

RF Power FETs Selector Guide (Cont'd)

28 Volt DC — 300 MHz Series

Part Number	Test Frequency* (MHz)	Rated Power Out (Watts) @ 28V _{DC}	Min. Gain (dB) 28 V, 175 MHz	Min. BV _{DSS}	θ_{Jc} (°C/W)
DV2805S	175	5	10	80	17.6
DV2805W	175	5	10	80	14.1
DV2805Z	175	5	10	80	17.6
DV2810S	175	10	10	80	8.8
DV2810W	175	10	10	80	7.0
DV2810Z	175	10	10	80	8.8
DV2820S	175	20	10	80	4.4
DV2820W	175	20	10	80	3.5
DV2820Z	175	20	10	80	4.4
DV2840S	175	40	10	80	2.2
DV2840W	175	40	10	80	1.8
DV2880T	175	80	10	80	1.1
DV2880U	175	80	10	80	1.1
DV2880W	175	80	10	80	0.9
DV28120T	175	120	10	80	0.73
DV28120U	175	120	9	80	0.73
VMP4	175	20	10	60	4.4

28 Volt Push-Pull — DC-300 MHz Series

Part Number	Test Frequency (MHz)	Test Voltage (V _{DS})	P _{in} (Max.) (Watts)	P _{out} @ 28 V (Watts)	G _{ps} (Min.) Power Gain (dB)	θ_{Jc} Thermal Impedance (°C/W)
DV2880V	175	28	8	80	10	1.1
DV28120V	175	28	12	120	10	0.73

100 Volt DC — 300 MHz Series

Part Number	Test Frequency* (MHz)	Rated Power Out (Watts) @ 12.5V _{DC}	Min. Gain (dB) 12.5V, 175 MHz	Min. BV _{DSS}	θ_{Jc} (°C/W)
DVD030S	175	25	13	220	4.40
DVD150T	175	120	10	220	0.73

*All parts tested at 20:1 VSWR.

DV2820S ■ DV2820W ■ DV2820Z

**N-Channel Enhancement -
Mode RF Power FETs**



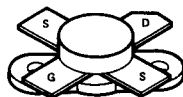
**175 MHz
20-35 V
20 W
10 dB**

Other Devices in Series:
DV2805, DV2810, DV2840, DV2880, DV28120

FEATURES

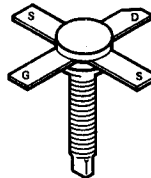
- Infinite VSWR
- No Thermal Runaway
- Broadband Capability
- Class A, B, C, D, E
- Low Noise Figure
- High Dynamic Range
- Simple Bias Circuitry
- S-Parameter Design

Package Type S



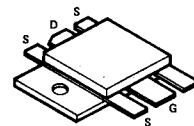
.380 SOE Flange

Package Type Z



.280 SOE Stud

Package Type W



C-220

See page 5-62 for Package Dimensions

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Gate-Source Voltage	40V	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

