

TOSHIBA**2SK2551**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

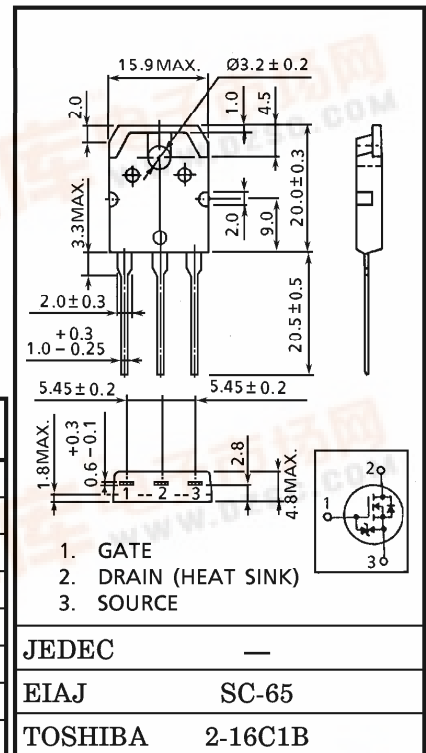
INDUSTRIAL APPLICATIONS

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 : $I_{DSS} = 100\text{ }\mu\text{A}$ (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}	$-55\sim 150$	$^\circ\text{C}$



Weight : 4.6 g

THERMAL 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.

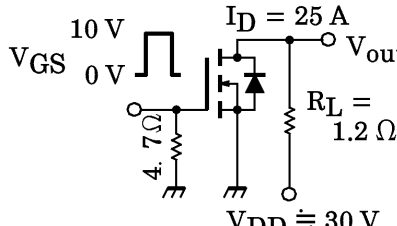
** $V_{DD} = 25\text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 440\text{ }\mu\text{H}$, $R_G = 25\text{ }\Omega$, $I_{AR} = 50\text{ A}$

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

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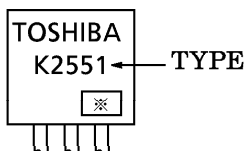
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0 \text{ V}$	—	—	± 10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = 50 \text{ V}, V_{GS} = 0 \text{ V}$	—	—	100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = 10 \text{ mA}, V_{GS} = 0 \text{ V}$	50	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$	1.5	—	3.0	V
Drain-Source ON Resistance		$R_{DS(ON)}$	$V_{GS} = 10 \text{ V}, I_D = 25 \text{ A}$	—	7.2	11	$\text{m}\Omega$
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = 10 \text{ V}, I_D = 25 \text{ A}$	30	50	—	S
Input Capacitance		C_{iss}	$V_{DS} = 10 \text{ V}, V_{GS} = 0 \text{ V},$ $f = 1 \text{ MHz}$	—	4000	—	pF
Reverse Transfer Capacitance		C_{rss}		—	800	—	
Output Capacitance		C_{oss}		—	2000	—	
Switching Time	Rise Time	t_r	 $V_{GS} = 10 \text{ V}, 0 \text{ V}$ $I_D = 25 \text{ A}$ $R_L = 1.2 \Omega$ $V_{DD} \approx 30 \text{ V}$	—	25	—	ns
	Turn-on Time	t_{on}		—	40	—	
	Fall Time	t_f		—	120	—	
	Turn-off Time	t_{off}		—	360	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \approx 40 \text{ V}, V_{GS} = 10 \text{ V}$ $I_D = 50 \text{ A}$	—	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}	$I_{DR} = 50 \text{ A}, V_{GS} = 0 \text{ V}$	—	—	—1.7	V
Reverse Recovery Time	t_{rr}	$I_{DR} = 50 \text{ A}, V_{GS} = 0 \text{ V}$	—	140	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_{DR} / dt = 50 \text{ A} / \mu\text{s}$	—	77	—	nC

