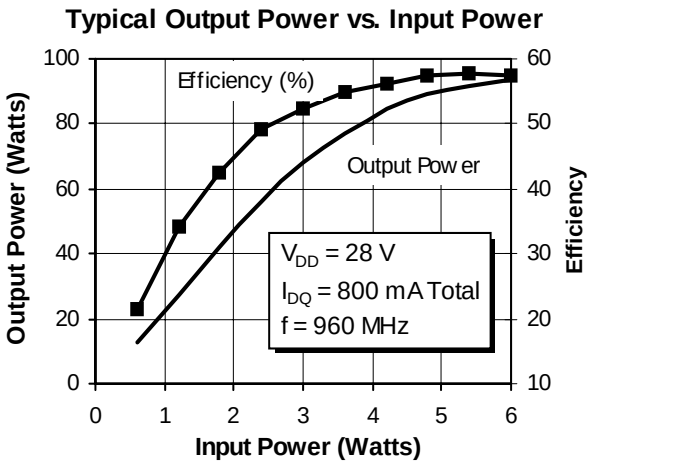
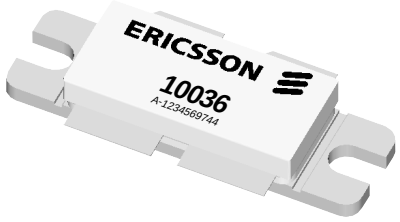
PTF 10036
85 Watts, 860–960 MHz
GOLDMOS™ Field Effect Transistor

Description

The PTF 10036 is an internally matched, 85 Watt LDMOS FET intended for large signal amplifier applications from 860 to 960 MHz. Nitride surface passivation and full gold metallization ensure excellent device lifetime and reliability.

- ***INTERNALLY MATCHED***
- **Performance at 960 MHz, 28 Volts**
  - Output Power = 85 Watts
  - Power Gain = 12.5 dB Typ
  - Efficiency = 55% Typ
- **Full Gold Metallization**
- **Silicon Nitride Passivated**
- **Back Side Common Source**
- **100% Lot Traceability**





Package 20240

RF Specifications (100% Tested)

Characteristic	Symbol	Min	Typ	Max	Units
Gain (V_{DD} = 28 V, P_{OUT} = 85 W, I_{DQ} = 800 mA Total, f = 900 MHz)	G_{ps}	11.0	12.5	—	dB
Power Output at 1 dB Compression (V_{DD} = 28 V, I_{DQ} = 800 mA Total, f = 900 MHz)	P-1dB	85	90	—	Watts
Drain Efficiency (V_{DD} = 28 V, P_{OUT} = 85 W, I_{DQ} = 800 mA Total, f = 900 MHz)	η	50	55	—	%
Load Mismatch Tolerance (V_{DD} = 28 V, P_{OUT} = 85 W(PEP), I_{DQ} = 800 mA Total, f = 867, 867.1 MHz—all phase angles at frequency of test)	Ψ	—	—	3:1	—

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

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Electrical Characteristics (100% Tested—characteristics, conditions and limits shown per side)

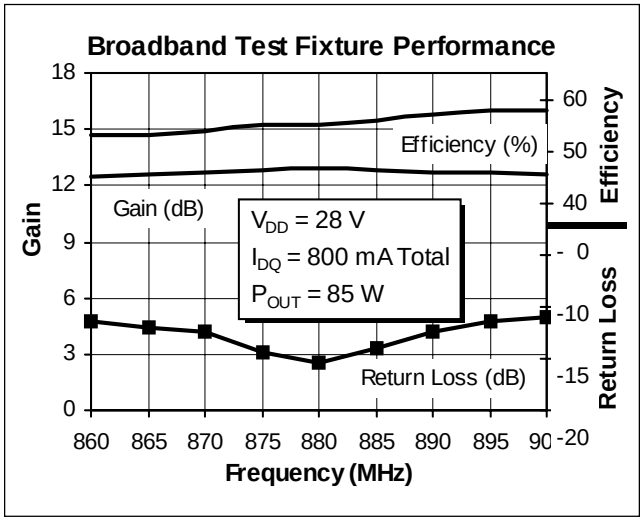
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 5 mA	$V_{(BR)DSS}$	65	—	—	Volts
Drain-Source Leakage Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	1.0	mA
Gate Threshold Voltage	V_{DS} = 10 V, I_D = 75 mA	$V_{GS(th)}$	3.0	—	5.0	Volts
Forward Transconductance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

