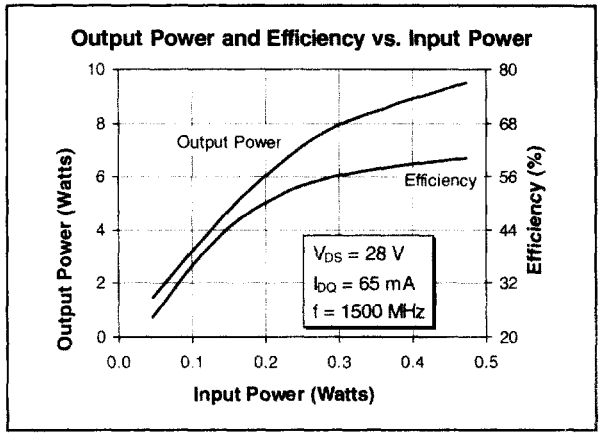
ERICSSON

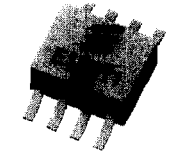
PTE 10011*
6 Watts, 1.5 GHz
LDMOS Field Effect Transistor

Description

The 10011 is a common source n-channel enhancement-mode lateral MOSFET intended for large signal amplifier applications to 1.5 GHz. It is rated at 6 watts minimum output power. Nitride surface passivation and gold metallization ensure excellent device lifetime and reliability. 100% lot traceability is standard.

- Performance at 1.5 GHz, 28 Volts
  - Output Power = 6 Watts
  - Efficiency = 55% Typ
  - Power Gain = 14.5 dB Typ
- Tested to solderability standards:
  - IEC-68-2-54
  - ANSI/J Std-002-A
- Gold Metallization
- Silicon Nitride Passivated
- Surface Mountable
- Available in Tape and Reel





Package 20239 (SO-8)

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 T_{flange} = 25°C Above 25°C derate by	P_D	28 0.159	Watts W/°C
Storage Temperature Range	T_{STG}	-40 to +150	°C
Thermal Resistance (T_{flange} = 50°C)	$R_{\theta JC}$	6.3	°C/W

* 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)

Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 25 mA	$V_{(BR)DSS}$	65	68	—	Volts
Drain-Source Leakage Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	1	mA
Gate Threshold Voltage	V_{DS} = 10 V, I_D = 75 mA	$V_{GS(th)}$	—	3.0	—	Volts
Forward Transconductance	V_{DS} = 10 V, I_D = 0.5 A	g_{fs}	—	0.2	—	Siemens

