

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

SSM6P26TU

High Speed Switching Applications

- Optimum for high-density mounting in small packages
- Low on-resistance: $R_{on} = 230m\Omega$ (max) (@ $V_{GS} = -4$ V)
 $R_{on} = 330m\Omega$ (max) (@ $V_{GS} = -2.5$ V)
 $R_{on} = 980m\Omega$ (max) (@ $V_{GS} = -1.8$ V)

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$) (Q1, Q2 Common)

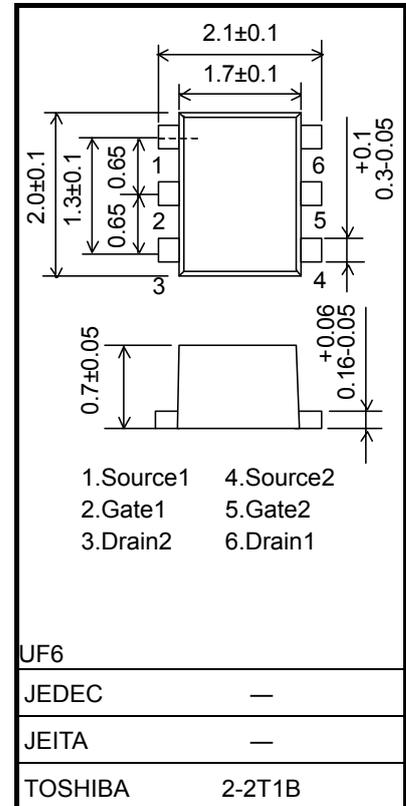
Characteristics	Symbol	Rating	Unit
Drain-Source voltage	V_{DS}	-20	V
Gate-Source voltage	V_{GSS}	± 8	V
Drain current	DC	I_D	-0.5
	Pulse	I_{DP}	-1.5
Drain power dissipation	P_D (Note 1)	500	mW
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55~150	$^\circ\text{C}$

Note: 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).

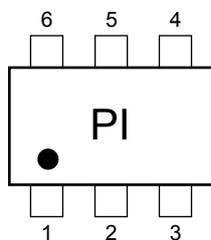
Note 1: Mounted on FR4 board. (total dissipation)
 (25.4 mm × 25.4 mm × 1.6 t, Cu Pad: 645 mm²)

Unit: mm

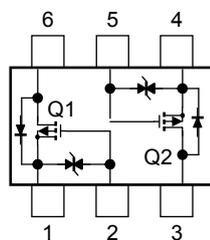


Weight: 7.0 mg (typ.)

Marking



Equivalent Circuit (top view)



Handling Precaution

When handling individual devices (which are not yet mounted on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

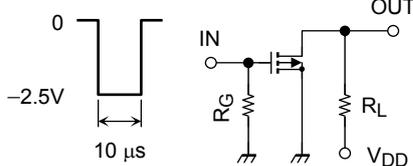
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	I_{GSS}	$V_{GS} = \pm 8 \text{ V}, V_{DS} = 0$	—	—	± 1	μA	
Drain-Source breakdown voltage	$V_{(BR)DSS}$	$I_D = -1 \text{ mA}, V_{GS} = 0$	-20	—	—	V	
	$V_{(BR)DSX}$	$I_D = -1 \text{ mA}, V_{GS} = +8 \text{ V}$	-12	—	—		
Drain cut-off current	I_{DSS}	$V_{DS} = -20 \text{ V}, V_{GS} = 0$	—	—	-1	μA	
Gate threshold voltage	V_{th}	$V_{DS} = -3 \text{ V}, I_D = -0.1 \text{ mA}$	-0.5	—	-1.1	V	
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = -3 \text{ V}, I_D = -0.25 \text{ A}$ (Note2)	0.8	1.7	—	S	
Drain-Source on-resistance	$R_{DS(ON)}$	$I_D = -0.25 \text{ A}, V_{GS} = -4 \text{ V}$ (Note2)	—	200	230	m Ω	
		$I_D = -0.25 \text{ A}, V_{GS} = -2.5 \text{ V}$ (Note2)	—	260	330		
		$I_D = -0.25 \text{ A}, V_{GS} = -1.8 \text{ V}$ (Note2)	—	400	980		
Input capacitance	C_{iss}	$V_{DS} = -10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	250	—	pF	
Reverse transfer capacitance	C_{rss}	$V_{DS} = -10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	35	—	pF	
Output capacitance	C_{oss}	$V_{DS} = -10 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	—	45	—	pF	
Switching time	Turn-on time	t_{on}	$V_{DD} = -10 \text{ V}, I_D = -0.25 \text{ A},$	—	14	—	ns
	Turn-off time	t_{off}	$V_{GS} = 0 \sim -2.5 \text{ V}, R_G = 4.7 \Omega$	—	15	—	

