

# PTF 10149

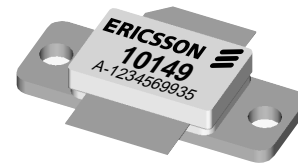
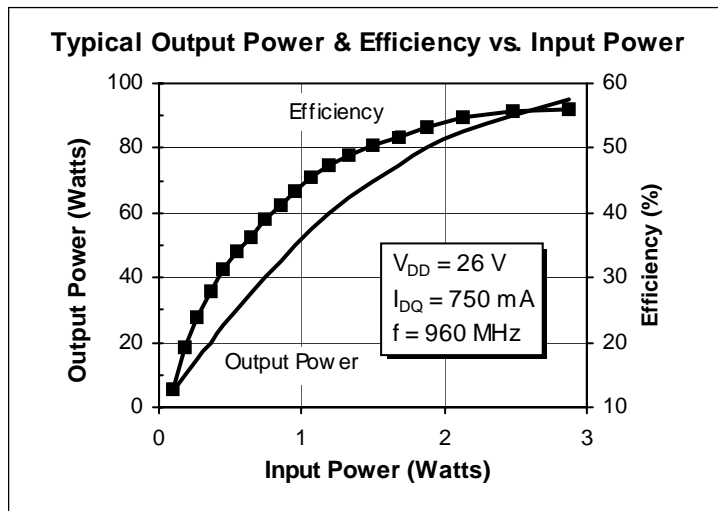
## 70 Watts, 921–960 MHz

### GOLDMOS Field Effect Transistor

#### Description

The PTF 10149 is an internally matched 70-watt GOLDMOS FET intended for cellular and GSM amplifier applications from 921 to 960 MHz. It operates with 50% efficiency and 16 dB typical gain. Nitride surface passivation and full gold metallization ensure excellent device lifetime and reliability.

- **INTERNALLY MATCHED**
- **Performance at 960 MHz, 26 Volts**
  - Output Power = 70 Watts
  - Power Gain = 16.0 dB Typ
  - Efficiency = 50% Typ
- **Full Gold Metallization**
- **Silicon Nitride Passivated**
- **Excellent Thermal Stability**
- **100% Lot Traceability**



Package 20252

#### RF Specifications (100% tested)

Characteristic	Symbol	Min	Typ	Max	Units
<b>Gain</b> ( $V_{DD} = 26\text{ V}$ , $P_{OUT} = 70\text{ W}$ , $I_{DQ} = 750\text{ mA}$ , $f = 960\text{ MHz}$ )	$G_{pe}$	15.0	16.0	—	dB
<b>Power Output at 1 dB Compression</b> ( $V_{DD} = 26\text{ V}$ , $I_{DQ} = 750\text{ mA}$ , $f = 960\text{ MHz}$ )	P-1dB	70	75	—	Watts
<b>Drain Efficiency</b> ( $V_{DD} = 26\text{ V}$ , $P_{OUT} = 70\text{ W}$ , $I_{DQ} = 750\text{ mA}$ , $f = 960\text{ MHz}$ )	$\eta$	47	50	—	%
<b>Load Mismatch Tolerance</b> ( $V_{DD} = 26\text{ V}$ , $P_{OUT} = 70\text{ W}$ , $I_{DQ} = 750\text{ mA}$ , $f = 921\text{ MHz}$ —all phase angles at frequency of test)	$\Psi$	—	—	5:1	—

