

# 2SJ168

High Speed Switching Applications

Analog Switch Applications

Interface Applications

- Excellent switching time:  $t_{on} = 14 \text{ ns}$  (typ.)
- High forward transfer admittance:  $|Y_{fs}| = 100 \text{ mS}$  (min)  
@  $I_D = -50 \text{ mA}$
- Low on resistance:  $R_{DS(ON)} = 1.3 \Omega$  (typ.) @  $I_D = -50 \text{ mA}$
- Enhancement-mode
- Complementary to 2SK1062

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

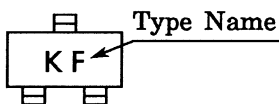
Characteristics	Symbol	Rating	Unit
Drain-source voltage	$V_{DSS}$	-60	V
Gate-source voltage	$V_{GSS}$	$\pm 20$	V
Drain current	DC	$I_D$	-200
	Pulse	$I_{DP}$	-800
Drain power dissipation ( $T_a = 25^\circ\text{C}$ )	$P_D$	200	mW
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature range	$T_{stg}$	-55 to 150	$^\circ\text{C}$

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.

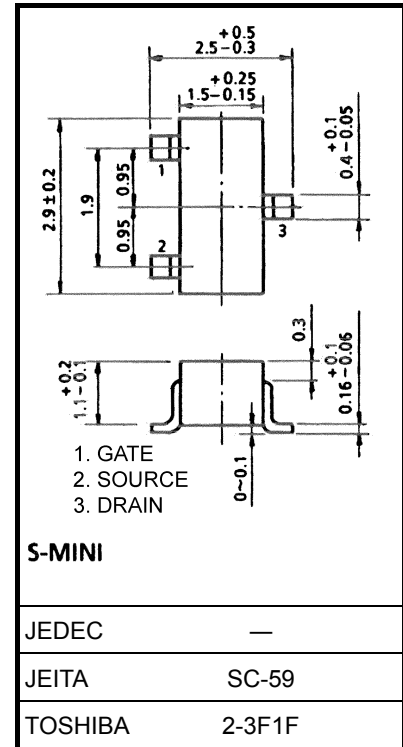
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

