

TPCF8002

Notebook PC Applications
 Portable Equipment Applications

- Small footprint due to a small and thin package
- Low drain-source ON resistance: $R_{DS(ON)} = 16 \text{ m}\Omega$ (typ.)
- Low leakage current: $I_{DSS} = 10 \text{ }\mu\text{A}$ (max) ($V_{DS} = 30 \text{ V}$)
- Enhancement mode: $V_{th} = 1.3 \text{ to } 2.5 \text{ V}$
 ($V_{DS} = 10 \text{ V}, I_D = 1\text{mA}$)

Absolute Maximum Ratings (Ta = 25°C)

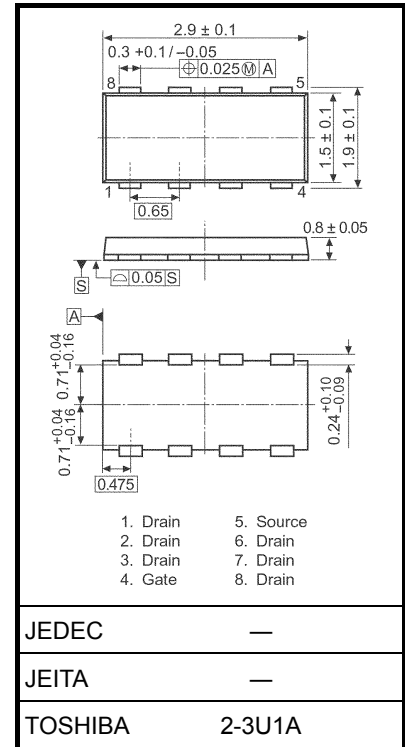
Characteristics		Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	30	V
Drain-gate voltage ($R_{GS} = 20 \text{ k}\Omega$)		V_{DGR}	30	V
Gate-source voltage		V_{GSS}	± 20	V
Drain current	DC (Note 1)	I_D	7	A
	Pulse (Note 1)	I_{DP}	28	
Drain power dissipation (t = 5 s) (Note 2a)		P_D	2.5	W
Drain power dissipation (t = 5 s) (Note 2b)		P_D	0.7	W
Single-pulse avalanche energy (Note 3)		E_{AS}	3.2	mJ
Avalanche current		I_{AR}	3.5	A
Channel temperature		T_{ch}	150	°C
Storage temperature range		T_{stg}	-55 to 150	°C

Note: For Notes 1 to 3, refer to the next page.

Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings. Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

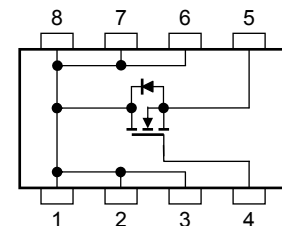
This transistor is an electrostatic-sensitive device. Handle with care.

Unit: mm



Weight: 0.011 g (typ.)

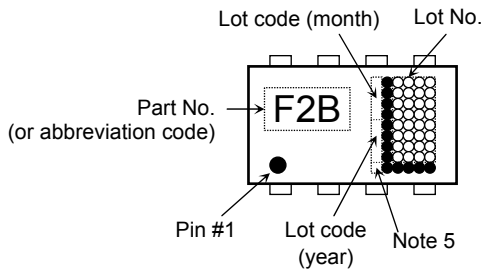
Circuit Configuration



Thermal Characteristics

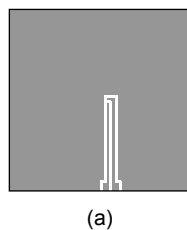
Characteristics	Symbol	Max	Unit
Thermal resistance, channel to ambient (t = 5 s) (Note 2a)	$R_{th (ch-a)}$	50.0	°C/W
Thermal resistance, channel to ambient (t = 5 s) (Note 2b)	$R_{th (ch-a)}$	178.6	°C/W

Marking (Note 4)

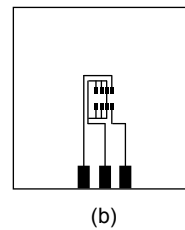


Note 1: Ensure that the channel temperature does not exceed 150°C.

