

TOSHIBA Multichip Discrete Device

# HN7G05FU

Power Management Switch Applications, Inverter Circuit Applications, Driver Circuit Applications and Interface Circuit Applications

Unit: mm

Q1 (transistor): RN2301 equivalent  
Q2 (MOSFET): 2SK1830 equivalent

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

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V <sub>CBO</sub>	-50	V
Collector-emitter voltage	V <sub>CEO</sub>	-50	V
Emitter-base voltage	V <sub>EBO</sub>	-10	V
Collector current	I <sub>C</sub>	-100	mA

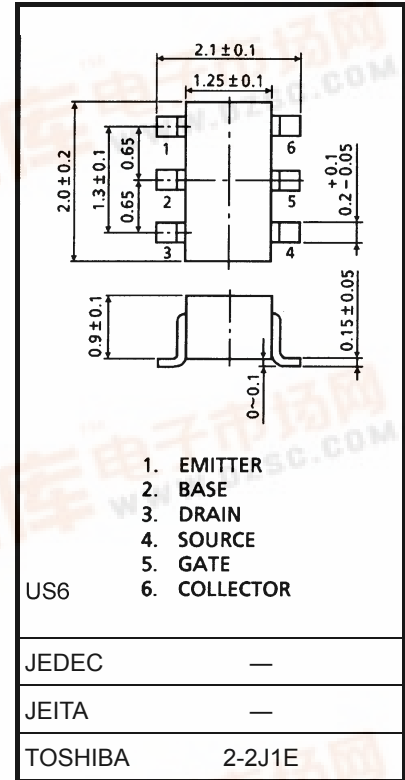
### Q2 (MOSFET) Absolute Maximum Ratings (Ta = 25°C)

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>	50	mA

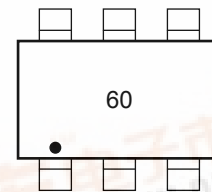
### Q1, Q2 Common Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Power dissipation	P (Note 1)	200	mW
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature range	T <sub>stg</sub>	-55~150	°C

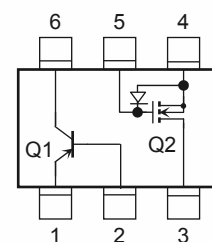
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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



### Marking



### Equivalent Circuit (top view)



Note: Total rating



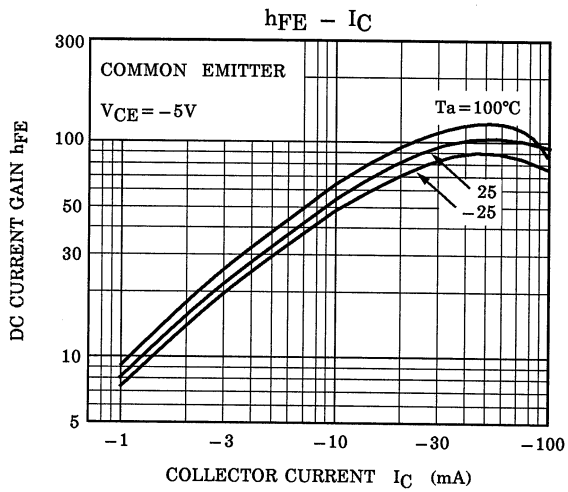
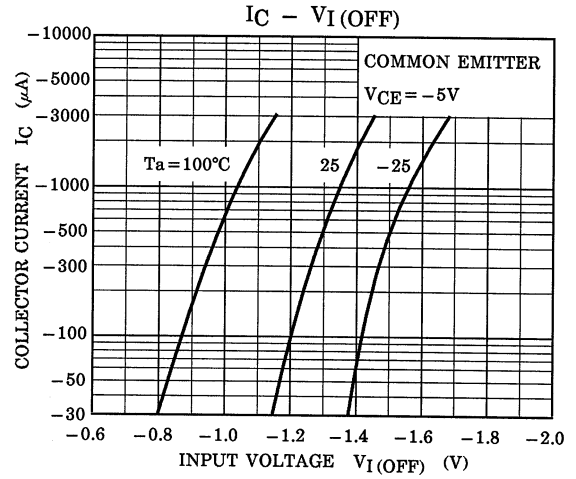
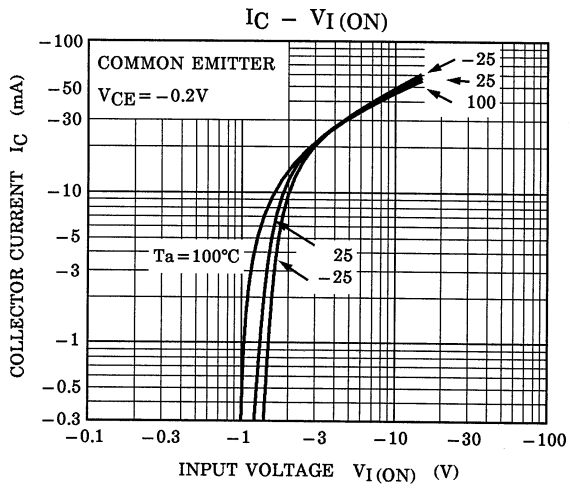
## Q1 (Transistor) Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	$I_{CBO}$	$V_{CB} = -50\text{ V}, I_E = 0$	—	—	-100	nA
	$I_{CEO}$	$V_{CE} = -50\text{ V}, I_E = 0$	—	—	-500	nA
Emitter cutoff current	$I_{EBO}$	$V_{EB} = -5\text{ V}, I_C = 0$	-0.82	—	-1.52	mA
DC current gain	$h_{FE}$	$V_{CE} = -5\text{ V}, I_C = -10\text{ mA}$	30	—	—	
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C = -5\text{ mA}, I_B = -0.25\text{ mA}$	—	-0.1	-0.3	V
Input voltage (ON)	$V_{I(ON)}$	$V_{CE} = -0.2\text{ V}, I_C = -5\text{ mA}$	-1.1	—	-2.0	V
Input voltage (OFF)	$V_{I(OFF)}$	$V_{CE} = -5\text{ V}, I_C = -0.1\text{ mA}$	-1.0	—	-1.5	V
Input resistor	R1	—	3.29	4.7	6.11	k $\Omega$
Resistor ratio	R1/R2	—	0.9	1.0	1.1	

