

# RF Power Field Effect Transistor

## LDMOS, 1600 — 1700 MHz, 30W, 28V

5/5/05

Preliminary

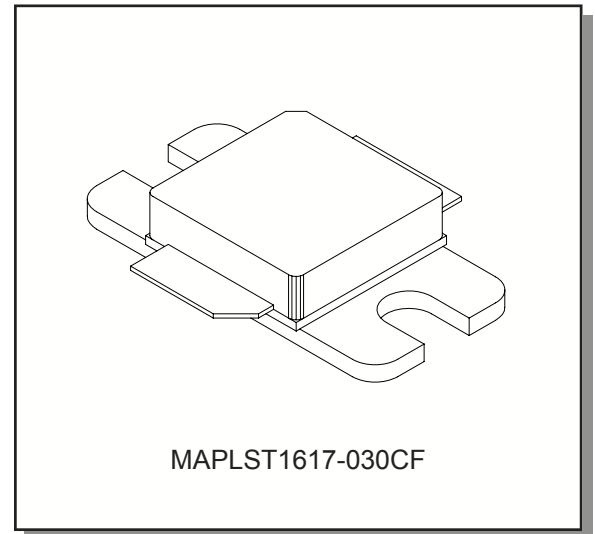
MAPLST1617-030CF

### Features

Designed for INMARSAT applications in the 1620-1670 MHz frequency band.

- Typical Two Tone Performance (IMD=-30 dBc):
  - Average Output Power: 15W
  - Gain: 14dB (typ.)
  - Efficiency: 38% (typ.)
- 10:1 VSWR Ruggedness at 30W, 28V, 1670MHz)

### Package Style



### Maximum Ratings

Parameter	Symbol	Rating	Units
Drain—Source Voltage	$V_{DSS}$	65	$V_{dc}$
Gate—Source Voltage	$V_{GS}$	20	$V_{dc}$
Total Power Dissipation @ $T_C = 25\text{ }^\circ\text{C}$	$P_D$	97	W
Storage Temperature	$T_{STG}$	-40 to +150	$^\circ\text{C}$
Junction Temperature	$T_J$	+200	$^\circ\text{C}$

### Thermal Characteristics

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.8	$^\circ\text{C/W}$

**NOTE—CAUTION**—MOS devices are susceptible to damage from electrostatic charge. Precautions in handling and packaging MOS devices should be observed.

Preliminary

Characteristic	Symbol	Min	Typ	Max	Unit
<b>DC CHARACTERISTICS @ 25°C</b>					
Drain-Source Breakdown Voltage ( $V_{GS} = 0$ Vdc, $I_D = 20$ $\mu$ Adc)	$V_{(BR)DSS}$	65	—	—	Vdc
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 28$ Vdc, $V_{GS} = 0$ )	$I_{DSS}$	—	—	1	$\mu$ Adc
Gate—Source Leakage Current ( $V_{GS} = 5$ Vdc, $V_{DS} = 0$ )	$I_{GSS}$	—	—	1	$\mu$ Adc
Gate Threshold Voltage ( $V_{DS} = 10$ Vdc, $I_D = 1$ mA)	$V_{GS(th)}$	2	—	4	Vdc
Gate Quiescent Voltage ( $V_{DS} = 28$ Vdc, $I_D = 250$ mA)	$V_{DS(Q)}$	2	—	4.5	Vdc
Drain-Source On-Voltage ( $V_{GS} = 10$ Vdc, $I_D = 1$ A)	$V_{DS(on)}$	—	0.2	—	Vdc
Forward Transconductance ( $V_{GS} = 10$ Vdc, $I_D = 1$ A)	$G_m$	—	1.2	—	S
<b>DYNAMIC CHARACTERISTICS @ 25°C</b>					
Input Capacitance (Including Input Matching Capacitor in Package) ( $V_{DS} = 28$ Vdc, $V_{GS} = 0$ , $f = 1$ MHz)	$C_{iss}$	—	90	—	pF
Output Capacitance ( $V_{DS} = 28$ Vdc, $V_{GS} = 0$ , $f = 1$ MHz)	$C_{oss}$	—	32.5	—	pF
Reverse Transfer Capacitance ( $V_{DS} = 28$ Vdc, $V_{GS} = 0$ , $f = 1$ MHz)	$C_{rss}$	—	1.5	—	pF
<b>RF FUNCTIONAL TESTS @ 25°C (In M/A-COM Test Fixture)</b>					
CW Gain ( $V_{DS} = 28$ Vdc, $P_{OUT} = 30$ W (avg.), $I_{DQ} = 250$ mA, $f_0 = 1670$ MHz)	$G_{ps}$	—	14	—	dB
CW Drain Efficiency ( $V_{DS} = 28$ Vdc, $P_{OUT} = 30$ W (avg.), $I_{DQ} = 250$ mA, $f_0 = 1670$ MHz)	EFF ( $\eta$ )	—	50	—	%
CW Input Return Loss ( $V_{DS} = 28$ Vdc, $P_{OUT} = 30$ W (avg.), $I_{DQ} = 250$ mA, $f_0 = 1670$ MHz)	IRL	—	-10	-9	dB
IMD ( $V_{DS} = 28$ Vdc, $P_{OUT} = 15$ W (avg.) (30 W PEP), $I_{DQ} = 250$ mA, $f_0 = 1670$ MHz, $f_1 = 1670.1$ MHz)	IMD	—	-30	—	dBc
Output VSWR Tolerance ( $V_{DS} = 28$ Vdc, $P_{OUT} = 30$ W (avg.), $I_{DQ} = 250$ mA, $f_0 = 1670$ MHz)	$\Psi$	No Degradation In Output Power Before and After Test			

