

UDR-500

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

GENERAL DESCRIPTION

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.

ABSOLUTE MAXIMUM RATINGS

Maximum Power Dissipation @ 25°C 1167 Watts

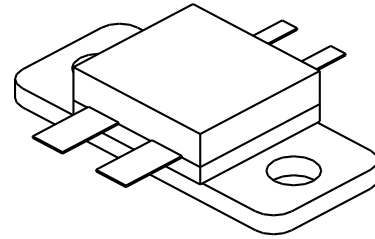
Maximum Voltage and Current

BVces	Collector to Emitter Voltage	60 Volts
BVebo	Emitter to Base Voltage	4.0 Volts
Ic	Collector Current	35 Amps

Maximum Temperatures

Storage Temperature	- 65 to + 200°C
Operating Junction Temperature	+ 200°C

CASE OUTLINE 55JV, STYLE 2



ELECTRICAL CHARACTERISTICS @ 25 °C

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

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

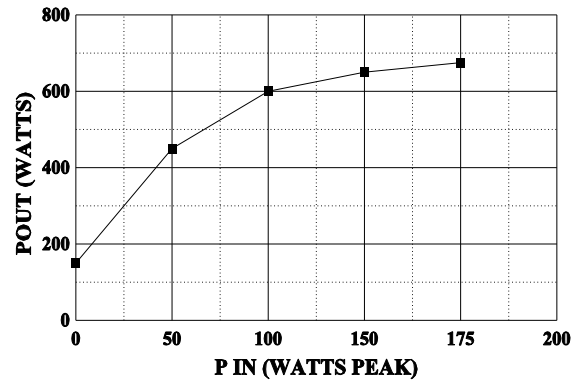
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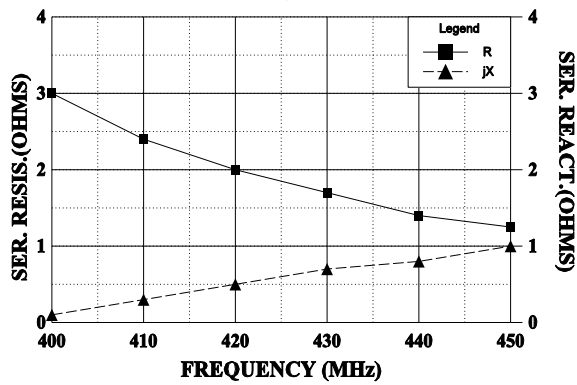
POWER OUTPUT vs POWER INPUT

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



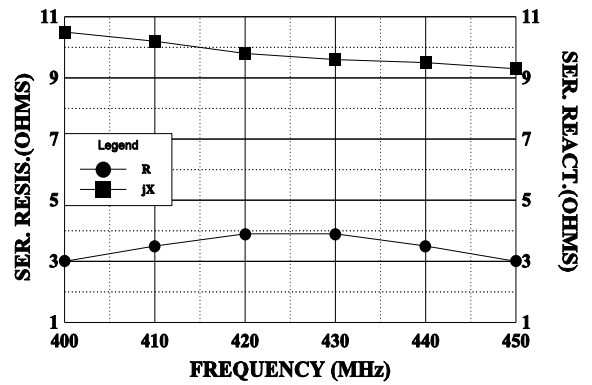
SERIES LOAD IMPEDANCE vs FREQUENCY

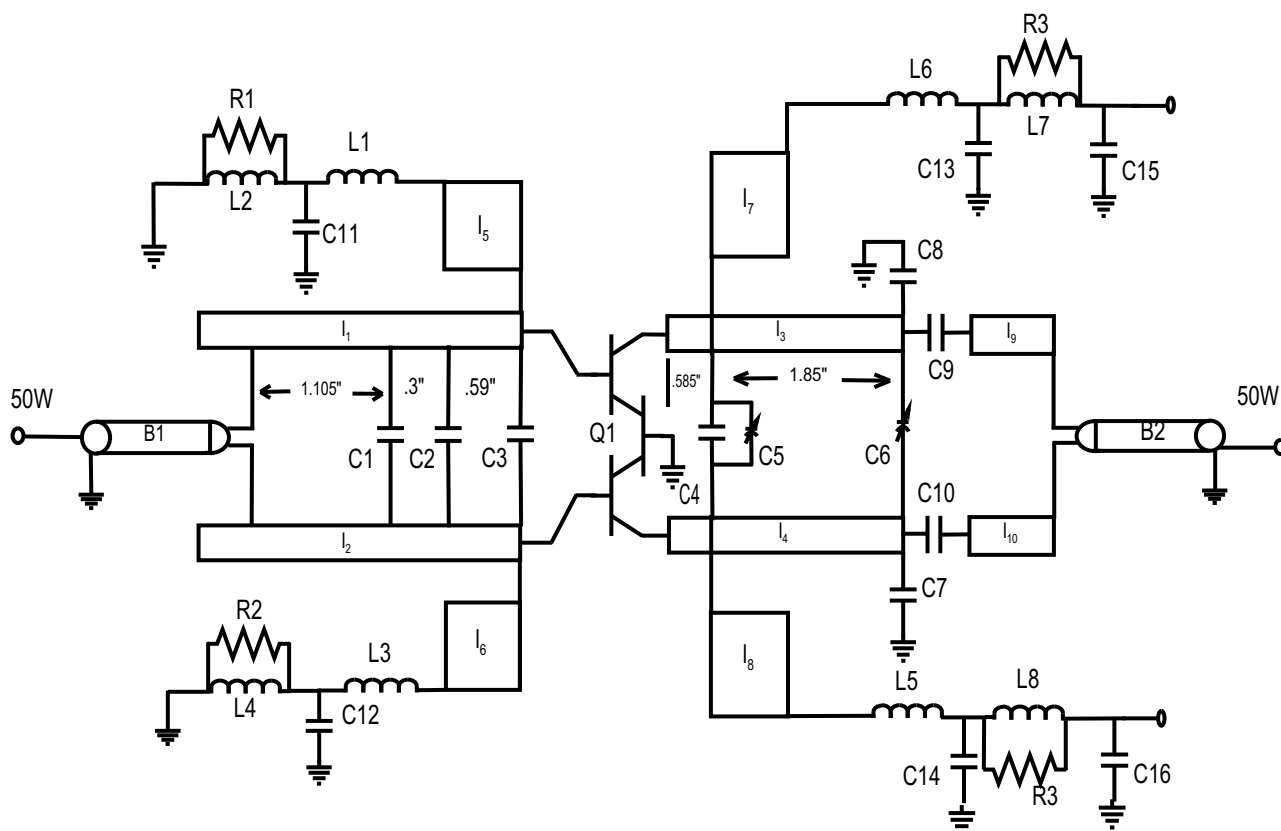
Pout=500W, Vcc=40V



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

I₁, I₂=25W, .149=.070"W x 2.76"L

I₃, I₄=25W, .132=.070"W x 2.43"L

I₅, I₆=7.3W, .038=.3"W x .6864"L

I₇, I₈=2.7W, .045=.840"W x .8"L

I₉, I₁₀=25W, .0162=0.70"W x .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