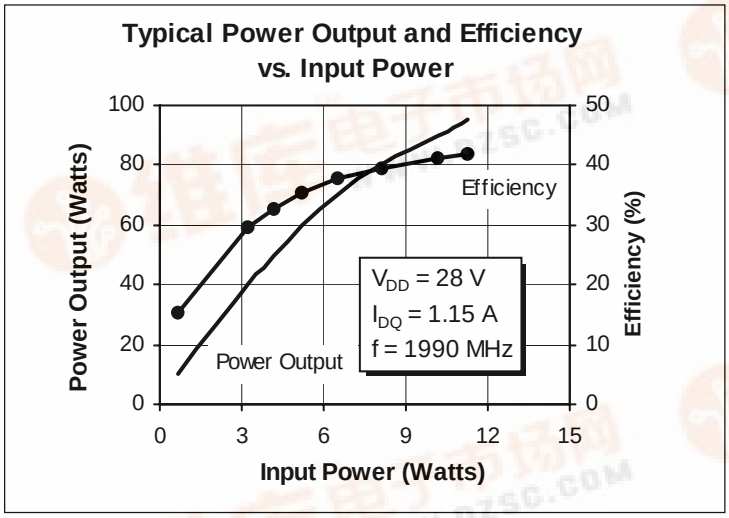
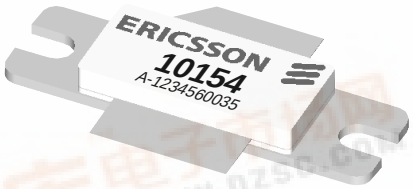
PTF 10154
85 Watts, 1.93–1.99 GHz
GOLDMOS® Field Effect Transistor

Description

The PTF 10154 is an internally matched 85–watt *GOLDMOS* FET intended for CDMA and TDMA applications from 1.93 to 1.99 GHz. This device operates at 43% efficiency with 11 dB gain. Nitride surface passivation and full gold metallization ensure excellent device lifetime and reliability.

- ***INTERNALLY MATCHED***
- **Guaranteed Performance at 1.93, 1.99 GHz, 28 V**
  - Output Power = 85 Watts Min
  - Power Gain = 11 dB Typ
- **Full Gold Metallization**
- **Silicon Nitride Passivated**
- **Back Side Common Source**
- **Excellent Thermal Stability**
- **100% Lot Traceability**





Package 20248

RF Specifications (100% Tested)

Characteristic	Symbol	Min	Typ	Max	Units
Gain (V_{DD} = 28 V, P_{OUT} = 10 W, I_{DQ} = 1.15 A, f = 1.96, 1.99 GHz)	G_{ps}	10.0	11	—	dB
Power Output at 1 dB Compression (V_{DD} = 28 V, I_{DQ} = 1.15 A, f = 1.99 GHz)	P-1dB	85	—	—	Watts
Drain Efficiency (V_{DD} = 28 V, P_{OUT} = 90 W, I_{DQ} = 1.15 A, f = 1.99 GHz)	η_D	—	43	—	%
Load Mismatch Tolerance (V_{DD} = 28 V, P_{OUT} = 90 W, I_{DQ} = 1.15 A, f = 1.99 GHz —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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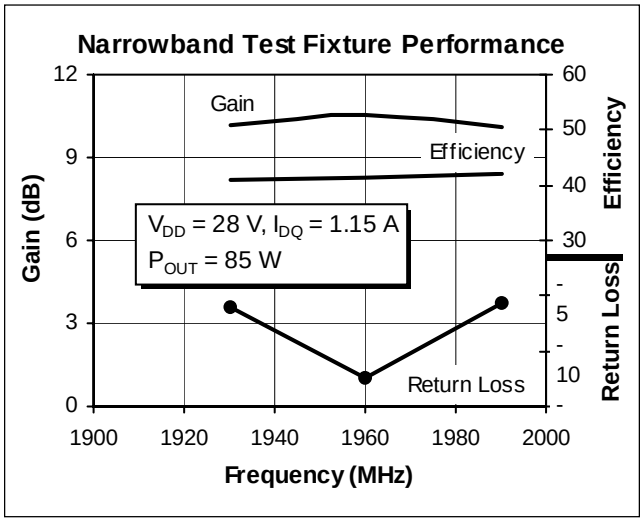
Electrical Characteristics (100% Tested)

