

HN1L02FU

High Speed Switching Applications
Analog Switch Applications

Unit in mm

Q1, Q2 common

- 2.5V gate drive
- Low threshold voltage
Q1: $V_{th} = 0.5 \sim 1.5V$ Q2: $V_{th} = -0.5 \sim -1.5V$
- High speed
- Small package

Q1 Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Drain-Source voltage	V_{DS}	20	V
Gate-Source voltage	V_{GSS}	10	V
Drain current	I_D	50	mA

Q2 Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Drain-Source voltage	V_{DS}	-20	V
Gate-Source voltage	V_{GSS}	-7	V
Drain current	I_D	-50	mA

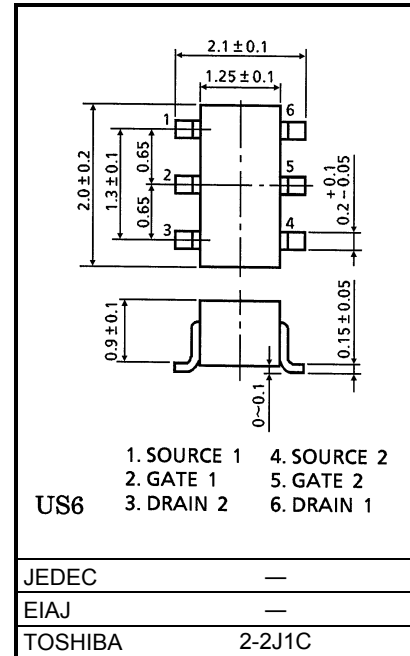
Absolute Maximum Ratings (Q1, Q2 Common) (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Drain power dissipation	P_{D^*}	200	mW
Channel temperature	T_{ch}	150	°C
Storage temperature range	T_{stg}	-55~150	°C

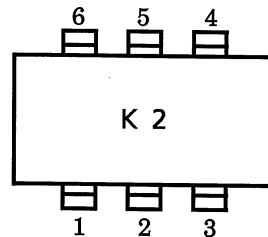
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

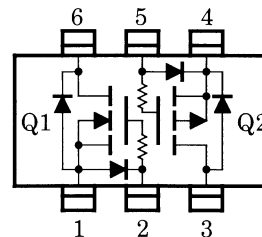
* Total rating



Marking



Equivalent Circuit (Top View)



Q1 Electrical Characteristics (Ta = 25°C)

