

PTB 20230

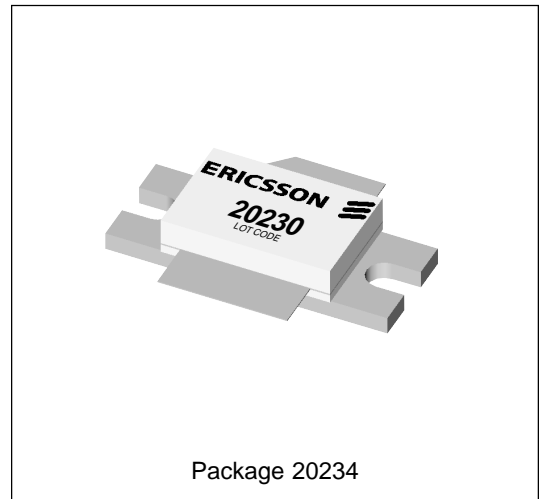
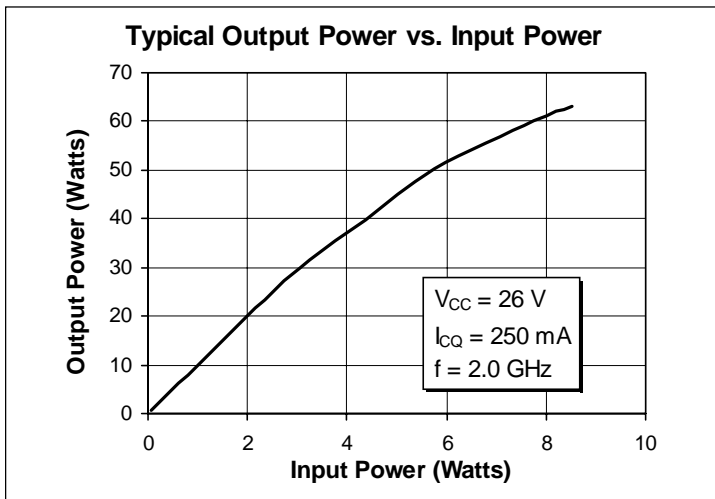
45 Watts, 1.8–2.0 GHz

PCN/PCS Power Transistor

Description

The 20230 is a class AB, NPN common emitter RF power transistor intended for 26 Vdc operation from 1.8 to 2.0 GHz. Rated at 45 watts minimum output power for PEP applications, it is specifically intended for operation as a final or driver stage in CDMA or TDMA systems. Ion implantation, nitride surface passivation and gold metallization ensure excellent device reliability. 100% lot traceability is standard.

- 45 Watts, 1.8–2.0 GHz
- Class AB Characteristics
- 45% Collector Efficiency at 45 Watts
- Gold Metallization
- Silicon Nitride Passivated



Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CER}	55	Vdc
Collector-Base Voltage	V_{CBO}	55	Vdc
Emitter-Base Voltage (collector open)	V_{EBO}	4.0	Vdc
Collector Current (continuous)	I_C	7.7	Adc
Total Device Dissipation at $T_{flange} = 25^\circ\text{ C}$ Above 25° C derate by	P_D	200 1.2	Watts W/ $^\circ\text{ C}$
Storage Temperature Range	T_{STG}	-40 to +150	$^\circ\text{ C}$
Thermal Resistance ($T_{flange} = 70^\circ\text{ C}$)	$R_{\theta JC}$	0.85	$^\circ\text{ C/W}$

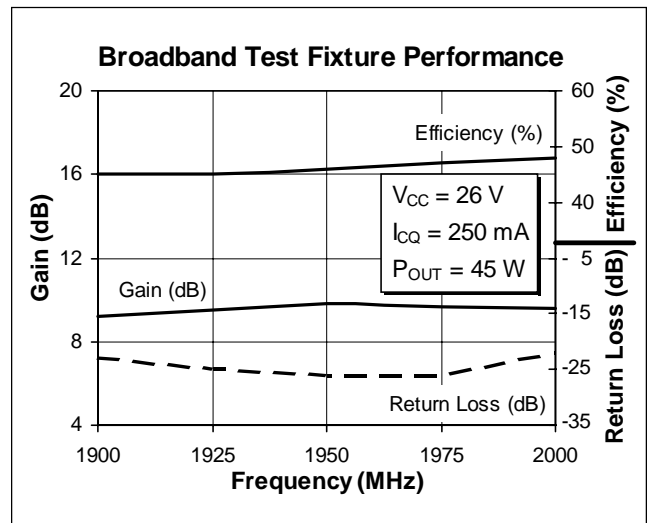
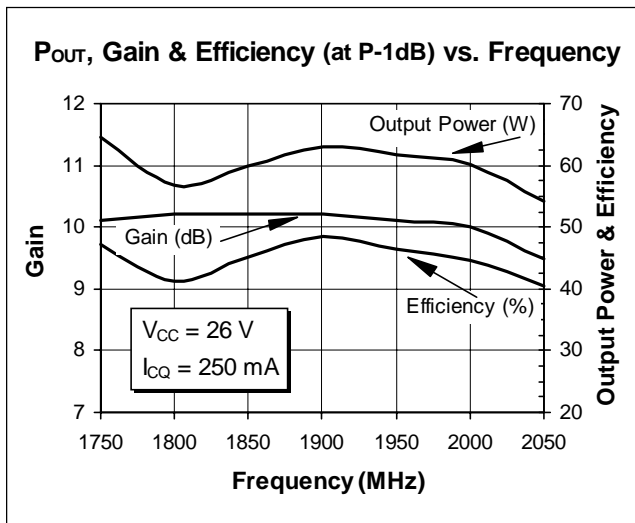
Electrical Characteristics (100% Tested)

