

# PTF 10160

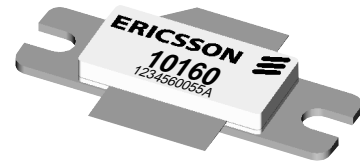
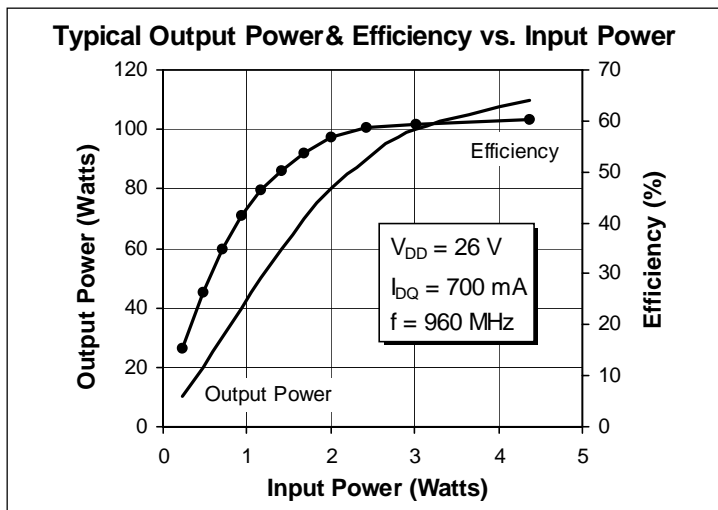
## 85 Watts, 860–960 MHz

### GOLDMOS® Field Effect Transistor

#### Description

The PTF 10160 is an internally matched 85-watt GOLDMOS FET intended for cellular, GSM, D-AMPS and EDGE applications. It operates with 53% efficiency and 16 dB typical gain. Full gold metallization ensures excellent device lifetime and reliability.

- **INTERNALLY MATCHED**
- **Performance at 960 MHz, 26 Volts**
  - Output Power = 85 Watts
  - Power Gain = 16 dB Typ
  - Efficiency = 53% Typ
- **Full Gold Metallization**
- **Silicon Nitride Passivated**
- **Excellent Thermal Stability**
- **100% Lot Traceability**



Package 20248

#### RF Specifications (100% Tested)

Characteristic	Symbol	Min	Typ	Max	Units
<b>Gain</b> ( $V_{DD} = 26\text{ V}$ , $P_{OUT} = 85\text{ W}$ , $I_{DQ} = 700\text{ mA}$ , $f = 960\text{ MHz}$ )	$G_{pe}$	15	16	—	dB
<b>Power Output at 1 dB Compression</b> ( $V_{DD} = 26\text{ V}$ , $I_{DQ} = 700\text{ mA}$ , $f = 960\text{ MHz}$ )	P-1dB	85	90	—	Watts
<b>Drain Efficiency</b> ( $V_{DD} = 26\text{ V}$ , $P_{OUT} = 85\text{ W}$ , $I_{DQ} = 700\text{ mA}$ , $f = 960\text{ MHz}$ )	$\eta$	50	53	—	%
<b>Load Mismatch Tolerance</b> ( $V_{DD} = 26\text{ V}$ , $P_{OUT} = 85\text{ W}$ , $I_{DQ} = 700\text{ mA}$ , $f = 960\text{ MHz}$ —all phase angles at frequency of test)	$\Psi$	—	—	5:1	—

All published data at  $T_{CASE} = 25^\circ\text{C}$  unless otherwise indicated.

