

RF Power Field Effect Transistor LDMOS, 1890 — 1925 MHz, 60W, 26V

10/31/03

Preliminary

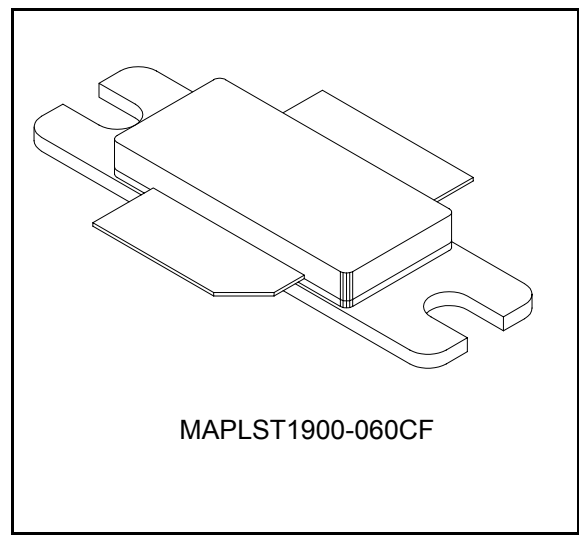
MAPLST1900-060CF

Features

Designed for PHS applications in the 1890-1925 MHz frequency band.

- Typical performance in PHS mode at -65 dBc ACPR (600kHz):
 - Average Output Power: 16W
 - Gain: 12.5dB (typ.)
 - Efficiency: 26% (typ.)
- 10:1 VSWR Ruggedness at 16W, 26V, 1890MHz)

Package Style



Maximum Ratings

Parameter	Symbol	Rating	Units
Drain—Source Voltage	V_{DS}	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	$R_{\theta JC}$	1.0	$^{\circ}\text{C/W}$

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 ($V_{DS} = 26$ 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 ($V_{DS} = 26$ Vdc, $I_D = 500$ mA)	$V_{DS(Q)}$	2	—	4.5	Vdc
Drain-Source On-Voltage ($V_{GS} = 10$ Vdc, $I_D = 1$ A)	$V_{DS(on)}$	—	0.2	—	Vdc
Forward Transconductance ($V_{GS} = 10$ Vdc, $I_D = 1$ A)	Gm	—	2.4	—	S
DYNAMIC CHARACTERISTICS @ 25°C					
Input Capacitance (Including Input Matching Capacitor in Package) ($V_{DS} = 26$ Vdc, $V_{GS} = 0$, $f = 1$ MHz)	C_{iss}	—	180	—	pF
Output Capacitance ($V_{DS} = 26$ Vdc, $V_{GS} = 0$, $f = 1$ MHz)	C_{oss}	—	65	—	pF
Reverse Transfer Capacitance ($V_{DS} = 26$ Vdc, $V_{GS} = 0$, $f = 1$ MHz)	C_{rss}	—	3.0	—	pF
RF FUNCTIONAL TESTS @ 25°C (In M/A-COM Test Fixture)					
PHS Gain ($V_{DS} = 26$ Vdc, Pi/4 DQPSK, 192 kHz, $P_{OUT} = 16$ W (avg.), $I_{DQ} = 500$ mA, $f_0 = 1920$ MHz)	G_{ps}	—	12.5	—	dB
PHS Drain Efficiency ($V_{DS} = 26$ Vdc, Pi/4 DQPSK, 192 kHz, $P_{OUT} = 16$ W (avg.), $I_{DQ} = 500$ mA, $f_0 = 1920$ MHz)	EFF (η)	—	30	—	%
PHS ACPR @ 600 kHz offset ($V_{DS} = 26$ Vdc, Pi/4 DQPSK, 192 kHz, $P_{OUT} = 16$ W (avg.), $I_{DQ} = 500$ mA, $f_0 = 1905$ MHz)	ACPR	—	-65	—	dBc
PHS ACPR @ 900 kHz offset ($V_{DS} = 26$ Vdc, Pi/4 DQPSK, 192 kHz, $P_{OUT} = 16$ W (avg.), $I_{DQ} = 500$ mA, $f_0 = 1905$ MHz)	ACPR	—	-72	—	dBc
PHS Gain ($V_{DS} = 26$ Vdc, Pi/4 DQPSK, 192 kHz, $P_{OUT} = 16$ W (avg.), $I_{DQ} = 500$ mA, $f_0 = 1890$ MHz)	G_{ps}	—	12.5	—	dB
PHS Drain Efficiency ($V_{DS} = 26$ Vdc, Pi/4 DQPSK, 192 kHz, $P_{OUT} = 16$ W (avg.), $I_{DQ} = 500$ mA, $f_0 = 1890$ MHz)	EFF (η)	—	30	—	%
Input Return Loss ($V_{DS} = 26$ Vdc, Pi/4 DQPSK, 192 kHz, $P_{OUT} = 16$ W (avg.), $I_{DQ} = 500$ mA, $f_0 = 1920$ MHz)	IRL	—	-12	-9	dB
Output VSWR Tolerance ($V_{DS} = 26$ Vdc, Pi/4 DQPSK, 192 kHz, $P_{OUT} = 16$ W (avg.), $I_{DQ} = 500$ mA, $f_0 = 1890$ MHz)	Ψ	No Degradation In Output Power Before and After Test			

