

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

2SK2949

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 : $R_{DS(ON)} = 0.4 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 8.0 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu A$ (Max.) ($V_{DS} = 400 V$)
- 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}	400	V
Drain-Gate Voltage ($R_{GS} = 20 k\Omega$)		V_{DGR}	400	V
Gate-Source Voltage		V_{GSS}	± 30	V
Drain Current	DC	I_D	10	A
	Pulse	I_{DP}	40	A
Drain Power Dissipation ($T_c = 25^\circ C$)		P_D	80	W
Single Pulse Avalanche Energy**		E_{AS}	360	mJ
Avalanche Current		I_{AR}	10	A
Repetitive Avalanche Energy*		E_{AR}	8	mJ
Channel Temperature		T_{ch}	150	$^\circ C$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ C$

THERMAL CHARACTERISTICS

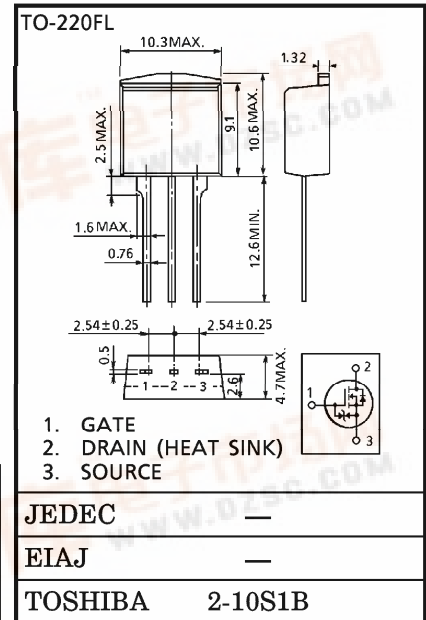
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	1.56	$^\circ C/W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	$^\circ C/W$

Note ;

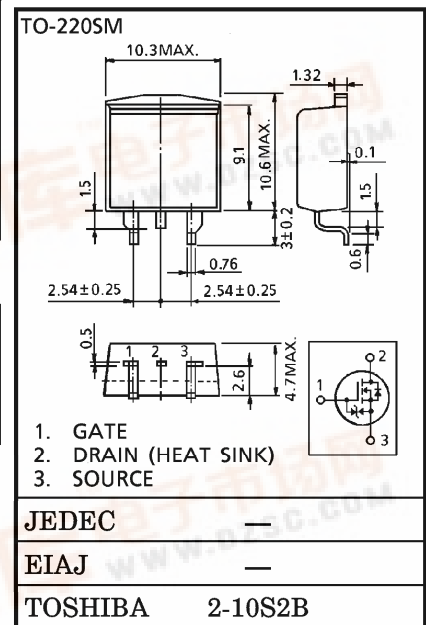
* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

** $V_{DD} = 90 V, T_{ch} = 25^\circ C$ (initial), $L = 5.85 mH, R_G = 25 \Omega, I_{AR} = 10 A$

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



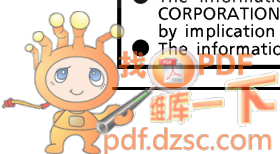
Weight : 1.5 g (Typ.)



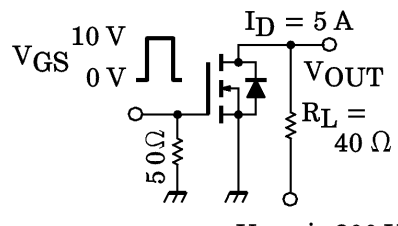
Weight : 1.5 g (Typ.)

