ERICSSON

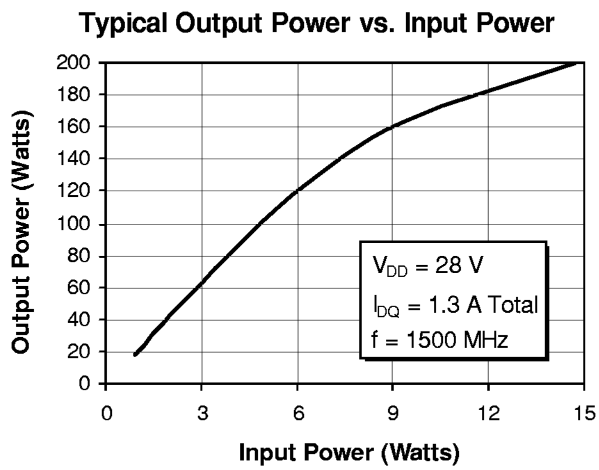
PRE-RELEASE

PTE 10125*
135 Watts, 1.4–1.6 GHz LDMOS Field Effect Transistor

Description

The 10125 is an internally matched, common source N-channel enhancement-mode lateral MOSFET intended for linear driver and final applications from 1.4 to 1.6 GHz, such as DAB/DAR. Rated output power is 135 watts. Nitride surface passivation and gold metallization ensure excellent device lifetime and reliability.

- ***INTERNALLY MATCHED***
- Guaranteed Performance at 1.5 GHz, 28 V
  - Output Power = 135 Watts Min
  - Power Gain = 11 dB Typ
- Full Gold Metallization
- Silicon Nitride Passivated
- Back Side Common Source
- Excellent Thermal Stability
- 100% Lot Traceability



Package 20250

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 Above 25°C derate by	P_D	440 2.51	Watts W/°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_C = 70°C)	$R_{\theta JC}$	0.39	°C/W

(1)per side

All published data is at T_C = 25°C unless otherwise indicated.

* A “PTE” number indicates that specification is preliminary and subject to change. Order this product or obtain additional information from your Ericsson Sales Representative.

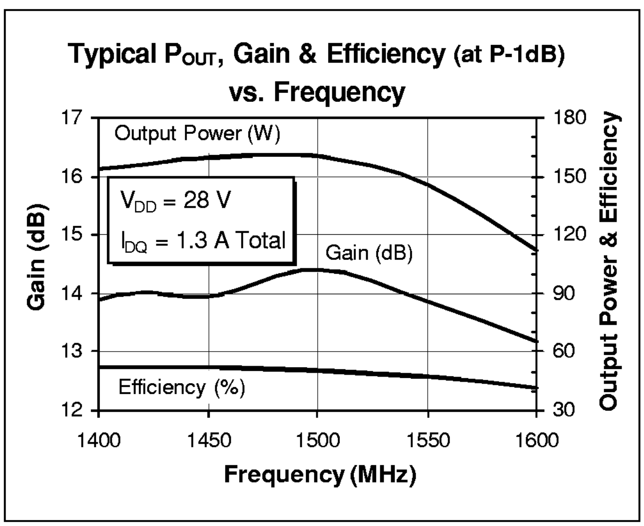
Electrical Characteristics (100% Tested—characteristics, conditions and limits shown per side)

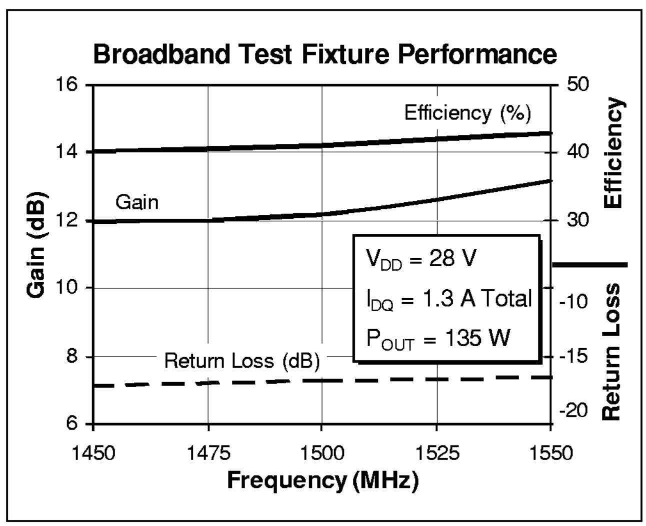
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 100 mA	$V_{(BR)DSS}$	65	—	—	Volts
Zero Gate Voltage Drain Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	5.0	mA
Gate Threshold Voltage	V_{DS} = 10 V, I_D = 150 mA	$V_{GS(th)}$	3.0	3.8	5.0	Volts
Forward Transconductance	V_{DS} = 10 V, I_D = 6 A	g_{fs}	2.0	4.0	—	Siemens

