Table 4. Electrical Characteristics (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
Off Characteristics					
Zero Gate Voltage Drain Leakage Current (V_{DS} = 65 Vdc, V_{GS} = 0)	I_{DSS}	—	—	10	μAdc
Zero Gate Voltage Drain Leakage Current (V_{DS} = 26 Vds, V_{GS} = 0)	I_{DSS}	—	—	1	μAdc
Gate-Source Leakage Current (V_{GS} = 5 Vdc, V_{DS} = 0)	I_{GSS}	—	—	1	μAdc
On Characteristics					
Gate Threshold Voltage (V_{DS} = 10 Vdc, I_D = 300 μAdc)	$V_{GS(th)}$	2.0	—	4.0	Vdc
Gate Quiescent Voltage (V_{DS} = 26 Vdc, I_D = 700 mAdc)	$V_{GS(Q)}$	—	3.7	—	Vdc
Drain-Source On-Voltage (V_{GS} = 10 Vdc, I_D = 2 Adc)	$V_{DS(on)}$	—	0.19	0.4	Vdc
Forward Transconductance (V_{DS} = 10 Vdc, I_D = 6 Adc)	g_{fs}	—	8.0	—	S
Dynamic Characteristics (1)					
Output Capacitance (V_{DS} = 26 Vdc, V_{GS} = 0, f = 1 MHz)	C_{oss}	—	73	—	pF
Reverse Transfer Capacitance (V_{DS} = 26 Vdc, V_{GS} = 0, f = 1 MHz)	C_{rss}	—	2.9	—	pF
Functional Tests (In Freescale Test Fixture, 50 ohm system)					
Power Output, 1 dB Compression Point (V_{DD} = 26 Vdc, I_{DQ} = 600 mA, f = 960 MHz)	P_{1dB}	68	75	—	W
Common-Source Amplifier Power Gain @ 70 W (Min) (V_{DD} = 26 Vdc, I_{DQ} = 600 mA, f = 960 MHz)	G_{ps}	17	18.5	20	dB
Drain Efficiency @ P_{out} = 70 W (V_{DD} = 26 Vdc, I_{DQ} = 600 mA, f = 960 MHz)	η1	47	52	—	%
Drain Efficiency @ P1dB (V_{DD} = 26 Vdc, I_{DQ} = 600 mA, f = 960 MHz)	η2	—	55	—	%
Input Return Loss (V_{DD} = 26 Vdc, P_{out} = 70 W, I_{DQ} = 600 mA, f = 960 MHz)	IRL	9.5	12.5	—	dB

