

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

## 2SK2717

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

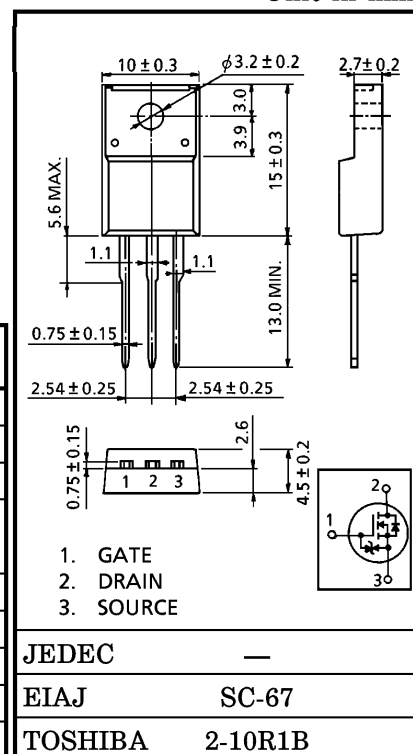
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 2.3\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 4.4S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100\mu A$  (Max.) ( $V_{DS} = 720V$ )
- Enhancement-Mode :  $V_{th} = 2.0 \sim 4.0V$  ( $V_{DS} = 10V$ ,  $I_D = 1mA$ )

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	$V_{GSS}$	$\pm 30$	V
Drain Current	$I_D$	5	A
	$I_{DP}$	15	
Drain Power Dissipation ( $T_c = 25^\circ C$ )	$P_D$	45	W
Single Pulse Avalanche Energy**	$E_{AS}$	595	mJ
Avalanche Current	$I_{AR}$	5	A
Repetitive Avalanche Energy*	$E_{AR}$	4.5	mJ
Channel Temperature	$T_{ch}$	150	$^\circ C$
Storage Temperature Range	$T_{stg}$	$-55 \sim 150$	$^\circ C$



Weight : 1.9g (Typ.)

## THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	2.78	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	62.5	$^\circ C / W$

Note ;

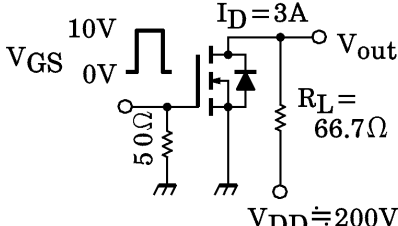
\* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

\*\*  $V_{DD} = 90V$ ,  $T_{ch} = 25^\circ C$  (initial),  $L = 43.6mH$ ,  $R_G = 25\Omega$ ,  $I_{AR} = 5A$ **This transistor is an electrostatic sensitive device.****Please handle with caution.**

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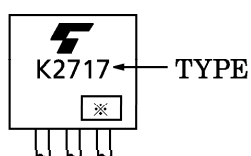
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		$I_{GSS}$	$V_{GS} = \pm 30V, V_{DS} = 0V$	—	—	$\pm 10$	$\mu A$
Gate-Source Breakdown Voltage		$V_{(BR)GSS}$	$I_G = \pm 10\mu A, V_{DS} = 0V$	$\pm 30$	—	—	V
Drain Cut-off Current		$I_{DSS}$	$V_{DS} = 720V, V_{GS} = 0V$	—	—	100	$\mu A$
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10mA, V_{GS} = 0V$	900	—	—	V
Gate Threshold Voltage		$V_{th}$	$V_{DS} = 10V, I_D = 1mA$	2.0	—	4.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 3.0A$	—	2.3	2.5	$\Omega$
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 20V, I_D = 3.0A$	1.1	4.4	—	S
Input Capacitance		$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V$ $f = 1MHz$	—	1200	—	pF
Reverse Transfer Capacitance		$C_{rss}$		—	20	—	
Output Capacitance		$C_{oss}$		—	120	—	
Switching Time	Rise Time	$t_r$		—	40	—	ns
	Turn-on Time	$t_{on}$		—	90	—	
	Fall Time	$t_f$		—	60	—	
	Turn-off Time	$t_{off}$		—	200	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		$Q_g$	$V_{DD} \doteq 400V, V_{GS} = 10V,$ $I_D = 5A$	—	45	—	nC
Gate-Source Charge		$Q_{gs}$		—	25	—	
Gate-Drain ("Miller") Charge		$Q_{gd}$		—	20	—	

