2SA1083, 2SA1084, 2SA1085

Silicon PNP Epitaxial

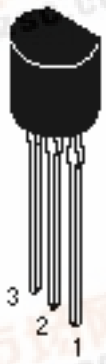
HITACHI

Application

- Low frequency low noise amplifier
- Complementary pair with 2SC2545, 2SC2546 and 2SC2547

Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

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Absolute Maximum Ratings (Ta = 25°C)

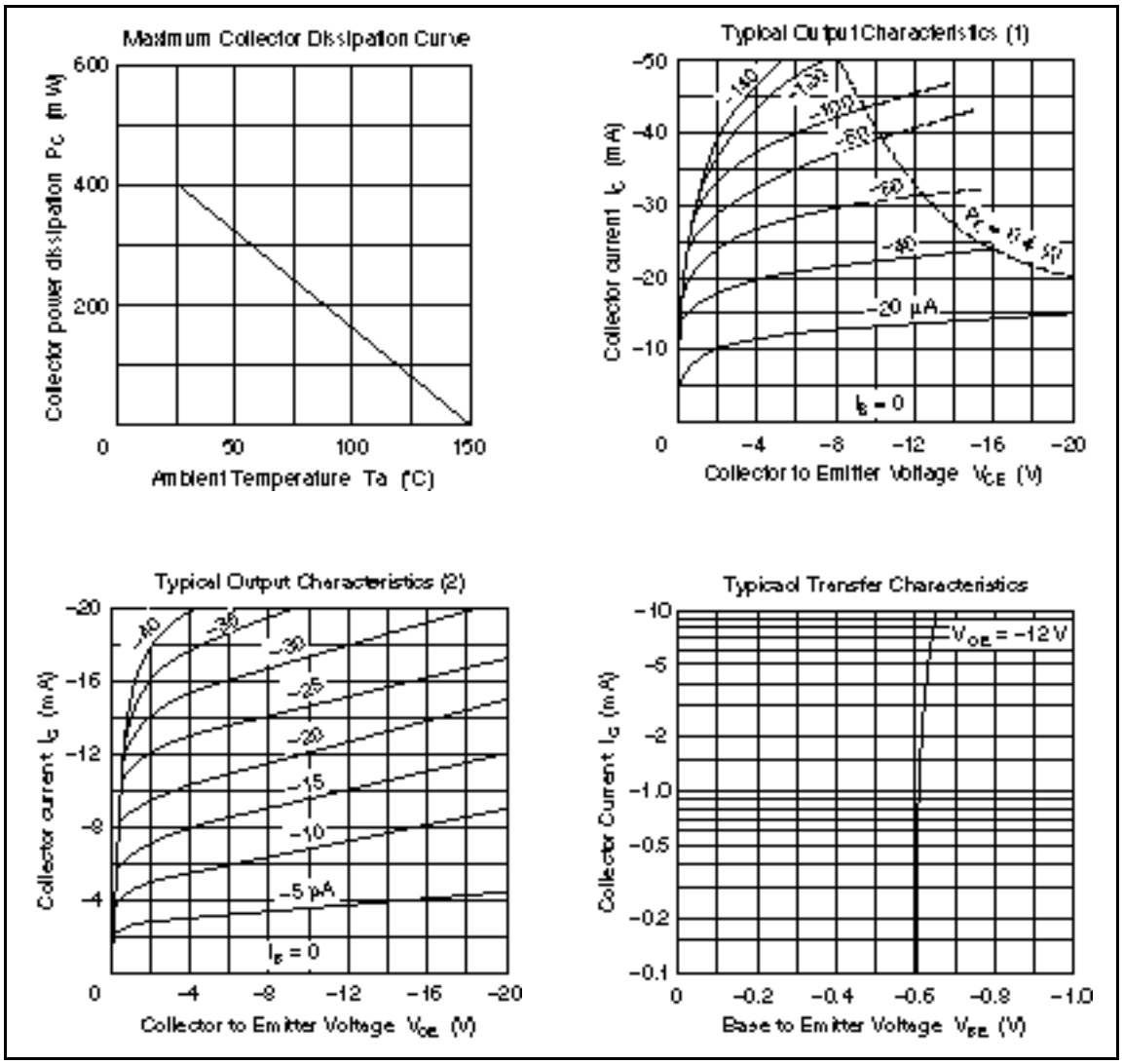
Item	Symbol	2SA1083	2SA1084	2SA1085	Unit
Collector to base voltage	V_{CBO}	–60	–90	–120	V
Collector to emitter voltage	V_{CEO}	–60	–90	–120	V
Emitter to base voltage	V_{EBO}	–5	–5	–5	V
Collector current	I_C	–100	–100	–100	mA
Emitter current	I_E	100	100	100	mA
Collector power dissipation	P_C	400	400	400	mW
Junction temperature	Tj	150	150	150	°C
Storage temperature	Tstg	–55 to +150	–55 to +150	–55 to +150	°C

