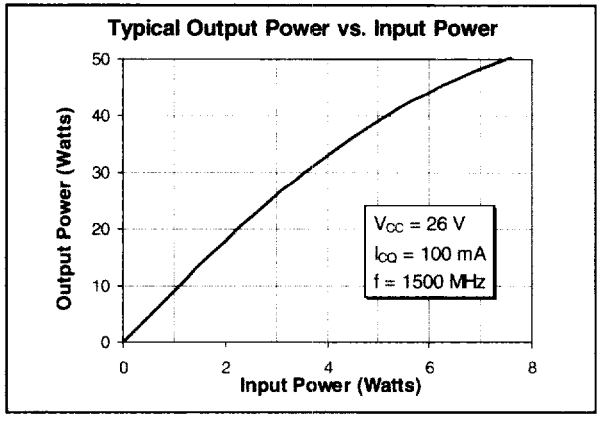
ERICSSON

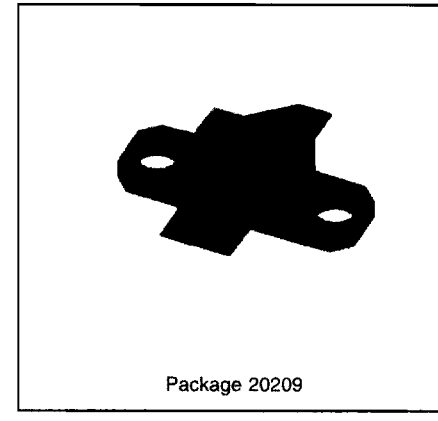
PTE 20124*
40 Watts, 1.465–1.513 GHz
Cellular Radio RF Power Transistor

Description

The 20124 is an NPN common emitter RF power transistor intended for 26 Vdc class AB operation from 1.45 to 1.52 GHz. Rated at 40 watts minimum output power, it is specifically intended for cellular and DAB power applications. Ion implantation, nitride surface passivation and gold metallization ensure excellent device reliability. 100% lot traceability is standard.

- 40 Watts, 1.465–1.513 GHz
- Class AB Characteristics
- Gold Metallization
- Silicon Nitride Passivated




Package 20209

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Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CER}	55	Vdc
Collector-Base Voltage	V_{CBO}	55	Vdc
Emitter-Base Voltage (collector open)	V_{EBO}	4.0	Vdc
Collector Current (continuous)	I_C	7.8	Adc
Total Device Dissipation at T_{flange} = 25°C Above 25°C derate by	P_D	130 0.70	Watts W/°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_{flange} = 70°C)	$R_{\theta JC}$	1.34	°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.

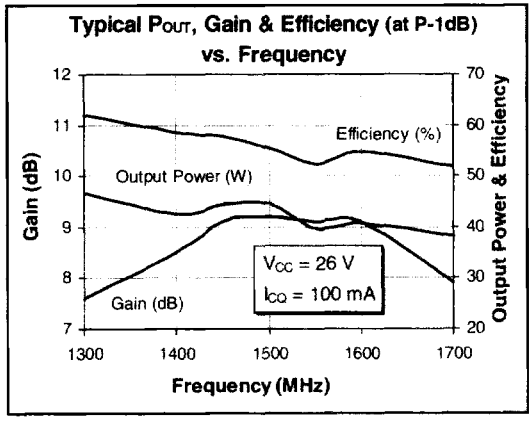
Electrical Characteristics (100% Tested)

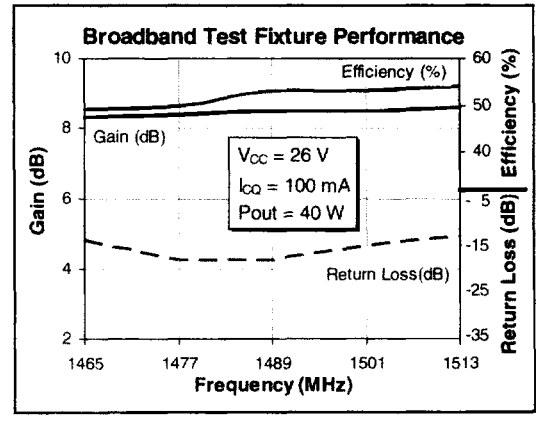
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Breakdown Voltage C to E	I_C = 60 mA, R_{BE} = 27 Ω	$V_{(BR)CER}$	55	—	—	Volts
Breakdown Voltage C to E	V_{BE} = 0 V, I_C = 60 mA	$V_{(BR)CES}$	55	—	—	Volts
Breakdown Voltage E to B	I_C = 0 A, I_E = 5 mA	$V_{(BR)EBO}$	4	5	—	Volts
DC Current Gain	V_{CE} = 5 V, I_C = 300 mA	h_{FE}	20	50	120	—