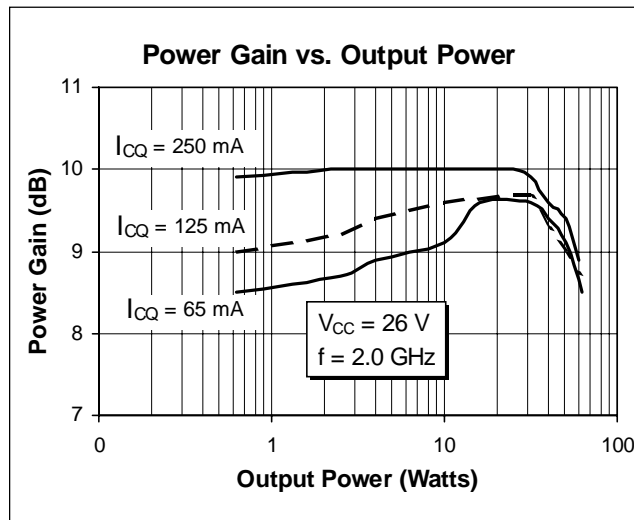
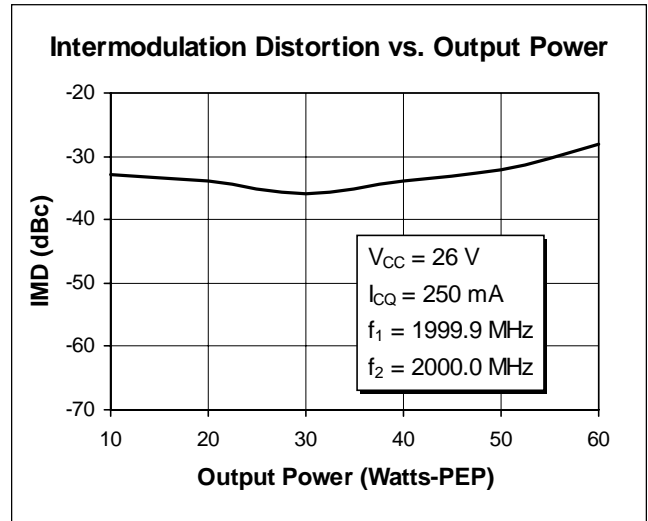
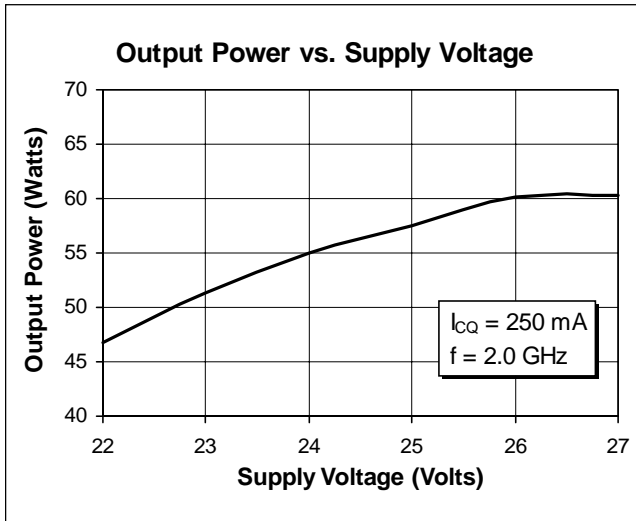
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Breakdown Voltage C to E	$V_{BE} = 0\text{ V}, I_C = 100\text{ mA}$	$V_{(BR)CES}$	55	—	—	Volts
Breakdown Voltage C to E	$I_B = 0\text{ A}, I_C = 100\text{ mA}, R_{BE} = 22\ \Omega$	$V_{(BR)CER}$	55	—	—	Volts
Breakdown Voltage E to B	$I_C = 0\text{ A}, I_E = 5\text{ mA}$	$V_{(BR)EBO}$	4.0	5.0	—	Volts
DC Current Gain	$V_{CE} = 5\text{ V}, I_C = 1\text{ A}$	h_{FE}	20	40	—	—