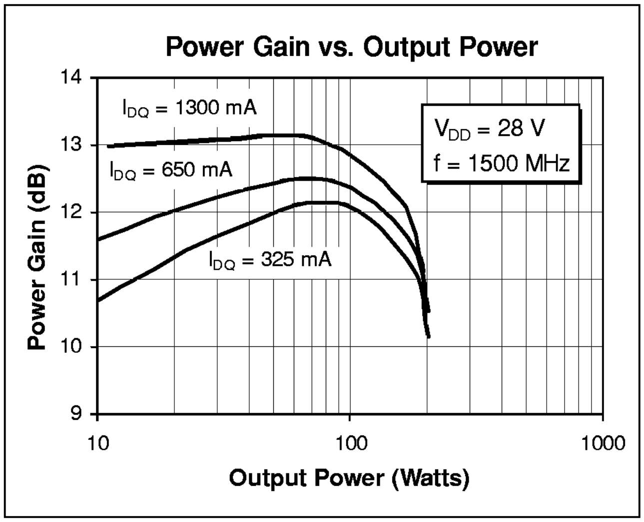
RF Specifications (100% Tested)

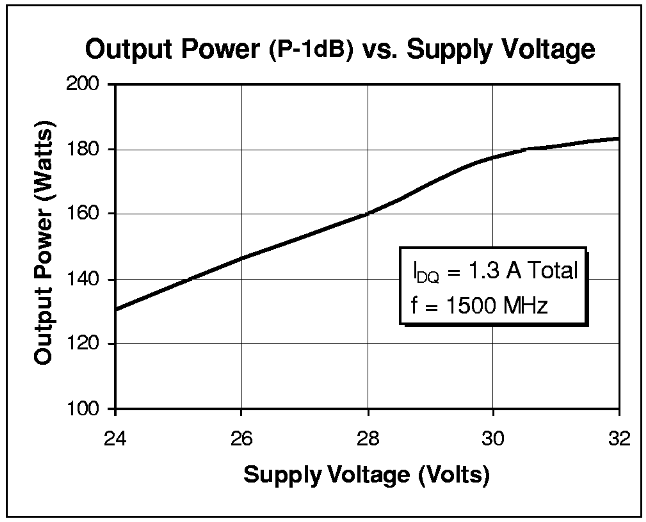
Characteristic	Symbol	Min	Typ	Max	Units
Gain (V_{DD} = 28 V, P_{out} = 30 W, I_{DQ} = 1.3 A Total, f = 1.50, 1.55 GHz)	G_{ps}	12	13.5	—	dB
Power Output at 1 dB Compression (V_{DD} = 28 V, I_{DQ} = 1.3 A Total, f = 1.50, 1.55 GHz)	P-1dB	135	150	—	Watts
Drain Efficiency (V_{DD} = 28 V, P_{out} = 135 W, I_{DQ} = 1.3 A Total, f = 1.5 GHz)	η_D	35	40	—	%
Load Mismatch Tolerance (V_{DD} = 28 V, P_{out} = 67.5 W, I_{DQ} = 1.3 A Total, f = 1.5 GHz —all phase angles at frequency of test)	Ψ	—	—	10:1	—

