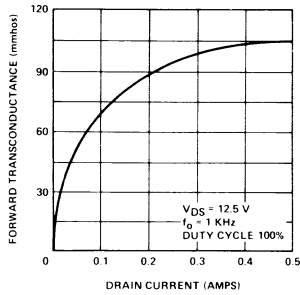
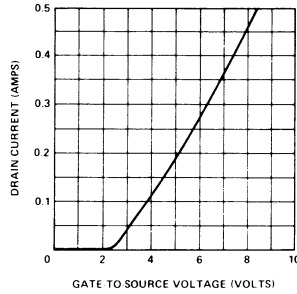


Typical Performance Curves (25°C)

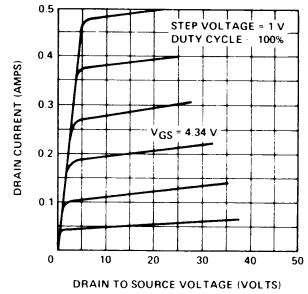
Transconductance vs Drain Current



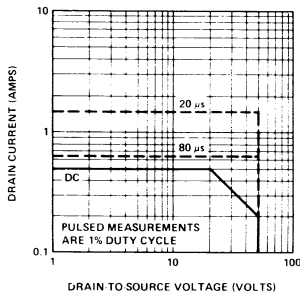
Drain Current vs Gate-to-Source Voltage



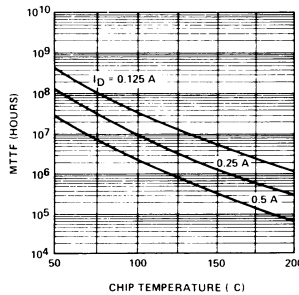
Output Characteristics vs Drain-to-Source Voltage



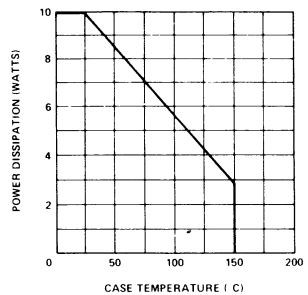
DC and Inductive Safe Operating Region
T_C = 25°C



MTTF vs Chip Temperature

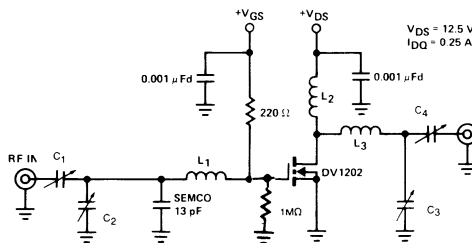


Power Dissipation vs Case Temperature



Test Fixture

DV1202S 175 MHz



Parts List

- L₁ 4 turns #18 AWG on 1/8" diameter
- L₂ 10 turns #22 AWG on 1/4" diameter
- L₃ 4 turns #16 AWG on 1/4" diameter
- C₁, C₃ #461 3-30pF
- C₂, C₄ #462 5-80 pf

All DV1202s are tested in this test fixture.



Small Signal 2-Port Parameters DV1202S

2-Port Y-Parameter Matrix in Millimhos

Freq (MHz)	Y ₁₁		Y ₂₁		Y ₁₂		Y ₂₂	
	(Real)	(Imag)	(Real)	(Imag)	(Real)	(Imag)	(Real)	(Imag)
10	-058	962	91.2	-3.76	-002	-108	1.59	1.54
20	021	1.48	89.8	-4.31	007	-335	1.78	2.38
30	-218	2.27	91.1	-6.85	027	-567	1.66	3.38
40	-369	3.07	91.9	-8.32	048	-822	1.47	4.51
50	-259	4.24	93.6	-10.7	089	-101	1.74	5.98
60	-200	5.30	92.9	-12.7	119	-1.23	1.83	7.39
70	-232	6.38	92.0	-17.0	169	-1.47	1.82	8.78
80	140	7.74	96.1	-17.8	217	-1.64	2.29	10.6
90	446	8.49	96.6	-19.1	306	-1.97	2.34	11.8
100	519	9.87	98.1	-23.7	363	-2.19	3.09	13.1
120	1.34	12.1	105	-27	460	-2.7	4.23	16.1
140	1.61	14.0	106	-33.9	695	-3.49	4.8	18.5
160	2.37	16.1	111	-38.8	949	-4.17	6.13	21.0
180	2.85	18.7	114	-47.9	1.25	-4.93	6.92	24.1
200	4.72	21.3	120	-58.5	1.47	-5.46	9.18	27.2
225	5.12	24.2	126	-70.1	1.83	-6.43	9.44	30.7
250	6.29	27.2	130	-84.7	2.36	-7.74	10.3	34.4
275	8.05	30.4	130	-101	3.03	-9.24	11.0	38.5
300	10.5	33.6	125	-118	3.64	-10.8	11.9	41.8
325	13.7	36.4	119	-128	4.46	-12.2	12.2	44.6
350	19.2	39.5	115	-148	4.98	-13.0	14.5	48.5
375	20.5	41.3	103	-152	6.43	-15.1	13.0	49.3
400	24.1	41.9	93.8	-159	7.68	-16.1	13.4	50.8
425	27.9	43.1	83.8	-162	8.49	-17.1	14.9	51.3
450	30.6	43.5	71.5	-167	9.22	-18.0	16.5	53.1
475	30.7	43.5	63.4	-162	11.0	-19.5	15.6	51.8
500	30.3	41.4	51.0	-156	12.1	-20.9	16.1	52.3

Conditions: 12.5 V @ 250 mA

Polar S-Parameters in 50.0 Ohm System

Freq (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	(Magn)	(Angl)	(Magn)	(Angl)	(Magn)	(Angl)	(Magn)	(Angl)
10	100	-8	8.41	170	01	81	85	-12
20	98	-16	8.04	163	03	77	83	-22
30	98	-26	8.04	154	05	71	83	-34
40	96	-36	7.85	146	07	64	83	-45
50	92	-45	7.41	137	08	58	80	-57
60	88	-53	6.84	129	09	52	78	-66
70	84	-61	6.31	120	10	47	76	-75
80	80	-69	5.89	114	10	42	74	-84
90	76	-76	5.43	109	11	39	74	-92
100	74	-83	5.01	103	11	36	70	-99
120	69	-95	4.37	96	11	30	68	-111
140	66	-105	3.76	88	12	27	67	-121
160	65	-114	3.31	83	12	25	67	-129
180	64	-122	2.92	76	12	23	67	-136
200	63	-129	2.60	72	11	23	67	-141
225	63	-136	2.37	66	11	21	68	-146
250	63	-143	2.11	61	11	21	69	-151
275	63	-149	1.86	56	11	22	70	-155
300	63	-155	1.66	52	11	24	70	-158
325	64	-159	1.48	49	11	26	71	-159
350	65	-162	1.35	46	10	29	72	-161
375	66	-165	1.23	43	11	32	72	-162
400	67	-167	1.14	41	11	36	73	-162
425	68	-169	1.05	40	11	39	73	-163
450	68	-170	0.99	38	11	42	73	-164
475	69	-171	0.93	37	12	45	73	-164
500	68	-172	0.88	36	13	48	73	-165

