TOSHIBA Field Effect Transistor Silicon N-Channel MOS Type

SSM3K16CT

High-Speed Switching Applications Analog Switch Applications

• Suitable for high-density mounting due to compact package

• Low ON-resistance : $R_{on} = 3.0 \Omega \text{ (max)} (@V_{GS} = 4 \text{ V})$

: $R_{on} = 4.0 \Omega (max) (@V_{GS} = 2.5 V)$

: $R_{on} = 15 \Omega (max) (@V_{GS} = 1.5 V)$

Absolute Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit	
Drain-Source voltage		V_{DS}	20	V	
Gate-Source voltage		V_{GSS}	±10	V	
Drain current	DC	I _D	100	mA	
	Pulse	I _{DP}	200		
Drain power dissipation (Ta = 25°C)		P _D (Note 1)	100	mW	
Channel temperature		T _{ch}	150	°C	
Storage temperature		T _{stg}	–55 to 150	°C	

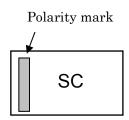
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

Please design the appropriate reliability upon reviewing the

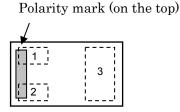
Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Mounted on FR4 board (10 mm \times 10 mm \times 1.0 t, Cu Pad: 100 mm 2)

Pin Condition (Top View)



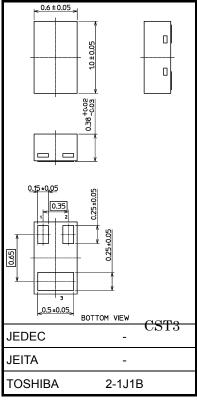
Marking (Top View)



- 1. Gate
- 2. Source
- 3. Drain

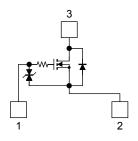
*Electrodes: on the bottom

Unit: mm



Weight: 0.75 mg (typ.)

Equivalent Circuit



Handling Precaution

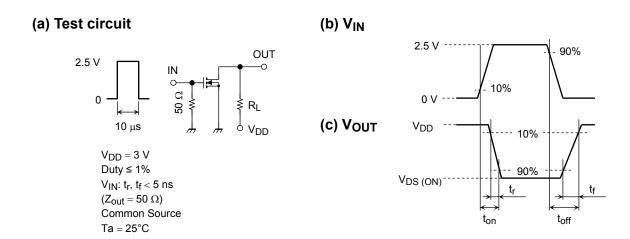
When handling individual devices that are not yet mounted on a circuit board, ensure that the environment is protected against electrostatic discharge. Operators should wear anti-static clothing, and containers and other objects that come into direct contact with devices should be made of anti-static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

Start of commercial production 2004-08

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Тур.	Max	Unit
Gate leakage current		I _{GSS}	$V_{GS} = \pm 10 \text{ V}, V_{DS} = 0$	_	_	±1	μА
Drain-Source breakdown voltage		V (BR) DSS	$I_D = 0.1 \text{ mA}, V_{GS} = 0$	20	_	_	V
Drain cut-off curre	ent	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0	_	_	1	μΑ
Gate threshold vo	Itage	V _{th}	$V_{DS} = 3 \text{ V}, I_{D} = 0.1 \text{ mA}$	0.6	_	1.1	V
Forward transfer a	admittance	Y _{fs}	V _{DS} = 3 V, I _D = 10 mA	40	_	_	mS
Drain-Source ON-resistance		R _{DS} (ON)	$I_D = 10$ mA, $V_{GS} = 4$ V	_	1.5	3.0	Ω
			$I_D = 10 \text{ mA}, V_{GS} = 2.5 \text{ V}$	_	2.2	4.0	
			I _D = 1 mA, V _{GS} = 1.5 V	_	5.2	15	
Input capacitance		C _{iss}	$V_{DS} = 3 V$, $V_{GS} = 0$, $f = 1 MHz$	_	9.3	_	pF
Reverse transfer capacitance		C _{rss}	$V_{DS} = 3 V$, $V_{GS} = 0$, $f = 1 MHz$	_	4.5	_	pF
Output capacitance		Coss	$V_{DS} = 3 V$, $V_{GS} = 0$, $f = 1 MHz$	_	9.8	_	pF
Switching time	Turn-on time	t _{on}	$V_{DD} = 3 \text{ V}, I_D = 10 \text{ mA},$ $V_{GS} = 0 \text{ to } 2.5 \text{ V}$	_	70	_	ns
	Turn-off time	t _{off}			125	_	

