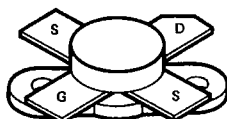


DV2820S**N-Channel Enhancement - Mode
RF Power FETs****HF/VHF Amplifiers Class A, B or C
High Dynamic Range Amp.****175MHz
20-35V
20W
10dB****FEATURES**

Package Type S

- 20:1 VSWR
- No Thermal Runaway
- Broadband Capability
- Class A, B, C, D, E
- Low Noise Figure
- High Dynamic Range
- Simple Bias Circuitry
- S-Parameter Design



.380 SOE Flange

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Gate-Source Voltage	20V	Total Device Dissipation	40W
Drain-Source Voltage	80V	Thermal Resistance, Junction to Case	4.4°C/W
Drain-Gate Voltage	80V	Junction Temperature	200°C
Drain Current (DC)	2A	Storage Temperature	-65°C to 150°C

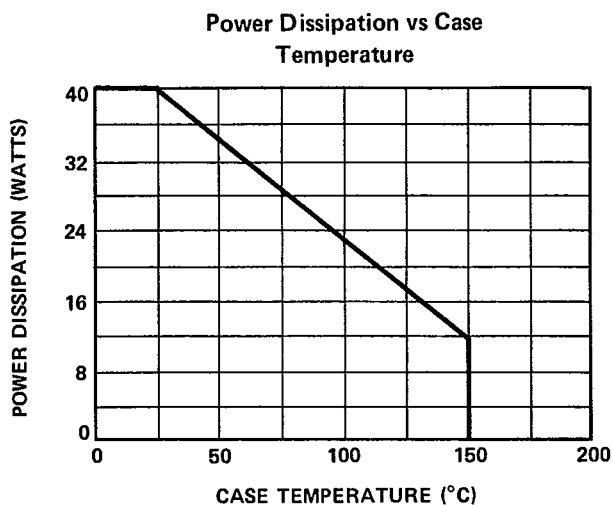
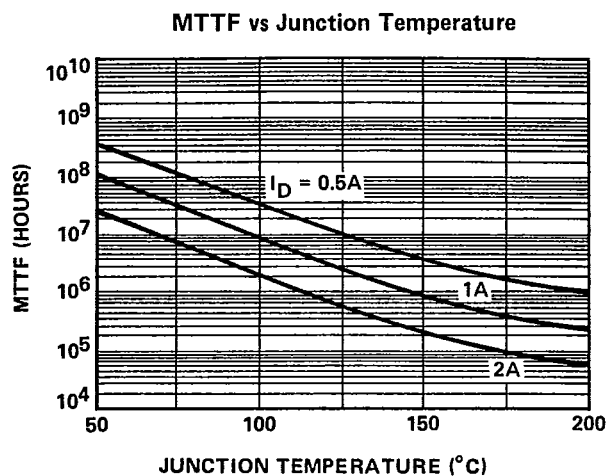
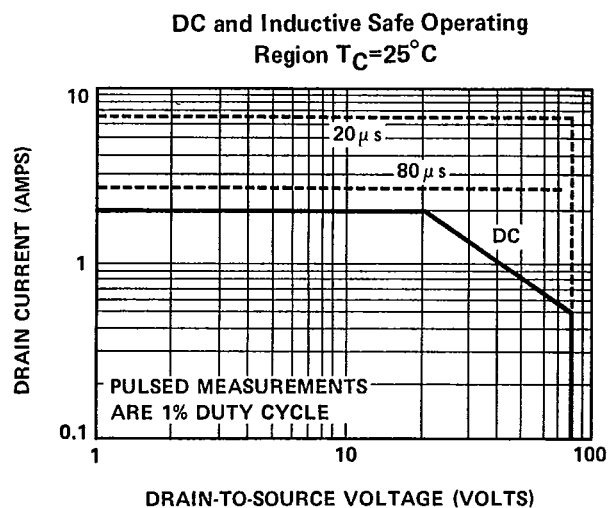
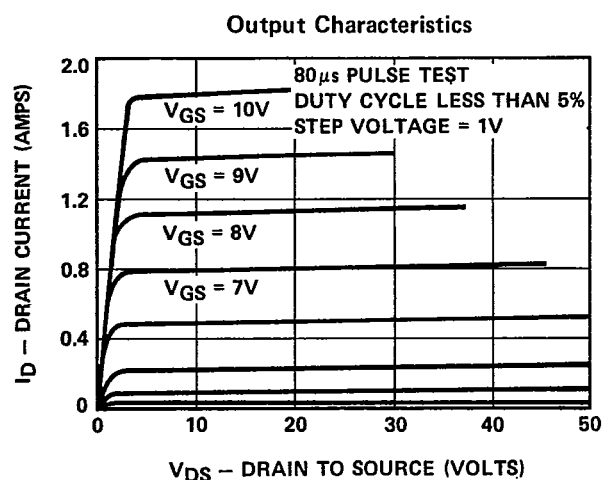
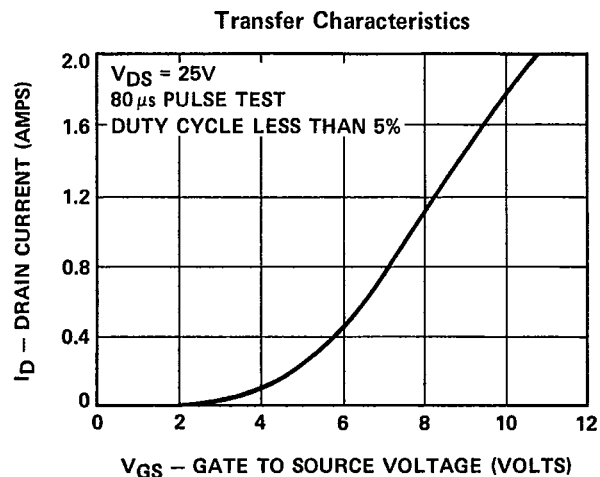
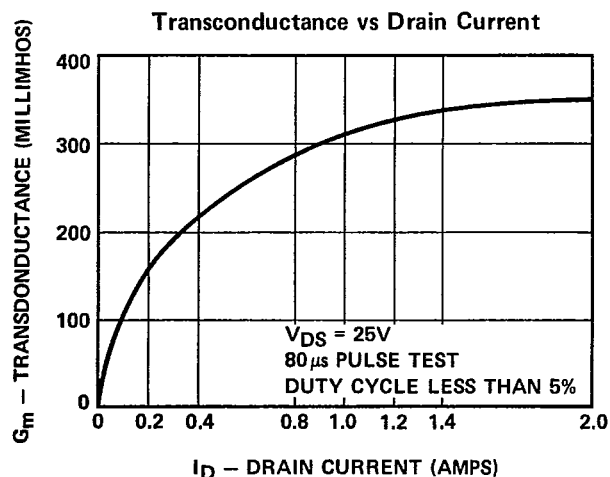
ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	80			V	$V_{GS} = 0V, I_D = 5\text{ mA}$
