

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

2SJ509

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

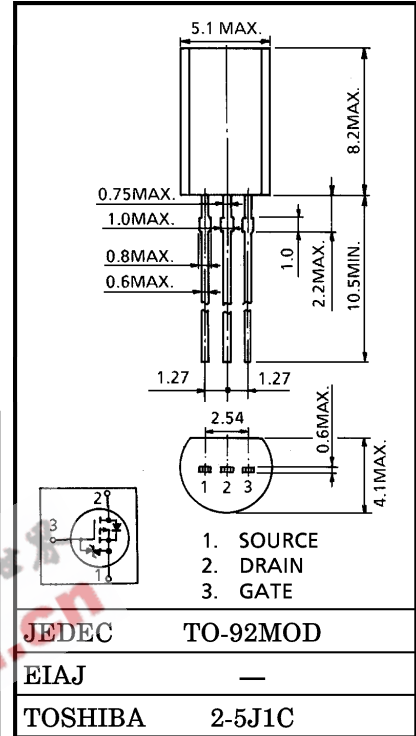
INDUSTRIAL APPLICATIONS

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	0.9	W
Single Pulse Avalanche Energy**		E_{AS}	136.5	mJ
Avalanche Current		I_{AR}	-1	A
Repetitive Avalanche Energy*		E_{AR}	0.09	mJ
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	-55~150	°C



Weight : 0.36 g (Typ.)

THERMAL CHARACTERISTICS

CHARACTERISTIC	SYMBOL	MAX.	UNIT
Thermal Resistance, Channel to Ambient	$R_{th(ch-a)}$	138	°C/W

Note ;

- * Repetitive rating ; Pulse Width Limited by Max. junction temperature.
- ** $V_{DD} = -50 V$, Starting $T_{ch} = 25^\circ C$, $L = 168 mH$, $R_G = 25 \Omega$, $I_{AR} = -1 A$

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

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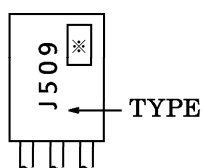
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		IGSS	VGS = ±16 V, VDS = 0 V	—	—	±10	μA
Drain Cut-off Current		IDSS	VDS = -100 V, VGS = 0 V	—	—	-100	μA
Drain-Source Breakdown Voltage		V(BR)DSS	ID = -10 mA, VGS = 0 V	-100	—	—	V
Gate Threshold Voltage		Vth	VDS = -10 V, ID = -1 mA	-0.8	—	-2.0	V
Drain-Source ON Resistance		RDS(ON)	VGS = -4 V, ID = -0.5 A	—	1.68	2.5	Ω
			VGS = -10 V, ID = -0.5 A	—	1.34	1.9	
Forward Transfer Admittance		Yfs	VDS = -10 V, ID = -0.5 A	0.3	0.7	—	S
Input Capacitance		Ciss	VDS = -10 V, VGS = 0 V, f = 1 MHz	—	135	—	pF
Reverse Transfer Capacitance		Crss		—	22	—	
Output Capacitance		Coss		—	48	—	
Switching Time	Rise Time	tr		—	20	—	ns
	Turn-on Time	ton		—	32	—	
	Fall Time	tf		—	25	—	
	Turn-off Time	t _{off}		VIN : tr, tf < 5 ns, Duty ≤ 1%, tw = 10 μs	—	130	
Total Gate Charge (Gate-Source Plus Gate-Drain)		Qg	VDD ≐ -80 V, VGS = -10 V, ID = -1 A	—	6.3	—	nC
Gate-Source Charge		Qgs		—	4.1	—	
Gate-Drain (“Miller”) Charge		Qgd		—	2.2	—	

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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Continuous Drain Reverse Current	IDR	—	—	—	-1	A
Pulse Drain Reverse Current	IDRP	—	—	—	-3	A
Diode Forward Voltage	VDSF	IDR = -1 A, VGS = 0 V	—	—	1.5	V
Reverse Recovery Time	t _{rr}	IDR = -1 A, VGS = 0 V	—	90	—	ns
Reverse Recovery Charge	Q _{rr}	dIDR / dt = 50 A / μs	—	180	—	nC

MARKING



※ Lot Number

□ □ — Month (Starting from Alphabet A)

— Year (Last Number of the Christian Era)