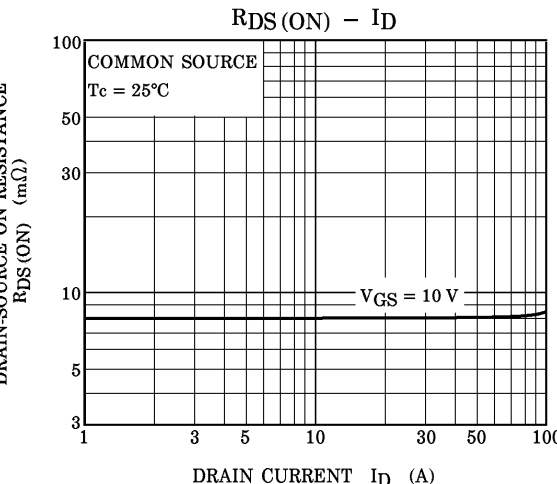
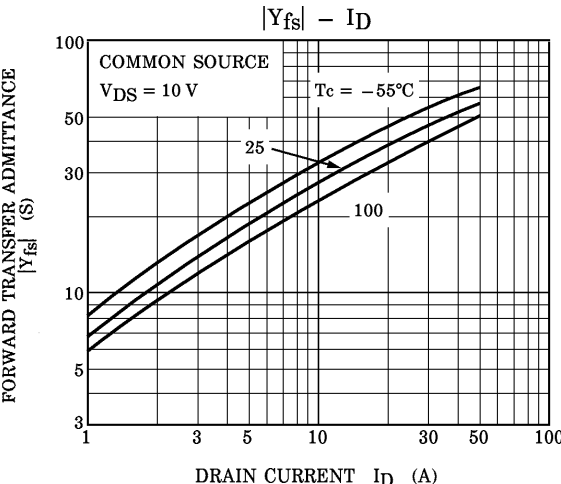
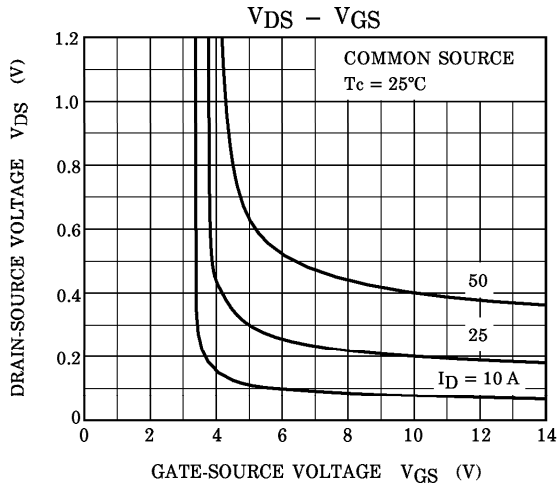
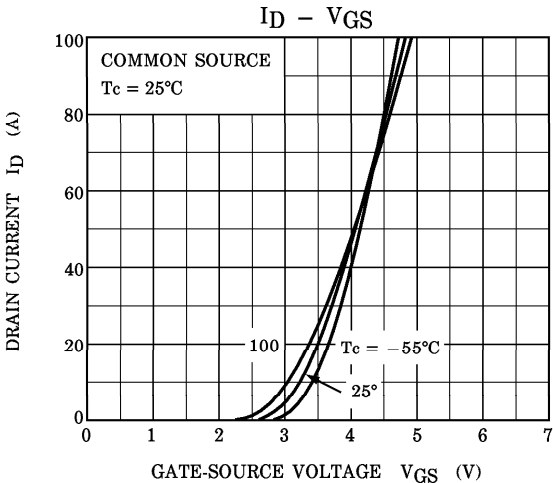
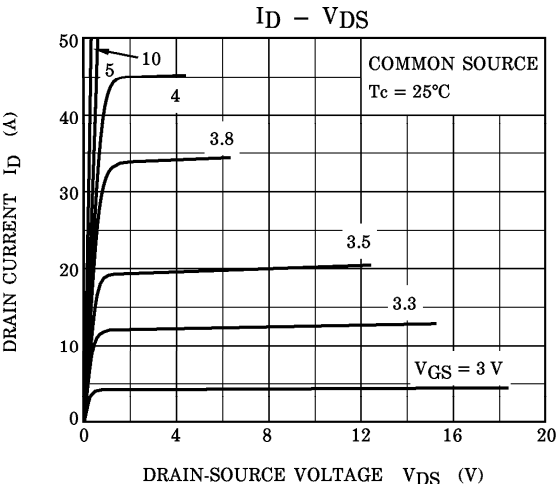
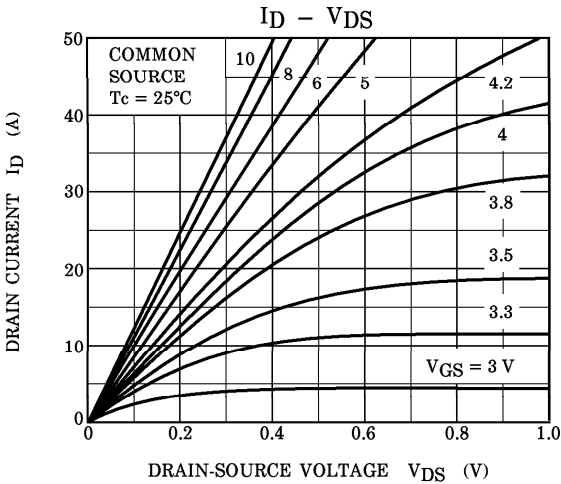
MARKING

