TYPE	MATERIAL	POLARITY	REPLACEMENT	PAGE NUMBER	USE	MAXIMUM RATINGS						ELECTRICAL CHARACTERISTICS							
						P_D @ 25°C	Ref Point	T_J °C	V_{CB} (volts)	V_{CE-} (volts)	Subscript	h_{FE} @ I_C (min)	(max)	Units	$V_{CE(SAT)}$ @ I_C (volts)	Units	h_{f-}	Subscript	f_- Units	Subscript
2N4877	S	N			LPA	10W	C	200		60	O	20	100	4.0A	1.0	4.0A			4.0M	T
2N4881 thru 2N4886	Field Effect Transistors, see Table on Page 1-166																			
2N4888	S	P			AFA	300M	A	125	150	150	O	40	400	10M	0.5	10M			30M	T
2N4889	S	P			AFA	300M	A	125	150	150	O	80	300	10M	0.5	10M			40M	T
2N4890	S	P		8-306	MSS	1.0W	A			60	40	O	50	250	150M	1.4	150M	5.0	E		
2N4891 thru 2N4894	Unijunction Transistors, see Table on Page 1-174																			
2N4895	S	N			PMS	4.0W	C	200	120	60	O	100	300	2.0A	1.0	5.0A	4.0	E		
2N4896	S	N			PMS	4.0W	C	200	120	60	O	40	120	2.0A	1.0	5.0A	2.5	E		
2N4897	S	N			PMS	4.0W	C	200	150	80	O	40	120	2.0A	1.0	5.0A	2.5	E		
2N4898	S	P		7-172	LPA	25W	C	200	40	40	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4899	S	P		7-172	LPA	25W	C	200	60	60	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4900	S	P		7-172	LPA	25W	C	200	80	80	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4901	S	P		7-176	LPA	87.5W	C	200	40	40	O	20	80	1.0A	0.4	1.0A	20	E	4.0M	T
2N4902	S	P		7-176	LPA	87.5W	C	200	60	60	O	20	80	1.0A	0.4	1.0A	20	E	4.0M	T
2N4903	S	P		7-176	LPA	87.5W	C	200	80	80	O	20	80	1.0A	0.4	1.0A	20	E	4.0M	T
2N4904	S	P		7-180	LPA	87.5W	C	200	40	40	O	25	100	2.5A	1.0	2.5A	40	E	4.0M	T
2N4905	S	P		7-180	LPA	87.5W	C	200	60	60	O	25	100	2.5A	1.0	2.5A	40	E	4.0M	T
2N4906	S	P		7-180	LPA	87.5W	C	200	80	80	O	25	100	2.5A	1.0	2.5A	40	E	4.0M	T
2N4907	S	P			LPA	150W	C	200		40	O	20	80	4.0A	0.75	4.0A			4.0M	T
2N4908	S	P			LPA	150W	C	200		60	O	20	80	4.0A	0.75	4.0A			4.0M	T
2N4909	S	P			LPA	150W	C	200		80	O	20	80	4.0A	0.75	4.0A			4.0M	T
2N4910	S	N		7-184	LPA	25W	C	200	40	40	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4911	S	N		7-184	LPA	25W	C	200	60	60	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4912	S	N		7-184	LPA	25W	C	200	80	80	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4913	S	N		7-188	LPA	87.5W	C	200	40	40	O	25	100	2.5A	1.0	2.5A	20	E	4.0M	T
2N4914	S	N		7-188	LPA	87.5W	C	200	60	60	O	25	100	2.5A	1.0	2.5A	20	E	4.0M	T
2N4915	S	N		7-188	LPA	87.5W	C	200	80	80	O	25	100	2.5A	1.0	2.5A	20	E	4.0M	T
2N4918	S	P		5-47	LPA	30W	C	150	40	40	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4919	S	P		5-47	LPA	30W	C	150	60	60	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4920	S	P		5-47	LPA	30W	C	150	80	80	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4921	S	N		5-51	LPA	30W	C	150	40	40	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4922	S	N		5-51	LPA	30W	C	150	60	60	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4923	S	N		5-51	LPA	30W	C	150	80	80	O	20	100	0.5A	0.6	1.0A	25	E	3.0M	T
2N4924	S	N		9-114	RFA	1.0W	A	175	100	100	O	40	200	150M	0.4	50M			100M	T