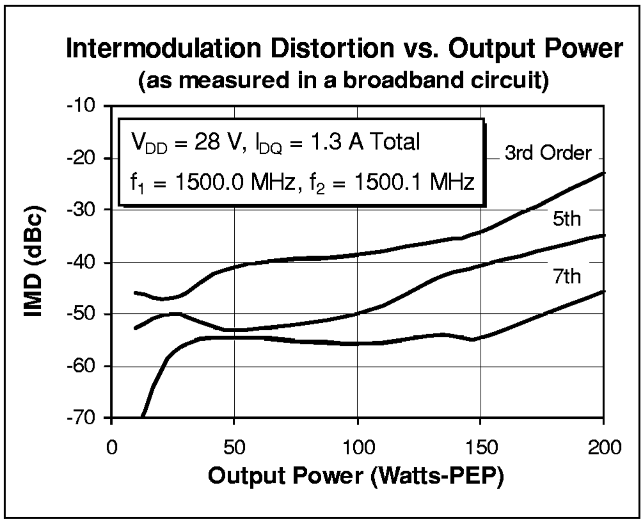
Typical Performance

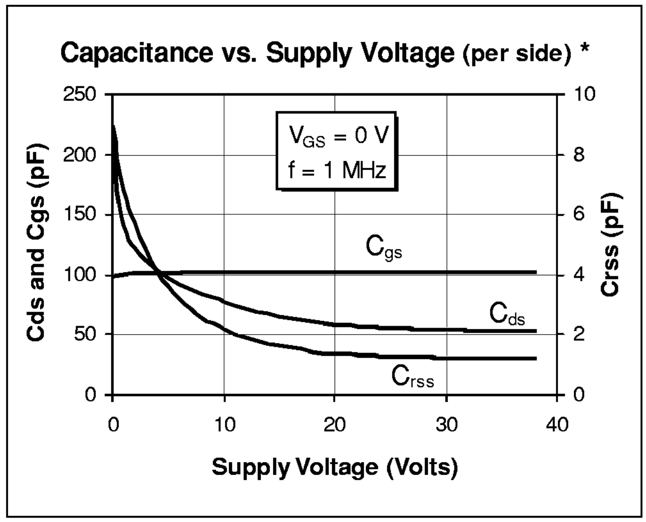








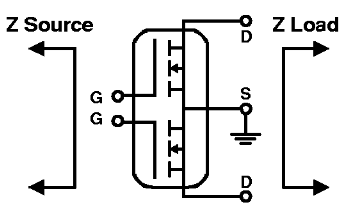


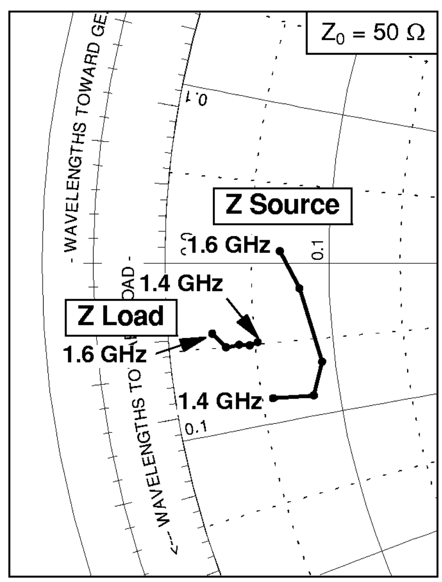


* This part is internally matched. Measurements of the finished product will not yield these results.

Impedance Data

(V_{DD} = 28 V, P_{out} = 120 W, I_{DQ} = 1.3 A Total)





Frequency	Z Source		Z Load	
GHz	R	jX	R	jX
1400	2.85	-4.23	2.60	-2.46
1450	4.16	-4.36	2.36	-2.53
1500	4.58	-3.30	2.04	-2.48
1550	4.02	-0.83	1.63	-2.52
1600	3.41	0.37	1.27	-2.08