Conditions: 12.5 V @ 250 mA

Small Signal 2-Port Parameters DV1202W

2-Port Y-Parameter Matrix in Millimhos

Freq (MHz)	Y ₁₁		Y ₂₁		Y ₁₂		Y ₂₂	
	(Real)	(Imag)	(Real)	(Imag)	(Real)	(Imag)	(Real)	(Imag)
10	241	745	98.7	-2.88	005	-227	2.21	1.32
20	063	1.70	96.1	-2.54	015	-343	2.21	2.56
30	-132	2.30	97.1	-3.78	038	-576	1.94	3.63
40	-370	3.11	97.2	-6.92	058	-837	1.73	4.94
50	-149	4.32	98.9	-7.94	080	-104	2.01	6.35
60	012	5.23	99.3	-7.01	131	-1.26	2.13	7.78
70	-005	6.33	101	-10.1	170	-1.53	2.21	9.17
80	045	7.03	102	-11.2	221	-1.84	2.64	10.4
90	319	8.46	103	-11.1	277	-2.01	2.95	11.8
100	474	9.56	106	-11.4	311	-2.24	3.47	13.5
120	101	11.3	107	-15.0	461	-2.89	4.0	16.0
140	162	13.3	108	-18.5	554	-3.38	4.65	18.4
160	193	15.5	113	-21.3	657	-4.01	5.88	21.2
180	2.81	17.5	115	-24.6	731	-4.66	6.49	23.6
200	2.66	18.8	113	-26.3	964	-5.53	6.25	25.4
225	3.18	20.9	117	-29.8	1.22	-6.44	6.98	28.4
250	4.17	24.3	128	-34.4	1.27	-7.30	8.30	33.4
275	5.00	27.9	131	-42.9	1.49	-8.54	8.20	36.7
300	7.48	31.6	136	-49.5	1.48	-9.27	9.45	41.4
325	9.41	34.3	137	-56.8	1.58	-10.77	10.43	44.0
350	13.7	38.9	140	-69.4	1.31	-11.3	11.8	48.2
375	16.1	41.8	142	-71.3	1.82	-12.5	12.0	49.7
400	18.9	44.7	136	-78.3	1.90	-13.4	11.7	51.7
425	25.0	52.1	154	-98.8	2.26	-15.4	13.6	56.9
450	26.4	54.7	160	-112	2.46	-17.6	16.9	60.1
475	31.8	56.6	160	-130	2.78	-19.7	15.4	64.3
500	38.6	59.1	162	-164	1.71	-21.1	24.0	71.4

Conditions: 12.5 V @ 0.25 A

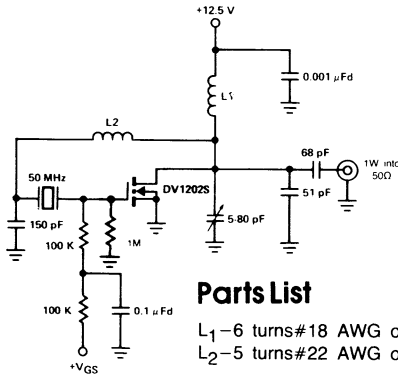
Polar S-Parameters in 50.0 Ohm System

Freq (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	(Magn)	(Angl)	(Magn)	(Angl)	(Magn)	(Angl)	(Magn)	(Angl)
10	97	-10	8.71	170	02	83	80	-14
20	98	-18	8.41	163	03	77	80	-24
30	98	-27	8.41	155	05	71	82	-36
40	96	-37	8.13	145	07	63	82	-49
50	91	-47	7.59	137	08	56	79	-60
60	88	-55	7.08	131	09	51	79	-70
70	84	-64	6.61	123	10	45	77	-80
80	81	-71	6.10	118	11	41	75	-89
90	79	-78	5.62	113	11	37	74	-95
100	76	-84	5.19	109	11	33	73	-102
120	72	-95	4.42	101	12	28	72	-113
140	69	-103	3.85	95	12	24	71	-120
160	68	-111	3.39	90	12	20	70	-128
180	66	-118	2.99	86	12	17	70	-133
200	66	-123	2.69	82	13	15	71	-137
225	66	-129	2.40	78	13	13	72	-142
250	66	-135	2.14	74	12	9	73	-147
275	66	-141	1.91	69	12	7	73	-150
300	66	-145	1.70	66	11	5	74	-152
325	66	-149	1.53	64	11	5	74	-154
350	66	-153	1.38	61	10	4	74	-155
375	68	-156	1.26	60	10	5	75	-156
400	68	-158	1.16	57	10	5	75	-156
425	71	-163	1.06	55	09	6	76	-159
450	72	-165	0.99	55	09	8	76	-162
475	72	-168	0.93	53	09	10	77	-163
500	72	-170	0.87	53	08	13	77	-166

Conditions: 12.5 V @ 0.25 A

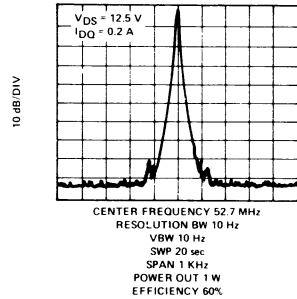
Applications

DV1202S 50 MHz Crystal Oscillator

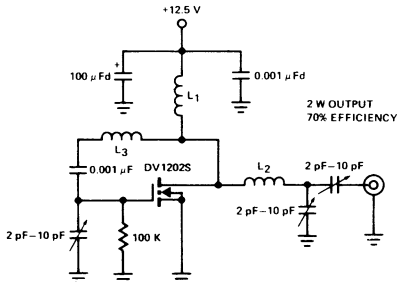


Parts List

- L₁ - 6 turns #18 AWG on 1/8" diameter
- L₂ - 5 turns #22 AWG on 3/16" diameter



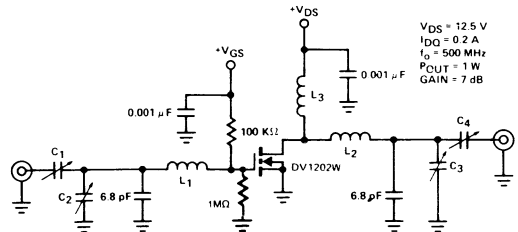
DV1202S 400 MHz Oscillator



Parts List

- L₁ - 8 turns #22 AWG close wound on 1/4" diameter
- L₂ - 1/2 inch #16 AWG wire
- L₃ - 1 inch #16 AWG wire

