

SILICON TRANSISTOR

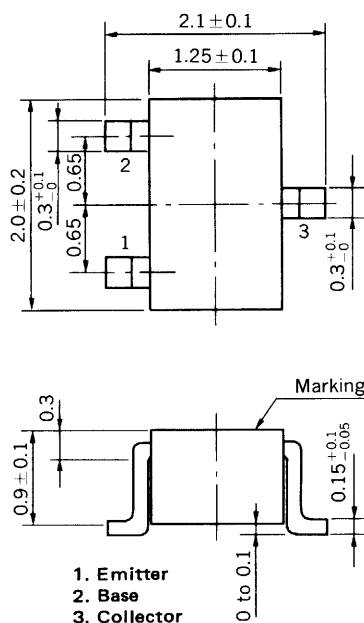
2SA1610

HIGH SPEED SWITCHING

PNP SILICON EPITAXIAL TRANSISTOR

PACKAGE DIMENSIONS

in millimeters



FEATURES

- High Speed Switching : $t_{on} = 9.0 \text{ ns}$ TYP.
 $t_{off} = 19.0 \text{ ns}$ TYP.
- High f_T : $f_T = 1\,800 \text{ MHz}$ TYP.
- Low C_{ob} : $C_{ob} = 2.0 \text{ pF}$ TYP.
- Complementary to 2SC4176

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Current ($T_a = 25^\circ\text{C}$)

Collector to Base Voltage	V_{CBO}	-15	V
Collector to Emitter Voltage	V_{CEO}	-15	V
Emitter to Base Voltage	V_{EBO}	-4.5	V
Collector Current (DC)	I_C	-50	mA

Maximum Power Dissipation

Total power Dissipation at 25°C Ambient Temperature	P_T	150	mW
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Maximum Temperatures

Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$

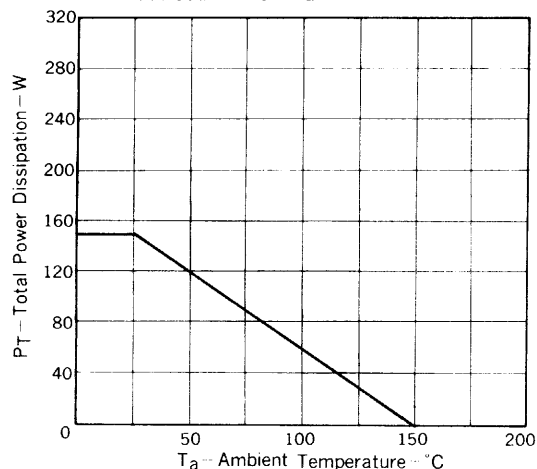
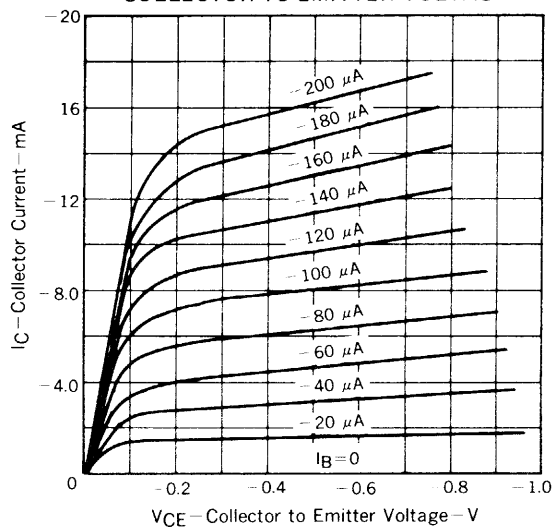
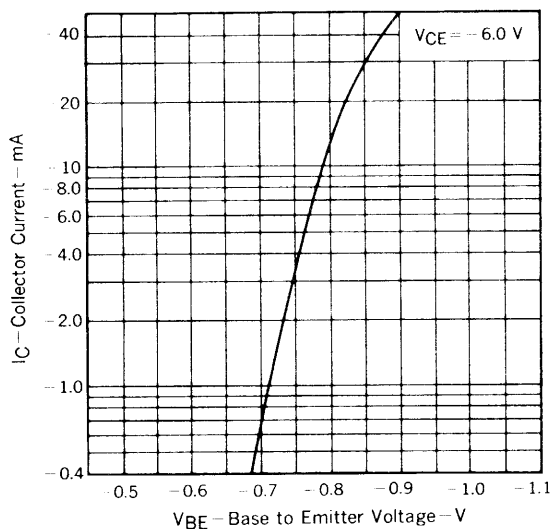
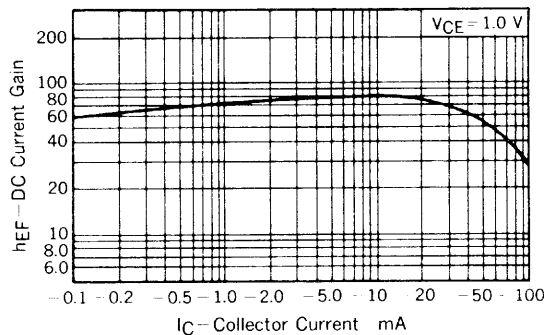
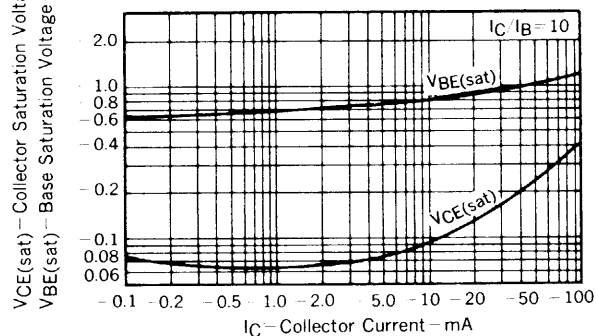
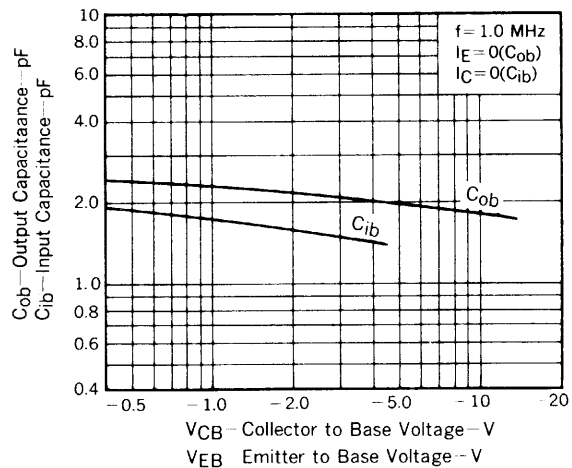
ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

