

TOSHIBA Field Effect Transistor Silicon P Channel MOS Type

SSM6P16FU

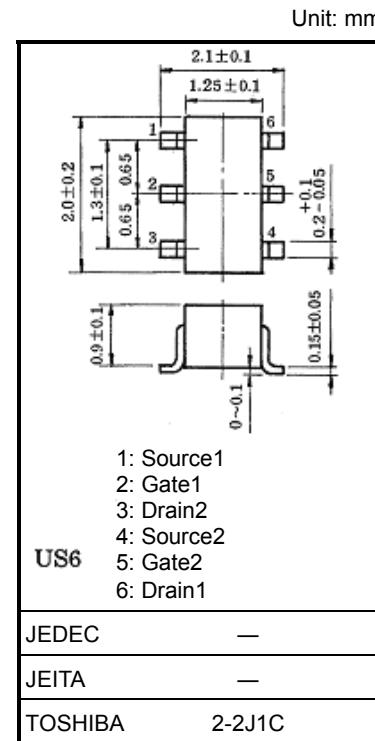
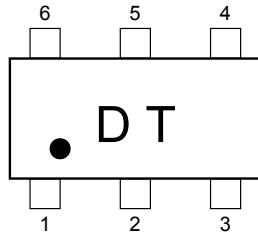
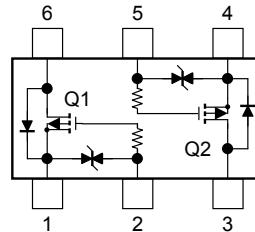
High Speed Switching Applications

Analog Switch Applications

- Small package
- Low on-resistance
 - : $R_{on} = 8 \Omega$ (max) (@ $V_{GS} = -4$ V)
 - : $R_{on} = 12 \Omega$ (max) (@ $V_{GS} = -2.5$ V)
 - : $R_{on} = 45 \Omega$ (max) (@ $V_{GS} = -1.5$ V)

Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

Characteristics	Symbol	Rating	Unit
Drain-Source voltage	V_{DS}	-20	V
Gate-Source voltage	V_{GSS}	± 10	V
Drain current	DC I_D	-100	mA
	Pulse I_{DP}	-200	
Drain power dissipation (Ta = 25°C)	P_D	200	mW
Channel temperature	T_{ch}	150	°C
Storage temperature range	T_{stg}	-55~150	°C

**Marking****Equivalent Circuit (top view)****Handling Precaution**

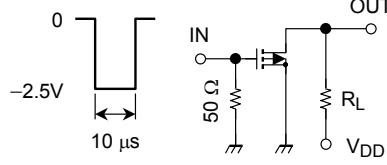
When handling individual devices (which are not yet mounted on a circuit board), ensure that the environment is protected against static electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

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

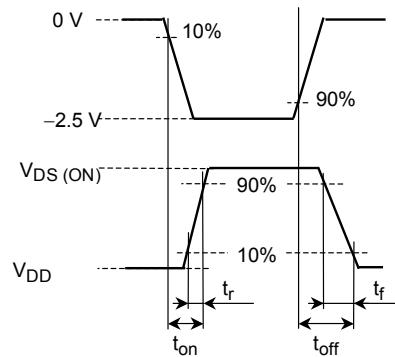
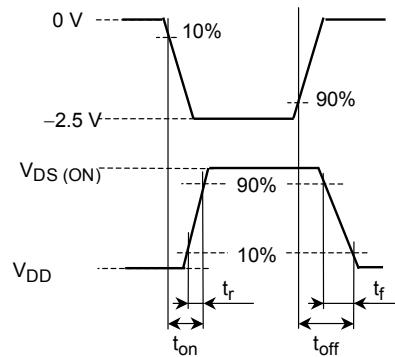
Characteristic	Symbol	Test Condition	MIN.	TYP.	MAX.	UNIT	
Gate leakage current	I _{GSS}	V _{GS} = ±10 V, V _{DS} = 0	—	—	±1	μA	
Drain-Source breakdown voltage	V _{(BR) DSS}	I _D = -0.1 mA, V _{GS} = 0	-20	—	—	V	
Drain cut-off current	I _{DSS}	V _{DS} = -20 V, V _{GS} = 0	—	—	-1	μA	
Gate threshold voltage	V _{th}	V _{DS} = -3 V, I _D = -0.1 mA	-0.6	—	-1.1	V	
Forward transfer admittance	Y _{fs}	V _{DS} = -3 V, I _D = -10 mA	25	—	—	mS	
Drain-Source on-resistance	R _{D(S) (ON)}	I _D = -10 mA, V _{GS} = -4 V	—	6	8	Ω	
		I _D = -10 mA, V _{GS} = -2.5 V	—	8	12		
		I _D = -1 mA, V _{GS} = -1.5 V	—	18	45		
Input capacitance	C _{iss}	V _{DS} = -3 V, V _{GS} = 0, f = 1 MHz	—	11	—	pF	
Reverse transfer capacitance	C _{rss}		—	3.7	—	pF	
Output capacitance	C _{oss}		—	10	—	pF	
Switching time	Turn-on time	t _{on}	V _{DD} = -3 V, I _D = -10 mA, V _{GS} = 0 ~ -2.5 V	—	130	—	ns
	Turn-off time	t _{off}		—	190	—	

