

# PTB 20082

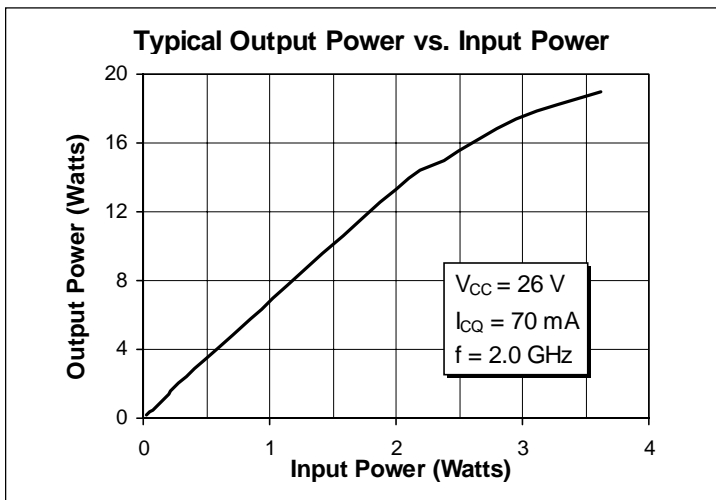
## 15 Watts, 1.8–2.0 GHz

### Cellular Radio RF Power Transistor

#### Description

The 20082 is a class AB, NPN, common emitter RF power transistor intended for 26 Vdc operation from 1.8 to 2.0 GHz. Rated at 15 watts output power, it may be used for both CW and PEP applications. Ion implantation, nitride surface passivation and gold metallization ensure excellent device reliability. 100% lot traceability is standard.

- 10 Watts Linear Power
- Output Power at 1 dB Compressed = 15 W
- Class AB Characteristics
- 30% Collector Efficiency at 7.5 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)	$V_{EBO}$	4.0	Vdc
Collector Current (continuous)	$I_C$	1.4	Adc
Total Device Dissipation at $T_{flange} = 25^\circ\text{C}$ Above $25^\circ\text{C}$ derate by	$P_D$	52 0.29	Watts W/ $^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-40 to +150	$^\circ\text{C}$
Thermal Resistance ( $T_{flange} = 70^\circ\text{C}$ )	$R_{\theta JC}$	3.4	$^\circ\text{C/W}$

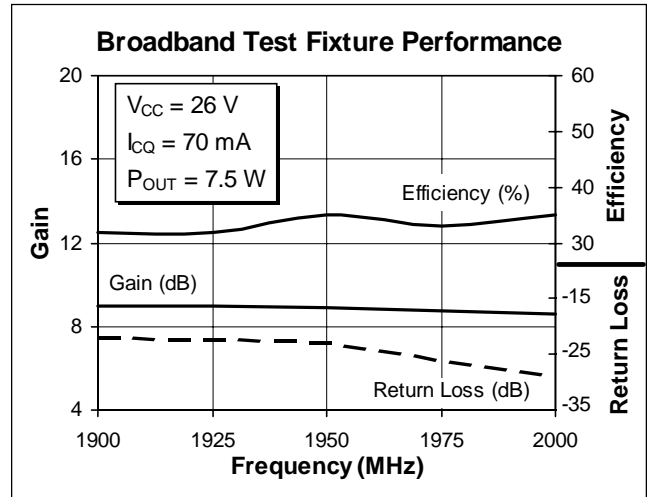
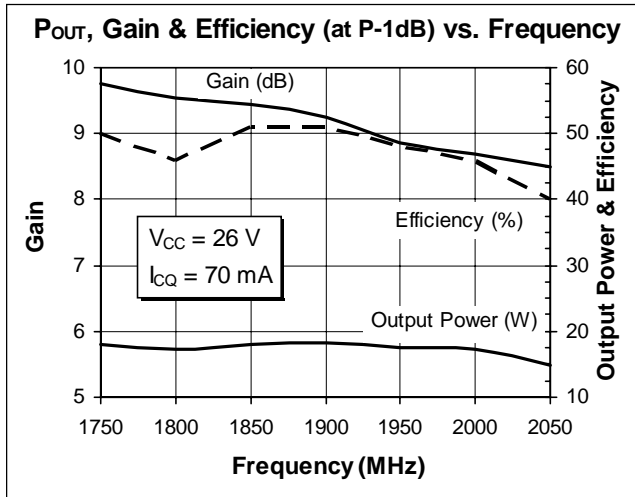
**Electrical Characteristics** (100% Tested)

