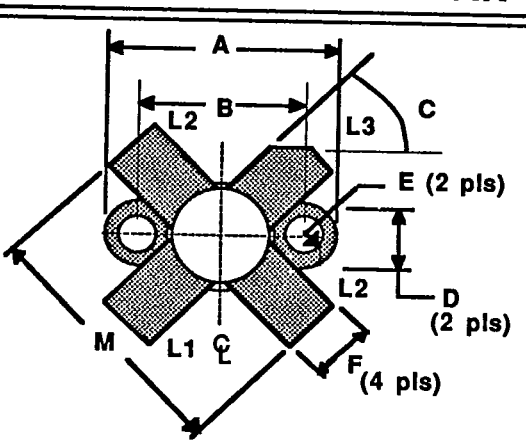
S175-50
175 WATTS - 50 VOLTS
2-30 MHz
HF LINEAR BIPOLAR

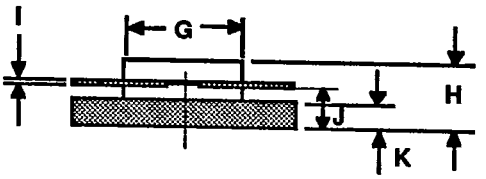
GENERAL DESCRIPTION

The S175-50 is a state-of-the-art 50 volt device designed for class A, AB, or C operation in the HF/VHF frequency bands. Its high collector voltage simplifies the design of wideband, SSB, linear amplifiers.

ABSOLUTE MAXIMUM RATINGS

Total Power Dissipation @ 25 C Case Temperature (Note 1)	270 W
Maximum Voltage and Current	
BVces Collector to Emitter Voltage	110 V
BVebo Emitter to Base Voltage	4.0V
Ic Collector Current	20 A
Maximum Temperatures	
Storage Temperature	-65 to +150°C
Operating JunctionTemperature	+200°C

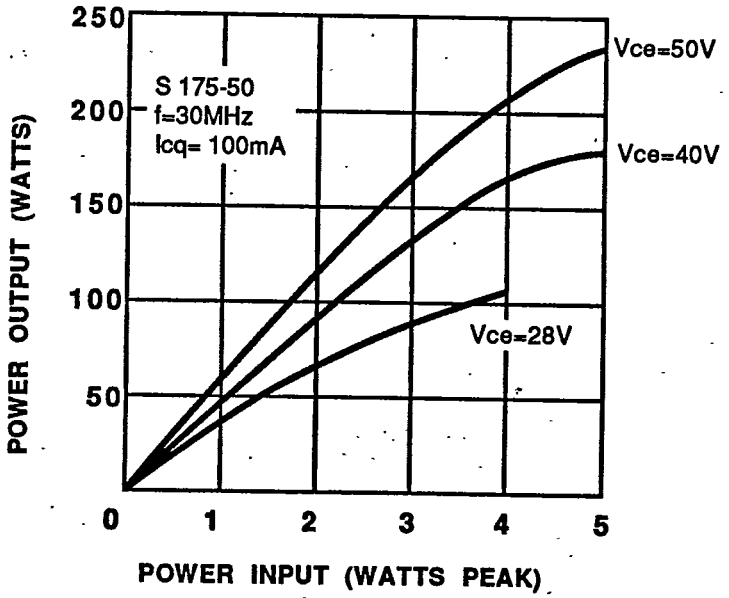




L1 : B
L2 : E
L3 : C

DIM	Millimeter	TOL	Inches	TOL
A	24.76	.13	.975	.005
B	18.42	.13	.725	.005
C	45°	5°	45°	5°
D	6.35	.13	.250	.005
E	3.17 DIA	.13	.125 DIA	.005
F	5.71	.13	.225	.005
G	12.70 DIA	.13	.500 DIA	.005
H	6.65	REF	.262	REF
I	0.13	.02	.005	.001
J	4.24	.13	.167	.005
K	3.17	.13	.125	.005
M	28.90	.25	1.140	.010