2N4925	S	N		9-114	RFA	1.0W	A	175	150	150	O	40	200	150M	0.4	50M			100M	T
2N4926	S	N		9-115	RFA	1.0W	A	175	200	200	O	20	200	30M	2.0	30M	25	E	300M	T
2N4927	S	N		9-115	RFA	1.0W	A	175	250	250	O	20	200	30M	2.0	30M	25	E	300M	T
2N4928	S	P		8-307	HSA	1.0W	A	200	100	100	O	25	200	10M	0.5	10M			100M	T
2N4929	S	P		8-307	HSA	1.0W	A	200	150	150	O	25	200	10M	0.5	10M			100M	T
2N4930	S	P		8-307	HSA	1.0W	A	200	200	200	O	20	200	10M	5.0	10M			20M	T
2N4931	S	P		8-307	HSA	1.0W	A	200	250	250	O	20	200	10M	5.0	10M			20M	T
2N4937	S	P		11-47	DFA	600M	A	200	50	40	O	50	250	1.0M			50	E	300M	T
2N4938	S	P		11-47	DFA	600M	A	200	50	40	O	50	250	1.0M			50	E	300M	T
2N4939	S	P		11-47	DFA	600M	A	200	50	40	O	50	250	1.0M			50	E	300M	T
2N4940	S	P		11-47	DFA	600M	A	200	50	40	O	50	250	1.0M			50	E	300M	T
2N4941	S	P		11-47	DFA	600M	A	200	50	40	O	50	250	1.0M			50	E	300M	T
2N4942	S	P		11-47	DFA	600M	A	200	50	40	O	50	250	1.0M			50	E	300M	T
2N4948																				
2N4949	Unijunction Transistors, see Table on Page 1-174																			
2N4957	S	P		9-117	LNA	200M	A	200	30	30	O	20	40	2.0M					1200M	T
2N4958	S	P		9-117	LNA	200M	A	200	30	30	O	20	40	2.0M					1000M	T
2N4959	S	P		9-117	LNA	200M	A	200	30	30	O	20	40	2.0M					1000M	T
2N4964	S	P			LNA	200M	A		50	40	O	30	120	10*	0.4	10M	40	E		
2N4965	S	P			LNA	200M	A		50	40	O	80	400	10*	0.4	10M	100	E		
2N4966	S	N			LNA	200M	A		50	40	O	40	200	10*	0.4	10M	40	E		
2N4967	S	N			LNA	200M	A		50	40	O	100	600	10*	0.4	10M	100	E		
2N4968	S	N			LNA	200M	A		30	25	O	40	200	10*	0.4	10M	40	E		
2N4969	S	N			HSS	200M	A		50	30	O	40	120	150M	0.4	150M				
2N4970	S	N			HSS	200M	A		50	30	O	100	350	150M	0.4	150M				
2N4971	S	P			HSS	200M	A		50	40	O	40	120	150M	0.4	150M				
2N4972	S	P			HSS	200M	A		50	40	O	100	300	150M	0.4	150M				
2N4973	S	P			RFA	200M	A		20	15	O	20		3.0M	0.5	10M				
2N4974	S	P			SPP	800M	A	200	40	30	O	5000	9000	1.0*			25000	E	175M	T
2N4975	S	P			SPP	800M	A	200	40	30	O	1000	4000	1.0*			15000	E	175M	T
2N4977 thru 2N4979	Field Effect Transistors, see Table on Page 1-166																			
2N4994	S	N			RFC	200M	A			60	45	O	40	160	10M					
2N4995	S	N			RFC	200M	A			60	45	O	100	400	10M					
2N4996	S	N			RFC	200M	A			30	18	O	50		2M					
2N4997	S	N			RFC	200M	A			30	18	O	30	150	2M					
2N5010	S	N			AFA	2.0W	C			500	500	R	30	180	25M	1.4	25M			
2N5011	S	N			AFA	2.0W	C			600	600	R	30	180	25M	1.5	25M			
2N5012	S	N			AFA	2.0W	C			700	700	R	30	180	25M	1.6	25M			
2N5013	S	N			AFA	2.0W	C			800	800	R	30	180	20M	1.6	20M			
2N5014	S	N			AFA	2.0W	C			900	900	R	30	180	20M	1.6	20M			
2N5015	S	N			AFA	2.0W	C			1000	1000	R	30	180	20M	1.8	20M			
2N5018 thru 2N5021	Field Effect Transistors, see Table on Page 1-166																			
2N5022	S	P			HSS	1.0W	A			50	50	O	25	100	500M	0.2	100M			
2N5023	S	P			HSS	1.0W	A			30	30	O	40	100	500M	0.17	100M			
2N5025	S	N			HPA	45W	C	300		75	75	O	20		2.0A	1.0	2.0A			
2N5026	S	N			HPA	45W	C	300		90	90	O	20		2.0A	1.0	2.0A			

