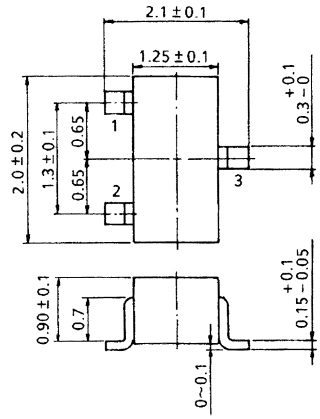
TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

2SK1827

High Speed Switching Applications
Analog Switch Applications

- 4 V gate drive
- Low threshold voltage: V_{th} = 0.8~2.5 V
- High speed
- Enhancement-mode
- Small package

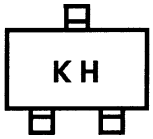
Unit: mm



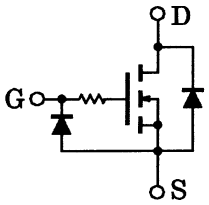
JEDEC	—
JEITA	SC-70
TOSHIBA	2-2E1E

Weight: 0.006 g (typ.)

Marking



Equivalent Circuit



Maximum Ratings (Ta = 25°C)

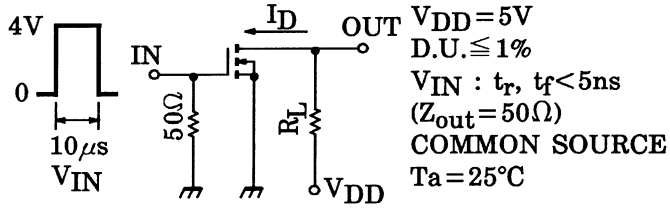
Characteristics	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	50	V
Gate-source voltage	V_{GSS}	10	V
DC drain current	I_D	50	mA
Drain power dissipation	P_D	100	mW
Channel temperature	T_{ch}	150	°C
Storage temperature range	T_{stg}	−55~150	°C

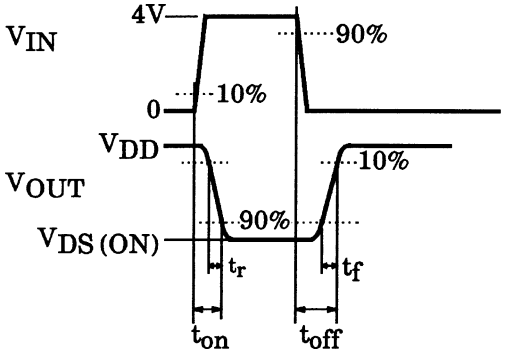
Note: This transistor is electrostatic sensitive device.
Please handle with caution.

Electrical Characteristics (Ta = 25°C)

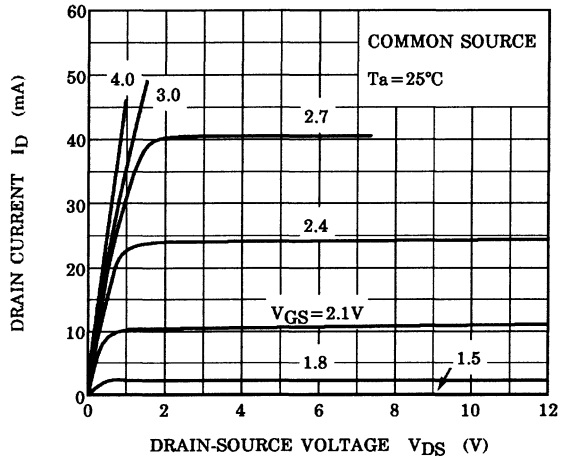
Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		I_{GSS}	V_{GS} = 10 V, V_{DS} = 0	—	—	1	μA
Drain-source breakdown voltage		$V_{(BR)\ DSS}$	I_D = 100 μA, V_{GS} = 0	50	—	—	V
Drain cut-off current		I_{DSS}	V_{DS} = 50 V, V_{GS} = 0	—	—	1	μA
Gate threshold voltage		V_{th}	V_{DS} = 5 V, I_D = 0.1 mA	0.8	—	2.5	V
Forward transfer admittance		$\|Y_{fs}\|$	V_{DS} = 5 V, I_D = 10 mA	20	—	—	mS
Drain-source ON resistance		$R_{DS\ (ON)}$	I_D = 10 mA, V_{GS} = 4.0 V	—	20	50	Ω
Input capacitance		C_{iss}	V_{DS} = 5 V, V_{GS} = 0, f = 1 MHz	—	6.3	—	pF
Reverse transfer capacitance		C_{rss}	V_{DS} = 5 V, V_{GS} = 0, f = 1 MHz	—	1.3	—	pF
Output capacitance		C_{oss}	V_{DS} = 5 V, V_{GS} = 0, f = 1 MHz	—	5.7	—	pF
Switching time	Turn-on time	t_{on}	V_{DD} = 5 V, I_D = 10 mA, V_{GS} = 0~4.0 V	—	0.11	—	μs
	Turn-off time	t_{off}	V_{DD} = 5 V, I_D = 10 mA, V_{GS} = 0~4.0 V	—	0.15	—	

