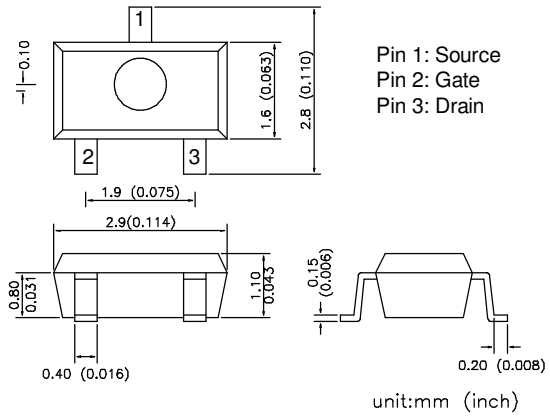
Features

- **Plastic Packaged GaAs Power FET**
- **Suitable for Commercial Wireless Applications**
- **High Efficiency**
- **3V to 6V Operation**

Outline Dimensions



PB Package (SOT-23)

Description

The HWL23NPB is a medium Power GaAs FET using surface mount type plastic package for various L-Band applications. It is suitable for various 900 MHz, 1900 MHz cellular/wireless applications.

Absolute Maximum Ratings

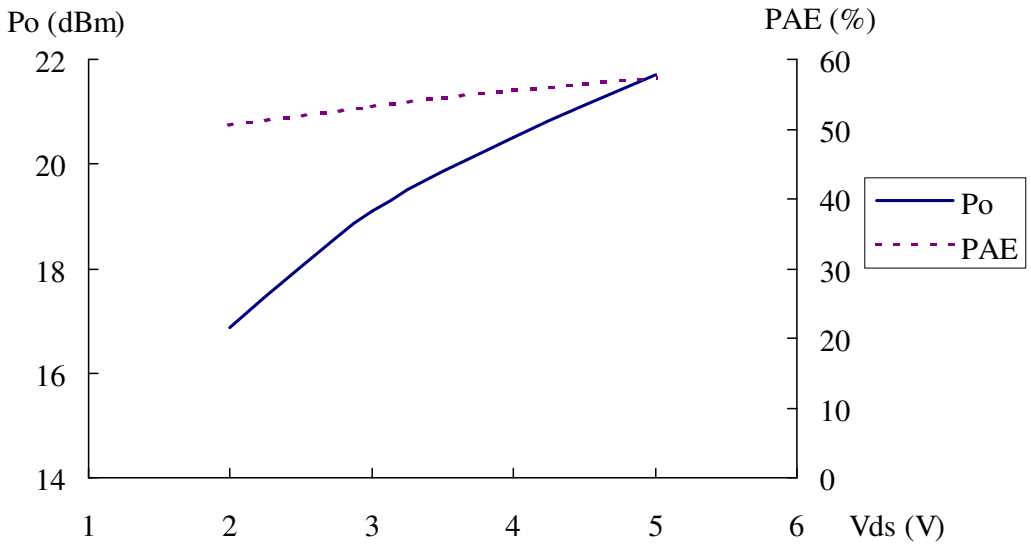
V_{DS}	Drain to Source Voltage	+7V
V_{GS}	Gate to Source Voltage	-5V
I_D	Drain Current	I_{DSS}
I_G	Gate Current	1mA
T_{CH}	Channel Temperature	150°C
T_{STG}	Storage Temperature	-65 to +150°C
P_T	Power Dissipation	0.7 Watt

