

Category TOSHIBA Field Effect Transistor Silicon N Channel MOS Type (U-MOSII)/Category

SSM6K08FU

High Speed Switching Applications

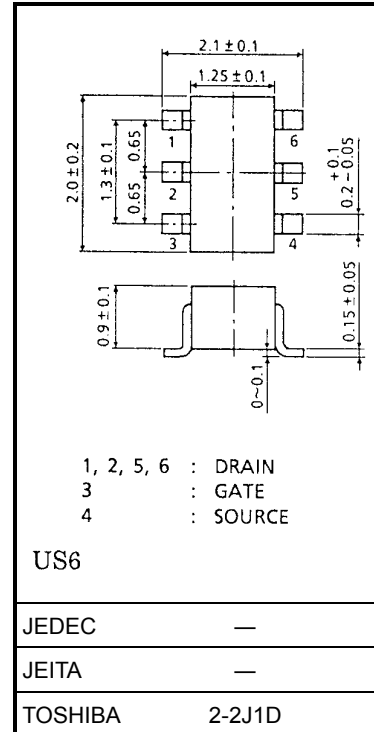
- Small package
- Low on resistance: $R_{on} = 105 \text{ m}\Omega$ (max) (@ $V_{GS} = 4 \text{ V}$)
 $R_{on} = 140 \text{ m}\Omega$ (max) (@ $V_{GS} = 2.5 \text{ V}$)
- High-speed switching: $t_{on} = 16 \text{ ns}$ (typ.)
 $t_{off} = 15 \text{ ns}$ (typ.)

Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Drain-Source voltage	V_{DS}	20	V
Gate-Source voltage	V_{GSS}	± 12	V
Drain current	DC	I_D	1.6
	Pulse	I_{DP}	3.2
Drain power dissipation	P_D (Note1)	300	mW
Channel temperature	T_{ch}	150	°C
Storage temperature range	T_{stg}	-55~150	°C

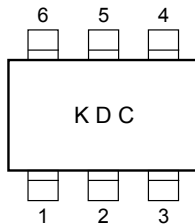
Note1: Mounted on FR4 board.
(25.4 mm × 25.4 mm × 1.6 t, Cu Pad: 0.32 mm² × 6) Figure 1.

Unit: mm

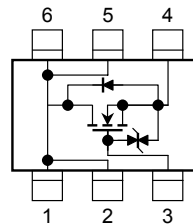


Weight: 6.8 mg (typ.)

Marking Circuit (top view)



Equivalent



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.

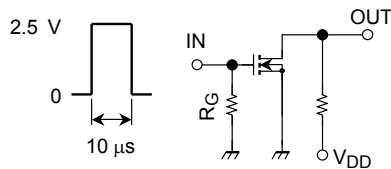
Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GSS}	$V_{GS} = \pm 12\text{ V}, V_{DS} = 0$	—	—	± 1	μA
Drain-Source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1\text{ mA}, V_{GS} = 0$	20	—	—	V
	$V_{(BR)DSX}$	$I_D = 1\text{ mA}, V_{GS} = -12\text{ V}$	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	—	1.2	V
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 3\text{ V}, I_D = 0.8\text{ A}$ (Note2)	2.0	—	—	S
Drain-Source ON resistance	$R_{DS(ON)}$	$I_D = 0.8\text{ A}, V_{GS} = 4\text{ V}$ (Note2)	—	77	105	m Ω
		$I_D = 0.8\text{ A}, V_{GS} = 2.5\text{ V}$ (Note2)	—	100	140	
		$I_D = 0.8\text{ A}, V_{GS} = 2.0\text{ V}$ (Note2)	—	125	210	
Input capacitance	C_{iss}	$V_{DS} = 10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	306	—	pF
Reverse transfer capacitance	C_{rss}	$V_{DS} = 10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	44	—	pF
Output capacitance	C_{oss}	$V_{DS} = 10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	74	—	pF
Switching time	Turn-on time	t_{on}	—	16	—	ns
	Turn-off time	t_{off}		15		