RF Specifications (100% Tested)

Characteristic	Symbol	Min	Typ	Max	Units
Gain (V_{CC} = 26 Vdc, P_{out} = 40 W, I_{CQ} = 100 mA, f = 1.5 GHz)	G_{pe}	7	8.5	—	dB
Collector Efficiency (V_{CC} = 26 Vdc, P_{out} = 40 W, I_{CQ} = 100 mA, f = 1.5 GHz)	η_C	—	50	—	%
Load Mismatch Tolerance (V_{CC} = 26 Vdc, P_{out} = 20 W, I_{CQ} = 100 mA, f = 1.5 GHz—all phase angles at frequency of test)	Ψ	—	—	5:1	—

Typical Performance





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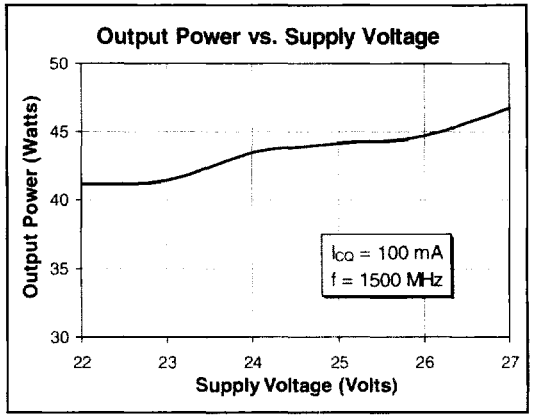

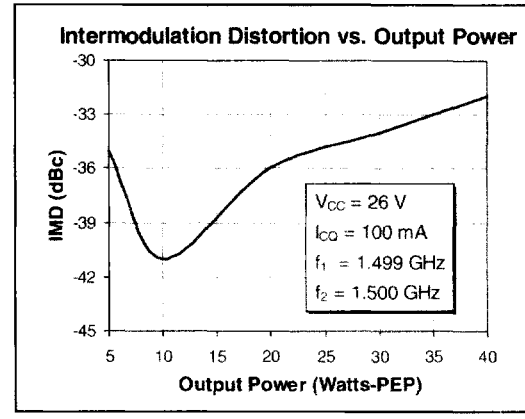

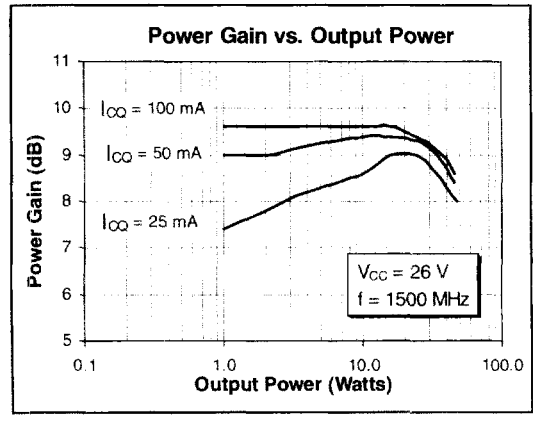

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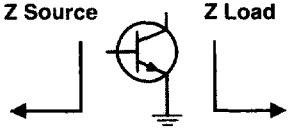
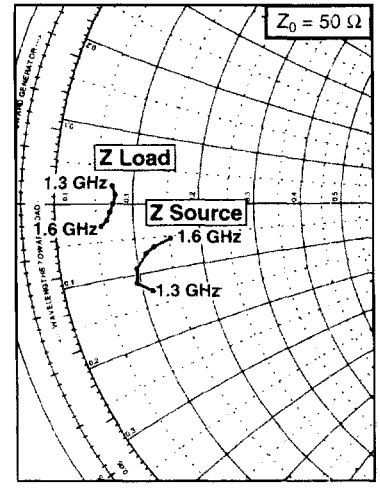
Impedance Data

