

# PTB 20179

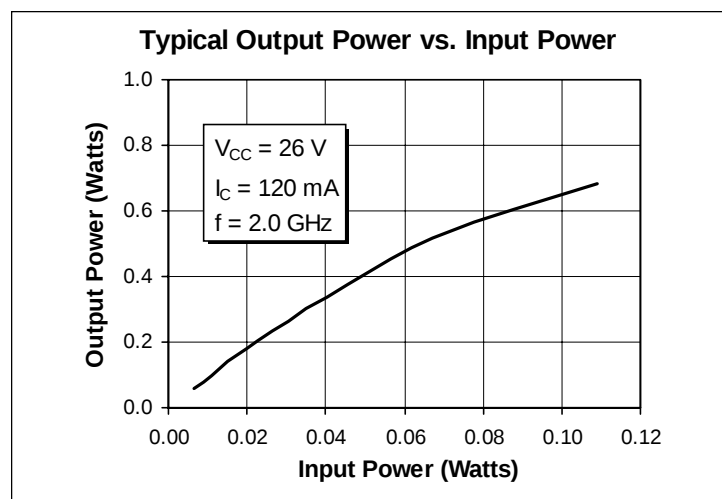
## 0.4 Watt, 1.8–2.0 GHz

### Cellular Radio RF Power Transistor

#### Description

The 20179 is an NPN, common emitter RF power transistor intended for class A, 26 Vdc operation from 1.8 to 2.0 GHz. Rated at 0.4 watt 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.

- 0.4 Watt, 1.8–2.0 GHz
- Class A Characteristics
- Gold Metallization
- Silicon Nitride Passivated
- Surface Mountable
- Available in Tape and Reel



#### Maximum Ratings

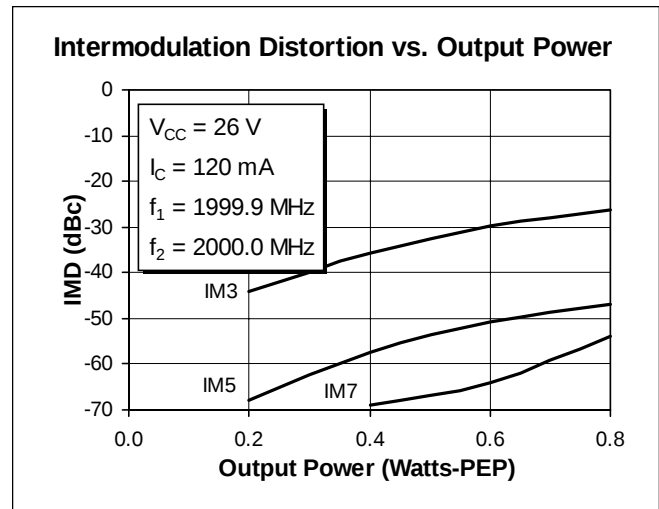
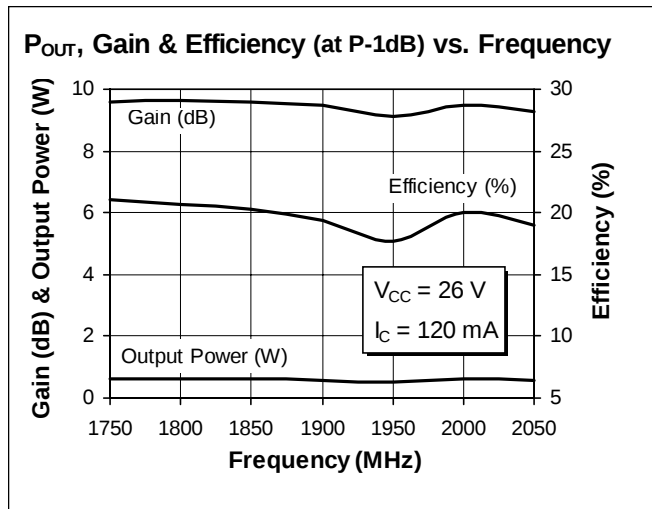
| Parameter                                                                               | Symbol          | Value        | Unit                   |
|-----------------------------------------------------------------------------------------|-----------------|--------------|------------------------|
| Collector-Emitter Voltage                                                               | $V_{CE}$        | 50           | Vdc                    |
| Collector-Base Voltage                                                                  | $V_{CB}$        | 50           | Vdc                    |
| Emitter-Base Voltage (collector open)                                                   | $V_{EB}$        | 4.0          | Vdc                    |
| Collector Current (continuous)                                                          | $I_C$           | 0.5          | Adc                    |
| Total Device Dissipation at $T_{flange} = 25^{\circ}C$<br>Above $25^{\circ}C$ derate by | $P_D$           | 5.4<br>0.031 | Watts<br>$W/^{\circ}C$ |
| Storage Temperature Range                                                               | $T_{STG}$       | -40 to +150  | $^{\circ}C$            |
| Thermal Resistance ( $T_{flange} = 70^{\circ}C$ )                                       | $R_{\theta JC}$ | 32.3         | $^{\circ}C/W$          |

