RF Power Field Effect Transistor
LDMOS, 2110 — 2170 MHz, 60W, 28V

4/6/2005

Preliminary

MAPLST2122-060CF

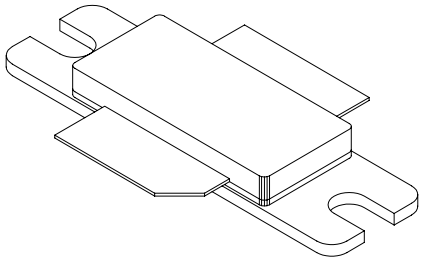
Features

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.

- 60W output power at P_{1dB} (CW)
- 12dB Minimum Gain at P_{1dB} (CW)

- W-CDMA Typical Performance: ($28V_{DC}$, -45dB ACPR @ 4.096MHz)
  - Output Power: 7.5W (typ.)
  - Gain: 12dB (typ.)
  - Efficiency: 16% (typ.)
- 10:1 VSWR Ruggedness (CW @ 60W, 28V, 2110MHz)

Package Style



MAPLST2122-060CF

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

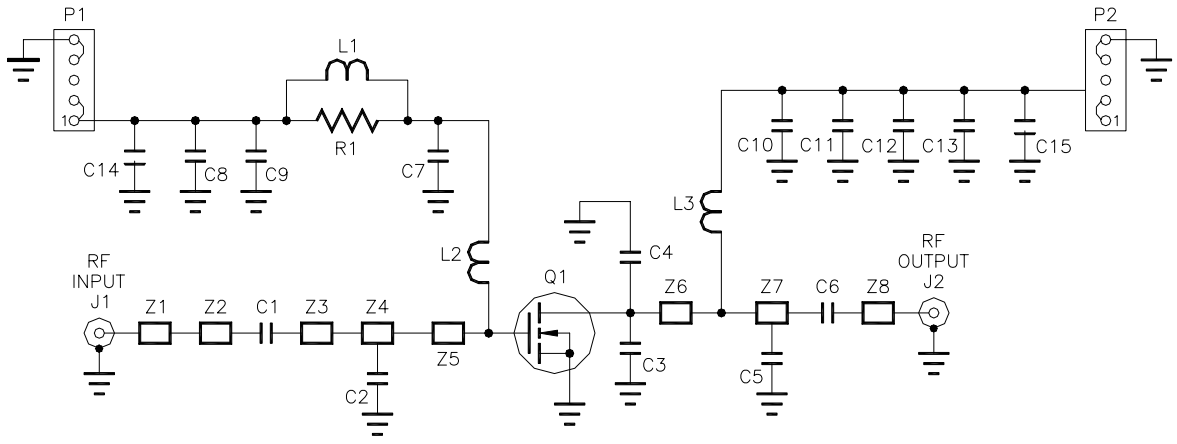
Thermal Characteristics

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\Theta JC}$	1.0	ºC/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 @ 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} = 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 = 500 mA)	$V_{DS(Q)}$	2	—	4.5	Vdc
Drain-Source On-Voltage (V_{GS} = 10 Vdc, I_D = 1 A)	$V_{DS(on)}$	—	0.4	—	Vdc
Forward Transconductance (V_{GS} = 10 Vdc, I_D = 1 A)	Gm	—	2.4	—	S
DYNAMIC CHARACTERISTICS @ 25ºC					
Input Capacitance (Including Input Matching Capacitor in Package) (V_{DS} = 28 Vdc, V_{GS} = 0, f = 1 MHz)	C_{iss}	—	180	—	pF
Output Capacitance (V_{DS} = 28 Vdc, V_{GS} = 0, f = 1 MHz)	C_{oss}	—	65	—	pF
Reverse Transfer Capacitance (V_{DS} = 28 Vdc, V_{GS} = 0, f = 1 MHz)	C_{rss}	—	3.0	—	pF
RF FUNCTIONAL TESTS @ 25ºC (In M/A-COM Test Fixture)					
Two-Tone Common-Source Amplifier Power Gain (V_{DS} = 28 Vdc, P_{OUT} = 60 W PEP, I_{DQ} = 500 mA, f1 = 2140.0 MHz, f2 = 2140.1 MHz)	G_{ps}	—	12.0	—	dB