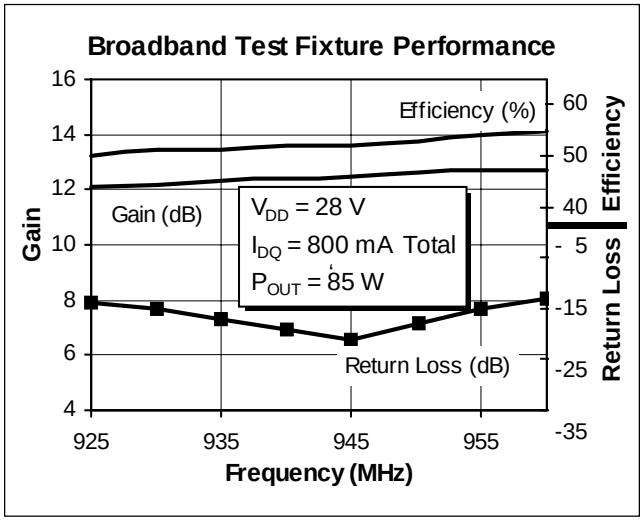
Maximum Ratings

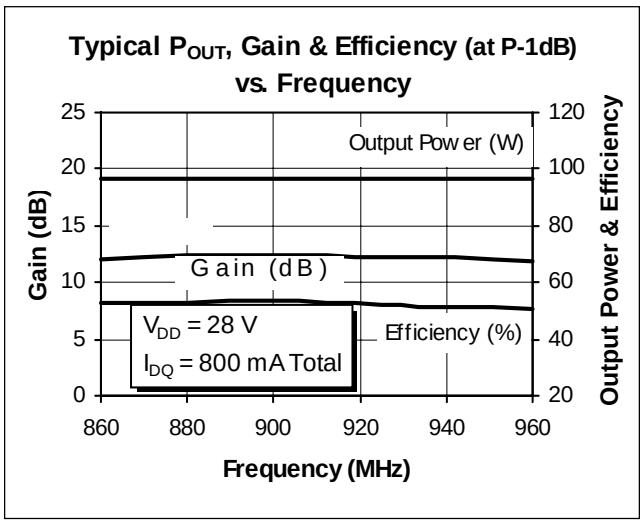
Parameter	Symbol	Value	Unit
Drain-Source Voltage(1)	V_{DSS}	65	Vdc
Gate-Source Voltage(1)	V_{GS}	±20	Vdc
Operating Junction Temperature	T_J	200	°C
Total Device Dissipation at Above 25°C derate by	P_D	250 1.43	Watts W/°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_{CASE} = 70°C)	$R_{\theta JC}$	0.7	°C/W

