

HTT1115S

Silicon NPN Epitaxial Twin Transistor

HITACHI

ADE-208-1440C(Z)

Rev.3
Aug. 2001

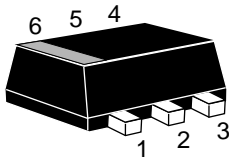
Features

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

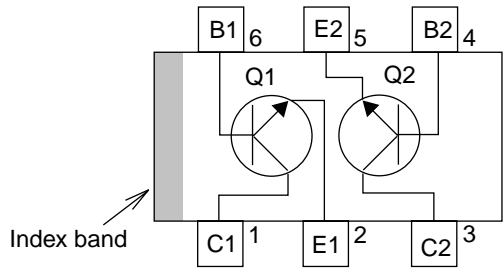
Q1: Equivalent Buffer transistor	Q2: Equivalent OSC transistor
2SC5700	2SC5757

Outline

SMFPAK-6



Pin Arrangement



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

Note: Marking is "EK1".

HTT1115S

Absolute Maximum Ratings

(Ta = 25 °C)

Item	Symbol	Ratings		Unit
		Q1	Q2	
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	T_j	150	150	°C
Storage temperature	T_{stg}	-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)

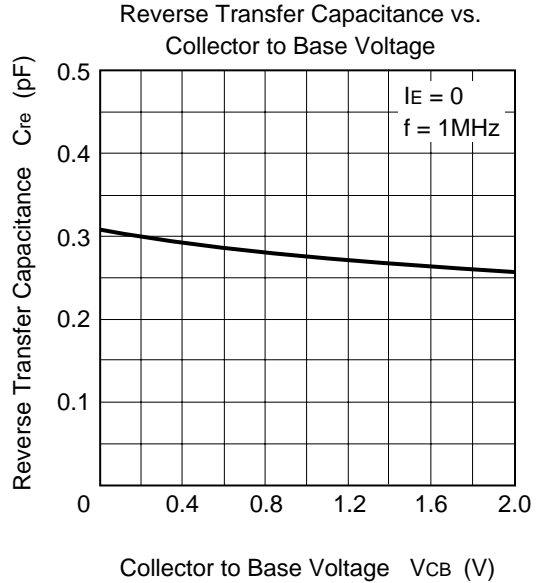
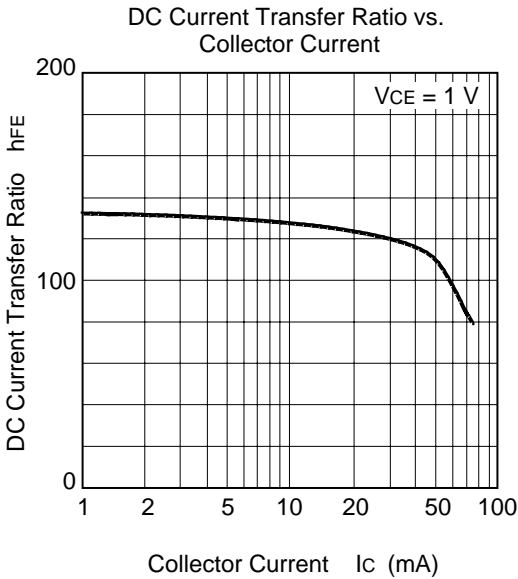
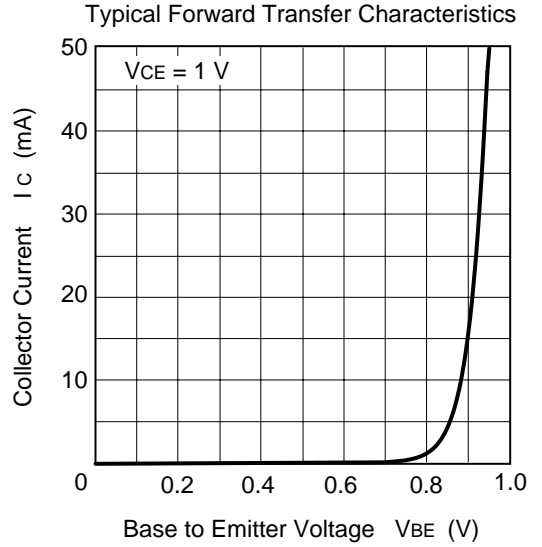
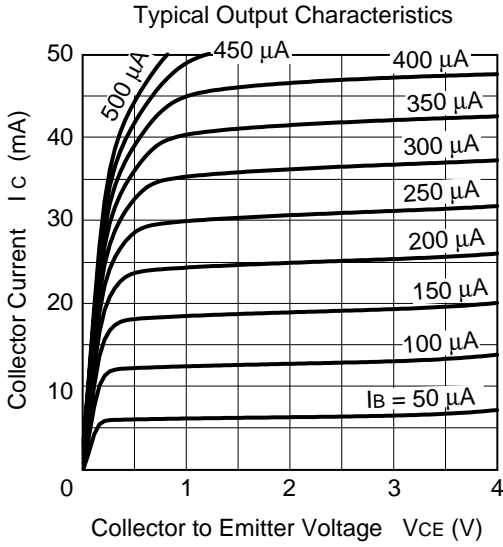
Item	Symbol	Min	Typ	Max	Unit	Test Condition
Collector to base breakdown voltage	$V_{(BR)CBO}$	15	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector cutoff current	I_{CBO}	—	—	0.1	μA	$V_{CB} = 15 V, I_E = 0$
Collector cutoff current	I_{CEO}	—	—	1	μA	$V_{CE} = 4 V, R_{BE} = \text{infinite}$
Emitter cutoff current	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	$V_{CE} = 1 V, I_C = 5 mA,$ $f = 900 MHz,$ $\Gamma_S = \Gamma_L = 50 \Omega$

