

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

SSM3K15F

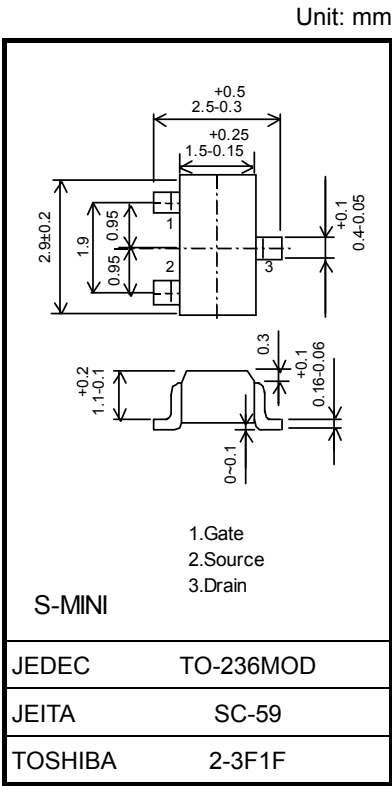
High Speed Switching Applications
Analog Switch Applications

- Small package
- Low on resistance
 - : $R_{on} = 4.0\ \Omega$ (max) (@ $V_{GS} = 4\text{ V}$)
 - : $R_{on} = 7.0\ \Omega$ (max) (@ $V_{GS} = 2.5\text{ V}$)

Absolute Maximum Ratings (Ta = 25°C)

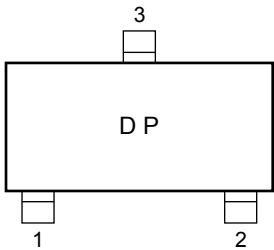
Characteristics		Symbol	Rating	Unit
Drain-source voltage		V_{DS}	30	V
Gate-source voltage		V_{GSS}	± 20	V
Drain current	DC	I_D	100	mA
	Pulse	I_{DP}	200	
Drain power dissipation (Ta = 25°C)		P_D	200	mW
Channel temperature		T_{ch}	150	°C
Storage temperature		T_{stg}	-55 to 150	°C

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).

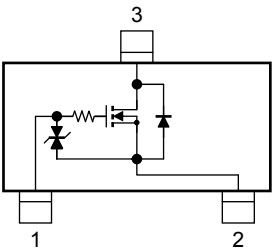


Weight: 0.012 g (typ.)

Marking



Equivalent Circuit



Handling Precaution

When handling individual devices (which are not yet mounting on a circuit board), be sure that the environment is protected against electrostatic electricity. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static materials.

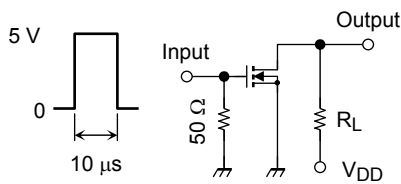
Start of commercial production
2001-02

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current		IGSS	VGS = ±16 V, VDS = 0	—	—	±1	μA
Drain-source breakdown voltage		V(BR) DSS	ID = 0.1 mA, VGS = 0	30	—	—	V
Drain cut-off current		IDSS	VDS = 30 V, VGS = 0	—	—	1	μA
Gate threshold voltage		Vth	VDS = 3 V, ID = 0.1 mA	0.8	—	1.5	V
Forward transfer admittance		Yfs	VDS = 3 V, ID = 10 mA	25	—	—	mS
Drain-source ON resistance		RDS (ON)	ID = 10 mA, VGS = 4 V	—	2.2	4.0	Ω
			ID = 10 mA, VGS = 2.5 V	—	4.0	7.0	
Input capacitance		Ciss	VDS = 3 V, VGS = 0, f = 1 MHz	—	7.8	—	pF
Reverse transfer capacitance		Crss	VDS = 3 V, VGS = 0, f = 1 MHz	—	3.6	—	pF
Output capacitance		Coss	VDS = 3 V, VGS = 0, f = 1 MHz	—	8.8	—	pF
Switching time	Turn-on time	ton	VDD = 5 V, ID = 10 mA, VGS = 0 to 5 V	—	50	—	ns
	Turn-off time	toff		—	180	—	

