

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

2SK2749

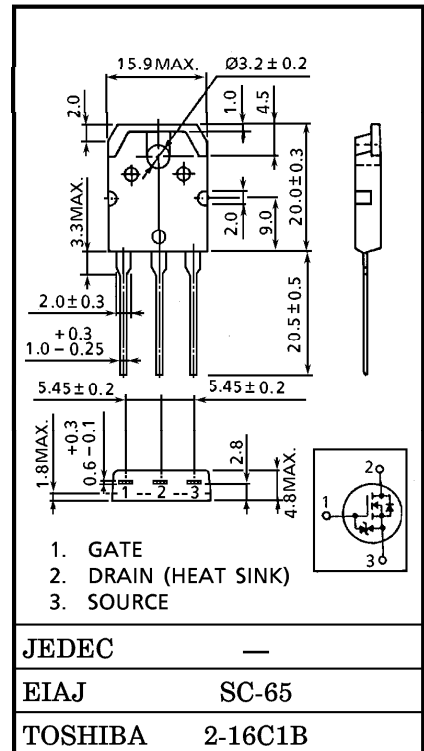
HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS
 CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS
 Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 1.6 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 5.0 S$ (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}	± 30	V
Drain Current	DC	7	A
	Pulse	21	
Drain Power Dissipation ($T_c = 25^\circ C$)	P_D	150	W
Single Pulse Avalanche Energy**	E_{AS}	682	mJ
Avalanche Current	I_{AR}	7	A
Repetitive Avalanche Energy*	E_{AR}	15	mJ
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature Range	T_{stg}	$-55 \sim 150$	$^\circ C$



Weight : 4.6 g

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	0.833	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	50	$^\circ C / W$

Note ;

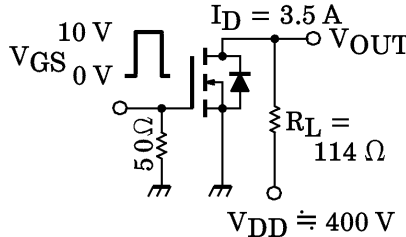
- * Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- ** $V_{DD} = 90 V, T_{ch} = 25^\circ C$ (initial), $L = 25.5 mH, I_{AR} = 7 A, R_G = 25 \Omega$

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

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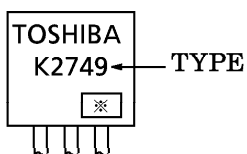
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 25 \text{ V}, V_{DS} = 0 \text{ V}$	—	—	± 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	$R_{DS(ON)}$	$V_{GS} = 10 \text{ V}, I_D = 3.5 \text{ A}$	—	1.6	2.0	Ω	
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 10 \text{ V}, I_D = 3.5 \text{ A}$	1.25	5.0	—	S	
Input Capacitance	C_{iss}	$V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V},$ $f = 1 \text{ MHz}$	—	1500	—	pF	
Reverse Transfer Capacitance	C_{rss}		—	30	—		
Output Capacitance	C_{oss}		—	140	—		
Switching Time	Rise Time	t_r		—	35	—	ns
	Turn-on Time	t_{on}		—	80	—	
	Fall Time	t_f		—	50	—	
	Turn-off Time	t_{off}		$V_{IN} : t_r, t_f < 5 \text{ ns},$ $\text{Duty} \leq 1\%, t_w = 10 \mu\text{s}$	—	220	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q_g	$V_{DD} \doteq 400 \text{ V}, V_{GS} = 10 \text{ V},$ $I_D = 7 \text{ A}$	—	55	—	nC	
Gate-Source Charge	Q_{gs}		—	30	—		
Gate-Drain ("Miller") Charge	Q_{gd}		—	25	—		

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	7	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	21	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = 7 \text{ A}, V_{GS} = 0 \text{ V}$	—	—	-1.9	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 7 \text{ A}, V_{GS} = 0 \text{ V}$	—	1400	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_{DR} / dt = 100 \text{ A} / \mu\text{s}$	—	14	—	μC