Electrical Specifications (T_A=25°C) f=1900 MHz for all RF Tests

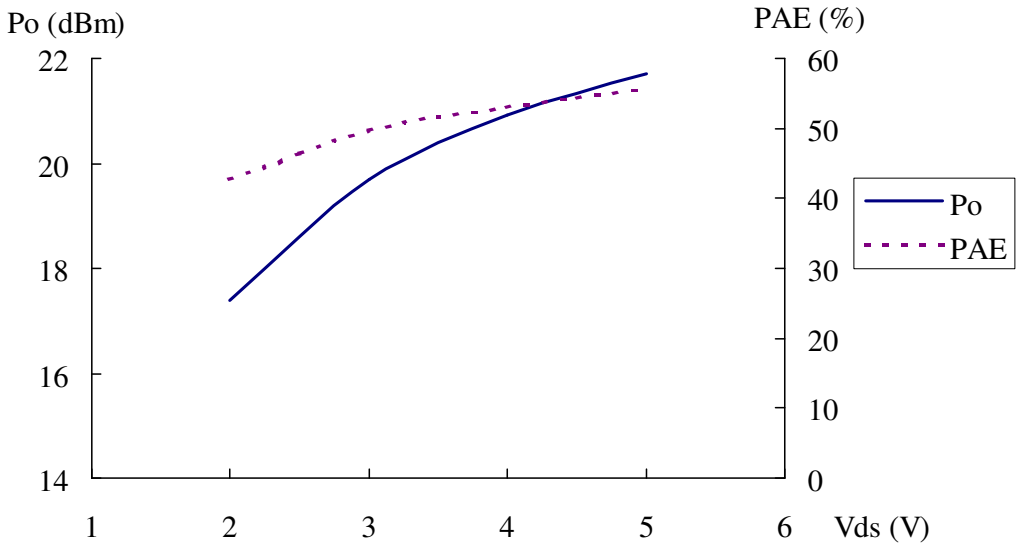
Symbol	Parameters & Conditions	Units	Min.	Typ.	Max.
I_{DSS}	Saturated Current at V_{DS}=5V, V_{GS}=0V	mA	90	110	-
V_P	Pinch-off Voltage at V_{DS}=5V, I_D=5.5mA	V	-3.5	-2.0	-1.5
gm	Transconductance at V_{DS}=5V, I_D=55mA	mS	-	60	-
R_{th}	Thermal Resistance	°C/W	-	200	-
P_{1dB}	Power Output at Test Points V_{DS}=3V, I_D=0.5I_{DSS} V_{DS}=5V, I_D=0.5I_{DSS}	dBm	 16.5 19.5	 17.5 21.0	 - -
G_{1dB}	Gain at 1dB Compression Point V_{DS}=3V, I_D=0.5I_{DSS} V_{DS}=5V, I_D=0.5I_{DSS}	dB		 13.0 14.0	 - -
PAE	Power-Added Efficiency (P_{OUT} = P_{1dB}) V_{DS}=3V, I_D=0.5I_{DSS} V_{DS}=5V, I_D=0.5I_{DSS}	%	 - -	 35.0 45.0	 - -

Typical Performance at 25°C

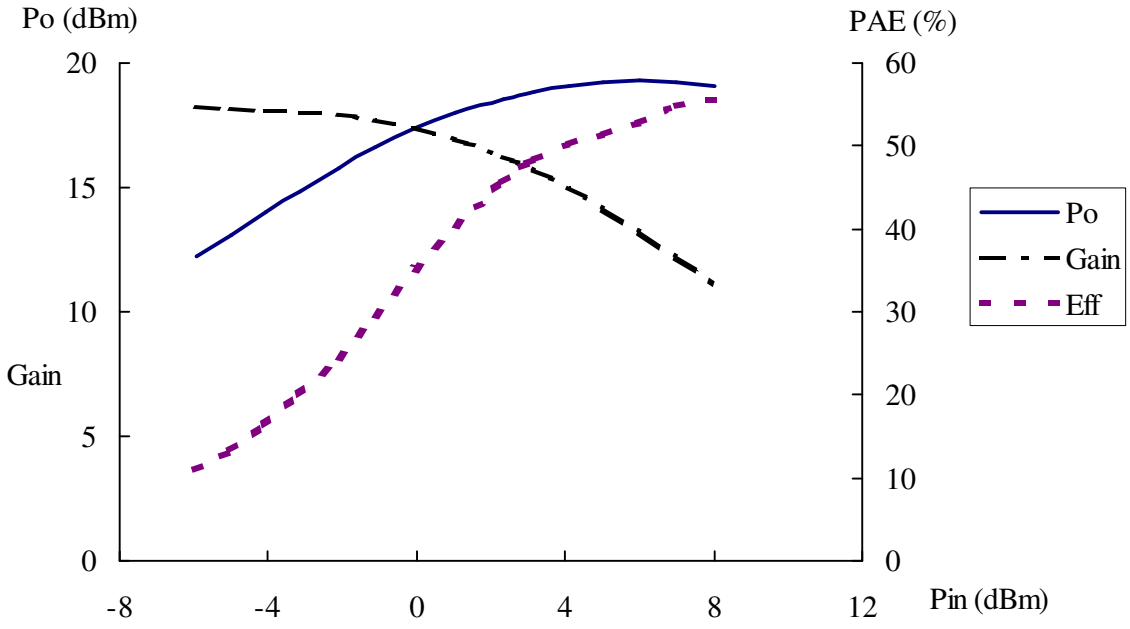
Output Power & Efficiency vs Vds
@ f=0.9GHz,Ids=55mA



