

TOSHIBA Multichip Discrete Device

HN7G07FU

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

- Combining transistor and BRT reduces the parts count, enabling the design of more compact equipment with a simpler system configuration.

Q1: 2SC5376F equivalent

Q2: RN1115F equivalent

Q1 Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V _{CB0}	15	V
Collector-emitter voltage	V _{CEO}	12	V
Emitter-base voltage	V _{EBO}	5	V
Collector current	I _C	500	mA
Base current	I _B	50	mA

Q2 Maximum Ratings (Ta = 25°C)

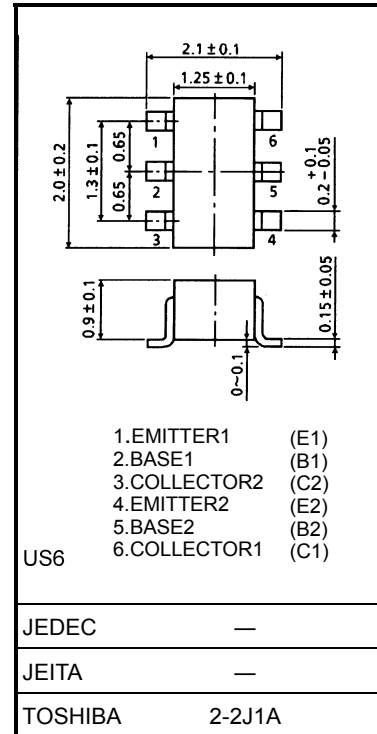
Characteristic	Symbol	Rating	Unit
Collector-base voltage	V _{CB0}	50	V
Collector-emitter voltage	V _{CEO}	50	V
Emitter-base voltage	V _{EBO}	10	V
Collector current	I _C	100	mA

Q1, Q2 Common Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector power dissipation	P _C *	200	mW
Junction temperature	T _J	150	°C
Storage temperature range	T _{stg}	-55~150	°C

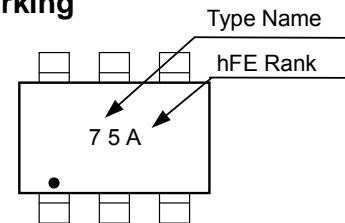
*: Total rating. 130 mW per element should not be exceeded.

Unit: mm

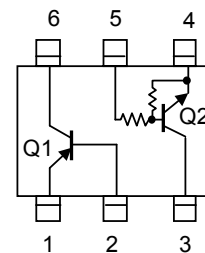


Weight: 0.0068 g (typ.)

Marking



Equivalent Circuit (top view)



Q1 Electrical Characteristics (Ta = 25°C)

