

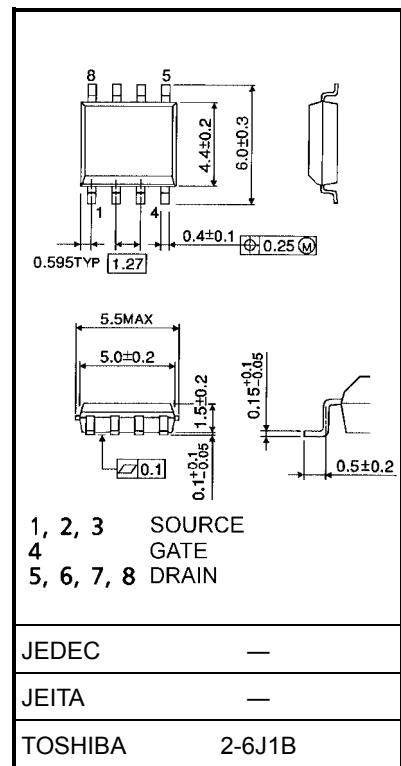
TPC8002

Lithium Ion Battery Applications

Portable Equipment Applications

Notebook PC Applications

Unit: mm



Weight: 0.080 g (typ.)

- Small footprint due to small and thin package
- Low drain-source ON resistance : $R_{DS(ON)} = 11.5 \text{ m}\Omega$ (typ.)
- High forward transfer admittance : $|Y_{fs}| = 15 \text{ S}$ (typ.)
- Low leakage current : $I_{DSS} = 10 \mu\text{A}$ (max) ($V_{DS} = 30 \text{ V}$)
- Enhancement-mode : $V_{th} = 0.8 \sim 2.0 \text{ V}$ ($V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$)

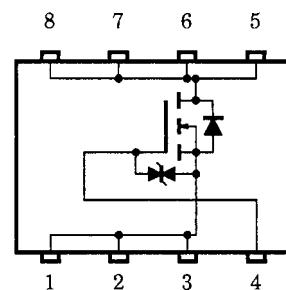
Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
Drain-source voltage	V_{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	A
	Pulse (Note 1)	I_{DP}	
Drain power dissipation ($t = 10 \text{ s}$) (Note 2a)	P_D	2.4	W
Drain power dissipation ($t = 10 \text{ s}$) (Note 2b)	P_D	1.0	W
Single pulse avalanche energy (Note 3)	E_{AS}	157	mJ
Avalanche current	I_{AR}	11	A
Repetitive avalanche energy (Note 2a) (Note 4)	E_{AR}	0.24	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.

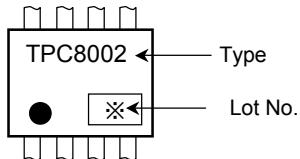
Circuit Configuration



Thermal Characteristics

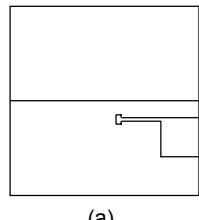
Characteristics	Symbol	Max	Unit
Thermal resistance, channel to ambient ($t = 10$ s)	R_{th} (ch-a)	52.1	°C/W
Thermal resistance, channel to ambient ($t = 10$ s)	R_{th} (ch-a)	125	°C/W

Marking (Note 5)



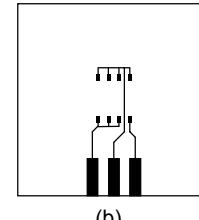
Note 1: Please use devices on condition that the channel temperature is below 150°C.

