TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (L^2-π-MOS V)

2SJ508

HIGH SPEED, HIGH CURRENT SWITCHING APPLICATIONS

CHOPPER REGULATOR, DC-DC CONVERTER AND MOTOR DRIVE APPLICATIONS

INDUSTRIAL APPLICATIONS

- 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)

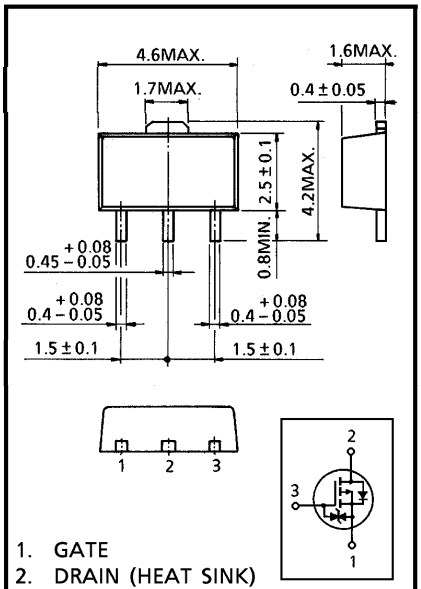
MAXIMUM RATINGS (Ta = 25°C)

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	0.5	W
Drain Power Dissipation***		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}	0.05	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	$R_{th\,(ch\text{-}a)}$	250	°C / W

Unit in mm

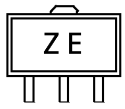


1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

JEDEC	—
EIAJ	—
TOSHIBA	2-5K1B

Weight : 0.05 g (Typ.)

MARKING



Note ;

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

** $V_{DD} = -50$ V, $T_{ch} = 25$°C (initial), L = 168 mH, $R_G = 25\ \Omega$, $I_{AR} = -1$ A

*** Mounted on ceramic substrate ($1\ inch^2 \times 0.8$ t)

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

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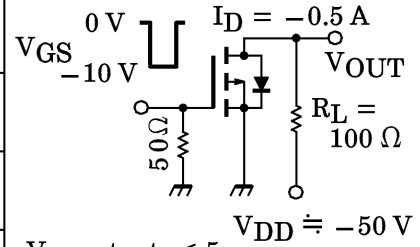
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS} = \pm 16$ V, $V_{DS} = 0$ V	—	—	±10	μA
Drain Cut-off Current		I_{DSS}	$V_{DS} = -100$ V, $V_{GS} = 0$ V	—	—	−100	μA
Drain-Source Breakdown Voltage		$V_{(BR)\,DSS}$	$I_D = -10$ mA, $V_{GS} = 0$ V	−100	—	—	V
Gate Threshold Voltage		V_{th}	$V_{DS} = -10$ V, $I_D = -1$ mA	−0.8	—	−2.0	V
Drain-Source ON Resistance		$R_{DS\,(ON)}$	$V_{GS} = -4$ V, $I_D = -0.5$ A	—	1.68	2.5	Ω
			$V_{GS} = -10$ V, $I_D = -0.5$ A	—	1.34	1.9	
Forward Transfer Admittance		$\|Y_{fs}\|$	$V_{DS} = -10$ V, $I_D = -0.5$ A	0.3	0.7	—	S
Input Capacitance		C_{iss}	$V_{DS} = -10$ V, $V_{GS} = 0$ V, f = 1 MHz	—	135	—	pF
Reverse Transfer Capacitance		C_{rss}		—	22	—	
Output Capacitance		C_{oss}		—	48	—	
Switching Time	Rise Time	t_r	 V_{IN} : t_r, $t_f < 5$ ns, Duty ≦ 1%, $t_w = 10$ μs	—	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	$V_{DD} \fallingdotseq -80$ V, $V_{GS} = -10$ V, $I_D = -1$ 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}	$I_{DR} = -1$ A, $V_{GS} = 0$ V	—	—	1.5	V
Reverse Recovery Time	t_{rr}	$I_{DR} = -1$ A, $V_{GS} = 0$ V, $dI_{DR}/dt = 50$ A/μs	—	90	—	ns
Reverse Recovery Charge	Q_{rr}		—	180	—	nC