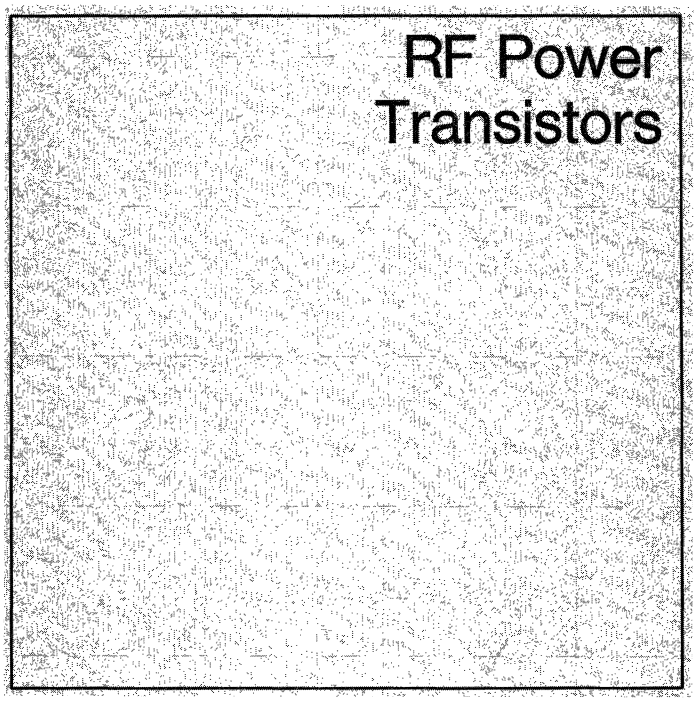
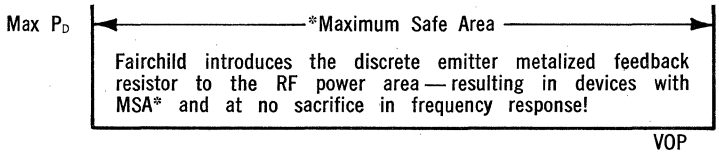

RF Power
Transistors

RF POWER TRANSISTOR OPERATIONAL ADVANTAGES



All Fairchild RF Power devices with ratings of 10 Watts and above have MSA thus eliminating the need for costly protective circuitry.

RF POWER DEVICE APPLICATION SPECTRUM SELECTION GUIDE

	Freq.	Voltage	Predriver	Driver	Output			
Application	**MHz**	**Volts**	**.1 → 1**	**3-5**	**5W**	**10W**	**25W**	**50W**
Military FM/SSB	2-76	12	2N4427	2N3553			2N5025	
Ham SSB	HF							
Lo Band Mobile FM	25-50							
RC Model Air-AM	72	28	2N3866			MSA 7505		
Overseas Mobile FM	66-68		2N3866	2N3553			2N5026	
Aircraft AM	108-152	12	2N4427		MSA 7505			
VHF Mobile FM	152-174	28	2N3866			MSA 7505		
Port. & Marine FM	152-174		2N3866	2N3375				
Sonobouy FM	175	28	2N3866	MSA 7505				MSA 7503
Military AM	225-400	28	2N3866	2N3375		MSA 7505		
Beacons AM CW	243							
Aero Glide	328-335							
Portable FM	450-470		2N3866	MSA 7505			MSA 7504	
CB FM	462-470							
Fuse Osc.	400-600	28	2N3866					

NPN SILICON PLANAR EPITAXIAL TRANSISTORS

RF Power
TBV0505XXX

Maximum Ratings

Maximum Junction Temperature	+200°C
Storage Temperature	−65°C to +200°C

Maximum Power Dissipation

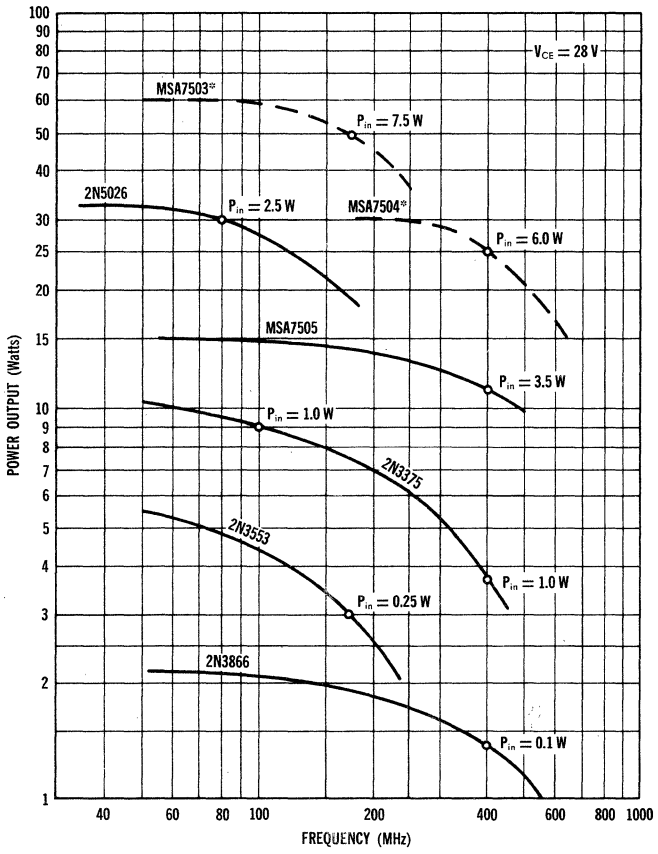
Total Dissipation, 25°C Case Temperature	23W*

Electrical Characteristics (25°C Free Air)

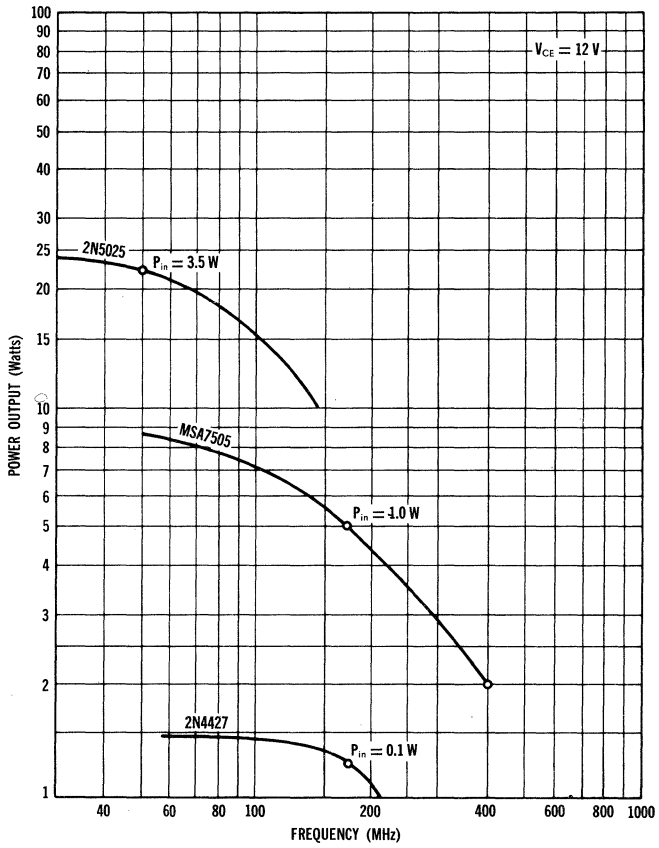
Parameter	Min	Max	Units	Test Conditions
LV_{CEO}	33		Volts	$I_C = 50mA$
BV_{CES}	65		Volts	$I_C = 1.0mA$
BV_{EBO}	4.0		Volts	$I_E = 1.0mA$
h_{FE}	10	150		$I_C = 250mA, V_{CE} = 5V$
$V_{BE(sat)}$		1.30	Volts	$I_C = 1.0A, I_B = 200mA$
h_{fe}	4.0			$I_C = 500mA, V_{CE} = 5V$ f = 100MHz
P_O	10.0		Watt	$V_{CC} = 28V, P_{in} = 1W$ f = 100MHz