RF Specifications (100% Tested)

Characteristic	Symbol	Min	Typ	Max	Units
Gain ($V_{CC} = 26\text{ Vdc}, P_{OUT} = 45\text{ W}, I_{CQ} = 250\text{ mA}, f = 2\text{ GHz}$)	G_{pe}	8.5	9.5	—	dB
Gain Compression ($V_{CC} = 26\text{ Vdc}, I_{CQ} = 250\text{ mA}, f = 2\text{ GHz}$)	P-1dB	45	—	—	Watts
Input Return Loss ($V_{CC} = 26\text{ Vdc}, P_{OUT} = 45\text{ W}, I_{CQ} = 250\text{ mA}, f = 2\text{ GHz}$)	Rtn Loss	10	—	—	dB
Collector Efficiency ($V_{CC} = 26\text{ Vdc}, P_{OUT} = 45\text{ W}, I_{CQ} = 250\text{ mA}, f = 2\text{ GHz}$)	η_C	45	50	—	%
Load Mismatch Tolerance ($V_{CC} = 26\text{ Vdc}, P_{OUT} = 45\text{ W}, I_{CQ} = 250\text{ mA}, f = 2\text{ GHz}$ —all phase angles at frequency of test)	Ψ	—	—	3:1	—

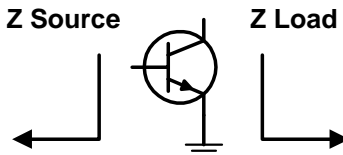
Typical Performance



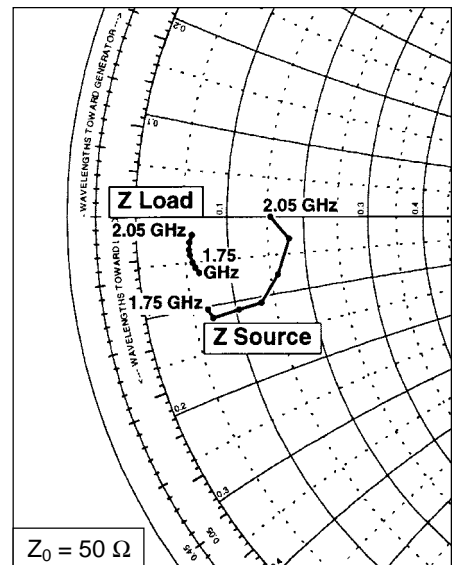


Impedance Data

$V_{CC} = 26 \text{ Vdc}$, $P_{OUT} = 45 \text{ W}$, $I_{CQ} = 250 \text{ mA}$



Frequency GHz	Z Source		Z Load	
	R	jX	R	jX
1.75	3.36	-5.20	3.20	-3.10
1.80	3.57	-5.70	3.00	-2.80
1.85	5.14	-5.55	2.90	-2.50
1.90	6.60	-5.40	2.77	-2.10
1.95	8.00	-3.80	2.75	-1.80
2.00	8.95	-1.50	2.80	-1.40
2.05	7.72	0.00	2.95	-1.00



Typical Scattering Parameters

($V_{CE} = 26\text{ V}$, $I_C = 1.75\text{ A}$)

f (MHz)	S11		S21		S12		S22	
	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang
100	0.936	-179	1.44	77	0.002	6	0.798	-172
200	0.946	-179	1.06	70	0.002	23	0.828	-174
300	0.963	-180	0.397	34	0.003	71	0.883	-174
400	0.970	179	0.194	19	0.004	85	0.924	-175
500	0.972	179	0.100	11	0.006	89	0.943	-177
600	0.971	178	0.046	12	0.009	88	0.982	-179
700	0.972	178	0.014	55	0.011	84	1.00	177
800	0.975	178	0.026	130	0.012	83	0.952	175
900	0.980	177	0.048	137	0.014	83	0.923	174
1000	0.980	177	0.069	135	0.017	80	0.895	174
1100	0.984	176	0.090	132	0.019	74	0.898	175
1200	0.986	176	0.113	128	0.019	72	0.897	174
1300	0.994	175	0.144	124	0.020	74	0.892	174
1400	1.00	173	0.186	119	0.023	75	0.885	174
1500	0.995	171	0.247	113	0.028	72	0.881	173
1600	0.976	169	0.350	105	0.034	67	0.875	172
1700	0.952	166	0.585	92	0.043	57	0.856	170
1800	0.757	162	1.02	48	0.052	23	0.751	171
1900	0.682	176	1.02	5	0.038	-7	0.756	178
2000	0.825	-171	0.979	-43	0.019	-55	0.848	-178
2100	0.965	-177	0.526	-76	0.004	67	0.897	178
2200	0.994	180	0.355	-87	0.009	94	0.908	177

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