

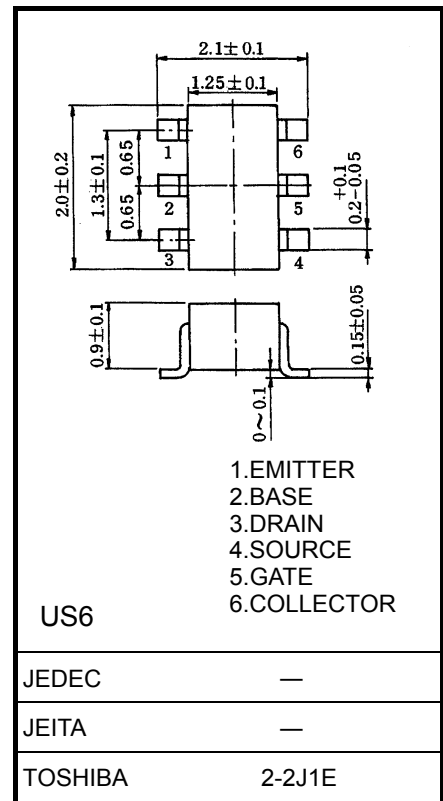
TOSHIBA Multichip Discrete Device

# HN7G03FU

Unit: mm

Power Management Switch Applications  
 Driver Circuit Applications  
 Interface Circuit Applications

Q1 (transistor) : 2SA1955 equivalent  
 Q2 (S-MOS) : SSM3K04FU equivalent



Weight: 6.8 mg (typ.)

### Q1 Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V <sub>CB0</sub>	-15	V
Collector-emitter voltage	V <sub>CEO</sub>	-12	V
Emitter-base voltage	V <sub>EBO</sub>	-5	V
Collector current	I <sub>C</sub>	-400	mA
Base current	I <sub>B</sub>	-50	mA

### Q2 Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V <sub>DS</sub>	20	V
Gate-source voltage	V <sub>GSS</sub>	10	V
Drain current	I <sub>D</sub>	100	mA

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

Characteristic	Symbol	Rating	Unit
Power dissipation	P*	200	mW
Junction temperature	T <sub>j</sub>	125	°C
Storage temperature range	T <sub>stg</sub>	-55~125	°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.

## Q1 Electrical Characteristics (Ta = 25°C)

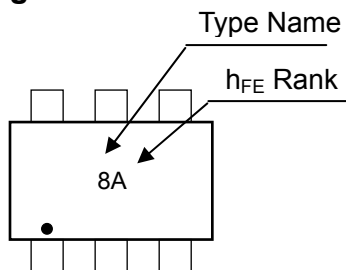
Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	$I_{CBO}$	—	$V_{CB} = -15\text{ V}, I_E = 0$	—	—	-0.1	$\mu\text{A}$
Emitter cutoff current	$I_{EBO}$	—	$V_{EB} = -5\text{ V}, I_C = 0$	—	—	-0.1	$\mu\text{A}$
DC current gain	$h_{FE}$ (Note 1)	—	$V_{CE} = -2\text{ V}, I_C = -10\text{ mA}$	300	—	1000	
Collector-emitter saturation voltage	$V_{CE(sat)} (1)$	—	$I_C = -10\text{ mA}, I_B = -0.5\text{ mA}$	—	-15	-30	mV
	$V_{CE(sat)} (2)$	—	$I_C = -200\text{ mA}, I_B = -10\text{ mA}$	—	-110	-250	
Base-emitter saturation voltage	$V_{BE(sat)}$	—	$I_C = -200\text{ mA}, I_B = -10\text{ mA}$	—	-0.87	-1.2	V

