

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

# 2SK2719

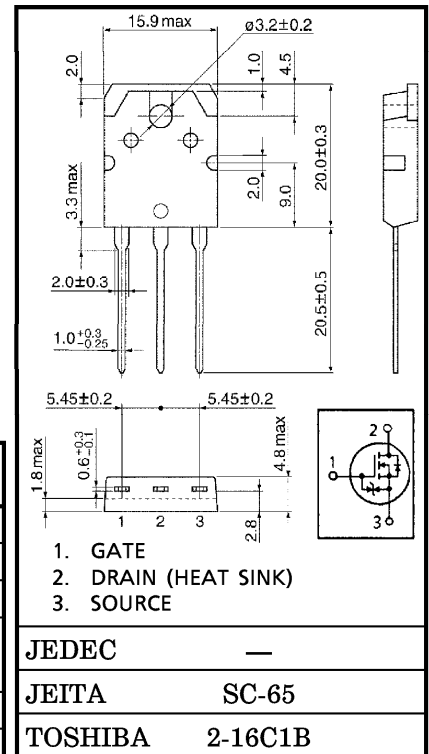
CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 3.7 \Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 2.6 S$  (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 ( $R_{GS} = 20 k\Omega$ )		$V_{DGR}$	900	V
Gate-Source Voltage		$V_{GSS}$	$\pm 30$	V
Drain Current	DC (Note 1)	$I_D$	3	A
	Pulse (Note 1)	$I_{DP}$	9	
Drain Power Dissipation ( $T_c = 25^\circ C$ )		$P_D$	125	W
Single Pulse Avalanche Energy (Note 2)		$E_{AS}$	295	mJ
Avalanche Current		$I_{AR}$	3	A
Repetitive Avalanche Energy (Note 3)		$E_{AR}$	12.5	mJ
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	$-55 \sim 150$	$^\circ C$

Unit in mm



Weight : 4.6 g (Typ.)

## THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	1.0	°C/W
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	50.0	°C/W

(Note 1) : Please use devices on condition that the channel temperature is below 150°C.

(Note 2) :  $V_{DD} = 25\text{ V}$ ,  $T_{ch} = 25^\circ\text{C}$  (initial),  $L = 58\ \mu\text{H}$ ,  $R_G = 25\ \Omega$ ,  $I_{AR} = 45\ \text{A}$

(Note 3) : Repetitive rating ; Pulse Width Limited by maximum junction temperature.

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

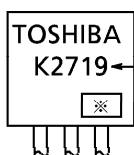
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I <sub>GSS</sub>	V <sub>GS</sub> = ±30 V, V <sub>DS</sub> = 0 V	—	—	±10	μA
Gate-Source Breakdown Voltage		V <sub>(BR)GSS</sub>	I <sub>G</sub> = ±10 μA, V <sub>DS</sub> = 0 V	±30	—	—	V
Drain Cut-off Current		I <sub>DSS</sub>	V <sub>DS</sub> = 720 V, V <sub>GS</sub> = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		V <sub>(BR)DSS</sub>	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0 V	900	—	—	V
Gate Threshold Voltage		V <sub>th</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 mA	2.0	—	4.0	V
Drain-Source ON Resistance		R <sub>D(S)ON</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 1.5 A	—	3.7	4.3	Ω
Forward Transfer Admittance		Y <sub>fs</sub>	V <sub>DS</sub> = 20 V, I <sub>D</sub> = 1.5 A	0.65	2.6	—	S
Input Capacitance		C <sub>iss</sub>	V <sub>DS</sub> = 25 V, V <sub>GS</sub> = 0 V, f = 1 MHz	—	750	—	pF
Reverse Transfer Capacitance		C <sub>rss</sub>		—	10	—	
Output Capacitance		C <sub>oss</sub>		—	70	—	
Switching Time	Rise Time	t <sub>r</sub>		—	15	—	ns
	Turn-on Time	t <sub>on</sub>		—	55	—	
	Fall Time	t <sub>f</sub>		—	30	—	
	Turn-off Time	t <sub>off</sub>		—	110	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q <sub>g</sub>	V <sub>DD</sub> ≐ 400 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 3 A	—	25	—	nC
Gate-Source Charge		Q <sub>gs</sub>		—	13	—	
Gate-Drain (“Miller”) Charge		Q <sub>gd</sub>		—	12	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current (Note 1)	I <sub>DR</sub>	—	—	—	3	A
Pulse Drain Reverse Current (Note 1)	I <sub>DRP</sub>	—	—	—	9	A
Diode Forward Voltage	V <sub>DSF</sub>	I <sub>DR</sub> = 3 A, V <sub>GS</sub> = 0 V	—	—	-1.9	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>DR</sub> = 3 A, V <sub>GS</sub> = 0 V dI <sub>DR</sub> /dt = 100 A/μs	—	1100	—	ns
Reverse Recovery Charge	Q <sub>rr</sub>		—	7.5	—	μC

