

DV2840S

85 DE 5642205 0000450 2

N-Channel Enhancement - Mode RF Power FETs

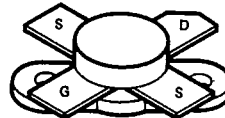
HF/VHF Amplifiers Class A, B or C
High Dynamic Range Amp.

175 MHz
20-35 V
40 W
10 dB

FEATURES

- 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

Package Type S



.380 SOE Flange

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

Gate-Source Voltage	20V	Total Device Dissipation	80 W
Drain-Source Voltage	80V	Thermal Resistance, Junction to Case	2.2°C/W
Drain-Gate Voltage	80V	Junction Temperature	200°C
Drain Current (DC)	4 A	Storage Temperature	-65°C to 150°C

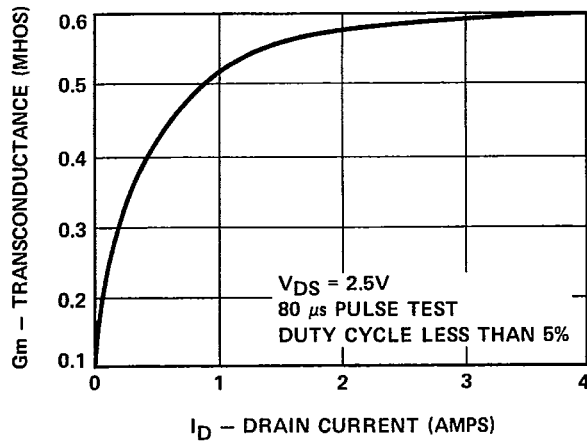
ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	80			V	$V_{GS} = 0V, I_D = 10\text{ mA}$
I_{DSS}	Drain-Source Leakage Current			2	mA	$V_{GS} = 0V, V_{DS} = 30\text{ V}$
I_{GSS}	Gate-Source Leakage Current			200	nA	$V_{GS} = 20V, V_{DS} = 0V$
g_{m1}	DC Forward Transconductance	0.4			mho	$V_{DS} = 10V, I_D = 2A, \Delta V_{GS} = 1.0V$
$I_{D(on)1}$	On-State Drain Current		3.0		A	$V_{DS} = 30V, V_{GS} = 10V$
$V_{GS(th)}$	Gate Threshold Voltage	2.0		6.0	V	$V_{GS} = V_{DS}, I_D = 200\text{ mA}$
C_{iss}	Common-Source Input Capacitance			100	pF	$V_{GS} = 0V, V_{DS} = 30V, f = 1.0\text{ MHz}$
C_{oss}	Common-Source Output Capacitance			80	pF	$V_{GS} = 0V, V_{DS} = 30V, f = 1.0\text{ MHz}$
C_{rss}	Reverse Transfer Capacitance			12	pF	$V_{GS} = 0V, V_{DS} = 30V, f = 1.0\text{ MHz}$
G_{ps}	Common-Source Power Gain	10			dB	$V_{DD} = 28V, P_o = 40W, f = 175\text{ MHz}, I_{DQ} = 0.2A$
η	Drain Efficiency	55	60		%	$V_{DD} = 28V, P_o = 40W, f = 175\text{ MHz}, I_{DQ} = 0.2A$
VSWR	Load Mismatch Tolerance	20:1				$V_{DD} = 28V, P_o = 40W, f = 175\text{ MHz}, I_{DQ} = 0.2A$

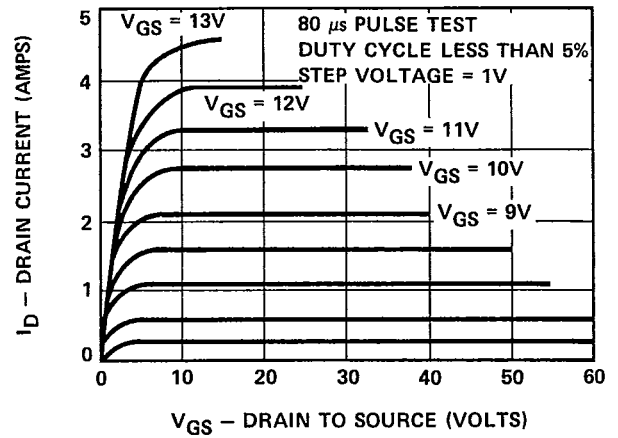
Note 1: Pulse Test — 80 μs to 300 μs , 1% duty cycle, 2: All devices 100% DC/RF tested.

