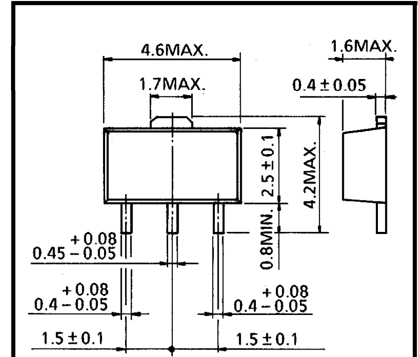
TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (L^2-π-MOSV)

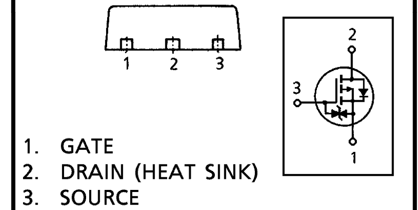
2SJ508

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

INDUSTRIAL APPLICATIONS

Unit in mm



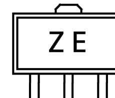


1. GATE
2. DRAIN (HEAT SINK)
3. SOURCE

JEDEC	—
EIAJ	—
TOSHIBA	2-5K1B

Weight : 0.05 g (Typ.)

MARKING



- 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 $T_{ch} = 25°C$, $L = 168\,mH$, $R_G = 25\,\Omega$, $I_{AR} = -1\,A$
- *** Mounted on ceramic substrate (1 inch^2 × 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}	$V_{GS} = \pm16$ 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		$\lvert Y_{fs} \rvert$	$V_{DS} = -10$ 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_{GS}: 0 V / −10 V; $I_D = -0.5$ A; V_{OUT}; 50 Ω; $R_L = 100$ Ω; $V_{DD} \fallingdotseq -50$ V; 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	—	90	—	ns
Reverse Recovery Charge	Q_{rr}	$dI_{DR}/dt = 50$ A/μs	—	180	—	nC