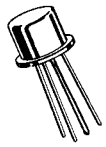
RF TRANSISTOR SELECTOR GUIDES

SMALL-SIGNAL TRANSISTORS
(Listed in order of operating test frequency and power gain)

Type	Material	Polarity	f MHz	Min G_{pe} (dB) Min P_{out} (mW)* Typ Conversion Gain (dB)†
2N3324	Ge	P	10	24
2N2273	Ge	P	30	10
2N741, A	Ge	P	30	16
2N2929	Ge	P	60	26
2N700	Ge	P	70	20
2N700A	Ge	P	70	22
2N3323	Ge	P	100	11
2N707, A	Si	N	100	200*
2N1562	Ge	P	160	5.0
2N1693	Ge	P	160	5.0
2N1561	Ge	P	160	6.0
2N1692	Ge	P	160	6.0
MM1941	Si	N	175	7.0
2N4072, 3	Si	N	175	10
2N3286	Ge	P	200	14
2N3294	Si	N	200	14
2N918	Si	N	200	15
2N2708	Si	N	200	15
2N3281	Ge	P	200	16
2N3282	Ge	P	200	16
2N3283	Ge	P	200	16
2N3284	Ge	P	200	16
2N3291, 2	Si	N	200	16
2N3127	Ge	P	200	17
2N3279, 80	Ge	P	200	17
2N3287 thru 90	Si	N	200	17
2N3307, 8	Si	P	200	17
2N3785	Ge	P	200	18
2N3783, 4	Ge	P	200	20
MM5002	Ge	P	200	20
MM5001	Ge	P	200	22
MM5000	Ge	P	200	24
2N3137	Si	N	250	6.0
MM1803	Si	N	250	7.5
2N2857	Si	N	450	12.5
2N3839	Si	N	450	12.5
2N4959	Si	P	450	15
2N4958	Si	P	450	16
2N4957	Si	P	450	17
2N1141, 2, 3	Ge	P	500	10 typ
2N1195	Ge	P	500	10 typ
AF239	Ge	P	800	11.2 G
2N3544	Si	N	1000	10*
MM1501	Si	N	1500	150*
MM1500	Si	N	1500	250*
MM380	Ge	P	1500 f_{max}	
MM1139	Ge	P	108 to 10.7	22†

2N4957 (SILICON)
2N4958
2N4959

V_{CEO} = 30 V
I_C = 30 mA
P_D = 200 mW



CASE 20
(TO-72)

