DU28120T

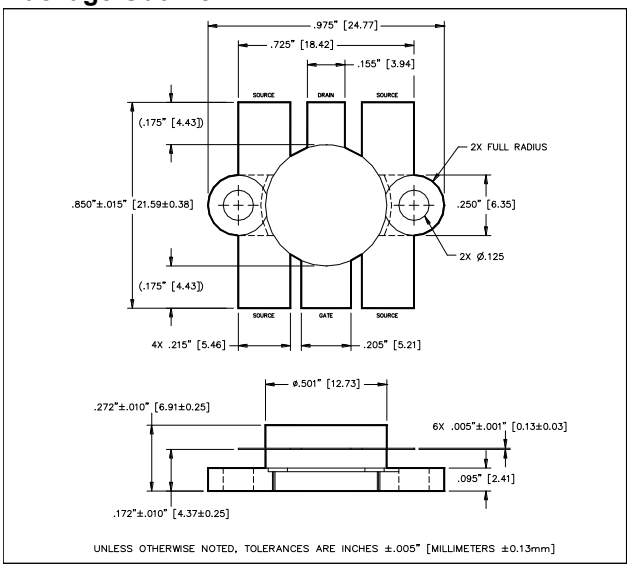
RF Power MOSFET Transistor
120 W, 2 - 175 MHz, 28 V

Rev. V1

Features

- N-Channel enhancement mode device
- DMOS structure
- Lower capacitances for broadband operation
- High saturated output power
- Lower noise figure than bipolar devices
- RoHS Compliant

Package Outline



ABSOLUTE MAXIMUM RATINGS AT 25° C

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	65	V
Gate-Source Voltage	V_{GS}	20	V
Drain-Source Current	I_{DS}	24	A
Power Dissipation	P_D	269	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	0.65	°C/W

TYPICAL DEVICE IMPEDANCE

F (MHz)	Z_{IN} (Ω)	Z_{LOAD} (Ω)
30	4.0 - j8.0	3.4 + j2.4
50	1.0 - j2.5	2.2 +j1.3
100	1.0 - j0.5	2.2 + j0.0
V_{DD} = 28V, I_{DQ} = 600mA, P_{OUT} = 120 W		

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.

LETTER DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	24.64	24.89	.970	.980
B	18.29	18.54	.720	.730
C	21.21	21.97	.835	.865
D	12.60	12.85	.496	.506
E	6.22	6.48	.245	.255
F	3.81	4.06	.150	.160
G	5.33	5.59	.210	.220
H	5.08	5.33	.200	.210
J	3.05	3.30	.120	.130
K	2.29	2.54	.90	.100
L	4.06	4.57	.160	.180
M	6.68	7.49	.263	.295
N	.10	.15	.004	.006

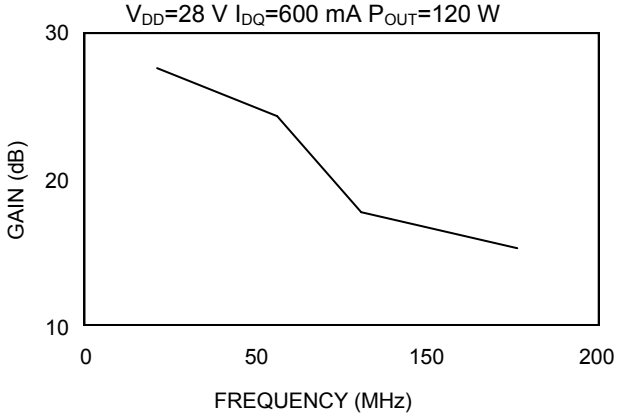
ELECTRICAL CHARACTERISTICS AT 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	65	-	V	V_{GS} = 0.0 V , I_{DS} = 3.0 mA
Drain-Source Leakage Current	I_{DSS}	-	6.0	mA	V_{GS} = 28.0 V , V_{GS} = 0.0 V
Gate-Source Leakage Current	I_{GSS}	-	6.0	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} = 600.0 mA
Forward Transconductance	G_M	3.0	-	S	V_{DS} = 10.0 V , I_{DS} = 6000.0 mA , Δ V_{GS} = 1.0V, 80 µs Pulse
Input Capacitance	C_{ISS}	-	270	pF	V_{DS} = 28.0 V , F = 1.0 MHz
Output Capacitance	C_{OSS}	-	240	pF	V_{DS} = 28.0 V , F = 1.0 MHz
Reverse Capacitance	C_{RSS}	-	48	pF	V_{DS} = 28.0 V , F = 1.0 MHz
Power Gain	G_P	13	-	dB	V_{DD} = 28.0 V, I_{DQ} = 600 mA, P_{OUT} = 120.0 W F =175 MHz
Drain Efficiency	η_D	60	-	%	V_{DD} = 28.0 V, I_{DQ} = 600 mA, P_{OUT} = 120.0 W F =175 MHz
Load Mismatch Tolerance	VSWR-T	-	30:1	-	V_{DD} = 28.0 V, I_{DQ} = 600 mA, P_{OUT} = 120.0 W F =175 MHz

