DV2805S

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

175MHz
20-35V
5W
10dB

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

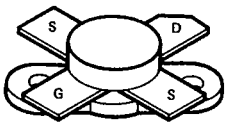
Benefits

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).....0.5 A
Total Device Dissipation.....10 W
@ 25° Case
θjc.....17.6°C/W
Storage Temperature....−65°C to 150°C
Junction Temperature.....200°C

Package Type S



.380 SOE FLANGE

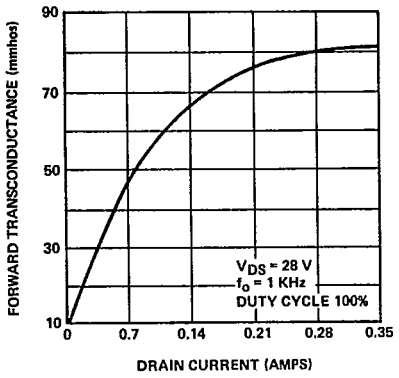
Electrical Characteristics (25°C)

Symbol	Characteristic	Min	Typ	Max	Unit	Test Conditions
P_{OUT}(1)	Power Output	5			W	V_{DS}=28 V, I_{DQ}=0.025 A
η(1)	Drain Efficiency	55			%	P_{IN}=0.5 W, f=175 MHz
gm	Transconductance	50			mmho	V_{DS}=0.28 V, I_D=0.125 A
C_{oss}	Output Capacity			15		
C_{rss}	Reverse Transfer Capacity			2	pF	V_{DS}=28 V, V_{GS}=0 V
C_{iss}	Input Capacity			15		
NF(2)	Small Signal Noise Figure		6.8		dB	f=175 MHz, V_{DS}=28 V, I_D=0.025 A

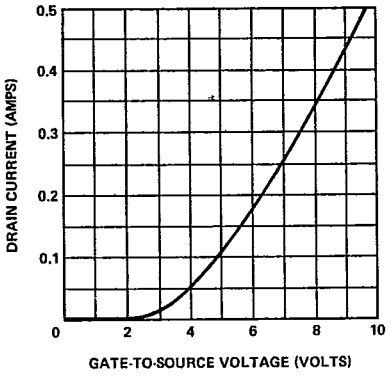
Notes: (1) All devices 100% DC/RF tested.
(2) Noise figure measured with 5 watt power matched source and load

Typical Performance Curves (25°C)

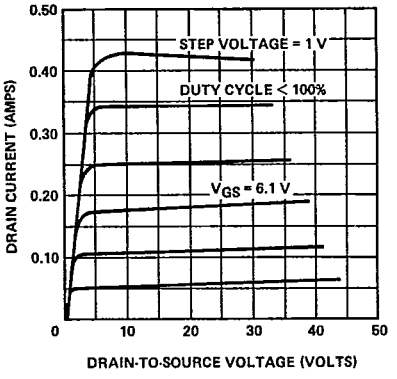
Transconductance vs Drain Current



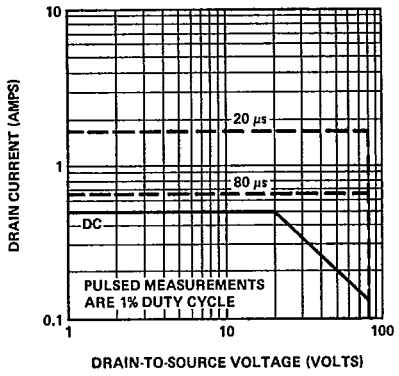
Drain Current vs Gate-to-Source Voltage



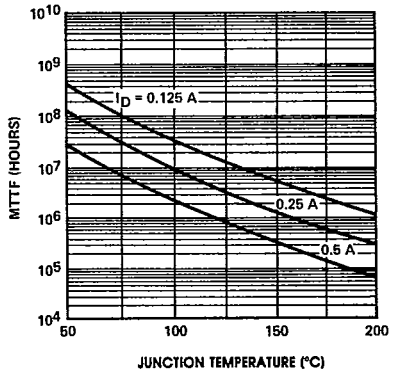
Output Characteristics vs Drain-to-Source Voltage



