

RF Power Field Effect Transistor

LDMOS, 1600 — 1700 MHz, 30W, 28V

5/5/05

Preliminary

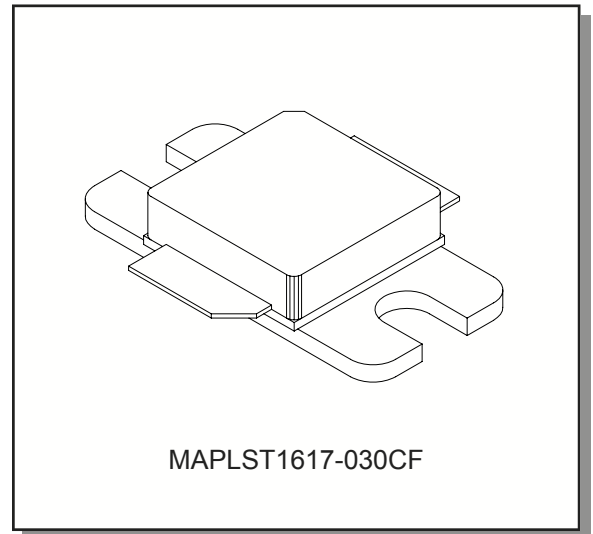
MAPLST1617-030CF

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.

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Characteristic	Symbol	Min	Typ	Max	Unit
DC CHARACTERISTICS @ 25°C					
Drain-Source Breakdown Voltage ($V_{GS} = 0$ Vdc, $I_D = 20$ μ Adc)	$V_{(BR)DSS}$	65	—	—	Vdc
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 28$ Vdc, $V_{GS} = 0$)	I_{DSS}	—	—	1	μ Adc
Gate—Source Leakage Current ($V_{GS} = 5$ Vdc, $V_{DS} = 0$)	I_{GSS}	—	—	1	μ 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)	Gm	—	1.2	—	S
DYNAMIC CHARACTERISTICS @ 25°C					
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
RF FUNCTIONAL TESTS @ 25°C (In M/A-COM Test Fixture)					
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 (η)	—	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)	Ψ	No Degradation In Output Power Before and After Test			

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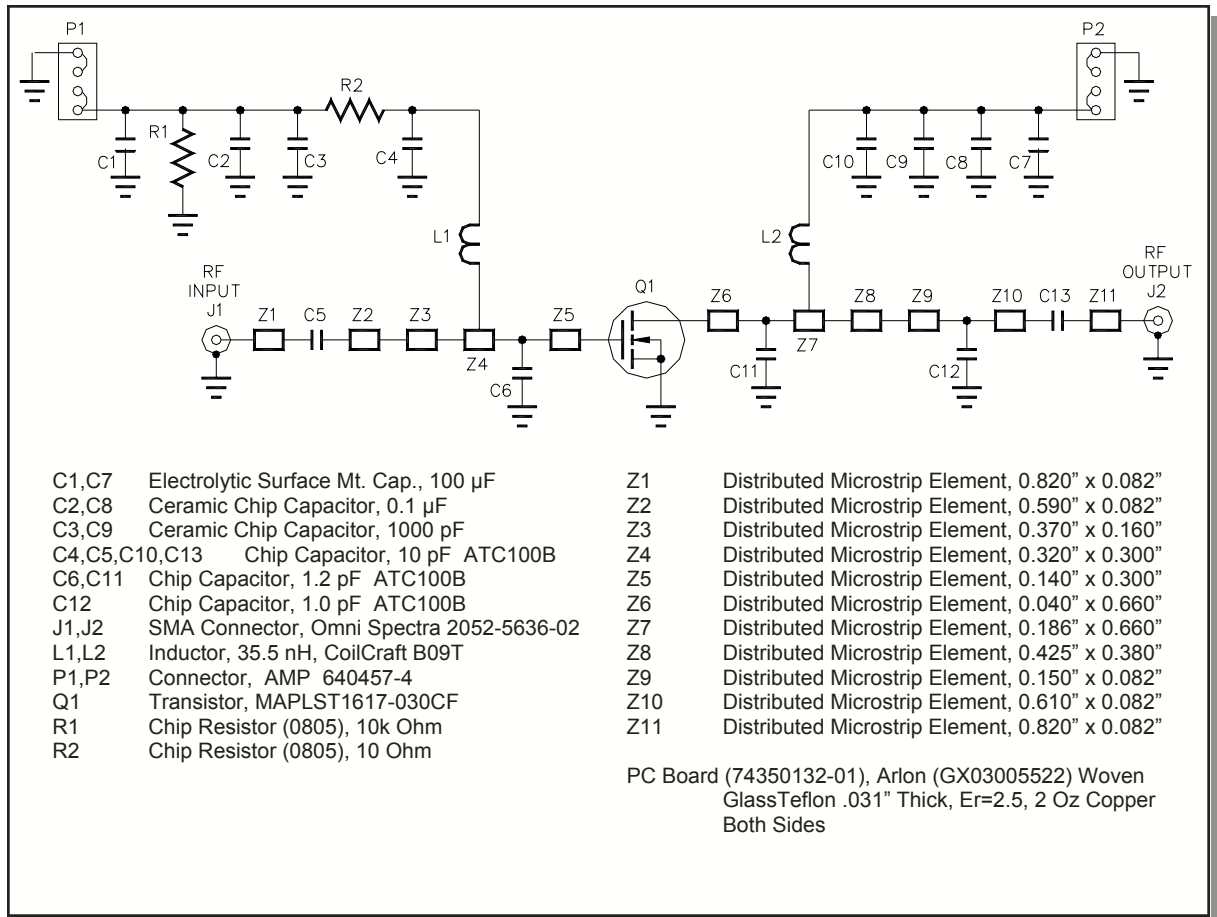