Switching Time Test Circuit

(a) Test circuit



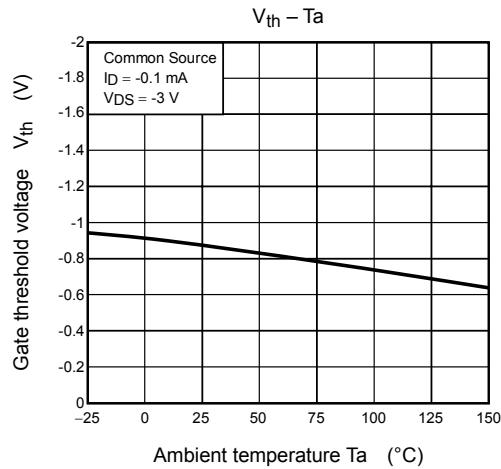
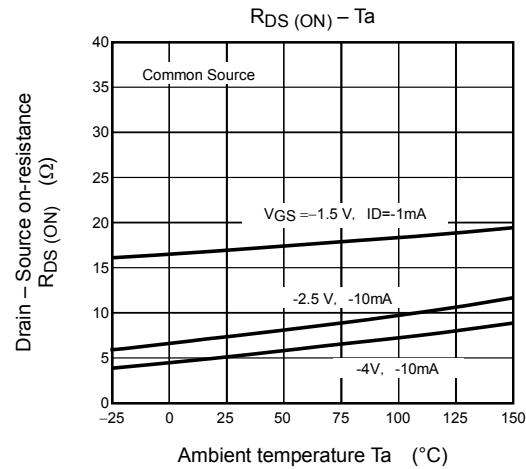
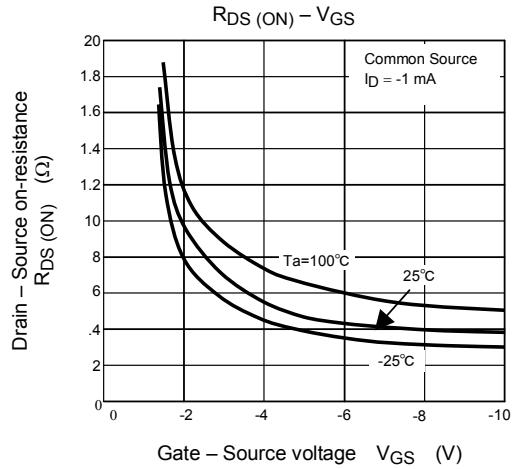
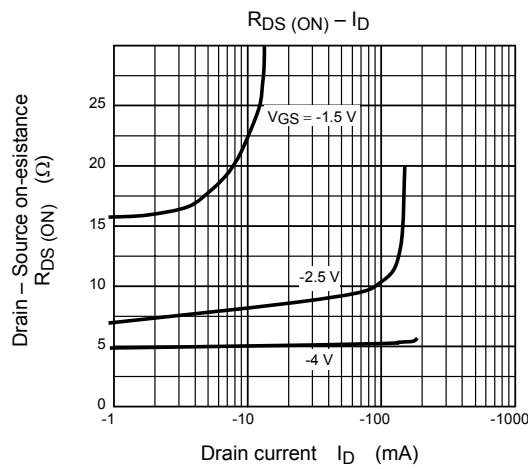
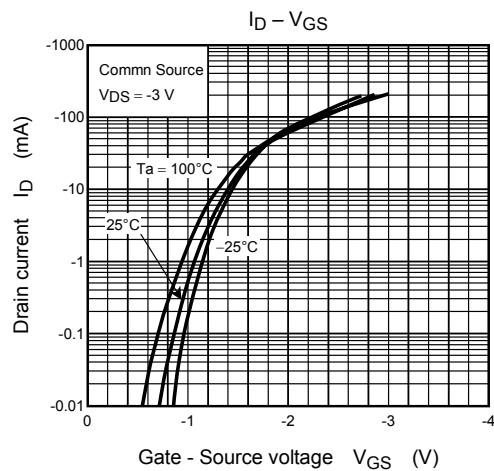
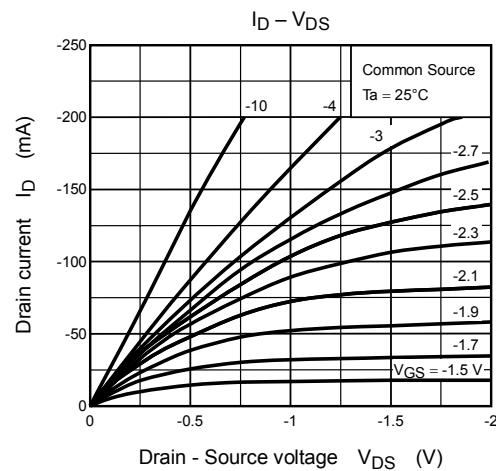
$V_{DD} = -3 V$
 Duty $\leq 1\%$
 V_{IN} : $t_r, t_f < 5$ ns
 $(Z_{out} = 50 \Omega)$
 Common Source
 $T_a = 25^\circ C$