Preliminary

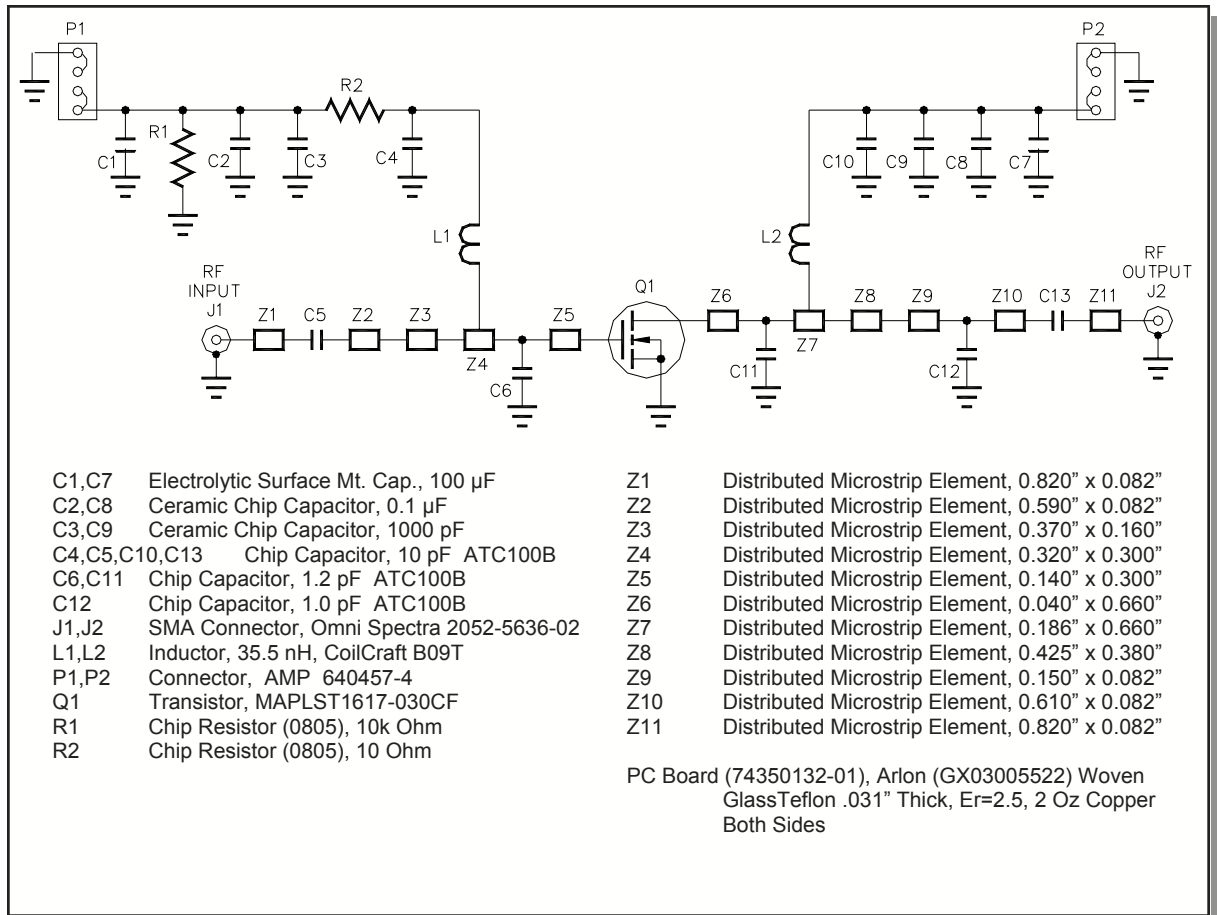


Figure 1. 