

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

TPC8020-H

High-Efficiency DC/DC Converter Applications
 Notebook PC Applications
 Portable Equipment Applications

- Small footprint due to a small and thin package
- High-speed switching
- Small gate charge: $Q_{SW} = 6.9 \text{ nC (typ.)}$
- Low drain-source ON-resistance: $R_{DS(ON)} = 6.8 \text{ m}\Omega \text{ (typ.)}$
- High forward transfer admittance: $|Y_{fs}| = 32 \text{ S (typ.)}$
- Low leakage current: $I_{DSS} = 10 \text{ }\mu\text{A (max) (}V_{DS} = 30 \text{ V)}$
- Enhancement mode: $V_{th} = 1.1 \text{ to } 2.3 \text{ V (}V_{DS} = 10 \text{ V, } I_D = 1 \text{ mA)}$

Absolute Maximum Ratings (Ta = 25°C)

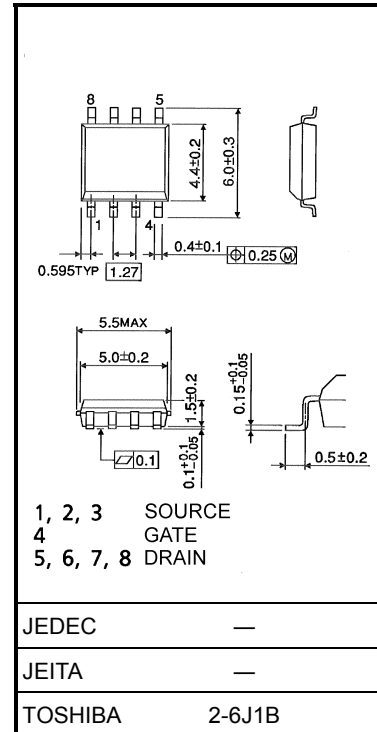
Characteristic		Symbol	Rating	Unit
Drain-source voltage		V_{DSS}	30	V
Drain-gate voltage ($R_{GS} = 20 \text{ k}\Omega$)		V_{DGR}	30	V
Gate-source voltage		V_{GSS}	± 20	V
Drain current	DC (Note 1)	I_D	13	A
	Pulsed (Note 1)	I_{DP}	52	
Drain power dissipation	(t = 10 s) (Note 2a)	P_D	1.9	W
Drain power dissipation	(t = 10 s) (Note 2b)	P_D	1.0	W
Single-pulse avalanche energy	(Note 3)	E_{AS}	110	mJ
Avalanche current		I_{AR}	13	A
Repetitive avalanche energy (Note 2a) (Note 4)		E_{AR}	0.084	mJ
Channel temperature		T_{ch}	150	°C
Storage temperature range		T_{stg}	-55 to 150	°C

Note: For Notes 1 to 4, 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).

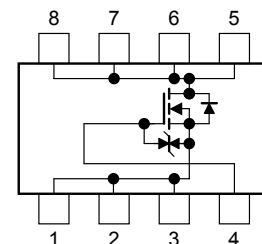
This transistor is an electrostatic-sensitive device. Handle with care.

Unit: mm



Weight: 0.085 g (typ.)

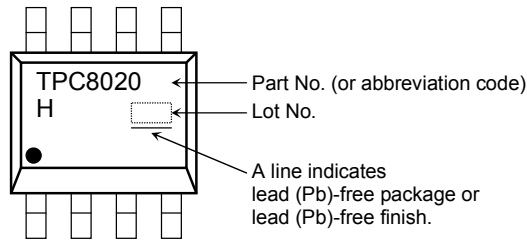
Circuit Configuration



Thermal Characteristics

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

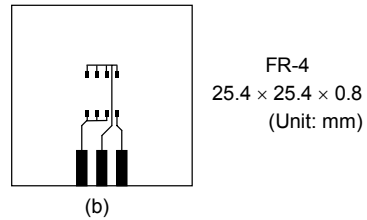
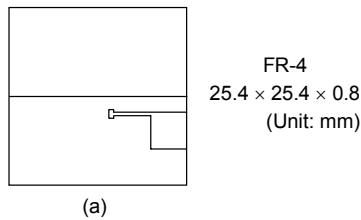
Marking (Note 5)



Note 1: The channel temperature should not exceed 150°C during use.