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



FR-4
25.4 × 25.4 × 0.8
(Unit: mm)



FR-4
25.4 × 25.4 × 0.8
(Unit: mm)

Note 3: $V_{DD} = 24 \text{ V}$, $T_{ch} = 25^\circ\text{C}$ (initial), $L = 200\mu\text{H}$, $R_G = 25 \Omega$, $I_{AR} = 3.5 \text{ A}$

Note 4: “●” on the lower left of the marking indicates Pin 1.

Note 5 A dot marking identifies the indication of product Labels.

Without a dot: [[Pb]]/INCLUDES > MCV

With a dot: [[G]]/RoHS COMPATIBLE or [[G]]/RoHS [[Pb]]

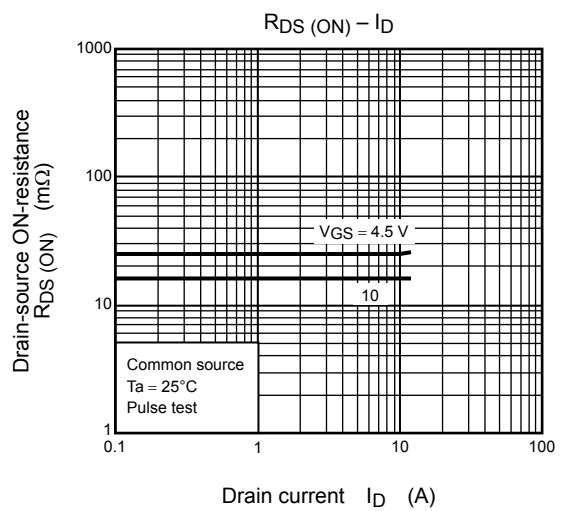
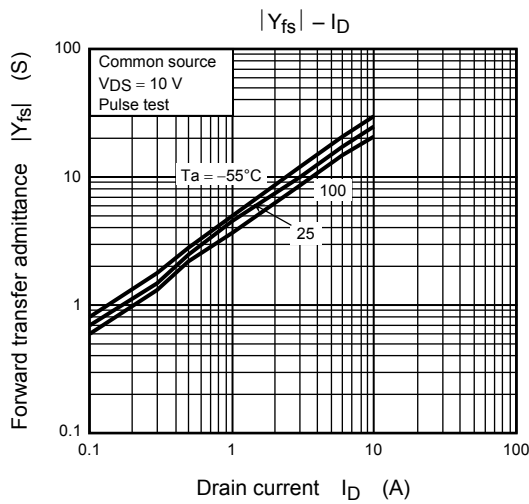
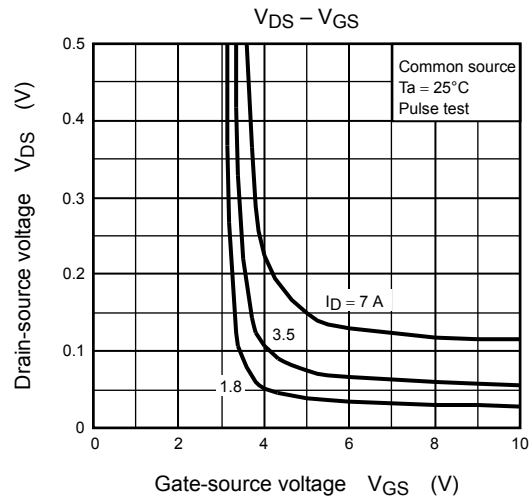
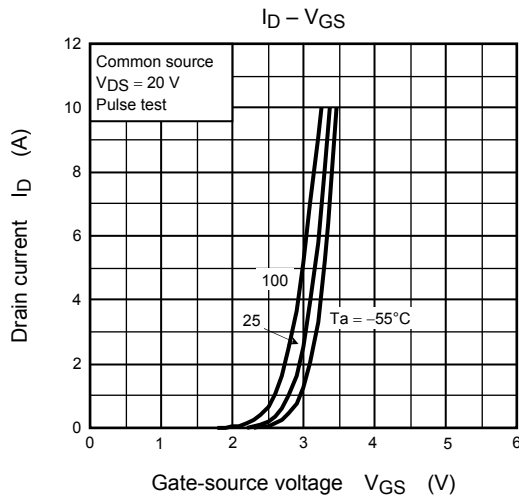
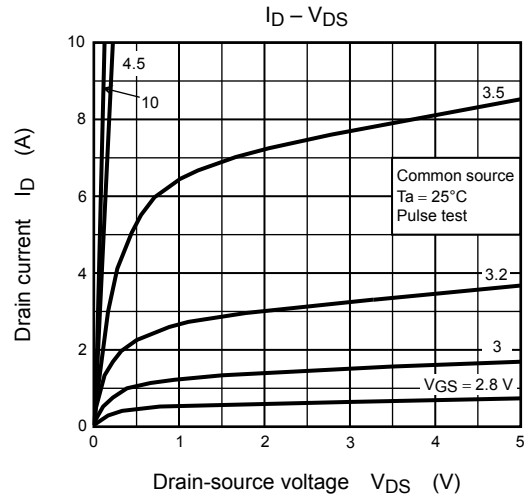
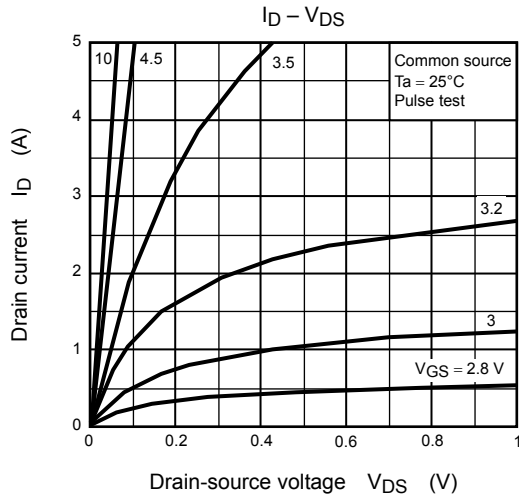
Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. The RoHS is the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