*Derating factor of 7.5° C/W

RF POWER TRANSISTORS NUMERICAL INDEX



*To be announced



2N3375 • 2N3553

NPN LARGE SIGNAL UHF POWER AMPLIFIER

DIFFUSED SILICON PLANAR* EPITAXIAL TRANSISTORS

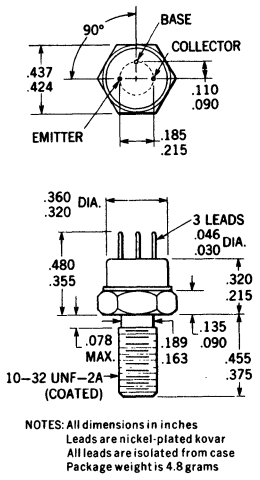
GENERAL DESCRIPTION—The 2N3375 and 2N3553 are NPN diffused silicon Planar* epitaxial transistors designed primarily for use in large signal VHF and UHF power amplifier output stages.

ABSOLUTE MAXIMUM RATINGS (Note 1)

		2N3375	2N3553
Maximum Temperatures			
Storage Temperature		−65°C to +200°C	
Operating Case Temperature		−65°C to +200°C	
Maximum Power Dissipation (Notes 2 and 3)		**2N3375**	**2N3553**
Total Dissipation at 25°C Case Temperature		11.6 Watts	7.0 Watts
Maximum Voltages and Current			
V_{CBO}	Collector to Base Voltage	65 Volts	65 Volts
V_{CEO}	Collector to Emitter Voltage	40 Volts	40 Volts
V_{EBO}	Emitter to Base Voltage	4.0 Volts	4.0 Volts
I_C	Collector Current	1.5 Amps	1.0 Amps

2N3375

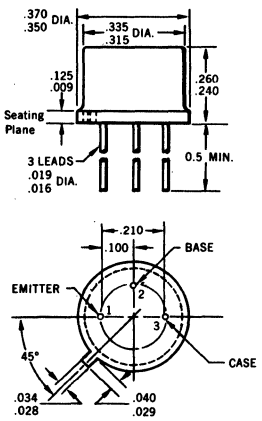
PHYSICAL DIMENSIONS
In accordance with JEDEC (TO-60)



NOTES: All dimensions in inches
Leads are nickel-plated kovar
All leads are isolated from case
Package weight is 4.8 grams

2N3553

PHYSICAL DIMENSIONS
in accordance with
JEDEC (TO-39) outline



NOTES: All dimensions in inches
Leads are gold-plated KOVAR
Lead No. 3 internally connected to case
Package weight is 1.23 grams

ELECTRICAL CHARACTERISTICS (25°C Case Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	2N3375 MIN.	2N3375 MAX.	2N3553 MIN.	2N3553 MAX.	UNITS	TEST CONDITIONS	
P_{out}	RF Power Output (f = 400 MHz, Fig. 1)	3.0				Watts	V_{CE} = 28 V	P_{IN} = 1.0 W
η	Collector Efficiency (f = 400 MHz, Fig. 1)	40				%	V_{CE} = 28 V	P_{IN} = 1.0 W
P_{out}	RF Power Output (f = 175 MHz, Fig. 2)			2.5		Watts	V_{CE} = 28 V	P_{IN} = 0.25 W
η	Collector Efficiency (f = 175 MHz, Fig. 2)			50		%	V_{CE} = 28 V	P_{IN} = 0.25 W
P_{out}	RF Power Output (f = 100 MHz, Fig. 2)	7.5				Watts	V_{CE} = 28 V	P_{IN} = 1.0 W
η	Collector Efficiency (f = 100 MHz, Fig. 2)	65				%	V_{CE} = 28 V	P_{IN} = 1.0 W
h_{FE}	DC Pulse Current Gain (Note 4)	10	100	10	100		I_C = 250 mA	V_{CE} = 5.0 V
h_{FE}	DC Pulse Current Gain (Note 4)		200		200		I_C = 125 mA	V_{CE} = 5.0 V
h_{fe}	High Frequency Current Gain (f = 100 MHz)	4.0		4.0			I_C = 125 mA	V_{CE} = 28 V

Additional Electrical Characteristics on page 2

*Planar is a patented Fairchild process.

NOTES:
(1) These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
(2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
(3) These ratings give a maximum junction temperature of 200°C and junction to case thermal resistance of 15°C/Watt (derating factor of 66 mW/°C) for the 2N3375 and 25°C/Watt (derating factor of 40 mW/°C) for the 2N3553.
(4) Pulse Conditions: length = 300 μs; duty cycle ≤ 2%.
(5) Pulsed through a 25 mH Inductor.

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313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

ELECTRICAL CHARACTERISTICS (25°C Case Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	2N3375 MIN.	2N3375 MAX.	2N3553 MIN.	2N3553 MAX.	UNITS	TEST CONDITIONS	
V_{CE}(sat)	Pulsed Collector Saturation Voltage (Note 4)		1.0		1.0	Volts	$I_C = 250$ mA	$I_B = 50$ mA
V_{CEO}(sust)	Collector to Emitter Sustaining Voltage (Note 5)	40		40		Volts	$I_C = 200$ mA	$I_B = 0$
V_{CER}(sust)	Collector to Emitter Sustaining Voltage (Note 5)	40		40		Volts	$I_C = 200$ mA	$R_{BE} = 100\ \Omega$
I_{CEO}	Collector Cutoff Current		0.1		0.1	mA	$V_{CE} = 30$ V	$I_B = 0$
I_{EBO}	Emitter Cutoff Current		0.1		0.1	mA	$V_{EB} = 4.0$ V	
I_{CEX}	Collector Cutoff Current		1.0		1.0	mA	$V_{CE} = 65$ V	$V_{BE} = -1.5$ V
I_{CEX}(+200°C)	Collector Cutoff Current		5.0		5.0	mA	$V_{CE} = 30$ V	$V_{BE} = -1.5$ V
C_{obo}	Common Base, Open Circuit Output Capacitance (f = 1.0 MHz)		10		10	pF	$V_{CB} = 30$ V	$I_E = 0$

FIGURE 1

RF AMPLIFIER CIRCUIT FOR 2N3375 – POWER-OUTPUT TEST

(400-MHz Operation)

