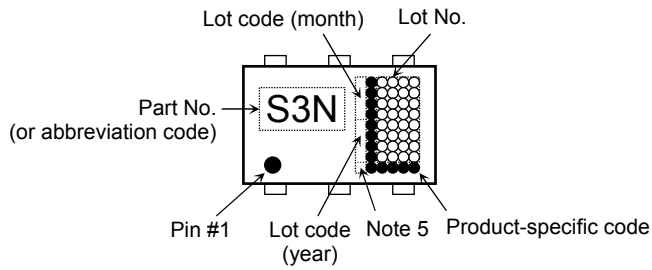


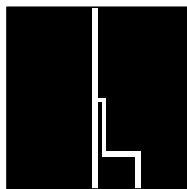


## Marking (Note 4)



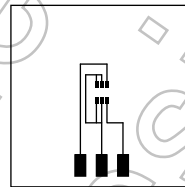
Note 1: Ensure that the channel temperature does not exceed 150°C.

Note 2: (a) Device mounted on a glass-epoxy board (a) ( $t = 5$  s)  
 (b) Device mounted on a glass-epoxy board (b) ( $t = 5$  s)



(a)

FR-4  
 $25.4 \times 25.4 \times 0.8$   
 (Unit: mm)



(b)

FR-4  
 $25.4 \times 25.4 \times 0.8$   
 (Unit: mm)

Note 3:  $V_{DD} = -16$  V,  $T_{ch} = 25^\circ\text{C}$  (initial),  $L = 0.2$  mH,  $R_G = 25 \Omega$ ,  $I_{AR} = -2.5$  A

Note 4: • on lower left of the marking indicates Pin 1.

Note 5: A line under a Lot No. identifies the indication of product Labels.

Not underlined: [[Pb]]/INCLUDES > MCV

Underlined: [[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 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

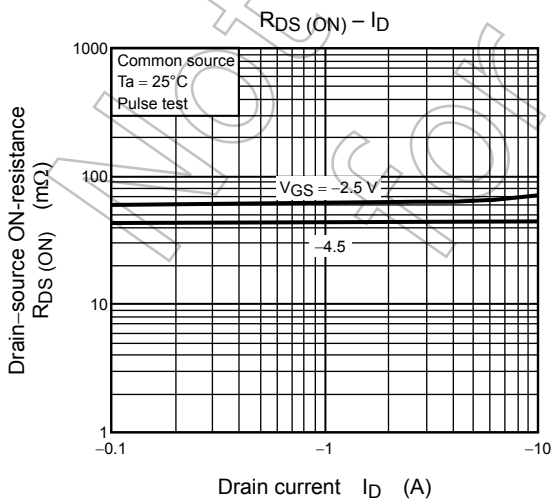
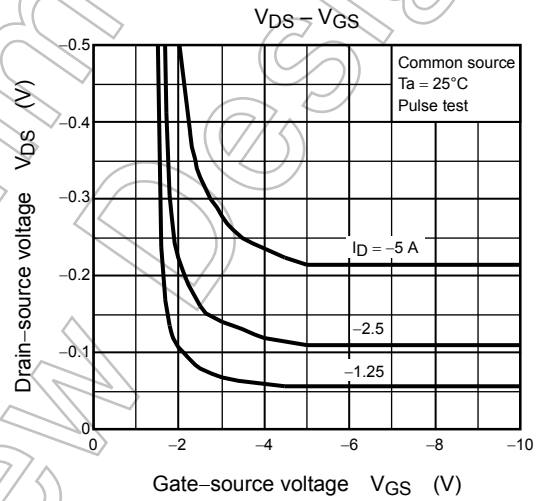
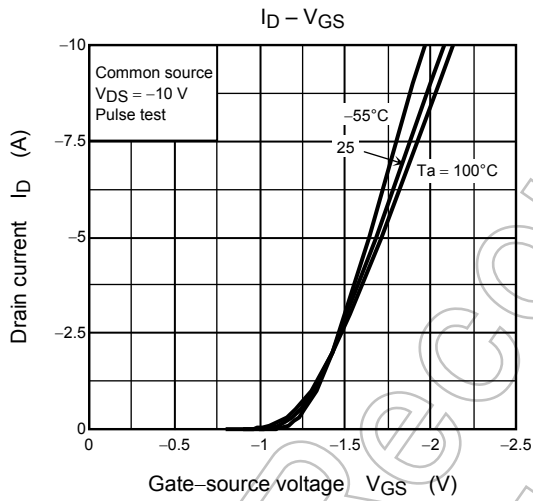
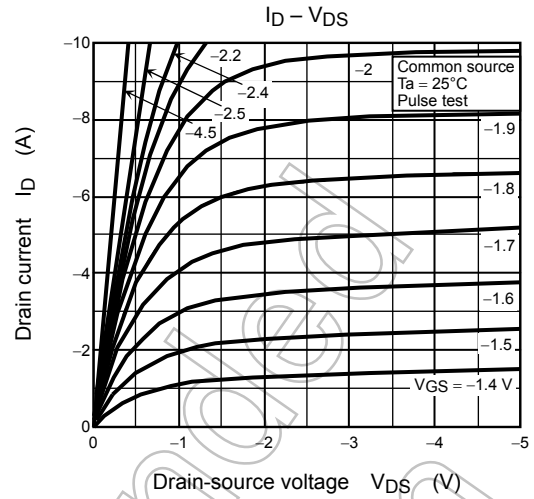
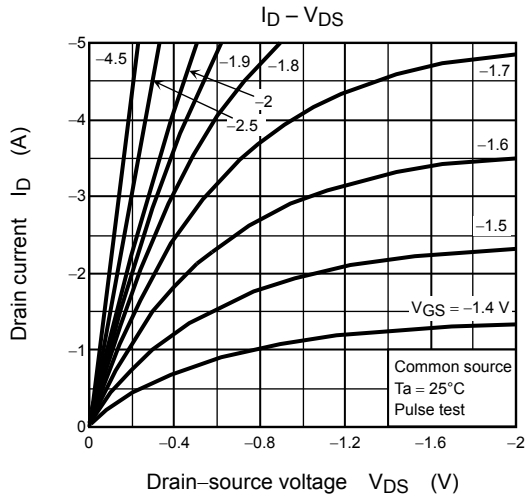
## Electrical Characteristics (Ta = 25°C)