TYPICAL PERFORMANCE CURVES (25° C unless otherwise specified)

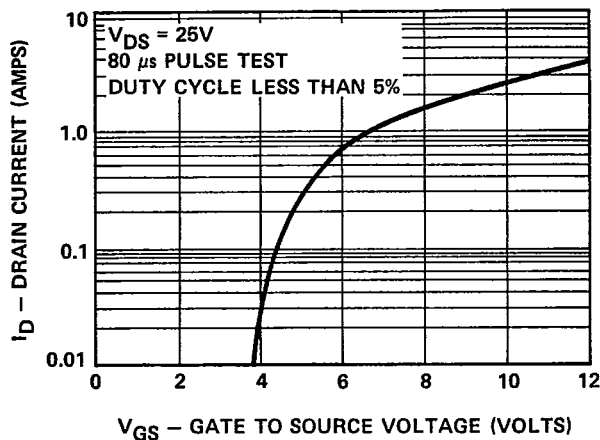
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Transconductance vs
Drain Current

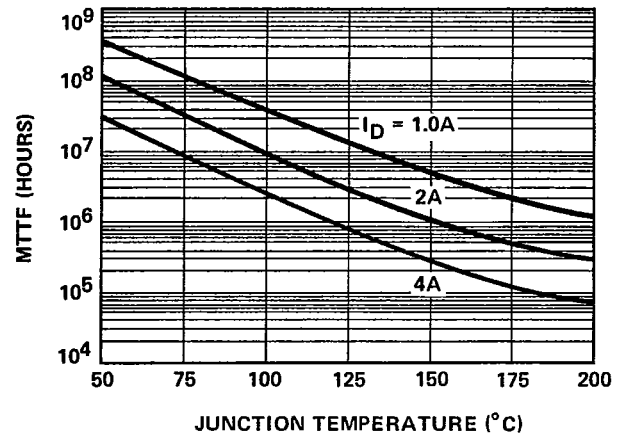
Output Characteristics



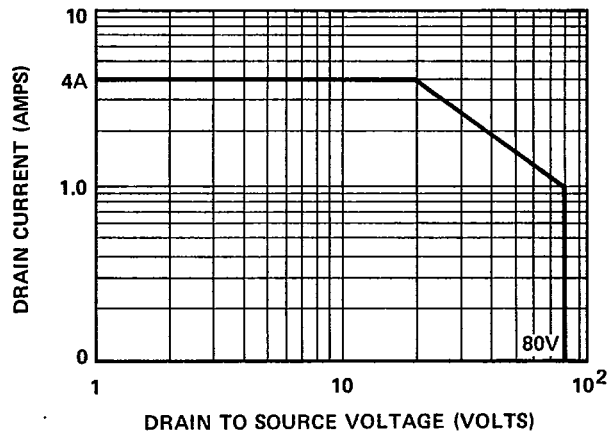
Transfer Characteristics



MTTF vs Junction Temperature

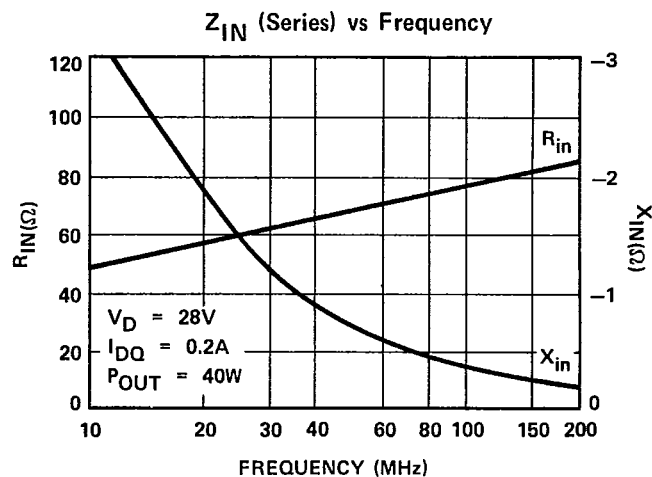
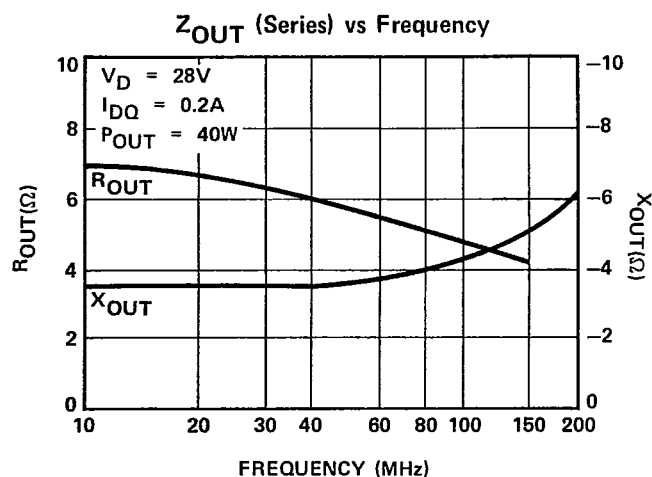


