

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

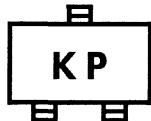
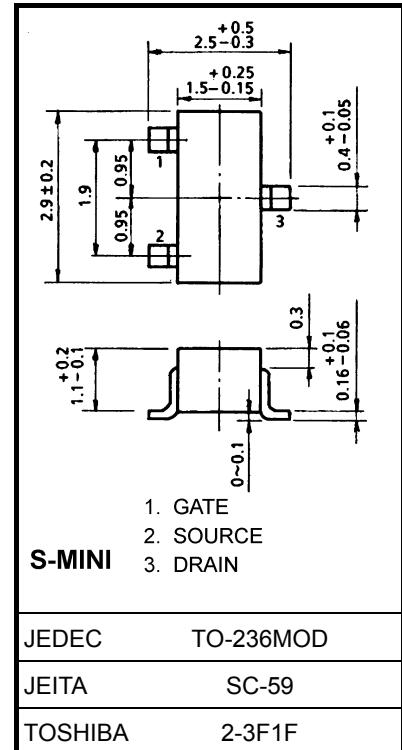
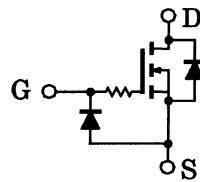
2SK2033

High Speed Switching Applications

Analog Switch Applications

Unit: mm

- High input impedance
- Low gate threshold voltage: $V_{th} = 0.5$ to 1.5 V
- Excellent switching times: $t_{on} = 0.16$ μ s (typ.)
 $t_{off} = 0.15$ μ s (typ.)
- Small package
- Enhancement-mode

Marking**Equivalent Circuit**

Weight: 0.012 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	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 to 150	°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.).

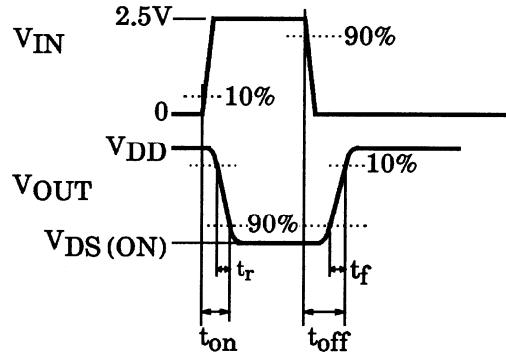
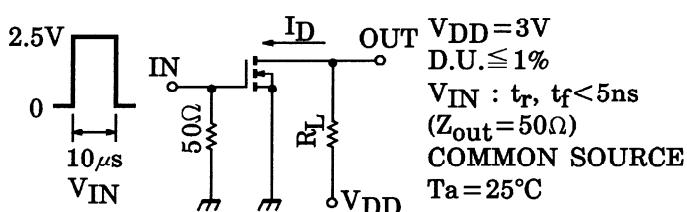
Note: This transistor is electrostatic sensitive device. Please handle with caution.