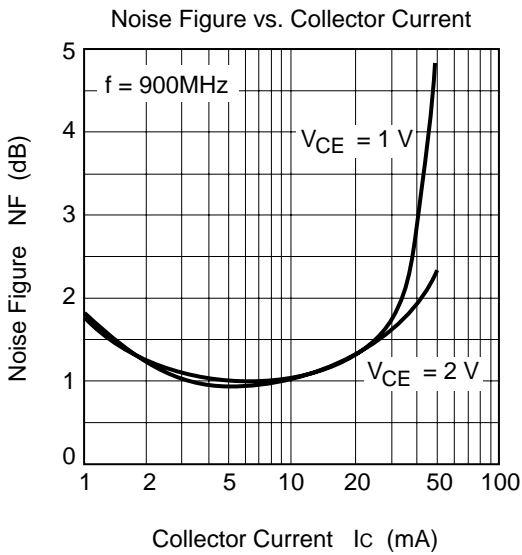
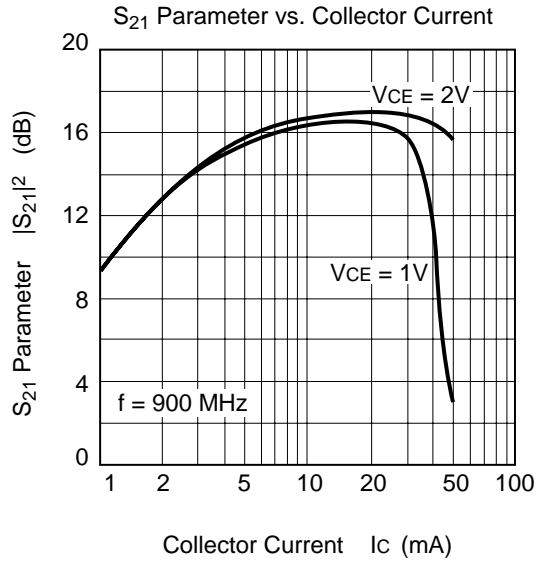
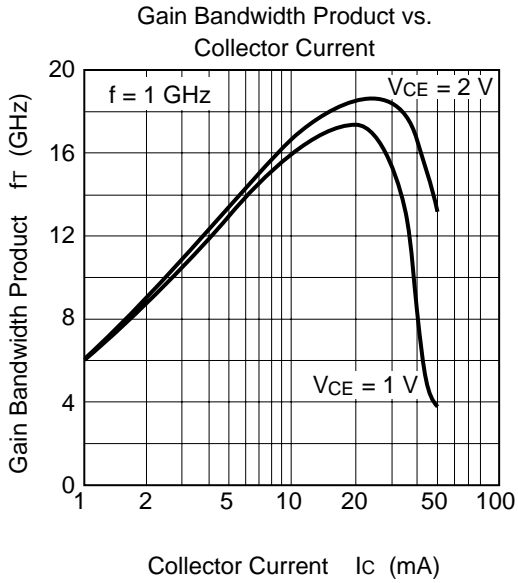
Electrical Characteristics (Q2)

(Ta = 25°C)

