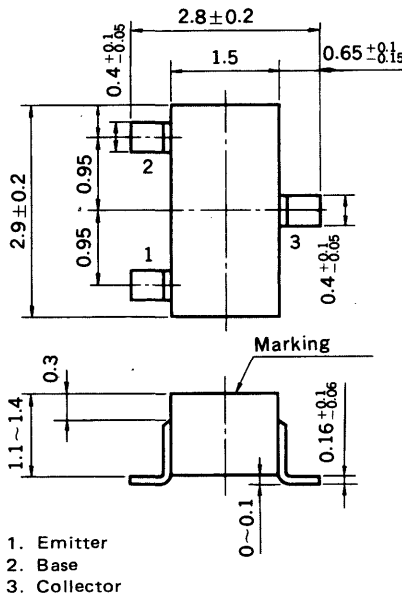


**HIGH FREQUENCY AMPLIFIER**  
**NPN SILICON EPITAXIAL TRANSISTOR**  
**MINI MOLD**

**PACKAGE DIMENSIONS**  
in millimeters



**FEATURES**

- High Speed:  $t_{stg} < 200$  ns
- Complementary to 2SA1461

**ABSOLUTE MAXIMUM RATINGS**

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

Collector to Base Voltage	$V_{CBO}$	60	V
Collector to Emitter Voltage	$V_{CEO}$	40	V
Emitter to Base Voltage	$V_{EBO}$	6	V
Collector Current (DC)	$I_C$	200	mA

Maximum Power Dissipation

Total Power Dissipation at $25^\circ\text{C}$ Ambient Temperature	$P_T$	200	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 ( $T_a = 25^\circ\text{C}$ )**

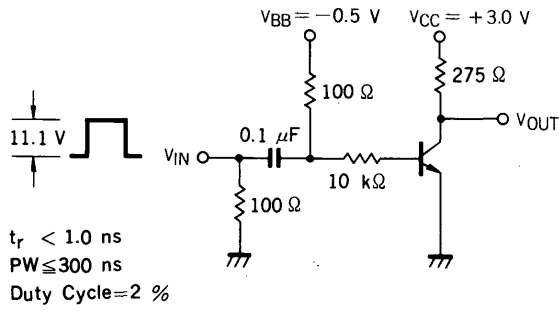
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	$I_{CBO}$			100	nA	$V_{CB} = 30\text{ V}, I_E = 0$
Emitter Cutoff Current	$I_{EBO}$			100	nA	$V_{EB} = 3.0\text{ V}, I_C = 0$
DC Current Gain	$h_{FE1}^*$	75	200	300		$V_{CE} = 1.0\text{ V}, I_C = 10\text{ mA}$
DC Current Gain	$h_{FE2}^*$	25	80			$V_{CE} = 1.0\text{ V}, I_C = 100\text{ mA}$
Collector Saturation Voltage	$V_{CE(sat)}^*$		0.12	0.3	V	$I_C = 50\text{ mA}, I_B = 5.0\text{ mA}$
Base Saturation Voltage	$V_{BE(sat)}^*$		0.80	0.95	V	$I_C = 50\text{ mA}, I_B = 5.0\text{ mA}$
Gain Bandwidth Product	$f_T$	300	510		MHz	$V_{CE} = 20\text{ V}, I_E = -10\text{ mA}$
Output Capacitance	$C_{ob}$		3.0	4.0	pF	$V_{CB} = 5.0\text{ V}, I_E = 0, f = 1.0\text{ MHz}$
Turn-on Time	$t_{on}$			70	ns	$V_{CC} = 3.0\text{ V}$
Storage Time	$t_{stg}$		100	200	ns	$I_C = 10\text{ mA}$
Turn-off Time	$t_{off}$			250	ns	$I_{B1} = -I_{B2} = 1.0\text{ mA}$

