

# MAPF-250128-150000



**Linear RF Power TMOS**  
**150W, 30MHz 100V**

M/A-COM Products  
 Preliminary - Rev. 1108

## Features

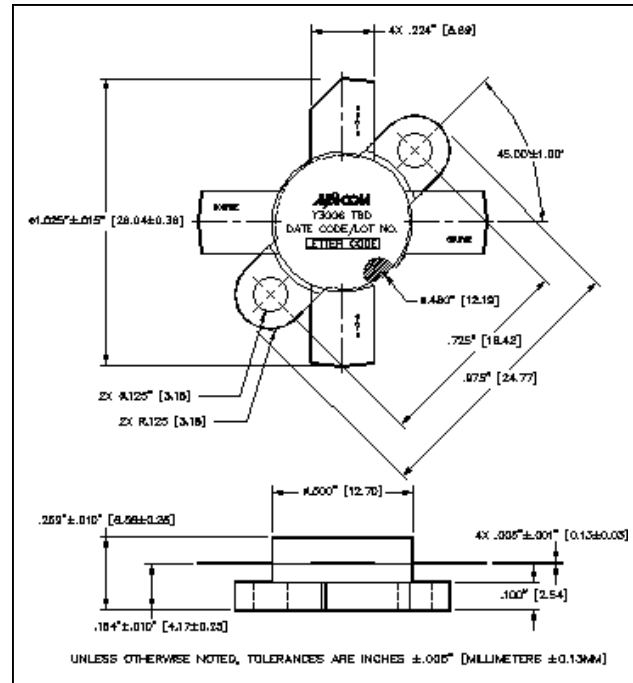
- Designed for Industrial, Scientific, Medical applications
- N-Channel enhancement mode MOSFET
- Specified 100V, 30MHz and 128MHz, Class AB
- Internally insulated Source terminals simplify heatsinking
- High Voltage - Lower Current - Less Circuit Loss
- Gold Metallization System for Reliability

## Characteristics

Output Power = 150 Watts  
 Power Gain = 20 dB (Typ, 30MHz), 15 dB (Typ, 128MHz)

## ABSOLUTE MAXIMUM RATINGS AT 25°C

Parameter	Symbol	Rating	Units
Drain Source Voltage	$V_{DS}$	250	V
Gate Source Voltage	$V_{GS}$	+/-40	V
Drain Current	$I_D$	8.0(tbd)	A
Total Power Dissipation	$P_D$	300	W
Storage Temperature	$T_{STG}$	-65 to +150	°C
Junction Temperature	$T_J$	200	°C



Case 211-11, Style 2

## ELECTRICAL CHARACTERISTICS AT 25°C

Parameter	Symbol	Test Conditions	Min	Max	Units
Drain Source Breakdown Voltage	$BV_{DSS}$	$I_D = 100\text{mA}$	250	-	V
Drain Source Leakage Current	$I_{DSS}$	$V_{DS} = 100\text{V}$	-	5	mA
Gate Source Leakage Current	$I_{GSS}$	$V_{GS} = 10\text{V}$	-	1	$\mu\text{A}$
Forward Transconductance	$G_M$	$I_{DS} = 2.0\text{A}, V_{DS} = 10\text{V}$	3	-	S
Gate Source Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = 10\text{V}, I_D = 100\text{mA}$	2	5	V
Drain Source On State Voltage	$V_{DS(ON)}$	$V_{GS} = 10\text{V}, I_{DS} = 5\text{A}$	-	6.6	V
Output Capacitance	$C_{OSS}$	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	-	120	pF
Feedback Capacitance	$C_{RSS}$	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	-	15	pF
Input Capacitance	$C_{ISS}$	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	-	350	pF
Thermal Resistance	$R_{THjc}$	$V_{DS} = 100\text{V}, P_{DISS} = 100\text{W}, T_j = 150\text{C}$	-	0.6	°C/W

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## RF Electrical Characteristics at 25°C\*

Parameter	Symbol	Test Conditions	Minimum	Maximum	Units
Power Gain	GP	$P_{out} = 150\text{ W (PEP)}$	19		dB
		$P_{out} = 150\text{ W, } F = 128\text{ MHz CW}$	14		dB
Drain Efficiency	$\eta$	$P_{out} = 150\text{ W (PEP)}$	40		%
		$P_{out} = 150\text{ W, } F = 128\text{ MHz CW}$	50		%
Intermodulation	IM3	$P_{out} = 150\text{ W (PEP)}$		-30	dBc
Electrical Ruggedness	$\Psi$	$P_{out} = 150\text{ W (PEP)}$ , VSWR 5:1, 360°	No degradation		
CW Output Power at P1dB	$P_{1DB}$	$V_{DD} = 100\text{ V, } F = 30\text{ MHz, } I_{DQ} = 160\text{ mA}$	150		Watts
		$V_{DD} = 100\text{ V, } F = 128\text{ MHz, } I_{DQ} = 160\text{ mA}$	150		Watts