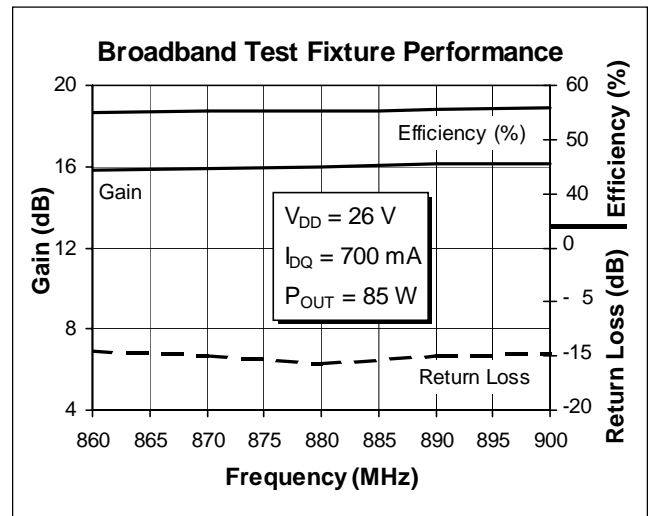
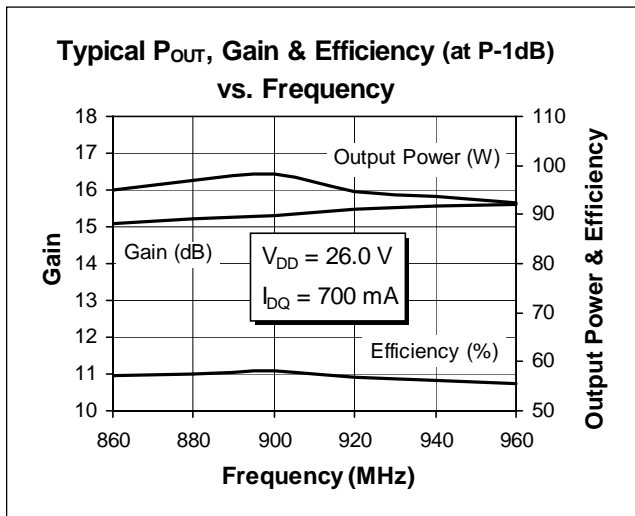
## Electrical Characteristics (100% Tested)