## 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	$I_{DRP}$	—	—	—	15	A
Diode Forward Voltage	$V_{DSF}$	$I_{DR} = 5A, V_{GS} = 0V$	—	—	—1.9	V
Reverse Recovery Time	$t_{rr}$	$I_{DR} = 5A, V_{GS} = 0V$ $dI_{DR}/dt = 100A/\mu s$	—	1300	—	ns
Reverse Recovery Charge	$Q_{rr}$		—	11	—	$\mu C$

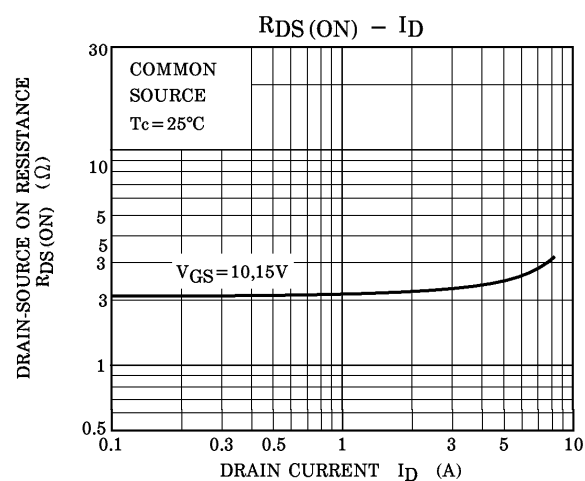
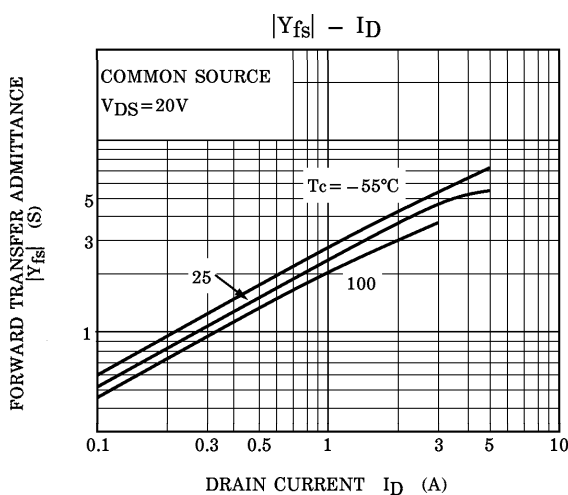
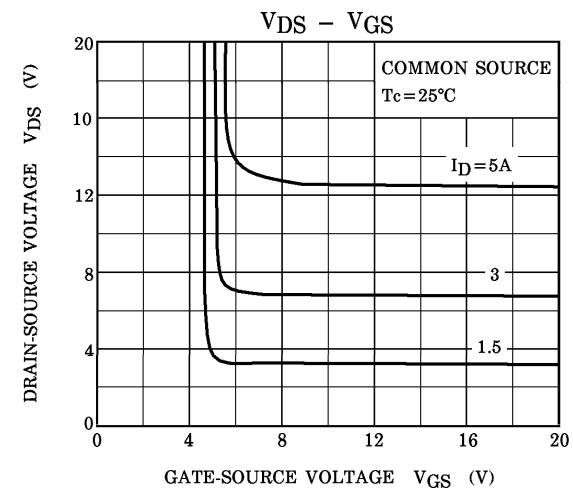
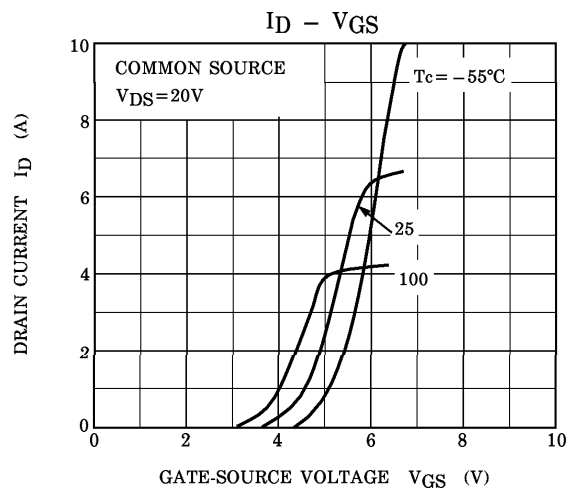
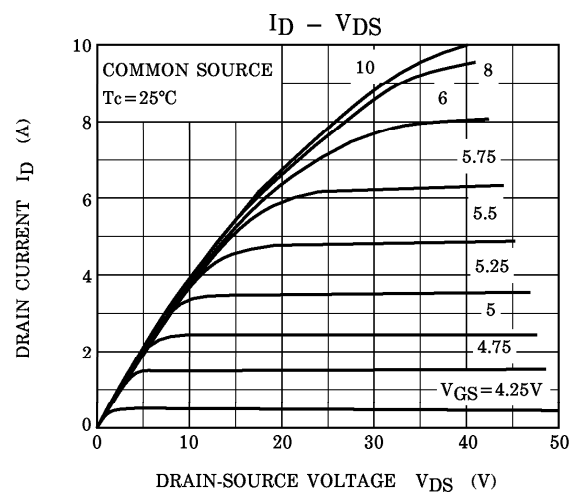
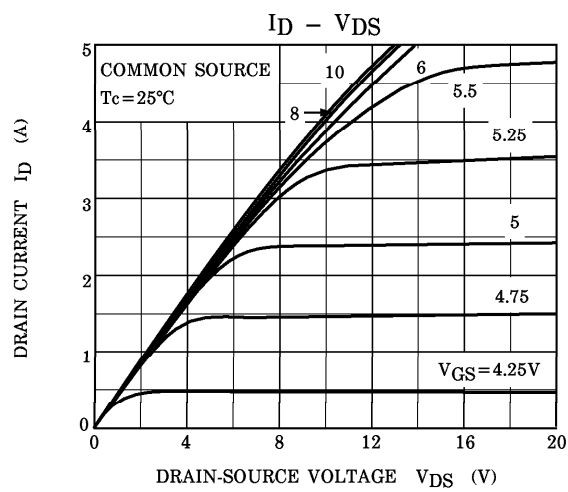
## MARKING

