DV1210S ■ DV1210W ■ DV1210Z

N-Channel Enhancement-Mode RF Power FETs

Siliconix

April 1982

Island Labs

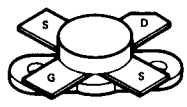
175 MHz **10 W**
10-20 V **10 dB**

Other Devices in Series:
DV1202, DV1205, DV1220, DV1230, DV1240, DV1260

FEATURES

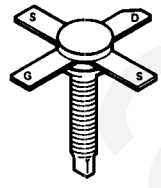
- Infinite VSWR
- No Thermal Runaway
- Broadband Capability
- Class A, B, C, D, E
- Low Noise Figure
- High Dynamic Range
- Simple Bias Circuitry

Package Type S



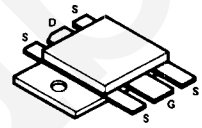
.380 SOE Flange

Package Type Z



.280 SOE Stud

Package Type W



C-220

See page 5-62 for Package Dimensions

ABSOLUTE MAXIMUM RATINGS (T_C = 25° C unless otherwise noted)

Gate-Source Voltage 30V
Drain-Source Voltage 45V
Drain-Gate Voltage 45V
Drain Current (DC) 2A

Total Device Dissipation 40W
Thermal Resistance, Junction to Case ... 4.4°C/W
Junction Temperature ..... 200°C
Storage Temperature ..... –65°C to 150° C

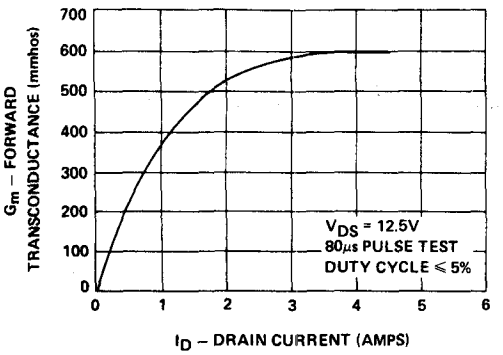
ELECTRICAL CHARACTERISTICS (T_C = 25° C unless otherwise noted)

Symbol	Characteristics	Min	Typ	Max	Unit	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage	45			V	V_{GS} = 0V, I_D = 5 mA
I_{DSS}	Drain-Source Leakage Current			0.5	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	0.2	0.4		Mho	V_{DS} = 10V, I_D = 1A, ΔV_{GS} = 1.0V
$I_{D(on)}$	On-State Drain Current		3.5		A	V_{DS} = 12V, V_{GS} = 10V
$V_{GS(th)}$	Gate Threshold Voltage	2		6	V	V_{GS} = V_{DS}, I_D = 100 mA
C_{iss}	Common-Source Input Capacitance			50	pF	V_{GS} = 0V, V_{DS} = 12.5V, f = 1.0 MHz
C_{oss}	Common-Source Output Capacitance			60	pF	V_{GS} = 0V, V_{DS} = 12.5V, f = 1.0 MHz
C_{rss}	Reverse Transfer Capacitance			10	pF	V_{GS} = 0V, V_{DS} = 12.5V, f = 1.0 MHz
G_{ps}	Common-Source Power Gain	10			dB	V_{DD} = 12.5V, Po = 10W, f = 175 MHz, I_{DQ} = 1.0 A
η	Drain Efficiency		65		%	V_{DD} = 12.5V, Po = 10W, f = 175 MHz, I_{DQ} = 1.0A
V_{SWR}	Load Mismatch Tolerance	30:1				V_{DD} = 12.5V, Po = 10W, f = 175 MHz, I_{DQ} = 1.0A

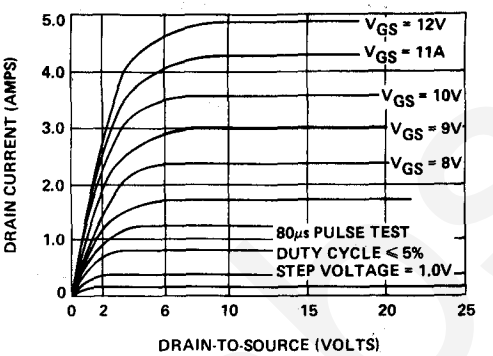
Note 1: Pulse Test—80μs to 300μs, 1% duty cycle

TYPICAL PERFORMANCE CURVES (T_C = 25° C unless otherwise noted)

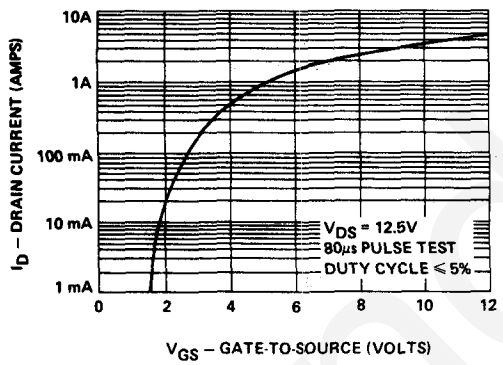
Typical Transconductance vs Drain Current



