

**Preliminary**

TOSHIBA Multi Chip Discrete Device

# HN7G01FU

Power Management Switch Application

Driver Circuit Application

Interface Circuit Application

- Q1 (transistor): 2SA1955 equivalent
- Q2 (MOS-FET): 2SK1830 equivalent

Unit: mm

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

Characteristics	Symbol	Rating	Unit
Collector-base voltage	V <sub>CBO</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 (MOS-FET) Absolute Maximum Ratings (Ta = 25°C)

Characteristics	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>	50	mA

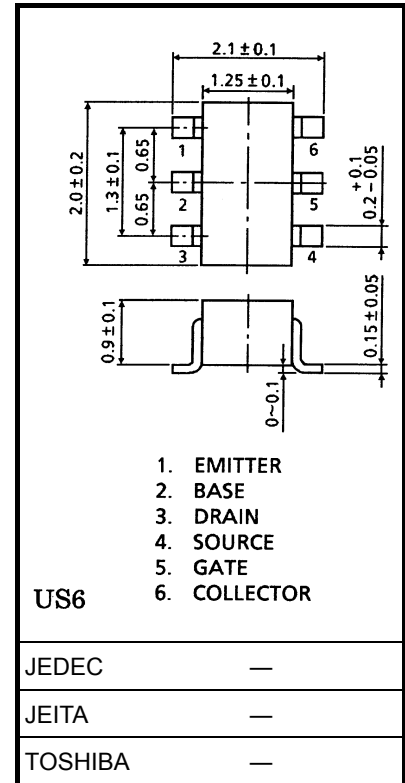
## Q1, Q2 Common Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Power dissipation	P <sub>C</sub> (Note 1)	200	mW
Junction temperature	T <sub>j</sub>	125	°C
Storage temperature range	T <sub>stg</sub>	-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.

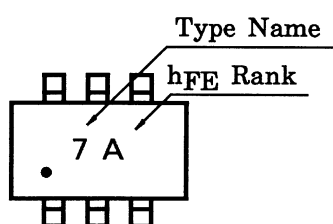
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Note 1: Total rating

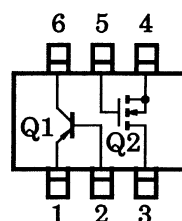


Weight: 6.8 mg (typ.)

## Marking



## Pin Assignment (top view)



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

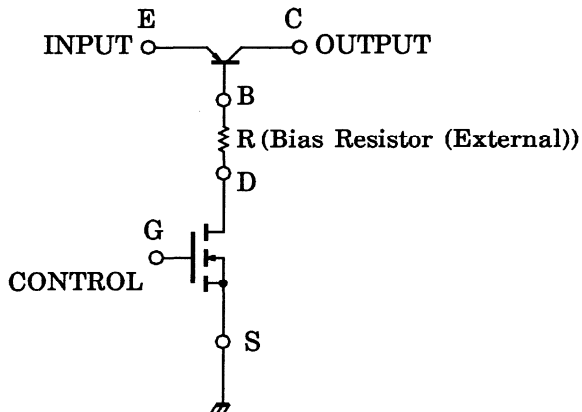
Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	$V_{CB} = -15\text{ V}, I_E = 0$	—	—	-0.1	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = -5\text{ V}, I_C = 0$	—	—	-0.1	$\text{mA}$
DC current gain	$h_{FE}$ (Note 2)	$V_{CE} = -2\text{ V}, I_C = -10\text{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