POWER OUTPUT VS POWER INPUT



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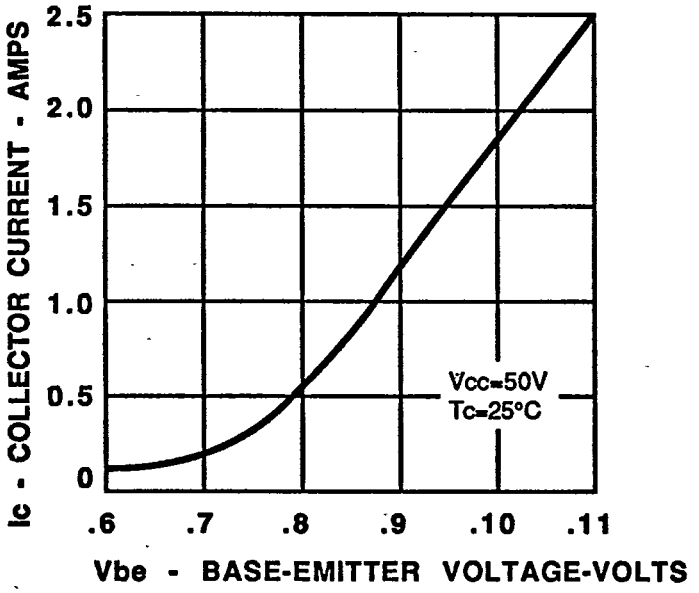
S175-50-2

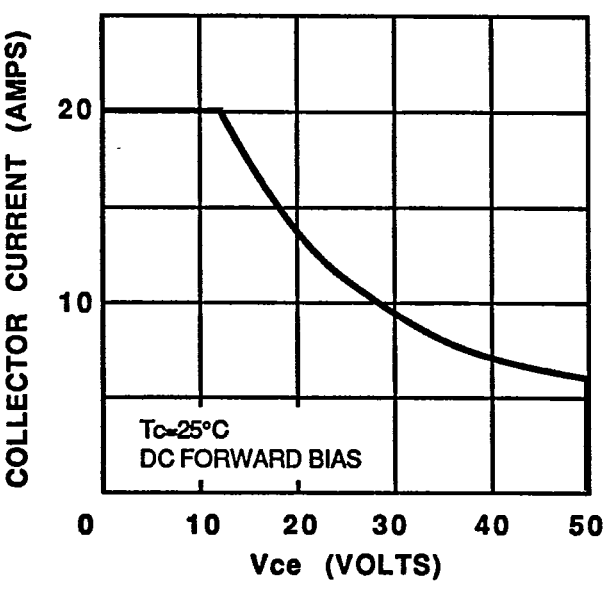
ELECTRICAL CHARACTERISTICS

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Pout	Power Output	f= 30 MHZ, Vcc= 50 V	175			Watts
Pin	Power Input	At Rated Power Out			3.5	Watts
Pg	Power Gain	At Rated Power Out	17			dB
BVebo	Voltage - Emitter to Base	Ie= 10 mA	4			Volts
BVces	Voltage - Collector to Emitter	Ic= 100 mA	110			Volts
BVceo	Voltage - Collector to Emitter	Ic= 100mA	53			Volts
η_c	Collector Efficiency	At Rated Power Out		65		%
Cob	Capacitance-Collector to Base	Vcb= 50 V, Ie= 0		180		pF
Zin	Series Input Impedance	At Rated Power Out and Frequency		0.6-j0.4		OHMS
Zl	Series Load Impedance	At Rated Power Out and Frequency		4.6+j2.1		OHMS
VSWR	Load Mismatch Tolerance	At Rated Power Out			∞:1	
h_{FE}	DC - Current Gain	Vce= 5V, Ic=2A	10			

COLLECTOR CURRENT VS BASE EMITTER VOLTAGE (TYPICAL)



DC SAFE OPERATING AREA (TYPICAL)