I_{DSS}	Drain-Source Leakage Current			1	mA	$V_{GS} = 0V, V_{DS} = 30V$
I_{GSS}	Gate-Source Leakage Current			100	nA	$V_{GS} = 20V, V_{DS} = 0V$
g_m	D.C. Forward Transconductance ¹	0.2	0.3		mho	$V_{DS} = 10V, I_D = 1A, \Delta V_{GS} = 1.0V$
$I_{D(on)}$	On-State Drain Current ¹		1.8		A	$V_{DS} = 30V, V_{GS} = 10V$
$V_{GS(th)}$	Gate Threshold Voltage	2		6	V	$V_{GS} = V_{DS}, I_D = 100\text{ mA}$
C_{iss}	Common-Source Input Capacitance			50	pF	$V_{GS} = 0V, V_{DS} = 30V, f = 1.0\text{ MHz}$
C_{oss}	Common-Source Output Capacitance			40	pF	$V_{GS} = 0V, V_{DS} = 30V, f = 1.0\text{ MHz}$
C_{rss}	Reverse Transfer Capacitance			7.5	pF	$V_{GS} = 0V, V_{DS} = 30V, f = 1.0\text{ MHz}$
G_{ps}	Common-Source Power Gain	10			dB	$V_{DD} = 28V, P_o = 20W, f = 175\text{ MHz}, I_{DQ} = 0.1A$
η	Drain Efficiency	55	60		%	$V_{DD} = 28V, P_o = 20W, f = 175\text{ MHz}, I_{DQ} = 0.1A$
VSWR	Load Mismatch Tolerance	20:1				$V_{DD} = 28V, P_o = 20W, f = 175\text{ MHz}, I_{DQ} = 0.1A$
N.F.	Noise Figure		5.6		dB	$V_{DS} = 28V, I_D = 0.1A, f = 175\text{ MHz}$

