

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

- 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.

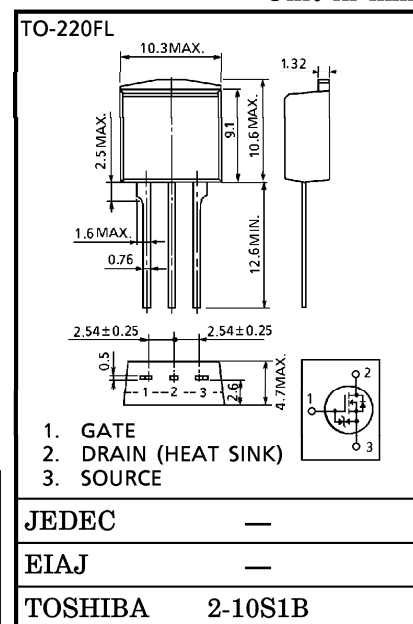
** $V_{DD} = 90 V$, $T_{ch} = 25^\circ C$ (initial), $L = 5.85 mH$, $R_G = 25 \Omega$,
 $I_{AR} = 10 A$

This transistor is an electrostatic sensitive device.

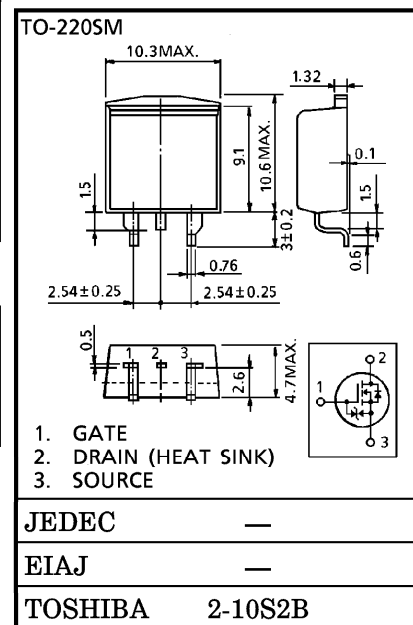
Please handle with caution.

INDUSTRIAL APPLICATIONS

Unit in mm



Weight : 1.5 g (Typ.)



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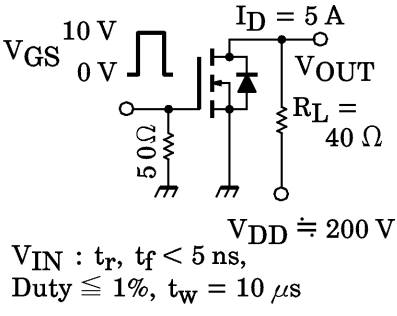
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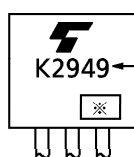
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GSS}	V _{GS} = ±25 V, V _{DS} = 0 V	—	—	±10	μA
Gate-Source Breakdown Voltage		V _{(BR) GSS}	I _G = ±10 μA, V _{DS} = 0 V	±30	—	—	V
Drain Cut-Off Current		I _{DSS}	V _{DS} = 400 V, V _{GS} = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		V _{(BR) DSS}	I _D = 10 mA, V _{GS} = 0 V	400	—	—	V
Gate Threshold Voltage		V _{th}	V _{DS} = 10 V, I _D = 1 mA	2.0	—	4.0	V
Drain-Source ON Resistance		R _{DS(ON)}	V _{GS} = 10 V, I _D = 5.0 A	—	0.4	0.55	Ω
Forward Transfer Admittance		Y _{fs}	V _{DS} = 10 V, I _D = 5.0 A	4.0	8.0	—	S
Input Capacitance		C _{iss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	—	1340	—	pF
Reverse Transfer Capacitance		C _{rss}		—	160	—	
Output Capacitance		C _{oss}		—	490	—	
Switching Time	Rise Time	t _r	 V_{IN} : t_r, t_f < 5 ns, Duty ≤ 1%, t_w = 10 μs	—	22	—	ns
	Turn-On Time	t _{on}		—	60	—	
	Fall Time	t _f		—	32	—	
	Turn-Off Time	t _{off}		—	140	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q _g	V _{DD} ≅ 320 V, V _{GS} = 10 V I _D = 10 A	—	34	—	nC
Gate-Source Charge		Q _{gs}		—	18	—	
Gate-Drain ("Miller") Charge		Q _{gd}		—	16	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I _{DR}	—	—	—	10	A
Pulse Drain Reverse Current	I _{DRP}	—	—	—	40	A
Diode Forward Voltage	V _{DSF}	I _{DR} = 10 A, V _{GS} = 0 V	—	—	−1.7	V
Reverse Recovery Time	t _{rr}	I _{DR} = 10 A, V _{GS} = 0 V	—	350	—	ns
Reverse Recovery Charge	Q _{rr}	dI _{DR} / dt = 100 A / μs	—	2.6	—	μC

