

PTB 20219

70 Watts, 925–960 MHz

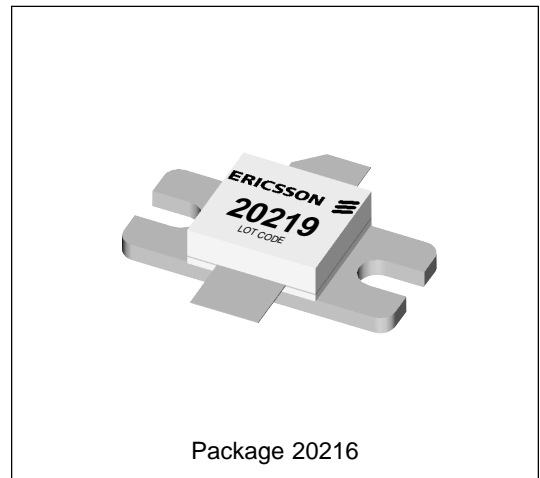
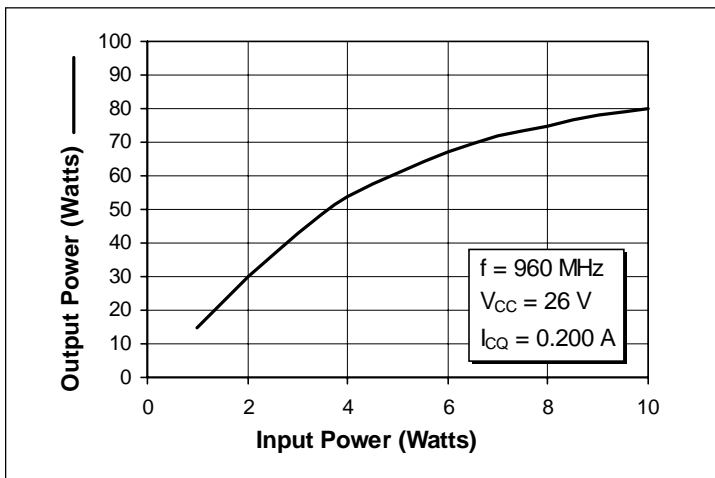
Cellular Radio RF Power Transistor

Description

The 20219 is a class AB, NPN common emitter RF power transistor intended for 26 Vdc operation across the 925 to 960 MHz frequency band. It is rated at 70 watts minimum output power 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.

- 70 Watts, 925–960 MHz
- Class AB Characteristics
- Guaranteed Performance at 26 Volts, 960 MHz
 - Output Power = 70 Watts
 - Collector Efficiency = 50% min. at 70 Watts
 - IMD = -30 max. at 50 W(PEP)
- Gold Metallization
- Silicon Nitride Passivated

Typical Output Power vs. Input Power



Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CER}	40	Vdc
Collector-Base Voltage	V_{CBO}	65	Vdc
Emitter-Base Voltage (collector open)	V_{EBO}	4.0	Vdc
Collector Current (continuous)	I_C	20	Adc
Total Device Dissipation at $T_{flange} = 25^\circ C$ Above $25^\circ C$ derate by	P_D	159 0.95	Watts W/ $^\circ C$
Storage Temperature Range	T_{STG}	-40 to +150	$^\circ C$
Thermal Resistance ($T_{flange} = 70^\circ C$)	$R_{\theta JC}$	1.1	$^\circ C/W$

Electrical Characteristics (100% Tested)

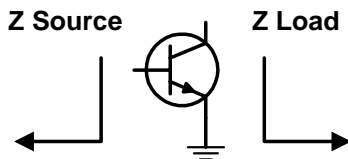
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Breakdown Voltage C to E	$I_B = 0\text{ A}, I_C = 100\text{ mA}$	$V_{(BR)CEO}$	25	30	—	Volts
Breakdown Voltage C to E	$V_{BE} = 0\text{ V}, I_C = 100\text{ mA}$	$V_{(BR)CES}$	55	70	—	Volts
Breakdown Voltage E to B	$I_C = 0\text{ A}, I_E = 5\text{ mA}$	$V_{(BR)EBO}$	3.5	5	—	Volts
DC Current Gain	$V_{CE} = 5\text{ V}, I_C = 1\text{ A}$	h_{FE}	20	50	100	—