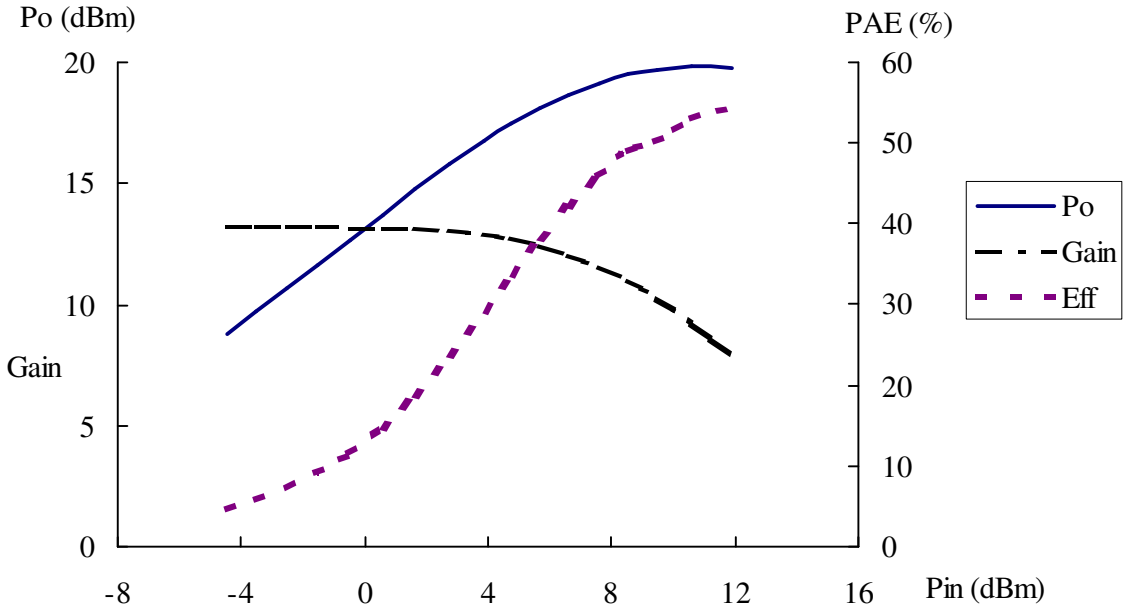
Output Power & Efficiency vs Vds
@ f=1.9GHz,Ids=55mA



