

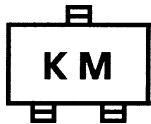
TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

2SK2009

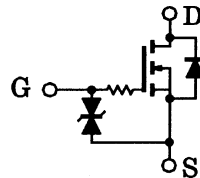
High Speed Switching Applications
Analog Switch Applications

- High input impedance.
- Low gate threshold voltage: $V_{th} = 0.5 \sim 1.5$ V
- 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

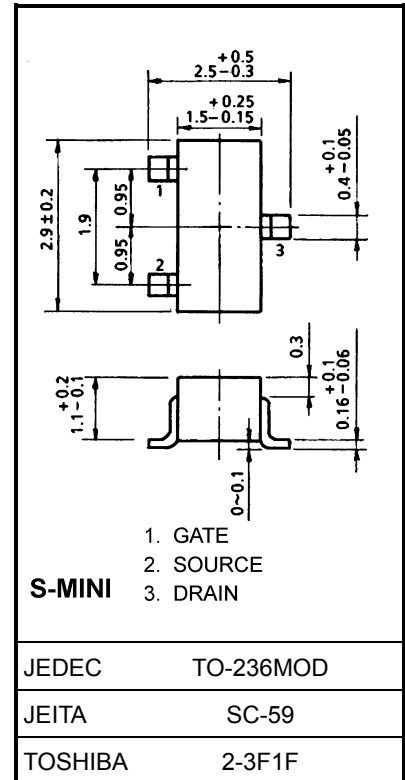
Marking



Equivalent Circuit



Unit: mm



Weight: 0.012 g (typ.)

Maximum Ratings ($T_a = 25^\circ C$)

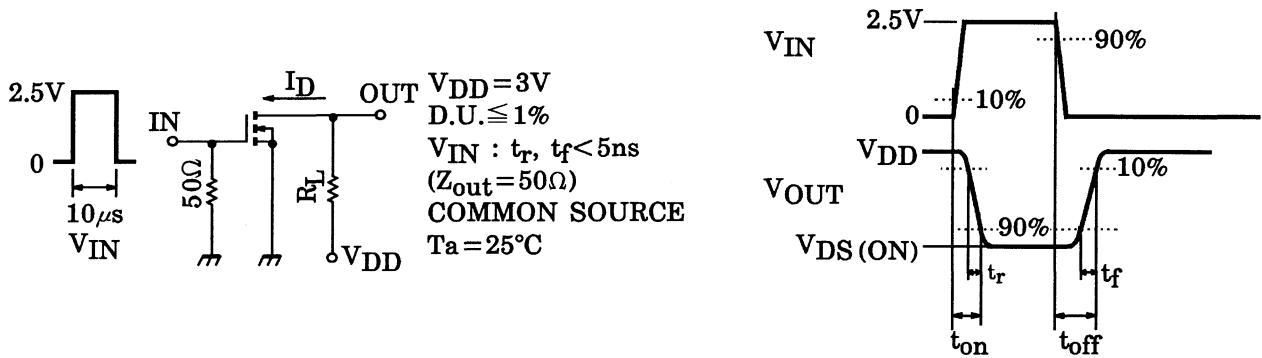
Characteristics	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	30	V
Gate-source voltage	V_{GSS}	± 20	V
DC drain current	I_D	200	mA
Drain power dissipation	P_D	200	mW
Channel temperature	T_{ch}	150	$^\circ C$
Storage temperature range	T_{stg}	$-55 \sim 150$	$^\circ C$