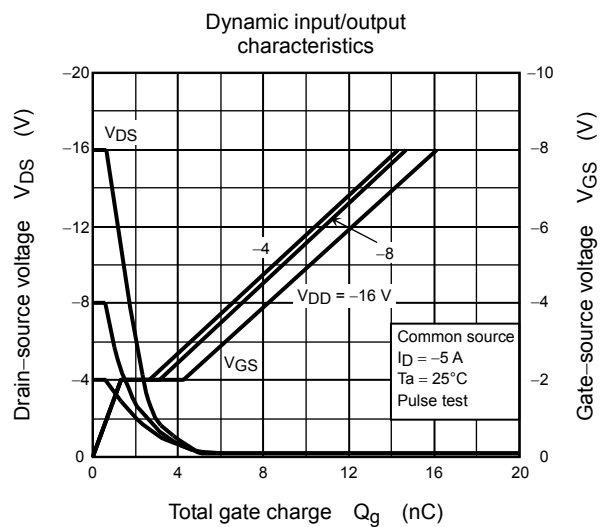
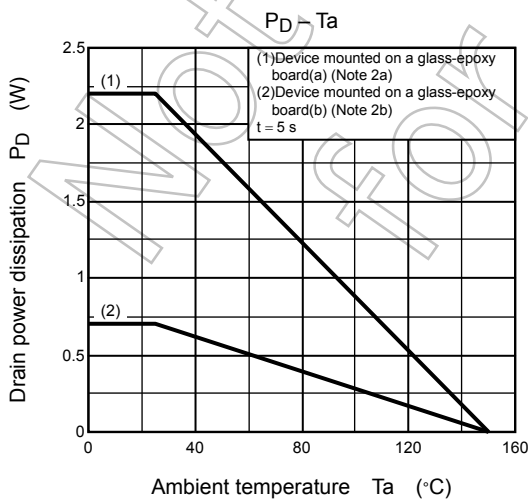
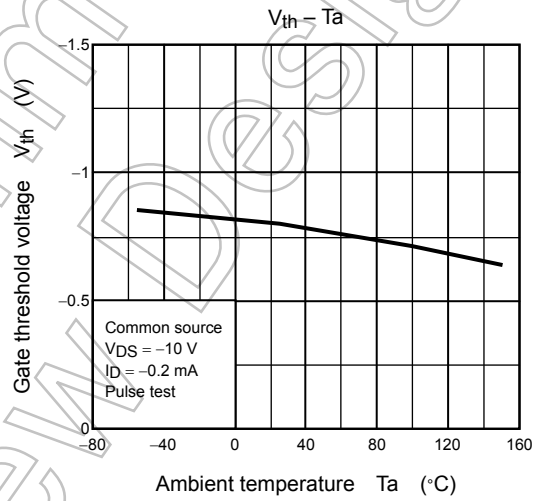
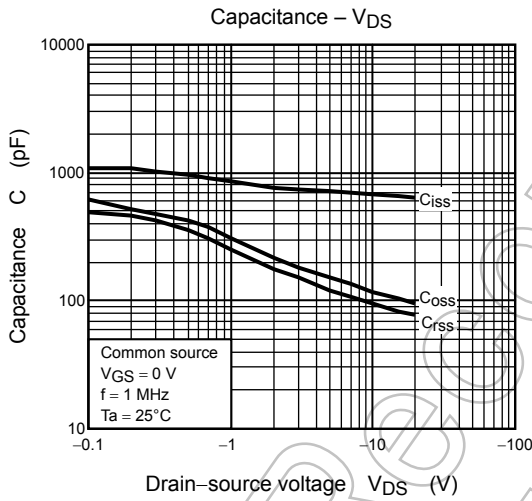
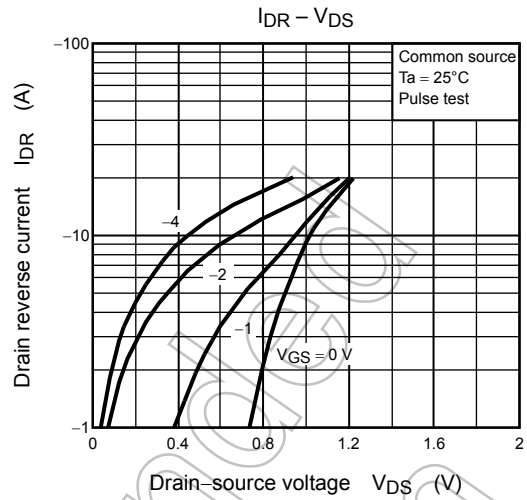
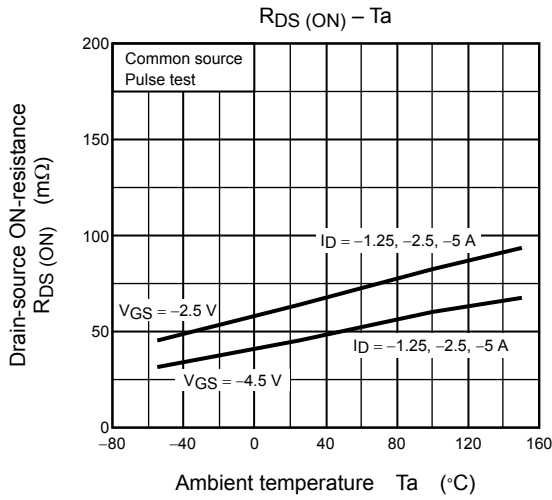
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GSS}$	$V_{GS} = \pm 12\text{ V}, V_{DS} = 0\text{ V}$	—	—	$\pm 100$	nA
Drain cut-off current		$I_{DSS}$	$V_{DS} = -20\text{ V}, V_{GS} = 0\text{ V}$	—	—	-10	$\mu\text{A}$
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D = -10\text{ mA}, V_{GS} = 0\text{ V}$	-20	—	—	V
		$V_{(BR)DSX}$	$I_D = -10\text{ mA}, V_{GS} = 8\text{ V}$ (Note 6)	-12	—	—	
Gate threshold voltage		$V_{th}$	$V_{DS} = -10\text{ V}, I_D = -0.2\text{ mA}$	-0.5	—	-1.2	V
Drain-source ON-resistance		$R_{DS(ON)}$	$V_{GS} = -2.5\text{ V}, I_D = -2.5\text{ A}$	—	56	85	m $\Omega$
		$R_{DS(ON)}$	$V_{GS} = -4.5\text{ V}, I_D = -2.5\text{ A}$	—	38	55	
Input capacitance		$C_{iss}$		—	690	—	pF
Reverse transfer capacitance		$C_{rss}$	$V_{DS} = -10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	93	—	
Output capacitance		$C_{oss}$		—	117	—	
Switching time	Rise time	$t_r$		—	6	—	ns
	Turn-on time	$t_{on}$		—	13	—	
	Fall time	$t_f$		—	25	—	
	Turn-off time	$t_{off}$		$V_{DD} \approx -10\text{ V}$ $\text{Duty} \leq 1\%, t_w = 10\ \mu\text{s}$	—	81	
Total gate charge (gate-source plus gate-drain)		$Q_g$	$V_{DD} \approx -16\text{ V}, V_{GS} = -5\text{ V}, I_D = -5\text{ A}$	—	10	—	nC
Gate-source charge 1		$Q_{gs1}$		—	1.3	—	
Gate-drain ("miller") charge		$Q_{gd}$		—	2.8	—	

