

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

2SK2551

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

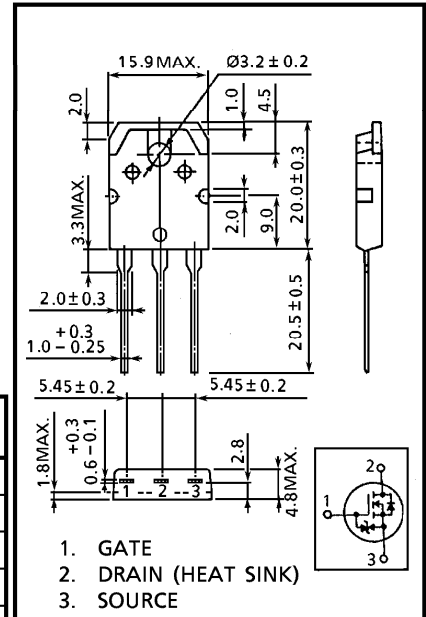
INDUSTRIAL APPLICATIONS

Unit in mm

- Low Drain-Source ON Resistance : $R_{DS(ON)} = 7.2 \text{ m}\Omega$ (Typ.)
- High Forward Transfer Admittance : $|Y_{fs}| = 50 \text{ S}$ (Typ.)
- Low Leakage Current : $I_{DSS} = 100 \mu\text{A}$ (Max.) ($V_{DS} = 50 \text{ V}$)
- Enhancement-Mode : $V_{th} = 1.5 \sim 3.0 \text{ V}$
($V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$)

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	50	V
Drain-Gate Voltage ($R_{GS} = 20 \text{ k}\Omega$)		V_{DGR}	50	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC	I_D	50	A
	Pulse	I_{DP}	200	A
Drain Power Dissipation ($T_c = 25^\circ\text{C}$)		P_D	150	W
Single Pulse Avalanche Energy**		E_{AS}	894	mJ
Avalanche Current		I_{AR}	50	A
Repetitive Avalanche Energy*		E_{AR}	15	mJ
Channel Temperature		T_{ch}	150	$^\circ\text{C}$
Storage Temperature Range		T_{stg}	$-55 \sim 150$	$^\circ\text{C}$



JEDEC	—
EIAJ	SC-65
TOSHIBA	2-16C1B

Weight : 4.6 g

HERMAL CHARACTERISTICS

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

Note ;

- * Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- ** $V_{DD} = 25 \text{ V}, T_{ch} = 25^\circ\text{C}$ (initial), $L = 440 \mu\text{H}, R_G = 25 \Omega, I_{AR} = 50 \text{ A}$

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

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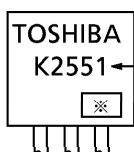
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GSS}	V _{GS} = ±16 V, V _{DS} = 0 V	—	—	±10	μA
Drain Cut-off Current		I _{DSS}	V _{DS} = 50 V, V _{GS} = 0 V	—	—	100	μA
Drain-Source Breakdown Voltage		V _{(BR) DSS}	I _D = 10 mA, V _{GS} = 0 V	50	—	—	V
Gate Threshold Voltage		V _{th}	V _{DS} = 10 V, I _D = 1 mA	1.5	—	3.0	V
Drain-Source ON Resistance		R _{DS (ON)}	V _{GS} = 10 V, I _D = 25 A	—	7.2	11	mΩ
Forward Transfer Admittance		Y _{fs}	V _{DS} = 10 V, I _D = 25 A	30	50	—	S
Input Capacitance		C _{iss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	—	4000	—	pF
Reverse Transfer Capacitance		C _{rss}		—	800	—	
Output Capacitance		C _{oss}		—	2000	—	
Switching Time	Rise Time	t _r		—	25	—	ns
	Turn-on Time	t _{on}		—	40	—	
	Fall Time	t _f		—	120	—	
	Turn-off Time	t _{off}		V _{IN} : t _r , t _f < 5 ns, Duty ≤ 1%, t _w = 10 μs	—	360	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q _g	V _{DD} ≐ 40 V, V _{GS} = 10 V I _D = 50 A	—	130	—	nC
Gate-Source Charge		Q _{gs}		—	90	—	
Gate-Drain ("Miller") Charge		Q _{gd}		—	40	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I _{DR}	—	—	—	50	A
Pulse Drain Reverse Current	I _{DRP}	—	—	—	200	A
Diode Forward Voltage	V _{DSF}	I _{DR} = 50 A, V _{GS} = 0 V	—	—	-1.7	V
Reverse Recovery Time	t _{rr}	I _{DR} = 50 A, V _{GS} = 0 V dI _{DR} /dt = 50 A/μs	—	140	—	ns
Reverse Recovery Charge	Q _{rr}		—	77	—	nC