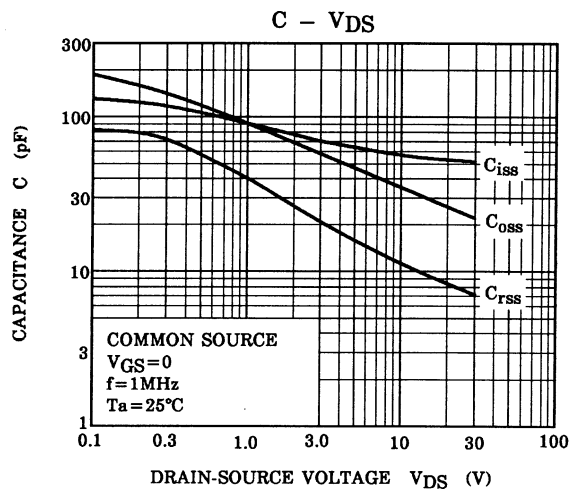
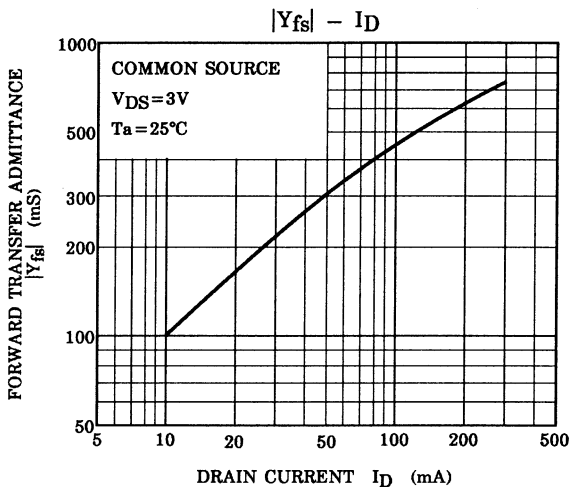
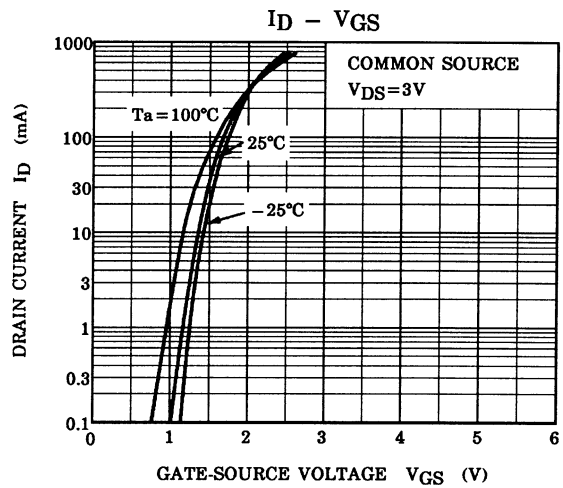
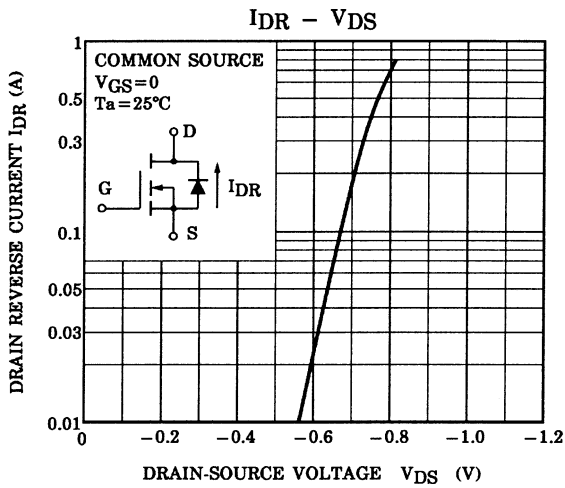
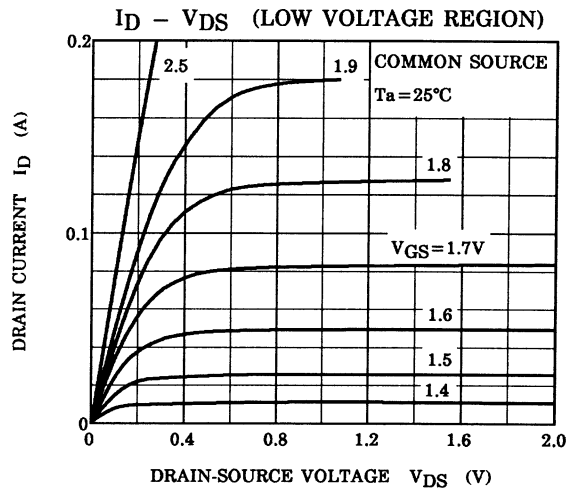
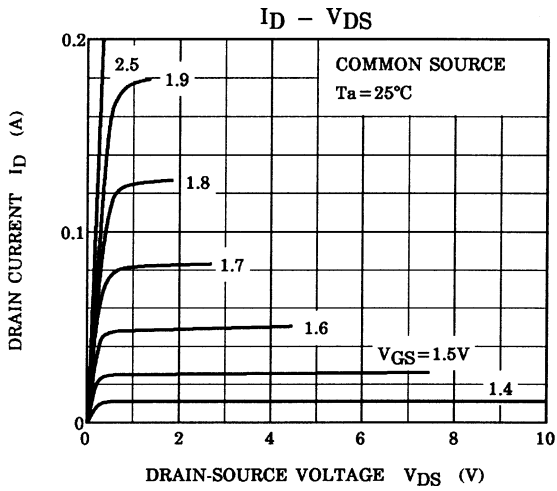
Note: This transistor is electrostatic sensitive device. Please handle with caution.

