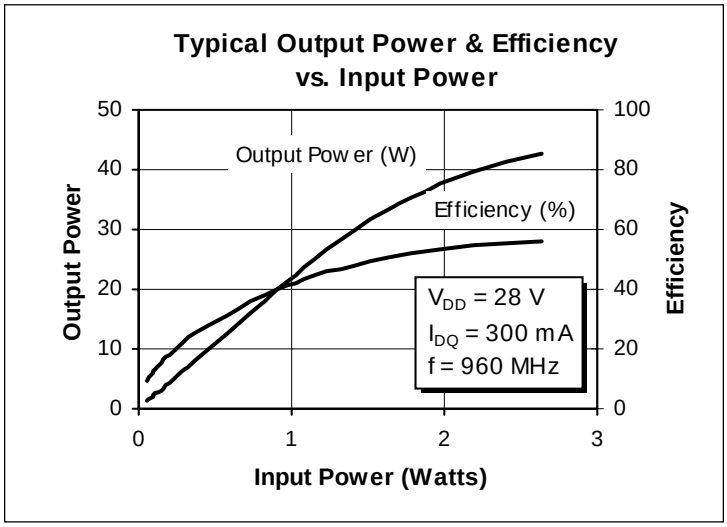
PTF 10052
35 Watts, 1.0 GHz
GOLDMOS™ Field Effect Transistor

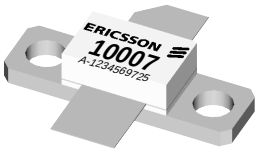
Description

The PTF 10052 is a 35 Watt LDMOS FET intended for large signal amplifier applications to 1.0 GHz. It operates at 55% efficiency and 13.5 dB of gain. Nitride surface passivation and full gold metallization ensure excellent device lifetime and reliability.

- **Performance at 960 MHz, 28 Volts**
  - **Output Power = 35 Watts**
  - **Power Gain = 13.5 dB Typ**
  - **Efficiency = 55% Typ**
- **Full Gold Metallization**
- **Silicon Nitride Passivated**
- **Back Side Common Source**
- **100% Lot Traceability**
- **Available in Package 20222 as PTF 10007**



Package 20235



Package 20222

RF Specifications (100% Tested)

Characteristic	Symbol	Min	Typ	Max	Units
Gain (V_{DD} = 28 V, P_{OUT} = 35 W, I_{DQ} = 300 mA, f = 960 MHz)	G_{ps}	12.0	13.5	—	dB
Power Output at 1 dB Compression (V_{DD} = 28 V, I_{DQ} = 300 mA, f = 960 MHz)	P-1dB	35	—	—	Watts
Drain Efficiency (V_{DD} = 28 V, P_{OUT} = 35 W, I_{DQ} = 300 mA, f = 960 MHz)	η	50	55	—	%
Load Mismatch Tolerance (V_{DD} = 28 V, P_{OUT} = 35 W, I_{DQ} = 300 mA, f = 960 MHz— all phase angles at frequency of test)	Ψ	—	—	10:1	—

All published data at T_{CASE} = 25°C unless otherwise indicated.

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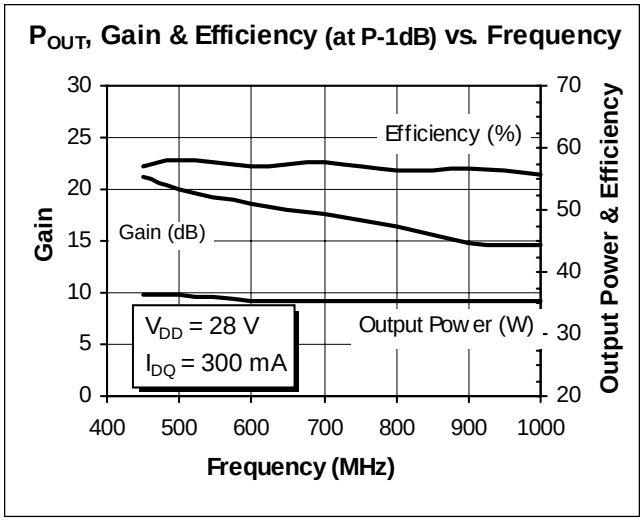
Electrical Characteristics (100% Tested)