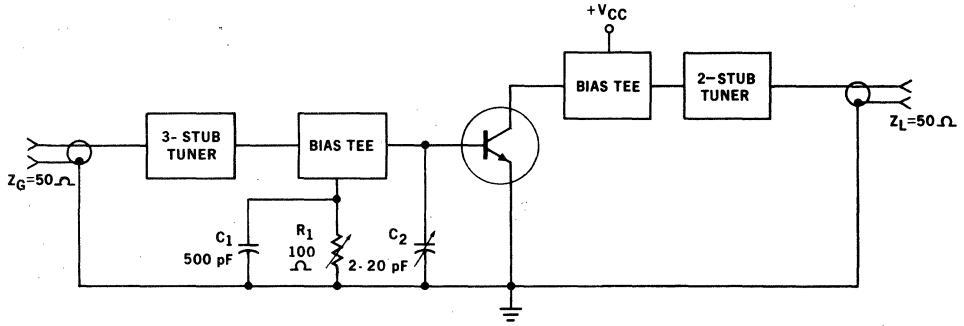
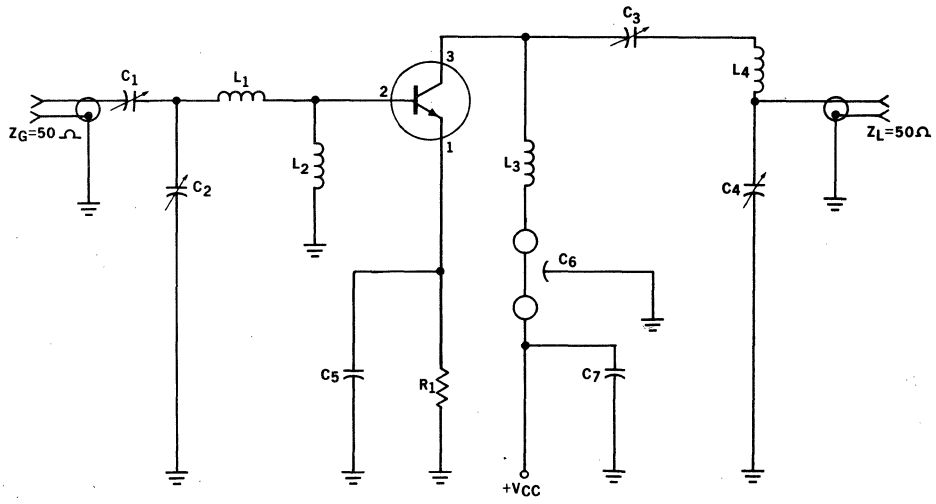


FIGURE 2

RF AMPLIFIER CIRCUIT FOR 2N3375 & 2N3553 – POWER-OUTPUT TEST

(100 & 175-MHz Operation)



For 2N3375 100-MHz Operation:

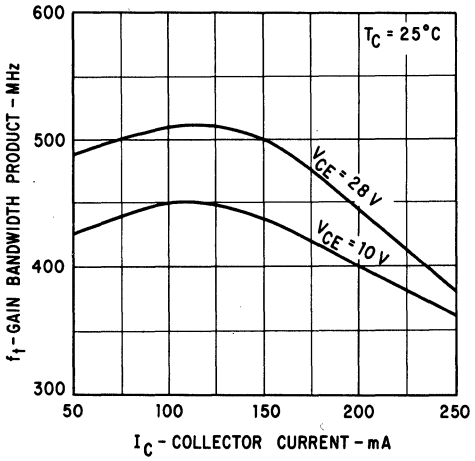
C_1,C_2: 7-100 pF
C_3,C_4: 4-40 pF
C_5: 330 pF, disc ceramic
C_6: 1500 pF
C_7: 0.005 μF, disc ceramic
L_1: 3 turns No. 16 wire, 1/4" ID, 5/16" long
L_2: Ferrite choke, Z = 750 (±20%) ohms
L_3: 2.4 μH choke
L_4: 5 turns No. 16 wire, 5/16" ID, 7/16" long
R_1: 1.35 ohms, non-inductive

For 2N3553 175-MHz Operation:

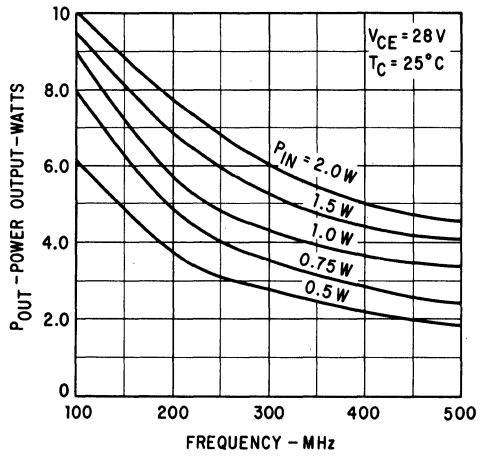
C_1, C_2, C_3, C_4: 3-35 pF
C_5: Not used
C_6: 1,000 pF
C_7: 0.005 μF, disc ceramic
L_1: 2 turns No. 16 wire, 3/16" ID, 1/4" long
L_2: Ferrite choke, Z = 450 ohms
L_3: 2 turns No. 16 wire, 1/4" ID, 1/4" long
L_4: 4 turns No. 16 wire, 3/8" ID, 3/8" long
R_1: Not used (emitter connected to ground)

