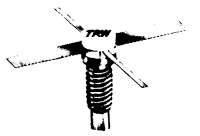
UHF Linear Transistor

- 0.25 W - Band 5
- 14 dB Gain at 860 MHz
- Gold Reliability
- TV Transposer



.200 SOE

The TPV 590 is a NPN gold metallized transistor using emitter ballast resistors for super linearity. The fine chip geometry gives typical gain in excess of 14 dB at 860 MHz.

These characteristics make TPV 590 an ideal candidate for very efficient low power stages in UHF transposers applications.

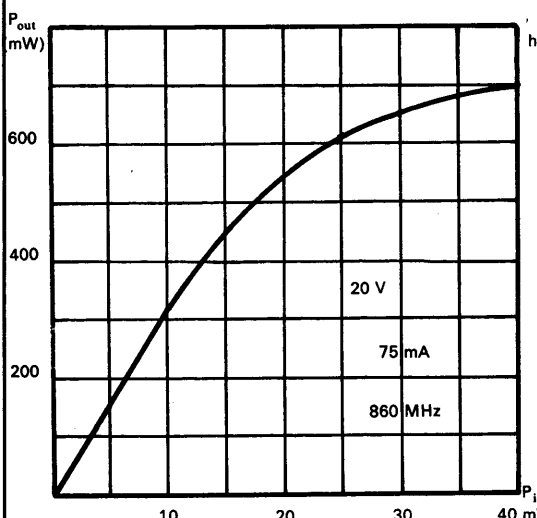
Electrical Characteristics (T_{case} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV_{EBO}	Emitter Base Breakdown Voltage	I_E = 0.25 mA	3.5			V
	BV_{CEO}	Collector Emitter Breakdown Voltage	I_C = 10 mA	24			V
	BV_{CBO}	Collector Base Breakdown Voltage	I_C = 1 mA	45			V
	BV_{CER}	Collector Emitter Breakdown Voltage	R_{BE} = 10 I_C = 10 mA	50			V
	I_{CBO}	Collector Cutoff Current	V_{CB} = 28 V			0.25	mA
	H_{FE}	DC Current Gain	V_{CE} = 5 V I_C = 100 mA	20		120	
RF TEST	I_{MD}	Intermodulation Distortion — 8 dB — 16 dB — 7 dB	F = 860 MHz V_{CE} = 20 V I_E = 75 mA P_{ref} = 0.25 W TRW DOCUMENT 05001		— 60	— 58	dB
	P_G	Power Gain		14	14.5		dB
	VSWR	Mismatch Tolerance			∞		
	C_{ob}	Collector Base Capacitance	V_{CB} = 20 V F = 1 MHz			3	pF
	F_T	Cutoff Frequency	V_{CE} = 20 V I_E = 75 mA	3			GHz
THERMAL	I_C	Maximum Collector Current				.4	A
	θ_{JF}	Thermal Resistance Junction Heatsink	Theatsink = 70 °C			30	°C/W
	T_J T_{STG}	Max Junction and Storage Temper		— 65		+ 200	°C

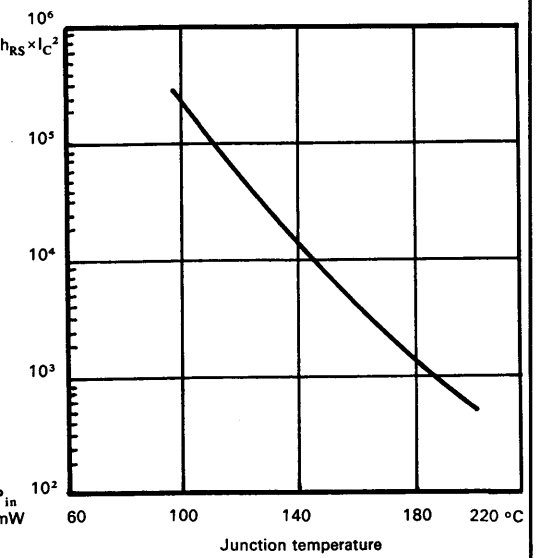
TPV 590 $V_{CE} \hat{=} 20$ V $I_C = 100$ mA

POLAR S-PARAMETERS IN 50 OHM SYSTEM								
F	S 11		S 21		S 12		S 22	
MHz	Magn	Angl°	Magn	Angl°	Magn	Angl°	Magn	Angl°
100 MHz	0.613	226°	17.78	126°	0.0199	35°	0.530	320°
200 MHz	0.732	203°	12.88	103°	0.028	33°	0.316	305°
300 MHz	0.767	192.5°	9.22	93°	0.029	33°	0.266	297°
400 MHz	0.767	185°	6.91	84°	0.033	33°	0.266	295°
500 MHz	0.754	179.5°	5.16	79°	0.033	38°	0.266	300°
600 MHz	0.776	174°	4.67	72°	0.035	42°	0.237	300°
700 MHz	0.776	170°	4.02	66°	0.039	43°	0.237	290°
800 MHz	0.767	167°	3.34	61°	0.044	44°	0.266	285°
900 MHz	0.767	163°	3.16	56°	0.047	44°	0.237	290°
1 GHz	0.776	160°	2.786	52°	0.053	45°	0.266	280°

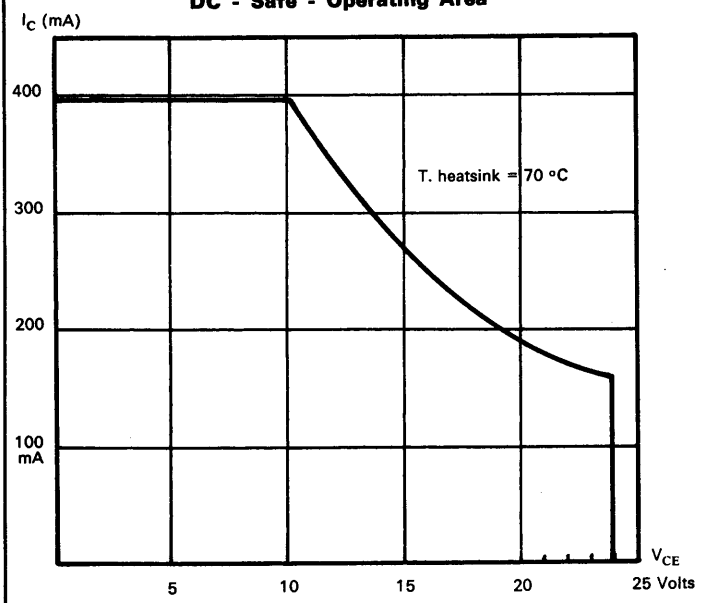
Power Output vs Power Input



MTTF Factor vs Junction Temperature

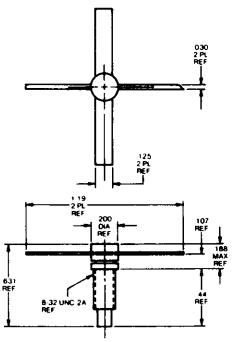


DC - Safe - Operating Area

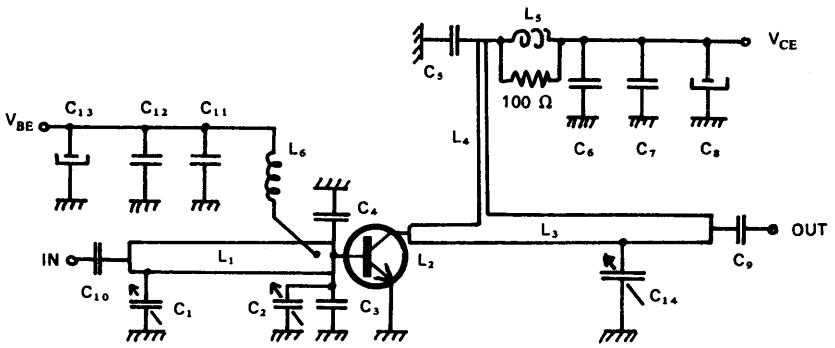


Package

.200 SOE STUD



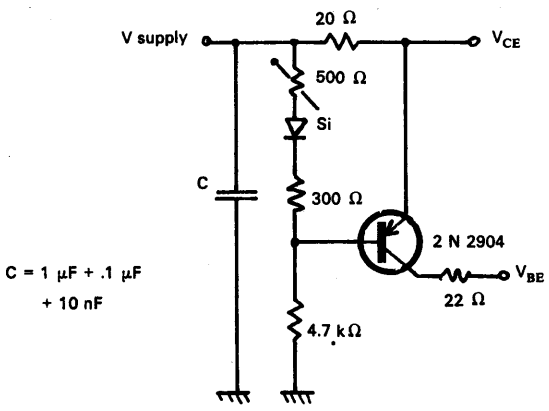
V_{CE} = 20 V I_C = 75 mA F_O = 860 MHz



D

L_1 : 50 Ω line l = 10 % λg at 860 MHz
L_2 : 100 Ω line l = 12 % λg at 860 MHz
L_3 : 50 Ω line l = 7 % λg at 860 MHz
L_4 : 120 Ω line l = 10 % λg at 860 MHz
L_5 : 6 turns ID 3 mm wire .5 mm
L_6 : 6 turns ID 3 mm wire .5 mm

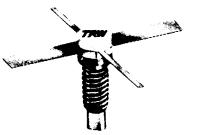
C_1 = C_2 = C_{14} = variable AIRTRONIC C max 4.7 pF AT 7275
C_3 = C_4 = ATC chip 10 pF
C_5 = 680 pF ATC chip
C_6 = C_{11} = 1 nF
C_7 = C_{12} = 10 nF
C_8 = 10 µF 63 V
C_{13} = 10 µF 25 V
C_9 = C_{10} = 1 nF chip



Bias Circuit

UHF Linear Transistor

- 0.5 W Band 5
- 14 dB Gain at 860 MHz
- High Efficiency
- Gold Reliability
- TV Transposer



200 SOE

The TPV 591 is a NPN gold metallized transistor using diffused emitter ballast resistors.

The sophisticated chip geometry allows the TPV 591 to expand the gain-efficiency frontier.