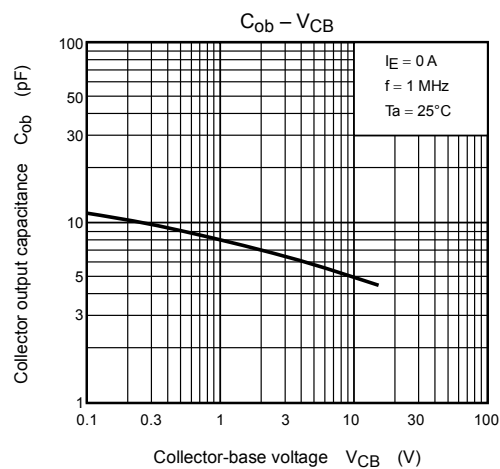
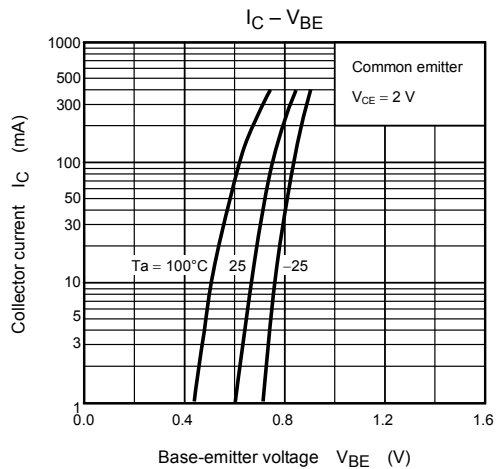
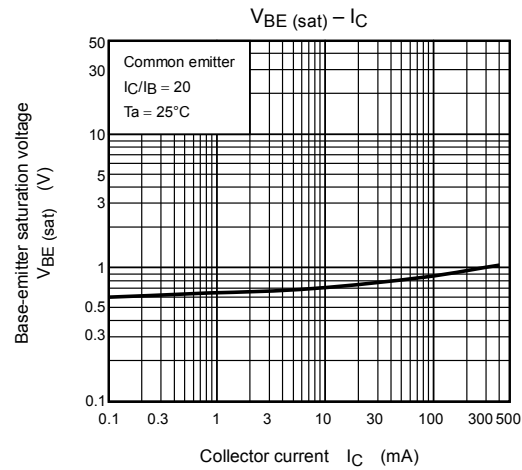
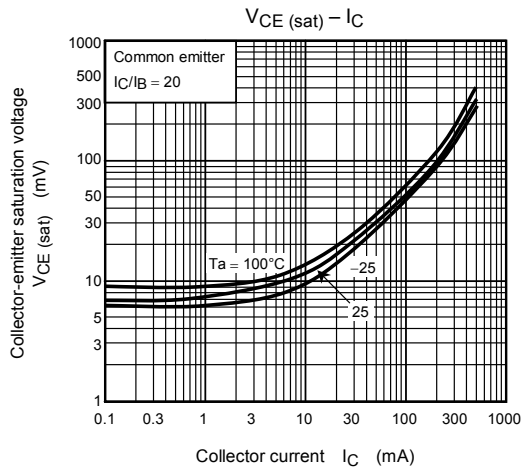
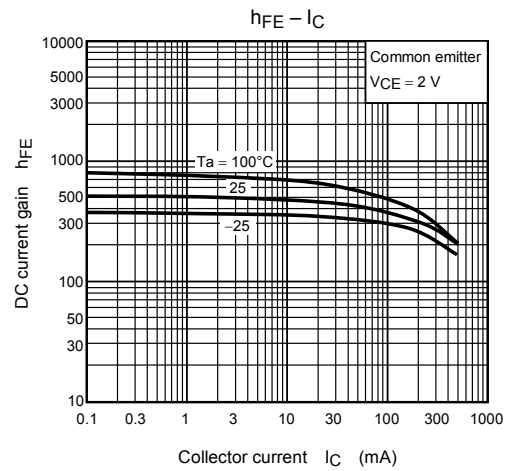
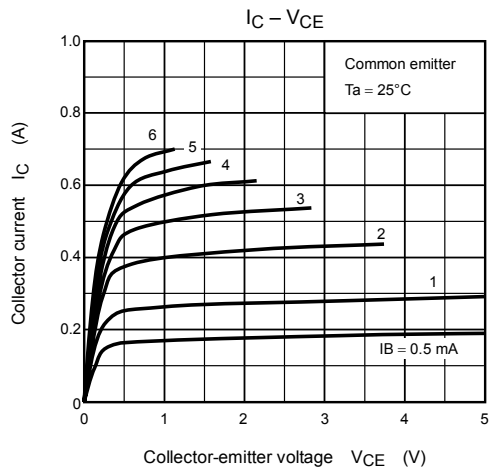
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit	
Collector cutoff current	I_{CBO}	$V_{CB} = 15\text{ V}, I_E = 0$	—	—	100	nA	
Emitter cutoff current	I_{EBO}	$V_{EB} = 5\text{ V}, I_C = 0$	—	—	100	nA	
DC current gain	h_{FE}^{**}	$V_{CE} = 2\text{ V}, I_C = 10\text{ mA}$	300	—	1000		
Collector-emitter 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	
Transition frequency	f_T	$V_{CE} = 2\text{ V}, I_C = 10\text{ mA}$	—	130	—	MHz	
Collector output capacitance	C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	4.2	—	pF	
Switching time	Turn-on time	t_{on}		—	85	—	ns
	Storage time	t_{stg}		—	170	—	ns
	Fall time	t_f		Duty cycle $\leq 2\%$ $I_{B1} = I_{B2} = 5\text{ mA}$	—	40	—

