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

TPC6108

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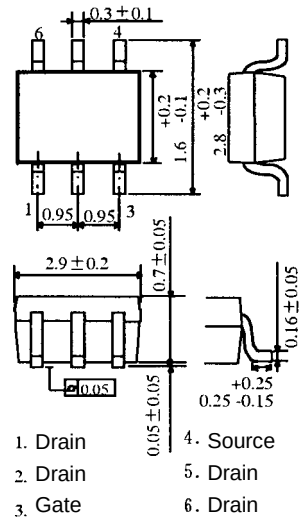
Notebook PC Applications

Portable Equipment Applications

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

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	2-3T1A

Weight: 0.011 g (typ.)

Maximum Ratings (Ta = 25°C)

Characteristics			Symbol	Rating	Unit
Drain-source voltage			V_{DSS}	−30	V
Drain-gate voltage (R_{GS} = 20 kΩ)			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 s)		(Note 2a)	P_D	2.2	W
Drain power dissipation(t = 5 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	°C
Storage temperature range			T_{stg}	−55~150	°C

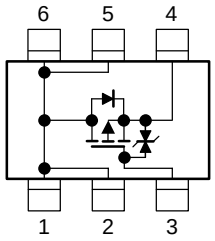
Thermal Characteristics

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

Circuit Configuration



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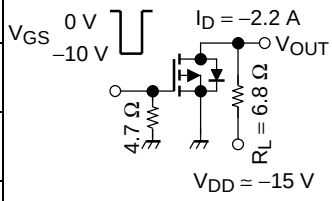
Electrical Characteristics (Ta = 25°C)

Characteristics		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} = −30 V, V_{GS} = 0 V	—	—	−10	μA
Drain-source breakdown voltage		$V_{(BR)\ DSS}$	I_D = −10 mA, V_{GS} = 0 V	−30	—	—	V
		$V_{(BR)\ DSX}$	I_D = −10 mA, V_{GS} = 20 V	−15	—	—	
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} = −4.5 V, I_D = −2.2 A	—	75	100	mΩ
		$R_{DS\ (ON)}$	V_{GS} = −10 V, I_D = −2.2 A	—	50	60	
Forward transfer admittance		$\|Y_{fs}\|$	V_{DS} = −10 V, I_D = −2.2 A	3.7	7.4	—	S
Input capacitance		C_{iss}	V_{DS} = −10 V, V_{GS} = 0 V, f = 1 MHz	—	570	—	pF
Reverse transfer capacitance		C_{rss}		—	75	—	
Output capacitance		C_{oss}		—	85	—	
Switching time	Rise time	t_r	 Duty ≦ 1%, t_w = 10 μs	—	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 V, V_{GS} = −10 V, I_D = −4.5 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 A, V_{GS} = 0 V	—	—	1.2	V

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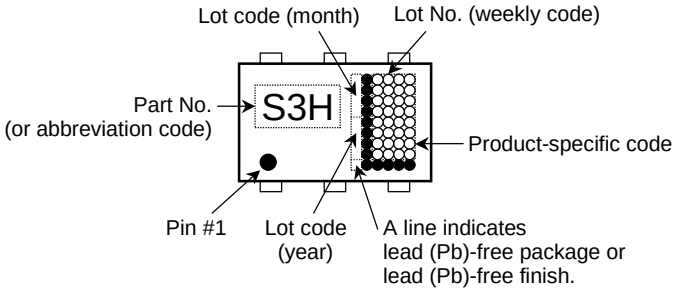
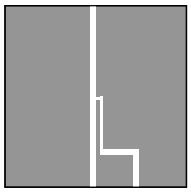
Marking (Note 5)



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

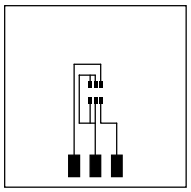
Note 2: (a) Device mounted on a glass-epoxy board (a) (t = 5 s)

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



FR-4
25.4 × 25.4 × 0.8
(Unit: mm)

(a)



FR-4
25.4 × 25.4 × 0.8
(Unit: mm)

(b)

Note 3: V_{DD} = −24 V, T_{ch} = 25°C (initial), L = 0.2 mH, R_G = 25 Ω, I_{AR} = -2.25 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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