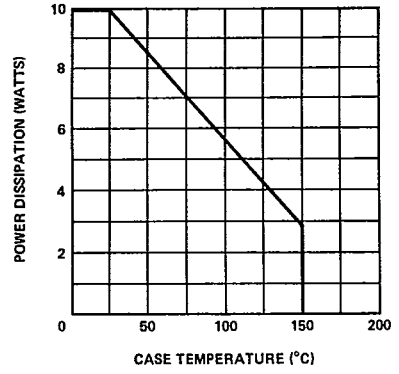
DC and Inductive Safe Operating Region T_C=25°C



MTTF vs Junction Temperature

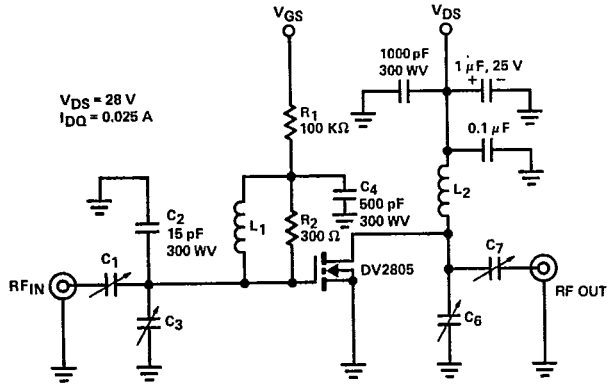


Power Dissipation vs Case Temperature



Test Fixture

DV2805 175 MHz



Parts List

C_3, 80 to 5 pF ARCO #462 trimmer capacitors
C_6, 30 to 2.7 pF ARCO #461 trimmer capacitors
L_1, 1 turn of #18 AWG on 1/4" diameter
L_2, 2 turns of #18 AWG on 1/4" diameter
C_1, 180 to 9 pF ARCO #463 trimmer capacitor

Small Signal 2-Port Parameters DV2805S

2-Port Y-Parameter Matrix in Millimhos

Freq (MHz)	Y_{11} (Real	Y_{11} Imag)	Y_{21} (Real	Y_{21} Imag)	Y_{12} (Real	Y_{12} Imag)	Y_{22} (Real	Y_{22} Imag)
10	.095	.660	64 5	−1.84	.001	−.107	.421	.725
20	.067	1 23	65 0	−1.49	.015	−.220	.449	1.18
30	−.147	1 66	70 0	−4.38	.015	−.338	.162	1 50
40	−.129	2.79	65 5	−3.62	.037	−.431	.146	2 62
50	.062	3 65	66 0	−3.97	.064	−.555	.261	3.36
60	.167	4 27	68.0	−5.90	.087	−.705	.298	3.97
70	.049	4.94	67.0	−9.05	.111	−.865	.204	4 47
80	.286	5.90	69.0	−9.55	.141	−.985	.294	5 30
90	.555	6.75	72 5	−10.9	.189	−1.13	530	6 05
100	.795	7.70	73 5	−13.4	.242	−1 28	.540	6 90
120	1.19	9.45	77.5	−15 7	.332	−1.62	.920	8.35
140	1.54	11.2	80.0	−20 5	.446	−1.98	1.13	9.85
160	2.15	13 2	85 5	−24.7	575	−2 51	1 25	11 3
180	2.90	14.9	88 0	−31 5	.710	−3.01	1.18	12 8
200	3 35	16 6	89.5	−35 3	.910	−3 51	1.23	14 3
225	3.43	18 6	96.0	−44.0	1.25	−4 27	1 07	16 1
250	6 00	23.0	112	−63 0	1 42	−5 40	−3 64	20 0
275	7.00	26 6	117	−76 5	1 81	−6.85	−1 38	23 3
300	10.3	30.1	119	−98 5	1.87	−8 65	−3 08	27 0
325	16 6	33.1	114	−124	1 58	−9 50	−1 86	32.2
350	22 5	36.2	105	−145	1.37	−11.3	−3 03	36 2.
375	27.7	37.3	93 5	−160	1 44	−12.9	−3.90	40 2
400	32.0	38.4	81.0	−170	1.38	−14 3	−3 09	42.8
425	41.3	33.5	49.7	−183	.067	−15 4	−1 99	47 9
450	43.0	31.9	33 0	−179	.122	−16 0	1 61	49.1
475	45 5	29.9	19.2	−182	−.297	−17.3	3 35	53 5
500	46.1	26 2	5.20	−172	.218	−16.9	6.10	52 0