** : h_{FE} Classification A:300~600, B:500~1000

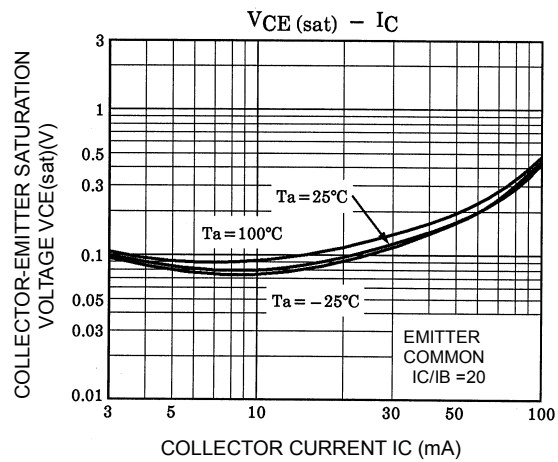
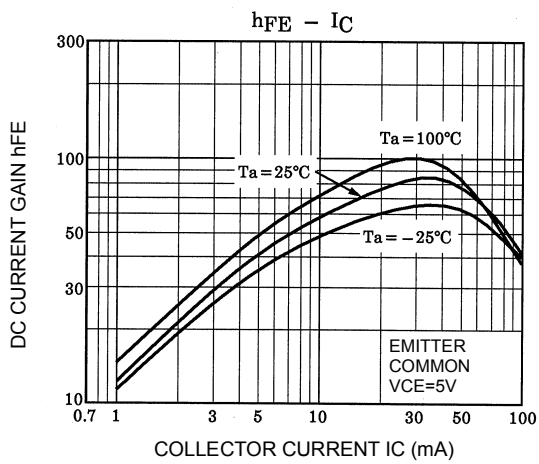
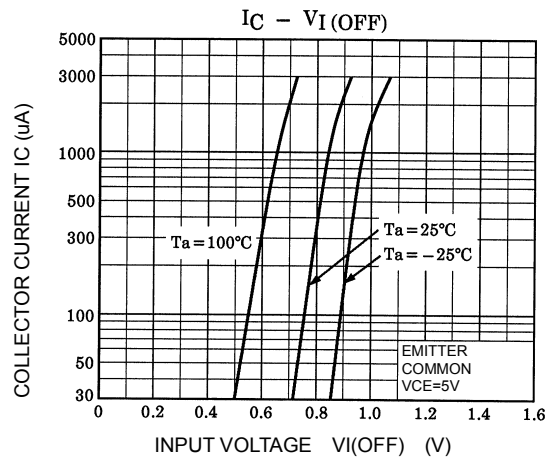
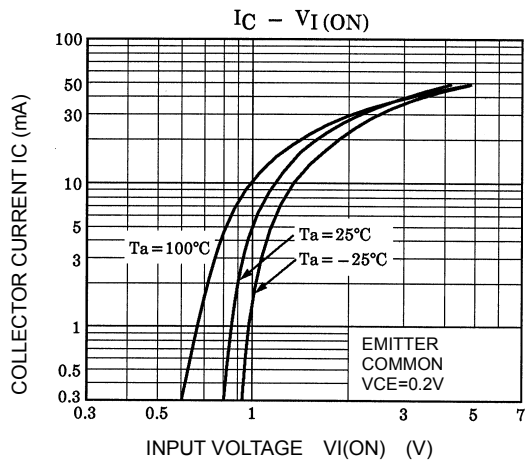
Q2 Electrical Characteristics (Ta = 25°C)

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}	$V_{EB} = 6\text{ V}, I_C = 0$	0.37	—	0.71	mA
DC current gain	h_{FE}	$V_{CE} = 5\text{ V}, I_C = 10\text{ mA}$	50	—	—	
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)	$V_{I(ON)}$	$V_{CE} = 0.2\text{ V}, I_C = 5\text{ mA}$	0.7	—	2.5	V
Input voltage (OFF)	$V_{I(OFF)}$	$V_{CE} = 5\text{ V}, I_C = 0.1\text{ mA}$	0.3	—	1.0	V
Transition frequency	f_T	$V_{CE} = 10\text{ V}, I_C = 5\text{ mA}$	—	250	—	MHz
Collector output capacitance	C_{ob}	$V_{CB} = 10\text{ V}, I_E = 0, f = 1\text{ MHz}$	—	3	—	pF
Input resistor	R1	—	1.54	2.2	2.86	k Ω
Resistor ratio	R1/R2	—	—	0.22	—	

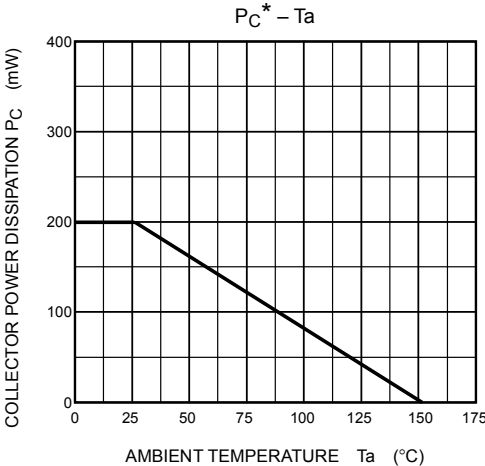
Q1



Q2



Q1, Q2 common



*:Total rating

RESTRICTIONS ON PRODUCT USE

030619EAA

- The information contained herein is subject to change without notice.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others.
- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk.
- TOSHIBA products should not be embedded to the downstream products which are prohibited to be produced and sold, under any law and regulations.