Its characteristics make the TPV 591 the best device available for very efficient low power stages in UHF transposers applications.

Electrical Characteristics (T_{case} = 25 °C)

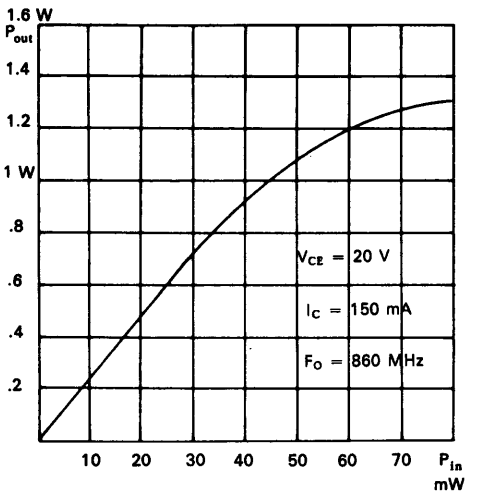
	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV_{CEO}	Collector - Emitter Breakdown Voltage	I_C = 20 mA	24			V
	BV_{CER}	Collector - Emitter Breakdown Voltage	R_{BE} = 10 Ω I_C = 20 mA	50			V
	BV_{EBO}	Emitter - Base Breakdown Voltage	I_E = 0.5 mA	3.5			V
	BV_{CBO}	Collector - Base Breakdown Voltage	I_C = 2 mA	45			V
	I_{CBO}	Collector Cutoff Current	V_{CB} = 28 V			0.5	mA
	H_{FE}	Forward Current Transfer Ratio	V_{CE} = 5 V I_C = 200 mA	20		120	
RF TEST	IMD	Intermodulation Distortion — 8 dB, — 16 dB, — 7 dB	F_O = 860 MHz **TRW DOCUMENT 05001**		— 60	— 58	dB
	P_G	Power Gain	V_{CE} = 20 V I_C = 150 mA	13	14		dB
	VSWR	Mismatch tolerance	P_{REF} = 0.5 W		∞		
	F_T	Cutoff Frequency	V_{CE} = 20 V I_E = 75 mA	3			GHz
	C_{OB}	Collector - Base Capacitance	V_{CB} = 20 V F = 1 MHz			5.5	pF
THERMAL	I_C	Maximum Collector Current				.8	A
	θ_{JF}	Thermal Resistance Junction - Heatsink	$T_{Heatsink}$ = 70 °C			16	°C/W
	T_J T_{STG}	Maximum Junction and Storage Temperature		— 65		+ 200	°C

V_{CE} = 20 V I_C = 150 mA

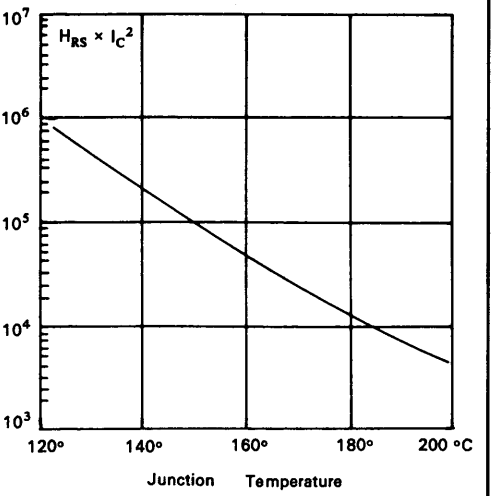
POLAR S-PARAMETERS IN 50 OHM SYSTEM								
F	S 11		S 21		S 12		S 22	
MHz	Magn	Angl°	Magn	Angl°	Magn	Angl°	Magn	Angl°
100	0.733	190	13.8	117	0.025	27	0.365	280
200	0.841	187	8.13	100	0.028	27	0.266	241
300	0.861	181	5.62	88	0.033	27	0.266	241
400	0.861	177	4.27	79	0.035	30	0.282	225
500	0.861	173	3.47	72	0.040	36	0.282	225
600	0.865	169	2.82	68	0.045	36	0.282	218
700	0.865	167	2.44	61	0.045	37	0.316	214
800	0.866	163	2.15	54	0.050	40	0.316	216
860	0.866	162	2.03	54	0.050	43	0.331	218
900	0.866	160	1.94	52	0.053	44	0.331	217
1 000	0.876	158	1.66	46	0.056	44	0.376	214

D

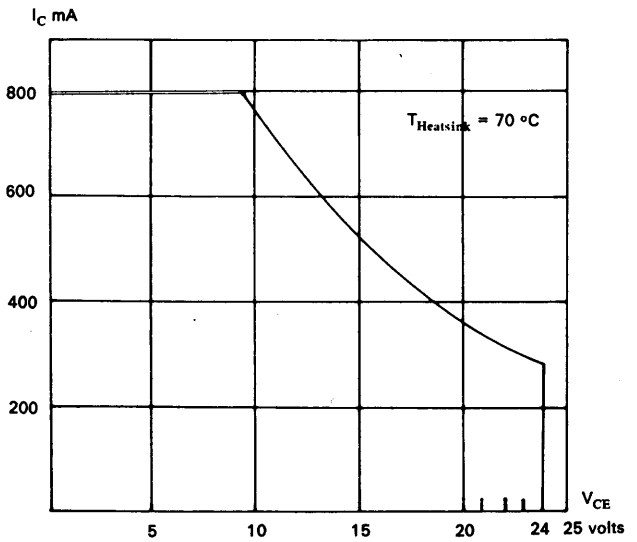
Power Output vs Power Input



MTTF Factor vs Junction Temperature

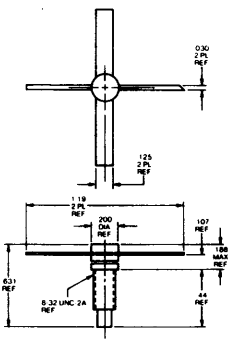


D.C Safe Operating Area

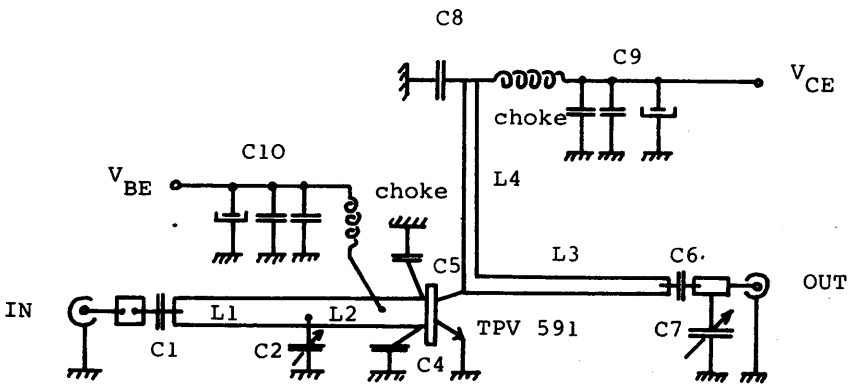


Package

.200 SOE STUD



F_o = 860 MHz — V_{CE} = 20 V — I_C = 150 mA

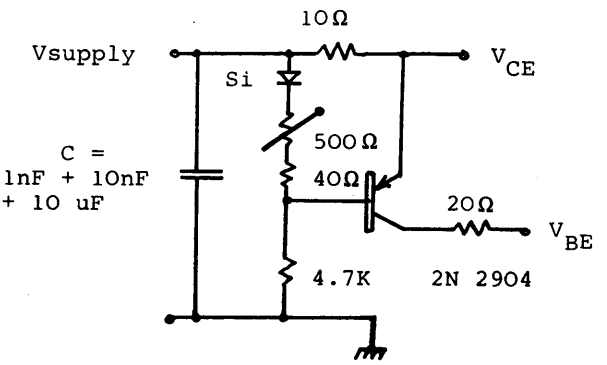


$C_1 = C_6$ = 1 nF
$C_2 = C_7$ = Variable Airtronic AT 7285 - max. 2.5 pF
C_4 = ATC 100 A 10 pF
C_5 = ATC 100 A 6.8 pF + 4.7 pF
C_8 = 1 nF
$C_9 = C_{10}$ = 1 nF + 10 nF + 10 µF

Choke : 8 turns — ID 6 mm — wire .5 mm

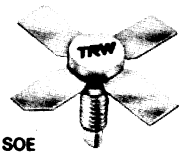
L_1 = 50 line — ℓ = 10 % λg at 860 MHz
L_2 = 50 line — ℓ = 5 % λg at 860 MHz
L_3 = 80 line — ℓ = 13 % λg at 860 MHz
L_4 = 100 line — ℓ = 8 % λg at 860 MHz

BIAS CIRCUIT



UHF Linear Transistor

- **0.5 W Band 5**
- **MATV 1.5 V**
- **860 MHz**
- **12 dB Gain**
- **Gold Reliability**
- **TV Transposer**



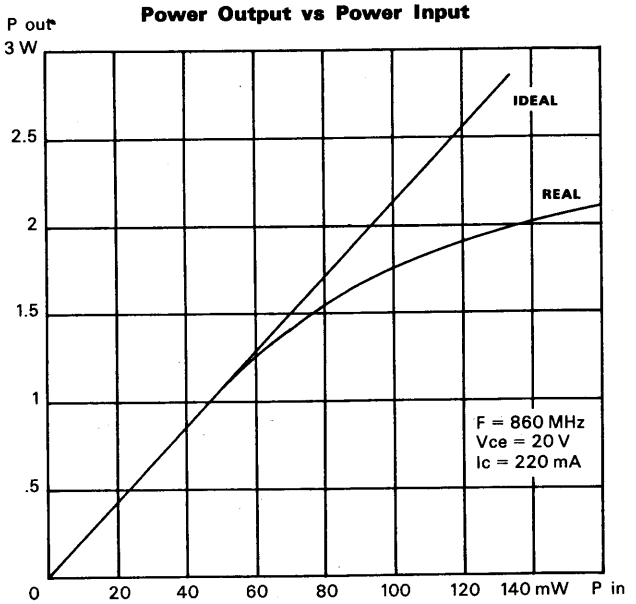
280 SOE

The TPV 596 is a NPN gold metallized transistor using diffused emitter ballast resistors for super linearity. The chip design using microwave techniques provides more than 12 dB gain at 860 MHz thereby reducing the complexity of the lower amplifier stages. The TPV 596 is specifically designed for very high output **1.5 volt MATV** amplifier up to 860 MHz and **500 mW band 5 TV transposers** stages.

