

# DV2805S

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

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

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

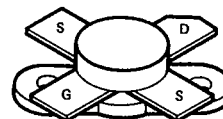
### Benefits

- 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) . . . . . 0.5 A
- Total Device Dissipation . . . . . 10 W  
@ 25° Case
- $\theta_{jc}$  . . . . . 17.6°C/W
- Storage Temperature . . . . -65°C to 150°C
- Junction Temperature . . . . . 200°C

### Package Type S



**.380 SOE  
FLANGE**

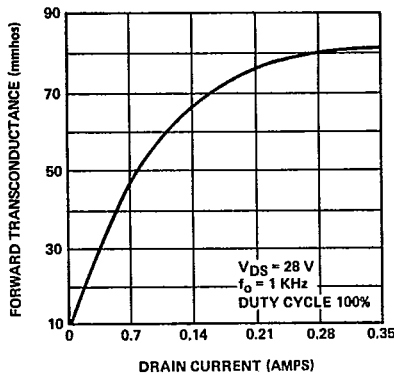
### Electrical Characteristics (25°C)

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

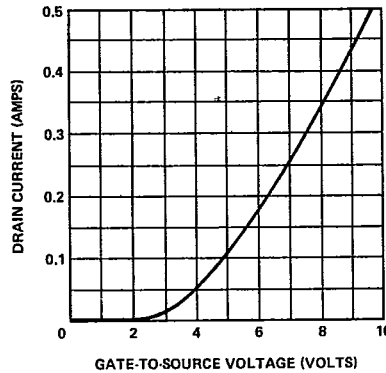
Notes: (1) All devices 100% DC/RF tested.  
(2) Noise figure measured with 5 watt power matched source and load

# Typical Performance Curves (25°C)

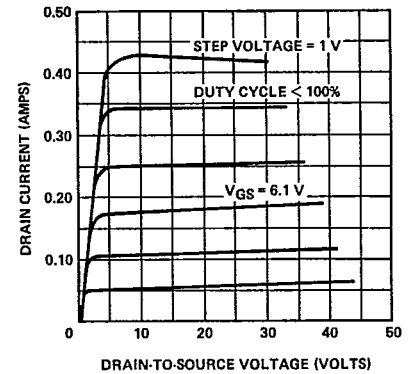
**Transconductance vs Drain Current**



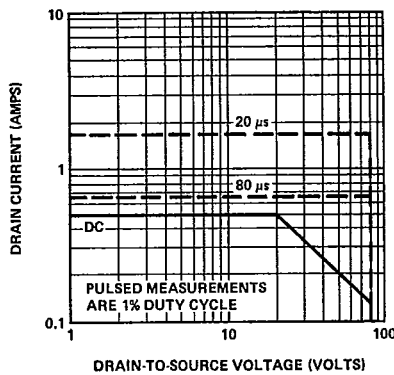
**Drain Current vs Gate-to-Source Voltage**



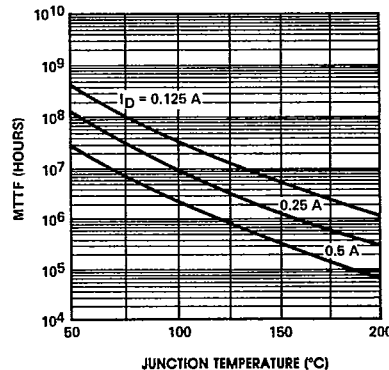
**Output Characteristics vs Drain-to-Source Voltage**



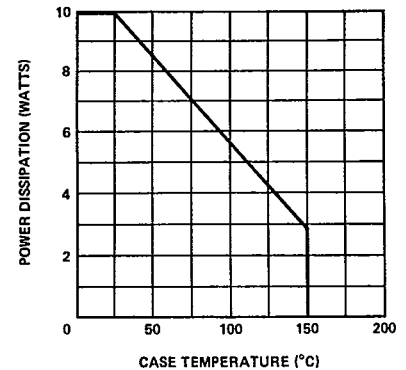
**DC and Inductive Safe Operating Region**  
TC = 25°C