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

### Marking



Unit: mm

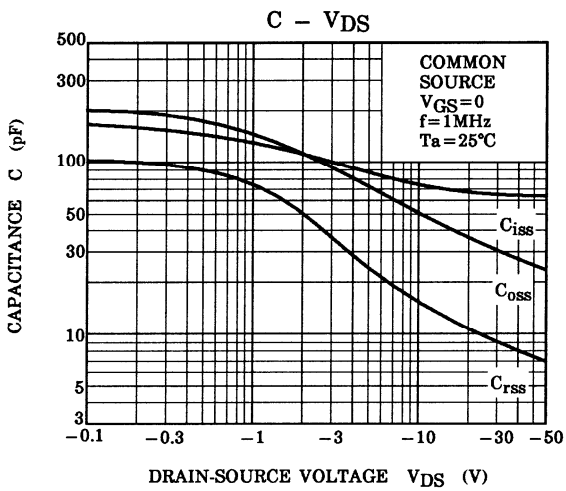
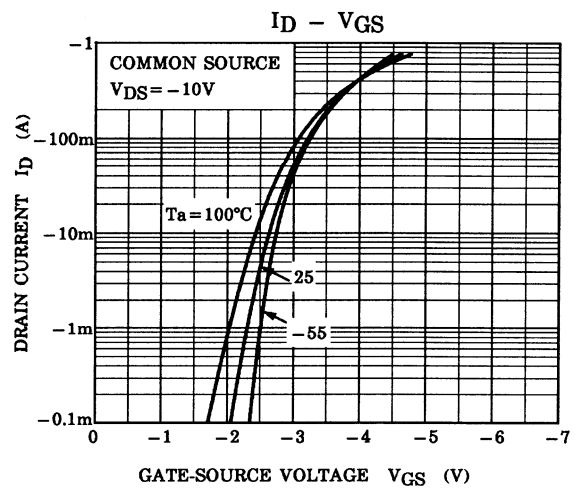
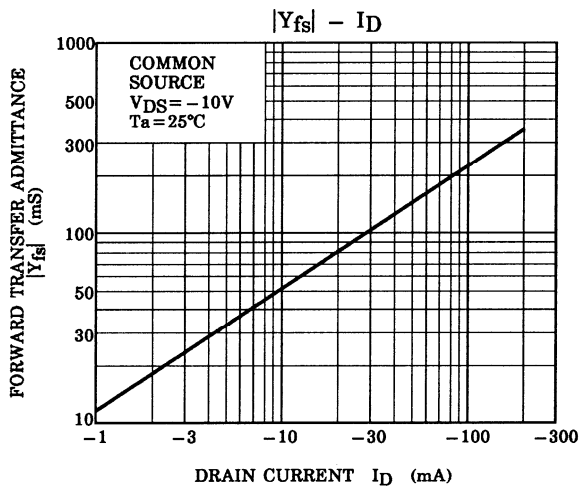
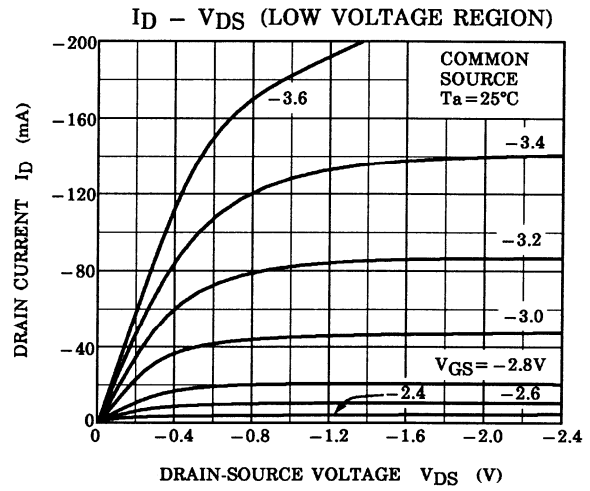
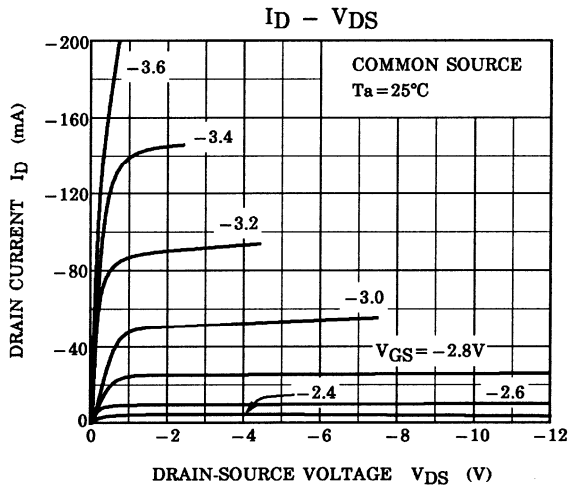