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

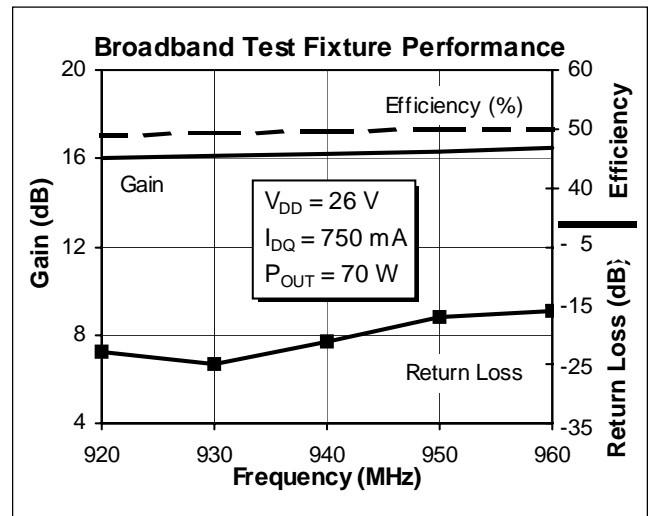
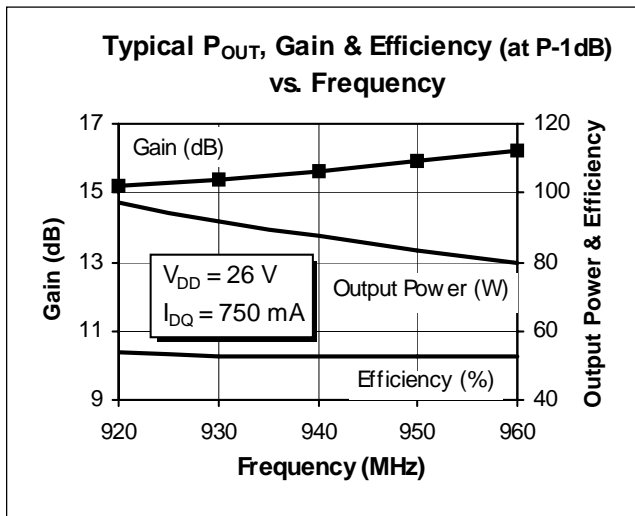
## Electrical Characteristics (100% Tested)

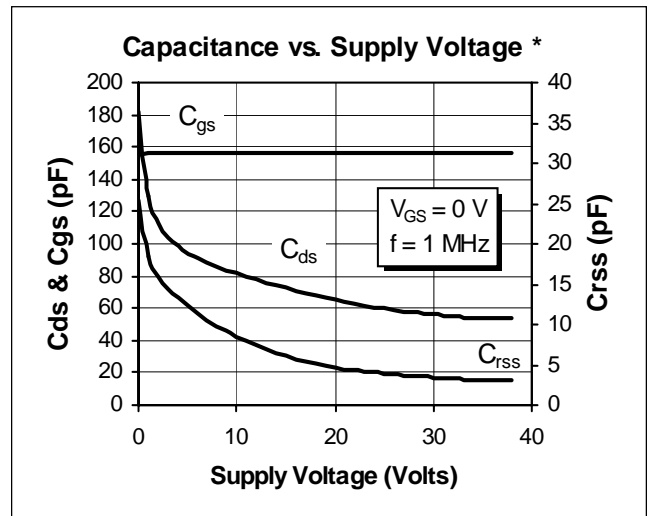
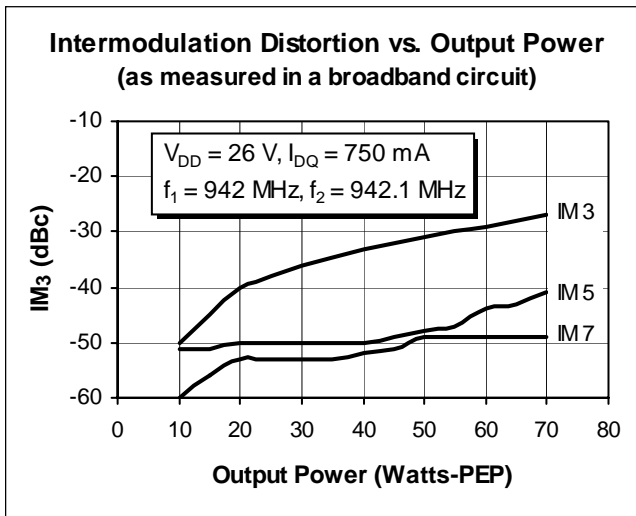
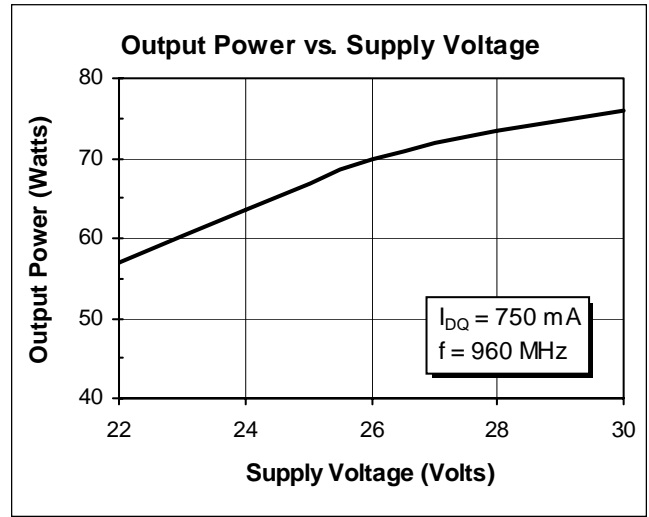
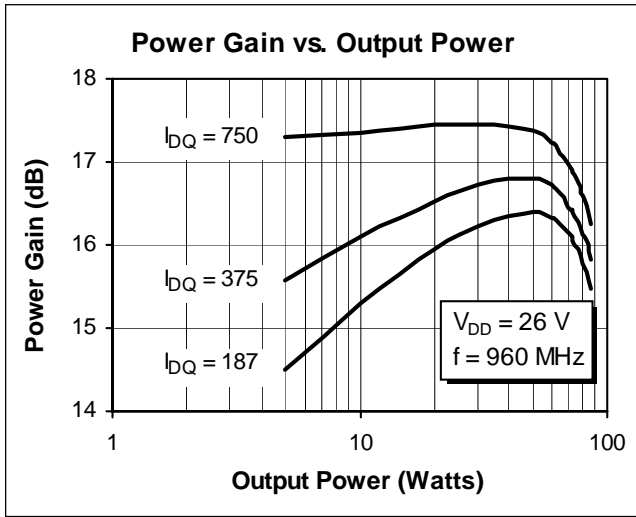
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 25\text{ mA}$	$V_{(BR)DSS}$	65	—	—	Volts
Drain-Source Leakage Current	$V_{DS} = 26\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	1.0	mA
Gate Threshold Voltage	$V_{DS} = 10\text{ V}, I_D = 75\text{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

