DATA SHEET

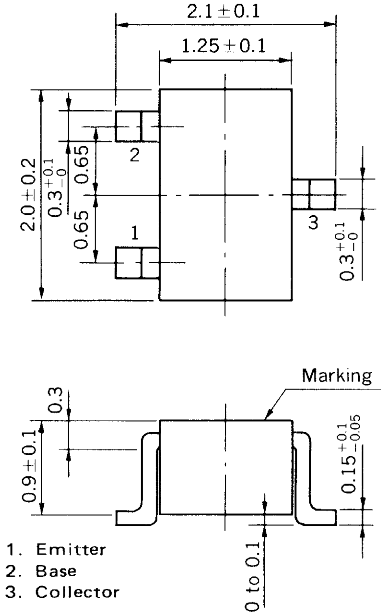
NEC
ELECTRON DEVICE

SILICON TRANSISTOR
2SC4173

HIGH FREQUENCY AMPLIFIER AND SWITCHING NPN SILICON EPITAXIAL TRANSISTOR

PACKAGE DIMENSIONS

in millimeters



FEATURES

- High Gain Bandwidth Product: f_T = 200 MHz MIN.
- Complementary to 2SA1608

ABSOLUTE MAXIMUM RATINGS

Maximum Voltages and Current (T_a = 25 °C)			
Collector to Base Voltage	V_{CBO}	60	V
Collector to Emitter Voltage	V_{CEO}	40	V
Emitter to Base Voltage	V_{EBO}	5.0	V
Collector Current (DC)	I_C	500	mA
Maximum Power Dissipation			
Total Power Dissipation			
at 25 °C Ambient Temperature	P_T	150	mW
Maximum Temperatures			
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	−55 to +150	°C

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

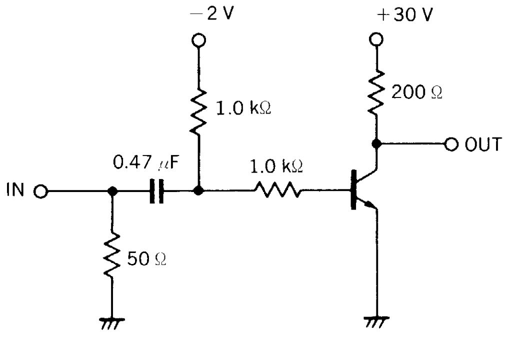
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			100	nA	V_{CB} = 40 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			100	nA	V_{EB} = 4.0 V, I_C = 0
DC Current Gain	h_{FE1}	75	150	300		V_{CE} = 1.0 V, I_C = 150 mA
DC Current Gain	h_{FE2}	20	75			V_{CE} = 2.0 V, I_C = 500 mA
Collector Saturation Voltage	$V_{CE(sat)}$		0.25	0.75	V	I_C = 500 mA, I_B = 50 mA
Base Saturation Voltage	$V_{BE(sat)}$		1.0	1.2	V	I_C = 500 mA, I_B = 50 mA
Gain Bandwidth Product	f_T	200	400		MHz	V_{CE} = 10 V, I_E = −20 mA
Output Capacitance	C_{ob}		3.5	8.0	pF	V_{CB} = 10 V, I_E = 0, f = 1.0 MHz
Turn-on Time	t_{on}		30		ns	V_{CC} = 30 V I_C = 150 mA I_{B1} = $-I_{B2}$ = 15 mA
Storage Time	t_{stg}		150		ns	
Turn-off Time	t_{off}		180		ns	