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

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

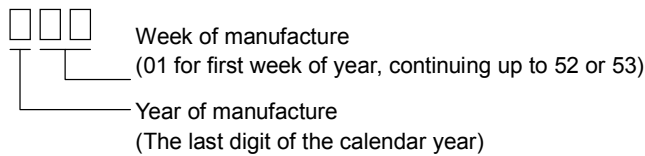


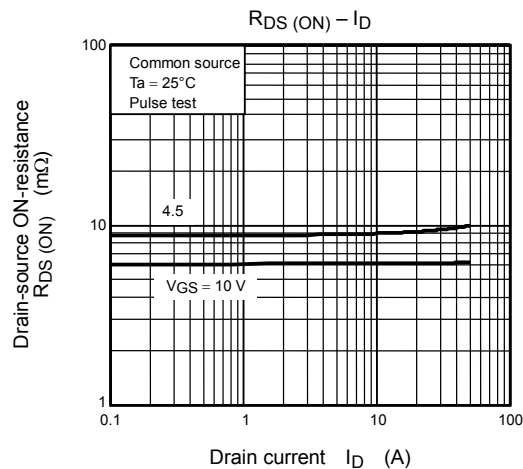
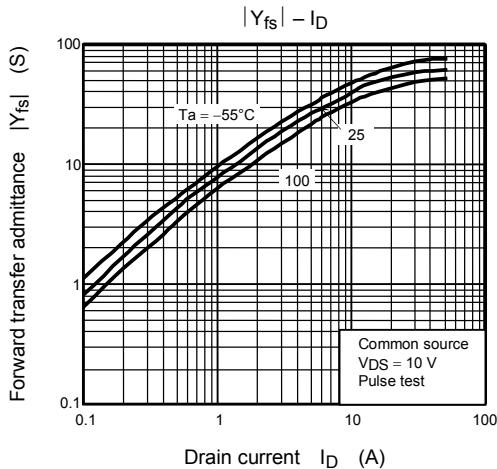
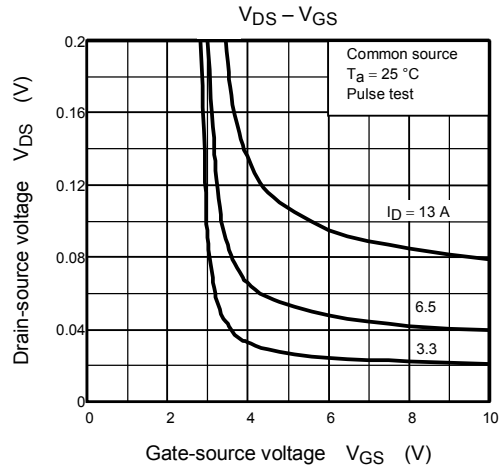
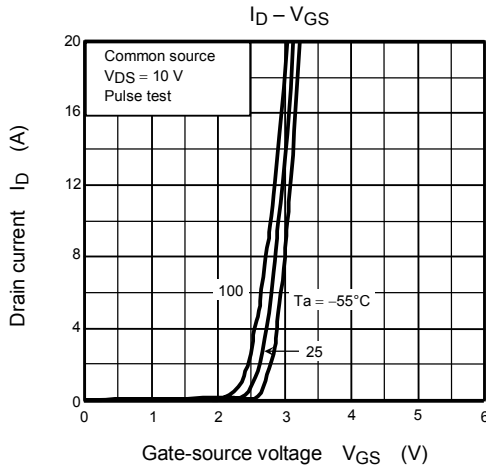
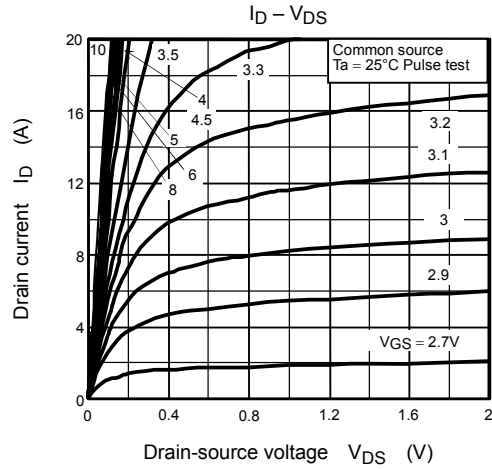
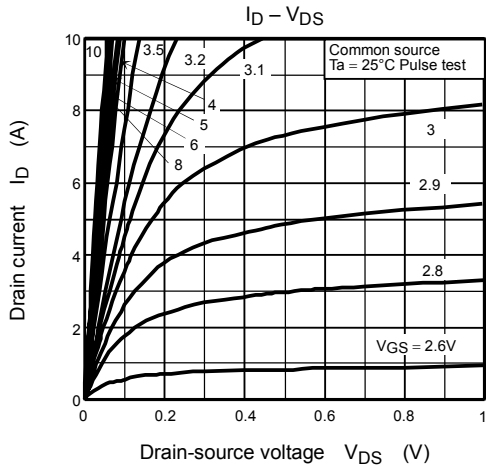
Note 3: $V_{DD} = 24 V$, $T_{ch} = 25^{\circ}C$ (initial), $L = 0.5 mH$, $R_G = 25 \Omega$, $I_{AR} = 13 A$