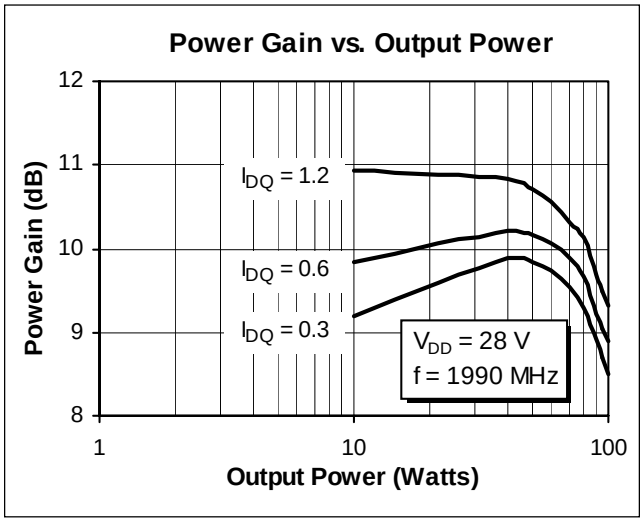
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 100 mA	$V_{(BR)DSS}$	65	—	—	Volts
Zero Gate Voltage Drain Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	5.0	mA
Gate Threshold Voltage	V_{DS} = 10 V, I_D = 150 mA	$V_{GS(th)}$	3.0	—	5.0	Volts
Forward Transconductance	V_{DS} = 10 V, I_D = 2 A	g_{fs}	—	1.0	—	Siemens

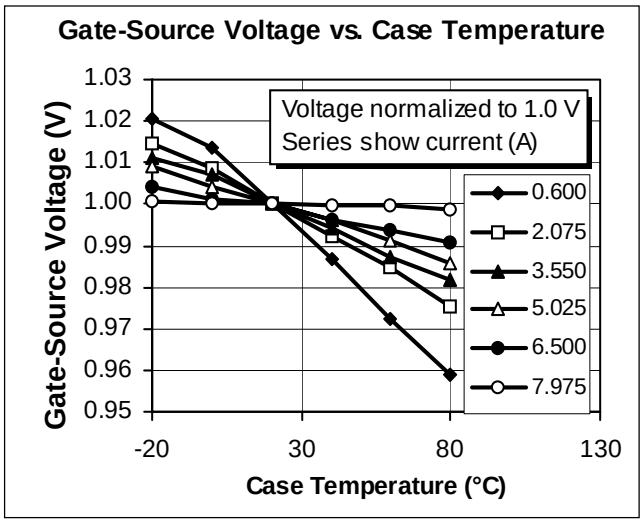
Maximum Ratings

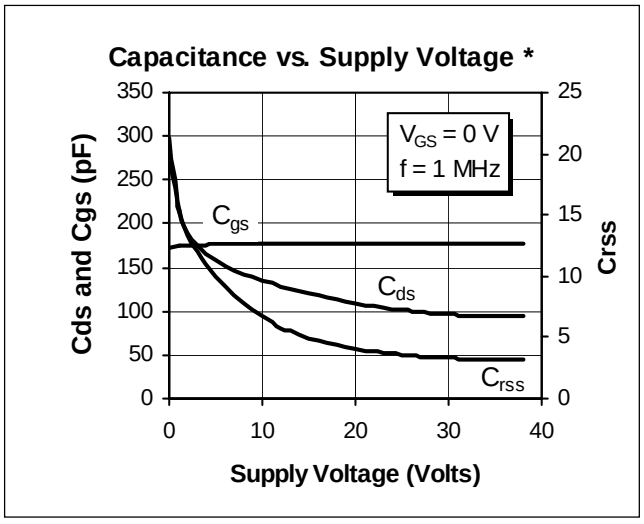
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	Vdc
Gate-Source Voltage	V_{GS}	±20	Vdc
Operating Junction Temperature	T_J	200	°C
Total Device Dissipation at Above 25°C derate by	P_D	365 2.08	Watts W/°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_{CASE} = 70°C)	$R_{\theta JC}$	0.48	°C/W