* Pulsed: PW ≤ 350 μs, Duty Cycle ≤ 2 %

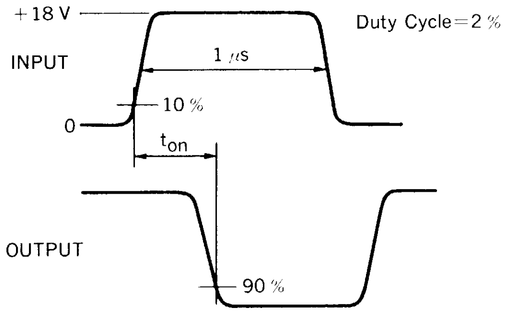
h_{FE} Classification

Marking	B12	B13	B14
h_{FE1}	75 to 150	100 to 200	150 to 300

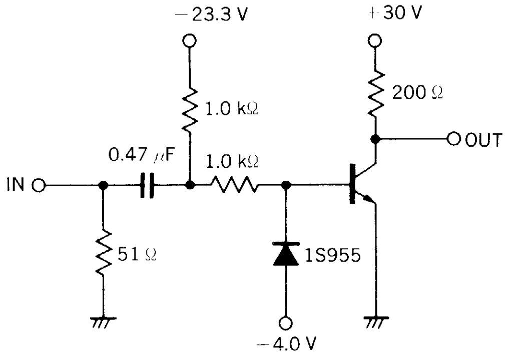
SWITCHING TIME TEST CIRCUIT



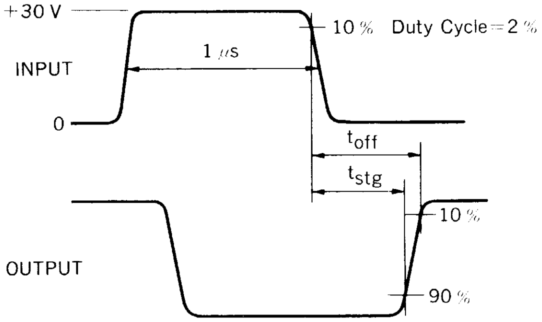
t_{on} SWITCHING



VOLTAGE WAVEFORMS

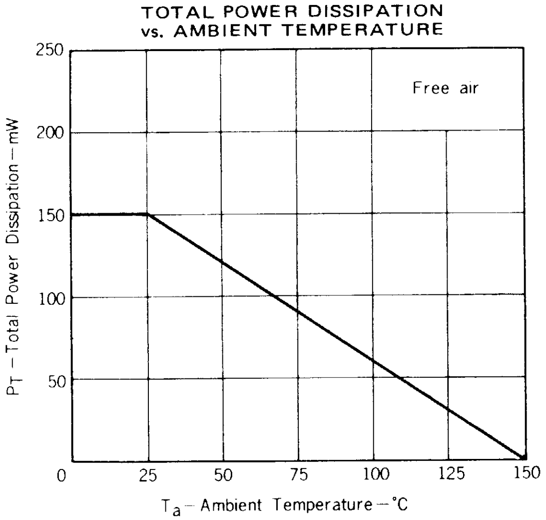


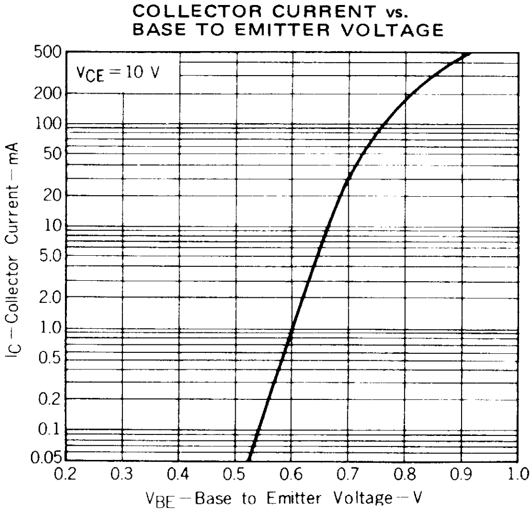
t_{off} SWITCHING



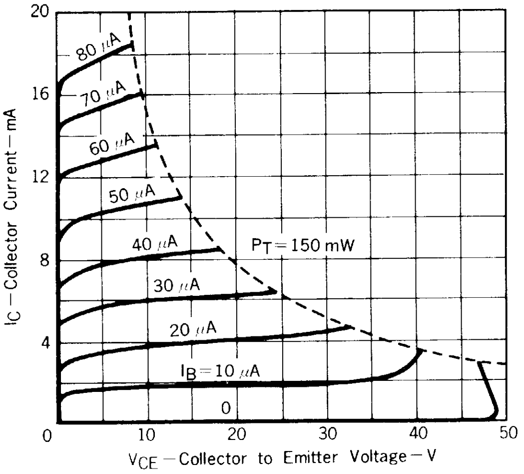
VOLTAGE WAVEFORMS

TYPICAL CHARACTERISTICS ($T_a = 25$ °C)