Electrical Characteristics (T_{flange} = 25 °C)

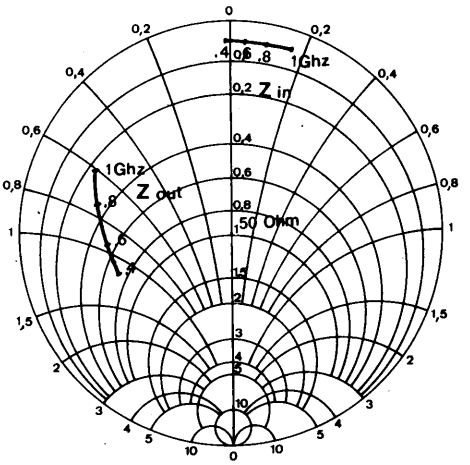
	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC Test	BV_{EBO}	Emitter - Base Breakdown Voltage	I_E = 0.25 mA	3.5			V
	BV_{CEO}	Collector - Emitter Breakdown Voltage	I_C = 20 mA	24			V
	BV_{CER}	Collector - Emitter Breakdown Voltage	I_C = 20 mA R_{BE} = 10 ohms	50			V
	BV_{CBO}	Collector - Base Breakdown Voltage	I_C = 1 mA	45			V
	I_{CBO}	Collector - Base Leakage	V_{CB} = 28 V			0.45	mA
	h_{FE}	D.C. Current Gain	V_{CE} = 5 V I_C = 100 mA	15		120	
RF Test	IMD 1	Intermodulation Distortion - 3 Tone Vision Carrier = Reference - 8 dB Sound Carrier = Reference - 7 dB Sideband Carrier = Reference - 16 dB	F = 860 MHz V_{CE} = 20 V I_E = 0.22 A P_{REF} = 1 W **TRW DOCUMENT 05001**			— 50	dB
	IMD 2	Idem	F = 860 MHz V_{CE} = 20 V I_E = 0.22 A P_{REF} = 0.5 W		— 60	— 58	dB
	P_G	Power Gain	F = 860 MHz V_{CE} = 20 V I_E = 0.22 A P_{REF} = 0.5 W	11.5	12		dB
	VSWR	Mismatch Tolerance	F = 860 MHz V_{CE} = 20 V I_E = 0.22 A P_{REF} = 1 W		∞		
	C_{OB}	Collector - Base Capacitance	V_{CB} = 28 V F = 1 MHz			5	pF
	f_T	Cutoff Frequency	V_{CE} = 20 V I_E = 220 mA	2.2	2.5		GHz
Thermal	I_C	Maximum Collector Current				0.7	A
	θ_{JC}	Thermal Resistance Junction - Case	T_{CASE} = 70 °C			20	°C/W
	P_T	Dissipated Power	$T_{HEATSINK}$ = 25 °C			8.75	W
	T_{STG} T_J	Storage Temperature Junction Temperature		— 65		+ 200	°C

Power Output vs Power Input



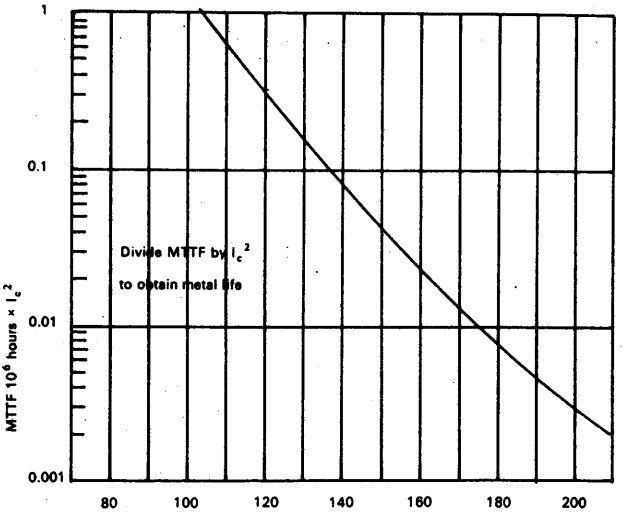
LARGE SIGNAL IMPEDANCES

Vce = 20 v
Ic = 220 mA

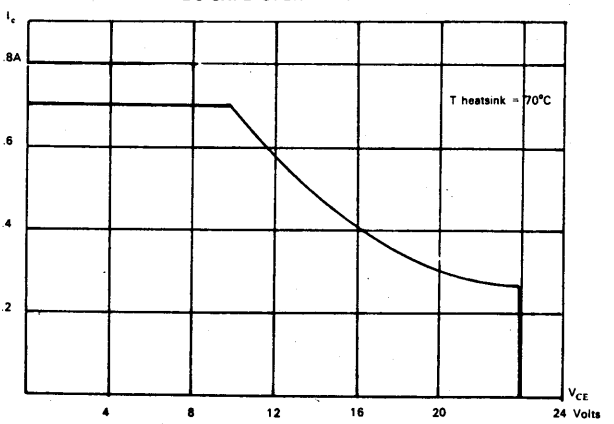


MTTF FACTOR vs

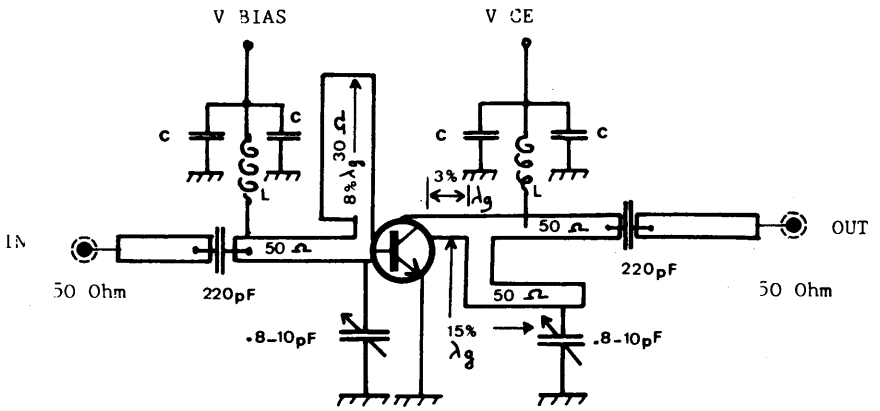
JUNCTION TEMPERATURE



DC-SAFE OPERATING AREA



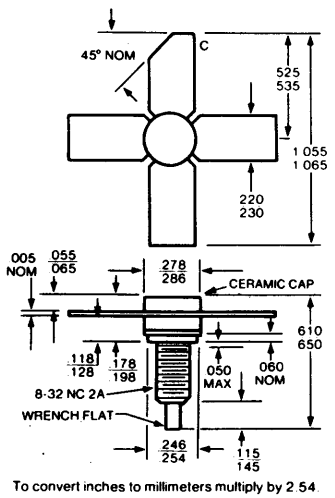
TEST CIRCUIT AT 860 MHz



L = 6 turns ID = 1 mm Wire diameter = 0.6 mm

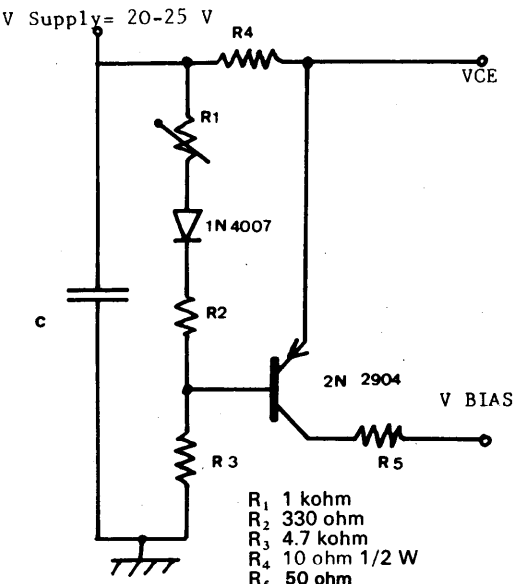
The lengths are given for F = 860 MHz

Package Outline



To convert inches to millimeters multiply by 2.54.

CLASS A BIAS CIRCUIT

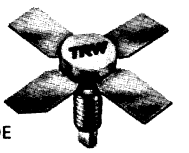


R_1 1 kohm
R_2 330 ohm
R_3 4.7 kohm
R_4 10 ohm 1/2 W
R_5 50 ohm
C 100 F + 10 nF + 1 nF

D

UHF Linear Transistor

- 1 W
- 11 dB Gain
- Gold Reliability
- TV Transposer
- Band 5



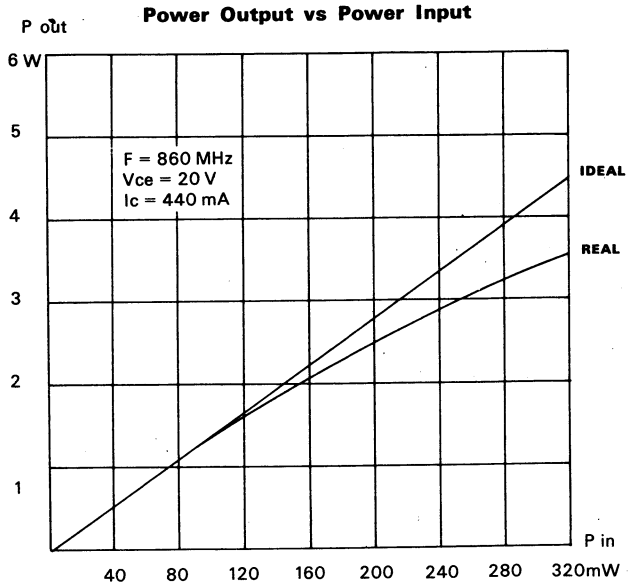
280 SOE

The TPV 597 is a NPN gold metallized transistor using diffused emitter ballast resistors for super linearity. The chip design using microwave techniques provides more than 11 dB gain at 860 MHz thereby reducing the complexity of the lower amplifier stages. The TPV 597 is specifically designed for **1 W - band 5 - TV transposers** stages.

