2SB648, 2SB648A

Silicon PNP Epitaxial

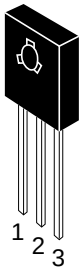
HITACHI

Application

Low frequency high voltage amplifier complementary pair with 2SD668/A

Outline

TO-126 MOD



1. Emitter
2. Collector
3. Base

Absolute Maximum Ratings (Ta = 25°C)

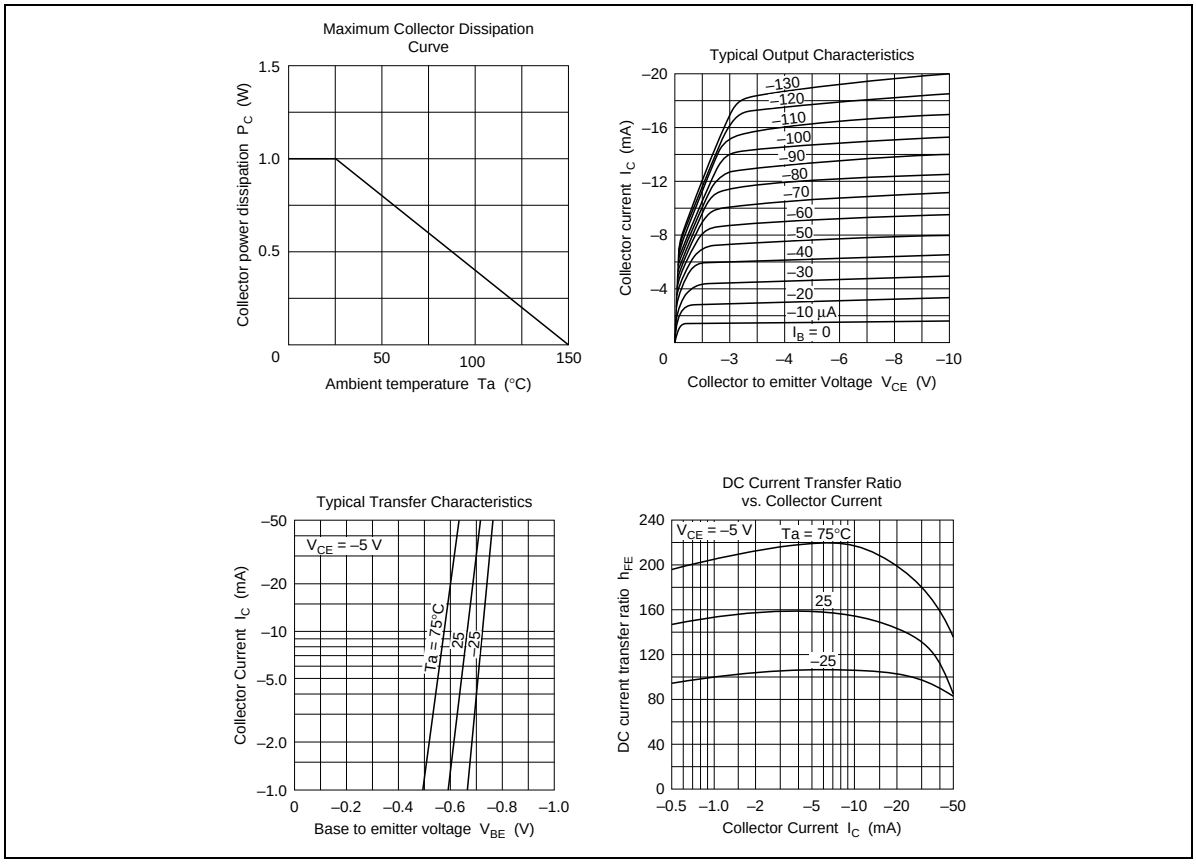
		Ratings		
Item	**Symbol**	**2SB648**	**2SB648A**	**Unit**
Collector to base voltage	V_{CBO}	–180	–180	V
Collector to emitter voltage	V_{CEO}	–120	–160	V
Emitter to base voltage	V_{EBO}	–5	–5	V
Collector current	I_C	–50	–50	mA
Collector peak current	$I_{C(peak)}$	–100	–100	mA
Collector power dissipation	P_C	1	1	W
Junction temperature	Tj	150	150	°C
Storage temperature	Tstg	–55 to +150	–55 to +150	°C