MARKING



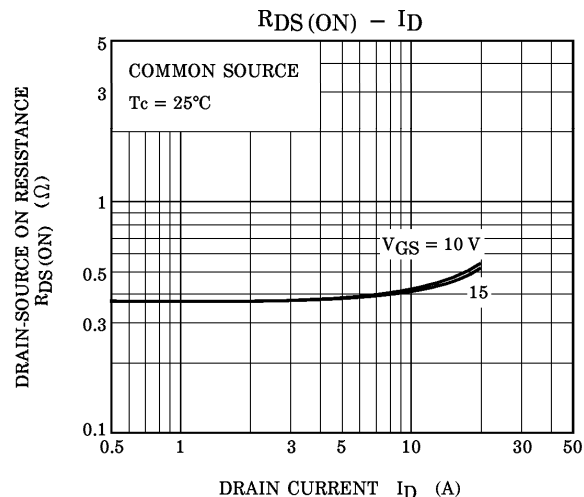
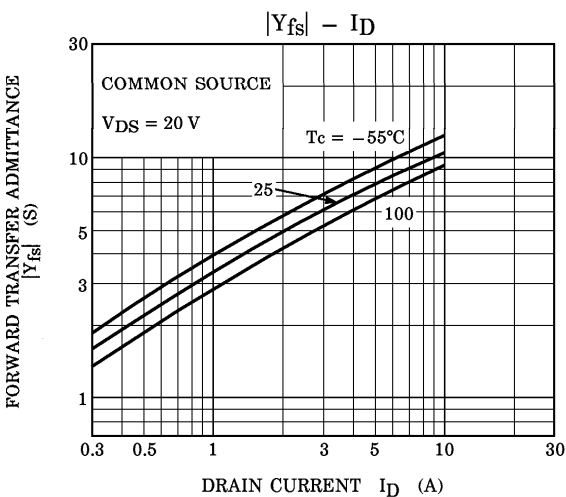
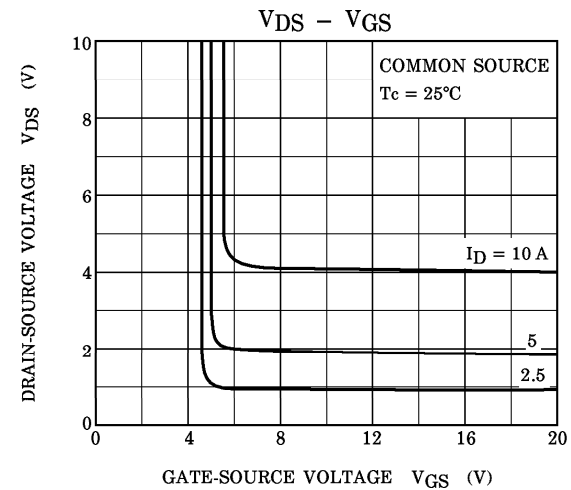
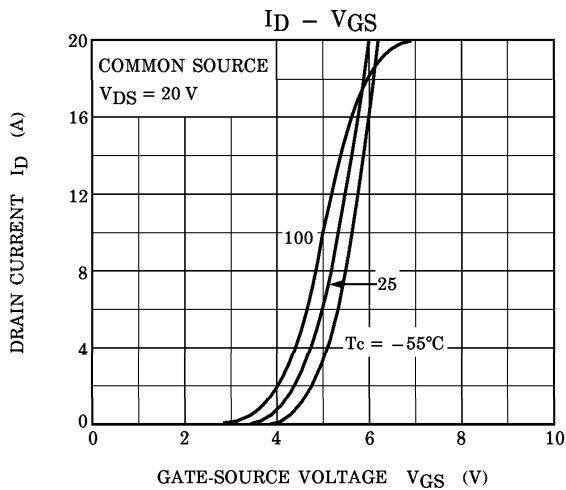
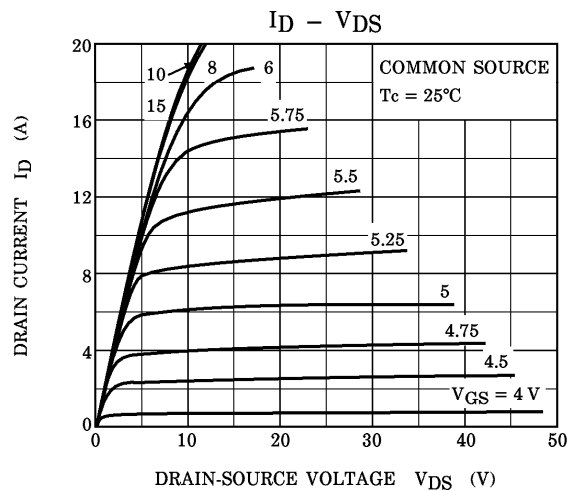
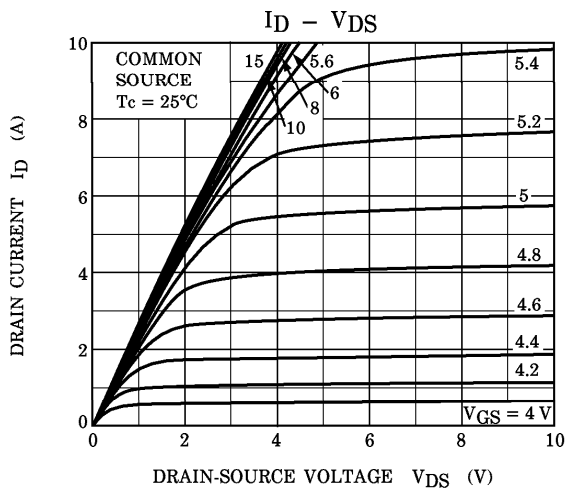