RF Specifications (100% Tested)

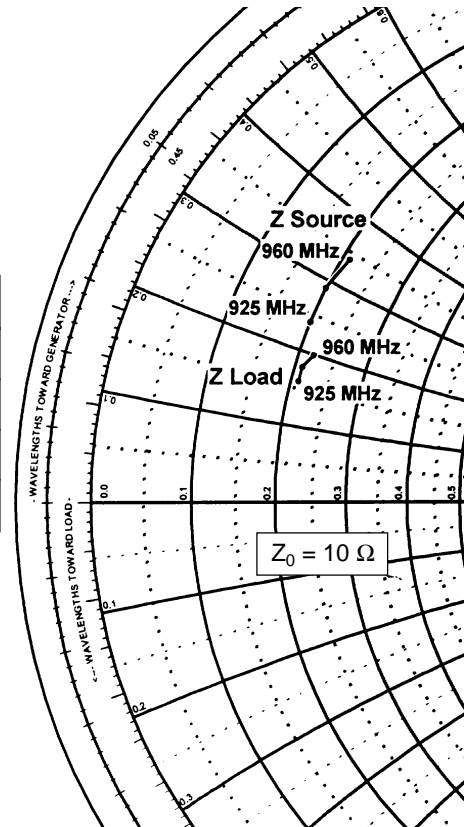
Characteristic	Symbol	Min	Typ	Max	Units
Gain ($V_{CC} = 26\text{ Vdc}, P_{out} = 70\text{ W}, I_{CQ} = 200\text{ mA}, f = 960\text{ MHz}$)	G_{pe}	8.5	9.5	—	dB
Collector Efficiency ($V_{CC} = 26\text{ Vdc}, P_{out} = 70\text{ W}, I_{CQ} = 200\text{ mA}, f = 960\text{ MHz}$)	η_C	50	—	—	%
Intermodulation Distortion ($V_{CC} = 26\text{ Vdc}, P_{out} = 50\text{ W(PEP)}, I_{CQ} = 200\text{ mA}, f = 960\text{ MHz}$)	IMD	—	-31	—	dBc
Load Mismatch Tolerance ($V_{CC} = 26\text{ Vdc}, P_{out} = 50\text{ W(PEP)}, I_{CQ} = 200\text{ mA}, f = 960\text{ MHz}$ —all phase angles at frequency of test)	Ψ	—	—	10:1	—

Impedance Data (data shown for fixed-tuned broadband circuit)