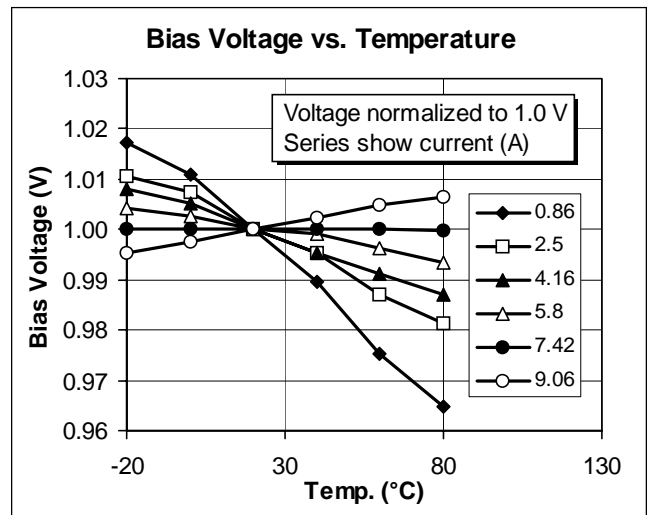
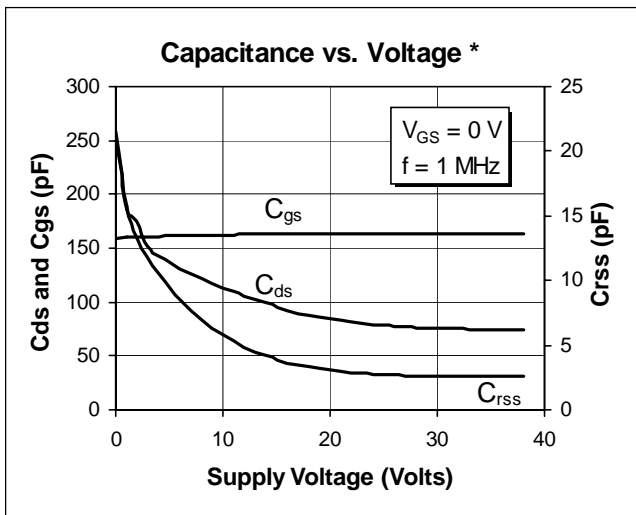
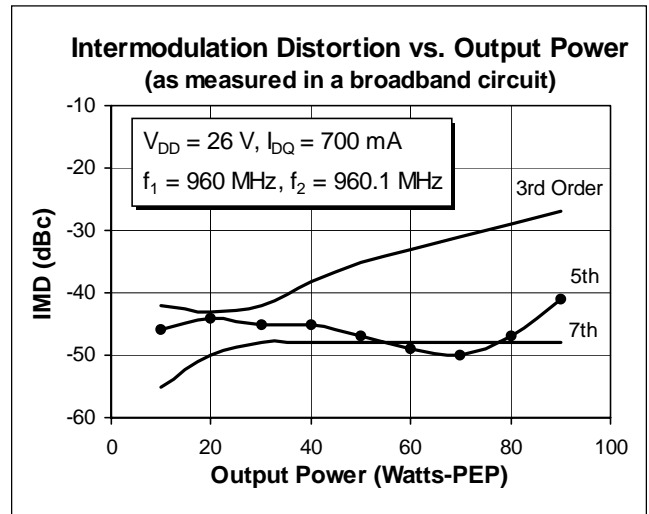
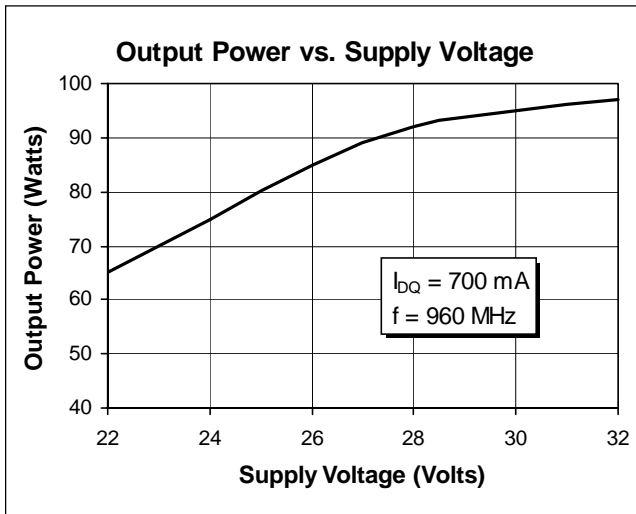
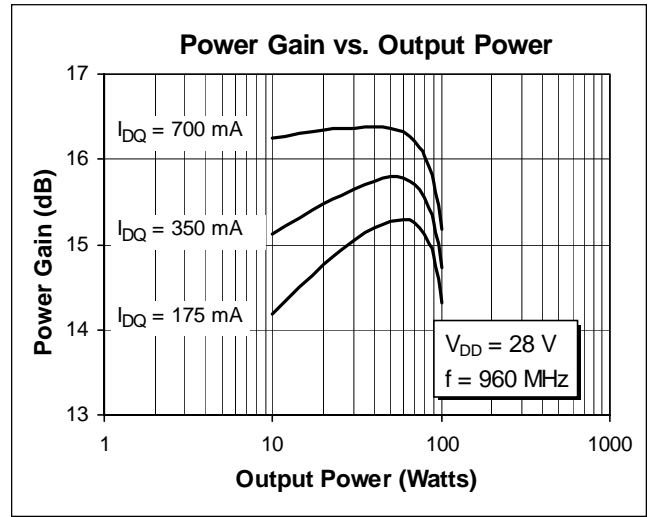
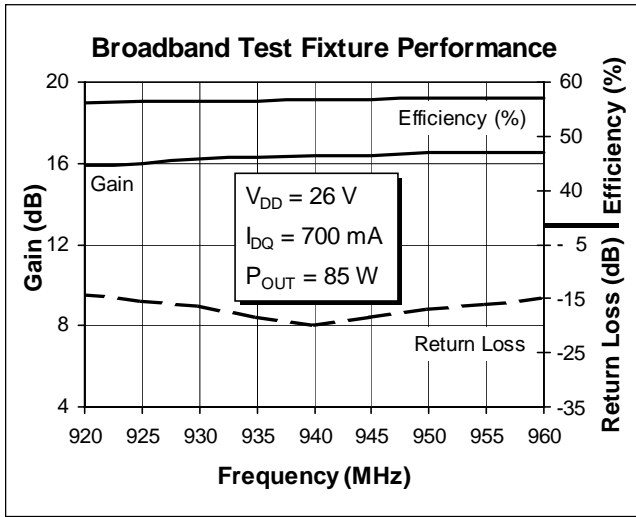
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 25\text{ mA}$	$V_{(BR)DSS}$	65	—	—	Volts
Drain-Source Leakage Current	$V_{DS} = 26\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	1.0	mA
Gate Threshold Voltage	$V_{DS} = 10\text{ V}, I_D = 75\text{ mA}$	$V_{GS(th)}$	3.0	—	5.0	Volts
Forward Transconductance	$V_{DS} = 10\text{ V}, I_D = 3\text{ A}$	$g_{fs}$	—	3.0	—	Siemens