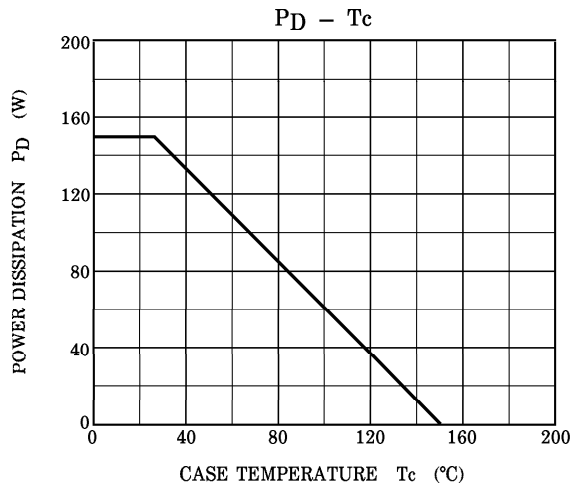
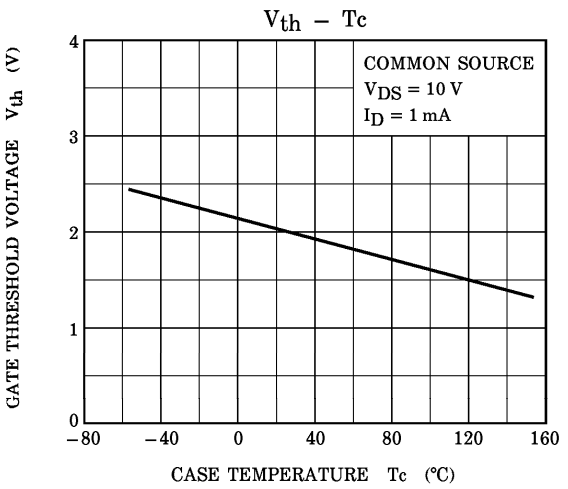
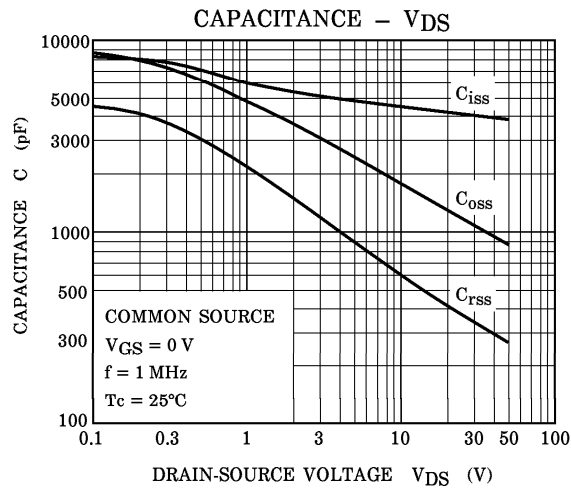
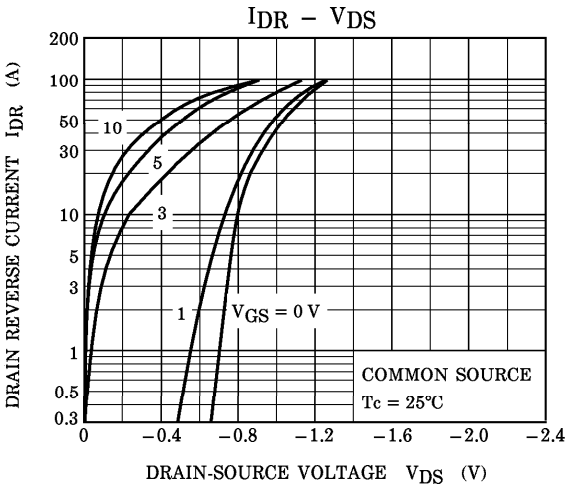
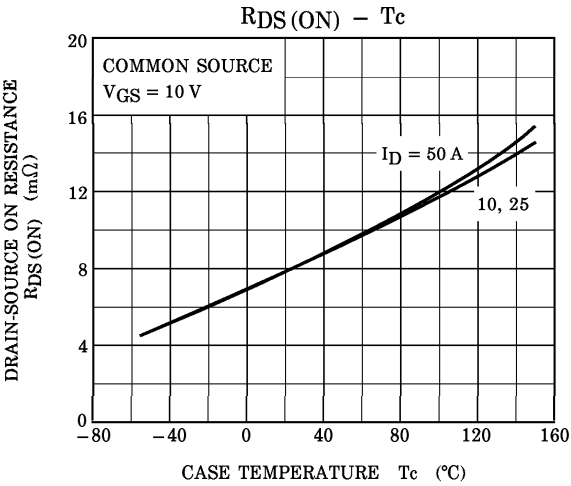


