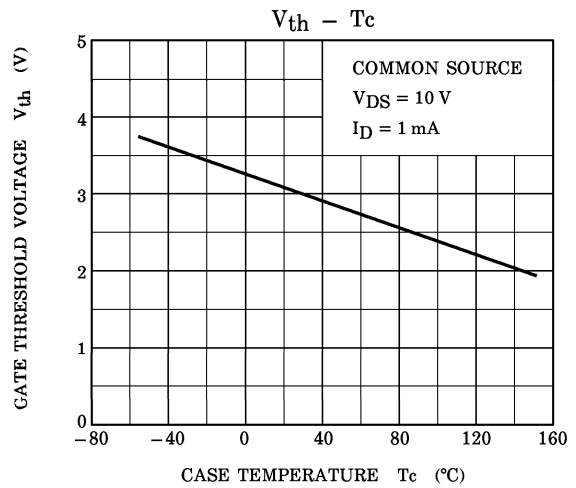
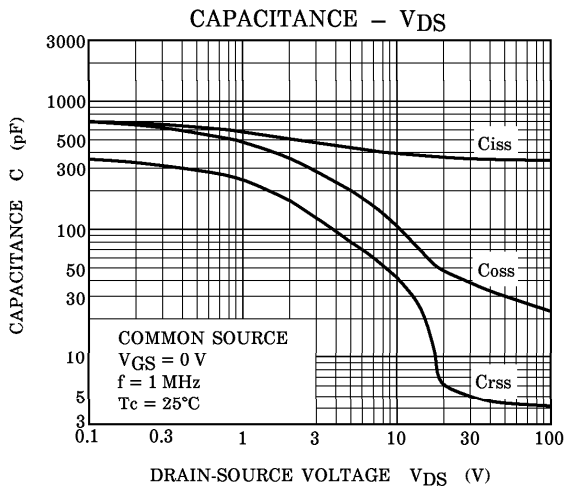
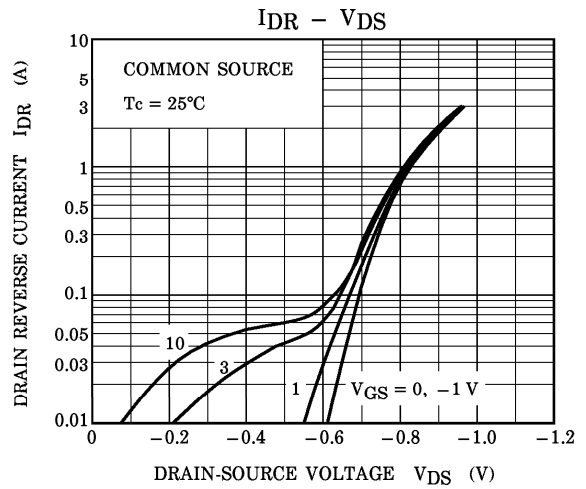
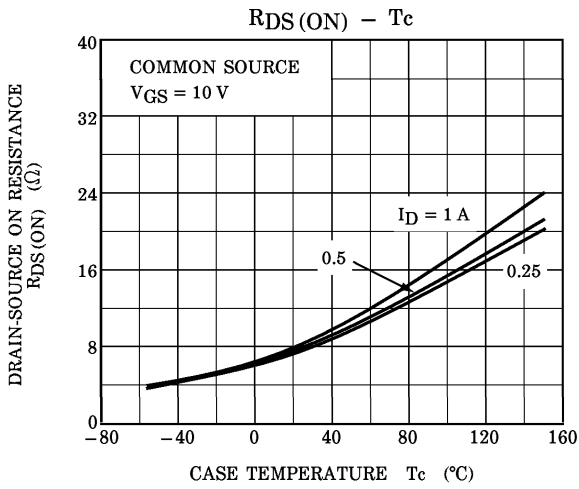


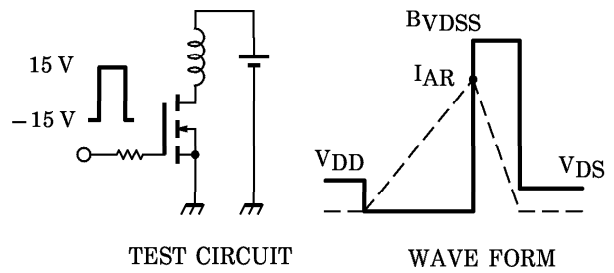
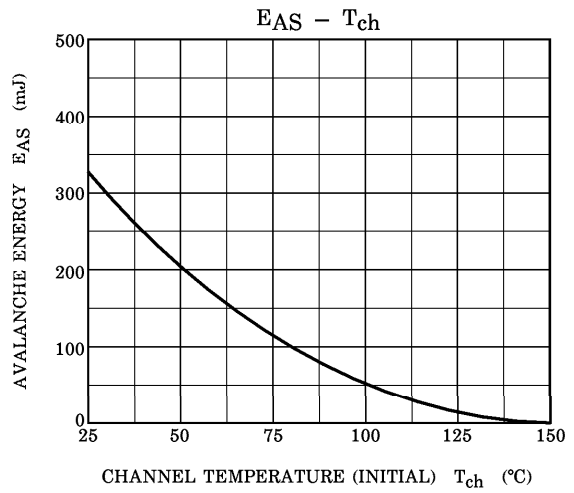