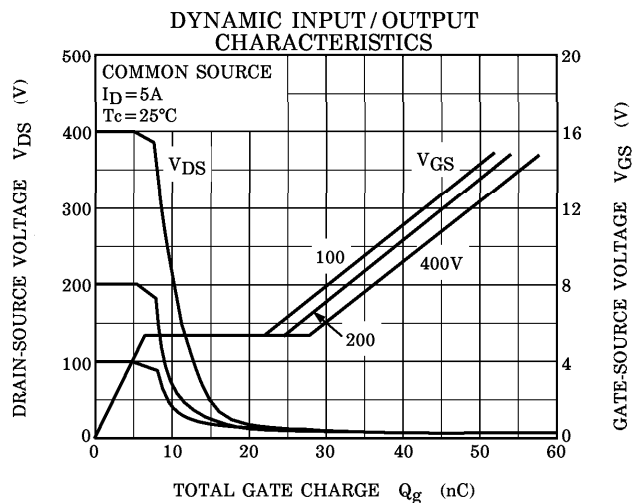
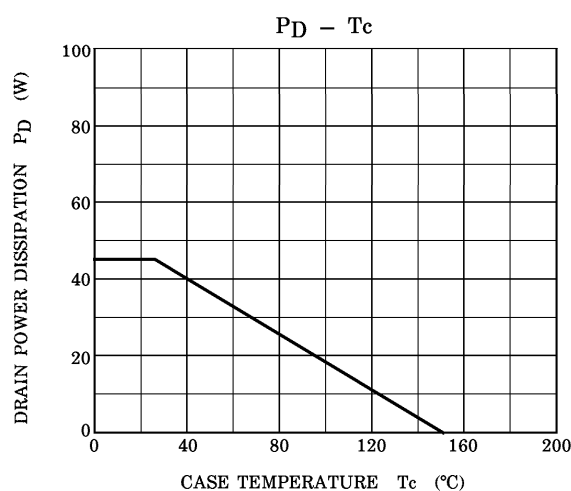
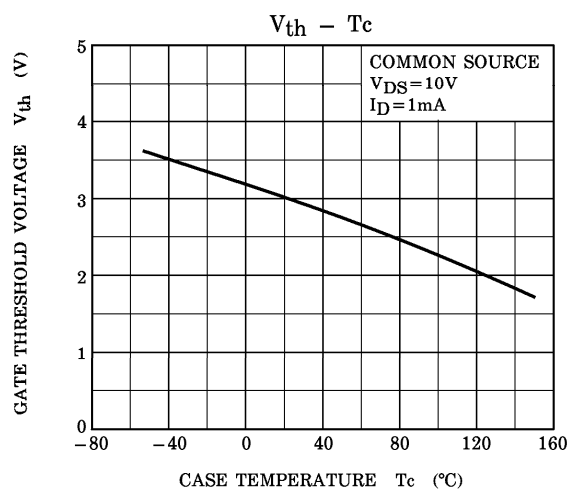
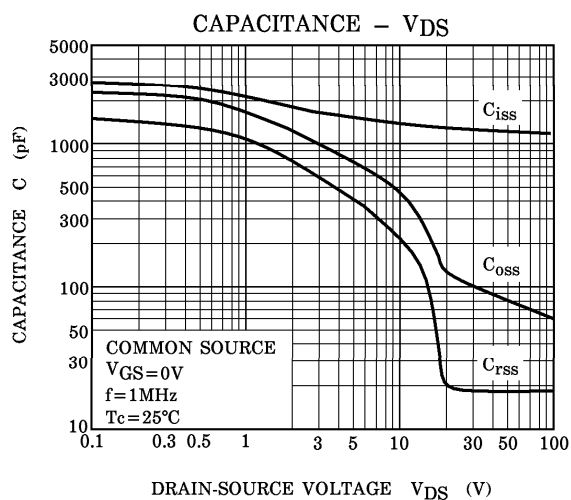
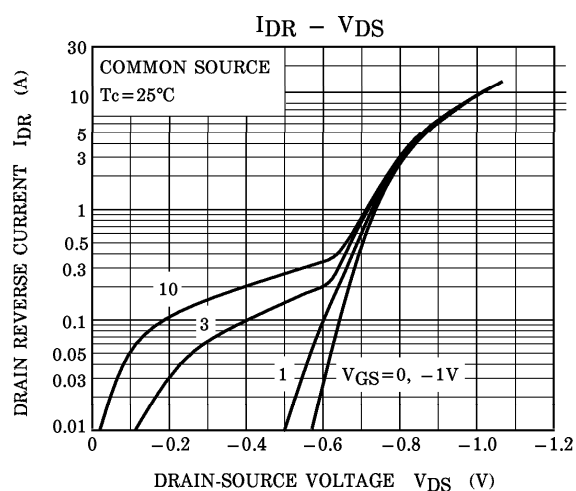
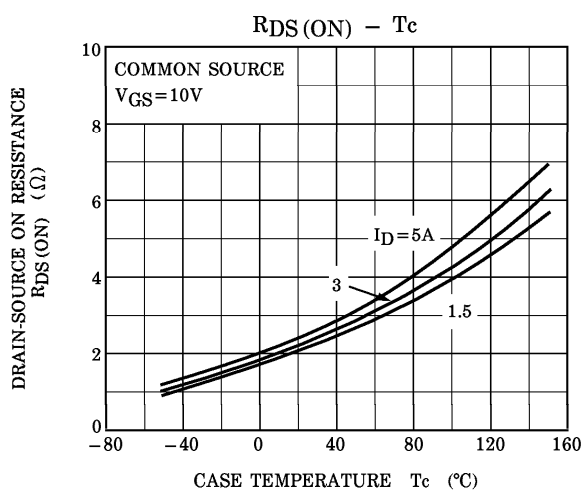