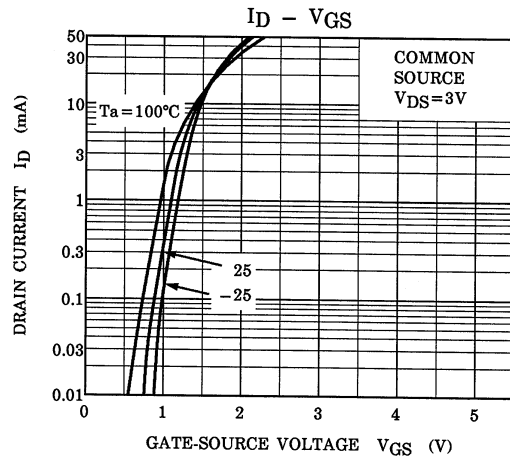
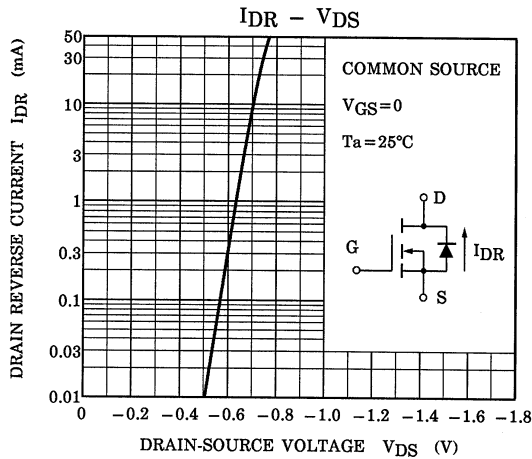
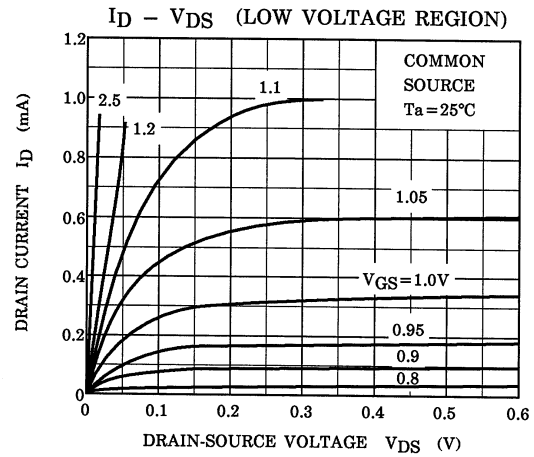
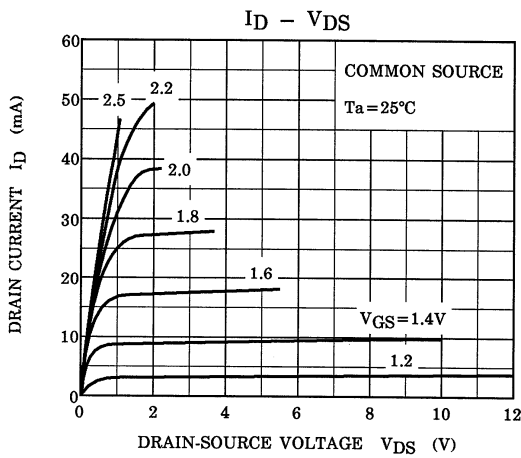
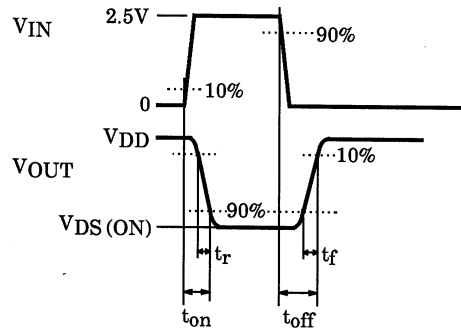
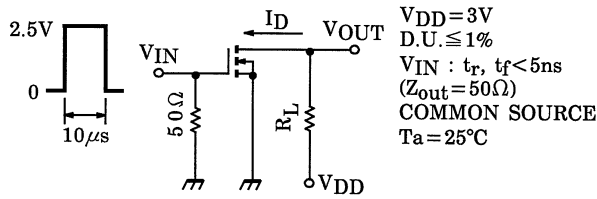
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	I _{GSS}	V _{GS} = 10V, V _{DS} = 0	—	—	1	μA	
Drain-Source breakdown voltage	V _{(BR) DSS}	I _D = 100μA, V _{GS} = 0	20	—	—	V	
Drain cut-off current	I _{DSS}	V _{DS} = 20V, V _{GS} = 0	—	—	1	μA	
Gate threshold voltage	V _{th}	V _{DS} = 3V, I _D = 0.1mA	0.5	—	1.5	V	
Forward transfer admittance	Y _{fs}	V _{DS} = 3V, I _D = 10mA	20	—	—	mS	
Drain-Source ON resistance	R _{DS (ON)}	I _D = 10mA, V _{GS} = 2.5V	—	20	40	Ω	
Input capacitance	C _{iss}	V _{DS} = 3V, V _{GS} = 0, f = 1MHz	—	5.5	—	pF	
Reverse transfer capacitance	C _{rss}	V _{DS} = 3V, V _{GS} = 0, f = 1MHz	—	1.6	—	pF	
Output capacitance	C _{oss}	V _{DS} = 3V, V _{GS} = 0, f = 1MHz	—	6.5	—	pF	
Switching time	Turn-on time	t _{on}	V _{DD} = 3V, I _D = 10mA, V _{GS} = 0~2.5V	—	0.14	—	μs
	Turn-off time	t _{off}	V _{DD} = 3V, I _D = 10mA, V _{GS} = 0~2.5V	—	0.14	—	μs

Q2 Electrical Characteristics (Ta = 25°C)