TYPICAL PERFORMANCE CHARACTERISTICS
2N3375

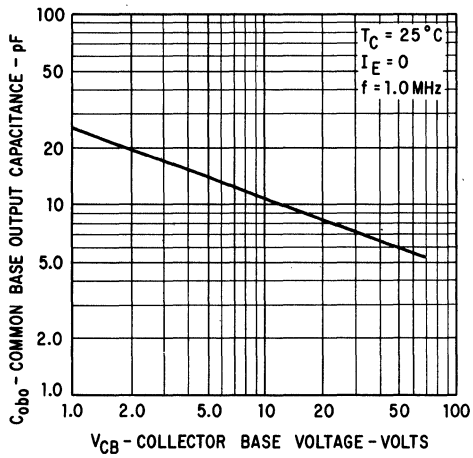
GAIN - BANDWIDTH PRODUCT VERSUS COLLECTOR CURRENT



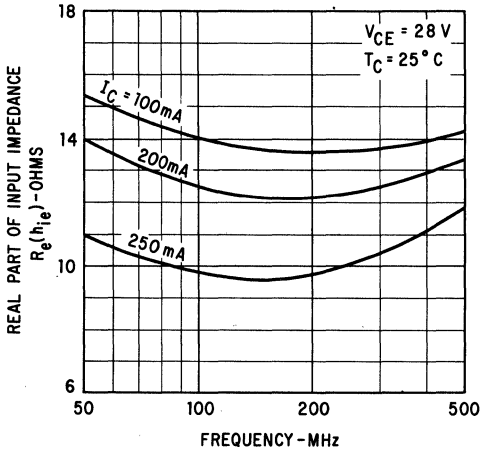
POWER OUTPUT VERSUS FREQUENCY



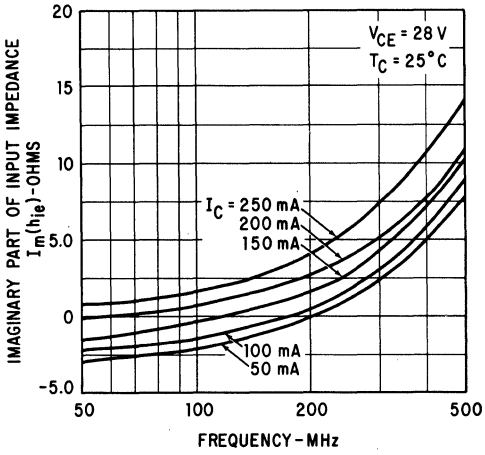
COMMON BASE OUTPUT CAPACITANCE VERSUS COLLECTOR BASE VOLTAGE



SERIES INPUT RESISTANCE VERSUS FREQUENCY

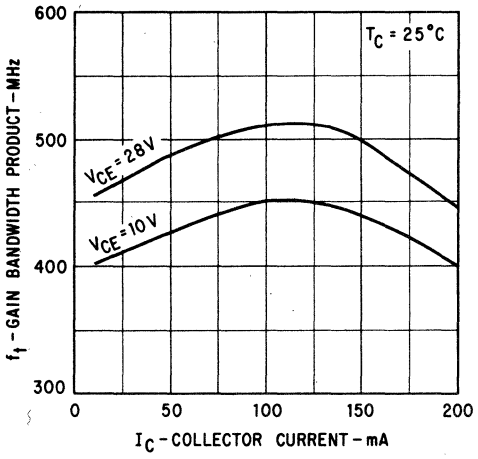


SERIES INPUT REACTANCE VERSUS FREQUENCY

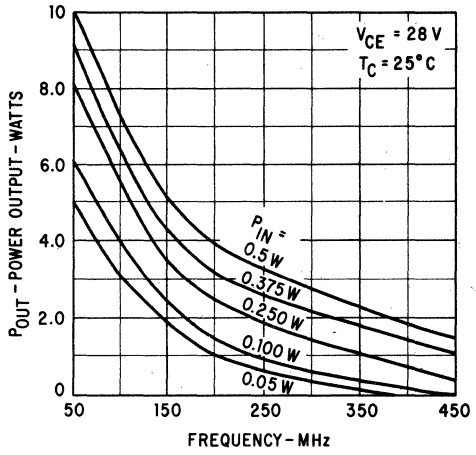


TYPICAL PERFORMANCE CHARACTERISTICS
2N3553

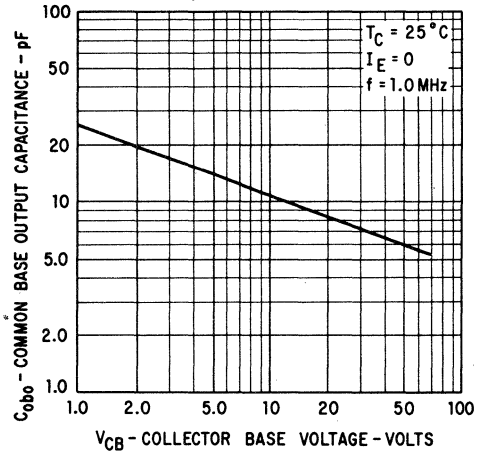
GAIN BANDWIDTH PRODUCT VERSUS COLLECTOR CURRENT



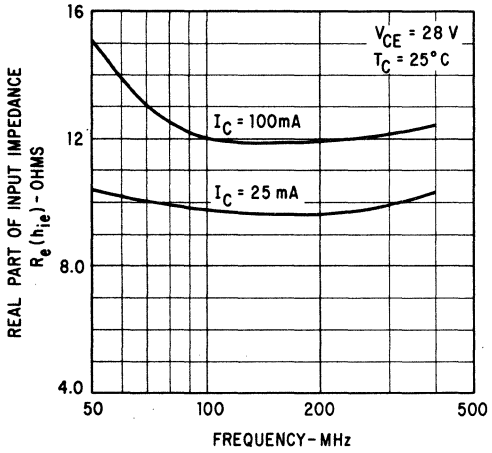
POWER OUTPUT VERSUS FREQUENCY



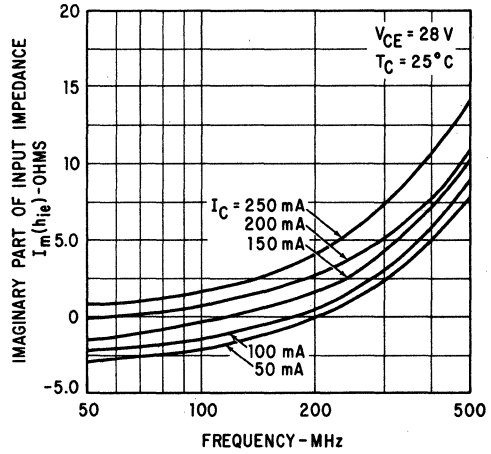
COMMON BASE OUTPUT CAPACITANCE VERSUS COLLECTOR BASE VOLTAGE



SERIES INPUT RESISTANCE VERSUS FREQUENCY



SERIES INPUT REACTANCE VERSUS FREQUENCY



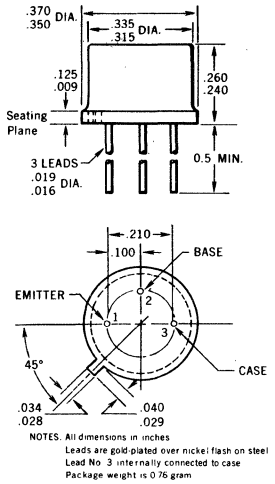
2N3866

NPN VHF-UHF OSCILLATOR, POWER AMPLIFIER

DIFFUSED SILICON PLANAR* EPITAXIAL TRANSISTOR

GENERAL DESCRIPTION — The 2N3866 is a NPN, silicon epitaxial planar transistor designed for class A, B, or C amplifier circuits and VHF-UHF oscillator applications.

PHYSICAL DIMENSIONS
in accordance with
JEDEC (TO-39) outline



NOTES. All dimensions in inches
Leads are gold-plated over nickel flash on steel
Lead No. 3 internally connected to case
Package weight is 0.76 gram

ABSOLUTE MAXIMUM RATINGS (Note 1)

Maximum Temperatures

Storage Temperature	−65°C to +200°C
Operating Junction Temperature	−65°C to +200°C

Maximum Power Dissipation (Notes 2 and 3)

Total Dissipation at 25°C Case Temperature	5.0 Watts

Maximum Voltages and Currents

V_{CEO}	Collector to Emitter Voltage (Note 4)	30 Volts
V_{EBO}	Emitter to Base Voltage	3.5 Volts
V_{CES}	Collector to Emitter Voltage	55 Volts

ELECTRICAL CHARACTERISTICS (25°C Case Temperature unless otherwise noted)

SYMBOL	CHARACTERISTICS	MIN.	MAX.	UNITS	TEST CONDITIONS	
P_{out}	RF Power Out (f = 400 MHz)	1.0		Watts	P_{in} = 100 mW	See Fig. 1
η	Collector Efficiency (f = 400 MHz)	45		%	P_{out} = 1.0 W	See Fig. 1
h_{fe}	High Frequency Current Gain (f = 200 MHz)	2.5			I_C = 50 mA	V_{CE} = 15 V
C_{ob}	Output Capacitance (f = 1.0 MHz)		3.0	pF	V_{CB} = 28 V	I_E = 0
h_{FE}	DC Pulse Current Gain (Note 5)	10	200		I_C = 50 mA	V_{CE} = 5.0 V
h_{FE}	DC Pulse Current Gain (Note 5)	5.0			I_C = 360 mA	V_{CE} = 5.0 V
$V_{CEO(sus)}$	Collector to Emitter Sustaining Voltage (Note 4)	30		Volts	I_C = 5.0 mA	I_B = 0
BV_{CES}	Collector to Emitter Breakdown Voltage	55			I_C = 5.0 mA	V_{BE} = 0
$V_{CE(sat)}$	Collector Saturation Voltage (Note 5)		1.0	Volts	I_C = 100 mA	I_B = 20 mA
I_{CEO}	Collector Cutoff Current		20	μA	V_{CE} = 28 V	I_B = 0

*Planar is a patented Fairchild process.

NOTES:

(1) These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
(2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.
(3) These ratings give a maximum junction temperature of 200°C and junction to case thermal resistance of 35°C/Watt (derating factor of 28.5 mW/°C).
(4) This rating refers to a high current point where collector to emitter voltage is lowest.
(5) Pulse Conditions: length = 300 μs; duty cycle = 1%.