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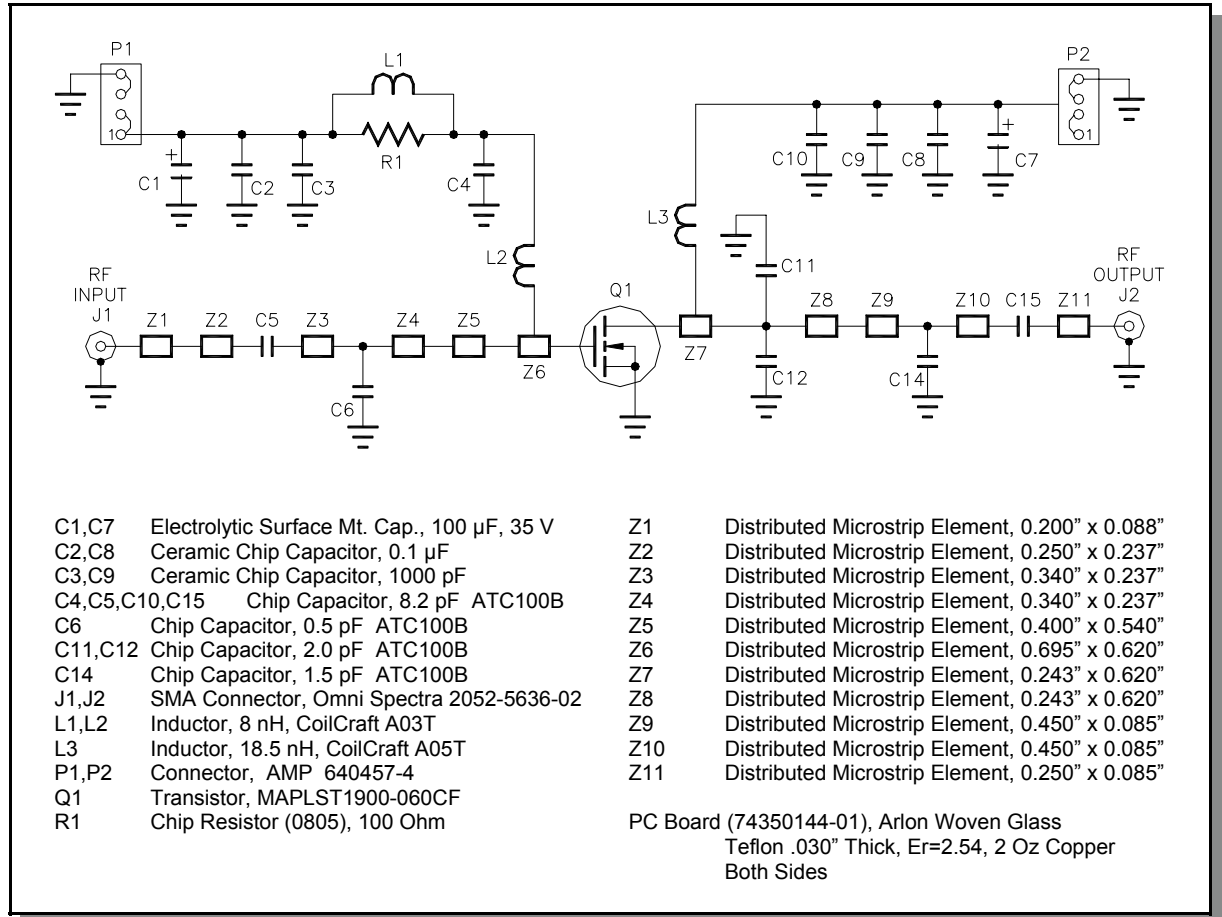