MARKING

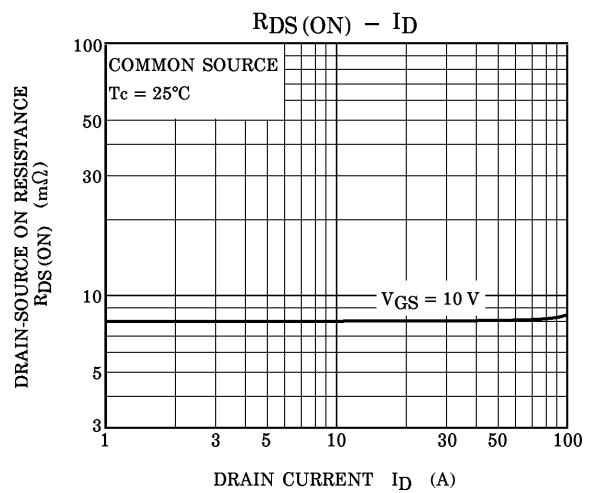
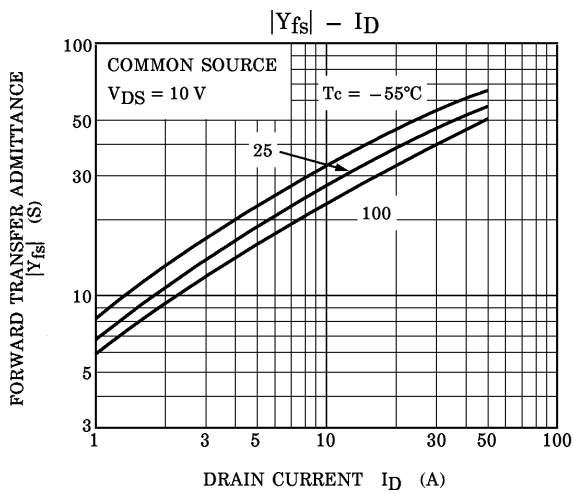
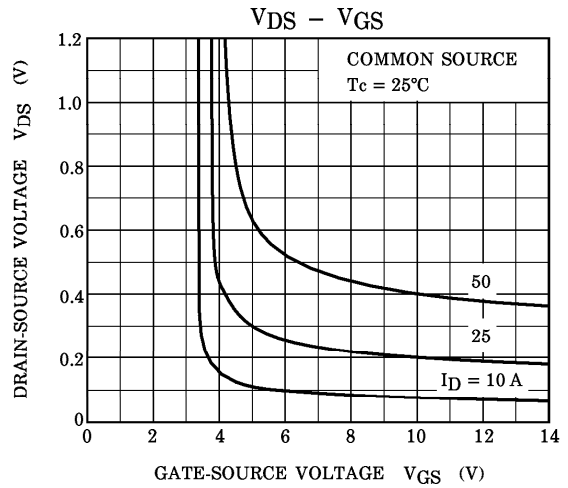