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RF PERFORMANCE

RF POWER OUTPUT VERSUS FREQUENCY

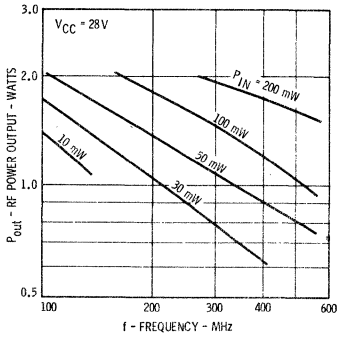
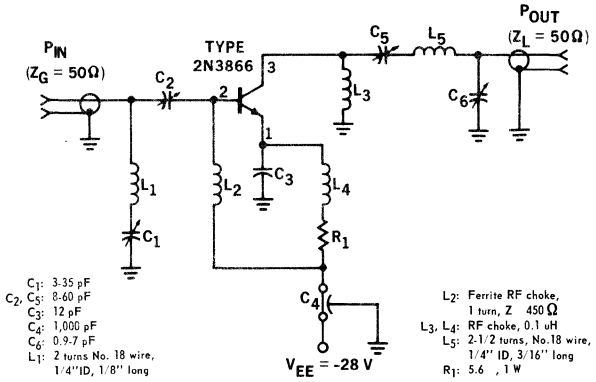
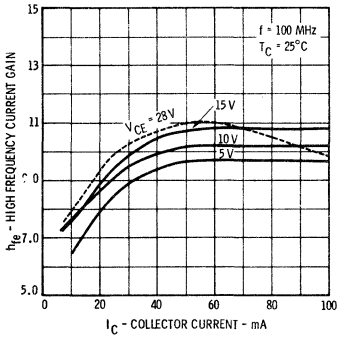


FIG. 1

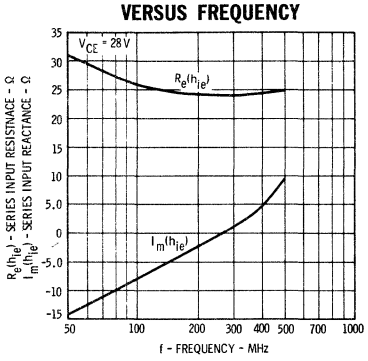
RF AMPLIFIER CIRCUIT FOR POWER-OUTPUT TEST (400 MHz/s Operation)



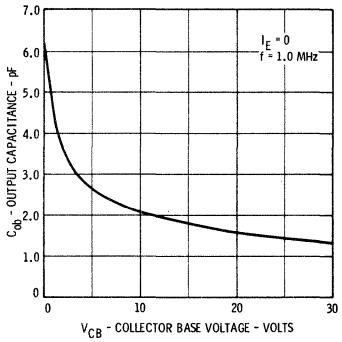
HIGH FREQUENCY CURRENT GAIN VERSUS COLLECTOR CURRENT



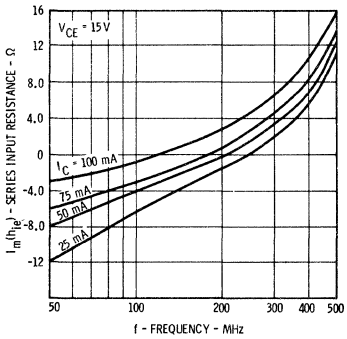
SERIES INPUT RESISTANCE AND REACTANCE VERSUS FREQUENCY



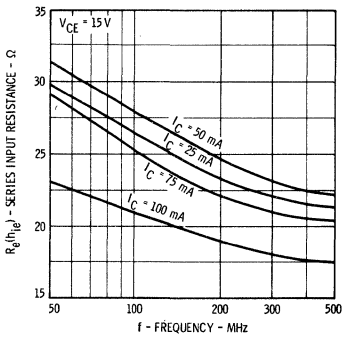
OUTPUT CAPACITANCE VERSUS COLLECTOR BASE VOLTAGE



SERIES INPUT REACTANCE VERSUS FREQUENCY



SERIES INPUT RESISTANCE VERSUS FREQUENCY



2N5025 · 2N5026

NPN VHF POWER TRANSISTORS

DIFFUSED SILICON PLANAR* EPITAXIAL TRANSISTORS

- **HIGH RF POWER GUARANTEE - - 13.5 V operation: 20 W @ 50 MHz, Pin = 3.5 W**
  (Unneutralized, Class C) - - 28 V operation: 25 W @ 80 MHz, Pin = 2.5 W
- **HIGH LV_{CEO} AND BV_{CES} - - 13.5 V operation: 40 V and 75 V**
  - - 28 V operation: 50 V and 90 V
- **DISCRETE EMITTER GEOMETRY WITH INTEGRATED FEEDBACK RESISTORS**

ABSOLUTE MAXIMUM RATINGS [Note 1]

Maximum Temperatures

Storage Temperature	− 65°C to + 200°C
Operating Junction Temperature	+ 200°C
Lead Temperature (soldering, 60 second time limit)	+ 300°C

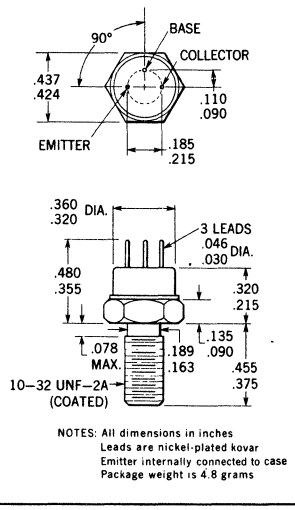
Maximum Power Dissipation

Total Dissipation at 25°C Case Temperature (See Maximum Permissible DC Power Dissipation Curve and Note 5)	45 Watts

Maximum Voltages and Current

		2N5025	2N5026
V_{CEO}	Collector to Emitter Voltage [Note 4]	40 Volts	50 Volts
V_{CES}	Collector to Emitter Voltage	75 Volts	90 Volts
V_{EBO}	Emitter to Base Voltage	4.5 Volts	4.5 Volts
V_{CER}	Collector to Emitter Voltage	40 Volts	50 Volts
I_C	Collector Current	7.5 Amps	7.5 Amps

PHYSICAL DIMENSIONS
In accordance with JEDEC (TO-60)



NOTES: All dimensions in inches
Leads are nickel-plated kovar
Emitter internally connected to case
Package weight is 4.8 grams

ELECTRICAL CHARACTERISTICS (25°C Case Temperature unless otherwise noted)

SYMBOL	CHARACTERISTIC	2N5025 MIN.	2N5025 TYP.	2N5025 MAX.	2N5026 MIN.	2N5026 TYP.	2N5026 MAX.	UNITS	TEST CONDITIONS	
P_{out}	**Power Output (f = 50 MHz)**	**20**	**22**					**Watts**	**P_{in} = 3.5 W**	**V_{CC} = 13.5 V**
P_{out}	**Power Output (f = 80 MHz)**				**25**	**30**		**Watts**	**P_{in} = 2.5 W**	**V_{CC} = 28 V**
η	Collector Efficiency (f = 50 MHz)	65						%	P_{out} = 20 W	V_{CC} = 13.5 V
η	Collector Efficiency (f = 80 MHz)				65			%	P_{out} = 25 W	V_{CC} = 28 V
h_{fe}	High Frequency Current Gain (f = 50 MHz)	3.0	4.0		3.0	4.0			I_C = 1.0 A	V_{CB} = 2.0 V
C_{obo}	Collector Base Capacitance (f = 1.0 MHz)		54	85				pF	V_{CB} = 13.5 V	I_E = 0
C_{obo}	Collector Base Capacitance (f = 1.0 MHz)					43	60	pF	V_{CB} = 28 V	I_E = 0
BV_{CES}	**Collector to Emitter Breakdown Voltage**	**75**			**90**			**Volts**	**I_C = 5.0 mA**	**V_{BE} = 0**
V_{CEO}(sust)	**Collector to Emitter Sustaining Voltage** [Notes 2 and 4]	**40**	**65**		**50**	**75**		**Volts**	**I_C = 200 mA**	**I_B = 0**
BV_{CER}	**Collector to Emitter Breakdown Voltage** [Note 4]	**40**			50			Volts	I_C = 200 mA	R_{BE} = 10 Ω
BV_{EBO}	Emitter to Base Breakdown Voltage	4.5			4.5			Volts	I_E = 1.0 mA	I_C = 0
h_{FE}	DC Pulse Current Gain [Note 3]	20	40		20	40			I_C = 2.0 A	V_{CE} = 2.0 V
V_{CE}(sat)	Pulsed Collector Saturation Voltage [Note 3]			1.0			1.0	Volts	I_C = 2.0 A	I_B = 0.2 A
V_{BE}(sat)	Pulsed Base Saturation Voltage [Note 3]			1.5			1.5	Volts	I_C = 2.0 A	I_B = 0.2 A
I_{CES}	Collector Cutoff Current			10				μA	V_{CE} = 50 V	V_{BE} = 0
I_{CES}	Collector Cutoff Current						10	μA	V_{CE} = 60 V	V_{BE} = 0
I_{CES} (150°C)	Collector Cutoff Current			1.0				mA	V_{CE} = 50 V	V_{BE} = 0
I_{CES} (150°C)	Collector Cutoff Current						1.0	mA	V_{CE} = 60 V	V_{BE} = 0

(See notes on back page)

*Planar is a patented Fairchild process.

