TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

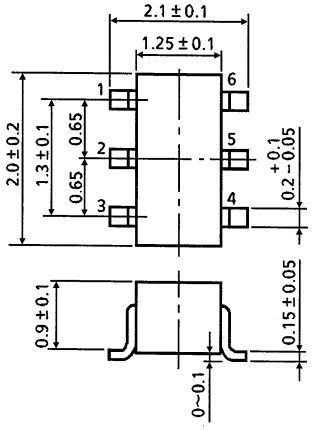
HN1K03FU

High Speed Switching Applications

Analog Switch Applications

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

Unit in mm



1. SOURCE 1
2. GATE 1
3. DRAIN 2
4. SOURCE 2
5. GATE 2
6. DRAIN 1

US6

JEDEC	—
JEITA	—
TOSHIBA	2-2J1C

Weight: 6.8 mg (typ.)

Absolute Maximum Ratings (Ta = 25°C) (Q1, Q2 Common)

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}	−55~150	°C

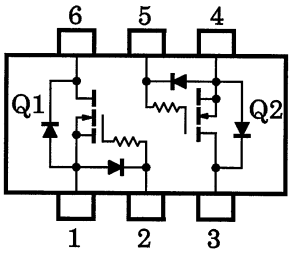
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

*: Total rating

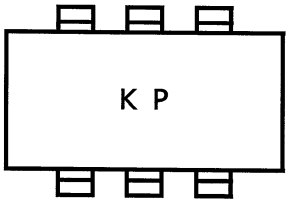
Electrical Characteristics (Ta = 25°C) (Q1, Q2 Common)

Characteristics		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Gate leakage current		I_{GSS}	V_{GS} = 10V, V_{DS} = 0	—	—	1	μA
Drain-Source breakdown voltage		$V_{(BR)\ DSS}$	I_D = 100μA, V_{GS} = 0	20	—	—	V
Drain cut-off current		I_{DSS}	V_{DS} = 20V, V_{GS} = 0	—	—	1	μA
Gate threshold voltage		V_{th}	V_{DS} = 3V, I_D = 0.1mA	0.5	—	1.5	V
Forward transfer admittance		$\|Y_{fs}\|$	V_{DS} = 3V, I_D = 10mA	25	50	—	mS
Drain-Source ON resistance		$R_{DS\ (ON)}$	I_D = 10mA, V_{GS} = 2.5V	—	8	12	Ω
Input capacitance		C_{iss}	V_{DS} = 3V, V_{GS} = 0, f = 1MHz	—	8.5	—	pF
Reverse transfer capacitance		C_{rss}	V_{DS} = 3V, V_{GS} = 0, f = 1MHz	—	3.3	—	pF
Output capacitance		C_{oss}	V_{DS} = 3V, V_{GS} = 0, f = 1MHz	—	9.3	—	pF
Switching time	Turn-on time	t_{on}	V_{DD} = 3V, I_D = 10mA, V_{GS} = 0~2.5V	—	0.16	—	μs
	Turn-off time	t_{off}	V_{DD} = 3V, I_D = 10mA, V_{GS} = 0~2.5V	—	0.15	—	μs

Equivalent Circuit (top view)