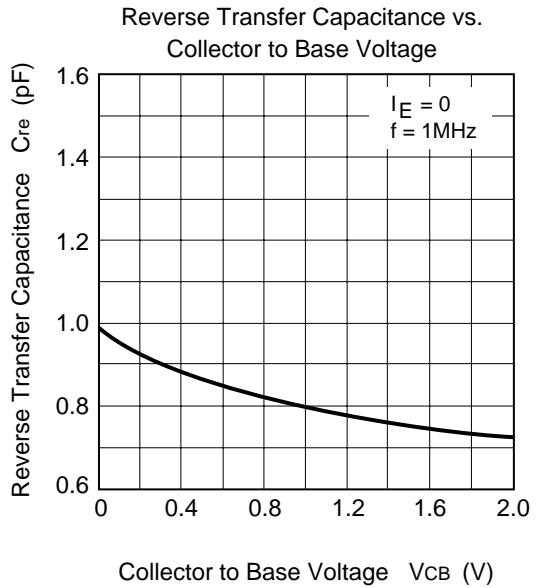
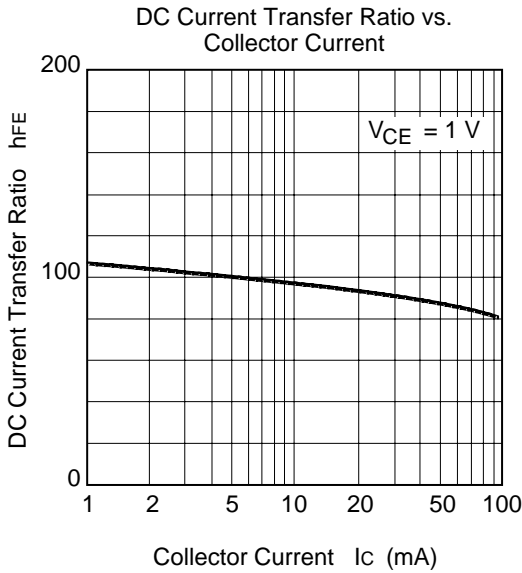
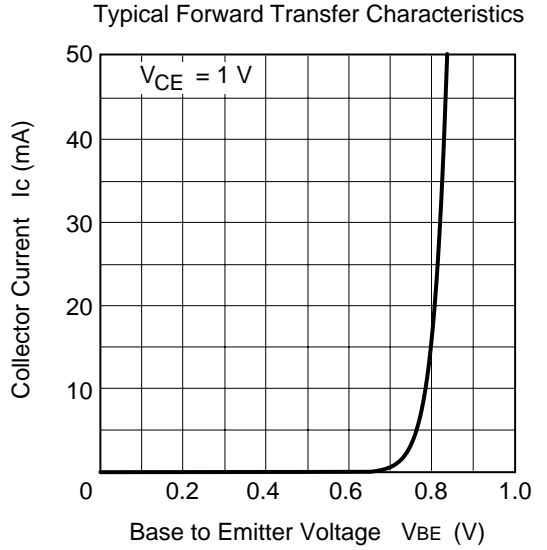
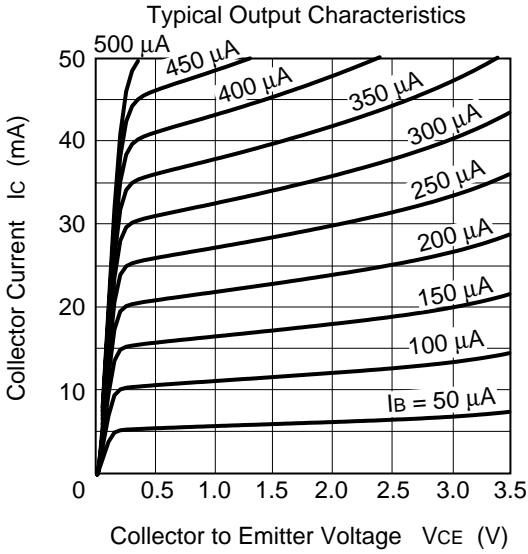
Item	Symbol	Min	Typ	Max	Unit	Test Condition
Collector to base breakdown voltage	$V_{(BR)CBO}$	10	—	—	V	$I_C = 10 \mu A, I_E = 0$
Collector cutoff current	I_{CBO}	—	—	1	μA	$V_{CB} = 10 V, I_E = 0$
Collector cutoff current	I_{CEO}	—	—	1	μA	$V_{CE} = 3.5 V, R_{BE} = \text{infinite}$
Emitter cutoff current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

Main Characteristics (Q1)