## Maximum Ratings

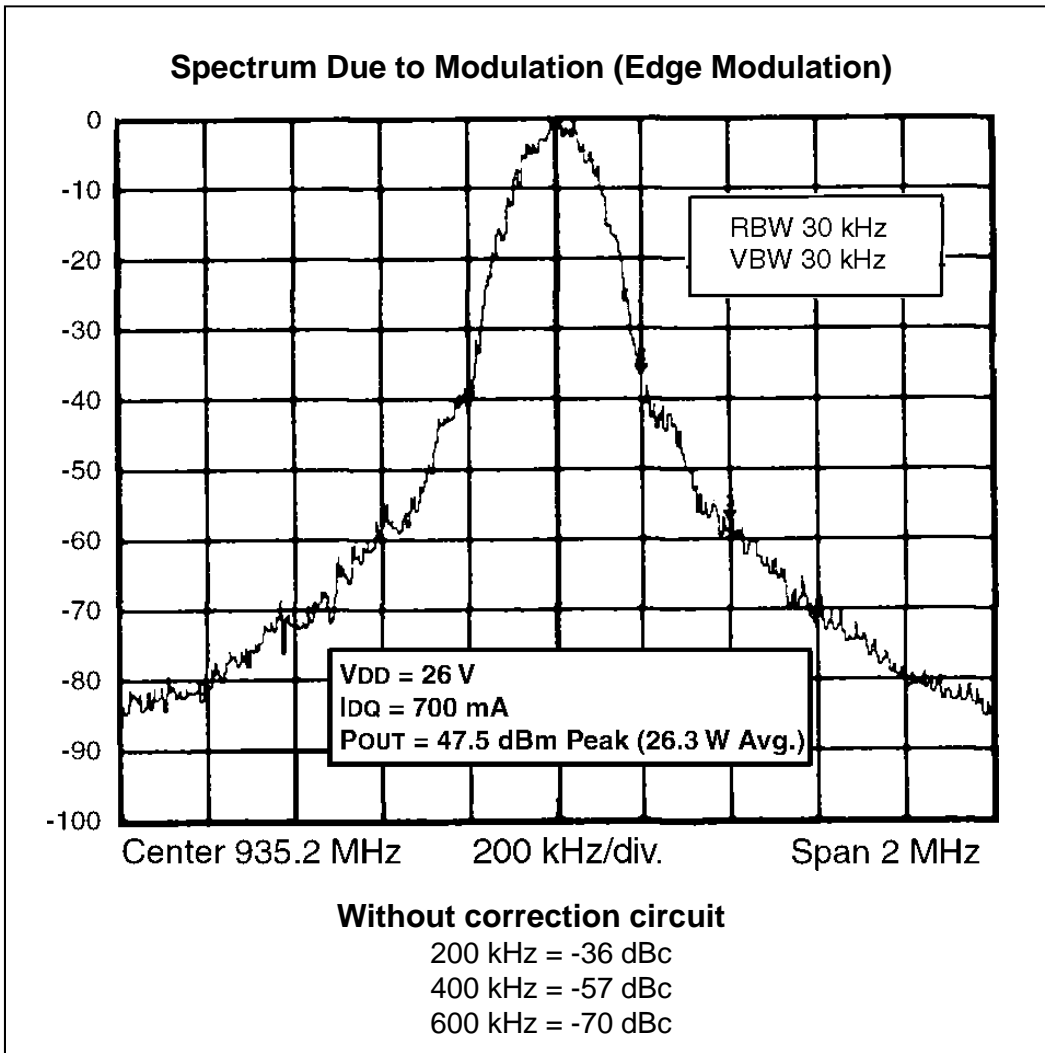
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	65	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 20$	Vdc
Operating Junction Temperature	$T_J$	200	$^{\circ}\text{C}$
Total Device Dissipation Above $25^{\circ}\text{C}$ derate by	$P_D$	205 1.18	Watts $\text{W}/^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	$-40$ to $+150$	$^{\circ}\text{C}$
Thermal Resistance ( $T_{CASE} = 70^{\circ}\text{C}$ )	$R_{\theta JC}$	0.85	$^{\circ}\text{C}/\text{W}$

## Typical Performance



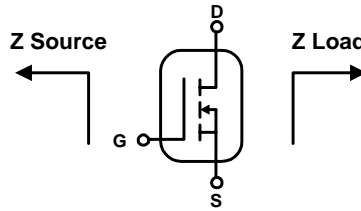


\* This part is internally matched. Measurements of the finished product will not yield these figures.