Switching Time Test Circuit

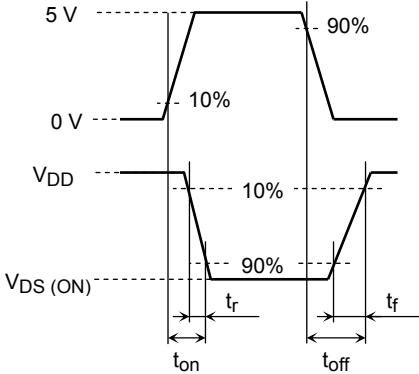
(a) Test circuit



VDD = 5 V
D.U. ≤ 1%
Input: tr, tf < 5 ns
(Zout = 50 Ω)
Common Source
Ta = 25°C

(b) VIN

(c) VOUT

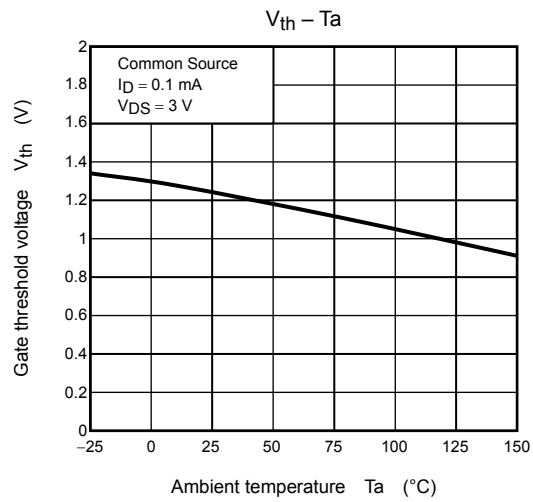