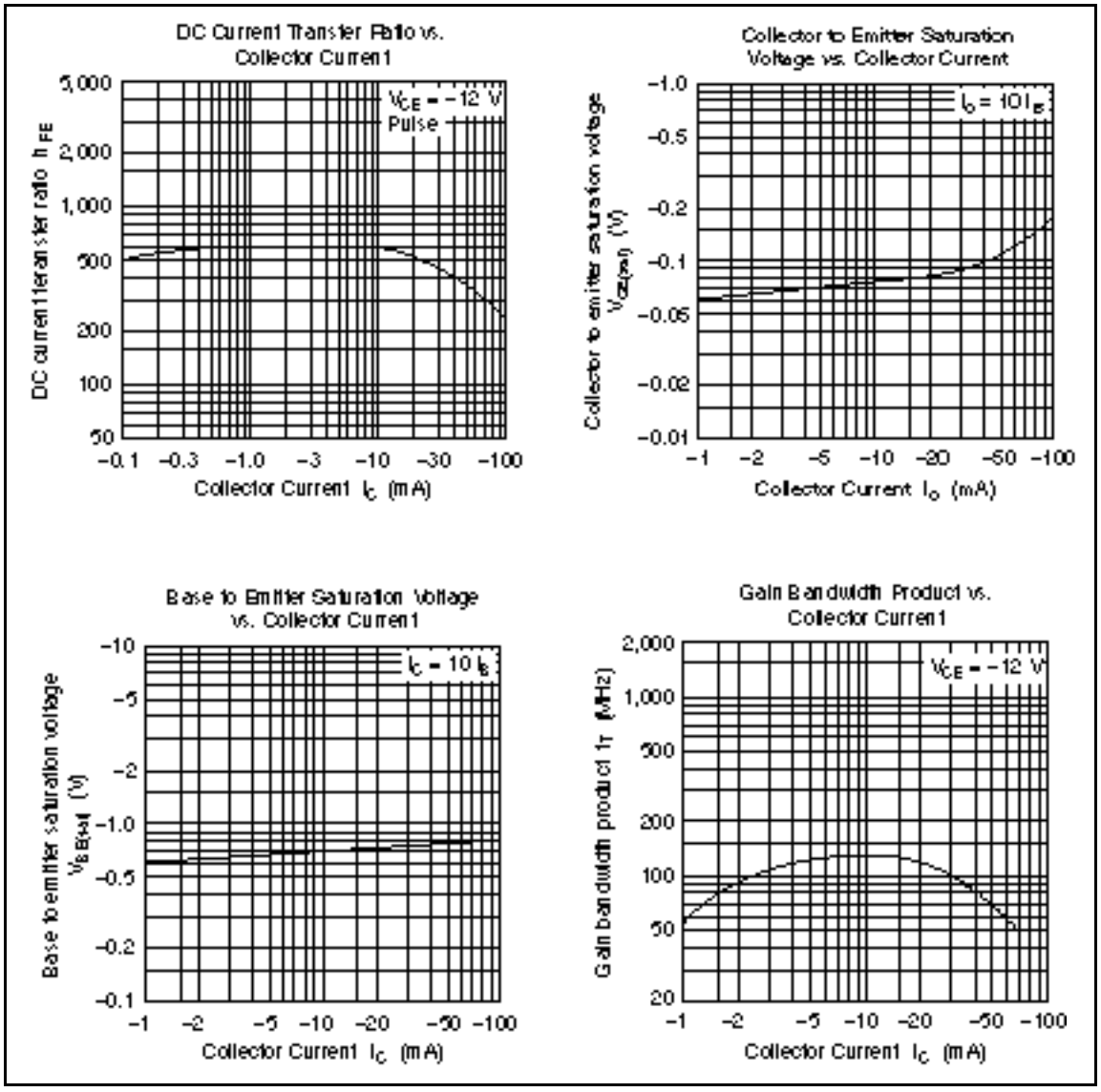
Electrical Characteristics (Ta = 25°C)