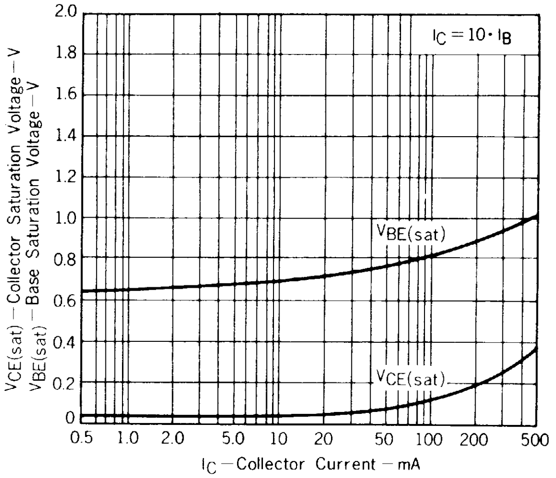

TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE


COLLECTOR CURRENT vs. BASE TO EMITTER VOLTAGE

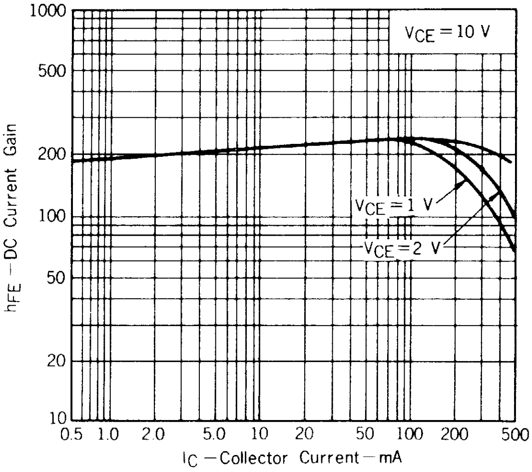
COLLECTOR CURRENT vs. COLLECTOR TO EMITTER VOLTAGE



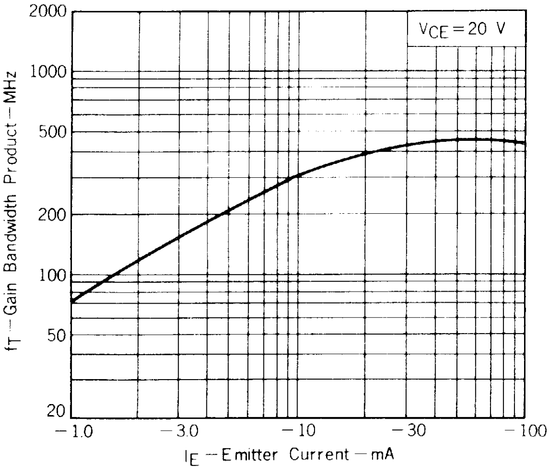
BASE AND COLLECTOR SATURATION VOLTAGE vs. COLLECTOR CURRENT



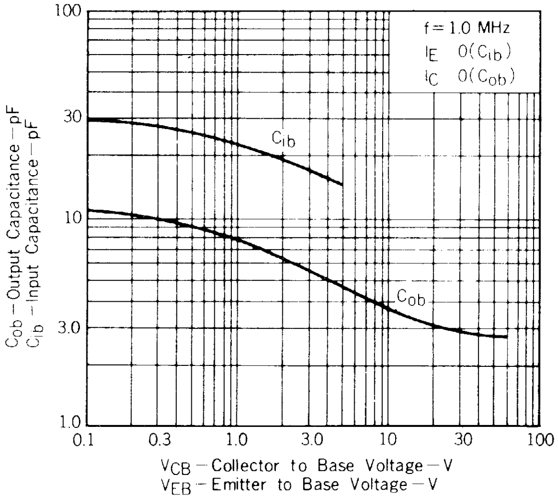
DC CURRENT GAIN vs. COLLECTOR CURRENT



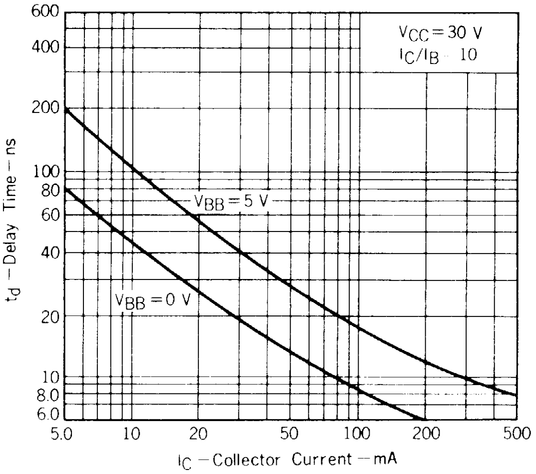