1620—1670 MHz Test Fixture Schematic

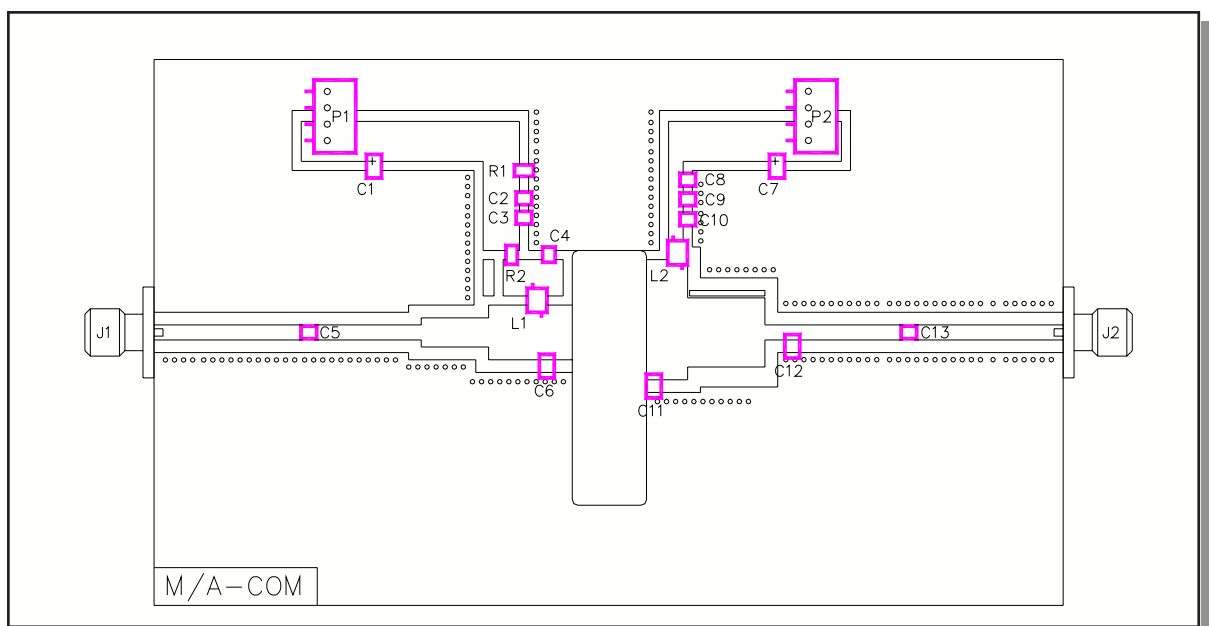
