

HN4B06J

Audio Frequency General Purpose Amplifier Applications

Unit: mm

Q1:

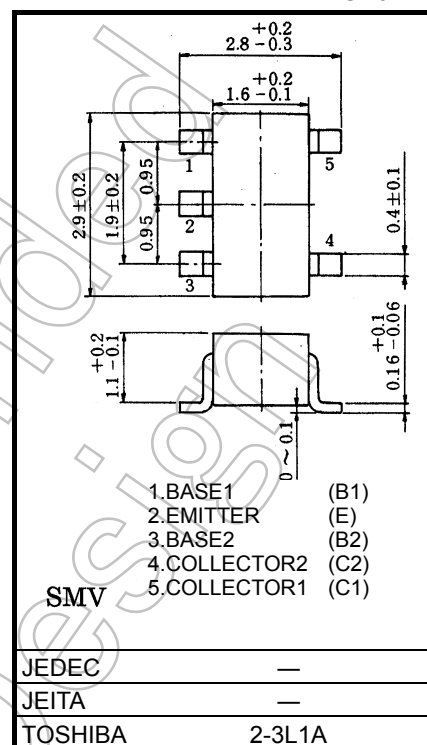
- High voltage : $V_{CEO} = -120V$
- High h_{FE} : $h_{FE} = 200$ to 700
- Excellent h_{FE} linearity
: $h_{FE}(I_C = -0.1mA) / h_{FE}(I_C = -2mA) = 0.95$ (typ.)

Q2:

- High voltage : $V_{CEO} = 120V$
- High h_{FE} : $h_{FE} = 200$ to 700
- Excellent h_{FE} linearity
: $h_{FE}(I_C = 0.1mA) / h_{FE}(I_C = 2mA) = 0.95$ (typ.)

Q1 Absolute Maximum Ratings ($T_a = 25^\circ C$)

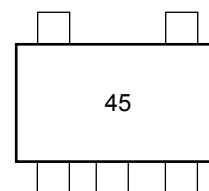
Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	-120	V
Collector-emitter voltage	V_{CEO}	-120	V
Emitter-base voltage	V_{EBO}	-5	V
Collector current	I_C	-100	mA
Base current	I_B	-20	mA



Q2 Absolute Maximum Ratings ($T_a = 25^\circ C$)

Characteristic	Symbol	Rating	Unit
Collector-base voltage	V_{CBO}	120	V
Collector-emitter voltage	V_{CEO}	120	V
Emitter-base voltage	V_{EBO}	5	V
Collector current	I_C	100	mA
Base current	I_B	20	mA

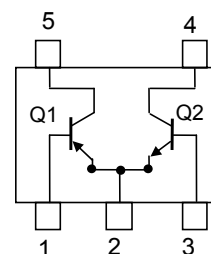
Marking



Q1,Q2 Common Absolute Maximum Ratings ($T_a = 25^\circ C$)

Characteristic	Symbol	Rating	Unit
Collector power dissipation	P_{C^*}	300	mW
Junction temperature	T_j	150	$^\circ C$
Storage temperature range	T_{stg}	-55 to 150	$^\circ C$

Equivalent Circuit (Top View)



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. Power dissipation per element should not exceed 200mW