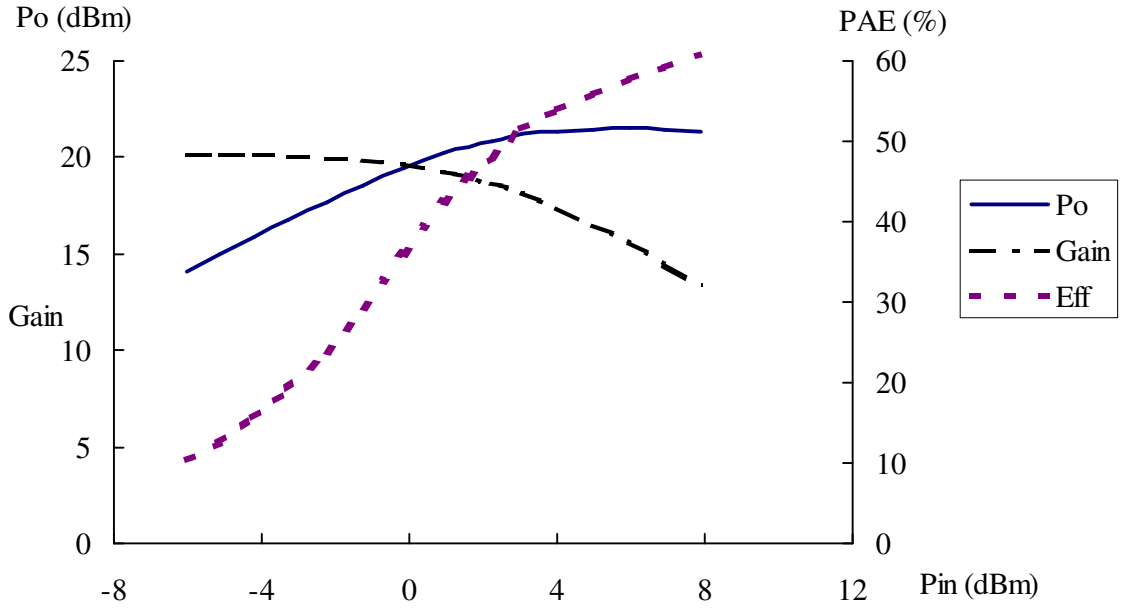
Output Power & Efficiency & Gain vs Input Power
@ f=0.9GHz, Vds=3V



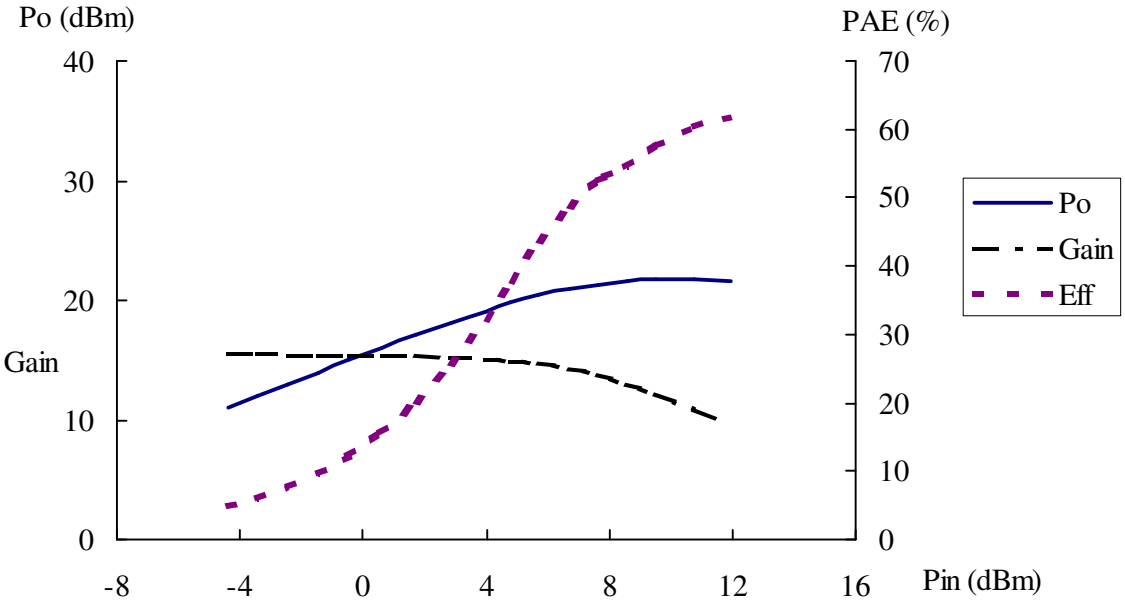
Output Power & Efficiency & Gain vs Input Power
@ f=1.9GHz, Vds=3V



