HTT1115S

Silicon NPN Epitaxial Twin Transistor

HITACHI

ADE–208–1440C(Z)

Rev.3
Aug. 2001

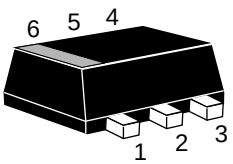
Features

- Include 2 transistors in a small size SMD package: SMFPAK–6(6 Leads: 1.5 x 1.1 x 0.55 mm)

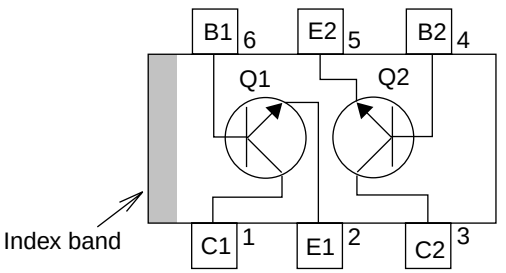
Q1: Equivalent Buffer transistor	Q2: Equivalent OSC transistor
2SC5700	2SC5757

Outline

SMFPAK-6



Pin Arrangement



1. Collector Q1
2. Emitter Q1
3. Collector Q2
4. Base Q2
5. Emitter Q2
6. Base Q1

Note: Marking is “EK1”.

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Absolute Maximum Ratings

(Ta = 25 °C)

Item	Symbol	Ratings Q1	Ratings Q2	Unit
Collector to base voltage	V_{CBO}	15	10	V
Collector to emitter voltage	V_{CEO}	4	3.5	V
Emitter to base voltage	V_{EBO}	1.5	1.5	V
Collector current	I_C	50	80	mA
Collector power dissipation	P_C	Total 220*		mW
Junction temperature	Tj	150	150	°C
Storage temperature	Tstg	–55 to +150	–55 to +150	°C

*Value on PCB. (FR–4(13 x 13 x 0.635 mm))

Electrical Characteristics (Q1)

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Condition
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	I_C = 10 μA, I_E = 0
Collector cutoff current	I_{CBO}	—	—	0.1	μA	V_{CB} = 15 V, I_E = 0
Collector cutoff current	I_{CEO}	—	—	1	μA	V_{CE} = 4 V, R_{BE} = infinite
Emitter cutoff current	I_{EBO}	—	—	0.2	μA	V_{EB} = 0.8 V, I_C = 0
DC current transfer ratio	h_{FE}	100	130	170	—	V_{CE} = 1 V, I_C = 5 mA
Reverse transfer capacitance	C_{re}	—	—	0.45	pF	V_{CB} = 1 V, f = 1 MHz, Emitter ground
Gain bandwidth product	f_T	10	13	—	GHz	V_{CE} = 1 V, I_C = 5 mA, f = 1 GHz
Forward transfer coefficient	$\|S_{21}\|^2$	13	16	—	dB	V_{CE} = 1 V, I_C = 5 mA, f = 900 MHz
Noise figure	NF	—	1.0	2.0	dB	V_{CE} = 1 V, I_C = 5 mA, f = 900 MHz, $\Gamma_S = \Gamma_L$ = 50 Ω

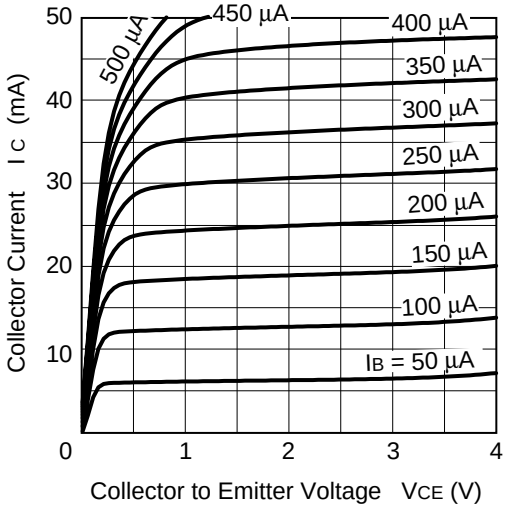
Electrical Characteristics (Q2)

(Ta = 25°C)

