

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

2SK2920

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS

Unit in mm

- 4 V Gate Drive
- Low Drain-Source ON Resistance : $R_{DS(ON)} = 0.56 \Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 4.5 S$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu A$ (Max.) ($V_{DS} = 200 V$)
- Enhancement-Mode : $V_{th} = 1.5 \sim 3.5 V$
($V_{DS} = 10 V, I_D = 1 mA$)

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

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DSS}	200	V
Drain-Gate Voltage ($R_{GS} = 20 k\Omega$)	V_{DGR}	200	V
Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current	DC	I_D	5 A
	Pulse	I_{DP}	20 A
Drain Power Dissipation ($T_c = 25^\circ C$)	P_D	20	W
Single Pulse Avalanche Energy**	E_{AS}	65	mJ
Avalanche Current	I_{AR}	5	A
Repetitive Avalanche Energy*	E_{AR}	2	mJ
Channel Temperature	T_{ch}	150	$^\circ C$
Storage Temperature Range	T_{stg}	$-55 \sim 150$	$^\circ C$

THERMAL CHARACTERISTICS

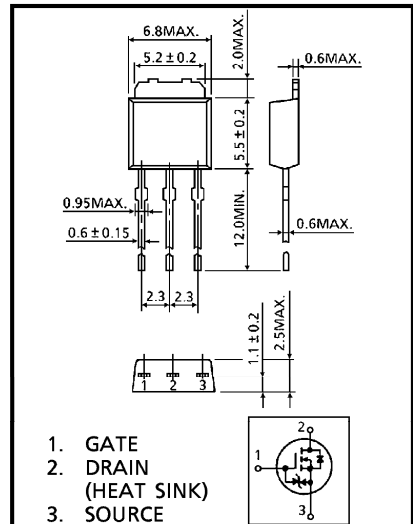
CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Case	$R_{th(ch-c)}$	6.25	$^\circ C / W$
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	125	$^\circ C / W$

Note ;

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

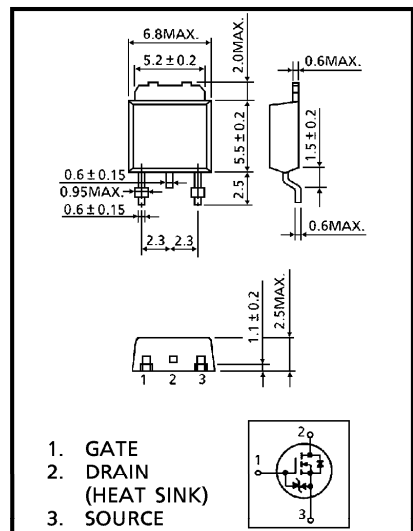
** $V_{DD} = 50 V$, Starting $T_{ch} = 25^\circ C$, $L = 4.2 mH$,
 $R_G = 25 \Omega$, $I_{AR} = 5 A$

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



JEDEC	—
EIAJ	SC-64
TOSHIBA	2-7B1B

Weight : 0.36 g (Typ.)



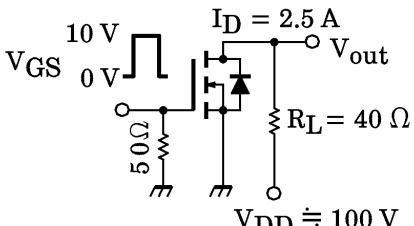
JEDEC	—
EIAJ	SC-64
TOSHIBA	2-7B2B

Weight : 0.36 g (Typ.)

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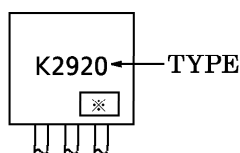
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16 V, VDS = 0 V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = 200 V, VGS = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = 10 mA, VGS = 0 V	200	—	—	V
Gate Threshold Voltage		Vth	VDS = 10 V, ID = 1 mA	1.5	—	3.5	V
Drain-Source ON Resistance		RDS(ON)	VGS = 10 V, ID = 2.5 A	—	0.56	0.8	Ω
Forward Transfer Admittance		Yfs	VDS = 10 V, ID = 2.5 A	2.0	4.5	—	S
Input Capacitance		Ciss	VDS = 10 V, VGS = 0 V f = 1 MHz	—	440	—	pF
Reverse Transfer Capacitance		Crss		—	35	—	
Output Capacitance		Coss		—	120	—	
Switching Time	Rise Time	tr		—	15	—	ns
	Turn-on Time	ton		—	20	—	
	Fall Time	tf		—	15	—	
	Turn-off Time	toff		VIN : tr, tf < 5 ns, Duty ≤ 1%, tw = 10 μs	—	60	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≐ 100 V, VGS = 10 V ID = 5 A	—	10	—	nC
Gate-Source Charge		Qgs		—	6	—	
Gate-Drain ("Miller") Charge		Qgd		—	4	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	5	A
Pulse Drain Reverse Current	IDRP	—	—	—	20	A
Diode Forward Voltage	VDSF	IDR = 5 A, VGS = 0 V	—	—	-2.0	V
Reverse Recovery Time	trr	IDR = 5 A, VGS = 0 V	—	150	—	ns
Reverse Recovery Charge	Qrr	dIDR / dt = 100 A / μs	—	0.45	—	μC

