2N2904,A, 2N2905,A, 2N2906,A, 2N2907,A, 2N3485,A, 2N3486,A

JAN, JTX, JTXV AVAILABLE*

CASE 79-02, STYLE 1
2N2904/2905 TO-39 (TO-205AD)
CASE 22-03, STYLE 1
2N2906/2907 TO-18 (TO-206AA)
CASE 26-03, STYLE 1
2N3485/3486 TO-46 (TO-206AB)

GENERAL PURPOSE TRANSISTOR

PNP SILICON

4

MAXIMUM RATINGS

Rating	Symbol	Non-A Suffix		A-Suffix	Unit
Collector-Emitter Voltage	V_{CEO}	40		60	Vdc
Collector-Base Voltage	V_{CBO}	60			Vdc
Emitter-Base Voltage	V_{EBO}	5.0			Vdc
Collector Current — Continuous	I_C	600			mAdc
		2N2904,A 2N2905,A	2N2906,A 2N2907,A	2N3485,A 2N3486,A	
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	600 3.43	400 2.28	400 2.28	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	3.0 17.2	1.8 10.3	2.0 11.43	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	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage(1) (I_C = 10 mAdc, I_B = 0)	Non-A Suffix A-Suffix	$V_{(BR)CEO}$	 40 60	 — —	 — —	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)		$V_{(BR)CBO}$	60	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)		$V_{(BR)EBO}$	5.0	—	—	Vdc
Collector Cutoff Current (V_{CE} = 30 Vdc, V_{BE} = 0.5 Vdc)		I_{CEX}	—	—	50	nAdc
Collector Cutoff Current (V_{CB} = 50 Vdc, I_E = 0)	Non-A Suffix A-Suffix	I_{CBO}	 —	 —	0.020 0.010	μAdc
(V_{CB} = 50 Vdc, I_E = 0, T_A = 150°C)	Non-A Suffix A-Suffix		 —	 —	20 10	
Base Current (V_{CE} = 30 Vdc, V_{BE} = 0.5 Vdc)		I_B	—	—	50	nAdc
ON CHARACTERISTICS						
DC Current Gain (I_C = 0.1 mAdc, V_{CE} = 10 Vdc)	2N2904, 2N2906, 2N3485 2N2905, 2N2907, 2N3486 2N2904A, 2N2906A, 2N3485A 2N2905A, 2N2907A, 2N3486A	h_{FE}	20 35 40 75	— — — —	— — — —	—
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc)	2N2904, 2N2906, 2N3485 2N2905, 2N2907, 2N3486 2N2904A, 2N2906A, 2N3485A 2N2905A, 2N2907A, 2N3486A		25 50 40 100	— — — —	— — — —	
(I_C = 10 mAdc, V_{CE} = 10 Vdc)	2N2904, 2N2906, 2N3485 2N2905, 2N2907, 2N3486 2N2904A, 2N2906A, 2N3485A 2N2905A, 2N2907A, 2N3486A		35 75 40 100	— — — —	— — — —	
(I_C = 150 mAdc, V_{CE} = 10 Vdc)(1)	2N2904A, 2N2906A, 2N3485,A 2N2905A, 2N2907A, 2N3486A		40 100	— —	120 300	

***ALSO AVAILABLE 2N2905ALJANS AND 2N2907AJANS**

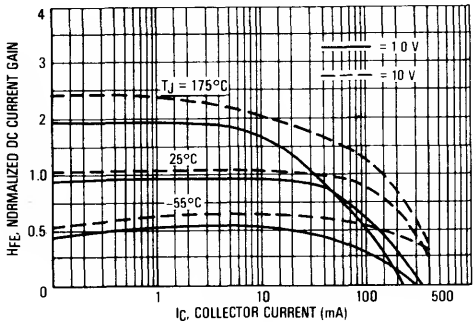
ELECTRICAL CHARACTERISTICS (continued) (T_A = 25°C unless otherwise noted.)

Characteristic		Symbol	Min	Typ	Max	Unit
(I_C = 500 mAdc, V_{CE} = 10 Vdc)(1)	2N2904, 2N2906, 2N3485		20	—	—	
	2N2905, 2N2907, 2N3486		30	—	—	
	2N2904A, 2N2906A, 2N3485A		40	—	—	
	2N2905A, 2N2907A, 2N3486A		50	—	—	
Collector-Emitter Saturation Voltage(1)		$V_{CE(sat)}$				Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)			—	—	0.4	
(I_C = 500 mAdc, I_B = 50 mAdc)			—	—	1.6	
Base-Emitter Saturation Voltage		$V_{BE(sat)}$				Vdc
(I_C = 150 mAdc, I_B = 15 mAdc)(1)			—	—	1.3	
(I_C = 500 mAdc, I_B = 50 mAdc)			—	—	2.6	
SMALL-SIGNAL CHARACTERISTICS						
Current-Gain — Bandwidth Product(2) (I_C = 50 mAdc, V_{CE} = 20 Vdc, f = 100 MHz)		f_T	200	—	—	MHz
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)		C_{obo}	—	—	8.0	pF
Input Capacitance (V_{BE} = 2.0 Vdc, I_C = 0, f = 100 kHz)		C_{ibo}	—	—	30	pF
SWITCHING CHARACTERISTICS						
Turn-On Time	(V_{CC} = 30 Vdc, I_C = 150 mAdc, I_{B1} = 15 mAdc)	t_{on}	—	26	45	ns
Delay Time		t_d	—	6.0	10	ns
Rise Time		t_r	—	20	40	ns
Turn-Off Time	(V_{CC} = 6.0 Vdc, I_C = 150 mAdc, I_{B1} = I_{B2} = 15 mAdc)	t_{off}	—	70	100	ns
Storage Time		t_s	—	50	80	ns
Fall Time		t_f	—	20	30	ns

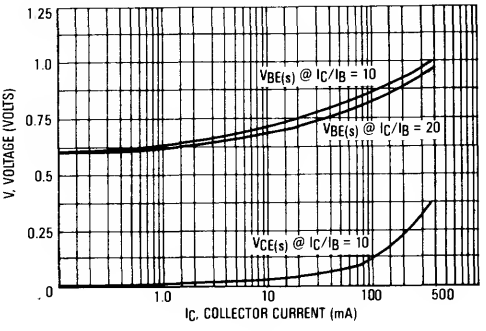
(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

(2) f_T is defined as the frequency at which $|h_{fe}|$ extrapolates to unity.