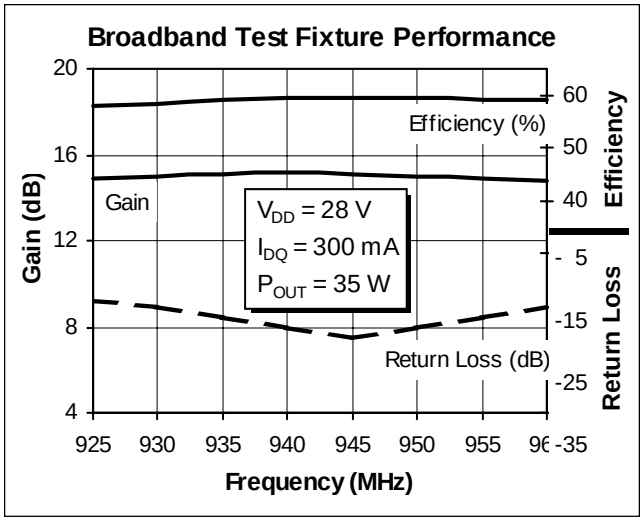
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 5 mA	$V_{(BR)DSS}$	65	70	—	Volts
Drain-Source Leakage Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	1.0	mA
Gate Threshold Voltage	V_{DS} = 10 V, I_D = 75 mA	$V_{GS(th)}$	3.0	—	5.0	Volts
Forward Transconductance	V_{DS} = 10 V, I_D = 3 A	g_{fs}	—	2.8	—	Siemens

Maximum Ratings

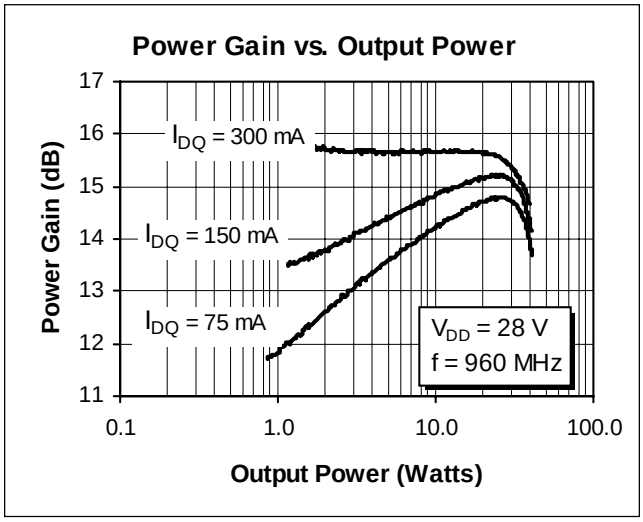
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	Vdc
Gate-Source Voltage	V_{GS}	±20	Vdc
Operating Junction Temperature	T_J	200	°C
Total Device Dissipation Above 25°C derate by	P_D	120 0.7	Watts W/°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_{CASE} = 70°C)	$R_{\theta JC}$	1.4	°C/W