Note2: Pulse test

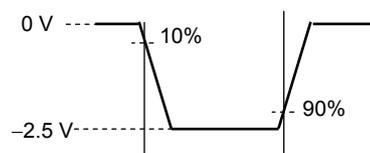
Switching Time Test Circuit

(a) Test circuit

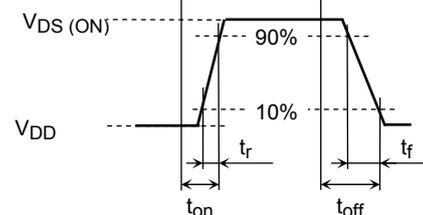


$V_{DD} = -10 \text{ V}$
 $R_G = 4.7 \Omega$
 $D.U. \leq 1\%$
 $V_{IN}: t_r, t_f < 5 \text{ ns}$
 Common Source
 $T_a = 25^\circ\text{C}$

(b) V_{IN}



(c) V_{OUT}

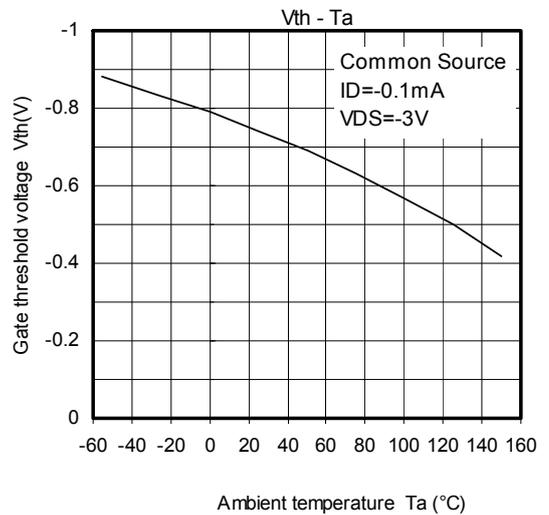
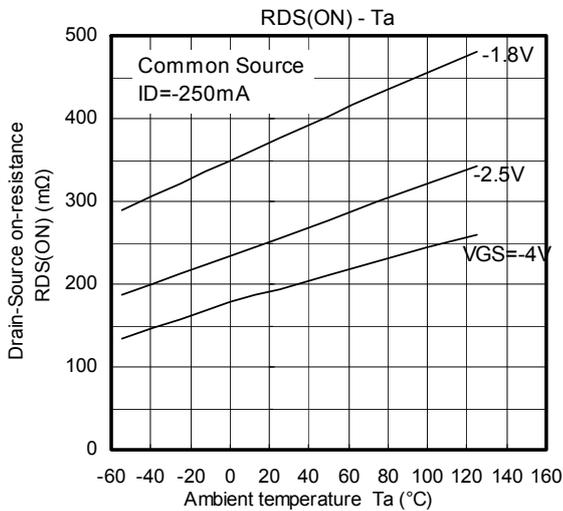
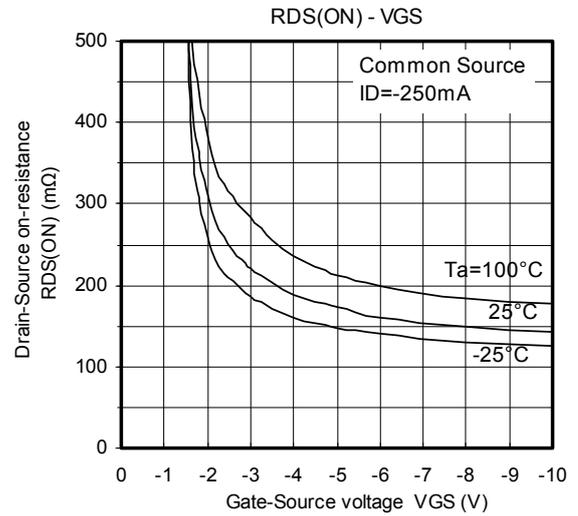
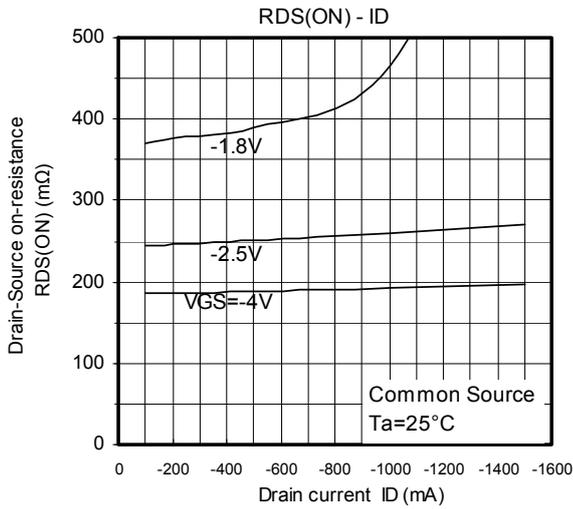
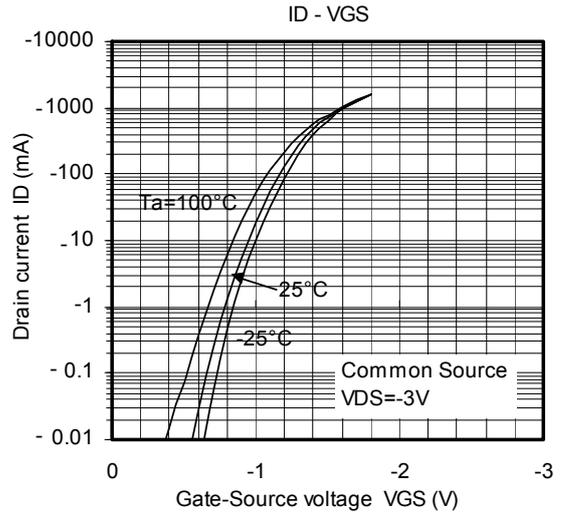
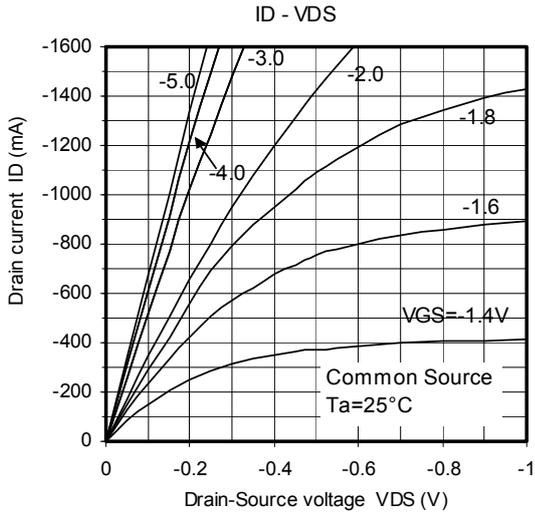