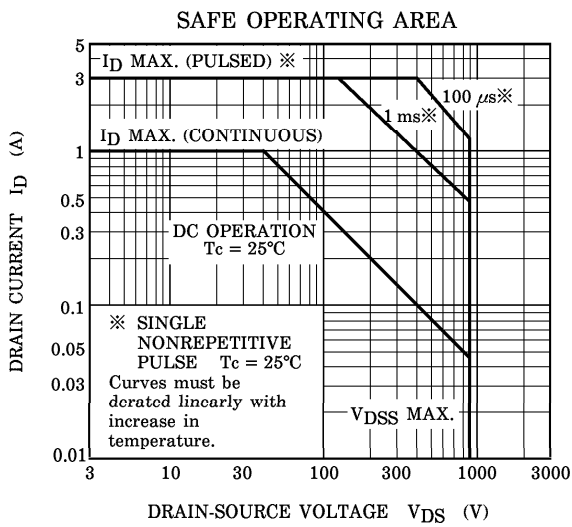
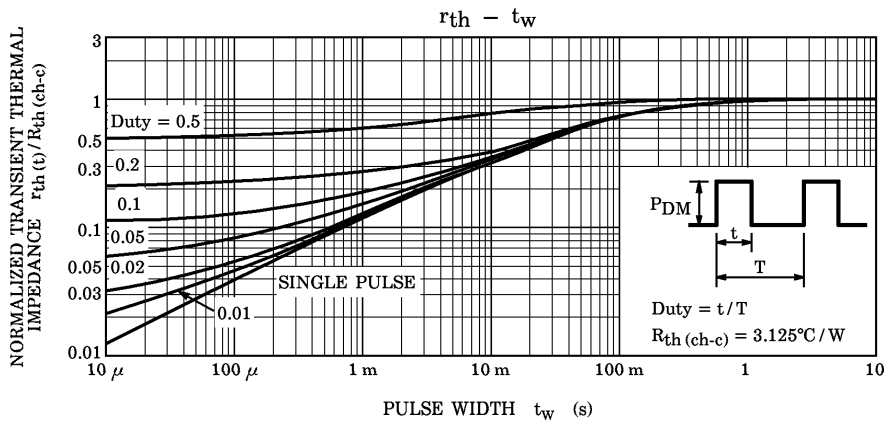
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 1 A$, $R_G = 25 \Omega$
 $V_{DD} = 90 V$, $L = 594 mH$

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