Typical Performance





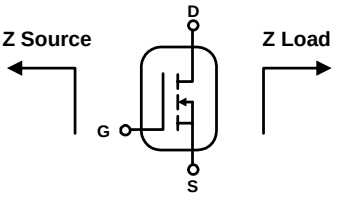


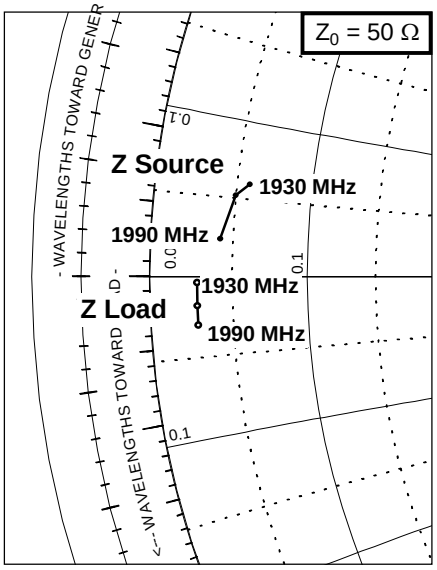


* This part is internally matched. Measurements of the finished product will not yield these results.

Impedance Data

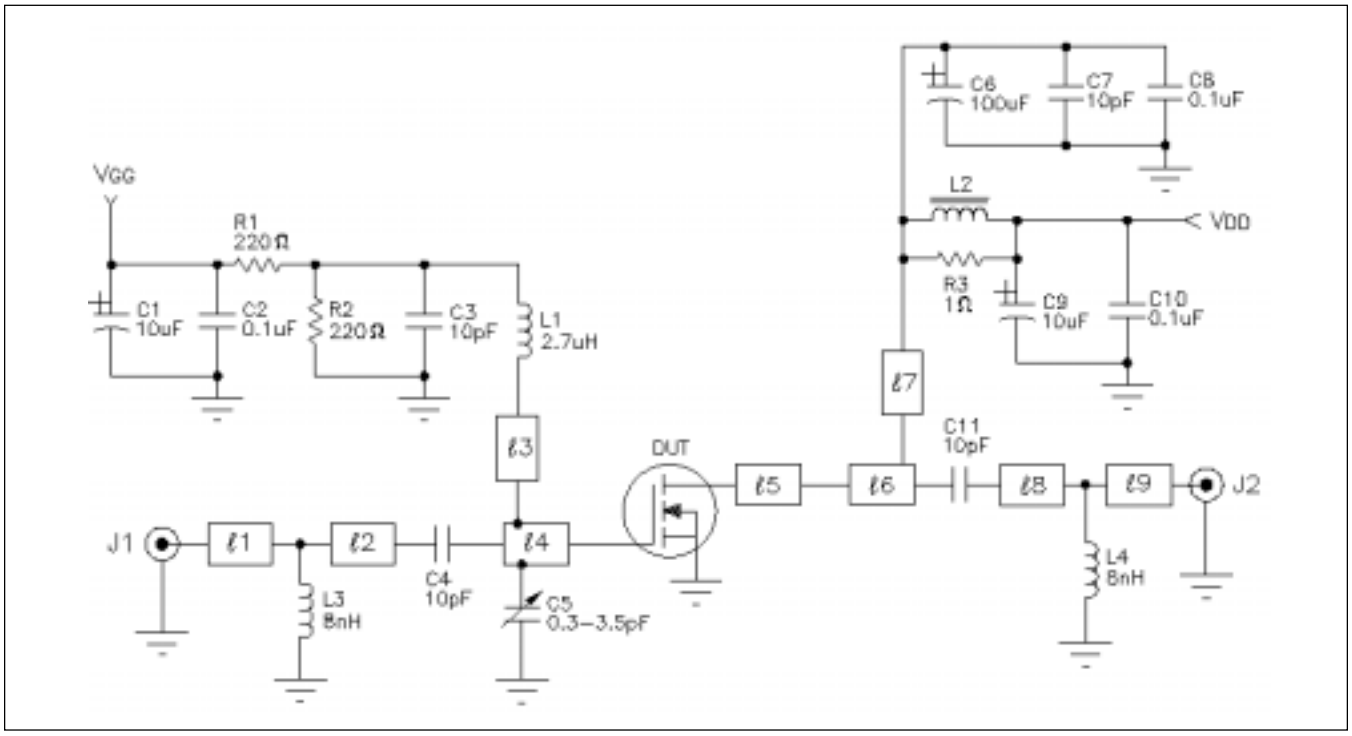
V_{DD} = 28 V, P_{OUT} = 85 W, I_{DQ} = 1.15 A