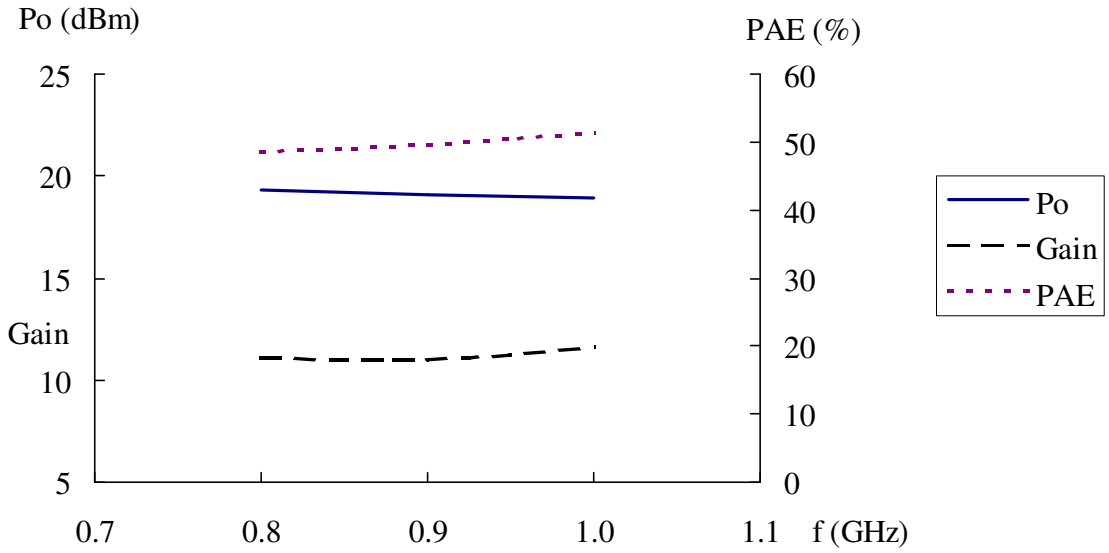
Output Power & Efficiency & Gain vs Input Power
@ f=0.9GHz, Vds=5V



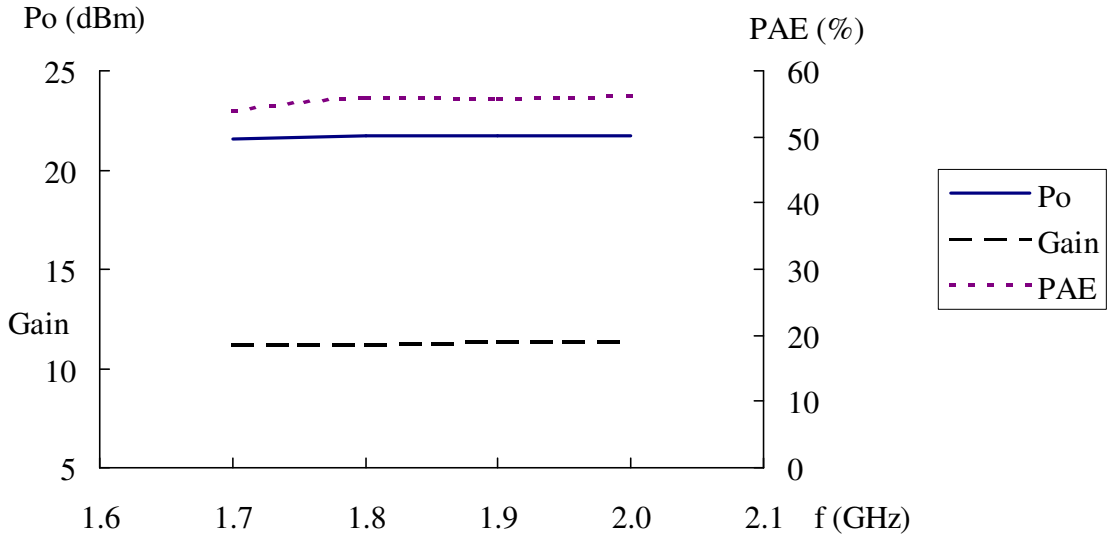
Output Power & Efficiency & Gain vs Input Power
@ f=1.9GHz, Vds=5V