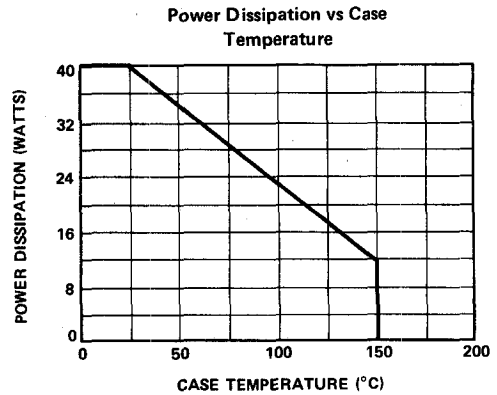
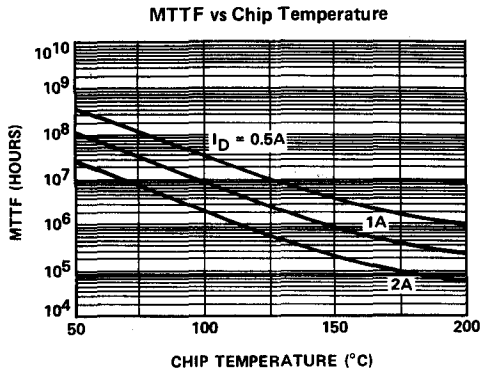
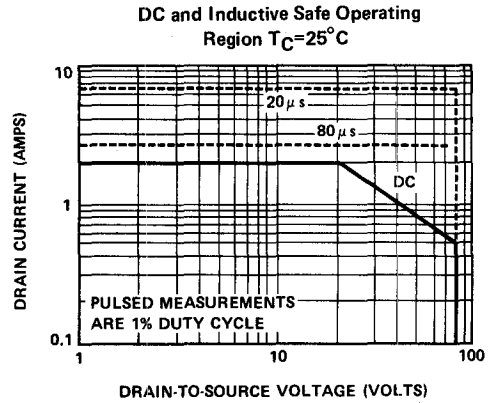
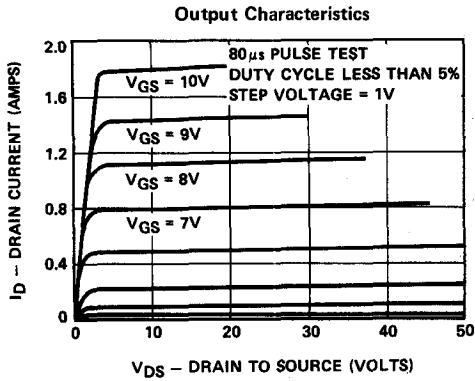
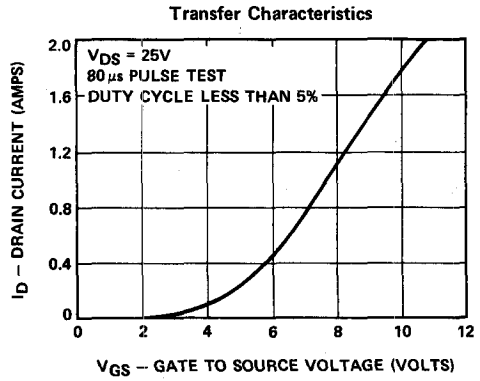
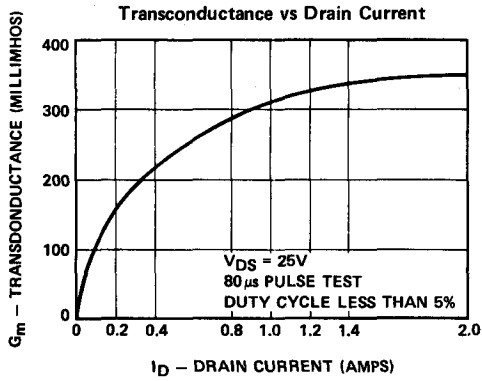
ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
BV _{DSS}	Drain-Source Breakdown Voltage	80			V	V _{GS} = 0V, I _D = 5 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} = 40V, V _{DS} = 0V
g _m	D.C. Forward Transconductance ¹	0.2	0.3		mho	V _{DS} = 10V, I _D = 1A, ΔV _{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 mA
C _{iSS}	Common-Source Input Capacitance			50	pF	V _{GS} = 0V, V _{DS} = 30V, f = 1.0 MHz
C _{oSS}	Common-Source Output Capacitance			40	pF	V _{GS} = 0V, V _{DS} = 30V, f = 1.0 MHz
C _{rSS}	Reverse Transfer Capacitance			7.5	pF	V _{GS} = 0V, V _{DS} = 30V, f = 1.0 MHz
G _{ps}	Common-Source Power Gain	10			dB	V _{DD} = 28V, P _o = 20W, f = 175 MHz, I _{DQ} = 0.1A
η	Drain Efficiency		65		%	V _{DD} = 28V, P _o = 20W, f = 175 MHz, I _{DQ} = 0.1A
V _{SWR}	Load Mismatch Tolerance	30:1				V _{DD} = 28V, P _o = 20W, f = 175 MHz, I _{DQ} = 0.1A
N.F.	Noise Figure		5.6		dB	V _{DS} = 28V, I _D = 0.1A, f = 175 MHz

