ERICSSON

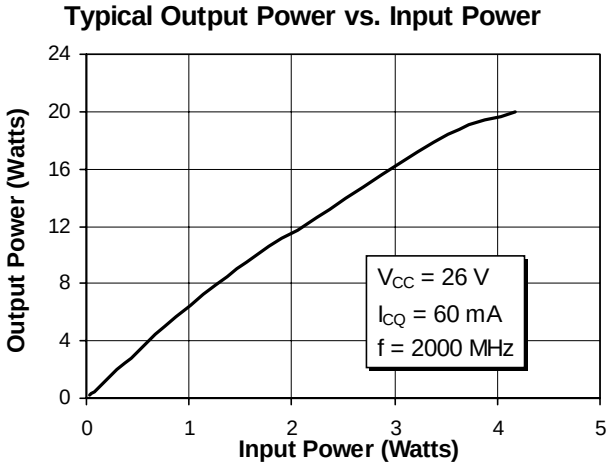
PRE-RELEASE

PTE 20231*
18 Watts, 2.1–2.2 GHz
Cellular Radio RF Power Transistor

Description

The 20231 is a class A/AB, NPN, common emitter RF power transistor intended for 26 Vdc operation from 2.1 to 2.2 GHz. Rated at 18 watts minimum output power in class AB and 8 watts minimum output power in class A, it may be used for both CW and PEP applications. Ion implantation, nitride surface passivation and gold metallization are used to ensure excellent device reliability. 100% lot traceability is standard.

- 18 Watts, 2.1–2.2 GHz
- Class A/AB Characteristics
- 40% Collector Efficiency at 18 Watts
- Gold Metallization
- Silicon Nitride Passivated



Package 20209

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CER}	50	Vdc
Collector-Base Voltage	V_{CBO}	50	Vdc
Emitter-Base Voltage (collector open)	V_{EBO}	4.0	Vdc
Collector Current (continuous)	I_C	2.8	Adc
Total Device Dissipation at T_{flange} = 25°C Above 25°C derate by	P_D	103 0.59	Watts W/°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_{flange} = 70°C)	$R_{\theta JC}$	1.7	°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.

5/18/98

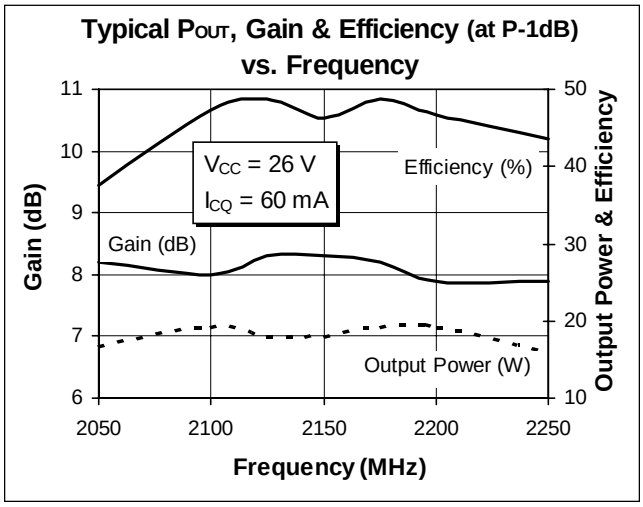
Electrical Characteristics (100% Tested)

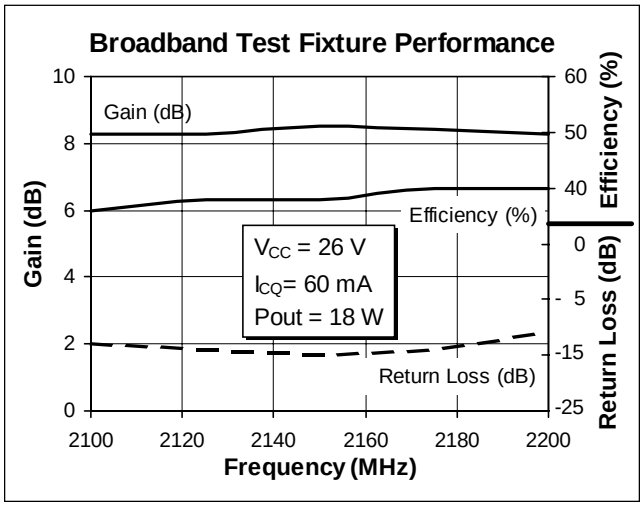
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Breakdown Voltage C to E	V_{BE} = 0 V, I_C = 100 mA	$V_{(BR)CES}$	55	70	—	Volts
Breakdown Voltage C to E	I_B = 0 A, I_C = 5 mA, R_{BE} = 22 Ω	$V_{(BR)CER}$	50	—	—	Volts
Breakdown Voltage E to B	I_C = 0 A, I_E = 5 mA	$V_{(BR)EBO}$	3.5	5	—	Volts
DC Current Gain	V_{CE} = 5 V, I_C = 1.0 A	h_{FE}	20	50	100	—