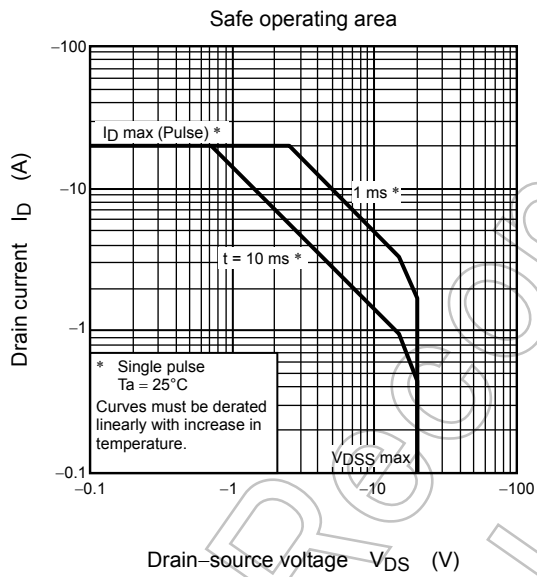
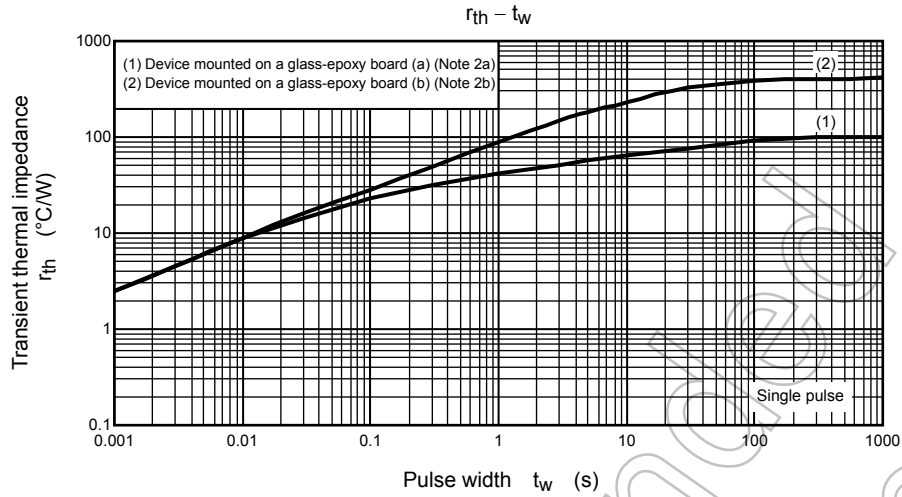
## Source-Drain Ratings and Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Drain reverse current	Pulse (Note 1)	$I_{DRP}$	—	—	—	-20	A
Forward voltage (diode)		$V_{DSF}$	$I_{DR} = -5\text{ A}, V_{GS} = 0\text{ V}$	—	—	1.2	V

Note 6: VDSX mode (the application of a plus voltage between gate and source) may cause decrease in maximum rating of drain-source voltage.







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