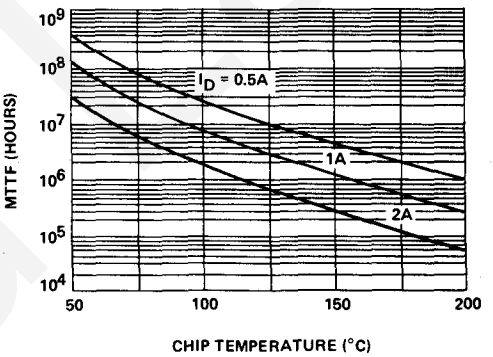
Typical Output Characteristics



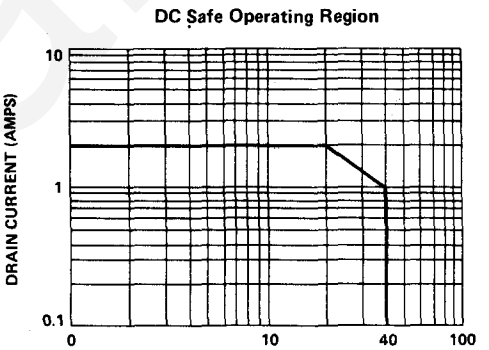
Typical Transfer Characteristics



MTTF vs Chip Temperature

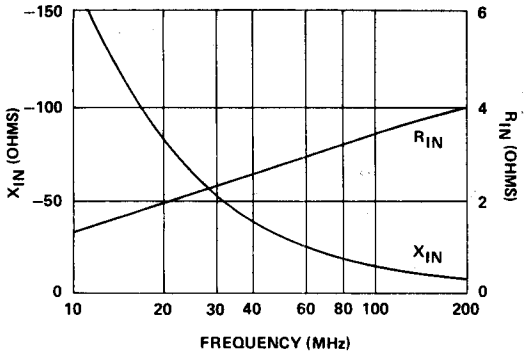


DC Safe Operating Region

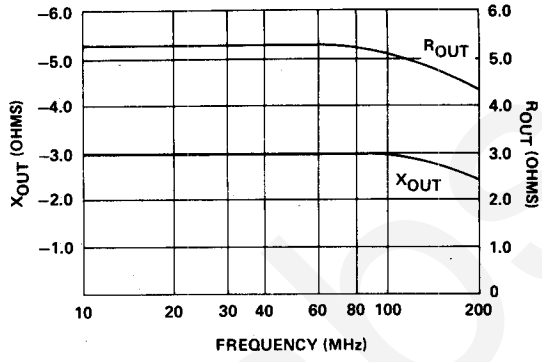


TYPICAL PERFORMANCE CURVES-CONTINUED

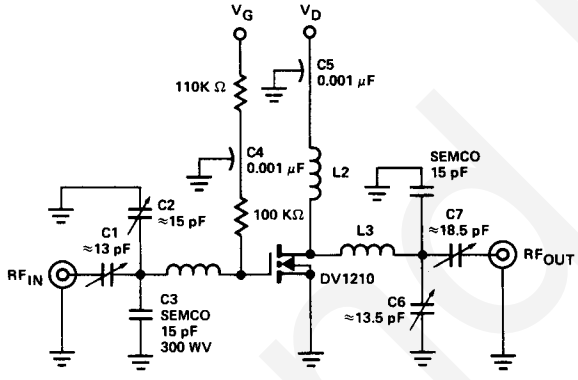
DV1210S
Series Input Impedance vs Frequency



DV1210S
Series Output Impedance vs Frequency



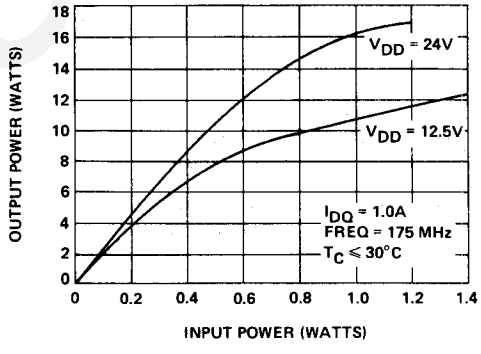
175 MHz TEST FIXTURE



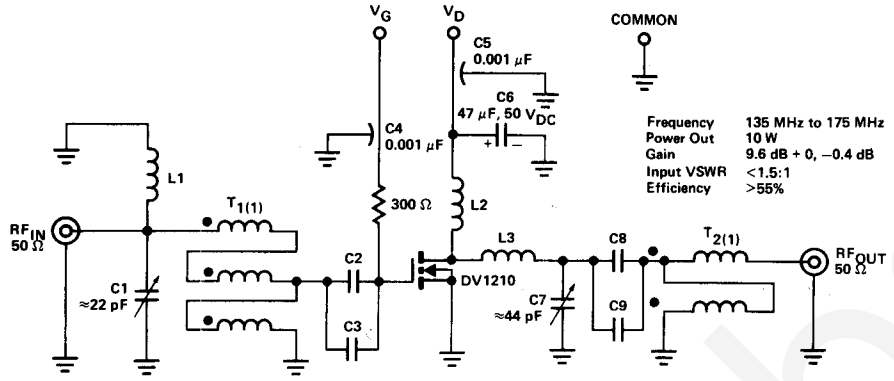
PARTS LIST

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

Typical Output Power vs Input Power



APPLICATIONS



PARTS LIST

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 μF chip capacitors, Johanson P/N 201 L64 N 103 MA
T1, One turn #22 enamel wire trifilar twisted with 13 crests per inch on one Stackpole balun core #57-0973
T2, One turn 25Ω coax wound on two balun cores placed end on end. Stackpole balun cores #57-0973
(1) – Dot indicates winding starts

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.