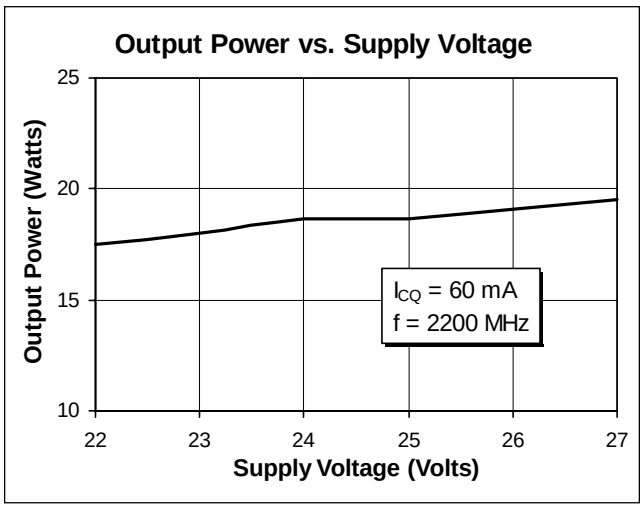
RF Specifications (100% Tested)

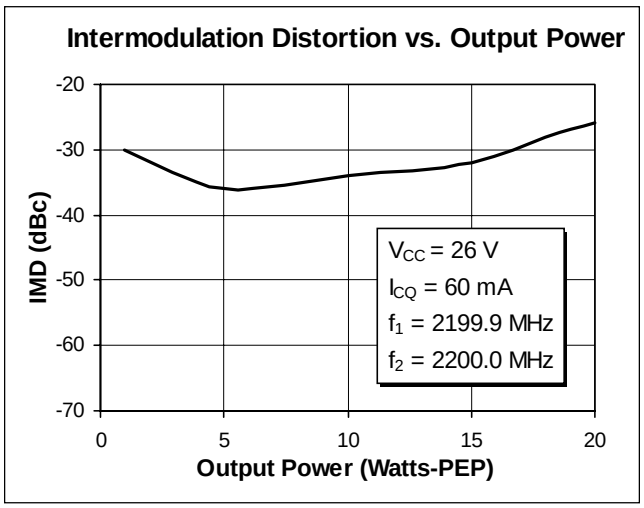
Characteristic	Symbol	Min	Typ	Max	Units
Gain (V_{CC} = 26 Vdc, P_{out} = 5 W, I_{CQ} = 130 mA, f = 2.2 GHz)	G_{pe}	8.0	8.5	—	dB
Gain Compression (V_{CC} = 26 Vdc, I_{CQ} = 130 mA, f = 2.2 GHz)	P-1dB	18	—	—	Watts
Collector Efficiency (V_{CC} = 26 Vdc, P_{out} = 18 W, I_{CQ} = 130 mA, f = 2.2 GHz)	η_C	40	—	—	%
Load Mismatch Tolerance (V_{CC} = 26 Vdc, P_{out} = 9 W, I_{CQ} = 130 mA f = 2.2 GHz—all phase angles at frequency of test)	Ψ	—	—	5:1	—

