

HN1K04FU

High Speed Switching Applications
 Analog Switch Applications

- High input impedance and extremely low drive current.
- V_{th} is low and it is possible to drive directly at low-voltage CMOS.
 : $V_{th} = 0.8$ to 2.5 V
- Switching speed is fast.
- Suitable for high-density mounting because of a compact package.

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$) (Q1, Q2 common)

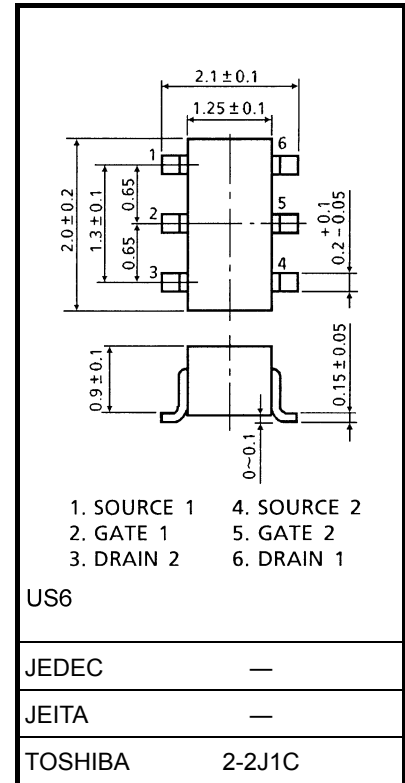
Characteristics	Symbol	Rating	Unit
Drain-source voltage	V_{DS}	50	V
Gate-source voltage	V_{GSS}	10	V
DC drain current	I_D	50	mA
Drain power dissipation	P_D (Note 1)	200	mW
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature range	T_{stg}	-55 to 150	$^\circ\text{C}$

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 1: TOTAL rating

Unit: mm

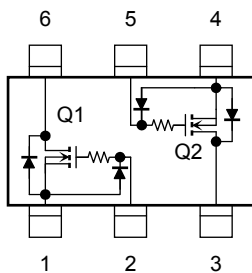


Weight: 6.8 mg

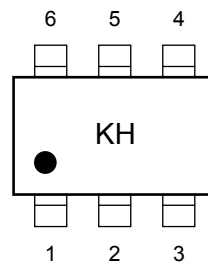
Electrical Characteristics (Ta = 25°C) (Q1, Q2 common)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	I_{GSS}	$V_{GS} = 10\text{ V}, V_{DS} = 0\text{ V}$	—	—	1	μA
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 100\ \mu\text{A}, V_{GS} = 0\text{ V}$	50	—	—	V
Drain cut-off current	I_{DSS}	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}$	—	—	1	μA
Gate threshold voltage	V_{th}	$V_{DS} = 5\text{ V}, I_D = 0.1\text{ mA}$	0.8	—	2.5	V
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 5\text{ V}, I_D = 10\text{ mA}$	20	—	—	mS
Drain-source ON resistance	$R_{DS(ON)}$	$I_D = 10\text{ mA}, V_{GS} = 4.0\text{ V}$	—	20	50	Ω
Input capacitance	C_{iss}	$V_{DS} = 5\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	6.3	—	pF
Reverse transfer capacitance	C_{rss}	$V_{DS} = 5\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	1.3	—	pF
Output capacitance	C_{oss}	$V_{DS} = 5\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	—	5.7	—	pF
Switching time	t_{on}	$V_{DD} = 5\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0\text{ to }4.0\text{ V}$	—	0.11	—	μs
	t_{off}	$V_{DD} = 5\text{ V}, I_D = 10\text{ mA}, V_{GS} = 0\text{ to }4.0\text{ V}$	—	0.15	—	

Equivalent Circuit (top view)



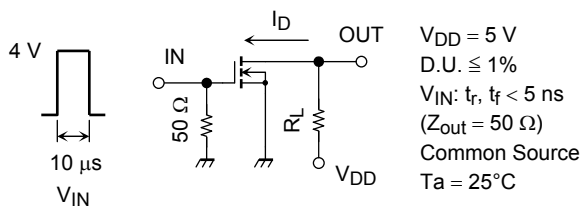
Marking



(Q1, Q2 common)