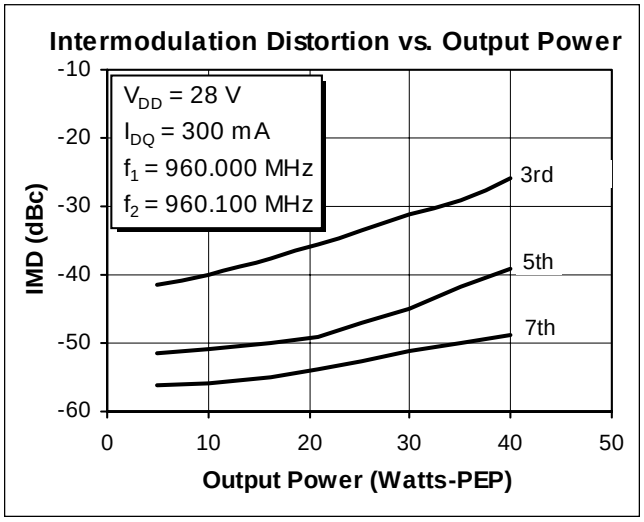
Typical Performance

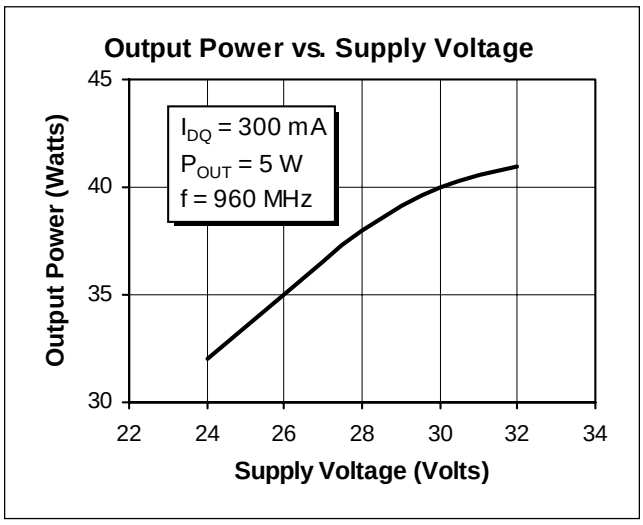


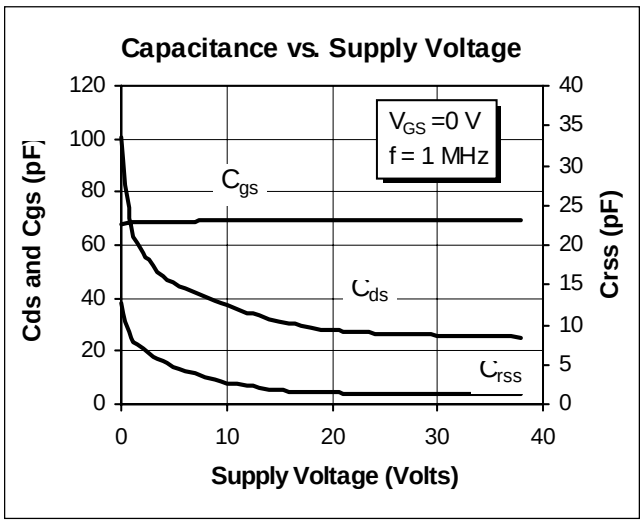


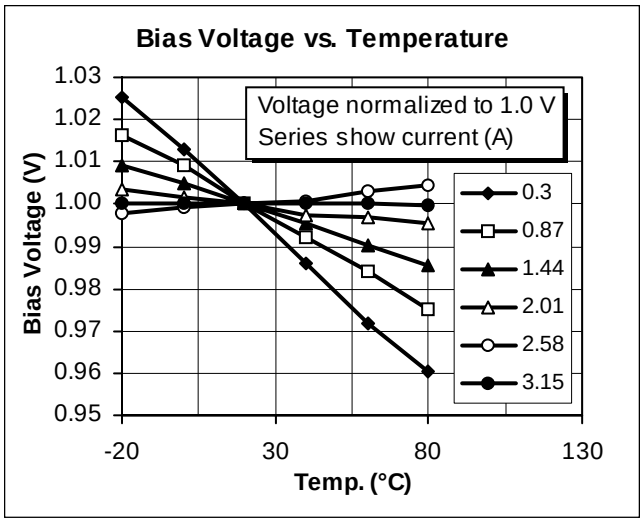
Typical Performance











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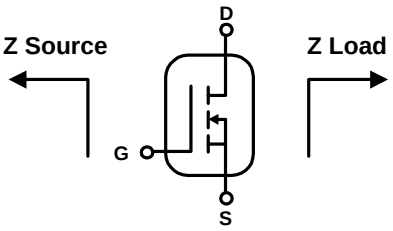
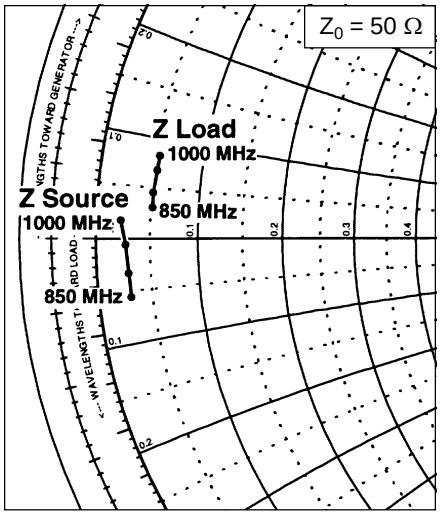
Impedance Data (shown for fixed-tuned broadband circuit)