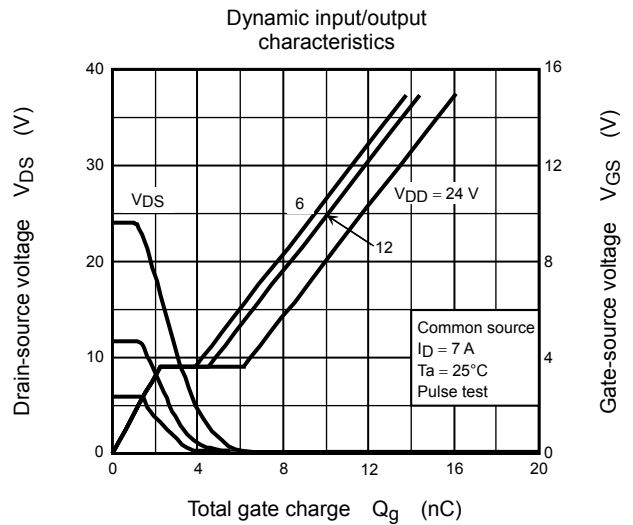
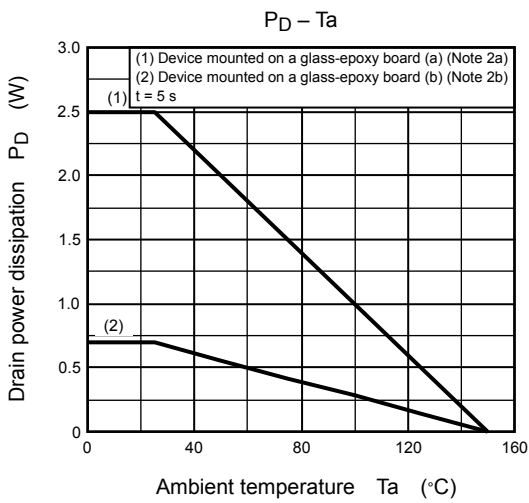
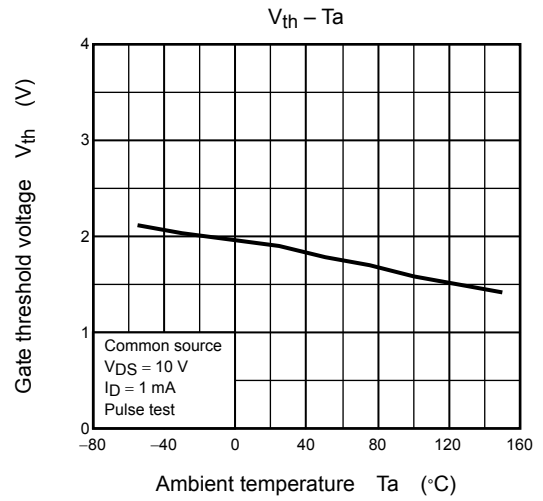
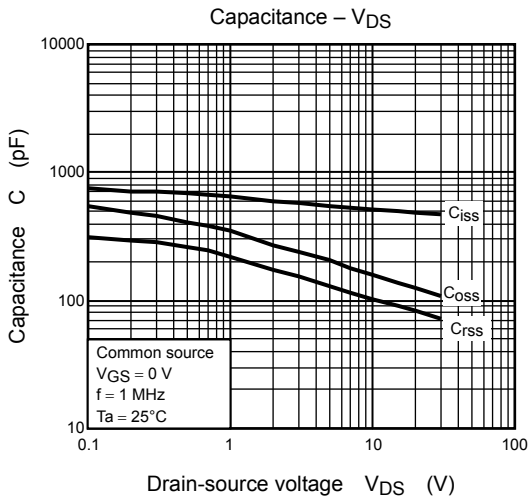
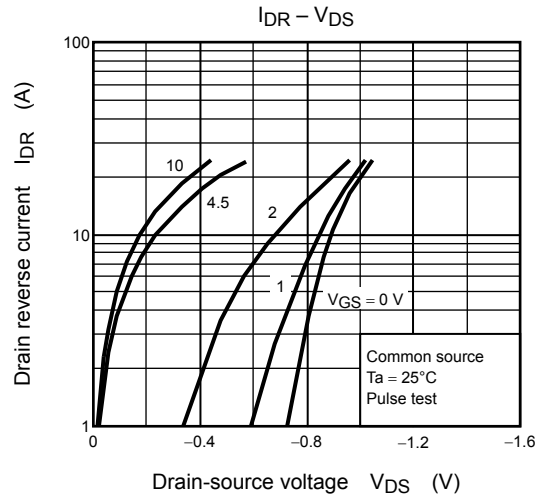
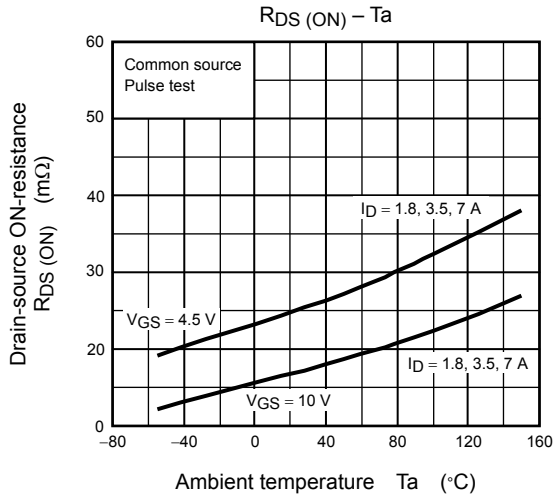
Electrical Characteristics (Ta = 25°C)