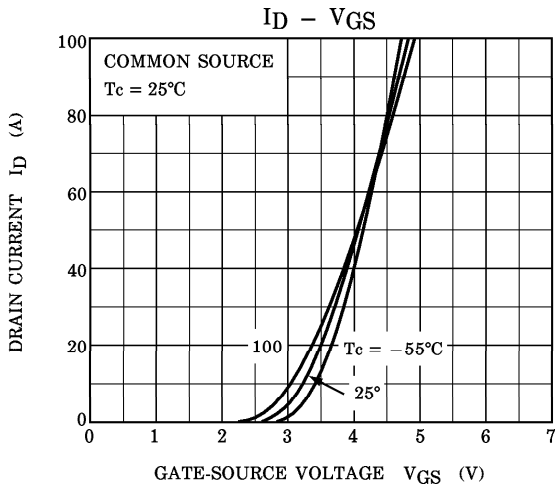
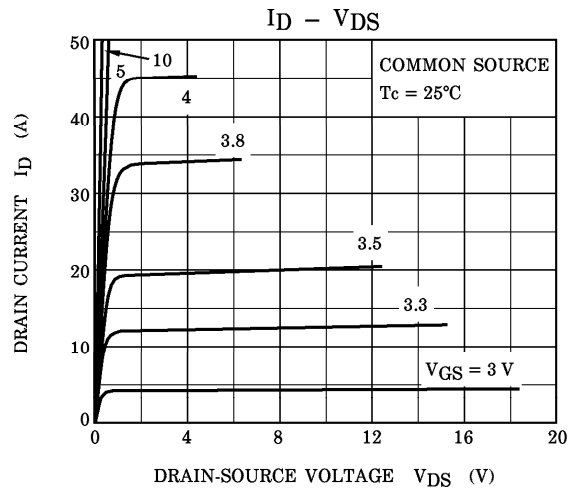
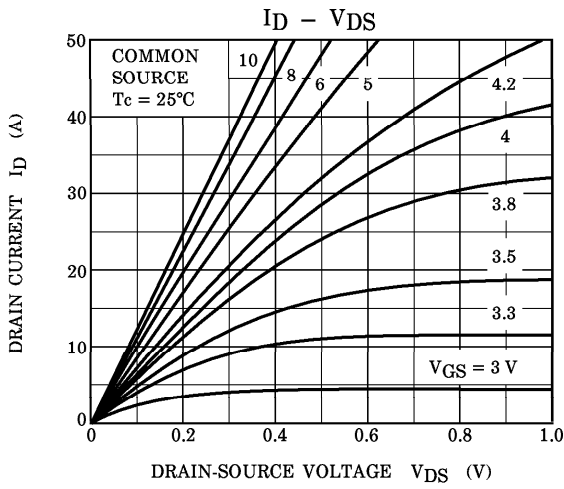