Note 2: (a) Device mounted on a glass-epoxy board (a) (b) Device mounted on a glass-epoxy board (b)



FR-4
25.4 × 25.4 × 0.8
(unit: mm)

(a)



FR-4
25.4 × 25.4 × 0.8
(unit: mm)

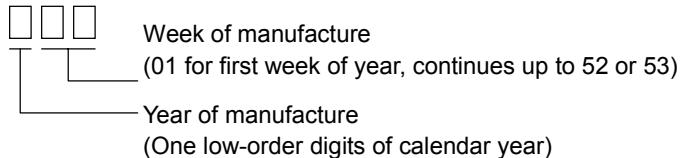
(b)

Note 3: $V_{DD} = 24$ V, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 1.0$ mH, $R_G = 25$ Ω, $I_{AR} = 11$ A

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

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

※ Weekly code: (Three digits)



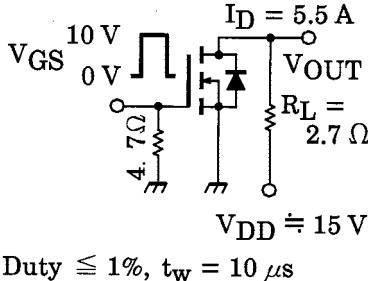
Week of manufacture

(01 for first week of year, continues up to 52 or 53)

Year of manufacture

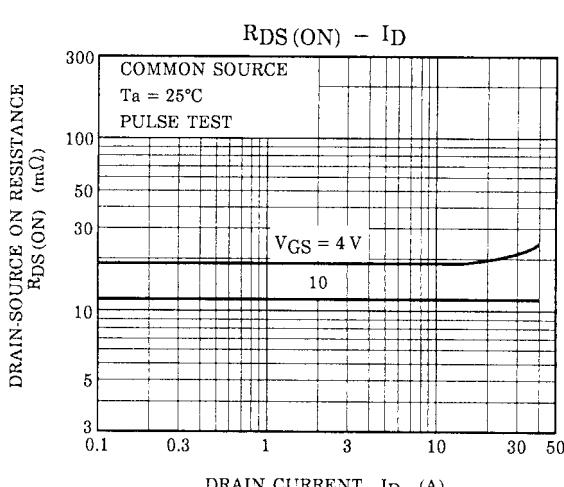
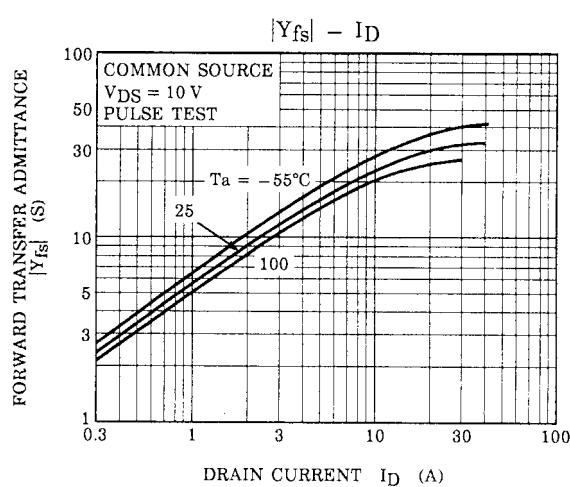
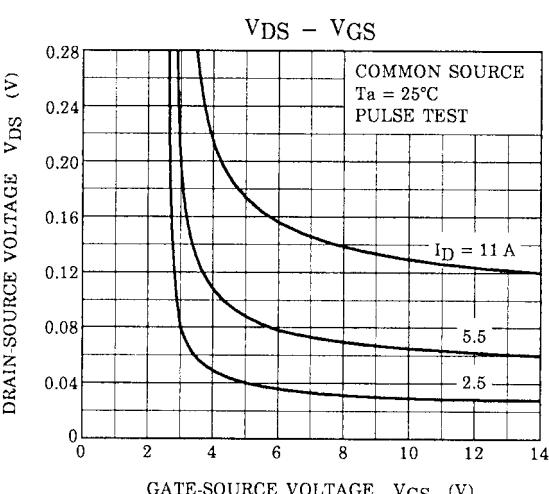
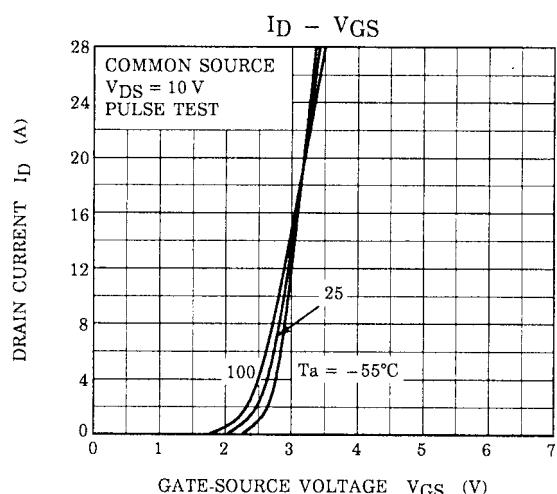
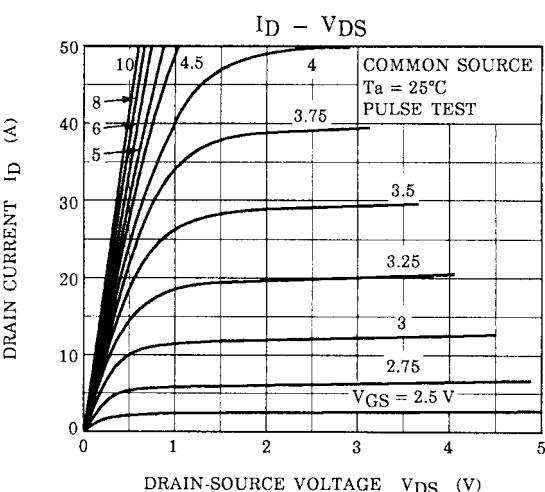
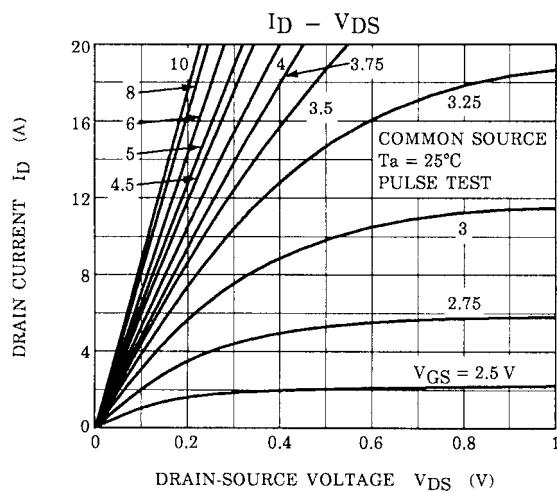
(One low-order digits of calendar year)

