2N3743

JAN, JTX AVAILABLE
CASE 79, STYLE 1
TO-39 (TO-205AD)

AMPLIFIER TRANSISTOR

PNP SILICON

4

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	300	Vdc
Collector-Base Voltage	V_{CBO}	300	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector Current — Continuous	I_C	50	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.0 5.7	Watts mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	5.0 28.6	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

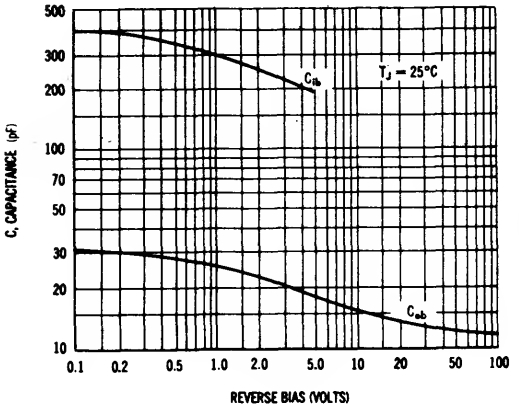
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage(1) (I_C = 10 mAdc, I_B = 0)	$V_{(BR)CEO}$	300	—	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	$V_{(BR)CBO}$	300	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	$V_{(BR)EBO}$	5.0	—	Vdc
Collector Cutoff Current (V_{CB} = 200 Vdc, I_E = 0) (V_{CB} = 200 Vdc, I_E = 0, T_A = 100°C)	I_{CBO}	— —	0.3 30	μAdc
Emitter Cutoff Current (V_{EB} = 3.0 Vdc, I_C = 0)	I_{EBO}	—	0.1	μAdc
ON CHARACTERISTICS				
DC Current Gain(2) (I_C = 100 μAdc, V_{CE} = 10 Vdc) (I_C = 1.0 mAdc, V_{CE} = 10 Vdc) (I_C = 10 mAdc, V_{CE} = 10 Vdc) (I_C = 30 mAdc, V_{CE} = 10 Vdc) (I_C = 50 mAdc, V_{CE} = 20 Vdc)	h_{FE}	 20 25 25 25 25	 — — — 250 —	—
Collector-Emitter Saturation Voltage(2) (I_C = 10 mAdc, I_B = 1 mAdc) (I_C = 30 mAdc, I_B = 3 mAdc)	$V_{CE(sat)}$	 — —	 5.0 8.0	Vdc
Base-Emitter Saturation Voltage(2) (I_C = 10 mAdc, I_B = 1 mAdc) (I_C = 30 mAdc, I_B = 3 mAdc)	$V_{BE(sat)}$	 — —	 1.0 1.2	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Output Capacitance (V_{CB} = 20 Vdc, I_E = 0, f = 100 kHz)	C_{obo}	—	15	pF
Input Capacitance (V_{EB} = 1.0 Vdc, I_C = 0, f = 100 kHz)	C_{ibo}	—	400	pF
Input Impedance (V_{CE} = 10 V, I_C = 10 mA, f = 1 kHz)	h_{ie}	—	1.0	kohms
Voltage Feedback Ratio (V_{CE} = 10 V, I_C = 10 mA, f = 1 kHz)	h_{re}	—	4.0	X 10^{-4}
Small-Signal Current Gain (V_{CE} = 10 V, I_C = 10 mA, f = 1 kHz)	h_{fe}	30	300	—

ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

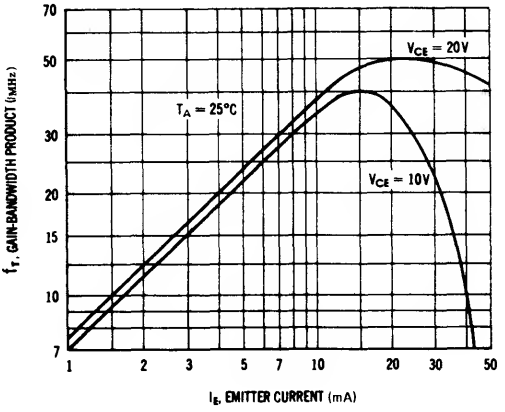
Characteristic	Symbol	Min	Max	Unit
Current Gain — High Frequency (I_C = 10 mAdc, V_{CE} = 20 Vdc, f = 20 MHz)	$\|h_{fe}\|$	1.5	—	—
Output Admittance (V_{CE} = 10 V, I_C = 10 mA, f = 1 kHz)	h_{oe}	—	200	μmhos
Real Part of Input Impedance (I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 5 MHz)	$Re(h_{ie})$	—	40	ohms

(1) PW ≤ 30 μs, Duty Cycle ≤ 1.0%.
(2) PW ≤ 300 μs, Duty Cycle ≤ 2.0%.

