To all our customers

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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

Cautions

Keep safety first in your circuit designs!

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   Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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2SC1775, 2SC1775A

Silicon NPN Epitaxial

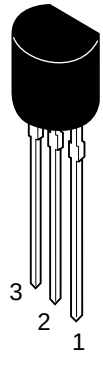
ADE-208-1056 (Z)
1st. Edition
Mar. 2001

Application

- Low frequency low noise amplifier
- Complementary pair with 2SA872/A

Outline

TO-92 (1)



1. Emitter
2. Collector
3. Base

Absolute Maximum Ratings (Ta = 25°C)

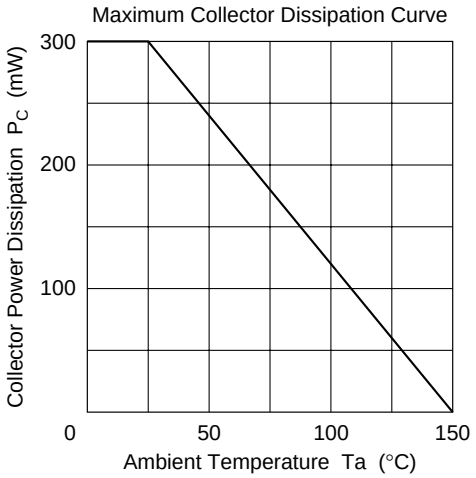
Item	Symbol	2SC1775	2SC1775A	Unit
Collector to base voltage	V_{CBO}	90	120	V
Collector to emitter voltage	V_{CEO}	90	120	V
Emitter to base voltage	V_{EBO}	5	5	V
Collector current	I_C	50	50	mA
Collector power dissipation	P_C	300	300	mW
Junction temperature	Tj	150	150	°C
Storage temperature	Tstg	–55 to +150	–50 to +150	°C

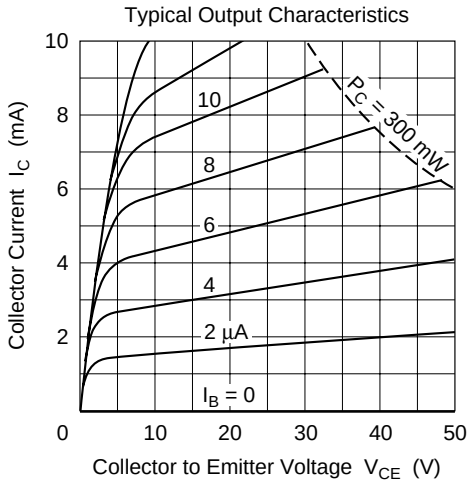
Electrical Characteristics (Ta = 25°C)

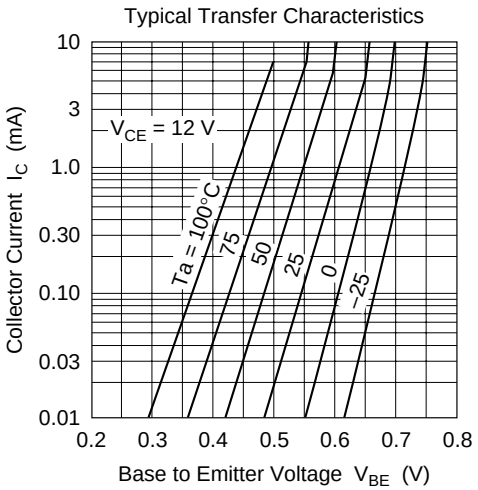
		2SC1775			2SC1775A					
Item	Symbol	Min	Typ	Max	Min	Typ	Max	Unit	Test conditions	
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	90	—	—	120	—	—	V	I_C = 1 mA, R_{BE} =	
Collector cutoff current	I_{CBO}	—	—	0.5	—	—	—	µA	V_{CB} = 75 V, I_E = 0	
		—	—	—	—	—	0.5	µA	V_{CB} = 100 V, I_E = 0	
DC current transfer ratio	h_{FE1}*[1]	400	—	1200	400	—	1200		V_{CE} = 12 V, I_C = 2 mA	
	h_{FE2}	160	—	—	160	—	—		V_{CE} = 12 V, I_C = 0.1 mA	
Base to emitter voltage	V_{BE}	—	—	0.75	—	—	0.75	V	V_{CE} = 12 V, I_C = 2 mA	
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	0.5	—	—	0.5	V	I_C = 10 mA, I_B = 1 mA	
Gain bandwidth product	f_T	—	200	—	—	200	—	MHz	V_{CE} = 12 V, I_C = 2 mA	
Collector output capacitance	Cob	—	1.6	—	—	1.6	—	pF	V_{CB} = 25 V, I_E = 0, f = 1 MHz	
Noise figure	NF	—	—	5.0	—	—	5.0	dB	V_{CE} = 6 V, I_C = 50 µA, R_g = 50 kΩ	f = 10 Hz
		—	—	1.5	—	—	1.5	dB		f = 1 kHz

