TOSHIBA Field Effect Transistor Silicon P Channel MOS Type

SSM5P05FU

Power Management Switch High Speed Switching Applications

• Small package

• Low on resistance : $R_{on} = 3.3 \Omega \text{ (max) } (@V_{GS} = -4 \text{ V})$

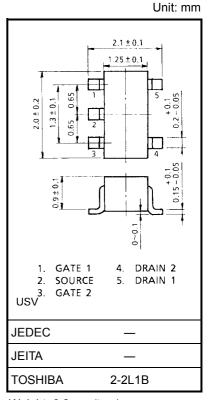
: $R_{on} = 4.0 \Omega (max) (@V_{GS} = -2.5 V)$

• Low gate threshold voltage

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

Characteristics		Symbol	Rating	Unit	
Drain-Source voltage		V _{DS}	-20	V	
Gate-Source voltage		V_{GSS}	±12	V	
Drain current	DC	I _D	-200	mA	
	Pulse	I _{DP}	-400		
Drain power dissipation (Ta = 25°C)		P _D (Note1)	300	mW	
Channel temperature		T _{ch}	150	°C	
Storage temperature range		T _{stg}	-55~150	°C	

Note1: Total rating, mounted on FR4 board (25.4 mm \times 25.4 mm \times 1.6 t, Cu Pad: 0.32 mm² \times 5)



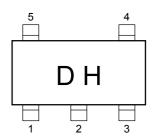
Weight: 6.2 mg (typ.)

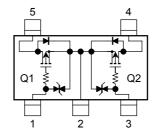
Handling Precaution

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.

Marking

Equivalent Circuit (top view)



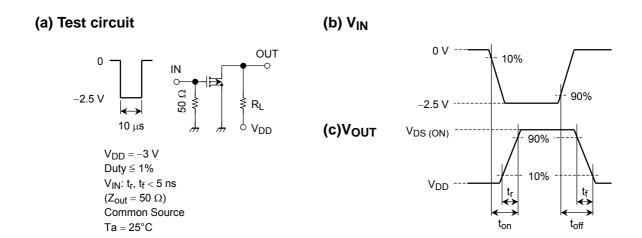


Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit	
Gate leakage current		I _{GSS}	$V_{GS} = \pm 12 \text{ V}, V_{DS} = 0$	_	_	±1	μΑ	
Drain-Source breakdown voltage		V (BR) DSS	$I_D = -1$ mA, $V_{GS} = 0$	-20	_	_	V	
Drain cut-off current		I _{DSS}	$V_{DS} = -20 \text{ V}, V_{GS} = 0$	_	_	-1	μΑ	
Gate threshold voltage		V_{th}	$V_{DS} = -3 \text{ V}, I_D = -0.1 \text{ mA}$	-0.6	_	-1.1	V	
Forward transfer admittance		Y _{fs}	$V_{DS} = -3 \text{ V}, I_D = -50 \text{ mA}$ (Note2)	100	_	_	mS	
Drain-Source ON resistance		R _{DS} (ON)	$I_D = -100 \text{ mA}, V_{GS} = -4 \text{ V} \text{ (Note2)}$	_	2.1	3.3	Ω	
			$I_D = -50 \text{ mA}, V_{GS} = -2.5 \text{ V} \text{ (Note2)}$	_	3.2	4.0		
Input capacitance		C _{iss}		_	27	_	pF	
Reverse transfer capacitance		C _{rss}	$V_{DS} = -3 \text{ V}, V_{GS} = 0, f = 1 \text{ MHz}$	_	7	_	pF	
Output capacitance		Coss			21	_	pF	
Switching time	Turn-on time	t _{on}	$V_{DD} = -3 \text{ V}, I_D = -50 \text{ mA},$	_	70	_	ns	
	Turn-off time	t _{off}	V _{GS} = 0~-2.5 V		70	_		

Note2: Pulse test

Switching Time Test Circuit (Q1, Q2 Common)

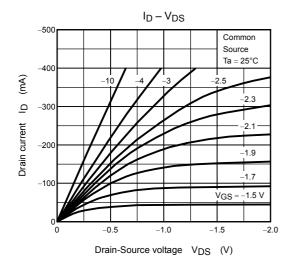


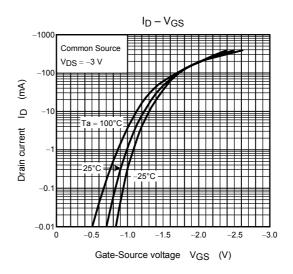
Precaution

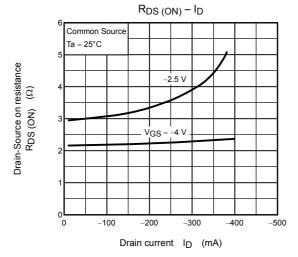
 V_{th} can be expressed as voltage between gate and source when low operating current value is $I_D = -100~\mu A$ for this product. For normal switching operation, V_{GS} (on) requires higher voltage than V_{th} and V_{GS} (off) requires lower voltage than V_{th} . (Relationship can be established as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

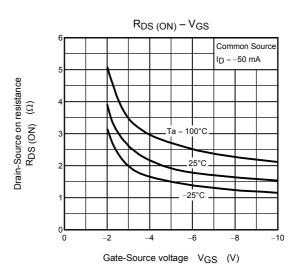
Please take this into consideration for using the device. V_{GS} recommended voltage of -2.5 V or higher to turn on this product.

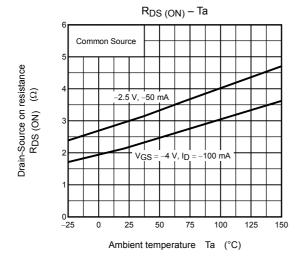
(Q1, Q2 common)

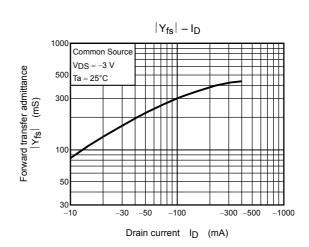






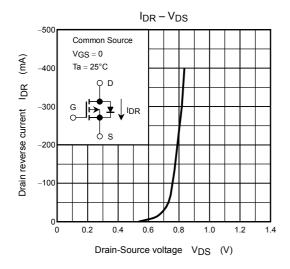


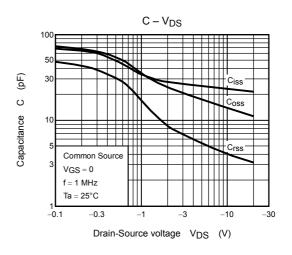


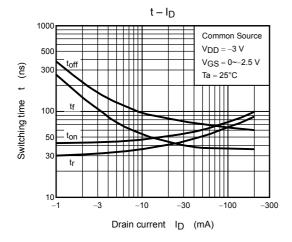


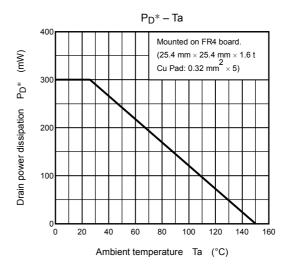
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(Q1, Q2 common)









*: Total rating

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