Note 1: Pulse test — 80 μs to 300 μs , 1% duty cycle.

2: All devices 100% DC/RF tested.

TYPICAL PERFORMANCE CURVES (25°C unless otherwise noted)

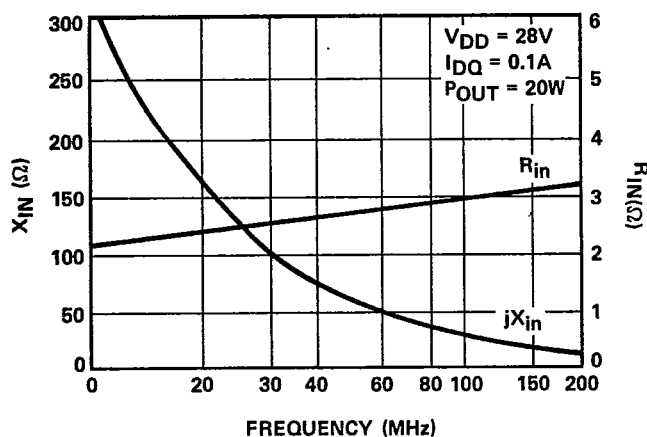


POLAR S-PARAMETERS DV2820S IN
50.0 OHM SYSTEM

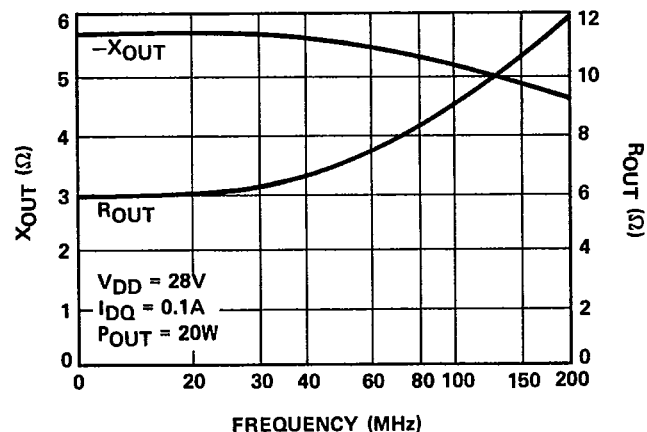
Freq (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	(Magn)	Angl)	(Magn)	Angl)	(Magn)	Angl)	(Magn)	Angl)
10	.93	-36	22.13	150	.03	63	.83	-35
20	.89	-67	18.84	134	.05	50	.78	-65
30	.84	-91	15.85	124	.06	41	.72	-85
40	.79	-107	12.59	113	.06	32	.69	-102
50	.76	-120	10.00	99	.07	19	.65	-114
60	.73	-129	8.41	91	.07	15	.62	-121
70	.72	-137	7.5	85	.07	12	.62	-128
80	.72	-142	6.31	80	.07	9	.62	-133
90	.72	-147	5.31	76	.06	8	.62	-139
100	.72	-151	5.01	73	.06	7	.62	-142
120	.73	-156	3.98	66	.06	6	.64	-148
140	.75	-162	3.35	61	.06	6	.66	-153
160	.76	-166	2.82	56	.06	7	.68	-157
180	.78	-169	2.37	53	.05	11	.71	-162
200	.79	-173	2.04	50	.05	14	.73	-165
225	.80	-175	1.78	45	.05	17	.78	-168
250	.81	180	1.51	40	.05	21	.78	-171
275	.82	175	1.29	37	.05	26	.79	-174
300	.82	173	1.12	35	.05	30	.80	-175
325	.83	171	.99	33	.05	36	.80	-176
350	.84	170	.87	31	.05	40	.81	-176
375	.84	169	.79	30	.06	45	.82	-177