Note2: Pulse test

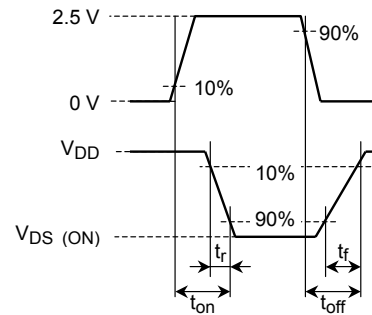
Switching Time Test Circuit

(a) Test Circuit

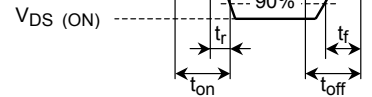


$V_{DD} = 10\text{ V}$
 $R_G = 4.7\ \Omega$
 D.U. $\leq 1\%$
 V_{IN} : $t_r, t_f < 5\text{ ns}$
 Common Source
 $T_a = 25^\circ\text{C}$

(b) V_{IN}



(c) V_{OUT}

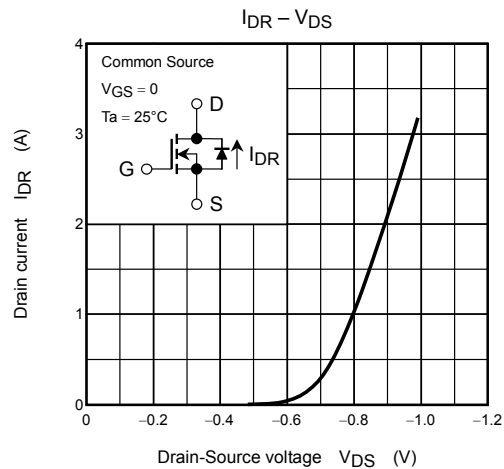
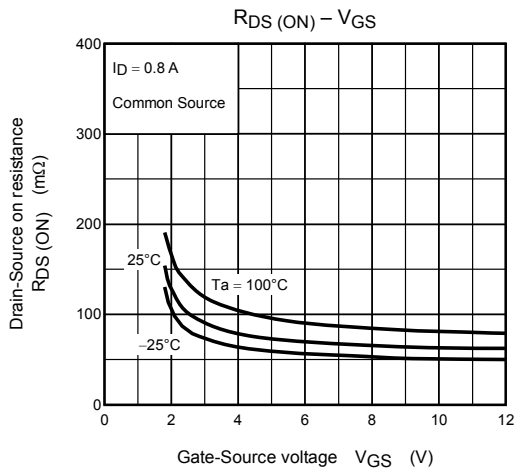
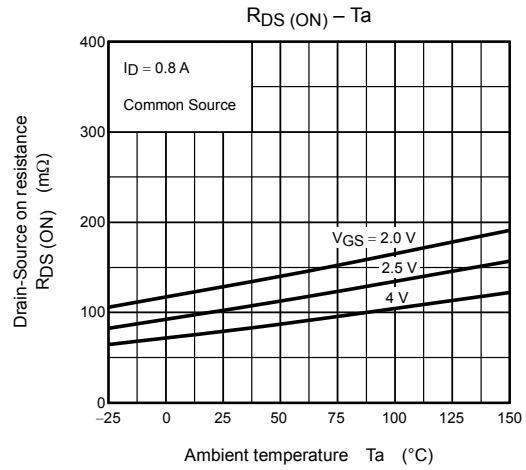
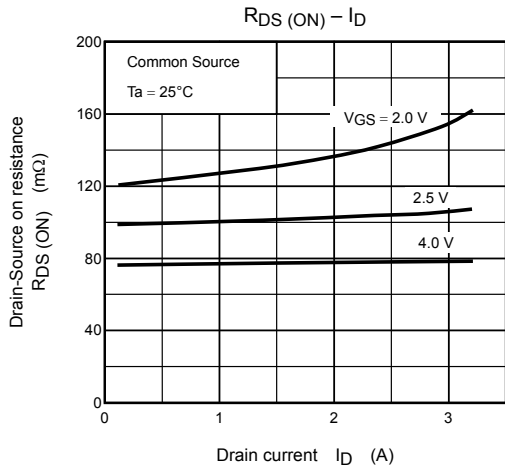
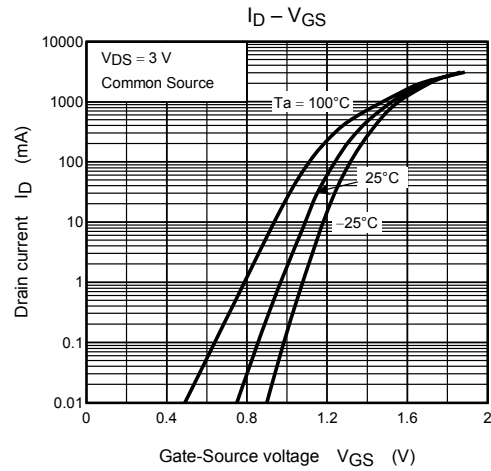
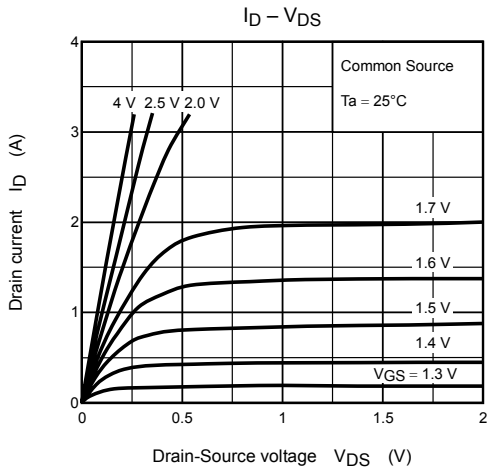


