TOSHIBA FIELD EFFECT TRANSISTOR SILICON N CHANNEL MOS TYPE

2SK2009

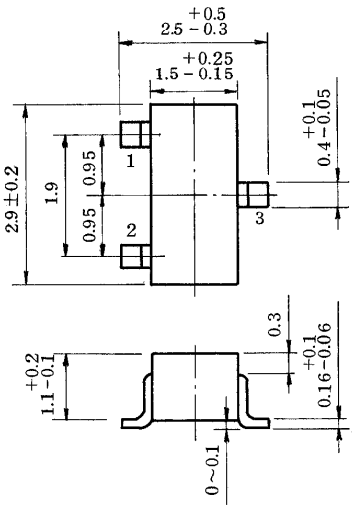
HIGH SPEED SWITCHING APPLICATIONS.
ANALOG SWITCH APPLICATIONS.

- High Input Impedance.
- Low Gate Threshold Voltage : $V_{th}=0.5\sim1.5V$
- Excellent Switching Times : $t_{on}=0.06\mu s$ (Typ.)
  $t_{off}=0.12\mu s$ (Typ.)
- Low Drain-Source ON Resistance : $R_{DS(ON)}=1.2\Omega$ (Typ.)
- Small Package.
- Enhancement-Mode

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GSS}	±20	V
DC Drain Current	I_D	200	mA
Drain Power Dissipation	P_D	200	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature Range	T_{stg}	−55~150	°C

Unit in mm

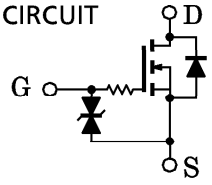


1. GATE
2. SOURCE
3. DRAIN

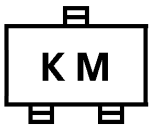
JEDEC	TO-236MOD
EIAJ	SC-59
TOSHIBA	2-3F1F

Weight : 0.012g

EQUIVALENT CIRCUIT



MARKING

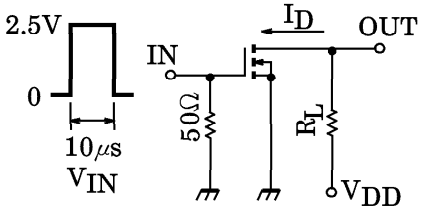


THIS TRANSISTOR ELECTROSTATIC SENSITIVE DEVICE. PLEASE HANDLE WITH CAUSHON.

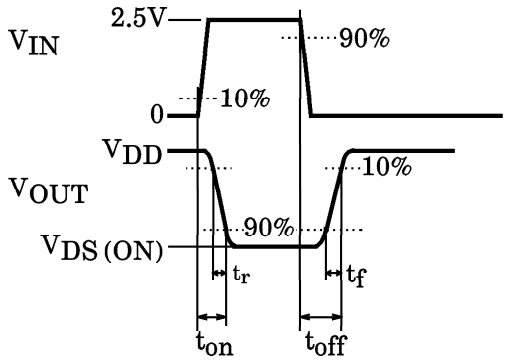
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gate Leakage Current		I_{GSS}	$V_{GS}=\pm10V$, $V_{DS}=0$	—	—	±0.1	μA
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	$I_D=1mA$, $V_{GS}=0$	30	—	—	V
Drain Cut-off Current		I_{DSS}	$V_{DS}=30V$, $V_{GS}=0$	—	—	10	μA
Gate Threshold Voltage		V_{th}	$V_{DS}=3V$, $I_D=0.1mA$	0.5	—	1.5	V
Forward Transfer Admittance		$\|Y_{fs}\|$	$V_{DS}=3V$, $I_D=50mA$	100	—	—	mS
Drain-Source ON Resistance		$R_{DS\,(ON)}$	$I_D=50mA$, $V_{GS}=2.5V$	—	1.2	2	Ω
Input Capacitance		C_{iss}	$V_{DS}=3V$, $V_{GS}=0$, f=1MHz	—	70	—	pF
Reverse Transfer Capacitance		C_{rss}	$V_{DS}=3V$, $V_{GS}=0$, f=1MHz	—	23	—	pF
Output Capacitance		C_{oss}	$V_{DS}=3V$, $V_{GS}=0$, f=1MHz	—	58	—	pF
Switching Time	Turn-on Time	t_{on}	$V_{DD}=3V$, $I_D=10mA$ $V_{GS}=0\sim2.5V$	—	0.06	—	μs
	Turn-off Time	t_{off}	$V_{DD}=3V$, $I_D=10mA$ VGS=0~2.5V	—	0.12	—	μs