V_{DD} = 28 V, P_{OUT} = 35 W, I_{DQ} = 300 mA





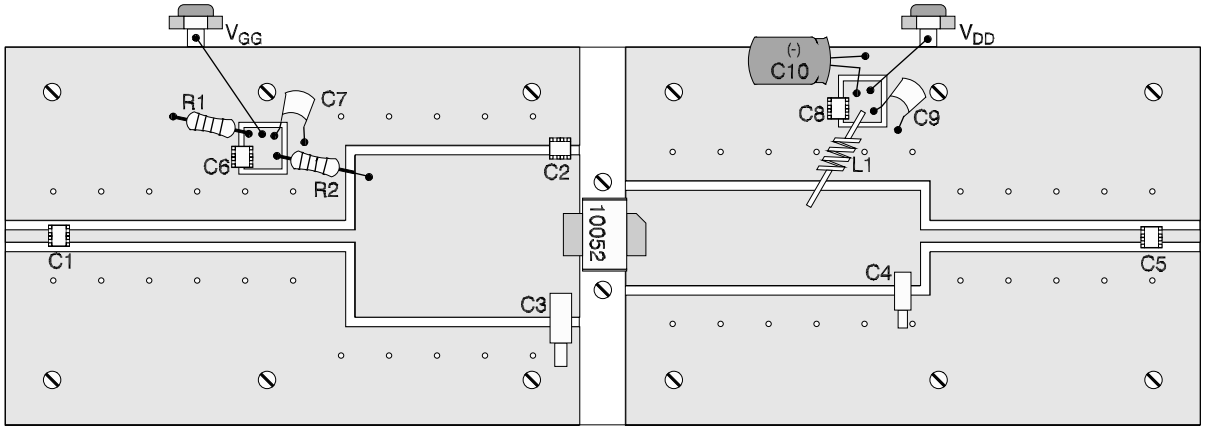
Frequency	Z Source Ω		Z Load Ω	
MHz	R	jX	R	jX
850	1.48	-2.80	2.60	1.55
900	1.45	-1.65	2.60	2.30
950	1.35	-0.30	2.68	3.40
1000	1.10	0.88	2.70	4.15

Typical Scattering Parameters

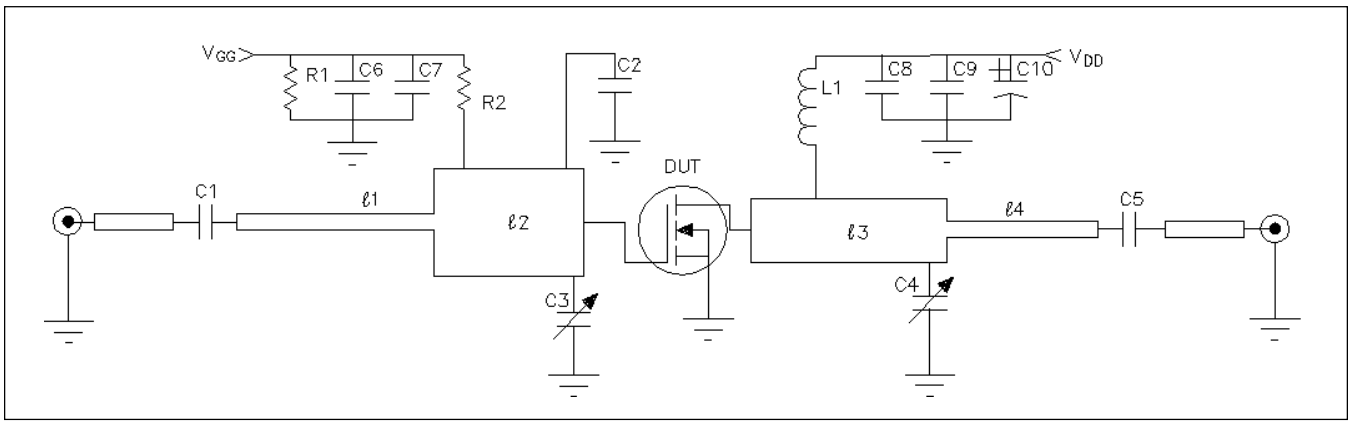
(V_{DS} = 28 V, I_D = 2.0 A)