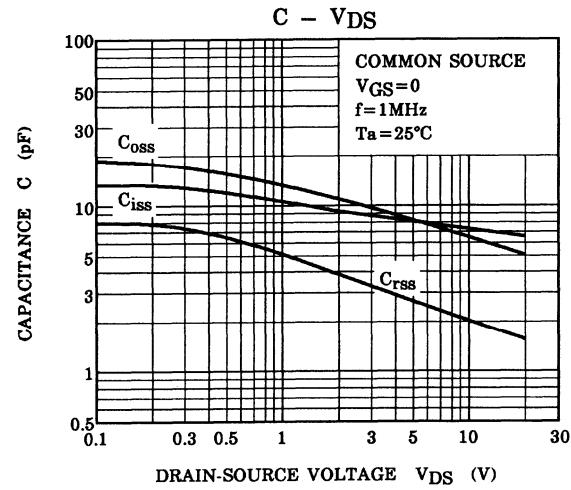
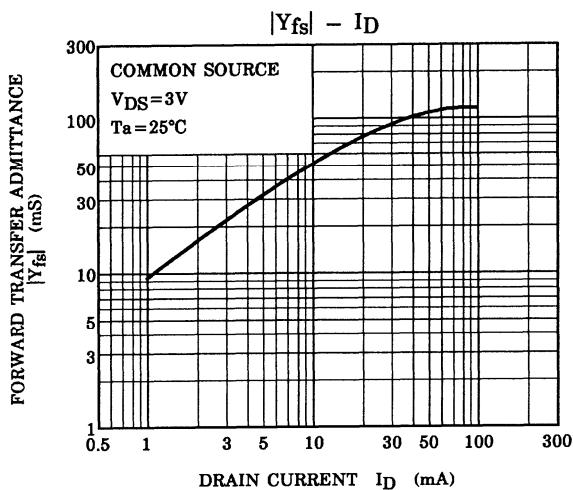
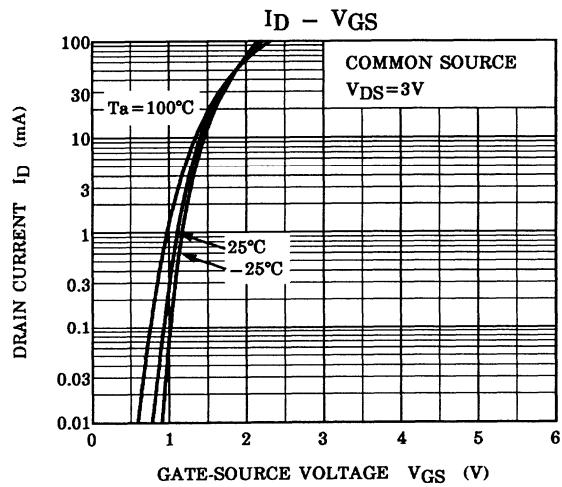
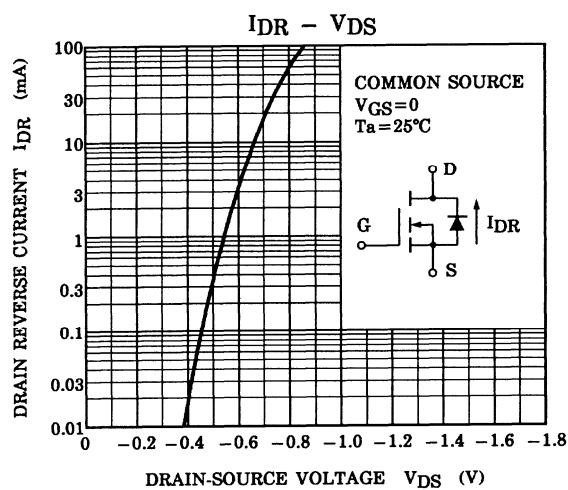
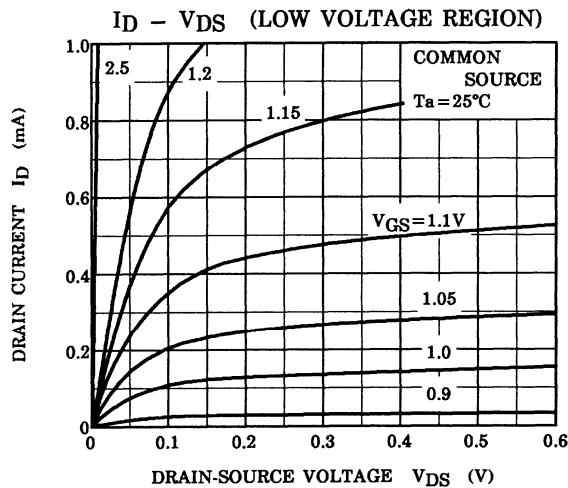
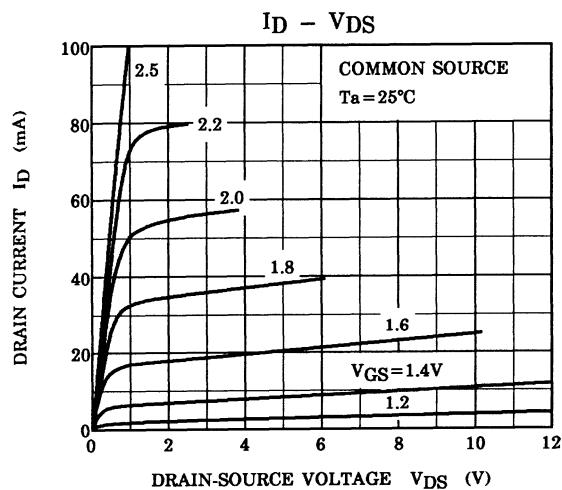
Start of commercial production
1992-05

