

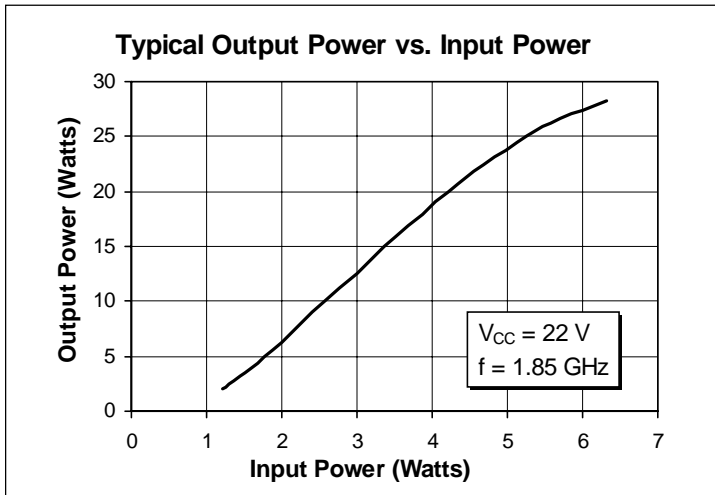
PTB 20157

20 Watts, 1.35–1.85 GHz RF Power Transistor

Description

The 20157 is an NPN common base RF power transistor intended for 22–26 Vdc class C operation from 1.35 to 1.85 GHz. Rated at 20 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.

- 20 Watts, 1.35–1.85 GHz
- Class C Characteristics
- 40% Min Collector Efficiency at 20 Watts
- Gold Metallization
- Silicon Nitride Passivated



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	Vdc
Collector Current (continuous)	I_C	6	Adc
Total Device Dissipation at $T_{flange} = 25^{\circ}C$ Above $25^{\circ}C$ derate by	P_D	75 0.43	Watts W/ $^{\circ}C$
Storage Temperature Range	T_{STG}	-40 to +150	$^{\circ}C$
Thermal Resistance ($T_{flange} = 70^{\circ}C$)	$R_{\theta JC}$	2.33	$^{\circ}C/W$

Electrical Characteristics (100% Tested)

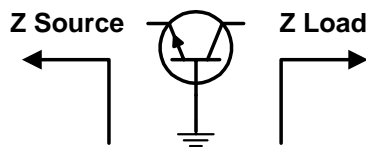
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Breakdown Voltage C to E	$I_C = 50 \text{ mA}$, $R_{BE} = 27 \Omega$	$V_{(BR)CER}$	50	—	—	Volts
Breakdown Voltage C to E	$V_{BE} = 0 \text{ V}$, $I_C = 50 \text{ mA}$	$V_{(BR)CES}$	50	—	—	Volts
Breakdown Voltage E to B	$I_C = 0 \text{ A}$, $I_E = 5 \text{ mA}$	$V_{(BR)EBO}$	4	5	—	Volts
DC Current Gain	$V_{CE} = 5 \text{ V}$, $I_C = 500 \text{ mA}$	h_{FE}	20	50	120	—

RF Specifications (100% Tested)

Characteristic	Symbol	Min	Typ	Max	Units
Gain ($V_{CC} = 22 \text{ Vdc}$, $P_{Out} = 20 \text{ W}$, $f = 1.85 \text{ GHz}$)	G_{pe}	6	7	—	dB
Collector Efficiency ($V_{CC} = 22 \text{ Vdc}$, $P_{Out} = 20 \text{ W}$, $f = 1.85 \text{ GHz}$)	η_C	40	43	—	%
Load Mismatch Tolerance ($V_{CC} = 22 \text{ Vdc}$, $P_{Out} = 20 \text{ W}$, $f = 1.85 \text{ GHz}$ —all phase angles at frequency of test)	Ψ	—	—	10:1	—

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

($V_{CC} = 22 \text{ Vdc}$, $P_{Out} = 20 \text{ W}$)



Frequency GHz	Z Source		Z Load	
	R	jX	R	jX
1.350	8.2	-15.0	9.3	-15
1.400	7.7	-13.0	8.8	-15
1.450	7.4	-12.0	8.3	-14
1.500	7.3	-11.0	7.9	-14
1.550	7.2	-10.0	7.5	-13
1.600	7.3	-9.2	7.2	-13
1.650	7.4	-8.6	6.9	-13
1.700	7.6	-8.1	6.6	-12
1.750	7.9	-7.8	6.4	-12
1.800	8.1	-7.6	6.2	-11
1.850	8.4	-7.5	6.1	-11

Typical Performance