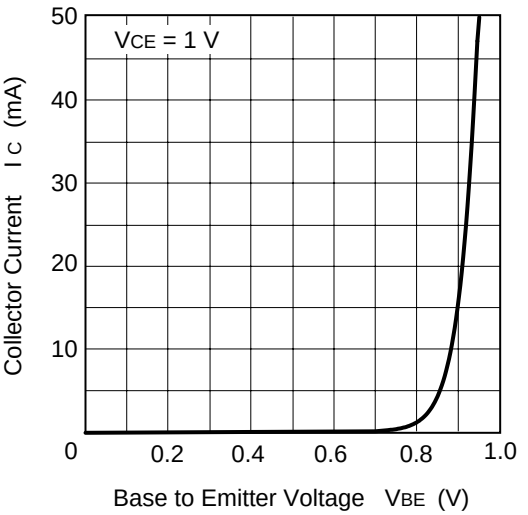
Item	Symbol	Min	Typ	Max	Unit	Test Condition
Collector to base breakdown voltage	$V_{(BR)CBO}$	10	—	—	V	I_C = 10 μA, I_E = 0
Collector cutoff current	I_{CBO}	—	—	1	μA	V_{CB} = 10 V, I_E = 0
Collector cutoff current	I_{CEO}	—	—	1	μA	V_{CE} = 3.5 V, R_{BE} = infinite
Emitter cutoff current	I_{EBO}	—	—	1.0	μA	V_{EB} = 1.5 V, I_C = 0
DC current transfer ratio	h_{FE}	80	100	130	—	V_{CE} = 1 V, I_C = 5 mA
Reverse transfer capacitance	C_{re}	—	0.8	1.1	pF	V_{CB} = 1 V, f = 1 MHz, Emitter ground
Gain bandwidth product	f_T	4	6	—	GHz	V_{CE} = 1 V, I_C = 5 mA, f = 1 GHz
Forward transfer coefficient	PG	7	12	—	dB	V_{CE} = 1 V, I_C = 5 mA, f = 900 MHz
Noise figure	NF	—	1.5	2.3	dB	V_{CE} = 1 V, I_C = 5 mA, f = 900 MHz, $\Gamma_S = \Gamma_L$ = 50 Ω

Main Characteristics (Q1)

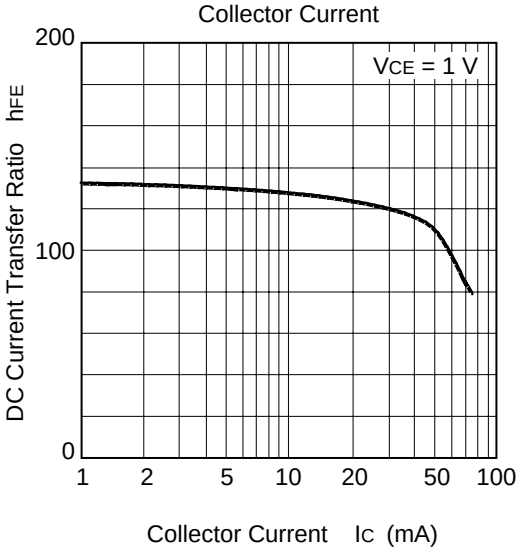
Typical Output Characteristics



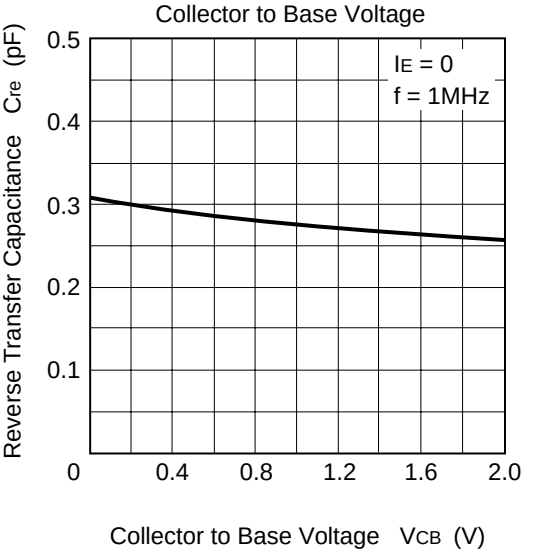
Typical Forward Transfer Characteristics