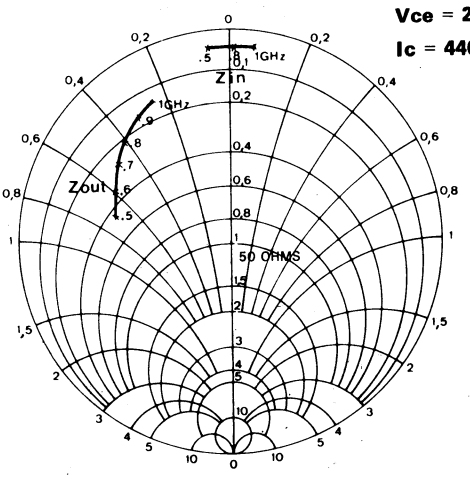
Electrical Characteristics (T_{flange} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC Test	BV_{EBO}	Emitter - Base Breakdown Voltage	I_E = 0.5 mA	3.5			V
	BV_{CEO}	Collector - Emitter Breakdown Voltage	I_C = 40 mA	24			V
	BV_{CER}	Collector - Emitter Breakdown Voltage	I_C = 40 mA R_{BE} = 10 ohms	50			V
	BV_{CBO}	Collector - Base Breakdown Voltage	I_C = 2 mA	45			V
	I_{CBO}	Collector - Base Leakage	V_{CB} = 28 V			0.45	mA
	h_{FE}	D.C. Current Gain	V_{CE} = 5 V I_C = 200 mA	15		120	
RF Test	IMD 1	Intermodulation Distortion - 3 Tone Vision Carrier = Reference - 8 dB Sound Carrier = Reference - 7 dB Sideband Carrier = Reference - 16 dB	F = 860 MHz V_{CE} = 20 V I_E = 0.44 A P_{REF} = 1 W **TRW DOCUMENT 05001**		— 60	— 58	dB
	IMD 2	Idem	F = 860 MHz V_{CE} = 20 V I_E = 0.44 A P_{REF} = 2 W			— 51	dB
	P_G	Power Gain	F = 860 MHz V_{CE} = 20 V I_E = 0.44 A P_{REF} = 1 W	10.5	11		dB
	VSWR	Mismatch Tolerance	F = 860 MHz V_{CE} = 20 V I_E = 0.44 A P_{REF} = 2 W		∞		
	C_{OB}	Collector - Base Capacitance	V_{CB} = 28 V F = 1 MHz			7	pF
	f_T	Cutoff Frequency	V_{CE} = 20 V I_E = 440 mA	2.2	2.5		GHz
Thermal	I_C	Maximum Collector Current				1.4	A
	0_{JC}	Thermal Resistance Junction - Case	T_{CASE} = 70 °C			9	°C/W
	P_T	Dissipated Power	$T_{HEATSINK}$ = 25 °C			19	W
	T_{STG} T_J	Storage Temperature Junction Temperature		— 65		+ 200	°C

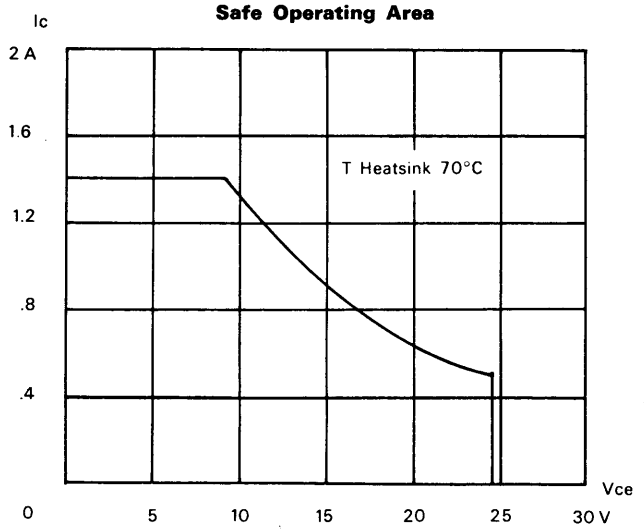
Power Output vs Power Input



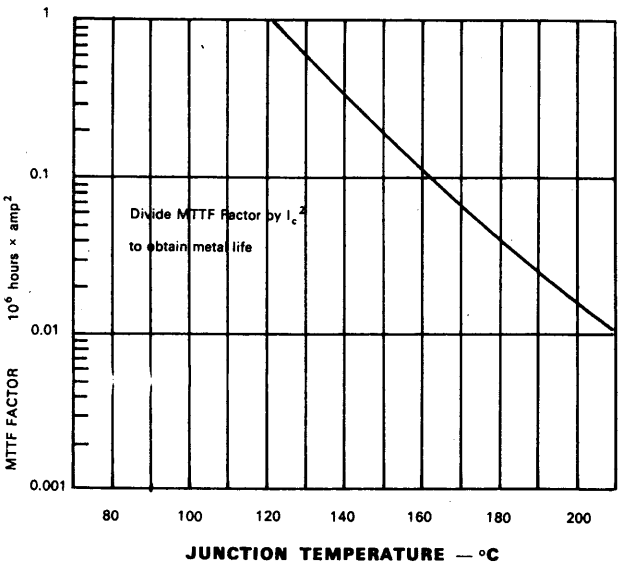
LARGE SIGNAL IMPEDANCES



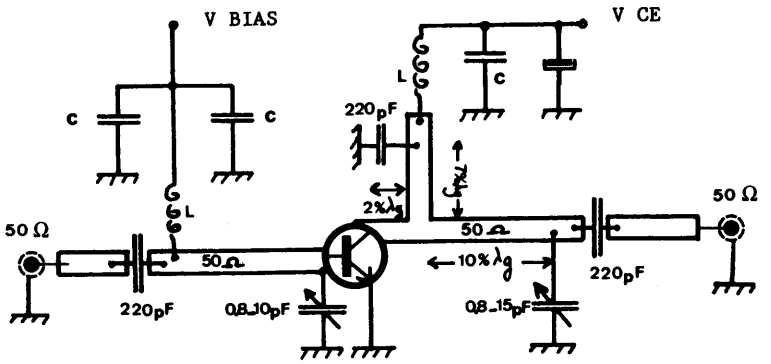
Safe Operating Area



MTTF FACTOR vs
JUNCTION TEMPERATURE

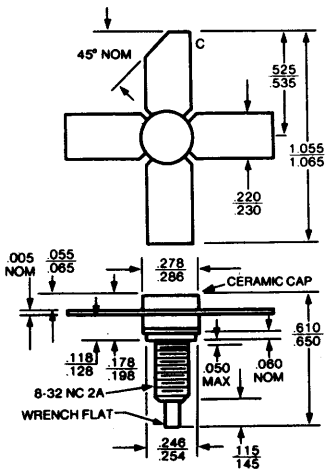


TEST CIRCUIT AT 860 MHz



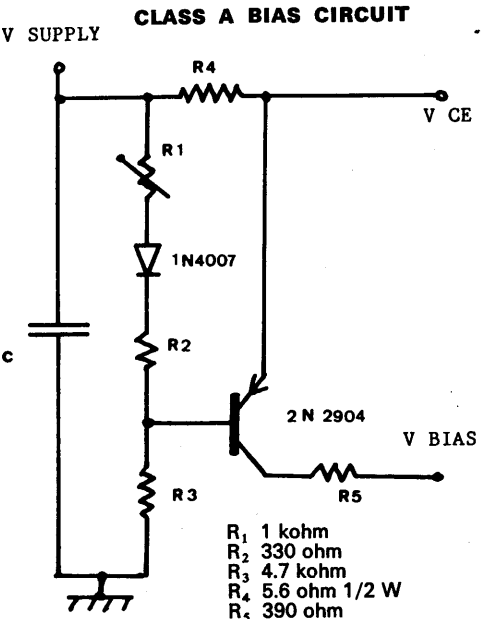
L = 6 turns ID = 1 mm Wire diameter = 0.6 mm
The lengths are given for F = 860 MHz

Package Outline



To convert inches to millimeters multiply by 2.54.

CLASS A BIAS CIRCUIT

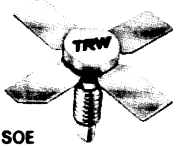


R_1 1 kohm
R_2 330 ohm
R_3 4.7 kohm
R_4 5.6 ohm 1/2 W
R_5 390 ohm
C 100 µF + 10 nF + 1 nF

D

UHF Linear Transistor

- 2 W
- 9 dB Gain
- Band 4 & 5
- TV Transposer



280 SOE

The TPV 593 is a NPN gold metallized transistor using diffused emitter ballast resistors for super linearity.

Its characteristics make the TPV 593 the best device available for very efficient medium power stages in UHF transposers applications.

