

## Features

- Low Cost GaAs Power FETs
- Class A or Class AB Operation
- High Efficiency
- 3V to 6V Operation

## Description

The HWL30NPA 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.

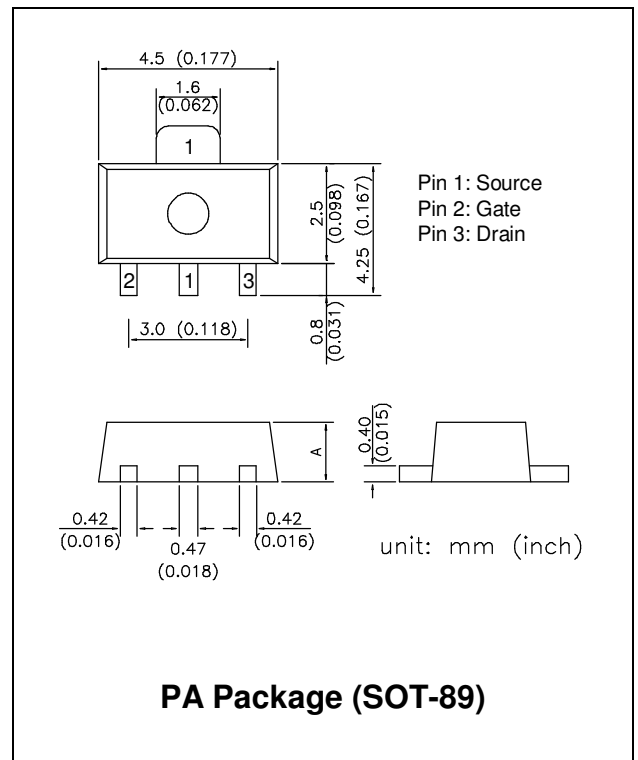
## Absolute Maximum Ratings

$V_{DS}$	Drain to Source Voltage	+7V
$V_{GS}$	Gate to Source Voltage	-5V
$I_D$	Drain Current	$I_{DSS}$
$I_G$	Gate Current	3mA
$T_{CH}$	Channel Temperature	150°C
$T_{STG}$	Storage Temperature	-65 to +150°C
$P_T^*$	Total Power Dissipation	2.8W

\* mounted on an infinite heat sink.

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

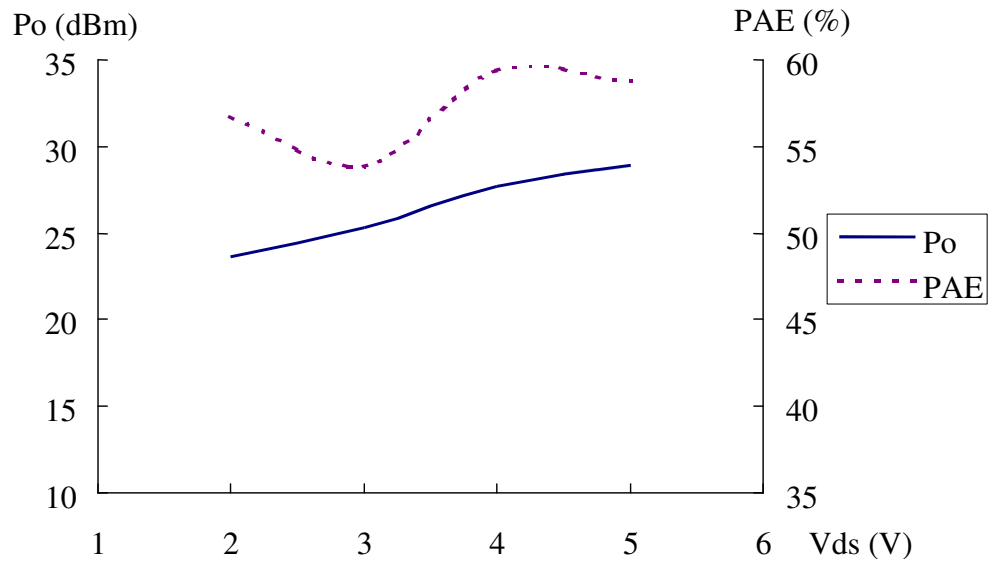
Symbol	Parameters & Conditions	Units	Min.	Typ.	Max.
$I_{DSS}$	Saturated Current at $V_{DS}=3V$ , $V_{GS}=0V$	mA	500	600	900
$V_P$	Pinch-off Voltage at $V_{DS}=3V$ , $I_D=30mA$	V	-3.5	-2.0	-1.5
$g_m$	Transconductance at $V_{DS}=3V$ , $I_D=300mA$	mS	200	300	-
$R_{th}$	Thermal Resistance	°C/W	-	35	45
$P_{1dB}$	Power Output at 1dB Compression Point $V_{DS}=3V$ , $I_D=0.5I_{DSS}$ $V_{DS}=5V$ , $I_D=0.5I_{DSS}$	dBm	24.5 27.5	25.5 28.5	-
$G_{1dB}$	Gain at 1dB Compression Point $V_{DS}=3V$ , $I_D=0.5I_{DSS}$ $V_{DS}=5V$ , $I_D=0.5I_{DSS}$	dB	9 10	10 11	-
PAE	Power-Added Efficiency ( $P_{OUT} = P_{1dB}$ ) $V_{DS}=3V$ , $I_D=0.5I_{DSS}$ $V_{DS}=5V$ , $I_D=0.5I_{DSS}$	%	-	40 40	-

