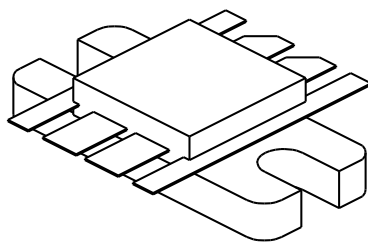


# UTV120

12 Watts, 26.5 Volts, Class A  
UHF Television - Band IV & V

<p><b>GENERAL DESCRIPTION</b></p> <p>The UTV 120 is a COMMON EMITTER transistor capable of providing 12 Watts Peak, Class A, RF Output Power over the band 470 - 860 MHz. The transistor includes double input prematching for full broadband capability. Gold Metalization and Diffused Ballasting are used to provide high reliability and supreme ruggedness.</p>	<p><b>CASE OUTLINE</b> <b>55JT, STYLE 2</b></p> 
<p><b>ABSOLUTE MAXIMUM RATINGS</b></p> <p>Maximum Power Dissipation @ 25°C <span style="float: right;">80 Watts</span></p> <p><b>Maximum Voltage and Current</b></p> <p>BVces Collector to Emitter Voltage <span style="float: right;">45 Volts</span>          BVceo Collector to Emitter Voltage <span style="float: right;">28 Volts</span>          BVebo Emitter to Base Voltage <span style="float: right;">4 Volts</span>          Ic Collector Current <span style="float: right;">3.5 Amps</span></p> <p><b>Maximum Temperatures</b></p> <p>Storage Temperature <span style="float: right;">- 65 to + 150°C</span>          Operating Junction Temperature <span style="float: right;">+ 200°C</span></p>	

## ELECTRICAL CHARACTERISTICS @ 25 °C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>Pout</b>	Power Out - Pk Sync	F = 470 - 860 MHz	12			Watts
<b>Pin</b>	Power Input	Vcc = 26.5 Volts			1.55	Watts
<b>Pg</b>	Power Gain	Ic = 1.7 Amps	8.9	9.5		dB
<b>IMD<sup>1</sup></b>	Intermodulation Distortion	Pref = 12 Watts			-52	dB
<b>VSWR<sub>1</sub></b>	Load Mismatch Tolerance	F = 860 MHz			3:1	

<b>LVceo<sup>2</sup></b>	Collector to Emitter	Ic = 65 mA	28			Volts
<b>BVces<sup>2</sup></b>	Breakdown	Ic = 25 mA	45			Volts
<b>BVebo<sup>2</sup></b>	Collector to Base Breakdown	Ie = 10 mA	4			Volts
<b>h<sub>FE</sub><sup>2</sup></b>	Emitter to Base Breakdown	Vce = 5 V, 500 mA	10			
<b>Cob<sup>2</sup></b>	Current Gain	Vcb = 26 V, F = 1		23		pF
<b>θjc</b>	Output Capacitance	MHz			1.6	°C/W
	Thermal Resistance	Tc = 25°C				

Note 1: F1=860 MHz, F2=863.5 MHz, F3=864.5 Mhz

European test method, Vision = - 8dB, Sideband= - 16dB, Sound = -7 dB

Note 2: Per side

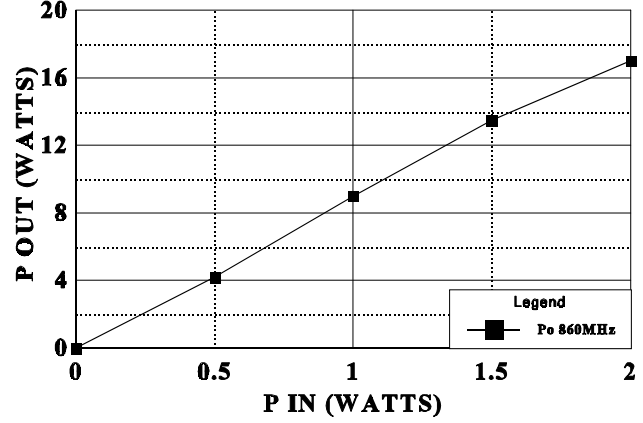
Initial Issue June, 1994

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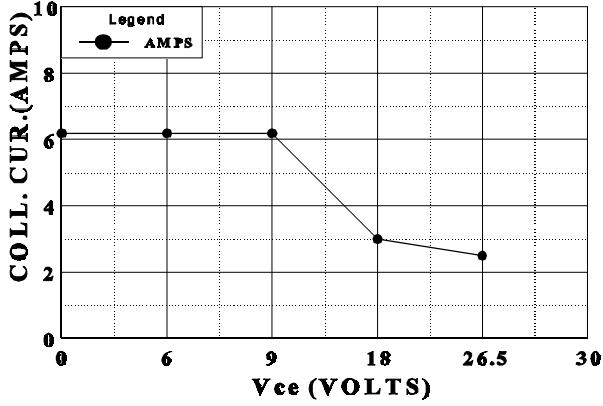


