

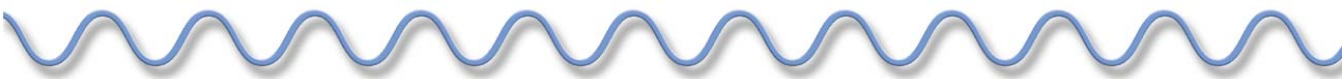


RF Power Field Effect Transistor LDMOS, 1800 — 2000 MHz, 30W, 26V

5/14/04

Preliminary

MAPLST1820-030CF

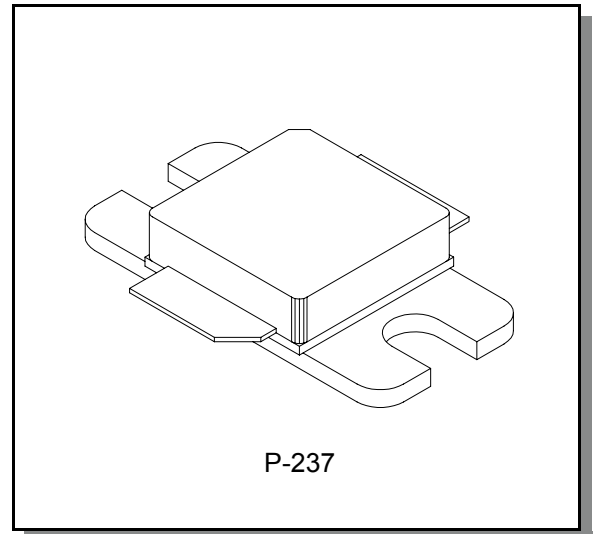


Features

Designed for base station applications in the 1805-1880MHz or 1930-1990MHz Frequency Band. Suitable for GSM, EDGE, TDMA, CDMA, and multi-carrier amplifier applications

- 30W CW Output Power at P_{1dB}
- 13dB Gain at P_{1dB}
- 45% Drain Efficiency at P_{1dB}
- 10:1 VSWR Ruggedness (CW @ 30W, 26V, 1900MHz)
- Internal input and output matching

Package Style



Maximum Ratings

Parameter	Symbol	Rating	Units
Drain—Source Voltage	V_{DSS}	65	V_{dc}
Gate—Source Voltage	V_{GS}	20	V_{dc}
Drain Current — Continuous	I_D	10	A_{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
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 ($V_{DS} = 26$ Vdc, $V_{GS} = 0$)	I_{DSS}	—	—	100	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, $I_D = 20$ mA)	$V_{GS(th)}$	2	2.6	4	Vdc
Drain-Source On-Voltage ($V_{GS} = 10$ Vdc, $I_D = 1$ A)	$V_{DS(on)}$	—	0.32	—	Vdc
Forward Transconductance ($V_{GS} = 10$ Vdc, $I_D = 1$ A)	Gm	—	1.6	—	S
DYNAMIC CHARACTERISTICS @ 25°C					
Input Capacitance (Capacitance includes internal matching capacitors) ($V_{DS} = 26$ Vdc, $V_{GS} = 0$, $f = 1$ MHz)	C_{iss}	—	50	—	pF
Output Capacitance ($V_{DS} = 26$ Vdc, $V_{GS} = 0$, $f = 1$ MHz)	C_{oss}	—	32	—	pF
Reverse Transfer Capacitance ($V_{DS} = 26$ Vdc, $V_{GS} = 0$, $f = 1$ MHz)	C_{rss}	—	1.4	—	pF
RF FUNCTIONAL TESTS @ 25°C (In M/A-COM Test Fixture)					
Two-Tone Common-Source Amplifier Power Gain ($V_{DS} = 26$ Vdc, $P_{OUT} = 30$ W PEP, $I_{DQ} = 300$ mA, $f_1 = 1990.0$ MHz, $f_2 = 1990.1$ MHz)	G_{ps}	12	13	—	dB
Two-Tone Drain Efficiency ($V_{DS} = 26$ Vdc, $P_{OUT} = 30$ W PEP, $I_{DQ} = 300$ mA, $f_1 = 1990.0$ MHz, $f_2 = 1990.1$ MHz)	EFF (η)	—	33	—	%
Two-Tone Common-Source Amplifier Power Gain ($V_{DS} = 26$ Vdc, $P_{OUT} = 30$ W PEP, $I_{DQ} = 300$ mA, $f_1 = 1990.0$ MHz, $f_2 = 1990.1$ MHz)	IMD	—	-30	—	dBc
Two-Tone Common-Source Amplifier Power Gain ($V_{DS} = 26$ Vdc, $P_{OUT} = 30$ W PEP, $I_{DQ} = 300$ mA, $f_1 = 1930.0$ MHz, $f_2 = 1930.1$ MHz)	G_{ps}	12	13	—	dB
Two-Tone Drain Efficiency ($V_{DS} = 26$ Vdc, $P_{OUT} = 30$ W PEP, $I_{DQ} = 300$ mA, $f_1 = 1930.0$ MHz, $f_2 = 1930.1$ MHz)	EFF (η)	—	33	—	%
Two-Tone Intermodulation Distortion ($V_{DS} = 26$ Vdc, $P_{OUT} = 30$ W PEP, $I_{DQ} = 300$ mA, $f_1 = 1930.0$ MHz, $f_2 = 1930.1$ MHz)	IMD	—	-30	-28	dBc
Output VSWR Tolerance ($V_{DD} = 26$ Vdc, $P_{OUT} = 30$ W, $I_{DQ} = 300$ mA, $f = 1900$ MHz, VSWR = 10:1, All Phase Angles at Frequency of Tests)	Ψ	No Degradation In Output Power Before and After Test			