DV1202W 500 MHz Amplifier



Parts List

- C₁, C₂, C₃, C₄, ARCO #4000, 1 → 7 pF
- L₁, L₂, 1/2" length #12 AWG wire
- L₃, 4 turns #22 AWG enamelled wire close wound on 1/4" diameter



RF Power FETs

N-Channel

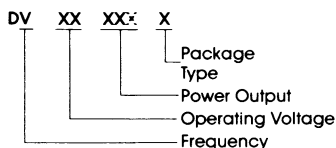
Enhancement-Mode

175 MHz 5W
6-24V 10dB

Benefits

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

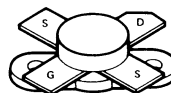
Other devices in series:
DV1202, DV1210, DV1220, DV1230, DV1240



Absolute Maximum Ratings (25°C)

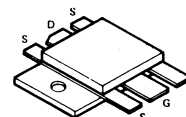
- Gate-Source Voltage 30 V
- Drain-Source Voltage 50 V
- Drain-Gate Voltage 50 V
- Drain Current (DC) 1 A
- Total Device Dissipation 20 W
@ 25° Case
- θ_{jC} 8.8°C/W
- Storage Temperature -65°C to 150°C
- Junction Temperature 200°C

Package Type S



.380 SOE
FLANGE

Package Type W



C-220

Electrical Characteristics (25°C)

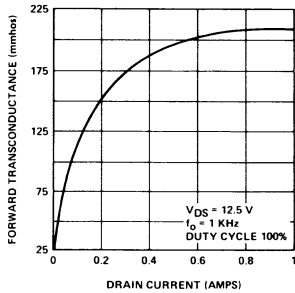
Symbol	Characteristic	Min	Typ	Max	Unit	Test Conditions
$P_{OUT(1)}$	Power Output	5			W	$V_{DS} = 12.5 \text{ V}, I_{DQ} = 0.5 \text{ A}$ $P_{IN} = 0.5 \text{ W}, f = 175 \text{ MHz}$
$\eta(1)$	Drain Efficiency		60		%	
g_m	Transconductance		200		mmho	$V_{DS} = 12.5 \text{ V}, I_D = 0.5 \text{ A}$
C_{oss}	Output Capacity		38			
C_{rss}	Reverse Transfer Capacity		4		pF	$V_{DS} = 12.5 \text{ V}, V_{GS} = 0 \text{ V}$
C_{iss}	Input Capacity		26			
$NF(2)$	Small Signal Noise Figure		7		dB	$f = 175 \text{ MHz}, V_{DS} = 12.5 \text{ V}$ $I_D = 0.5 \text{ A}$

Notes: (1) All devices 100% power tested in Siliconix test fixture No. RF12175 [5]
(2) Noise figure measured with amplifier source and load power matched at 5 watts output.

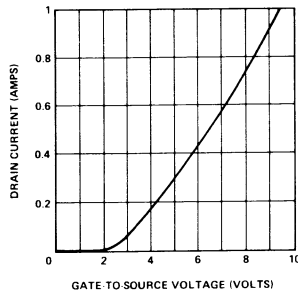
Siliconix Incorporated

Typical Performance Curves (25°C)

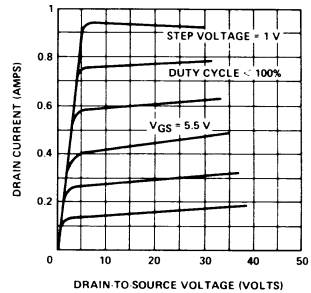
Transconductance vs Drain Current



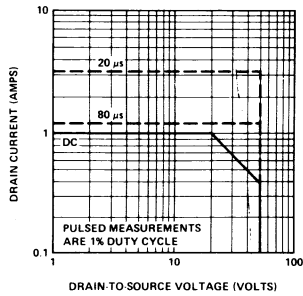
Drain Current vs Gate-to-Source Voltage



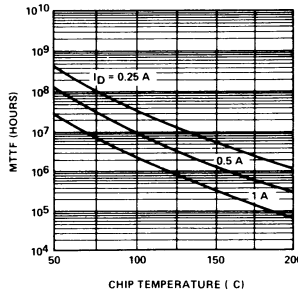
Output Characteristics vs Drain-to-Source Voltage



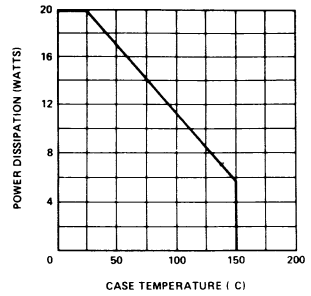
DC and Inductive Safe Operating Region
TC = 25°C



MTF vs Chip Temperature

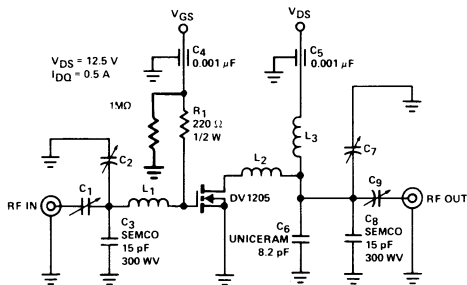


Power Dissipation vs Case Temperature



Test Fixture

DV1205 175 MHz



Parts List

- C1, C7, 2.7 to 30 pF, ARCO #461 trimmer capacitors
- C2, C9, 5 to 80 pF, ARCO #462 trimmer capacitors
- L1, 3 turns #18 AWG on 1/8" diameter, close wound
- L2, 2 turns #16 AWG on 1/8" diameter, close wound
- L3, 10 turns #22 AWG on 1/4" diameter, close wound

All DV1205s are tested in this test fixture.