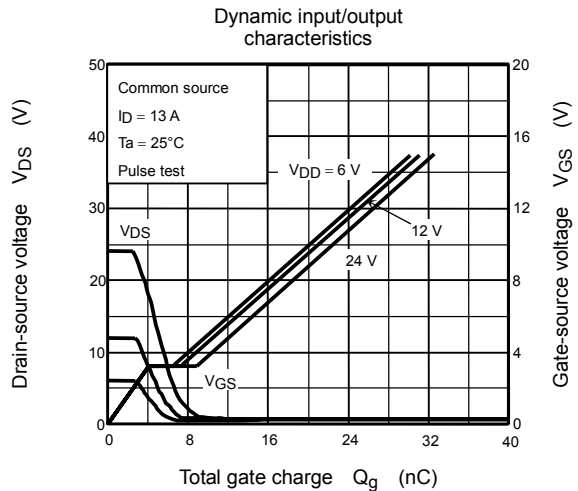
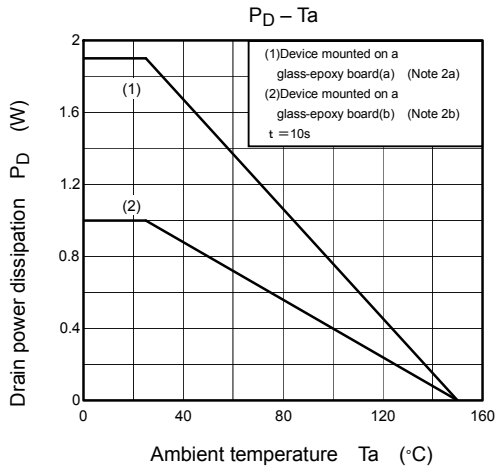
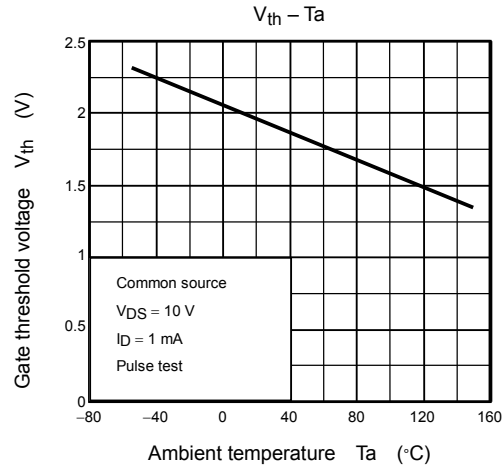
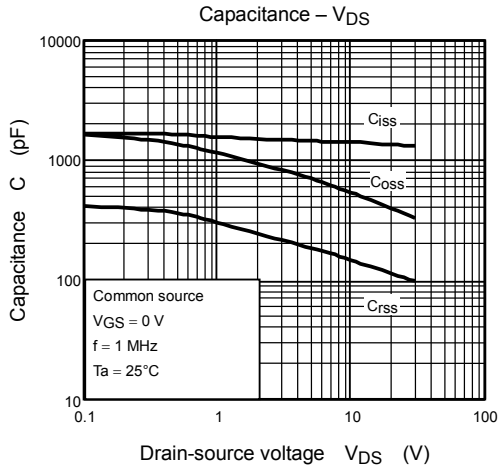
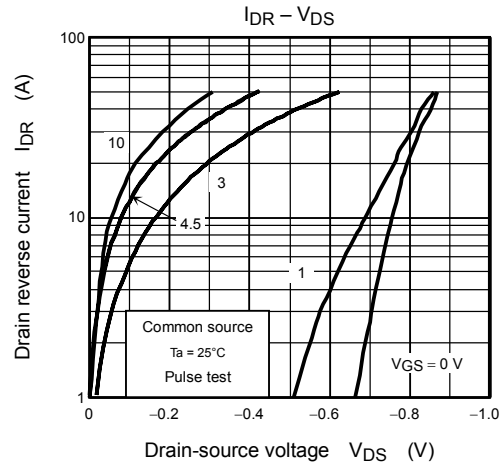
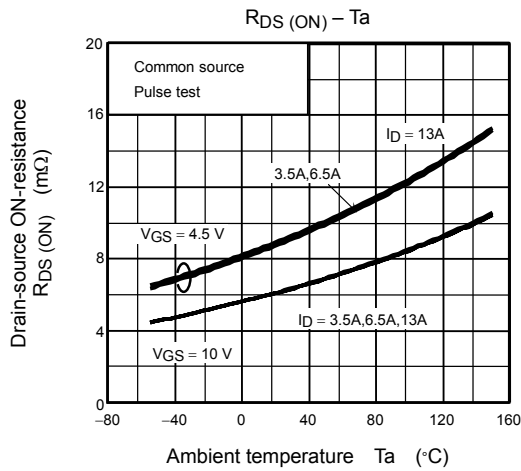
Note 4: Repetitive rating: pulse width limited by max channel temperature