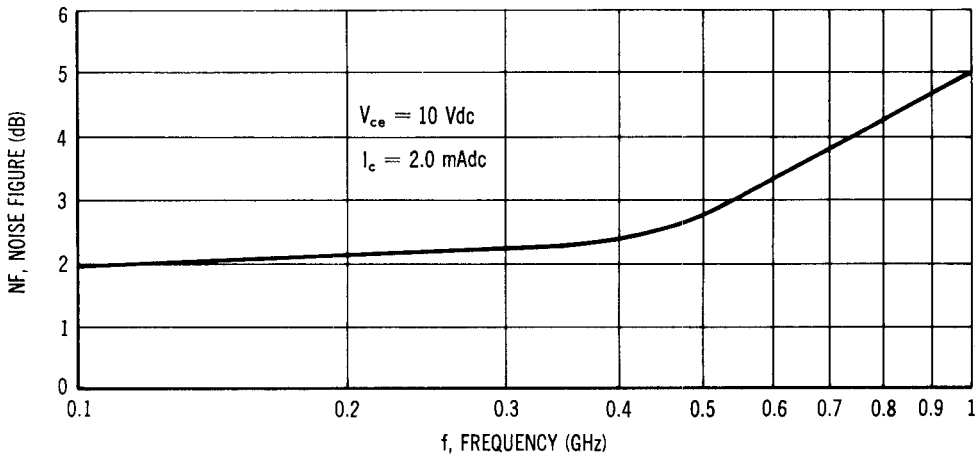
Active Elements Isolated From Case

PNP silicon annular small-signal RF transistor designed for high-gain, low-noise amplifier, oscillator, and mixer applications.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Collector-Base Voltage	V_{CB}	30	Vdc
Emitter-Base Voltage	V_{EB}	3.0	Vdc
Collector Current — Continuous	I_C	30	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	200 1.14	mWatt mW/°C
Operating Junction & Storage Temperature Range	T_J,T_{stg}	-65 to +200	°C

TYPICAL NOISE FIGURE vs. FREQUENCY (2N4957)

