TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE

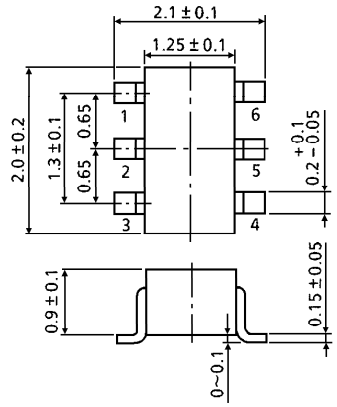
SSM6K07FU

DC-DC CONVERTERS

HIGH SPEED SWITCHING APPLICATIONS

- Small Package
- Low on Resistance
  : R_{on} = 130 mΩ max. (@V_{GS} = 10 V)
  : R_{on} = 220 mΩ max. (@V_{GS} = 4 V)
- Low Input Capacitance
  : C_{iss} = 102 pF Typ.
  : C_{rss} = 22 pF Typ.

Unit in mm



1, 2, 5, 6 : DRAIN
3 : GATE
4 : SOURCE

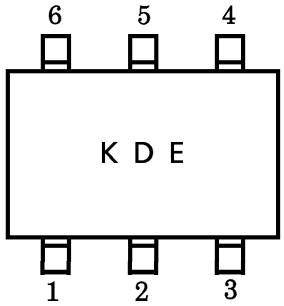
US6	
JEDEC	—
EIAJ	—
TOSHIBA	2-2J1D

MAXIMUM RATINGS (Ta = 25°C)

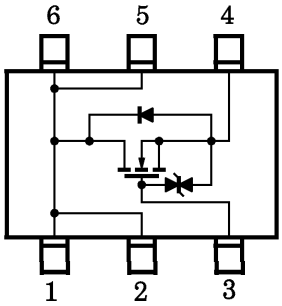
CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	DC	I_D	1.5	A
	Pulse	I_{DP}	3.0	
Drain Power Dissipation		P_D*	300	mW
Channel Temperature		T_{ch}	150	°C
Storage Temperature Range		T_{stg}	− 55~150	°C

* Mounted on FR4 Board.
(25.4 mm × 25.4 mm × 1.6 t, Cu Pad : 0.32 mm² × 6)

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.

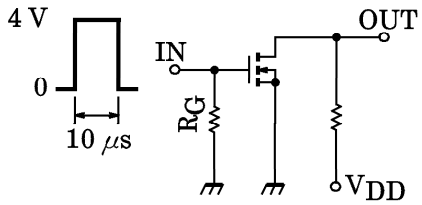
961001EAA1

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

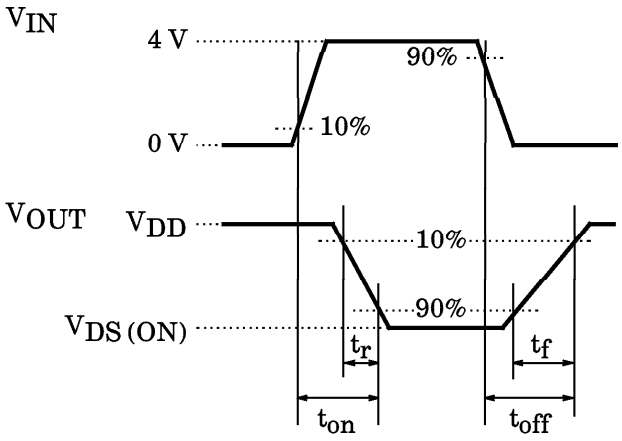
CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	V_{GS} = ± 16 V, V_{DS} = 0	—	—	± 1	μA
Drain-Source Breakdown Voltage		$V_{(BR)\,DSS}$	I_D = 1 mA, V_{GS} = 0	30	—	—	V
Drain Cut-off Current		I_{DSS}	V_{DS} = 30 V, V_{GS} = 0	—	—	1	μA
Gate Threshold Voltage		V_{th}	V_{DS} = 5 V, I_D = 0.1 mA	1.1	—	1.8	V
Forward Transfer Admittance		$\|Y_{fs}\|$	V_{DS} = 5 V, I_D = 0.75 A (Note)	1.0	—	—	S
Drain-Source ON Resistance		$R_{DS\,(ON)}$	I_D = 0.75 A, V_{GS} = 10 V (Note)	—	105	130	mΩ
		$R_{DS\,(ON)}$	I_D = 0.75 A, V_{GS} = 4 V (Note)	—	170	220	mΩ
		$R_{DS\,(ON)}$	I_D = 0.75 A, V_{GS} = 3.3 V (Note)	—	230	500	mΩ
Input Capacitance		C_{iss}	V_{DS} = 15 V, V_{GS} = 0, f = 1 MHz	—	102	—	pF
Reverse Transfer Capacitance		C_{rss}	V_{DS} = 15 V, V_{GS} = 0, f = 1 MHz	—	22	—	pF
Output Capacitance		C_{oss}	V_{DS} = 15 V, V_{GS} = 0, f = 1 MHz	—	57	—	pF
Switching Time	Turn-on Time	t_{on}	V_{DD} = 15 V, I_D = 0.75 A, V_{GS} = 0~4 V, R_G = 10 Ω	—	46	—	ns
	Turn-off Time	t_{off}		—	65	—	ns