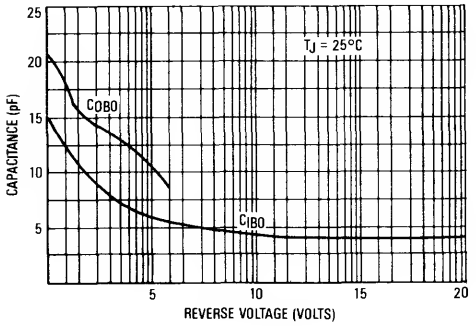
NORMALIZED DC CURRENT GAIN



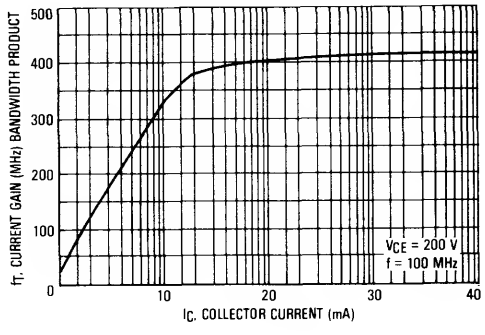
CURRENT GAIN—BANDWIDTH PRODUCT



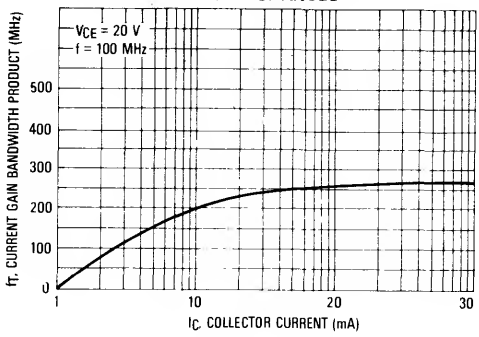
"ON" VOLTAGES



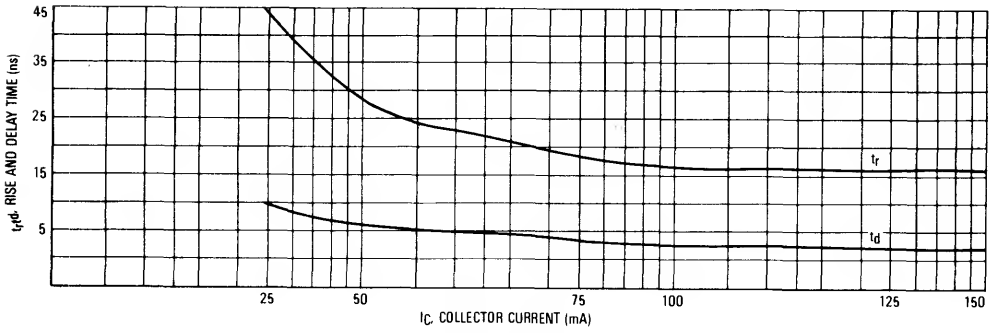
CURRENT GAIN—BANDWIDTH PRODUCT



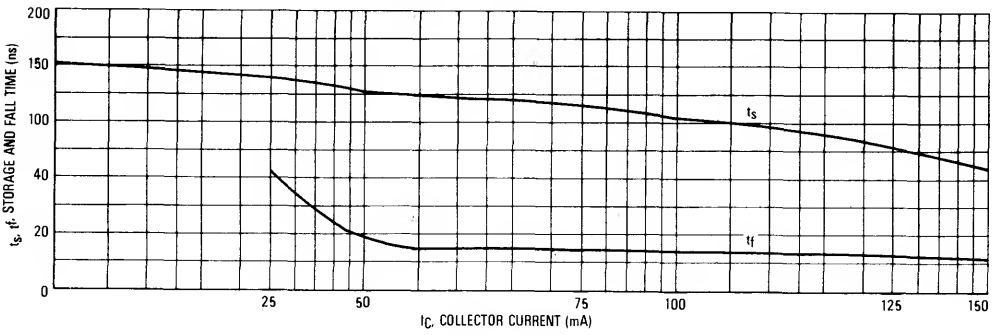
CAPACITANCES



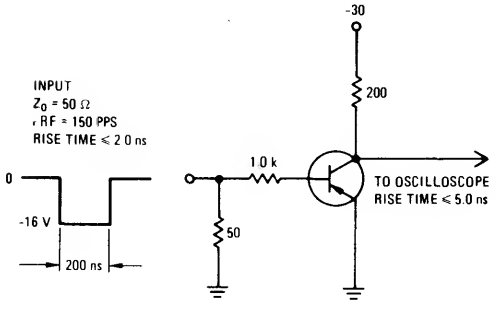
TURN ON BEHAVIOR



TURN OFF BEHAVIOR



DELAY AND RISE TIME TEST CIRCUIT



STORAGE AND FALL TIME TEST CIRCUIT