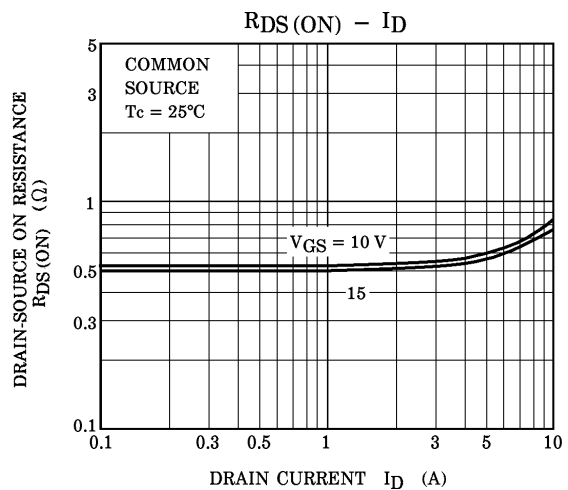
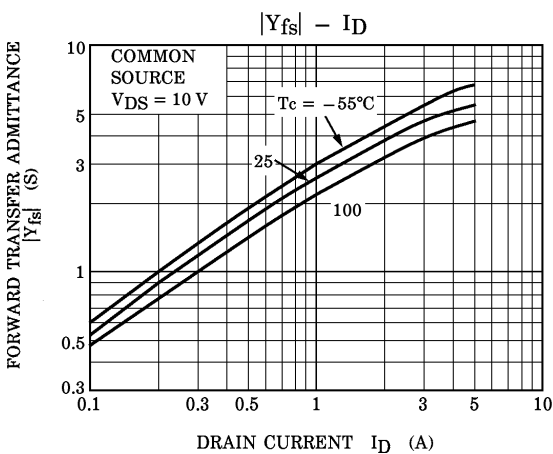
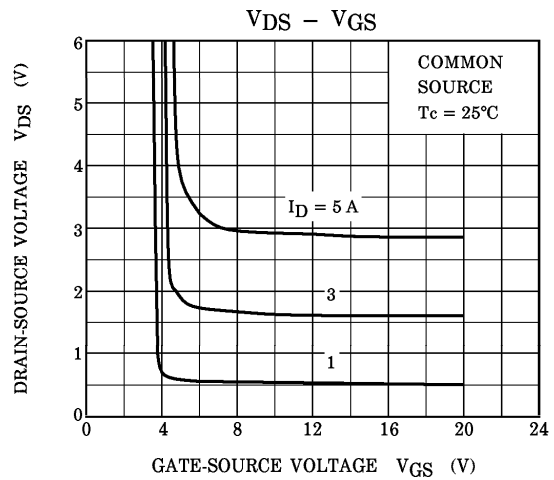
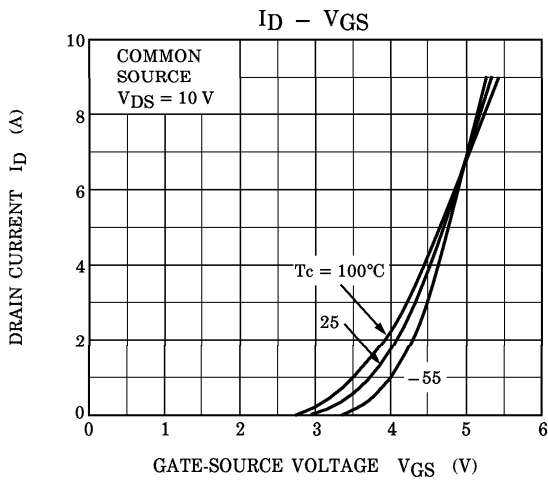
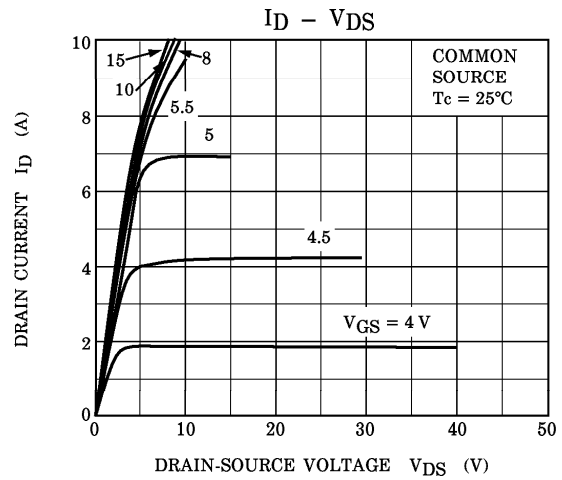
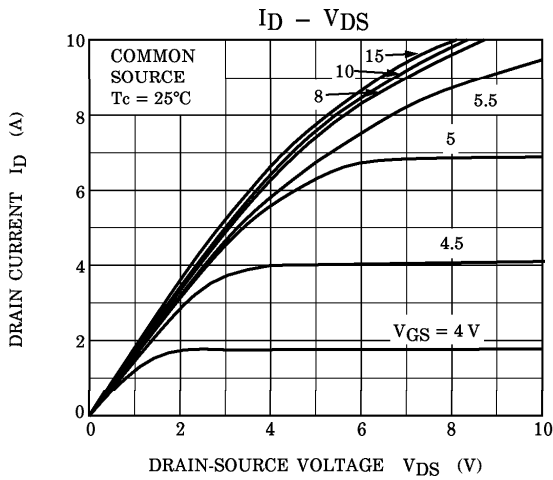
MARKING