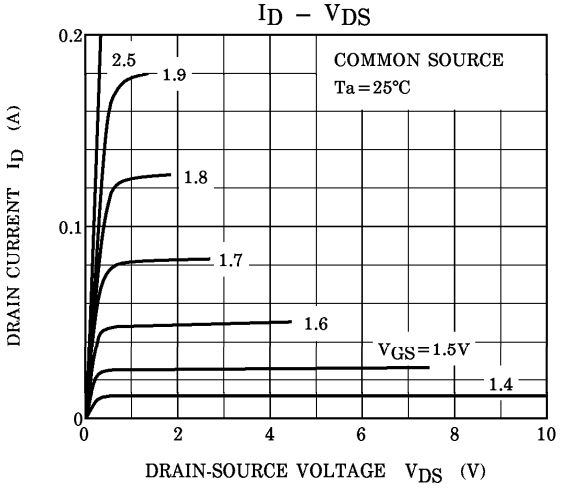
SWITCHING TIME TEST CIRCUIT



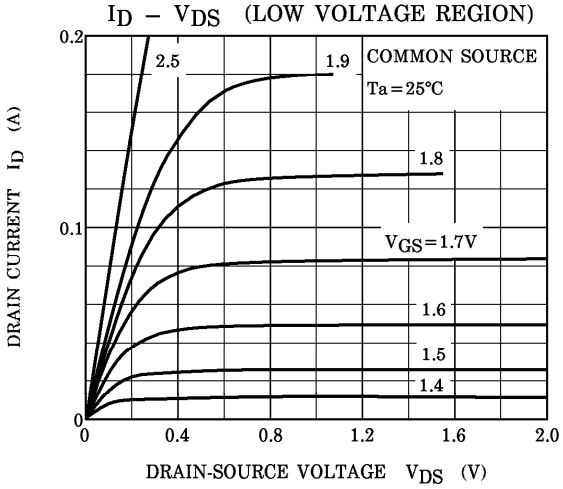
$V_{DD}=3V$
D.U.≦1%
V_{IN} : t_r, $t_f<5ns$
($Z_{out}=50\Omega$)
COMMON SOURCE
Ta=25°C



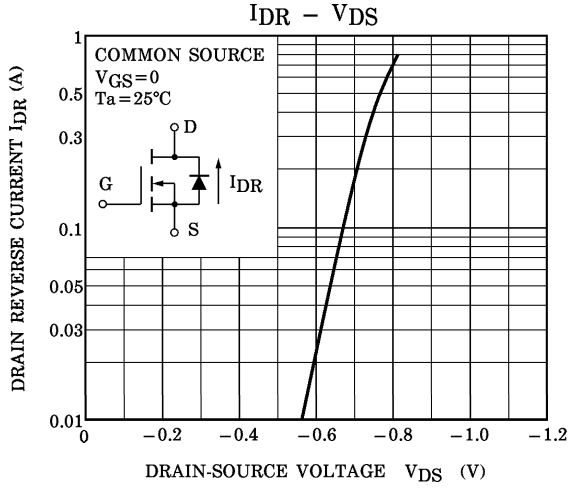
$I_D - V_{DS}$



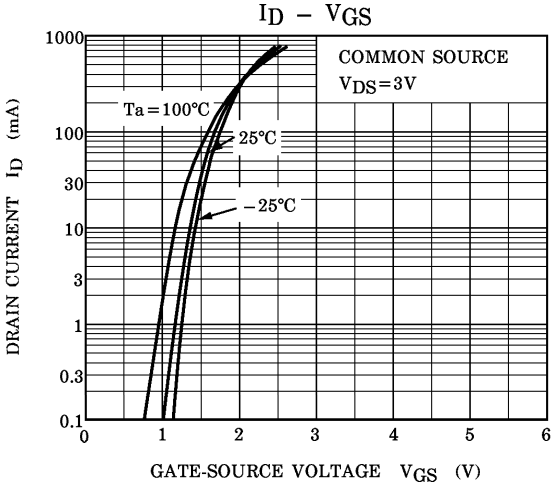
$I_D - V_{DS}$ (LOW VOLTAGE REGION)



