DU2880V

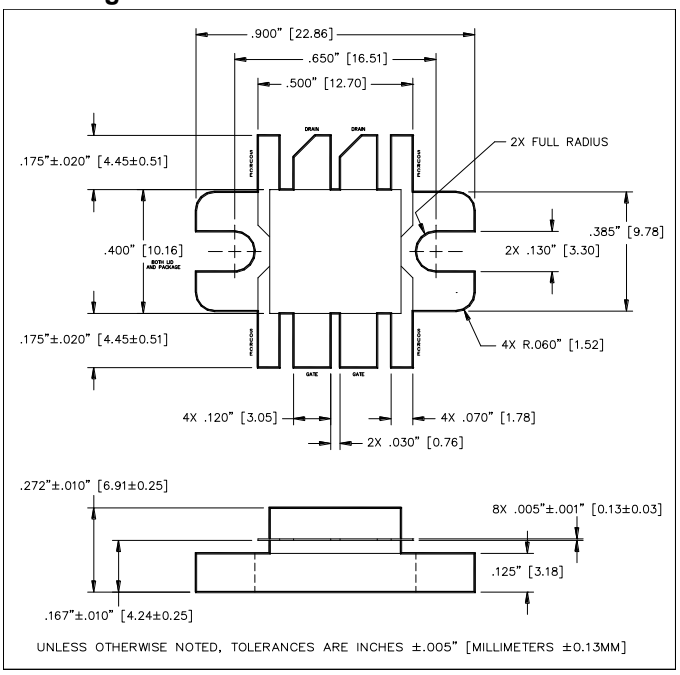
RF Power MOSFET Transistor
80 W, 2 - 175 MHz, 28 V

Rev. V1

Features

- N-Channel enhancement mode device
- DMOS structure
- Lower capacitances for broadband operation
- High saturated output power
- Lower noise figure than competitive 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}	8*	A
Power Dissipation	P_D	206	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	0.85	°C/W

TYPICAL DEVICE IMPEDANCE

F (MHz)	Z_{IN} (Ω)	Z_{LOAD} (Ω)
30	4.5 - j14.5	13.5 +j4.5
100	3.0 - j10.5	13.5 + j6.0
175	2.0 - j7.5	12.0 + j4.5
V_{DD} = 28V, I_{DQ} = 400mA, P_{OUT} = 80 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.

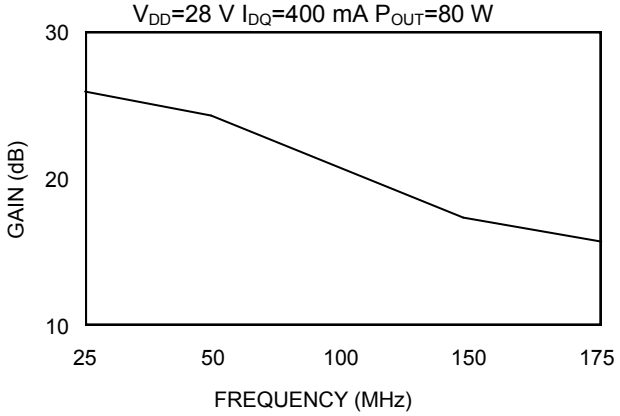
ELECTRICAL CHARACTERISTICS AT 25°C

Parameter	Symbol	Min	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	65	-	V	V_{GS} = 0.0 V , I_{DS} = 10.0 mA
Drain-Source Leakage Current	I_{DSS}	-	2.0	mA	V_{GS} = 28.0 V , V_{GS} = 0.0 V
Gate-Source Leakage Current	I_{GSS}	-	2.0	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} = 200.0 mA
Forward Transconductance	G_M	1.0	-	S	V_{DS} = 10.0 V , I_{DS} = 2000.00 mA , Δ V_{GS} = 1.0V, 80 µs Pulse
Input Capacitance	C_{ISS}	-	90	pF	V_{DS} = 28.0 V , F = 1.0 MHz
Output Capacitance	C_{OSS}	-	80	pF	V_{DS} = 28.0 V , F = 1.0 MHz
Reverse Capacitance	C_{RSS}	-	16	pF	V_{DS} = 28.0 V , F = 1.0 MHz
Power Gain	G_P	13	-	dB	V_{DD} = 28.0 V, I_{DQ} = 400 mA, P_{OUT} = 80.0 W F =175 MHz
Drain Efficiency	η_D	60	-	%	V_{DD} = 28.0 V, I_{DQ} = 400 mA, P_{OUT} = 80.0 W F =175 MHz
Load Mismatch Tolerance	VSWR-T	-	30:1	-	V_{DD} = 28.0 V, I_{DQ} = 400 mA, P_{OUT} = 80.0 W F =175 MHz