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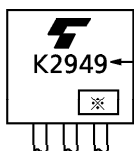
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±25 V, VDS = 0 V	—	—	±10	μA
Gate-Source Breakdown Voltage		V(BR)GSS	IG = ±10 μA, VDS = 0 V	±30	—	—	V
Drain Cut-Off Current		IDSS	VDS = 400 V, VGS = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10 mA, VGS = 0 V	400	—	—	V
Gate Threshold Voltage		Vth	VDS = 10 V, ID = 1 mA	2.0	—	4.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = 10 V, ID = 5.0 A	—	0.4	0.55	Ω
Forward Transfer Admittance		Yfs	VDS = 10 V, ID = 5.0 A	4.0	8.0	—	S
Input Capacitance		Ciss	VDS = 10 V, VGS = 0 V, f = 1 MHz	—	1340	—	pF
Reverse Transfer Capacitance		Crss		—	160	—	
Output Capacitance		Coss		—	490	—	
Switching Time	Rise Time	tr	 <p>VGS 10 V 0 V</p> <p>ID = 5 A</p> <p>VOUT</p> <p>RL = 40 Ω</p> <p>VDD ≐ 200 V</p> <p>VIN : tr, tf < 5 ns, Duty ≤ 1%, tw = 10 μs</p>	—	22	—	ns