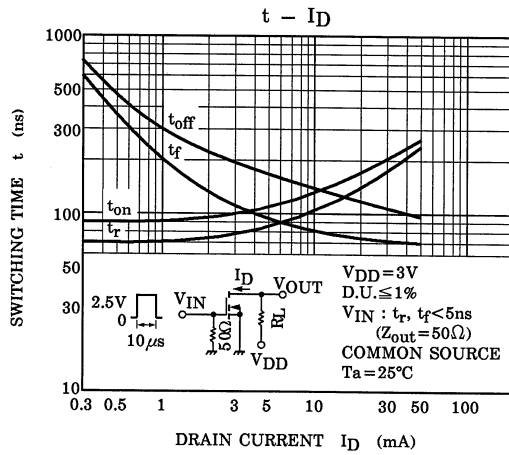
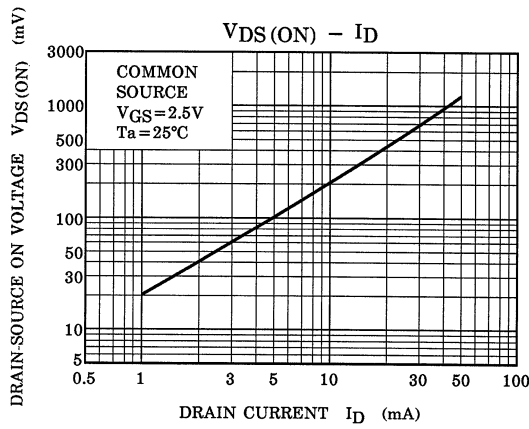
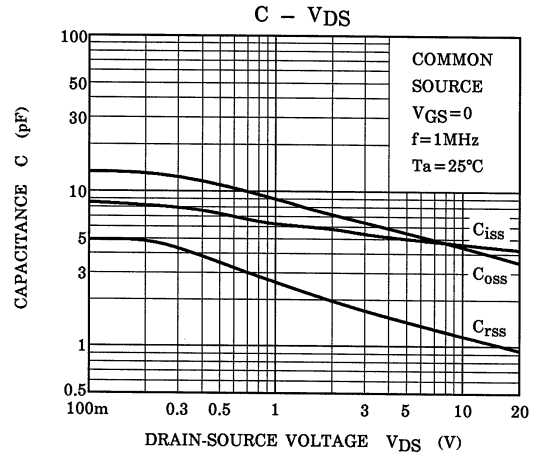
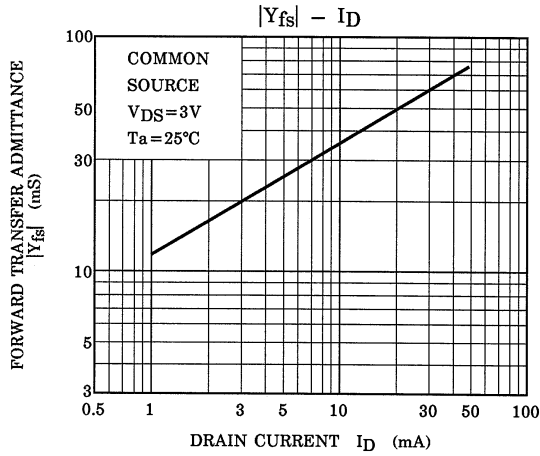
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit	
Gate leakage current	I _{GSS}	V _{GS} = -7V, V _{DS} = 0	—	—	-1	μA	
Drain-Source breakdown voltage	V _{(BR) DSS}	I _D = -100μA, V _{GS} = 0	-20	—	—	V	
Drain cut-off current	I _{DSS}	V _{DS} = -20V, V _{GS} = 0	—	—	-1	μA	
Gate threshold voltage	V _{th}	V _{DS} = -3V, I _D = -0.1mA	-0.5	—	-1.5	V	
Forward transfer admittance	Y _{fs}	V _{DS} = -3V, I _D = -10mA	15	—	—	mS	
Drain-Source ON resistance	R _{DS (ON)}	I _D = -10mA, V _{GS} = -2.5V	—	20	40	Ω	
Input capacitance	C _{iss}	V _{DS} = -3V, V _{GS} = 0, f = 1MHz	—	10.4	—	pF	
Reverse transfer capacitance	C _{rss}	V _{DS} = -3V, V _{GS} = 0, f = 1MHz	—	2.8	—	pF	
Output capacitance	C _{oss}	V _{DS} = -3V, V _{GS} = 0, f = 1MHz	—	8.4	—	pF	
Switching time	Turn-on time	t _{on}	V _{DD} = -3V, I _D = -10mA, V _{GS} = 0~-2.5V	—	0.15	—	μs
	Turn-off time	t _{off}	V _{DD} = -3V, I _D = -10mA, V _{GS} = 0~-2.5V	—	0.13	—	μs

Q1 (Nch MOS FET)

