DV2810S

n-channel enhancement-mode RF Power FETs designed for...

175 MHz
20-35 V
10 W
10 dB

HF/VHF Amplifiers Class A, B, or C
High Dynamic Range Amp

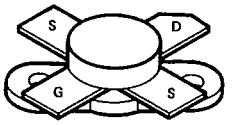
Benefits

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

Absolute Maximum Ratings (25°C)

Gate-Source Voltage . . . . . 20 V
Drain-Source Voltage . . . . . 80 V
Drain-Gate Voltage . . . . . 80 V
Drain Current (DC) . . . . . 1 A
Total Device Dissipation . . . . . 20 W
@ 25° Case
θjc . . . . . 8.8°C/W
Storage Temperature . . . . −65°C to 150°C
Junction Temperature . . . . . 200°C

Package
Type S



.380 SOE FLANGE

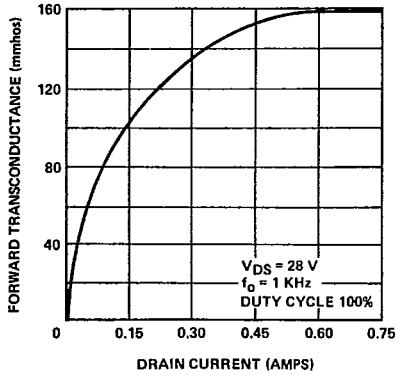
Electrical Characteristics (25°C)

Symbol	Characteristic	Min	Typ	Max	Unit	Test Conditions
P_{OUT}(1)	Power Output	10			W	V_{DS}=28 V, I_{DQ}=0.05 A
η(1)	Drain Efficiency	55			%	P_{IN}=1 W, f=175 MHz
gm	Transconductance	100			mmho	V_{DS}=28 V, I_D=0.25 A
C_{oss}	Output Capacity			30		
C_{rss}	Reverse Transfer Capacity			5	pF	V_{DS}=28 V, V_{GS}=0 V
C_{iss}	Input Capacity			30		
NF(2)	Small Signal Noise Figure		6.8		dB	f=175 MHz, V_{DS}=28 V, I_D=0.05 A

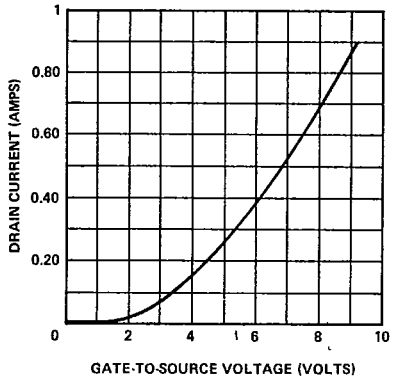
Notes: (1) All devices 100% DC/RF tested.
(2) Noise figure measured with 10 watt power matched source and load

Typical Performance Curves (25°C)

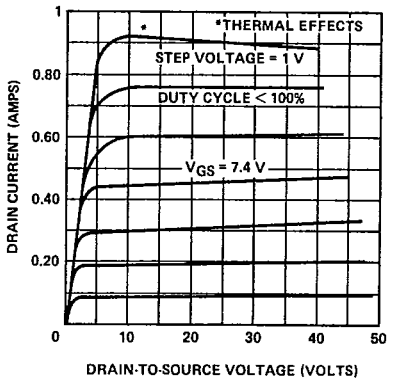
Transconductance vs Drain Current



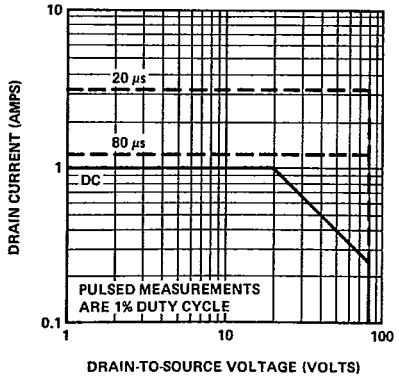
Drain Current vs Gate-to-Source Voltage



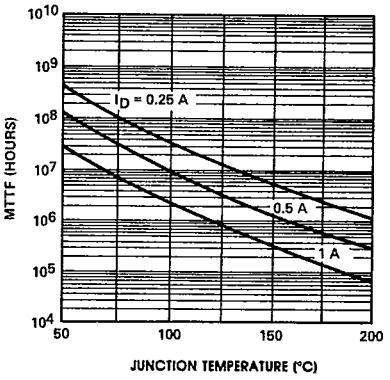
Output Characteristics vs Drain-to-Source Voltage