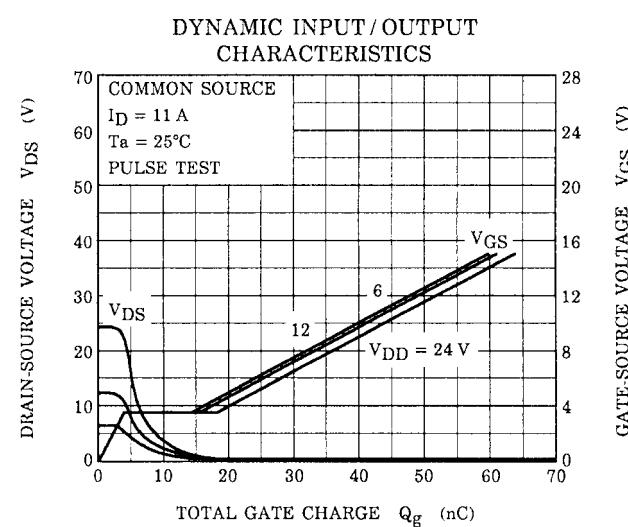
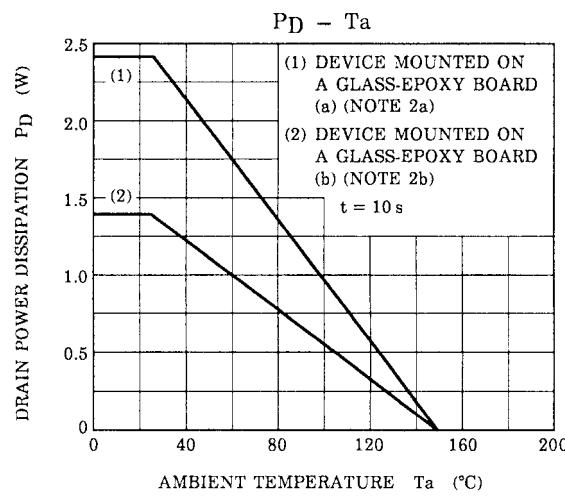
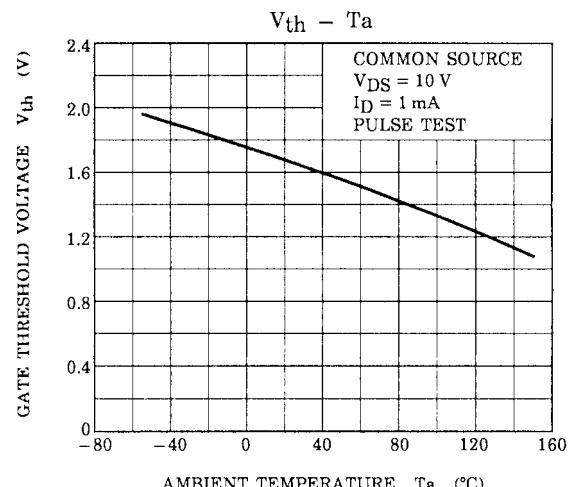
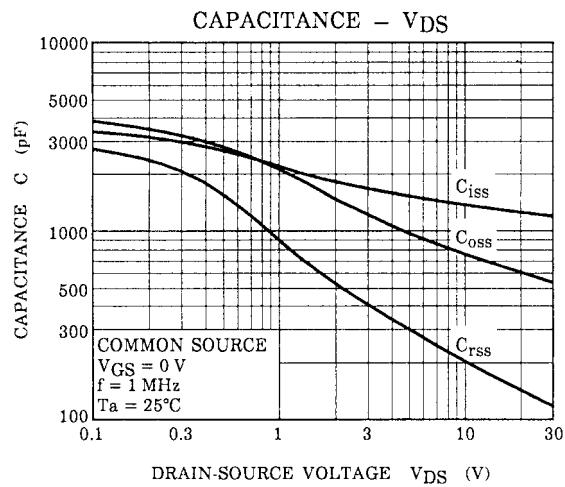
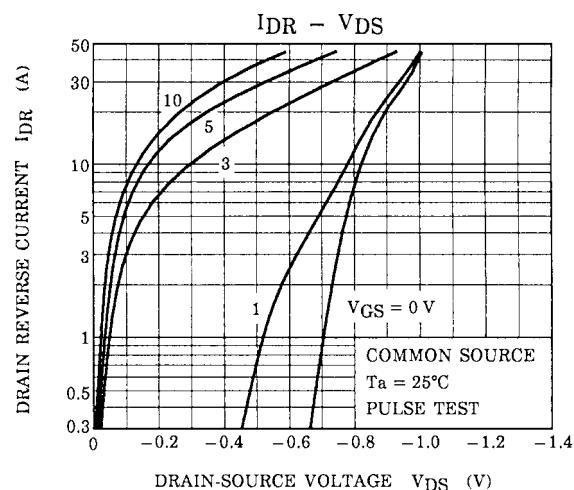
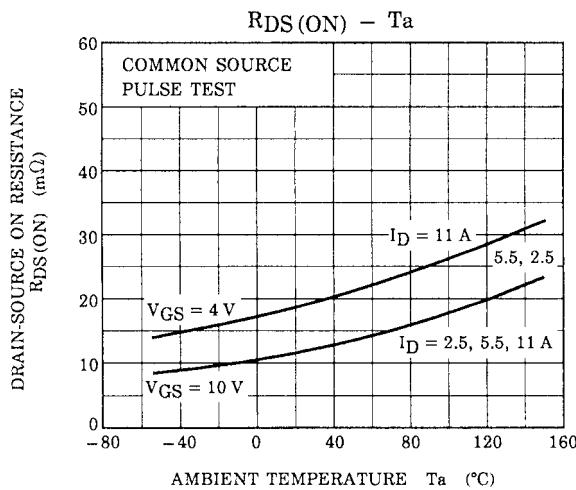
Electrical Characteristics (Ta = 25°C)