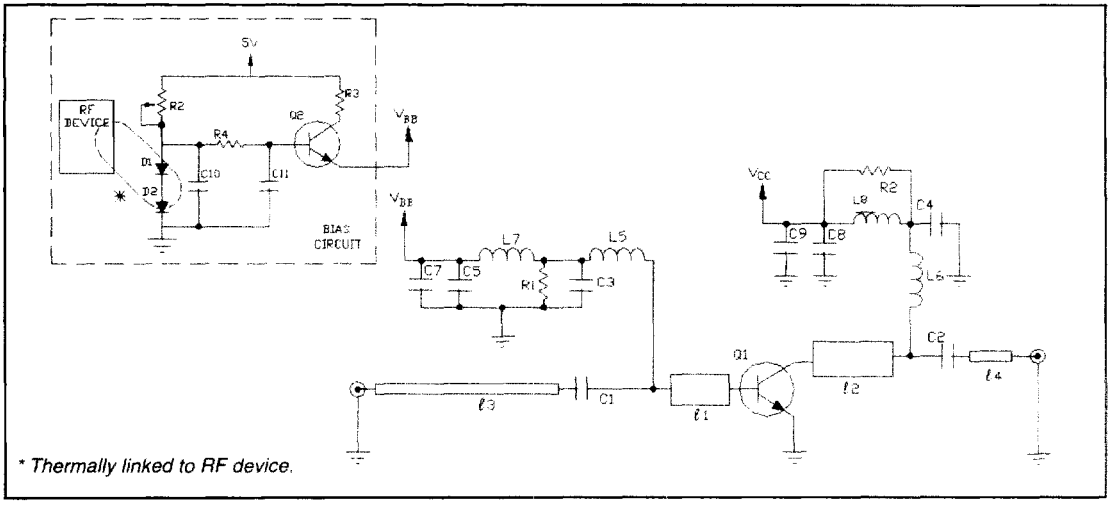
(V_{CC} = 26 Vdc, P_{out} = 40 W, I_{CQ} = 100 mA)



Frequency	Z Source		Z Load	
GHz	R	jX	R	jX
1.30	5.7	-6.4	3.6	1.2
1.40	4.7	-5.6	3.8	0.6
1.45	4.9	-4.6	3.7	0.0
1.50	5.7	-3.6	3.4	-0.6
1.55	6.3	-3.2	3.2	-1.1
1.60	7.6	-2.7	2.8	-1.5

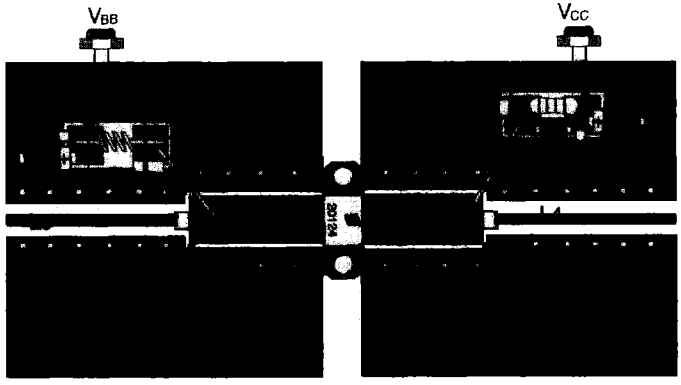


Test Circuit

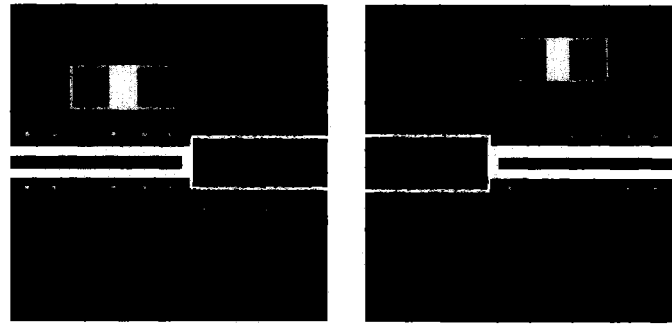


Schematic for f = 2 GHz

Q1	20170, NPN RF Transistor	R1	22 Ω .5 W SMT Resistor
L1	.185 λ 2GHz, Microstrip 18 Ω	R2	12 Ω .5 W SMT Resistor
L1	.195 λ 2GHz, Microstrip 9.5 Ω	Circuit Board	.031 G200, AlliedSignal, Solid Copper Bottom
L5, L6	4 Turn #20 AWG, .120" I.D.		
L7	56 μA SMT Inductor	*Bias Parts (not shown on layout)*	
L8	Ferrite Bead	Q2	BCP 56 SMT NPN Transistor
C1, C2	33 pF ATC-A	D1	BAV 99 Diode
C3, C4	33 pF ATC-B	C10, C11	0.1 pF SMT Capacitor
C5, C7	0.1 υF, 1206	R2	2K Potentiometer
C6, C8	10 pF SMT Electrolytic Capacitor	R3, R4	10 Ω 1206 SMT Resistor



Board Assembly (not to scale)



Artwork (1 inch)

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