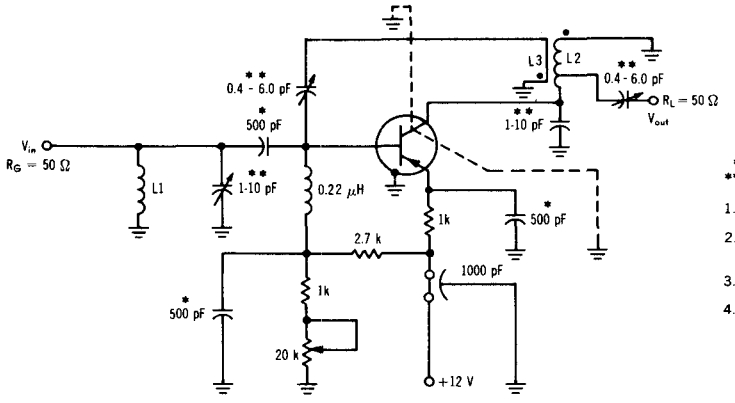


2N4957, 2N4958, 2N4959 (continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 1.0 mAdc, I_B = 0)	BV_{CEO}	30	-	-	Vdc
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	BV_{CBO}	30	-	-	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	BV_{EBO}	3.0	-	-	Vdc
Collector Cutoff Current (V_{CB} = 20 Vdc, I_E = 0)	I_{CBO}	-	-	0.1	μAdc
(V_{CB} = 20 Vdc, 0, T_A = 150°C)		-	-	100	
ON CHARACTERISTICS					
DC Current Gain (I_C = 2.0 mAdc, V_{CE} = 10 Vdc)	h_{FE}	20	40	-	-
DYNAMIC CHARACTERISTICS					
Current-Gain — Bandwidth Product (I_E = 2.0 mAdc, V_{CE} = 10 Vdc, f = 100 MHz) 2N4957	f_T	1200	1600	-	MHz
2N4958, 2N4959		1000	1500	-	
Output Capacitance (V_{CB} = 10 Vdc, I_E = 0, f = 100 kHz)	C_{cb}	-	0.4	0.8	pF
Collector-Base Time Constant (I_E = 2.0 mAdc, V_{CB} = 10 Vdc, f = 63.6 MHz)	$r_b'C_C$	-	-	8.0	ps
Noise Figure (I_C = 2.0 mAdc, V_{CE} = 10 Vdc, f = 450 MHz) Fig. 1 2N4957	NF	-	2.6	3.0	dB
2N4958		-	2.9	3.3	
2N4959		-	3.2	3.8	
(I_C = 2.0 mAdc, V_{CE} = 10 Vdc, R_G = 50 ohms, f = 1.0 GHz) 2N4957		-	5.0	-	
FUNCTIONAL TESTS					
Common-Emitter Amplifier Power Gain (V_{CE} = 10 Vdc, I_C = 2.0 mAdc, f = 450 MHz) 2N4957	G_{pe}	17	-	-	dB
2N4958		16	-	-	
2N4959		15	-	-	
(V_{CE} = 10 Vdc, I_C = 2.0 mAdc, R_G = 50 ohms, f = 1.0 GHz) 2N4957		-	13	-	

FIGURE 1 — NOISE FIGURE AND POWER GAIN TEST CIRCUIT



* Button type capacitors
** Variable air piston type capacitors

1. L1 — silver plated brass bar, 1.0 in. lg by 0.25 in od.
2. L2 — silver plated brass bar, 1.5 in. lg by 0.25 in od. Tap is 0.25 in. from collector
3. L3 — ½ turn of AWG #16 wire 0.25 in. from and parallel to L2.
4. The noise source is a hot-cold body (AIL type 70 or equivalent) with a test receiver (AIL type 136 or equivalent).

2N4957, 2N4958, 2N4959 (continued)

COMMON EMITTER Y PARAMETER VARIATIONS

Y PARAMETERS VS FREQUENCY

V_{CE} = 10 Vdc

I_C = 2.0 mAdc

FIGURE 2 — INPUT ADMITTANCE

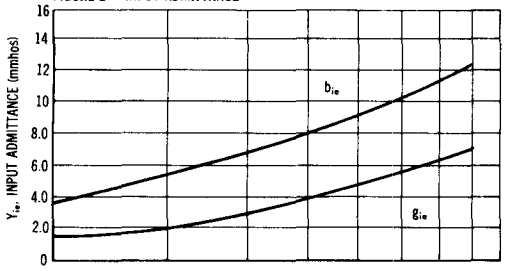


FIGURE 3 — FORWARD TRANSFER ADMITTANCE

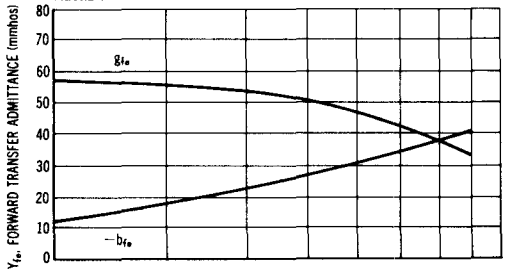


FIGURE 4 — OUTPUT ADMITTANCE

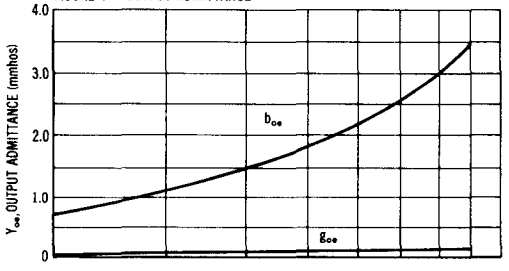
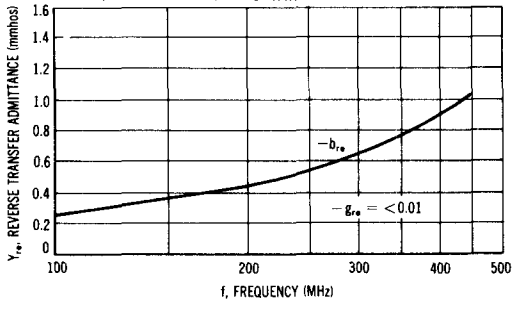