Small Signal 2-Port Parameters DV1205S

Polar S-Parameters in 50.0 Ohm System

2-Port Y-Parameter Matrix in Millimhos

Freq (MHz)	Y ₁₁		Y ₂₁		Y ₁₂		Y ₂₂	
	(Real)	(Imag)	(Real)	(Imag)	(Real)	(Imag)	(Real)	(Imag)
10	-116	1.92	182	-7.52	-.004	-216	3.18	3.08
20	042	2.96	180	-8.62	014	-670	3.56	4.76
30	-436	4.54	182	-13.7	054	-113	3.32	6.76
40	-738	6.14	184	-16.6	096	-164	2.94	9.02
50	-516	8.48	187	-21.4	.178	-202	3.48	12.0
60	-400	10.6	186	-25.4	338	-2.46	3.66	14.8
70	-464	12.8	184	-34.0	238	-2.94	3.64	17.6
80	280	15.5	192	-35.6	434	-3.28	4.58	21.2
90	892	17.0	193	-38.2	612	-3.94	4.68	23.6
100	104	19.7	196	-47.4	726	-4.38	6.18	26.2
120	2.68	24.2	210	-54.0	920	-5.40	8.46	32.2
140	3.22	28.0	212	-67.8	1.39	-6.98	9.60	37.0
160	4.74	32.2	222	-77.6	1.90	-8.34	12.3	42.0
180	5.70	37.4	228	-95.8	2.50	-9.86	13.8	48.2
200	9.44	42.6	240	-117	2.94	-10.9	18.4	54.4
225	10.2	48.4	252	-140	3.66	-12.9	18.9	61.4
250	12.6	54.4	260	-169	4.72	-15.5	20.6	68.8
275	14.1	60.8	266	-202	6.06	-18.5	22.0	77.0
300	21.0	67.2	250	-236	7.28	-21.5	23.8	83.6
325	27.4	72.8	238	-256	8.92	-24.4	24.4	89.2
350	38.4	79.0	230	-296	9.96	-26.0	29.0	97.0
375	41.0	82.6	206	-304	12.9	-30.2	26.0	98.6
400	48.2	83.8	188	-318	15.4	-32.2	26.8	102
425	56.8	86.2	168	-324	17.0	-34.2	29.8	103
450	61.2	87.0	143	-334	18.4	-36.0	33.0	106
475	61.4	87.0	127	-324	22.0	-39.0	31.2	104
500	60.6	82.8	102	-312	24.2	-41.8	32.2	105

Conditions: 12.5 V @ 500 mA

Freq (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	(Magn)	(Angl)	(Magn)	(Angl)	(Magn)	(Angl)	(Magn)	(Angl)
10	.98	-20	15.2	160	.02	71	.72	-29
20	.90	-43	13.3	145	.05	59	.70	-58
30	.86	-65	11.8	130	.07	47	.71	-83
40	.79	-84	10.1	117	.09	36	.72	-102
50	.74	-96	8.44	108	.09	29	.71	-115
60	.71	-106	7.11	100	.09	23	.70	-124
70	.68	-113	6.09	92	.10	20	.69	-131
80	.67	-120	5.32	87	.09	16	.70	-136
90	.66	-127	4.63	84	.09	14	.72	-141
100	.67	-131	4.11	79	.09	12	.71	-145
120	.68	-139	3.33	75	.08	9	.72	-151
140	.69	-146	2.73	69	.09	8	.74	-156
160	.71	-151	2.30	66	.08	8	.75	-159
180	.72	-154	1.97	61	.08	8	.76	-162
200	.73	-158	1.71	58	.07	9	.78	-164
225	.74	-161	1.53	54	.07	9	.79	-166
250	.75	-164	1.33	51	.07	11	.80	-168
275	.76	-167	1.15	47	.07	13	.81	-170
300	.77	-170	1.02	44	.07	16	.82	-171
325	.78	-171	.90	42	.07	19	.82	-174
350	.79	-173	.81	40	.06	23	.83	-172
375	.80	-174	.74	38	.07	26	.84	-172
400	.81	-175	.68	36	.07	31	.84	-173
425	.82	-176	.62	36	.06	34	.84	-173
450	.82	-176	.58	33	.06	37	.85	-173
475	.83	-177	.55	33	.07	41	.85	-173
500	.82	-177	.52	32	.08	44	.85	-174

Conditions: 12.5 V @ 500 mA

Small Signal 2-Port Parameters DV1205W

Polar S-Parameters in 50.0 Ohm System

2-Port Y-Parameter Matrix in Millimhos

Freq (MHz)	Y ₁₁		Y ₂₁		Y ₁₂		Y ₂₂	
	(Real)	(Imag)	(Real)	(Imag)	(Real)	(Imag)	(Real)	(Imag)
10	482	1.49	197	-5.77	.01	-.453	4.42	2.64
20	126	3.4	192	-5.07	03	-.685	4.42	5.12
30	-.263	4.6	194	-7.56	.08	1.15	3.87	7.27
40	-.739	6.22	194	-13.8	115	-1.67	3.46	9.89
50	-.298	8.65	196	-15.9	161	-2.09	4.02	12.7
60	-.023	10.5	199	-14	263	-2.52	4.26	15.6
70	-.005	12.7	202	-20	339	-3.06	4.42	18.3
80	.090	14.1	204	-22	442	-3.68	5.28	20.8
90	.638	16.9	206	-22	554	-4.03	5.91	23.7
100	1.35	19.1	212	-23	622	-4.48	6.93	27.0
120	2.02	22.7	214	-30	921	-5.79	8.01	31.9
140	3.24	26.7	216	-37	111	-6.75	9.29	36.9
160	3.86	30.9	226	-42.6	1.31	-8.02	11.8	42.3
180	5.62	35.0	230	-49.2	1.46	-9.32	13.0	47.3
200	5.31	37.6	226	-52.6	1.93	-11.1	12.5	50.8
225	6.35	41.8	234	-59.5	2.45	-12.9	14.0	56.9
250	8.34	48.6	255	-68.9	2.54	-14.6	16.6	66.7
275	10.0	55.7	262	-85.8	2.98	-17.1	16.4	73.3
300	15.0	63.2	273	-98.9	2.96	-18.5	18.9	82.8
325	18.8	68.6	274	-114	3.15	-21.1	20.7	88.1
350	27.3	77.9	280	-139	2.63	-22.5	23.5	96.4
375	32.2	83.7	284	-143	3.65	-24.9	24.1	99.4
400	37.8	89.5	272	-157	3.80	-26.8	23.5	103
425	50.0	104	309	-198	4.53	-30.8	27.1	114
450	52.9	109	320	-225	4.91	-35.2	33.7	120
475	63.6	113	320	-259	5.55	-39.4	30.8	129
500	77.1	118	324	-328	3.42	-42.2	48.0	143