## Maximum Ratings

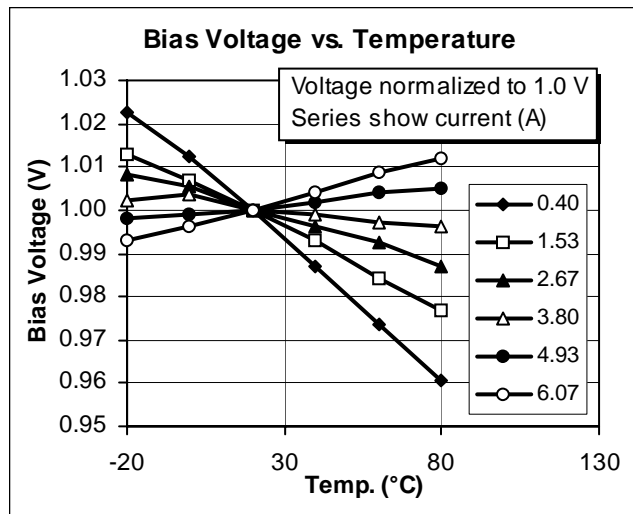
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	65	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 20$	Vdc
Operating Junction Temperature	$T_J$	200	$^{\circ}\text{C}$
Total Device Dissipation Above $25^{\circ}\text{C}$ derate by	$P_D$	197 1.12	Watts $\text{W}/^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-40 to +150	$^{\circ}\text{C}$
Thermal Resistance ( $T_{CASE} = 70^{\circ}\text{C}$ )	$R_{\theta JC}$	0.89	$^{\circ}\text{C}/\text{W}$

## Typical Performance



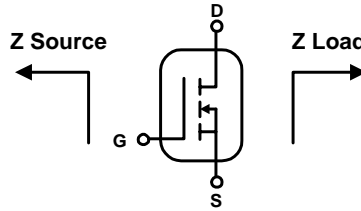


\* This part is internally matched. Measurements of the finished product will not yield these figures.