\* Test conditions unless otherwise specified:  $V_{DD} = 100\text{ V}$ ,  $I_{DQ} = 160\text{ mA}$ ,  $F_1 = 30\text{ MHz}$ ,  $F_2 = F_1 + 0.001\text{ MHz}$

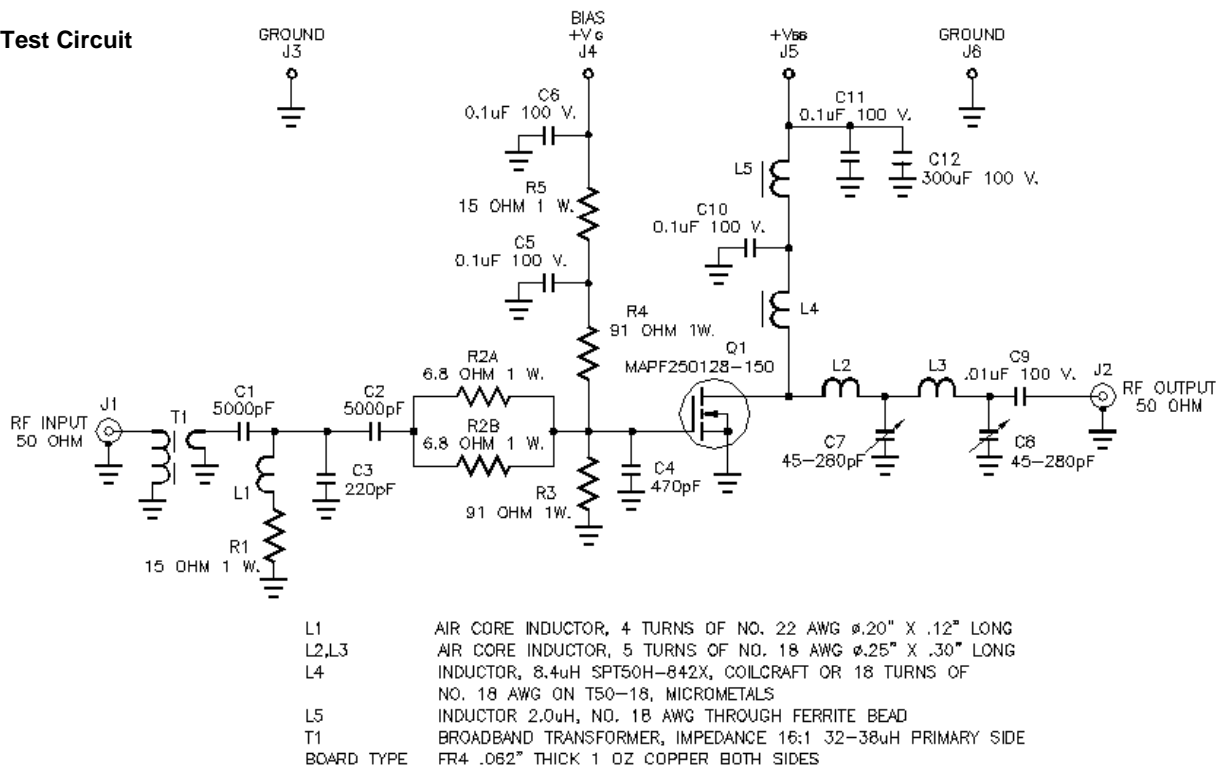
## Large Signal Impedance

$V_{DD} = 100\text{ V}$ ;  $I_{DQ} = 160\text{ mA}$ ;  $P_{OUT} = 150\text{ W (PEP)}$ , 30MHz;  $P_{OUT} = 150\text{ W (P1dB)}$ , 128MHz

F (MHz)	Z IN ( $\Omega$ )	Z L(opt) ( $\Omega$ )
30	5.09-j0.84	17.71+j14.21
128	1.90+j2.71	3.04+j7.08

$Z_{IN}$  = Complex conjugate of source impedance  
 $Z_{L(OPT)}$  = Load impedance for optimum output power and IMD at specified voltage, quiescent current and efficiency.

## 30MHz Test Circuit



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