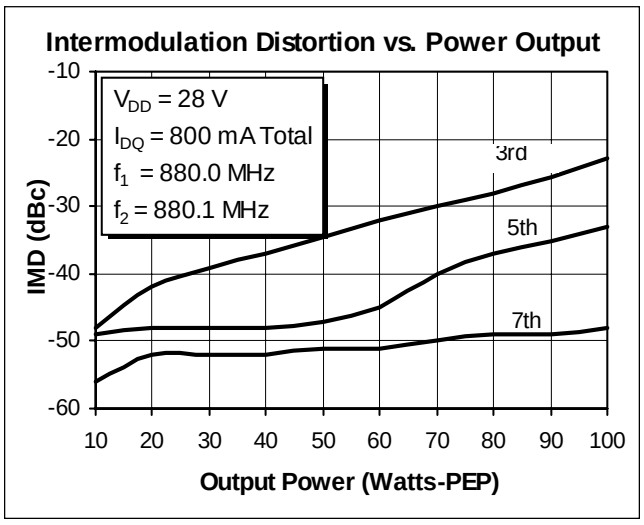
(1) per side

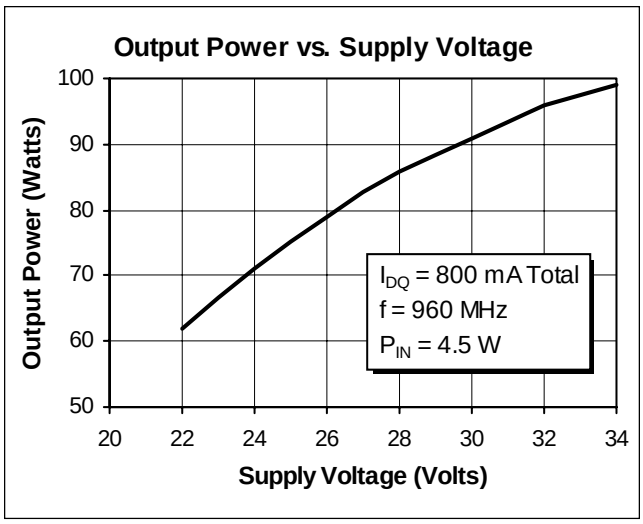
Typical Performance

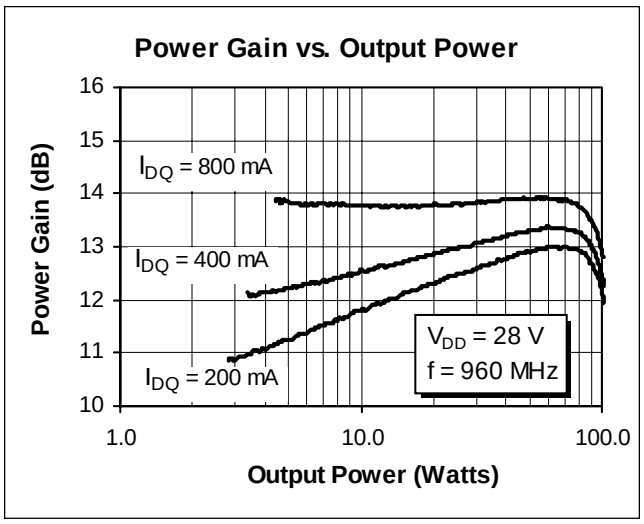


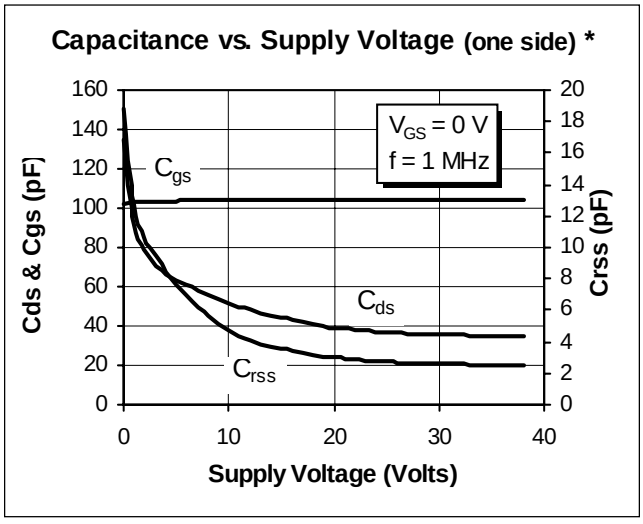


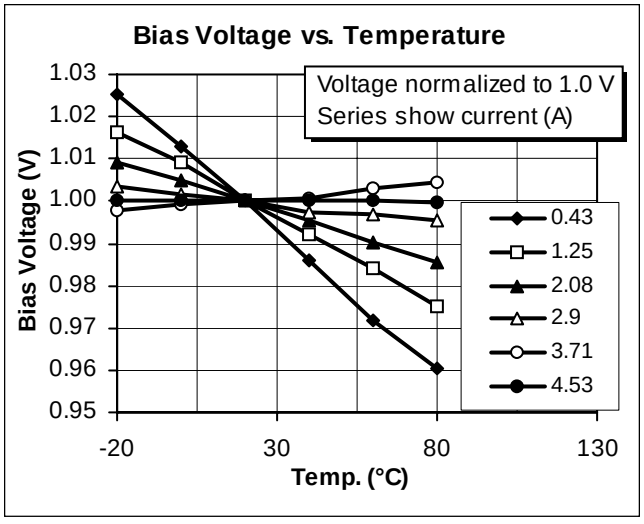












* This part is internally matched. Measurements of the finished product will not yield these results.