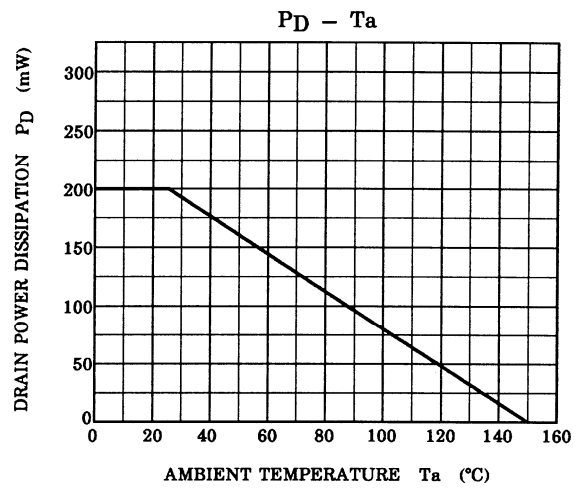
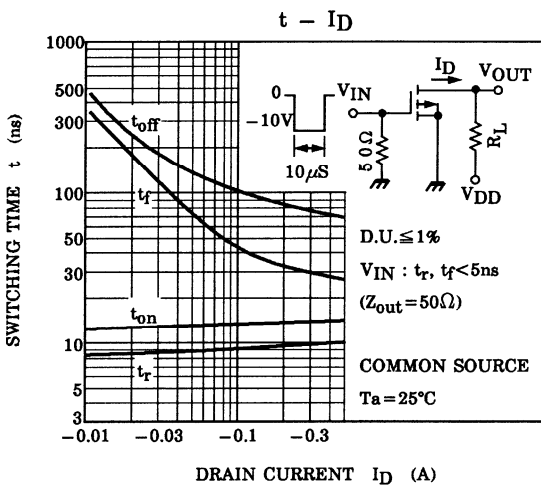
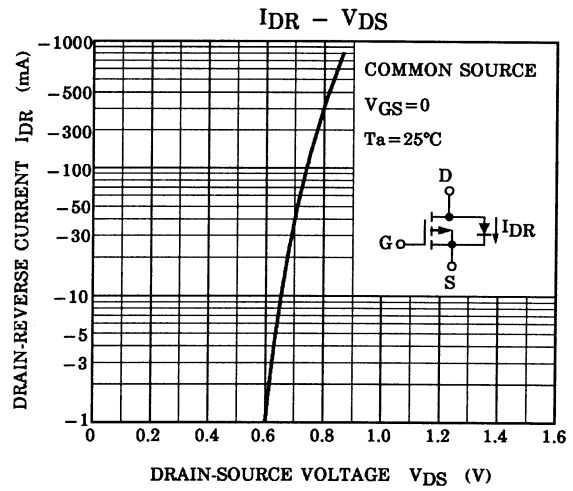
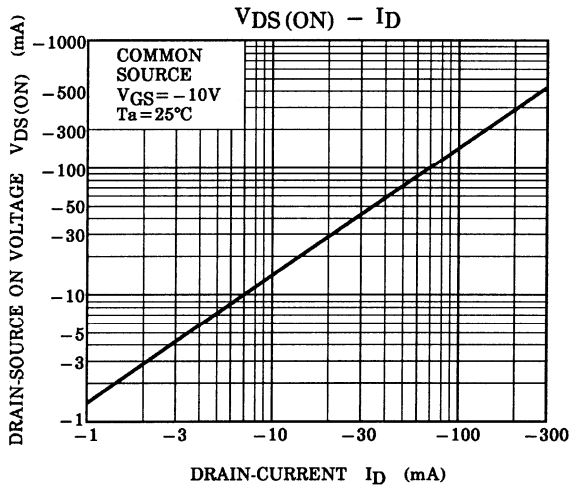
Weight: 0.012 g (typ.)

Start of commercial production  
1988-06

## Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		$I_{GSS}$	$V_{GS} = \pm 10\text{ V}, V_{DS} = 0$	—	—	$\pm 100$	nA
Drain cut-off current		$I_{DSS}$	$V_{DS} = -60\text{ V}, V_{GS} = 0$	—	—	-10	$\mu\text{A}$
Drain-source breakdown voltage		$V_{(BR)DSS}$	$I_D = -1\text{ mA}, V_{GS} = 0$	-60	—	—	V
Gate threshold voltage		$V_{th}$	$V_{DS} = -10\text{ V}, I_D = -1\text{ mA}$	-2	—	-3.5	V
Forward transfer admittance		$ Y_{fs} $	$V_{DS} = -10\text{ V}, I_D = -50\text{ mA}$	100	—	—	mS
Drain-source ON resistance		$R_{DS(ON)}$	$I_D = -50\text{ mA}, V_{GS} = -10\text{ V}$	—	1.3	2.0	$\Omega$
Drain-source ON voltage		$V_{DS(ON)}$	$I_D = -50\text{ mA}, V_{GS} = -10\text{ V}$	—	-65	-100	mV
Input capacitance		$C_{iss}$	$V_{DS} = -10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	73	85	pF
Reverse transfer capacitance		$C_{rss}$	$V_{DS} = -10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	15	22	pF
Output capacitance		$C_{oss}$	$V_{DS} = -10\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	48	60	pF
Switching time	Rise time	$t_r$	<p> <math>I_D = -100\text{ mA}</math>  <math>V_{IN}</math>  <math>V_{OUT}</math>  <math>V_{DD} = -30\text{ V}</math>  <math>10\mu\text{s}</math>  <math>50\Omega</math> </p>	—	8	—	ns
	Turn-on time	$t_{on}$		—	14	—	
	Fall time	$t_f$		—	35	—	
	Turn-off Time	$t_{off}$		$V_{IN}: t_r, t_f < 5\text{ ns}$ $D.U. \leq 1\% (Z_{out} = 50\ \Omega)$	—	100	





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