MAPLST2122-030CF

LDMOS RF Line Power FET Transistor
30 W , 2110-2170 MHz, 28V

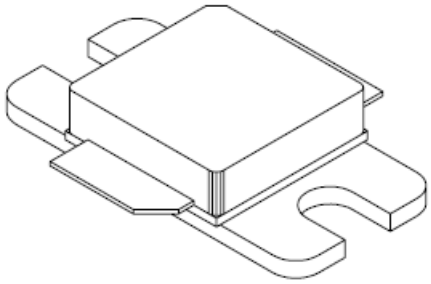
M/A-COM Products
Released - Rev. 07.07

Designed for W-CDMA base station applications in the 2.1 to 2.2 GHz frequency band. Suitable for TDMA, CDMA, and multicarrier power amplifier applications.

- 30W output power at P1dB (CW)
- 12dB minimum gain at P1dB (CW)

- W-CDMA typical performance:
  (28VDC, -45dBc ACPR @ 4.096MHz)
  Output power: 4.5W (typ.)
  Gain: 12dB (typ.)
  Efficiency: 16% (typ.)
- 10:1 VSWR ruggedness (CW @ 30W, 28V, 2110MHz)

Product Image



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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 °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.

- **North America** Tel: 800.366.2266 / Fax: 978.366.2266
- **Europe** Tel: 44.1908.574.200 / Fax: 44.1908.574.300
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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 µAdc)	$V_{(BR)DSS}$	65	—	—	Vdc
Zero Gate Voltage Drain Leakage Current (V_{DS} = 28 Vdc, V_{GS} = 0)	I_{DSS}	—	—	1	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 = 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

(1) Device specifications obtained on a Production Test Fixture.

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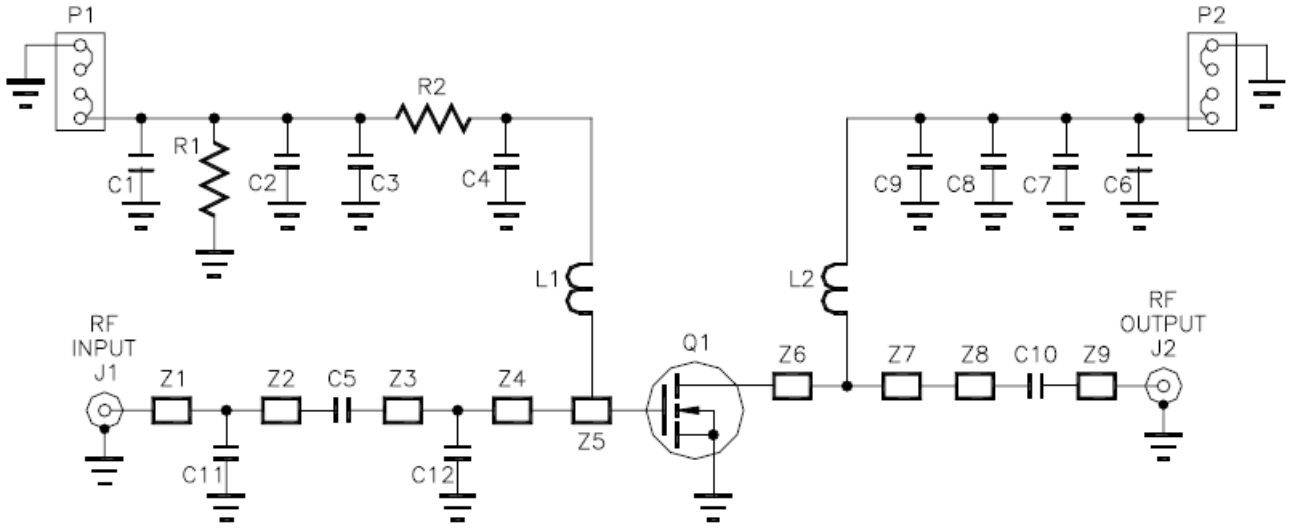
RF FUNCTIONAL TESTS @ 25°C (In M/A-COM Test Fixture)					
Two-Tone Common-Source Amplifier Power Gain (V_{DS} = 28 Vdc, P_{OUT} = 30 W PEP, I_{DQ} = 250 mA, f1 = 2140.0 MHz, f2 = 2140.1 MHz)	G_{ps}	—	12.5	—	dB
Two-Tone Drain Efficiency (V_{DS} = 28 Vdc, P_{OUT} = 30 W PEP, I_{DQ} = 250 mA, f1 = 2140.0 MHz, f2 = 2140.1 MHz)	EFF (η)	—	36	—	%
Two-Tone Common-Source Amplifier Power Gain (V_{DS} = 28 Vdc, P_{OUT} = 30 W PEP, I_{DQ} = 250 mA, f1 = 2140.0 MHz, f2 = 2140.1 MHz)	IMD	—	-30	-28	dBc
Input Return Loss (V_{DS} = 28 Vdc, P_{OUT} = 30 W PEP, I_{DQ} = 250 mA, f1 = 2140.0 MHz, f2 = 2140.1 MHz)	IRL	—	-12	—	dB
Two-Tone Common-Source Amplifier Power Gain (V_{DS} = 28 Vdc, P_{OUT} = 30 W PEP, I_{DQ} = 250 mA, f1 = 2110.0 MHz, f2 = 2110.1 MHz and f1 = 2170.0 MHz, f2 = 2170.1 MHz)	G_{ps}	—	12.5	—	dB
Two-Tone Drain Efficiency (V_{DS} = 28 Vdc, P_{OUT} = 30 W PEP, I_{DQ} = 250 mA, f1 = 2110.0 MHz, f2 = 2110.1 MHz and f1 = 2170.0 MHz, f2 = 2170.1 MHz)	EFF (η)	—	36	—	%
Two-Tone Common-Source Amplifier Power Gain (V_{DS} = 28 Vdc, P_{OUT} = 30 W PEP, I_{DQ} = 250 mA, f1 = 2110.0 MHz, f2 = 2110.1 MHz and f1 = 2170.0 MHz, f2 = 2170.1 MHz)	IMD	—	-30	-28	dBc
Input Return Loss (V_{DS} = 28 Vdc, P_{OUT} = 30 W PEP, I_{DQ} = 250 mA, f1 = 2110.0 MHz, f2 = 2110.1 MHz and f1 = 2170.0 MHz, f2 = 2170.1 MHz)	IRL	—	-12	-9	dB
Output VSWR Tolerance (V_{DD} = 28 Vdc, P_{OUT} = 30 W, I_{DQ} = 250 mA, f = 2110 MHz, VSWR = 10:1, All Phase Angles at Frequency of Tests)	Ψ	No Degradation In Output Power Before and After Test			