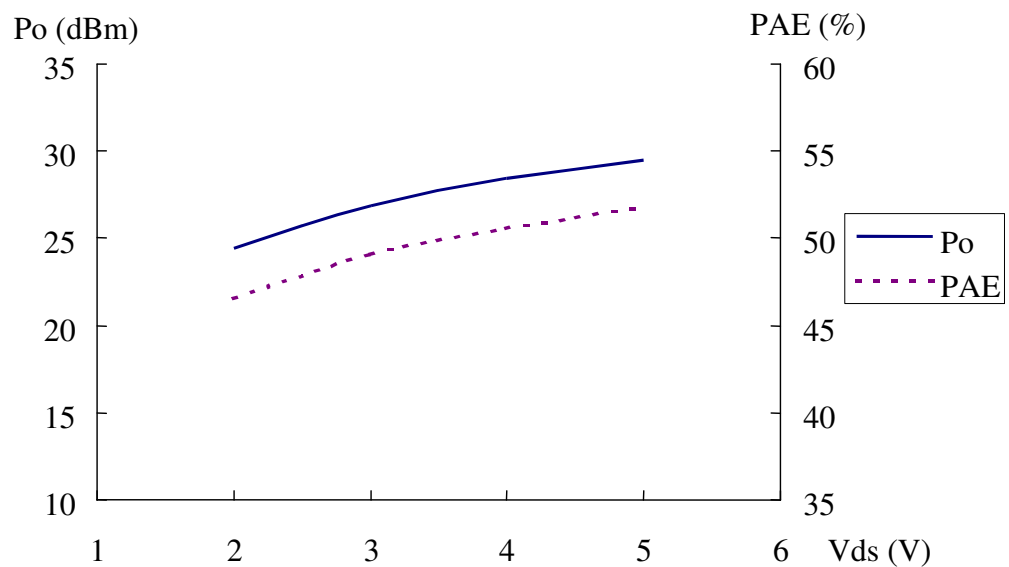


**PA Package (SOT-89)**

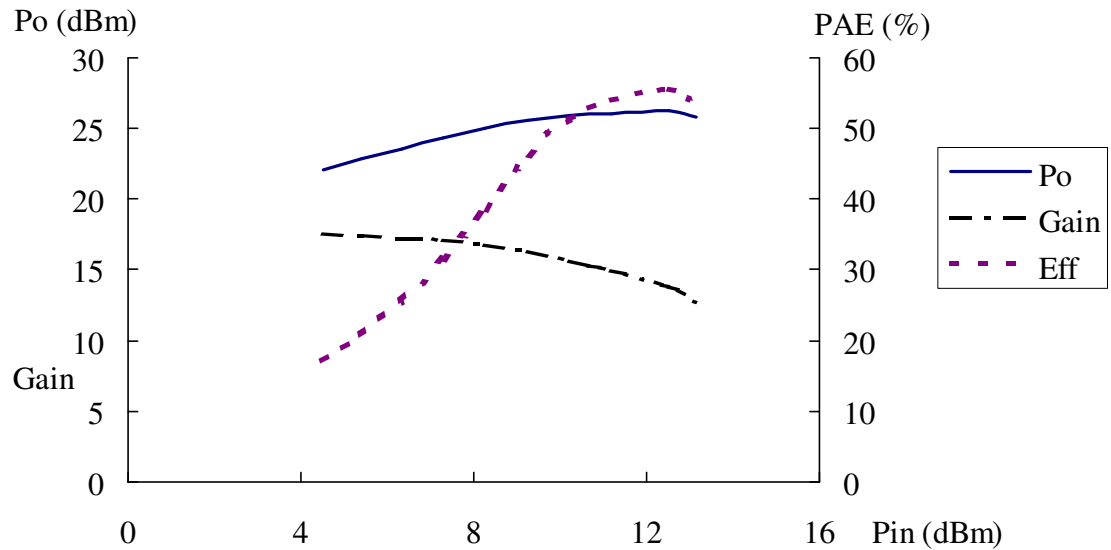
## Outline Dimensions

**Typical Performance at 25°C**
**Output Power & Efficiency vs Vds**

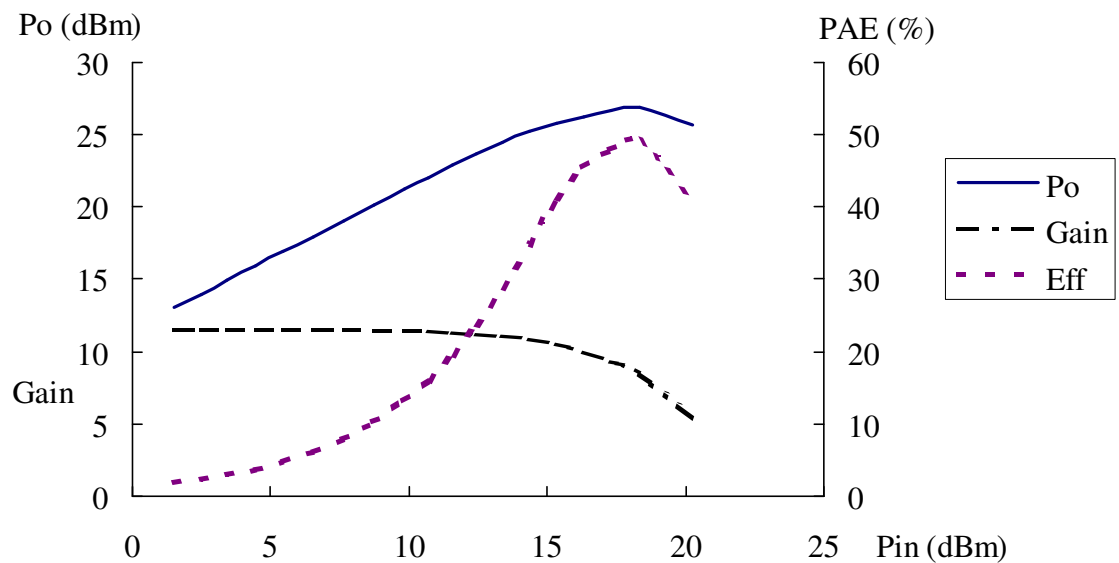
 @ f=0.9GHz, I<sub>ds</sub>=0.5I<sub>DSS</sub>