Conditions: 28V @ 450 mA

Series Equivalent Input Impedance
vs Frequency

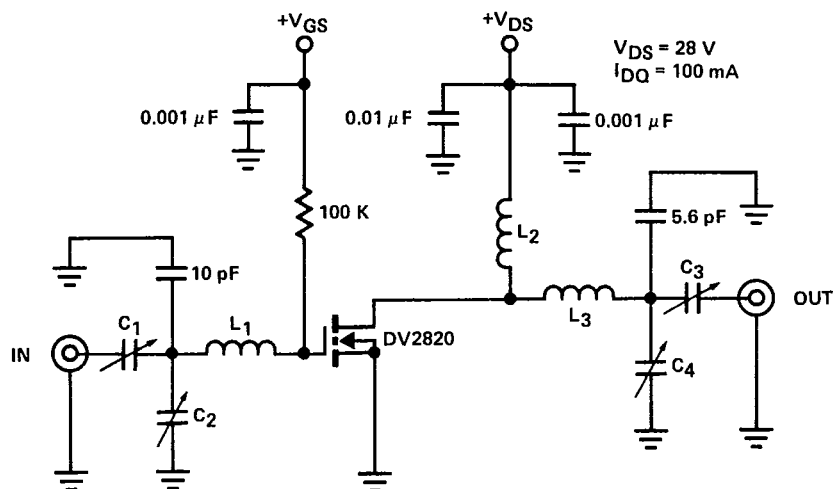


Series Equivalent Output Impedance
vs Frequency



TEST FIXTURE

DV2820 175MHz



Parts List

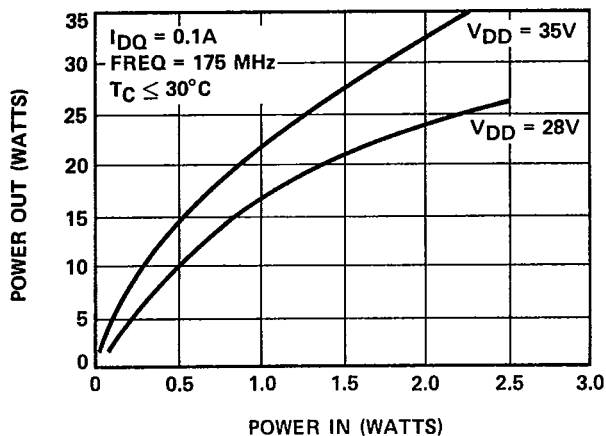
C1, C3, 5–80 pF

C2, C4, 3–30 pF

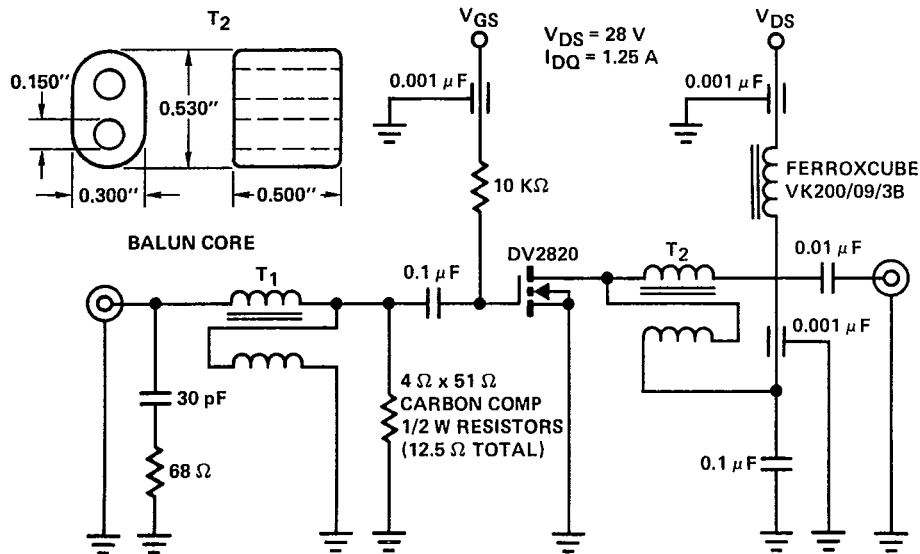
L1, L3, 2 turns #20 enamel wire, close wound on 1/4" dia.

