

# PTB 20166

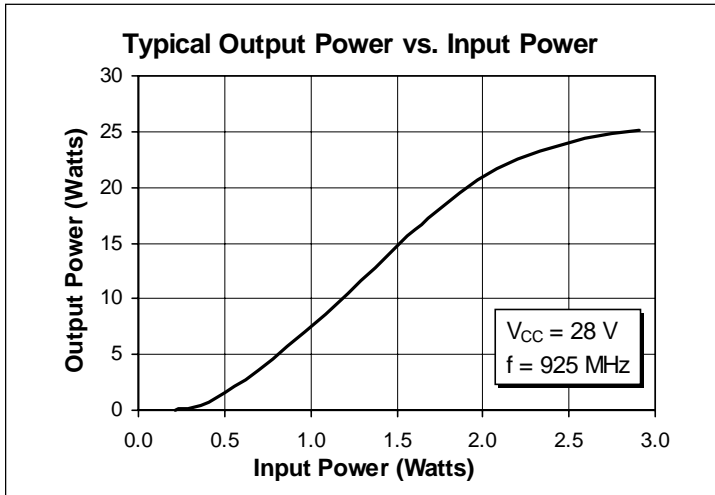
## 23 Watts, 675–925 MHz

### Common Base RF Power Transistor

#### Description

The 20166 is an NPN, common base RF power transistor intended for 24–30 Vdc class C operation from 675 to 925 MHz. Rated at 23 watts minimum output power, it may be used for both CW and pulsed applications. Ion implantation, nitride surface passivation and gold metallization are used to ensure excellent device reliability. 100% lot traceability is standard.

- Specified at 28 Volt, 925 MHz
- Class C Characteristics
- 55% Min Collector Efficiency at 23 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)	$I_C$	4	Adc
Total Device Dissipation at $T_{flange} = 25^{\circ}C$ Above $25^{\circ}C$ derate by	$P_D$	48 0.27	Watts W/ $^{\circ}C$
Storage Temperature Range	$T_{STG}$	-40 to +150	$^{\circ}C$
Thermal Resistance ( $T_{flange} = 70^{\circ}C$ )	$R_{\theta JC}$	3.6	$^{\circ}C/W$

## Electrical Characteristics (100% Tested)

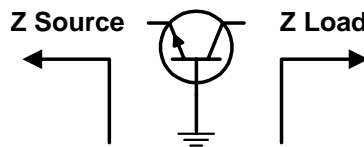
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Breakdown Voltage C to E	$I_C = 50 \text{ mA}$ , $R_{BE} = 27 \Omega$	$V_{(BR)CER}$	50	—	—	Volts
Breakdown Voltage C to E	$V_{BE} = 0 \text{ V}$ , $I_C = 50 \text{ mA}$	$V_{(BR)CES}$	50	—	—	Volts
Breakdown Voltage E to B	$I_C = 0 \text{ A}$ , $I_E = 5 \text{ mA}$	$V_{(BR)EBO}$	4	—	—	Volts
DC Current Gain	$V_{CE} = 5 \text{ V}$ , $I_C = 500 \text{ mA}$	$h_{FE}$	30	50	100	—

## RF Specifications (100% Tested)

Characteristic	Symbol	Min	Typ	Max	Units
<b>Gain</b> ( $V_{CC} = 28 \text{ Vdc}$ , $P_{Out} = 23 \text{ W}$ , $f = 925 \text{ MHz}$ )	$G_{pe}$	8	9	—	dB
<b>Collector Efficiency</b> ( $V_{CC} = 28 \text{ Vdc}$ , $P_{Out} = 23 \text{ W}$ , $f = 925 \text{ MHz}$ )	$\eta_C$	55	65	—	%
<b>Load Mismatch Tolerance</b> ( $V_{CC} = 28 \text{ Vdc}$ , $P_{Out} = 23 \text{ W}$ , $f = 925 \text{ MHz}$ —all phase angles at frequency of test)	$\Psi$	—	—	5:1	—

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

( $V_{CC} = 28 \text{ Vdc}$ ,  $P_{Out} = 23 \text{ W}$ )



Frequency	Z Source		Z Load	
	R	jX	R	jX
675	7.4	-1.8	6.6	9.0
700	7.2	-1.4	7.2	8.6
725	7.0	-1.1	7.5	8.1
750	6.9	-0.79	7.6	7.6
775	6.6	-0.52	7.6	7.1
800	6.4	-0.26	7.5	6.7
825	6.1	0.01	7.2	6.4
850	5.7	0.29	6.9	6.2
875	5.3	0.62	6.6	6.1
900	4.9	1.0	6.2	6.0
925	4.5	1.4	5.9	6.1

**Typical Performance**