Note 1:  $h_{FE}$  classification A: 300~600, B: 500~1000

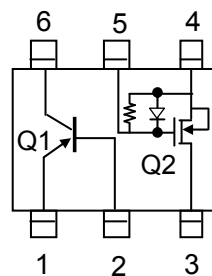
## Q2 Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	$I_{GSS}$	—	$V_{GS} = 10\text{ V}, V_{DS} = 0$	—	—	15	$\mu\text{A}$
Drain-source breakdown voltage	$V_{(BR)DSS}$	—	$I_D = 100\text{ }\mu\text{A}, V_{GS} = 0$	20	—	—	V
Drain current	$I_{DSS}$	—	$V_{DS} = 20\text{ V}, V_{GS} = 0$	—	—	1	$\mu\text{A}$
Gate threshold voltage	$V_{th}$	—	$V_{DS} = 3\text{ V}, I_D = 0.1\text{ mA}$	0.7	—	1.3	V
Forward transfer admittance	$ Y_{fs} $	—	$V_{DS} = 3\text{ V}, I_D = 10\text{ mA}$	25	50	—	mS
Drain-source ON-resistance	$R_{DS(ON)}$	—	$I_D = 10\text{ mA}, V_{GS} = 2.5\text{ V}$	—	4	12	$\Omega$
Gate-source ON-resistance	$R_{GS}$	—	$V_{GS} = 0 \sim 10\text{ V}$	0.7	1.0	1.3	M $\Omega$

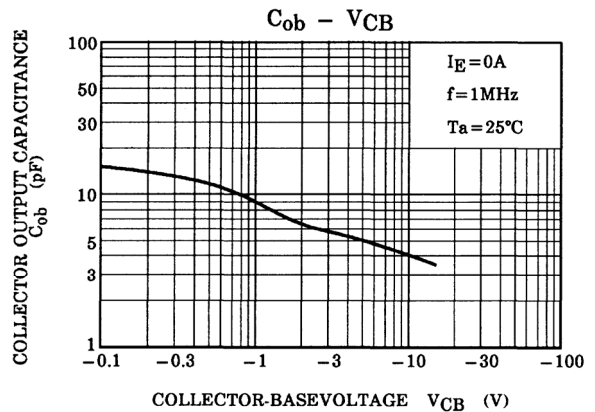
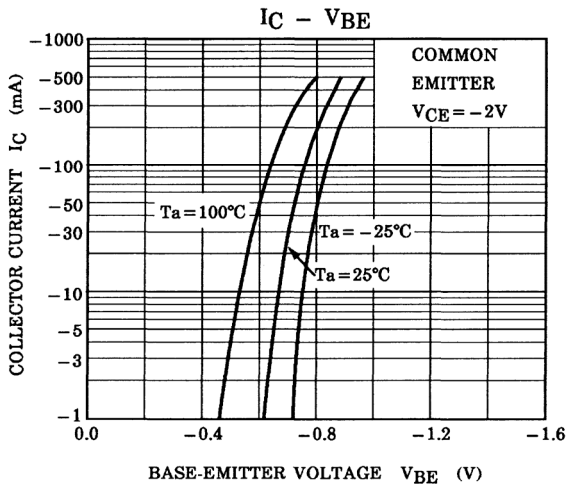
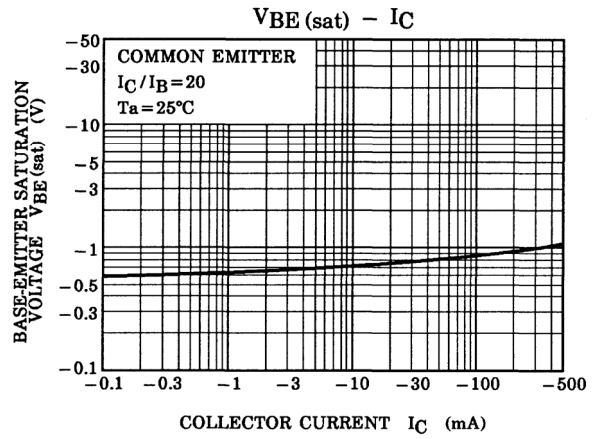
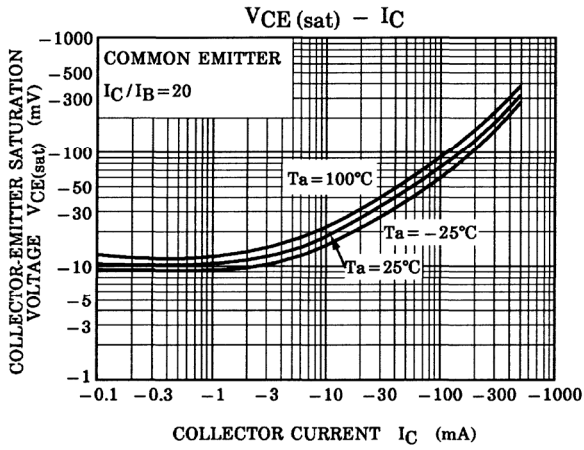
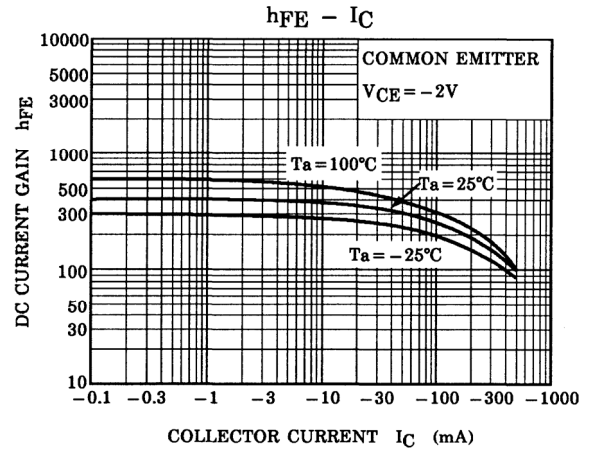
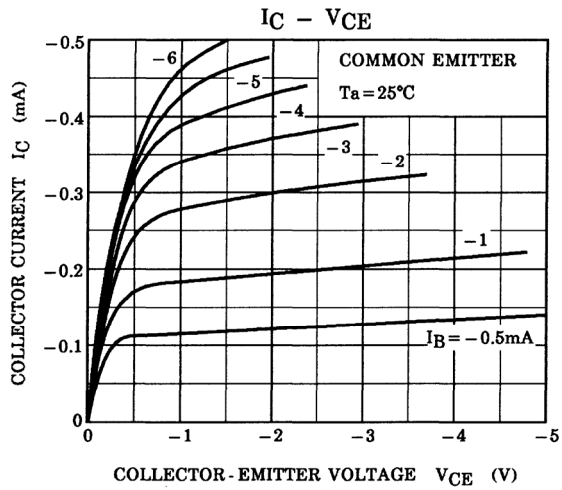
## Marking