MARKING

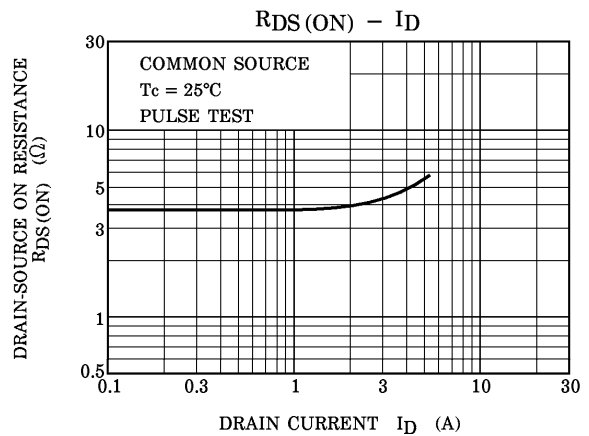
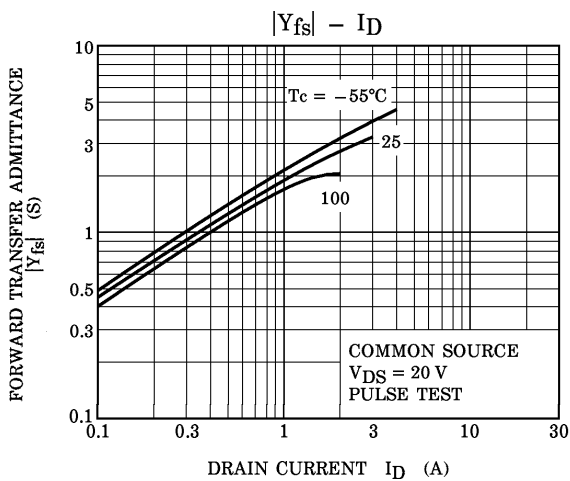
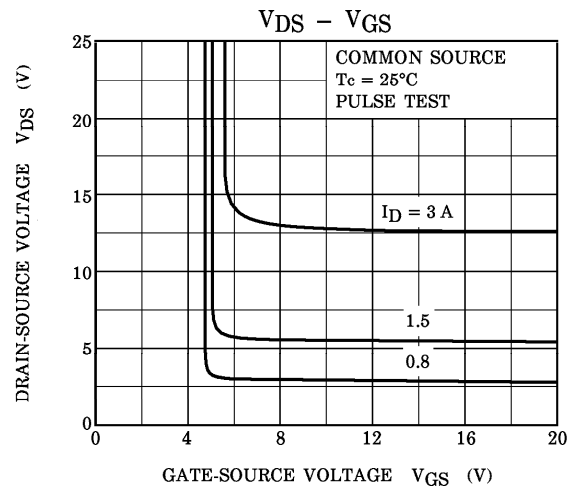
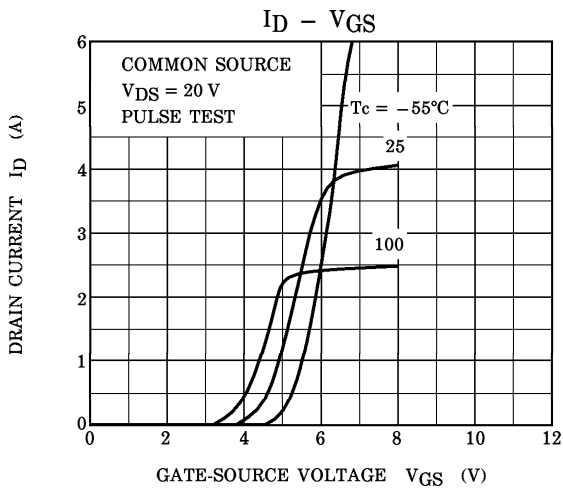
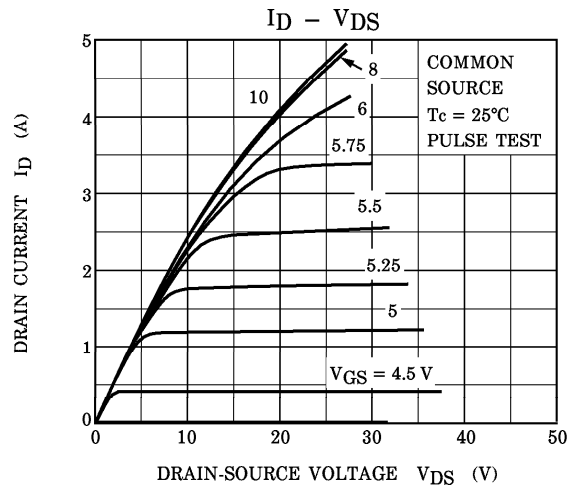
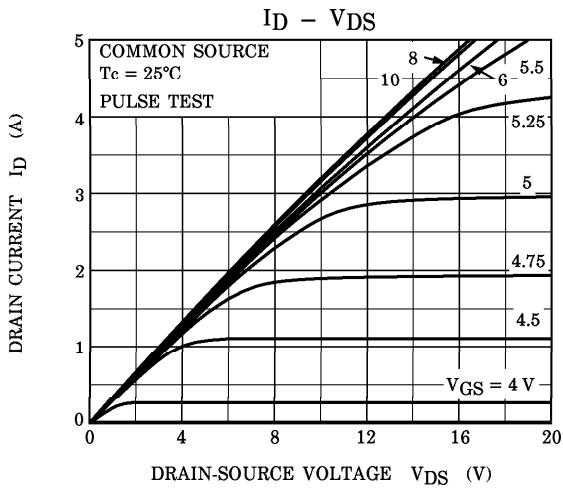