1. Part is internally input matched.

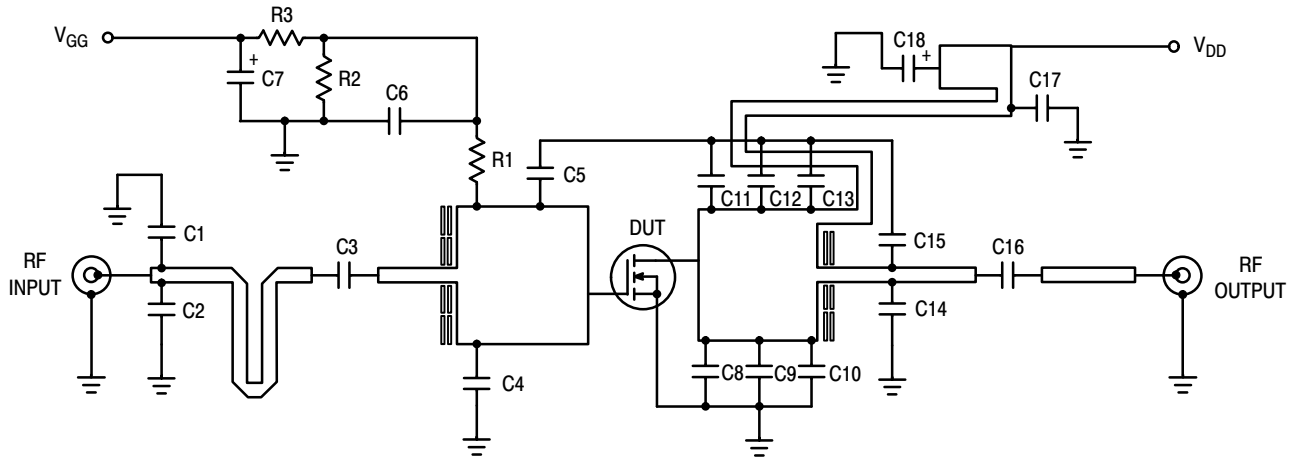
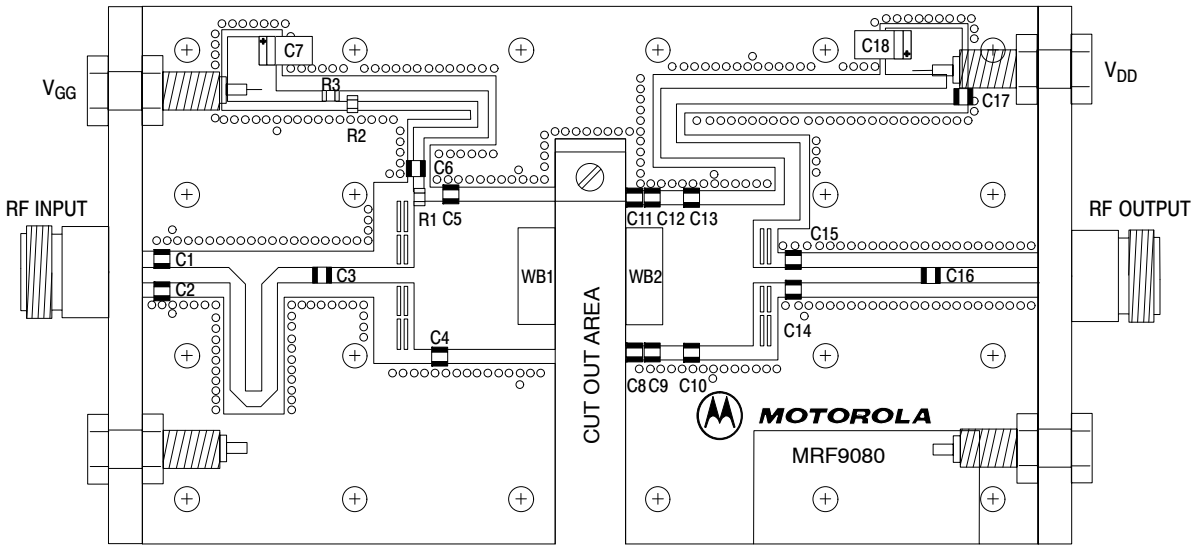


Figure 1. Broadband GSM 900 Test Circuit Schematic

Table 5. Broadband GSM 900 Test Circuit Component Designations and Values

Part	Description	Part Number	Manufacturer
C1	4.7 pF Chip Capacitor	ATC100B4R7BT500XT	ATC
C2	2.7 pF Chip Capacitor	ATC100B2R7BT500XT	ATC
C3	1.5 pF Chip Capacitor	ATC100B1R5BT500XT	ATC
C4, C5, C9, C10, C12, C13	5.6 pF Chip Capacitors	ATC100B5R6CT500XT	ATC
C6, C16, C17	22 pF Chip Capacitors	ATC100B220GT500XT	ATC
C7, C18	10 μF, 35 V Tantalum Chip Capacitors	T491D106M035AT	Kemet
C8, C11	10 pF Chip Capacitors	ATC100B100JT500XT	ATC
C14	0.8 pF Chip Capacitor	ATC100B0R8BT500XT	ATC
C15	8.2 pF Chip Capacitor	ATC100B8R2GT500XT	ATC
R1, R2, R3	1.0 kΩ, 1/8 W Chip Resistors	CRCW08051001FKEA	Vishay
Raw PCB Material	30 mil Glass Teflon®, ε_r = 2.55	TLX8-0300	Taconic



Freescale has begun the transition of marking Printed Circuit Boards (PCBs) with the Freescale Semiconductor signature/logo. PCBs may have either Motorola or Freescale markings during the transition period. These changes will have no impact on form, fit or function of the current product.

