

TOSHIBA Field Effect Transistor Silicon P Channel MOS Type

SSM6P15FU

High Speed Switching Applications

Analog Switch Applications

- Small package
- Low ON resistance : $R_{on} = 12 \Omega$ (max) (@ $V_{GS} = -4$ V)
- : $R_{on} = 32 \Omega$ (max) (@ $V_{GS} = -2.5$ V)

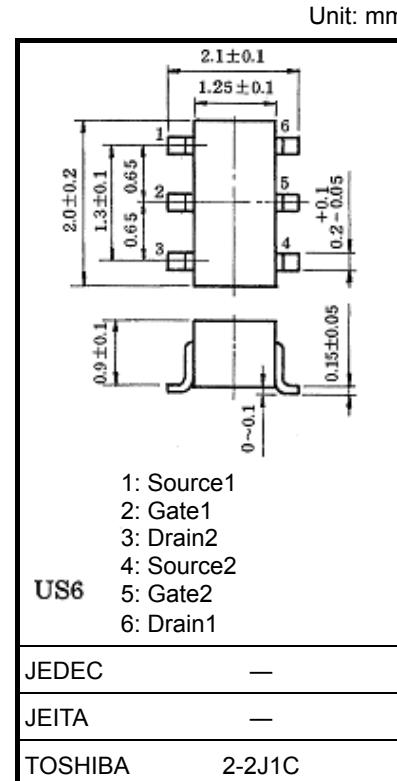
Absolute Maximum Ratings (Ta = 25°C)
(Q1, Q2 Common)

Characteristics	Symbol	Rating	Unit
Drain-Source voltage	V_{DS}	-30	V
Gate-Source voltage	V_{GSS}	± 20	V
Drain current	DC	I_D	mA
	Pulse	I_{DP}	
Drain power dissipation (Ta = 25°C)	P_D (Note 1)	200	mW
Channel temperature	T_{ch}	150	°C
Storage temperature range	T_{stg}	-55 to 150	°C

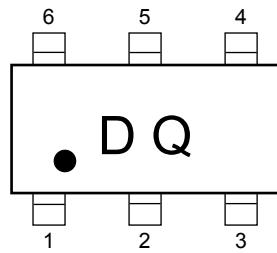
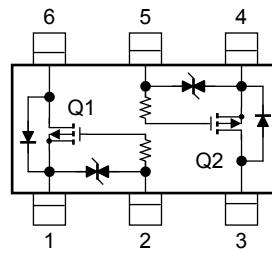
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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: Total rating.



Weight: 0.0068g(typ.)

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

When handling individual devices (which are not yet mounting 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.

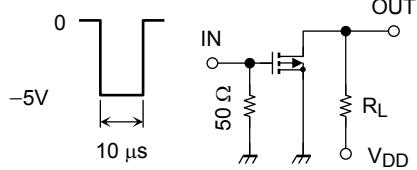
Start of commercial production
2002-03

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

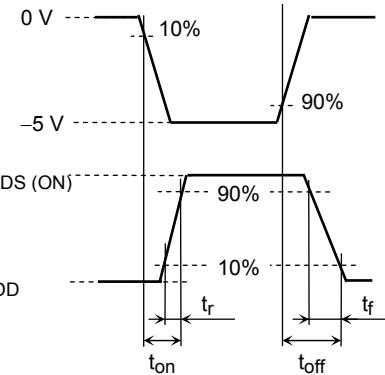
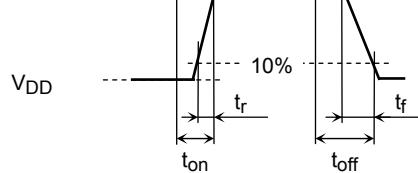
Characteristic	Symbol	Test Condition	MIN.	TYP.	MAX.	UNIT
Gate leakage current	I _{GSS}	V _{GS} = ±16 V, V _{DS} = 0	—	—	±1	μA
Drain-Source breakdown voltage	V _{(BR) DSS}	I _D = -0.1 mA, V _{GS} = 0	-30	—	—	V
Drain cut-off current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0	—	—	-1	μA
Gate threshold voltage	V _{th}	V _{DS} = -3 V, I _D = -0.1 mA	-1.1	—	-1.7	V
Forward transfer admittance	Y _{fs}	V _{DS} = -3 V, I _D = -10 mA	20	—	—	mS
Drain-Source ON resistance	R _{DS (ON)}	I _D = -10 mA, V _{GS} = -4 V	—	8	12	Ω
		I _D = -1 mA, V _{GS} = -2.5 V	—	14	32	
Input capacitance	C _{iss}	V _{DS} = -3 V, V _{GS} = 0, f = 1 MHz	—	9.1	—	pF
Reverse transfer capacitance	C _{rss}		—	3.5	—	pF
Output capacitance	C _{oss}		—	8.6	—	pF
Switching time	Turn-on time	t _{on}	V _{DD} = -5 V, I _D = -10 mA, V _{GS} = 0 to -5 V	—	65	—
	Turn-off time	t _{off}		—	175	—
						ns