Electrical Characteristics (T_{case} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV_{CEO}	Collector - Emitter Breakdown Voltage	I_C = 80 mA	25			V
	BV_{CBO}	Collector - Base Breakdown Voltage	I_C = 10 mA	45			V
	BV_{EBO}	Emitter - Base Breakdown Voltage	I_E = 1 mA	4			V
	H_{FE}	D.C. Current Gain	V_{CE} = 20 V I_C = 250 mA	10			—
RF TEST	IMD	Intermodulation distortion vision = — 8 dB sound = — 7 dB Sideband = — 16 dB	**TRW DOCUMENT 05001** F = 860 MHz P_{REF} = 2 W V_{CE} = 25 V I_C = 450 mA			— 60	dB
	P_G	Power Gain		8.5	9		dB
	C_{OB}	Collector Base Capacitance	V_{CB} = 25 V F = 1 MHz			10	pF
THERMAL	θ_{j-c}	Thermal Resistance Junction Case	T_{case} 70 °C			11	°C/W
	T_{STG}	Storage Temperature		— 65		+ 200	°C
	T_J	Junction Temperature		— 65		+ 200	°C

POLAR « S » PARAMETERS IN 50 OHMS SYSTEM

F	S11		S21		S12		S22		S21	K
MHz	MAGN	ANGL	MAGN	ANGL	MAGN	ANGL	MAGN	ANGL	dB	FACTOR
470	0.93	170°	1.5	63	0.04	50°	0.55	— 166°	3.52	1.01
650	0.93	165°	1.06	50	0.05	54°	0.60	— 169°	0.51	1.04
860	0.92	162°	0.79	38	0.06	54°	0.65	— 169°	— 2	1.15

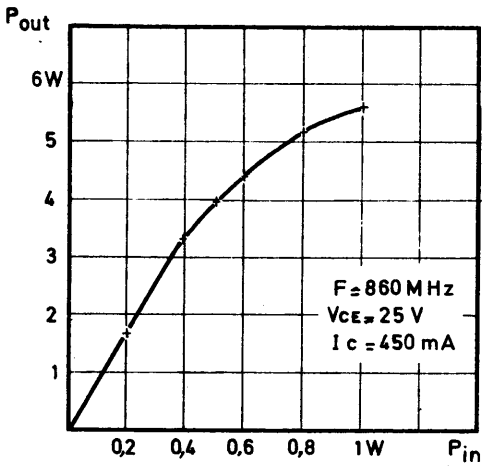
NOTE : V_{CE} = 25 Volts — I_C = 450 mA — Class A

POLAR COORDINATES OF SIMULTANEOUS CONJUGATE MATCH IN 50 OHMS SYSTEM

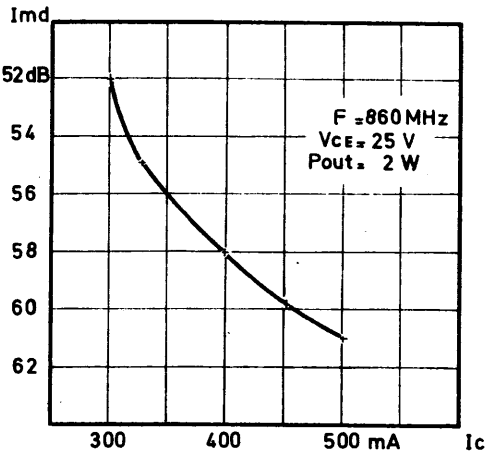
F	SOURCE REFL. COEFF.		LOAD REFL. COEFF.		G MAX
MHz	MAGN	ANGLE	MAGN	ANGLE	dB
470	0.99	— 173°	0.91	124°	15.2
650	0.99	— 168°	0.83	134°	12.0
860	0.95	— 165°	0.79	146°	9.2

NOTE : V_{CE} = 25 Volts — I_C = 450 mA — Class A

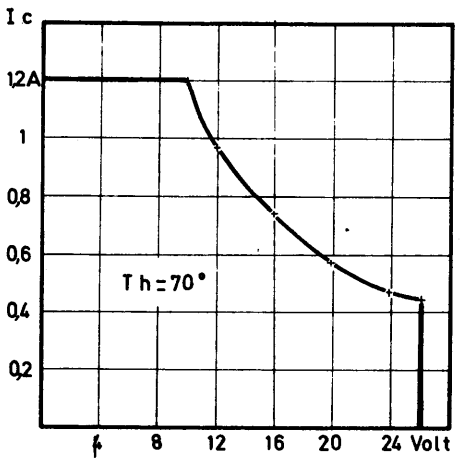
Output Power vs Input Power



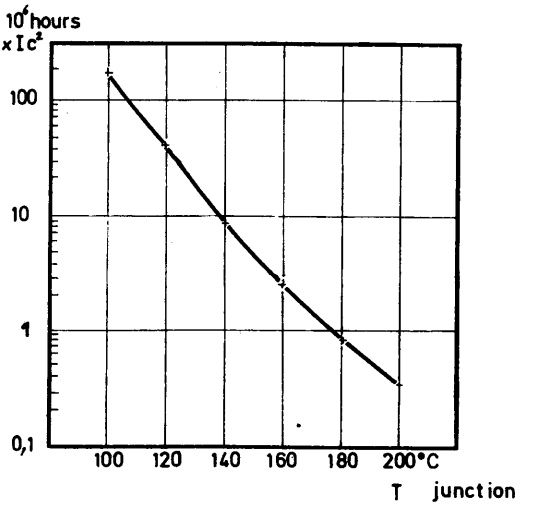
IMD vs Collector Current



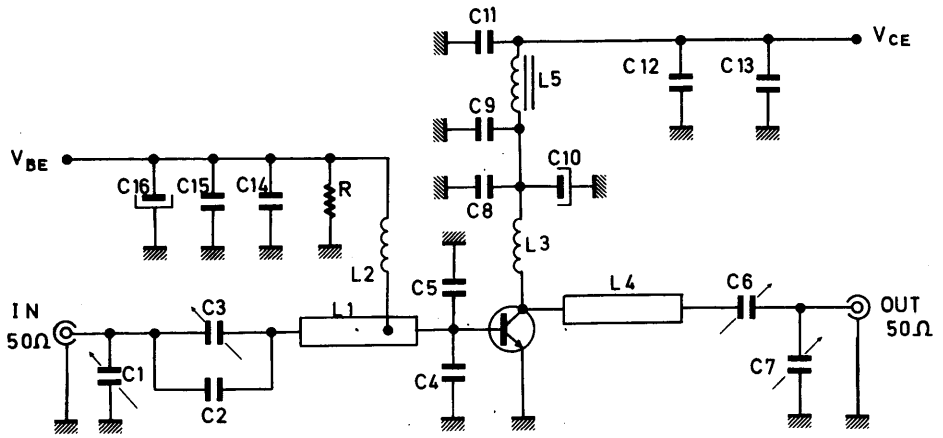
DC Safe Operating Area



MTTF vs Junction Temperature



TEST CIRCUIT AT 860 MHz

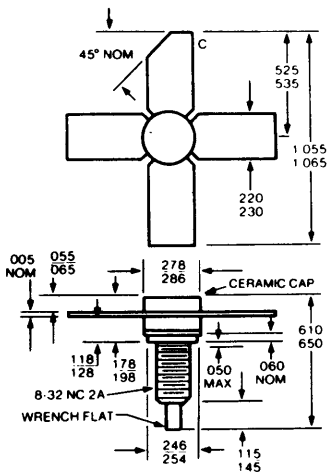


Components Part List

C_1 = AIR TRIMMER AT 5201 0.8 - 10 pF TEKELEC
C_2 = CHIP ATC 4.7 pF
C_3 = AIR TRIMMER AT 5751 0.6 - 6 pF TEKELEC
C_4 = C_5 = CHIP ATC 3.3 pF
C_6 = C_7 = AIR TRIMMER AT 5501 1 - 20 pF TEKELEC
C_8 = C_{13} = C_{14} = 1 nF CHIP CAPACITOR
C_9 = C_{11} = C_{15} = 10 nF RTC
C_{12} = 0.1 µF RTC
C_{10} = C_{16} = 10 µF 63 V electrolytic

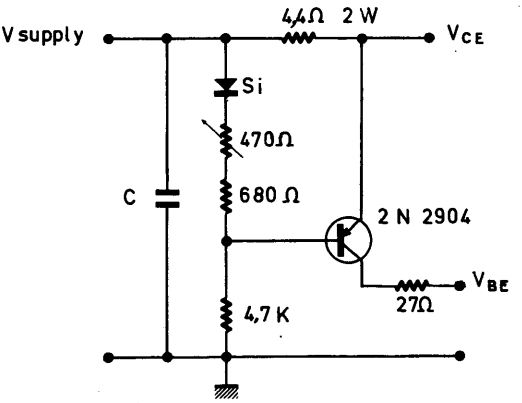
L_1 = 30 Ω line 1 = 6.5 % λg
L_2 = choke 0.47 µH
L_3 = 1 turn - ID 6 mm - wire 10/10
L_4 = 30 Ω line 1 = 19 % λg
L_5 = 8 turns on a CN 20 FERRITE BEAD - CERAMICL - MAGNETICS
R = 43 Ω 1/4 Watt

Package Outline



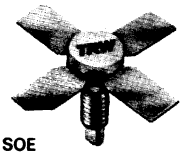
To convert inches to millimeters multiply by 2 54

Class a Bias Circuit



UHF Linear Transistor

- 4 W
- 7 dB Gain
- TV Transposer
- Band 4 & 5



280 SOE

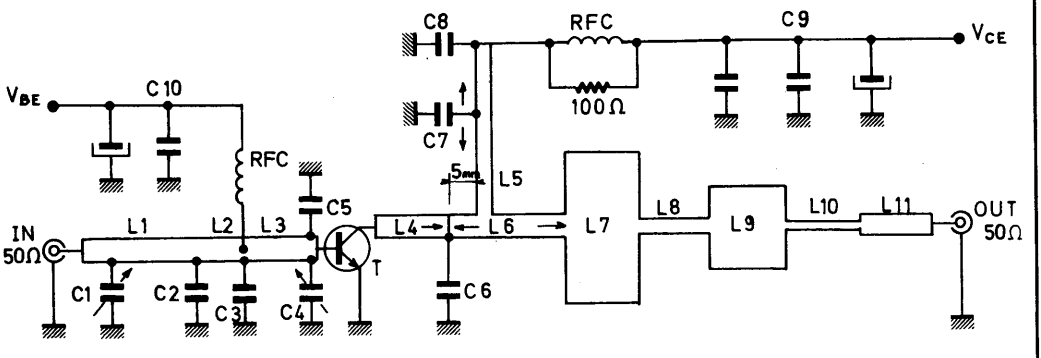
The TPV 598 is a NPN gold metallized transistor using diffused emitter ballast resistors for super linearity. The chip design using microwave techniques provides over 7 dB gain at 860 MHz.

The TPV 598 is specifically designed for high power band 4 and 5 TV Transposers.