**Output Power & Efficiency vs Vds**

 @ f=1.9GHz, I<sub>ds</sub>=0.5I<sub>DSS</sub>


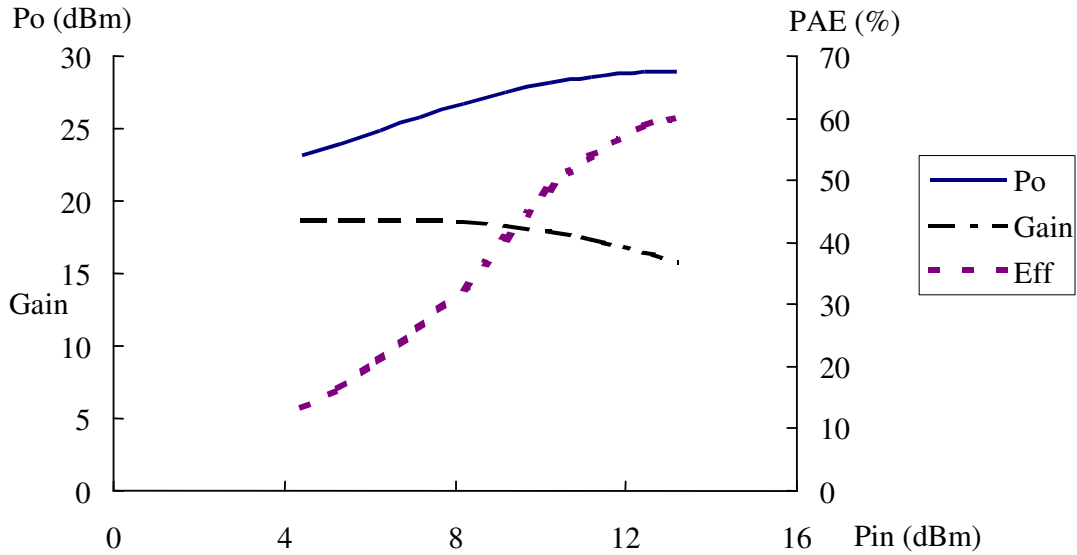
Output Power & Efficiency & Gain vs Input Power  
@ f=0.9GHz, Vds=3V

