

# PTF 102027

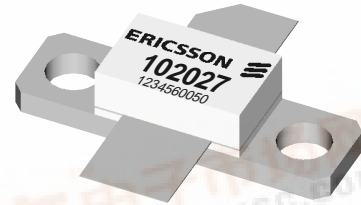
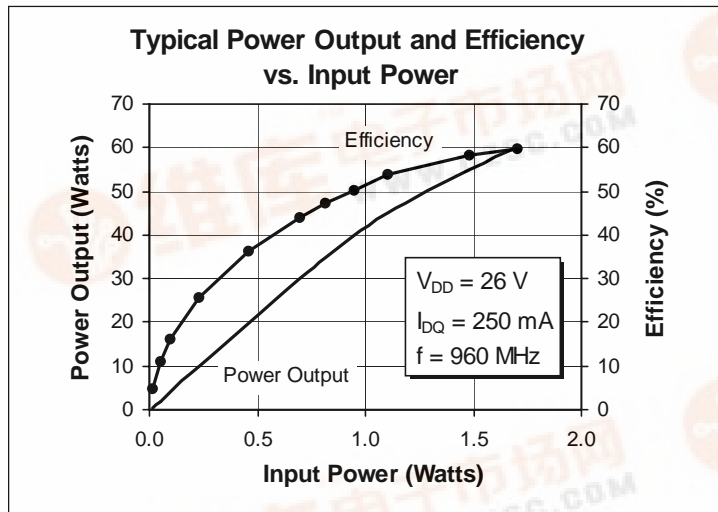
## 40 Watts, 925–960 MHz

### GOLDMOS<sup>®</sup> Field Effect Transistor

#### Description

The PTF 102027 is a 40-watt GOLDMOS FET intended for EDGE applications from 925 to 960 MHz. This device operates at 53% efficiency with 15 dB of gain typical. Full gold metallization ensures excellent device lifetime and reliability.

- Performance at 960 MHz, 26 Volts
  - Output Power = 40 Watts
  - Power Gain = 15.0 dB Typical
  - Efficiency = 53% Typical
- Full Gold Metallization
- Excellent Thermal Stability
- 100% Lot Traceability



Package 20222

#### RF Specifications (100% Tested)

Characteristic	Symbol	Min	Typ	Max	Units
<b>Gain</b> ( $V_{DD} = 26\text{ V}$ , $P_{OUT} = 40\text{ W}$ , $I_{DQ} = 250\text{ mA}$ , $f = 960\text{ MHz}$ )	$G_{pe}$	14.5	15	—	dB
<b>Power Output at 1 dB Compression</b> ( $V_{DD} = 26\text{ V}$ , $I_{DQ} = 250\text{ mA}$ , $f = 960\text{ MHz}$ )	P-1dB	40	45	—	Watts
<b>Drain Efficiency</b> ( $V_{DD} = 26\text{ V}$ , $P_{OUT} = 40\text{ W}$ , $I_{DQ} = 250\text{ mA}$ , $f = 960\text{ MHz}$ )	$\eta$	40	53	—	%
<b>Load Mismatch Tolerance</b> ( $V_{DD} = 26\text{ V}$ , $P_{OUT} = 40\text{ W}$ , $I_{DQ} = 250\text{ mA}$ , $f = 960\text{ MHz}$ —all phase angles at frequency of test)	$\Psi$	10:1	—	—	—