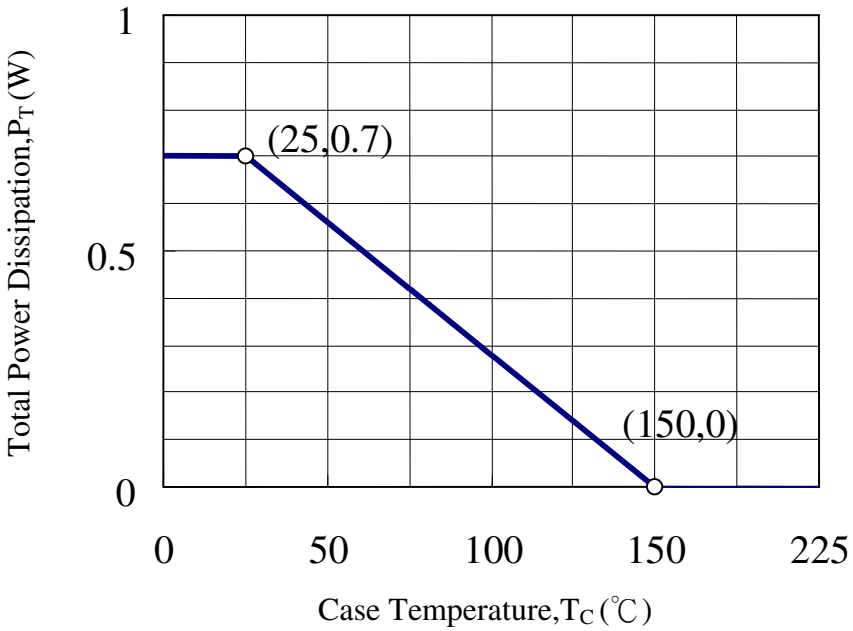
Output Power & Efficiency & Gain vs Frequency
@ Vds=3V, Ids=55mA



