

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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Phase out/Discontinued

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

ABSOLUTE MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

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		$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150		$^\circ\text{C}$

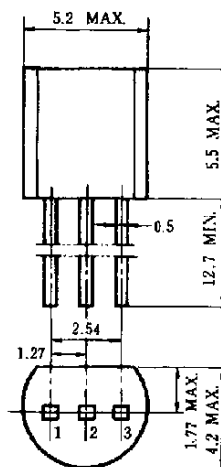
\*  $PW \leq 10$  ms, duty cycle  $\leq 50\%$

ELECTRICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )

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		$\mu\text{s}$
Storage temperature	$t_{stg}$	$I_{B1} = -I_{B2} = -10$ mA,		0.70		$\mu\text{s}$
Fall time	$t_f$	$V_{BE(off)} = 2$ to 3 V		0.07		$\mu\text{s}$

\*\* Pulse test  $PW \leq 350$   $\mu\text{s}$ , duty cycle  $\leq 2\%$

PACKAGE DRAWING (UNIT: mm)



Electrode Connection

1. Emitter EIAJ : SC-43B
2. Collector JEDEC : TO-92
3. Base IEC : PA33

2SB1116, 1116A

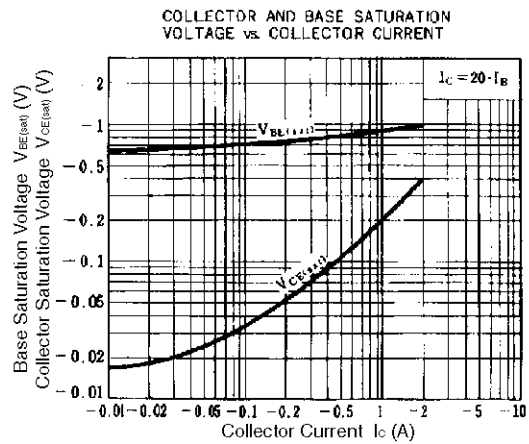
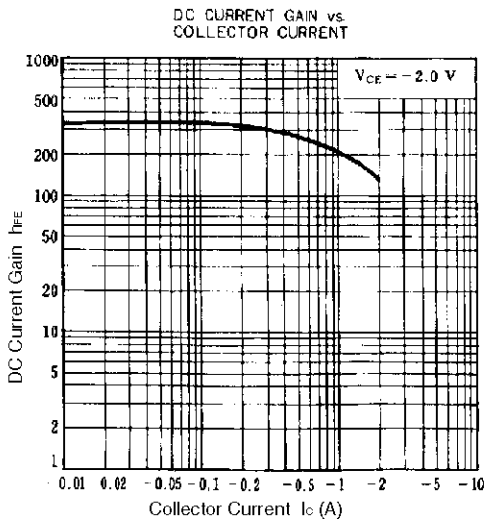
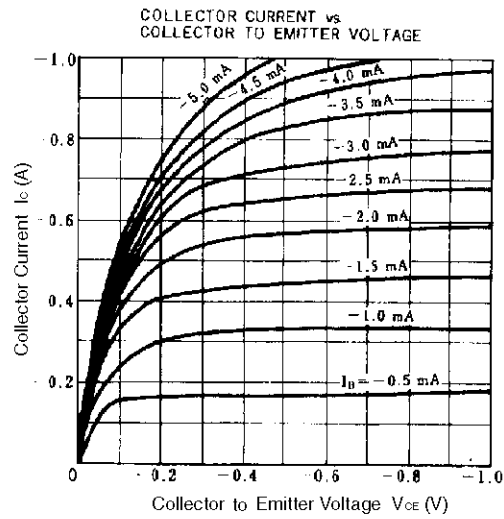
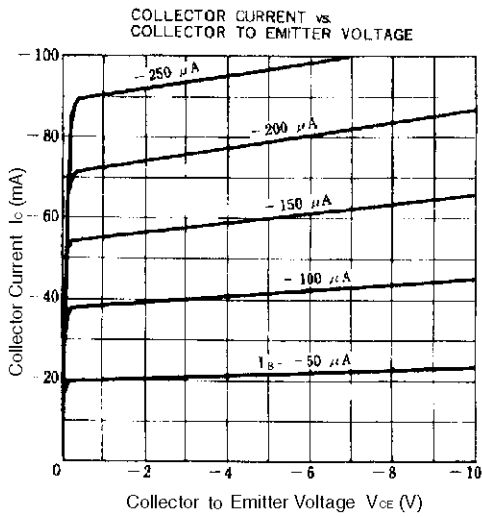
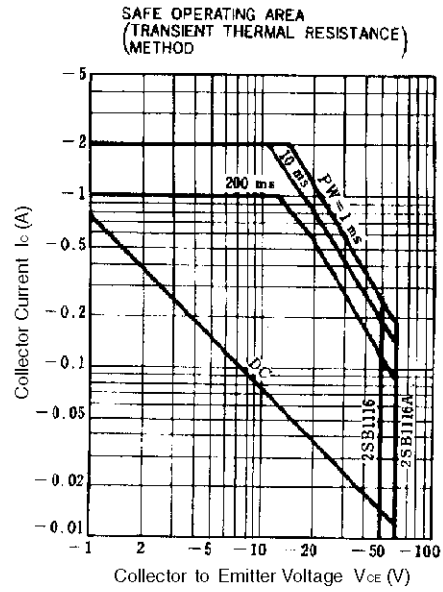
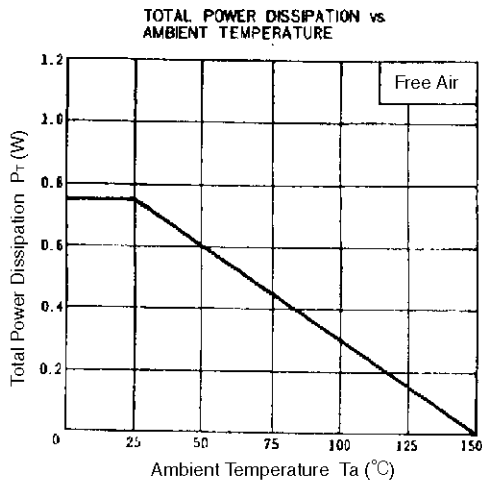
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**hFE CLASSIFICATION**