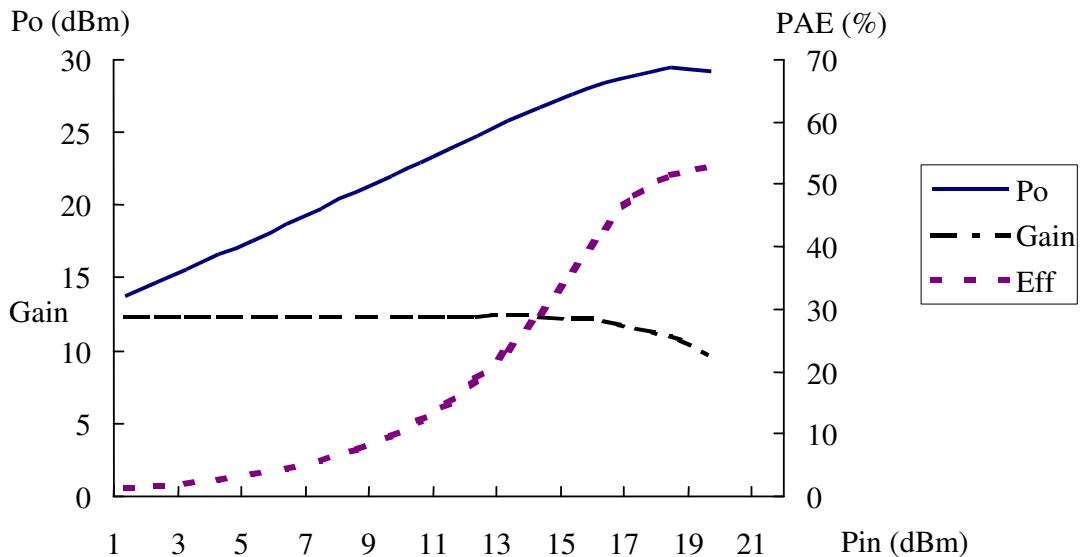


Output Power & Efficiency & Gain vs Input Power  
@ f=1.9GHz, Vds=3V

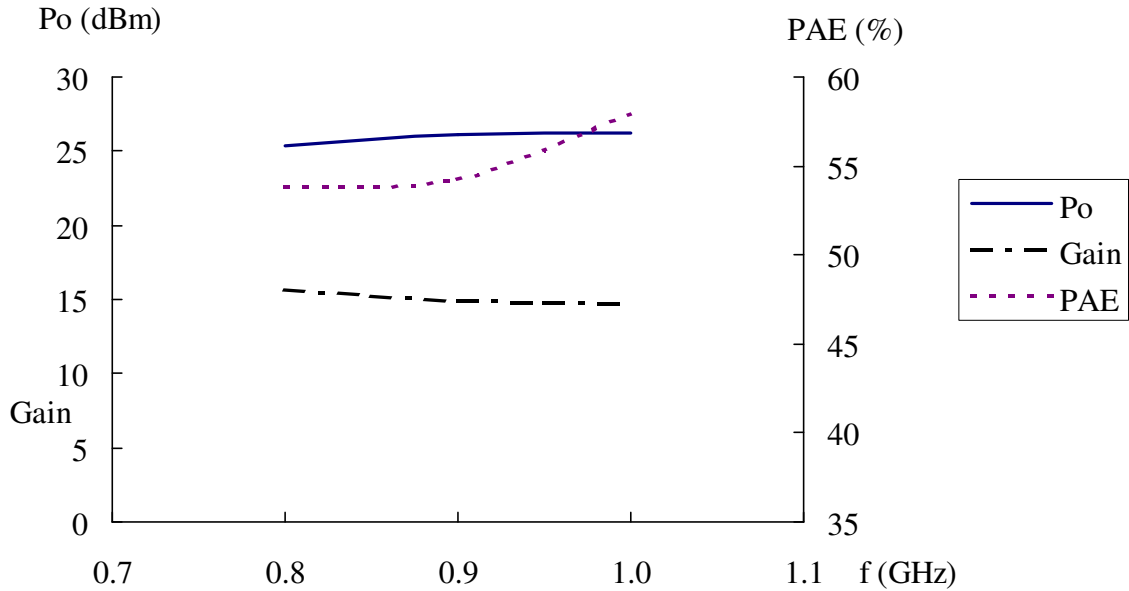


