

# PTB 20239

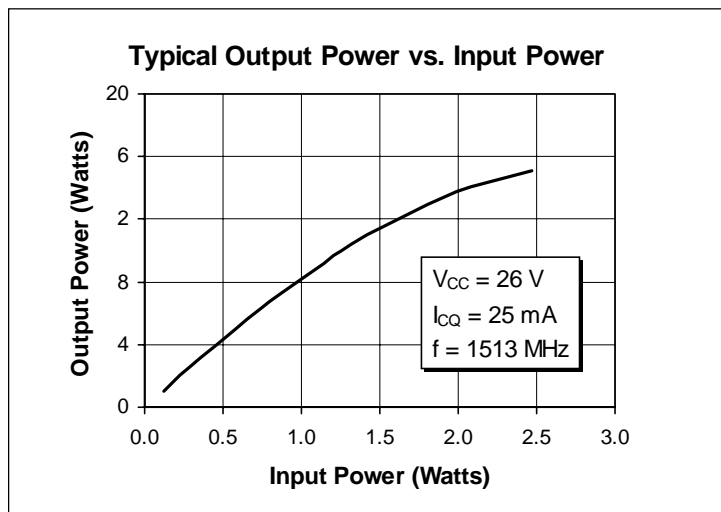
## 12 Watts, 1465–1513 MHz

### Cellular Radio RF Power Transistor

#### Description

The PTB 20239 is a class AB, NPN, common emitter RF power transistor intended for 26 Vdc operation from 1465 to 1513 MHz. Rated at 12 watts minimum 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.

- 12 Watts, 26 Vdc
- Class AB Characteristics
- Surface Mountable
- Available in Tape and Reel
- 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)	$I_C$	2.0	Adc
Total Device Dissipation at $T_{flange} = 25^\circ\text{C}$ Above $25^\circ\text{C}$ derate by	$P_D$	33 0.189	Watts W/ $^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-40 to +150	$^\circ\text{C}$
Thermal Resistance ( $T_{flange} = 70^\circ\text{C}$ )	$R_{\theta JC}$	5.3	$^\circ\text{C}/\text{W}$

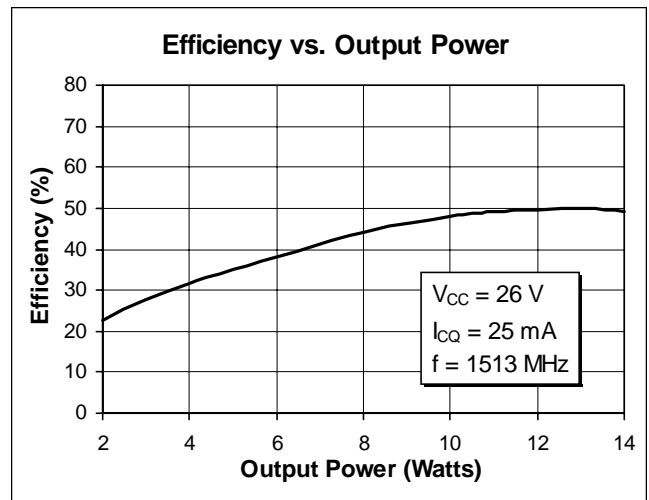
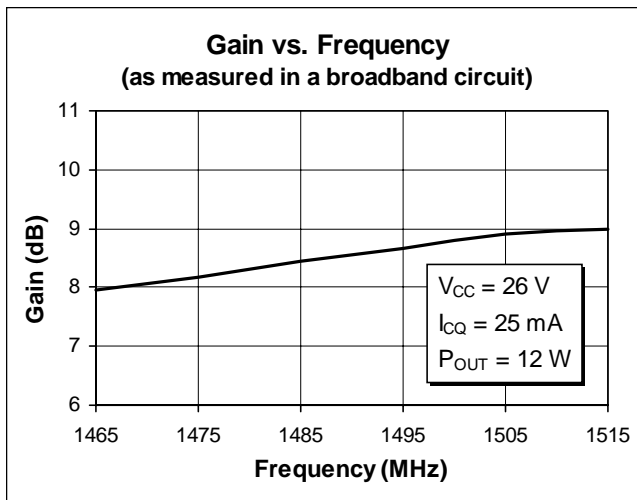
**Electrical Characteristics** (100% Tested)

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)