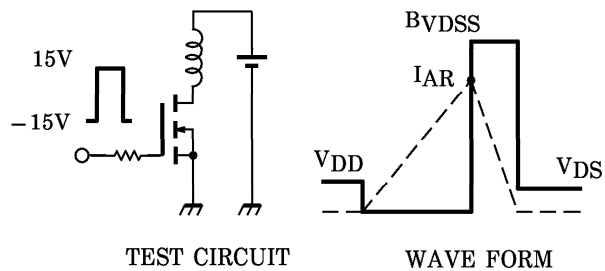
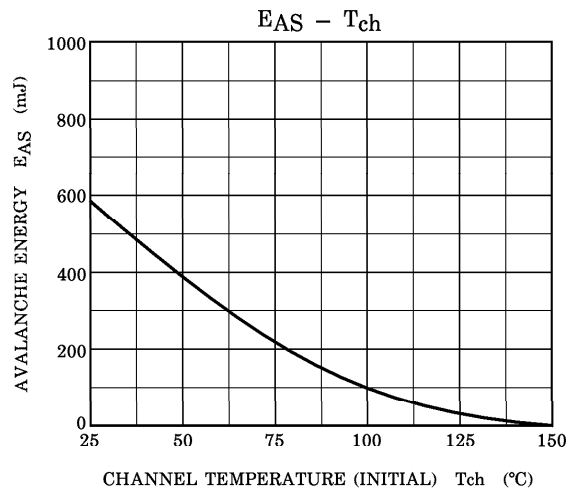
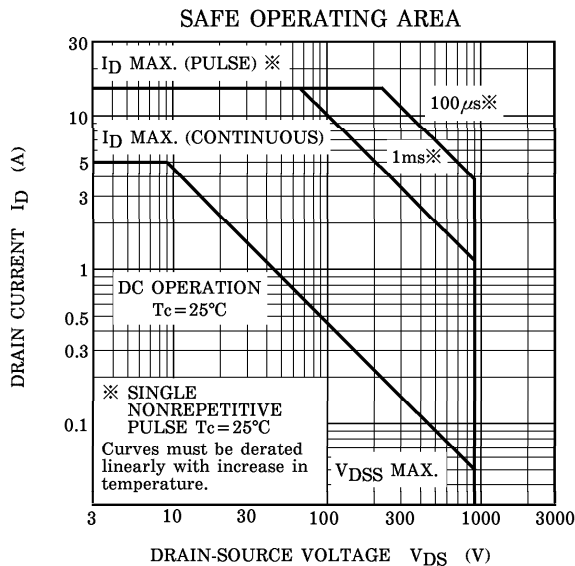
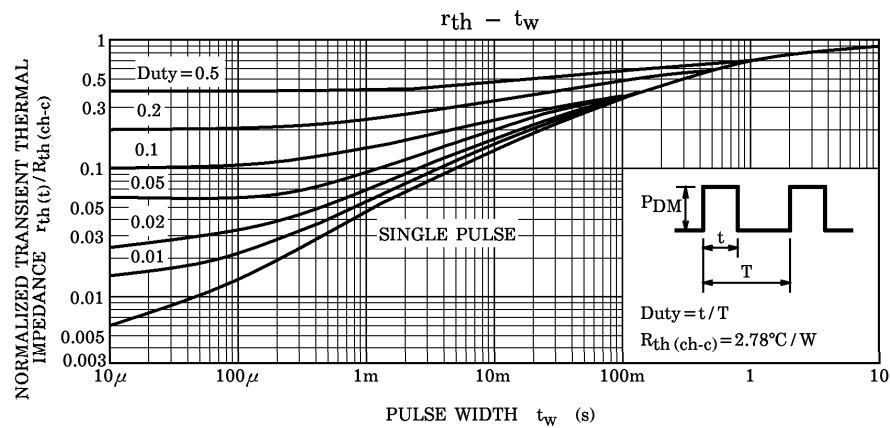
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak  $I_{AR} = 5A$ ,  $R_G = 25\Omega$   
 $V_{DD} = 90V$ ,  $L = 43.6mH$

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