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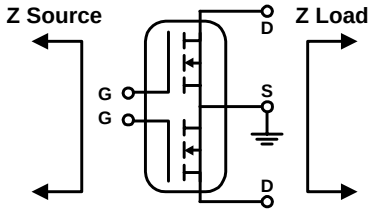
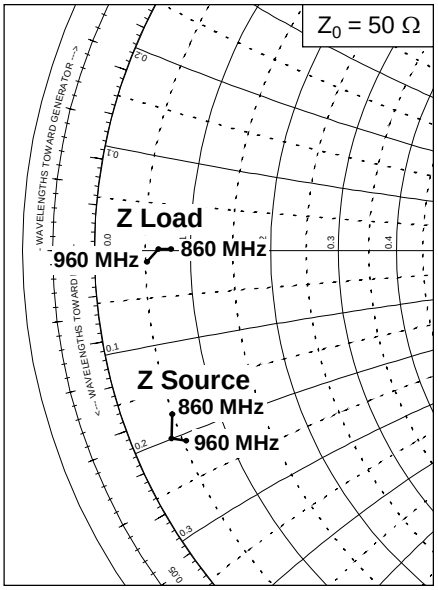
Impedance Data

V_{DD} = 28 V, P_{OUT} = 85 W, I_{DQ} = 800 mA Total





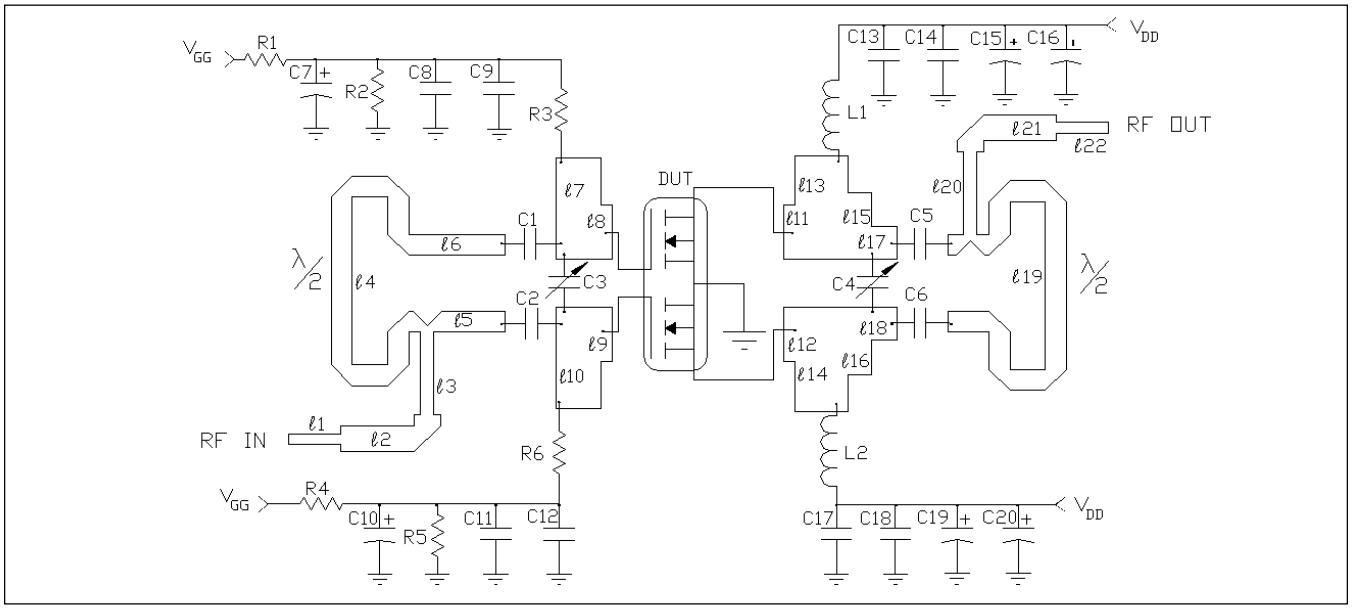
Frequency	Z Source Ω		Z Load Ω	
MHz	R	jX	R	jX
860	2.5	-8.8	3.9	0.1
900	2.0	-10.0	3.2	0.1
960	2.7	-10.4	2.6	-0.6

