

TOSHIBA FIELD EFFECT TRANSISTOR SILICON P CHANNEL MOS TYPE (U-MOSⅢ)

TPC8109**TENTATIVE**

LITHIUM ION BATTERY
 PORTABLE MACHINES AND TOOLS
 NOTE BOOK PC

- Compact and thin package, and a small mounting area
- Low drain-source ON resistance : $R_{DS(ON)} = 14 \text{ m}\Omega$ (typ.)
- High forward transfer admittance : $|Y_{fs}| = 19 \text{ S}$ (typ.)
- Low leakage current : $I_{DSS} = -10 \mu\text{A}$ (max.) ($V_{DS} = -30\text{V}$)
- Enhancement mode : $V_{th} = -0.8 \sim -2.0\text{V}$ ($V_{DS} = -10\text{V}$, $I_D = -1\text{mA}$)

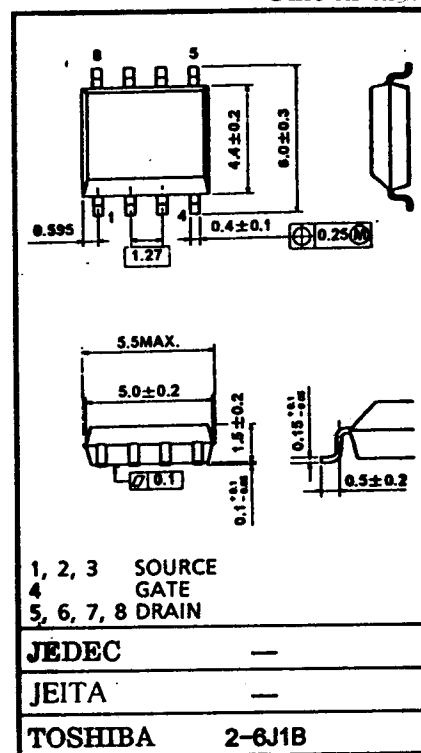
Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics		Symbol	Rating	Unit
Drain-source voltage		V_{DS}	-30	V
Drain-gate voltage ($R_{GS} = 20\text{k}\Omega$)		V_{DGR}	-30	V
Gate-source voltage		V_{GSS}	± 20	V
Drain current	DC (Note 1)	I_D	-10	A
	Pulse (Note 1)	I_{DP}	-40	
Drain power dissipation ($t = 10\text{s}$) (Note 2a)		P_D	1.9	W
Drain power dissipation ($t = 10\text{s}$) (Note 2b)		P_D	1.0	
Single pulse avalanche energy (Note 3)		E_{AS}	130	mJ
Avalanche current		I_{AR}	-10	A
Repetitive avalanche energy (Note 2a)(Note 4)		E_{AR}	0.19	mJ
Channel temperature		T_{ch}	150	$^\circ\text{C}$
Storage temperature range		T_{stg}	$-55 \sim 150$	$^\circ\text{C}$

Note:(Note 1),(Note 2),(Note 3),(Note 4) Please see next page.

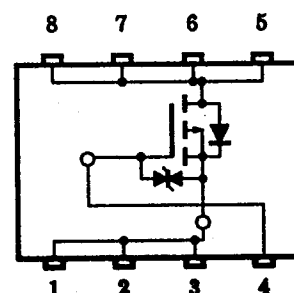
This transistor is an electrostatic sensitive device. Please handle with caution.

Unit in mm



Weight: 0.080g (typ.)

CIRCUIT CONFIGURATION

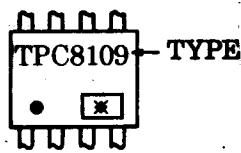


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Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to ambient (t=10s) (Note 2a)	$R_{th(ch-a)}$	65.8	°C/W
Thermal resistance, channel to ambient (t=10s) (Note 2b)	$R_{th(ch-a)}$	125	°C/W

Marking(Note 5)

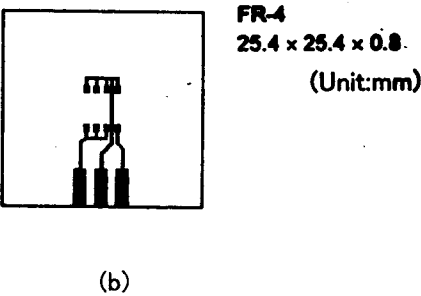
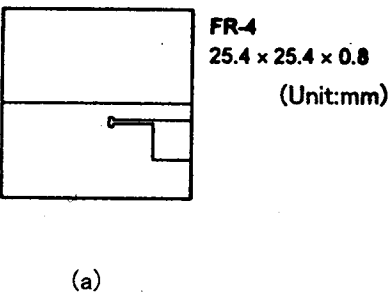


Note 1: Please use devices on condition that the channel temperature is below 150°C.

Note 2:

a) Device mounted on a glass-epoxy board(a)

b) Device mounted on glass-epoxy board(b)



Note 3: $V_{DD} = -24V$, $T_{ch} = 25^{\circ}C$ (initial), $L = 1.0mH$, $R_G = 25\Omega$, $I_{AR} = -10A$

Note 4: Reptitive rating; pulse width limited by max channel temperature.

Note 5: ● on lower left of the marking indicates Pin 1.

✕ shows Lot number. (Year of manufacture: last decimal digit of the year of manufacture, Month of manufacture : January to December are denoted by letters A to L respectively)

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Electrical Characteristics ($T_a=25^\circ\text{C}$)

Characteristics		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}	$V_{DS}=-30\text{V}, V_{GS}=0\text{V}$	—	—	-10	μA
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D=-10\text{mA}, V_{GS}=0\text{V}$	-30	—	—	V
		$V_{(BR)DSX}$	$I_D=-10\text{mA}, V_{GS}=20\text{V}$	-15	—	—	
Gate threshold voltage		V_{th}	$V_{DS}=-10\text{V}, I_D=-1\text{mA}$	-0.8	—	-2.0	V
Drain-source ON resistance		$R_{DS(ON)}$	$V_{GS}=-4\text{V}, I_D=-5\text{A}$	—	24	30	$\text{m}\Omega$
			$V_{GS}=-10\text{V}, I_D=-5\text{A}$	—	14	20	
Forward transfer admittance		$ Y_{fs} $	$V_{DS}=-10\text{V}, I_D=-5\text{A}$	9	19	—	S
Input capacitance		C_{iss}	$V_{DS}=-10\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$	—	2260	—	pF
Reverse transfer capacitance		C_{rss}		—	290	—	
Output capacitance		C_{oss}		—	350	—	
Switching time	Rise time	t_r		—	5	—	ns
	Turn-ON time	t_{on}		—	13	—	
	Fall time	t_f		—	34	—	
	Turn-OFF time	t_{off}		—	143	—	
Total gate charge (gate-source plus gate-drain)		Q_g	$V_{DD}=-24\text{V}, V_{GS}=-10\text{V}, I_D=-10\text{A}$	—	45	—	nC
Gate-source charge 1		Q_{gs1}		—	6.5	—	
Gate-Drain("miller")charge		Q_{gd}		—	10	—	

Source-Drain Diode Ratings and Characteristics ($T_a=25^\circ\text{C}$)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Drain reverse current	Pulse (Note 1)	I_{DRP}	—	—	—	-40	A
Diode forward voltage		V_{DSF}	$I_{DR}=-10\text{A}, V_{GS}=0\text{V}$	—	—	1.2	V

TENTATIVE**RESTRICTIONS ON PRODUCT USE**

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