Figure 2. Broadband GSM 900 Test Circuit Component Layout

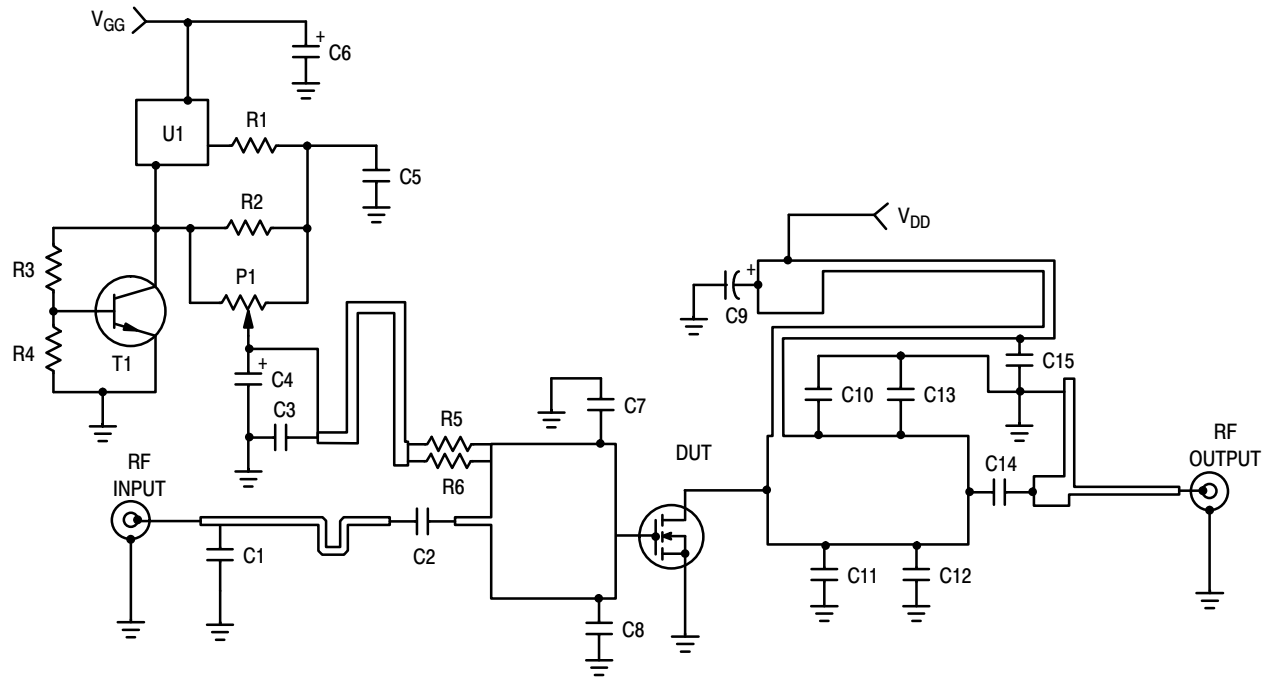
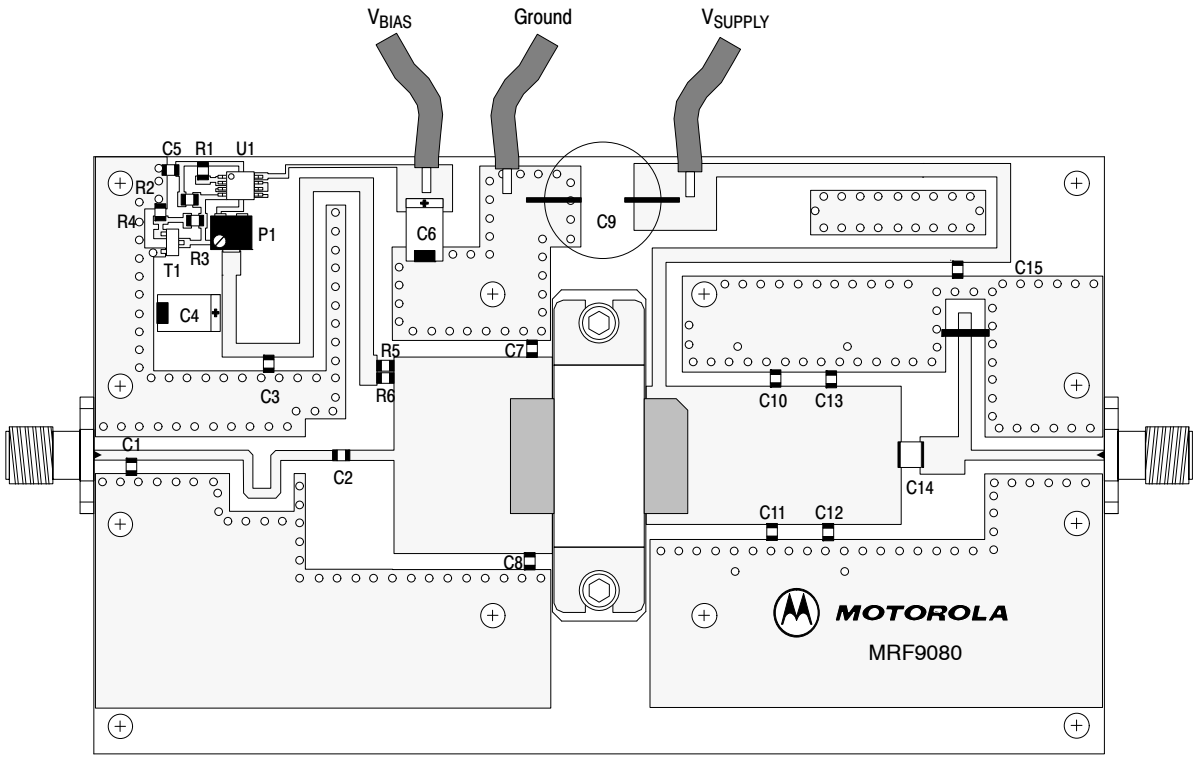