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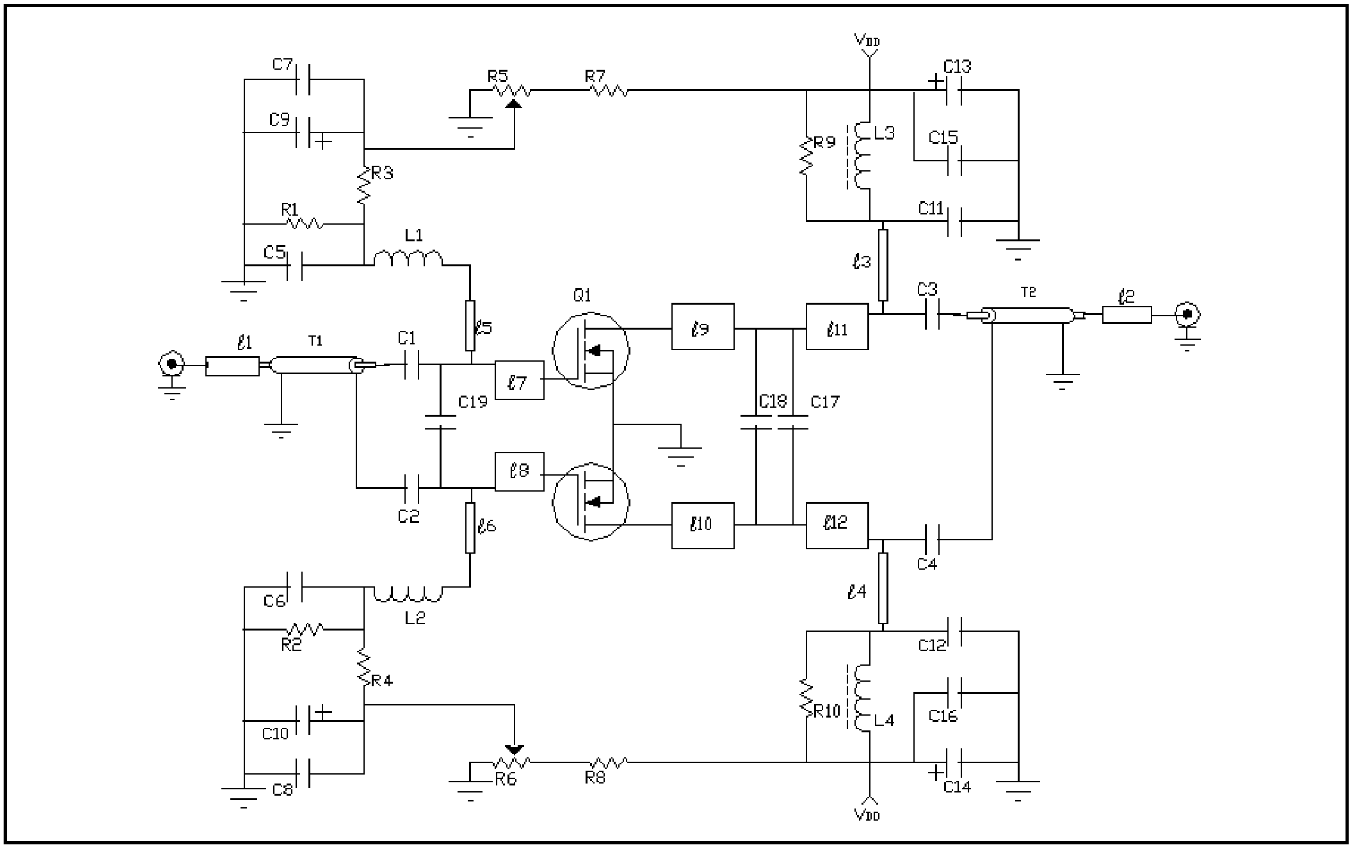
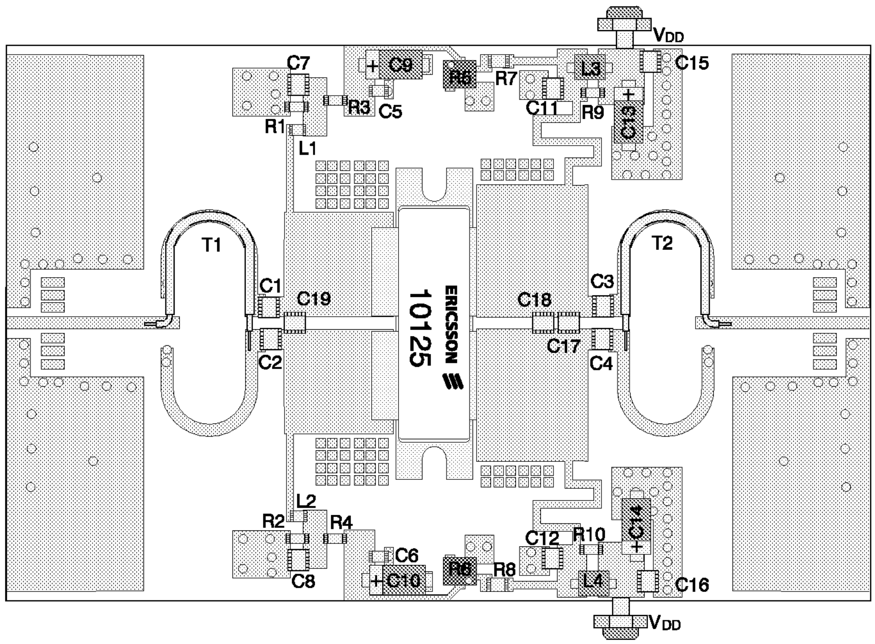
Test Circuit