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

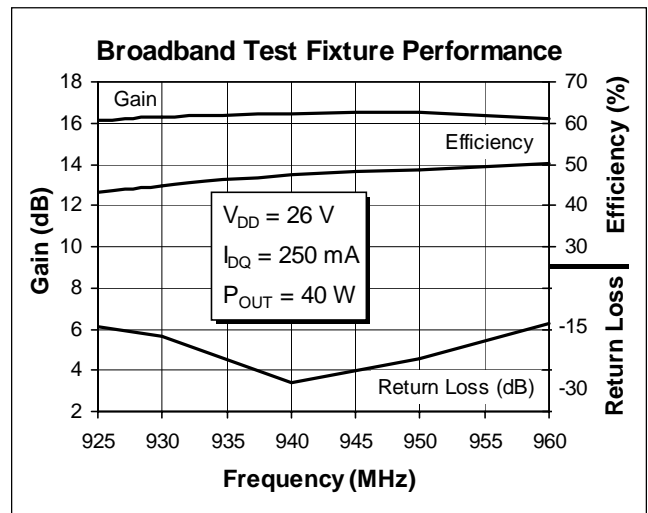
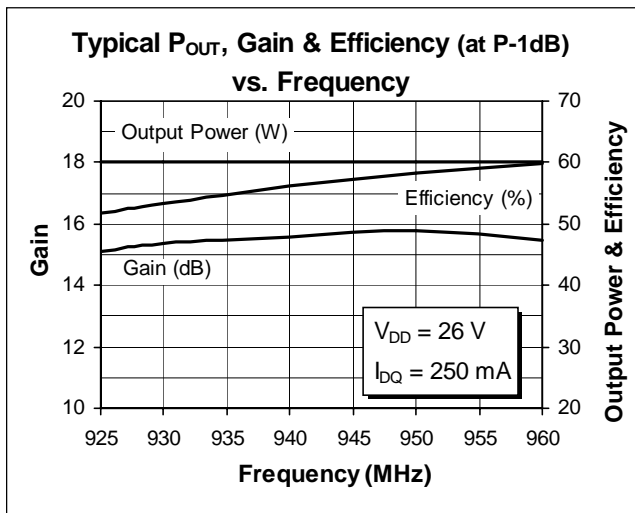
## Electrical Characteristics (100% Tested)

