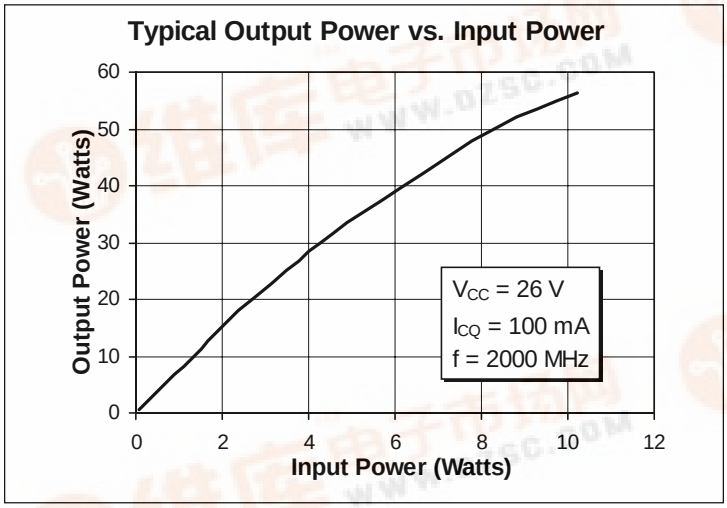
ERICSSON

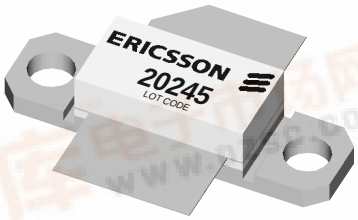
PTB 20245
35 Watts, 2.1–2.2 GHz
Wide-Band CDMA Power Transistor

Description

The 20245 is a class AB, NPN common emitter RF power transistor intended for 26 Vdc operation from 2.1 to 2.2 GHz frequency band. Rated at 35 watts minimum output power for PEP applications, it is specifically intended for operation as a final or driver stage in Wide CDMA or TDMA systems. Ion implantation, nitride surface passivation and gold metallization ensure excellent device reliability. 100% lot traceability is standard.

- 35 Watts, 2.1–2.2 GHz
- Class AB Characteristics
- Gold Metallization
- Silicon Nitride Passivated





Package 20223

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}	3.5	Vdc
Collector Current (continuous)	I_C	7.7	Adc
Total Device Dissipation at T_{flange} = 25° C Above 25°C derate by	P_D	200 1.2	Watts W/°C
Storage Temperature Range	T_{STG}	–40 to +150	°C
Thermal Resistance (T_{flange} = 70° C)	$R_{\theta JC}$	0.85	°C/W

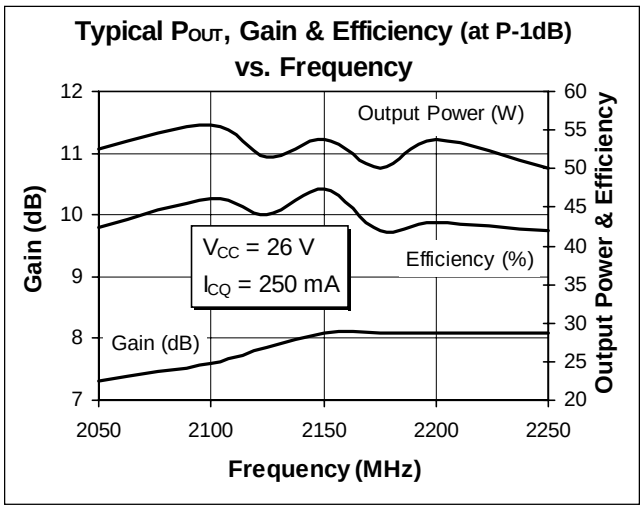
Electrical Characteristics (100% Tested)