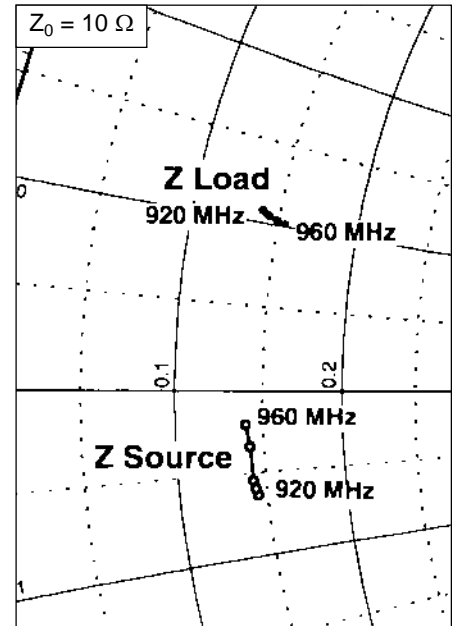


## Impedance Data

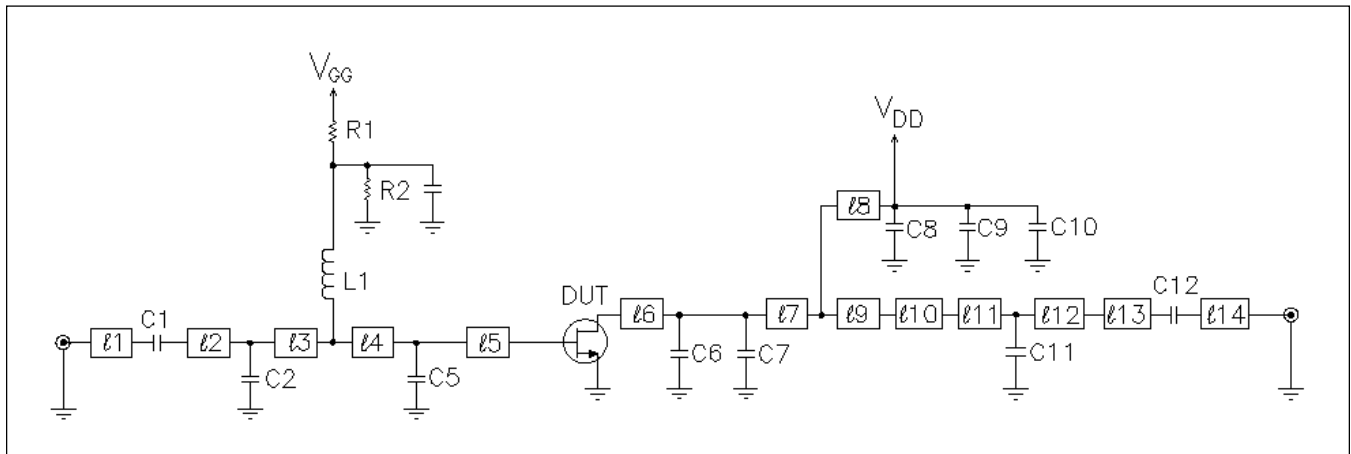
( $V_{DD} = 26\text{ V}$ ,  $P_{OUT} = 70\text{ W}$ ,  $I_{DQ} = 700\text{ mA}$ )



Frequency MHz	Z Source $\Omega$		Z Load $\Omega$	
	R	jX	R	jX
920	1.45	-0.64	1.40	1.08
930	1.44	-0.60	1.43	1.06
940	1.43	-0.55	1.45	1.05
950	1.42	-0.34	1.50	1.03
960	1.40	-0.21	1.55	1.02