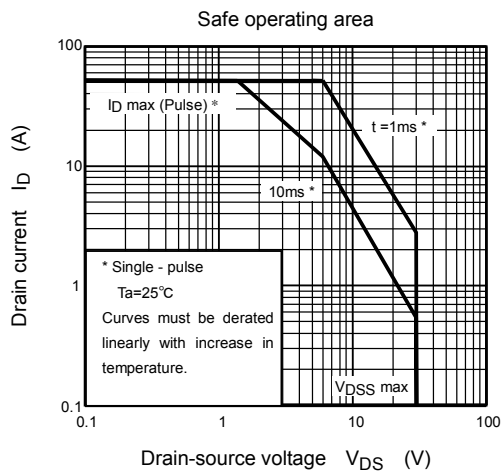
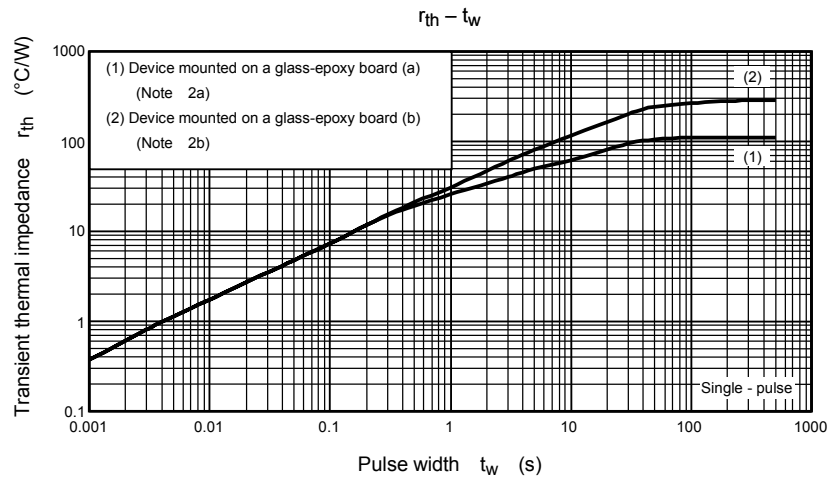
Note 5: • on the lower left of the marking indicates Pin 1.

* Weekly code: (Three digits)









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