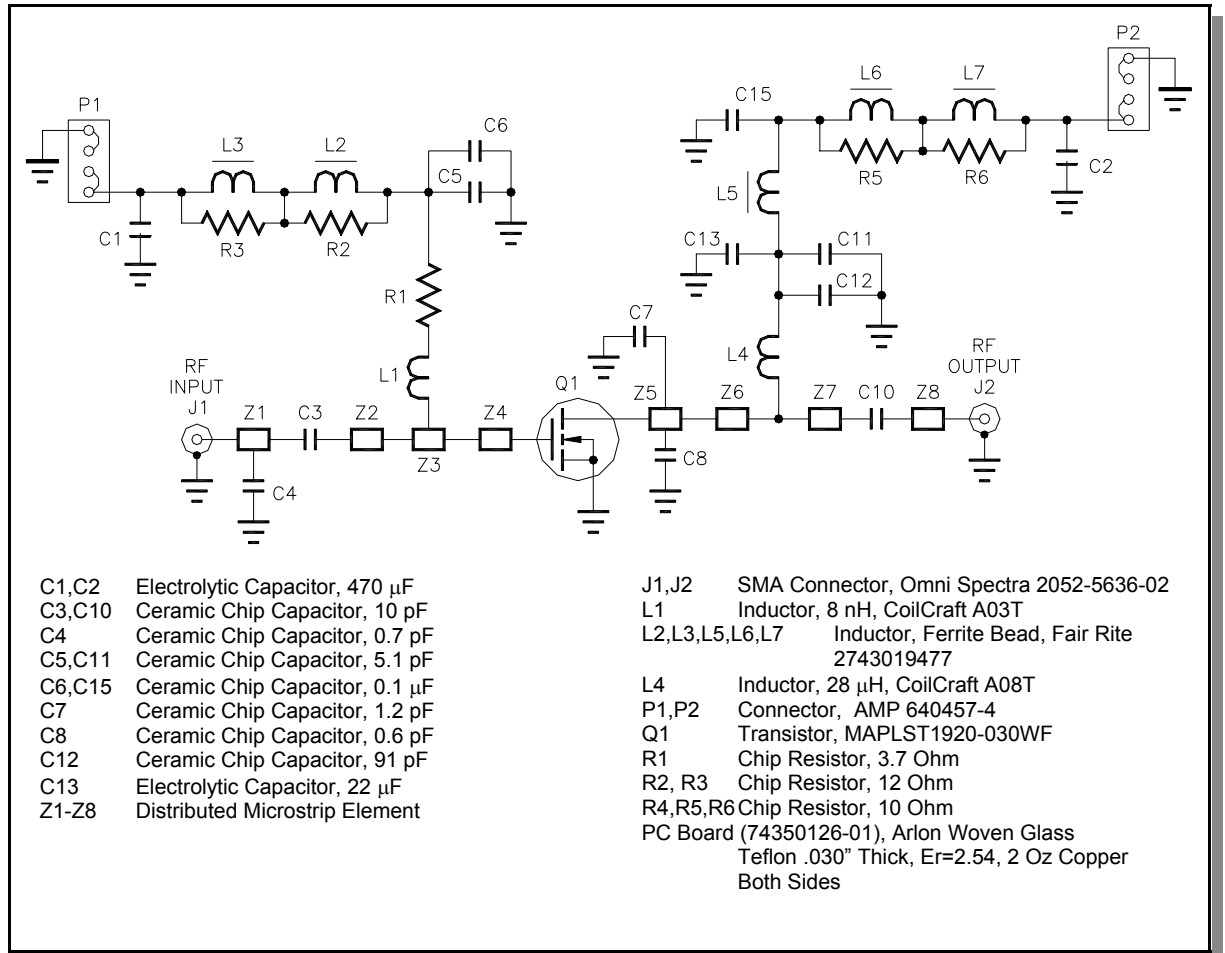


Figure 1. 1930—1990 MHz Test Fixture Schematic

