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# 2SB1109, 2SB1110

Silicon PNP Epitaxial

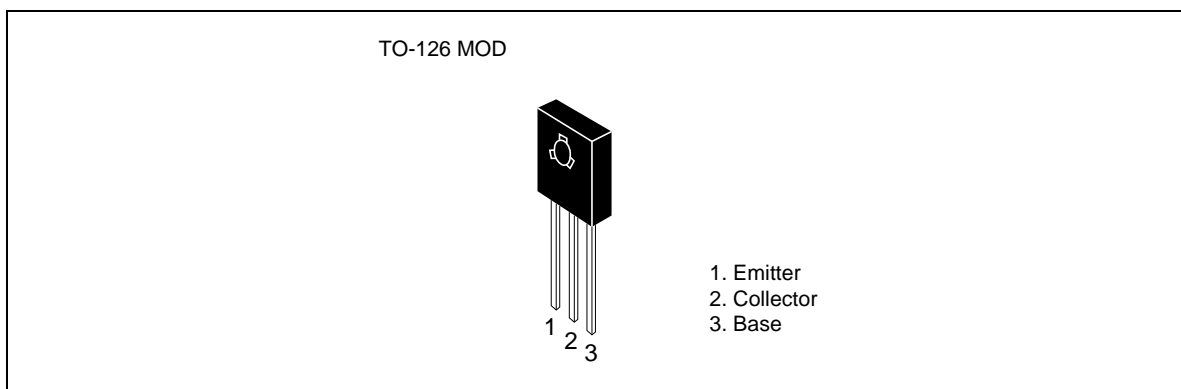
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### Application

Low frequency high voltage amplifier complementary pair with 2SD1609 and 2SD1610

### Outline



### Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings		Unit
		2SB1109	2SB1110	
Collector to base voltage	$V_{CBO}$	-160	-200	V
Collector to emitter voltage	$V_{CEO}$	-160	-200	V
Emitter to base voltage	$V_{EBO}$	-5	-5	V
Collector current	$I_C$	-100	-100	mA
Collector power dissipation	$P_C$	1.25	1.25	W
Junction temperature	$T_j$	150	150	°C
Storage temperature	$T_{stg}$	-45 to +150	-45 to +150	°C