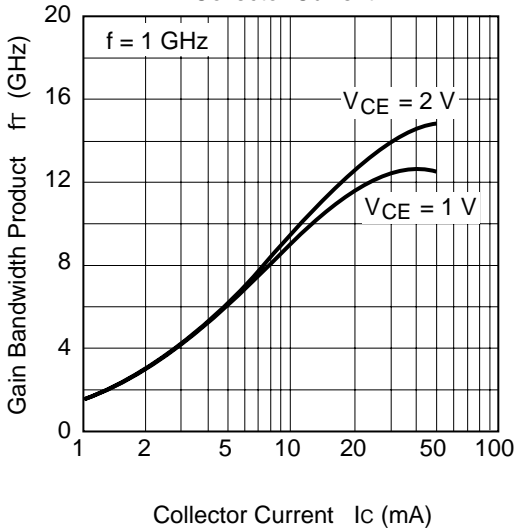




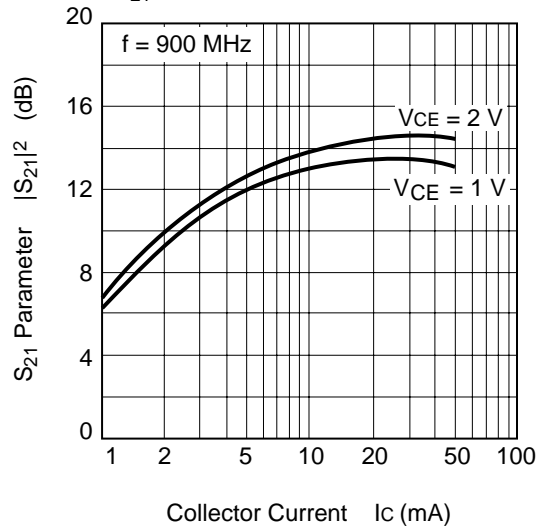
Main Characteristics (Q2)



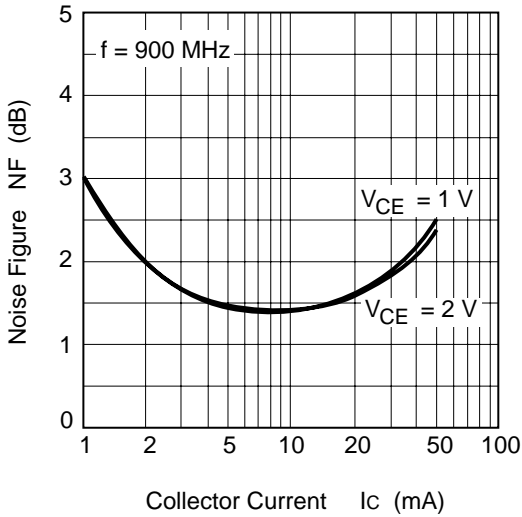
Gain Bandwidth Product vs. Collector Current

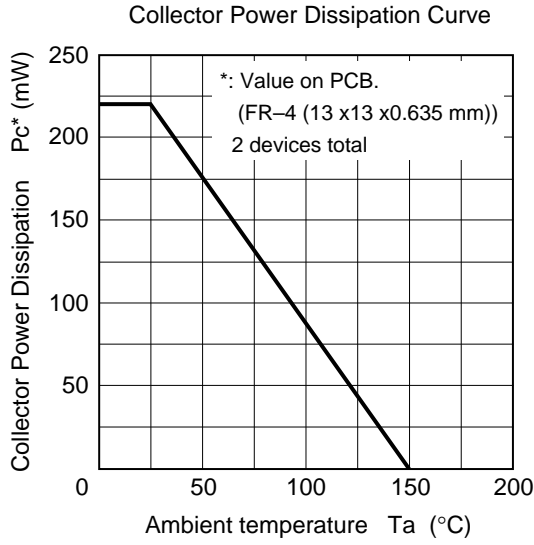


S_{21} Parameter vs. Collector Current



Noise Figure vs. Collector Current

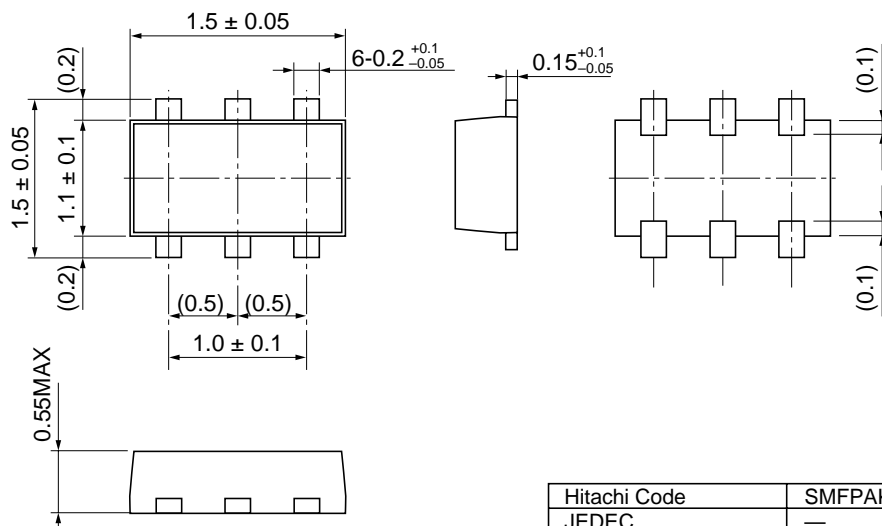




Package Dimensions

As of July, 2001

Unit: mm



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

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