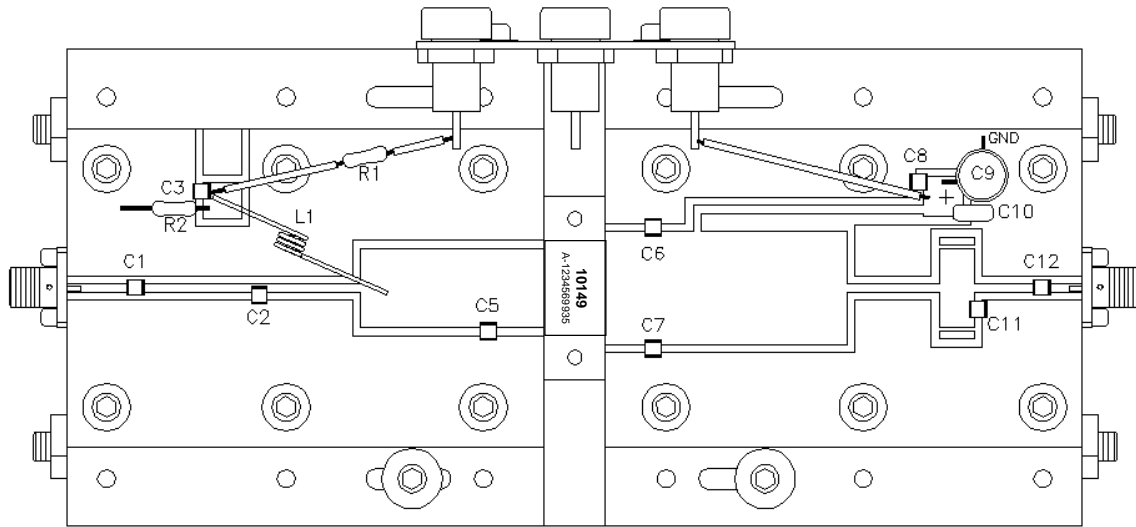
## Test Circuit



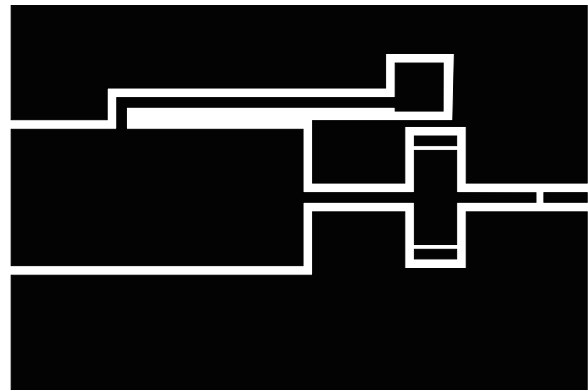
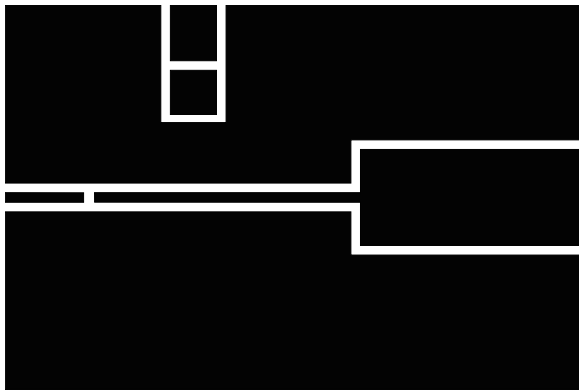
Test Circuit Schematic for  $f = 960\text{ MHz}$

DUT	PTF 10149	LDMOS Field Effect Transistor
$l1$	$0.0633 \lambda$ 960 GHz	Microstrip $50\ \Omega$
$l2$	$0.1142 \lambda$ 960 GHz	Microstrip $50\ \Omega$
$l3$	$0.0821 \lambda$ 960 GHz	Microstrip $50\ \Omega$
$l4$	$0.1294 \lambda$ 960 GHz	Microstrip $9.18\ \Omega$
$l5$	$0.0468 \lambda$ 960 GHz	Microstrip $9.18\ \Omega$
$l6$	$0.0481 \lambda$ 960 GHz	Microstrip $6.79\ \Omega$
$l7$	$0.0441 \lambda$ 960 GHz	Microstrip $6.79\ \Omega$
$l8$	$0.2500 \lambda$ 960 GHz	Microstrip $59\ \Omega$
$l9$	$0.1398 \lambda$ 960 GHz	Microstrip $6.79\ \Omega$
$l10$	$0.0821 \lambda$ 960 GHz	Microstrip $50\ \Omega$
$l11$	$0.0226 \lambda$ 960 GHz	Microstrip $9.69\ \Omega$
$l12$	$0.0109 \lambda$ 960 GHz	Microstrip $9.69\ \Omega$
$l13$	$0.0504 \lambda$ 960 GHz	Microstrip $50\ \Omega$
$l14$	$0.034 \lambda$ 960 GHz	Microstrip $50\ \Omega$

C1, C3, C8, C12	33 pF	Capacitor ATC 100 B
C2	1.3 pF, 50 V	Capacitor, ATC 100 B
C4	Not Used	
C5, C6, C7	7.5 pF	Capacitor, ATC 100 B
C9	100 $\mu\text{F}$ , 50 V	Capacitor, Digi-Key P5182-ND
C10	0.1 $\mu\text{F}$ , 50 V	Capacitor, Digi-Key P4525-ND
C11	0.3 pF	Capacitor ATC 100 B
R1, R2	1K	Resistor, Digi-Key 1KQBK
L1, L2	4 Turn, 20 AWG, .120" I.D.	
Circuit Board	.031" thick, $\epsilon_r = 4.0$ , G200, AlliedSignal, 2 oz. copper	



Assembly Diagram



Artwork (not to scale)

Case Outline Specifications