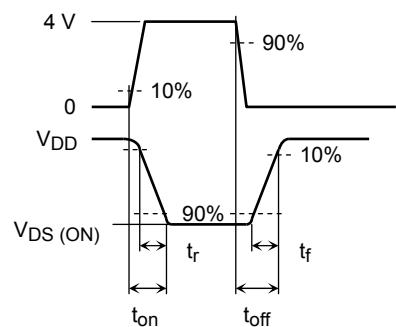
Switching Time Test Circuit

(a) Test circuit



(b) V_{IN}

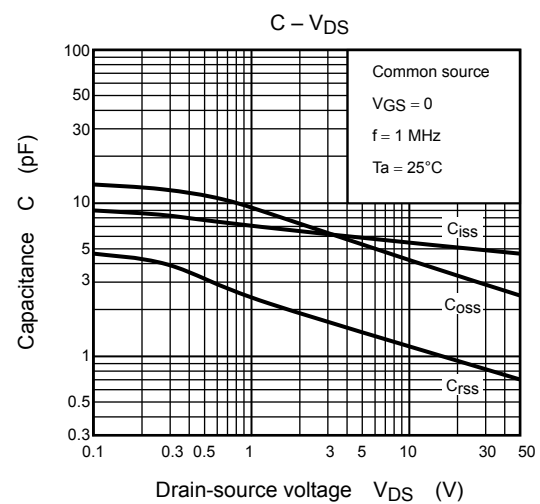
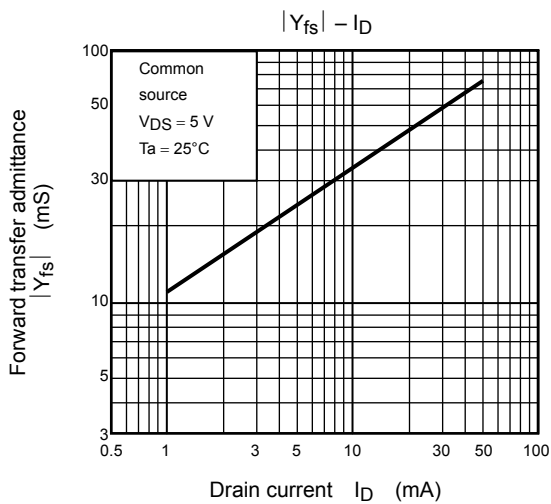
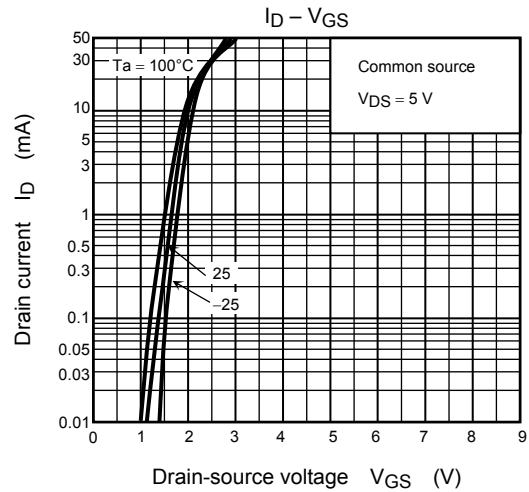
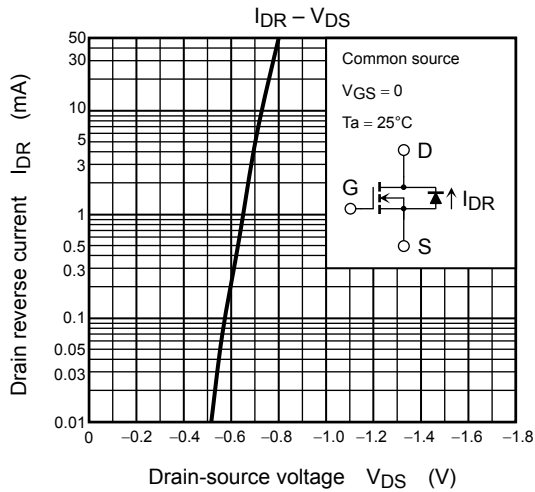
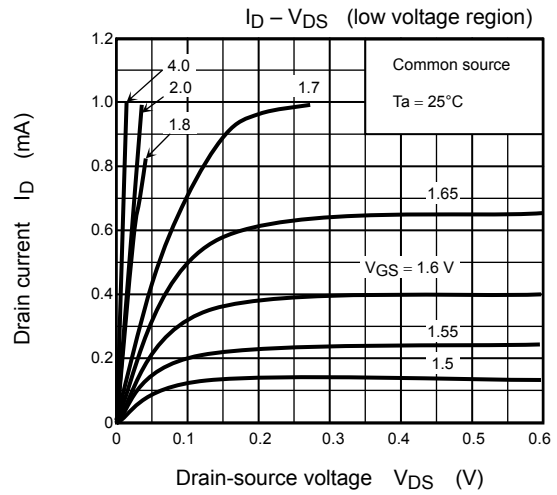
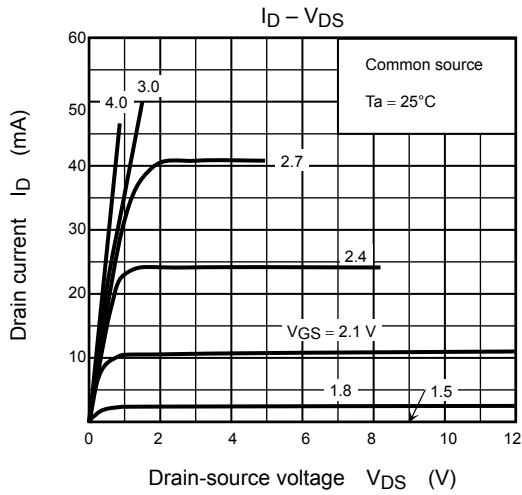
V_{GS}