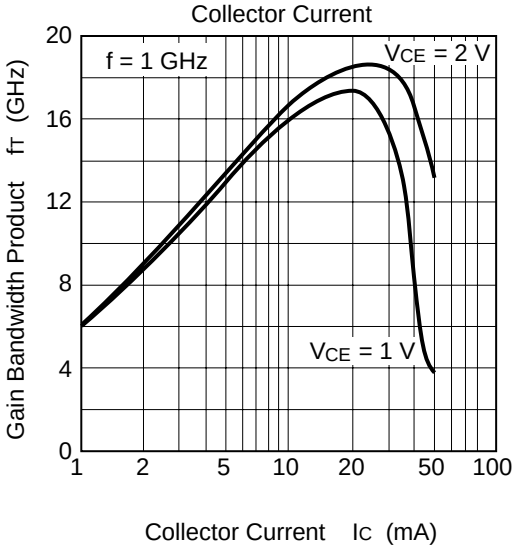
DC Current Transfer Ratio vs. Collector Current



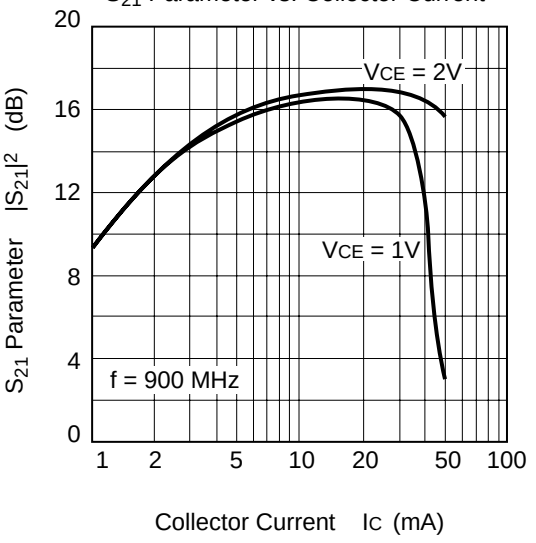
Reverse Transfer Capacitance vs. Collector to Base Voltage



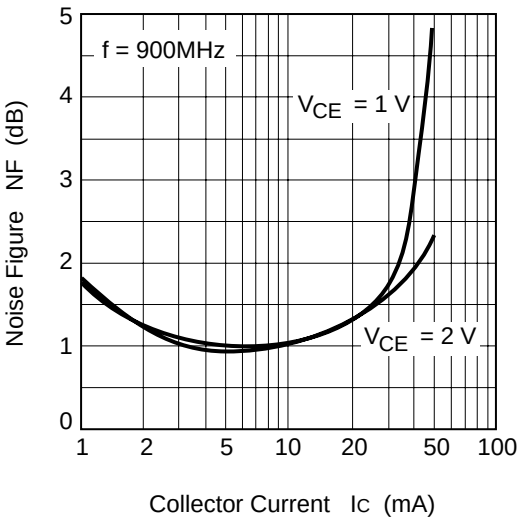
Gain Bandwidth Product vs. Collector Current



S_{21} Parameter vs. Collector Current

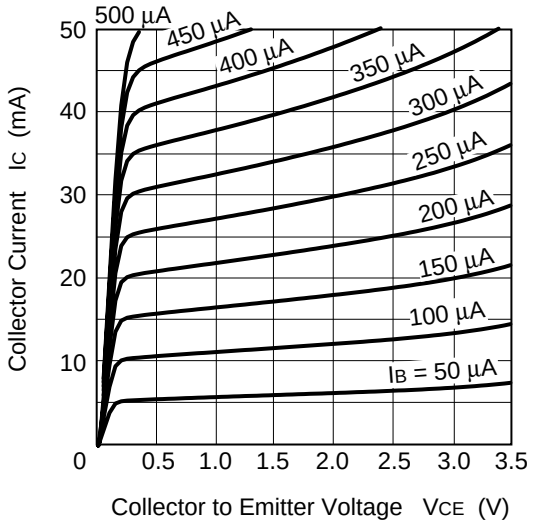


Noise Figure vs. Collector Current

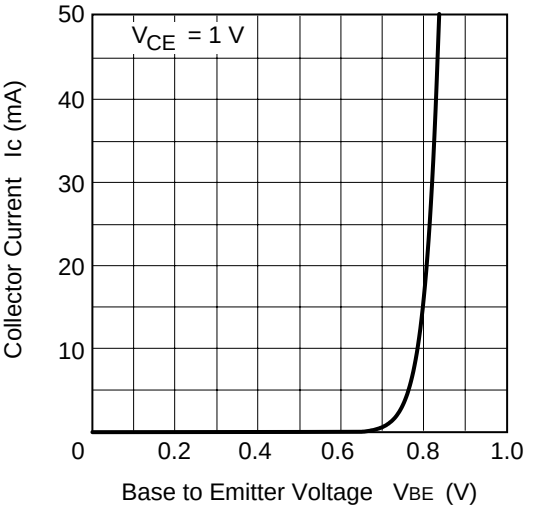


Main Characteristics (Q2)