Output Power & Efficiency & Gain vs Frequency
@ Vds=5V, Ids=55mA



Power Derating Curve



Small Signal Common Source Scattering Parameters

S-MAGN AND ANGLES

V_{DS}=3V, I_{DS}=0.5I_{DSS}

(GHz)	|S11|	∠ANG	|S21|	∠ANG	|S12|	∠ANG	|S22|	∠ANG
0.70	0.948	-23.77	3.799	156.53	0.023	81.85	0.628	-6.09
0.80	0.951	-26.56	3.804	154.09	0.027	80.61	0.635	-8.06
0.90	0.917	-30.62	3.776	150.89	0.030	78.24	0.640	-8.25
1.00	0.921	-33.76	3.791	147.31	0.033	78.56	0.620	-10.94
1.10	0.900	-37.95	3.749	144.12	0.036	77.09	0.623	-11.31
1.20	0.882	-41.80	3.718	140.69	0.040	75.16	0.608	-12.06
1.30	0.863	-45.32	3.675	137.44	0.042	74.56	0.607	-13.70
1.40	0.845	-49.01	3.660	134.23	0.045	74.13	0.609	-14.52
1.50	0.830	-53.02	3.617	130.89	0.047	72.62	0.596	-16.12
1.60	0.806	-56.42	3.573	127.74	0.050	71.86	0.592	-17.43
1.70	0.790	-60.86	3.516	124.44	0.053	70.62	0.585	-18.68
1.80	0.772	-64.64	3.459	121.28	0.054	70.36	0.579	-19.89
1.90	0.754	-68.42	3.416	118.34	0.056	69.35	0.573	-20.89
2.00	0.737	-72.35	3.360	115.14	0.059	68.31	0.566	-22.35
2.10	0.719	-75.84	3.295	112.33	0.061	67.38	0.556	-23.90
2.20	0.705	-79.81	3.246	109.54	0.063	68.36	0.549	-25.25
2.30	0.688	-83.30	3.177	106.66	0.065	66.96	0.543	-26.54
2.40	0.672	-86.86	3.111	103.89	0.067	66.79	0.541	-27.60
2.50	0.656	-90.42	3.050	101.13	0.067	65.87	0.539	-28.52
2.60	0.645	-93.62	2.997	98.78	0.070	66.25	0.536	-30.05
2.70	0.633	-96.88	2.943	96.01	0.070	66.11	0.535	-31.04
2.80	0.621	-99.97	2.882	93.79	0.072	65.76	0.533	-32.48
2.90	0.609	-102.83	2.834	91.39	0.074	66.42	0.530	-33.54
3.00	0.592	-106.18	2.773	88.94	0.074	66.09	0.531	-34.72

S-MAGN AND ANGLES

V_{DS}=5V, I_{DS}=0.5I_{DSS}

(GHz)	|S11|	∠ANG	|S21|	∠ANG	|S12|	∠ANG	|S22|	∠ANG
0.70	0.951	-23.36	3.450	157.05	0.020	82.24	0.758	-5.60
0.80	0.954	-26.14	3.461	154.77	0.022	80.78	0.767	-7.30
0.90	0.920	-30.14	3.448	151.59	0.024	78.75	0.776	-7.48
1.00	0.926	-33.20	3.452	147.98	0.026	79.31	0.753	-9.89
1.10	0.904	-37.37	3.426	144.89	0.030	77.60	0.757	-10.29
1.20	0.889	-41.13	3.402	141.52	0.031	75.36	0.746	-10.86
1.30	0.870	-44.66	3.370	138.17	0.033	74.89	0.741	-12.40
1.40	0.851	-48.32	3.359	135.14	0.036	73.98	0.745	-13.31
1.50	0.837	-52.25	3.326	131.69	0.037	73.82	0.734	-14.61
1.60	0.816	-55.67	3.287	128.60	0.039	72.86	0.726	-15.93
1.70	0.800	-60.05	3.243	125.29	0.040	71.72	0.722	-17.17
1.80	0.784	-63.85	3.195	122.12	0.042	72.09	0.714	-18.31
1.90	0.764	-67.67	3.159	119.17	0.043	70.69	0.711	-19.07
2.00	0.750	-71.58	3.110	115.98	0.045	71.38	0.702	-20.61
2.10	0.732	-75.13	3.055	113.24	0.047	70.94	0.697	-21.68
2.20	0.716	-79.06	3.018	110.26	0.048	71.01	0.693	-22.81
2.30	0.700	-82.44	2.957	107.41	0.049	71.24	0.690	-24.09
2.40	0.686	-86.01	2.902	104.53	0.050	70.51	0.687	-25.21
2.50	0.672	-89.49	2.846	101.76	0.052	70.96	0.682	-26.31
2.60	0.658	-92.95	2.794	99.40	0.052	71.62	0.681	-27.68
2.70	0.647	-96.07	2.753	96.46	0.054	71.12	0.678	-28.79
2.80	0.636	-99.18	2.695	94.13	0.055	72.37	0.675	-30.12
2.90	0.625	-102.21	2.648	91.62	0.057	73.34	0.674	-31.29
3.00	0.606	-105.58	2.595	89.15	0.058	72.95	0.672	-32.53