Start of commercial production
2002-03

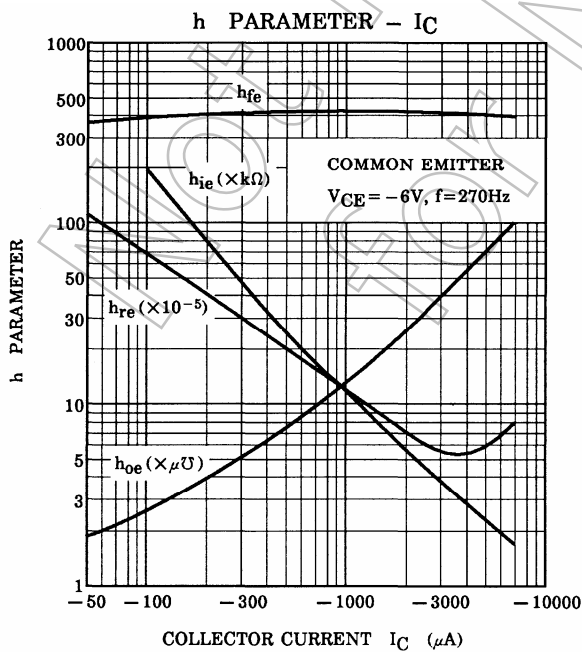
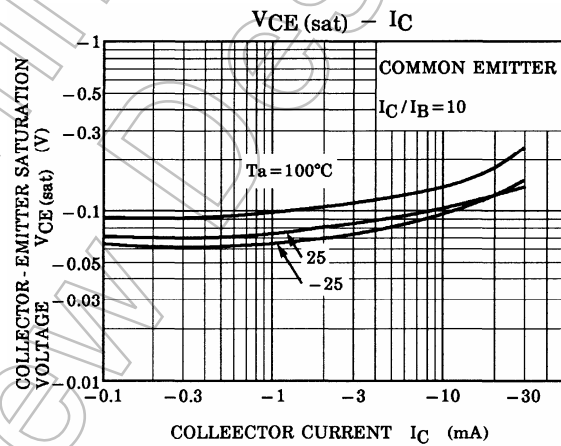
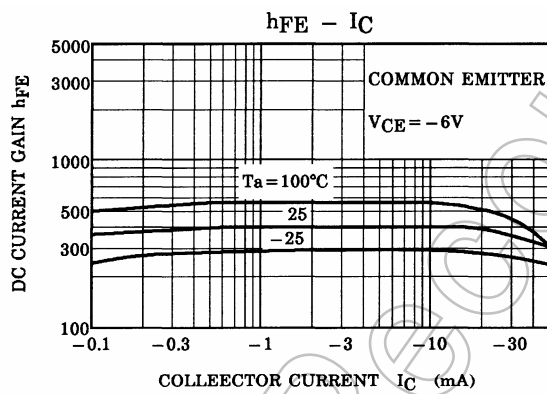
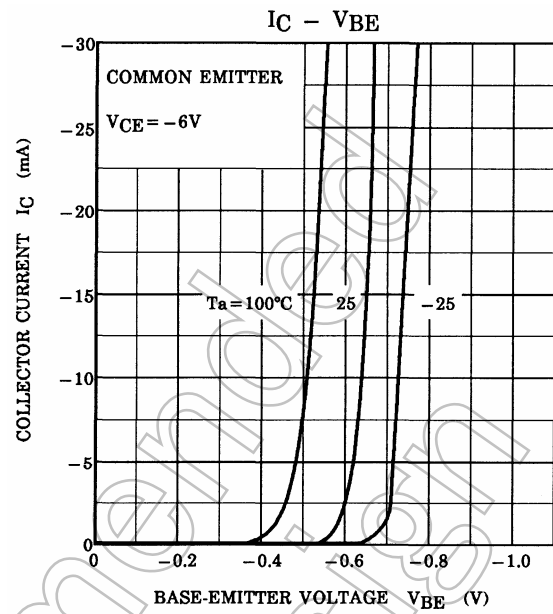
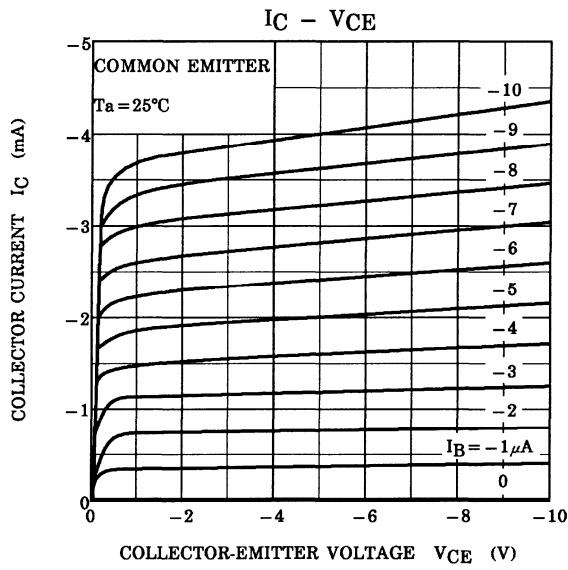
Q1 Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	—	$V_{CB} = -120V, I_E = 0$	—	—	-0.1	μA
Emitter cut-off current	I_{EBO}	—	$V_{EB} = -5V, I_C = 0$	—	—	-0.1	μA
DC current gain	h_{FE}	—	$V_{CE} = -6V, I_C = -2mA$	200	—	700	
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	$I_C = -10mA, I_B = -1mA$	—	—	-0.3	V
Transition frequency	f_T	—	$V_{CE} = -6V, I_C = -1mA$	—	100	—	MHz
Collector output capacitance	C_{ob}	—	$V_{CB} = -10V, I_E = 0, f = 1MHz$	—	4.0	—	pF
Noise figure	NF	—	$V_{CE} = 6V, I_C = 0.1mA$ $f = 1kHz, R_G = 10k\Omega$	—	1.0	—	dB