FAIRCHILD SEMICONDUCTOR
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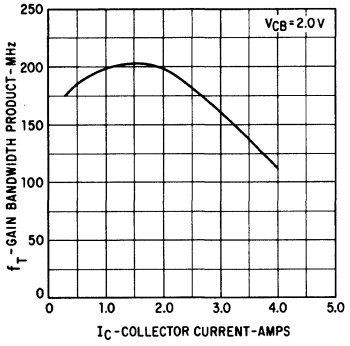
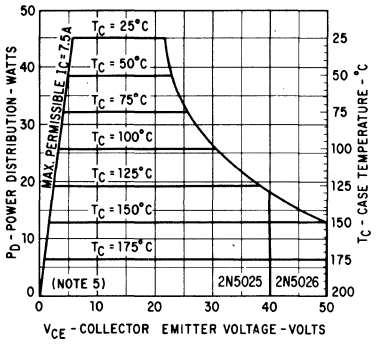
FAIRCHILD TRANSISTORS 2N5025 • 2N5026

TYPICAL ELECTRICAL CHARACTERISTICS

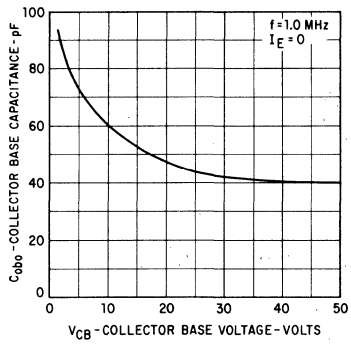
GAIN BANDWIDTH PRODUCT VERSUS COLLECTOR CURRENT



MAXIMUM PERMISSIBLE DC FORWARD BIASED POWER DISSIPATION

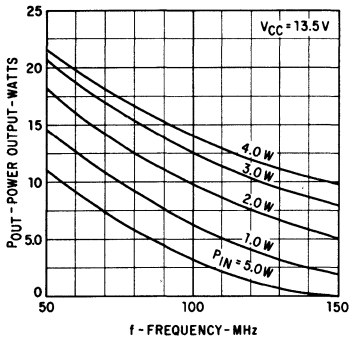


COLLECTOR BASE CAPACITANCE VERSUS COLLECTOR BASE VOLTAGE

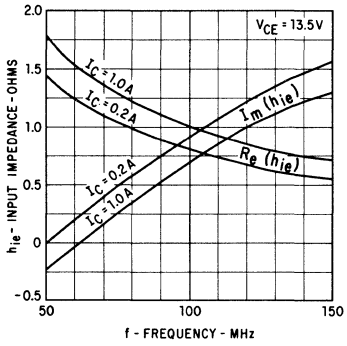


2N5025

POWER OUTPUT VERSUS FREQUENCY

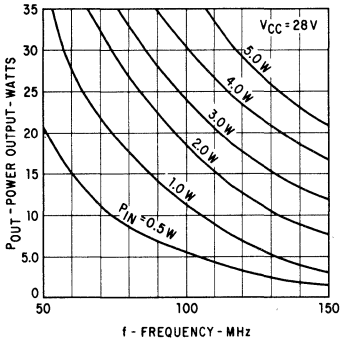


INPUT IMPEDANCE VERSUS FREQUENCY

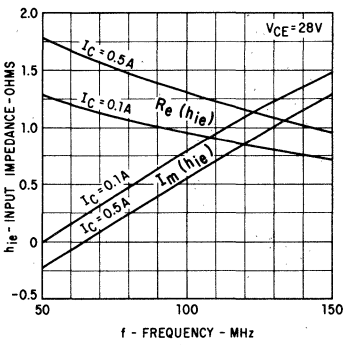


2N5026

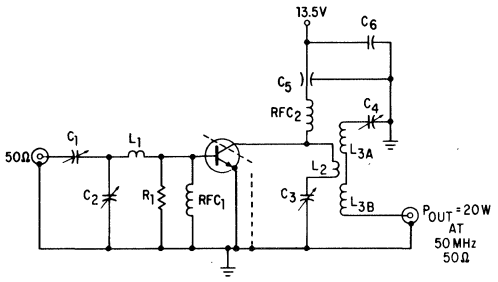
POWER OUTPUT VERSUS FREQUENCY



INPUT IMPEDANCE VERSUS FREQUENCY



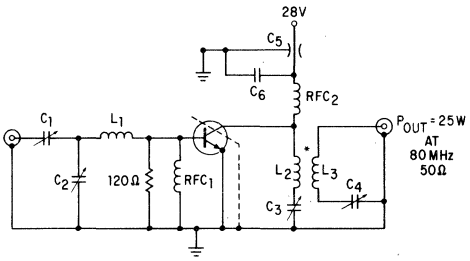
50 MHz AMPLIFIER TEST CIRCUIT



C_1 = 9 - 180 pF (ARCO #463 or Equivalent)
C_2 = 50 - 380 pF (ARCO #465 or Equivalent)
C_3 = 50 - 380 pF (ARCO #465 or Equivalent)
C_4 = 4 - 40 pF (ARCO #403 or Equivalent)
C_5 = 1000 pF Feed - thru
C_6 = 1.0 μF, 50 WVDC
L_1 = 2t., 1/8" dia. copper tubing, 1/2" I.D., 3/8" long, 0.10 μH, Qu > 200
L_2 = 2t., 1/8" dia. copper tubing, 3/4" I.D., 7/16" long, 0.13 μH, Qu > 200
L_{3A} = 4t., 1/8" dia. copper tubing, 3/4" I.D., 3/4" long
L_{3B} = 6t., 1/8" dia. copper tubing, 3/4" I.D., 1" long
} 1.0 μH, Qu > 200
R_1 = 120 Ω non-inductive
RFC_1 = 7 μH (Ohmite Z - 50 or Equivalent)
RFC_2 = 11t., #22 enameled wire, close-wound, 1/4" I.D., 0.3 μH

Note: L_{3A} & L_{3B} are wound continuously with 1/2" space between sections to admit L_2. kHz< K ≈ 0.2.