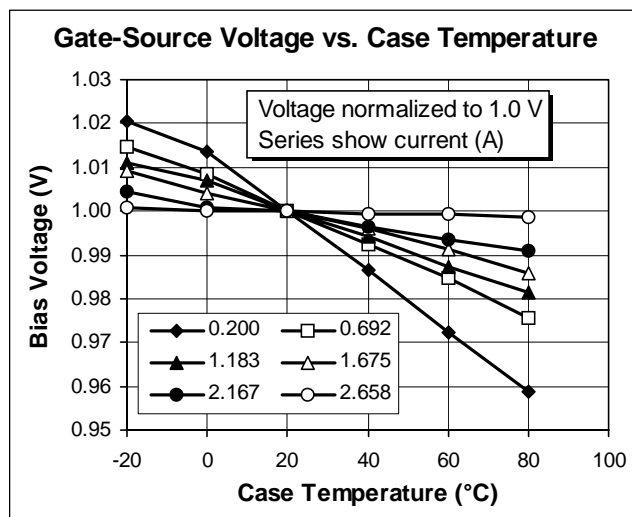
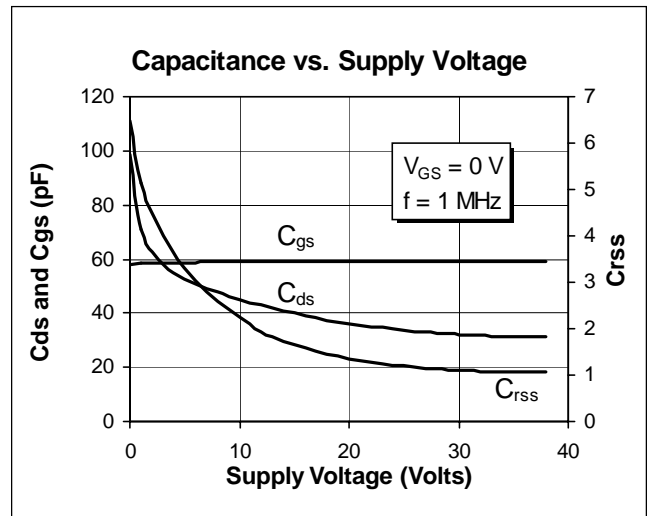
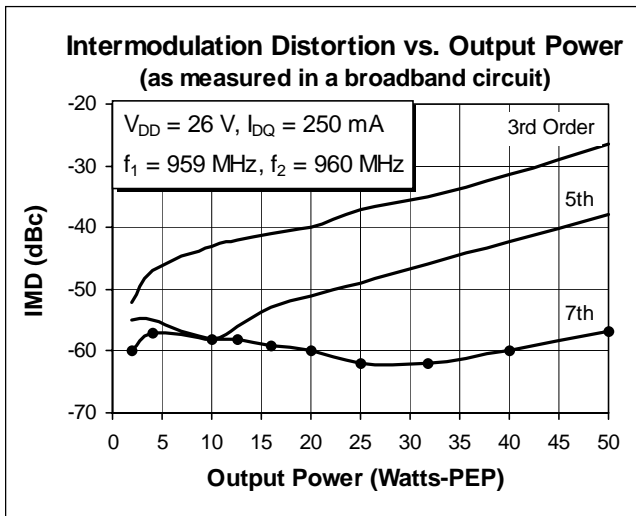
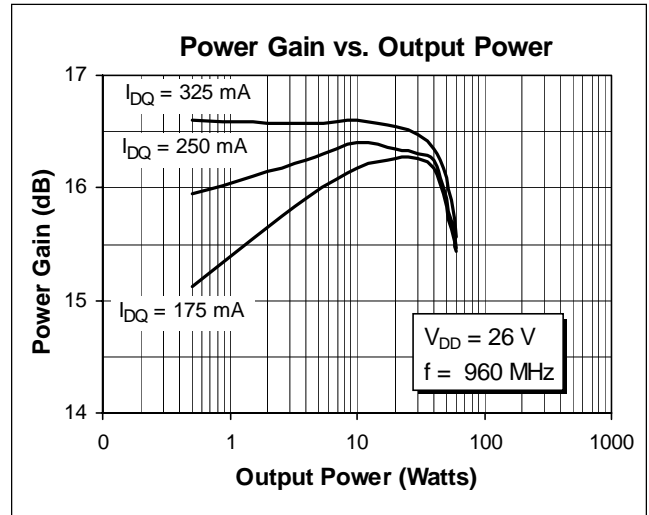
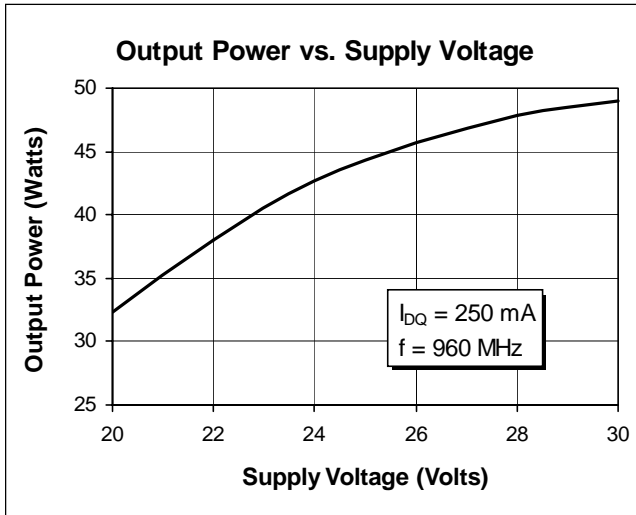
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 25\text{ mA}$	$V_{(BR)DSS}$	65	—	—	Volts
Drain-Source Leakage Current	$V_{DS} = 26\text{ V}, V_{GS} = 0\text{ V}$	$I_{DSS}$	—	—	1.0	mA
Gate Threshold Voltage	$V_{DS} = 10\text{ V}, I_D = 100\text{ mA}$	$V_{GS(th)}$	3.0	—	5.0	Volts
Forward Transconductance	$V_{DS} = 5\text{ V}, I_D = 3\text{ A}$	$g_{fs}$	—	2.0	—	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	$P_D$	125 0.714	Watts W/ $^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-40 to +150	$^{\circ}\text{C}$
Thermal Resistance ( $T_{CASE} = 70^{\circ}\text{C}$ )	$R_{\theta JC}$	1.4	$^{\circ}\text{C}/\text{W}$

## Typical Performance



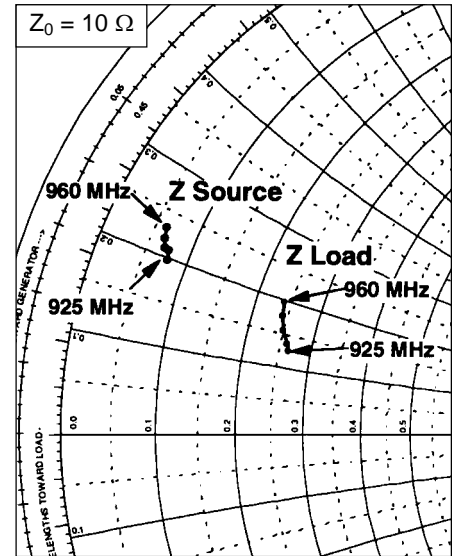
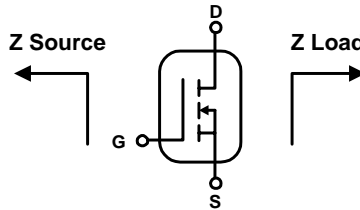