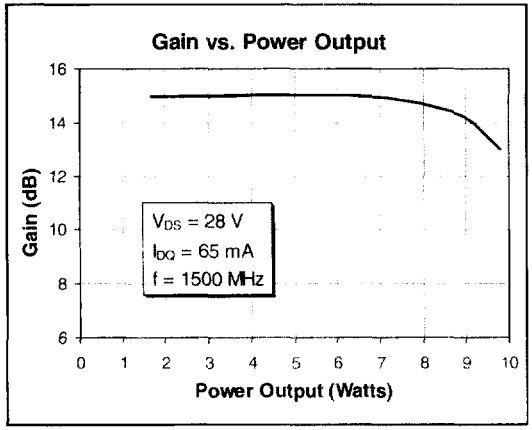
Dynamic Characteristics

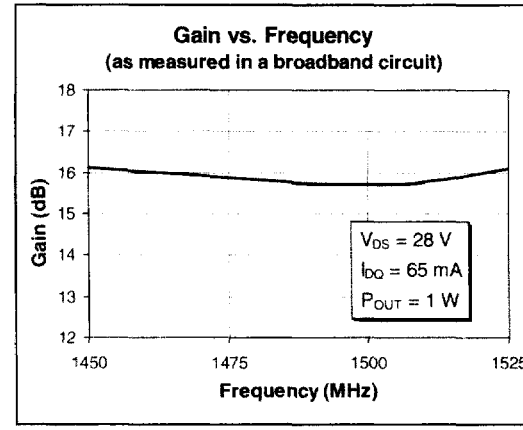
Characteristic	Symbol	Min	Typ	Max	Units
Input Capacitance (V_{DS} = 28 V, V_{GS} = 0 V, f = 1 MHz)	C_{iss}	—	10	—	pF
Output Capacitance (V_{DS} = 28 V, V_{GS} = 0 V, f = 1 MHz)	C_{oss}	—	5.5	—	pF
Reverse Transfer Capacitance (V_{DS} = 28 V, V_{GS} = 0 V, f = 1 MHz)	C_{rss}	—	0.3	—	pF

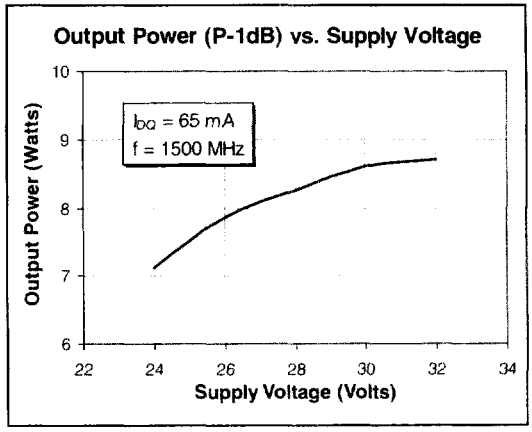
RF Specifications (100% Tested)

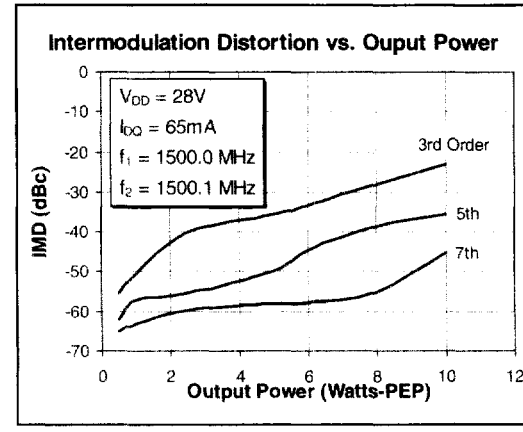
Characteristic	Symbol	Min	Typ	Max	Units
Common Source Power Gain (V_{DD} = 28 V, P_{out} = 1 W, I_{DQ} = 65 mA, f = 1.5 GHz)	G_{ps}	14.0	15.5	—	dB
Power Output at 1 dB Compressed (V_{DD} = 28 V, I_{DQ} = 65 mA, f = 1.5 GHz)	P-1dB	6	8	—	Watts
Drain Efficiency (V_{DD} = 28 V, P_{out} = 6 W, I_{DQ} = 65 mA, f = 1.5 GHz)	η_D	50	55	—	%
Load Mismatch Tolerance (V_{DD} = 28 V, P_{out} = 6 W, I_{DQ} = 65 mA, f = 1.5 GHz— all phase angles at frequency of test)	Ψ	—	—	10:1	—

Typical Performance



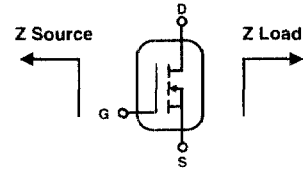


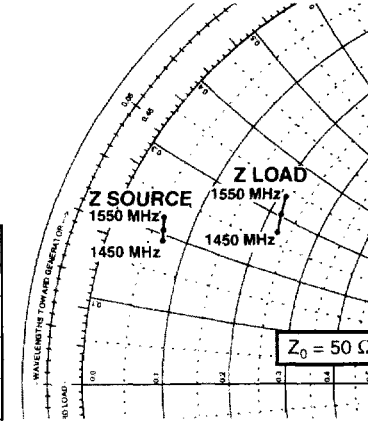




Impedance Data (shown for fixed-tuned broadband circuit)

