TOSHIBA Field Effect Transistor Silicon N Channel MOS Type (U-MOSIII)

TPC8207

Lithium Ion Battery Applications Notebook PC Applications Portable Equipment Applications

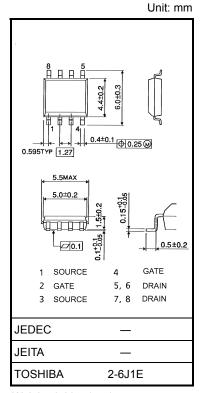
- Small footprint due to small and thin package
- Low drain-source ON resistance: RDS (ON) = $16 \text{ m}\Omega$ (typ.)
- High forward transfer admittance: $|Y_{fs}| = 11 \text{ S (typ.)}$
- Low leakage current: $I_{DSS} = 10 \mu A \text{ (max) (V}_{DS} = 20 \text{ V)}$
- Enhancement-mode: $V_{th} = 0.5 \sim 1.2 \text{ V (V}_{DS} = 10 \text{ V, I}_{D} = 200 \text{ }\mu\text{A})$

Maximum Ratings (Ta = 25°C)

Chai	racteristics	Symbol	Rating	Unit	
Drain-source vol	tage	V_{DSS}	20	V	
Drain-gate voltage	ge (R _{GS} = 20 kΩ)	V_{DGR}	20	V	
Gate-source vol	tage	V _{GSS}	±12	V	
Drain ourrent	DC (Note 1)	I _D	6	Α	
Drain current	Pulse (Note 1)	I _{DP}	24	A	
Drain power dissipation	Single-device operation (Note 3a)	P _{D (1)}	1.5		
(t = 10 s) (Note 2a)	Single-device value at dual operation (Note 3b)	P _{D (2)}	1.1	W	
Drain power dissipation	Single-device operation (Note 3a)	P _{D (1)}	0.75	W	
(t = 10 s) (Note 2b)	Single-device value at dual operation (Note 3b)	P _{D (2)}	0.45		
Single pulse avalanche energy (Note 4)		E _{AS}	46.8	mJ	
Avalanche current		I _{AR}	6	Α	
Repetitive avalanche energy Single-device value at dual operation (Note 2a, 3b, 5)		E _{AR}	0.1	mJ	
Channel temperature		T _{ch}	150	°C	
Storage tempera	ature range	T _{stg}	-55~150	°C	

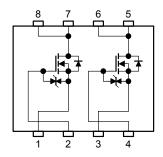
Note 1, Note 2, Note 3, Note 4 and Note 5: See the next page.

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



Weight: 0.08 g (typ.)

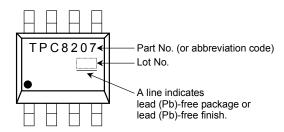
Circuit Configuration



Thermal Characteristics

Characteristics	Symbol	Max	Unit		
Thermal resistance, channel to ambient (t = 10 s) (Note 2a)	Single-device operation (Note 3a)	R _{th (ch-a) (1)}	83.3	°C/W	
	Single-device value at dual operation (Note 3b)	R _{th (ch-a) (2)}	114		
Thermal resistance, channel to ambient	Single-device operation (Note 3a)	R _{th (ch-a) (1)}	167		
(t = 10 s) (Note 2b)	Single-device value at dual operation (Note 3b)	R _{th (ch-a) (2)}	278	°C/W	

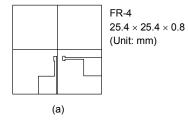
Marking (Note 6)

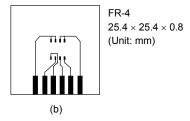


Note 1: Ensure that the channel temperature does not exceed 150°C.

Note 2:

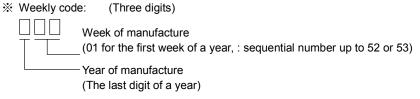
- a) Device mounted on a glass-epoxy board (a)
- b) Device mounted on a glass-epoxy board (b)





Note 3:

- a) The power dissipation and thermal resistance values are shown for a single device (During single-device operation, power is only applied to one device.).
- b) The power dissipation and thermal resistance values are shown for a single device (During dual operation, power is evenly applied to both devices.).
- Note 4: $V_{DD} = 16 \text{ V}$, $T_{ch} = 25^{\circ}\text{C}$ (initial), L = 1.0 mH, $R_G = 25 \Omega$, $I_{AR} = 6 \text{ A}$
- Note 5: Repetitive rating: pulse width limited by max channel temperature.
- Note 6: on lower right of the marking indicates Pin 1.



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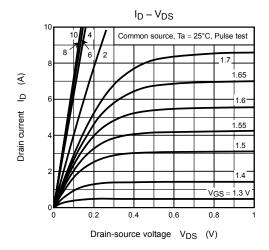
Electrical Characteristics (Ta = 25°C)