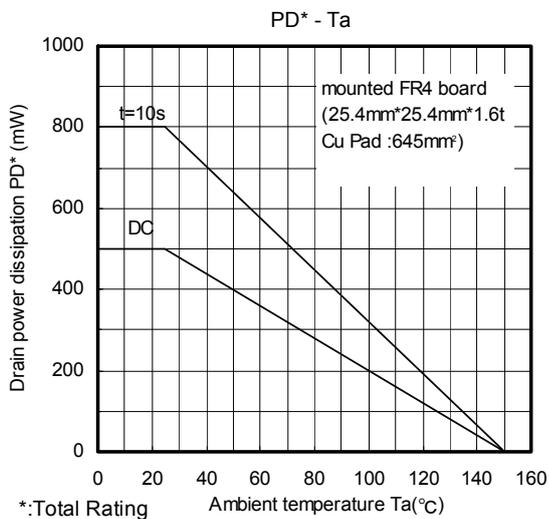
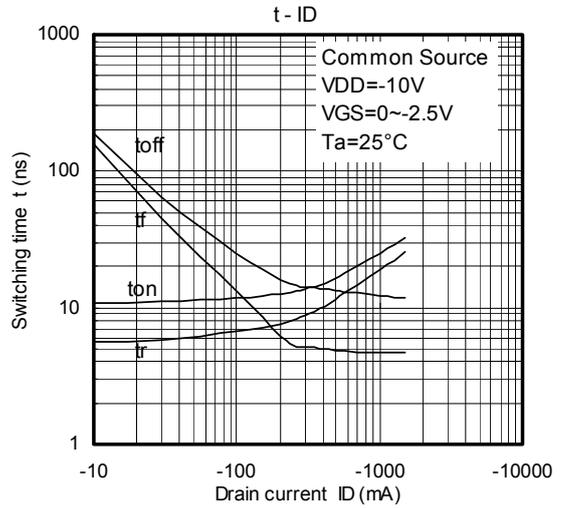
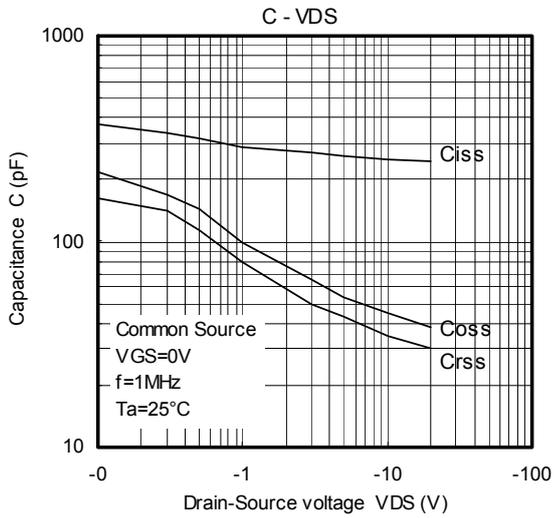
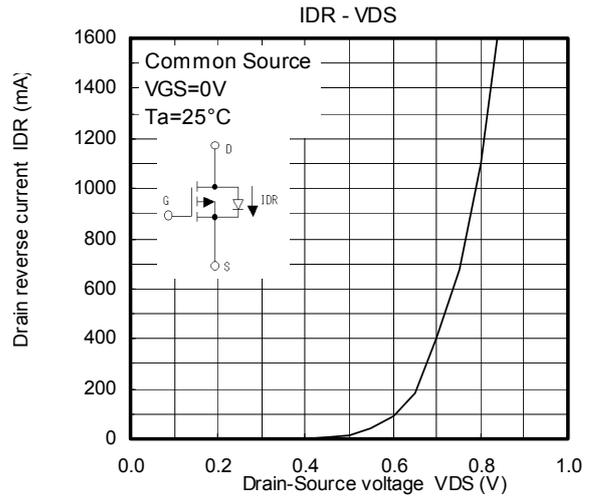
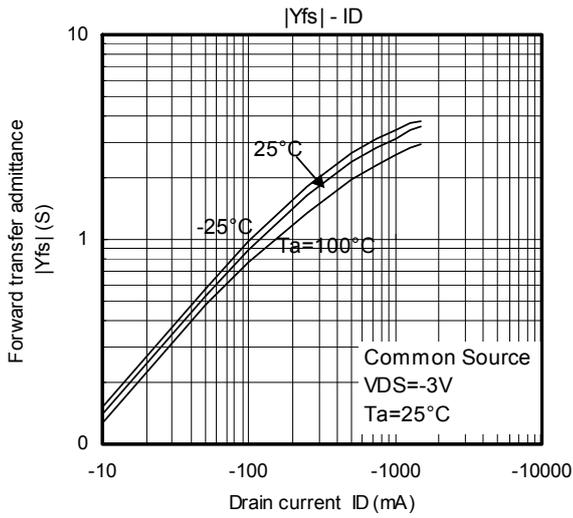
Precaution