**MTF vs Junction Temperature**

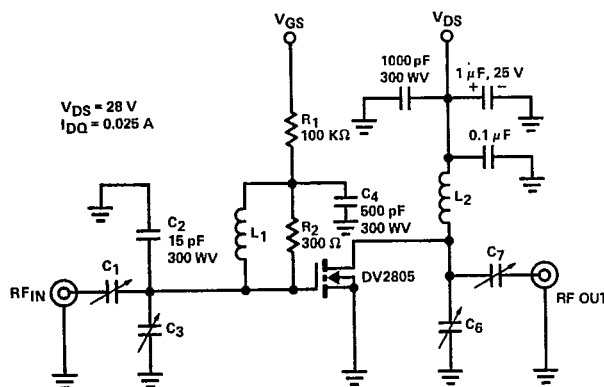


**Power Dissipation vs Case Temperature**



## Test Fixture

DV2805 175 MHz



### Parts List

- C3, 80 to 5 pF ARCO #462 trimmer capacitors
- C6, 30 to 2.7 pF ARCO #461 trimmer capacitors
- L1, 1 turn of #18 AWG on 1/4" diameter
- L2, 2 turns of #18 AWG on 1/4" diameter
- C1, 180 to 9 pF ARCO #463 trimmer capacitor

# Small Signal 2-Port Parameters DV2805S

## 2-Port Y-Parameter Matrix in Millimhos

## Polar S-Parameters in 50.0 Ohm System

Freq (MHz)	Y <sub>11</sub>		Y <sub>21</sub>		Y <sub>12</sub>		Y <sub>22</sub>	
	Real	Imag	Real	Imag	Real	Imag	Real	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

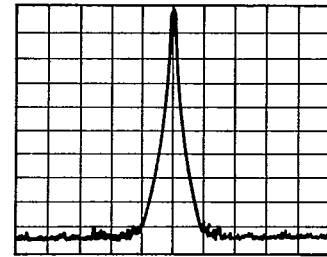
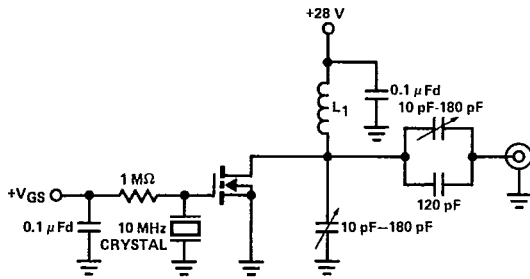
Freq (MHz)	S <sub>11</sub>		S <sub>21</sub>		S <sub>12</sub>		S <sub>22</sub>	
	Magn	Angl	Magn	Angl	Magn	Angl	Magn	Angl
10	.99	-6	6.27	173	.01	86	.96	-6
20	.99	-11	6.30	170	.02	85	.96	-11
30	1.0	-16	6.88	164	.03	80	.97	-15
40	1.0	-24	6.32	158	.04	76	.97	-23
50	.98	-30	6.14	152	.05	72	.96	-29
60	.95	-37	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

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# Applications

## DV2805 10 MHz Crystal Oscillator

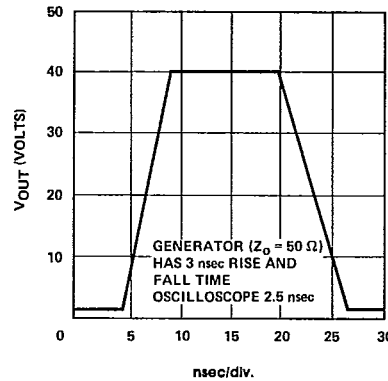
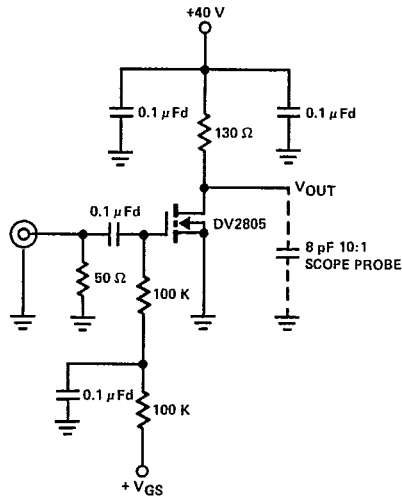


CENTER FREQ 10 MHz  
RESOLUTION BW 10 Hz  
VBW 10 Hz  
SWP 20 sec  
SPAN 1 KHz  
POWER OUT 5 W  
EFFICIENCY 65%

### Parts List

L<sub>1</sub> ~ 18 turns #22 enameled wire on micrometals  
T-50-6 torroid core. ≈ 1.0 μH.

## DV2805 Video CRT Driver



GENERATOR ( $Z_0 = 50 \Omega$ )  
HAS 3 nsec RISE AND  
FALL TIME  
OSCILLOSCOPE 2.5 nsec

**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.