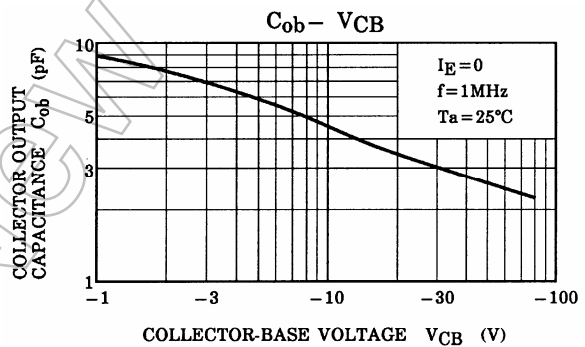
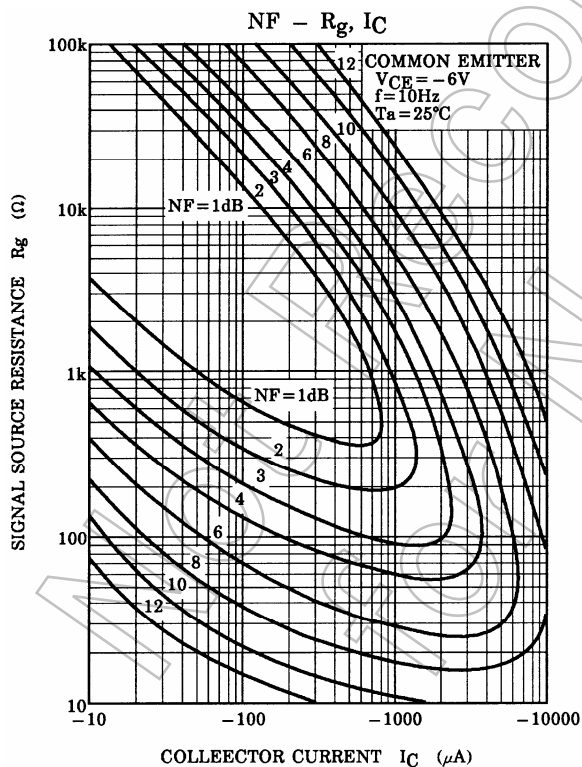
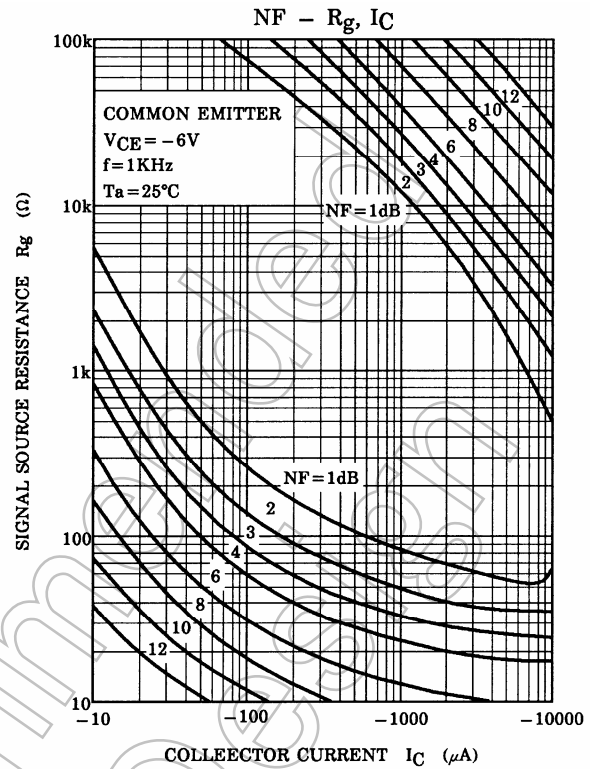
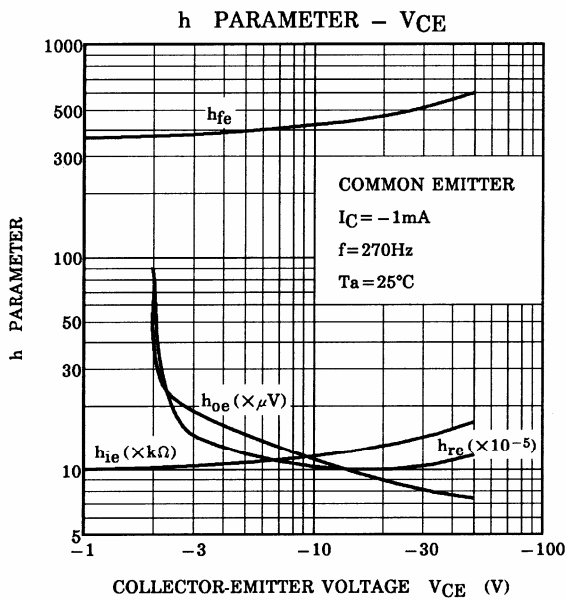
Q2 Electrical Characteristics (Ta = 25°C)