Figure 1. 1620—1670 MHz Test Fixture Schematic

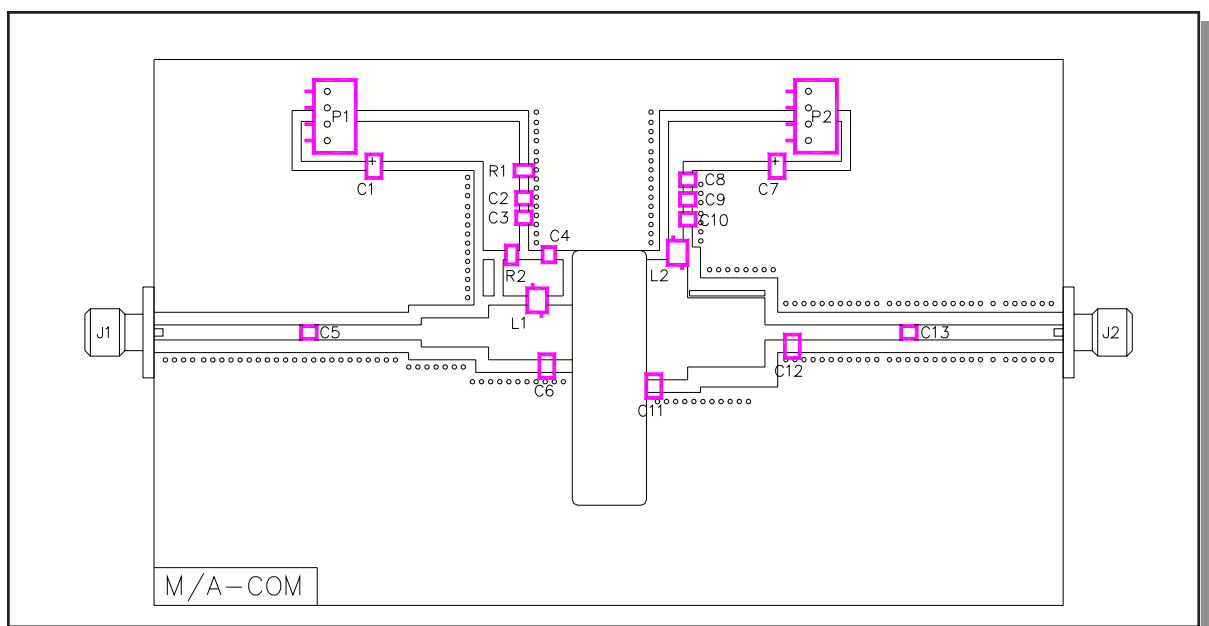
