M/A-COM

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

5/14/04

Preliminary

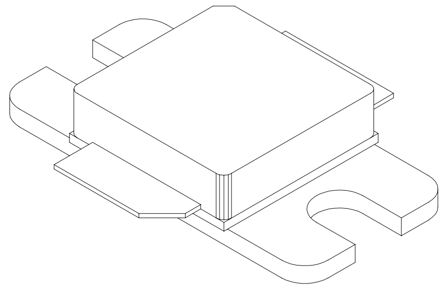
MAPLST1820-030CF

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



P-237

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 °C	P_D	97	W
Storage Temperature	T_{STG}	-40 to +150	°C
Junction Temperature	T_J	+200	°C

Thermal Characteristics

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\Theta JC}$	1.8	°C/W

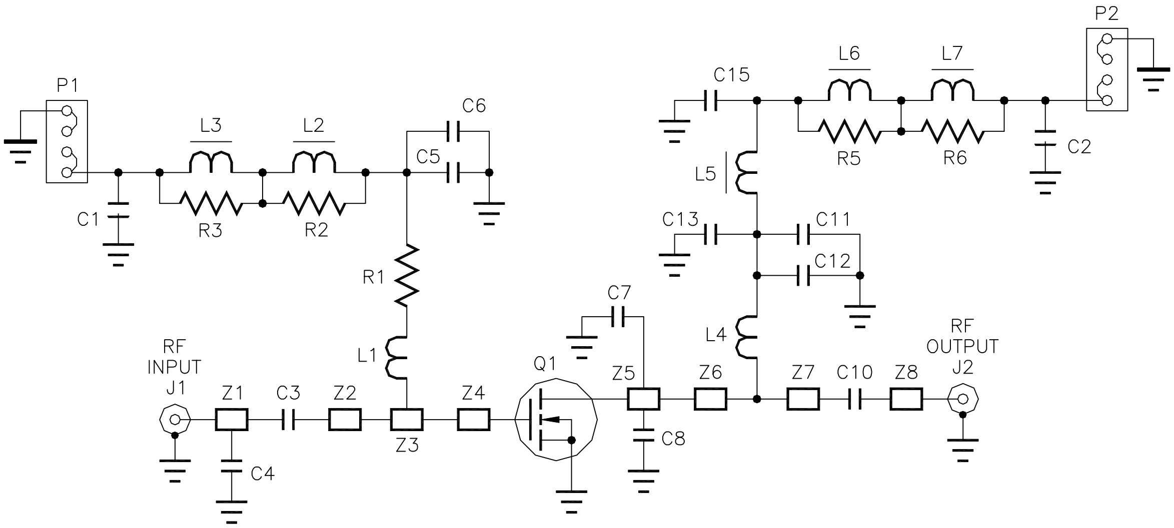
NOTE—**CAUTION**—MOS devices are susceptible to damage from electrostatic charge. Precautions in handling and packaging MOS devices should be observed.

5/14/04

Preliminary

Characteristic	Symbol	Min	Typ	Max	Unit
DC CHARACTERISTICS @ 25ºC					
Drain-Source Breakdown Voltage (V_{GS} = 0 Vdc, I_D = 20 µAdc)	$V_{(BR)DSS}$	65	—	—	Vdc
Zero Gate Voltage Drain Leakage Current (V_{DS} = 26 Vdc, V_{GS} = 0)	I_{DSS}	—	—	100	µAdc
Gate—Source Leakage Current (V_{GS} = 5 Vdc, V_{DS} = 0)	I_{GSS}	—	—	1	µAdc
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 @ 25ºC					
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 @ 25ºC (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, f1 = 1990.0 MHz, f2 = 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, f1 = 1990.0 MHz, f2 = 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, f1 = 1990.0 MHz, f2 = 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, f1 = 1930.0 MHz, f2 = 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, f1 = 1930.0 MHz, f2 = 1930.1 MHz)	EFF (η)	—	33	—	%
Two-Tone Intermodulation Distortion (V_{DS} = 26 Vdc, P_{OUT} = 30 W PEP, I_{DQ} = 300 mA, f1 = 1930.0 MHz, f2 = 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			

Preliminary



C1,C2	Electrolytic Capacitor, 470 µF
C3,C10	Ceramic Chip Capacitor, 10 pF
C4	Ceramic Chip Capacitor, 0.7 pF
C5,C11	Ceramic Chip Capacitor, 5.1 pF
C6,C15	Ceramic Chip Capacitor, 0.1 µF
C7	Ceramic Chip Capacitor, 1.2 pF
C8	Ceramic Chip Capacitor, 0.6 pF
C12	Ceramic Chip Capacitor, 91 pF
C13	Electrolytic Capacitor, 22 µF
Z1-Z8	Distributed Microstrip Element