Switching Time Test Circuit

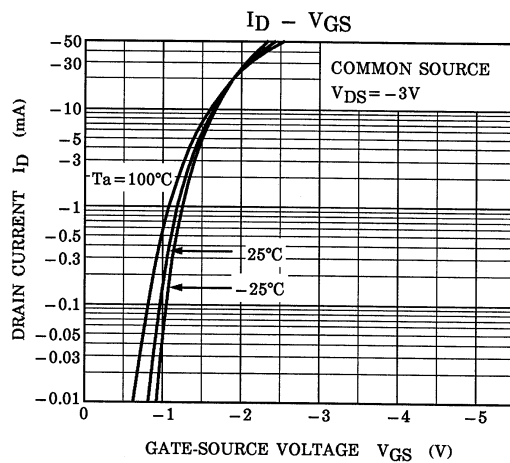
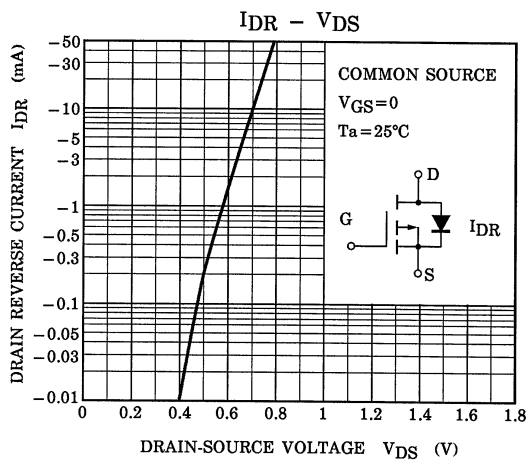
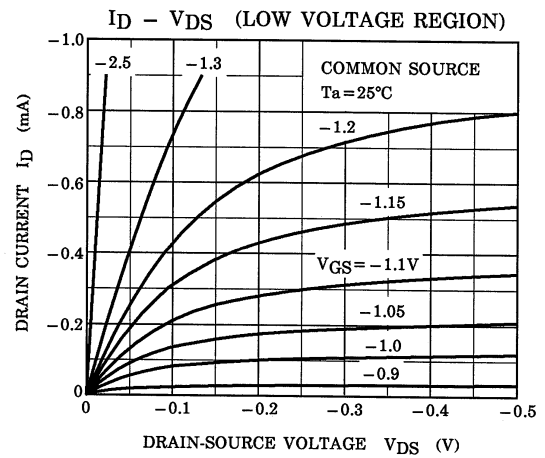
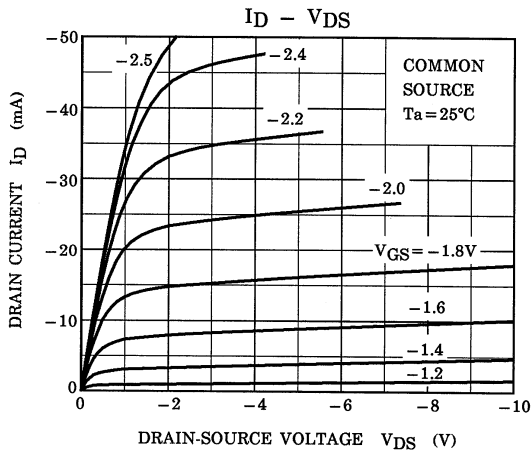
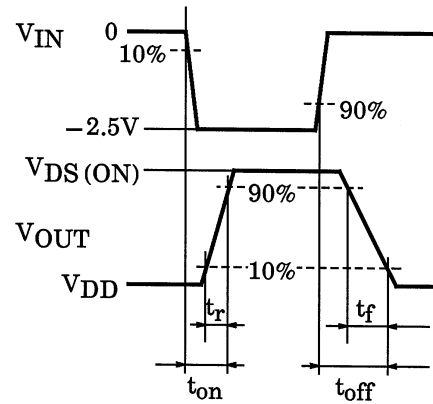
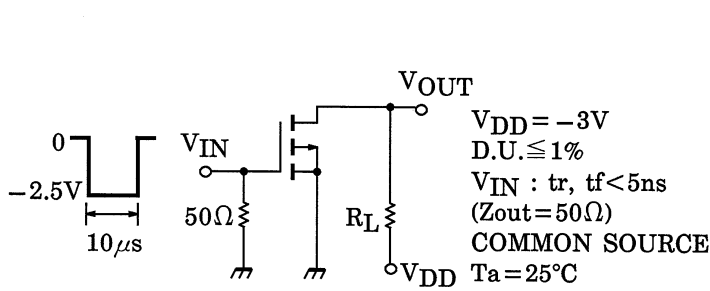


Q1 (Nch MOS FET)