(Note) : Pulse test

SWITCHING TIME TEST CIRCUIT



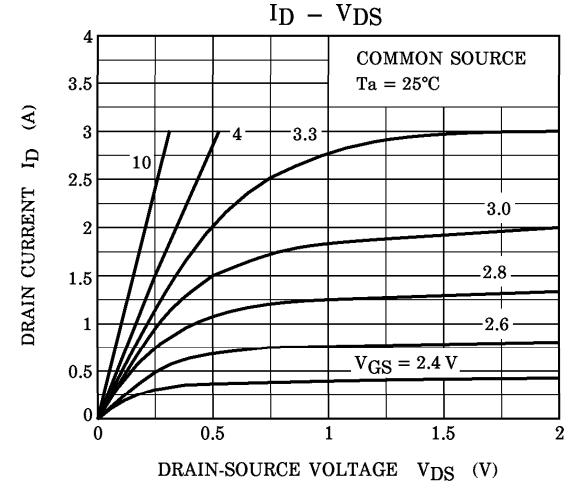
V_{DD} = 15 V
R_G = 10 Ω
D.U. ≦ 1%
V_{IN} : t_r, t_f < 5 ns
COMMON SOURCE
Ta = 25°C



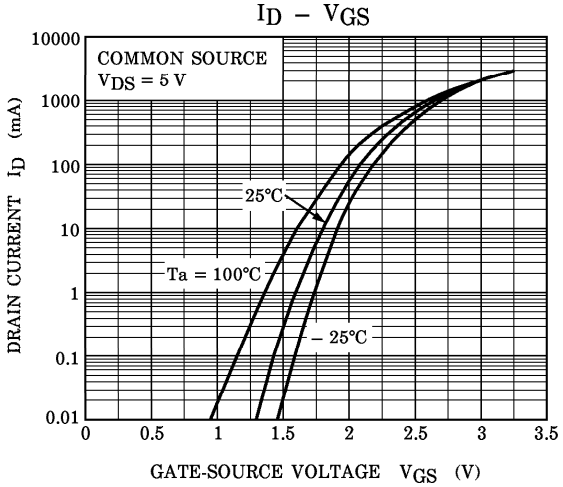
PRECAUTION

V_{th} can be expressed as voltage between gate and source when low operating current value is I_D = 100 μA 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 4 V or higher to turn on this product.