Figure 1. 1890—1925 MHz Test Fixture Schematic

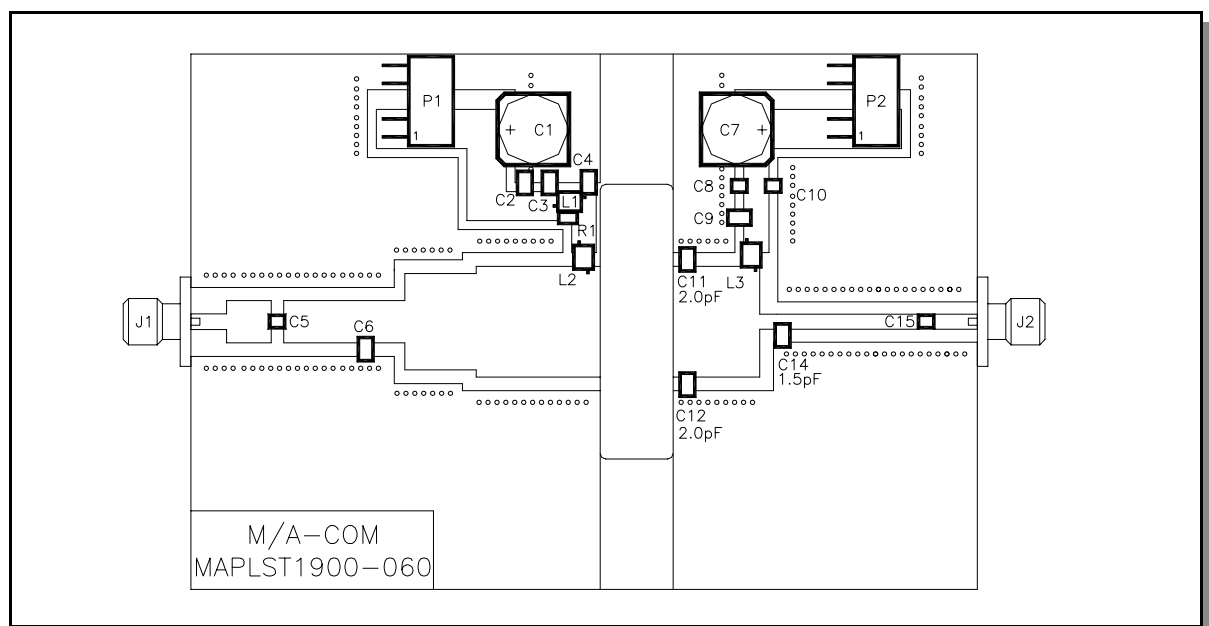