**Output Power & Efficiency & Gain vs Input Power**

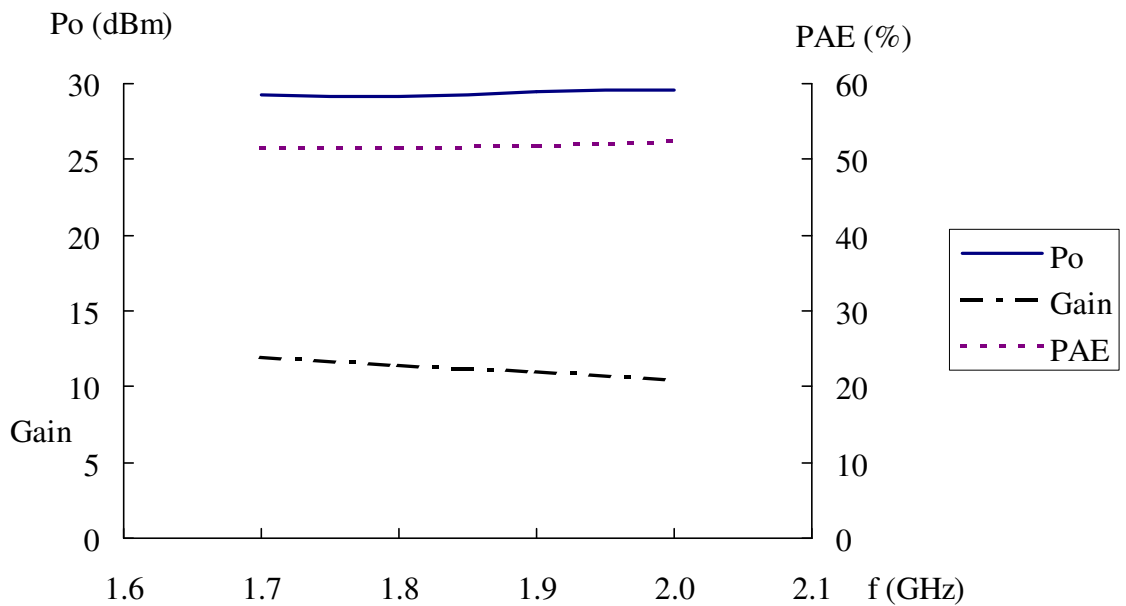
 @  $f=0.9\text{GHz}$ ,  $V_{ds}=5\text{V}$ ,  $I_{DS}=0.5I_{DSS}$ 