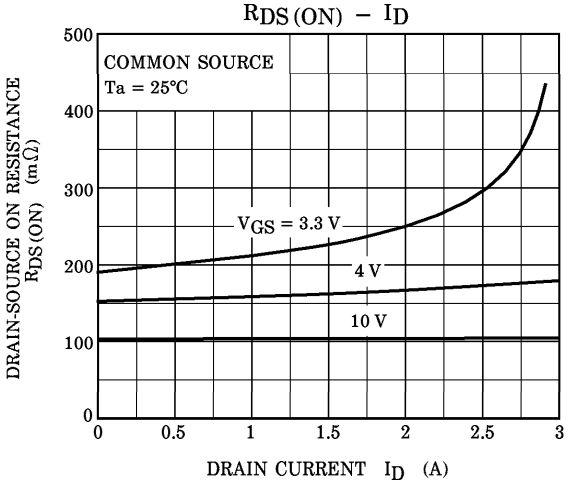
$I_D - V_{DS}$



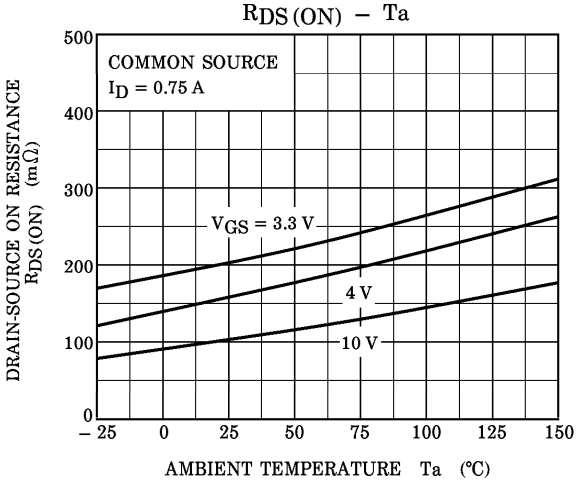
$I_D - V_{GS}$



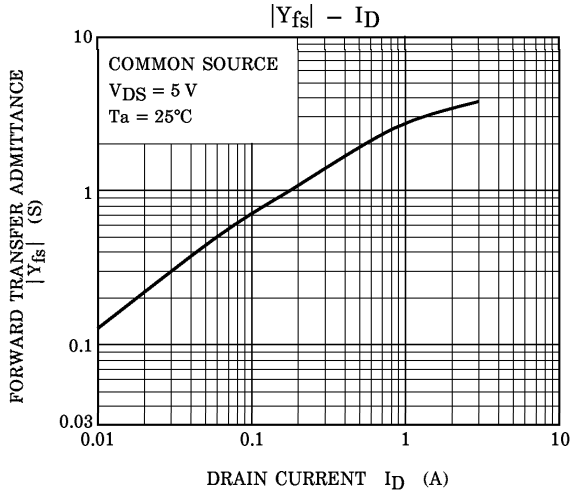
$R_{DS\,(ON)} - I_D$



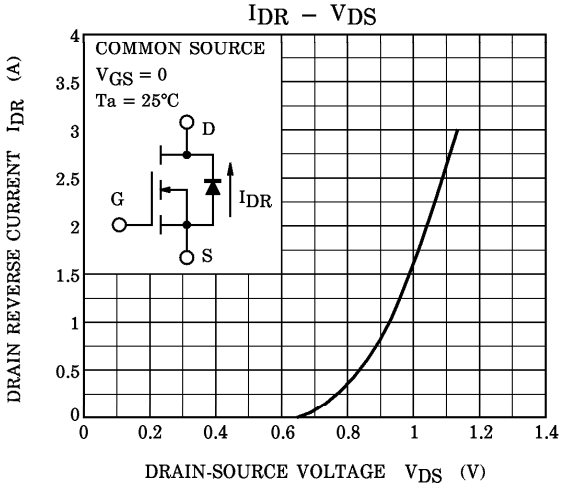
$R_{DS\,(ON)} - Ta$