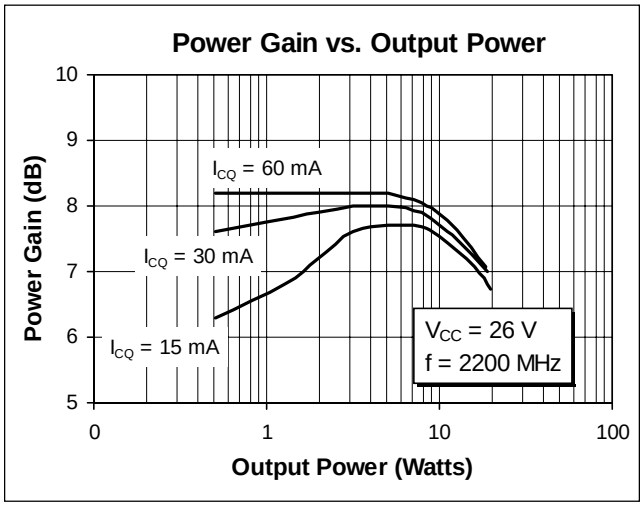
Typical Performance





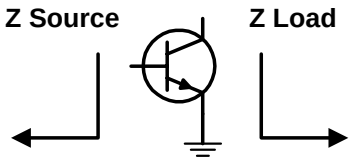


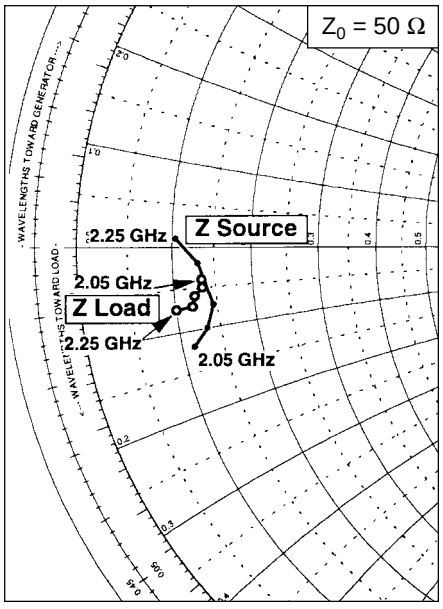




Impedance Data

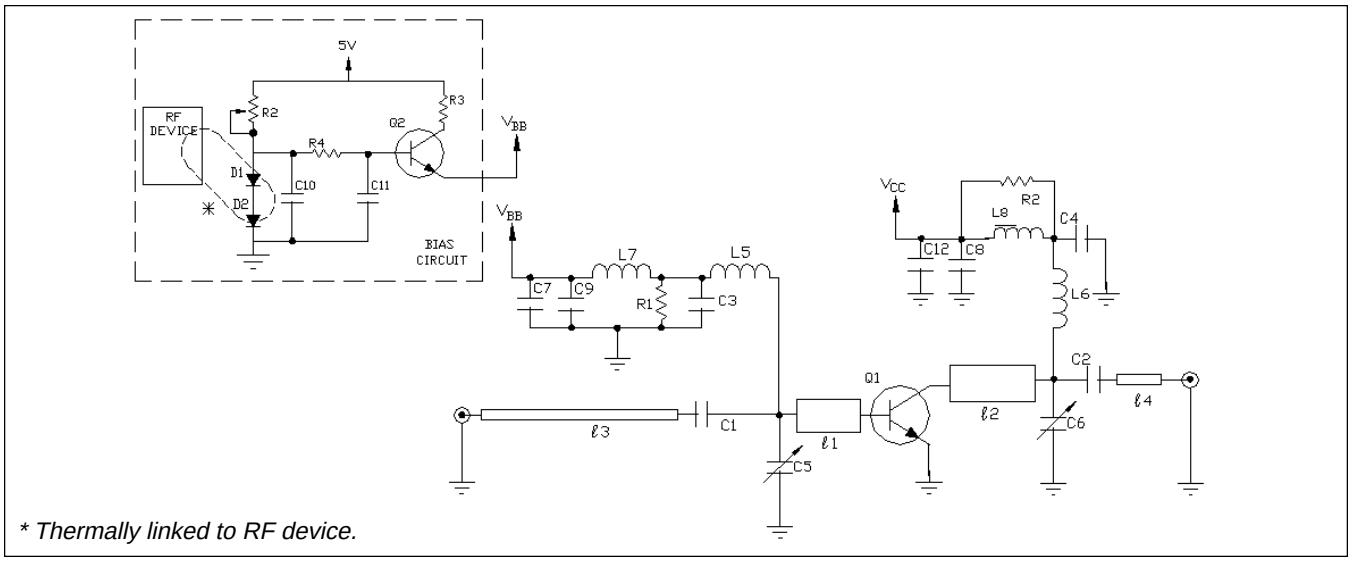
(V_{CC} = 26 Vdc, P_{out} = 18 W, I_{CQ} = 130 mA)