Two-Tone Drain Efficiency (V_{DS} = 28 Vdc, P_{OUT} = 60 W PEP, I_{DQ} = 500 mA, f1 = 2140.0 MHz, f2 = 2140.1 MHz)	EFF (ŋ)	—	35	—	%
Two-Tone Common-Source Amplifier Power Gain (V_{DS} = 28 Vdc, P_{OUT} = 60 W PEP, I_{DQ} = 500 mA, f1 = 2140.0 MHz, f2 = 2140.1 MHz)	IMD	—	-30	-28	dBc
Input Return Loss (V_{DS} = 28 Vdc, P_{OUT} = 60 W PEP, I_{DQ} = 500 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} = 60 W PEP, I_{DQ} = 500 mA, f1 = 2110.0 MHz, f2 = 2110.1 MHz and f1 = 2170.0 MHz, f2 = 2170.1 MHz)	G_{ps}	—	12.0	—	dB
Two-Tone Drain Efficiency (V_{DS} = 28 Vdc, P_{OUT} = 60 W PEP, I_{DQ} = 500 mA, f1 = 2110.0 MHz, f2 = 2110.1 MHz and f1 = 2170.0 MHz, f2 = 2170.1 MHz)	EFF (ŋ)	—	35	—	%
Two-Tone Common-Source Amplifier Power Gain (V_{DS} = 28 Vdc, P_{OUT} = 60 W PEP, I_{DQ} = 500 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} = 60 W PEP, I_{DQ} = 500 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} = 60 W, I_{DQ} = 500 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	Ceramic Chip Capacitor, 10 pF
C2,C5	Ceramic Chip Capacitor, 0.5 pF
C3,C4	Ceramic Chip Capacitor, 1.8 pF
C6,C7,C12,C13	Chip Capacitor, 8.2 pF
C8, C10	Chip Capacitor, 1 μF
C9, C11	Chip Capacitor, 0.1 μF
C14,C15	Ceramic Capacitor, 100 μF
Z1-Z8	Distributed Microstrip Element

J1,J2	SMA Connector, Omni Spectra 2052-5636-02
L1	Inductor, 8 nH, CoilCraft B Series
L2, L3	Inductor, 18.5 nH, CoilCraft B Series
P1,P2	Connector, 5 Pin
Q1	Transistor, MAPLST2122-060CF
R1	Chip Resistor, 10 Ohm
PC Board	(74350144-01), Arlon Woven Glass Teflon .030” Thick, Er=2.54, 2 Oz Copper Both Sides