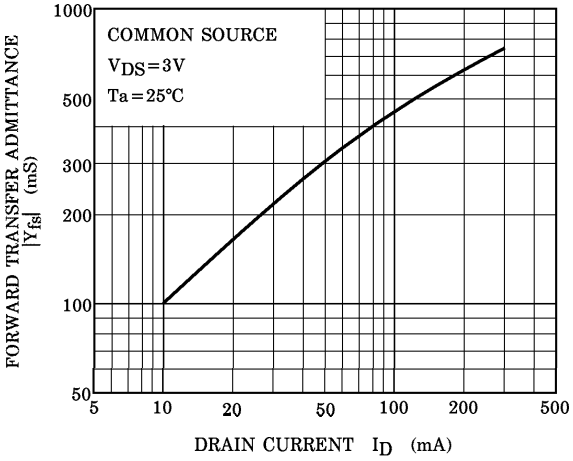
$I_{DR} - V_{DS}$



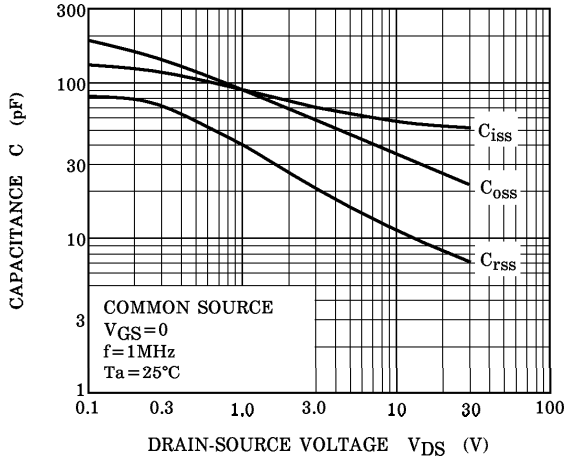
$I_D - V_{GS}$



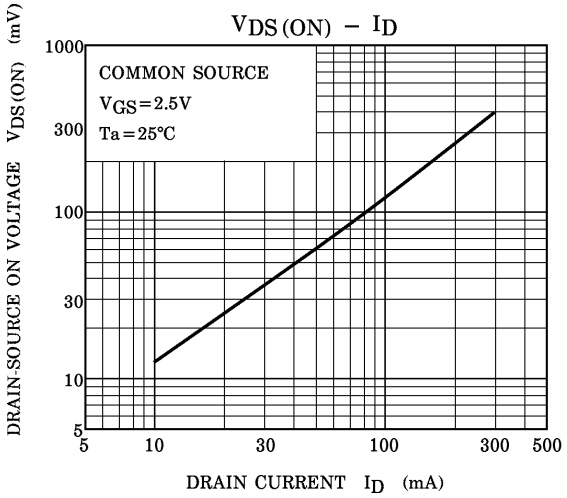
$|Y_{fs}| - I_D$



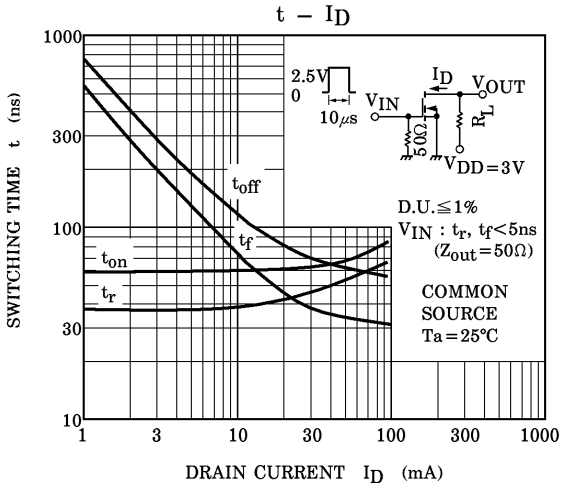
$C - V_{DS}$



$V_{DS\,(ON)}$ – I_D



t – I_D



P_D – Ta