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

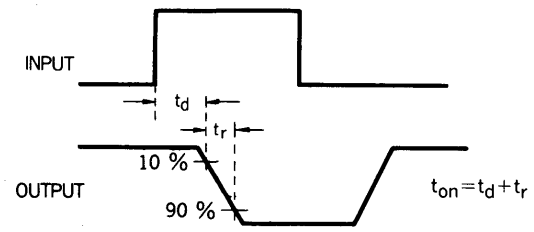
**$h_{FE}$  Classification**

Marking	B22	B23	B24
$h_{FE1}$	75 to 150	100 to 200	150 to 300

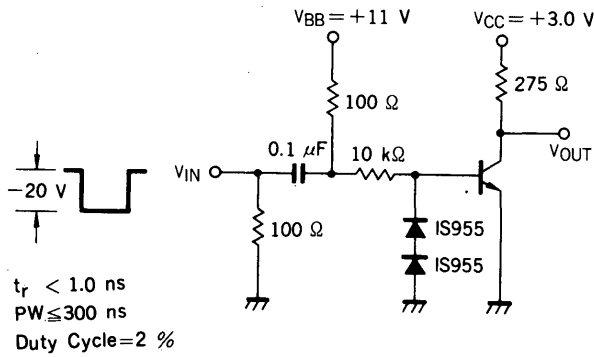
SWITCHING TIME TEST CIRCUIT



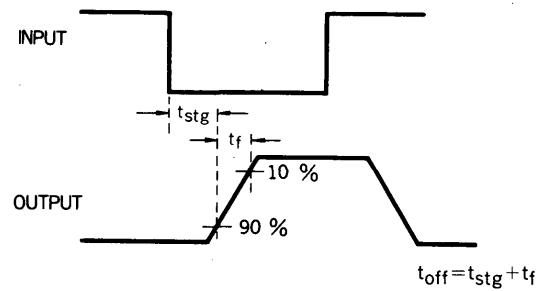
$t_{on}$  SWITCHING



VOLTAGE WAVEFORMS

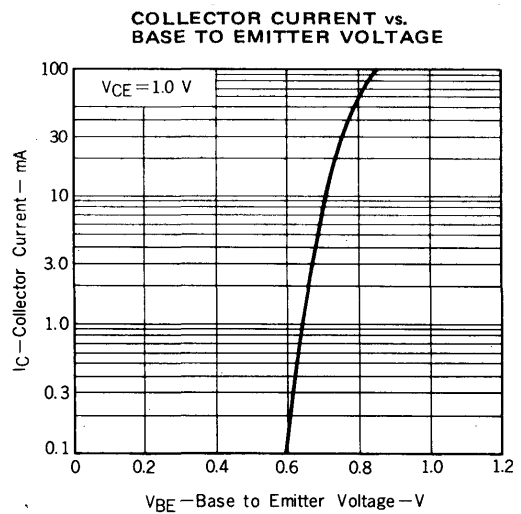
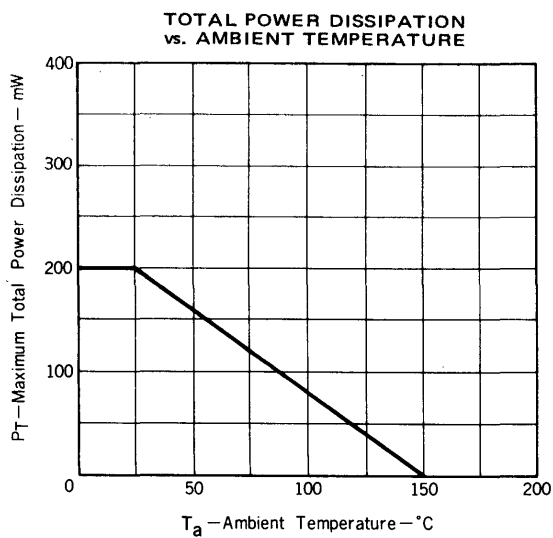