Figure 1. 2110—2170 MHz Test Fixture Schematic

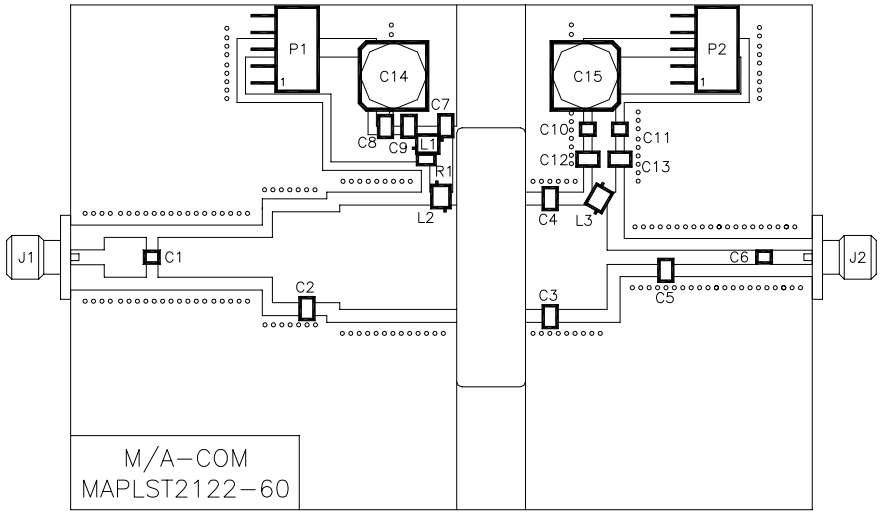
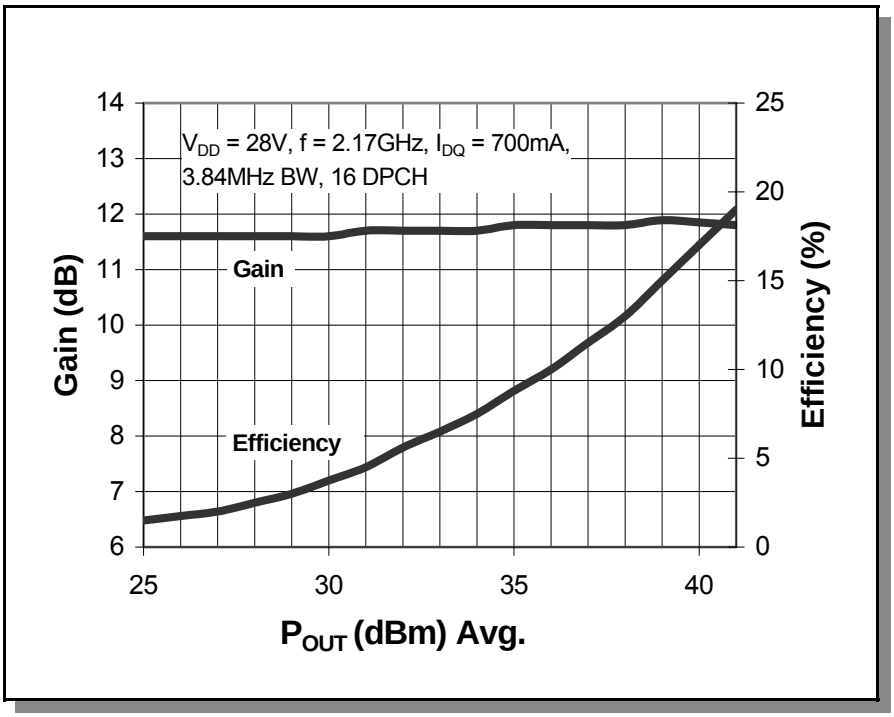
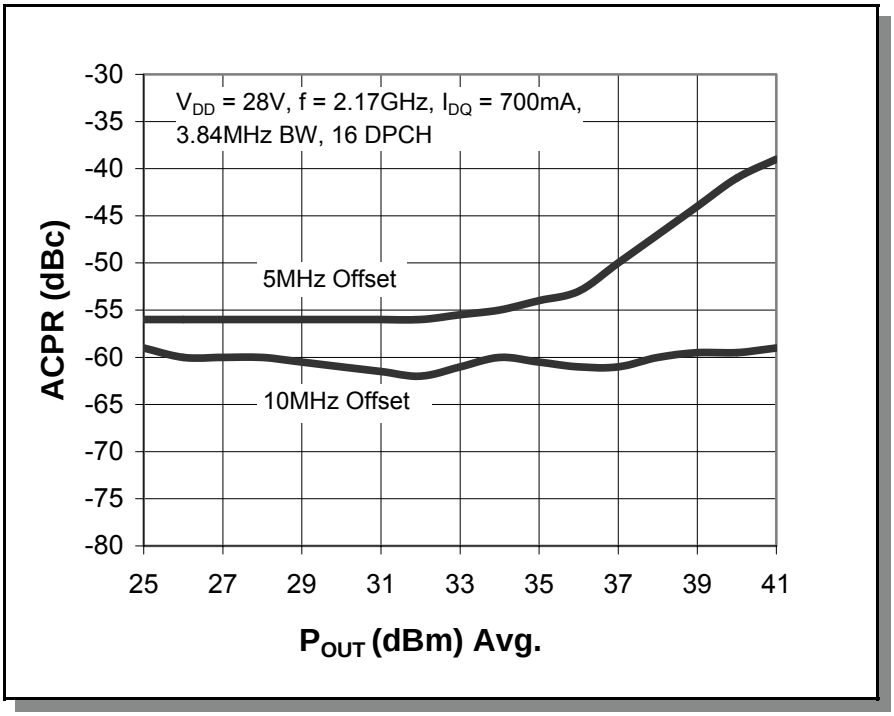


