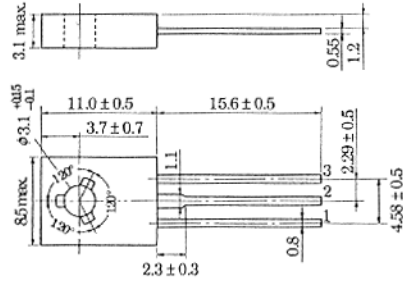


## 2SB1109, 2SB1110

SILICON PNP EPITAXIAL

LOW FREQUENCY HIGH VOLTAGE AMPLIFIER  
COMPLEMENTARY PAIR WITH 2SD1609 AND 2SD1610



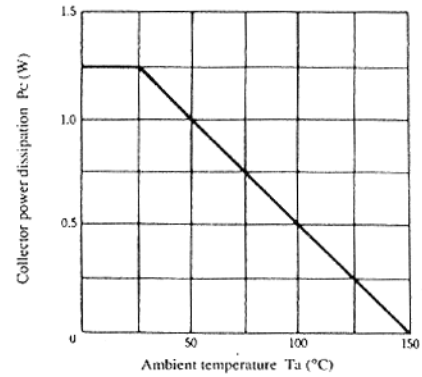
1. Emitter
  2. Collector
  3. Base
- (Dimensions in mm)

(JEDEC TO-126 MOD.)

### ■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Item	Symbol	2SB1109	2SB1110	Unit
Collector to base voltage	V <sub>CB0</sub>	-160	-200	V
Collector to emitter voltage	V <sub>CEO</sub>	-160	-200	V
Emitter to base voltage	V <sub>EB0</sub>	-5	-5	V
Collector current	I <sub>C</sub>	-100	-100	mA
Collector power dissipation	P <sub>C</sub>	1.25	1.25	W
Junction temperature	T <sub>j</sub>	150	150	°C
Storage temperature	T <sub>stg</sub>	-45 to +150	-45 to +150	°C

### MAXIMUM COLLECTOR DISSIPATION CURVE



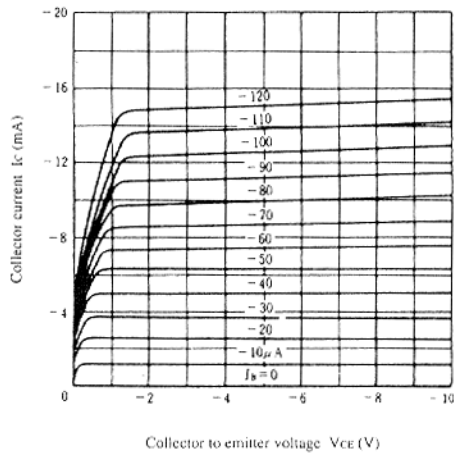
### ■ ELECTRICAL CHARACTERISTICS (Ta=25°C)

Item	Symbol	Test Condition	2SB1109			2SB1110			Unit
			min.	typ.	max.	min.	typ.	max.	
Collector to base breakdown voltage	V <sub>(BR)CBO</sub>	I <sub>C</sub> = -10μA, I <sub>E</sub> = 0	-160	—	—	-200	—	—	V
Collector to emitter breakdown voltage	V <sub>(BR)CEO</sub>	I <sub>C</sub> = -1mA, R <sub>BE</sub> = ∞	-160	—	—	-200	—	—	V
Emitter to base breakdown voltage	V <sub>(BR)EBO</sub>	I <sub>E</sub> = -10μA, I <sub>C</sub> = 0	-5	—	—	-5	—	—	V
Collector cutoff current	I <sub>CBO</sub>	V <sub>CB</sub> = -140V, I <sub>E</sub> = 0	—	—	-10	—	—	—	μA
		V <sub>CB</sub> = -160V, I <sub>E</sub> = 0	—	—	—	—	—	-10	μA
DC current transfer ratio	h <sub>FE1</sub> *	V <sub>CE</sub> = -5V, I <sub>C</sub> = -10mA	60	—	320	60	—	320	
	h <sub>FE2</sub>	V <sub>CE</sub> = -5V, I <sub>C</sub> = -1mA	30	—	—	30	—	—	
Base to emitter voltage	V <sub>BE</sub>	V <sub>CE</sub> = -5V, I <sub>C</sub> = -10mA	—	—	-1.5	—	—	-1.5	V
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> = -30mA, I <sub>B</sub> = -3mA	—	—	-2	—	—	-2	V
Gain bandwidth product	f <sub>T</sub>	V <sub>CE</sub> = -5V, I <sub>C</sub> = -10mA	—	140	—	—	140	—	MHz
Collector output capacitance	C <sub>ob</sub>	V <sub>CB</sub> = -10V, I <sub>E</sub> = 0, f = 1MHz	—	5.5	—	—	5.5	—	pF