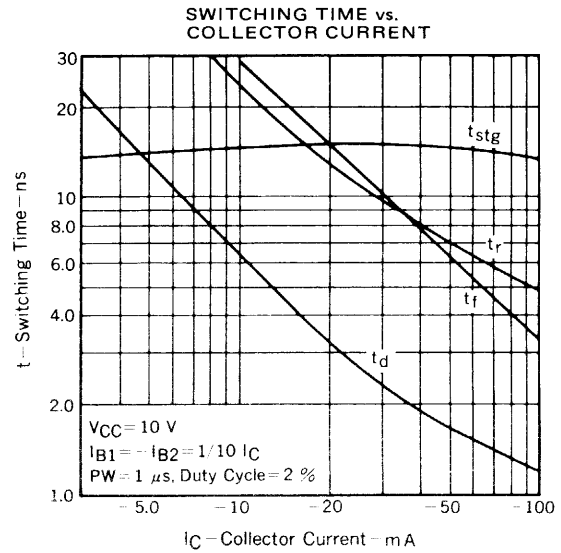
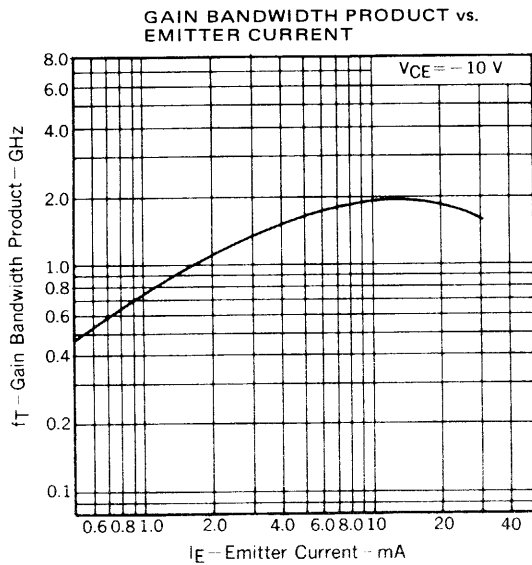
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			-100	nA	$V_{CB} = -8.0 \text{ V}, I_E = 0$
Emitter Cutoff Current	I_{EBO}			-100	nA	$V_{EB} = -3.0 \text{ V}, I_C = 0$
DC Current Gain	h_{FE1}^*	30	70			$V_{CE} = -1.0 \text{ V}, I_C = -1.0 \text{ mA}$
DC Current Gain	h_{FE2}^*	50	80	150		$V_{CE} = -1.0 \text{ V}, I_C = -10 \text{ mA}$
Collector Saturation Voltage	$V_{CE(sat)}^*$		-0.09	-0.20	V	$I_C = -10 \text{ mA}, I_B = -1.0 \text{ mA}$
Base Saturation Voltage	$V_{BE(sat)}^*$		-0.80	-0.95	V	$I_C = -10 \text{ mA}, I_B = -1.0 \text{ mA}$
Gain Bandwidth Product	f_T	800	1800		MHz	$V_{CE} = -10 \text{ V}, I_E = 10 \text{ mA}$
Output Capacitance	C_{ob}		2.0	3.0	pF	$V_{CB} = -5.0 \text{ V}, I_E = 0, f = 1.0 \text{ MHz}$
Turn-on Time	t_{on}		9.0	20	ns	See Test Circuit
Storage Time	t_{stg}		16	40	ns	
Turn-off Time	t_{off}		19	40	ns	

* Pulsed: $PW \leq 350 \mu\text{s}$, Duty Cycle $\leq 2\%$

h_{FE2} Classification

Making	Y33	Y34
h_{FE2}	50 to 100	75 to 150

TYPICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)TOTAL POWER DISSIPATION vs.
AMBIENT TEMPERATURECOLLECTOR CURRENT vs.
COLLECTOR TO EMITTER VOLTAGECOLLECTOR CURRENT vs.
BASE TO EMITTER VOLTAGEDC CURRENT GAIN vs.
COLLECTOR CURRENTBASE AND COLLECTOR SATURATION
VOLTAGE vs. COLLECTOR CURRENTINPUT AND OUTPUT CAPACITANCE
vs. REVERSE VOLTAGE



SWITCHING TIME TEST CIRCUIT

