TOSHIBA Multichip Discrete Device

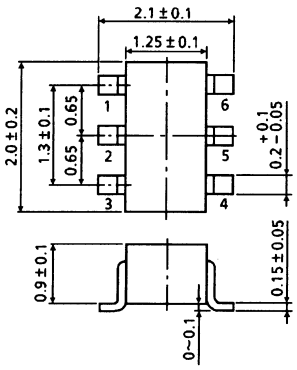
HN7G04FU

General-Purpose Amplifier Applications

Driver Circuit Applications

Switching and Muting Switch Applications

Unit: mm



1.EMITTER (E1)
2.BASE (B1)
3.COLLECTOR (C2)
4.EMITTER (E2)
5.BASE (B2)
6.COLLECTOR (C1)

US6

JEDEC	—
JEITA	—
TOSHIBA	2-2J1A

Weight: 0.0068 g (typ.)

Q1: 2SA1954 equivalent
Q2: RN1307 equivalent

Q1 Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	−15	V
Collector-emitter voltage	V_{CEO}	−12	V
Emitter-base voltage	V_{EBO}	−5	V
Collector current	I_C	−400	mA
Base current	I_B	−50	mA

Q2 Maximum Ratings (Ta = 25°C)

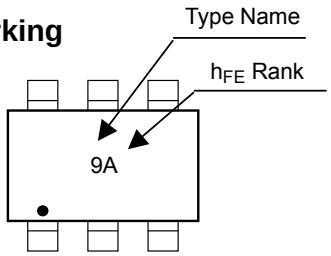
Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	50	V
Collector-emitter voltage	V_{CEO}	50	V
Emitter-base voltage	V_{EBO}	6	V
Collector current	I_C	100	mA

Q1, Q2 Common Ratings (Ta = 25°C)

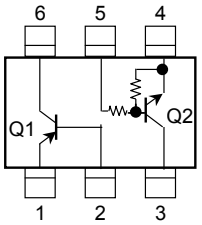
Characteristic	Symbol	Rating	Unit
Collector power dissipation	P_C (Note)	200	mW
Junction temperature	T_j	150	°C
Storage temperature range	T_{stg}	−55~150	°C

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

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 V, I_E = 0	—	—	−100	nA
Emitter cutoff current	I_{EBO}	V_{EB} = −5 V, I_C = 0	—	—	−100	nA
DC current gain	$h_{FE\ (Note)}$	V_{CE} = −2 V, I_C = −10 mA	300	—	1000	
Collector-emitter saturation voltage	$V_{CE\ (sat)(1)}$	I_C = −10 mA, I_B = −0.5 mA	—	−15	−30	mV
	$V_{CE\ (sat)(2)}$	I_C = −200 mA, I_B = −10 mA	—	−110	−250	
Base-emitter saturation voltage	$V_{BE\ (sat)}$	I_C = −200 mA, I_B = −10 mA	—	−0.87	−1.2	V
Transition frequency	f_T	V_{CE} = −2 V, I_C = −10 mA	—	130	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = −10 V, I_E = 0, f = 1 MHz	—	4.2	—	pF

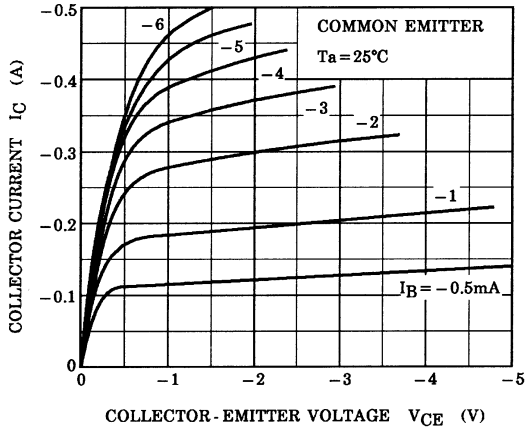
(Note) hFE Classification A : 300~600, B : 500~1000

Q2 Electrical Characteristics (Ta = 25°C)