J1,J2	SMA Connector, Omni Spectra 2052-5636-02
L1	Inductor, 8 nH, CoilCraft A03T
L2,L3,L5,L6,L7	Inductor, Ferrite Bead, Fair Rite 2743019477
L4	Inductor, 28 µH, CoilCraft A08T
P1,P2	Connector, AMP 640457-4
Q1	Transistor, MAPLST1920-030WF
R1	Chip Resistor, 3.7 Ohm
R2, R3	Chip Resistor, 12 Ohm
R4,R5,R6	Chip Resistor, 10 Ohm
PC Board	(74350126-01), Arlon Woven Glass Teflon .030" Thick, Er=2.54, 2 Oz Copper Both Sides

Figure 1. 1930—1990 MHz Test Fixture Schematic

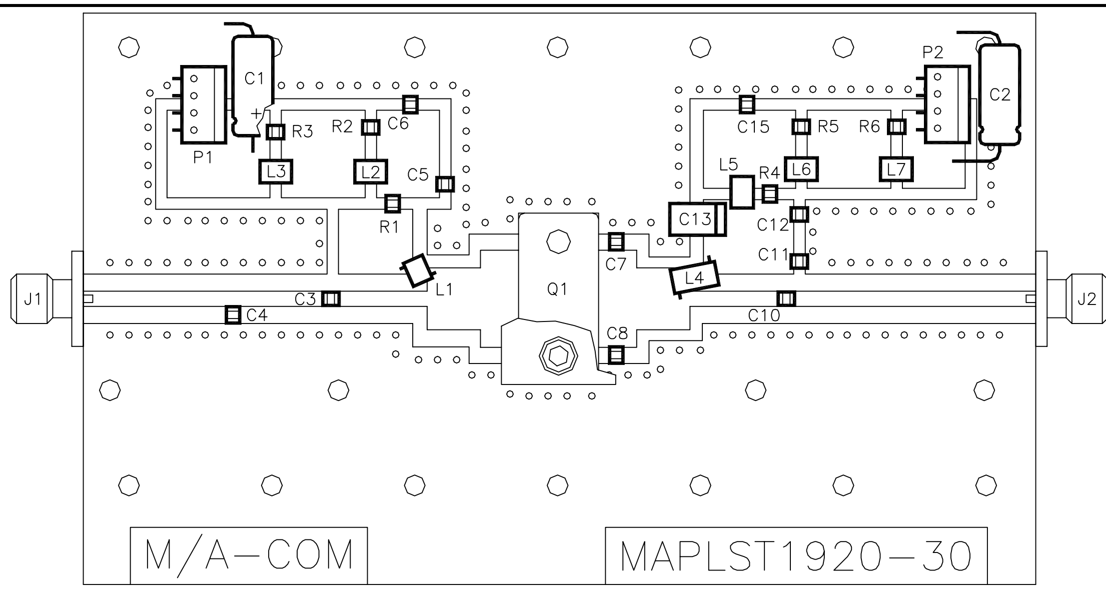
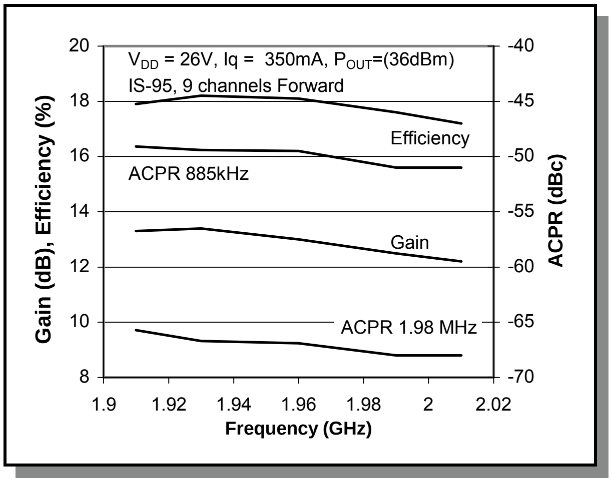
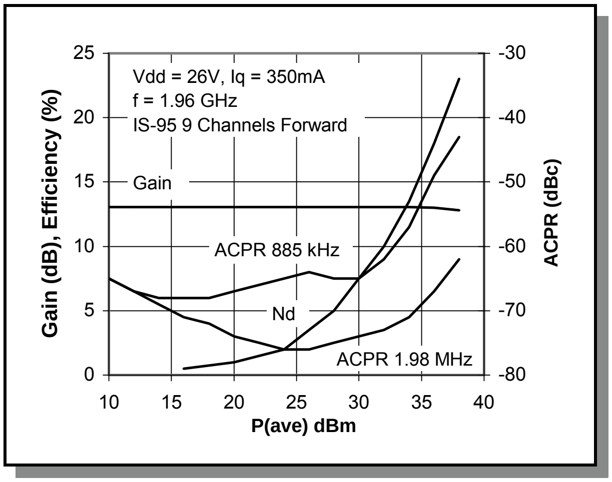