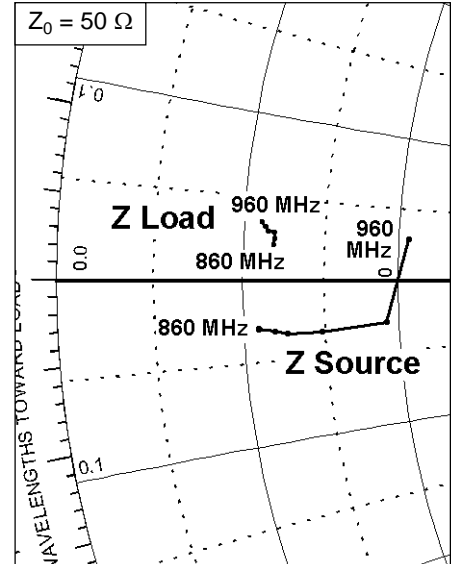


**Impedance Data**

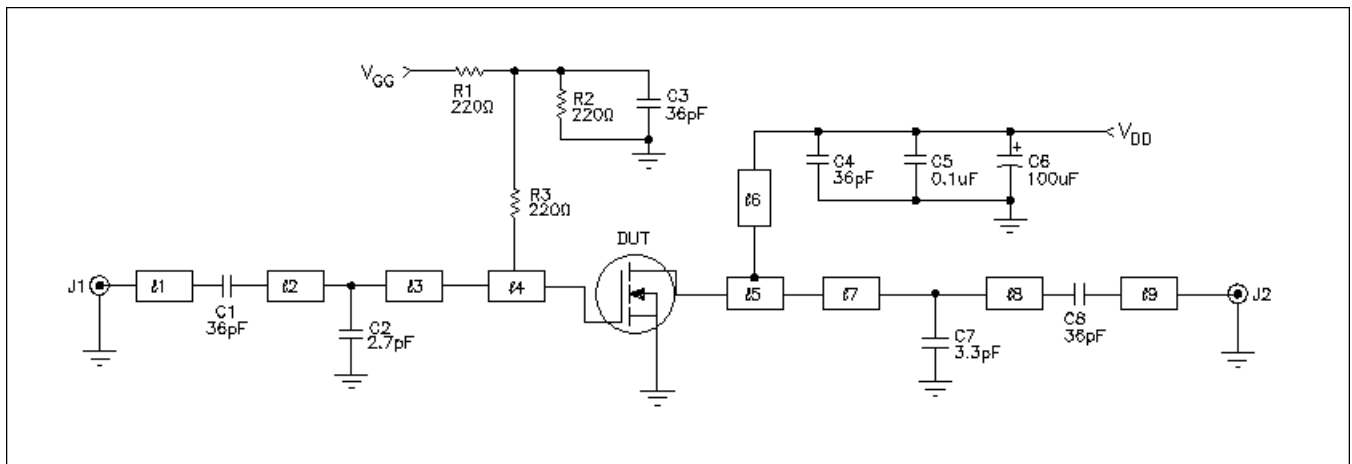
$V_{DD} = 26\text{ V}$ ,  $P_{OUT} = 85\text{ W}$ ,  $I_{DQ} = 700\text{ mA}$



Frequency MHz	Z Source $\Omega$		Z Load $\Omega$	
	R	jX	R	jX
860	2.1	-1.5	2.6	1.1
880	2.6	-1.6	2.6	1.3
900	3	-1.7	2.6	1.5
920	4.1	-1.7	2.4	1.5
940	6.3	-1.5	2.3	1.65
960	7.1	1.5	2.2	1.8