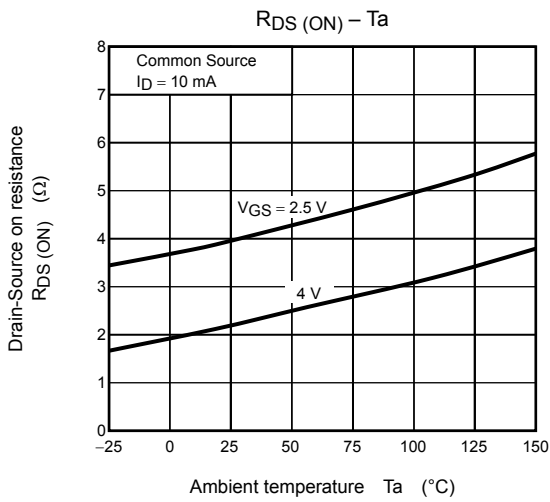
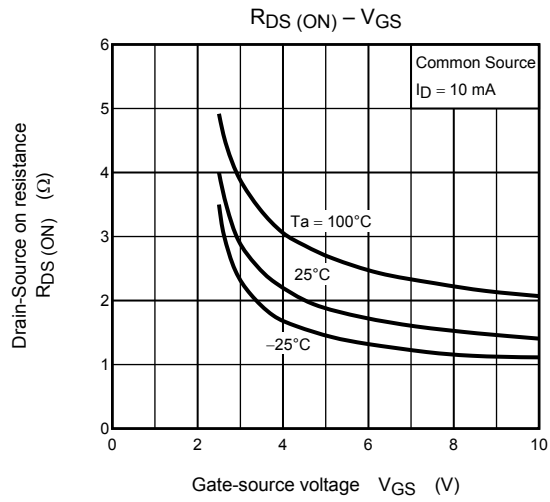
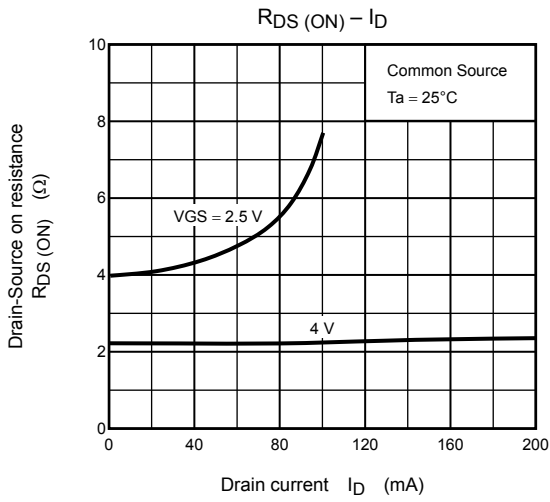
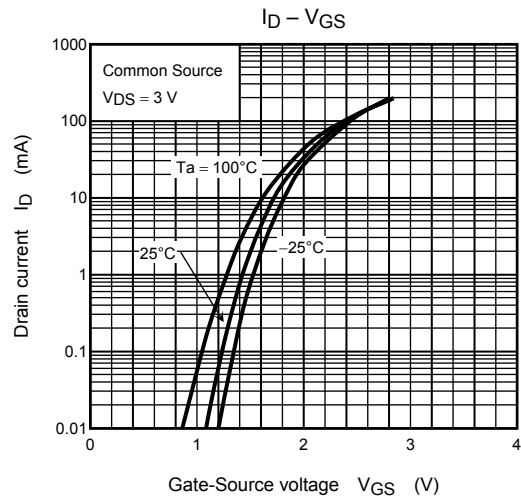
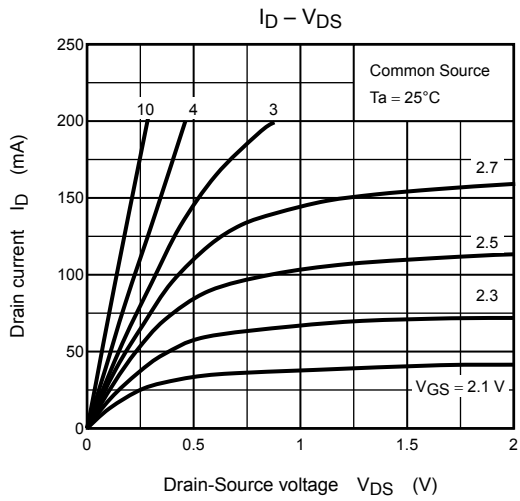


