Bipolar Transistors Silicon NPN Epitaxial Type

HN1C01FE

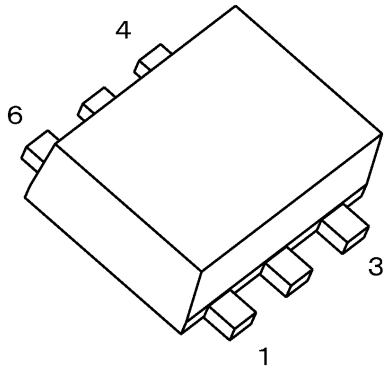
1. Applications

- Low-Frequency Amplifiers

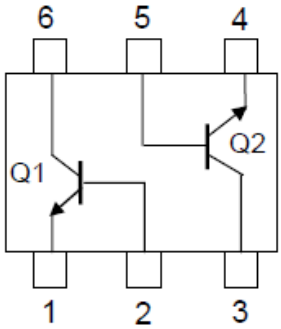
2. Features

(1) AEC-Q101 qualified (Please see the orderable part number list)
(2) Small package (Dual type)
(3) High voltage: V_{CEO} = 50 V
(4) High collector current: I_C = 150 mA (max)
(5) High h_{FE}: h_{FE} = 120 to 400
(6) Excellent h_{FE} linearity: h_{FE} (I_C = 0.1 mA)/h_{FE} (I_C = 2 mA) = 0.95 (typ.)

3. Packaging and Internal Circuit



ES6



1: Emitter1
2: Base1
3: Collector2
4: Emitter2
5: Base2
6: Collector1

Start of commercial production
2000-05

4. Orderable part number

Orderable part number		AEC-Q101	Note
HN1C01FE-Y	HN1C01FE-Y,LF	—	General Use
	HN1C01FE-Y,LXGF	YES (Note 1)	Unintended Use (Note 1)
	HN1C01FE-Y,LXHF	YES	Automotive Use
HN1C01FE-GR	HN1C01FE-GR,LF	—	General Use
	HN1C01FE-GR,LXGF	YES (Note 1)	Unintended Use (Note 1)
	HN1C01FE-GR,LXHF	YES	Automotive Use

Note 1: For more information, please contact our sales or use the inquiry form on our website.

5. Absolute Maximum Ratings (Note) (Unless otherwise specified, T_a = 25°C) (Q1, Q2 Common)

Characteristics	Note	Symbol	Rating	Unit
Collector-base voltage		V_{CBO}	60	V
Collector-emitter voltage		V_{CEO}	50	
Emitter-base voltage		V_{EBO}	5	
Collector current		I_C	150	mA
Base current		I_B	30	
Collector power dissipation	(Note 1)	P_C	100	mW
Junction temperature		T_j	150	°C
Storage temperature		T_{stg}	-55 to 150	

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).

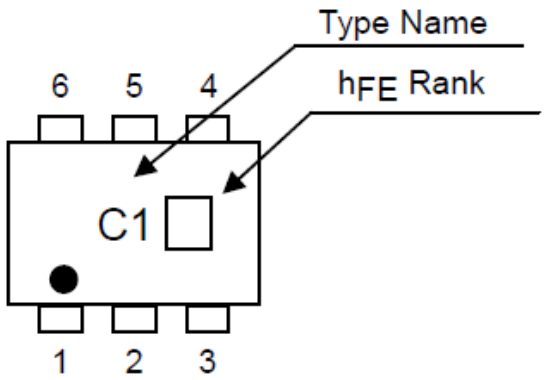
Note 1: Total rating

6. Electrical Characteristics (Note) (Unless otherwise specified, T_a = 25 °C)(Q1, Q2 Common)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Collector cut-off current	I_{CBO}	V_{CB} = 60 V, I_E = 0 mA	—	—	100	nA
Emitter cut-off current	I_{EBO}	V_{EB} = 5 V, I_C = 0 mA	—	—	100	
DC current gain	h_{FE}	V_{CE} = 6 V, I_C = 2 mA	120	—	400	—
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C = 100 mA, I_B = 10 mA	—	0.1	0.25	V
Transition frequency	f_T	V_{CE} = 10 V, I_C = 1 mA	80	—	—	MHz
Collector output capacitance	C_{ob}	V_{CB} = 10 V, I_E = 0 mA, f = 1 MHz	—	2	—	pF

Note: h_{FE} classification Y (Y): 120 to 240, GR (G): 200 to 400
( ) marking symbol