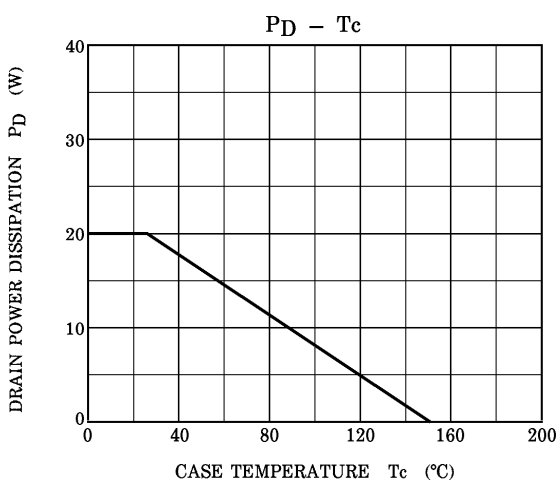
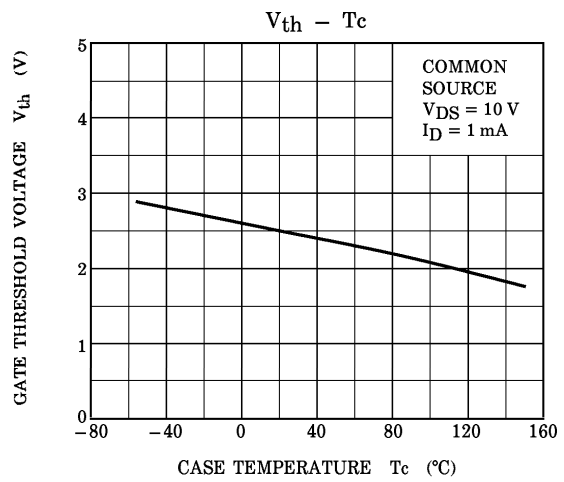
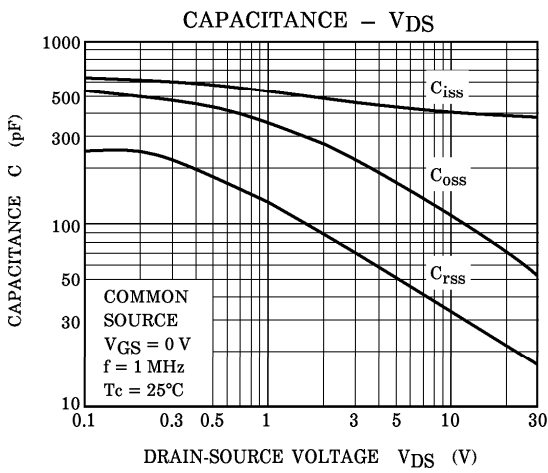
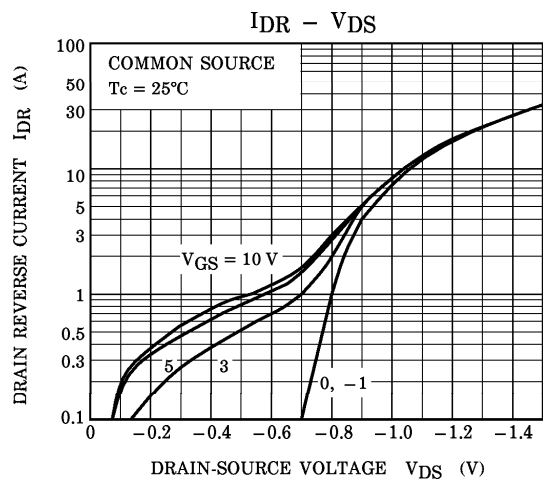
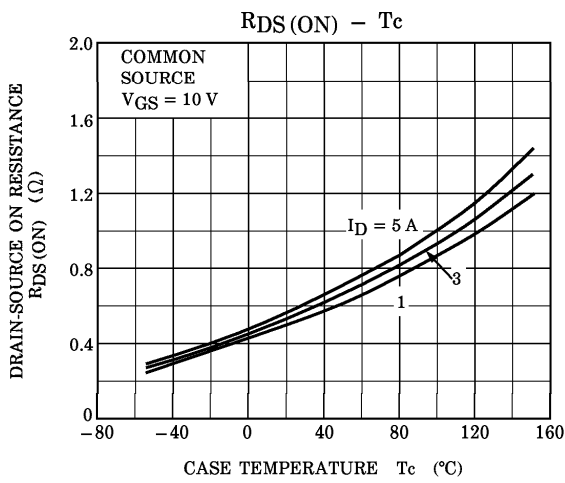