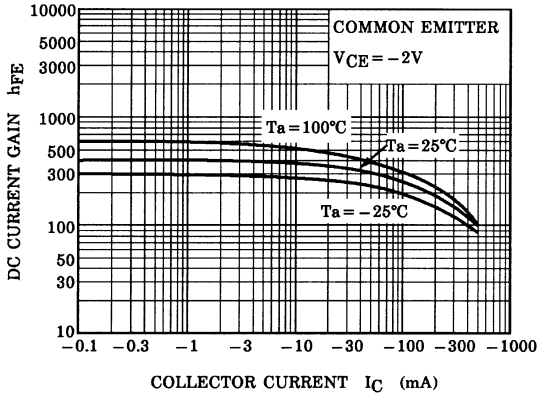
Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cutoff current	I_{CBO}	V_{CB} = 50 V, I_E = 0	—	—	100	nA
	I_{CEO}	V_{CE} = 50 V, I_B = 0	—	—	500	
Emitter cutoff current	I_{EBO}	V_{EB} = 6 V, I_C = 0	0.081	—	0.15	nA
DC current gain	h_{FE}	V_{CE} = 5 V, I_C = 10 mA	80	—	—	
Collector-emitter saturation voltage	$V_{CE\ (sat)}$	I_C = 5 mA, I_B = 0.25 mA	—	0.1	0.3	V
Input voltage (ON)	$V_{I(ON)}$	V_{CE} = 0.2 V, I_C = 5 mA	0.7	—	1.8	V
Input voltage (OFF)	$V_{I(OFF)}$	V_{CE} = 5 V, I_C = 0.1 mA	0.5	—	1.0	V
Transition frequency	f_T	V_{CE} = 10 V, I_C = 5 mA	—	250	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0, f = 1 MHz	—	3	—	pF
Input resistor	R1	—	7	10	13	kΩ
Resistor ratio	R1/R2	—	0.191	0.213	0.232	