FIGURE 5 — REVERSE TRANSFER ADMITTANCE



Y PARAMETERS VS CURRENT

V_{CE} = 10 Vdc ——— V_{CE} = 15 Vdc — — —

f = 450 MHZ

FIGURE 6 — INPUT ADMITTANCE

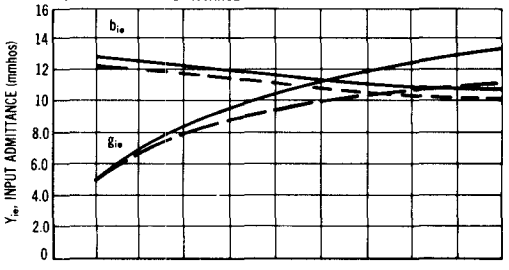


FIGURE 7 — FORWARD TRANSFER ADMITTANCE

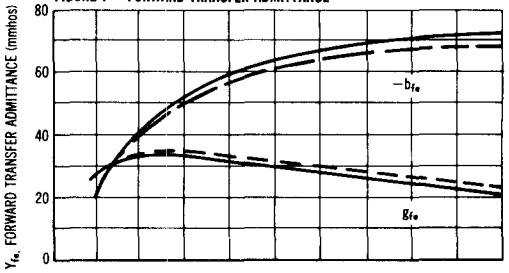


FIGURE 8 — OUTPUT ADMITTANCE

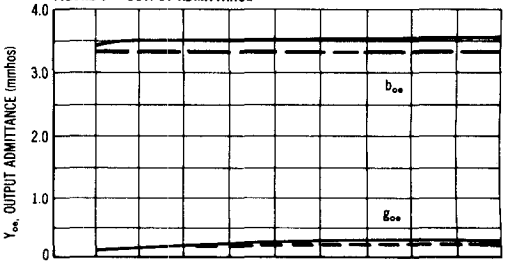
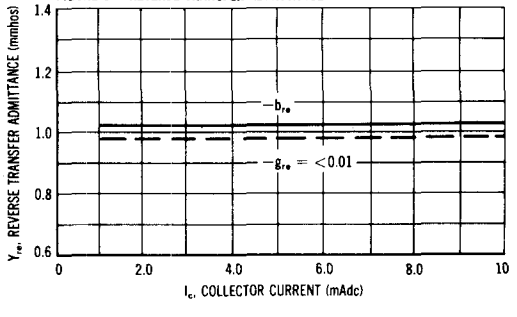


FIGURE 9 — REVERSE TRANSFER ADMITTANCE



2N4957, 2N4958, 2N4959 (continued)