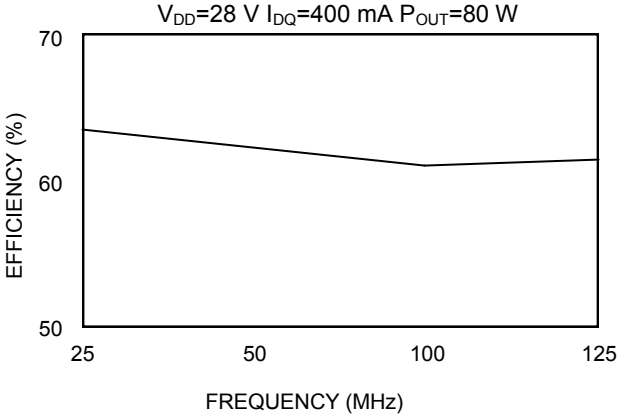
*Per side

Typical Broadband Performance Curves

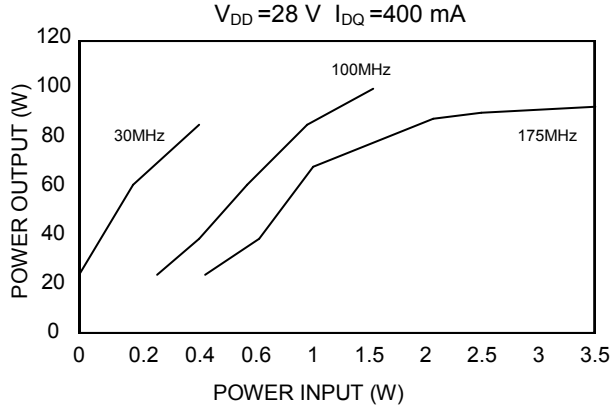
GAIN vs FREQUENCY
V_{DD}=28 V I_{DQ}=400 mA P_{OUT}=80 W



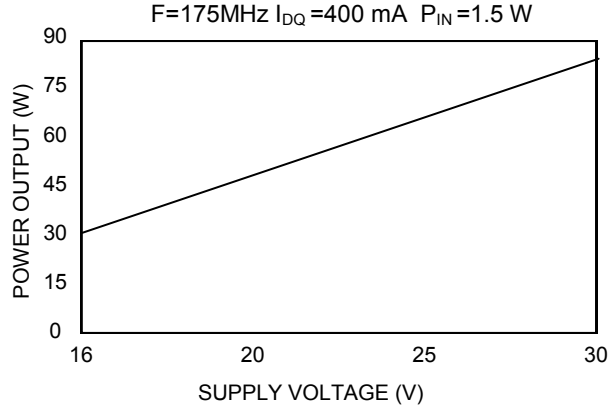
EFFICIENCY vs FREQUENCY
V_{DD}=28 V I_{DQ}=400 mA P_{OUT}=80 W