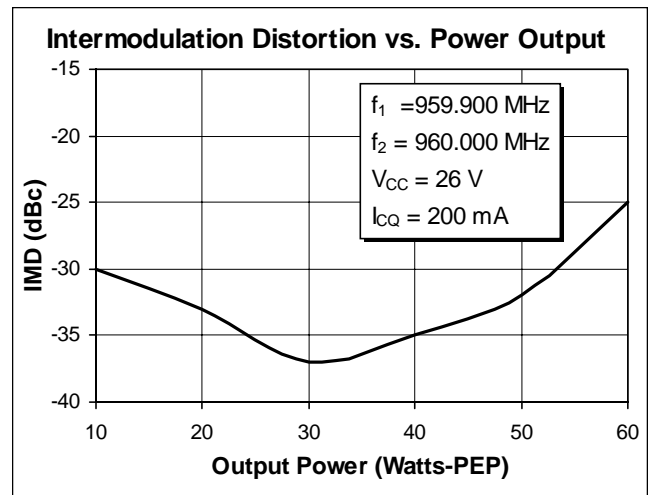
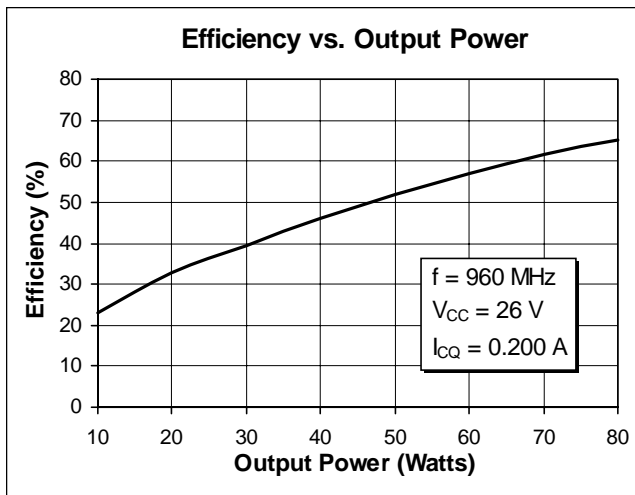
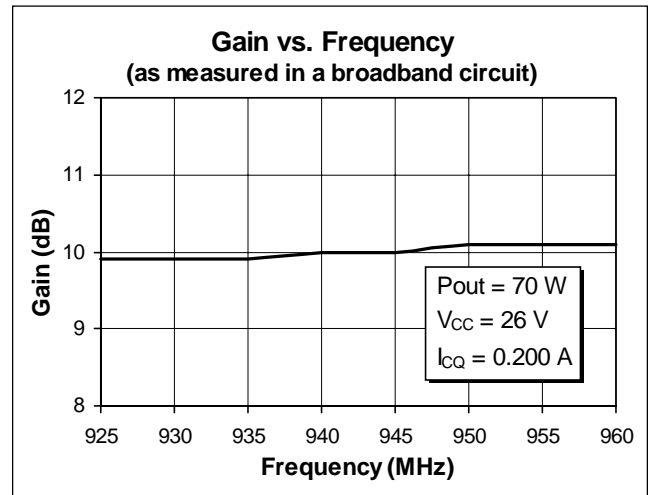
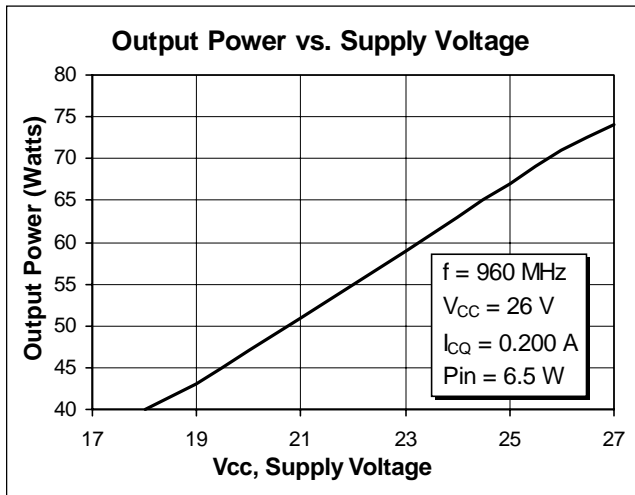
($V_{CC} = 26\text{ Vdc}, P_{out} = 70\text{ W}, I_{CQ} = 200\text{ mA}$)



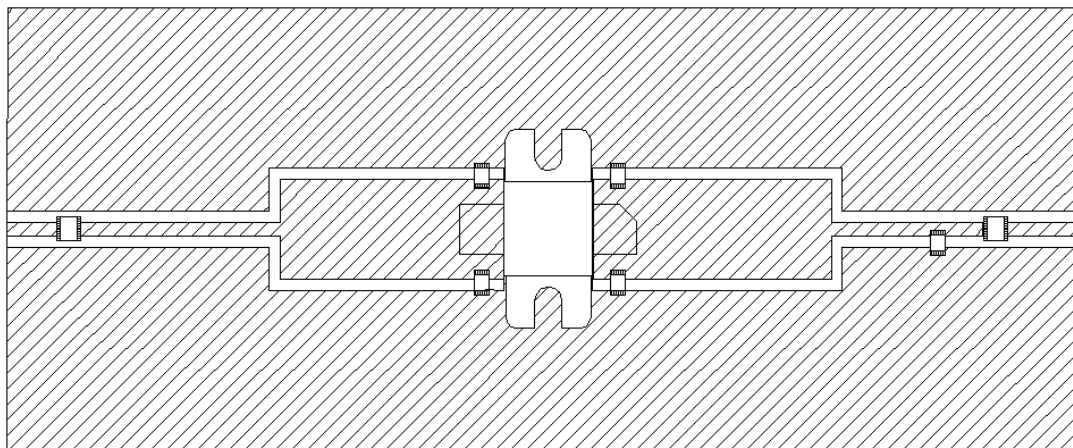
Frequency MHz	Z Source		Z Load	
	R	jX	R	jX
925	2.0	2.4	2.1	1.6
942	2.0	2.9	2.1	1.8
960	2.1	3.4	2.2	2.0