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

6VNR

TYPICAL PERFORMANCE CURVES (25°C unless otherwise noted)



SMALL SIGNAL 2-PORT PARAMETERS

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

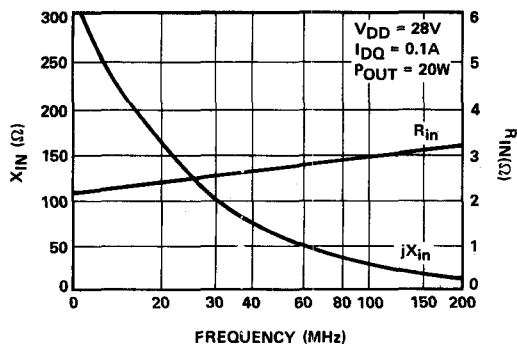
Conditions: 28V @ 450 mA

POLAR S-PARAMETERS DV2820W IN 50.0 OHM SYSTEM

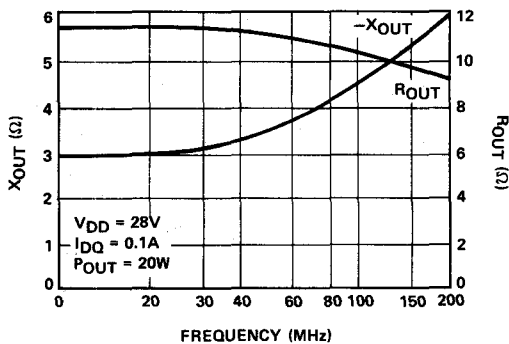
Freq (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	(Magn)	(Angl)	(Magn)	(Angl)	(Magn)	(Angl)	(Magn)	(Angl)
10	.94	-34	20.89	155	.03	66	.84	-33
20	.92	-61	17.78	137	.05	51	.80	-58
30	.88	-85	14.96	122	.06	37	.76	-80
40	.83	-103	12.30	110	.07	27	.72	-95
50	.79	-115	10.00	102	.07	19	.69	-107
60	.77	-124	8.41	96	.07	15	.67	-116
70	.76	-131	7.24	89	.07	12	.66	-123
80	.76	-137	6.31	85	.07	7	.66	-127
90	.75	-141	5.62	81	.07	5	.66	-131
100	.75	-144	4.95	77	.07	3	.66	-135
120	.76	-151	3.98	72	.07	1	.68	-140
140	.78	-155	3.16	67	.06	-1	.70	-144
160	.79	-159	2.82	64	.06	-3	.71	-149
180	.79	-162	2.37	60	.06	-5	.73	-152
200	.80	-164	2.07	57	.06	-5	.75	-154
225	.81	-167	1.76	53	.06	-6	.77	-156
250	.82	-171	1.51	50	.05	-7	.78	-159
275	.83	-174	1.30	47	.05	-6	.79	-161
300	.84	-174	1.14	45	.05	-5	.82	-161
325	.84	-176	1.00	42	.05	-3	.82	-162
350	.85	-178	.88	41	.04	-1	.83	-163
375	.86	179	.79	40	.04	2	.84	-164
400	.88	175	.74	39	.04	5	.86	-165
425	.88	173	.66	39	.04	9	.86	-166
450	.88	172	.61	39	.04	14	.86	-168
475	.87	170	.57	38	.03	18	.86	-169
500	.87	168	.53	38	.03	24	.86	-172