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	—	$V_{CB} = 120V, I_E = 0$	—	—	0.1	μA
Emitter cut-off current	I_{EBO}	—	$V_{EB} = 5V, I_C = 0$	—	—	0.1	μA
DC current gain	h_{FE}	—	$V_{CE} = 6V, I_C = 2mA$	200	—	700	
Collector-emitter saturation voltage	$V_{CE(sat)}$	—	$I_C = 10mA, I_B = 1mA$	—	—	0.3	V
Transition frequency	f_T	—	$V_{CE} = 6V, I_C = 1mA$	—	100	—	MHz
Collector output capacitance	C_{ob}	—	$V_{CB} = 10V, I_E = 0, f = 1MHz$	—	3.0	—	pF
Noise figure	NF	—	$V_{CE} = 6V, I_C = 0.1mA$ $f = 1kHz, R_G = 10k\Omega$	—	1.0	—	dB

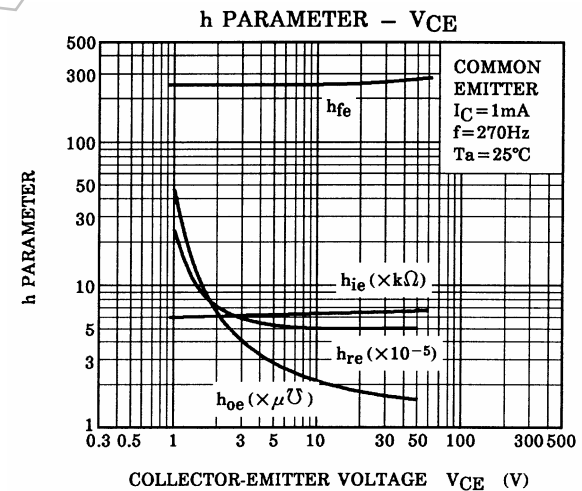
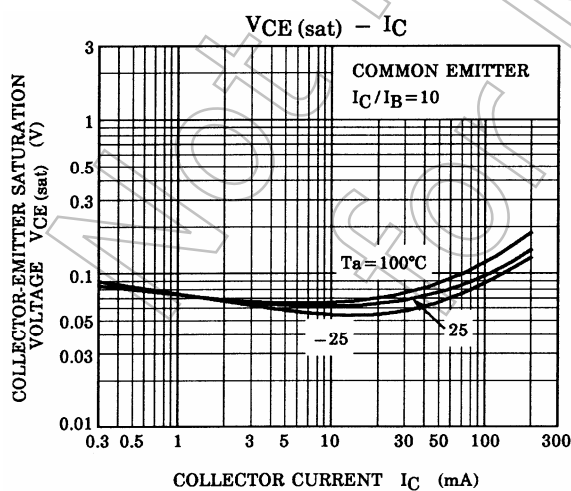
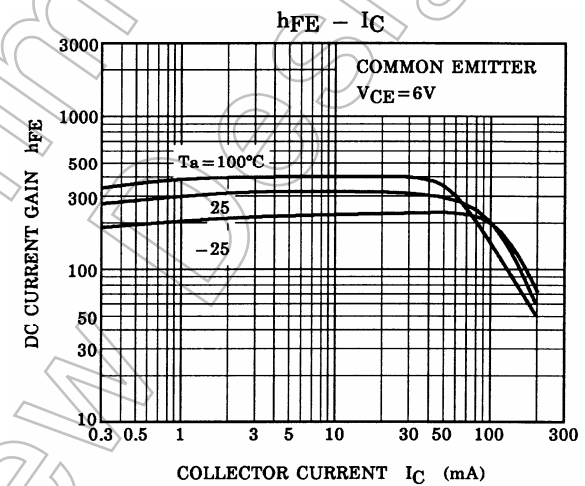
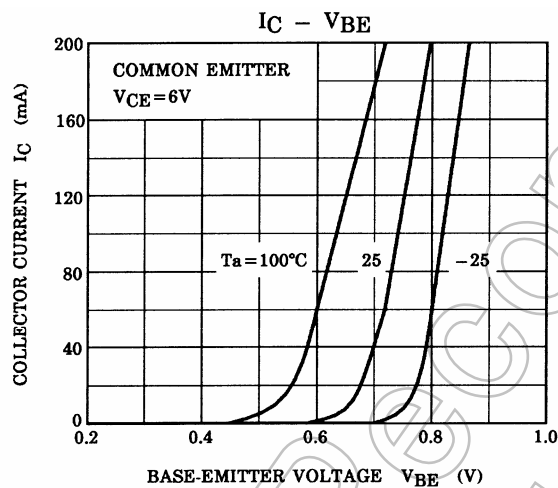
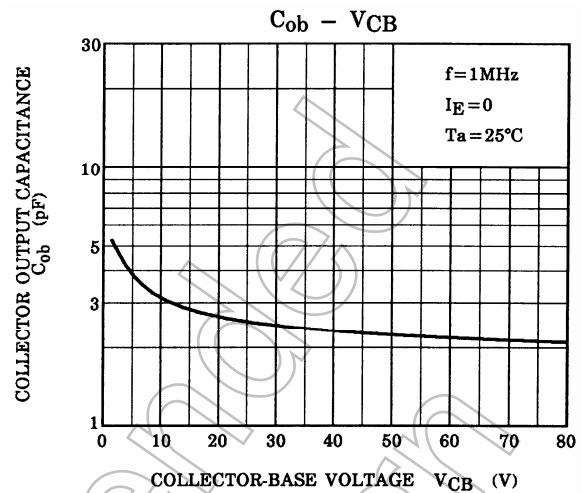
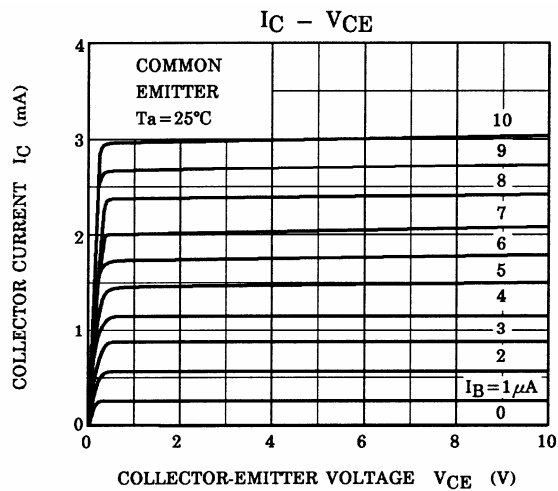
Q1 (PNP transistor)