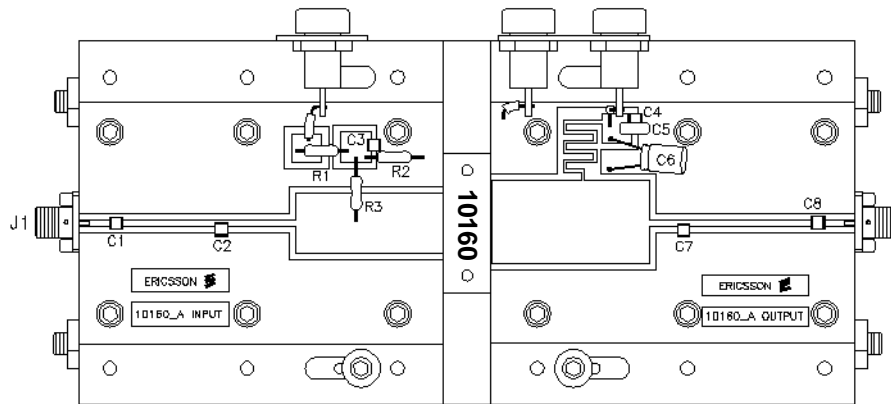


**Test Circuit**

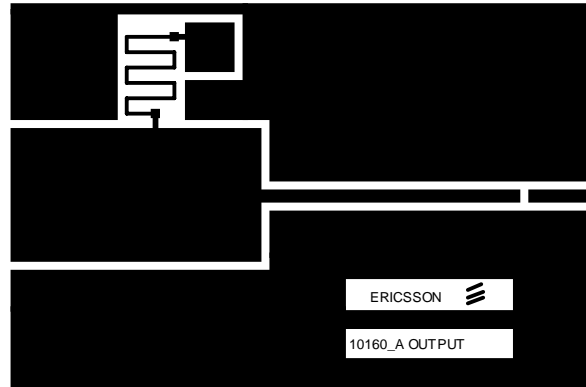
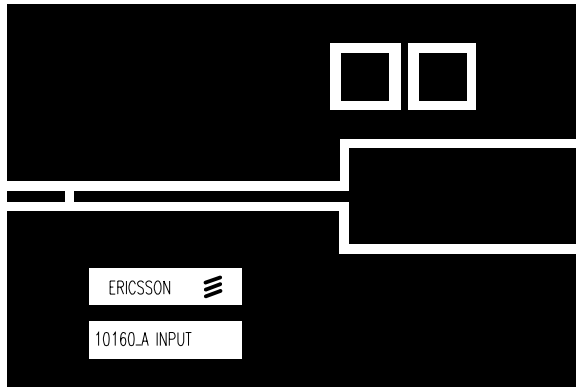


Test Circuit Schematic for  $f = 921\text{ to }960\text{ MHz}$

DUT	PTF 10160	LDMOS Transistor	C1, C3, C4, C8	100 B	Capacitor, 36 pF
$\ell_1, \ell_9$	$0.037\lambda$	Microstrip $50\ \Omega$	C2	100 B	Capacitor, 2.7 pF
$\ell_2$	$0.120\lambda$	Microstrip $50\ \Omega$	C5	Digi-Key P4525-ND	Capacitor, 0.1 $\mu\text{F}$ , 50 V
$\ell_3$	$0.080\lambda$	Microstrip $50\ \Omega$	C6	Digi-Key P5182-ND	Capacitor, 100 $\mu\text{F}$ , 50 V
$\ell_4$	$0.187\lambda$	Microstrip $9.29\ \Omega$	C7	ATC 100 B	Capacitor, 3.3 pF
$\ell_5$	$0.204\lambda$	Microstrip $6.98\ \Omega$	J1, J2	SMA Panel Mount Female Connector	
$\ell_6$	$0.250\lambda$	Microstrip $77.9\ \Omega$	R1, R2, R3	$220\ \Omega$	Resistor, Digi-Key 1K QBK
$\ell_7$	$0.031\lambda$	Microstrip $50\ \Omega$	Circuit Board	.031" Thickness, $\epsilon_r = 4.0$ , AlliedSignal, G200, 2 oz. copper	
$\ell_8$	$0.157\lambda$	Microstrip $50\ \Omega$			
$\ell_1, \ell_9$	$0.037\lambda$	Microstrip $50\ \Omega$			



Components Layout (not to scale)



Artwork (not to scale)