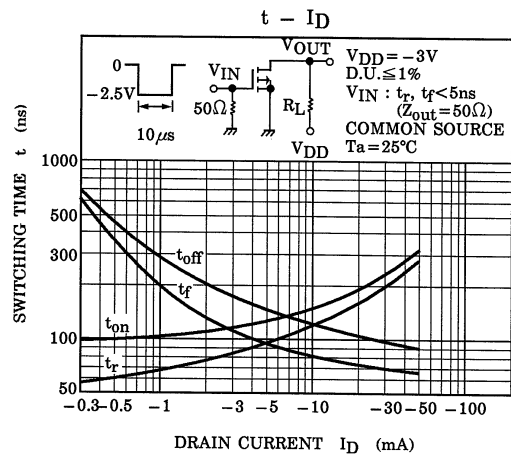
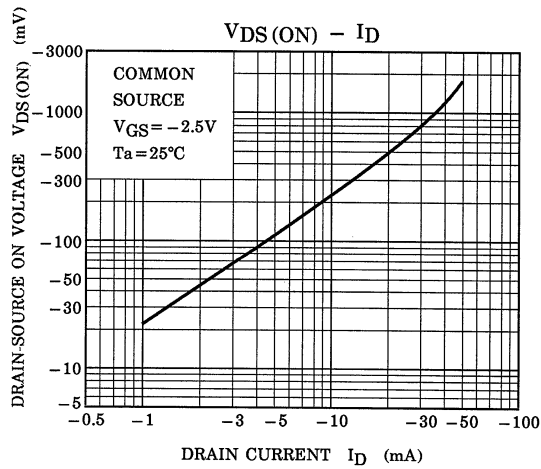
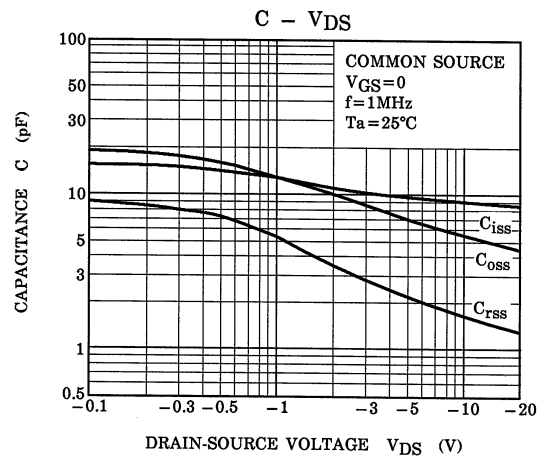
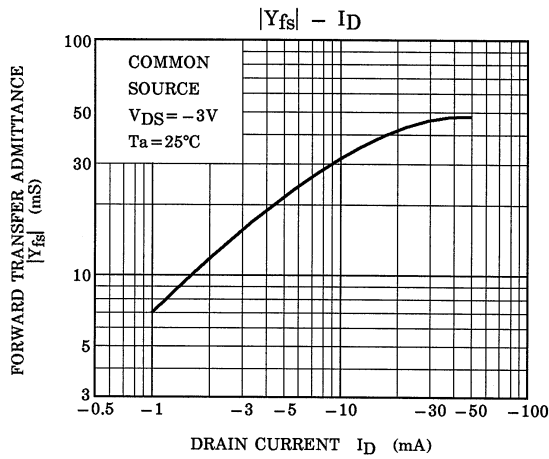


Q2 (Pch MOS FET)

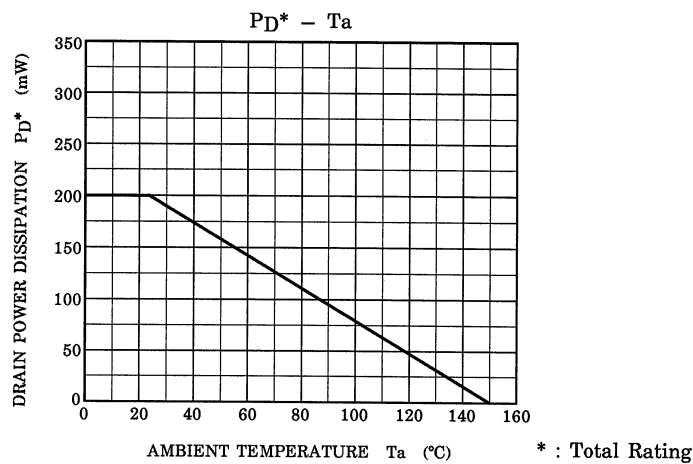
Switching Time Test Circuit



Q2 (Pch MOS FET)



(Q1, Q2 common)



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20070701-EN GENERAL

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