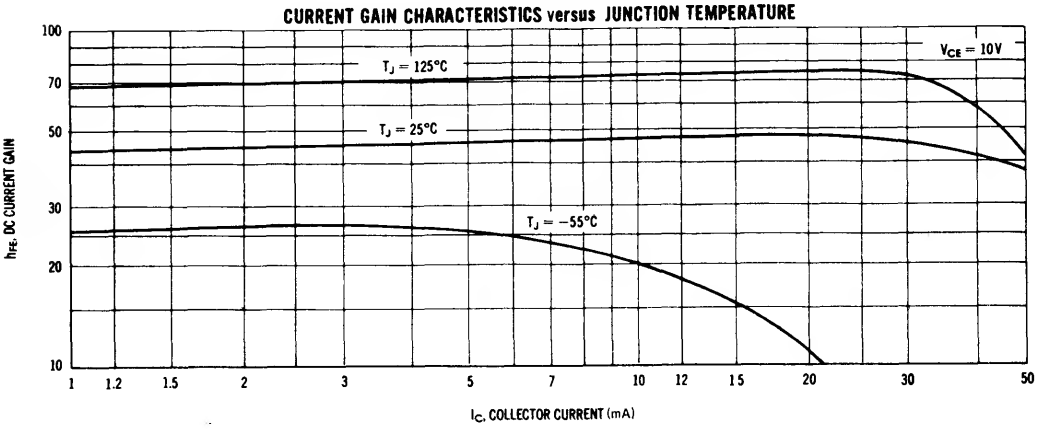
JUNCTION CAPACITANCE



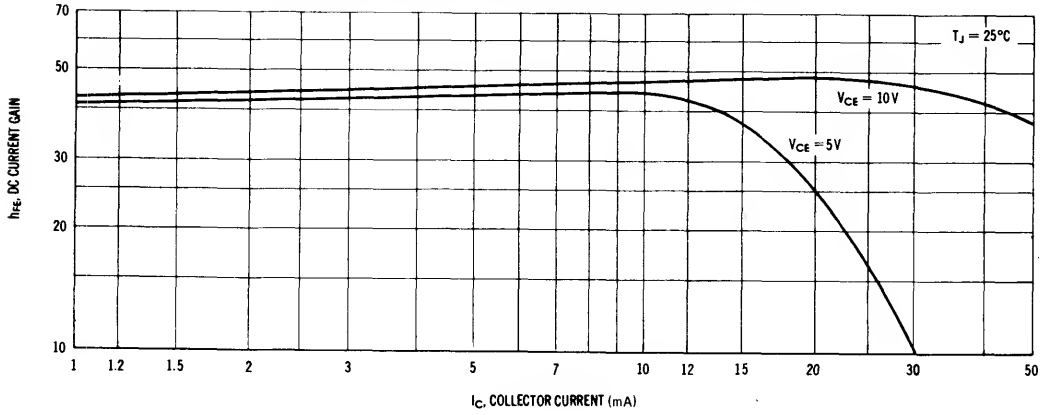
GAIN-BANDWIDTH PRODUCT



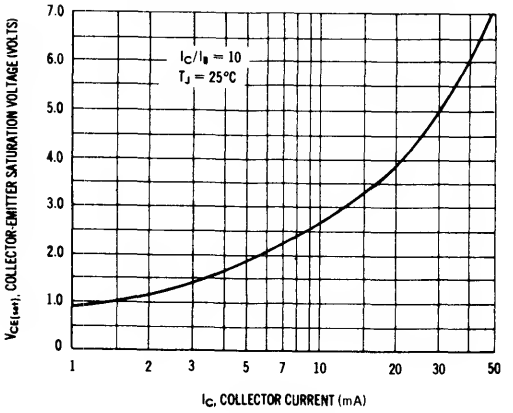
CURRENT GAIN CHARACTERISTICS versus JUNCTION TEMPERATURE



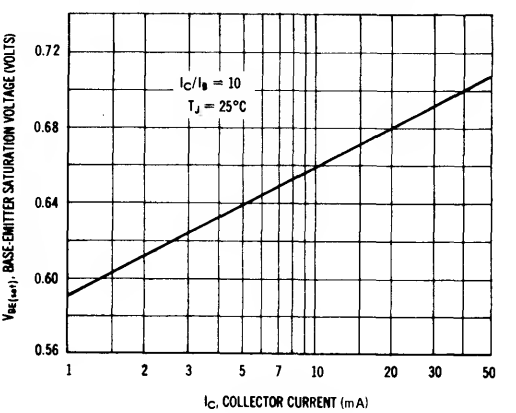
CURRENT GAIN CHARACTERISTICS versus COLLECTOR-EMITTER VOLTAGE