Electrical Characteristics (T_{case} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST	BV_{EBO}	Emitter - Base Breakdown Voltage	I_E = 1 mA	4			V
	BV_{CEO}	Collector - Emitter Breakdown Voltage	I_C = 20 mA	27			V
	BV_{CBO}	Collector - Base Breakdown Voltage	I_C = 10 mA	45			V
	H_{FE}	D.C. Current Gain	V_{CE} = 20 V I_C = 500 mA	10			
RF TEST	IMD	Intermodulation distortion 3 tones : — 8 dB vision — 7 dB sound — 16 dB Sideband	F = 860 MHz V_{CE} = 25 V I_C = 850 mA **TRW DOCUMENT 05001**			— 60	dB
	P_G	Power Gain	P_{REF} = 4 W	7			dB
	C_{OB}	Collector Base Capacitance	V_{CB} = 25 V F = 1 MHz			20	pF
	F_T	Cutoff Frequency	V_{CE} = 25 V I_C = 850 mA		2		GHz
THERMAL	θ_{JC}	Thermal Resistance Junction Case	DC Dissipation Average Temperature T_{case} = 70 °C			5	°C/W
	θ_{JC}	Thermal Resistance Junction Case	High Resolution DC Dissipation T_{case} = 70 °C			6.2	°C/W
	θ_{CH}	Thermal Resistance Case Heatsink			0.4		°C/W
	T_{STG}	Storage Temperature		— 65		+ 200	°C

BROADBAND TEST CIRCUIT



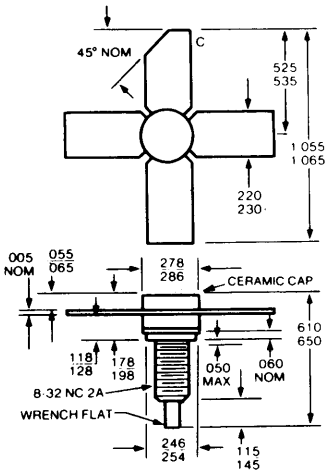
D

C_1 = VARIABLE .5 - 4.7 pF AIRTRONIC
C_2 = C_3 = ATC 4.7 pF
C_4 = ATC 10 pF + VARIABLE .5 - 4.7 pF AIRTRONIC
C_5 = ATC 10 pF + ATC 5.6 pF
C_6 = ATC 18 pF + .5 - 4.7 pF VARIABLE AIRTRONIC
C_7 = 470 pF CHIP CAPACITOR
C_8 = 1 nF + 10 nF DECOUPLING
C_9 = 1 nF + 10 nF + .1 µF + 10 µF
C_{10} = 10 nF + 1 µF + 10 µF

RFC = 8 turns ID 2.5 mm Wire = .5 mm

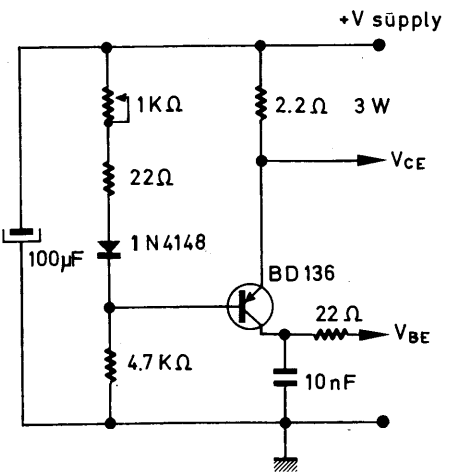
L_1 = 50 Ω line 6.2 % λg at 860 MHz
L_2 = 50 Ω line 4.2 % λg at 760 MHz
L_3 = 50 Ω line 4.9 % λg at 860 MHz
L_4 = 20 Ω line 6.5 % λg at 860 MHz
L_5 = 50 Ω line 5 % λg at 860 MHz
L_6 = 20 Ω line 9.5 % λg at 860 MHz
L_7 = 4 Ω line 8 % λg at 860 MHz
L_8 = 55 Ω line 7.5 % λg at 860 MHz
L_9 = 7.5 Ω line 8 % λg at 860 MHz
L_{10} = 100 Ω line 8 % λg at 860 MHz
L_{11} = 20 Ω line 8 % λg at 860 MHz

Package Outline



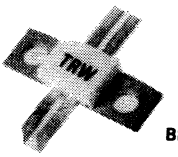
To convert inches to millimeters multiply by 2.54

Class a Bias Circuit



High Linear Transistor

- 8 W
- 8.5 dB Gain
- Gold Reliability
- TV Transposers
- Band 4 & 5



BMA-2

The TPV 595 A is a push-pull device incorporating gold metallized dice and diffused emitter ballast resistors for linearity and ruggedness.

The chip design using microwave techniques provides over 8.5 dB gain at 860 MHz.

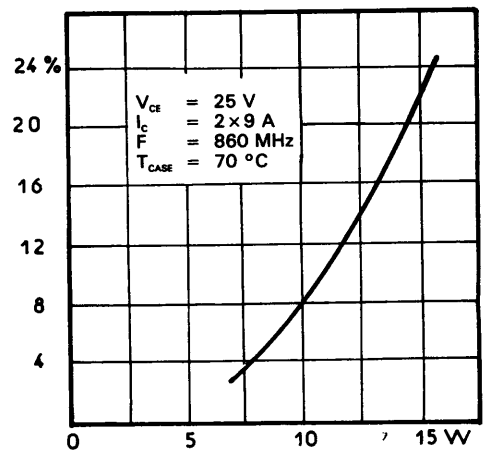
The TPV 595 A is specifically designed for high power band 4 & 5 TV transposers and solid state transmitters.

Electrical Characteristics (T_{CASE} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC TEST EACH SIDE	BV_{EBO}	Emitter - Base Breakdown Voltage	I_E = 3 mA	4			V
	BV_{CEO}	Collector - Emitter Breakdown Voltage	I_C = 60 mA	28			V
	BV_{CBO}	Collector - Base Breakdown Voltage	I_C = 10 mA	45			V
	BV_{CER}	Collector Emitter Breakdown Voltage	I_C = 10 mA, RBE = 51 Ohms	40			V
	IC_{EO}	Collector Emitter cut-off Current	V_{CE} = 20 V			5	mA
	H_{FE}	DC Current Gain	V_{CE} = 20 V, I_C = 500 mA	10			
RF TEST	I_{MD}*	Intermodulation	F_O = 860 MHz, Pref = 8 W V_{CE} = 25 V, I_C = 2×900 mA			−58	dB
	P_G	Power Gain	TRW DOCUMENT 05001	8.5			dB
	P_{IN}	Pin Overdrive (no degradation)	F_O = 470 MHz, V_{CE} = 25 V I_C = 2×900 mA	8.5			W
	C_{OB}	Collector - Base Capacitance	F_O = 1 MHz, V_{CB} = 28 V		20		pF
THERMAL	θ_jC	Thermal Resistance Junction Case	$T°_{CASE}$ = 70 °C DC DISSIP High resolution			2.5	°C/W
	P_{DISS}	Maximum Total Power Dissipat.	$T°_{CASE}$ = 70 °C			50	W
	IC_{MAX}	Maximum Collector Current				5	
	T_{CASE}	Maximum Mini Case Temperature		−15		+70	°C
	T_{STG}	Storage Temperature		−50		+200	

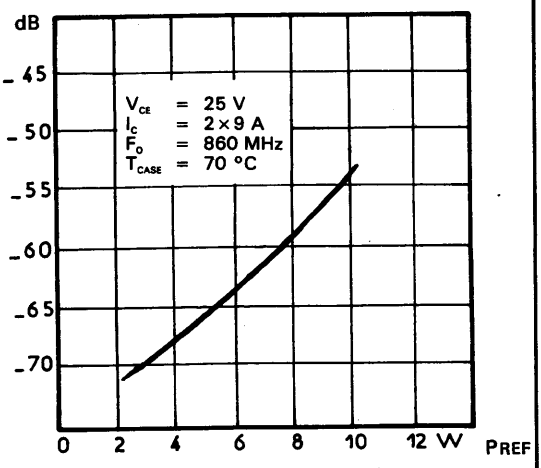
TYPICAL VALUES

Cross-mod* vs Output Power



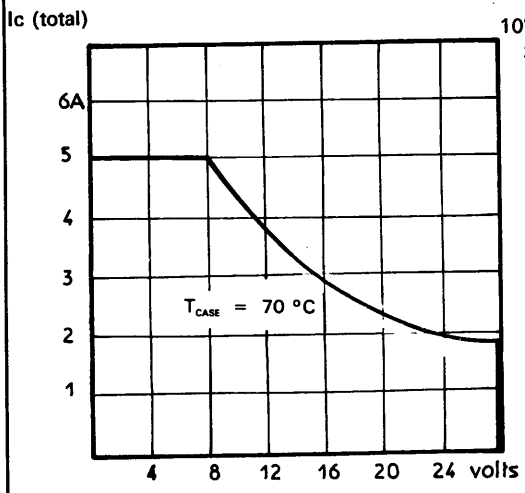
* Cross-mod : Δ % sound (— 7 dB)
— vision O ——→ PEAK