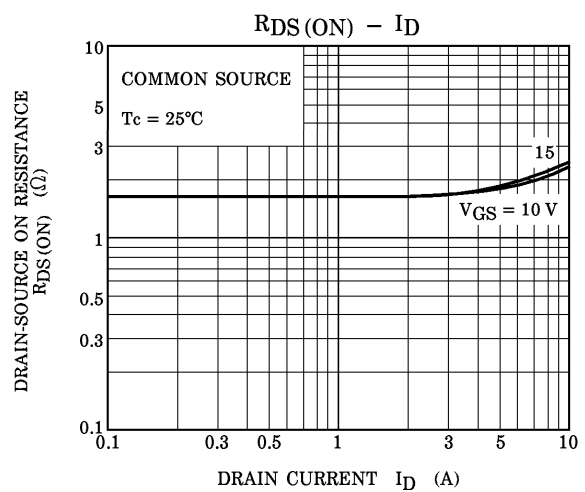
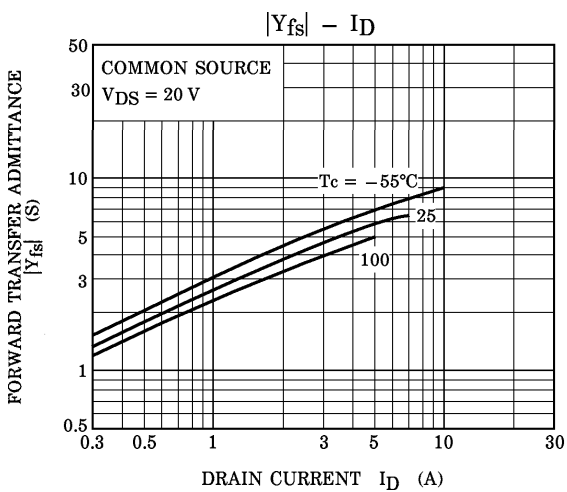
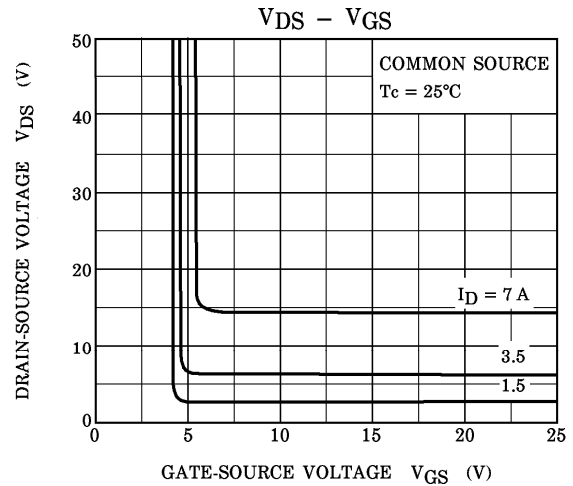
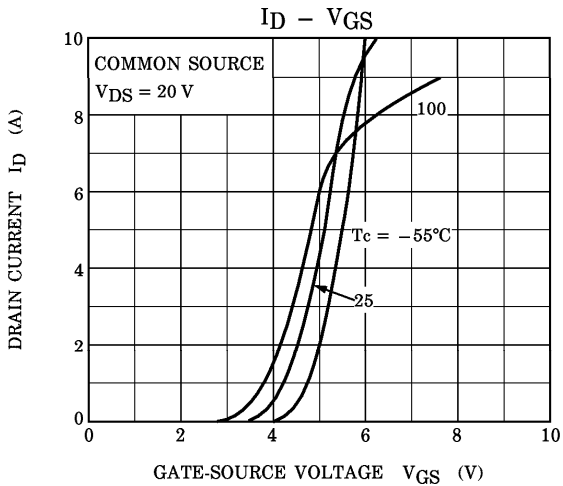
