

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE ( $L^2-\pi$ -MOS V)**2SJ525**

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

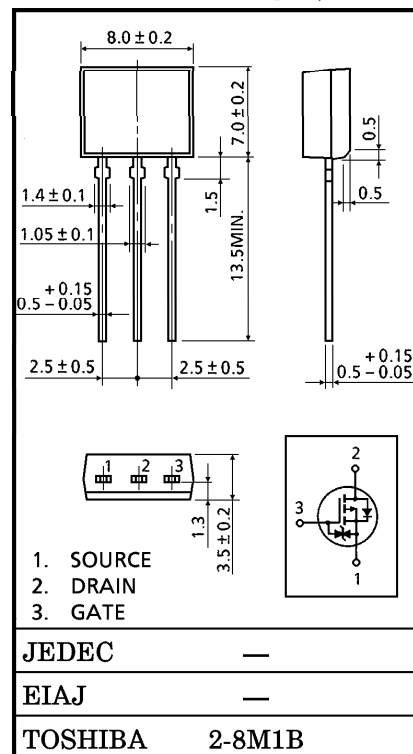
INDUSTRIAL APPLICATIONS

Unit in mm

- 4 V Gate Drive
- Low Drain-Source ON Resistance :  $R_{DS(ON)} = 0.1 \Omega$  (Typ.)
- High Forward Transfer Admittance :  $|Y_{fs}| = 4.5 S$  (Typ.)
- Low Leakage Current :  $I_{DSS} = -100 \mu A$  (Max.)  
( $V_{DS} = -30 V$ )
- Enhancement-Mode :  $V_{th} = -0.8 \sim -2.0 V$   
( $V_{DS} = -10 V$ ,  $I_D = -1 mA$ )

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		$V_{DSS}$	-30	V
Drain-Gate Voltage ( $R_{GS} = 20 k\Omega$ )		$V_{DGR}$	-30	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Drain Current	DC	$I_D$	-5	A
	Pulse	$I_{DP}$	-20	A
Drain Power Dissipation ( $T_a = 25^\circ C$ )		$P_D$	1.3	W
Single Pulse Avalanche Energy**		$E_{AS}$	517	mJ
Avalanche Current		$I_{AR}$	-5	A
Repetitive Avalanche Energy*		$E_{AR}$	0.13	mJ
Channel Temperature		$T_{ch}$	150	$^\circ C$
Storage Temperature Range		$T_{stg}$	-55~150	$^\circ C$



Weight : 0.54 g (Typ.)

## THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	96.1	$^\circ C / W$

Note ;

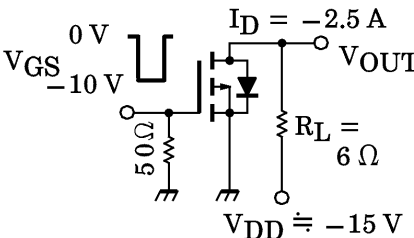
\* Repetitive rating ; Pulse Width Limited by Max. junction temperature.

\*\*  $V_{DD} = -25 V$ ,  $T_{ch} = 25^\circ C$  (initial),  $L = 14.84 mH$ ,  $R_G = 25 \Omega$ ,  $I_D = -5 A$ **This transistor is an electrostatic sensitive device. Please handle with caution.**

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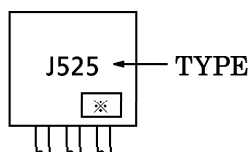
## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0 \text{ V}$	—	—	$\pm 10$	$\mu\text{A}$
Drain Cut-off Current	$I_{DSS}$	$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}$	—	—	-100	$\mu\text{A}$
Drain-Source Breakdown Voltage	$V_{(BR) DSS}$	$I_D = -10 \text{ mA}, V_{GS} = 0 \text{ V}$	-30	—	—	V
Gate Threshold Voltage	$V_{th}$	$V_{DS} = -10 \text{ V}, I_D = -1 \text{ mA}$	-0.8	—	-2.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = -4 \text{ V}, I_D = -2.5 \text{ A}$	—	0.17	0.2	$\Omega$
		$V_{GS} = -10 \text{ V}, I_D = -2.5 \text{ A}$	—	0.1	0.12	
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = -10 \text{ V}, I_D = -2.5 \text{ A}$	2.0	4.5	—	S
Input Capacitance	$C_{iss}$	$V_{DS} = -10 \text{ V}, V_{GS} = 0 \text{ V},$ $f = 1 \text{ MHz}$	—	850	—	pF
Reverse Transfer Capacitance	$C_{rss}$		—	250	—	
Output Capacitance	$C_{oss}$		—	330	—	
Switching Time	Rise Time		—	50	—	ns
	Turn-on Time		—	75	—	
	Fall Time		—	20	—	
	Turn-off Time		—	95	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)	$Q_g$	$V_{DD} \approx -24 \text{ V}, V_{GS} = -10 \text{ V},$ $I_D = -5 \text{ A}$	—	27	—	nC
Gate-Source Charge	$Q_{gs}$		—	19	—	
Gate-Drain ("Miller") Charge	$Q_{gd}$		—	8	—	

## 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	$t_{rr}$	$I_{DR} = -5 \text{ A}, V_{GS} = 0 \text{ V}$ $dI_{DR}/dt = 50 \text{ A}/\mu\text{s}$	—	60	—	ns
Reverse Recovery Charge	$Q_{rr}$		—	56	—	nC

## MARKING



※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)