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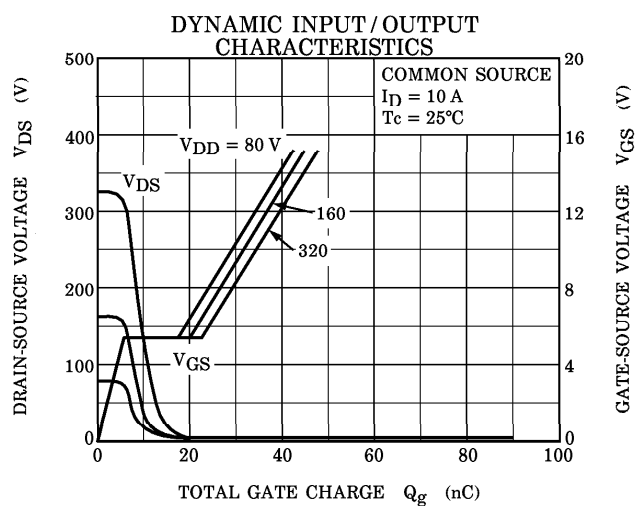
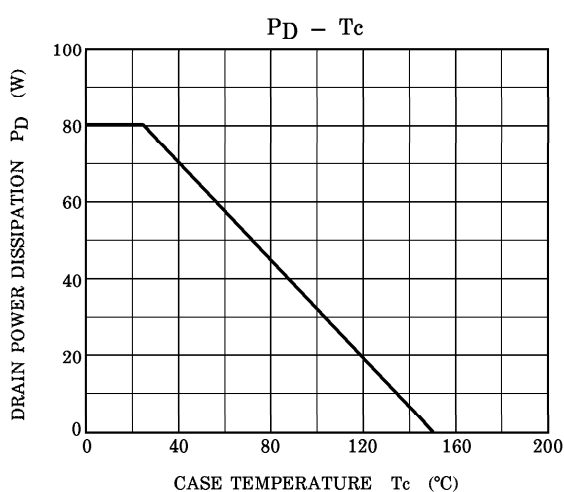
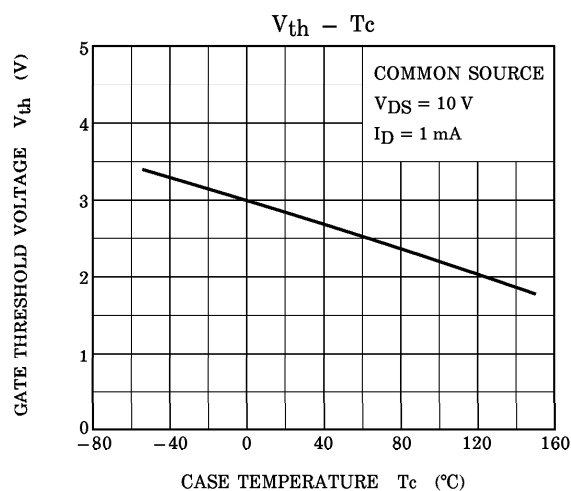
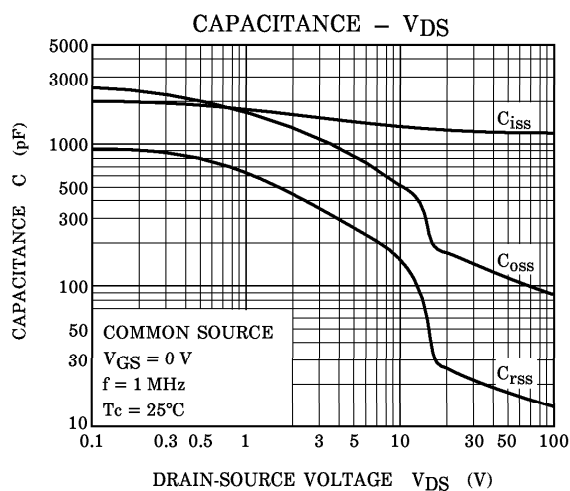
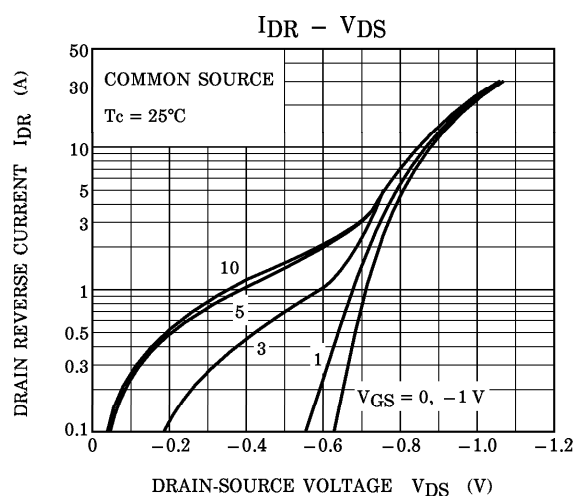