	Turn-On Time	ton		—	60	—	
	Fall Time	tf		—	32	—	
	Turn-Off Time	toff		—	140	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≐ 320 V, VGS = 10 V	—	34	—	nC
Gate-Source Charge		Qgs	ID = 10 A	—	18	—	
Gate-Drain ("Miller") Charge		Qgd		—	16	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	10	A
Pulse Drain Reverse Current	IDRP	—	—	—	40	A
Diode Forward Voltage	VDSF	IDR = 10 A, VGS = 0 V	—	—	-1.7	V
Reverse Recovery Time	trr	IDR = 10 A, VGS = 0 V	—	350	—	ns
Reverse Recovery Charge	Qrr	dIDR/dt = 100 A/μs	—	2.6	—	μC

MARKING

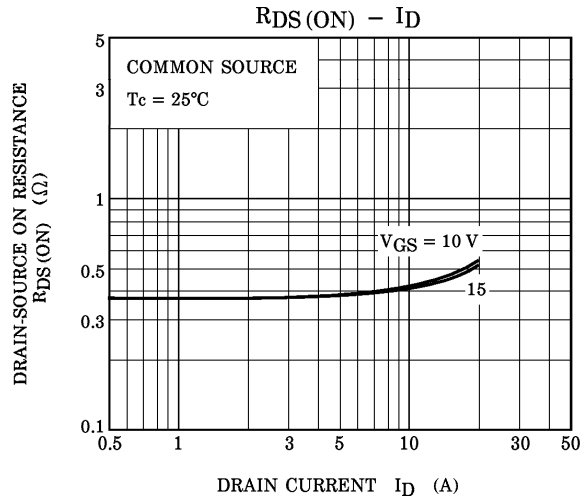
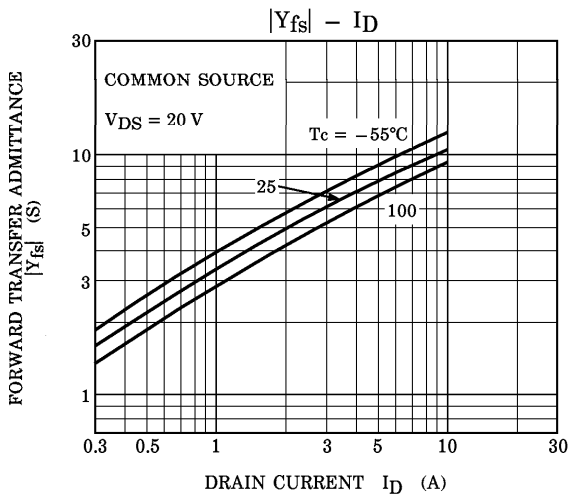
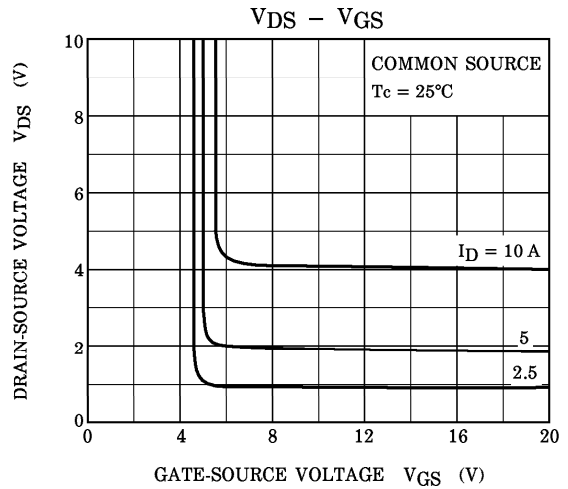
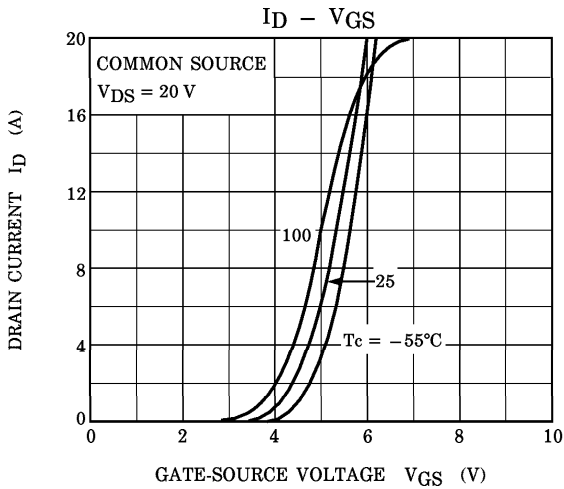
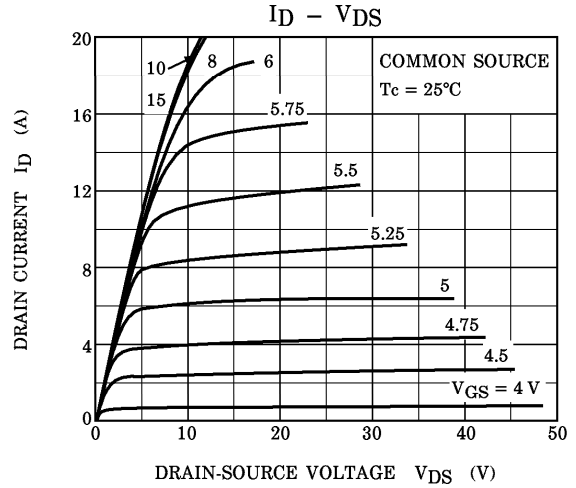
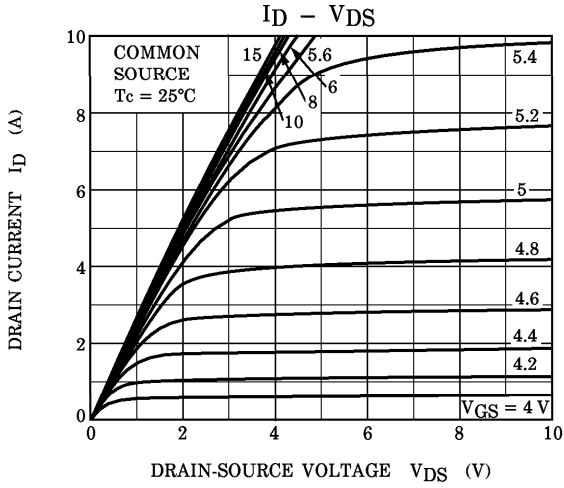