C1,C6	Tantalum Electrolytic Surface Mt. Cap., 22 µF	L1	Inductor, 8 nH, CoilCraft A03T
C2,C7	Ceramic Chip Capacitor, 0.1 µF	L2	Inductor, 18.5 nH, CoilCraft A05T
C3,C8	Ceramic Chip Capacitor, 1000 pF	P1,P2	Connector, AMP 640457-4
C4,C5,C9,C10	Chip Capacitor, 8.2 pF ATC100B	Q1	Transistor, MAPLST2122-030CF
C11	Chip Capacitor, 0.5 pF ATC100B	R1	Chip Resistor (0805), 100k Ohm
C12	Chip Capacitor, 1.2 pF ATC100B	R2	Chip Resistor (0805), 10K Ohm
Z1-Z9	Distributed Microstrip Element	PC Board	(74350132-01), Arlon Woven Glass Teflon .030" Thick, Er=2.54, 2 Oz Copper Both Sides
J1,J2	SMA Connector, Omni Spectra 2052-5636-02		

FIGURE 1. 2110—2170 MHZ TEST FIXTURE SCHEMATIC

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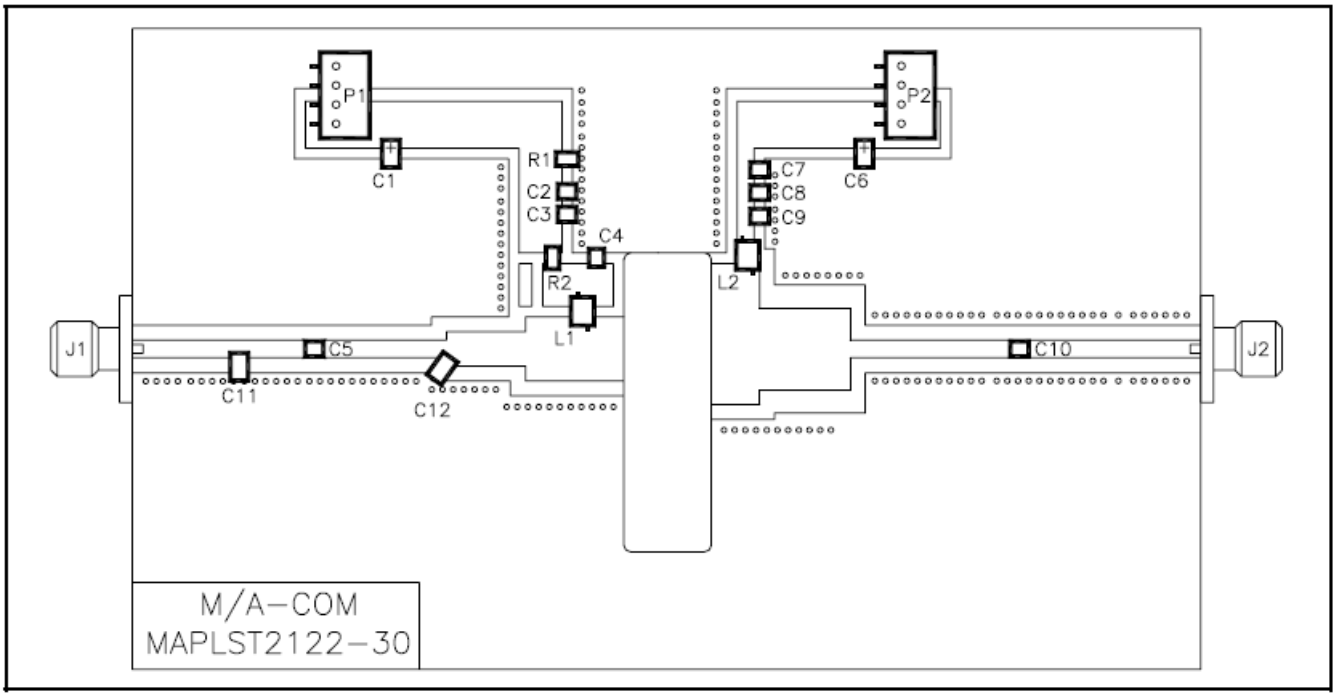
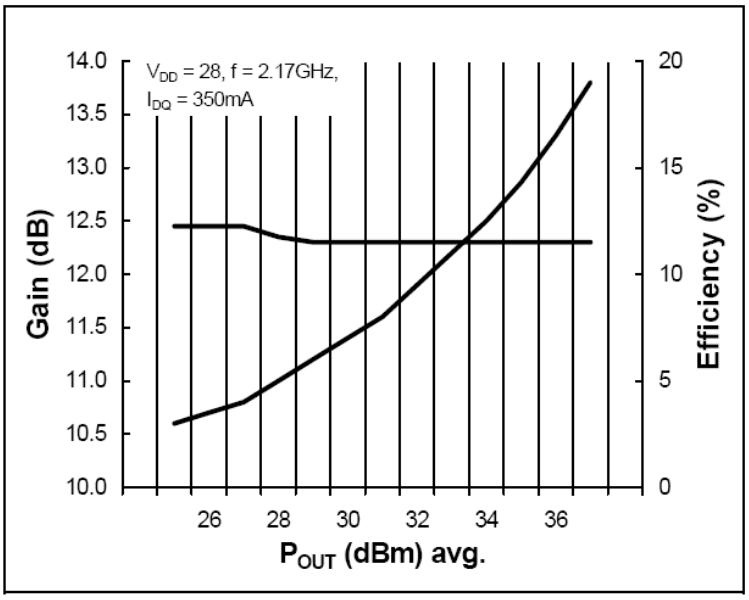
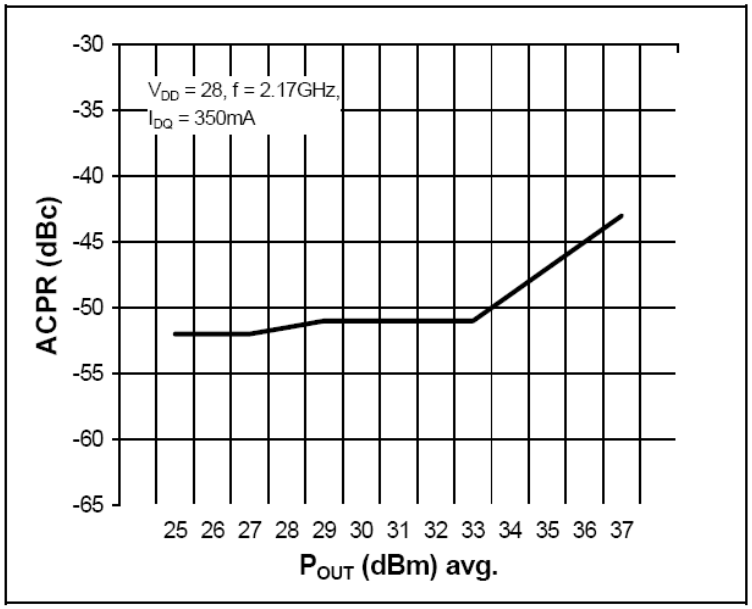


