TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE

2SK2823

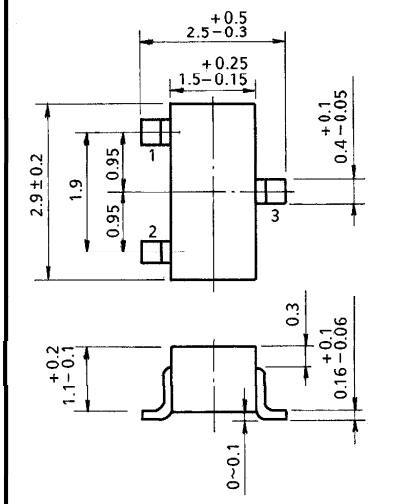
FOR PORTABLE EQUIPMENT

HIGH SPEED SWITCH APPLICATIONS

ANALOG SWITCH APPLICATIONS

- High Input Impedance
- 1.5V Gate Drive
- Low Gate Threshold Voltage : V_{th} = 0.5~1.0V
- Small Package

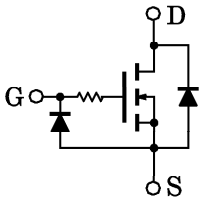
Unit in mm



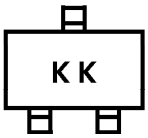
S-MINI	1. GATE 2. SOURCE 3. DRAIN
JEDEC	TO-236MOD
EIAJ	SC-59
TOSHIBA	2-3F1F

Weight : 0.012g (Typ.)

EQUIVALENT CIRCUIT



MARKING



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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GSS}	10	V
DC Drain Current	I_D	100	mA
Drain Power Dissipation	P_D	200	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	−55~150	°C

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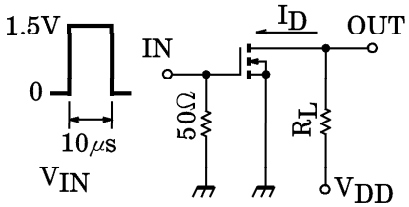
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS}=10V$, $V_{DS}=0$	—	—	1	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D=100\mu A$, $V_{GS}=0$	20	—	—	V
Drain Cut-off Current		I_{DSS}	$V_{DS}=20V$, $V_{GS}=0$	—	—	1	μA
Gate Threshold Voltage		V_{th}	$V_{DS}=1.5V$, $I_D=0.1mA$	0.5	—	1.0	V
Forward Transfer Admittance		$\|Y_{fs}\|$	$V_{DS}=1.5V$, $I_D=10mA$	35	70	—	mS
Drain-Source ON Resistance 1		$R_{DS(ON)1}$	$I_D=1mA$, $V_{GS}=1.2V$	—	15	50	Ω
Drain-Source ON Resistance 2		$R_{DS(ON)2}$	$I_D=10mA$, $V_{GS}=1.5V$	—	10	40	Ω
Drain-Source ON Resistance 3		$R_{DS(ON)3}$	$I_D=10mA$, $V_{GS}=2.5V$	—	7	28	Ω
Input Capacitance		C_{iss}	$V_{DS}=1.5V$, $V_{GS}=0$, f=1MHz	—	12	—	pF
Reverse Transfer Capacitance		C_{rss}	$V_{DS}=1.5V$, $V_{GS}=0$, f=1MHz	—	3.4	—	pF
Output Capacitance		C_{oss}	$V_{DS}=1.5V$, $V_{GS}=0$, f=1MHz	—	12	—	pF
Switching Time	Turn-on Time	t_{on}	$V_{DD}=1.5V$, $I_D=10mA$, $V_{GS}=0\sim1.5V$	—	0.35	—	μs
	Turn-off Time	t_{off}		—	0.2	—	