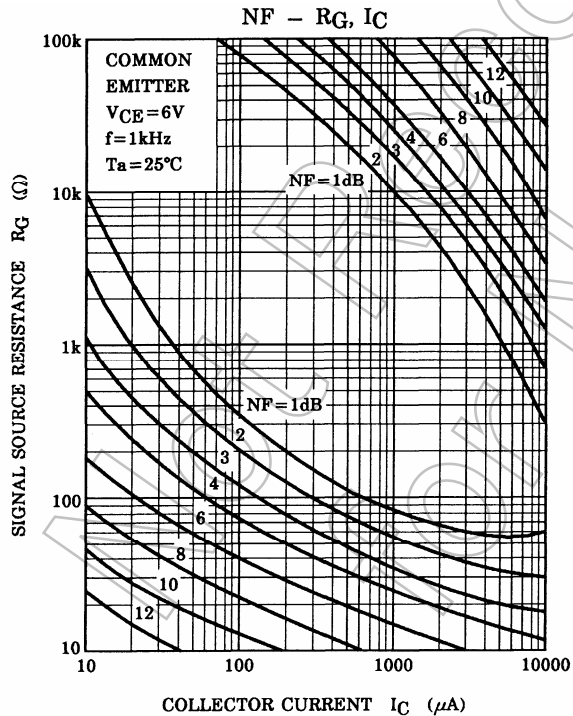
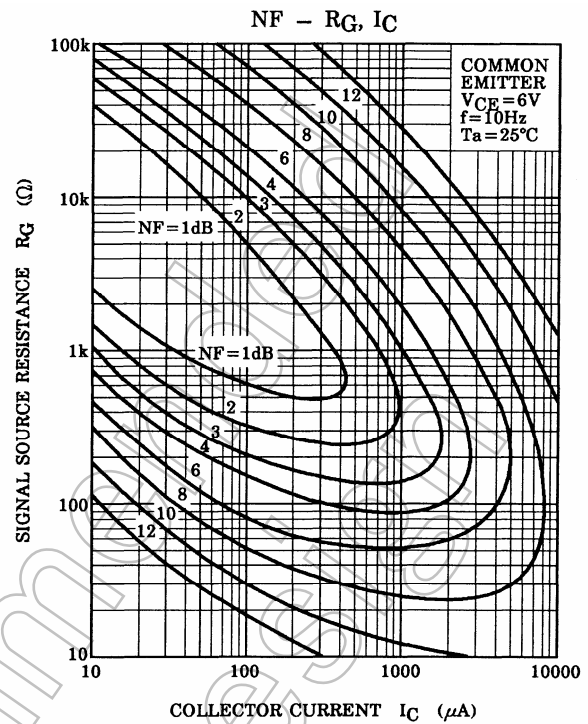
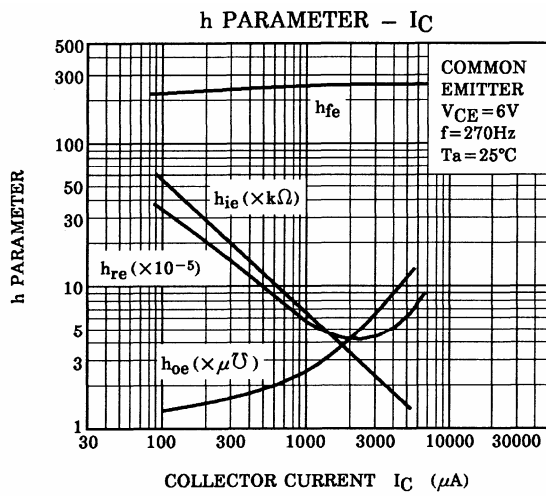
Q1(PNP transistor)



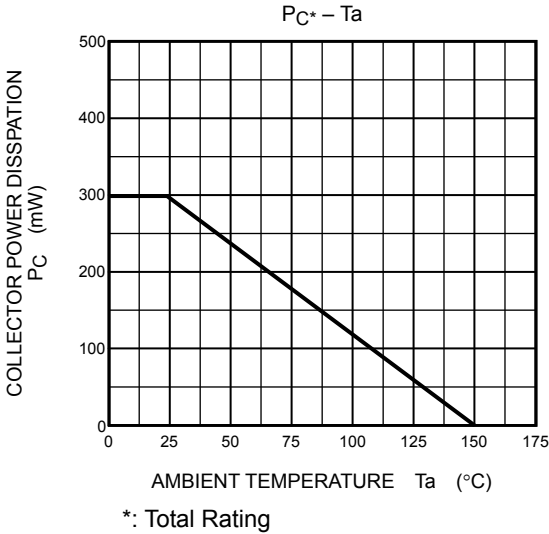
Q2 (NPN transistor)



Q2(NPN transistor)



(Q1, Q2 Common)



Not Recommended
for New Design

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