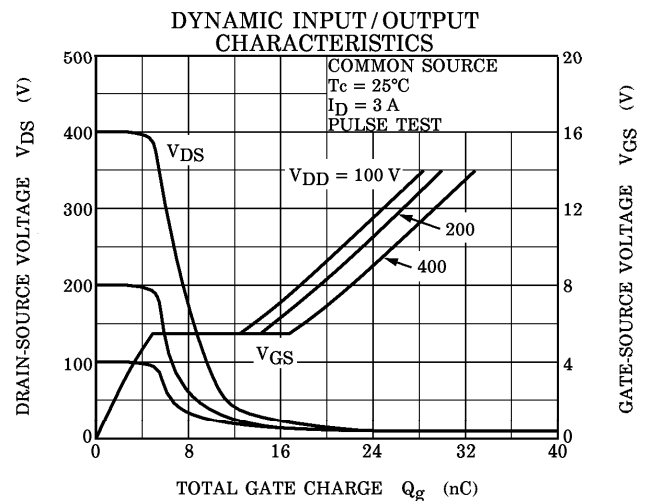
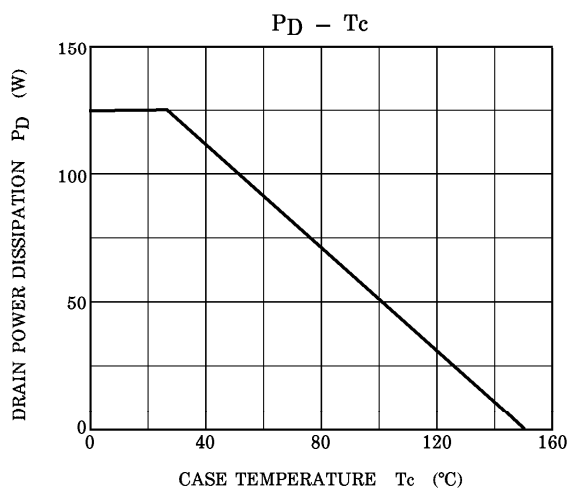
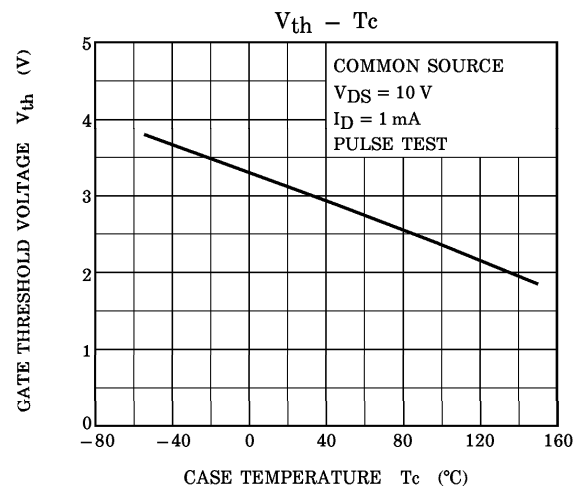
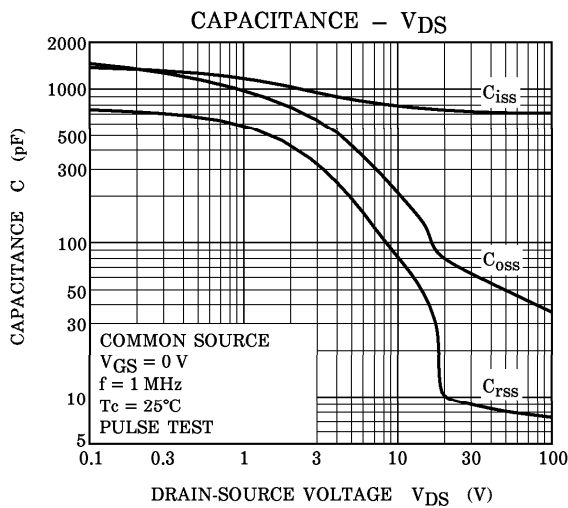
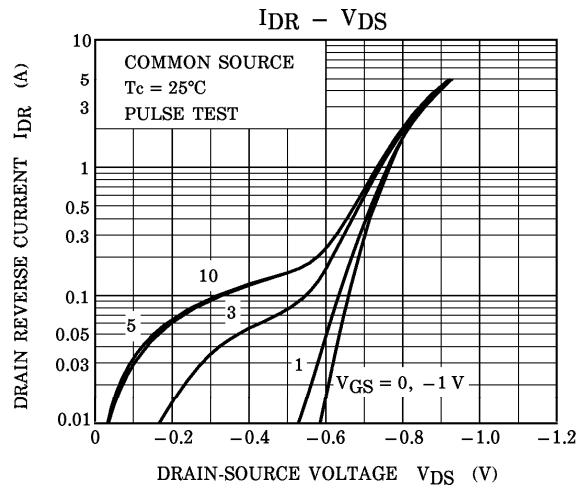
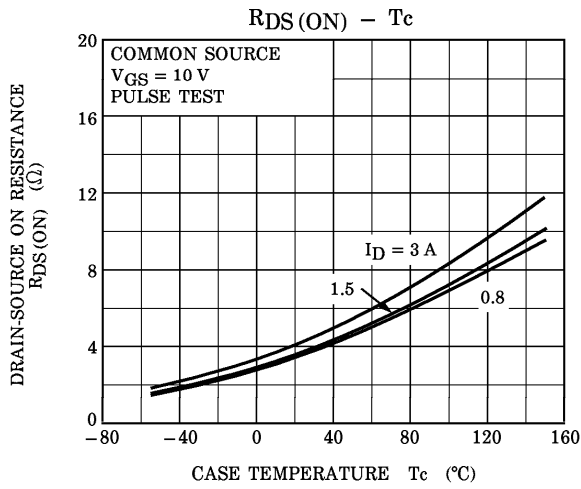