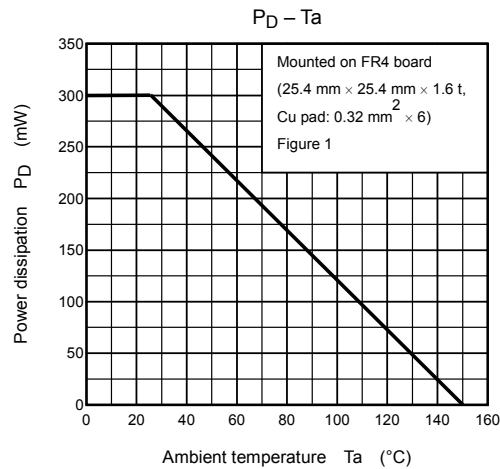
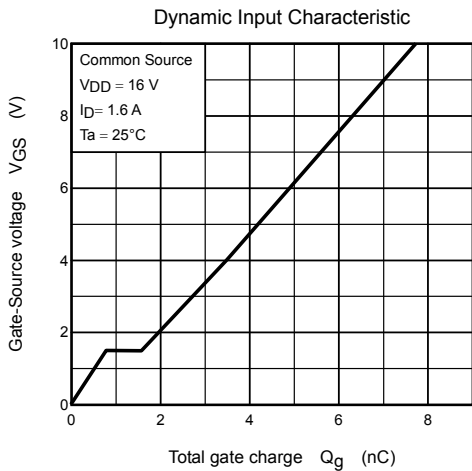
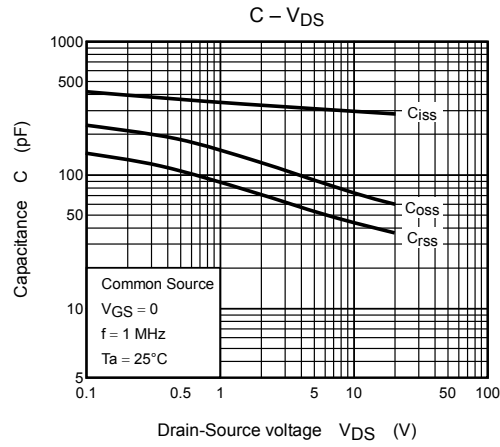
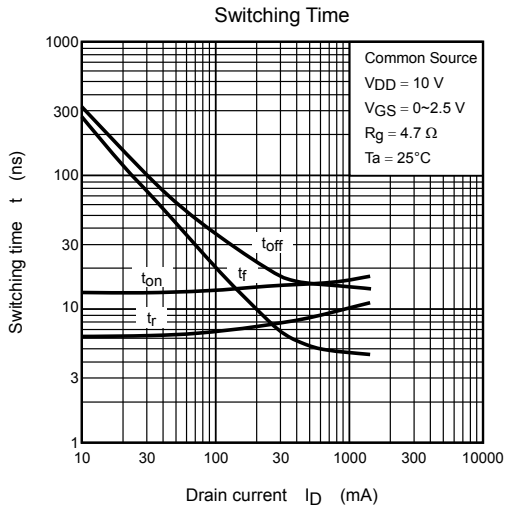
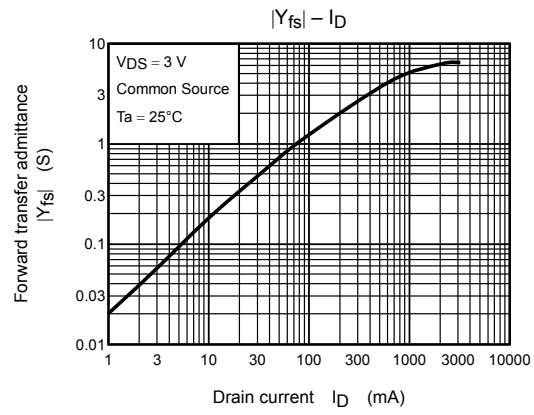
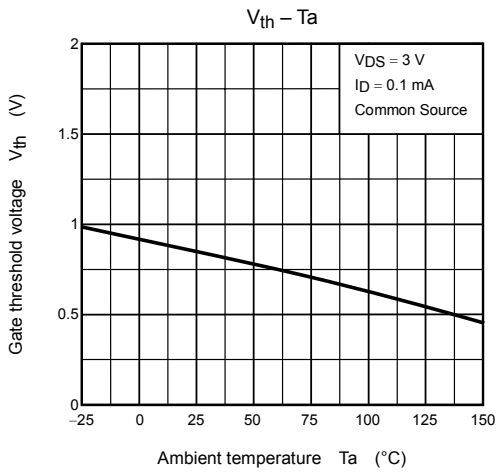
Precaution

