UF28100M

RF Power MOSFET Transistor
100W, 100-500 MHz, 28V

M/A-COM Products
Released - 08.07

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

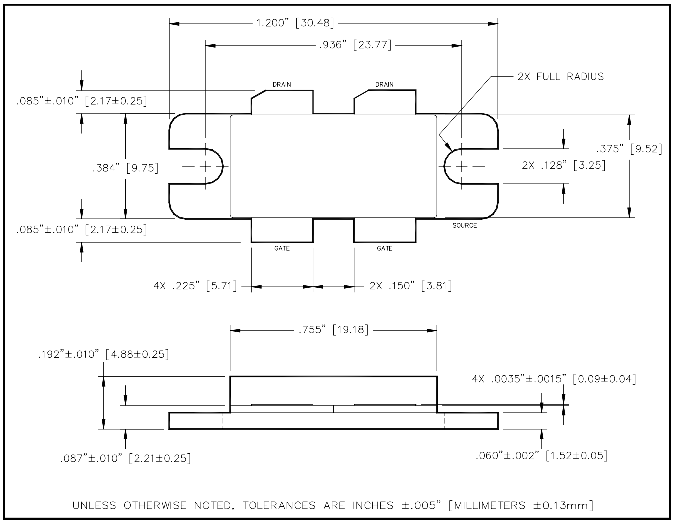
ABSOLUTE MAXIMUM RATINGS AT 25° C

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	65	V
Gate-Source Voltage	V_{GS}	20	V
Drain-Source Current	I_{DS}	12*	A
Power Dissipation	P_D	250	W
Junction Temperature	T_J	200	°C
Storage Temperature	T_{STG}	-55 to +150	°C
Thermal Resistance	θ_{JC}	0.7	°C/W

TYPICAL DEVICE IMPEDANCES

F (MHz)	Z_{IN} (Ω)	Z_{LOAD} (Ω)
100	4.5-j6.0	14.5+j0.5
300	2.25-j1.75	7.5j1.0
500	1.5+j5.5	3.5+j3.5
V_{DD}=28V, I_{DQ}=600 Ma, P_{OUT} =100.0 W		

PACKAGE OUTLINE



Z_{IN} is the series equivalent input impedance of the device from gate to gate.

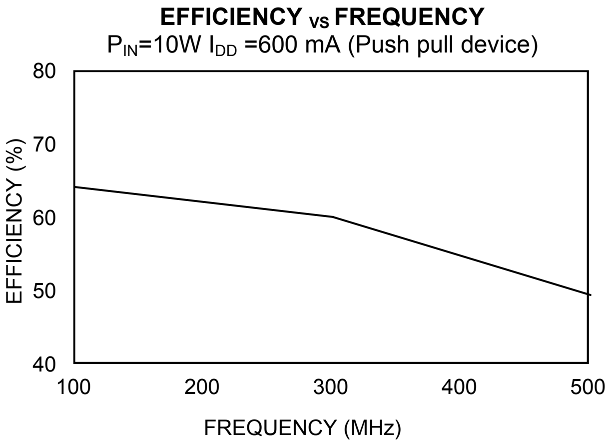
Z_{LOAD} is the optimum series equivalent load impedance as measured from drain to drain.

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} = 15.0 mA
Drain-Source Leakage Current	I_{DSS}	-	3.0	mA	V_{GS} = 28.0 V , V_{GS} = 0.0 V
Gate-Source Leakage Current	I_{GSS}	-	3.0	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} = 300.0 mA
Forward Transconductance	G_M	1.5	-	S	V_{DS} = 10.0 V , I_{DS} 3000.0 mA , Δ V_{GS} = 1.0V, 80 μs Pulse
Input Capacitance	C_{ISS}	-	135	pF	V_{DS} = 28.0 V , F = 1.0 MHz
Output Capacitance	C_{OSS}	-	90	pF	V_{DS} = 28.0 V , F = 1.0 MHz
Reverse Capacitance	C_{RSS}	-	24	pF	V_{DS} = 28.0 V , F = 1.0 MHz
Power Gain	G_P	10	-	dB	V_{DD} = 28.0 V, I_{DQ} = 600.0 mA, P_{OUT} = 100.0 W F =500 MHz
Drain Efficiency	η_D	50	-	%	V_{DD} = 28.0 V, I_{DQ} = 600.0 mA, P_{OUT} = 100.0 W F =500 MHz
Return Loss	R_L	10	-	dB	V_{DD} = 28.0 V, I_{DQ} = 600.0 mA, P_{OUT} = 100.0 W F =500 MHz
Load Mismatch Tolerance	VSWR-T	-	30:1	-	V_{DD} = 28.0 V, I_{DQ} = 600.0 mA, P_{OUT} = 100.0 W F =500 MHz