Figure 3. Broadband GSM 900 Optimized Demo Board Schematic

Table 6. Broadband GSM 900 Optimized Demo Board Component Designations and Values

Part	Description	Part Number	Manufacturer
C1	4.7 pF Chip Capacitor, ACCU-P	08051J4R7CBS	AVX
C2	3.9 pF Chip Capacitor, ACCU-P	08051J3R9CBS	AVX
C3, C15	22 pF Chip Capacitors, ACCU-P	08051J221CBS	AVX
C4, C6	22 μF, 35 V Tantalum Chip Capacitors	T491X226K035AS	Kemet
C5	1 μF Chip Capacitor, ACCU-P	08053105	AVX
C7, C8	5.6 pF Chip Capacitors, ACCU-P	08051J5R6CBS	AVX
C9	220 μF, 63 V Electrolytic Capacitor	2222-136-68221	Vishay
C10, C11	3.3 pF Chip Capacitors, ACCU-P	08051J3R3CBS	AVX
C12, C13	2.2 pF Chip Capacitors, ACCU-P	08051J2R2CBS	AVX
C14	4.7 pF Chip Capacitor	ATC100B4R7JT500XT	ATC
P1	5.0 kΩ Potentiometer CMS Cermet Multi-turn	3224W	Bourns
R1	10 Ω, 1/8 W Chip Resistor	CRCW080510R0FKEA	Vishay
R2, R5, R6	1 kΩ, 1/8 W Chip Resistor	CRCW08051001FKEA	Vishay
R3	1.2 kΩ, 1/8 W Chip Resistor	CRCW08051201FKEA	Vishay
R4	2.2 kΩ, 1/8 W Chip Resistor	CRCW08052201FKEA	Vishay
T1	Bipolar NPN Transistor, SOT-23	BC847ALT1G	ON Semiconductor
U1	Voltage Regulator, Micro-8	LP2951ACDMR2G	ON Semiconductor
	Substrate = Taconic RF35, Thickness 0.5 mm		



Freescale has begun the transition of marking Printed Circuit Boards (PCBs) with the Freescale Semiconductor signature/logo. PCBs may have either Motorola or Freescale markings during the transition period. These changes will have no impact on form, fit or function of the current product.