Figure 2. 1930—1900 MHz Test Fixture Component Layout

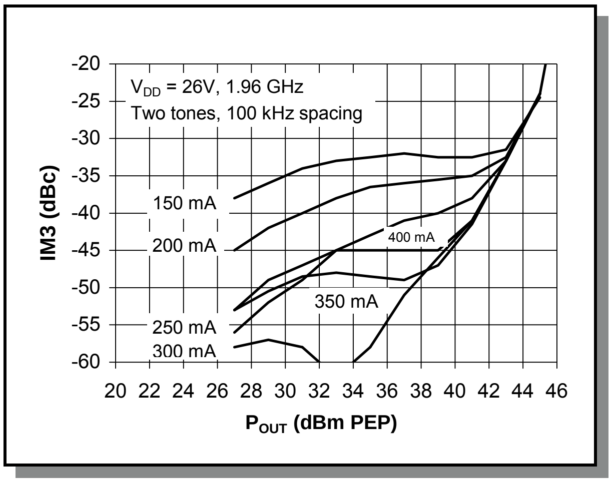
Preliminary



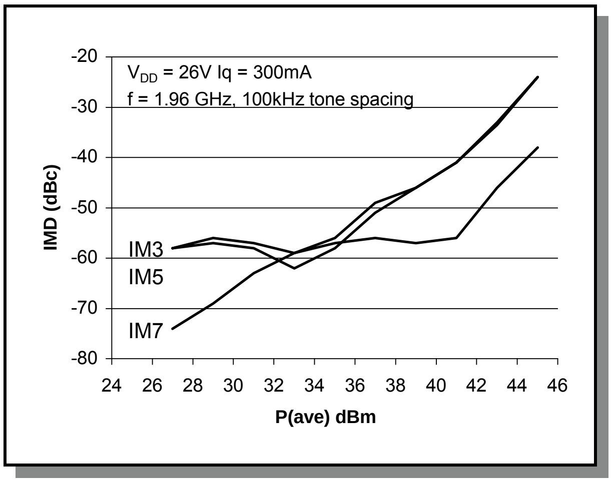
Graph 1. Class AB Broadband Circuit Performance



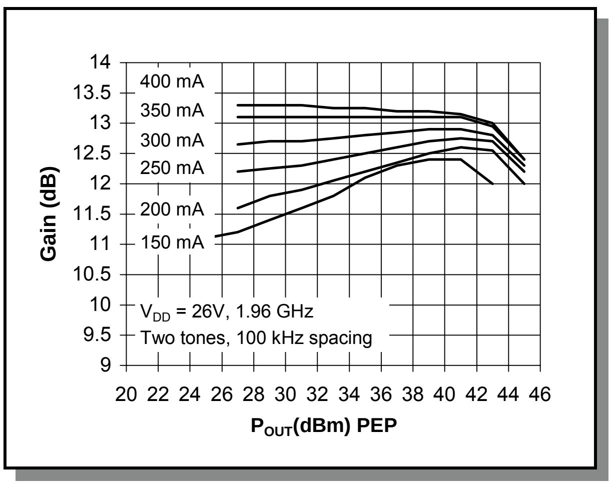
Graph 2. CDMA ACPR, Power Gain and Drain Efficiency vs. Output Power



Graph 3. Intermodulation Distortion vs. Output Power



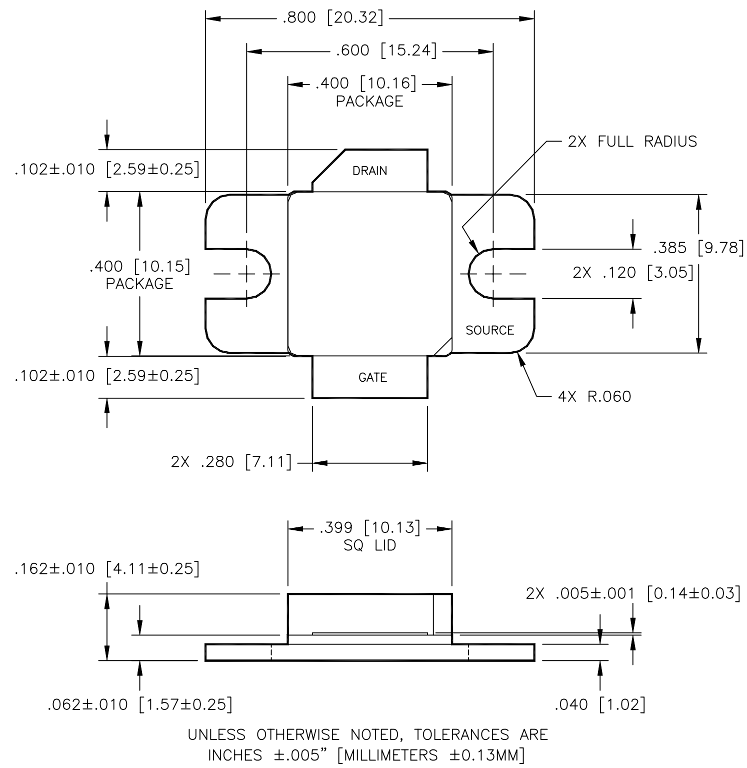
Graph 4. Intermodulation Distortion Products vs. Output Power



Graph 5. Power Gain versus Output Power

Preliminary

Package Dimensions



- **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