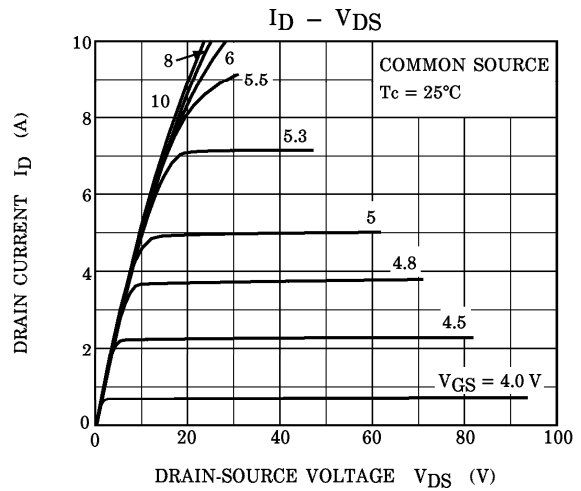
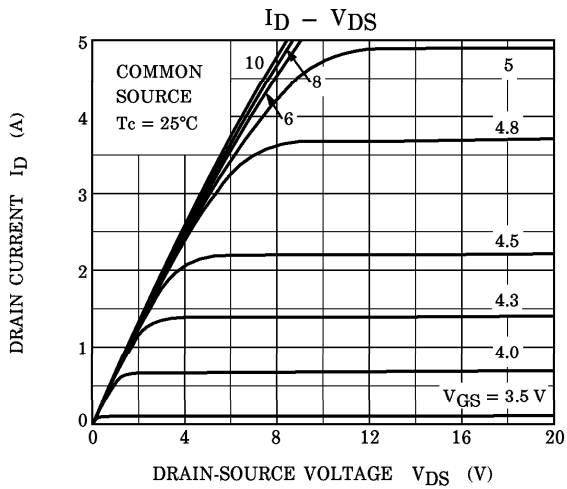
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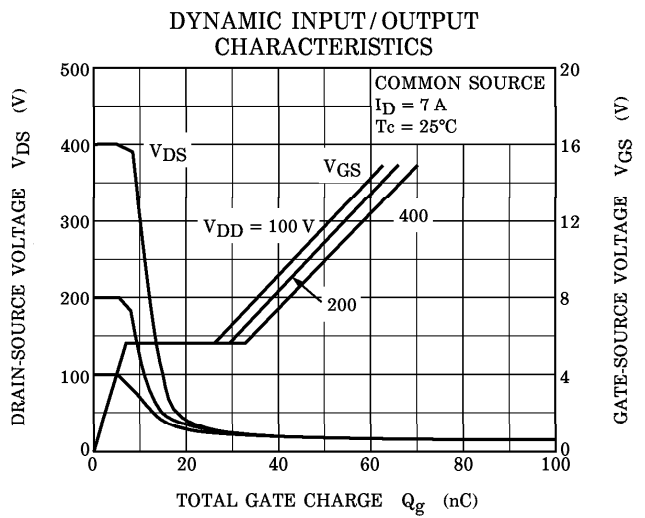
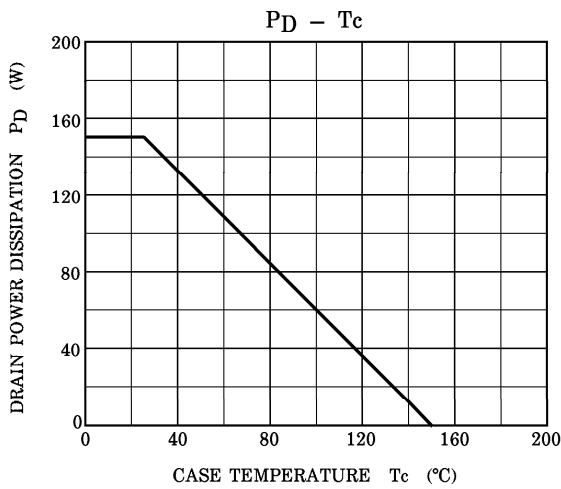