$t_{off}$  SWITCHING

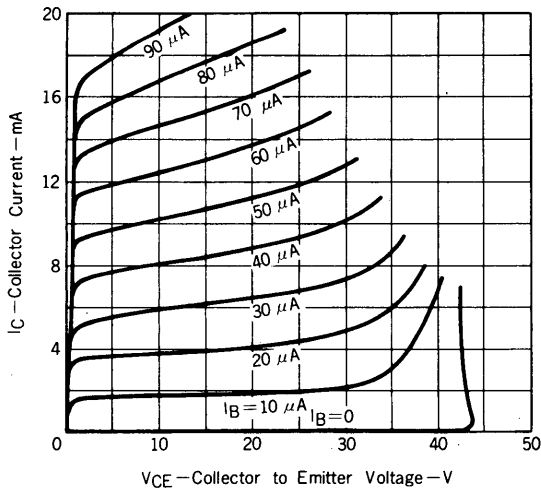


VOLTAGE WAVEFORMS

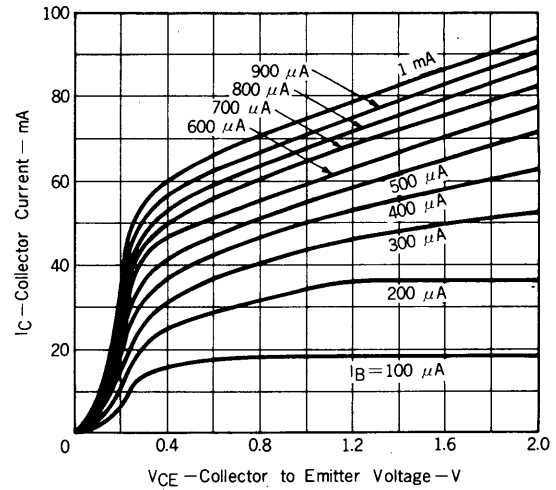
TYPICAL CHARACTERISTICS ( $T_a = 25^\circ\text{C}$ )



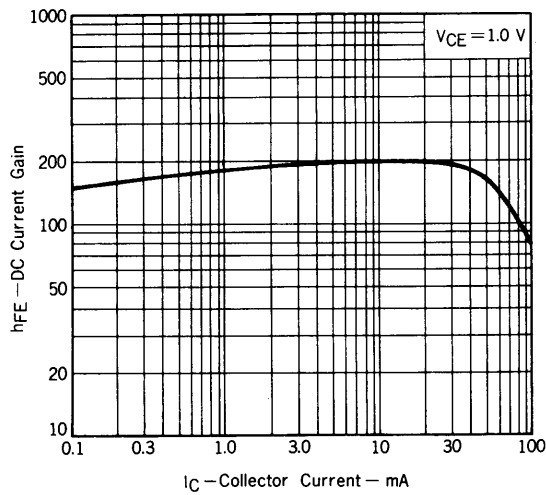
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



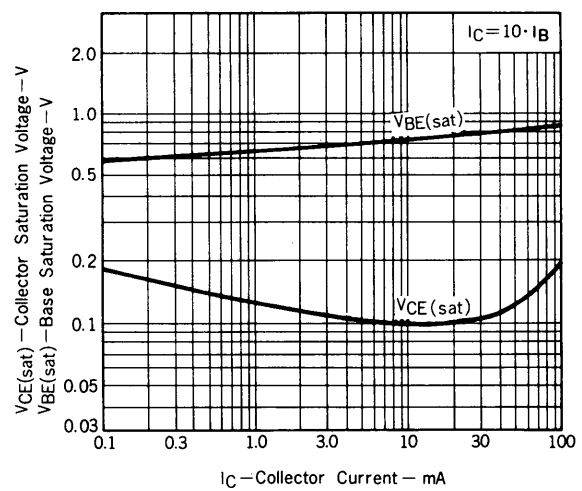
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



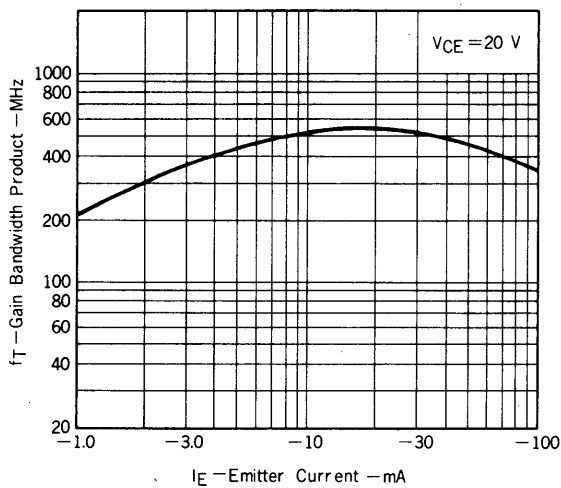
DC CURRENT GAIN vs. COLLECTOR CURRENT



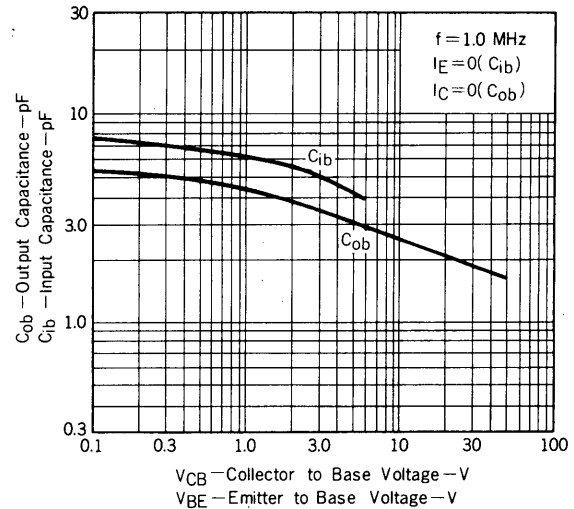
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