7. Marking



Marking

8. Characteristics Curves (Note) (Q1, Q2 Common)

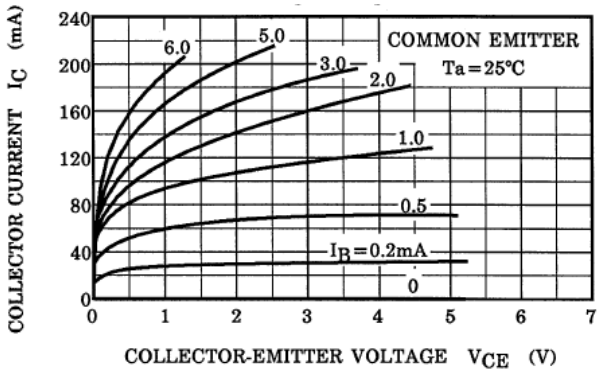


Fig. 8.1 I_C - V_{CE}

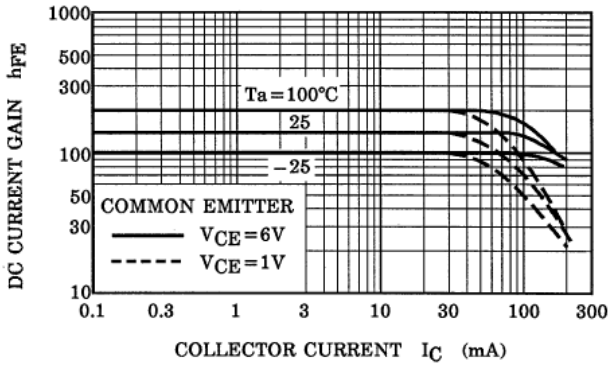


Fig. 8.2 h_{FE} - I_C

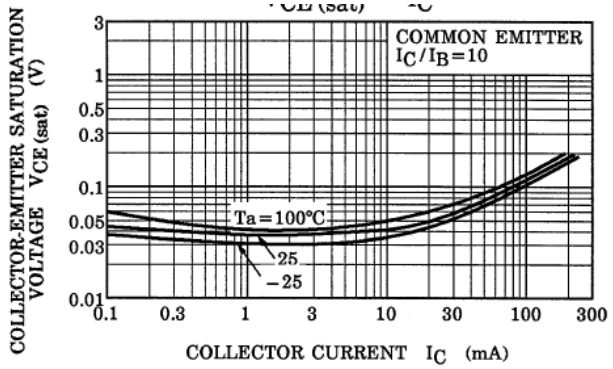


Fig. 8.3 $V_{CE(sat)}$ - I_C

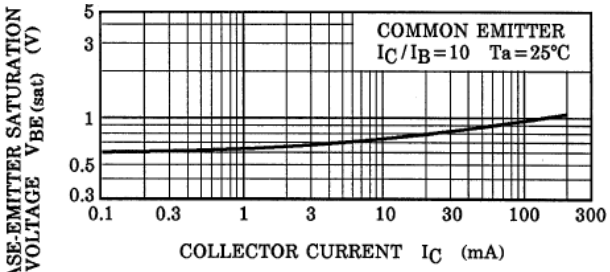


Fig. 8.4 $V_{BE(sat)}$ - I_C

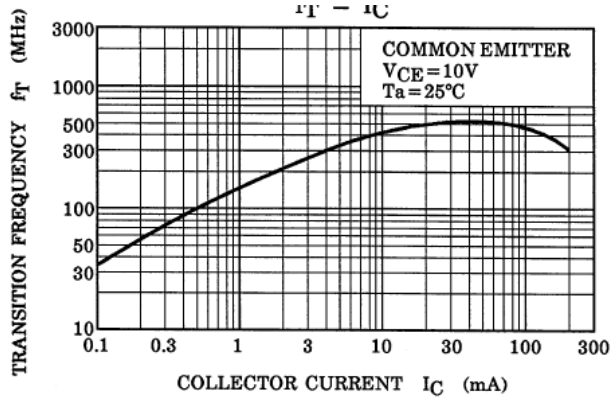


Fig. 8.5 f_T - I_C

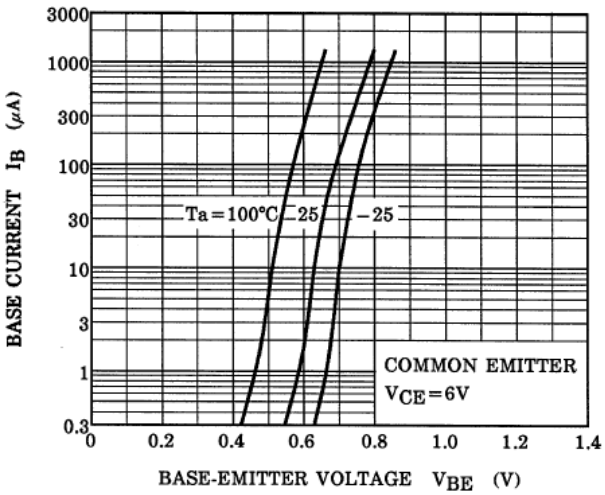


