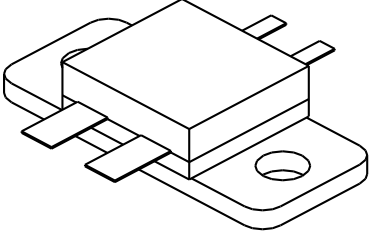


# UDR-500

500 Watts - 40 Volts, Pulsed  
Radar 400 - 450 MHz

<p><b>GENERAL DESCRIPTION</b> The UDR-500 is an internally matched, COMMON EMITTER transistor capable of providing 500 Watts of pulsed RF output power at sixty microseconds pulse width, two percent duty factor across the band 400-450 MHz. This hermetically solder sealed transistor is specifically designed for long pulse radar applications. It utilizes gold metalization and diffused emitter ballasting to provide high reliability and supreme ruggedness.</p>	<p><b>CASE OUTLINE</b> <b>55JV, STYLE 2</b></p> 													
<p><b>ABSOLUTE MAXIMUM RATINGS</b> Maximum Power Dissipation @ 25°C <span style="float: right;">1167 Watts</span></p> <p><b>Maximum Voltage and Current</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 15%;">BVces</td> <td style="width: 55%;">Collector to Emitter Voltage</td> <td style="width: 30%; text-align: right;">60 Volts</td> </tr> <tr> <td>BVebo</td> <td>Emitter to Base Voltage</td> <td style="text-align: right;">4.0 Volts</td> </tr> <tr> <td>Ic</td> <td>Collector Current</td> <td style="text-align: right;">35 Amps</td> </tr> </table> <p><b>Maximum Temperatures</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 55%;">Storage Temperature</td> <td style="text-align: right;">- 65 to + 200°C</td> </tr> <tr> <td>Operating Junction Temperature</td> <td style="text-align: right;">+ 200°C</td> </tr> </table>	BVces	Collector to Emitter Voltage	60 Volts	BVebo	Emitter to Base Voltage	4.0 Volts	Ic	Collector Current	35 Amps	Storage Temperature	- 65 to + 200°C	Operating Junction Temperature	+ 200°C	
BVces	Collector to Emitter Voltage	60 Volts												
BVebo	Emitter to Base Voltage	4.0 Volts												
Ic	Collector Current	35 Amps												
Storage Temperature	- 65 to + 200°C													
Operating Junction Temperature	+ 200°C													

## ELECTRICAL CHARACTERISTICS @ 25 °C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
<b>Pout</b>	Power Out	F = 450 MHz	500	535		Watts
<b>Pin</b>	Power Input	Vcc = 40 Volts			70	Watts
<b>Pg</b>	Power Gain	Pulse Width = 60 μs	8.5			d B
<b>ηc</b>	Collector Efficiency	Duty = 2%		60		%
<b>VSWR</b>	Load Mismatch Tolerance	Rated Conditions			5:1	

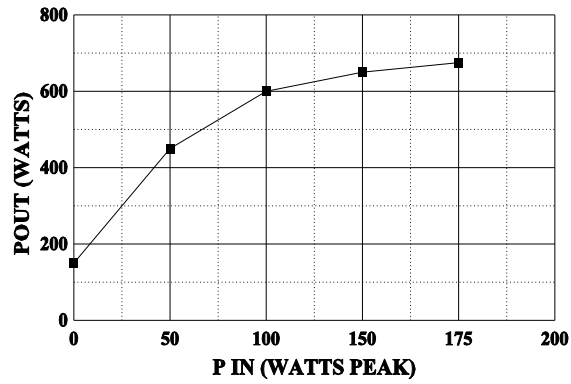
<b>BVces</b>	Collector to Emitter Breakdown	Ic = 50 mA	70			Volts
<b>BVceo</b>	Collector to Emitter Breakdown	Ic = 30 mA	30			Volts
<b>BVebo</b>	Emitter to Base Breakdown	Ie = 20 mA	4.0			
<b>Hfe</b>	DC Current Gain	Vce = 5 V, Ic = 1A	20			
<b>Cob</b>	Output Capacitance	Vcb = 40V, F = 1 MHz		60		
<b>θjc</b>	Thermal Resistance	Rated Pulse Condition			0.15	°C/W

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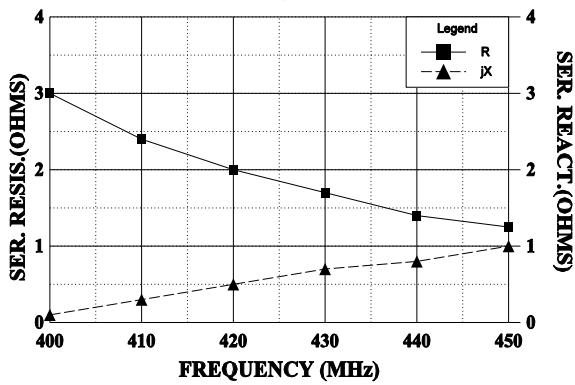
**POWER OUTPUT vs POWER INPUT**