Switching Time Test Circuit

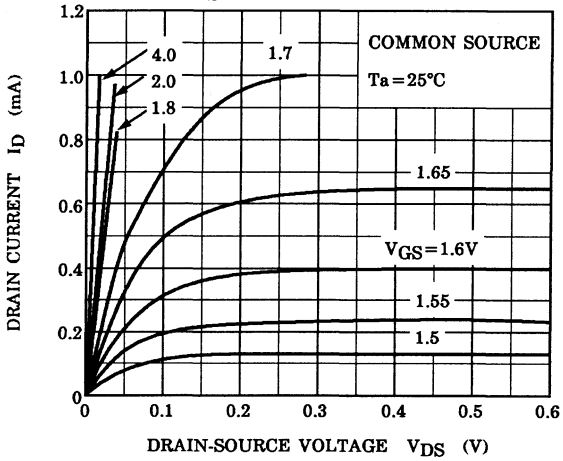




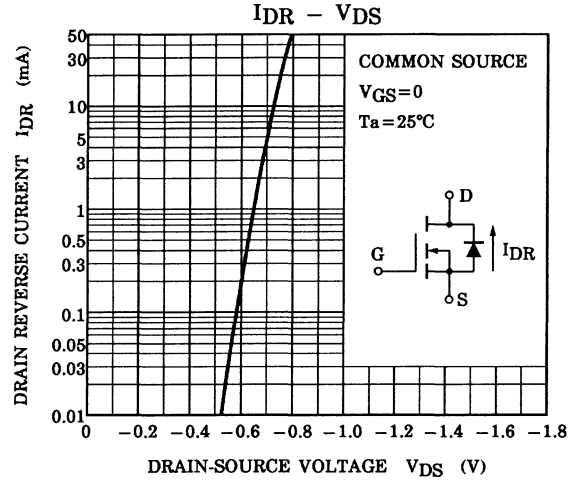
I_D – V_{DS}



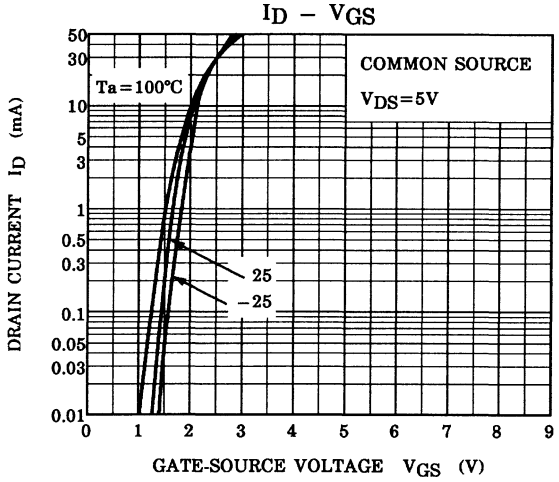
I_D – V_{DS} (LOW VOLTAGE REGION)