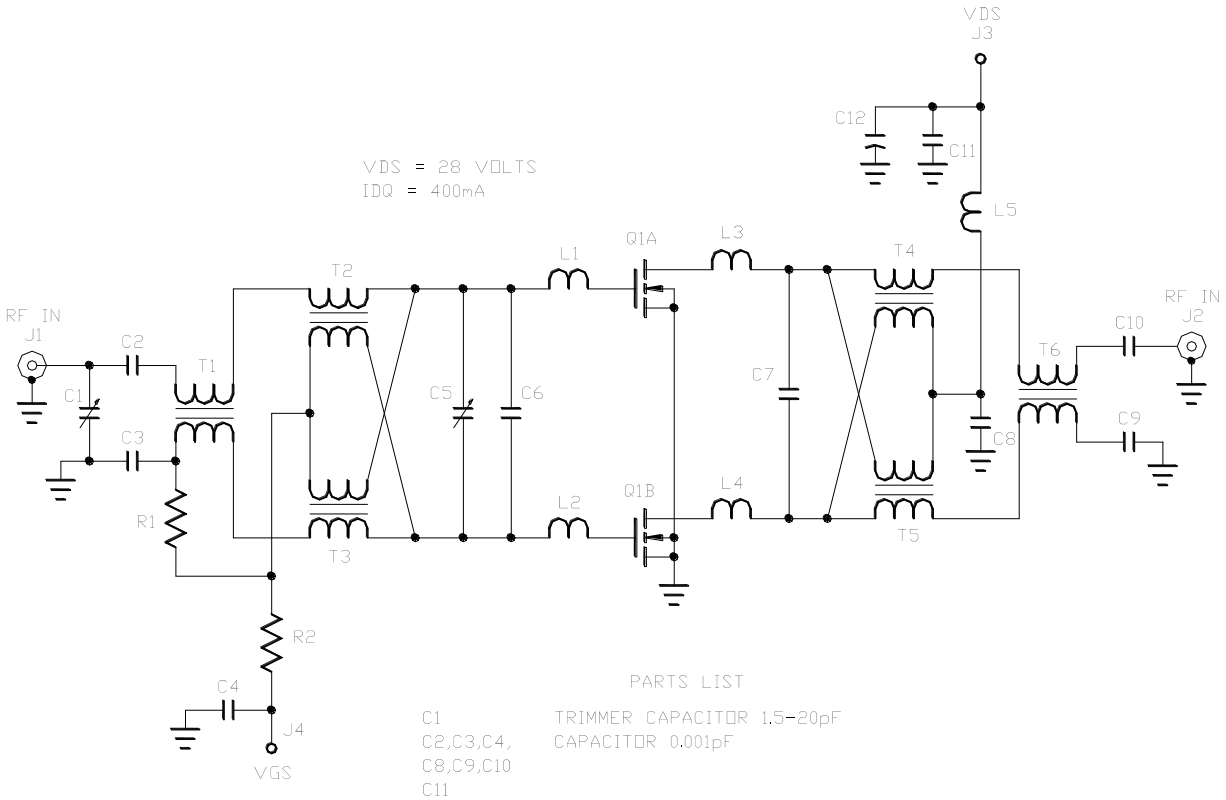
POWER OUTPUT vs POWER INPUT
V_{DD} =28 V I_{DQ} =400 mA



POWER OUTPUT vs SUPPLY VOLTAGE
F=175MHz I_{DQ} =400 mA P_{IN} =1.5 W



TEST FIXTURE ASSEMBLY



PARTS LIST

C1	TRIMMER CAPACITOR 1.5-20pF
C2,C3,C4, C8,C9,C10	CAPACITOR 0.001pF
C11	
C5	TRIMMER CAPACITOR 5-80pF
C6	CAPACITOR 68pF
C7	CAPACITOR 50pF
C12	ELECTROLYTYIC CAPACITOR 100uF 50 VOLTS
L1,L2	0.50" X 0.10" TRACE ON BOARD + Ø0.125" X Ø0.25" LOOP
L3,L4	0.87" X 0.10" TRACE ON BOARD
L5	7.5 TURNS OF NO. 20 AWG COPPER WIRE X Ø0.31"
R1	RESISTOR 18 OHMS 2 WATTS
R2	RESISTOR 10K OHMS
T1,T6	50 OHM BALUN CORES, 2 TURNS OF 50 OHM COAX THRU 2 STACKPOLE 57-1522
T2,T3,T4	4:1 TRANSFORMER 1 TURN OF 2 50 OHM COAX IN
T5	PARALLEL THRU 2 STACKPOLE 57-1522 BALUN CORES
Q1	DU2880V
BOARD	FR4 0.062"