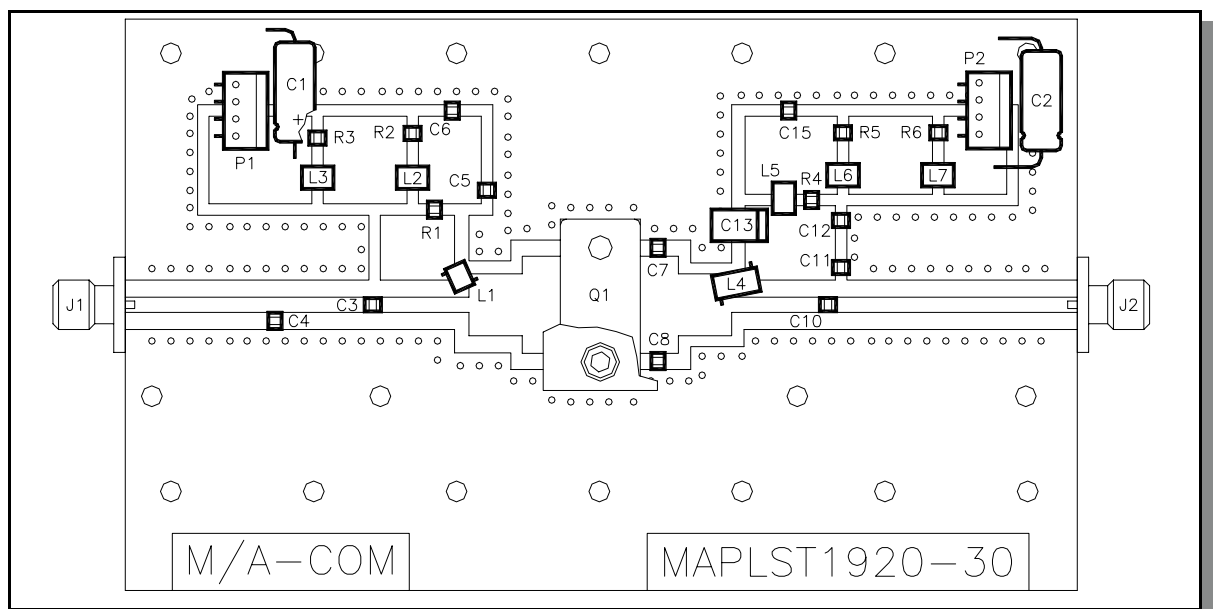
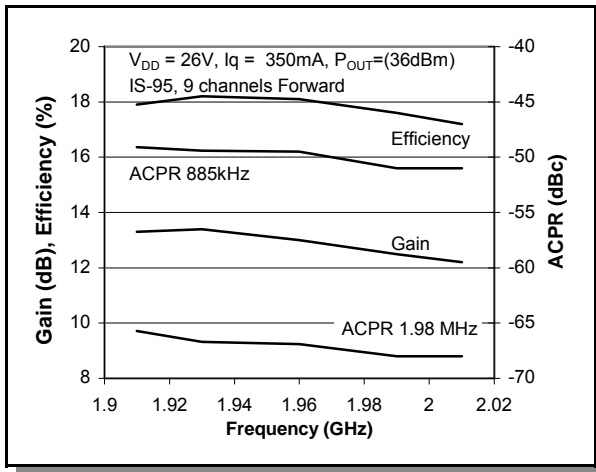
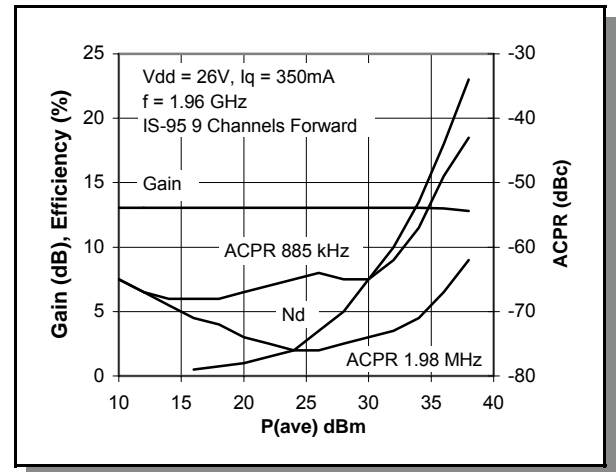