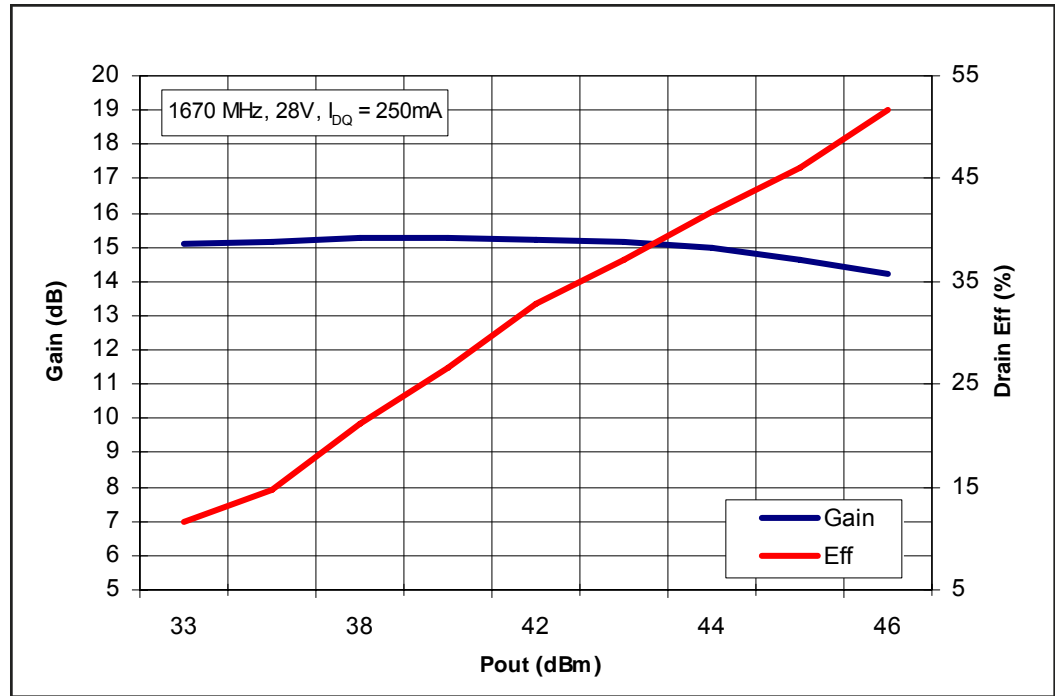
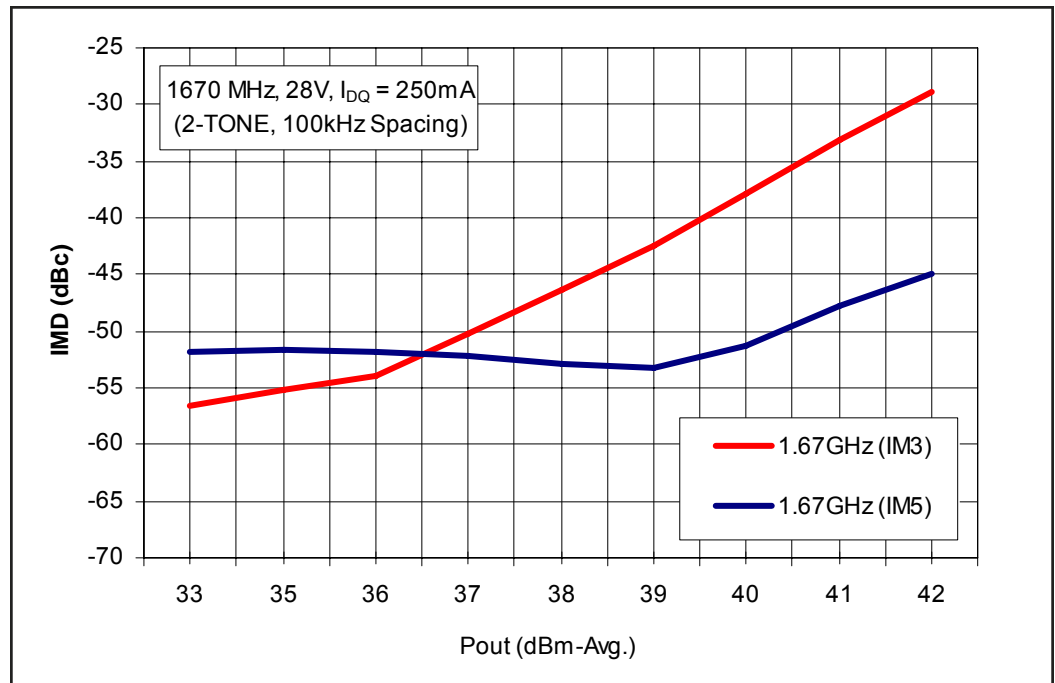