Conditions: 28V @ 450 mA

Series Equivalent Input Impedance vs Frequency

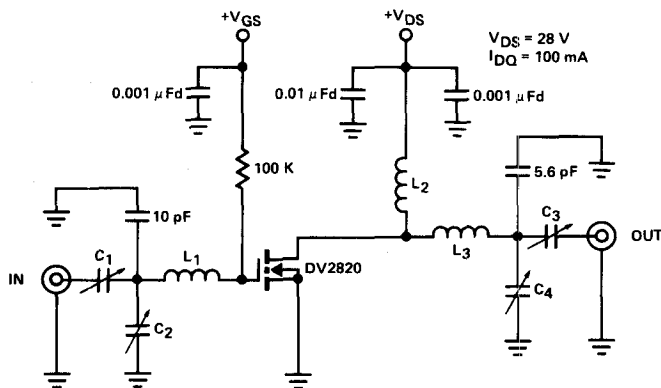


Series Equivalent Output Impedance vs Frequency



TEST FIXTURE

DV2820 175MHz

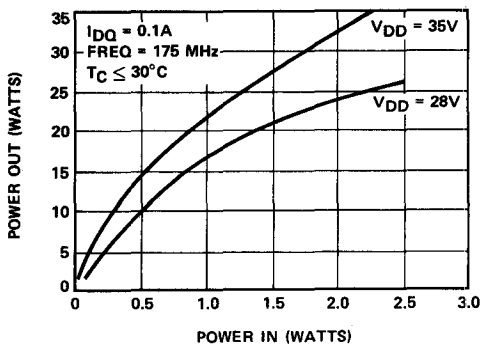


Parts List

- C1, C3, 5-80 pFd
- C2, C4, 3-30 pFd
- 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.

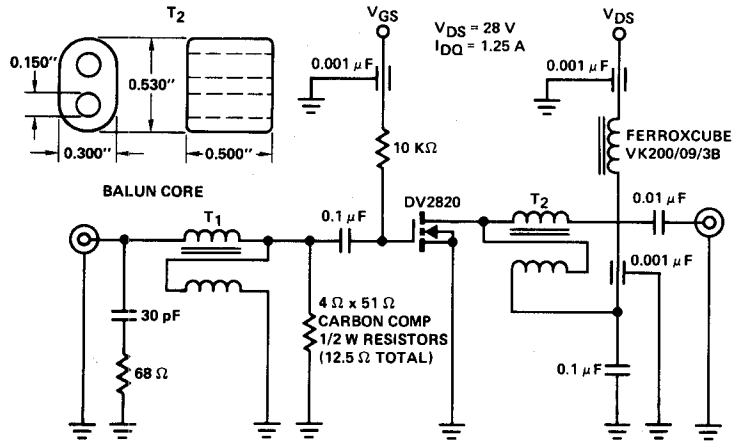
All DV2820s are tested in this test fixture.

Typical Output Power vs Input Power



APPLICATIONS

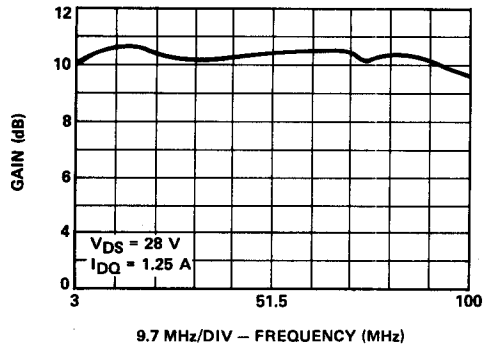
28V WIDEBAND AMPLIFIER



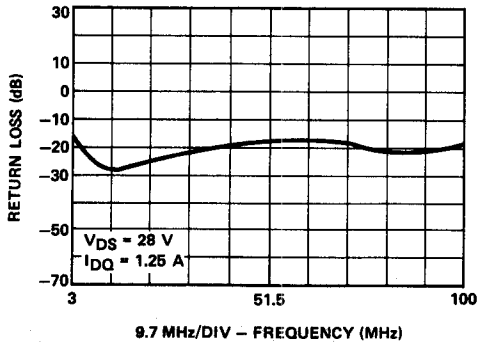
Parts List

- 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 $\mu_0 = 125$

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



Input Return Loss vs Frequency



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