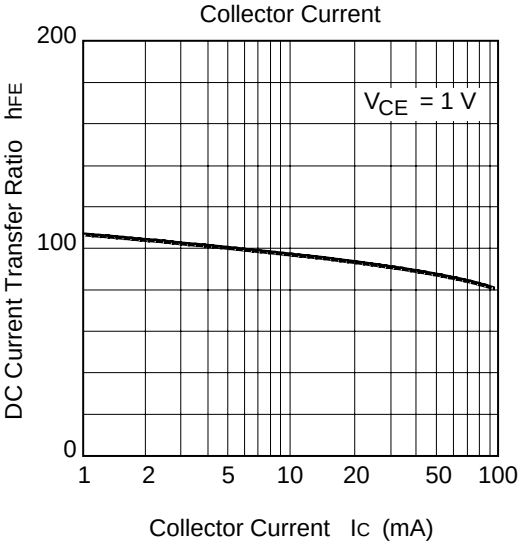
Typical Output Characteristics



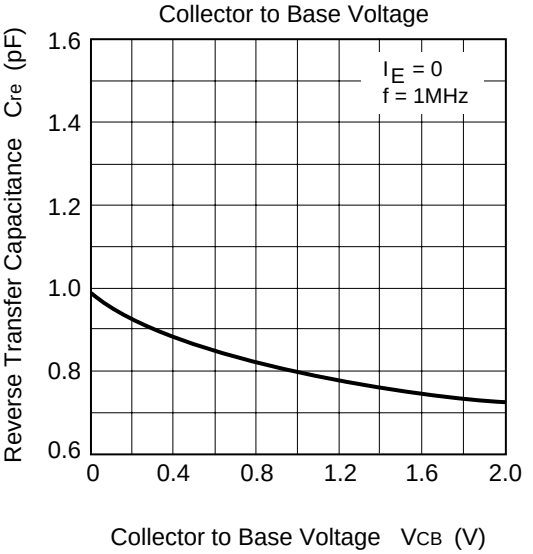
Typical Forward Transfer Characteristics



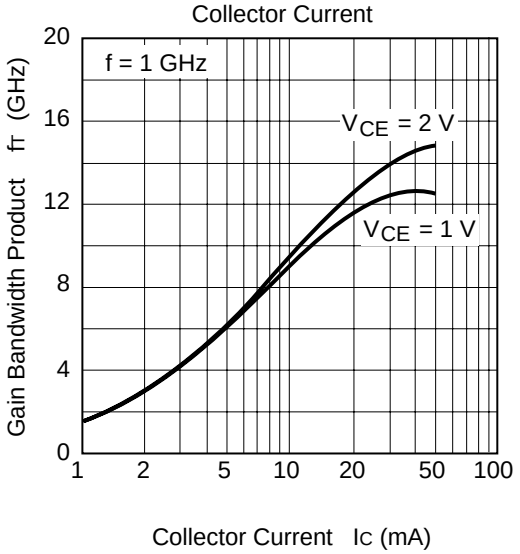
DC Current Transfer Ratio vs. Collector Current



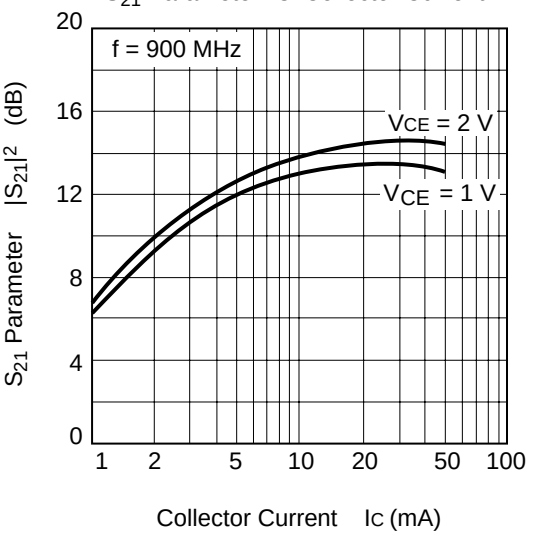
Reverse Transfer Capacitance vs. Collector to Base Voltage