V_{DD} = 28 V, I_{DQ} = 65 mA, P-1dB = 6 W





Frequency	Z Source		Z Load	
MHz	R	jX	R	jX
1450	3.4	9.6	11.4	13.6
1500	3.2	10.3	11.0	15.2
1550	2.9	11.1	10.6	16.8

Typical Scattering Parameters

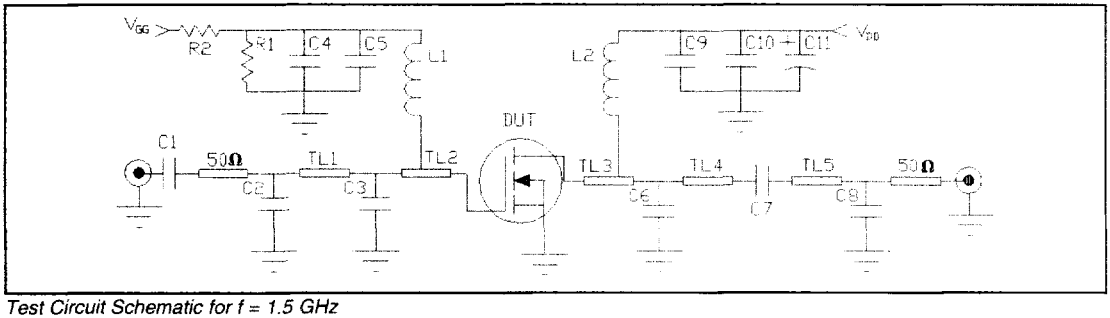
(V_{DS} = 28 V, I_{DQ} = 200 mA)

f	S11		S21		S12		S22	
(MHz)	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
100	0.949	-45.3	25.407	145.4	0.007	60.2	0.874	-25.8
150	0.919	-64.6	22.661	130.5	0.008	58.3	0.851	-37.4
200	0.867	-80.8	19.749	118.0	0.011	41.6	0.802	-47.7
250	0.831	-94.8	16.886	107.4	0.012	36.4	0.770	-57.8
300	0.808	-105.4	14.851	99.4	0.012	26.2	0.741	-65.2
350	0.794	-114.9	12.984	91.0	0.010	22.7	0.734	-73.0
400	0.783	-122.6	11.445	85.0	0.009	20.2	0.727	-80.1
450	0.776	-129.4	10.223	78.4	0.008	20.9	0.723	-86.8
500	0.770	-134.9	9.135	73.8	0.006	12.8	0.723	-91.6
550	0.785	-140.1	8.319	67.4	0.005	45.3	0.749	-98.3
600	0.791	-144.6	7.410	62.5	0.005	59.7	0.760	-104.0
650	0.797	-149.0	6.726	57.7	0.005	80.2	0.776	-109.5
700	0.807	-153.2	6.066	53.6	0.007	94.8	0.783	-114.6
750	0.813	-156.4	5.571	49.5	0.008	100.9	0.796	-119.1
800	0.822	-159.7	5.112	46.1	0.011	108.6	0.814	-123.2
850	0.830	-162.8	4.725	41.5	0.013	108.2	0.828	-127.2
900	0.835	-165.4	4.291	38.7	0.015	110.8	0.841	-130.7
950	0.843	-168.1	4.055	35.1	0.018	109.3	0.860	-134.4
1000	0.849	-170.4	3.704	31.5	0.020	111.2	0.868	-137.4
1050	0.855	-172.8	3.454	28.9	0.024	109.0	0.881	-140.5
1100	0.862	-175.1	3.242	26.0	0.027	108.4	0.890	-143.1
1150	0.868	-177.2	3.036	22.7	0.030	106.2	0.903	-146.1
1200	0.870	-179.5	2.823	21.1	0.033	107.4	0.906	-148.4
1250	0.873	178.5	2.735	17.7	0.037	103.5	0.917	-151.0
1300	0.876	176.5	2.500	14.6	0.039	102.2	0.916	-153.2
1350	0.878	174.5	2.419	14.1	0.044	102.3	0.925	-155.5
1400	0.882	172.8	2.313	10.1	0.048	100.2	0.922	-157.8
1450	0.877	170.6	2.150	8.0	0.051	98.2	0.928	-160.1
1500	0.878	168.7	2.067	7.7	0.056	99.5	0.917	-162.5
1550	0.877	166.7	2.039	3.6	0.061	95.8	0.928	-164.1
1600	0.874	164.8	1.853	2.4	0.062	96.1	0.918	-166.3
1650	0.872	162.9	1.892	3.2	0.071	94.8	0.920	-167.9
1700	0.865	160.8	1.800	-3.0	0.071	91.6	0.918	-169.9
1750	0.864	159.2	1.670	-3.1	0.078	94.9	0.928	-172.0
1800	0.865	157.5	1.633	-5.6	0.085	91.6	0.925	-175.1
1850	0.864	155.4	1.535	-6.8	0.089	91.5	0.923	-176.7
1900	0.866	153.4	1.457	-6.6	0.094	90.4	0.919	-179.3
1950	0.865	151.5	1.439	-7.0	0.101	89.9	0.917	178.8
2000	0.865	149.2	1.363	-10.1	0.106	87.6	0.918	176.2
2050	0.862	147.0	1.321	-9.2	0.117	88.6	0.913	174.5
2100	0.864	145.0	1.273	-10.5	0.121	86.8	0.916	171.8
2150	0.862	143.3	1.252	-10.9	0.134	86.8	0.910	170.3
2200	0.864	141.1	1.178	-13.1	0.137	83.4	0.916	167.7