COMMON BASE Y PARAMETER VARIATIONS

Y PARAMETERS versus FREQUENCY
V_{CB} = 10 Vdc
I_C = 2.0 mAdc

FIGURE 10 — INPUT ADMITTANCE

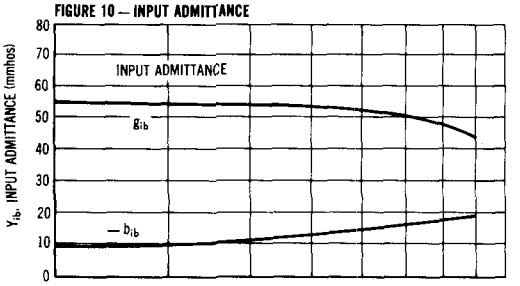


FIGURE 11 — FORWARD TRANSFER ADMITTANCE

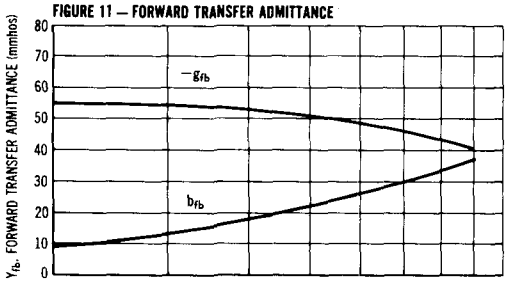


FIGURE 12 — OUTPUT ADMITTANCE

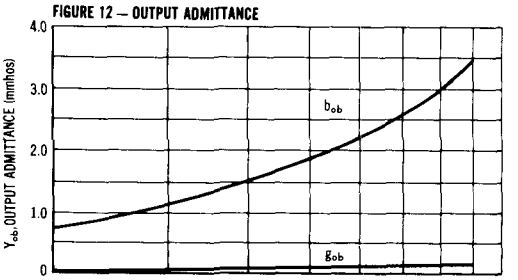
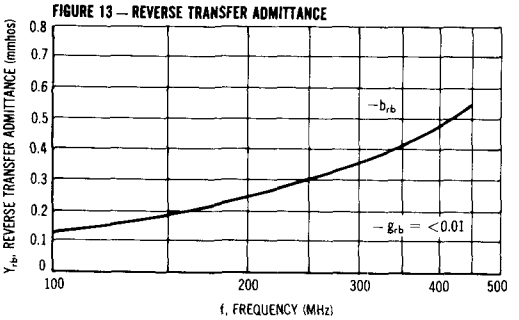


FIGURE 13 — REVERSE TRANSFER ADMITTANCE



Y PARAMETERS versus CURRENT
V_{CB} = 10 Vdc —— V_{CB} = 15 Vdc — — —
f = 450 MHZ

FIGURE 14 — INPUT ADMITTANCE

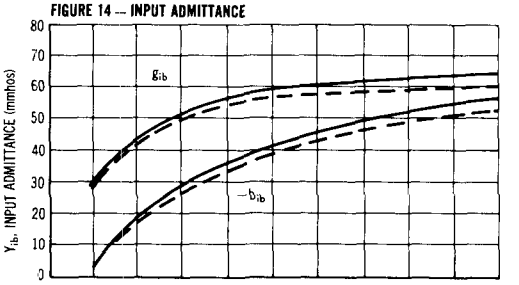


FIGURE 15 — FORWARD TRANSFER ADMITTANCE

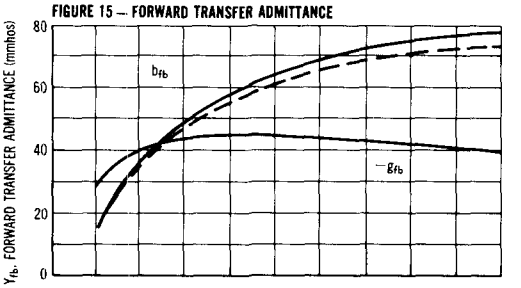


FIGURE 16 — OUTPUT ADMITTANCE

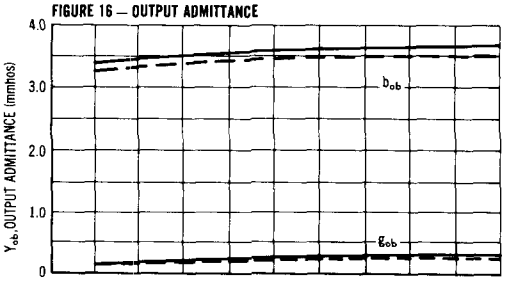


FIGURE 17 — REVERSE TRANSFER ADMITTANCE