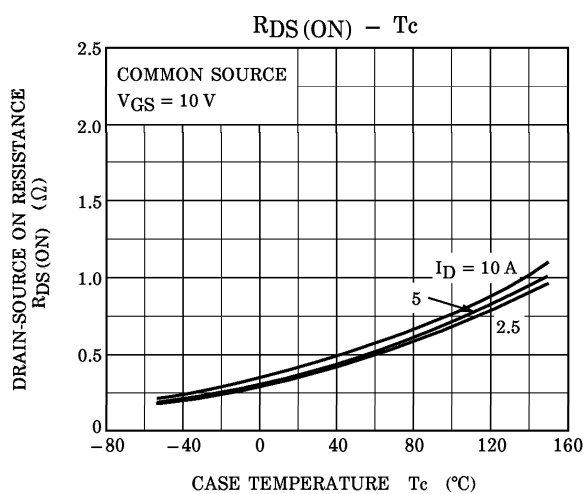
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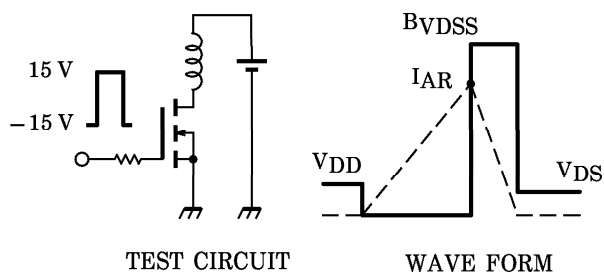
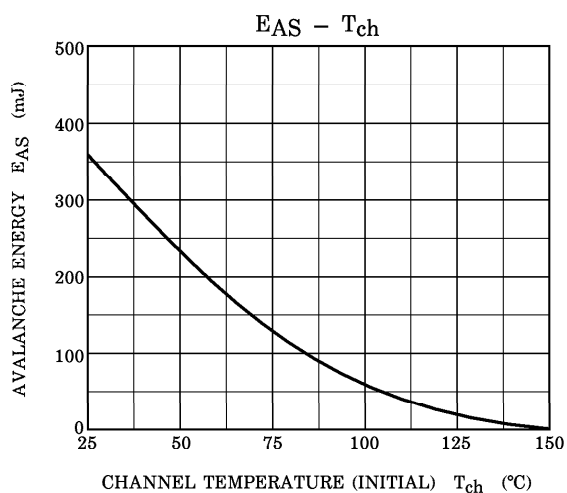
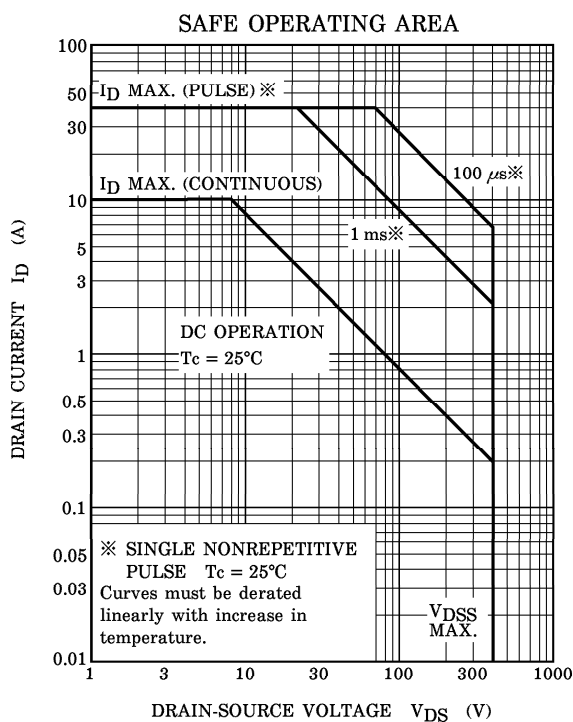