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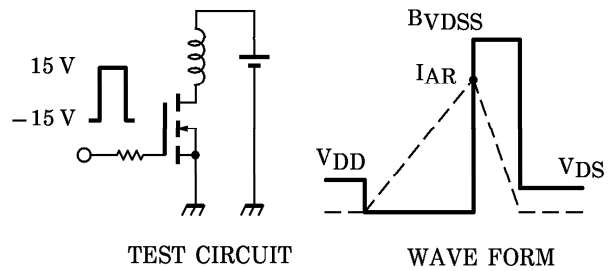
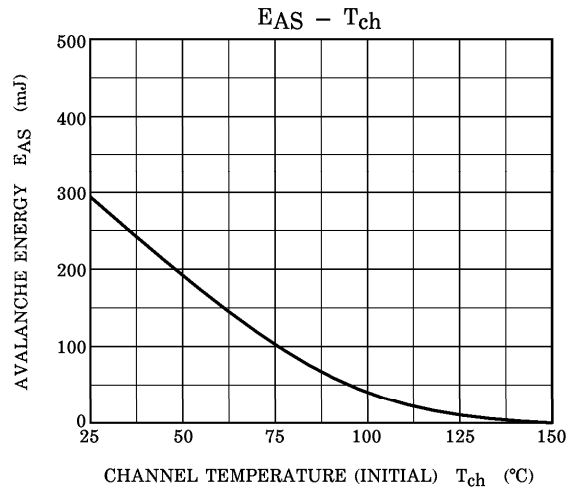
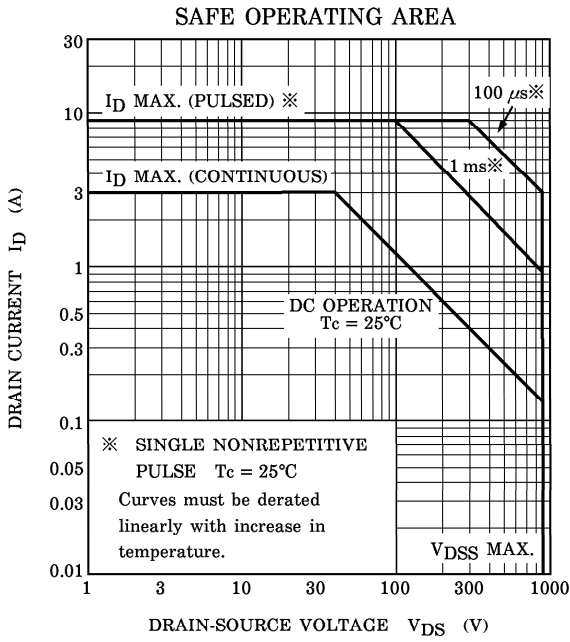
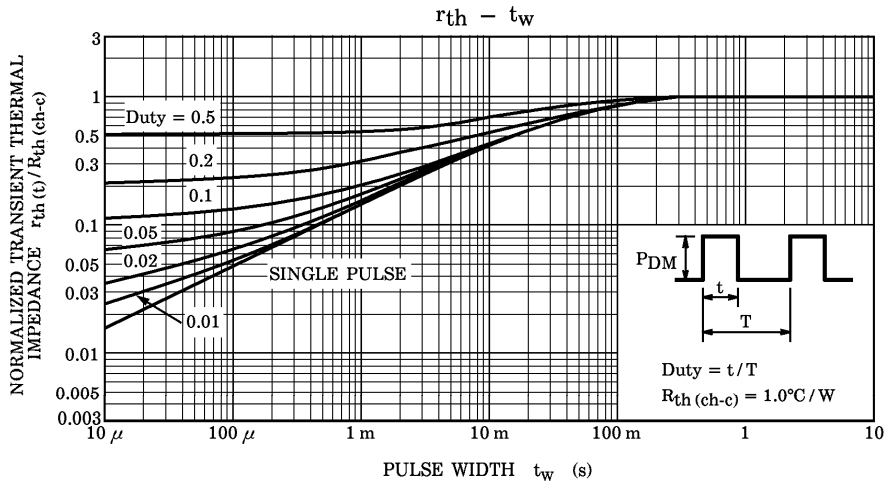
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







$R_G = 25 \Omega$   
 $V_{DD} = 90 V, L = 60 mH$

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

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