Figure 2. 2110—2170 MHz Test Fixture Component Layout

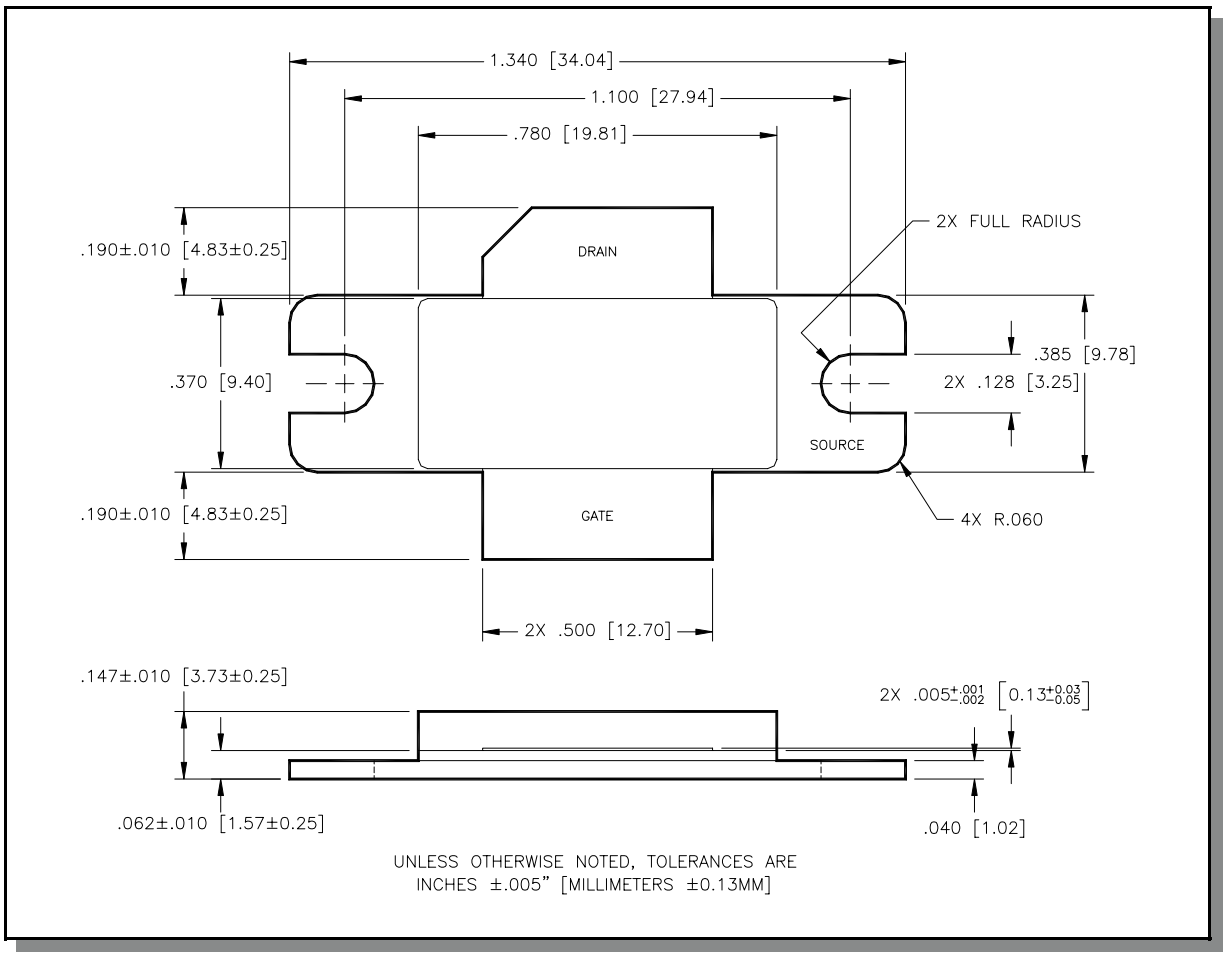


Graph 1. W-CDMA: Power Gain and Drain Efficiency vs. Output Power



Graph 2. W-CDMA: Adjacent Channel Power Ratio vs. Output Power

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