

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

2SK2992

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

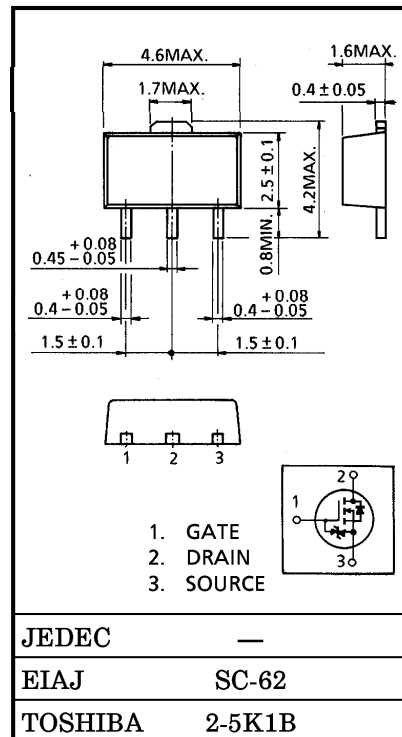
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 2.2\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 0.9S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100\mu A$ (Max.) ($V_{DS} = 200V$)
- Enhancement-Mode : $V_{th} = 2.0 \sim 3.5V$ ($V_{DS} = 10V, I_D = 1mA$)

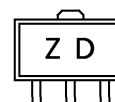
MAXIMUM RATINGS ($T_a = 25^\circ C$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	200	V
Drain-Gate Voltage ($R_{GS} = 20k\Omega$)	V_{DGR}	200	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	1 A
	Pulse	I_{DP}	3 A
Drain Power Dissipation***	P_D	1.5	W
Single Pulse Avalanche Energy**	E_{AS}	36	mJ
Avalanche Current	I_{AR}	1	A
Repetitive Avalanche Energy*	E_{AR}	0.15	mJ
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature Range	T_{stg}	$-55 \sim 150$	$^\circ C$



Weight : 0.05g (Typ.)

MARKING



THEMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	250	$^\circ C / W$

Note ;

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

** $V_{DD} = 50V$, Starting $T_{ch} = 25^\circ C$, $L = 56.7mH$, $R_G = 25\Omega$, $I_{AR} = 1A$

*** Mounted on ceramic substrate ($1inch^2 \times 0.8t$)

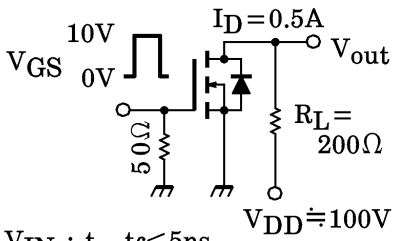
This transistor is an electrostatic sensitive device.

Please handle with caution.