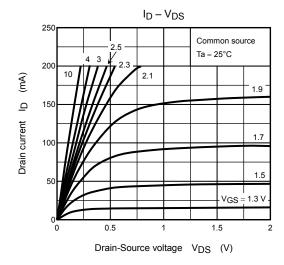
Switching Time Test Circuit

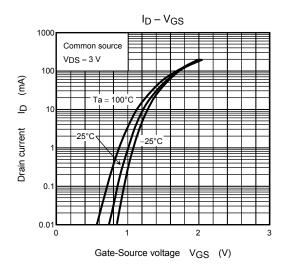


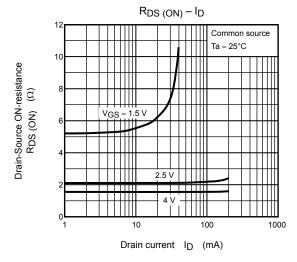
Precaution

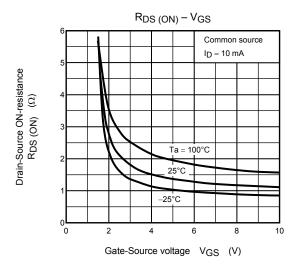
 V_{th} can be expressed as the voltage between gate and source when the low operating current value is I_D = 100 μ A for this product. For normal switching operation, $V_{GS\ (on)}$ requires a higher voltage than V_{th} and $V_{GS\ (off)}$ requires a lower voltage than V_{th} . (The relationship can be established as follows: $V_{GS\ (off)} < V_{th} < V_{GS\ (on)}$.)

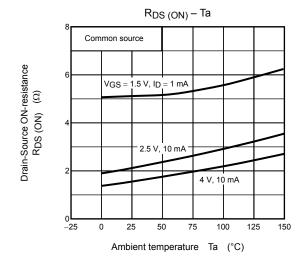
Take this into consideration when using the device.

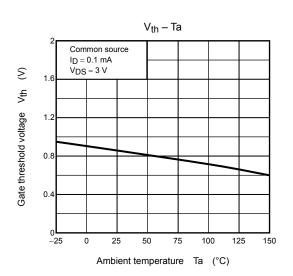


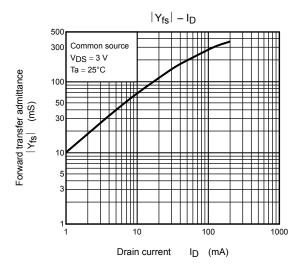


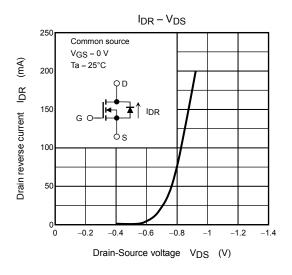


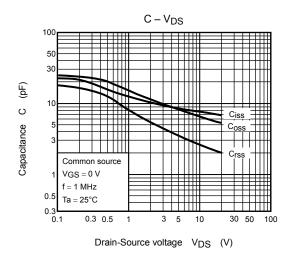


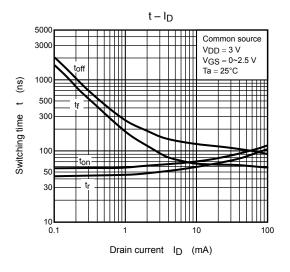


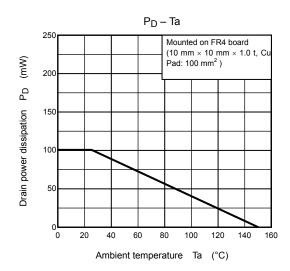












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