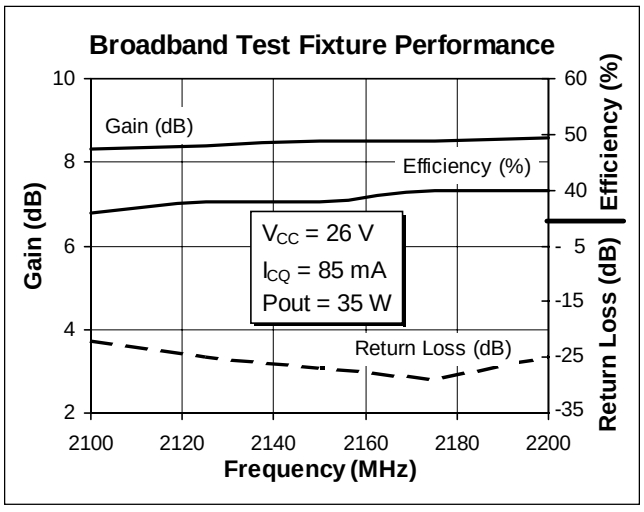
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Breakdown Voltage C to E	V_{BE} = 0 V, I_C = 20 mA	$V_{(BR)CES}$	55	—	—	Volts
Breakdown Voltage C to E	I_B = 0 A, I_C = 20 mA, R_{BE} = 22 Ω	$V_{(BR)CER}$	55	—	—	Volts
Breakdown Voltage E to B	I_C = 0 A, I_E = 5 mA	$V_{(BR)EBO}$	3.5	4.0	—	Volts
DC Current Gain	V_{CE} = 10 V, I_C = 1.5 A	h_{FE}	30	40	—	—

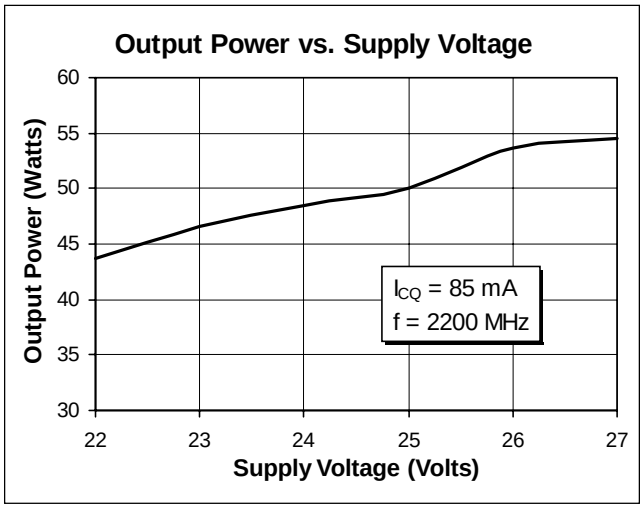
RF Specifications (100% Tested)

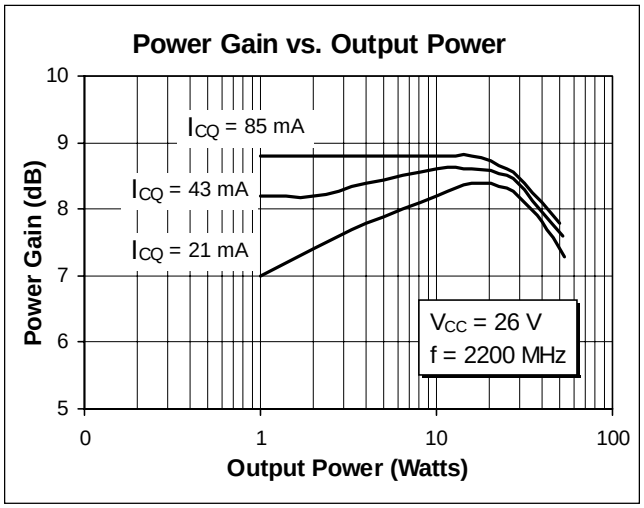
Characteristic	Symbol	Min	Typ	Max	Units
Gain (V_{CC} = 26 Vdc, P_{out} = 10 W, I_{CQ} = 85 mA, f = 2.2 GHz)	G_{pe}	7.5	8.5	—	dB
Power Output at 1 dB Compression (V_{CC} = 26 Vdc, I_{CQ} = 85 mA, f = 2.2 GHz)	P–1dB	35.0	—	—	Watts
Collector Efficiency (V_{CC} = 26 Vdc, P_{out} = 35 W, I_{CQ} = 85 mA, f = 2.2 GHz)	η_C	—	40	—	%
Load Mismatch Tolerance (V_{CC} = 26 Vdc, P_{out} = 17.5 W, I_{CQ} = 85 mA f = 2.2 GHz—all phase angles at frequency of test)	Ψ	—	—	5:1	—