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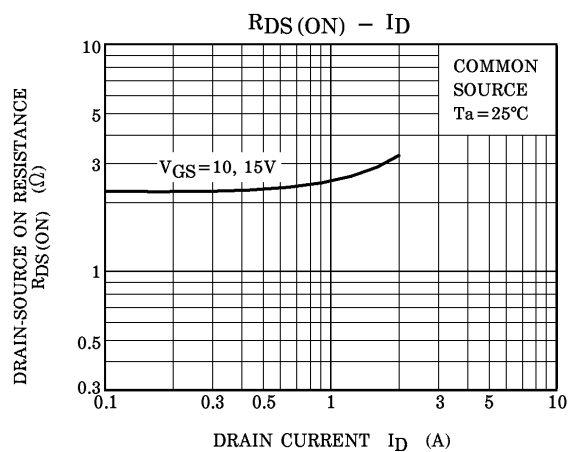
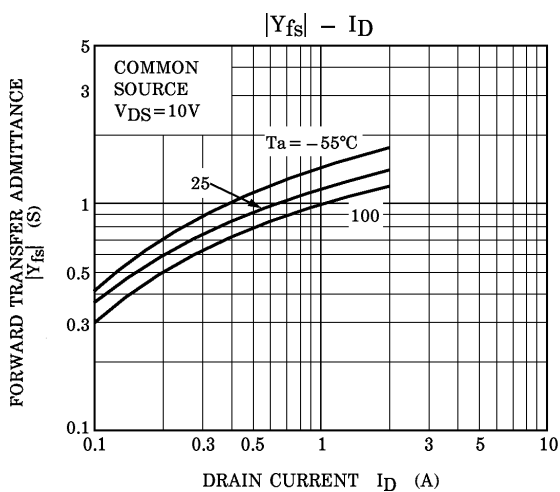
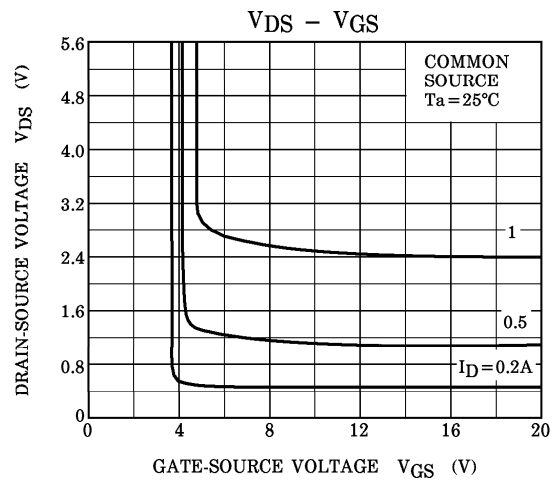
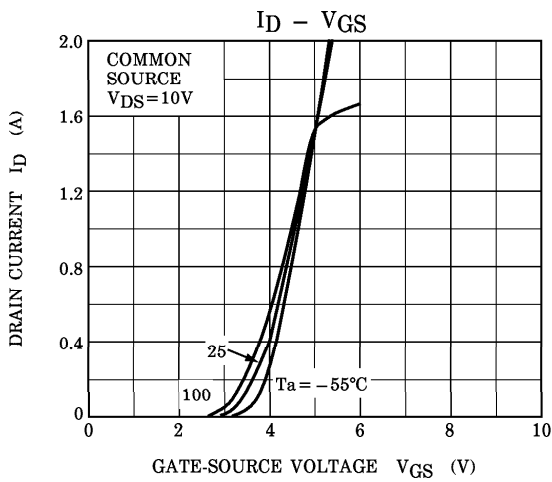
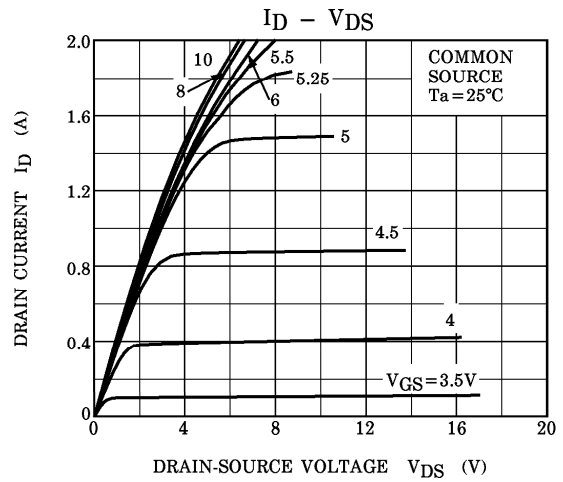
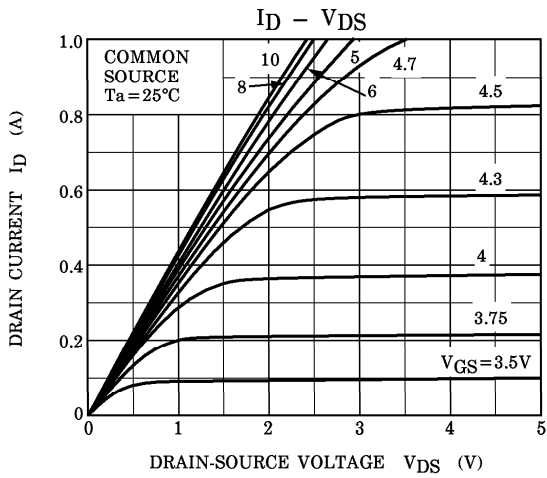