Vcc=40V, f=450MHz, 60 usec @2% Duty



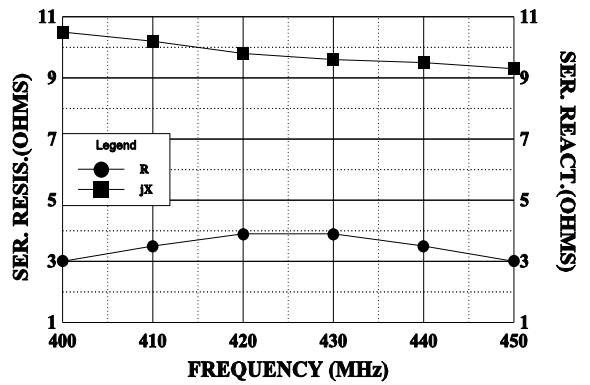
**SERIES LOAD IMPEDANCE vs FREQUENCY**

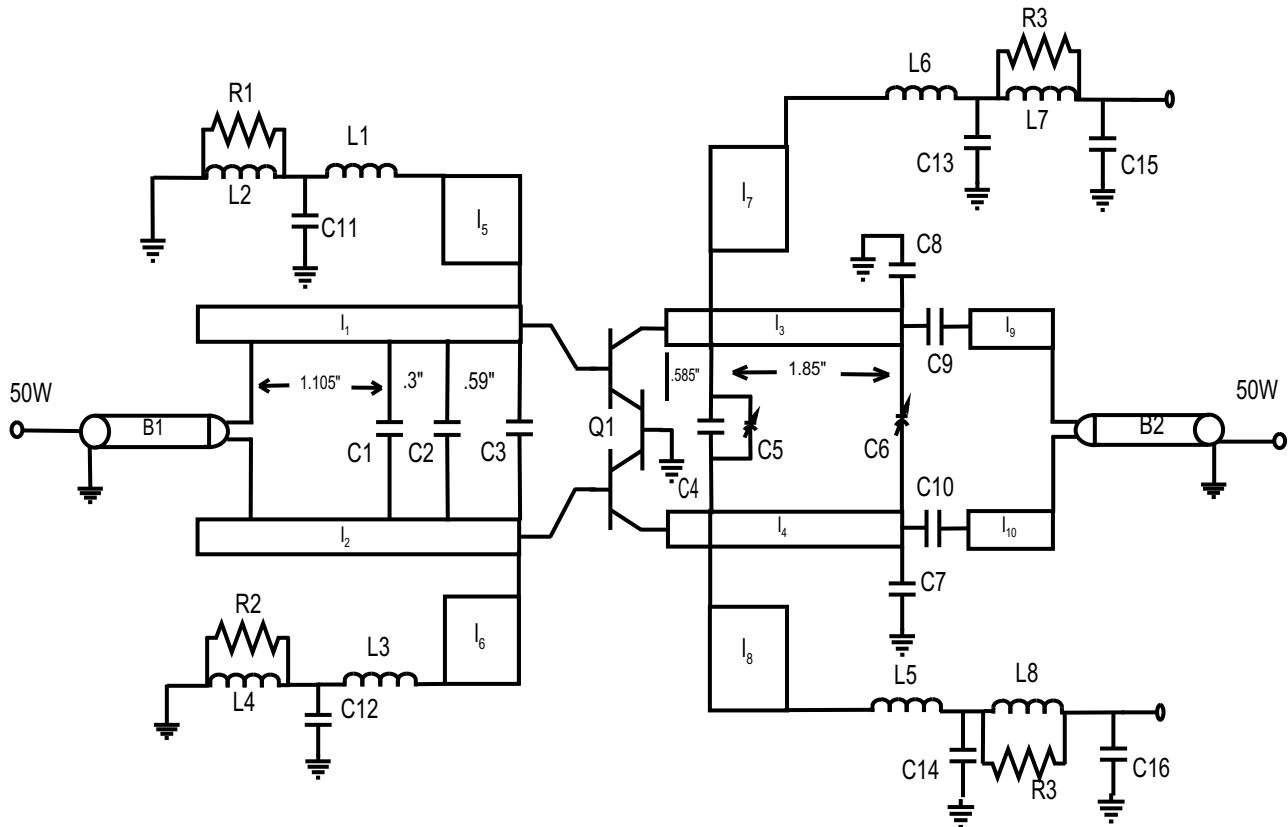
Pout=500W, Vcc=40V



**SERIES INPUT IMPEDANCE vs FREQUENCY**

Pout=500W, Vcc=40V





PC BOARD MATERIAL 0.015" TEFLON FIBERGLASS

B1, B2=Balun 50W semi-rigid coax 5.1" long

$I_1, I_2=25W, .149=.070"W \times 2.76"L$

$I_3, I_4=25W, .132=.070"W \times 2.43"L$

$I_5, I_6=7.3W, .038=.3"W \times .6864"L$

$I_7, I_8=2.7W, .045=.840"W \times .8"L$

$I_9, I_{10}=25W, .0162=0.70"W \times .3"L$

C1=12pf, ATC "B" (100MIL)  
 C2=6.2pf, ATC "B" (100MIL)  
 C3=5.6pf, Dielectric Labs  
 C4=20pf, ATC "B" (100MIL)  
 C5,C6=.3-3.5pf, Johanson Piston Trimmer  
 C7,C8=5.2pf, ATC "B" (100MIL)  
 C9,C10=180pf, ATC "B" (100MIL)  
 C11,C12,C13,C14=470pf, ATC "B" (100MIL)  
 C15,C16=50mf, 50 WVDC Electrolytic

R1,R2=15W, 1/2 watt

R3,R4=15W, 1 watt

L1,L3=1 1/2 turns #18 AWG on .250 I.D

L2,L4=4 turns #16 AWG on Indiana General ferrite toroid #FG27-8

L5,L6=2 mil copper strap .6" x .0625"

L7,L8=5 turns #16 AWG on Indiana General ferrite toroid #F624-19