Figure 2. 1620—1670 MHz Test Fixture Component Layout

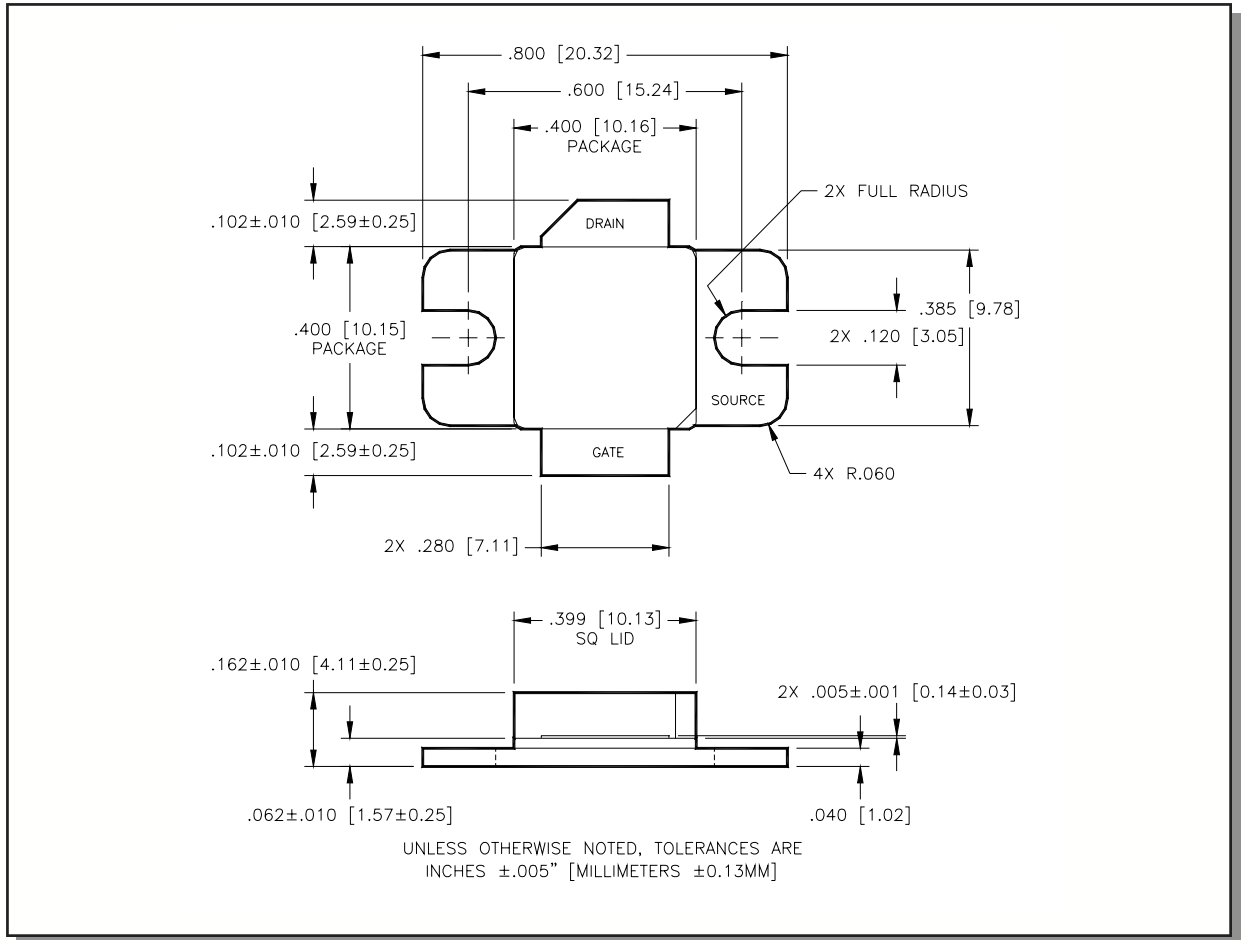


Graph 1. CW: Gain and Efficiency vs. Output Power



Graph 2. Two Tone: Intermodulation Distortion vs. Output Power

Package Dimensions



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- North America: Tel. (800) 366-2266
- Asia/Pacific: Tel.+81-44-844-8296, Fax +81-44-844-8298
- Europe: Tel. +44 (1344) 869 595, Fax+44 (1344) 300 020