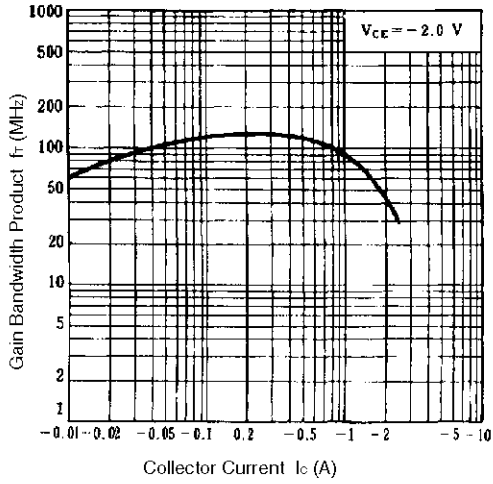
(The U rank is not available for the 2SB1116A.)

Marking	L	K	U
hFE1	135 to 270	200 to 400	300 to 600

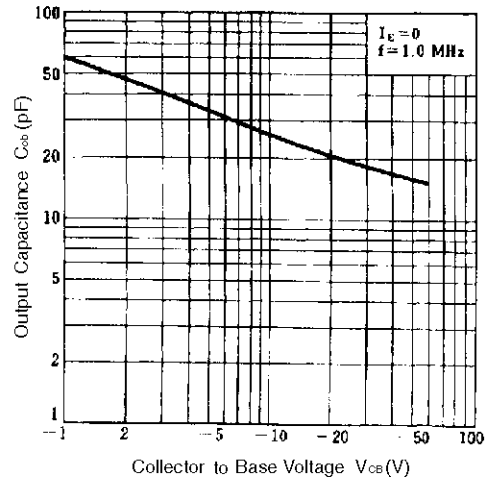
TYPICAL CHARACTERISTICS (Ta = 25°C)



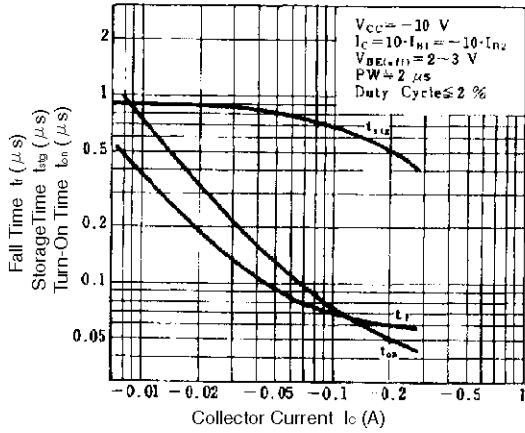
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



SWITCHING TIME vs. COLLECTOR CURRENT



[MEMO]

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