Q1

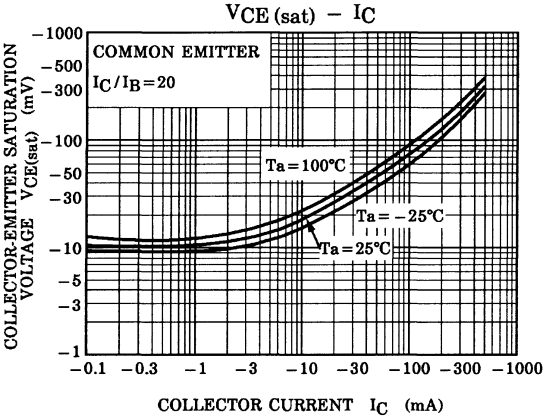
$I_C - V_{CE}$



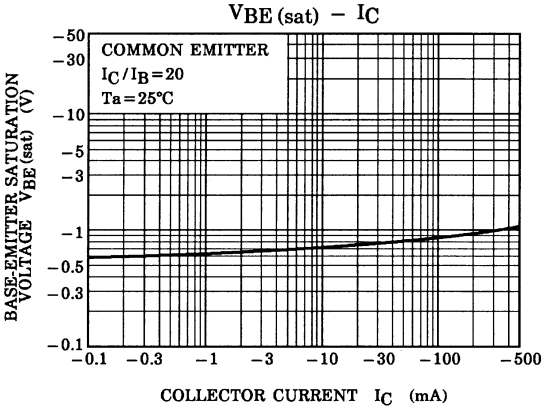
$h_{FE} - I_C$



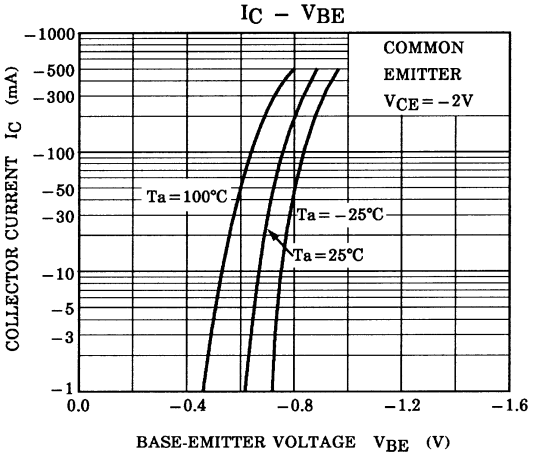
$V_{CE\,(sat)} - I_C$



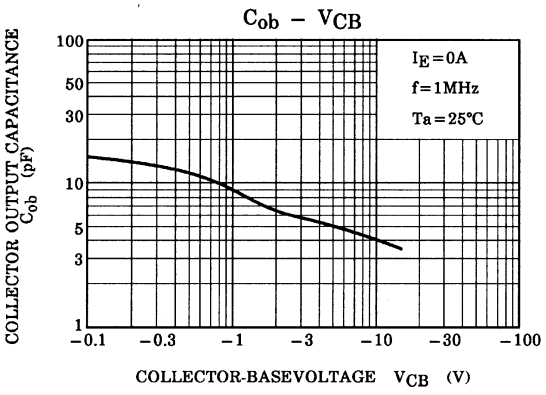
$V_{BE\,(sat)} - I_C$



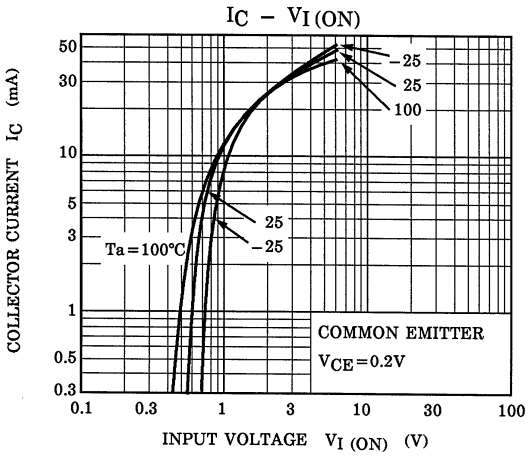
$I_C - V_{BE}$

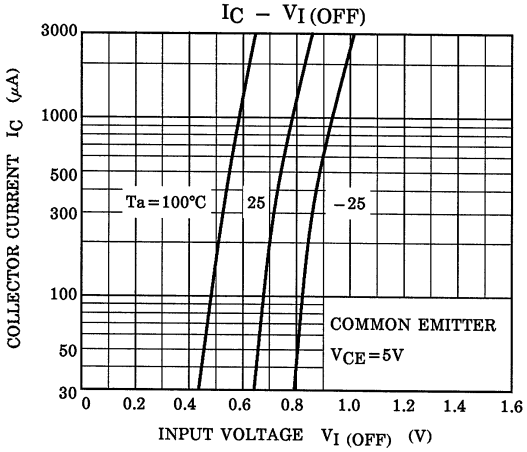


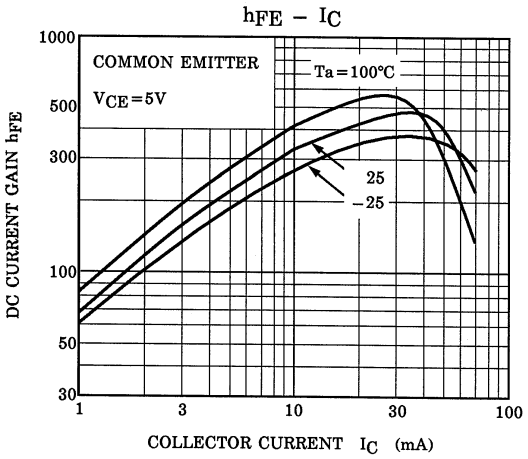
$C_{ob} - V_{CB}$



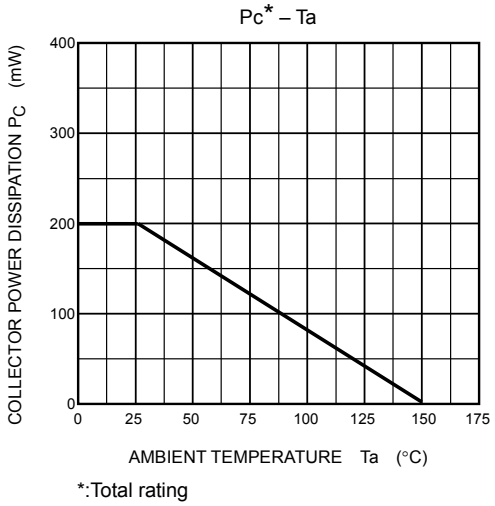
Q2


I_C – $V_{I\,(ON)}$
COLLECTOR CURRENT I_C (mA)
INPUT VOLTAGE $V_{I\,(ON)}$ (V)
Ta = 100°C
25
−25
−25
25
100
COMMON EMITTER
V_{CE} = 0.2V
50
30
10
5
3
1
0.5
0.3
0.1
0.3
1
3
10
30
100


I_C – $V_{I\,(OFF)}$
COLLECTOR CURRENT I_C (μA)
INPUT VOLTAGE $V_{I\,(OFF)}$ (V)
Ta = 100°C
25
−25
COMMON EMITTER
V_{CE} = 5V
3000
1000
500
300
100
50
30
0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6


h_{FE} – I_C
DC CURRENT GAIN h_{FE}
COLLECTOR CURRENT I_C (mA)
COMMON EMITTER
V_{CE} = 5V
Ta = 100°C
25
−25
1000
500
300
100
50
30
1
3
10
30
100

Q1, Q2 common



*:Total rating

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