IMD* vs Output Power

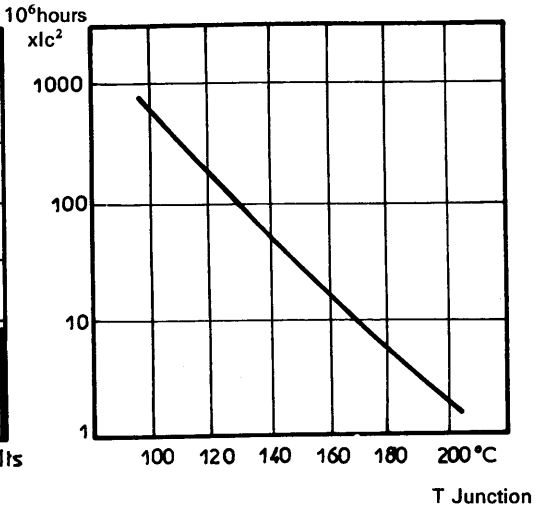


* IMD : 3 tones — 7 dB, — 8 dB, — 16 dB

DC Safe Operating Area



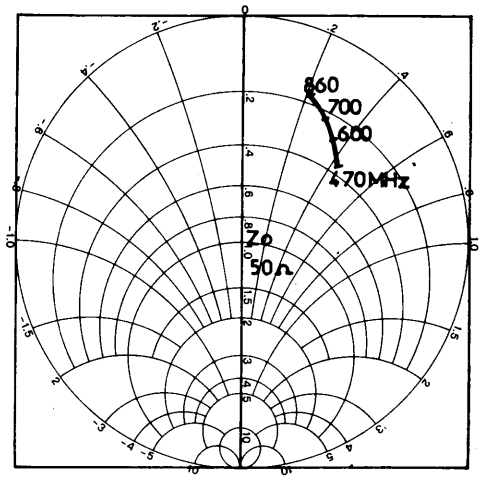
MTTF vs Junction Temperature



D

Z LOAD FOR BEST IMD (8 W) and CROSS-MODULATION (12 W)

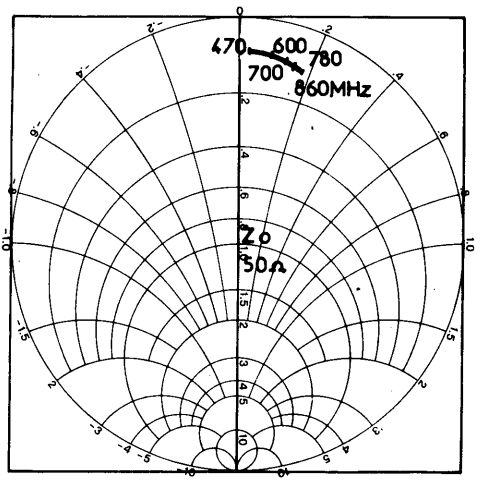
Collector to collector



V_{CE} = 25 V
I_C = 2 X 0.9 A

ZIN FOR BEST INPUT VSWR

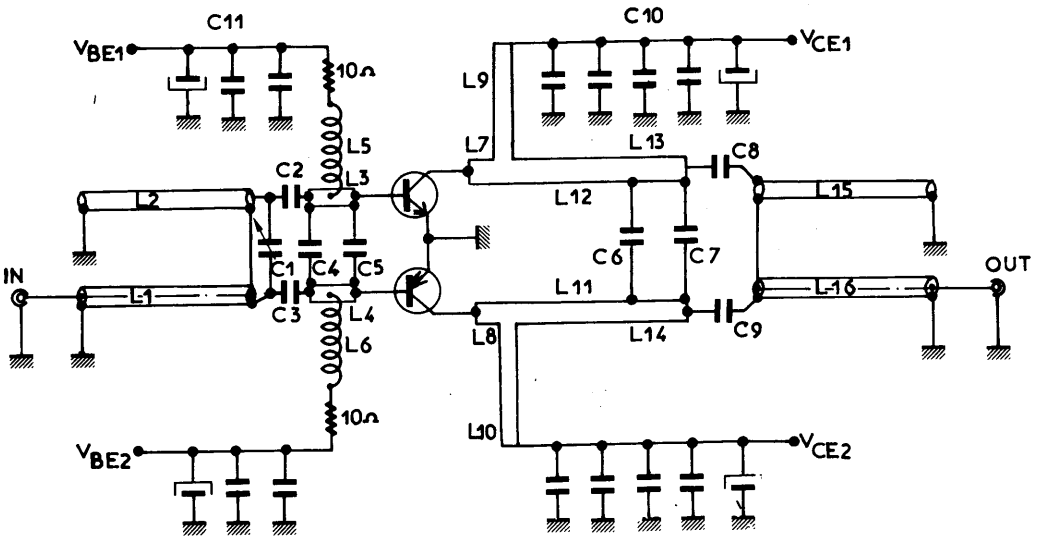
Base to base



V_{CE} = 25 V
I_C = 2 X 0.9 A

TPV 595 A BROADBAND AMPLIFIER 470-860 MHz

Class A

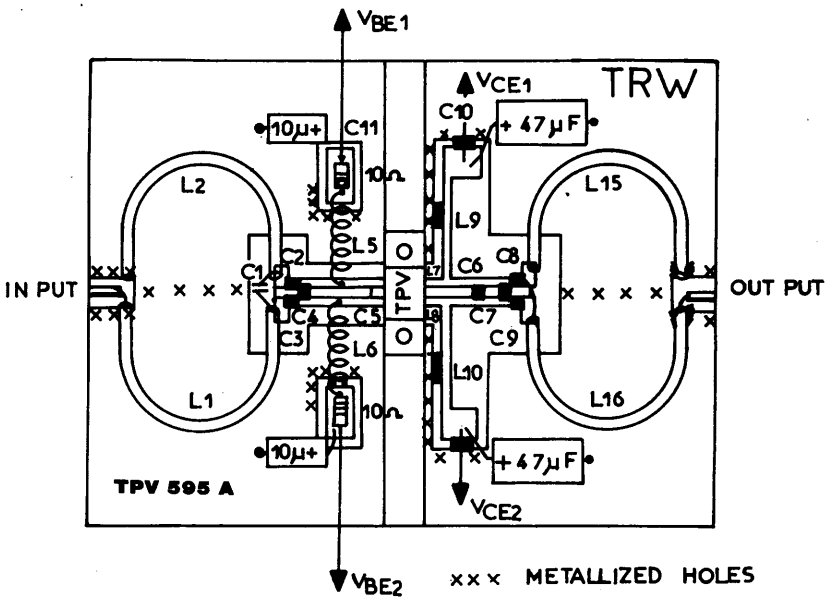


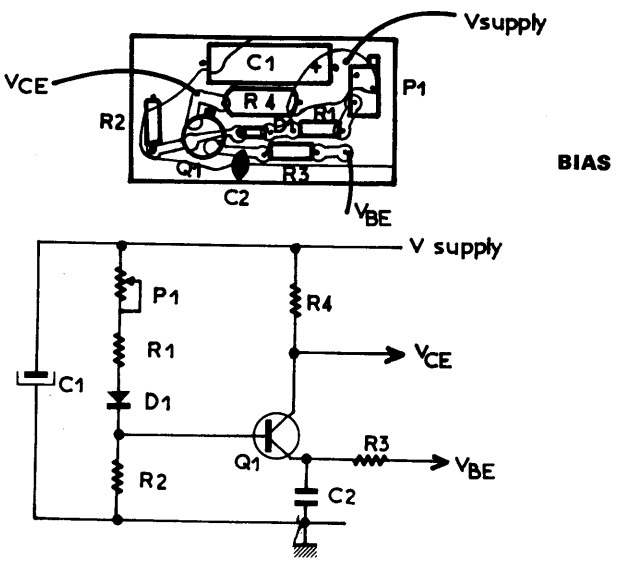
$L_1 = L_2 = L_{15} = L_{16}$ = 60 mm of 50 Ω - 2.2 mm semi rigid coax
$L_3 = L_4$ = 50 Ω line - 5.5 % λ g at 860 MHz
$L_5 = L_6$ = 3 turns ID 2 mm
$L_7 = L_8$ = 50 Ω line - 1.5 % λ g at 860 MHz
$L_9 = L_{10}$ = 50 Ω line - 4.9 % λ g at 860 MHz
$L_{11} = L_{12}$ = 50 Ω line - 2 % λ g at 860 MHz
$L_{13} = L_{14}$ = 50 Ω line - 1.5 % λ g at 860 MHz

C_1 = .5 — 4.5 pF GIGATRIM TRIMMER
$C_2 = C_3$ = 27 pF ATC 100 A
C_4 = 6.8 pF ATC 100 A
C_5 = 18 pF ATC 100 A
C_6 = 3.3 pF ATC 100 A
C_7 = 4.7 pF ATC 100 A
$C_8 = C_9$ = 27 pF ATC 100 A
C_{10} = + 330 pF ATC 100 B + 1 nF + 10 nF + 47 μF
C_{11} = 1 nF + 10 nF + 10 μF

470-860 MHz BROADBAND AMPLIFIER

Class A



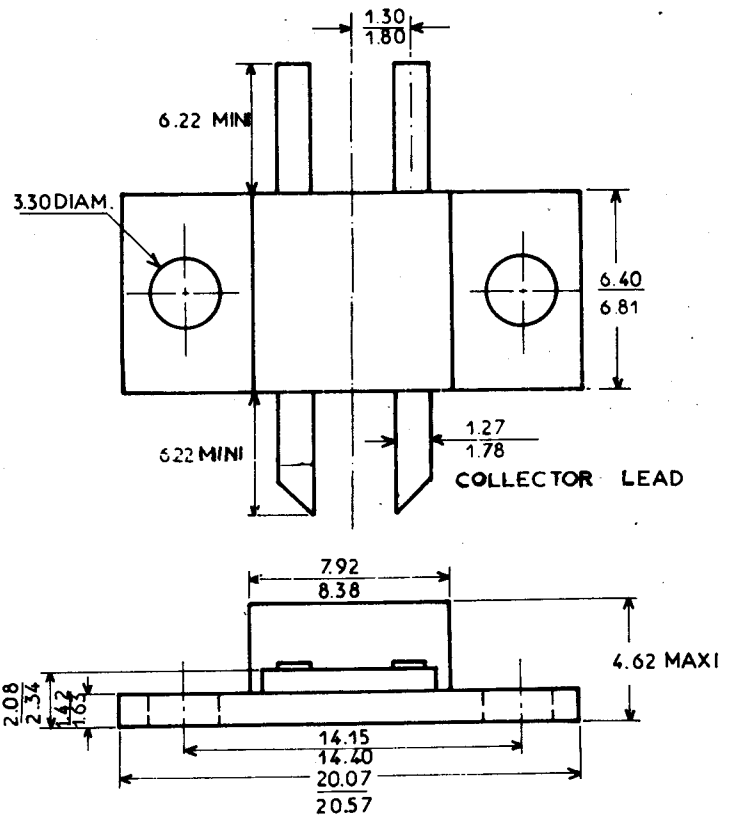


PART LIST

C_1 = 100 MF	R_2 = 5.6 KΩ	D_1 = 1 N 4148
C_2 = 10 nF	R_3 = 100 Ω	Q_1 = 2 N 2904
R_1 = 150 Ω	R_4 = 2.7 Ω 2 W.	P_1 = 1 K Ω

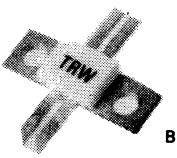
D

PACKAGE OUTLINE



UHF Linear Transistor

- 50 W Class AB
- TV Transmitter
- Band 4 & 5
- Push-Pull
- Gold Reliability



BMA-2

The TPV 5051 is a push-pull device incorporating gold mettalized dice and diffused emitter ballast resitors for linearity and ruggedness.