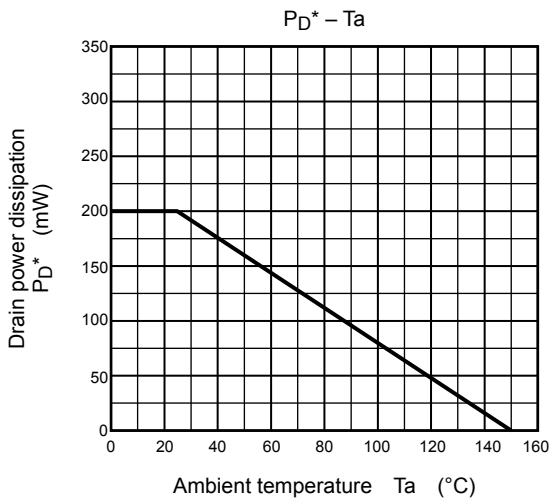
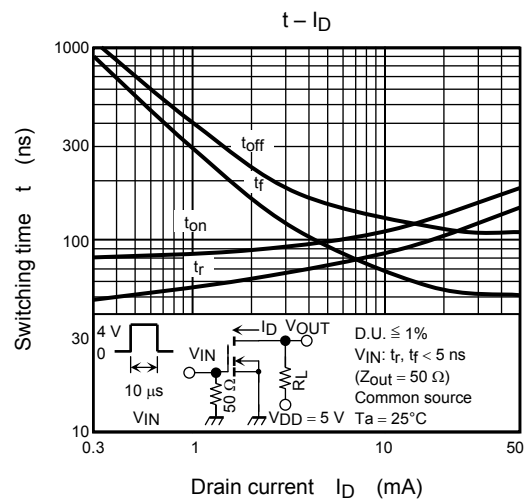
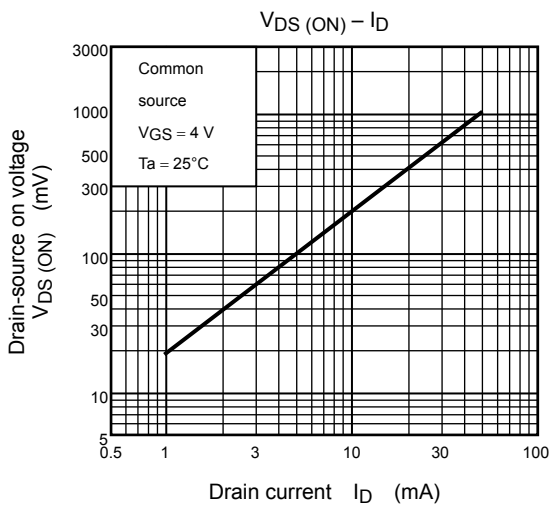
(c) V_{OUT}

V_{DS}

(Q1, Q2 common)



(Q1, Q2 common)



*: TOTAL rating

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20070701-EN GENERAL

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