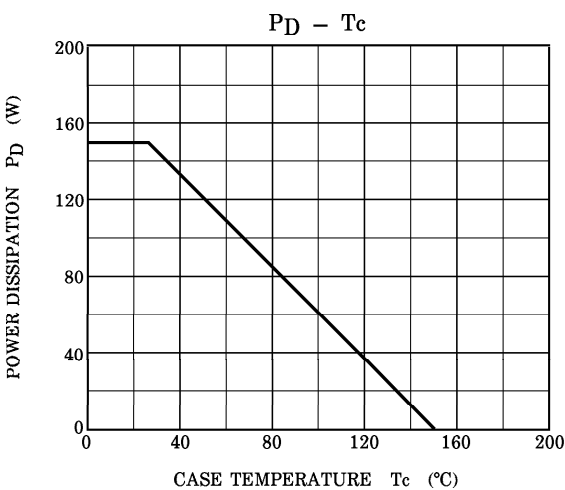
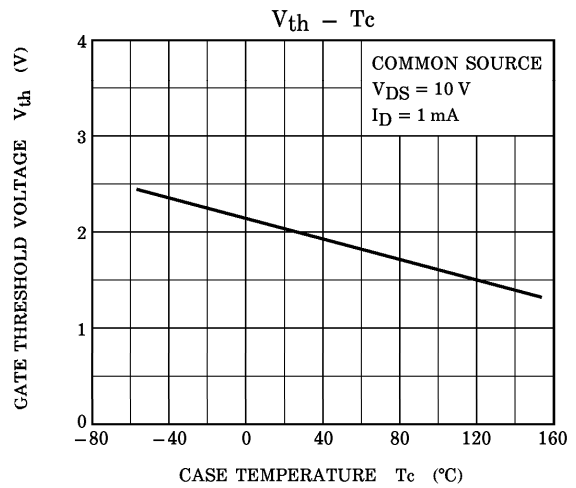
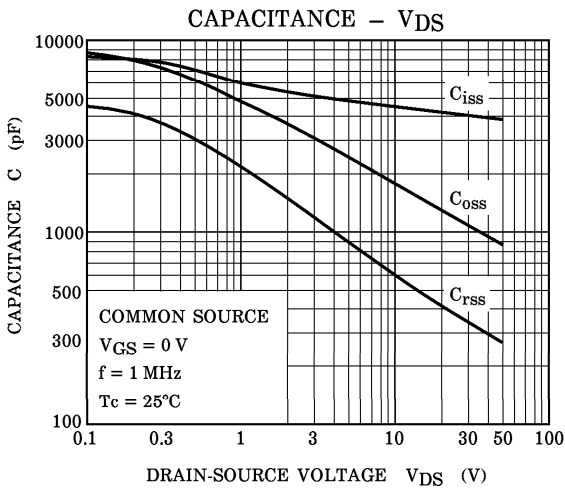
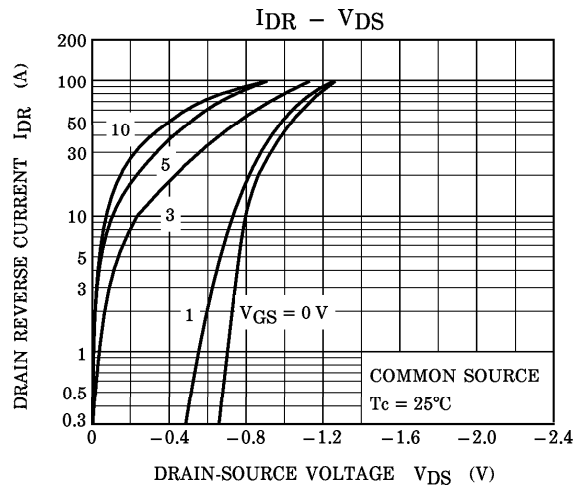
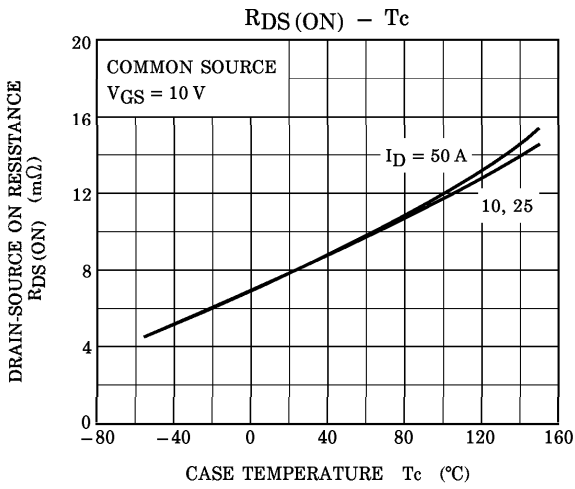
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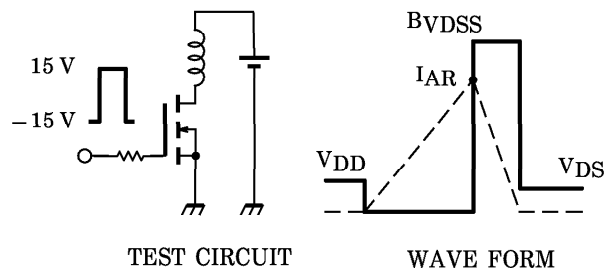