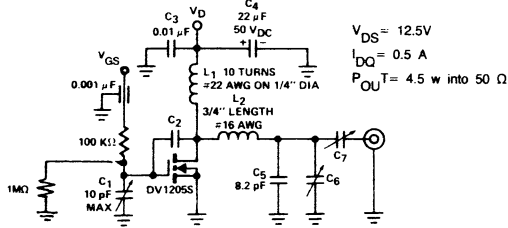
Conditions: 12.5 V @ 0.50 A

Freq (MHz)	S ₁₁		S ₂₁		S ₁₂		S ₂₂	
	(Magn)	(Angl)	(Magn)	(Angl)	(Magn)	(Angl)	(Magn)	(Angl)
10	.92	-29	.15	158	.03	71	.65	-40
20	.91	-47	13.5	145	.05	59	.67	-63
30	.86	-68	12.1	130	.07	46	.72	-87
40	.79	-86	10.1	116	.09	34	.73	-107
50	.74	-99	8.39	108	.09	27	.71	-119
60	.72	-108	7.46	102	.09	22	.73	-127
70	.70	-117	6.14	95	.09	17	.73	-134
80	.69	-124	5.31	92	.10	15	.74	-141
90	.70	-128	4.68	87	.09	11	.74	-143
100	.70	-132	4.15	85	.09	8.7	.75	-147
120	.70	-140	3.31	79	.09	6.2	.76	-152
140	.70	-144	2.78	75	.09	4.0	.76	-155
160	.72	-148	2.36	72	.08	2	.77	-158
180	.72	-152	2.03	69	.08	4	.78	-160
200	.73	-154	1.79	66	.09	-5	.79	-162
225	.75	-157	1.56	64	.08	-1.2	.80	-164
250	.76	-160	1.36	61	.08	-3.9	.82	-166
275	.77	-162	1.19	57	.07	-4.6	.82	-167
300	.78	-164	1.05	55	.07	-5.8	.83	-167
325	.78	-166	.93	54	.07	-4.9	.84	-168
350	.79	-168	.84	52	.06	-5.2	.84	-169
375	.81	-169	.75	51	.06	-3.7	.85	-169
400	.81	-170	.69	49	.06	-3.4	.85	-169
425	.83	-172	.62	48	.05	-1.1	.86	-170
450	.84	-173	.58	49	.05	1.8	.86	-172
475	.84	-175	.54	48	.05	4.5	.87	-172
500	.84	-176	.50	48	.05	8.5	.87	-174

Conditions: 12.5 V @ 0.5 A

Applications

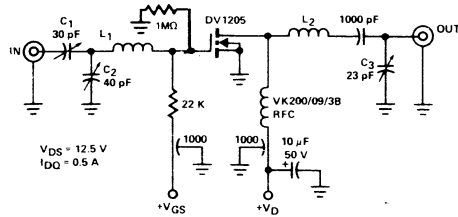
DV1205S 400 MHz Oscillator



Parts List

- L1, 10 turns #22 AWG on 1/4" diameter, close wound
- L2, 3/4" length of #16 AWG
- C6, 1.5 to 20 pF, ARCO #402 trimmer capacitor
- C7, 0.9 to 7 pF, ARCO #400 trimmer capacitor
- C2, Unicoram 47 pF capacitor with ribbon leads. Lead length $\approx 0.25"$ long and $.05"$ wide.

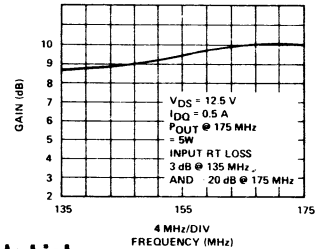
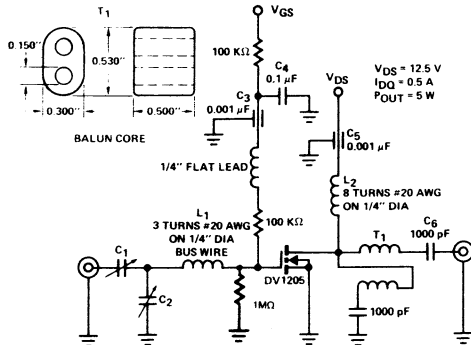
2 Meter Amplifier 5 W Output



Parts List

- L1, 60 nH 4T #22 AWG close wound 0.125" I.D.
- L2, 54 nH 3 1/2T #22 AWG close wound 0.125" I.D.
- C1, C2, C3, ARCO #462 5-80 pF

DV1205S 135-175 MHz Amplifier



Parts List

- C1, C2 ARCO #462, 2 to 80 pF, trimmer capacitors
- L1, 3 turns buss wire #20 AWG on 1/4" diameter
- L2, 8 turns #20 AWG on 1/4" diameter
- T1, 1 turn of 25 Ω coax on 2 balun cores. Stackpole #57-0973 $\mu_o = 35$.



Preliminary

RF Power FETs N-Channel Enhancement-Mode

175 MHz 10W
12.5V 10dB

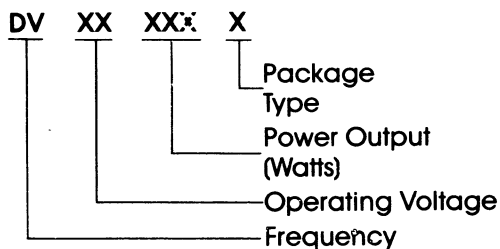
HF/VHF/UHF Amplifiers
Class A, B, or C
High Dynamic Range Amp

Benefits

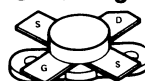
No Thermal Runaway
Withstands Infinite VSWR
Class A, B, or C Operation
Low Noise Figure
High Dynamic Range
Simple Bias Circuitry

Absolute Maximum Ratings (25°C)

Gate-source Voltage	30V
Drain-Source Voltage	50V
Drain-Gate Voltage	50V
Drain Current	2A
Total Device Dissipation	40W
@ 25° Case	
θ_{jc} for C-220	3.5°C/W
Storage temperature	-65°C to 150°C
Junction Temperature	200°C

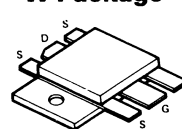


S - Package



.380 SOE
FLANGE

W-Package



C-220

Electrical Characteristics (25°C)