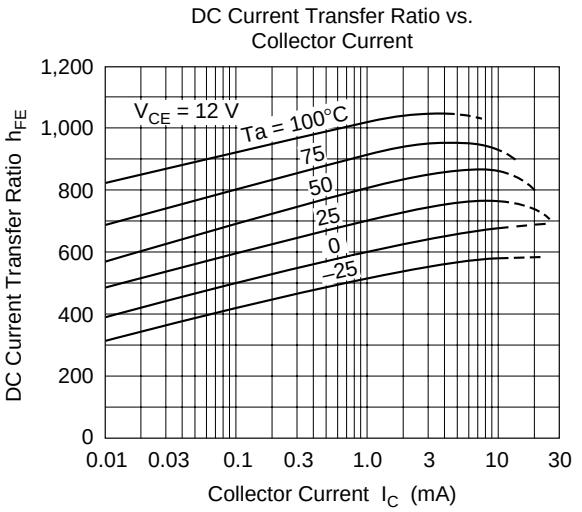
Note: 1. The 2SC1775/A is grouped by h_{FE1} as follows.

E	F
400 to 800	600 to 1200

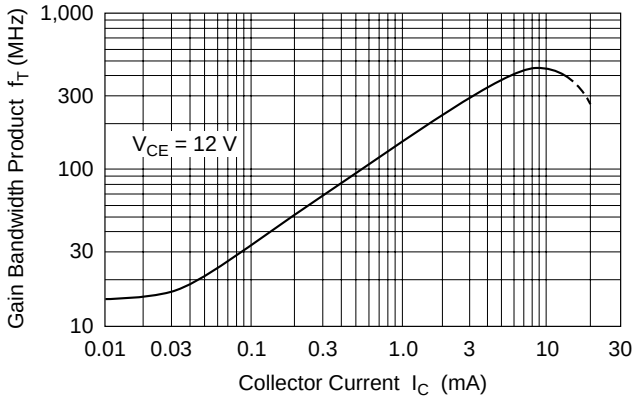

Maximum Collector Dissipation Curve
Collector Power Dissipation P_C (mW)
300
200
100
0
50
100
150
Ambient Temperature Ta (°C)


Typical Output Characteristics
Collector Current I_C (mA)
10
8
6
4
2
0
10
20
30
40
50
Collector to Emitter Voltage V_{CE} (V)
P_C = 300 mW
10
8
6
4
2 μA
I_B = 0

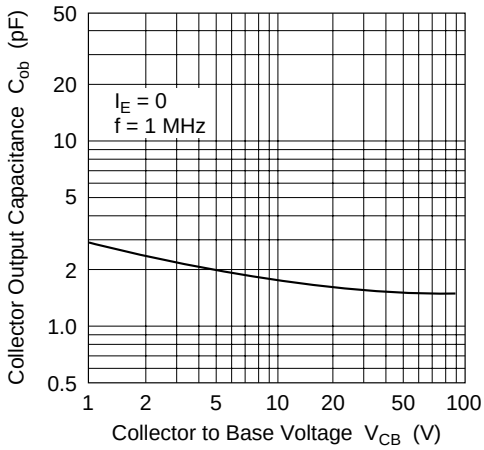

Typical Transfer Characteristics
Collector Current I_C (mA)
10
3
1.0
0.30
0.10
0.03
0.01
0.2
0.3
0.4
0.5
0.6
0.7
0.8
Base to Emitter Voltage V_{BE} (V)
V_{CE} = 12 V
Ta = 100°C
75
50
25
0
−25


DC Current Transfer Ratio vs.
Collector Current
DC Current Transfer Ratio h_{FE}
1,200
1,000
800
600
400
200
0
0.01
0.03
0.1
0.3
1.0
3
10
30
Collector Current I_C (mA)
V_{CE} = 12 V
Ta = 100°C
75
50
25
0
−25

