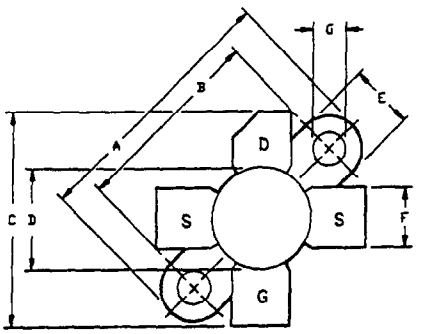
RF MOSFET Power Transistor, 15W, 12V
2 - 175 MHz

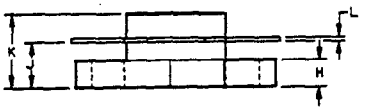
DU1215S

V2.00

Features

- N-Channel Enhancement Mode Device
- DMOS Structure
- Lower Capacitances for Broadband Operation
- High Saturated Output Power
- Lower Noise Figure Than Bipolar Devices
- Specifically Designed for 12 Volt Applications





LETTER DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.64	24.89	.970	.980
B	18.29	18.54	.720	.730
C	20.07	20.83	.790	.820
D	9.47	9.73	.373	.383
E	6.22	6.48	.245	.255
F	5.64	5.79	.222	.228
G	2.92	3.30	.115	.130
H	2.29	2.67	.090	.105
J	4.04	4.55	.159	.179
K	6.58	7.39	.259	.291
L	.10	.15	.004	.006

Absolute Maximum Ratings at 25°C

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	20	V
Drain-Source Current	I_{DS}	4	A
Power Dissipation	P_D	87.5	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	2	°C/W

Electrical Characteristics at 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	40	-	V	V_{GS}=0.0 V, I_{DS}=5.0 mA
Drain-Source Leakage Current	I_{DSS}	-	1.0	mA	V_{DS}=15.0 V, V_{GS}=0.0 V
Gate-Source Leakage Current	I_{GSS}	-	1.0	µA	V_{GS}=20.0 V, V_{DS}=0.0 V
Gate Threshold Voltage	$V_{GS(TH)}$	2.0	6.0	V	V_{DS}=10.0 V, I_{DS}=100 mA
Forward Transconductance	G_M	0.5	-	S	V_{DS}=10.0 V, I_{DS}=1000 mA, ΔV_{GS}=1.0 V
Input Capacitance	C_{ISS}	-	50	pF	V_{DS}=12.0 V, F=1.0 MHz
Output Capacitance	C_{OSS}	-	60	pF	V_{DS}=12.0 V, F=1.0 MHz
Reverse Capacitance	C_{RSS}	-	12	pF	V_{DS}=12.0 V, F=1.0 MHz
Power Gain	G_P	9.5	-	dB	V_{DD}=12.0 V, I_{DQ}=100 mA, P_{OUT}=15 W, F=175 MHz
Drain Efficiency	η_D	60	-	%	V_{DD}=12.0 V, I_{DQ}=100 mA, P_{OUT}=15 W, F=175 MHz
Load Mismatch Tolerance	VSWR-T	-	30:1	-	V_{DD}=12.0 V, I_{DQ}=100 mA, P_{OUT}=15 W, F=175 MHz

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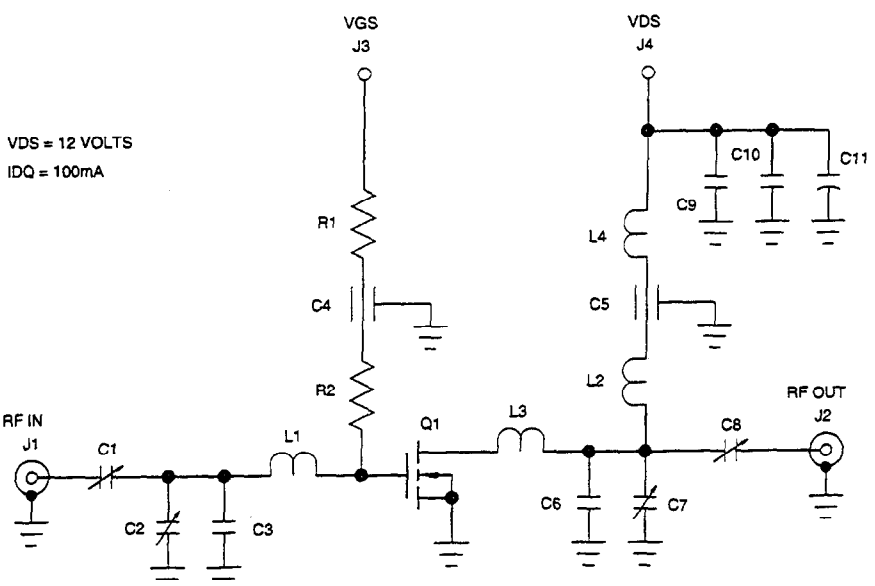
Typical Device Impedance

Frequency (MHz)	Z_{IN} (OHMS)	Z_{LOAD} (OHMS)
30	3.0 - j 25	4.0 - j 3.0
100	3.0 - j 15	3.5 - j 1.5
175	5.0 - j 8	4.0 + j 0.0

V_{DD}=12 V, I_{DQ}=100 mA, P_{OUT}=15 Watts

Z_{IN} is the series equivalent input impedance of the device from gate to source.
Z_{LOAD} is the optimum series equivalent load impedance as measured from drain to ground.