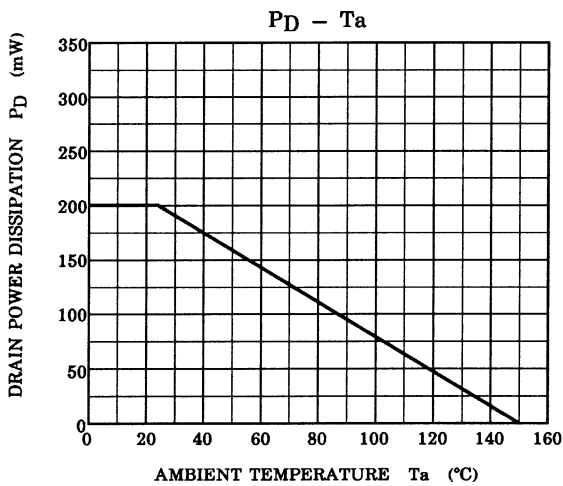
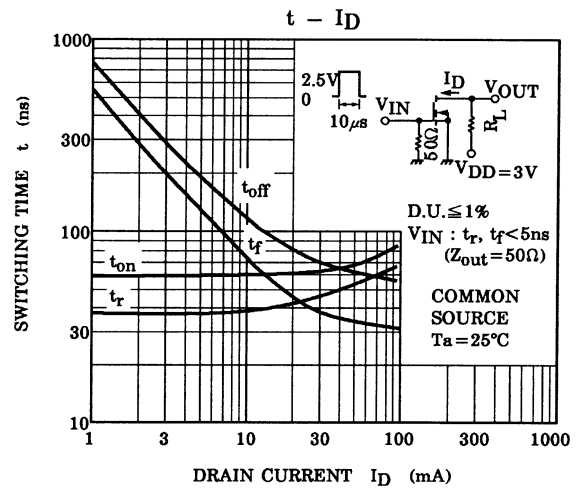
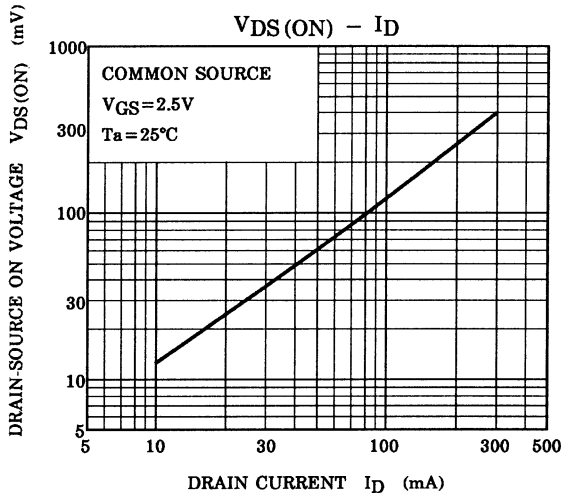
Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	I_{GSS}	$V_{GS} = \pm 10\text{ V}, V_{DS} = 0$	—	—	± 0.1	μA	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 1\text{ mA}, V_{GS} = 0$	30	—	—	V	
Drain cut-off current	I_{DSS}	$V_{DS} = 30\text{ V}, V_{GS} = 0$	—	—	10	μA	
Gate threshold voltage	V_{th}	$V_{DS} = 3\text{ V}, I_D = 0.1\text{ mA}$	0.5	—	1.5	V	
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 3\text{ V}, I_D = 50\text{ mA}$	100	—	—	mS	
Drain-source ON resistance	$R_{DS(ON)}$	$I_D = 50\text{ mA}, V_{GS} = 2.5\text{ V}$	—	1.2	2	Ω	
Input capacitance	C_{iss}	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	70	—	pF	
Reverse transfer capacitance	C_{rss}	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	23	—	pF	
Output capacitance	C_{oss}	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	58	—	pF	
Switching time	Turn-on time	t_{on}	$V_{DD} = 3\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0 \sim 2.5\text{ V}$	—	0.06	—	μs
	Turn-off time	t_{off}	$V_{DD} = 3\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0 \sim 2.5\text{ V}$	—	0.12	—	

Switching Time Test Circuit







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