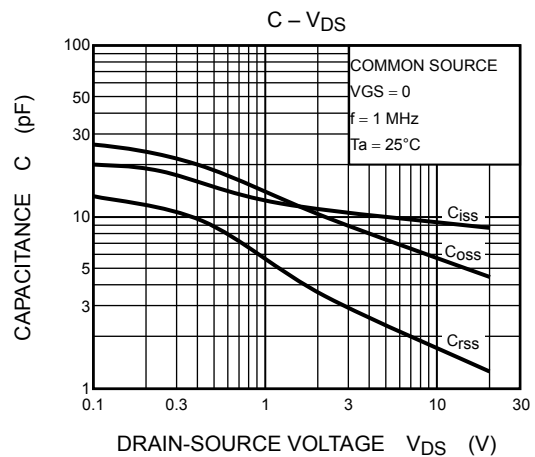
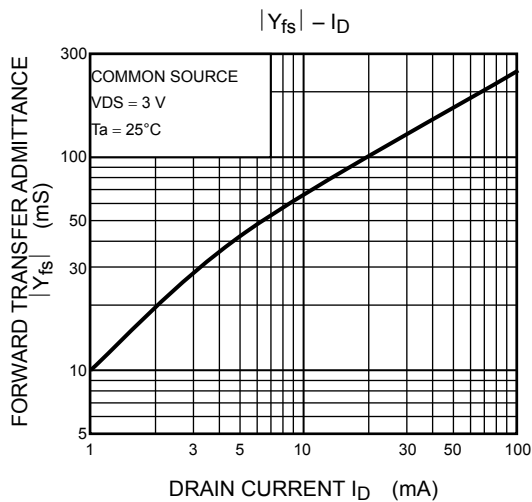
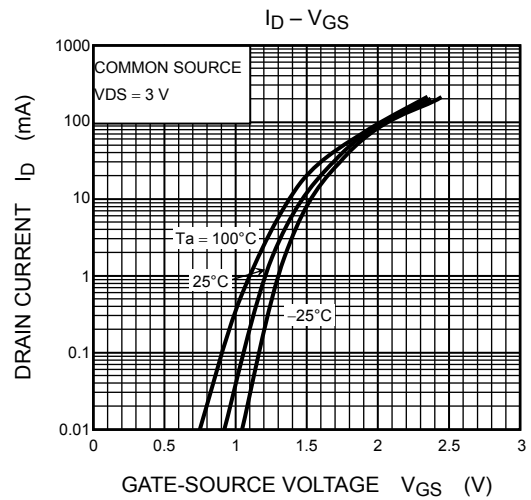
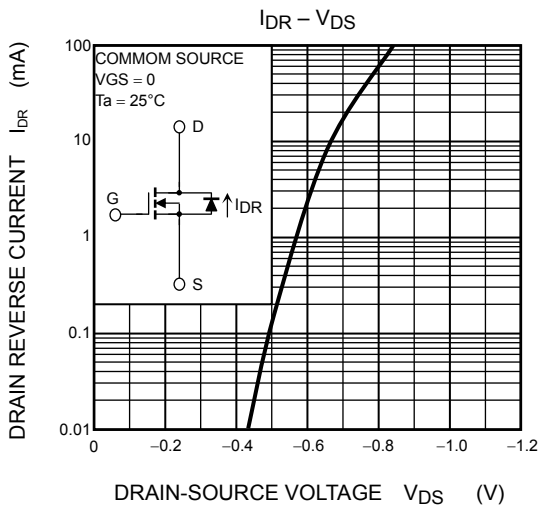
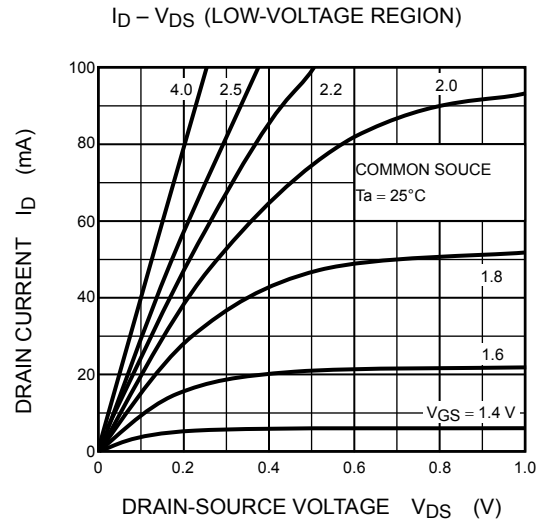
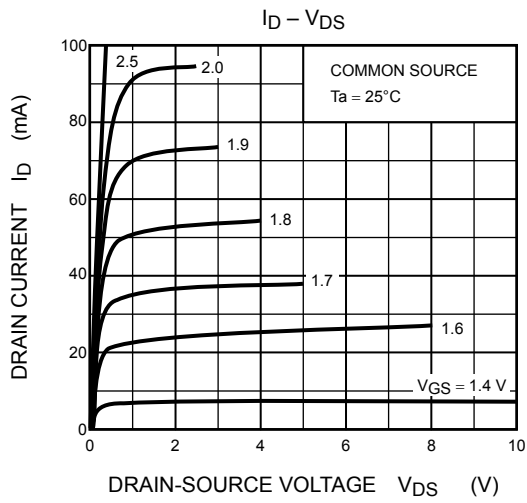
## Equivalent Circuit (Top View)