Figure 4. Broadband GSM 900 Optimized Demo Board Component Layout

TYPICAL CHARACTERISTICS
(IN FREESCALE BROADBAND GSM 900 OPTIMIZED DEMO BOARD)

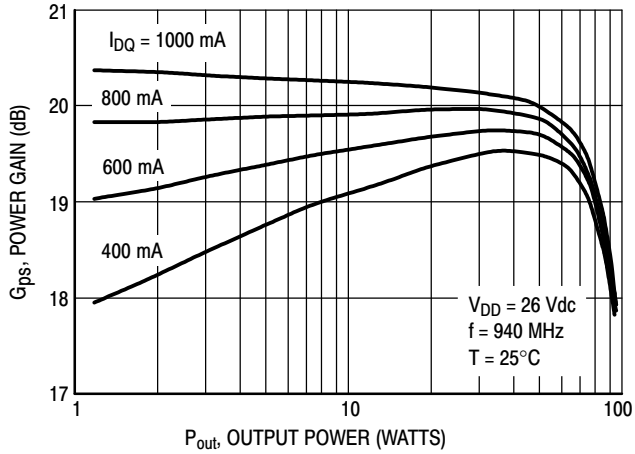


Figure 5. Power Gain versus Output Power

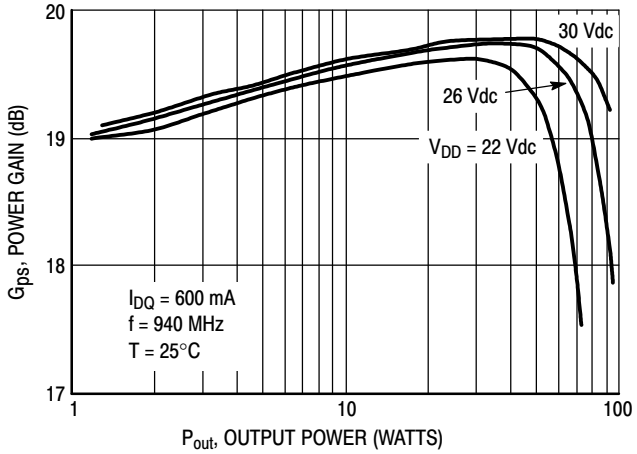


Figure 6. Power Gain versus Output Power

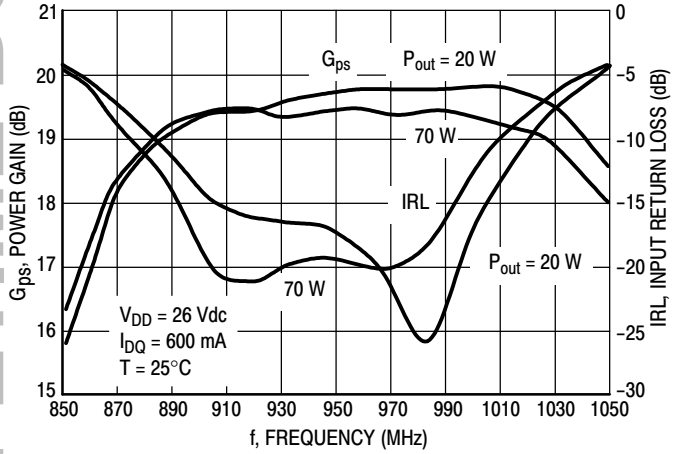