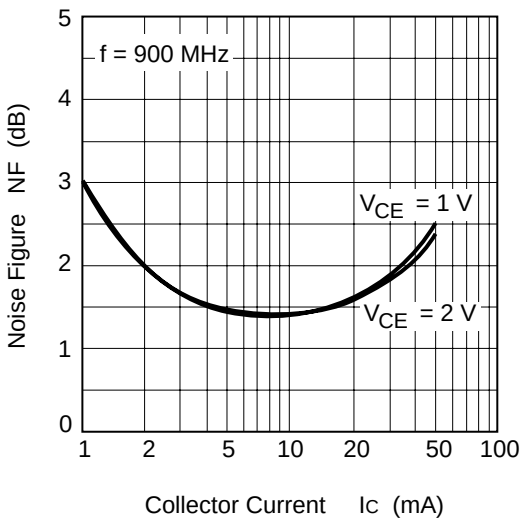
Gain Bandwidth Product vs. Collector Current



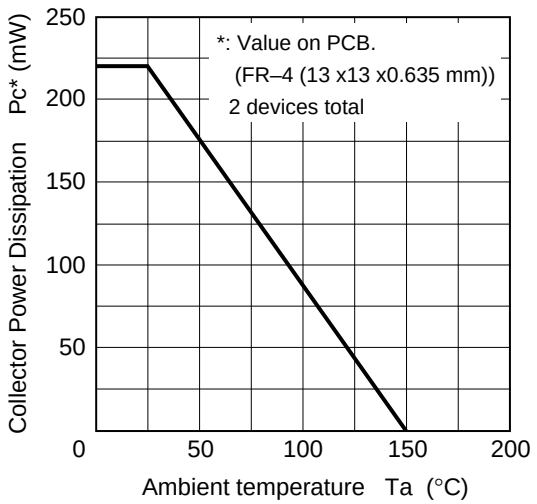
S_{21} Parameter vs. Collector Current



Noise Figure vs. Collector Current

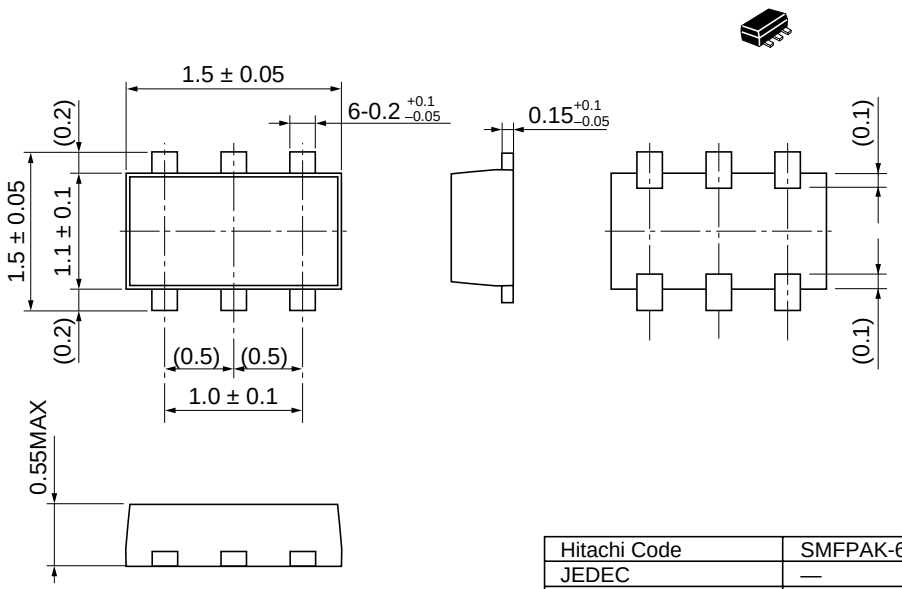


Collector Power Dissipation Curve



Package Dimensions

As of July, 2001
Unit: mm



Hitachi Code	SMFPAK-6
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.0025 g

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