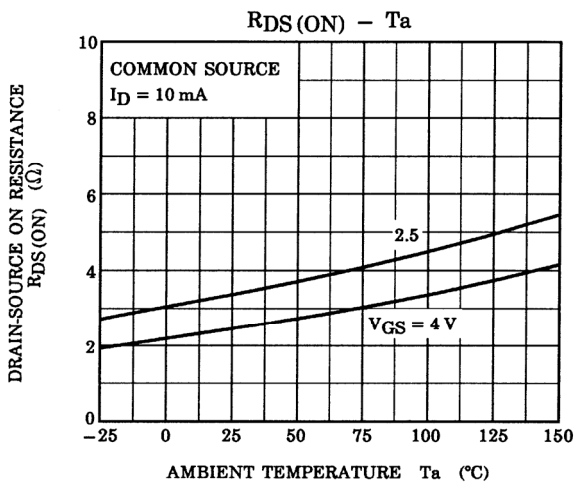
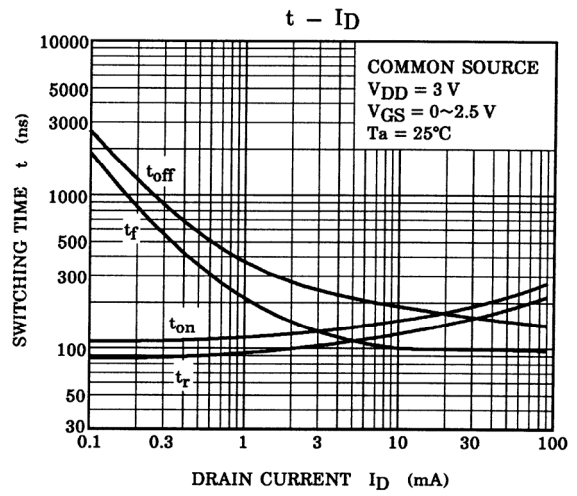
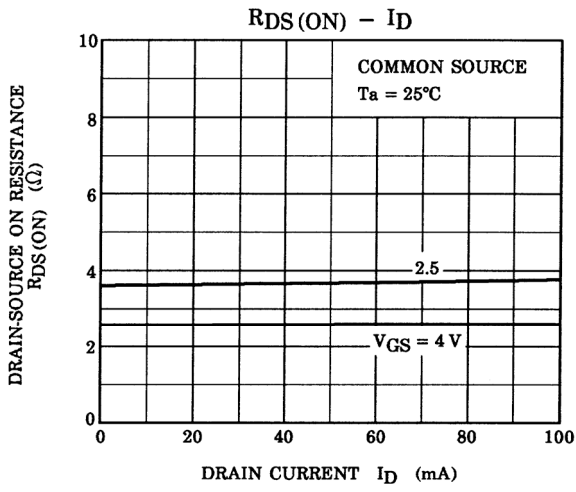
Q1



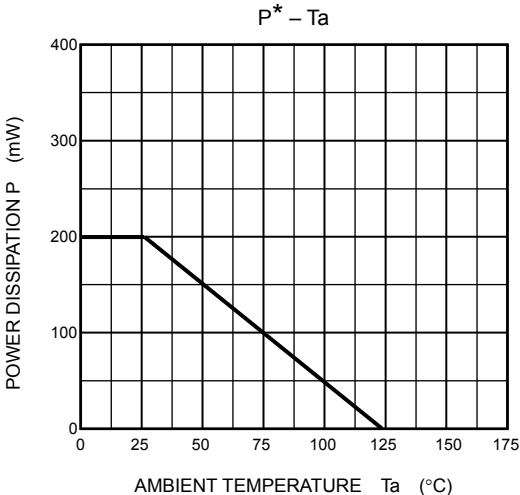
Q2



Q2



Q1, Q2 common



\*:Total rating

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20070701-EN GENERAL

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