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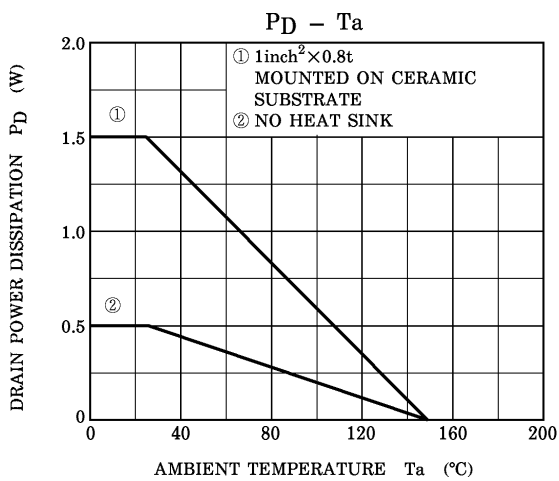
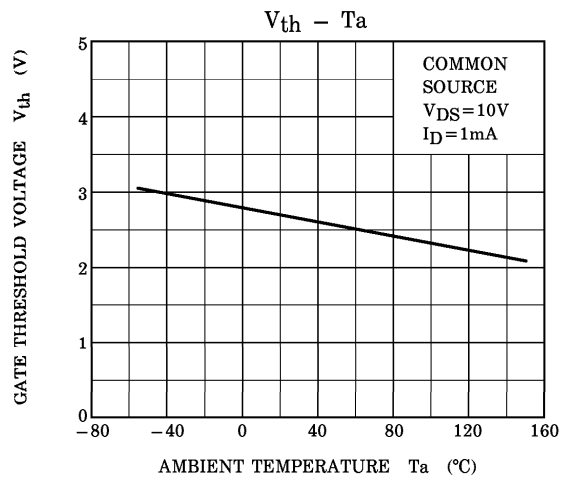
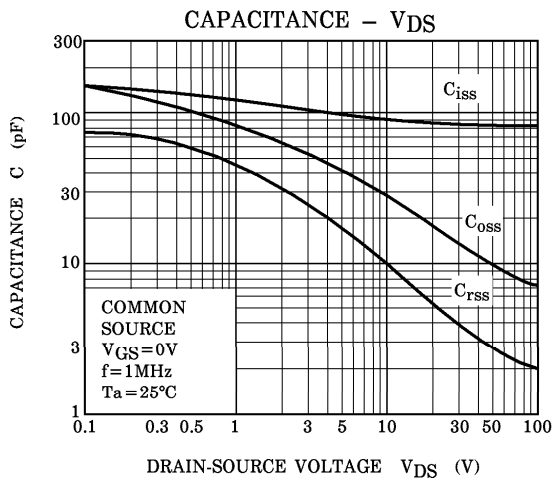
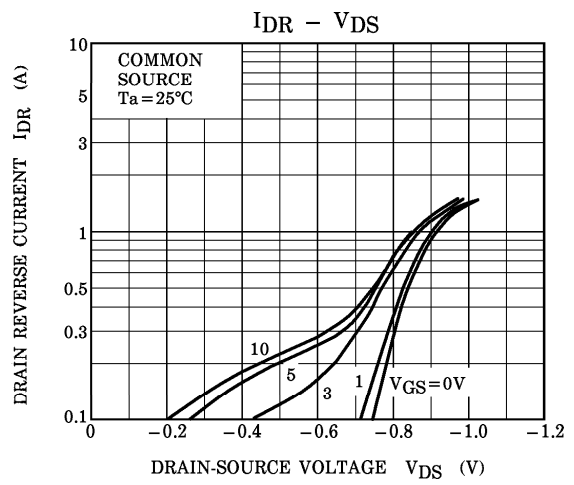
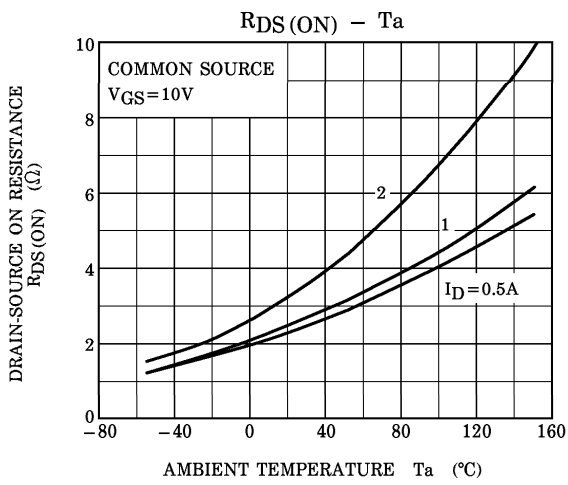
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