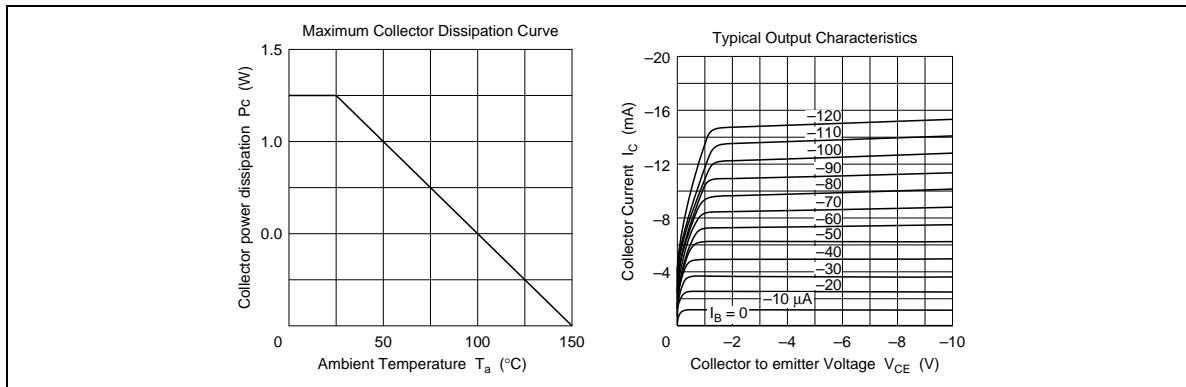
## 2SB1109, 2SB1110

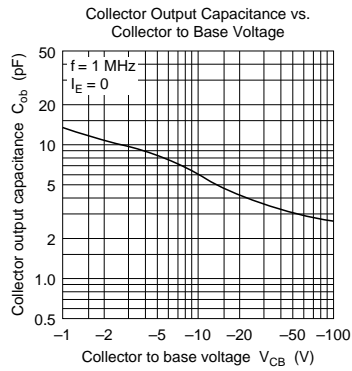
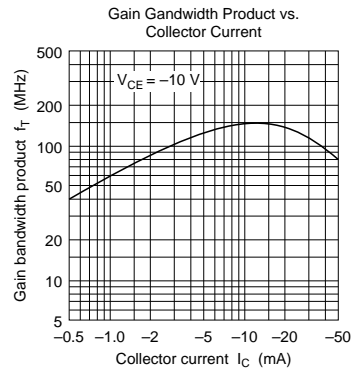
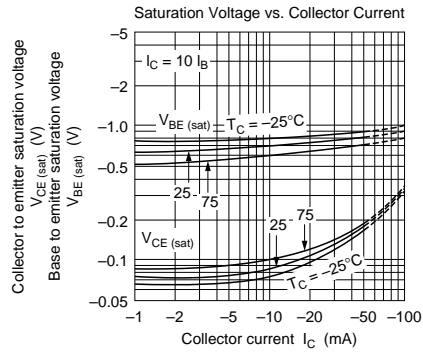
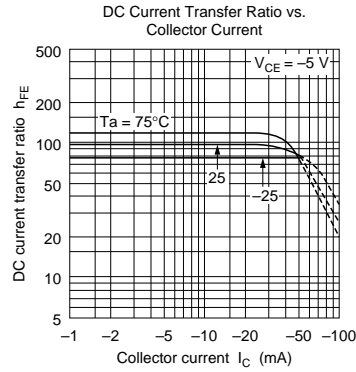
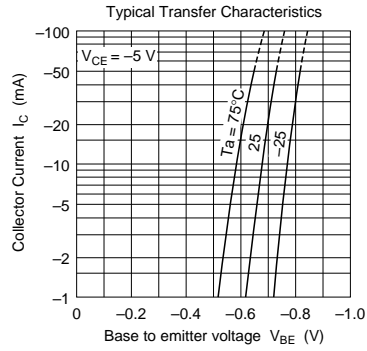
### Electrical Characteristics (Ta = 25°C)

Item	Symbol	2SB1109			2SB1110			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max		
Collector to base breakdown voltage	$V_{(BR)CBO}$	-160	—	—	-200	—	—	V	$I_C = -10 \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	-160	—	—	-200	—	—	V	$I_C = -1 \text{ mA}, R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	-5	—	—	-5	—	—	V	$I_E = -10 \mu A, I_C = 0$
Collector cutoff current	$I_{CBO}$	—	—	-10	—	—	—	$\mu A$	$V_{CB} = -140 \text{ V}, I_E = 0$
		—	—	—	—	—	-10	$\mu A$	$V_{CE} = -160 \text{ V}, I_E = 0$
DC current transfer ratio	$h_{FE1}^{*1}$	60	—	320	60	—	320		$V_{CE} = -5 \text{ V}, I_C = -10 \text{ mA}$
	$h_{FE2}$	30	—	—	30	—	—		$V_{CE} = -5 \text{ V}, I_C = -1 \text{ mA}$
Base to emitter voltage	$V_{BE}$	—	—	-1.5	—	—	-1.5	V	$I_C = -5 \text{ V}, I_C = -10 \text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	—	-2	—	—	-2	V	$I_C = -30 \text{ mA}, I_B = -3 \text{ mA}$
Gain bandwidth product	$f_T$	—	140	—	—	140	—	MHz	$V_{CE} = -5 \text{ V}, I_C = -10 \text{ mA}$
Collector output capacitance	$C_{ob}$	—	5.5	—	—	5.5	—	pF	$V_{CB} = -10 \text{ V}, I_E = 0, f = 1 \text{ MHz}$

Note: 1. The 2SB1109 and 2SB1110 are grouped by  $h_{FE1}$  as follows.

B	C	D
60 to 120	100 to 200	160 to 320





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