Fig. 8.6 I_B - V_{BE}

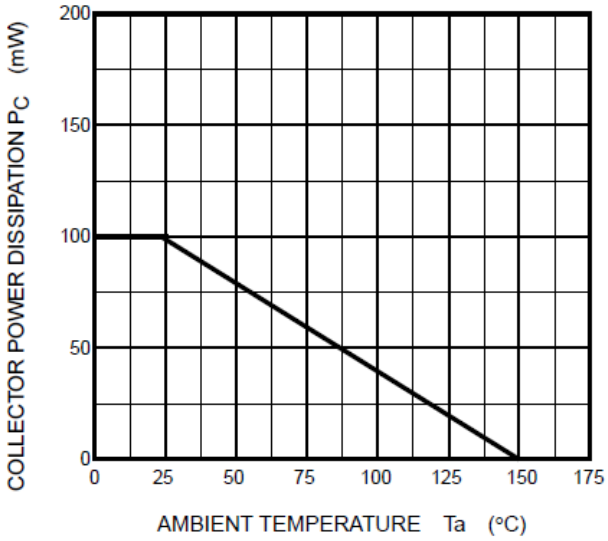
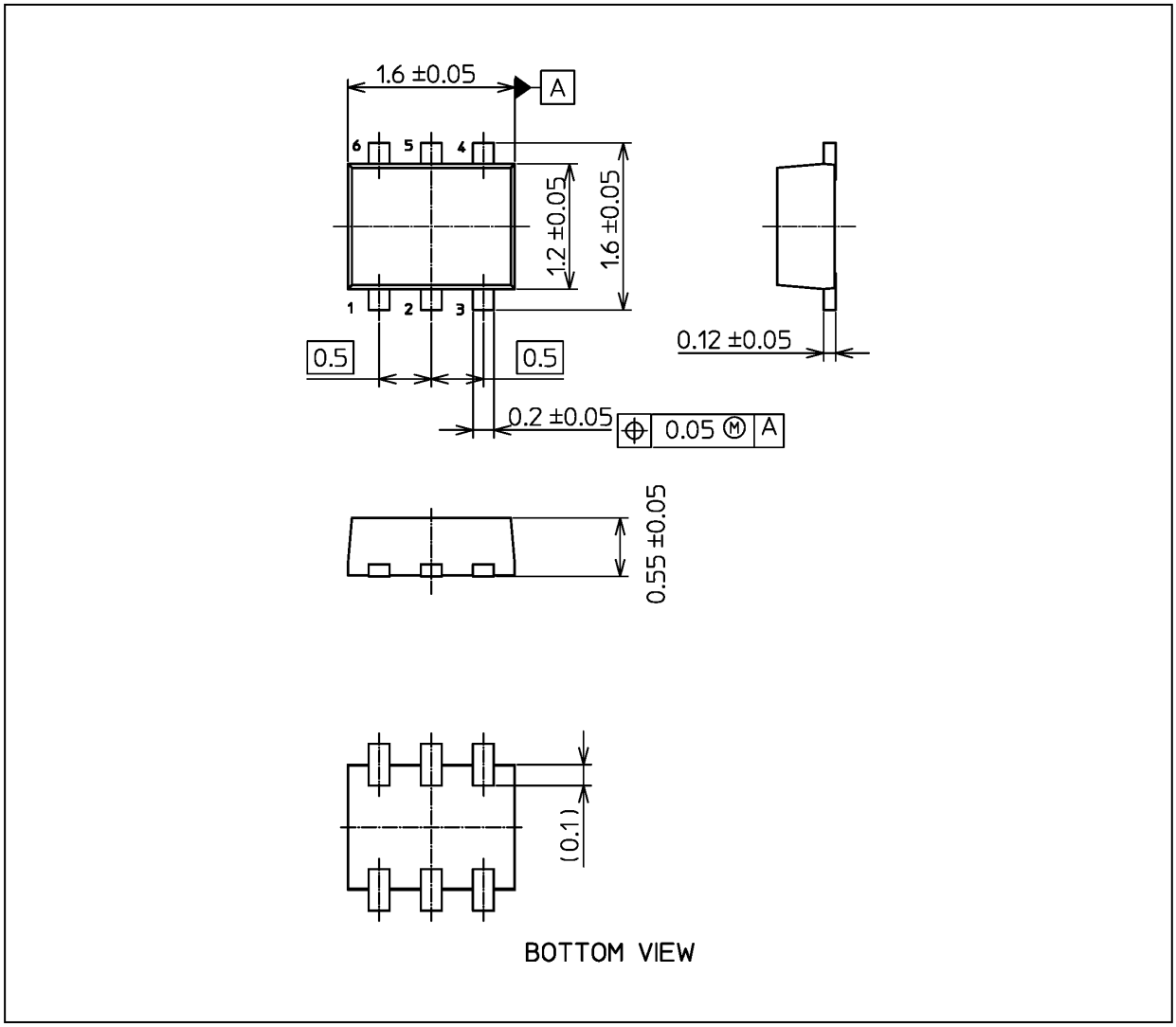


Fig. 8.7 P_C (Note1) - T_a

Note: The above characteristics curves are presented for reference only and not guaranteed by production test, unless otherwise noted.

Package Dimensions

Unit: mm



Weight: 3.0 mg (typ.)

Package Name(s)
TOSHIBA: 1-2X1S
Nickname: ES6

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