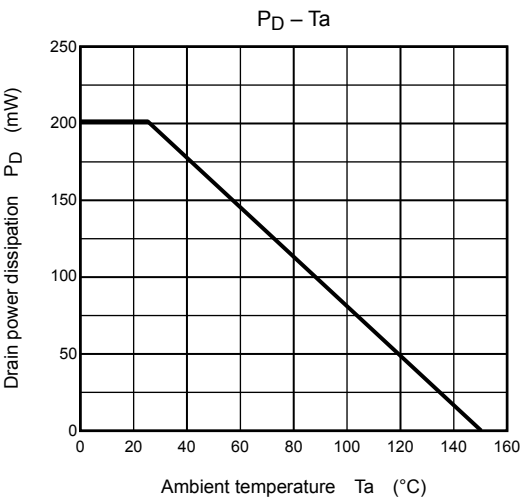
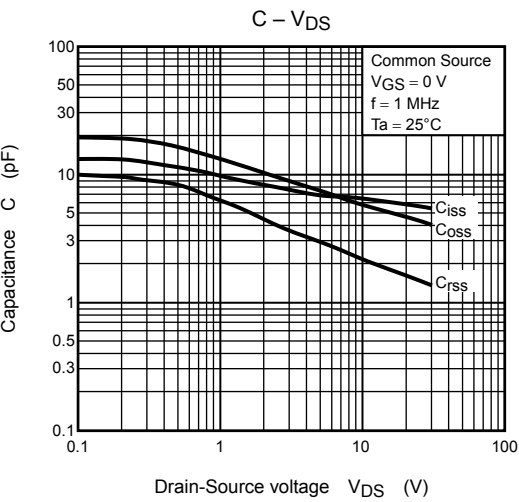
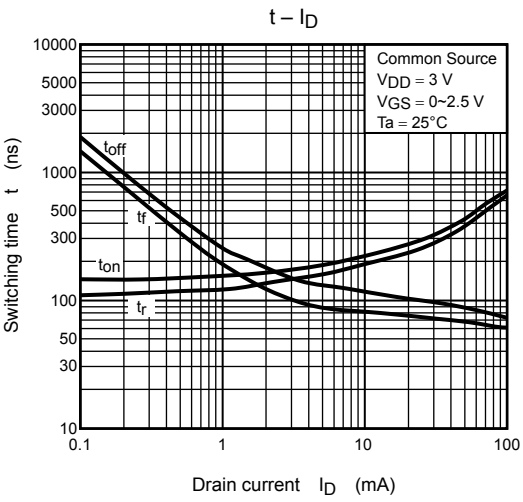
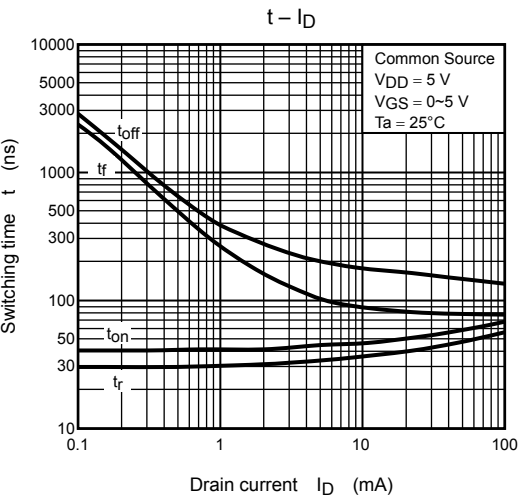
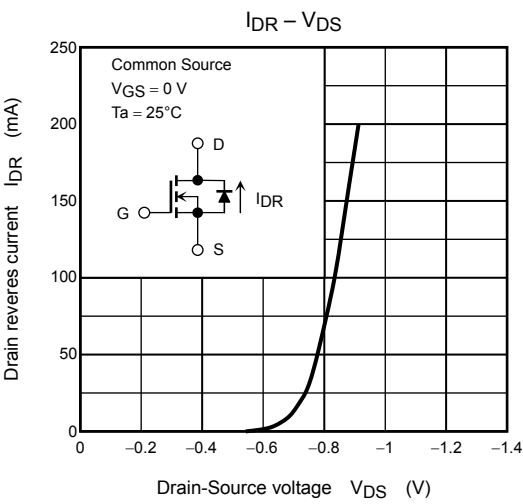
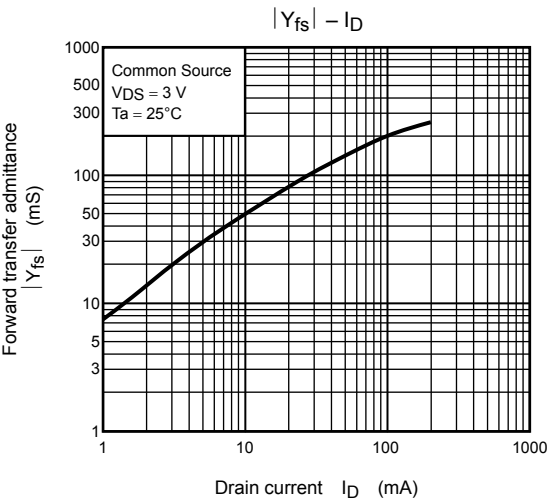
Precaution

Vth can be expressed as voltage between gate and source when low operating current value is ID = 100 μA for this product. For normal switching operation, VGS (on) requires higher voltage than Vth and VGS (off) requires lower voltage than Vth.

(relationship can be established as follows: VGS (off) < Vth < VGS (on))

Please take this into consideration for using the device.





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