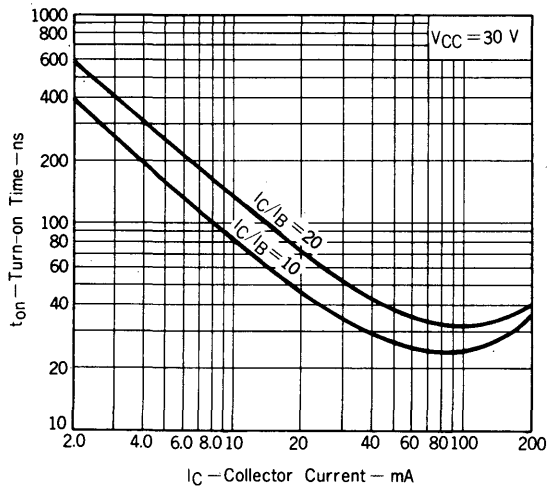
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



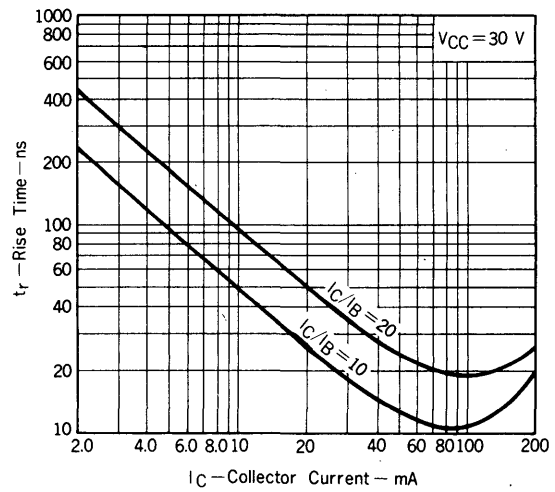
INPUT AND OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



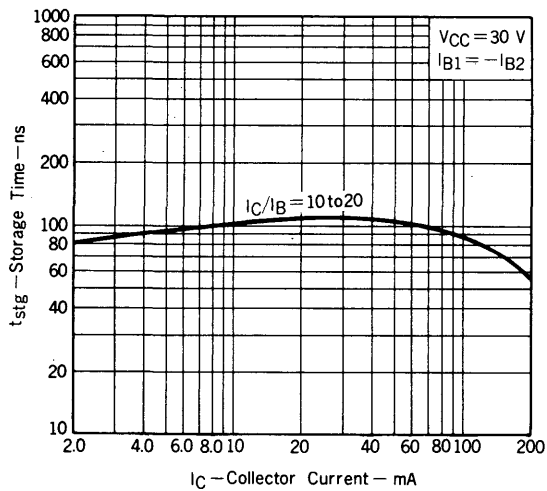
TURN-ON TIME vs. COLLECTOR CURRENT



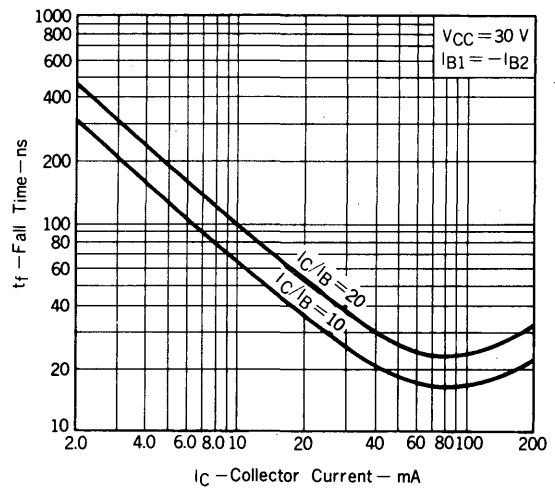
RISE TIME vs. COLLECTOR CURRENT



STORAGE TIME vs. COLLECTOR CURRENT



FALL TIME vs. COLLECTOR CURRENT



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