Typical Broadband Performance Curves

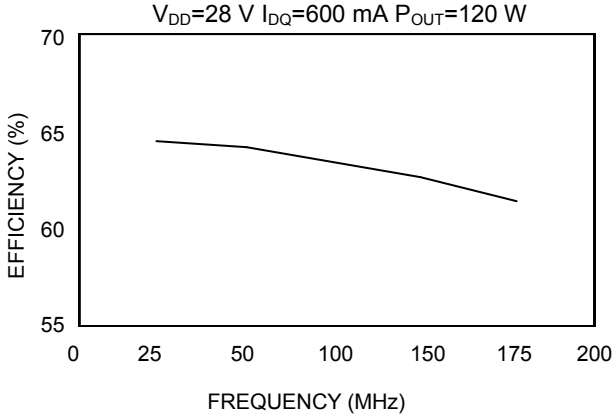
GAIN vs FREQUENCY

V_{DD}=28 V I_{DQ}=600 mA P_{OUT}=120 W



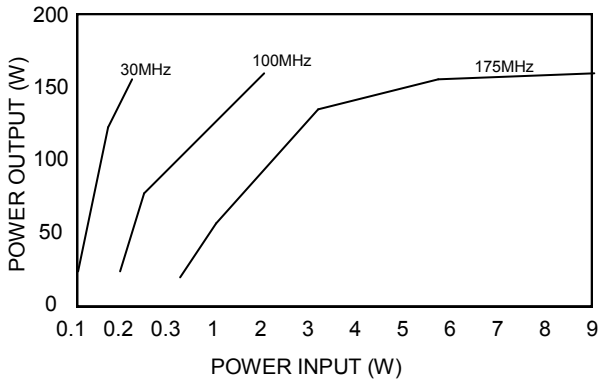
EFFICIENCY vs FREQUENCY

V_{DD}=28 V I_{DQ}=600 mA P_{OUT}=120 W



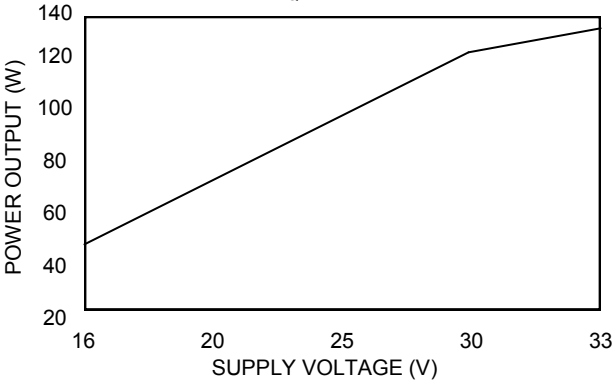
POWER OUTPUT vs POWER INPUT

V_{DD} =28 V I_{DQ} =50 mA

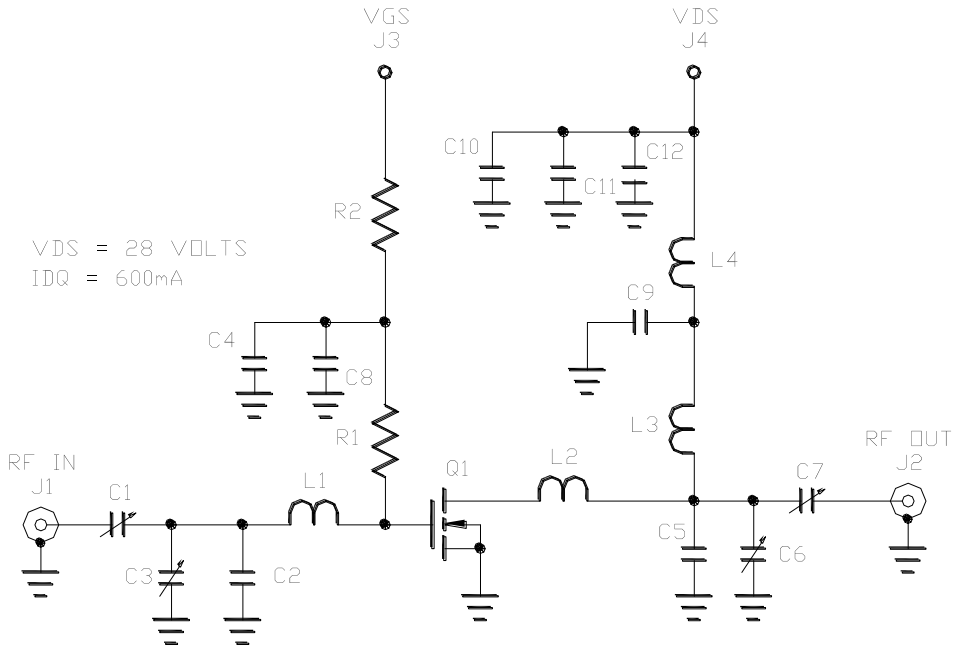


POWER OUTPUT vs SUPPLY VOLTAGE

F=175 MHz I_{DQ} =600 mA P_{IN} =3.0 W



TEST FIXTURE SCHEMATIC



PARTS LIST

C1,C6	TRIMMER CAPACITOR 5-80pF
C2,C5	CAPACITOR 50pF
C3	TRIMMER CAPACITOR 4-40pF
C4,C11	MONOLITHIC CIRCUIT CAPACITOR 0.01uF
C7	TRIMMER CAPACITOR 9-180pF
C8,C9	CAPACITOR 500pF
C10	CAPACITOR 1000pF
C12	ELECTROLYTIC CAPACITOR 50uF 50 VOLT
L1,L2	NO. 12 AWG COPPER WIRE X 0.87" (LOOP 0.4")
L3,L4	8 TURNS OF NO. 16 AWG ENAMEL WIRE ON ø0.25", CLOSE WOUND
R1,R2	RESISTOR 2.7K OHMS 0.25 WATT
Q1	DU28120T
BOARD	FR4 0.062"