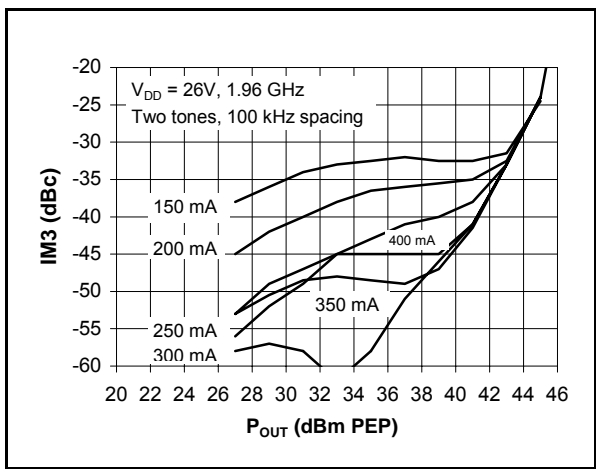
Figure 2. 1930—1990 MHz Test Fixture Component Layout



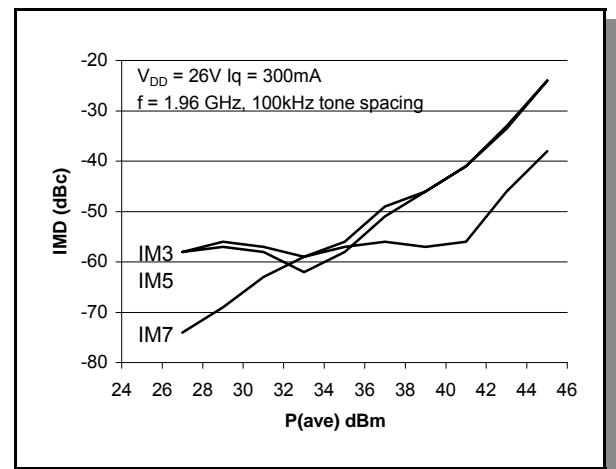
Graph 1. Class AB Broadband Circuit Performance



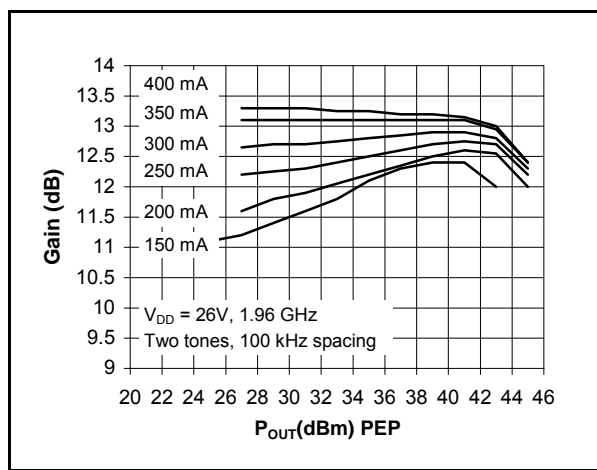
Graph 2. CDMA ACPR, Power Gain and Drain Efficiency vs. Output Power



Graph 3. Intermodulation Distortion vs. Output Power



Graph 4. Intermodulation Distortion Products vs. Output Power



Graph 5. Power Gain versus Output Power