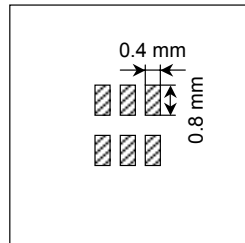
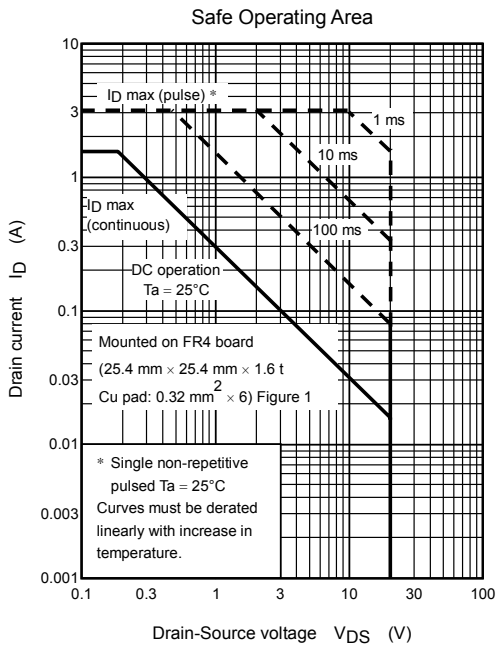
V_{th} can be expressed as voltage between gate and source when low operating current value is $I_D = 100\ \mu\text{A}$ for this product. For normal switching operation, $V_{GS(on)}$ requires higher voltage than V_{th} and $V_{GS(off)}$ requires lower voltage than V_{th} .

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

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







25.4 mm × 25.4 mm × 1.6 t,
Cu Pad: 0.32 mm² × 6

Figure 1

RESTRICTIONS ON PRODUCT USE

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