SPECIFICATIONS MAY BE SUBJECT TO CHANGE WITHOUT NOTICE

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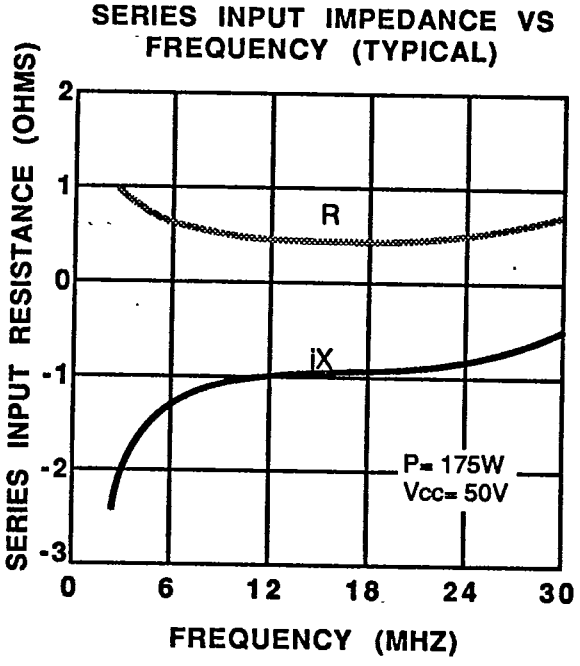
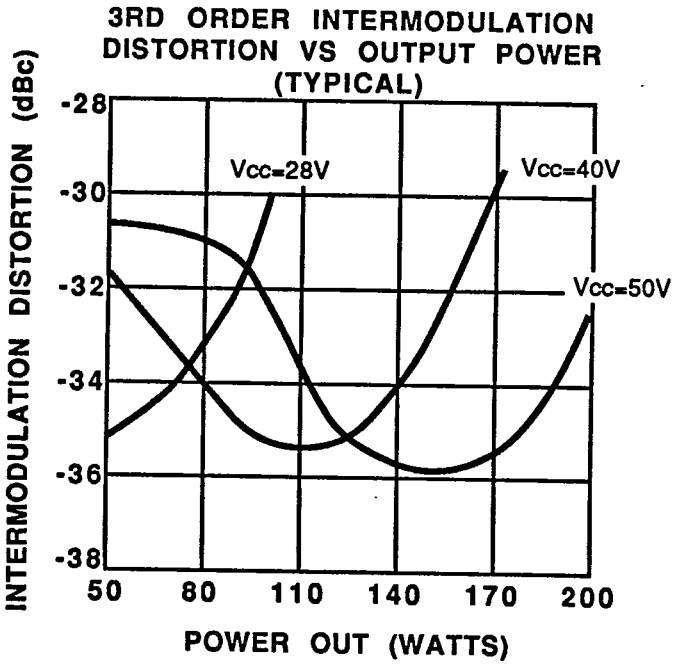
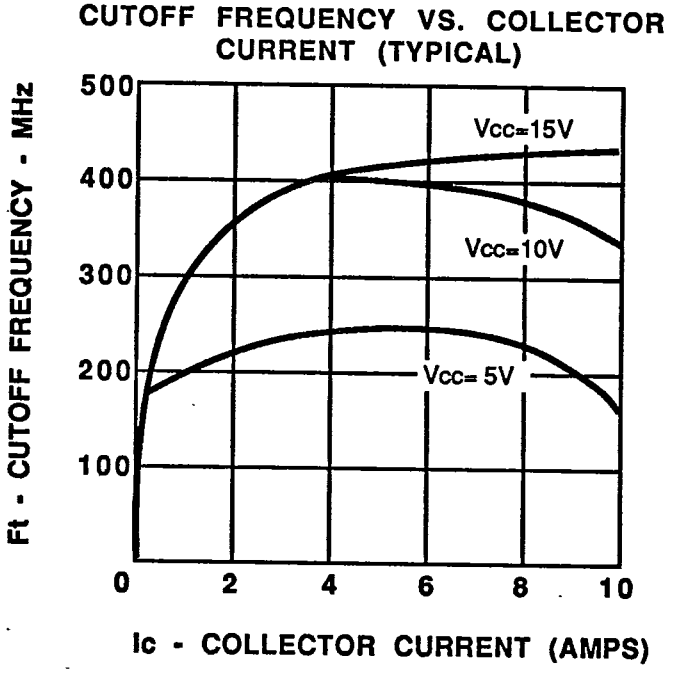

SERIES INPUT IMPEDANCE VS FREQUENCY (TYPICAL)
SERIES INPUT RESISTANCE (OHMS)
2
1
0
-1
-2
-3
R
iX
P= 175W
Vcc= 50V
0
6
12
18
24
30
FREQUENCY (MHZ)