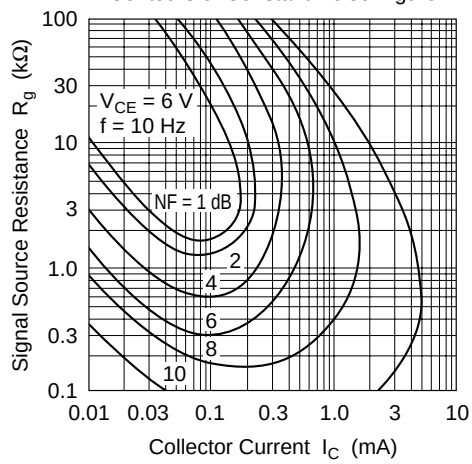
Gain Bandwidth Product vs.
Collector Current

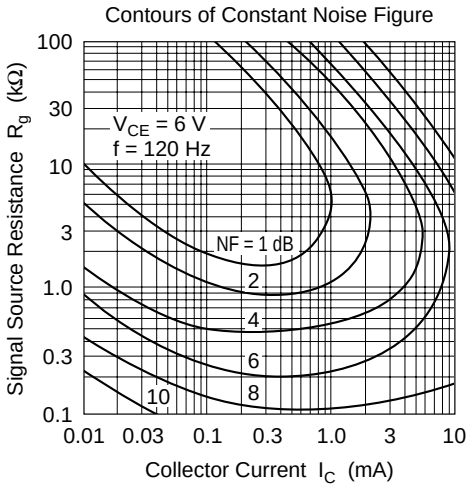


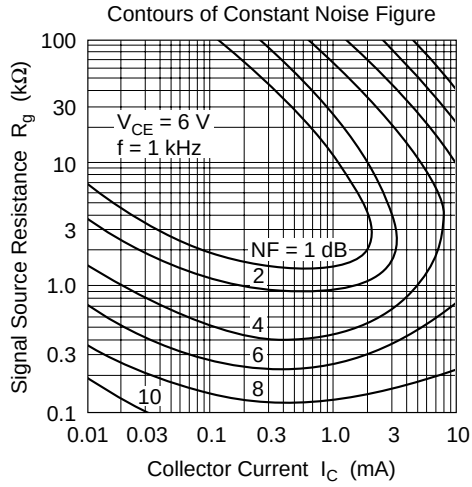
Collector Output Capacitance vs.
Collector to Base Voltage



Contours of Constant Noise Figure



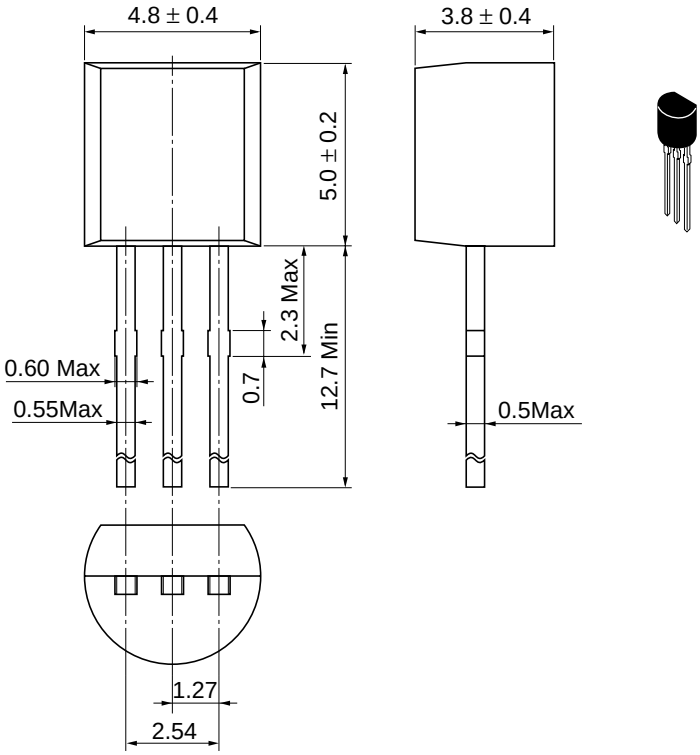

Contours of Constant Noise Figure
Signal Source Resistance R_g (kΩ)
100
30
10
3
1.0
0.3
0.1
V_{CE} = 6 V
f = 120 Hz
NF = 1 dB
2
4
6
8
10
0.01
0.03
0.1
0.3
1.0
3
10
Collector Current I_C (mA)


Contours of Constant Noise Figure
Signal Source Resistance R_g (kΩ)
100
30
10
3
1.0
0.3
0.1
V_{CE} = 6 V
f = 1 kHz
NF = 1 dB
2
4
6
8
10
0.01
0.03
0.1
0.3
1.0
3
10
Collector Current I_C (mA)

Package Dimensions

As of January, 2001

Unit: mm



Hitachi Code	TO-92 (1)
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.25 g

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