SWITCHING TIME TEST CIRCUIT

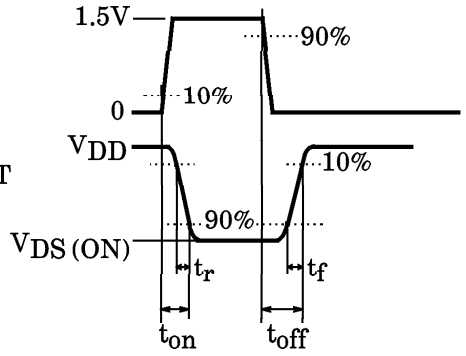
(a) TEST CIRCUIT

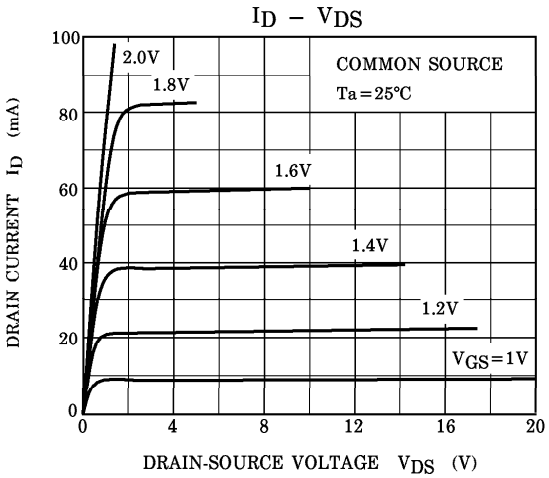


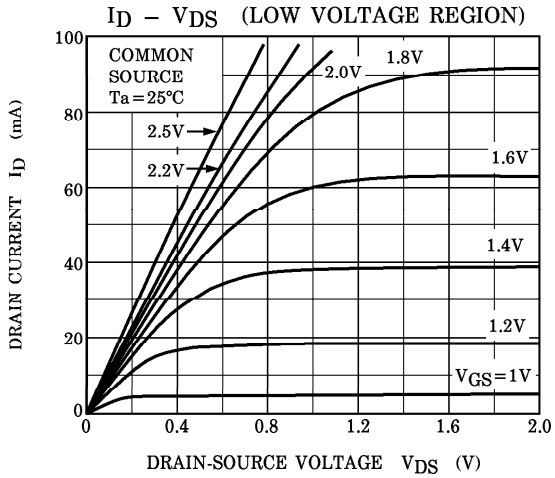
$V_{DD}=1.5V$
D.U.≦1%
V_{IN} : t_r, $t_f<5ns$
($Z_{out}=50\Omega$)
COMMON SOURCE
Ta = 25°C

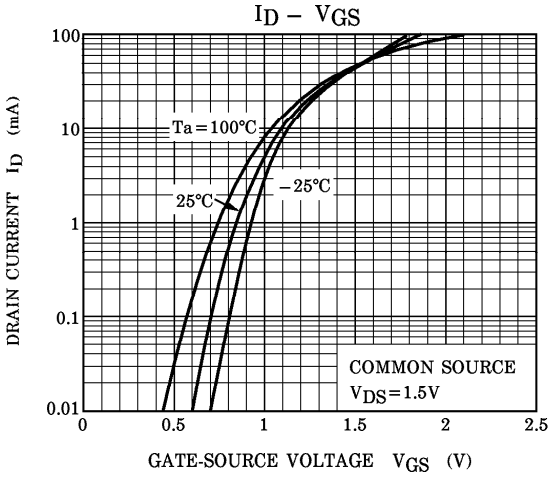
(b) V_{IN}
V_{GS}

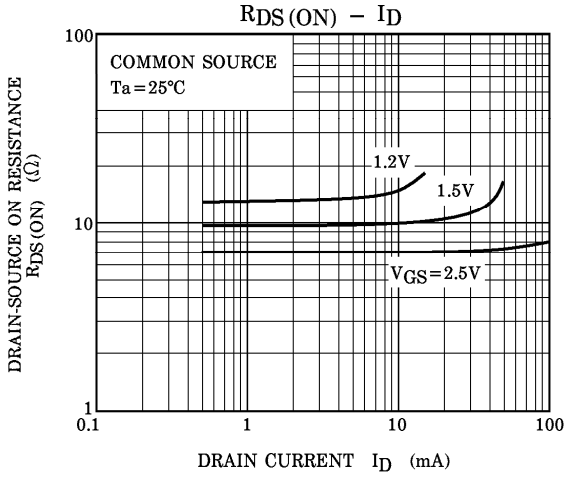
(c) V_{OUT}
V_{DS}

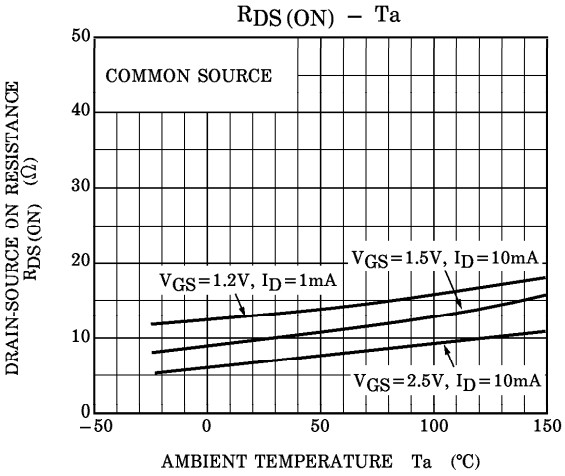


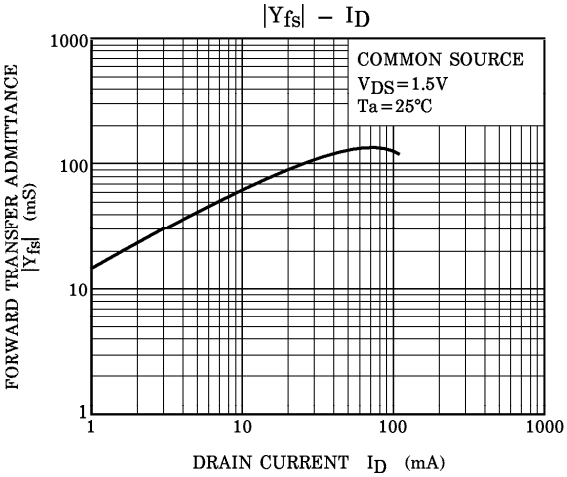

ID – VDS
COMMON SOURCE
Ta = 25°C
2.0V
1.8V
1.6V
1.4V
1.2V
VGS = 1V
DRAIN CURRENT ID (mA)
DRAIN-SOURCE VOLTAGE VDS (V)

