

TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE ( $\pi$ -MOSV)

# 2SK2493

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS  
CHOPPER REGULATOR, AND DC-DC CONVERTER APPLICATIONS

INDUSTRIAL APPLICATIONS  
Unit in mm

- 2.5 V Gate Drive
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 0.08 \text{ m}\Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 8.0 \text{ S}$  (Typ.)
- Low Leakage Current :  $I_{DSS} = 100 \mu\text{A}$  (Max.) ( $V_{DS} = 16 \text{ V}$ )
- Enhancement-Mode :  $V_{th} = 0.5 \sim 1.1 \text{ V}$   
( $V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$ )

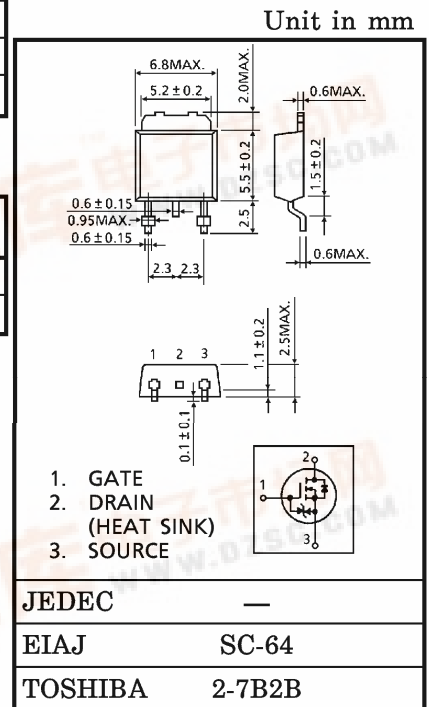
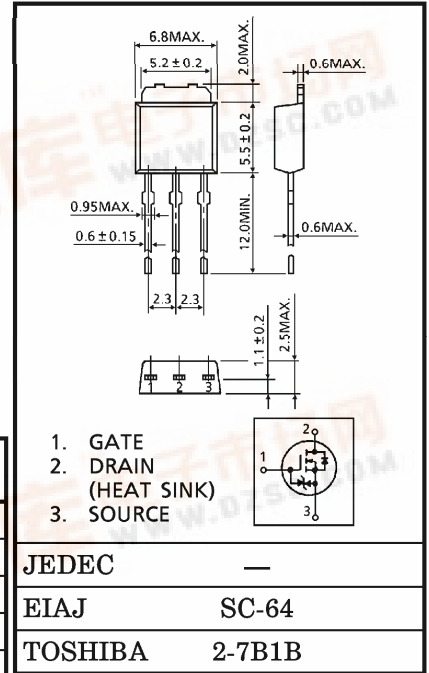
MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DSS}$	16	V
Drain-Gate Voltage ( $R_{GS} = 20 \text{ k}\Omega$ )		$V_{DGR}$	16	V
Gate-Source Voltage		$V_{GSS}$	$\pm 8$	V
Drain Current	DC	$I_D$	5	A
	Pulse	$I_{DP}$	20	A
Drain Power Dissipation ( $T_c = 25^\circ\text{C}$ )		$P_D$	20	W
Channel Temperature		$T_{ch}$	150	$^\circ\text{C}$
Storage Temperature Range		$T_{stg}$	$-55 \sim 150$	$^\circ\text{C}$

THERMAL CHARACTERISTICS

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

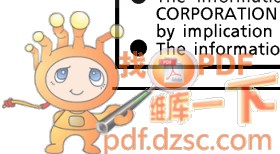
**This transistor is an electrostatic sensitive device.  
Please handle with caution.**



Weight : 0.36 g

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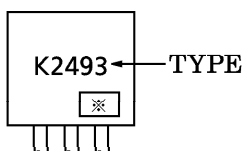
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 6.5 \text{ V}, V_{DS} = 0 \text{ V}$	—	—	$\pm 10$	$\mu\text{A}$
Drain Cut-off Current	$I_{DSS}$	$V_{DS} = 16 \text{ V}, V_{GS} = 0 \text{ V}$	—	—	100	$\mu\text{A}$
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 10 \text{ mA}, V_{GS} = 0 \text{ V}$	16	—	—	V
Gate Threshold Voltage	$V_{th}$	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$	0.5	—	1.1	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 2.5 \text{ V}, I_D = 2.5 \text{ A}$	—	0.08	0.12	$\Omega$
		$V_{GS} = 4 \text{ V}, I_D = 2.5 \text{ A}$	—	0.07	0.1	
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 10 \text{ V}, I_D = 2.5 \text{ A}$	4.0	8.0	—	S
Input Capacitance	$C_{iss}$	$V_{DS} = 10 \text{ V}, V_{GS} = 0 \text{ V}$ $f = 1 \text{ MHz}$	—	1200	—	pF
Reverse Transfer Capacitance	$C_{rss}$		—	110	—	
Output Capacitance	$C_{oss}$		—	380	—	
Switching Time	Rise Time	$t_r$		—	30	ns
	Turn-on Time	$t_{on}$		—	50	
	Fall Time	$t_f$		—	200	
	Turn-off Time	$t_{off}$		$V_{IN} : t_r, t_f < 5 \text{ ns},$ $\text{Duty} \leq 1\%, t_w = 10 \mu\text{s}$	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)	$Q_g$	$V_{DD} \doteq 16 \text{ V}, V_{GS} = 5 \text{ V}$	—	23	—	nC
Gate-Source Charge	$Q_{gs}$	$I_D = 5 \text{ A}$	—	17	—	
Gate-Drain ("Miller") Charge	$Q_{gd}$		—	6	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	$I_{DR}$	—	—	—	5	A
Pulse Drain Reverse Current	$I_{DRP}$	—	—	—	20	A
Diode Forward Voltage	$V_{DSF}$	$I_{DR} = 5 \text{ A}, V_{GS} = 0 \text{ V}$	—	—	-1.7	V
Reverse Recovery Time	$t_{rr}$	$I_{DR} = 5 \text{ A}, V_{GS} = 0 \text{ V}$	—	120	—	ns
Reverse Recovery Charge	$Q_{rr}$	$dI_{DR}/dt = 50 \text{ A}/\mu\text{s}$	—	0.12	—	$\mu\text{C}$

MARKING



※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)