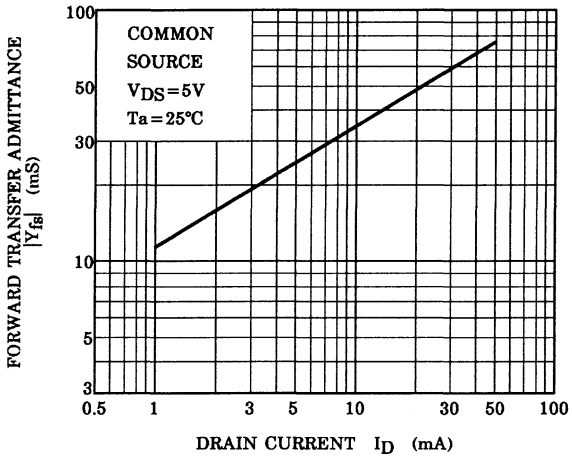
I_{DR} – V_{DS}



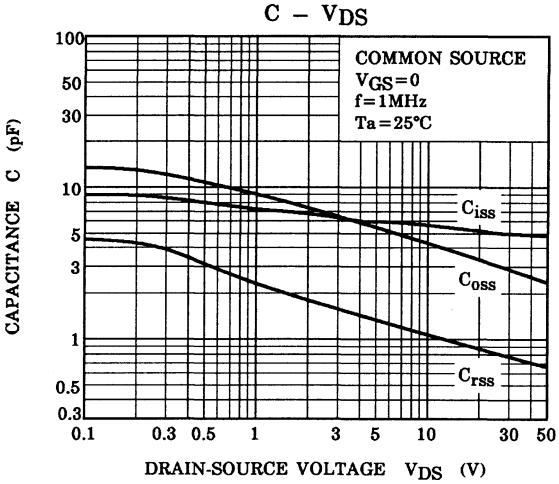
I_D – V_{GS}

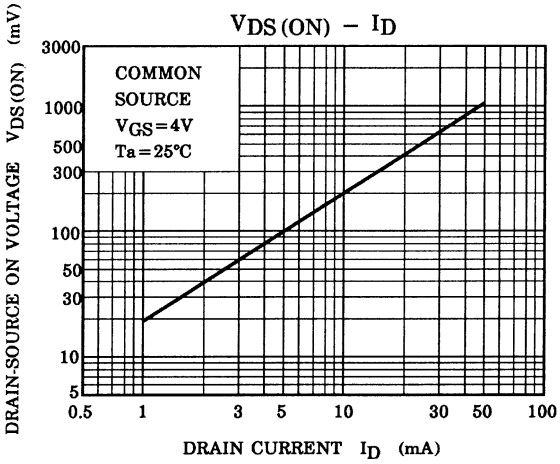


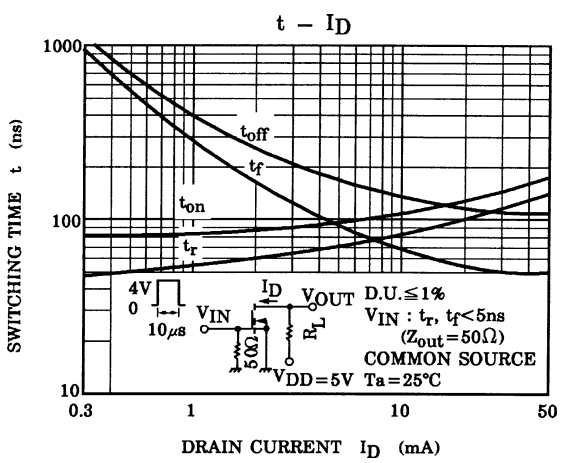
$|Y_{fs}|$ – I_D

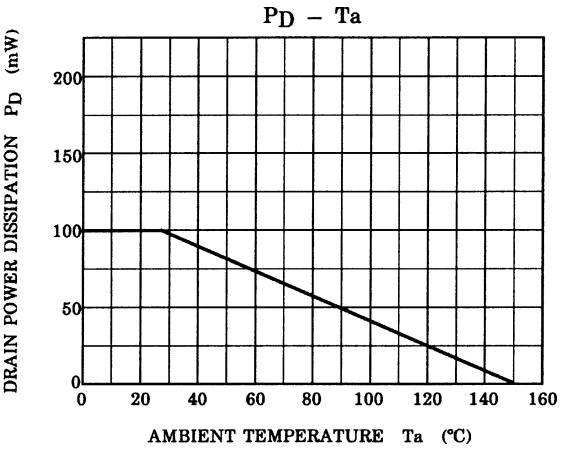


C – V_{DS}




$V_{DS(ON)}$ – I_D
COMMON SOURCE
V_{GS}=4V
Ta=25°C
DRAIN-SOURCE ON VOLTAGE $V_{DS(ON)}$ (mV)
DRAIN CURRENT I_D (mA)
3000
1000
500
300
100
50
30
10
5
0.5
1
3
5
10
30
50
100


t – I_D
SWITCHING TIME t (ns)
DRAIN CURRENT I_D (mA)
t_{off}
t_f
t_{on}
t_r
1000
100
10
0.3
1
10
50
4V
0
10μs
V_{IN}
I_D
V_{OUT}
R_L
50Ω
V_{DD}=5V
D.U.≦1%
V_{IN} : t_r, t_f<5ns
(Z_{out}=50Ω)
COMMON SOURCE
Ta=25°C


P_D – Ta
DRAIN POWER DISSIPATION P_D (mW)
AMBIENT TEMPERATURE Ta (°C)
200
150
100
50
0
0
20
40
60
80
100
120
140
160

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