Symbol	Characteristic	Min	Typ	Max	Unit	Test Conditions
$P_{OUT(1)}$	Power Output	9	10		W	$V_{DD} = 12.5\text{ V}$, $I_{DQ} = 1\text{ A}$ $P_{IN} = 1\text{ W Max}$, $F = 175\text{ MHz}$
$\eta(1)$	Drain Efficiency	55	60		%	
g_m	Transconductance		0.4		Mho	$V_{DS} = 12.5\text{ V}$, $I_D = 1\text{ A}$
C_{OSS}	Output Capacity		49			
C_{RSS}	Reverse Transfer Capacity		7.5		pF	$V_{DS} = 12.5\text{ V}$, $V_{GS} = 0\text{ V}$
C_{ISS}	Input Capacity		41			
Z_{IN}	Input (Series) Impedance		3.1-j 12.9		Ω	$V_{DS} = 12.5\text{ V}$, $P_{IN} = 1\text{ W}$ $F = 175\text{ MHz}$, $P_{OUT} = 10\text{ W}$
Z_{OUT}	Output (Series) Impedance		4.0-j 4.0			

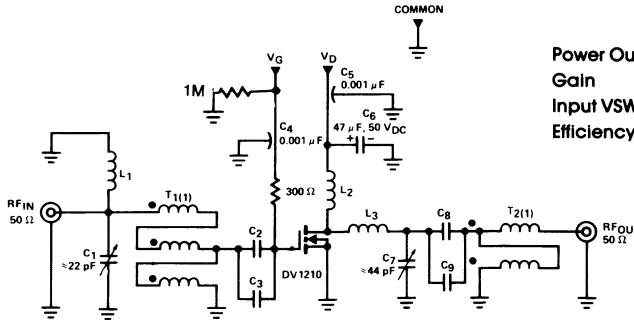
Note:

(1) All devices 100% power tested in Siliconix test fixture No. RF12175 [10]

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Test Fixture/Applications

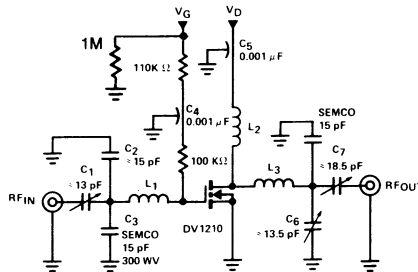
135 MHz to 175 MHz, 12.5 Volt Amplifier



Power Out	10 W
Gain	9.6 dB +0, -0.4 dB
Input VSWR	< 1.5:1
Efficiency	> 55%

- Notes:** C1, Arco #462 trimmer capacitor, 5 to 80 pF
 C7, Arco #463 trimmer capacitor, 9 to 180 pF
 L1, 2 turns, #AWG 22 on 1/4" diameter close wound
 L2, 7 turns, #AWG 22 on 1/4" diameter close wound
 L3, 1/2" #AWG 18 buss, 1/2-turn on 1/4" diameter
 C2, C3, C8, C9, 0.01 μ F chip capacitors, Johanson P/N 201 L64 N 103 MA
 T1, One turn #22 AWG enamel wire trifilar twisted with 13 crests per inch on one Stackpole balun core #57-0973
 T2, One turn 25 Ω coax wound on two balun cores placed end on end. Stackpole balun cores #57-0973
 (1) — Dot indicates winding starts

175 MHz, 12.5 Volt Amplifier Siliconix Test Fixture #RF12175 [10]



Power Out	10 W
Gain	10 dB
Efficiency	> 60%

- Notes:** C1, C2, C5, C6, Arco #462, 5 to 80 pF
 L1, 2 1/2" length of #AWG 12, 1/2 turn on 1/3" diameter
 L2, 8 turns #AWG 22 on 1/4" diameter, close wound
 L3, 1 5/8" length of #AWG 12, 1/2 turn on 1/3" diameter

RF Power FETs

N-Channel

Enhancement-Mode



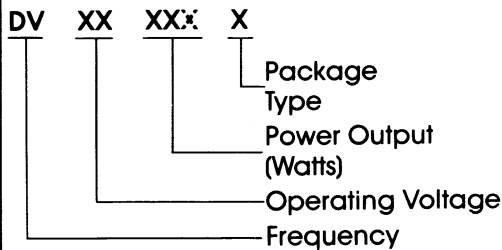
Preliminary

175 MHz 20W
12.5V 10dB

DV1220S DV1220W

Benefits

- No Thermal Runaway
- Withstands Infinite VSWR
- Class A, B, or C Operation
- Low Noise Figure
- High Dynamic Range
- Simple Bias Circuitry



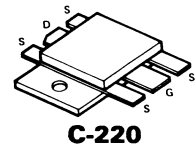
Absolute Maximum Ratings (25°C)

Gate-Source Voltage.....	30V
Drain-Source Voltage.....	50V
Drain-Gate Voltage.....	50V
Drain Current.....	4A
Total Device Dissipation.....	80W
@ 25° Case	
θ _{jc} for .380SOE	2.2°C/W
θ _{jc} for C-220	1.76°C/W
Storage Temperature....	-65°C to 150°C
Junction Temperature	200°C

S-Package



W-Package



Electrical Characteristics (25°C)

Symbol	Characteristic	Min	Typ	Max	Unit	Test Conditions
P _{OUT} (1)	Power Output	18	20		W	V _{DD} = 12.5 V, I _{DQ} = 2 A P _{IN} = 2 W Max, F = 175 MHz
η(1)	Drain Efficiency	55	60		%	
g _m	Transconductance		0.8		Mho	V _{DS} = 12.5 V, I _D = 2 A
C _{oss}	Output Capacity		98			
C _{rss}	Reverse Transfer Capacity		15		pF	V _{DS} = 12.5 V, V _{GS} = 0 V
C _{iss}	Input Capacity		82			
Z _{IN}	Input (Series) Impedance		1.6-j6.5		Ω	V _{DS} = 12.5 V, P _{IN} = 2 W
Z _{OUT}	Output (Series) Impedance		2-j2			F = 175 MHz, P _{OUT} = 20 W

Note: (1) All devices 100% power tested in Siliconix test fixture No. RF12175 [20]

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Preliminary

RF Power FETs N-Channel Enhancement-Mode

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

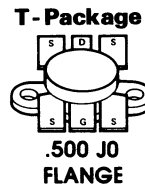
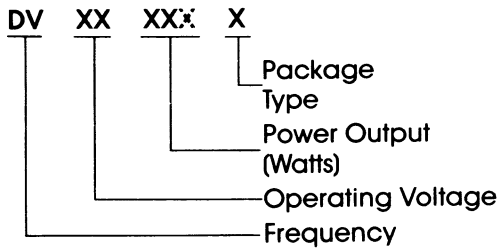
30 W Broadband
12.5 V
10 dB Gain
175 MHz

Benefits

- No Thermal Runaway
- Withstands Infinite VSWR
- Class A, B, or C Operation
- Low Noise Figure
- High Dynamic Range
- Simple Bias Circuitry