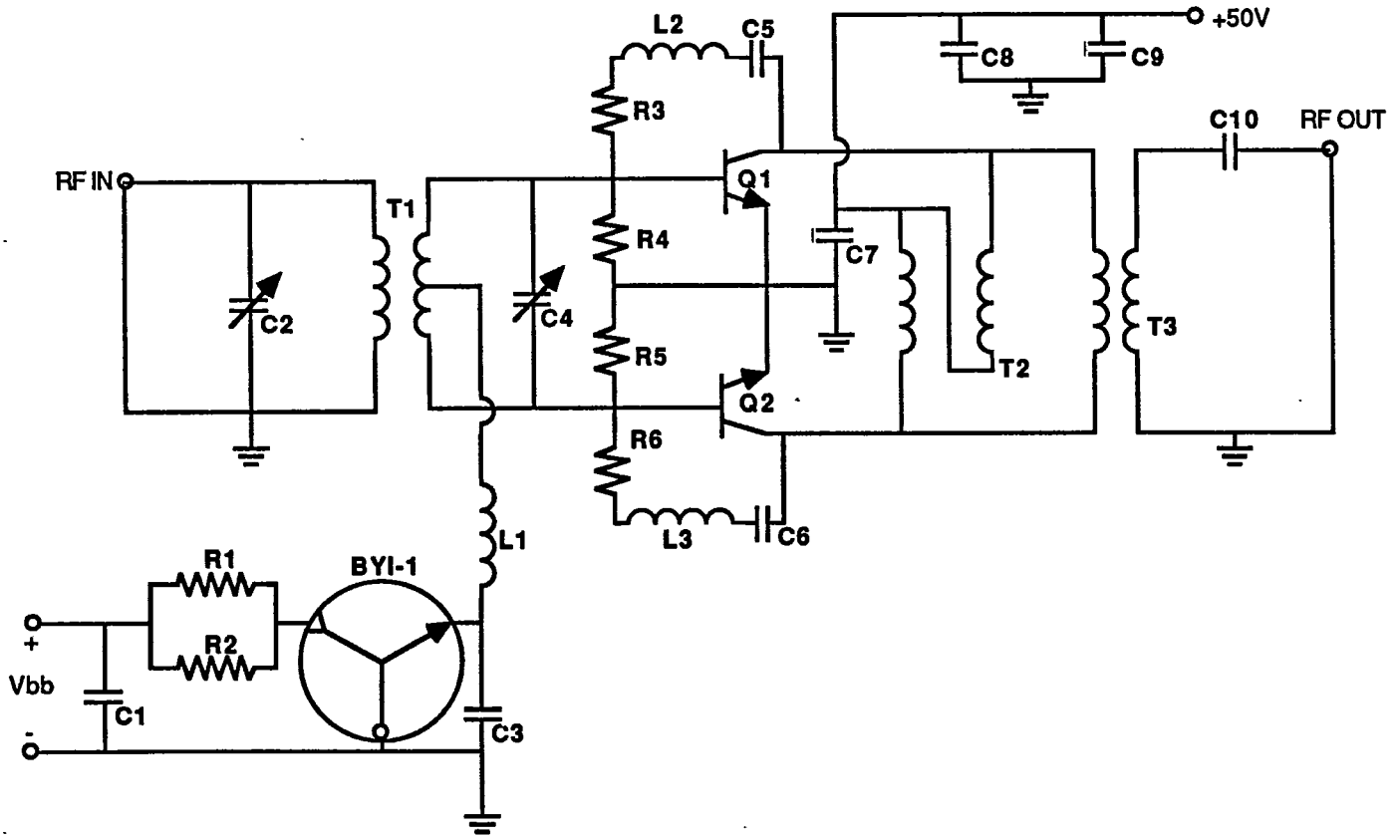

3RD ORDER INTERMODULATION DISTORTION VS OUTPUT POWER (TYPICAL)
INTERMODULATION DISTORTION (dBc)
-28
-30
-32
-34
-36
-38
Vcc=28V
Vcc=40V
Vcc=50V
50
80
110
140
170
200
POWER OUT (WATTS)


CUTOFF FREQUENCY VS. COLLECTOR CURRENT (TYPICAL)
Ft - CUTOFF FREQUENCY - MHz
500
400
300
200
100
Vcc=15V
Vcc=10V
Vcc= 5V
0
2
4
6
8
10
Ic - COLLECTOR CURRENT (AMPS)

S175-50-4

S175-50 TEST CIRCUIT

2-30 MHz, 300 Watts
Linear Amplifier



Q1, Q1	ACRIAN S175-50
BYISTOR	ACRIAN BYI-1
C1, C3, C5, C6, C7, C8	0.1µF CERAMIC
C2	25-240pF COMPRESSION MICA
C4	75-480pF COMPRESSION MICA
C9	10µF, 50V, ELECTROLYTIC
C10	2700pF DM15
L1	6 TURNS ON INDIANA GENERAL F627-9, H MATERIAL
L2, L3	2.2µH, MOLDED INDUCTOR
R1, R2	22Ω, 2 WATTS
R3, R6	220Ω, 2 WATTS
R4, R5	10Ω, 1/4 WATT

TRANSFORMER DETAILS

T1: 8 BEADS OF INDIANA GENERAL F625-9, H MATERIAL ON TWO BRASS TUBES. THE PRIMARY IS FOUR TURNS OF #20 VINYL CLAD WIRE WOUND THROUGH THE BRASS TUBES.

T2: #20 TWISTED PAIR, APPROXIMATELY 2 CRESTS PER CENTIMETER, WOUND ON INDIANA GENERAL F624-19, H MATERIAL

T3: 10 BEADS OF INDIANA GENERAL F627-8, H MATERIAL MOUNTED ON TWO BRASS TUBES. THE SECONDARY CONSIST OF 3 #20 VINYL CLAD WIRES IN PARALLEL. THE THREE WIRES SHOULD BE WOUND TO PRODUCE A 2:1 TURNS RATIO.