f	S11		S21		S12		S22	
(MHz)	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
400	0.948	-167	3.668	33	0.006	-37	0.858	-149
420	0.951	-168	3.403	32	0.005	-37	0.866	-150
440	0.955	-168	3.161	30	0.005	-37	0.877	-151
460	0.956	-168	2.943	29	0.005	-36	0.886	-152
480	0.957	-168	2.745	28	0.004	-38	0.892	-152
500	0.959	-168	2.575	27	0.004	-35	0.898	-153
520	0.960	-169	2.421	26	0.004	-34	0.903	-153
540	0.962	-169	2.282	25	0.004	-30	0.907	-154
560	0.963	-169	2.151	24	0.003	-29	0.911	-155
580	0.964	-169	2.024	22	0.003	-28	0.913	-155
600	0.964	-169	1.907	22	0.003	-23	0.919	-156
620	0.965	-169	1.806	21	0.002	-20	0.925	-156
640	0.967	-169	1.72	21	0.002	-13	0.929	-156
660	0.966	-170	1.636	20	0.002	-6	0.929	-157
680	0.967	-170	1.558	19	0.002	3	0.929	-157
700	0.967	-170	1.483	18	0.002	8	0.928	-157
720	0.968	-170	1.413	18	0.002	21	0.930	-158
740	0.968	-170	1.345	17	0.002	25	0.932	-158
760	0.967	-170	1.281	17	0.002	33	0.935	-159
780	0.966	-170	1.228	17	0.002	44	0.937	-159
800	0.967	-170	1.179	16	0.002	51	0.938	-159
820	0.968	-170	1.134	16	0.002	55	0.939	-159
840	0.967	-170	1.088	15	0.002	59	0.938	-160
860	0.967	-170	1.039	15	0.003	67	0.938	-160
880	0.967	-170	0.993	14	0.003	68	0.938	-160
900	0.966	-170	0.957	14	0.003	73	0.941	-161
920	0.966	-171	0.922	14	0.003	75	0.943	-161
940	0.966	-171	0.890	14	0.003	79	0.941	-161
960	0.966	-171	0.859	13	0.004	81	0.942	-161
980	0.966	-171	0.827	13	0.004	83	0.943	-161
1000	0.965	-171	0.794	12	0.004	86	0.942	-162

Test Circuit



Parts Layout (not to scale)



Test Circuit Schematic for f = 960 MHz

DUT	PTF 10052	
C1, C5	39 pF, Capacitor ATC 100 B	
C2	7.5 pF, Capacitor ATC 100 B	
C3	0.6–6.0 pF, Trimmer Capacitor, Johanson, 5701-PC	
C4	0.35–3.5 pF, Trimmer Capacitor, Johanson, 5801-PC	
C6, C8	51 pF, Capacitor ATC 100 B	
C7, C9	0.1 μF, 50 V, Capacitor, Digi-Key P4917-ND	
C10	100 μF, 50 V, Electrolytic Capacitor, Digi-Key P5276	
L1	4 Turn, #20 AWG, .120” I.D.	
R1	1 K, 1/4 W Resistor	
R2	10 K, 1/4 W Resistor	
ℓ1, ℓ4		Microstrip 50 Ω
ℓ2	0.185 λ 960 MHz	Microstrip 5.70 Ω
ℓ3	0.240 λ 960 MHz	Microstrip 9.30 Ω
Circuit Board	.028" Dielectric Thickness, ε_r = 4.0, AlliedSignal, G200, 2 oz. copper	

Artwork (1 inch)

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