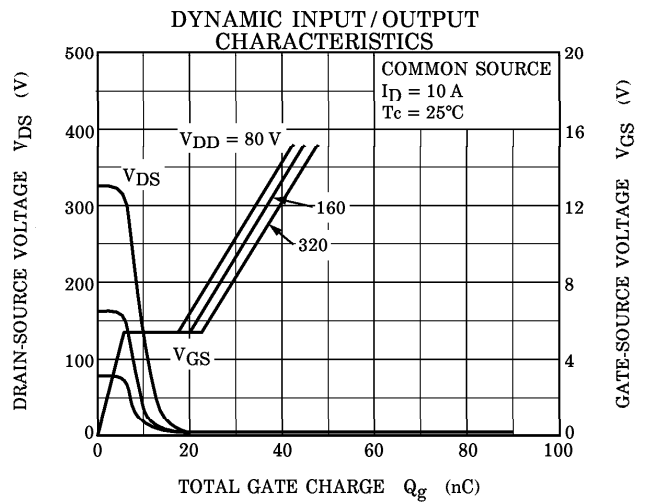
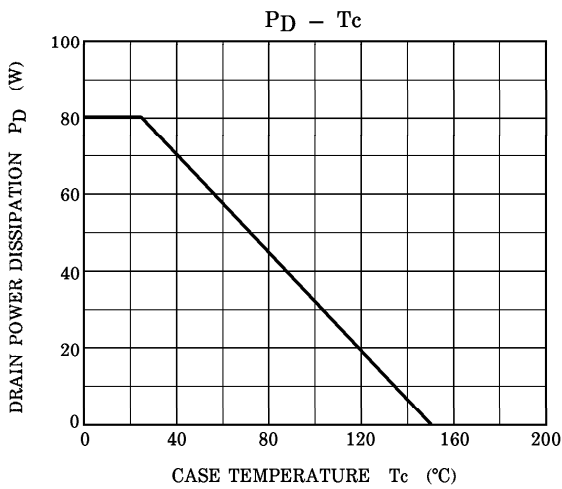
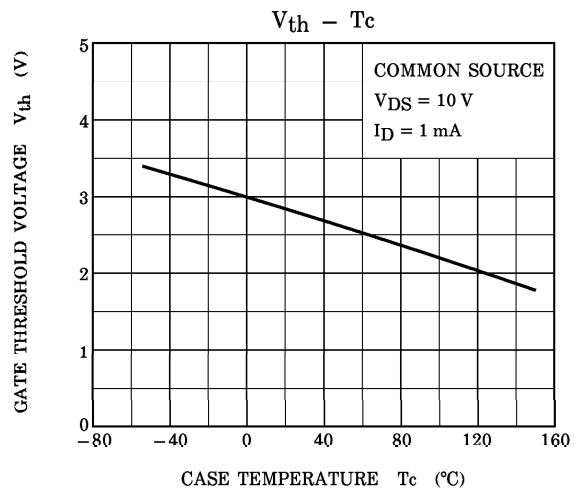
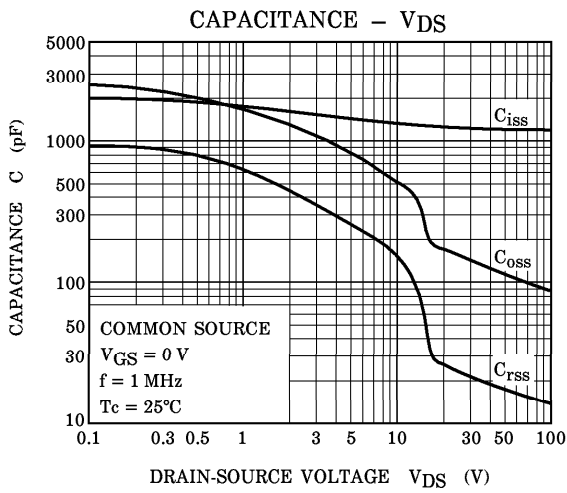
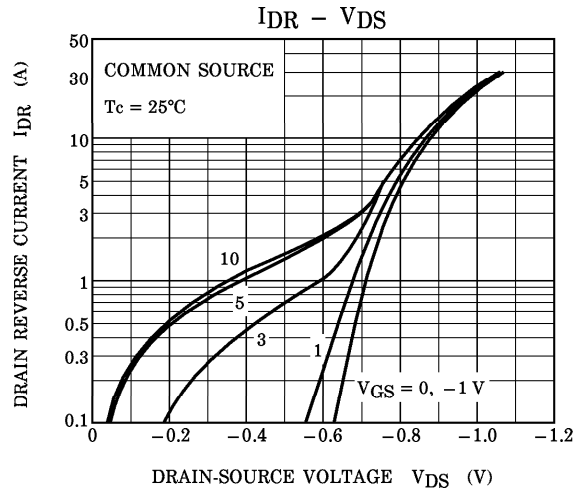
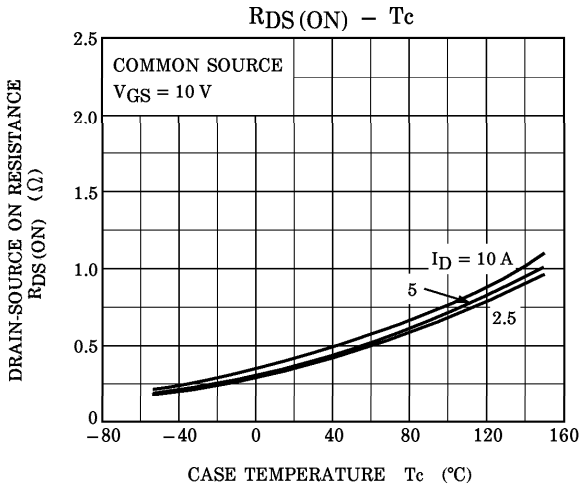
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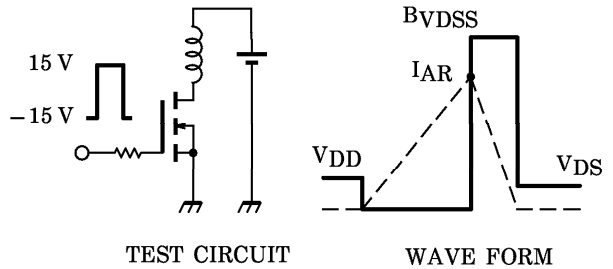
