

# HN4A51J

## Audio Frequency General Purpose Amplifier Applications

- High voltage :  $V_{CE0} = -120V$
- 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.)
- Low noise:  $NF = 1dB$  (typ.)

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

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
Collector power dissipation	$P_C^*$	300	mW
Junction temperature	$T_j$	150	°C
Storage temperature range	$T_{stg}$	-55 to 150	°C

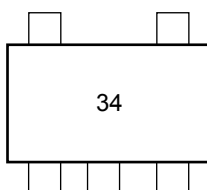
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.)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

\*Total rating. Power dissipation per element should not exceed 200mW.

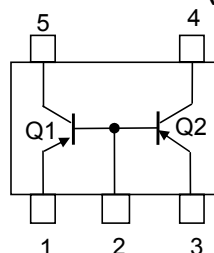
## Electrical Characteristics (Ta = 25°C) (Q1,Q2 Common)

Characteristic	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	$I_{CBO}$	—	$V_{CB} = -120V, I_E = 0$	—	—	-0.1	$\mu A$
Emitter cut-off current	$I_{EBO}$	—	$V_{EB} = -5V, I_C = 0$	—	—	-0.1	$\mu A$
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	—	pF
Noise figure	NF	—	$V_{CE} = -6V, I_C = -0.1mA$ $f = 1kHz, R_G = 10k\Omega$	—	1.0	—	dB