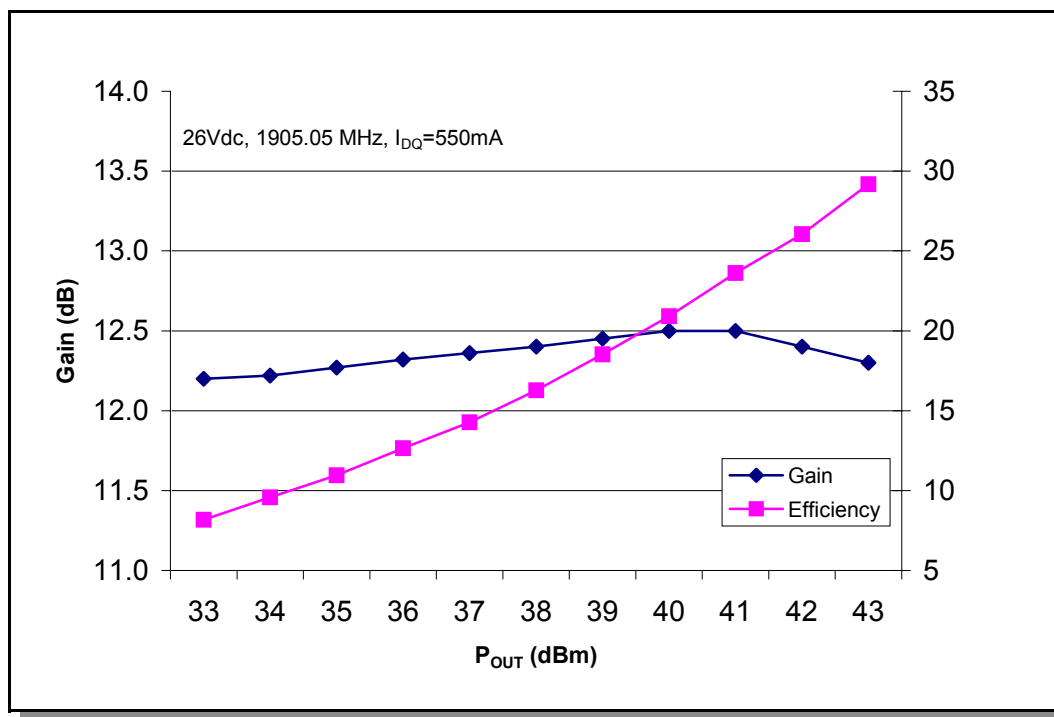
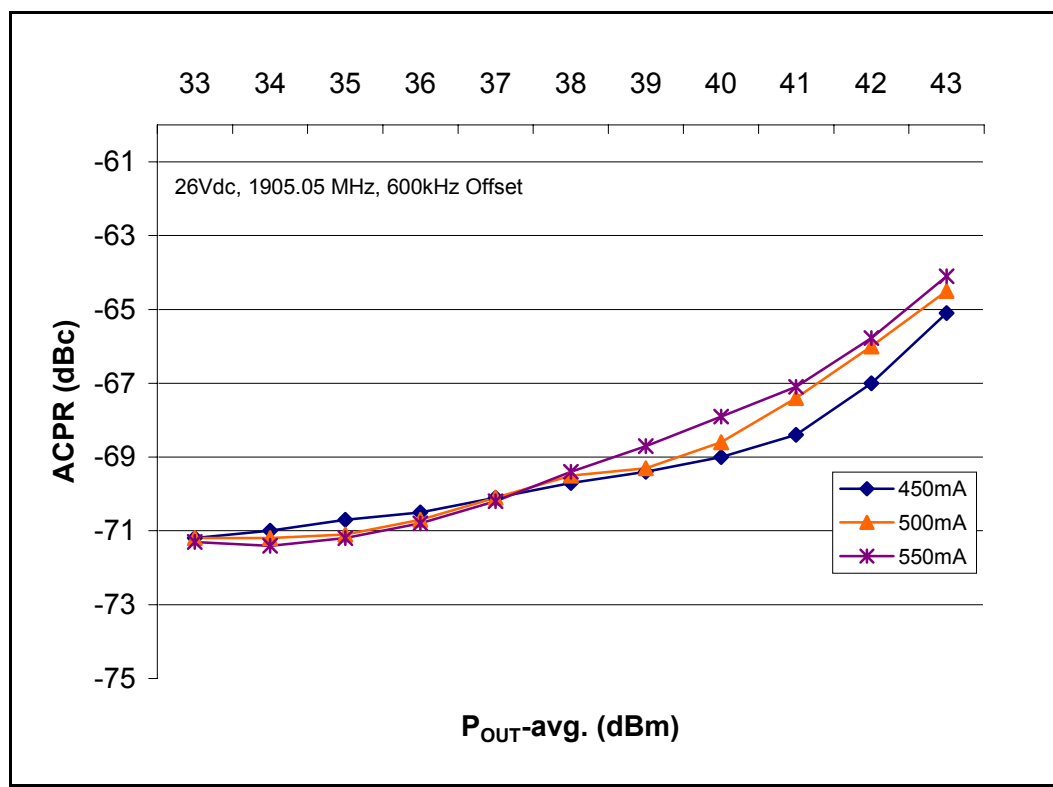