FIGURE 2. 2110—2170 MHZ TEST FIXTURE COMPONENT LAYOUT



GRAPH 1. W-CDMA: POWER GAIN AND DRAIN EFFICIENCY VS. OUTPUT POWER



GRAPH 2. W-CDMA: ADJACENT CHANNEL POWER RATIO VS. OUTPUT POWER

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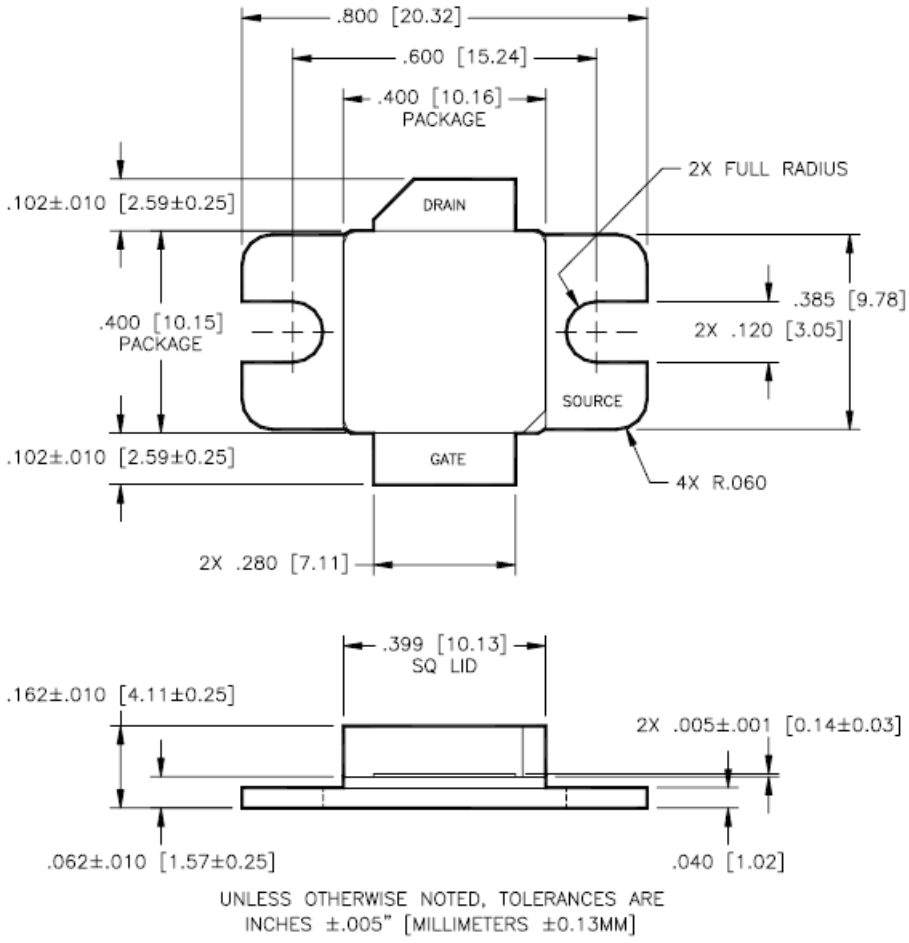
PACKAGE DIMENSIONSP



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