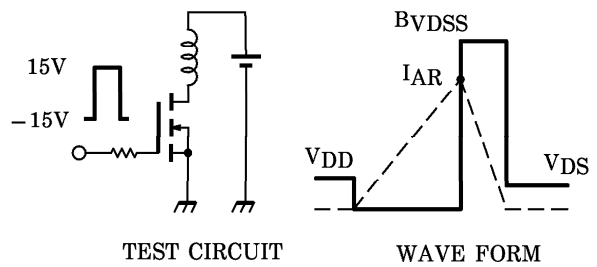
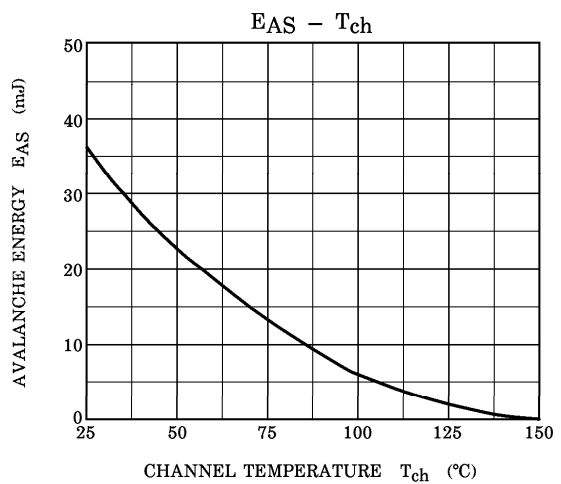
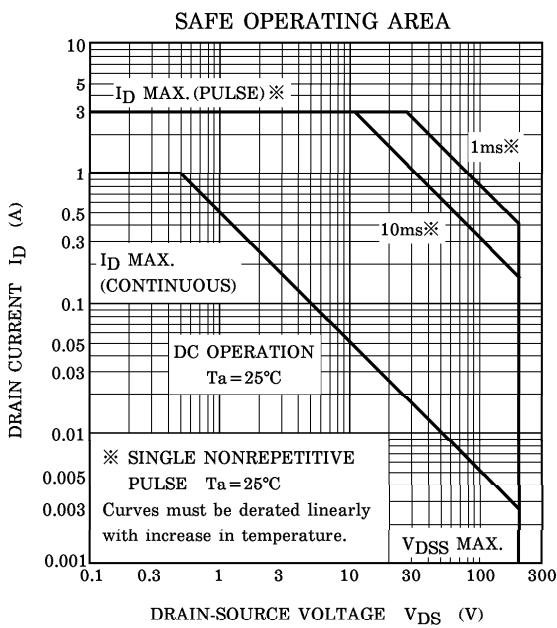
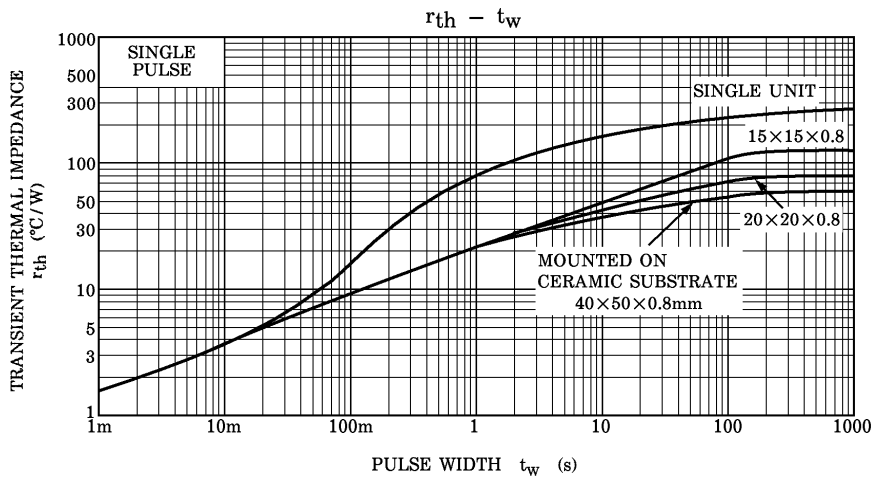
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16V, VDS = 0V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 200V, VGS = 0V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10mA, VGS = 0V	200	—	—	V
Gate Threshold Voltage		Vth	VDS = 10V, ID = 1mA	2.0	—	3.5	V
Drain-Source ON Resistance		RDS(ON)	VGS = 10V, ID = 0.5A	—	2.2	3.5	Ω
Forward Transfer Admittance		Yfs	VDS = 10V, ID = 0.5A	0.5	0.9	—	S
Input Capacitance		Ciss	VDS = 10V, VGS = 0V f = 1MHz	—	90	—	pF
Reverse Transfer Capacitance		Crss		—	10	—	
Output Capacitance		Coss		—	30	—	
Switching Time	Rise Time	tr		—	9	—	ns
	Turn-on Time	ton		—	17	—	
	Fall Time	tf		—	16	—	
	Turn-off Time	toff		—	45	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD = 160V, VGS = 10V ID = 1A	—	3.0	—	nC
Gate-Source Charge		Qgs		—	1.8	—	
Gate-Drain ("Miller") Charge		Qgd		—	1.2	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	1	A
Pulse Drain Reverse Current	IDRP	—	—	—	3	A
Diode Forward Voltage	VDSF	IDR = 1A, VGS = 0V	—	—	-1.5	V
Reverse Recovery Time	t _{rr}	IDR = 1A, VGS = 0V	—	85	—	ns
Reverse Recovery Charge	Q _{rr}	dIDR / dt = 100A / μs	—	190	—	nC







Peak $I_{AR} = 1\text{A}$, $R_G = 25\Omega$
 $V_{DD} = 50\text{V}$, $L = 56.7\text{mH}$

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