Absolute Maximum Ratings (25°C)

- Gate-Source Voltage..... 30V
- Drain-Source Voltage..... 50V
- Drain-Gate Voltage..... 50V
- Drain Current..... 6A
- Total Device Dissipation..... 120W
@ 25° Case
- θ_{jc} for .500 J0..... 1.5°C/W
- θ_{jc} for C-220..... 1.2°C/W
- Storage Temperature... -65°C to 150°C
- Junction Temperature..... 200°C



Electrical Characteristics (25°C)

Symbol	Characteristic	Min	Typ	Max	Unit	Test Conditions
$P_{OUT(1)}$	Power Output	27	30		W	$V_{DD} = 12.5\text{ V}$, $I_{DQ} = 3\text{ A}$ $P_{IN} = 3\text{ W Max}$, $F = 175\text{ MHz}$
$\eta(1)$	Drain Efficiency	55	60		%	
g_m	Transconductance		1.2		Mho	$V_{DS} = 12.5\text{ V}$, $I_D = 3\text{ A}$
C_{OSS}	Output Capacity		147			
C_{RSS}	Reverse Transfer Capacity		22.5		pF	$V_{DS} = 12.5\text{ V}$, $V_{GS} = 0\text{ V}$
C_{ISS}	Input Capacity		123			
Z_{IN}	Input (Series) Impedance		1-j4.3		Ω	$V_{DS} = 12.5\text{ V}$, $P_{IN} = 3\text{ W}$
Z_{OUT}	Output (Series) Impedance		1.3-j1.3			$F = 175\text{ MHz}$, $P_{OUT} = 30\text{ W}$

Note: (1) All devices 100% power tested in Siliconix test fixture No. RF12175 [30]

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Preliminary

RF Power FETs N-Channel Enhancement-Mode

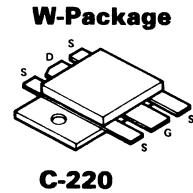
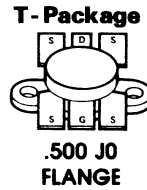
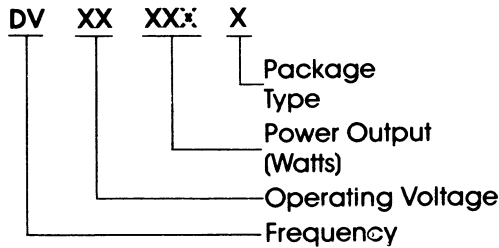
175 MHz 40W
12.5V 10dB

Benefits

- No Thermal Runaway
- Withstands Infinite VSWR
- Class A, B, or C Operation
- Low Noise Figure
- High Dynamic Range
- Simple Bias Circuitry

Absolute Maximum Ratings (25°C)

- Gate-Source Voltage..... 30V
- Drain-Source Voltage..... 50V
- Drain-Gate Voltage..... 50V
- Drain Current..... 8A
- Total Device Dissipation..... 160W
@ 25° Case
- θ_{jc} for .500 J0..... 1.1°C/W
- θ_{jc} for C-220..... 0.9°C/W
- Storage Temperature... -65°C to 150°C
- Junction Temperature..... 200°C



Electrical Characteristics (25°C)

Symbol	Characteristic	Min	Typ	Max	Unit	Test Conditions
$P_{OUT(1)}$	Power Output	36	40		W	$V_{DD} = 12.5\text{ V}$, $I_{DQ} = 4\text{ A}$ $P_{IN} = 4\text{ W Max}$, $F = 175\text{ MHz}$
$\eta(1)$	Drain Efficiency	55	60		%	
g_m	Transconductance		1.6		Mho	$V_{DS} = 12.5\text{ V}$, $I_D = 4.0\text{ A}$
C_{oss}	Output Capacity		196			
C_{rss}	Reverse Transfer Capacity		30		pF	$V_{DS} = 12.5\text{ V}$, $V_{GS} = 0\text{ V}$
C_{iss}	Input Capacity		164			
Z_{IN}	Input (Series) Impedance		0.8-j3.2		Ω	$V_{DS} = 12.5\text{ V}$, $P_{IN} = 4\text{ W}$
Z_{OUT}	Output (Series) Impedance		1.0-j1.0			$F = 175\text{ MHz}$, $P_{OUT} = 40\text{ W}$

Note: (1) All devices 100% power tested in Siliconix test fixture No. RF12175 [40]

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DV1260T



N-Channel MOSPOWER FETs

Enhancement-Mode

175 MHz

12.5 V

60 W

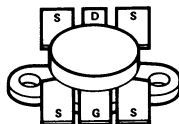
Other Devices in Series:

DV1202, DV1205, DV1210, DV1220, DV1230, DV1240

FEATURES

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

Package Type T



.500 JO Flange

See page 5-62 for Package Dimensions

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

Gate-Source Voltage	30V	Total Device Dissipation	240W
Drain-Source Voltage	45V	Thermal Resistance, Junction to Case	0.73°C/W
Drain-Gate Voltage	45V	Junction Temperature	200°C
Drain Current (DC)	12A	Storage Temperature	-65°C to 150°C

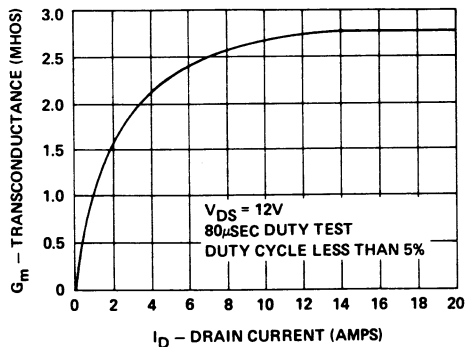
ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Characteristics	Min	Typ	Max	Unit	Test Condition
BV_{DSS}	Drain-Source Breakdown Voltage	45			V	$V_{GS} = 0V, I_D = 30\text{ mA}$
I_{DSS}	Drain-Source Leakage Current			3.0	mA	$V_{GS} = 0V, V_{DS} = 15V$
I_{GSS}	Gate-Source Leakage Current			100	nA	$V_{GS} = 30V, V_{DS} = 0V$
g_m	D.C. Forward Transconductance ¹	1.5	2.4		Mho	$V_{DS} = 10V, I_D = 6A, \Delta V_{GS} = 1.0V$
$I_{D(on)}$	On-State Drain Current ¹		20		A	$V_{DS} = 12V, V_{GS} = 10V$
$V_{GS(th)}$	Gate Threshold Voltage	2		6	V	$V_{GS} = V_{DS}, I_D = 600\text{ mA}$
C_{iss}	Common-Source Input Capacitance			285	pF	$V_{GS} = 0V, V_{DS} = 12.5V, f = 1.0\text{ MHz}$
C_{oss}	Common-Source Output Capacitance			340	pF	$V_{GS} = 0V, V_{DS} = 12.5V, f = 1.0\text{ MHz}$
C_{rss}	Reverse Transfer Capacitance			60	pF	$V_{GS} = 0V, V_{DS} = 12.5V, f = 1.0\text{ MHz}$
G_{ps}	Common-Source Power Gain	8.0			dB	$V_{DD} = 12.5V, P_o = 60W, f = 175\text{ MHz}, I_{DQ} = 6A$
η	Drain Efficiency		60		%	$V_{DD} = 12.5, P_o = 60W, f = 175\text{ MHz}, I_{DQ} = 6A$
V_{SWR}	Load Mismatch Tolerance	30:1				$V_{DD} = 12.5, P_o = 60W, f = 175\text{ MHz}, I_{DQ} = 6A$

