

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (L²-π-MOSV)

2SJ508

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 : $R_{DS(ON)} = 1.35 \Omega$ (Typ.)
- High Forward Transfer Admittance: $|Y_{fs}| = 0.7 S$ (Typ.)
- Low Leakage Current
: $I_{DSS} = -100 \mu A$ ($V_{DS} = -100 V$)
- Enhancement-Mode
: $V_{th} = -0.8 \sim -2.0 V$ ($V_{DS} = -10 V, I_D = -1 mA$)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	-100	V
Drain-Gate Voltage ($R_{GS} = 20 k\Omega$)		V_{DGR}	-100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC	I_D	-1	A
	Pulse	I_{DP}	-3	A
Drain Power Dissipation (Ta = 25°C)***		P_D	1.5	W
Single Pulse Avalanche Energy**		E_{AS}	136.5	mJ
Avalanche Current		I_{AR}	-1	A
Repetitive Avalanche Energy*		E_{AR}	0.15	mJ
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	-55~150	°C

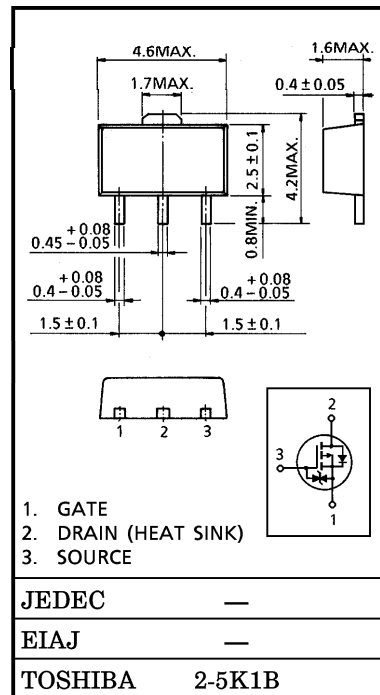
THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	83.3	°C/W

Note ;

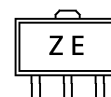
- * Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- ** $V_{DD} = -50 V$, Starting $T_{ch} = 25^\circ C$, $L = 168 mH$, $R_G = 25 \Omega$, $I_{AR} = -1 A$
- *** Mounted on ceramic substrate (1 inch² × 0.8 t)

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



Weight : 0.05 g (Typ.)

MARKING



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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}	$V_{DS} = -100 \text{ V}, V_{GS} = 0 \text{ V}$	—	—	-100	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D = -10 \text{ mA}, V_{GS} = 0 \text{ V}$	-100	—	—	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		$R_{DS(ON)}$	$V_{GS} = -4 \text{ V}, I_D = -0.5 \text{ A}$	—	1.68	2.5	Ω
			$V_{GS} = -10 \text{ V}, I_D = -0.5 \text{ A}$	—	1.34	1.9	
Forward Transfer Admittance		$ Y_{fs} $	$V_{DS} = -10 \text{ V}, I_D = -0.5 \text{ A}$	0.3	0.7	—	S
Input Capacitance		C_{iss}	$V_{DS} = -10 \text{ V}, V_{GS} = 0 \text{ V},$ $f = 1 \text{ MHz}$	—	135	—	pF
Reverse Transfer Capacitance		C_{rss}		—	22	—	
Output Capacitance		C_{oss}		—	48	—	
Switching Time	Rise Time	t_r		—	20	—	ns
	Turn-on Time	t_{on}		—	32	—	
	Fall Time	t_f		—	25	—	
	Turn-off Time	t_{off}		—	130	—	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Q_g	$V_{DD} \cong -80 \text{ V}, V_{GS} = -10 \text{ V},$ $I_D = -1 \text{ A}$	—	6.3	—	nC
Gate-Source Charge		Q_{gs}		—	4.1	—	
Gate-Drain ("Miller") Charge		Q_{gd}		—	2.2	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	I_{DR}	—	—	—	-1	A
Pulse Drain Reverse Current	I_{DRP}	—	—	—	-3	A
Diode Forward Voltage	V_{DSF}	$I_{DR} = -1 \text{ A}, V_{GS} = 0 \text{ V}$	—	—	1.5	V
Reverse Recovery Time	t_{rr}	$I_{DR} = -1 \text{ A}, V_{GS} = 0 \text{ V}$	—	90	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_{DR} / dt = 50 \text{ A} / \mu\text{s}$	—	180	—	nC