

PTB 20237

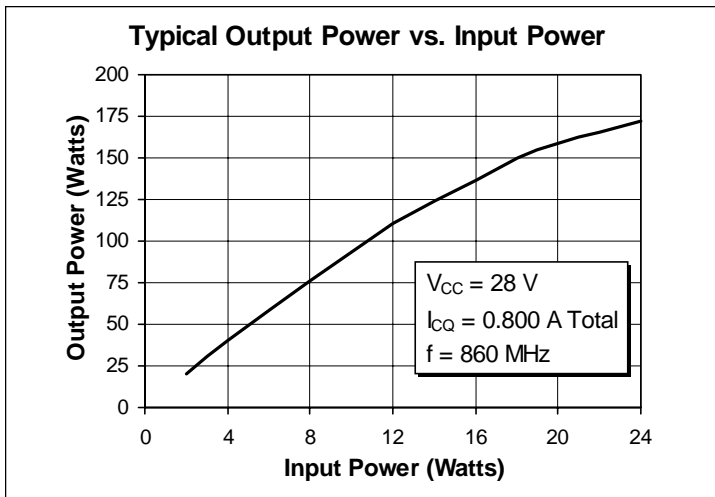
150 Watts, 470–860 MHz

UHF TV Power Transistor

Description

The 20237 is a class AB, NPN, common emitter UHF TV power transistor intended for 28 Vdc operation from 470 to 860 MHz. Rated at 150 watts minimum output power, it may be used for both CW and PEP applications. Ion implantation, nitride surface passivation and gold metallization ensure excellent device reliability. 100% lot traceability is standard.

- 470–860 MHz, 28 Volts
- Class AB Characteristics
- 50% Collector Efficiency at 150 Watts
- Gold Metallization
- Silicon Nitride Passivated



Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CER}	55	Vdc
Collector-Base Voltage	V_{CBO}	60	Vdc
Emitter-Base Voltage (collector open)	V_{EBO}	4	Vdc
Collector Current (continuous)	I_C	25	Adc
Total Device Dissipation at $T_{flange} = 25^{\circ}C$ Above $25^{\circ}C$ derate by	P_D	330 1.89	Watts W/ $^{\circ}C$
Storage Temperature Range	T_{STG}	-40 to +150	$^{\circ}C$
Thermal Resistance ($T_{flange} = 70^{\circ}C$)	$R_{\theta JC}$	0.53	$^{\circ}C/W$

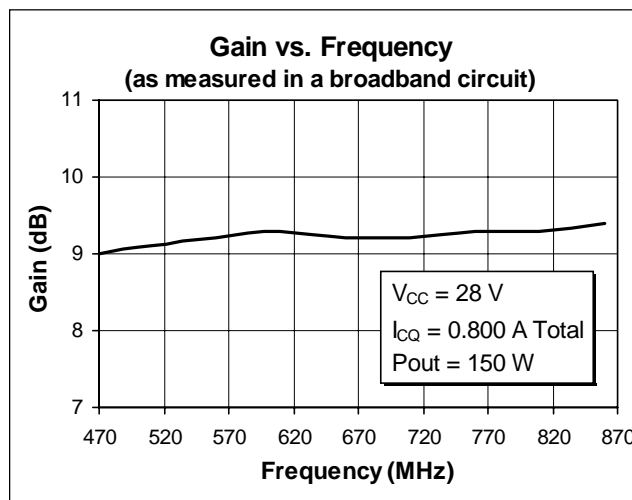
Electrical Characteristics (100% Tested)

Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Breakdown Voltage C to E	$I_C = 0\text{ A}, I_B = 100\text{ A}$	$V_{(BR)CEO}$	28	30	—	Volts
Breakdown Voltage E to B	$I_C = 0\text{ A}, I_E = 5\text{ mA}$	$V_{(BR)EBO}$	3.5	5	—	Volts
DC Current Gain	$V_{CE} = 5\text{ V}, I_C = 1\text{ mA}$	h_{FE}	20	50	100	—

RF Specifications (100% Tested)