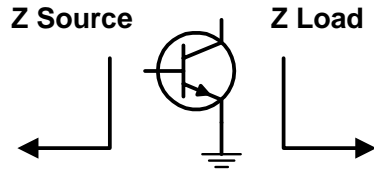
Characteristic	Symbol	Min	Typ	Max	Units
<b>Gain</b> ( $V_{CC} = 26\text{ Vdc}, P_{OUT} = 10\text{ W}, I_{CQ} = 25\text{ mA}, f = 1513\text{ MHz}$ )	$G_{pe}$	8	—	—	dB
<b>Power Output at 1 dB Compression</b> ( $V_{CC} = 26\text{ Vdc}, I_{CQ} = 25\text{ mA}, f = 1513\text{ MHz}$ )	P-1dB	12	13	—	Watts
<b>Collector Efficiency</b> ( $V_{CC} = 26\text{ Vdc}, P_{OUT} = 12\text{ W}, I_{CQ} = 25\text{ mA}, f = 1513\text{ MHz}$ )	$\eta_C$	40	—	—	%
<b>Load Mismatch Tolerance</b> ( $V_{CC} = 26\text{ Vdc}, P_{OUT} = 12\text{ W}, I_{CQ} = 25\text{ mA}, f = 1513\text{ MHz}$ —all phase angles at frequency of test)	$\Psi$	—	—	5:1	—

**Typical Performance**

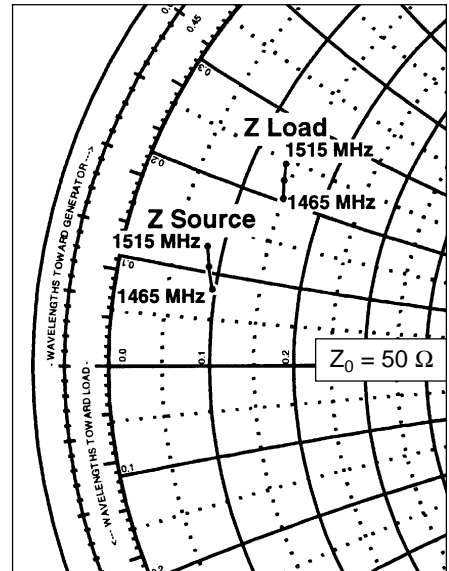


**Impedance Data** (shown for fixed-tuned broadband circuit)

$V_{CC} = 26 \text{ Vdc}$ ,  $P_{OUT} = 12 \text{ W}$ ,  $I_{CQ} = 25 \text{ mA}$



Frequency MHz	Z Source		Z Load	
	R	jX	R	jX
1465	4.84	4.15	7.52	10.26
1490	4.45	5.33	7.16	11.29
1515	4.13	6.39	6.89	12.25



**Typical Scattering Parameters**

( $V_{CE} = 26 \text{ V}$ ,  $I_C = 0.250 \text{ A}$ )

f (MHz)	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
100	0.914	-179	6.76	103	0.018	34	0.597	172
200	0.920	180	5.58	99	0.019	40	0.591	173
300	0.930	177	3.28	85	0.025	51	0.581	176
400	0.930	175	2.46	77	0.031	56	0.581	177
500	0.924	174	2.02	69	0.037	58	0.578	179
600	0.916	172	1.75	62	0.044	59	0.580	180
700	0.909	171	1.56	56	0.051	59	0.580	179
800	0.901	170	1.43	49	0.057	58	0.570	180
900	0.895	168	1.35	42	0.064	57	0.566	-179
1000	0.882	167	1.30	35	0.070	56	0.561	-177
1100	0.867	165	1.28	28	0.076	54	0.564	-175
1200	0.844	164	1.28	19	0.082	51	0.569	-173
1300	0.818	163	1.30	9	0.086	48	0.584	-170
1400	0.785	163	1.32	-2	0.087	45	0.614	-167
1500	0.756	165	1.34	-16	0.084	42	0.672	-164
1600	0.744	168	1.33	-32	0.077	42	0.755	-164
1700	0.768	171	1.26	-51	0.071	48	0.852	-167
1800	0.823	173	1.13	-70	0.072	61	0.932	-171
1900	0.888	172	0.951	-88	0.086	72	0.980	-177
2000	0.941	169	0.766	-105	0.108	75	0.995	177
2100	0.974	166	0.601	-121	0.131	75	0.987	172
2200	0.992	162	0.467	-135	0.153	72	0.972	168