(V_{DS} = 13.5 V, I_{DQ} = 200 mA)

f	S11		S21		S12		S22	
(MHz)	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
100	0.929	-48.4	25.248	142.3	0.010	56.0	0.807	-34.6
150	0.891	-68.2	22.035	126.7	0.013	47.7	0.775	-48.9
200	0.837	-84.4	18.851	114.0	0.015	36.0	0.725	-61.4
250	0.804	-98.2	15.909	103.3	0.016	27.8	0.698	-72.8
300	0.777	-108.7	13.796	95.5	0.015	22.6	0.673	-81.3
350	0.765	-117.2	11.909	87.4	0.014	18.7	0.670	-89.6
400	0.757	-124.8	10.441	81.6	0.014	15.2	0.670	-97.0
450	0.755	-131.3	9.249	75.0	0.012	12.2	0.675	-103.8
500	0.752	-136.6	8.225	70.6	0.010	12.5	0.680	-108.8
550	0.769	-141.4	7.437	64.5	0.008	21.6	0.711	-114.7
600	0.778	-146.1	6.584	59.5	0.007	34.8	0.727	-120.2
650	0.786	-150.3	5.940	55.1	0.006	49.9	0.745	-125.1
700	0.798	-154.1	5.356	51.4	0.008	68.9	0.758	-129.7
750	0.803	-157.3	4.876	47.3	0.009	82.6	0.773	-133.8
800	0.813	-160.6	4.472	44.1	0.011	92.5	0.792	-137.4
850	0.822	-163.7	4.099	39.7	0.012	94.6	0.806	-141.1
900	0.830	-166.2	3.728	37.5	0.016	98.9	0.822	-144.1
950	0.839	-169.0	3.504	33.4	0.019	98.7	0.836	-147.5
1000	0.845	-171.2	3.188	30.4	0.021	99.4	0.847	-150.0
1050	0.851	-173.6	2.968	28.0	0.024	100.2	0.860	-152.8
1100	0.859	-175.9	2.782	25.1	0.027	100.0	0.868	-155.2
1150	0.866	-178.0	2.587	21.7	0.031	96.6	0.881	-157.9
1200	0.868	179.7	2.411	20.9	0.034	100.2	0.885	-160.1
1250	0.871	177.7	2.333	17.2	0.039	96.0	0.895	-162.5
1300	0.876	175.8	2.122	14.7	0.041	94.9	0.894	-164.5
1350	0.877	173.8	2.057	14.3	0.046	95.3	0.903	-166.8
1400	0.878	171.9	1.944	10.4	0.050	92.6	0.899	-168.9
1450	0.876	169.9	1.821	8.5	0.053	91.7	0.907	-170.9
1500	0.876	167.8	1.752	8.4	0.057	92.6	0.898	-173.1
1550	0.877	165.9	1.710	4.4	0.063	89.7	0.908	-175.0
1600	0.873	164.0	1.559	4.1	0.065	91.6	0.898	-177.0
1650	0.870	161.9	1.599	3.7	0.075	89.3	0.902	-178.7
1700	0.866	159.9	1.502	-1.1	0.076	87.1	0.898	179.4
1750	0.863	158.4	1.408	-0.8	0.083	89.6	0.906	177.5
1800	0.865	156.3	1.369	-3.9	0.088	85.4	0.902	174.4
1850	0.863	154.5	1.288	-4.0	0.095	86.4	0.902	173.2
1900	0.862	152.4	1.233	-4.3	0.099	85.1	0.898	170.6
1950	0.865	150.6	1.222	-3.6	0.107	84.6	0.898	168.8
2000	0.864	148.1	1.152	-6.1	0.111	83.6	0.902	166.5
2050	0.860	146.2	1.140	-5.2	0.123	83.7	0.895	164.7
2100	0.864	143.8	1.089	-7.7	0.127	81.6	0.901	162.3
2150	0.862	141.9	1.073	-7.6	0.141	81.5	0.895	160.5
2200	0.864	139.7	1.003	-9.6	0.144	78.4	0.900	158.0