Switching Time Test Circuit

(a) Test circuit



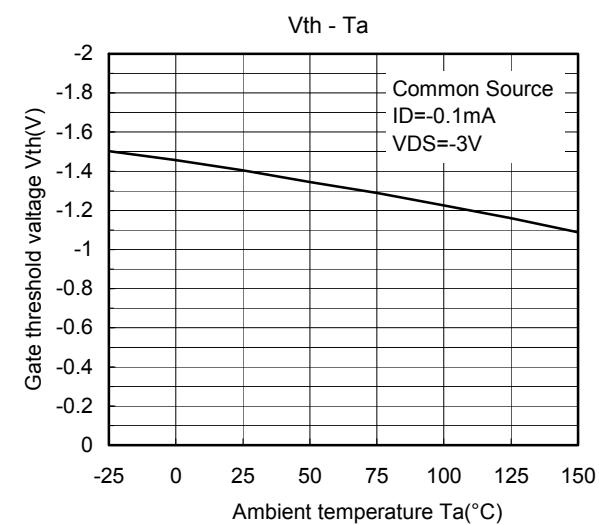
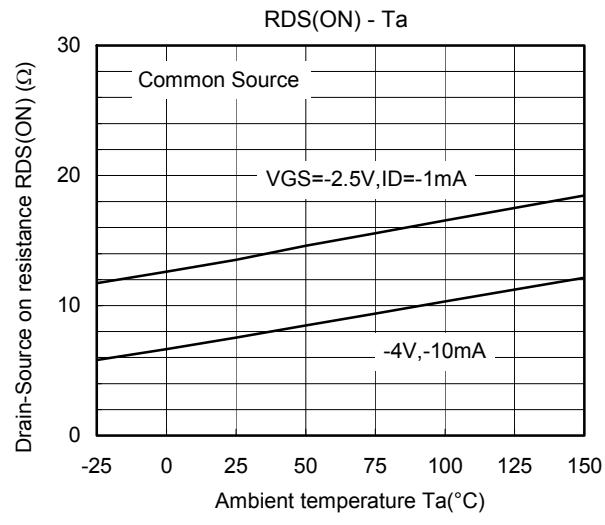
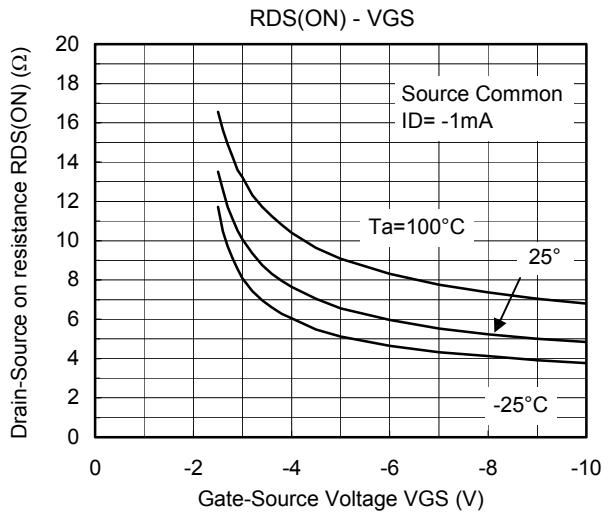
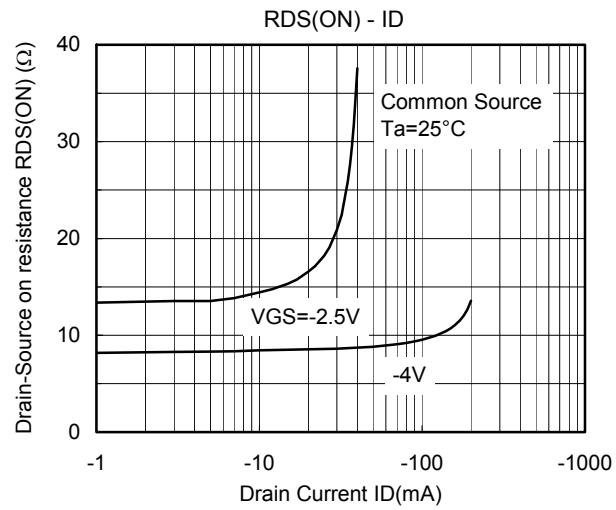