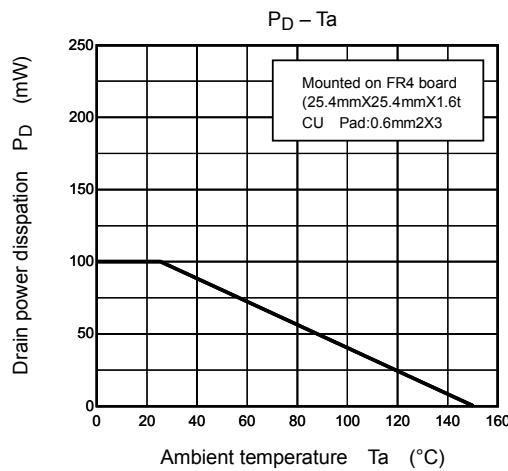
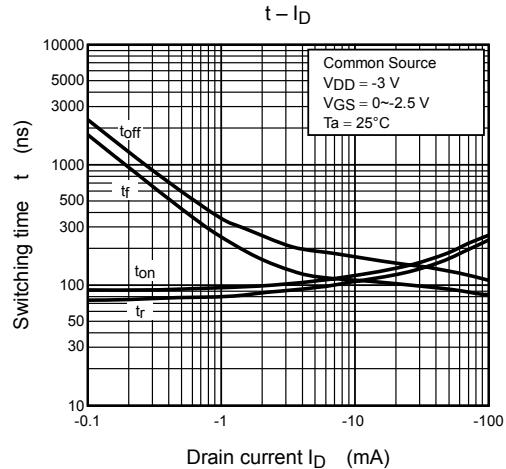
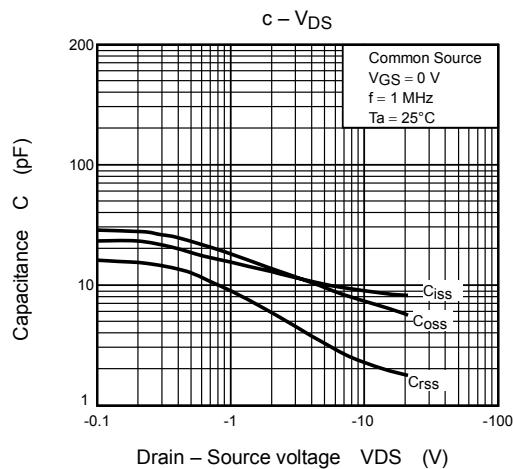
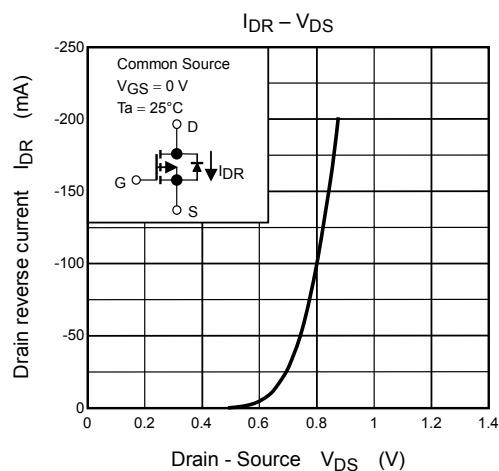
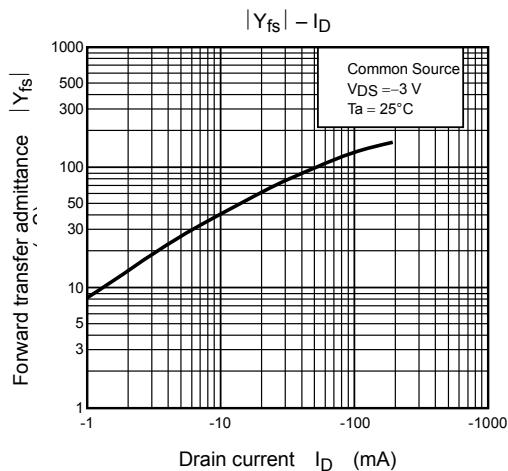
(b) V_{IN} (c) V_{OUT} 

Precaution

V_{th} can be expressed as the voltage between the gate and source when the low operating current value is $I_D = 100 \mu A$ 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)).

Be sure to take this into consideration when using the device. The V_{GS} recommended voltage for turning on this product is -1.5V or higher.





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