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



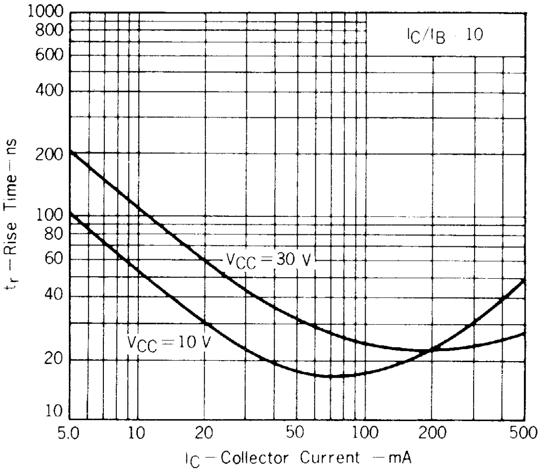
INPUT AND OUTPUT CAPACITANCE vs. REVERSE VOLTAGE



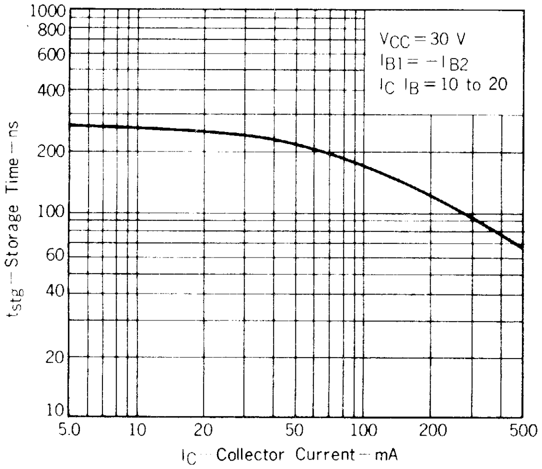
DELAY TIME vs.
COLLECTOR CURRENT



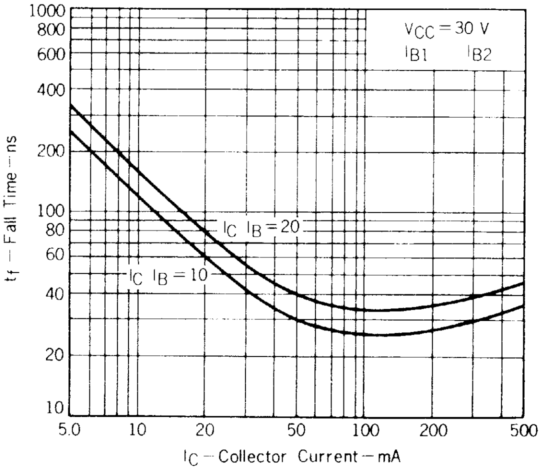
RISE TIME vs.
COLLECTOR CURRENT



STORAGE TIME vs.
COLLECTOR CURRENT



FALL TIME vs.
COLLECTOR CURRENT



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