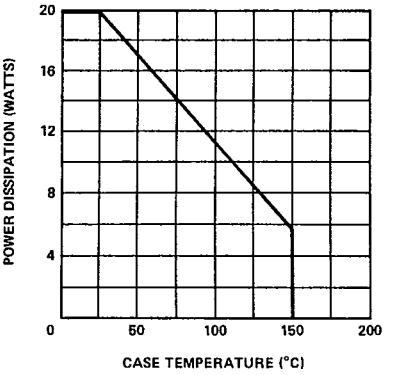
DC and Inductive Safe Operating Region T_C=25°C



MTTF vs Junction Temperature

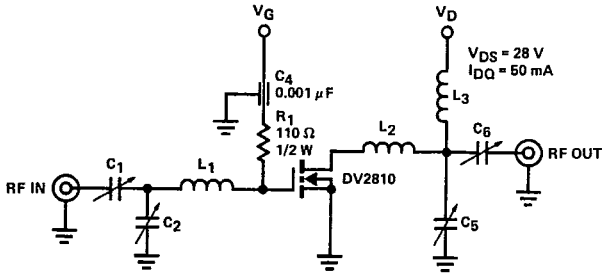


Power Dissipation vs Case Temperature



Test Fixture

DV2810 175 MHz



Parts List

C_1, C_2, C_3, C_4, 5 to 80 pF, ARCO #462 trimmer capacitors
L_1, 4 turns #18 AWG on 1/8" diameter, close wound
L_2, 4 turns #16 AWG on 1/8" diameter, close wound
L_3, 10 turns #20 AWG on 1/4" diameter, close wound

Small Signal 2-Port Parameters DV2810S

2-Port Y-Parameter Matrix in Millimhos

Freq (MHz)	Y_{11} (Real	Imag)	Y_{21} (Real	Imag)	Y_{12} (Real	Imag)	Y_{22} (Real	Imag)
10	.189	1.32	129	−3 67	.002	−.214	.842	1.45
20	.134	2.46	130	−2.97	.030	− 440	.897	2.35
30	−.293	3.32	140	−8.76	.030	− 675	.323	2.99
40	−.257	5.58	131	−7.23	.073	−.862	.291	5 23
50	.123	7.29	132	−7.93	.128	−1.11	.521	6.72
60	.334	8.53	136	−11.8	.174	−1.41	.595	7.93
70	.098	9.88	134	−18.1	.221	−1 73	.408	8 94
80	.572	11.8	138	−19.1	.281	−1.97	.588	10 6
90	1.11	13.5	145	−21.7	.377	−2.26	1.06	12.1
100	1.59	15.4	147	−26 7	.483	−2 56	1.08	13 8
120	2.38	18.9	155	−31.3	.664	−3.24	1.84	16 7
140	3 08	22 3	160	−40 9	.891	−3.96	2 26	19.7
160	4.3	26 3	171	−49.3	1.15	−5 01	2 49	22.6
180	5.79	29.7	176	−63	1 42	−6 01	2 36	25 6
200	6.69	33.2	179	−70.6	1.82	−7 02	2 45	28 5
225	6.85	37.2	192	−88	2 50	−8 54	2.13	32 2
250	12 0	45 9	224	−126	2 84	−10 8	−.727	39.9
275	14 0	53.1	234	−153	3 62	−13.7	−2.75	46 5
300	20.6	60.1	237	−197	3.73	−17 3	−6 15	54.0
325	33.2	66.2	227	−248	3.15	−19	−3.71	64 4
350	45 0	72.3	209	−289	2.74	−22 5	−6 06	72 4
375	55.4	74 6	187	−319	2 88	−25 8	−7.8	80 3
400	64	76 8	162	−339	2 76	−28 5	−6.18	85 6
425	82.5	67	99.4	−365	.133	−30 8	−3.98	95 8
450	85.9	63 8	66	−358	.243	−32 0	3.21	98 1
475	91	59.7	38 4	−364	− 593	−34 5	6 7	107
500	92.1	52 3	10 4	−343	.436	−33 8	12.2	104

