

# PTB 20004

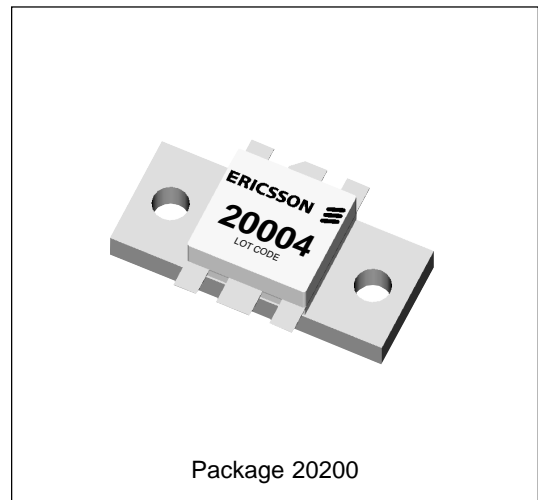
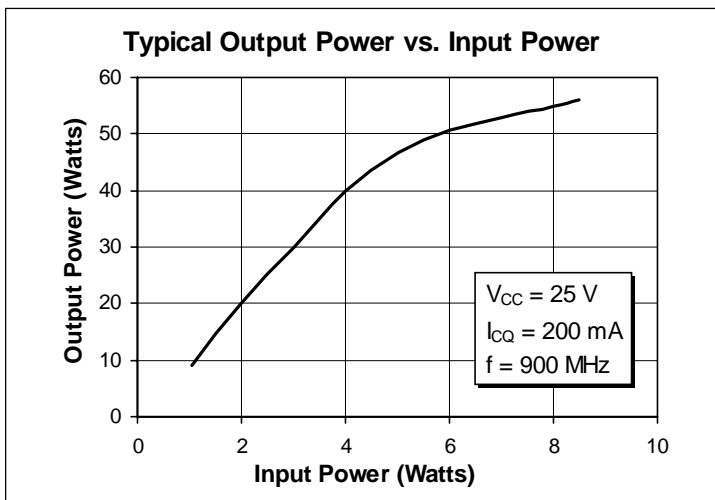
## 50 Watts, 860–900 MHz

### Cellular Radio RF Power Transistor

#### Description

The 20004 is a class AB, NPN, common emitter RF power transistor intended for 25 Vdc operation across the 860 to 900 MHz frequency band. Rated at 50 watts minimum output power, 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.

- 50 Watts, 860–900 MHz
- Class AB Characteristics
- 50% Collector Efficiency at 50 Watts
- Gold Metallization
- Silicon Nitride Passivated



#### Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CER}$	40	Vdc
Collector-Base Voltage	$V_{CBO}$	50	Vdc
Emitter-Base Voltage (collector open)	$V_{EBO}$	4.0	Vdc
Collector Current (continuous)	$I_C$	10.0	Adc
Total Device Dissipation at $T_{flange} = 25^\circ\text{C}$ Above $25^\circ\text{C}$ derate by	$P_D$	175 1.0	Watts W/°C
Storage Temperature Range	$T_{STG}$	-40 to +150	°C
Thermal Resistance ( $T_{flange} = 70^\circ\text{C}$ )	$R_{\theta JC}$	1.0	°C/W

**Electrical Characteristics** (100% Tested)

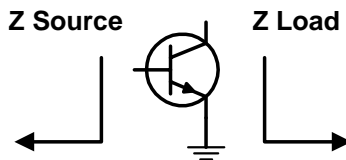
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Breakdown Voltage C to E	$I_B = 0\text{ A}, I_C = 100\text{ mA}$	$V_{(BR)CEO}$	25	30	—	Volts
Breakdown Voltage C to E	$V_{BE} = 0\text{ V}, I_C = 100\text{ mA}$	$V_{(BR)CES}$	55	70	—	Volts
Breakdown Voltage E to B	$I_C = 0\text{ A}, I_E = 5\text{ mA}$	$V_{(BR)EBO}$	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
<b>Gain</b> ( $V_{CC} = 25\text{ Vdc}, P_{out} = 50\text{ W}, I_{CQ} = 200\text{ mA}, f = 900\text{ MHz}$ )	$G_{pe}$	8.0	9.5	—	dB
<b>Collector Efficiency</b> ( $V_{CC} = 25\text{ Vdc}, P_{out} = 50\text{ W}, I_{CQ} = 200\text{ mA}, f = 900\text{ MHz}$ )	$\eta_C$	50	—	—	%
<b>Intermodulation Distortion</b> ( $V_{CC} = 25\text{ Vdc}, P_{out} = 50\text{ W(PEP)}, I_{CQ} = 200\text{ mA}, f_1 = 899\text{ MHz}, f_2 = 900\text{ MHz}$ )	IMD	—	-21	—	dBc
<b>Load Mismatch Tolerance</b> ( $V_{CC} = 25\text{ Vdc}, P_{out} = 50\text{ W}, I_{CQ} = 200\text{ mA}, f = 900\text{ MHz}$ —all phase angles at frequency of test)	$\Psi$	—	—	10:1	—

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

( $V_{CC} = 25\text{ Vdc}, P_{out} = 50\text{ W}, I_{CQ} = 200\text{ mA}$ )



Frequency MHz	Z Source		Z Load	
	R	jX	R	jX
860	7.1	-1.7	5.0	-3.5
880	6.9	-1.2	5.1	-3.9
900	6.7	-0.6	5.2	-4.5