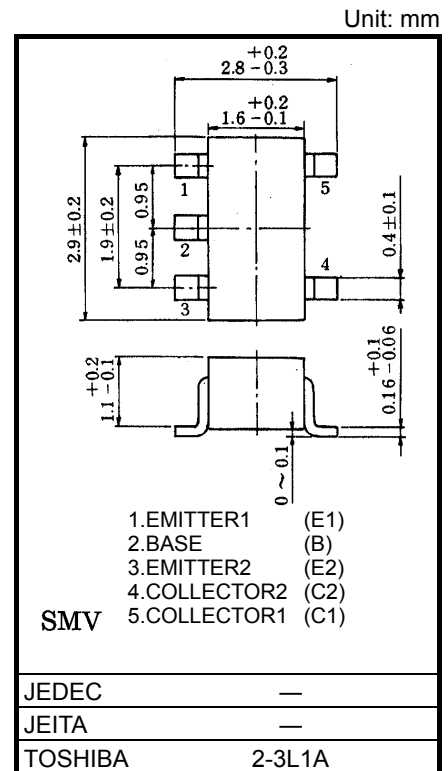
## Marking



## Equivalent Circuit (Top View)

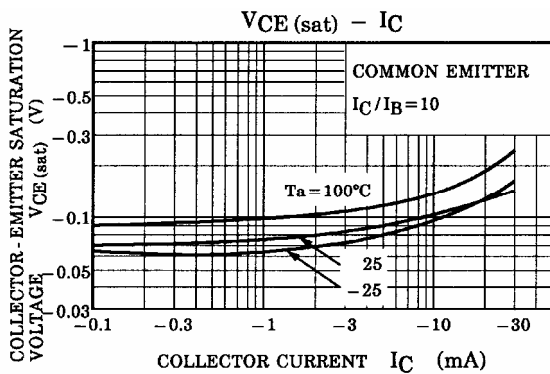
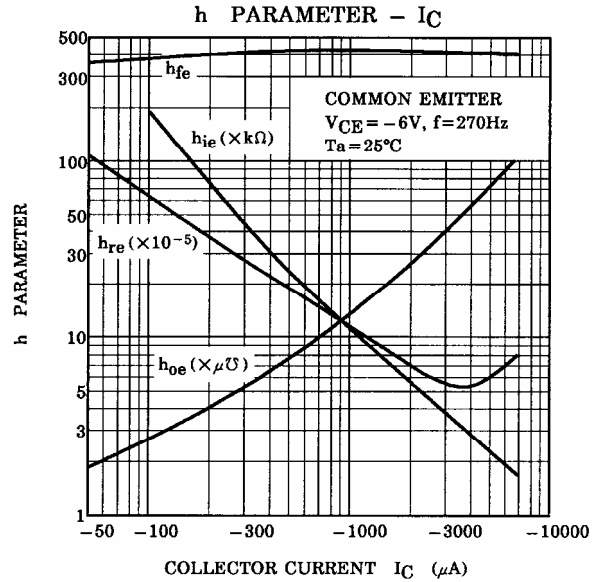
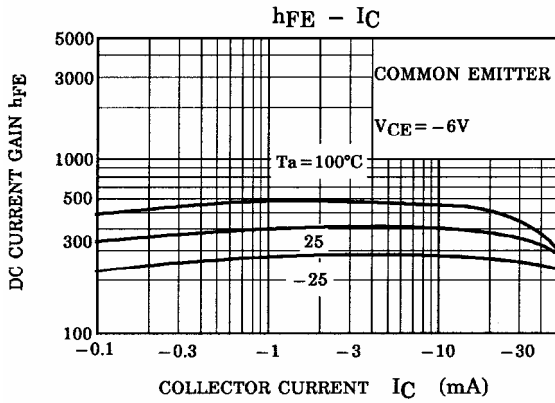
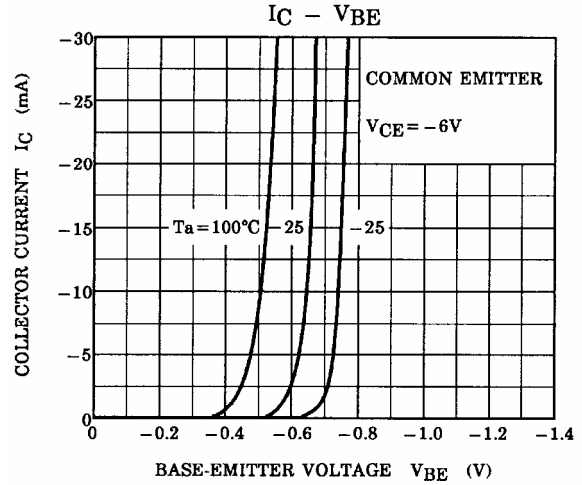
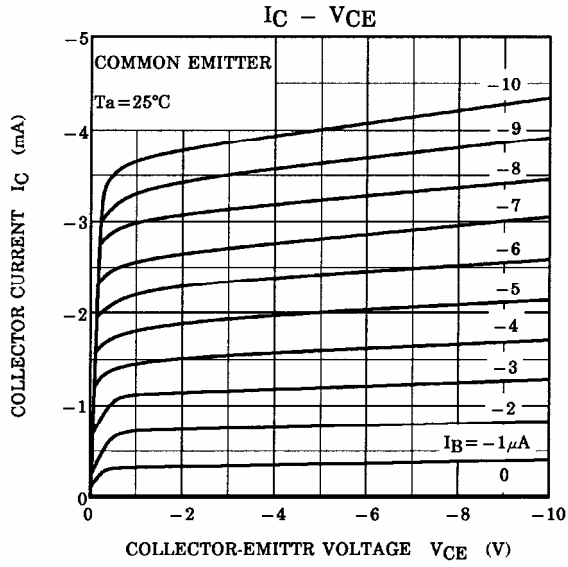


