

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

2SJ509

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

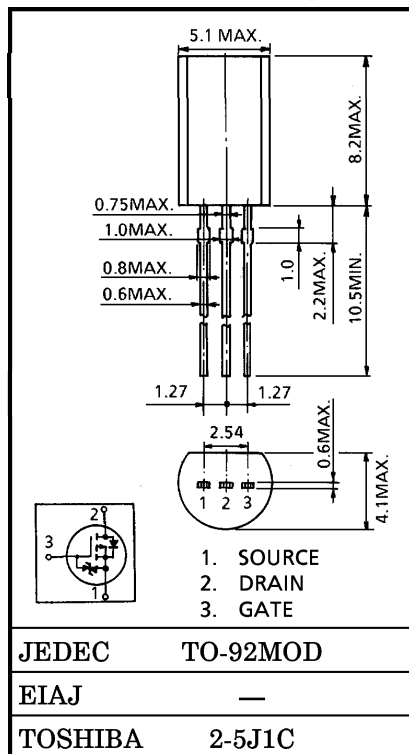
INDUSTRIAL APPLICATIONS

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 ($T_a = 25^\circ C$)

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 ($T_a = 25^\circ C$)		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	$^\circ C$
Storage Temperature Range		T_{stg}	-55~150	$^\circ C$



Weight : 0.36 g (Typ.)

THERMAL CHARACTERISTICS

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

Note ;

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

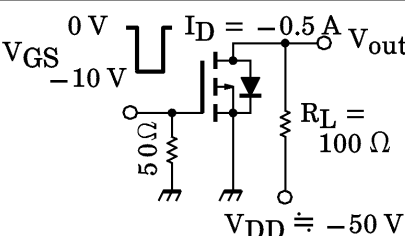
** $V_{DD} = -50 V$, $T_{ch} = 25^\circ C$ (initial), $L = 168 mH$, $R_G = 25 \Omega$, $I_{AR} = -1 A$

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

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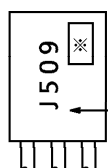
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I _{GSS}	V _{GS} = ±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		—	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} ≐ −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 ($T_a = 25^\circ\text{C}$)

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

MARKING



※ Lot Number



Month (Starting from Alphabet A)

Year (Last Number of the Christian Era)