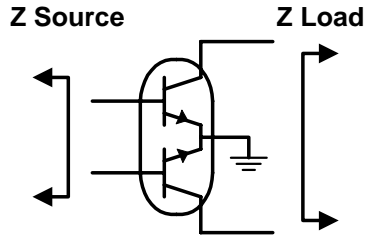
Characteristic	Symbol	Min	Typ	Max	Units
Gain ($V_{CC} = 28\text{ Vdc}, P_{OUT} = 150\text{ W}, I_{CQ} = 800\text{ mA Total}, f = 470, 860\text{ MHz}$)	G_{pe}	8	9	—	dB
Collector Efficiency ($V_{CC} = 28\text{ Vdc}, P_{OUT} = 150\text{ W}, I_{CQ} = 800\text{ mA Total}, f = 470, 860\text{ MHz}$)	η_C	50	—	—	%
Intermodulation Distortion ($V_{CC} = 28\text{ Vdc}, I_{CQ} = 800\text{ mA Total}, P_{OUT} = 100\text{ W(PEP)}, f_1 = 855.25\text{ MHz}, \text{Vision} = -8\text{ dB}, f_2 = 859.75\text{ MHz}, \text{Subcarrier} = -16\text{ dB}, f_3 = 860.75\text{ MHz}, \text{Sound} = -10\text{ dB}$)	IMD	—	-44	—	dBc
Load Mismatch Tolerance ($V_{CC} = 28\text{ Vdc}, P_{OUT} = 150\text{ W(PEP)}, I_{CQ} = 800\text{ mA Total}, f_1 = 860.0\text{ MHz}, f_2 = 860.1$ —all phase angles at frequency of test)	Ψ	—	—	3:1	—

Typical Performance

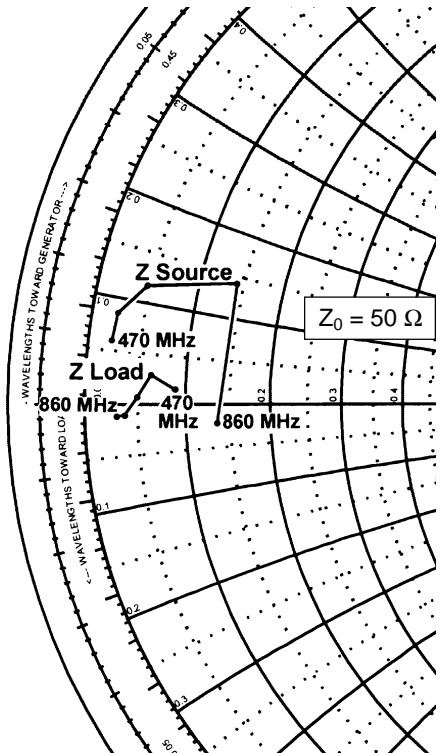


Impedance Data (shown for fixed-tuned broadband circuit)

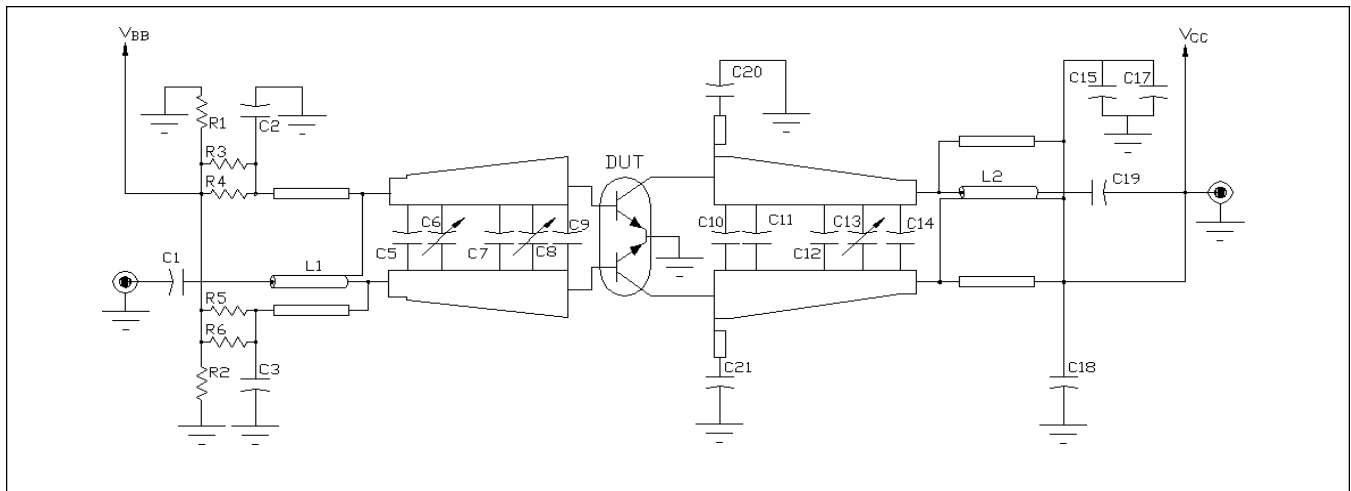
$V_{CC} = 28 \text{ Vdc}$, $P_{OUT} = 150 \text{ W}$, $I_{CQ} = 800 \text{ mA Total}$