# PTF 102027



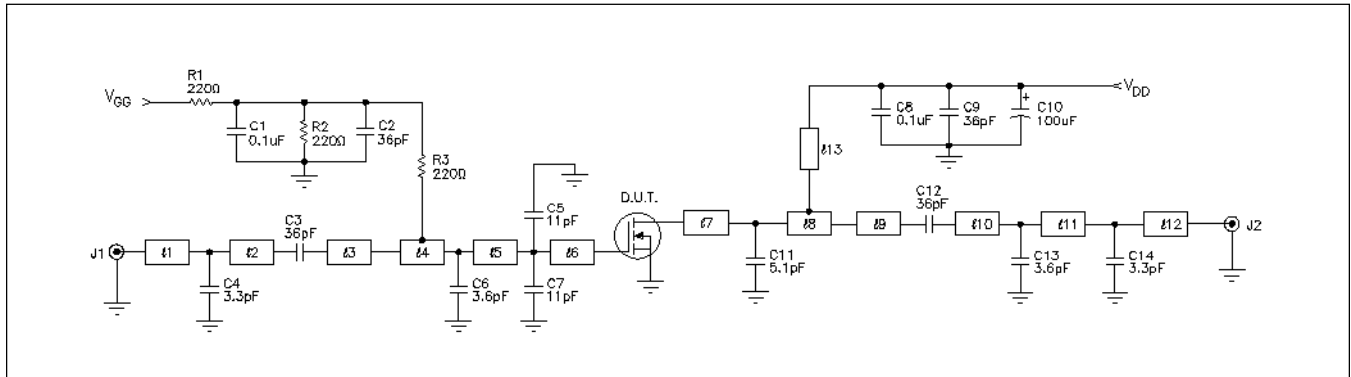
## Impedance Data

$V_{DD} = 26 \text{ V}$ ,  $P_{OUT} = 40 \text{ W}$ ,  $I_{DQ} = 250 \text{ mA}$



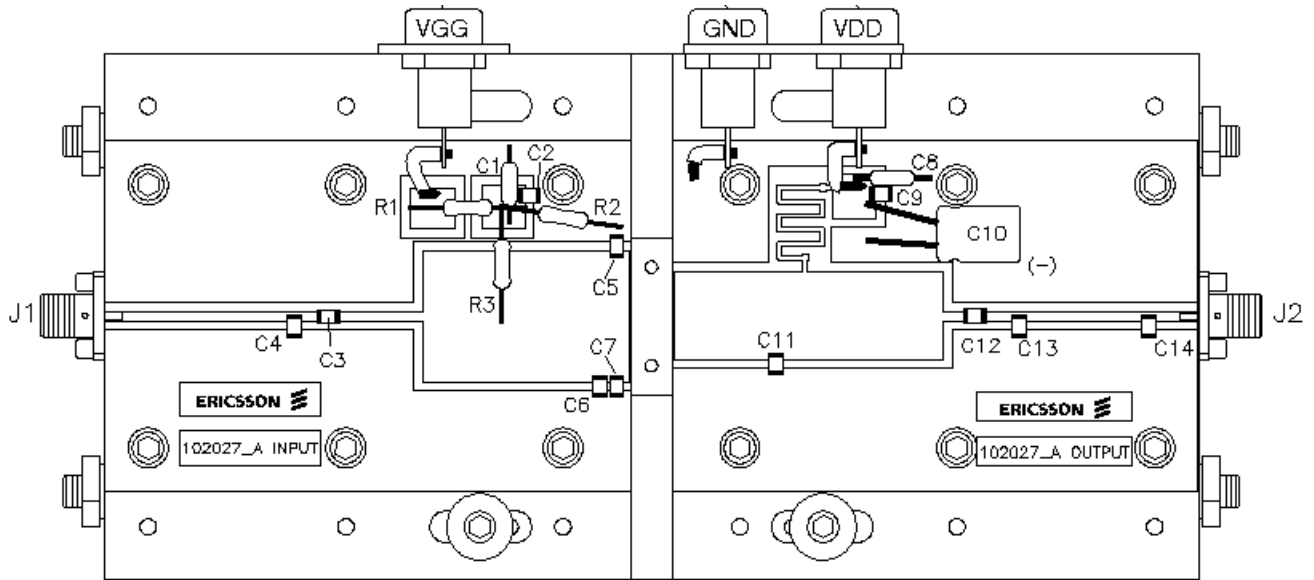
Frequency MHz	Z Source $\Omega$		Z Load $\Omega$	
	R	jX	R	jX
925	0.770	1.98	2.64	1.28
930	0.750	2.09	2.60	1.38
940	0.700	2.10	2.50	1.57
950	0.650	2.20	2.43	1.78
960	0.625	2.32	2.40	1.98