Typical Characteristics

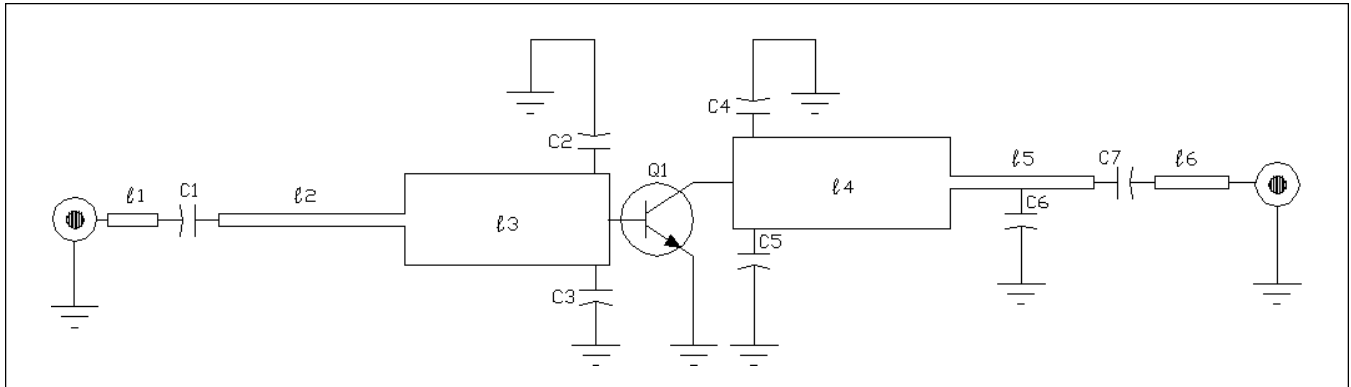


Test Circuit



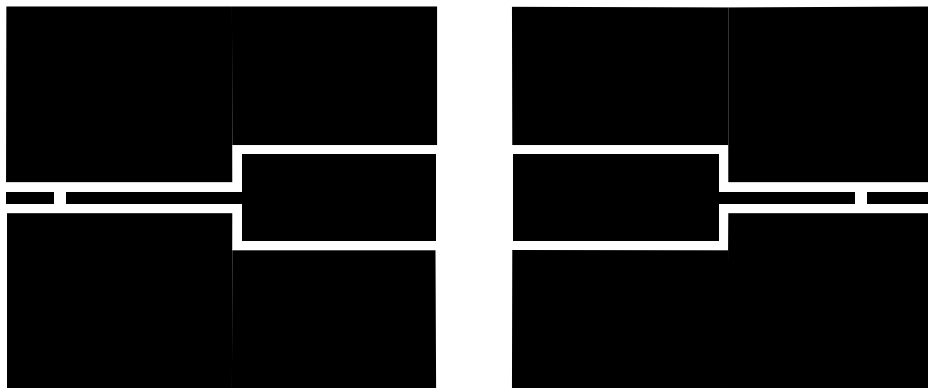
Parts Layout (not to scale)


Test Circuit



Schematic for test circuit

Q1	PTB 20219, NPN RF Transistor
l1-l6	Microstrip (see Artwork detail below)
C1, C7	51 pF, Capacitor ATC 100 B
C2, C3	3.0 pF, Capacitor ATC 100 B
C4	7.5 pF, Capacitor ATC 100 B
C5	6.2 pF, Capacitor ATC 100 B
C6	4.3 pF, Capacitor ATC 100 B
Circuit Board	.031" Thick, G-200, Solid Copper Bottom



Artwork (1 inch )

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