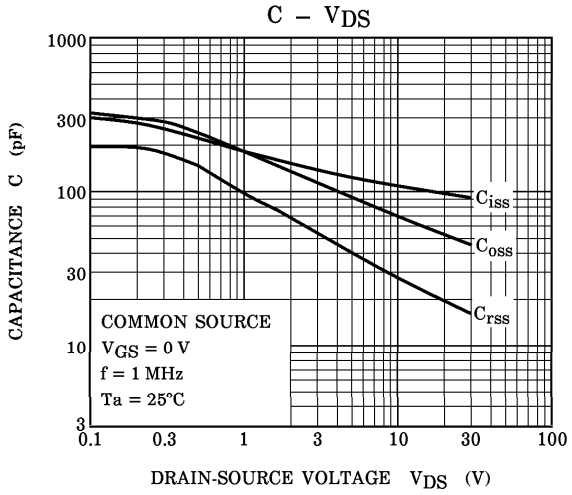


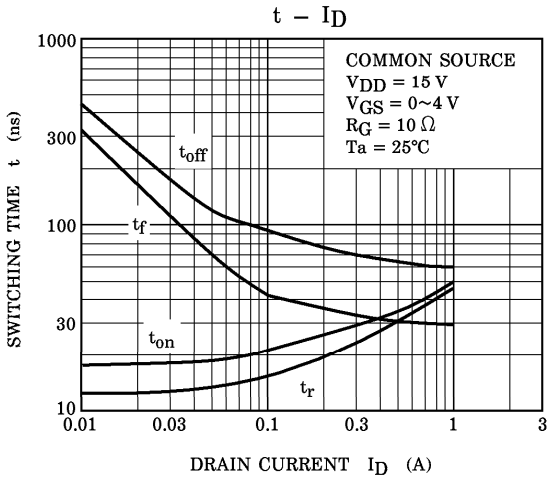
$|Y_{fs}| - I_D$

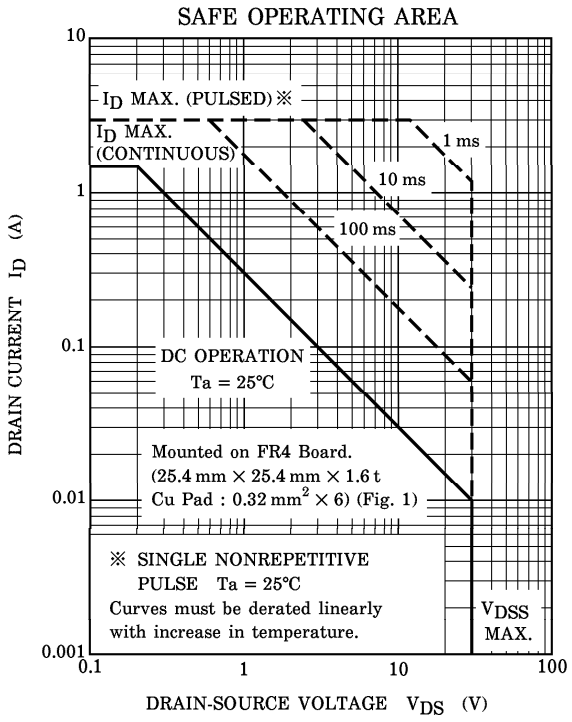


$I_{DR} - V_{DS}$









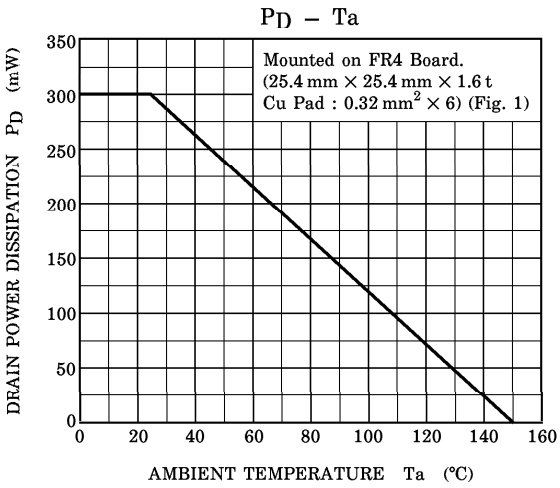


Fig.1 : 25.4 mm × 25.4 mm × 1.6 t, Cu Pad : 0.32 mm^2 × 6