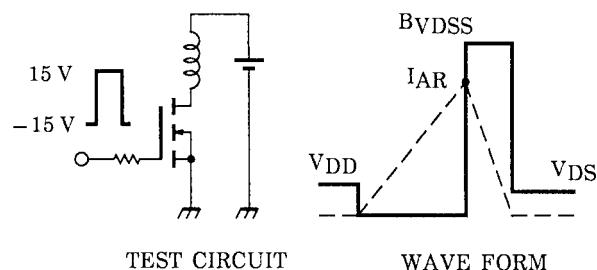
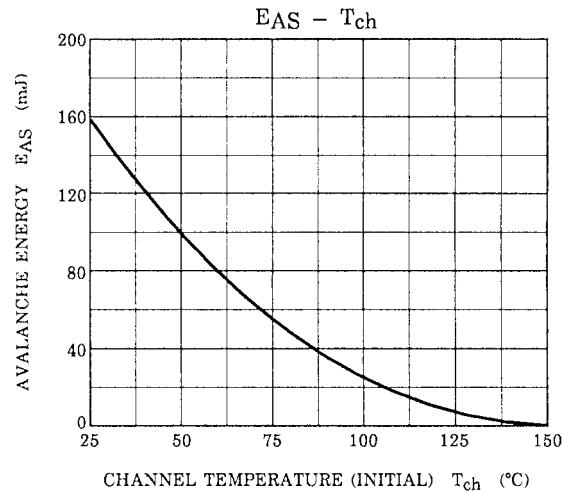
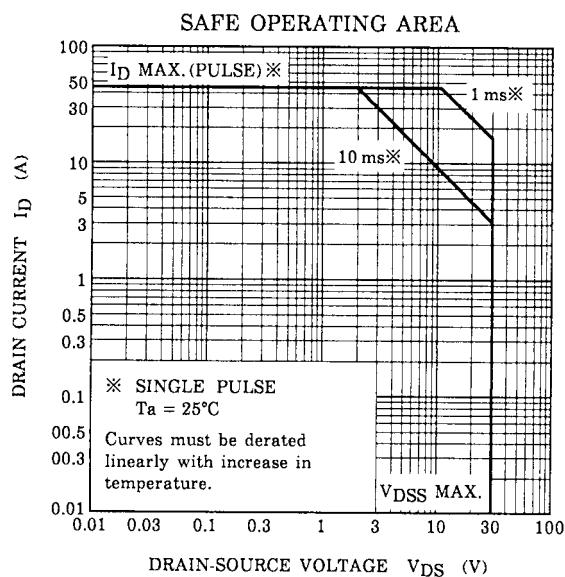
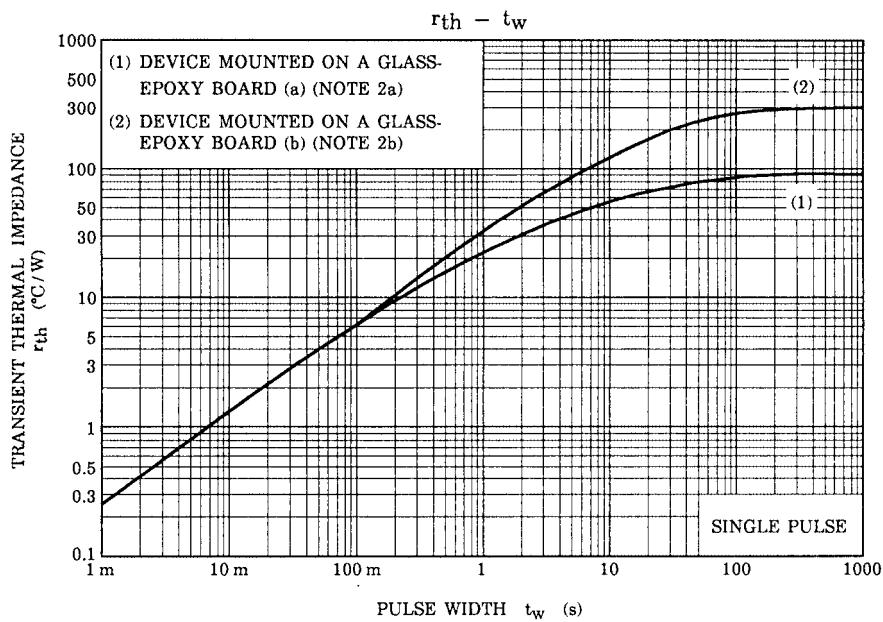
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	I _{GSS}	V _{GS} = ±16 V, V _{DS} = 0 V	—	—	±10	µA	
Drain cut-off current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V	—	—	10	µA	
Drain-source breakdown voltage	V (BR) DSS	I _D = 10 mA, V _{GS} = 0 V	30	—	—	V	
Gate threshold voltage	V _{th}	V _{DS} = 10 V, I _D = 1 mA	0.8	—	2.0	V	
Drain-source ON resistance	R _{DSS} (ON)	V _{GS} = 4 V, I _D = 5.5 A	—	19	22	mΩ	
	R _{DSS} (ON)	V _{GS} = 10 V, I _D = 5.5 A	—	12	14	mΩ	
Forward transfer admittance	Y _{fs}	V _{DS} = 10 V, I _D = 5.5 A	7.5	15	—	S	
Input capacitance	C _{iss}	V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	—	1425	—	pF	
Reverse transfer capacitance	C _{rss}		—	200	—		
Output capacitance	C _{oss}		—	790	—		
Switching time	Rise time	t _r	 Duty $\leq 1\%$, $t_W = 10 \mu s$	—	11	—	ns
	Turn-on time	t _{on}		—	19	—	
	Fall time	t _f		—	25	—	
	Turn-off time	t _{off}		—	100	—	
Total gate charge (Gate-source plus gate-drain)	Q _g	V _{DD} ≈ 24 V, V _{GS} = 10 V, I _D = 11 A	—	44	—	nC	
Gate-source charge	Q _{gs}		—	29	—		
Gate-drain ("miller") charge	Q _{gd}		—	15	—		

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

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Drain reverse current Pulse (Note 1)	I _{DRP}	—	—	—	44	A
Forward voltage (diode)	V _{DSF}	I _{DR} = 11 A, V _{GS} = 0 V	—	—	-1.2	V







$$T_{ch} = 25^{\circ}\text{C} \text{ (Initial)}$$

$$\text{Peak } I_{AR} = 11 \text{ A}, R_G = 25 \Omega \quad E_{AS} = \frac{1}{2} \cdot L \cdot I^2 \cdot \left(\frac{B_{VDSS}}{B_{VDSS} - V_{DD}} \right)$$

$$V_{DD} = 24 \text{ V}, L = 1.0 \text{ mH}$$

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