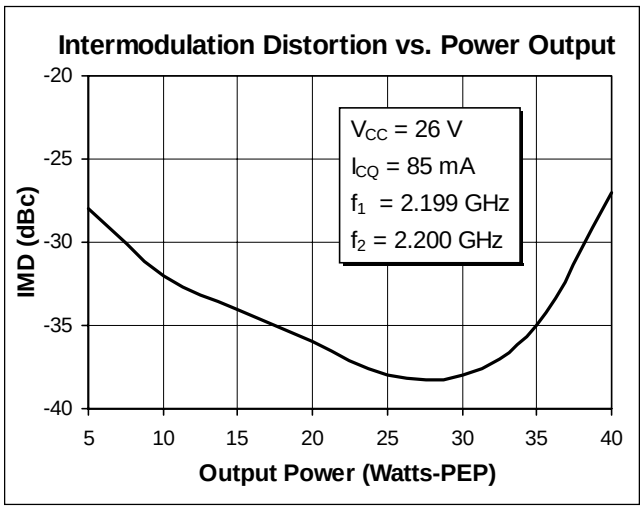
Typical Performance





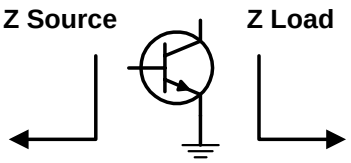




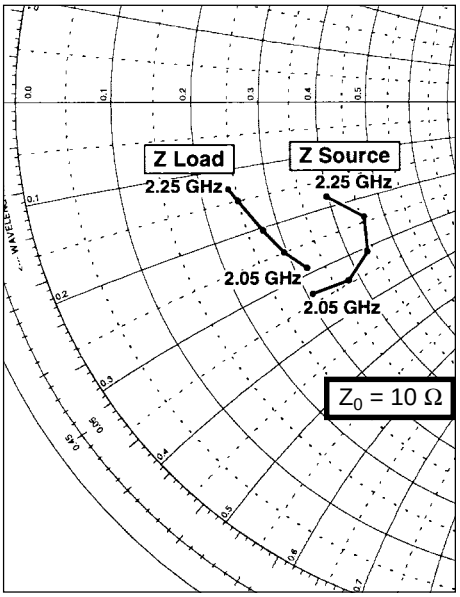


Impedance Data

(V_{CC} = 26 Vdc, Pout = 35 W, I_{CQ} = 85 mA)



Frequency	Z Source		Z Load	
GHz	R	jX	R	jX
2.05	3.09	–3.35	3.20	–2.90
2.10	3.79	–3.45	2.95	–2.50
2.15	4.38	–3.10	2.75	–2.05
2.20	4.58	–2.40	2.50	–1.50
2.25	3.98	–1.80	2.40	–1.30



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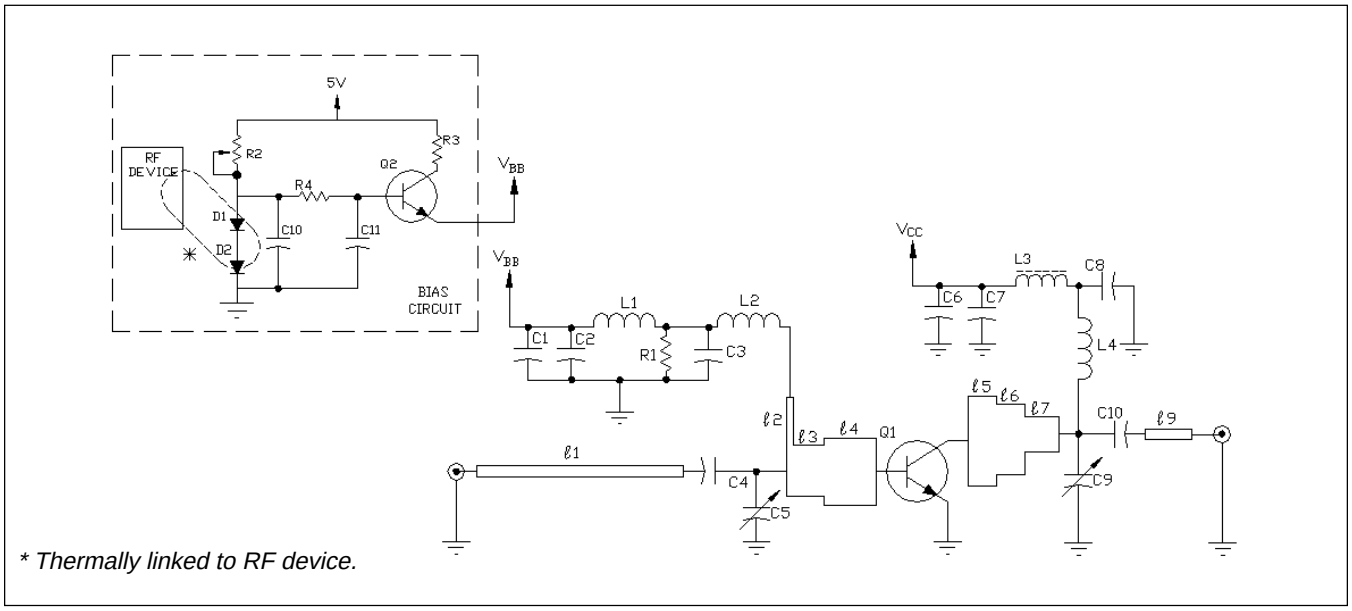
Test Circuit