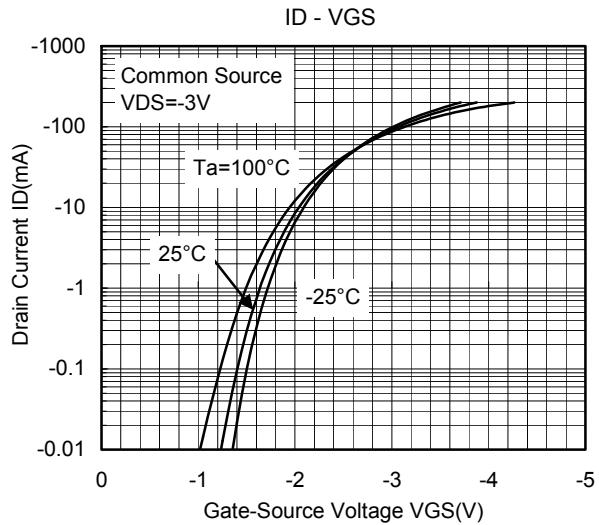
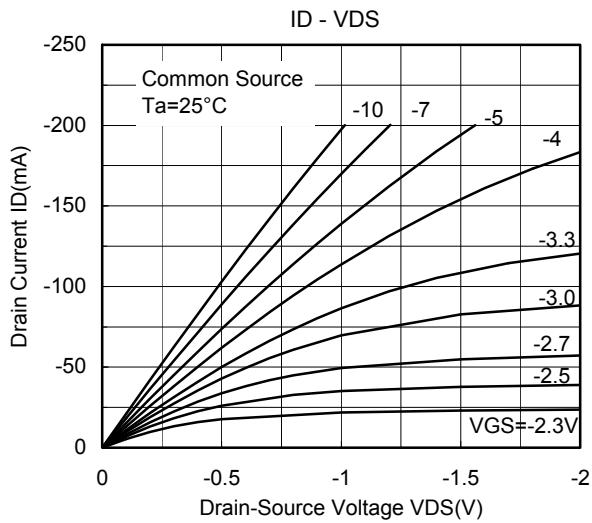
$V_{DD} = -5$ V
 Duty $\leq 1\%$
 V_{IN} : $t_r, t_f < 5$ ns
 $(Z_{out} = 50 \Omega)$
 Common Source
 $T_a = 25^\circ\text{C}$