Electrical Characteristics (Ta = 25°C)

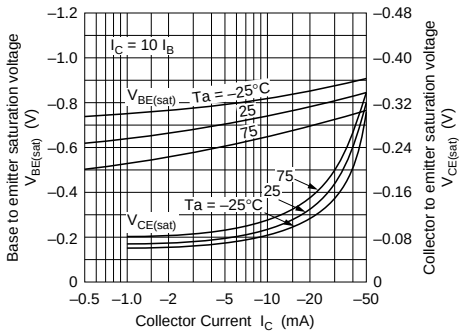
Item	Symbol	2SB648 Min	2SB648 Typ	2SB648 Max	2SB648A Min	2SB648A Typ	2SB648A Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	–180	—	—	–180	—	—	V	I_C = –10 µA, I_E = 0
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	–120	—	—	–160	—	—	V	I_C = –1 mA, R_{BE} = ∞
Emitter to base breakdown voltage	$V_{(BR)EBO}$	–5	—	—	–5	—	—	V	I_E = –10 µA, I_C = 0
Collector cutoff current	I_{CBO}	—	—	–10	—	—	–10	µA	V_{CB} = –160 V, I_E = 0
DC current transfer ratio	h_{FE1}*[1]	60	—	320	60	—	200		V_{CE} = –5 V, I_C = –10 mA
	h_{FE2}	30	—	—	30	—	—		V_{CE} = –5 V, I_C = –1 mA
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	–2	—	—	–2	V	I_C = –30 mA, I_B = –3 mA
Base to emitter voltage	V_{BE}	—	—	–1.5	—	—	–1.5	V	V_{CE} = –5 V, I_C = –10 mA
Gain bandwidth product	f_T	—	140	—	—	140	—	MHz	V_{CE} = –10 V, I_C = –10 mA
Collector output capacitance	Cob	—	4.5	—	—	4.5	—	pF	V_{CB} = –10 V, I_E = 0, f = 1 MHz

Note: 1. The 2SB648 and 2SB648A are grouped by h_{FE1} as follows.

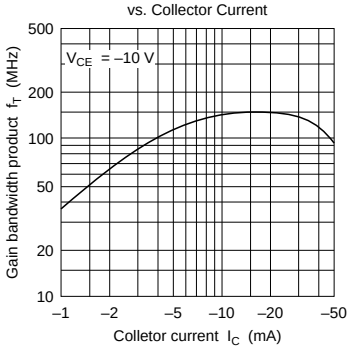
	B	C	D
2SB648	60 to 120	100 to 200	160 to 320
2SB648A	60 to 120	100 to 200	—


Maximum Collector Dissipation Curve
Collector power dissipation P_C (W)
1.5
1.0
0.5
0
50
100
150
Ambient temperature Ta (°C)
Typical Output Characteristics
Collector current I_C (mA)
–20
–16
–12
–8
–4
–130
–120
–110
–100
–90
–80
–70
–60
–50
–40
–30
–20
–10 µA
I_B = 0
0
–3
–4
–6
–8
–10
Collector to emitter Voltage V_{CE} (V)
Typical Transfer Characteristics
V_{CE} = –5 V
Collector Current I_C (mA)
–50
–20
–10
–5.0
–2.0
–1.0
Ta = 75°C
25
–25
0
–0.2
–0.4
–0.6
–0.8
–1.0
Base to emitter voltage V_{BE} (V)
DC Current Transfer Ratio vs. Collector Current
V_{CE} = –5 V
Ta = 75°C
25
–25
DC current transfer ratio h_{FE}
240
200
160
120
80
40
0
–0.5
–1.0
–2
–5
–10
–20
–50
Collector Current I_C (mA)

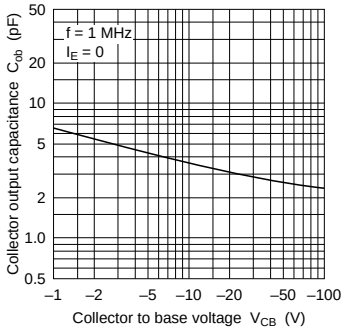
Saturation Voltage vs.
Collector Current



Gain Bandwidth Product
vs. Collector Current



Collector Output Capacitance vs.
Collector to Base Voltage



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