

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

TPC8115

Lithium Ion Battery Applications
 Notebook PC Applications
 Portable Equipment Applications

- Small footprint due to small and thin package
- Low drain-source ON resistance: $R_{DS(ON)} = 6.5 \text{ m}\Omega$ (typ.)
- High forward transfer admittance: $|Y_{fs}| = 40 \text{ S}$ (typ.)
- Low leakage current: $I_{DSS} = -10 \text{ }\mu\text{A}$ (max) ($V_{DS} = -20 \text{ V}$)
- Enhancement mode: $V_{th} = -0.5 \text{ to } -1.2 \text{ V}$ ($V_{DS} = -10 \text{ V}$, $I_D = -1\text{mA}$)

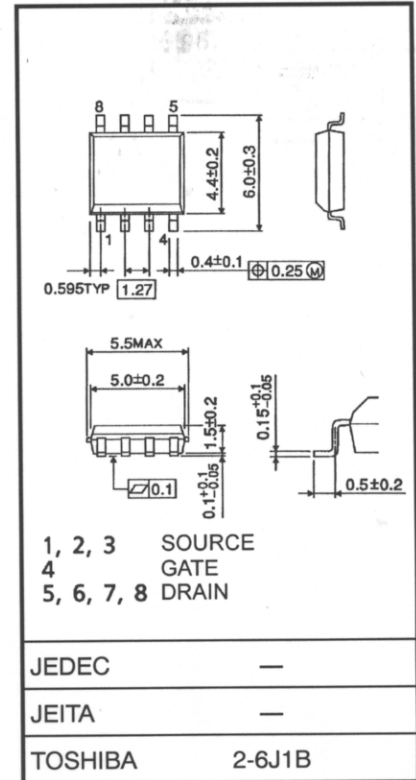
Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics		Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	-20	V
Drain-gate voltage ($R_{GS} = 20 \text{ k}\Omega$)		V_{DGR}	-20	V
Gate-source voltage		V_{GSS}	± 8	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	W
Single pulse avalanche energy	(Note 3)	E_{AS}	26	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 to 150	$^\circ\text{C}$

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

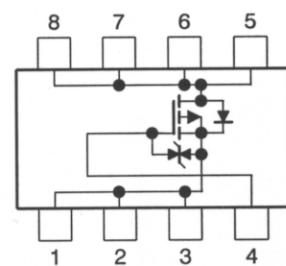
This transistor is an electrostatic sensitive device. Please handle with caution.

Unit: mm



Weight: 0.080 g (typ.)

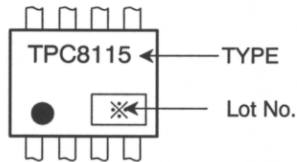
Circuit Configuration



Thermal Characteristics

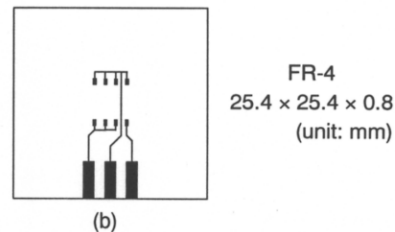
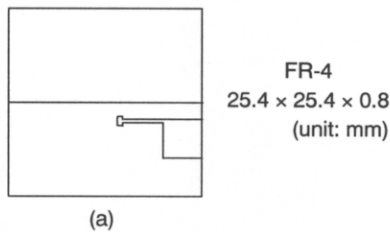
Characteristics	Symbol	Max	Unit
Thermal resistance, channel to ambient (t = 10 s) (Note 2a)	$R_{th(ch-a)}$	65.8	°C/W
Thermal resistance, channel to ambient (t = 10 s) (Note 2b)	$R_{th(ch-a)}$	125	°C/W

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 a glass-epoxy board (b)

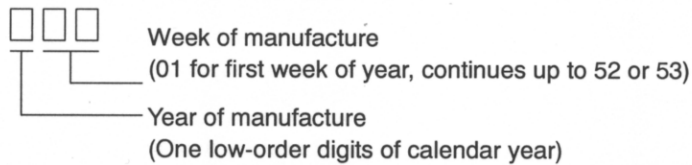


Note 3: $V_{DD} = -16V$, $T_{ch} = 25^{\circ}C$ (initial), $L = 0.2$ mH, $R_G = 25 \Omega$, $I_{AR} = -10$ A

Note 4: Repetitive rating; pulse width limited by maximum channel temperature

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

※ Weekly code: (Three digits)



Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GSS}	$V_{GS} = \pm 8\text{ V}, V_{DS} = 0\text{ V}$	—	—	± 10	μA
Drain cut-OFF current		I_{DSS}	$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}$	—	—	-10	μA
Drain-source breakdown voltage		$V_{(BR) DSS}$	$I_D = -10\text{ mA}, V_{GS} = 0\text{ V}$	-20	—	—	V
		$V_{(BR) DSX}$	$I_D = -10\text{ mA}, V_{GS} = 8\text{ V}$	-10	—	—	
Gate threshold voltage		V_{th}	$V_{DS} = -10\text{ V}, I_D = -1\text{ mA}$	-0.5	—	-1.2	V
Drain-source ON resistance		$R_{DS(ON)}$	$V_{GS} = -1.8\text{ V}, I_D = -5.0\text{ A}$	—	15	30	m Ω
			$V_{GS} = -2.5\text{ V}, I_D = -5.0\text{ A}$	—	9.0	14	
			$V_{GS} = -4.5\text{ V}, I_D = -5.0\text{ A}$	—	6.5	10	
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = -10\text{ V}, I_D = -5.0\text{ A}$	20	40	—	S
Input capacitance		C_{iss}	$V_{DS} = -10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	9130	—	pF
Reverse transfer capacitance		C_{rss}		—	1020	—	
Output capacitance		C_{oss}		—	1110	—	
Switching time	Rise time	t_r	<p>$V_{GS} = 0\text{ V}$ $V_{GS} = -5\text{ V}$ $I_D = -5\text{ A}$ V_{OUT} $R_L = 2\ \Omega$ $V_{DD} = -10\text{ V}$ Duty $\leq 1\%$, $t_w = 10\ \mu\text{s}$</p>	—	14	—	ns
	Turn-ON time	t_{on}		—	26	—	
	Fall time	t_f		—	228	—	
	Turn-OFF time	t_{off}		—	666	—	
Total gate charge (gate-source plus gate-drain)		Q_g	$V_{DD} = -16\text{ V}, V_{GS} = -5\text{ V}, I_D = -10\text{ A}$	—	115	—	nC
Gate-source charge 1		Q_{gs1}		—	18	—	
Gate-drain ("miller") charge		Q_{gd}		—	34	—	

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

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

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