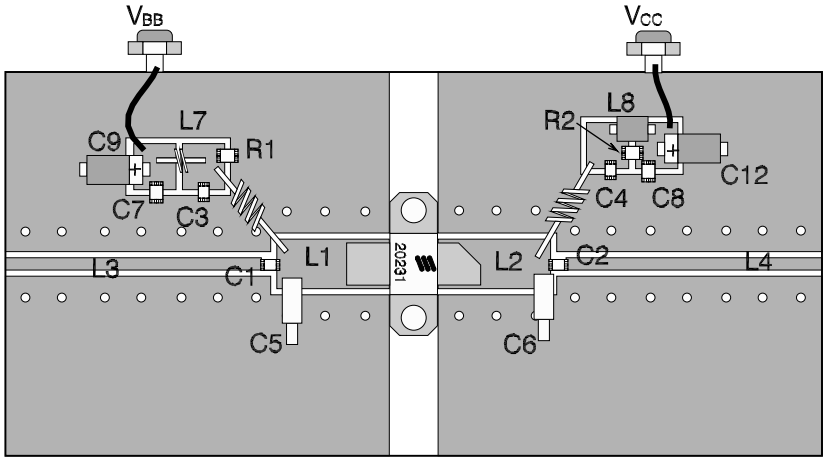
Frequency	Z Source		Z Load	
2.05	5.7	-6.0	6.7	-2.0
2.10	6.7	-5.0	6.7	-2.5
2.15	7.3	-3.6	6.2	-3.0
2.20	6.5	-1.0	6.0	-3.6
2.25	5.2	0.5	5.0	-3.7

Test Circuit

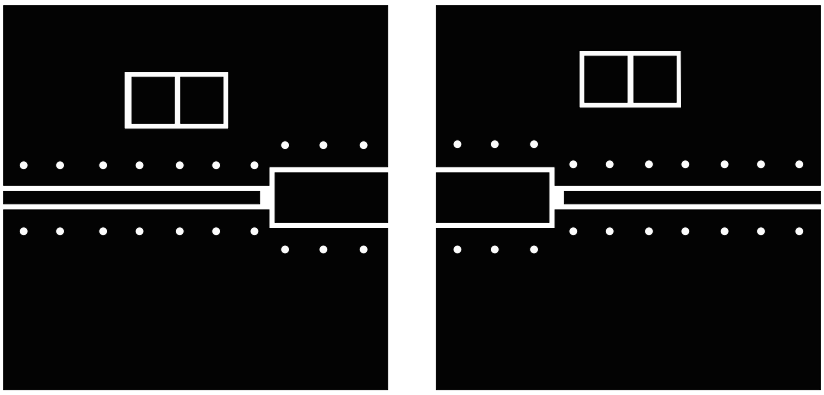


Schematic for f = 2 GHz

Q1	20321, NPN RF Transistor	C9, C10	10 pF Electrolytic Capacitor 35 V
L1, L2	0.198 λ 2.2GHz, Microstrip 18 Ω	Circuit Board	.031 G-200, Solid Copper Bottom
L3, L4	Microstrip		
50 Ω			
L5, L6	4 Turn #20 AWG, .120” I.D.	*Bias Parts (not shown on layout)*	
L7	56 μA SMT Inductor	Q2	BCP 56 SMT NPN Transistor
L8	Ferrite Bead	D1	BAV 99 Diode
C1, C2, C3, C4	18 pF 100 ATC-A	C10, C11	0.1 pF SMT Capacitor
C5, C6	0-4 pF Johanson Variable Capacitor	R2	2K Potentiometer
C7, C8	0.1 υF, 1206	R3, R4	10 Ω 1206 SMT Resistor



Board Assembly (not to scale)



Artwork (1 inch)

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

1-877-GOLDMOS
(1-877-465-3667)
e-mail: rfpower@ericsson.com
www.ericsson.com/rfpower

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