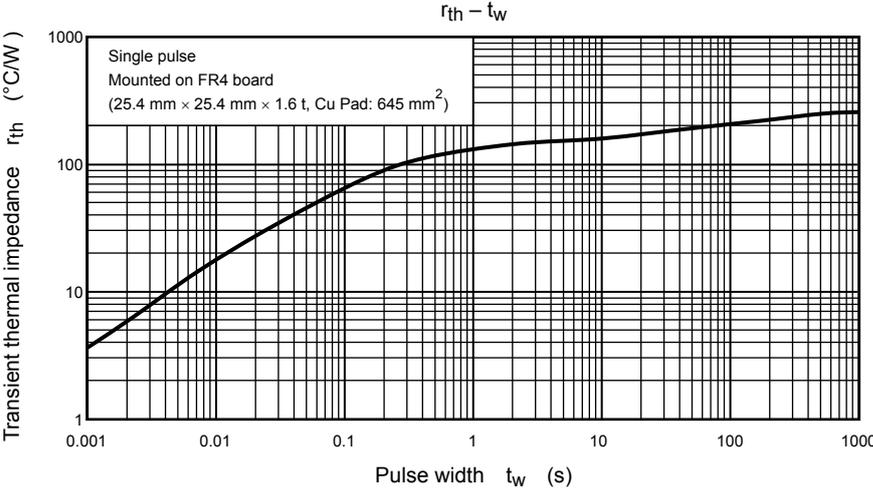
V_{th} can be expressed as the voltage between gate and source when the low operating current value is $I_D = -100 \mu\text{A}$ for this product. For normal switching operation, $V_{GS(on)}$ requires a higher voltage than V_{th} and $V_{GS(off)}$ requires a lower voltage than V_{th} .

(The relationship can be established as follows: $V_{GS(off)} < V_{th} < V_{GS(on)}$)

Please take this into consideration when using the device.







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20070701-EN GENERAL

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