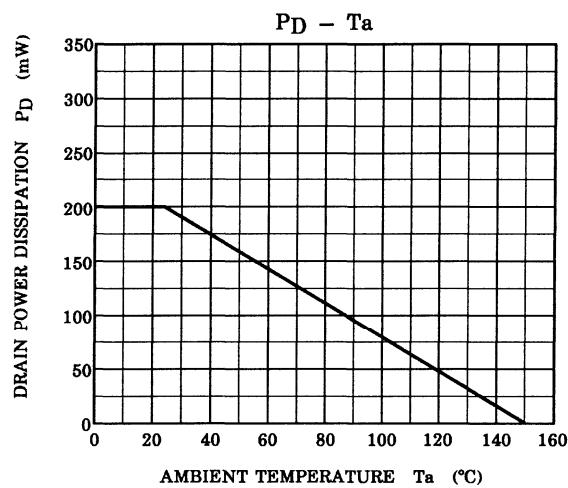
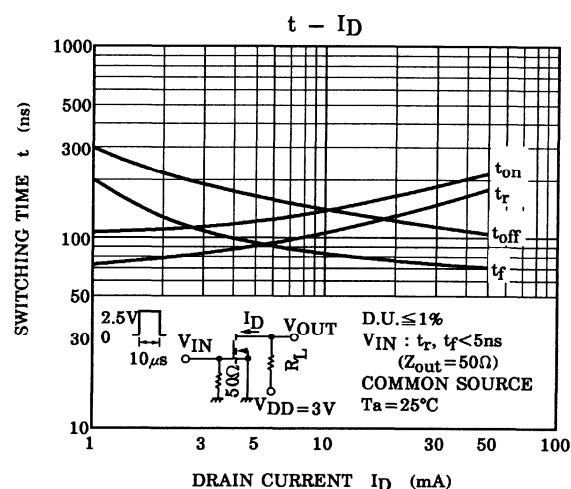
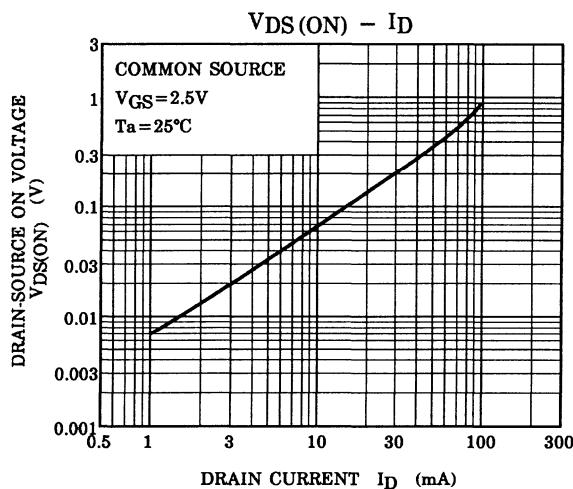
Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GSS}	$V_{GS} = 10\text{ V}, V_{DS} = 0$	—	—	1	μA
Drain-source breakdown voltage	$V_{(\text{BR})\text{DSS}}$	$I_D = 100\text{ }\mu\text{A}, V_{GS} = 0$	20	—	—	V
Drain cut-off current	I_{DSS}	$V_{DS} = 20\text{ V}, V_{GS} = 0$	—	—	1	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} $	$V_{DS} = 3\text{ V}, I_D = 10\text{ mA}$	25	50	—	mS
Drain-source ON resistance	$R_{DS\text{ (ON)}}$	$I_D = 10\text{ mA}, V_{GS} = 2.5\text{ V}$	—	8	12	Ω
Input capacitance	C_{iss}	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	8.5	—	pF
Reverse transfer capacitance	C_{rss}	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	3.3	—	pF
Output capacitance	C_{oss}	$V_{DS} = 3\text{ V}, V_{GS} = 0, f = 1\text{ MHz}$	—	9.3	—	pF
Switching time	Turn-on time	t_{on}	$V_{DD} = 3\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0\text{ to }2.5\text{ V}$	—	0.16	—
	Turn-off time	t_{off}	$V_{DD} = 3\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0\text{ to }2.5\text{ V}$	—	0.15	—

Switching Time Test Circuit







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