COLLECTOR-EMITTER SATURATION VOLTAGE



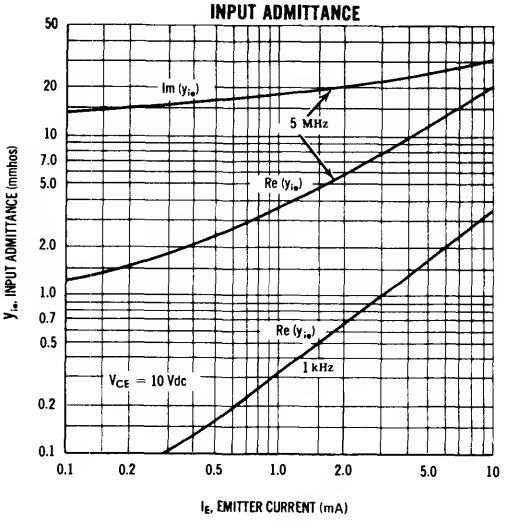
BASE-EMITTER SATURATION VOLTAGE



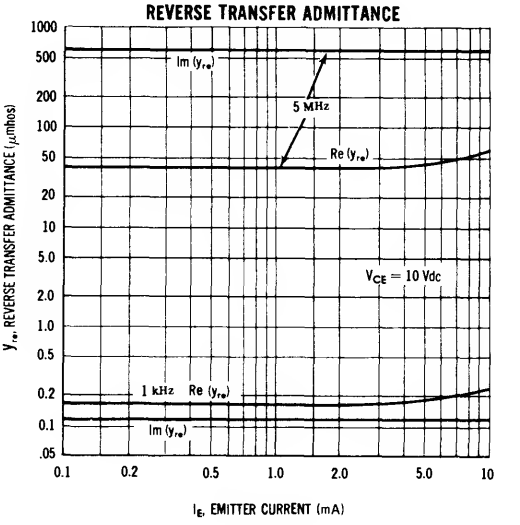
SMALL SIGNAL y PARAMETERS

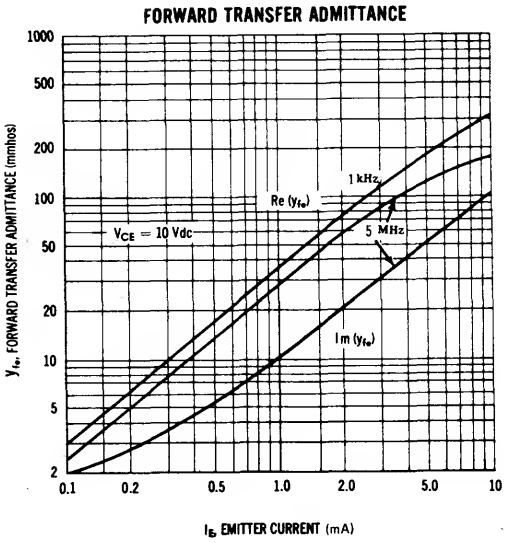
$T_A = 25°C$

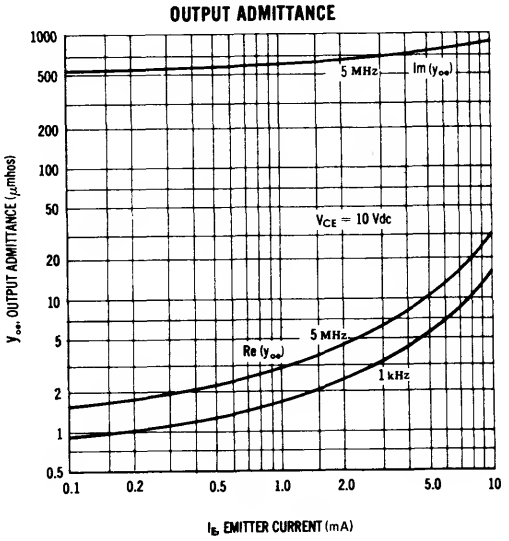
INPUT ADMITTANCE



REVERSE TRANSFER ADMITTANCE




FORWARD TRANSFER ADMITTANCE
y_{fe}, FORWARD TRANSFER ADMITTANCE (mmhos)
1000
500
200
100
50
20
10
5
2
0.1
0.2
0.5
1.0
2.0
5.0
10
V_{CE} = 10 Vdc
Re (y_{fe})
1 kHz
5 MHz
Im (y_{fe})
I_E, EMITTER CURRENT (mA)


OUTPUT ADMITTANCE
y_{oe}, OUTPUT ADMITTANCE (μmhos)
1000
500
200
100
50
20
10
5
2
1
0.5
0.1
0.2
0.5
1.0
2.0
5.0
10
5 MHz
Im (y_{oe})
V_{CE} = 10 Vdc
5 MHz
Re (y_{oe})
1 kHz
I_E, EMITTER CURRENT (mA)

4