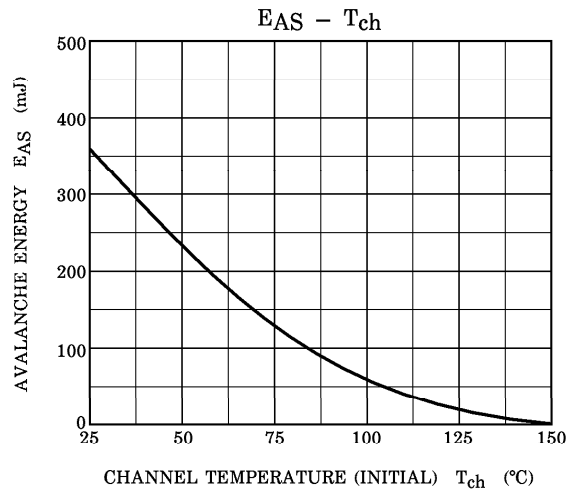
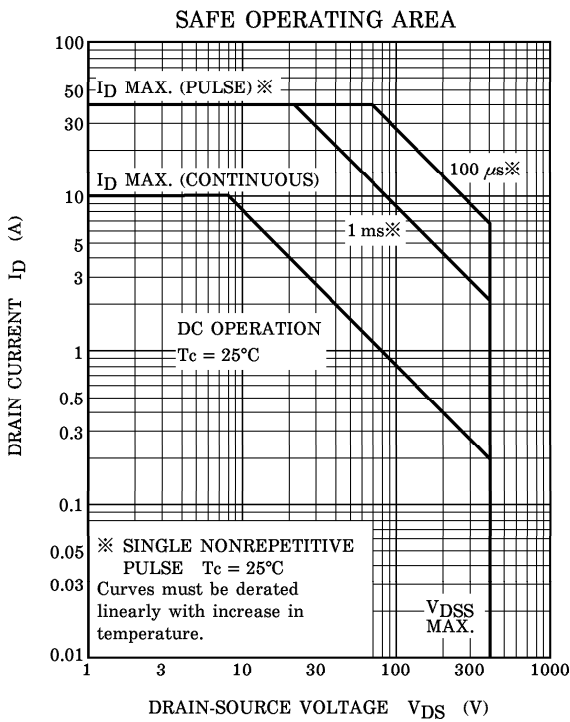
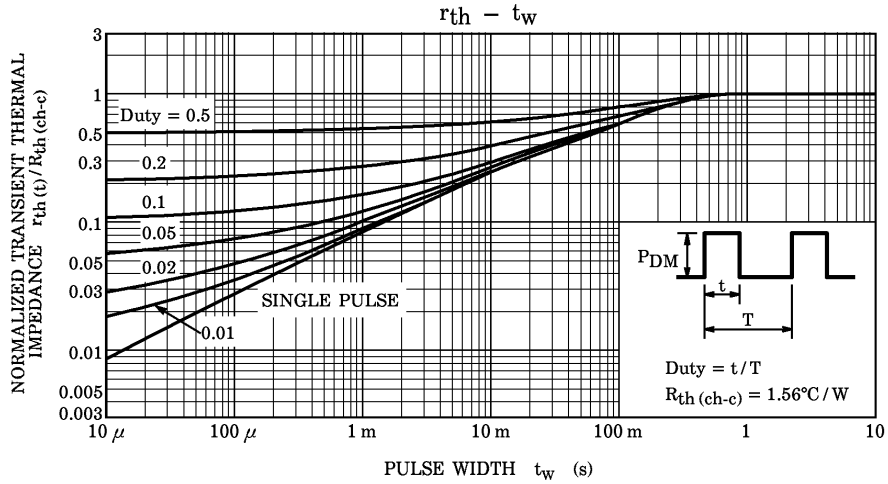
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak IAR = 10 A, $R_G = 25 \Omega$
 $V_{DD} = 90 \text{ V}$, $L = 5.85 \text{ mH}$ $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{BV_{DSS}}{BV_{DSS} - V_{DD}} \right)$