Note 2:  $h_{FE}$  classification A: 300~600, B: 500~1000

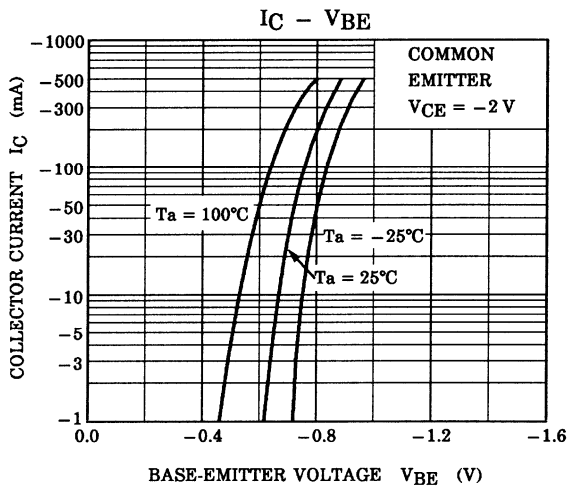
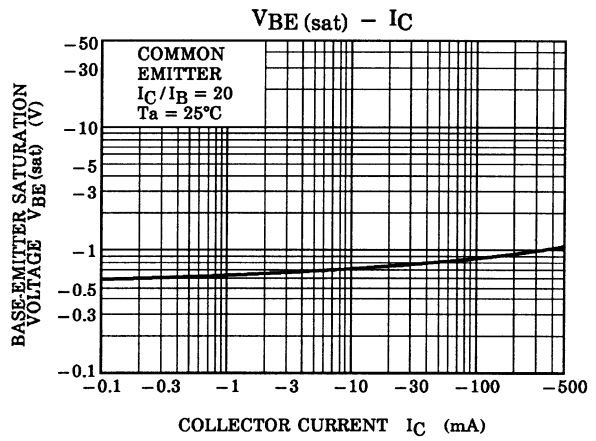
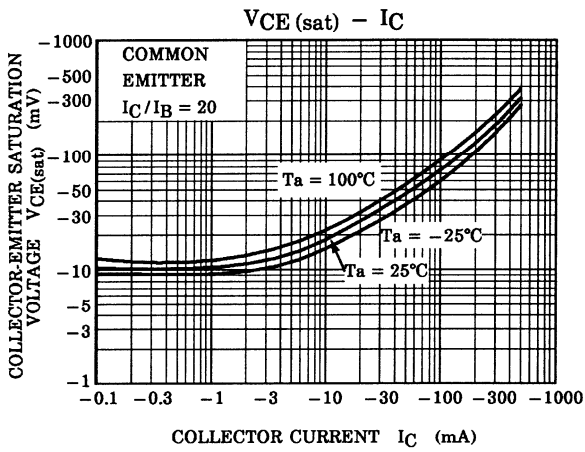
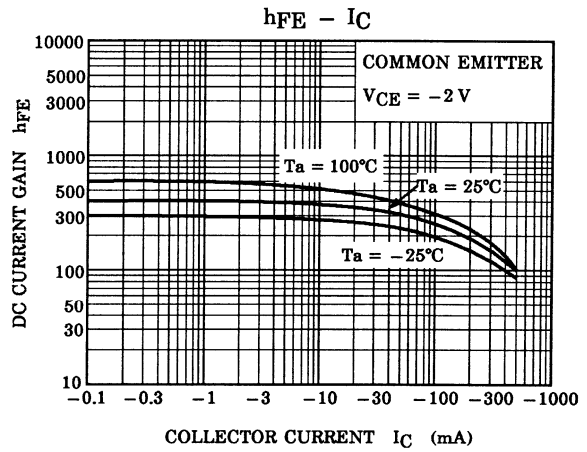
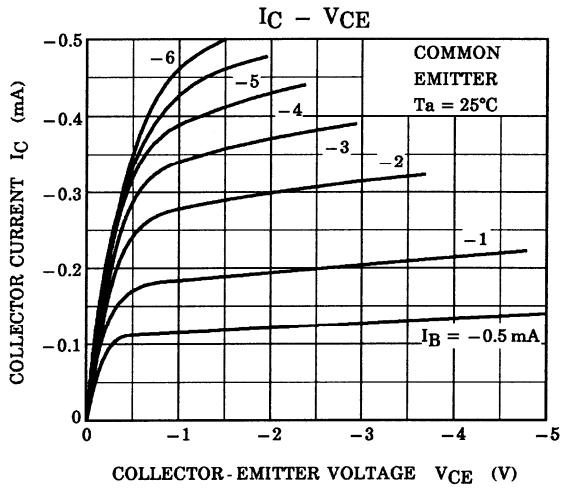
## Q2 (MOS-FET) Electrical Characteristics (Ta = 25°C)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Gate leakage current	$I_{GSS}$	$V_{GS} = 10\text{ V}, V_{DS} = 0$	—	—	1	$\mu\text{A}$
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 100\text{ }\mu\text{A}, V_{GS} = 0$	20	—	—	$\text{V}$
Drain current	$I_{DSS}$	$V_{DS} = 20\text{ V}, V_{GS} = 0$	—	—	1	$\mu\text{A}$
Gate threshold voltage	$V_{th}$	$V_{DS} = 3\text{ V}, I_D = 0.1\text{ mA}$	0.5	—	1.5	$\text{V}$
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 3\text{ V}, I_D = 10\text{ mA}$	20	—	—	$\text{mS}$
Drain-source ON resistance	$R_{DS(ON)}$	$I_D = 10\text{ mA}, V_{GS} = 2.5\text{ V}$	—	20	40	$\Omega$