Figure 2. 1890—1925 MHz Test Fixture Component Layout

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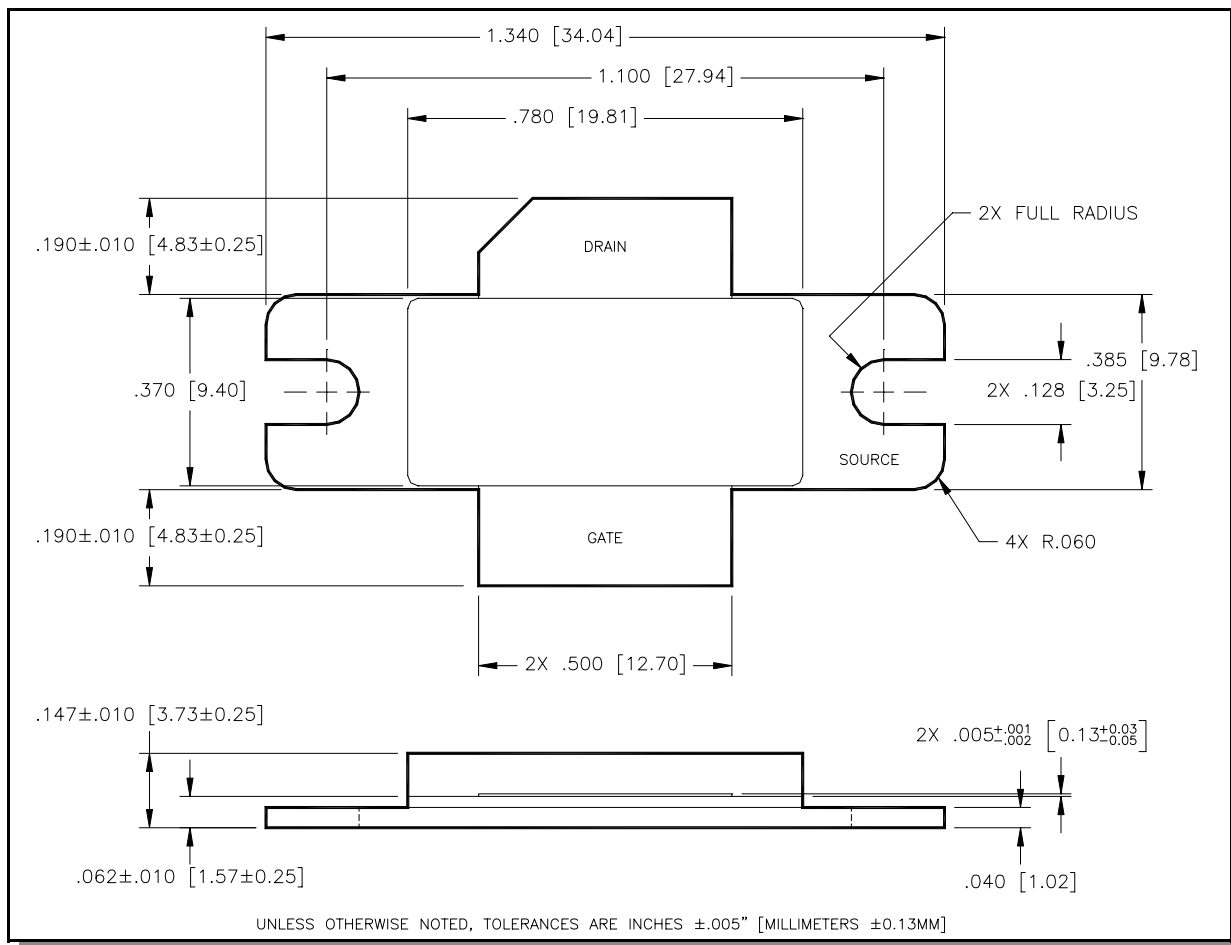
Graph 1. PHS: Power Gain and Drain Efficiency vs. Output Power



Graph 2. PHS: Adjacent Channel Power Ratio vs. Output Power

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Package Dimensions



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