**POWER OUTPUT vs POWER INPUT**

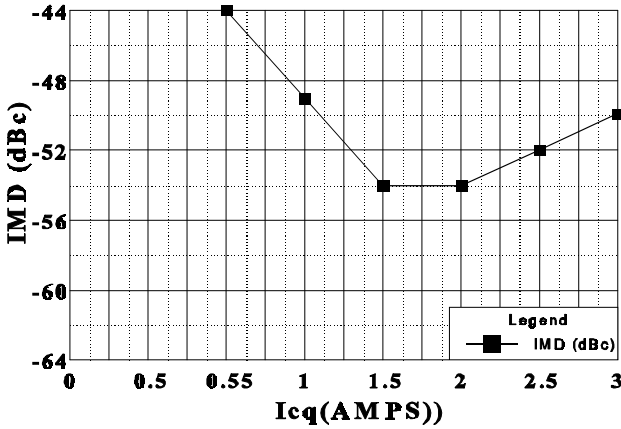
Vcc = 26.5 Frequency 860MHz



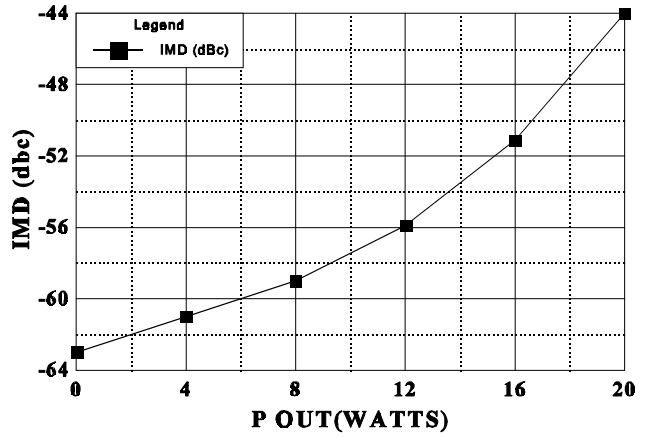
**DC SAFE OPERATING AREA**



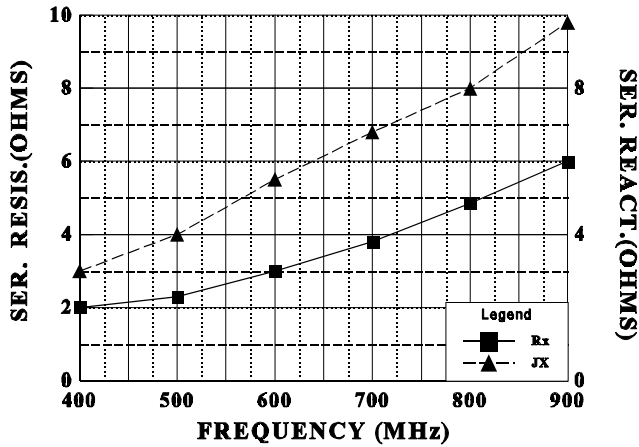
**IMD vs Icq**



**IMD vs P out**

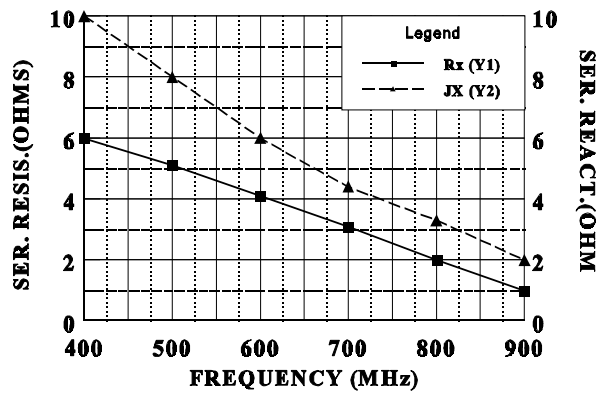


**SERIES INPUT IMPEDANCE vs FREQUENCY**

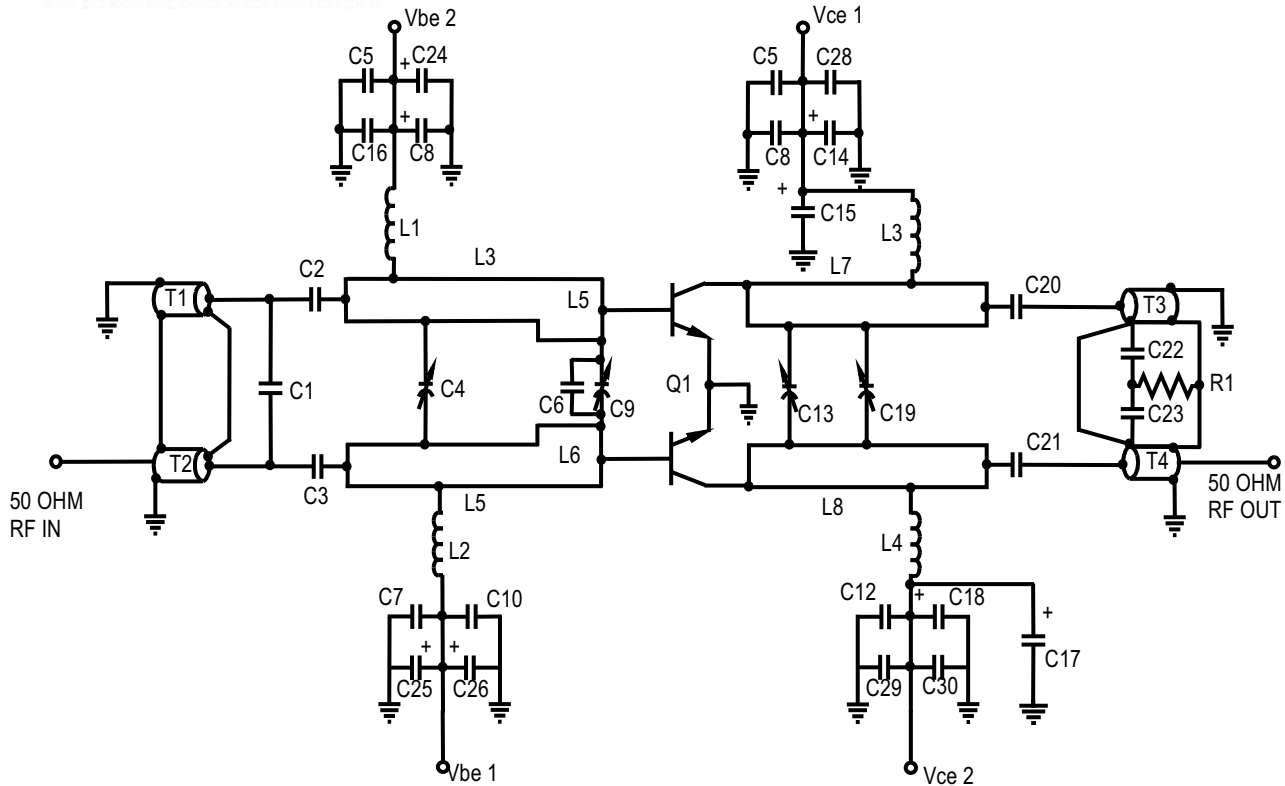


**SERIES LOAD IMPEDANCE vs FREQUENCY**

Vcc = 26.5V



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### CAPACITORS

C1,C6=4.7 pF ATC series A  
 C2,C3,C20,C21=33 pF ATC series A  
 C4,C9=1.2-3.5 pF film diel. trimmer  
 C5,C7,C11,C12=0.01 mF, 50V Tantalum  
 C8,C15,C17,C25=1 mF, 50 V Tantalum  
 C10,C16,C27,C12=0.1 mF 50 V disc ceramic  
 C13=0.6-6 pF piston trimmer  