** Thermally linked to RF device.*

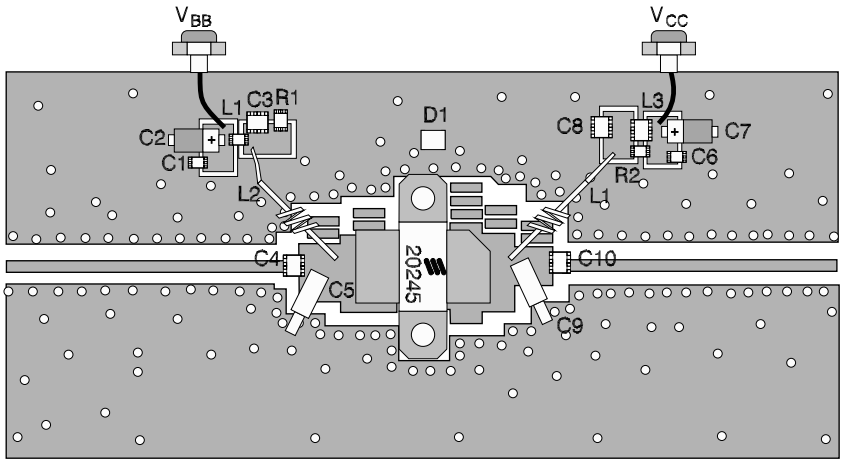
Schematic for f = 2.2 GHz

Q1	PTB 20245	NPN RF Transistor
ℓ1, ℓ9		Microstrip 50 Ω
ℓ2	.1 λ 2 GHz	Microstrip 75 Ω
ℓ3	.065 λ 2 GHz	Microstrip 16 Ω
ℓ4	.095 λ 2 GHz	Microstrip 12.5 Ω
ℓ5	.055 λ 2 GHz	Microstrip 9.7 Ω
ℓ6	.055 λ 2 GHz	Microstrip 12.5 Ω
ℓ7	.065 λ 2 GHz	Microstrip 22 Ω
C1, C6	0.1 µF	1206 Chip
C2, C7	10 µF, 35 V	SMT Tantalum
C3, C4, C8, C10	20 pF	ATC-100
C5, C9	0–4 pf	Johanson Trimmer

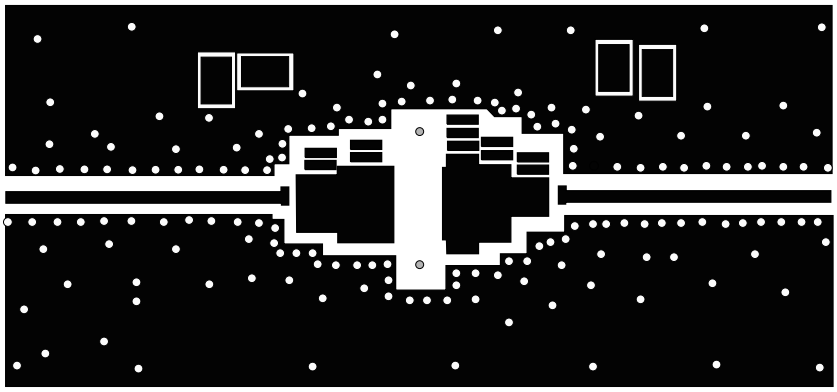
L1	56 nh	SMT Inductor
L2, L4	3 Turn #22, 0.25” O.D.	
L3	4 mm.	SMT Ferrite
R1	22 Ω	1206 SMT Resistor
Board	0.031 G-200 Solid Copper Bottom, AlliedSignal	

Bias Parts (not shown on layout)

Q2	BCP 56	SMT NPN Transistor
D1	BAV 99	Diode
C10, C11	0.1 pF	SMT Capacitor
R2	2K	Potentiometer
R3, R4	10 Ω	1206 SMT Resistor



Parts Layout (not to scale)



Artwork (1 inch)

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