80 MHz AMPLIFIER TEST CIRCUIT



C_1 = 16 - 150 pF (ARCO #424 or equivalent)
C_2 = 24 - 200 pF (ARCO #425 or equivalent)
C_3 = 4 - 40 pF (ARCO #422 or equivalent)
C_4 = 2 - 25 pF (ARCO #421 or equivalent)
C_5 = 1000 μF, Feed - thru
C_6 = 1.0 μF, 50 WVDC
L_1 = 1t., 1/8" dia. copper tubing, 3/8" I.D., 3/8" long, 0.01 μH, Qu > 200
L_2 = 3t., 1/8" dia. copper tubing, 3/4" I.D., 5/8" long, 0.2 μH, Qu > 200
L_3 = 6t., 1/8" dia. copper tubing, 3/4" I.D., 1 1/16" long, 0.6 μH, Qu > 200
RFC_1 = 7.0 μH (Ohmite Z-50 or equivalent)
RFC_2 = 11t., #20 Nylclad copper wire, close wound, 1/4" I.D., 0.3 μH

Note: Spacing between L_2 and L_3 is 1 turn. kHz< K ≈ 0.2

NOTES:

(1) These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.
(2) Ratings refer to a high-current point where collector to emitter voltage is lowest. For more information send for Fairchild Publication APP-4/2.
(3) Pulse conditions: length = 300 μs; duty cycle = 1%.
(4) Pulsed thru a 25MH inductor.
(5) Contact factory for maximum permissible power under pulsed or reverse biased operating conditions.

MSA7505 • MSA8505

NPN VHF•UHF POWER TRANSISTORS

DIFFUSED SILICON PLANAR* EPITAXIAL TRANSISTORS

GENERAL DESCRIPTION — These devices are designed for use as RF Power Amplifiers with the maximum available safe operating area, thus making them ideal as drivers or output transistors for class A, B or C amplifier applications. These devices utilize Fairchild's unique discrete emitter thin film stabilizing resistors.

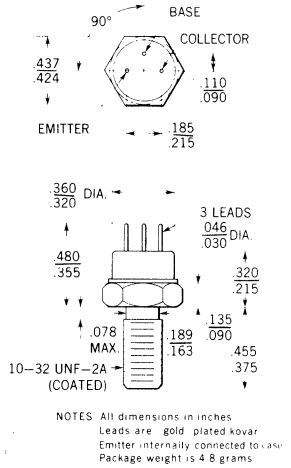
FEATURES

- **HIGH POWER STABILITY THROUGH DISCRETE EMITTER THIN FILM RESISTORS**
- **MAXIMUM SAFE OPERATING AREA — NO SECOND BREAKDOWN TO 30 VOLTS**
- **IMPROVED HIGH FREQUENCY PERFORMANCE IN A LOW INDUCTANCE STRIPLINE PACKAGE (MSA8505)**

ABSOLUTE MAXIMUM RATINGS (Note 1)

	MSA7505	MSA8505
Maximum Temperatures		
Storage Temperature	−65°C to +200°C	−65°C to +200°C
Operating Junction Temperature	200°C	200°C
Lead Temperature (Soldering, 10 seconds time limit)		
≥ 1/32" from Ceramic Disk	230°C	
≥ 1/4" from Encapsulated Area		270°C
Maximum Power Dissipation (Notes 2 and 3)		
Total Power Dissipation at 25°C Case Temperature	25 W	21 W
Maximum Voltages and Current		
V_{CE} Collector to Emitter Voltage		65 Volts
V_{CER} Collector to Emitter Voltage (Note 4)		55 Volts
V_{CEO} Collector to Emitter Voltage		33 Volts
V_{EBO} Emitter to Base Voltage		4.0 Volts
I_C Collector Current		3.0 A

PHYSICAL DIMENSIONS
in accordance with JEDEC (TO-60)



NOTES: All dimensions in inches
Leads are gold plated kovar
Emitter internally connected to case
Package weight is 4.8 grams

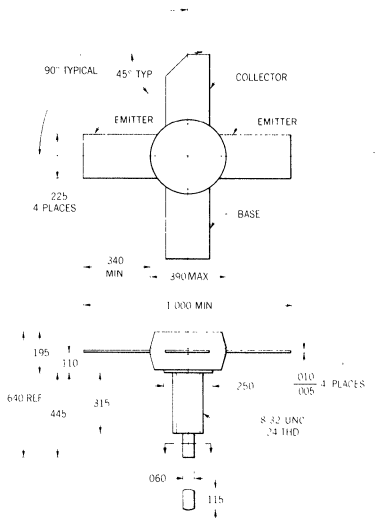
MSA7505

ELECTRICAL CHARACTERISTICS (25°C Case Temperature unless otherwise noted)

SYMBOL	CHARACTERISTIC	MSA7505 MIN.	MSA7505 TYP.	MSA7505 MAX.	MSA8505 MIN.	MSA8505 TYP.	MSA8505 MAX.	UNITS	TEST CONDITIONS
P_{OUT}	Power Output (f = 400 MHz)				10			Watts	P_{IN} = 2.75 W V_{CC} = 28 V
P_{OUT}	Power Output (f = 400 MHz)	10						Watts	P_{IN} = 3.5 W V_{CC} = 28 V
η	Collector Efficiency (f = 400 MHz)	60			60			%	P_{OUT} = 10 W V_{CC} = 28 V
h_{fe}	High Frequency Current Gain (f = 100 MHz)	2.5	4.35		2.5	4.35			I_C = 0.5 A V_{CE} = 3.0 V
C_{ob}	Collector to Base Capacitance (f = 1.0 MHz)			20			20	pF	I_C = 0 V_{CB} = 28 V
$V_{CES(BR)}$	Collector to Emitter Breakdown Voltage	65			65			Volts	I_C = 5.0 mA V_{BE} = 0
$V_{CER(BR)}$	Collector to Emitter Breakdown Voltage (Note 4)	55			55			Volts	I_C = 200 mA R_{BE} = 10 Ω
$V_{CEO(sus)}$	Collector to Emitter Sustaining Voltage	33	45		33	45		Volts	I_C = 50 mA I_B = 0
$V_{EBO(BR)}$	Emitter to Base Breakdown Voltage	4.0			4.0			Volts	I_E = 1.0 mA I_C = 0
h_{FE}	DC Pulse Current Gain (Note 5)	10			10				I_C = 1.0 A V_{CE} = 5.0 V
I_{CES}	Collector Cutoff Current			5.0			5.0	mA	V_{CE} = 65 V V_{BE} = 0 V
I_{CES}(150°C)	Collector Cutoff Current			5.0			5.0	mA	V_{CE} = 30 V V_{BE} = 0 V

See Notes on Page 2

PHYSICAL DIMENSIONS



Note: All dimensions in inches

MSA8505

*Planar is a patented Fairchild process.

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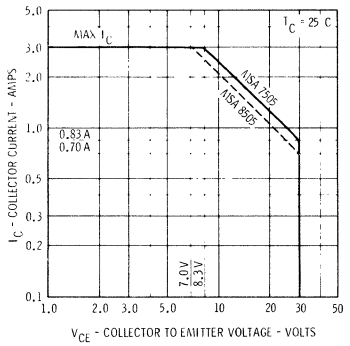
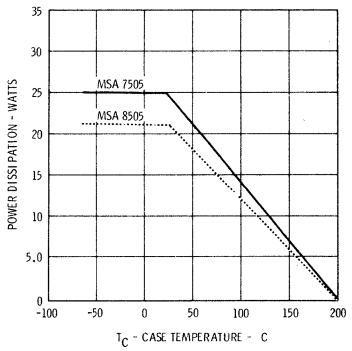
SAFE OPERATING AREA

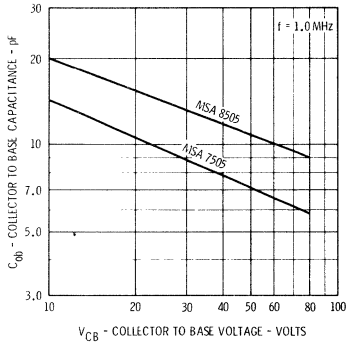
DC SAFE OPERATING AREA CURVE



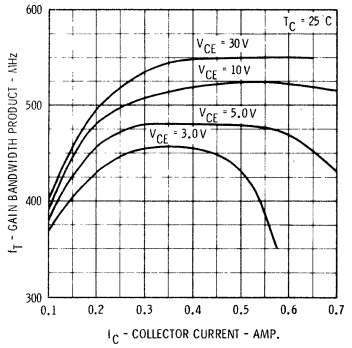
POWER DISSIPATION DERATING CURVE



COLLECTOR TO BASE CAPACITANCE VERSUS COLLECTOR TO BASE VOLTAGE



GAIN BANDWIDTH PRODUCT VERSUS COLLECTOR CURRENT



NOTES:

(1) These ratings are limiting values above which the servicability of any individual semiconductor device may be impaired.