 C19=0.35-3.5 pF piston trimmer  
 C18,C24,C14,C26=10 mF, 50 V  
 C28,C30=0.001 mF, 50 V disc ceramic  
 C31=100 mF, 50 V electrolytic

### RESISTORS

R1=10 Ohm, 1/2 W Carbon  
 R2,R6=500 Ohm potentiometer  
 R3,R7=4.7K Ohm, 3W, 1% Carbon  
 R4,R8=1 Ohm, 3W, 1% Carbon film  
 R5,R9=47 Ohm, 1/4W Carbon film

### DIODES

CR1,CR2=IN4148

### INDUCTORS

L1,L2=0.46 microHenry molded  
 L3,L4=1 turn #18 magnet wire on a 0.325" form

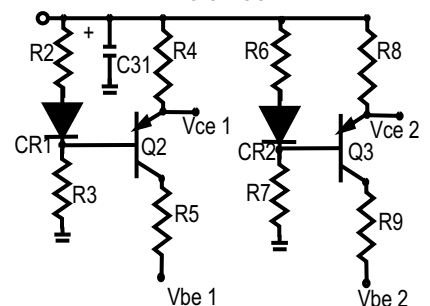
### TRANSISTORS

Q1=GHz UTV-120  
 Q2,Q3=MJE172

### TRANSFORMERS

T1,T2,T3,T4=50 Ohm semi-rigid coax cable  
 (0.056" X 1.1") soldered to  
 0.035" X 1.1" microstrip

### BIAS CIRCUIT



### MICROSTRIPLINES

L3,L4=0.075" X 0.65"  
 L5,L6=0.120" X 0.31"  
 L7,L8=0.120" X 1.33"