DC Safe Operating Region



TYPICAL PERFORMANCE CURVES—CONTINUED (25° C unless otherwise specified)

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SMALL SIGNAL 2-PORT PARAMETERS

2-PORT S-PARAMETERS DV2840S

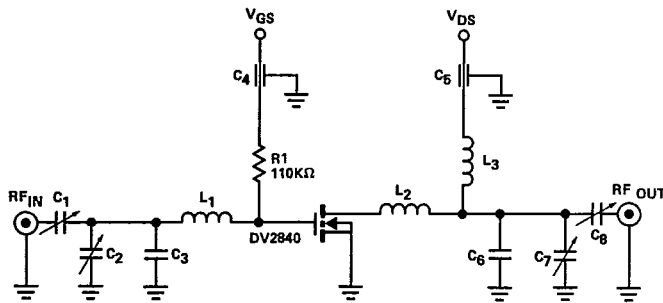
Freq	0	1	2	3	4	5	6	7
	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
10	.78	-92°	28.71	124°	.04	37°	.65	-97°
20	.76	-127	17.44	108°	.05	19°	.66	-131
30	.78	-145	12.19	104	.05	13	.67	-146
40	.81	-151	9.07	91	.05	10	.73	-151
50	.78	-157	6.95	81	.05	10	.69	-155
60	.78	-160	5.71	75	.05	-1	.69	-157
70	.78	-164	4.96	71	.04	-2	.70	-160
80	.79	-165	4.11	67	.04	-4	.71	-161
90	.80	-167	3.39	65	.04	-3	.73	-163
100	.81	-169	3.16	63	.04	-3	.74	-164
120	.83	-170	2.45	57	.04	-3	.76	-166
140	.84	-173	2.01	54	.04	-2	.78	-168
160	.85	-174	1.67	50	.03	1	.80	-170
180	.87	-176	1.38	48	.03	6	.83	-172
200	.88	-177	1.17	46	.03	10	.84	-173
225	.89	-178	1.00	42	.03	14	.87	-175
250	.90	179	.84	38	.03	19	.87	-176
275	.88	180	.88	31	.03	20	.86	-176
300	.90	-177	.62	33	.03	28	.89	-178
325	.91	-176	.55	30	.03	33	.89	-178
350	.91	-175	.48	28	.03	37	.90	-178
375	.91	-175	.43	27	.03	42	.90	-179

Conditions: 28 Volts @ 90 mA

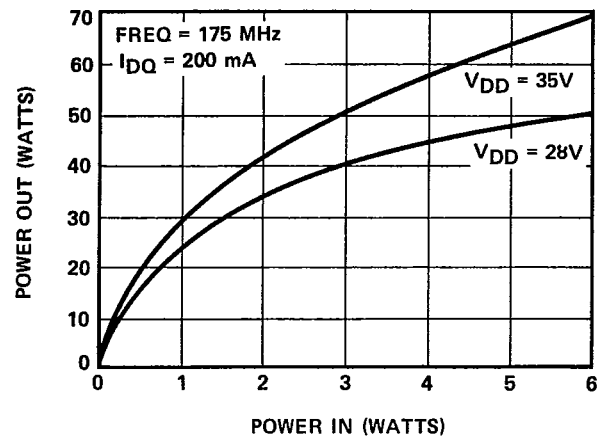
TEST FIXTURE

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175 MHz Schematic



NOTES: C₁, C₇, C₈, ARCO #422 TRIMMER CAPACITORS, 4-40 pF
 C₂, ARCO #463 TRIMMER CAPACITOR, 9-180 pF
 C₃, C₆, 50 pF POWER CAPACITOR
 C₄, C₅, 0.004 μF FEED-THRU CAPACITORS
 L₁, 1 1/4" LENGTH OF #12 AWG COPPER WIRE
 L₂, 1 1/2" LENGTH OF #12 AWG COPPER WIRE
 L₃, 8-TURNS OF #22 AWG ENAMELED WIRE ON
 1/4" DIAMETER, CLOSE WOUND

P_{IN} vs P_{OUT}

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.