Figure 7. Power Gain and Input Return Loss versus Frequency

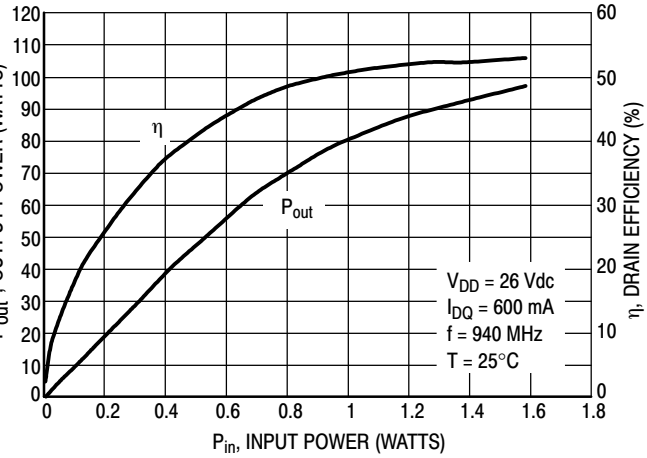


Figure 8. Output Power and Efficiency versus Input Power

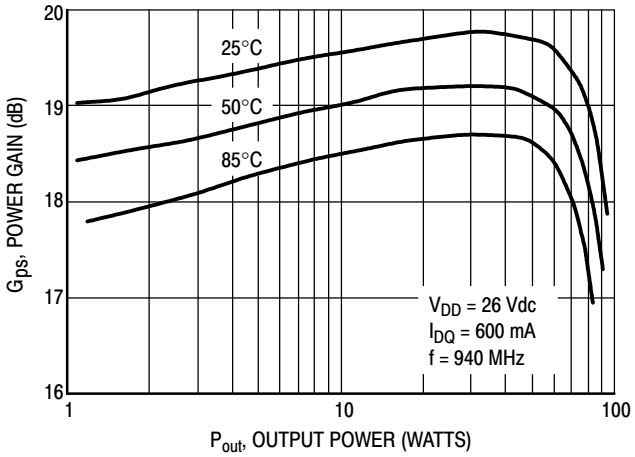


Figure 9. Power Gain versus Output Power

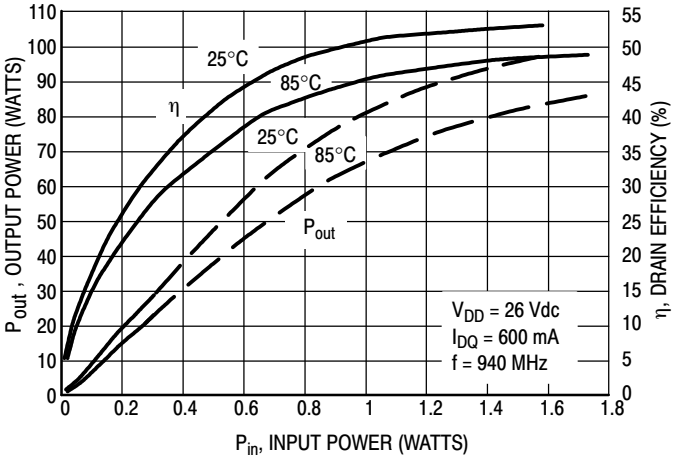
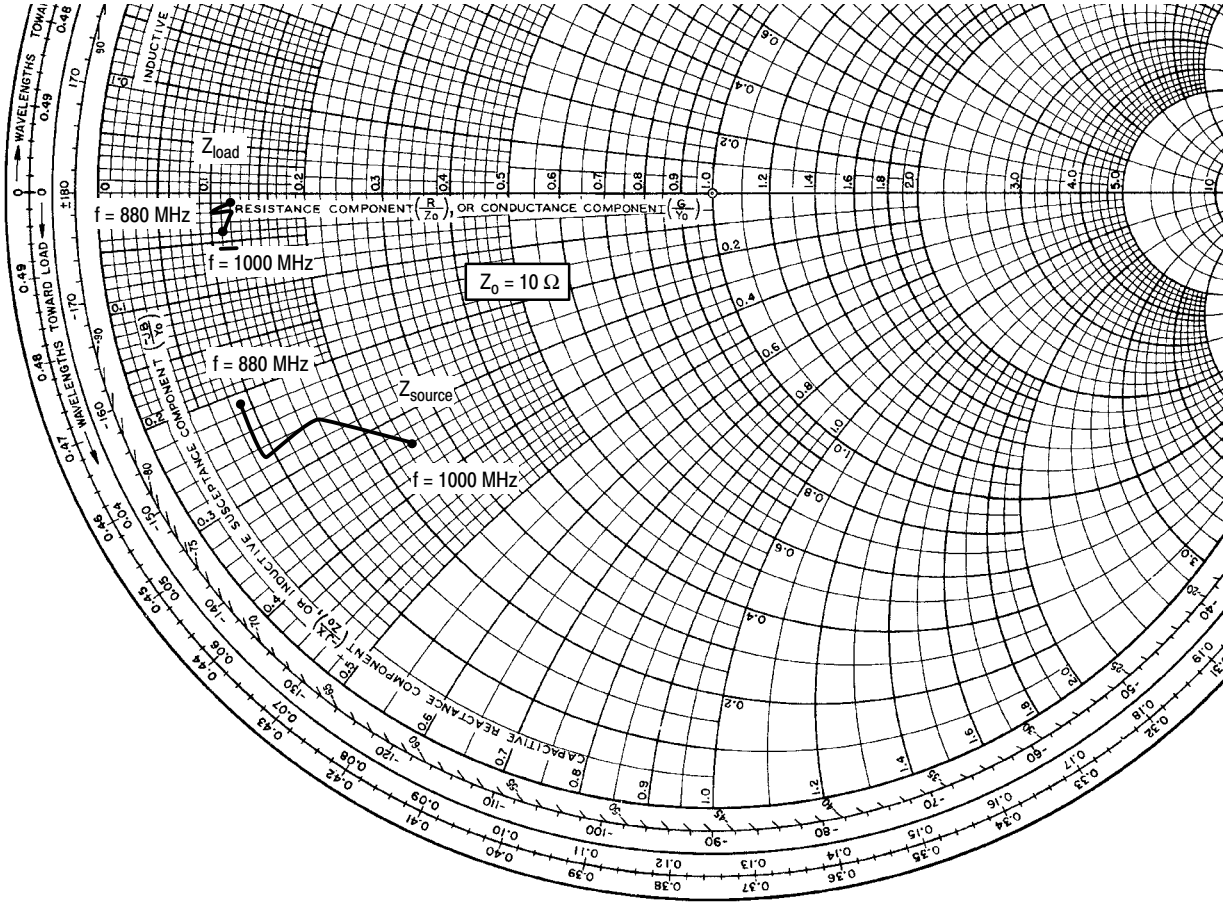