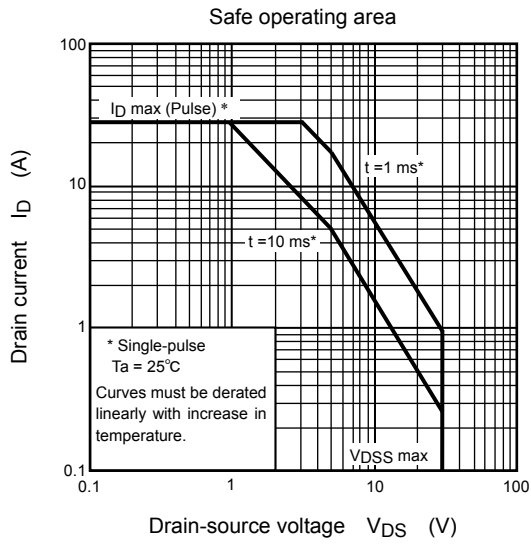
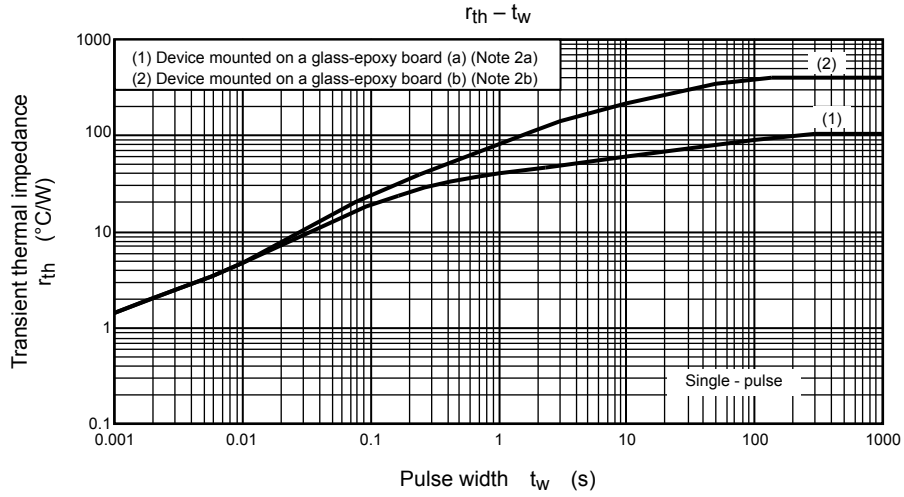
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GSS}	$V_{GS} = \pm 20\text{ V}, V_{DS} = 0\text{ V}$	—	—	± 100	nA
Drain cut-off current		I_{DSS}	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	—	—	10	μA
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D = 10\text{ mA}, V_{GS} = 0\text{ V}$	30	—	—	V
		$V_{(BR)DSX}$	$I_D = 10\text{ mA}, V_{GS} = -20\text{ V}$	10	—	—	
Gate threshold voltage		V_{th}	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	1.3	—	2.5	V
Drain-source ON resistance		$R_{DS(ON)}$	$V_{GS} = 4.5\text{ V}, I_D = 3.5\text{ A}$	—	24	32	m Ω
			$V_{GS} = 10\text{ V}, I_D = 3.5\text{ A}$	—	16	21	
Input capacitance		C_{iss}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	500	—	pF
Reverse transfer capacitance		C_{rss}		—	105	—	
Output capacitance		C_{oss}		—	160	—	
Switching time	Rise time	t_r		—	4.8	—	ns
	Turn-on time	t_{on}		—	8.8	—	
	Fall time	t_f		—	5.3	—	
	Turn-off time	t_{off}		—	21	—	
Total gate charge (gate-source plus gate-drain)		Q_g	$V_{DD} \approx 24\text{ V}, V_{GS} = 10\text{ V}, I_D = 7.0\text{ A}$	—	11.5	—	nC
Gate-source charge 1		Q_{gs1}		—	2.1	—	
Gate-drain ("miller") charge		Q_{gd}		—	3.8	—	

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

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Drain reverse current	Pulse (Note 1)	I_{DRP}	—	—	—	24	A
Forward voltage (diode)		V_{DSF}	$I_{DR} = 7.0\text{ A}, V_{GS} = 0\text{ V}$	—	—	-1.2	V







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