Frequency	Z Source Ω		Z Load Ω	
GHz	R	jX	R	jX
1930	2.9	3.0	1.4	-0.2
1960	2.5	2.6	1.4	-0.9
1990	2.1	1.2	1.4	-1.5

Test Circuit

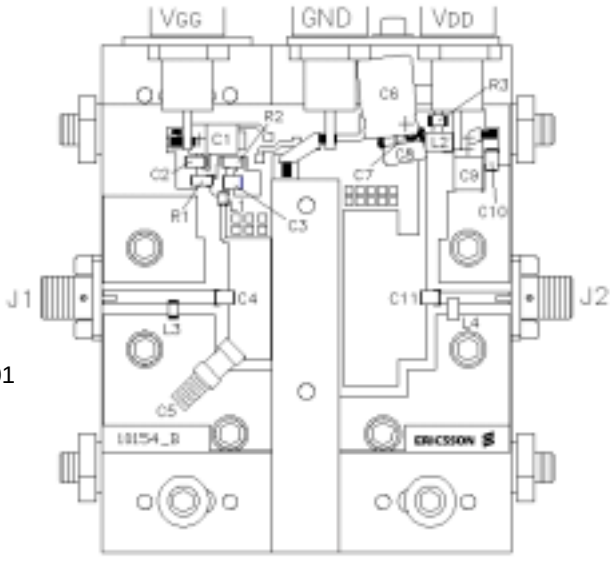


Test Circuit Block Diagram for f = 1.93–1.99 GHz

Q1 PTF 10154 LDMOS RF Transistor

	1.96 GHz	IPM (OHMS)
ℓ1	0.105 λ 1.96 GHz	Microstrip 50 Ω
ℓ2	0.119 λ 1.96 GHz	Microstrip 50 Ω
ℓ3	0.073 λ 1.96 GHz	Microstrip 76.64 Ω
ℓ4	0.094 λ 1.96 GHz	Microstrip 9.73 Ω
ℓ5	0.126 λ 1.96 GHz	Microstrip 6.67 Ω
ℓ6	0.614 λ 1.96 GHz	Microstrip 9.62 Ω
ℓ7	0.170 λ 1.96 GHz	Microstrip 64.30 Ω
ℓ8	0.050 λ 1.96 GHz	Microstrip 50 Ω
ℓ9	0.073 λ 1.96 GHz	Microstrip 50 Ω