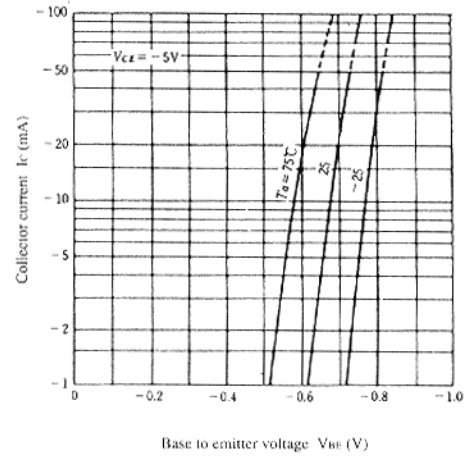
\* The 2SB1109 and 2SB1110 are grouped by h<sub>FE1</sub> as follows.

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

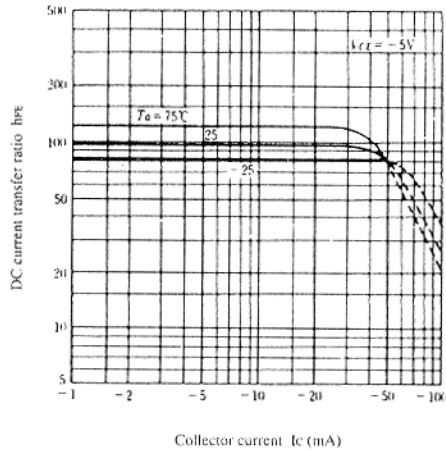
TYPICAL OUTPUT CHARACTERISTICS



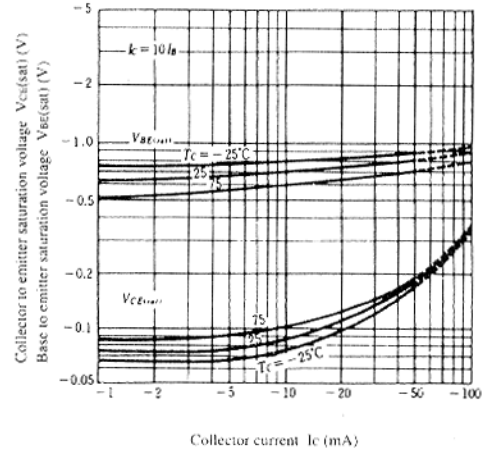
TYPICAL TRANSFER CHARACTERISTICS



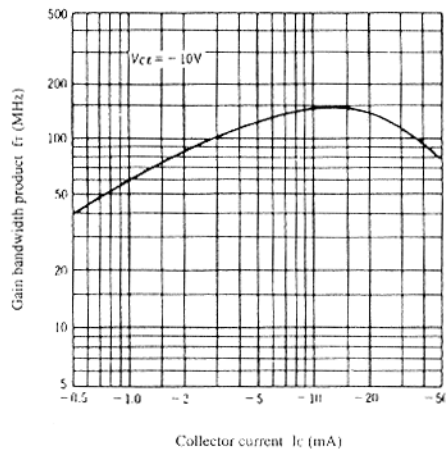
DC CURRENT TRANSFER RATIO VS. COLLECTOR CURRENT



SATURATION VOLTAGE VS. COLLECTOR CURRENT



GAIN BANDWIDTH PRODUCT VS. COLLECTOR CURRENT



COLLECTOR OUTPUT CAPACITANCE VS. COLLECTOR TO BASE VOLTAGE