		2SA1083			2SA1084			2SA1085				
Item	Symbol	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	–60	—	—	–90	—	—	–120	—	—	V	I_C = –10 µA, I_E = 0
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	–60	—	—	–90	—	—	–120	—	—	V	I_C = –1 mA, R_{BE} = ∞
Emitter to base breakdown voltage	$V_{(BR)EBO}$	–5	—	—	–5	—	—	–5	—	—	V	I_E = –10 µA, I_C = 0
Collector cutoff current	I_{CBO}	—	—	–0.1	—	—	–0.1	—	—	–0.1	µA	V_{CB} = –50 V, I_E = 0
Emitter cutoff current	I_{EBO}	—	—	–0.1	—	—	–0.1	—	—	–0.1	µA	V_{EB} = –2 V, I_C = 0
DC current transfer ratio	h_{FE}*1	250	—	800	250	—	800	250	—	800		V_{CE} = –12 V, I_C = –2 mA
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	–0.2	—	—	–0.2	—	—	–0.2	V	I_C = –10 mA, I_B = –1 mA
Base to emitter voltage	V_{BE}	—	–0.6	—	—	–0.6	—	—	–0.6	—	V	V_{CE} = –12 V, I_C = –2 mA
Gain bandwidth product	f_T	—	90	—	—	90	—	—	90	—	MHz	V_{CE} = –12 V, I_C = –2 mA
Collector output capacitance	Cob	—	3.5	—	—	3.5	—	—	3.5	—	pF	V_{CB} = –10 V, I_E = 0, f = 1 MHz
Noise voltage reffered to input	e_n	—	0.5	—	—	0.5	—	—	0.5	—	nV/√Hz	V_{CE} = –6V, I_C = –10 mA, f = 1 kHz, R_g = 0, Δf = 1Hz

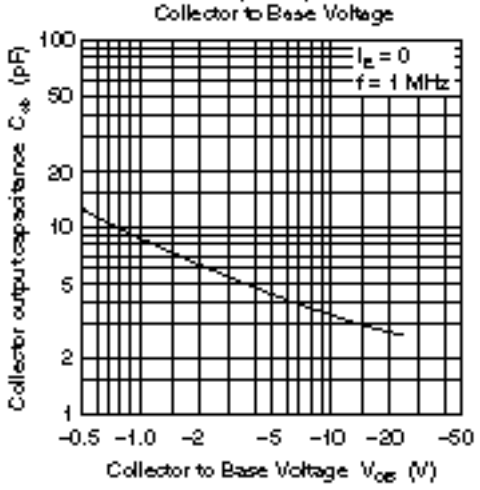
Note: 1. The 2SA1083, 2SA1084 and 2SA1085 are grouped by h_{FE} as follows.