Typical Scattering Parameters (one side only)

(V_{DS} = 28 V, I_D = 1.5 A)

f	S11		S21		S12		S22	
(MHz)	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
100	0.913	-167.7	11.706	62.7	0.008	-21.5	0.605	-126.8
150	0.934	-171.3	6.956	47.4	0.007	-31.1	0.725	-136.6
200	0.950	-173.4	4.507	37.7	0.006	-38.4	0.799	-143.5
250	0.962	-175.0	3.257	29.4	0.005	-43.8	0.873	-148.7
300	0.968	-176.4	2.413	22.8	0.004	-42.4	0.887	-153.0
350	0.971	-177.6	1.905	18.3	0.003	-35.6	0.922	-156.1
400	0.974	-178.6	1.555	13.2	0.002	-30.6	0.943	-158.9
450	0.975	-179.6	1.297	10.4	0.002	-11.8	0.943	-160.6
500	0.976	179.4	1.117	6.5	0.001	7.4	0.961	-162.6
550	0.976	178.4	0.978	3.6	0.002	24.6	0.960	-164.0
600	0.975	177.4	0.881	0.9	0.002	49.2	0.960	-165.1
650	0.975	176.6	0.801	-1.8	0.002	58.7	0.969	-166.6
700	0.972	175.7	0.750	-3.8	0.003	65.0	0.962	-167.1
750	0.971	174.6	0.713	-6.0	0.004	67.9	0.967	-168.3
800	0.968	173.3	0.688	-8.6	0.005	66.2	0.970	-169.0
850	0.968	172.4	0.677	-10.9	0.005	71.8	0.962	-169.4
900	0.962	171.0	0.686	-13.6	0.006	71.3	0.965	-170.5
950	0.956	169.6	0.704	-17.3	0.007	69.6	0.966	-170.8
1000	0.945	167.8	0.750	-21.4	0.008	67.1	0.962	-171.0
1050	0.926	165.7	0.819	-27.7	0.009	64.8	0.961	-171.9
1100	0.887	163.0	0.938	-36.3	0.011	57.6	0.964	-171.6
1150	0.803	160.6	1.128	-51.8	0.013	46.6	0.965	-171.4
1200	0.662	164.4	1.299	-77.1	0.014	27.1	0.981	-171.8
1250	0.659	-178.9	1.183	-109.8	0.012	-0.2	1.006	-172.1
1300	0.803	-174.8	0.856	-136.0	0.007	-16.6	1.008	-173.7
1350	0.897	-177.2	0.587	-151.8	0.004	-14.3	1.004	-175.0
1400	0.938	-179.7	0.416	-161.0	0.002	13.8	1.005	-175.1
1450	0.963	178.1	0.315	-169.1	0.003	50.8	0.996	-176.2
1500	0.977	176.3	0.238	-174.6	0.003	60.3	1.000	-176.4