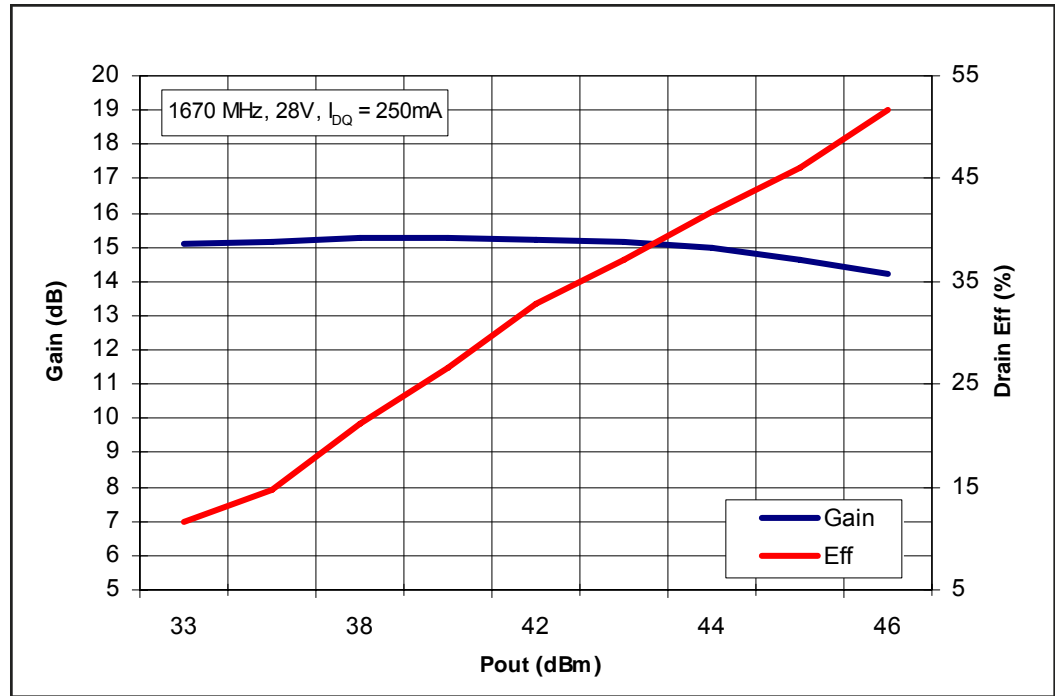
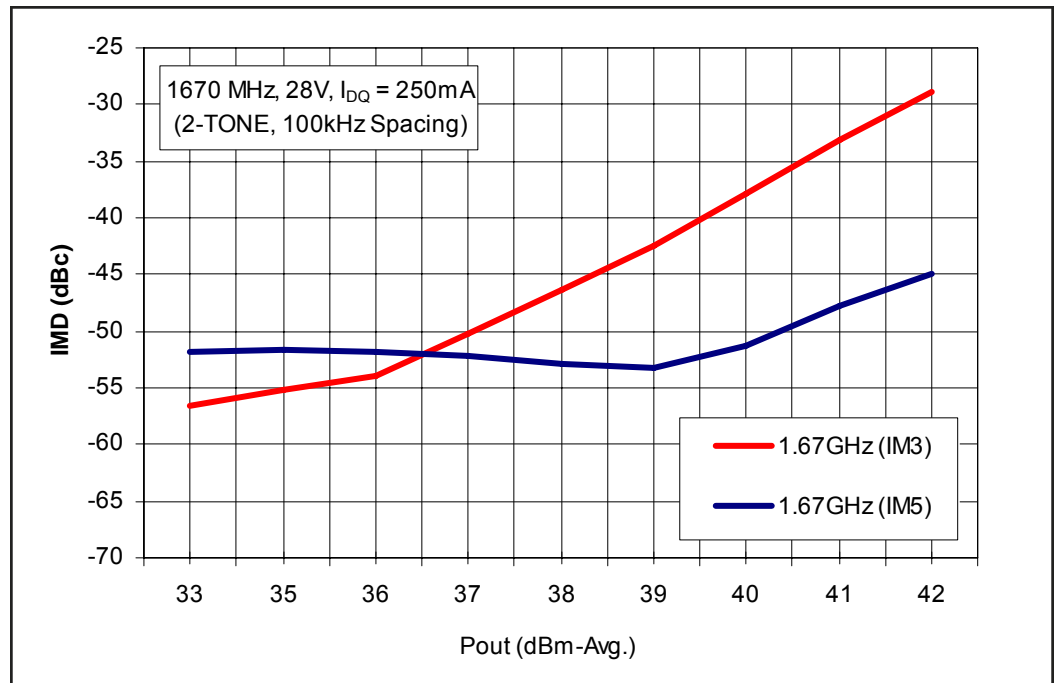