Figure 10. Output Power and Efficiency versus Input Power



V_{DD} = 26 V, I_{DQ} = 600 mA, P_{out} = 90 W CW

f MHz	Z_{source} Ω	Z_{load} Ω
880	0.91 - j2.11	1.22 - j0.12
920	0.88 - j2.65	1.00 - j0.16
960	1.6 - j2.61	1.22 - j0.22
1000	2.45 - j3.38	1.14 - j0.41

Z_{source} = Test circuit impedance as measured from gate to ground.

Z_{load} = Test circuit impedance as measured from drain to ground.

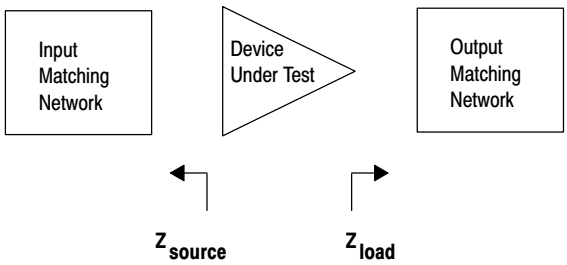
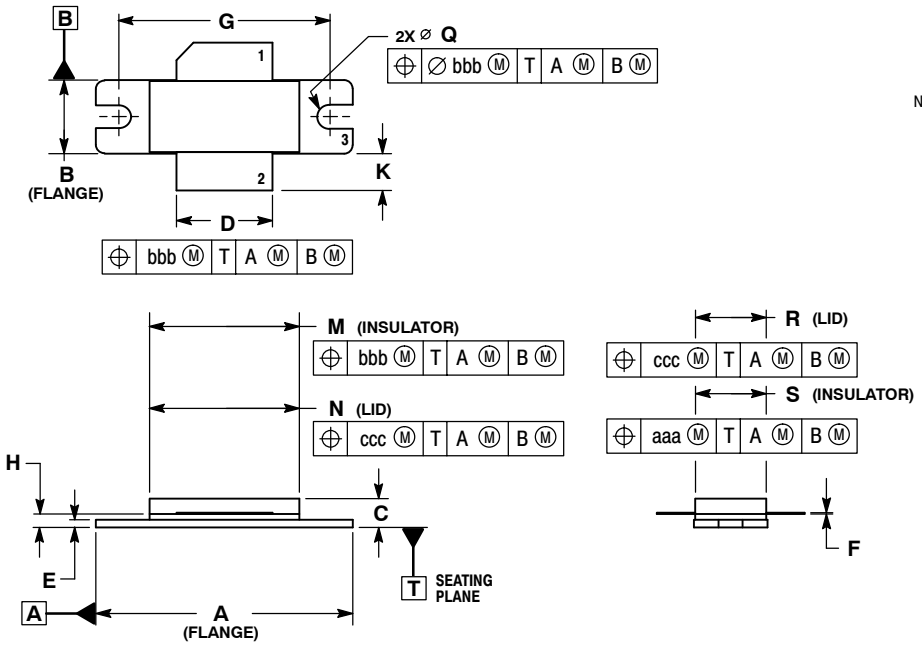


