NEC

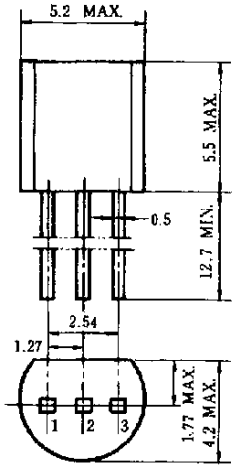
SILICON TRANSISTORS
2SB1116, 1116A

PNP SILICON EPITAXIAL TRANSISTOR
FOR LOW-FREQUENCY POWER AMPLIFIERS AND MID-SPEED SWITCHING

FEATURES

- Low $V_{CE(sat)}$
  $V_{CE(sat)}$ = –0.20 V TYP. (I_C = –1.0 A, I_B = –50 mA)
- High P_T in small dimension with general-purpose
  P_T = 0.75 W, V_{CEO} = –50/–60 V, $I_{C(DC)}$ = –1.0 A
- Complementary transistor with 2SD1616 and 1616A

PACKAGE DRAWING (UNIT: mm)



Electrode Connection
1. Emitter
2. Collector
3. Base

EIAJ : SC-43B
JEDEC : TO-92
IEC : PA33

2SB1116, 1116A

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

Parameter	Symbol	Ratings		Unit
		2SB1116	2SB1116A	
Collector to base voltage	V_{CBO}	–60	–80	V
Collector to emitter voltage	V_{CEO}	–50	–60	V
Emitter to base voltage	V_{EBO}	–6.0		V
Collector current (DC)	$I_{C(DC)}$	–1.0		A
Collector current (pulse)	$I_{C(pulse)}$*	–2.0		A
Total power dissipation	P_T	0.75		W
Junction temperature	T_j	150		°C
Storage temperature	T_{stg}	–55 to +150		°C

* PW ≤ 10 ms, duty cycle ≤ 50%

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector cutoff current	I_{CBO}	V_{CB} = –60 V, I_E = 0			–100	nA
Emitter cutoff current	I_{EBO}	V_{EB} = –6.0 V, I_C = 0			–100	nA
DC current gain	h_{FE1} **	V_{CE} = –2.0 V, I_C = –100 mA	135		600/400	
DC current gain	h_{FE2} **	V_{CE} = –2.0 V, I_C = –1.0 A	81			
DC base voltage	V_{BE} **	V_{CE} = –2.0 V, I_C = –50 mA	–600	–650	–700	mV
Collector saturation voltage	$V_{CE(sat)}$ **	I_C = –1.0 A, I_B = –50 mA		–0.20	–0.3	V
Base saturation voltage	$V_{BE(sat)}$ **	I_C = –1.0 A, I_B = –50 mA		–0.9	–1.2	V
Output capacitance	C_{ob}	V_{CB} = –10 V, I_E = 0, f = 1.0 MHz		25		pF
Gain bandwidth product	f_T	V_{CE} = –2.0 V, I_C = –100 mA	70	120		MHz
Turn-on time	t_{on}	V_{CC} = –10 V, I_C = –100 mA		0.07		μs
Storage temperature	t_{stg}	I_{B1} = –I_{B2} = –10 mA,		0.70		μs
Fall time	t_f	$V_{BE(off)}$ = 2 to 3 V		0.07		μs

** Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

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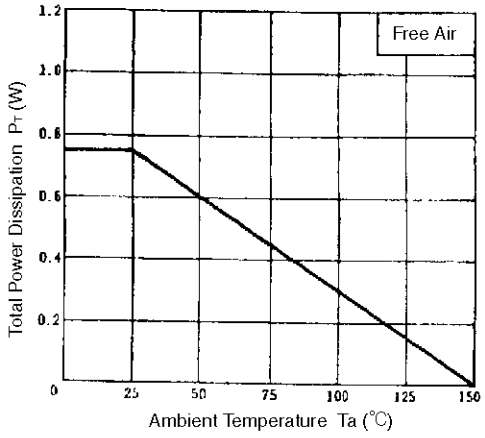
h_{FE} CLASSIFICATION

(The U rank is not available for the 2SB1116A.)

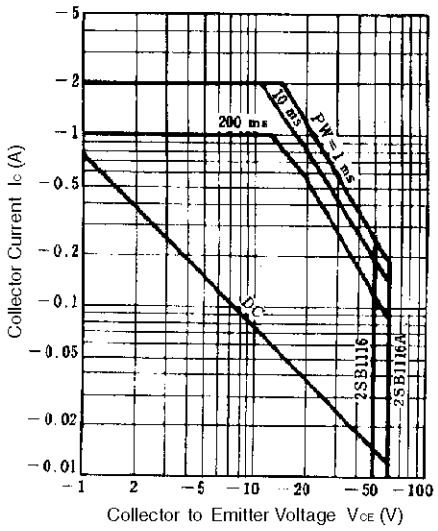
Marking	L	K	U
h_{FE1}	135 to 270	200 to 400	300 to 600

TYPICAL CHARACTERISTICS (Ta = 25°C)

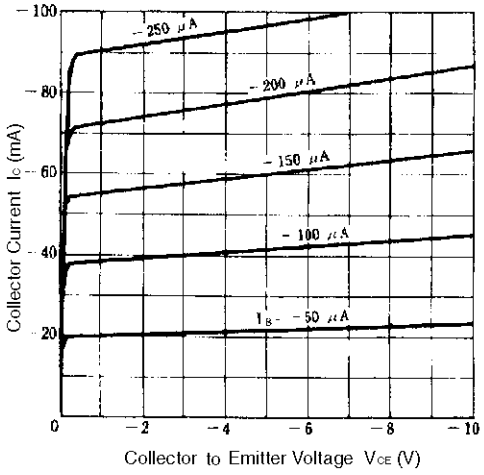
TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