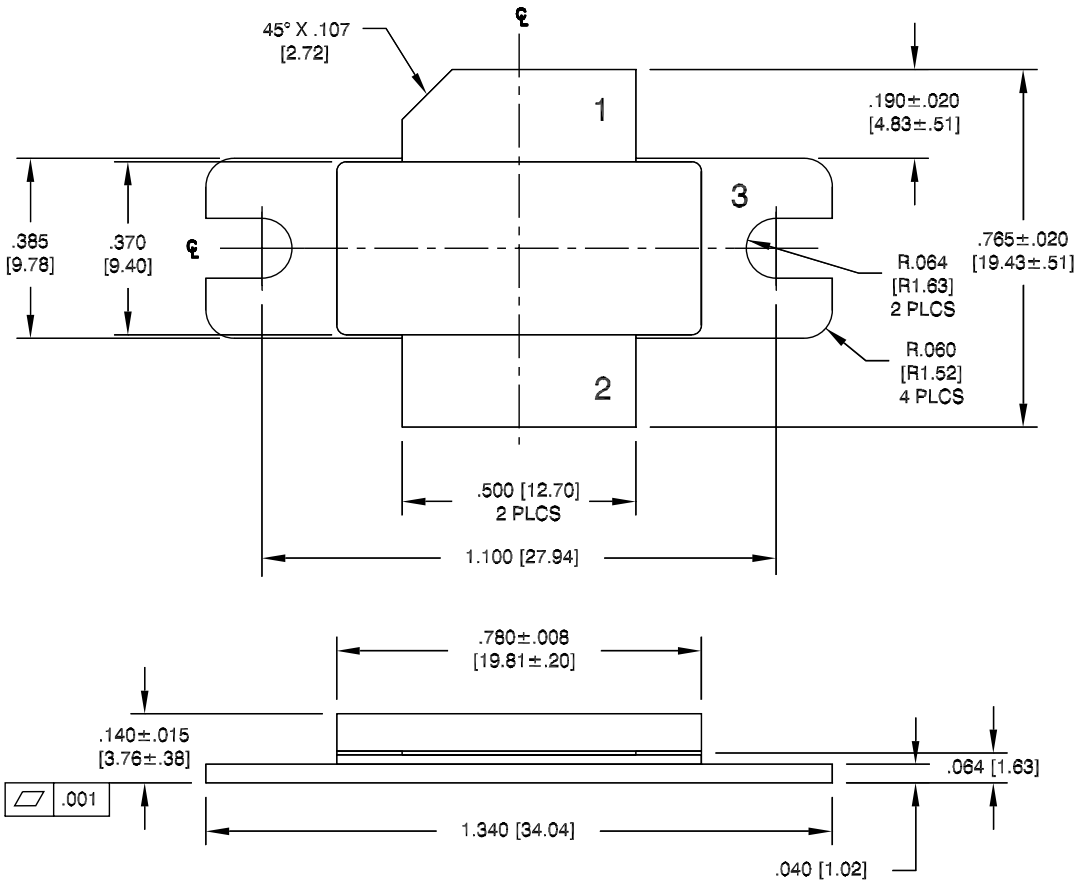
C1, C9	Capacitor,10µF Digi-Key pcs 6106
C2, C10	Capacitor,0.1µF,50V Digi-Key PCC103BCT
C3, C4, C7, C11	Capacitor,10pF ATC 100 b
C5	Capacitor, variable 0.3-3.5pF JACO johanson 5801
C6	Capacitor,100µF,50V Digi-Key P5182-ND
C8	Capacitor,0.1µF,50V Digi-Key P4525-ND
J1, J2	Connector, SMA female,panel mount 1301-rpm 513 412/53
L1	Chip inductor,2.7µH
L2	Ferrite, 6mm phillips 53/3/4.6-452
L3, L4	Inductor ,8nH coilcraft 0805CS-080 jbc
R1, R2	Resistor, 220 ohm Digi-Key 220 qbk
R3	Resistor, 1 ohm DIGI-KEY 1.0 qbk
Circuit Board	0.050", 2 OZ Copper rogers corporation, TMM6



Parts Layout (not to scale)

Package Mechanical Specifications

Package 20248



Unless otherwise specified
all tolerance ±0.005" [0.13mm]

Pins: 1. Drain 2. Gate 3. Source
Lead Thickness: 0.004 +0.002/-0.001"
[0.10 +.05/-0.03mm]

Primary Dimensions are in inches, altermate dimensions are mm.

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