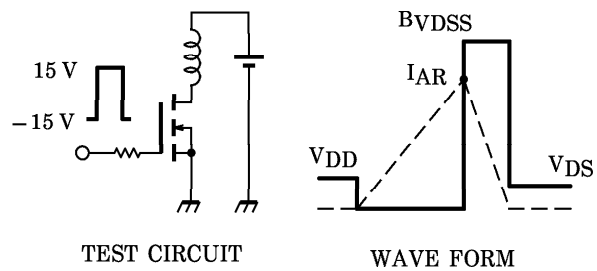
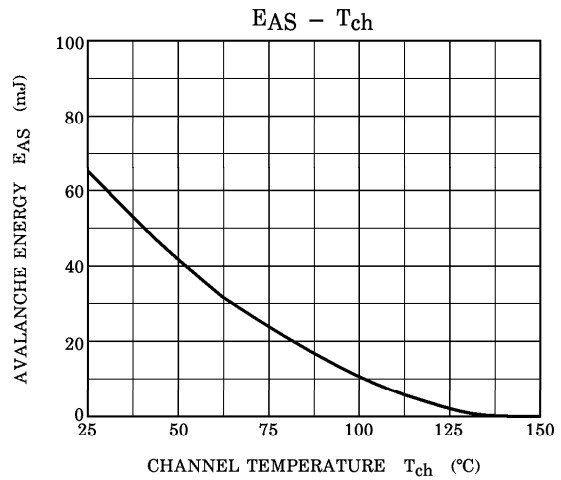
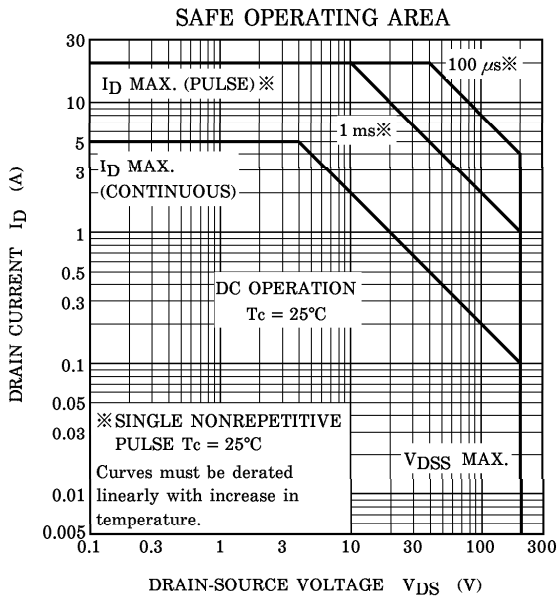
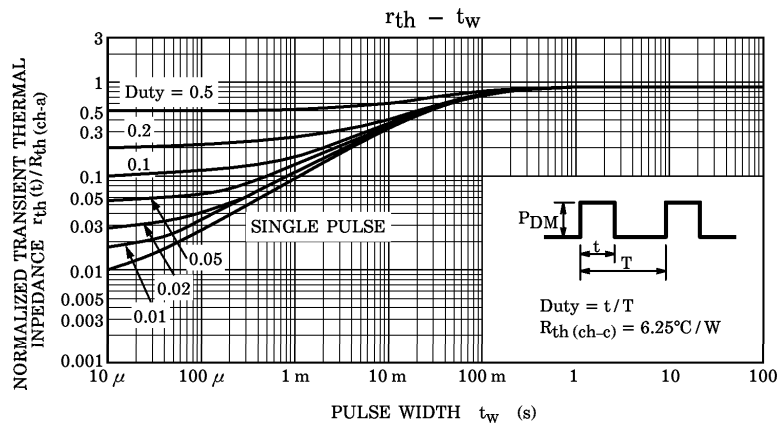
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 5\text{ A}$, $R_G = 25\ \Omega$
 $V_{DD} = 25\text{ V}$, $L = 4.2\text{ mH}$

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