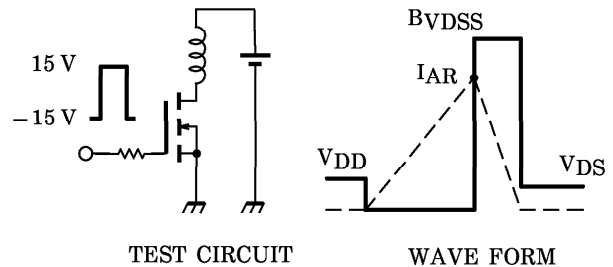
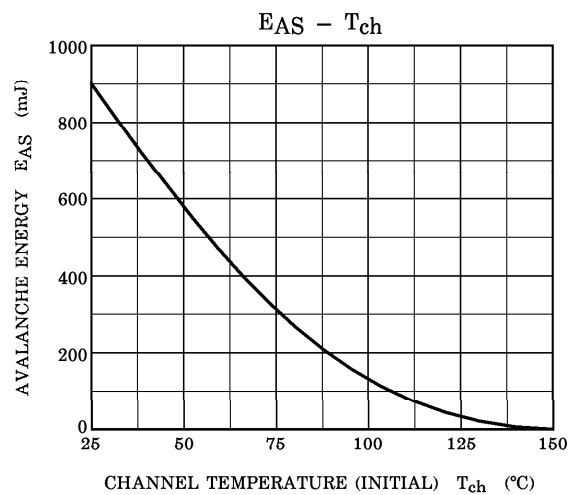
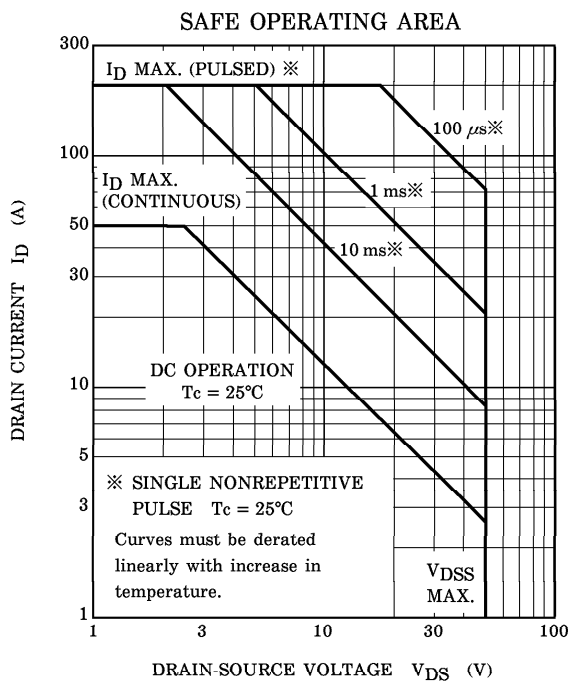
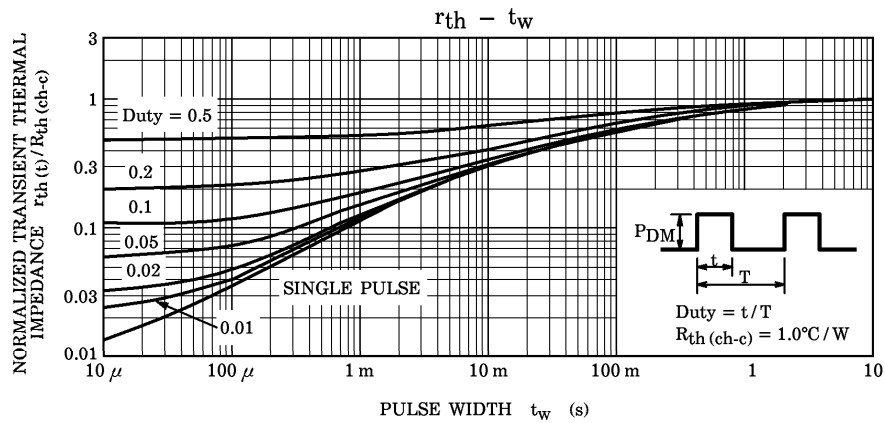
※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)







$\text{Peak } I_{AR} = 50 \text{ A, } R_G = 25 \Omega$
 $E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$
 $V_{DD} = 25 \text{ V, } L = 440 \mu\text{H}$