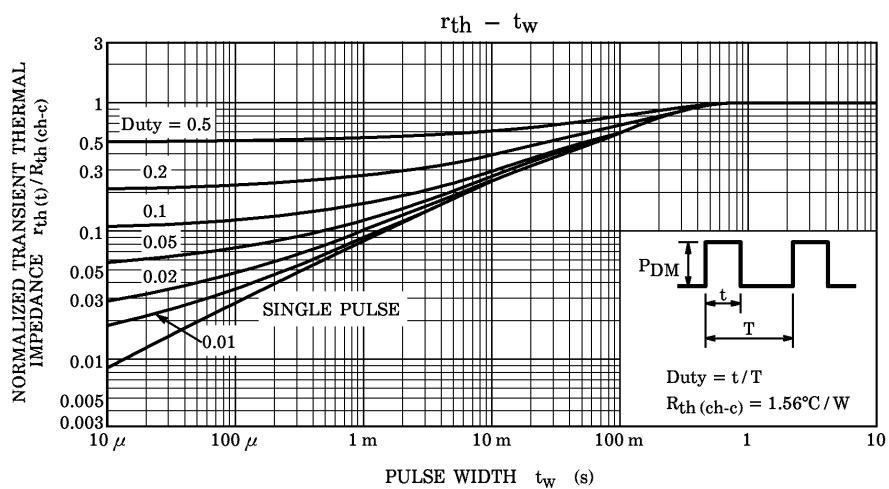


Month (Starting from Alphabet A)

Year (Last Number of the Christian Era)







Peak $I_{AR} = 10\text{ A}$, $R_G = 25\ \Omega$
 $V_{DD} = 90\text{ V}$, $L = 5.85\text{ mH}$

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