It provides 6.5 dB gain at 50 W and 860 MHz.

The TPV 5051 is specifically designed for high power vision only TV amplifiers operating in Bands IV or V.

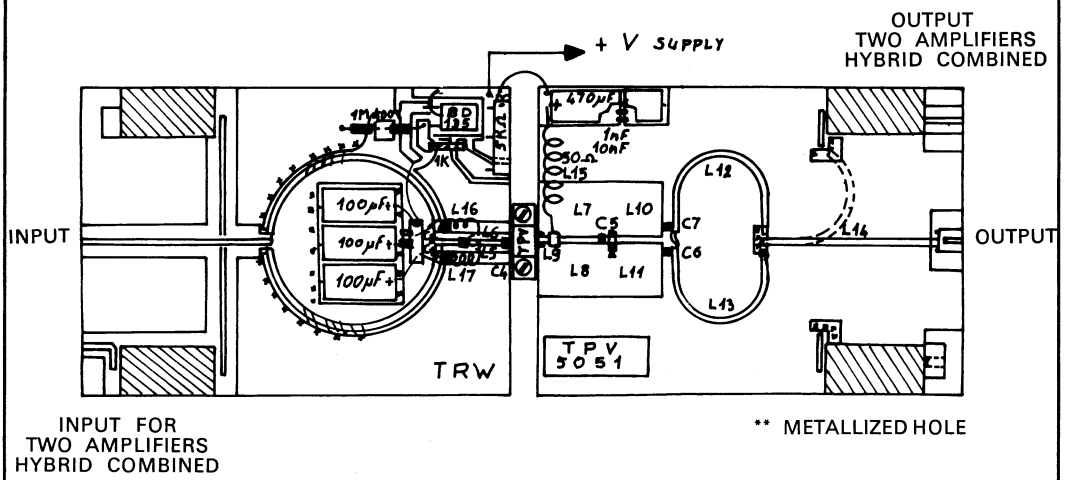
Electrical Characteristics (T_{case} = 25 °C)

	SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
DC Test each side	BV_{EBO}	Emitter - Base Breakdown Voltage	I_E = 6 mA	4			V
	BV_{ECO}	Collector Emitter Breakdown Voltage	I_C = 40 mA	30			V
	BV_{CBO}	Collector - Base Breakdown Voltage	I_C = 20 mA	45			V
	H_{FE}	D.C Current Gain	V_{CE} = 20 V I_C = 800 mA	10			
RF Test	P_G	Power Gain	V_{CE} = 28 V I_q = 2 X 100 mA F = 860 MHz P_{out} = 50 W	6.5	7		dB
	η_C	Collector Efficiency		45	50		%
Thermal	Cob/Side	Collector - Base Capitance	V_{CB} = 28 V F = 1 MHz			40	pF
	θ_{JC}	Thermal Resistance Junction - Case	— High resolution — T_{case} = 70 °C — Rated output power			1.8	°C/W
	θ_{CH}	Thermal Resistance Case Heatsink			0.2		°C/W
	T_{STG}	Storage Temperature		— 65		+ 200	°C

TYPICAL APPLICATION

600-860 MHz BROADBAND AMPLIFIER CLASS A-B

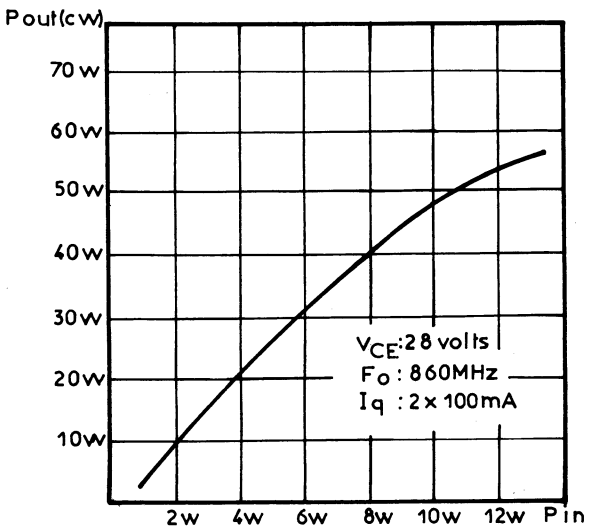
CIRCUIT LAYOUT



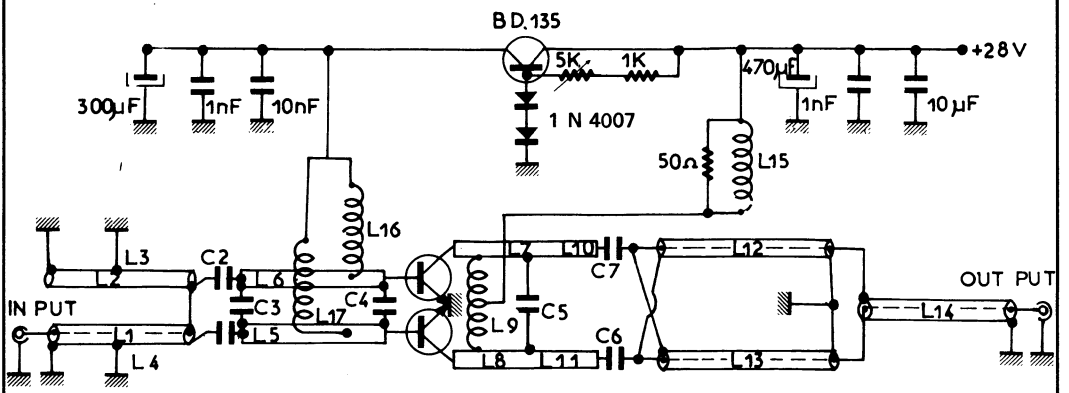
INPUT FOR
TWO AMPLIFIERS
HYBRID COMBINED

** METALLIZED HOLE

TYPICAL OUTPUT POWER US INPUT POWER



600-860 MHz CIRCUIT DIAGRAM



$L_1 = L_2$ = 70 mm of 50 Ω semi rigid coax — ⌀ 2.2 mm
$L_3 = L_4$ = 50 Ω micro-strip line — 17 % λ g at 860 MHz
$L_5 = L_6$ = 40 Ω micro-strip line — 6 % λ g at 860 MHz
$L_7 = L_8$ = 10 Ω micro-strip line — 6 % λ g at 860 MHz

L_9 = 

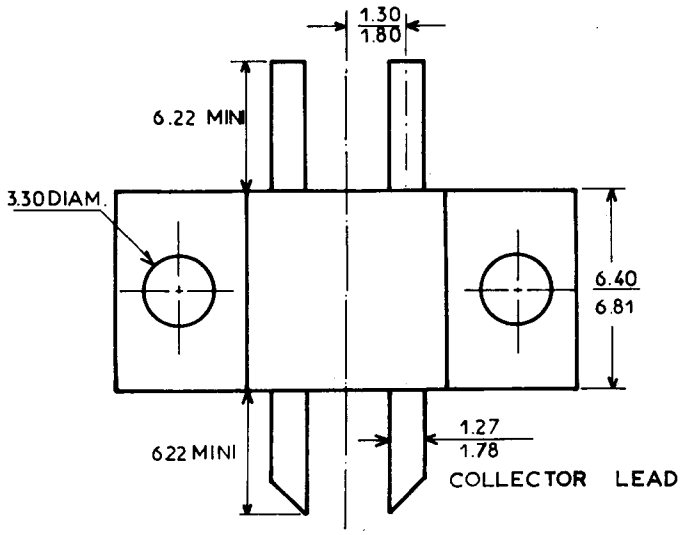
cooper ribbon

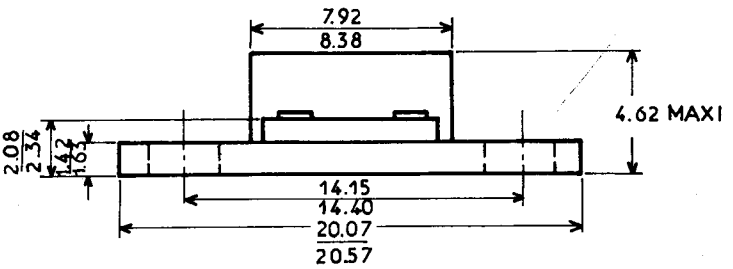
$L_{10} = L_{11}$ = 12 Ω micro-strip line — 6 % λ g at 860 MHz
$L_{12} = L_{13}$ = 25 Ω semi-rigid — 50 mm long
L_{14} = 50 Ω semi-rigid — 47 mm long

$C_1 = C_2$ = 8.2 pF ATC 100 A
C_3 = 2.2 pF ATC 100 A + .5 — 4.5 pF GIGATRIM TRIMMER
C_4 = 12 pF + 4.7 pF ATC 100 A
C_5 = 10 pF ATC 100 A + .5 — 4.5 pF GIGATRIM TRIMMER
$C_6 = C_7$ = 100 pF ATC 100 A
L_{15} = 3 turns — wire 1 mm — ID 5 mm
$L_{16} = L_{17}$ = 6 turns — wire .5 mm — ID 2 mm

D

PACKAGE OUTLINE





DIMENSIONS GIVEN IN mm