Conditions: 28 V @ 125 mA

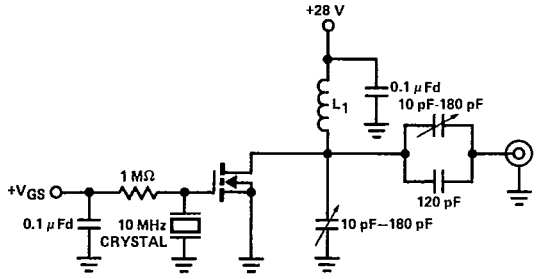
Polar S-Parameters in 50.0 Ohm System

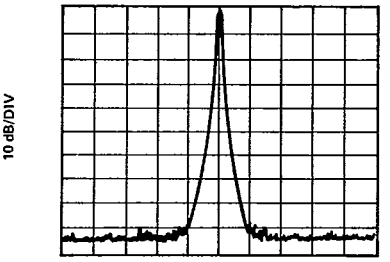
Freq (MHz)	S_{11} (Magn	S_{11} Angl)	S_{21} (Magn	S_{21} Angl)	S_{12} (Magn	S_{12} Angl)	S_{22} (Magn	S_{22} Angl)
10	.99	−6	6.27	173	.01	86	.96	−6
20	.99	−11	6 30	170	.02	85	.96	−11
30	1.0	−16	6 88	164	03	80	.97	−15
40	1.0	−24	6 32	158	.04	76	.97	−23
50	.98	−30	6.14	152	.05	72	.96	−29
60	.95	−37	6.12	146	.06	68	.94	−35
70	.94	−42	5.92	139	.08	64	.92	−40
80	.91	−49	5 78	134	.08	60	.90	−46
90	.88	−56	5 70	129	.09	57	.87	−52
100	85	−62	5 47	123	.10	54	.86	−58
120	.81	−74	5 08	114	.11	47	.80	−69
140	.77	−85	4 66	105	.11	42	.76	−79
160	.72	−97	4.29	98	.12	37	.72	−89
180	68	−106	3 92	90	.13	33	.69	−97
200	.67	−114	3.58	85	.13	31	.68	−104
225	66	−123	3 35	77	.14	28	.66	−114
250	59	−142	3 22	66	.14	20	.70	−122
275	61	−149	2.70	62	.14	20	.64	−133
300	59	−159	2.41	58	.14	20	.63	−139
325	.57	−165	2.16	54	.12	20	.62	−142
350	58	−172	1.96	50	.12	21	.61	−145
375	.58	−176	1 79	47	.13	23	.62	−147
400	59	−179	1 66	46	.13	26	.61	−149
425	59	175	1 55	43	.13	28	61	−149
450	.58	174	1 43	42	.13	32	.60	−151
475	.58	172	1 35	41	.13	34	.61	−154
500	58	172	1.28	39	.13	38	61	−153

Conditions: 28 V @ 125 mA

Applications

DV2805 10 MHz Crystal Oscillator



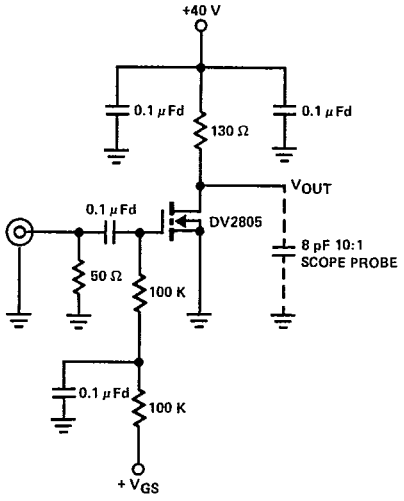


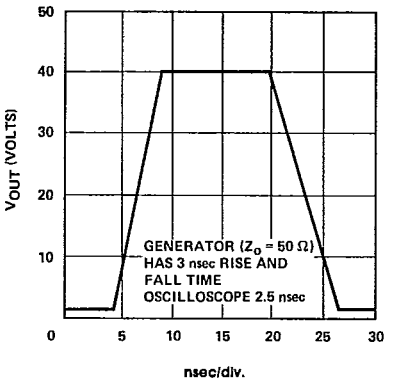
CENTER FREQ 10 MHz
RESOLUTION BW 10 Hz
VBW 10 Hz
SWP 20 sec
SPAN 1 KHz
POWER OUT 5 W
EFFICIENCY 65%

Parts List

L_1 ~ 18 turns #22 enameled wire on micrometals T-50-6 torroid core. ≈ 1.0 μH.

DV2805 Video CRT Driver





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.