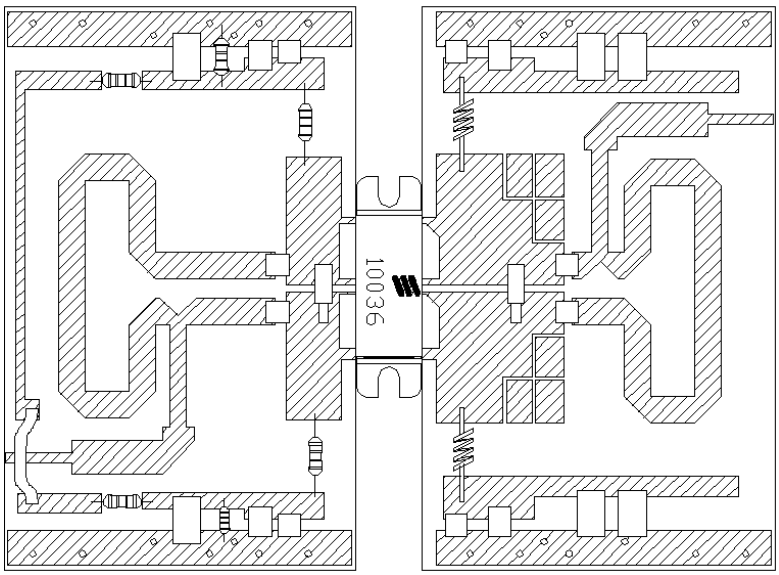
Test Circuit



Schematic for f = 900 MHz

DUT	PTF 10036
C1-2	15 pF, Capacitor ATC 100 B
C3	0.35–3.5 pF, Variable Capacitor
C4	1–9 pF, Variable Capacitor
C5-6, C9, C12-13, C17	33 pF, Capacitor ATC 100 B
C7, C10	10 µF, +10 V Electrolytic Capacitor
C8, C11, C14, C18	0.01 µF, Capacitor ATC 100 B
C15, C16, C19, C20	10 µF, +30 V Electrolytic Capacitor
L1. L2	4 Turn, #20 AWG, .120" I.D.
R1, R2, R4, R5	1.0 K, Ω Resistor
R3, R6	5.1 K, 1/4 Ω Resistor
ℓ1, ℓ22	50 Ω, .030 λ
ℓ2, ℓ21	20 Ω, .080 λ
ℓ3, ℓ20	32 Ω, .191 λ
ℓ4, ℓ19	25 Ω, .500 λ
ℓ5, ℓ6	25 Ω, .091 λ
ℓ7, ℓ10	7 Ω, .056 λ
ℓ8, ℓ9	13.0 Ω, .017 λ
ℓ11, ℓ12	13.0 Ω, .017 λ
ℓ13, ℓ14	7.0 Ω, .064 λ
ℓ15, ℓ16	10.0 Ω, .029 λ
ℓ17, ℓ18	19.0 Ω, .028 λ
Circuit Board	.028" Dielectric Thickness, ε_r = 4.0, AlliedSignal, G200, 2 oz. copper

Components Layout (not to scale)



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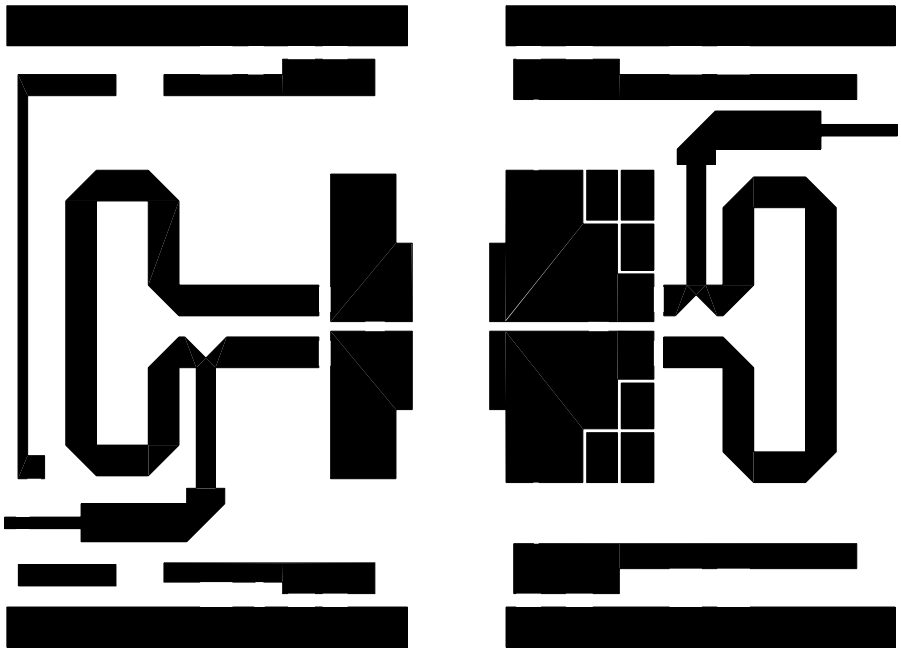

Artwork (1 inch)

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