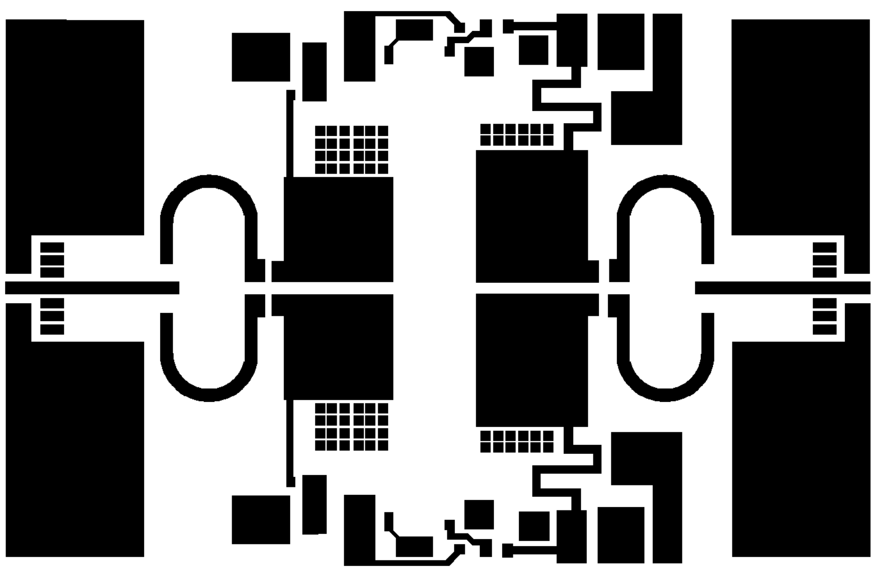
Test Circuit Block Diagram for f = 1.5 GHz

Q1	10125	LDMOS RF Transistor
ℓ1, ℓ2		Microstrip 50 Ω
ℓ3, ℓ4	.25 λ @ 1.5 GHz	Microstrip 70 Ω
ℓ5, ℓ6	.08 λ @ 1.5 GHz	Microstrip 80 Ω
ℓ7, ℓ8	.138 λ @ 1.5 GHz	Microstrip 9.5 Ω
ℓ9, ℓ10	.096 λ @ 1.5 GHz	Microstrip 7.7 Ω
ℓ11, ℓ12	.045 λ @ 1.5 GHz	Microstrip 7.7 Ω
C1, C2, C3, C4, C7, C8, C11, C12	13 pF Chip Cap	ATC 100 B
C5, C6, C15, C16	0.1 μF Chip Cap	K1206
C9, C10, C13, C14	10 μF SMT Tantalum Cap	
C17, C19	2.0 pF Chip Cap	ATC 100 B
C18	0.3 pF Chip Cap	ATC 100 B

L1, L2	2.7 nh SMT Coil	
L3, L4	4 mm SMT Ferrite Bead	
R1, R2, R3, R4	220 Ω Chip Resistor	K1206
R5, R6	2K SMT Potentiometer	
R7, R8	10 Ω Chip Resistor	K1206
R9, R10	1 Ω Chip Resistor	K1206
T1, T2	50 Ω Coaxial Balun	
Circuit Board	.031” G-200, Solid Copper Bottom, AlliedSignal	



Parts Layout (not to scale)



Artwork (1 inch)

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Specifications subject to change without notice.
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