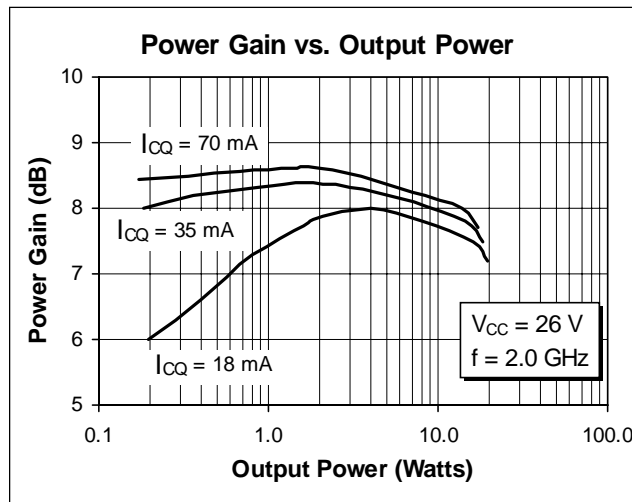
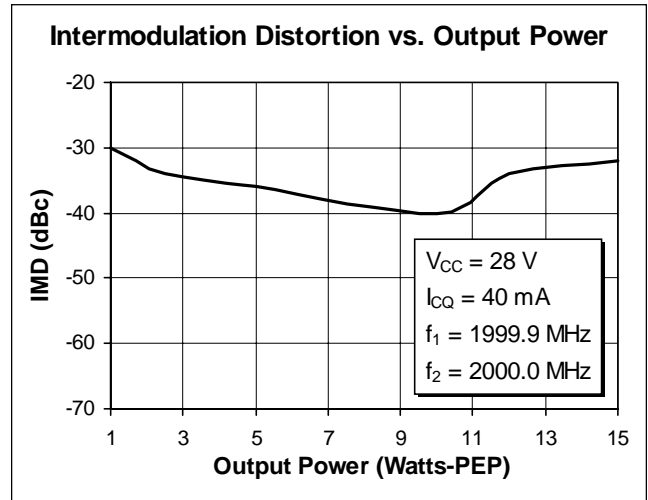
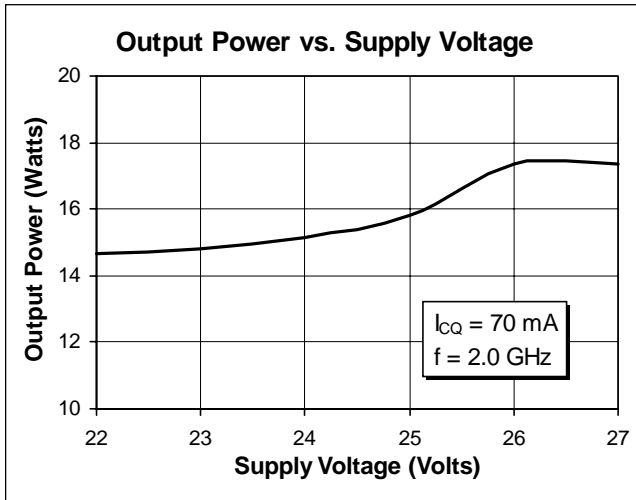
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Breakdown Voltage C to E	$I_B = 0\text{ A}, I_C = 5\text{ mA}, R_{BE} = 22\ \Omega$	$V_{(BR)CER}$	50	—	—	Volts
Breakdown Voltage C to E	$V_{BE} = 0\text{ V}, I_C = 5\text{ mA}$	$V_{(BR)CES}$	50	—	—	Volts
Breakdown Voltage E to B	$I_C = 0\text{ A}, I_E = 5\text{ mA}$	$V_{(BR)EBO}$	4	5	—	Volts
DC Current Gain	$V_{CE} = 5\text{ V}, I_C = 250\text{ mA}$	$h_{FE}$	20	—	—	—