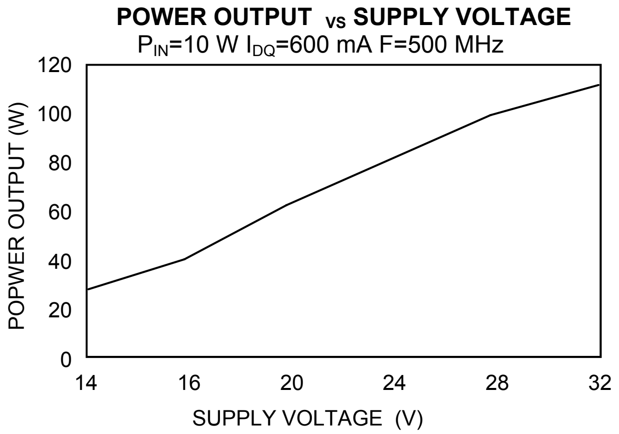
*Per side

Typical Broadband Performance Curves



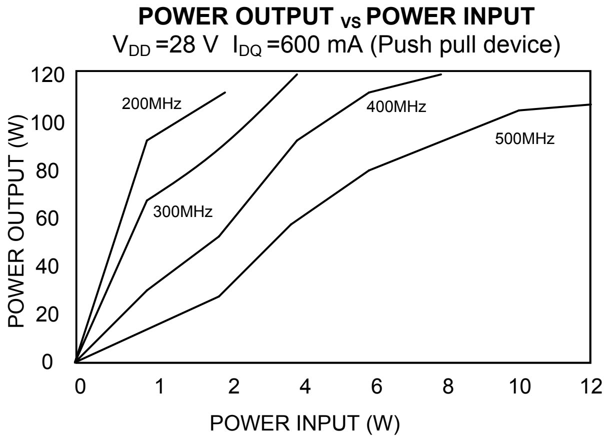
EFFICIENCY vs FREQUENCY

P_{IN}=10W I_{DD} =600 mA (Push pull device)



POWER OUTPUT vs SUPPLY VOLTAGE

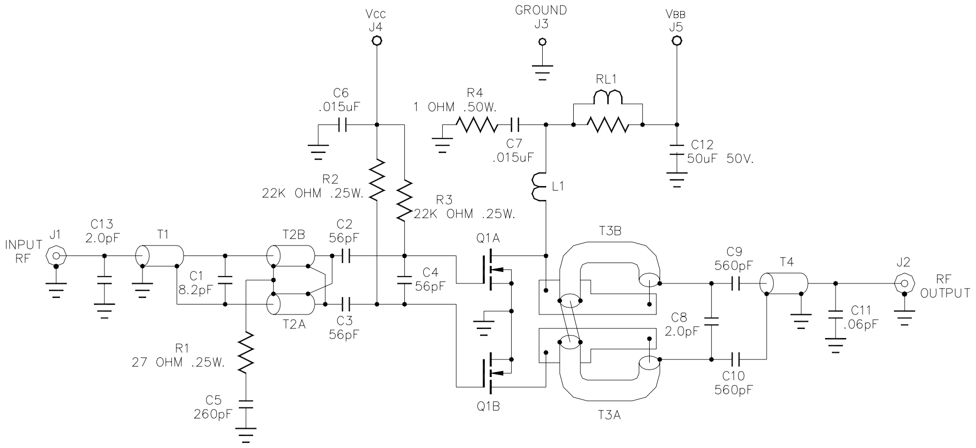
P_{IN}=10 W I_{DQ}=600 mA F=500 MHz



POWER OUTPUT vs POWER INPUT

V_{DD} =28 V I_{DQ} =600 mA (Push pull device)

TEST FIXTURE SCHEMATIC



SCHEMATIC

L1	INDUCTOR, 5 TURNS OF NO. 18 AWG ON ø.10"
Q1A,Q1B	TRANSISTOR UF28100M
RL1	INDUCTOR/ RESISTOR, 10 TURNS OF NO. 22 AWG ON 27 OHM .25 WATT
T1	1:1 BALUN TRANSFORMER, 50 OHM SEMI-RIGID COAX ø.085" X 3" LONG
T2A,T2B	4:1 BALUN TRANSFORMER, 10 OHM SEMI-RIGID COAX ø.070" X 2.5" LONG
T3A,T3B	1:9 BALUN TRANSFORMER, 10 OHM SEMI-RIGID COAX ø.070" X 2.5" LONG
T4	1:1 BALUN TRANSFORMER, 50 OHM SEMI-RIGID COAX ø.085" X 4.0" LONG
BOARD TYPE	ROGERS 5870, .031" THICK

TEST FIXTURE ASSEMBLY