## Test Circuit

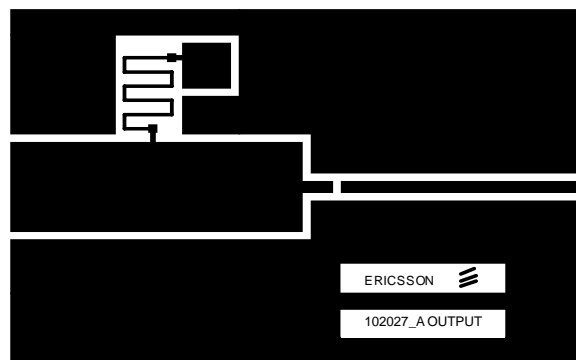
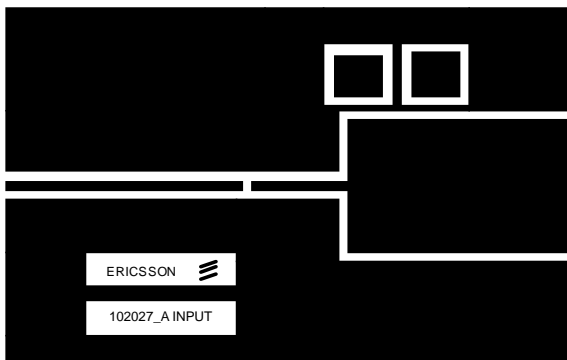


Test Circuit Schematic for  $f = 960 \text{ MHz}$

DUT	PTF 102027	LDMOS Transistor	C1, C8	Capacitor, 0.1 $\mu\text{F}$ , 50V	Digi-Key P4525-ND
$l_1, l_9$	$0.169 \lambda$ 960 MHz	Microstrip 50 $\Omega$	C2, C3, C9, C12	Capacitor, 36 pF	100B 360
$l_2$	$0.020 \lambda$ 960 MHz	Microstrip 50 $\Omega$	C6, C13	Capacitor, 3.6 pF	100B 3R6
$l_3$	$0.079 \lambda$ 960 MHz	Microstrip 50 $\Omega$	C4, C14	Capacitor, 3.3 pF	100B 3R3
$l_4$	$0.158 \lambda$ 960 MHz	Microstrip 7.0 $\Omega$	C5, C7	Capacitor, 11 pF	100B 110
$l_5, l_6$	$0.016 \lambda$ 960 MHz	Microstrip 7.0 $\Omega$	C10	Capacitor, 100 $\mu\text{F}$ , 50 V	Digi-Key P5182-ND
$l_7$	$0.095 \lambda$ 960 MHz	Microstrip 10 $\Omega$	C11	Capacitor, 5.1 pF	100B 5R1
$l_8$	$0.150 \lambda$ 960 MHz	Microstrip 10 $\Omega$	J1, J2	Connector, SMA, Female, Panel Mount	
$l_{10}$	$0.047 \lambda$ 960 MHz	Microstrip 50 $\Omega$		Ericsson, #Rpm 513 412/53	
$l_{11}$	$0.118 \lambda$ 960 MHz	Microstrip 50 $\Omega$	R1, R2, R3	Resistor, 220 ohm, 1/4W	Digi-Key 220QBK-ND
$l_{12}$	$0.254 \lambda$ 960 MHz	Microstrip 50 $\Omega$	PCB	.031" Thick, 2 Oz Copper Both Sides	
$l_{13}$	$0.315 \lambda$ 960 MHz	Microstrip 85 $\Omega$		AlliedSignal, G200	



*Assembly Diagram (not to scale)*



*Artwork (not to scale)*

# PTF 102027



## Case Outline Specifications