**Electrical Characteristics** (100% Tested)

| Characteristic           | Conditions                                                        | Symbol        | Min | Typ | Max | Units |
|--------------------------|-------------------------------------------------------------------|---------------|-----|-----|-----|-------|
| Breakdown Voltage C to E | $I_B = 0\text{ A}$ , $I_C = 10\text{ mA}$ , $R_{BE} = 22\ \Omega$ | $V_{(BR)CER}$ | 50  | —   | —   | Volts |
| Breakdown Voltage C to E | $V_{BE} = 0\text{ V}$ , $I_C = 5\text{ mA}$                       | $V_{(BR)CES}$ | 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          | $V_{CE} = 5\text{ V}$ , $I_C = 250\text{ mA}$                     | $h_{FE}$      | 20  | 40  | —   | —     |

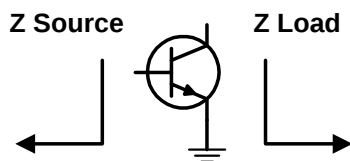
**RF Specifications** (100% Tested)

| Characteristic                                                                                                                                                                    | Symbol   | Min | Typ | Max | Units |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----|-----|-----|-------|
| <b>Gain</b><br>( $V_{CC} = 26\text{ Vdc}$ , $P_{Out} = 0.2\text{ W}$ , $I_C = 120\text{ mA}$ , $f = 2.0\text{ GHz}$ )                                                             | $G_{pe}$ | 8   | 10  | —   | dB    |
| <b>Output Power at 1 dB Compressed</b><br>( $V_{CC} = 26\text{ Vdc}$ , $I_C = 120\text{ mA}$ , $f = 2.0\text{ GHz}$ )                                                             | P-1dB    | 0.4 | 0.6 | —   | Watts |
| <b>Load Mismatch Tolerance</b><br>( $V_{CC} = 26\text{ Vdc}$ , $P_{Out} = 0.2\text{ W}$ , $I_C = 120\text{ mA}$ ,<br>$f = 2.0\text{ GHz}$ —all phase angles at frequency of test) | $\Psi$   | —   | —   | 5:1 | —     |

**Typical Performance**

## Impedance Data

$V_{CC} = 26 \text{ Vdc}$ ,  $P_{out} = 0.2 \text{ W}$ ,  $I_C = 120 \text{ mA}$



| Frequency | Z Source |      | Z Load |      |
|-----------|----------|------|--------|------|
| GHz       | R        | jX   | R      | jX   |
| 1.75      | 12.0     | -0.9 | 20.8   | 28.0 |
| 1.80      | 12.6     | -1.2 | 23.3   | 28.3 |
| 1.85      | 13.0     | -1.7 | 21.2   | 26.3 |
| 1.90      | 12.8     | -2.5 | 19.4   | 23.8 |
| 1.95      | 11.0     | -1.9 | 18.2   | 23.2 |
| 2.00      | 10.4     | -1.3 | 17.5   | 23.7 |
| 2.05      | 11.9     | 1.2  | 17.2   | 24.0 |