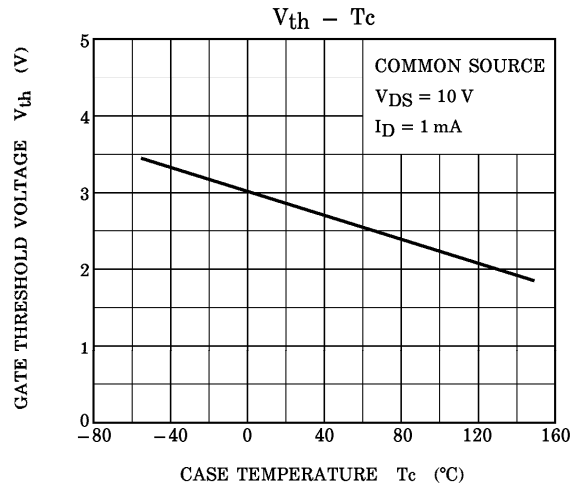
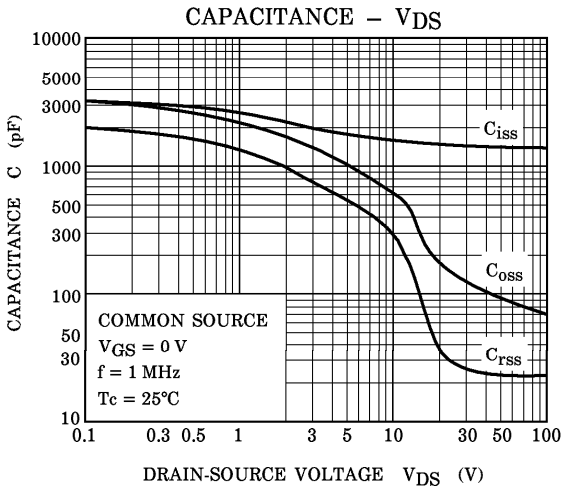
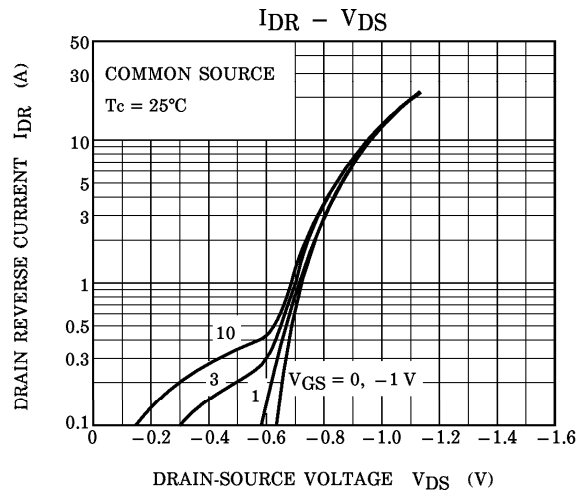
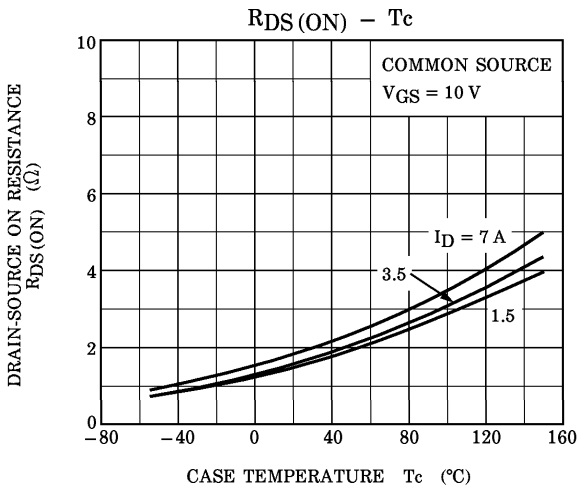