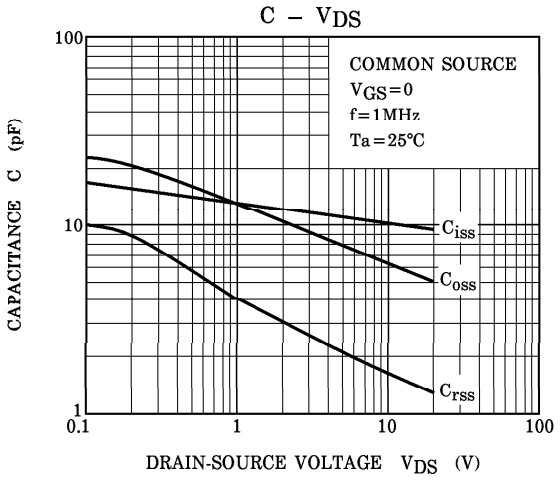

ID – VDS (LOW VOLTAGE REGION)
COMMON SOURCE
Ta = 25°C
2.5V
2.2V
2.0V
1.8V
1.6V
1.4V
1.2V
VGS = 1V
DRAIN CURRENT ID (mA)
DRAIN-SOURCE VOLTAGE VDS (V)

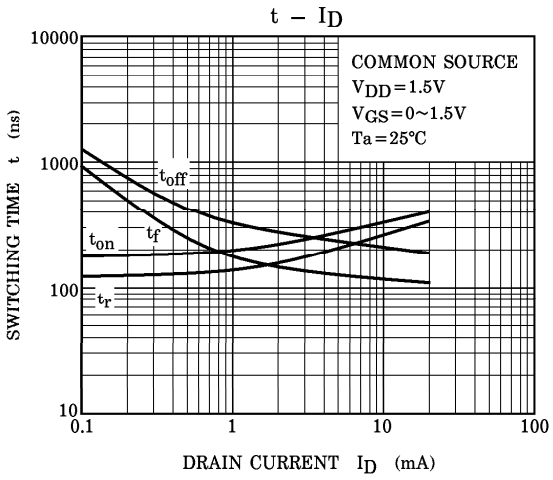

ID – VGS
Ta = 100°C
25°C
–25°C
COMMON SOURCE
VDS = 1.5V
DRAIN CURRENT ID (mA)
GATE-SOURCE VOLTAGE VGS (V)

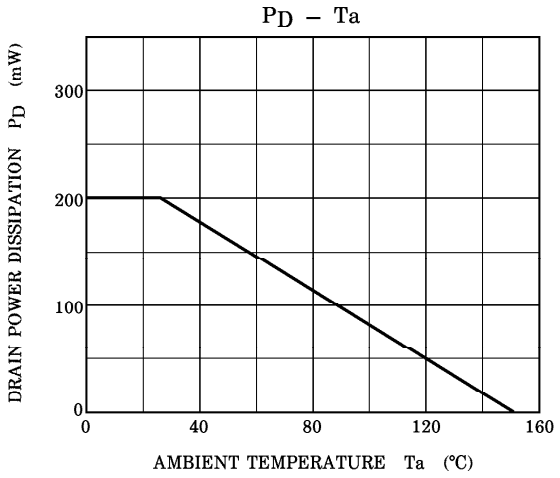

RDS (ON) – ID
COMMON SOURCE
Ta = 25°C
1.2V
1.5V
VGS = 2.5V
DRAIN-SOURCE ON RESISTANCE RDS (ON) (Ω)
DRAIN CURRENT ID (mA)


RDS (ON) – Ta
COMMON SOURCE
VGS = 1.5V, ID = 10mA
VGS = 1.2V, ID = 1mA
VGS = 2.5V, ID = 10mA
DRAIN-SOURCE ON RESISTANCE RDS (ON) (Ω)
AMBIENT TEMPERATURE Ta (°C)


|Yfs| – ID
COMMON SOURCE
VDS = 1.5V
Ta = 25°C
FORWARD TRANSFER ADMITTANCE |Yfs| (mS)
DRAIN CURRENT ID (mA)


C – VDS
COMMON SOURCE
VGS=0
f=1MHz
Ta=25°C
Ciss
Coss
Crss
CAPACITANCE C (pF)
DRAIN-SOURCE VOLTAGE VDS (V)
100
10
1
0.1
1
10
100


t – ID
COMMON SOURCE
VDD=1.5V
VGS=0~1.5V
Ta=25°C
toff
ton
tf
tr
SWITCHING TIME t (ns)
DRAIN CURRENT ID (mA)
10000
1000
100
10
0.1
1
10
100


PD – Ta
DRAIN POWER DISSIPATION PD (mW)
AMBIENT TEMPERATURE Ta (°C)
300
200
100
0
0
40
80
120
160