Figure 11. Series Equivalent Source and Load Impedance

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M–1994.
2. CONTROLLING DIMENSION: INCH.
3. DELETED
4. DIMENSION H IS MEASURED 0.030 (0.762) AWAY FROM PACKAGE BODY.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	1.335	1.345	33.91	34.16
B	0.380	0.390	9.65	9.91
C	0.125	0.170	3.18	4.32
D	0.495	0.505	12.57	12.83
E	0.035	0.045	0.89	1.14
F	0.003	0.006	0.08	0.15
G	1.100 BSC		27.94 BSC	
H	0.057	0.067	1.45	1.70
K	0.170	0.210	4.32	5.33
M	0.774	0.786	19.66	19.96
N	0.772	0.788	19.60	20.00
Q	Ø.118	Ø.138	Ø3.00	Ø3.51
R	0.365	0.375	9.27	9.53
S	0.365	0.375	9.27	9.52
aaa	0.005 REF		0.127 REF	
bbb	0.010 REF		0.254 REF	
ccc	0.015 REF		0.381 REF	

STYLE 1:
PIN 1. DRAIN
2. GATE
3. SOURCE

CASE 465-06
ISSUE G
NI-780
MRF9080LR3

PRODUCT DOCUMENTATION

Refer to the following documents to aid your design process.

Engineering Bulletins

- EB212: Using Data Sheet Impedances for RF LDMOS Devices

REVISION HISTORY

The following table summarizes revisions to this document.

Revision	Date	Description
8	Oct. 2008	• Data sheet revised to reflect part status change, p. 1, including use of applicable overlay. • Modified data sheet to reflect RF Test Reduction described in Product and Process Change Notification number, PCN12779, p. 1, 2 • Updated Part Numbers in Tables 5 and 6, Component Designations and Values, to RoHS compliant part numbers, p. 3, 5 • Added Product Documentation and Revision History, p. 10

How to Reach Us:

Home Page:
www.freescale.com

Web Support:
http://www.freescale.com/support

USA/Europe or Locations Not Listed:
Freescale Semiconductor, Inc.
Technical Information Center, EL516
2100 East Elliot Road
Tempe, Arizona 85284
1-800-521-6274 or +1-480-768-2130
www.freescale.com/support

Europe, Middle East, and Africa:
Freescale Halbleiter Deutschland GmbH
Technical Information Center
Schatzbogen 7
81829 Muenchen, Germany
+44 1296 380 456 (English)
+46 8 52200080 (English)
+49 89 92103 559 (German)
+33 1 69 35 48 48 (French)
www.freescale.com/support

Japan:
Freescale Semiconductor Japan Ltd.
Headquarters
ARCO Tower 15F
1-8-1, Shimo-Meguro, Meguro-ku,
Tokyo 153-0064
Japan
0120 191014 or +81 3 5437 9125
support.japan@freescale.com

Asia/Pacific:
Freescale Semiconductor China Ltd.
Exchange Building 23F
No. 118 Jianguo Road
Chaoyang District
Beijing 100022
China
+86 10 5879 8000
support.asia@freescale.com

For Literature Requests Only:
Freescale Semiconductor Literature Distribution Center
P.O. Box 5405
Denver, Colorado 80217
1-800-441-2447 or +1-303-675-2140
Fax: +1-303-675-2150
LDCForFreescaleSemiconductor@hibbertgroup.com

freescale™ semiconductor

Document Number: MRF9080
Rev. 8, 10/2008

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

NXP:

MRF9080LR5 MRF9080LR3