Conditions: 28 V @ 250 mA

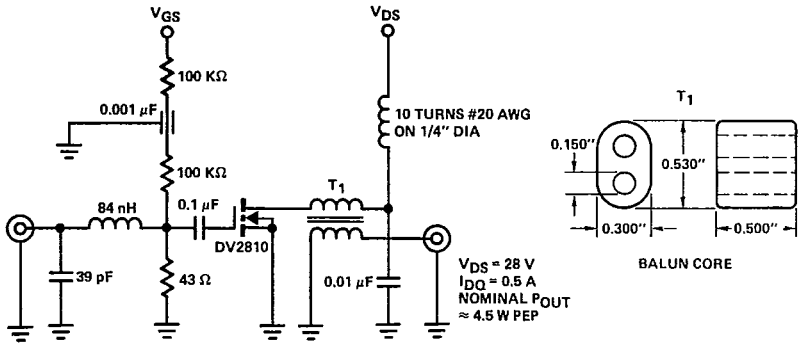
Polar S-Parameters in 50.0 Ohm System

Freq (MHz)	S_{11} (Magn	Angl)	S_{21} (Magn	Angl)	S_{12} (Magn	Angl)	S_{22} (Magn	Angl)
10	.97	−15	12.02	167	.02	79	.91	−16
20	.97	−29	11.75	158	04	73	.90	−29
30	96	−43	12 45	147	.06	63	.90	−42
40	.93	−57	10.59	135	07	53	.88	−56
50	.88	−70	9.44	126	.08	46	84	−68
60	83	−81	8 61	118	09	40	80	−79
70	.80	−90	7.76	110	.10	35	.76	−87
80	.77	−99	7.0	104	.10	30	.74	−95
90	.75	−107	6 38	99	.10	27	.72	−103
100	.73	−114	5 75	93	.10	24	.71	−109
120	.72	−125	4.79	86	.10	19	.69	−120
140	.71	−133	4 07	79	.10	16	68	−128
160	.71	−142	3.47	74	.10	13	.68	−136
180	.70	−148	3 02	69	.10	12	68	−141
200	.71	−152	2.66	65	.10	11	.69	−145
225	.72	−157	2 37	60	.10	11	.70	−151
250	.72	−165	2 07	55	.09	9	.72	−156
275	.73	−169	1.78	51	.09	9	.73	−160
300	.73	−174	1.57	49	09	11	.73	−163
325	.73	−176	1.40	46	.08	13	.74	−164
350	.74	−179	1 26	44	.08	15	.74	−165
375	.75	179	1.14	42	.08	18	.75	−166
400	.76	178	1 05	41	.08	21	.75	−167
425	.76	175	.98	40	.08	25	.75	−167
450	.76	175	.91	39	.08	29	.75	−168
475	.76	174	85	38	08	31	.76	−169
500	.76	174	81	37	.08	36	.76	−169

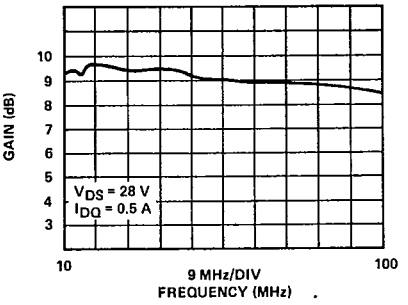
Conditions 28 V @ 250 mA

Applications

DV2810 28 V Wideband Amplifier



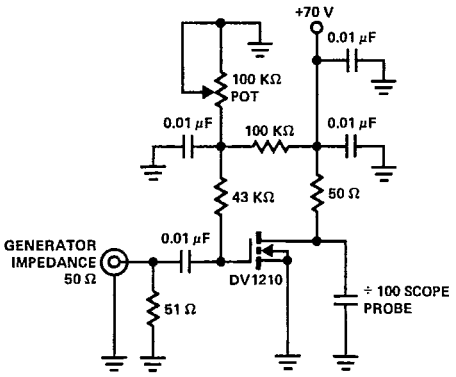
Gain vs Frequency (Nominal POUT=9.5)



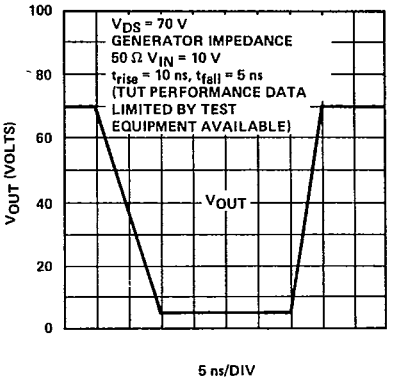
Parts List

T_1, 2 turns 50 Ω coax on 3-balun cores stackpole 57-0973, $\mu o = 35$

DV2810 70 V CRT Driver



t_{on} and t_{off} vs Voltage



CAUTION: Beryllium Oxide — The top cap of this device is alumina which is harmless. However the ceramic portion between the leads and the metal flange is Beryllium Oxide, the dust of which is toxic. Care must therefore be taken during handling and mounting the device to prevent any damage to this area.

Steps must be taken to ensure that all those who may handle, use, or dispose of this device are aware of its nature and of these necessary safety precautions. In particular the transistor should never be thrown out with general industrial or domestic waste.