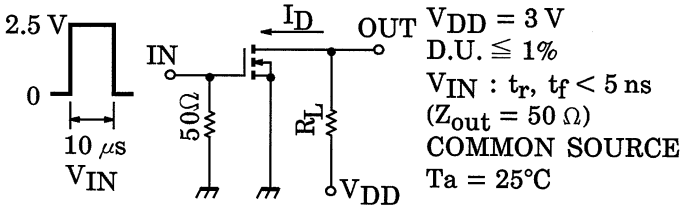


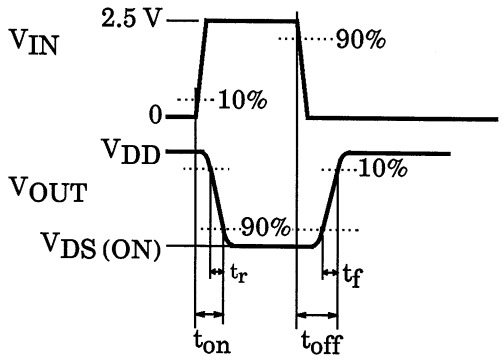
Marking

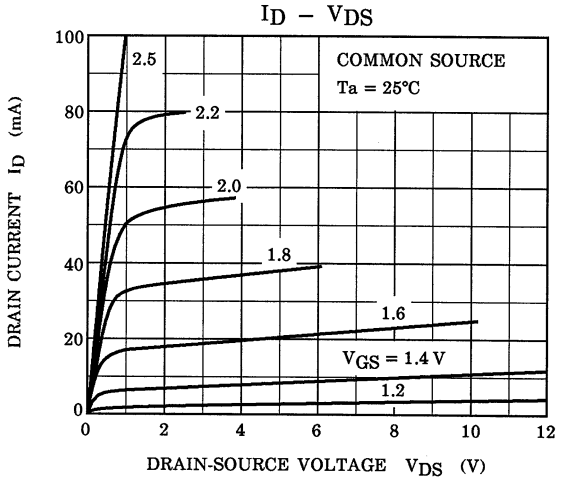


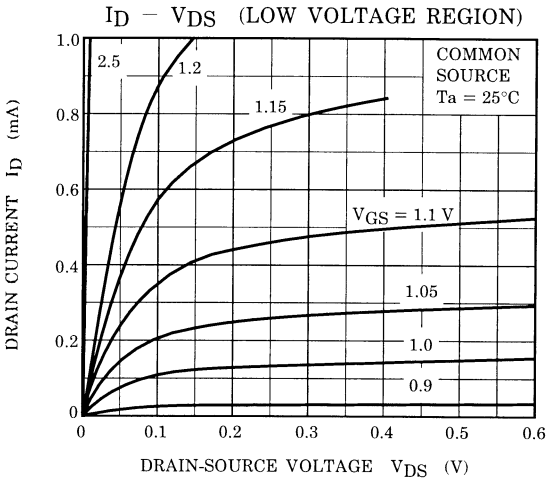
(Q1,Q2 Common)