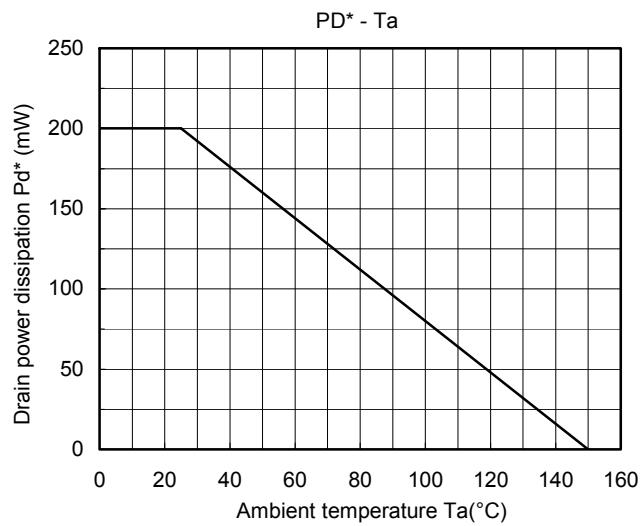
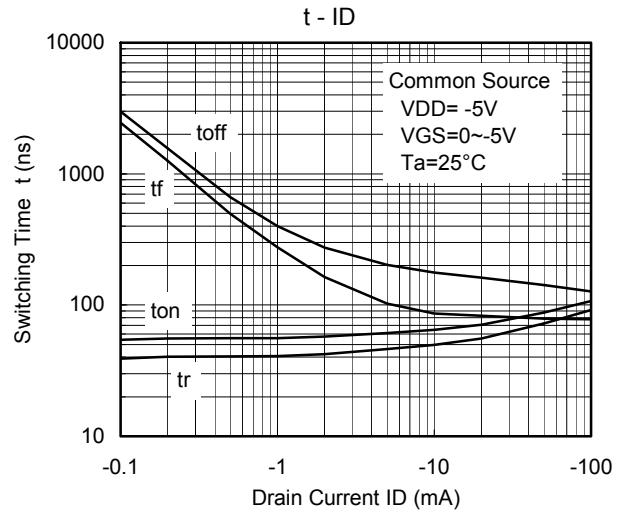
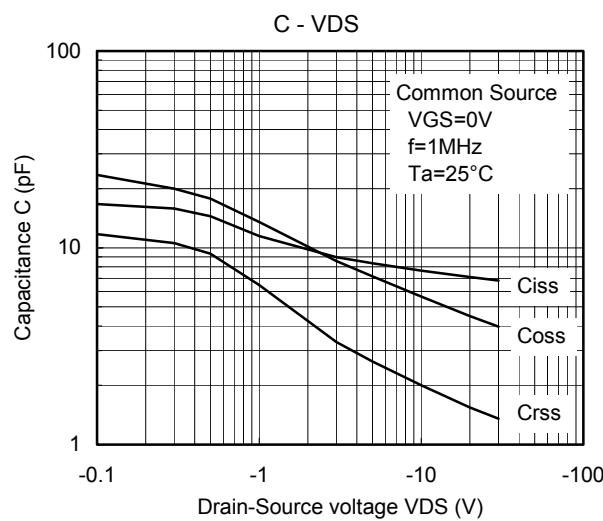
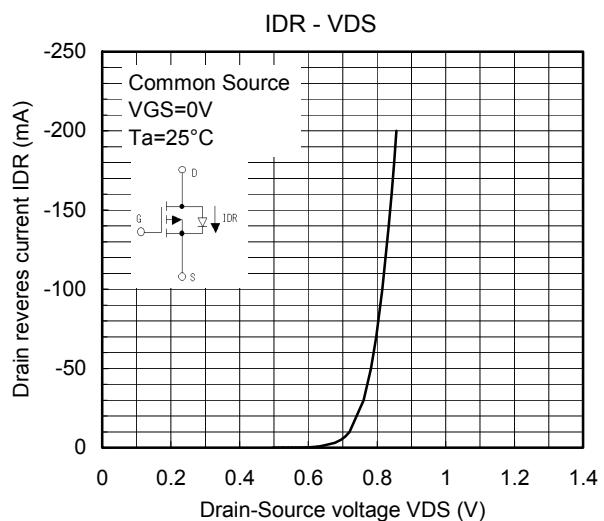
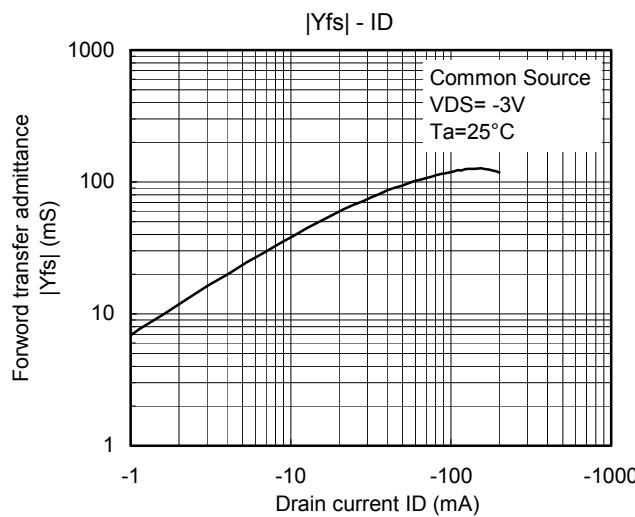
(b) V_{IN} (c) V_{OUT} 

Precaution

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

Please take this into consideration for using the device.





*: Total Rating

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