Frequency MHz	Z Source		Z Load	
	R	jX	R	jX
470	1.10	3.00	4.40	0.80
560	1.20	4.30	3.15	1.50
665	2.35	5.85	2.50	0.35
760	7.10	7.10	1.85	-0.55
860	6.75	-1.10	1.50	-0.60

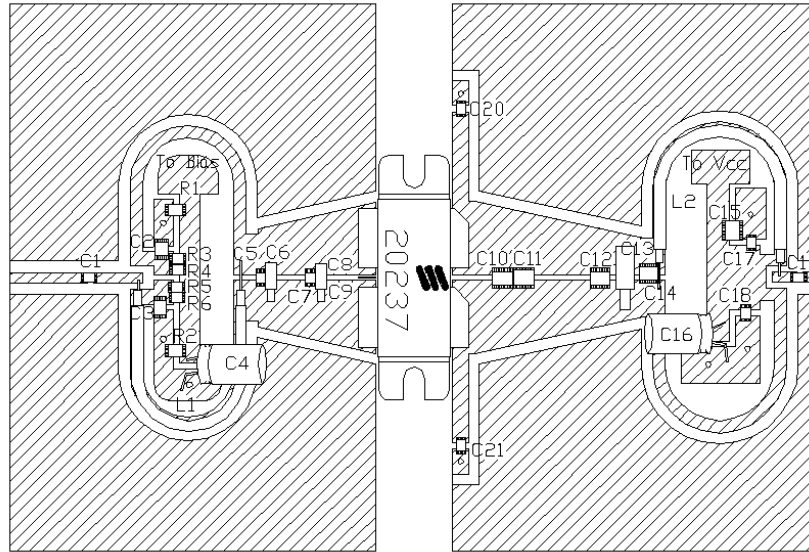


Test Circuit

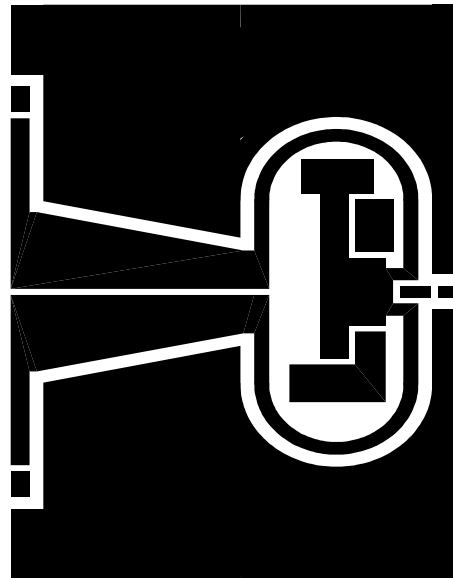
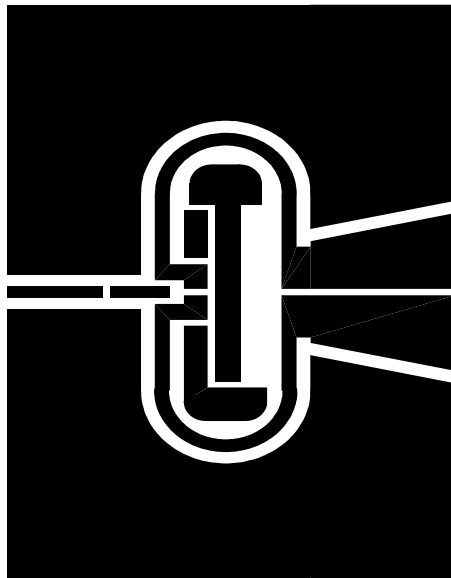


Schematic for broadband test fixture ($f = 470-860$)

DUT	20237		C14	7.5 pF	ATC 100B
C1	10 pF	ATC 100A	C15	75 pF	ATC 100B
C2, 3	0.001 uF	ATC 100B	C17, 18	0.1 uF	1206 Chip
C4, 16	100 uF, 50 V	Electrolytic Capacitor	C19	22 pF	ATC 100B
C5,7	3.6 pF	ATC 100B	C20, 21	100 pF	ATC 100A
C6, 8	0.35-3.5 pF	Johanson Trimmer	L1		25 Ω , Semi-rigid Balun
C9	15 pF	Dialectric Labs	L2		25 Ω , Semi-rigid Balun
C10	7.5 pF	ATC 100B	R1	100 Ω	Chip Resistor
C11	12 pF	ATC 100B	R2	100 Ω	Chip Resistor
C12	8.2 pF	ATC 100B	R3-6	1 Ω	Chip Resistor
C13	0.35-3.5 pF	Johanson Trimmer	Circuit Board		Copper Clad PTFE $\epsilon_r = 2.5$, .031" Thick



Components Layout (not to scale)



Artwork (1 inch )