L2, 7 turns #20 enamel wire, close wound on 1/4" dia.

Typical Output Power vs Input Power



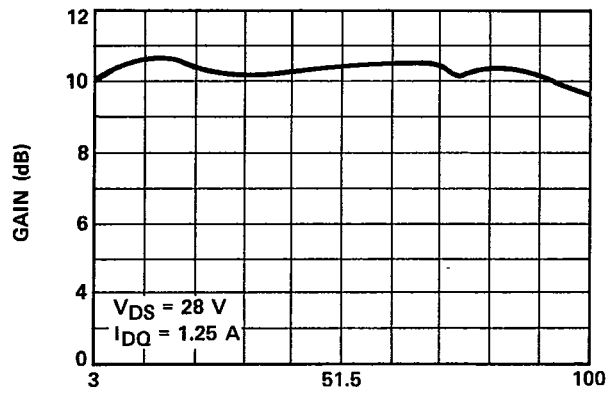
28V WIDEBAND AMPLIFIER



Parts List

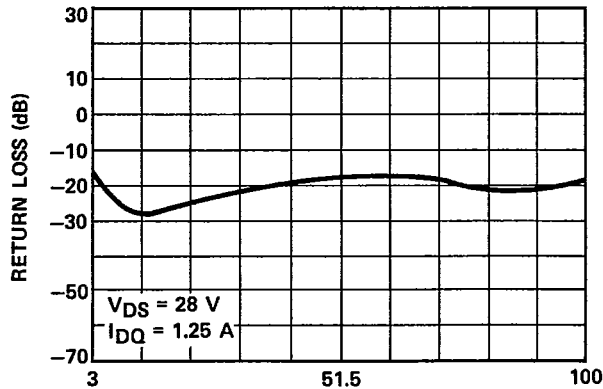
T₁, 20 turns 30 Ω, #30 bifilar on micrometals T-50-6 Toroid
 T₂, 1 turn of 2-50 Ω coax cables in parallel through 2 balun cores stackpole #57-9130 $\mu_o = 125$

Gain vs Frequency
 (Nominal P_{OUT}=19.4 W)



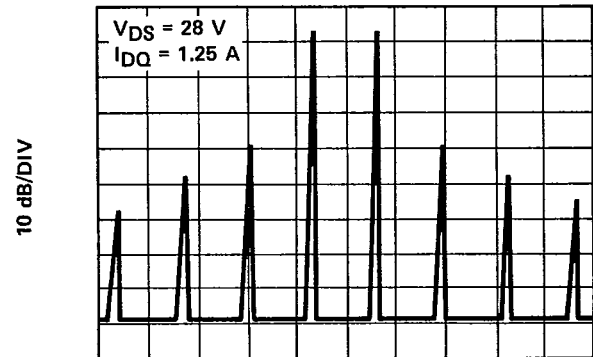
9.7 MHz/DIV – FREQUENCY (MHz)

Input Return Loss vs Frequency



9.7 MHz/DIV – FREQUENCY (MHz)

Intermodulation Distortion vs Frequency
 (Nominal Power Output 12 W PEP)



10 dB/DIV
 TONE SPACING = 30 KHz