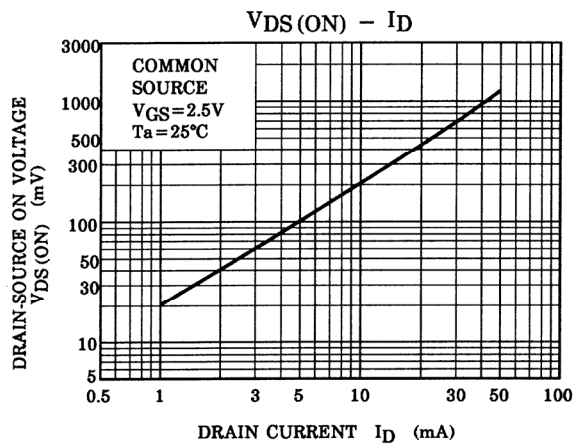
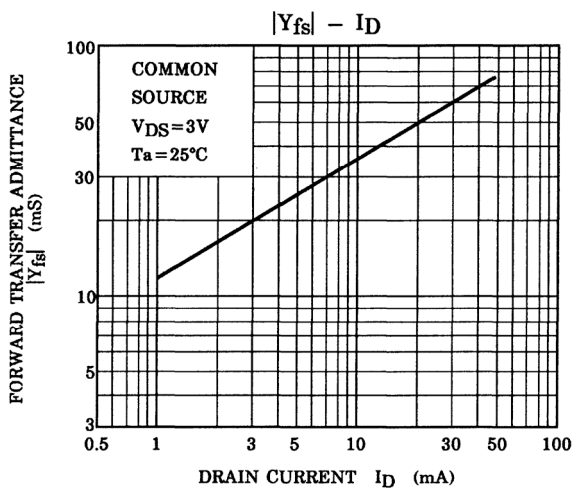
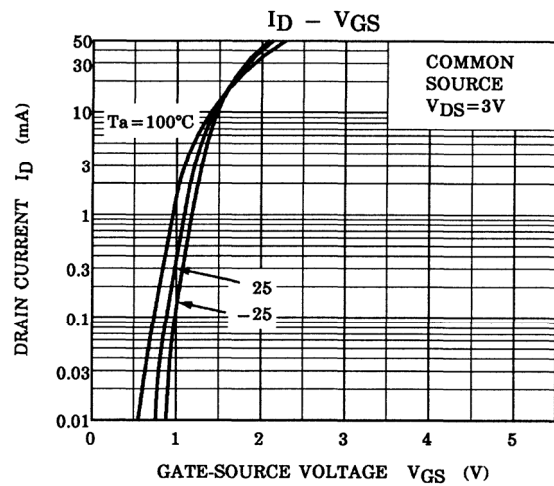
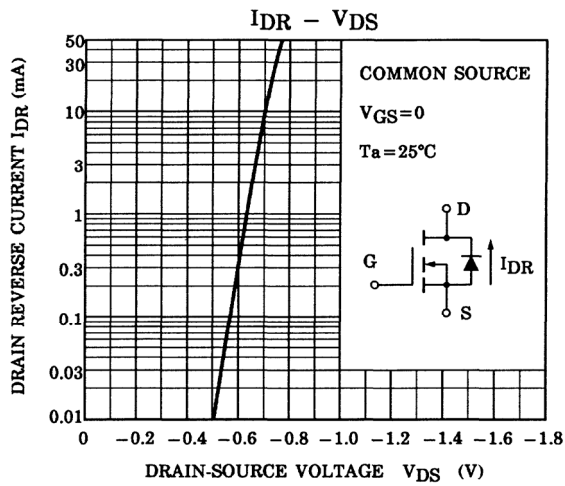
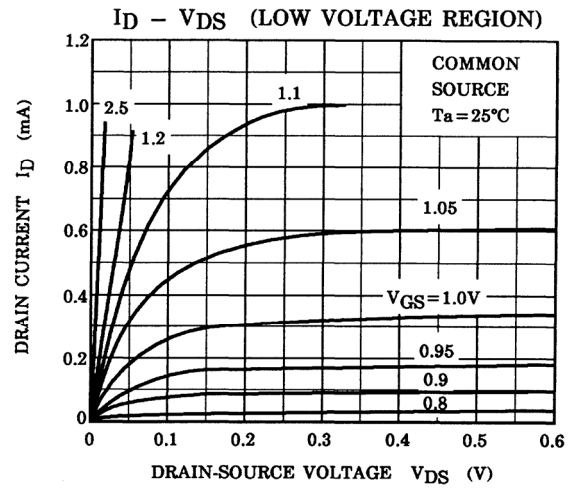
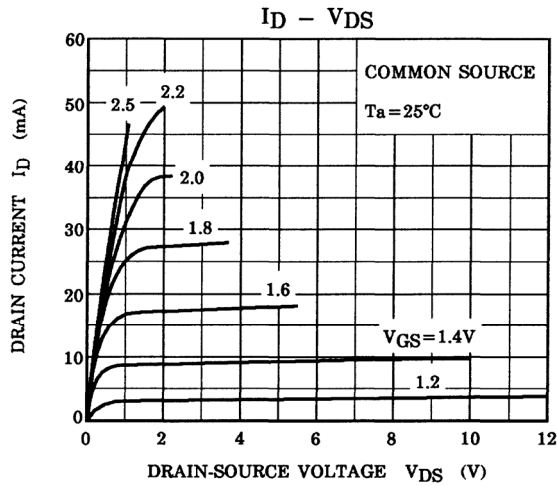
## Q2 (MOSFET) Electrical Characteristics (Ta = 25°C)

