

TOSHIBA Field Effect Transistor Silicon P Channel MOS Type (U-MOSIV)

TPC6108

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Notebook PC Applications

Portable Equipment Applications

- Small footprint due to small and thin package
- Low drain-source ON resistance: $R_{DS(ON)} = 50 \text{ m}\Omega$ (typ.)
- High forward transfer admittance: $|Y_{fs}| = 7.4 \text{ S}$ (typ.)
- Low leakage current: $I_{DSS} = -10 \text{ }\mu\text{A}$ (max) ($V_{DS} = -30 \text{ V}$)
- Enhancement model: $V_{th} = -0.8 \text{ to } -2.0 \text{ V}$
($V_{DS} = -10 \text{ V}$, $I_D = -1 \text{ mA}$)

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

Characteristics		Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	-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	-4.5	A
	Pulse (Note 1)	I_{DP}	-18	
Drain power dissipation ($t = 5 \text{ s}$) (Note 2a)		P_D	2.2	W
Drain power dissipation ($t = 5 \text{ s}$) (Note 2b)		P_D	0.7	
Single pulse avalanche energy (Note 4)		E_{AS}	1.3	mJ
Avalanche current		I_{AR}	-2.25	A
Repetitive avalanche energy Single-device value at dual operation (Note 2a, 3b, 5)		E_{AR}	0.22	mJ
Channel temperature		T_{ch}	150	$^\circ\text{C}$
Storage temperature range		T_{stg}	-55~150	$^\circ\text{C}$

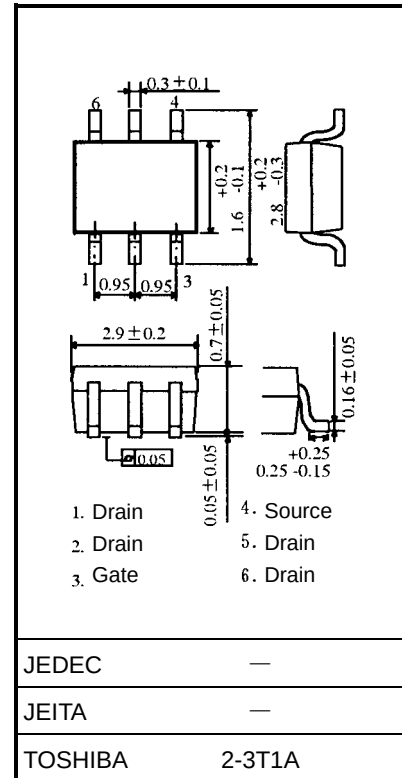
Thermal Characteristics

Characteristics	Symbol	Max	Unit
Thermal resistance, channel to ambient ($t = 5 \text{ s}$) (Note 2a)	$R_{th(ch-a)}$	56.8	$^\circ\text{C/W}$
Thermal resistance, channel to ambient ($t = 5 \text{ s}$) (Note 2b)	$R_{th(ch-a)}$	178.5	$^\circ\text{C/W}$

Note: For (Note 1), (Note 2), (Note 3), (Note 4) and (Note 5), please refer to the next page.

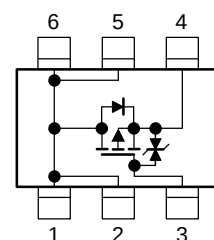
This transistor is an electrostatic sensitive device. Please handle with caution.

Unit: mm



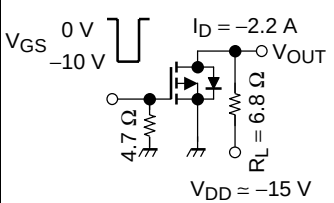
Weight: 0.011 g (typ.)

Circuit Configuration



Electrical Characteristics (Ta = 25°C)

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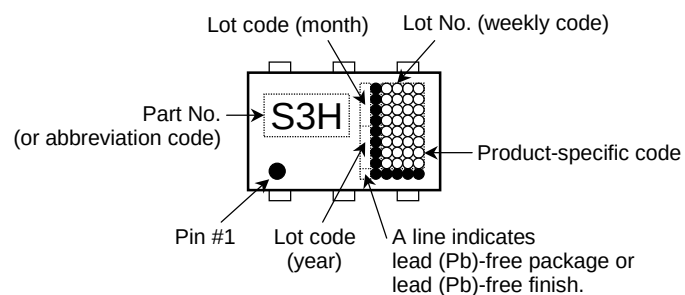
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GSS}	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0 \text{ V}$	—	—	± 10	μA
Drain cut-off current		I_{DSS}	$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}$	—	—	-10	μA
Drain-source breakdown voltage		$V_{(BR) DSS}$	$I_D = -10 \text{ mA}, V_{GS} = 0 \text{ V}$	-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		$R_{DS(ON)}$	$V_{GS} = -4.5 \text{ V}, I_D = -2.2 \text{ A}$	—	75	100	$\text{m}\Omega$
		$R_{DS(ON)}$	$V_{GS} = -10 \text{ V}, I_D = -2.2 \text{ A}$	—	50	60	
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = -10 \text{ V}, I_D = -2.2 \text{ A}$	3.7	7.4	—	S
Input capacitance		C_{iss}	$V_{DS} = -10 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$	—	570	—	pF
Reverse transfer capacitance		C_{rss}		—	75	—	
Output capacitance		C_{oss}		—	85	—	
Switching time	Rise time	t_r	 $V_{GS} = 0 \text{ V}, -10 \text{ V}$ $I_D = -2.2 \text{ A}$ $R_L = 6.8 \Omega$ $V_{DD} = -15 \text{ V}$ 4.7Ω V_{OUT} $Duty \leq 1\%, t_W = 10 \mu\text{s}$	—	3.5	—	ns
	Turn-on time	t_{on}		—	12	—	
	Fall time	t_f		—	21	—	
	Turn-off time	t_{off}		—	70	—	
Total gate charge (gate-source plus gate-drain)		Q_g	$V_{DD} = -24 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -4.5 \text{ A}$	—	13	—	nC
Gate-source charge1		Q_{gs1}		—	1.8	—	
Gate-drain ("miller") charge		Q_{gd}		—	2.5	—	

Source-Drain Ratings and Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Drain reverse current	Pulse (Note 1)	I_{DRP}	—	—	—	-18	A
Forward voltage (diode)		V_{DSF}	$I_{DR} = -4.5 \text{ A}, V_{GS} = 0 \text{ V}$	—	—	1.2	V

Marking (Note 5)

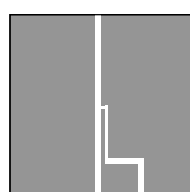
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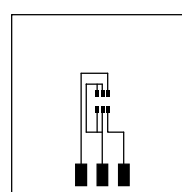
Note 1: Ensure that the channel temperature does not exceed 150°C.

Note 2: (a) Device mounted on a glass-epoxy board (a) (t = 5 s)

(b) Device mounted on a glass-epoxy board (b) (t = 5 s)



(a)



(b)

Note 3: $V_{DD} = -24\text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 0.2\text{ mH}$, $R_G = 25\ \Omega$, $I_{AR} = -2.25\text{ A}$

Note 4: Repetitive rating: pulse width limited by max channel temperature

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

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