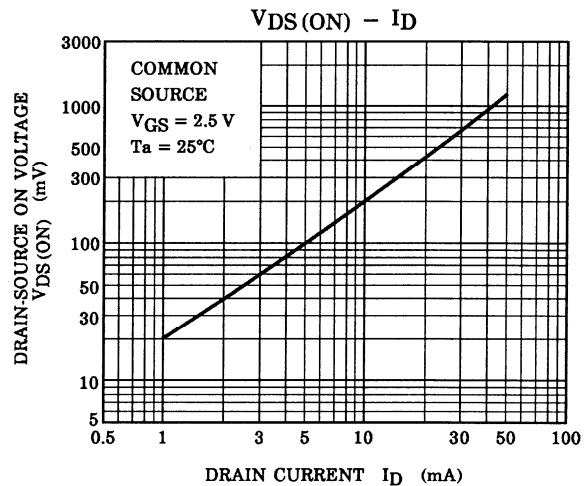
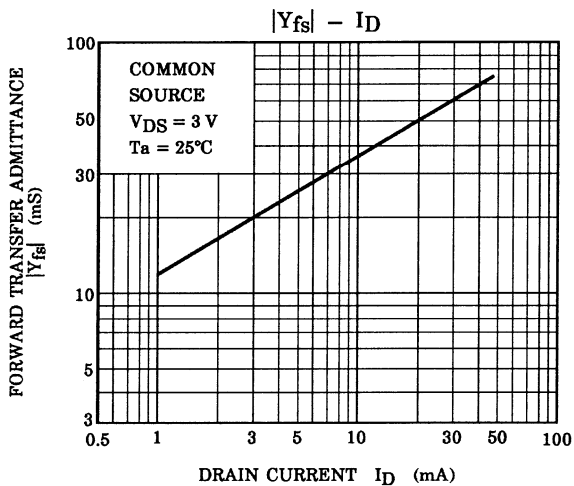
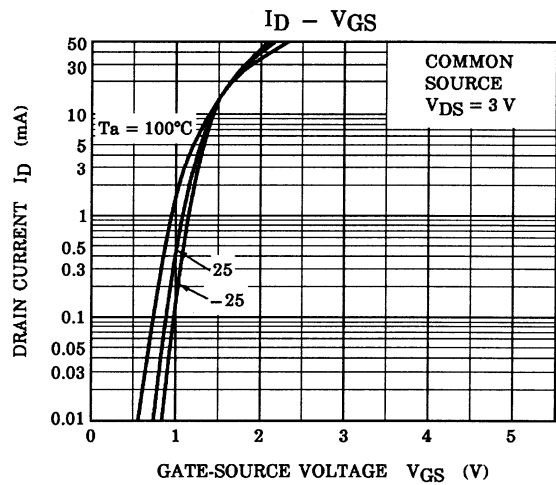
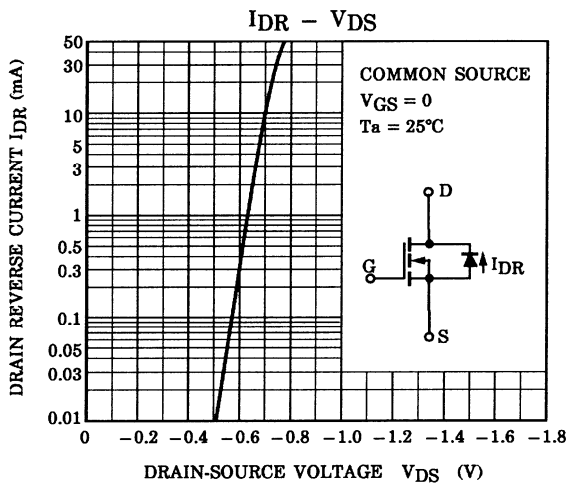
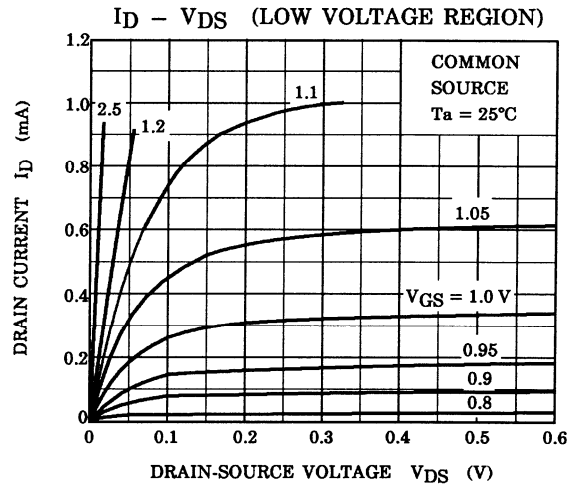
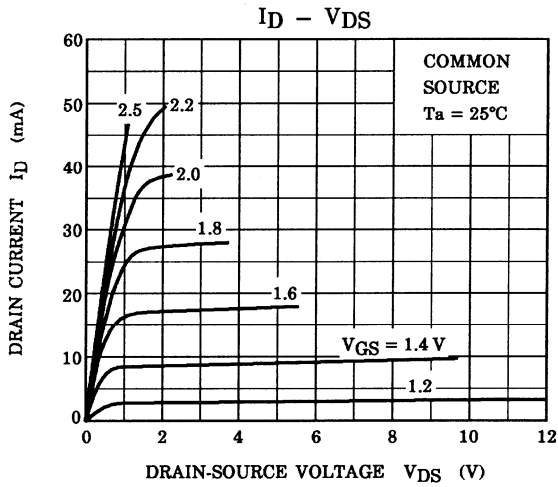
## Application Example (power management switch)



**Transistor**



## MOS-FET



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