Characteristic	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	—	—	V
Drain cutoff 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	V
Forward transfer admittance	$ Y_{fs} $	$V_{DS} = 3\text{ V}, I_D = 10\text{ mA}$	20	—	—	mS
Drain-source ON-resistance	$R_{DS(ON)}$	$I_D = 10\text{ mA}, V_{GS} = 2.5\text{ V}$	—	20	40	$\Omega$

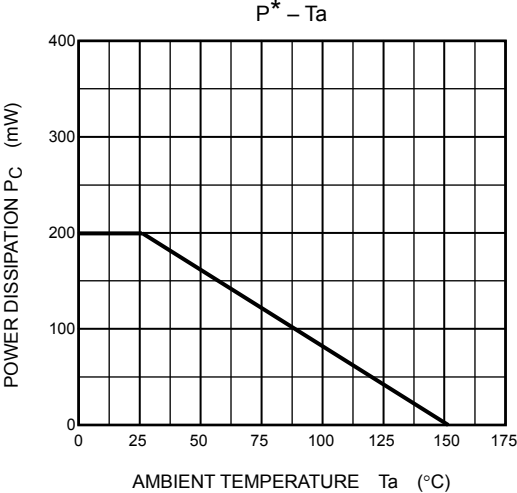
**Q1 (Transistor)**



## Q2 (S-MOS)



Q1, Q2 common



\*:Total rating

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20070701-EN GENERAL

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