Start of commercial production  
2000-08

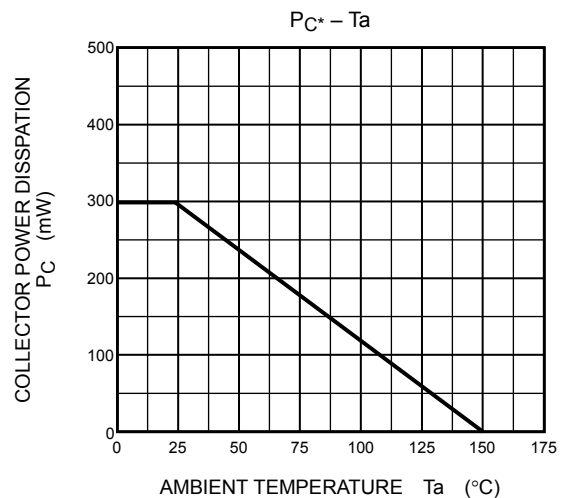
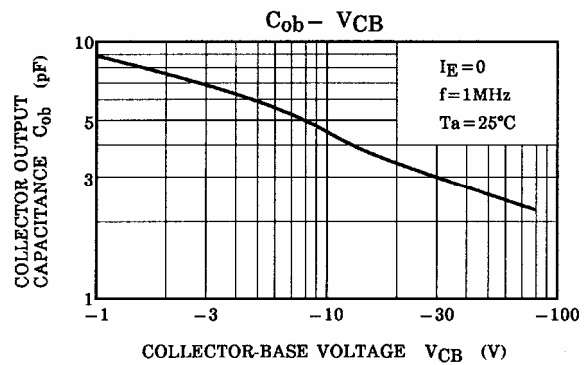
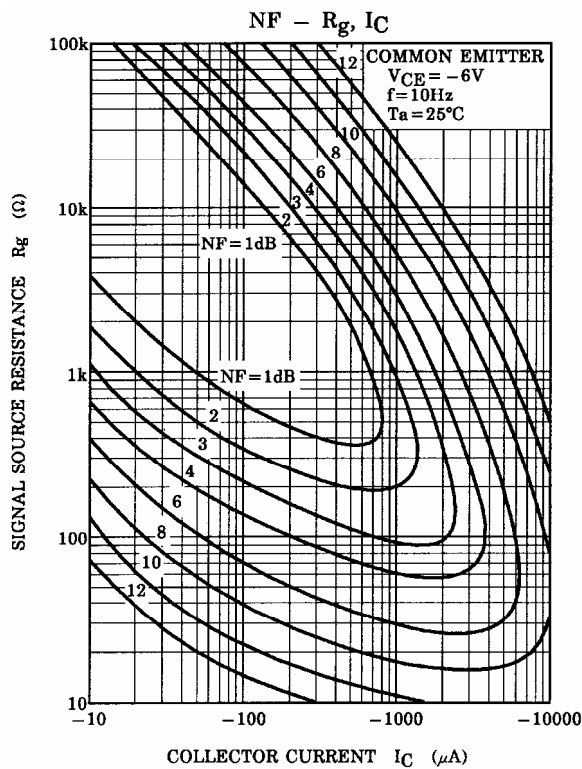
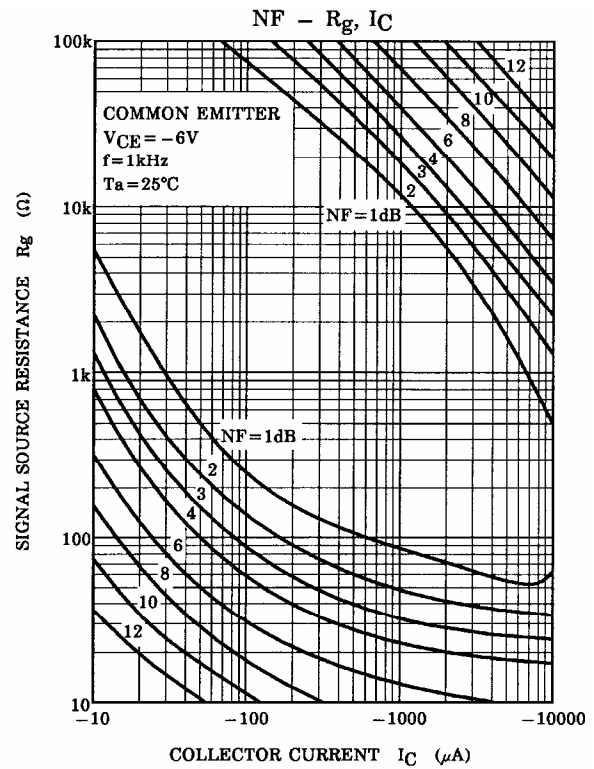
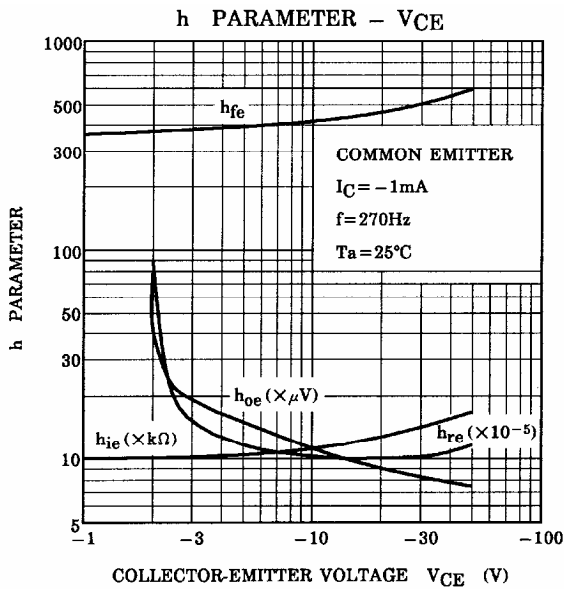


Weight: 0.014g (typ.)

## Q1,Q2 Common



(Q1,Q2 Common)



\*: Total Rating

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