RF Test Fixture



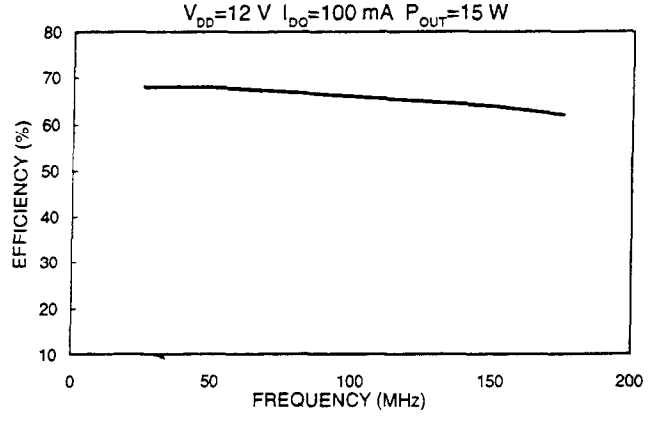
PARTS LIST

C1,C8	TRIMMER CAPACITOR 5-80pF
C2,C7	TRIMMER CAPACITOR 4-40pF
C3,C6	SEMCO CAPACITOR 30pF
C4,C5	FEEDTHROUGH CAPACITOR 0.001uF
C9	SEMCO CAPACITOR 1000pF
C10	MONOLITHIC CERAMIC CAPACITOR 0.01uF
C11	ELECTROLYTIC CAPACITOR 50uF 50 V.
L1,L3	NO. 12 AWG COPPER WIRE X 1"
L2	8 TURNS OF NO. 20 AWG ENAMEL WIRE ON '0.25", CLOSE WOUND
L4	12 TURNS OF NO. 20 AWG ON '0.25", CLOSE WOUND
R1,R2	RESISTOR 100K OHMS
Q1	DU1215S
BOARD	FR4 0.062"

Typical Broadband Performance Curves

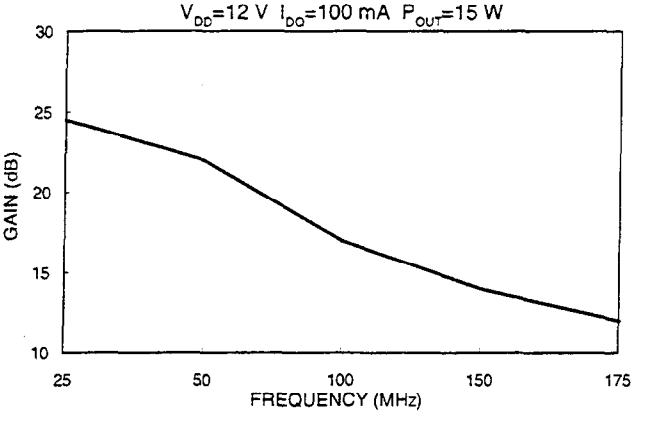
EFFICIENCY vs FREQUENCY

V_{DD}=12 V I_{DQ}=100 mA P_{OUT}=15 W



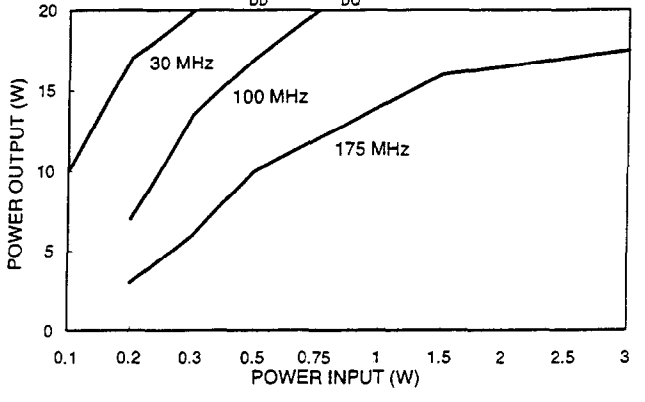
GAIN vs FREQUENCY

V_{DD}=12 V I_{DQ}=100 mA P_{OUT}=15 W



POWER OUTPUT vs POWER INPUT

V_{DD}=12 V I_{DQ}=100 mA



POWER OUTPUT vs SUPPLY VOLTAGE

V_{DD}=12 V F=175 MHz P_{IN}=1.0 W