D	E
250 to 500	400 to 800

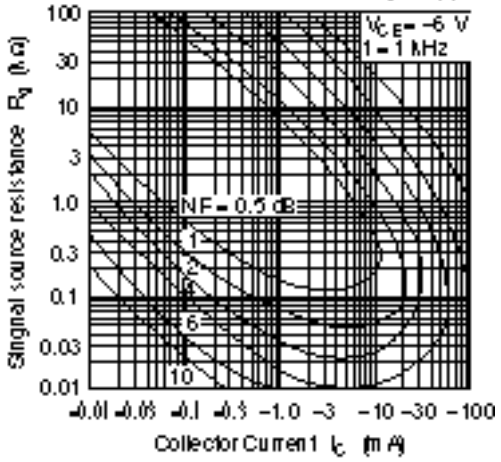

Maximum Collector Dissipation Curve
Collector power dissipation Pc (mW)
600
400
200
0
50
100
150
Ambient Temperature Ta (°C)
Typical Output Characteristics (1)
Collector current Ic (mA)
-50
-40
-30
-20
-10
-140
-120
-100
-80
-60
-40
-20 µA
IB = 0
0
-4
-8
-12
-16
-20
Collector to Emitter Voltage VCE (V)
Typical Output Characteristics (2)
Collector current Ic (mA)
-20
-16
-12
-8
-4
-40
-35
-30
-25
-20
-15
-10
-5 µA
IB = 0
0
-4
-8
-12
-16
-20
Collector to Emitter Voltage VCE (V)
Typical Transfer Characteristics
Collector Current Ic (mA)
-10
-5
-2
-1.0
-0.5
-0.2
-0.1
VCE = -12 V
0
-0.2
-0.4
-0.6
-0.8
-1.0
Base to Emitter Voltage VBE (V)


DC Current Transfer Ratio vs. Collector Current
DC current transfer ratio h_{FE}
5,000
2,000
1,000
500
200
100
50
V_{CE} = −12 V
Pulse
−0.1 −0.3 −1.0 −3 −10 −30 −100
Collector Current I_C (mA)
Collector to Emitter Saturation Voltage vs. Collector Current
Collector to emitter saturation voltage $V_{CE(sat)}$ (V)
−1.0
−0.5
−0.2
−0.1
−0.05
−0.02
−0.01
I_C = 10 I_B
−1 −2 −5 −10 −20 −50 −100
Collector Current I_C (mA)
Base to Emitter Saturation Voltage vs. Collector Current
Base to emitter saturation voltage $V_{BE(sat)}$ (V)
−10
−5
−2
−1.0
−0.5
−0.2
−0.1
I_C = 10 I_B
−1 −2 −5 −10 −20 −50 −100
Collector Current I_C (mA)
Gain Bandwidth Product vs. Collector Current
Gain bandwidth product f_T (MHz)
2,000
1,000
500
200
100
50
20
V_{CE} = −12 V
−1 −2 −5 −10 −20 −50 −100
Collector Current I_C (mA)

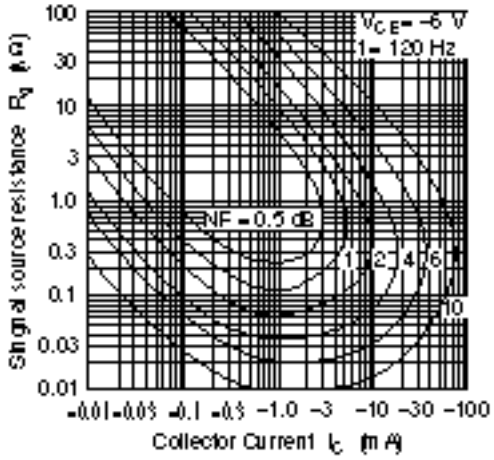
Collector Output Capacitance vs. Collector to Base Voltage



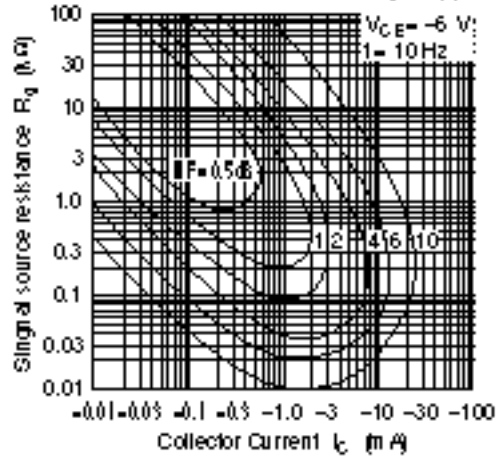
Contours of Constant Noise Figure (1)



Contours of Constant Noise Figure (2)



Contours of Constant Noise Figure (3)



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