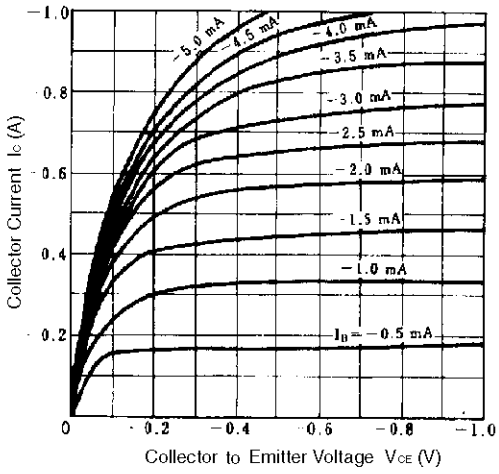
SAFE OPERATING AREA (TRANSIENT THERMAL RESISTANCE METHOD)



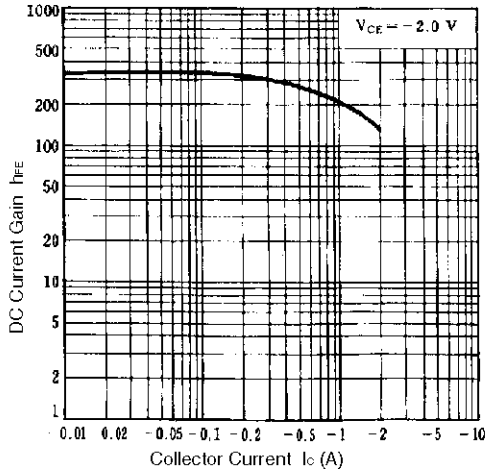
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



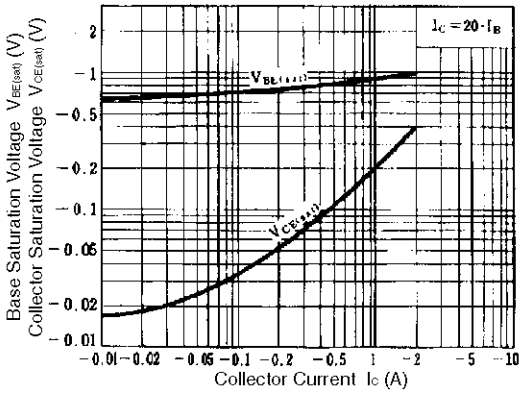
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



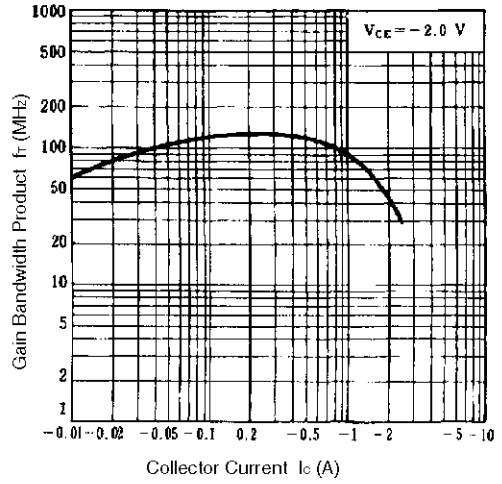
DC CURRENT GAIN vs. COLLECTOR CURRENT



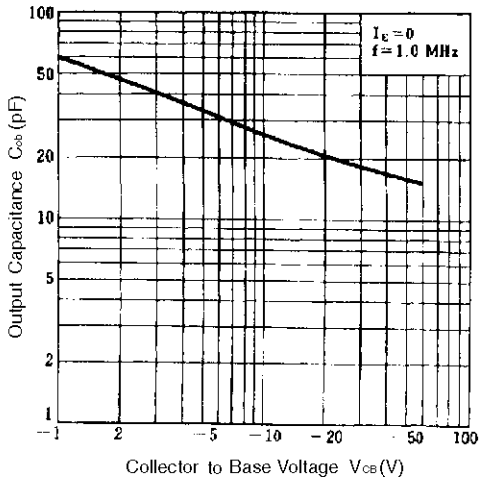
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



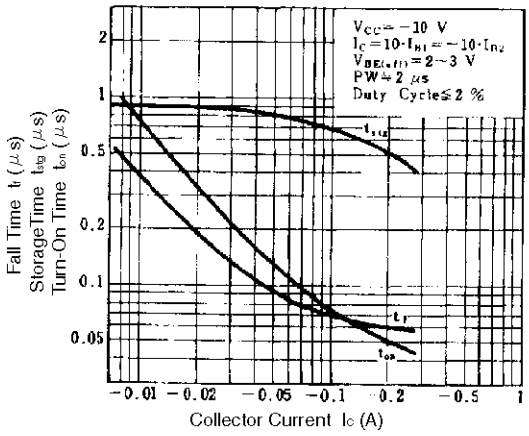
GAIN BANDWIDTH PRODUCT vs.
COLLECTOR CURRENT



OUTPUT CAPACITANCE vs.
COLLECTOR TO BASE VOLTAGE



SWITCHING TIME vs.
COLLECTOR CURRENT



[MEMO]

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