Figure 2. 1620—1670 MHz Test Fixture Component Layout

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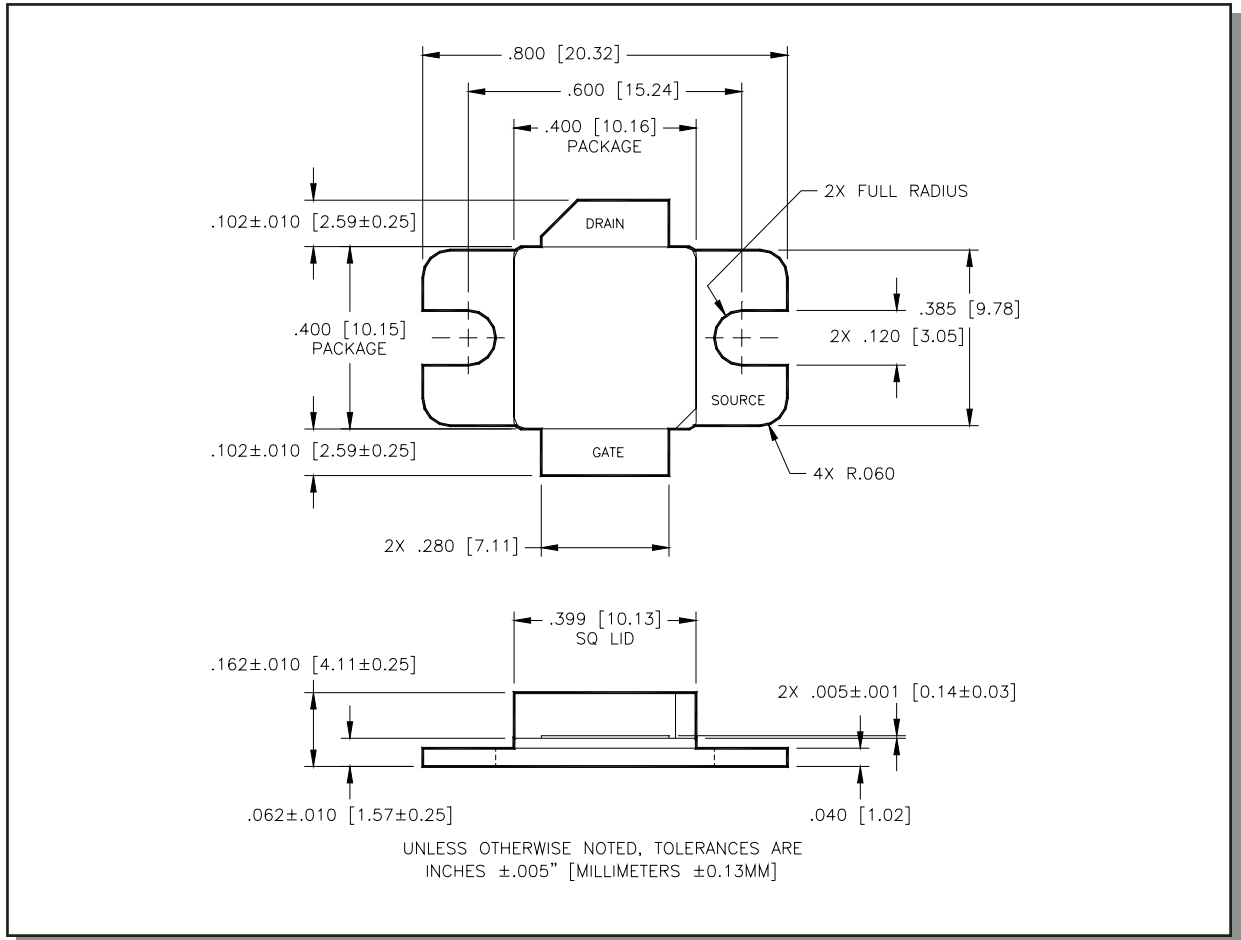


Graph 1. CW: Gain and Efficiency vs. Output Power



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

Package Dimensions



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