**RF Specifications** (100% Tested)

Characteristic	Symbol	Min	Typ	Max	Units
<b>Gain</b> ( $V_{CC} = 26\text{ Vdc}, P_{OUT} = 7.5\text{ W}, I_{CQ} = 70\text{ mA}, f = 2.0\text{ GHz}$ )	$G_{pe}$	8	9	—	dB
<b>Output Power at 1 dB Compression</b> ( $V_{CC} = 26\text{ Vdc}, I_{CQ} = 70\text{ mA}, f = 2.0\text{ GHz}$ )	P-1dB	15	—	—	Watts
<b>Collector Efficiency</b> ( $V_{CC} = 26\text{ Vdc}, P_{OUT} = 7.5\text{ W}, I_{CQ} = 70\text{ mA}, f = 2.0\text{ GHz}$ )	$\eta_C$	30	—	—	%
<b>Load Mismatch Tolerance</b> ( $V_{CC} = 26\text{ Vdc}, P_{OUT} = 7.5\text{ W}, I_{CQ} = 70\text{ mA}, f = 2.0\text{ GHz}$ —all phase angles at frequency of test)	$\Psi$	—	—	5:1	—

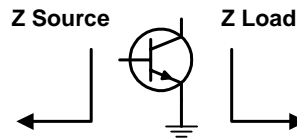
**Typical Performance**



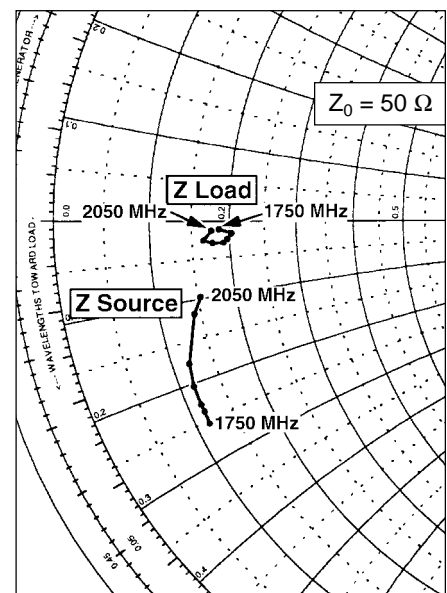


**Impedance Data**

$V_{CC} = 26 \text{ Vdc}$ ,  $P_{OUT} = 7.5 \text{ W}$ ,  $I_{CQ} = 70 \text{ mA}$



Frequency GHz	Z Source		Z Load	
	R	jX	R	jX
1.75	5.8	-12.7	9.29	-0.6
1.80	5.8	-11.9	10.15	-0.9
1.85	5.8	-11.4	9.80	-1.3
1.90	5.8	-10.2	9.58	-1.5
1.95	6.0	-8.8	8.83	-1.5
2.00	7.1	-5.9	8.23	-1.3
2.05	7.7	-4.9	8.79	-0.7



**Typical Scattering Parameters**

( $V_{CE} = 26\text{ V}$ ,  $I_C = 0.5\text{ A}$ )

f (MHz)	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
100	0.855	-176	4.80	82	0.008	-24	0.776	-172
200	0.879	-176	3.55	75	0.007	-27	0.821	-172
300	0.931	-176	1.36	40	0.003	-29	0.911	-174
400	0.961	-178	0.558	22	0.002	31	0.962	-177
500	0.977	-179	0.157	19	0.004	78	0.985	180
600	0.984	180	0.103	145	0.006	84	1.00	177
700	0.989	178	0.263	149	0.009	81	0.998	173
800	0.992	177	0.380	142	0.012	76	0.962	170
900	0.998	176	0.476	134	0.015	72	0.931	168
1000	0.998	175	0.563	125	0.018	66	0.896	166
1100	0.997	173	0.650	116	0.021	60	0.868	165
1200	0.991	172	0.740	107	0.023	54	0.833	164
1300	0.987	170	0.847	98	0.026	50	0.791	162
1400	0.974	168	0.978	87	0.030	44	0.738	161
1500	0.950	165	1.15	75	0.035	35	0.674	161
1600	0.905	163	1.39	59	0.041	24	0.594	164
1700	0.824	160	1.67	39	0.047	7	0.523	173
1800	0.708	163	1.86	12	0.050	-18	0.552	-172
1900	0.659	173	1.83	-17	0.044	-45	0.702	-167
2000	0.731	-178	1.57	-46	0.033	-69	0.839	-171
2100	0.827	-178	1.22	-69	0.023	-91	0.892	-178
2200	0.889	-180	0.919	-85	0.016	-114	0.894	178