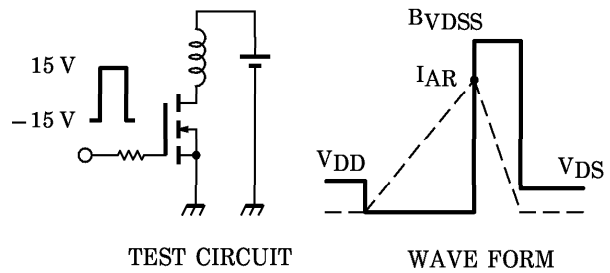
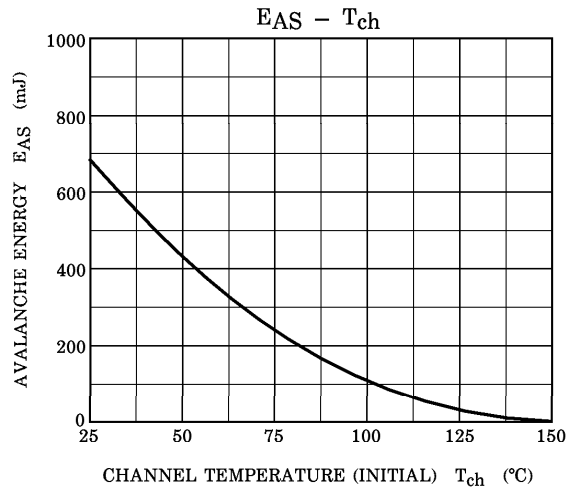
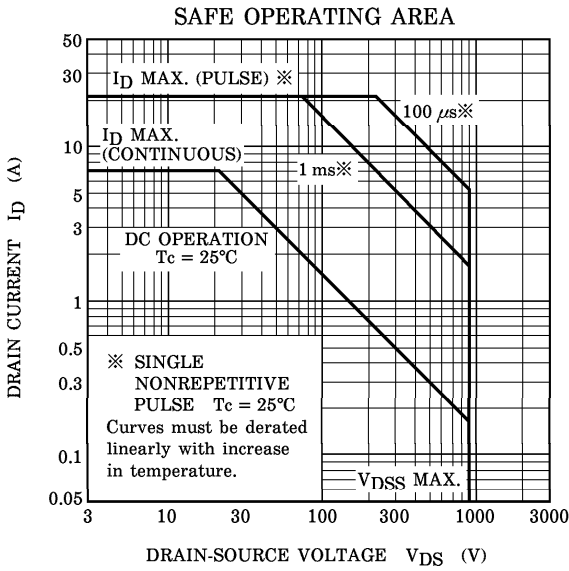
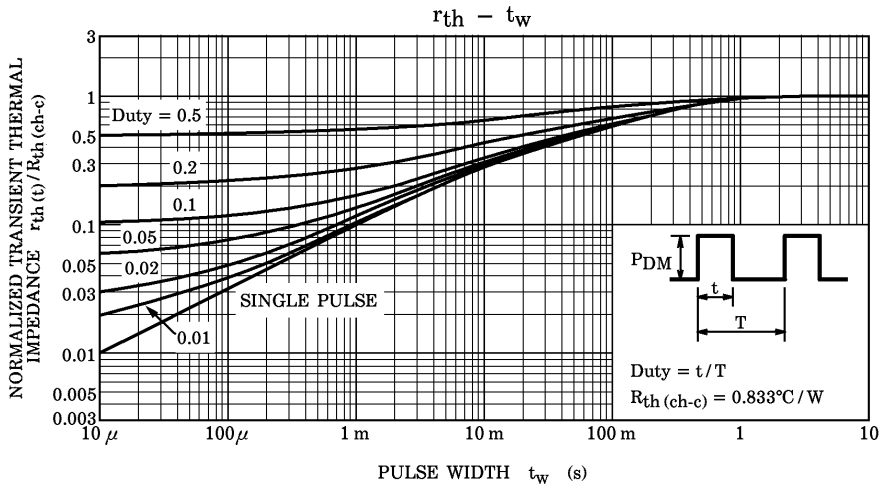
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 7$ A, $R_G = 25 \Omega$
 $V_{DD} = 90$ V, $L = 25.5$ mH

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