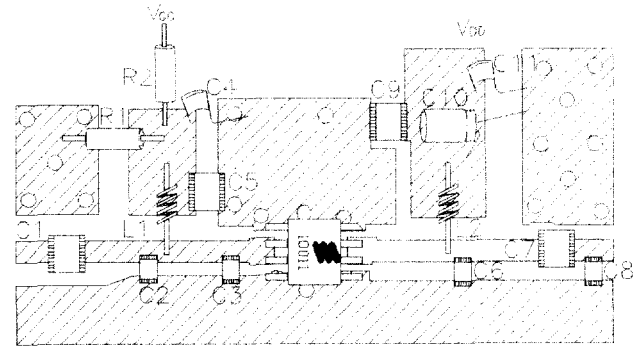
Test Circuit



Test Circuit Schematic for f = 1.5 GHz

DUT	10011
C1, C7	36 pF, Capacitor ATC 100 B
C2	3.0 pF, Capacitor ATC 200 B
C3	7.5 pF, Capacitor ATC 100 A
C4, C10	0.1 µF, 50 V, Capacitor Digi-Key P4917-ND
C5, C9	51 pF, Capacitor ATC 100 B
C8	1.1 pF, Capacitor ATC 100 A
C6	2.0 pF, Capacitor ATC 100 A
C11	100 µF, 50 V, Electrolytic Capacitor, Digi-Key P5276
L1, L2	4 Turn, #20 AWG, .120" I.D.
R1	560 Ω, 1/4 W Resistor
R2	220 Ω, 1/4 W Resistor

TL1	0.066 λ 1.5 GHz, Microstrip 50 Ω
TL2	0.035 λ 1.5 GHz, Microstrip 50 Ω
TL3	0.099 λ 1.5 GHz, Microstrip 50 Ω
TL4	0.045 λ 1.5 GHz, Microstrip 50 Ω
TL5	0.033 λ 1.5 GHz, Microstrip 50 Ω
Circuit Board	.031" Thick, ε_r = 4.0, AlliedSignal, G-200



Placement Diagram (not to scale)

Artwork (1 inch)

ERICSSON

Ericsson Inc.
RF Power Products
675 Jarvis Drive
Morgan Hill, CA 95037
Telephone: 408-778-9434

R1A March 1998