(2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

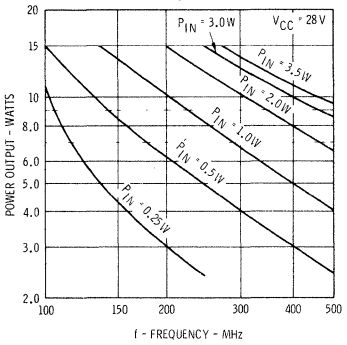
(3) These ratings give a maximum junction temperature of 200°C and junction to case thermal resistance of 7.0°C/Watt for MSA7505 and 8.34°C/Watt for MSA8505.

(4) Pulsed through a 25 mH inductor.

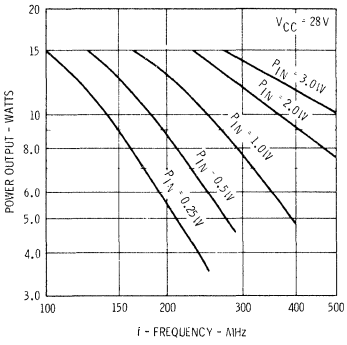
(5) Pulse Conditions: length = 300 μs; duty cycle $\leq$ 2%.

TYPICAL POWER OUTPUT VERSUS FREQUENCY AND VOLTAGE

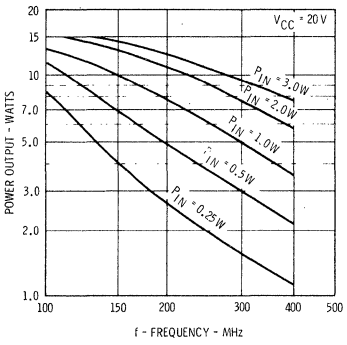
MSA7505
POWER OUTPUT VERSUS FREQUENCY



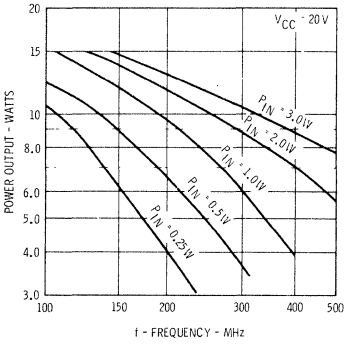
MSA8505
POWER OUTPUT VERSUS FREQUENCY



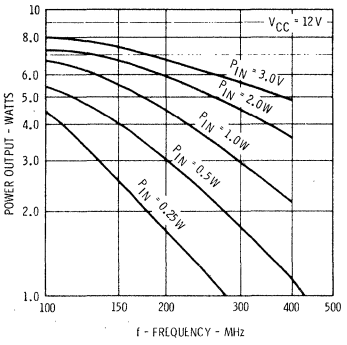
MSA7505
POWER OUTPUT VERSUS FREQUENCY



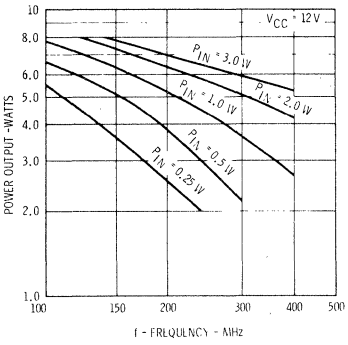
MSA8505
POWER OUTPUT VERSUS FREQUENCY



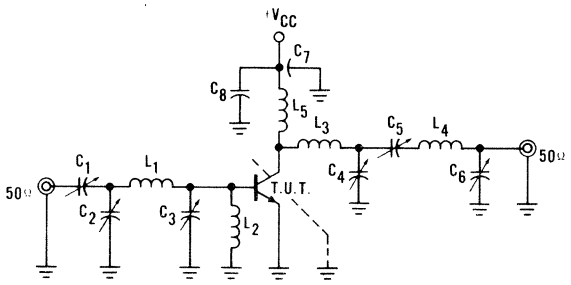
MSA7505
POWER OUTPUT VERSUS FREQUENCY



MSA8505
POWER OUTPUT VERSUS FREQUENCY

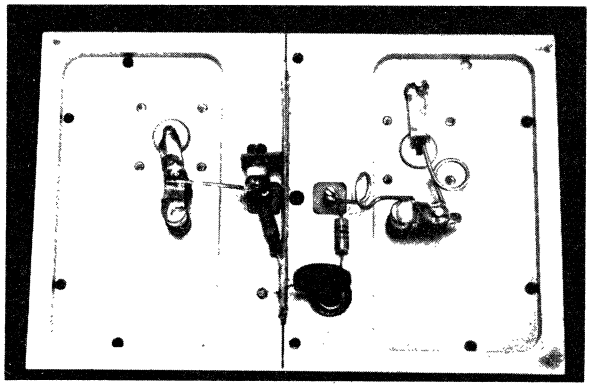


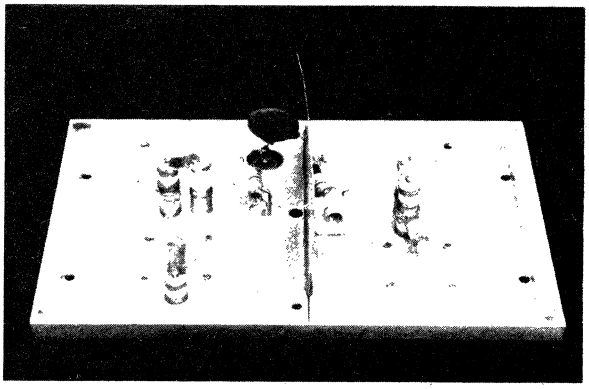
400 MHz RF TEST AMPLIFIER



C_1, C_3, C_5, C_6: 1-10 pF
C_2, C_4: 1-20 pF
C_7: 1000 pF
C_8: 0.1 μF disk

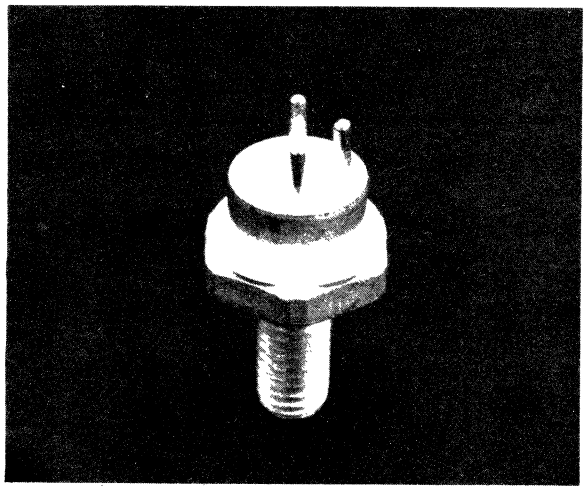
L_1: 1", #16, TC
L_2: .15 μH RFC with ferrite bead
L_3, L_4: IT, 5/16" d, #16, TC
L_5: .15 μH RFC





PACKAGE PICTURES

MSA7505



MSA8505