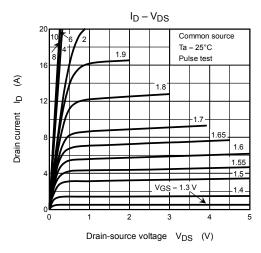
Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit	
Gate leakage current		I _{GSS}	$V_{GS} = \pm 10 \text{ V}, V_{DS} = 0 \text{ V}$	_	_	±10	μА	
Drain cut-OFF cu	Drain cut-OFF current		$V_{DS} = 20 \text{ V}, V_{GS} = 0 \text{ V}$	_	_	10	μА	
Drain source bre	akdown voltage	V _{(BR) DSS}	$I_D = 10$ mA, $V_{GS} = 0$ V	20	_	_	V	
Drain-source breakdown voltage		V _{(BR) DSX}	$I_D = 10 \text{ mA}, V_{GS} = -12 \text{ V}$	8	_		v	
Gate threshold ve	oltage	V _{th}	$V_{DS}=10~V,~I_D=200~\mu A$	0.5	_	1.2	٧	
			$V_{GS} = 2.0 \text{ V}, I_D = 4.2 \text{ A}$	_	22	45	mΩ	
Drain-source ON	resistance	R _{DS (ON)}	$V_{GS} = 2.5 \text{ V}, I_D = 4.2 \text{ A}$	_	19	30		
			V _{GS} = 4.0 V, I _D = 4.8 A	_	16	20		
Forward transfer	admittance	Y _{fs}	V _{DS} = 10 V, I _D = 3.0 A	5.5	11	_	S	
Input capacitance	e	C _{iss}		_	2010	_		
Reverse transfer	Reverse transfer capacitance		$V_{DS} = 10 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$	_	210	_	pF	
Output capacitan	Output capacitance]	_	240	_		
Switching time	Rise time	t _r	V _{GS} ⁰ V	_	6	_		
	Turn-ON time	t _{on}		_	14			
	Fall time	t _f		_	22	_	ns	
	Turn-OFF time	t _{off}	$V_{DD} \simeq 10 \text{ V}$ Duty $\leq 1\%$, $t_W = 10 \mu\text{s}$	_	94	_		
Total gate charge (gate-source plus gate-drain)		Qg		_	22	_		
Gate-source charge 1		Q _{gs1}	$V_{DD} \simeq 16 \text{ V}, V_{GS} = 5 \text{ V}, I_{D} = 6 \text{ A}$		3.2		nC -	
Gate-drain ("miller") charge		Q _{gd}			4.7			

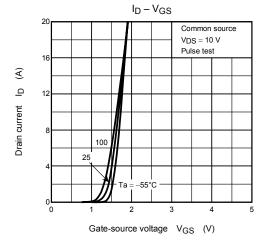
Source-Drain Ratings and Characteristics (Ta = 25°C)

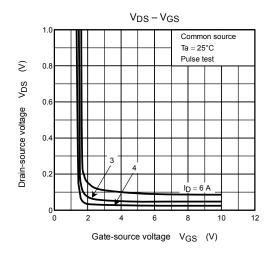
Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit
Drain reverse current	Pulse (Note 1)	I _{DRP}	_	_	_	24	Α
Forward voltage (diode)		V_{DSF}	$I_{DR} = 6 A$, $V_{GS} = 0 V$	_	_	-1.2	V

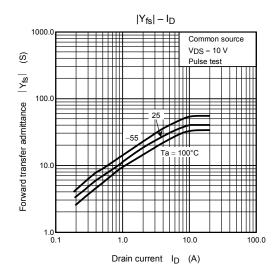
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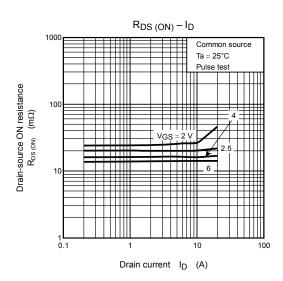


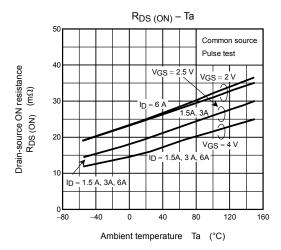


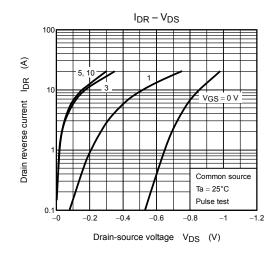


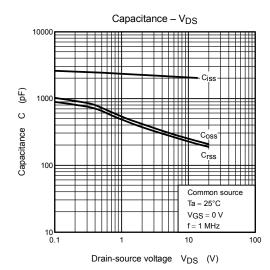


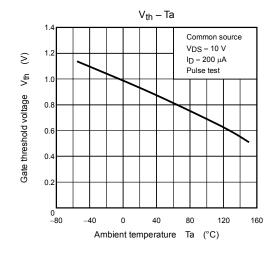


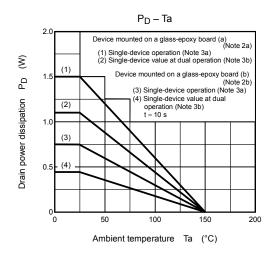


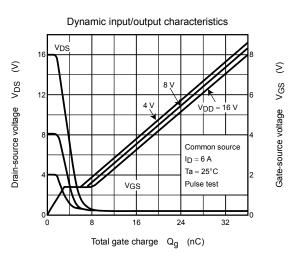


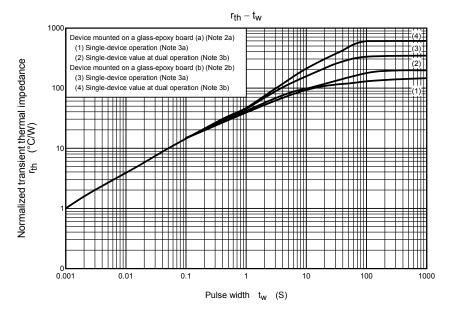




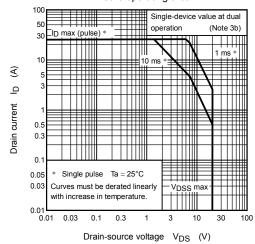












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