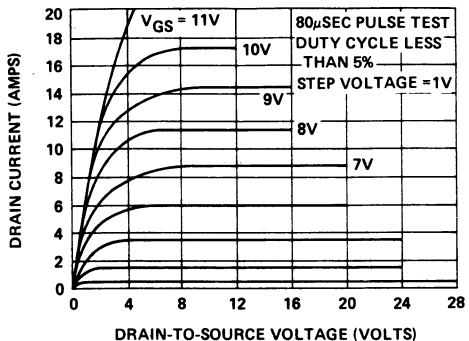
Note 1: Pulse Test—80 μ s to 300 μ s, 1% duty cycle

TYPICAL PERFORMANCE CURVES ($T_C = 25^\circ\text{C}$ unless otherwise noted)

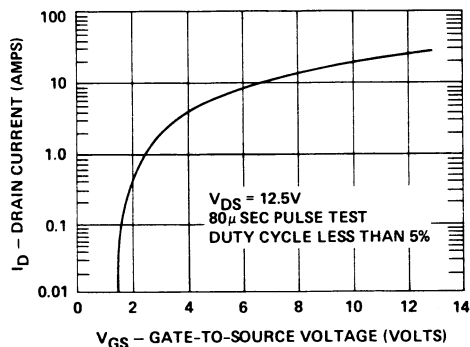
Transconductance vs Drain Current



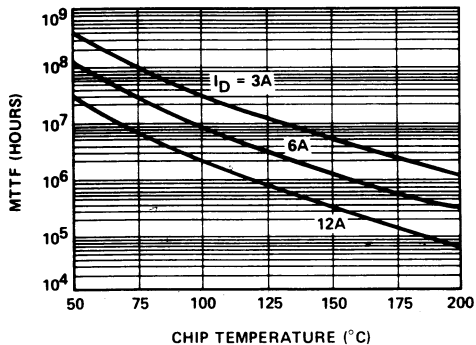
Output Characteristics



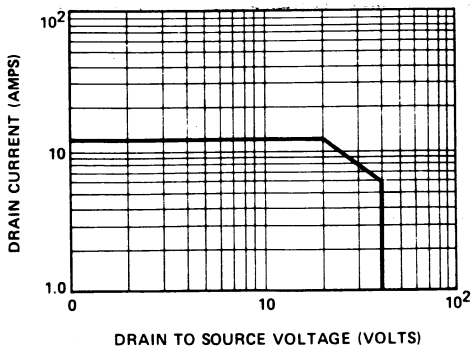
Transfer Characteristics



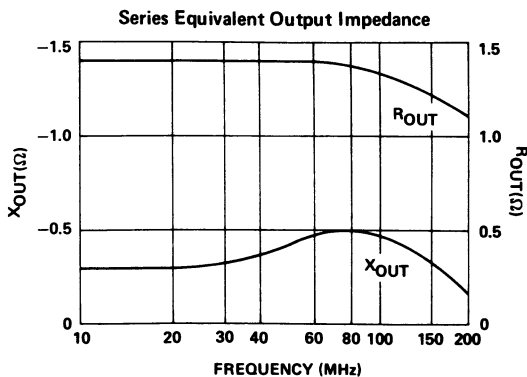
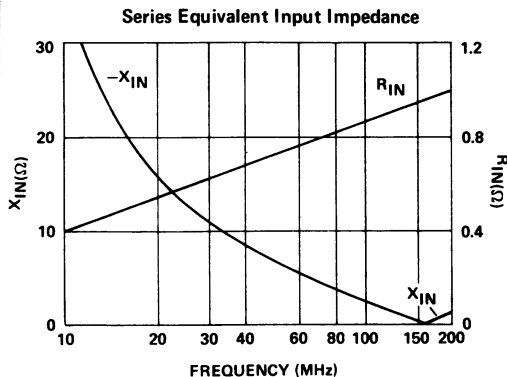
MTTF vs Chip Temperature



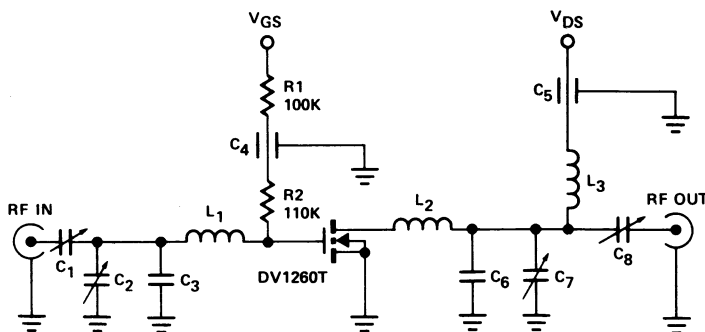
DC Safe Operating Region



TYPICAL PERFORMANCE CURVES-CONTINUED



175 MHz TEST FIXTURE



NOTES:

- C₁, C₈, ARCO #462 TRIMMER CAPACITORS, 5–80pF.
- C₂, C₇, ARCO #422 TRIMMER CAPACITORS, 4–40pF.
- C₃, SEMCO 50pF, POWER CAPACITOR.
- C₆, SEMCO 30pF, POWER CAPACITOR.
- C₄, C₅, .001 μ F FEED-THRU CAPACITORS.
- L₁, L₃, 1" LENGTH OF #12 AWG COPPER WIRE.
- L₂, 8-TURNS OF #20 AWG ENAMELED WIRE ON 1/4" DIAMETER, CLOSE WOUND.