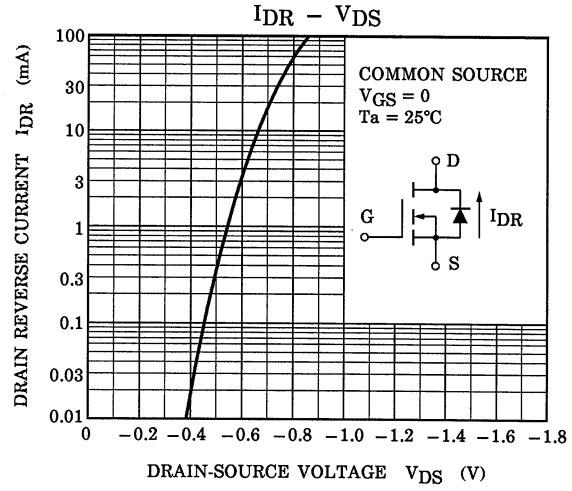
Switching Time Test Circuit

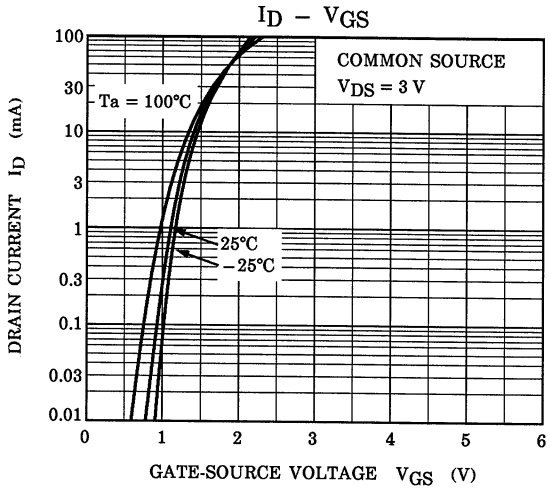






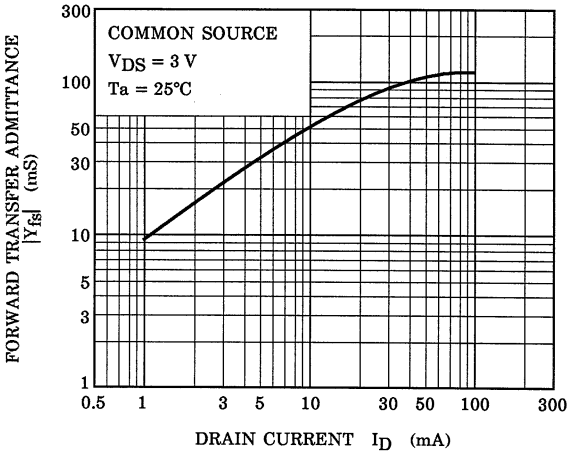




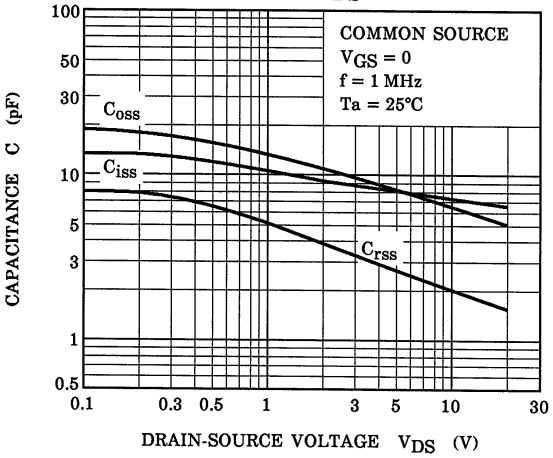


(Q1,Q2 Common)

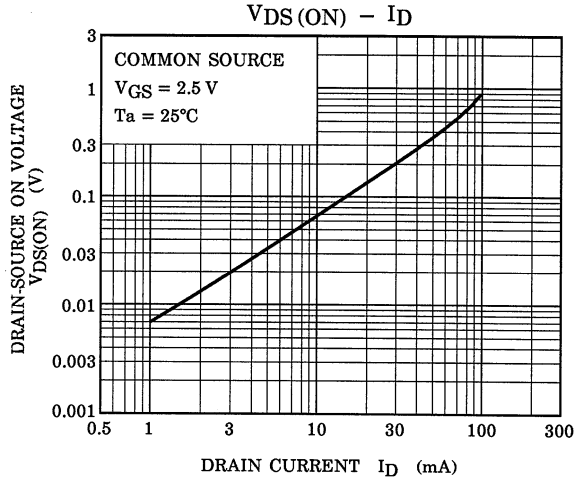
$|Y_{fs}|$ – I_D



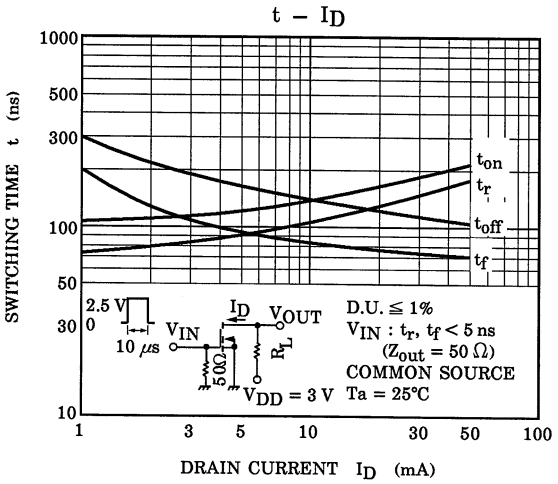
C – V_{DS}



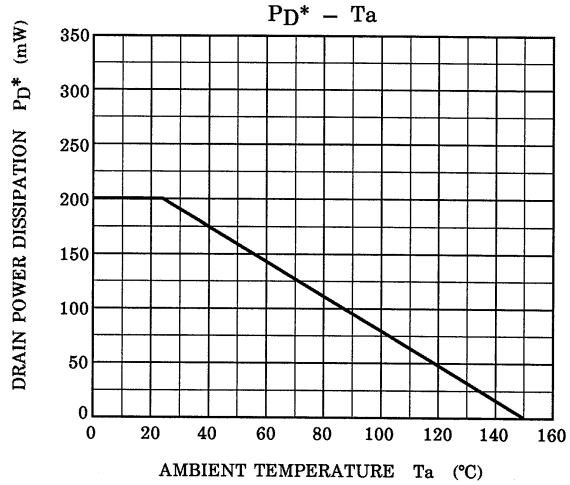
$V_{DS\,(ON)}$ – I_D



t – I_D



P_D* – Ta



* : Total Rating

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