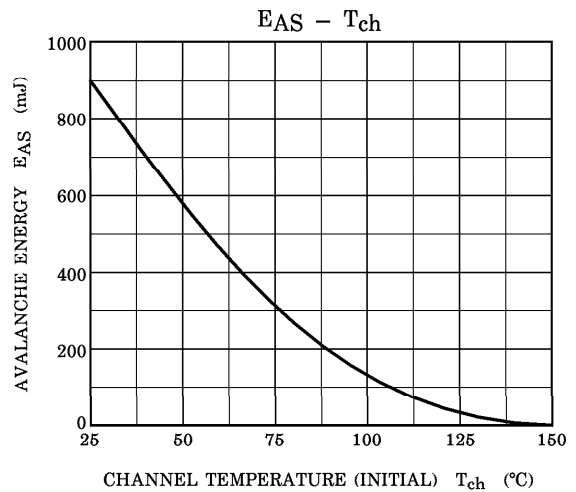
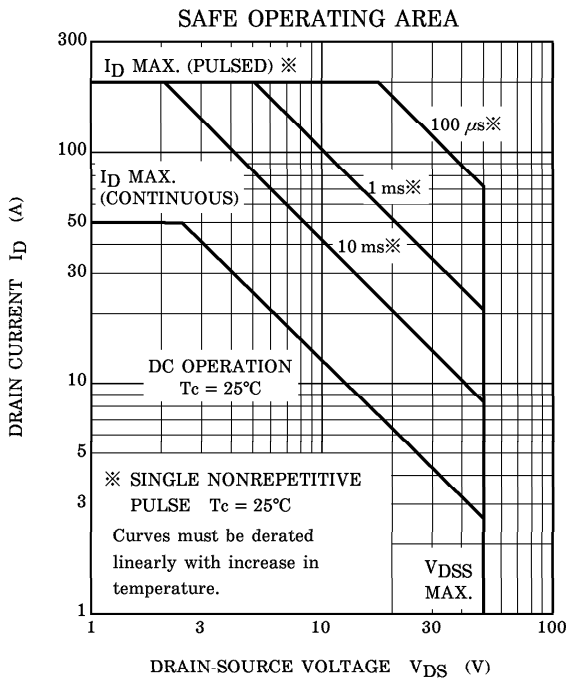
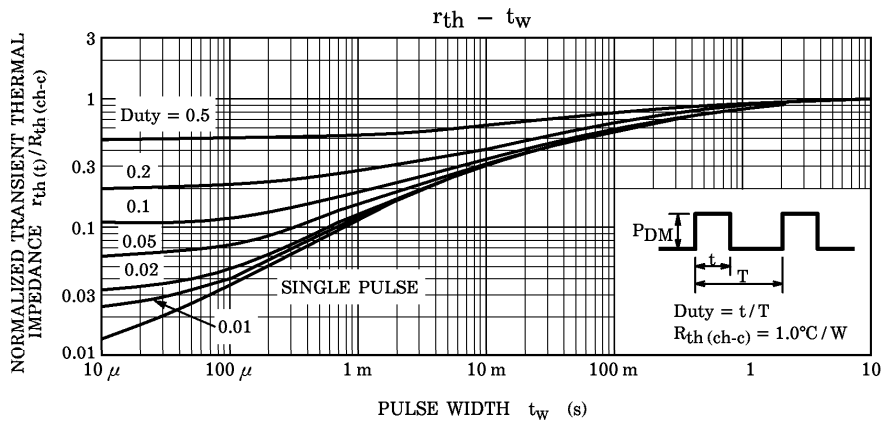
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







Peak $I_{AR} = 50 \text{ A}$, $R_G = 25 \Omega$
 $V_{DD} = 25 \text{ V}$, $L = 440 \mu\text{H}$

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