**Output Power & Efficiency & Gain vs Input Power**

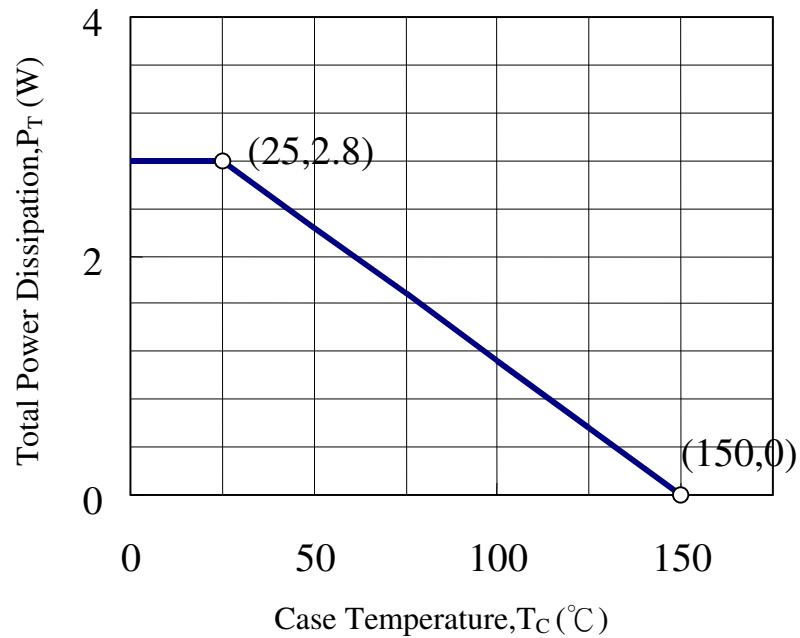
 @  $f=1.9\text{GHz}$ ,  $V_{ds}=5\text{V}$ ,  $I_{DS}=0.5I_{DSS}$ 


Output Power & Efficiency & Gain vs Frequency  
 @  $V_{ds}=3V, I_{ds}=300mA$



Output Power & Efficiency & Gain vs Frequency  
 @  $V_{ds}=5V, I_{ds}=300mA$



**Power Derating Curve**

**Small Signal Common Source Scattering Parameters**
**S-MAGN AND ANGLES**
 $V_{DS}=3V, I_{DS}=0.5I_{DSS}$ 

(GHz)	IS11I	∠ANG	IS21I	∠ANG	IS12I	∠ANG	IS22I	∠ANG
0.70	0.823	-124.08	6.597	106.16	0.038	47.22	0.312	-169.26
0.80	0.815	-132.50	5.940	100.82	0.039	45.96	0.328	-171.51
0.90	0.808	-139.69	5.432	96.62	0.044	46.57	0.332	-174.06
1.00	0.805	-145.83	4.975	92.04	0.045	44.56	0.338	-175.87
1.10	0.799	-151.61	4.589	87.95	0.048	44.03	0.337	-176.95
1.20	0.801	-156.12	4.265	84.98	0.049	44.90	0.347	-178.61
1.30	0.797	-160.71	3.973	81.12	0.051	43.79	0.346	179.70
1.40	0.798	-164.76	3.711	78.13	0.053	42.66	0.351	179.33
1.50	0.801	-168.30	3.500	75.17	0.056	42.80	0.358	177.29
1.60	0.795	-171.96	3.277	71.97	0.058	42.28	0.359	175.88
1.70	0.799	-175.00	3.124	69.30	0.060	42.45	0.360	175.12
1.80	0.794	-177.52	2.952	66.88	0.062	42.19	0.359	175.17
1.90	0.801	179.69	2.838	64.24	0.065	42.39	0.367	174.20
2.00	0.795	177.19	2.685	61.61	0.067	42.03	0.366	173.35
2.10	0.792	175.03	2.576	59.56	0.070	41.59	0.367	172.36
2.20	0.793	172.48	2.475	57.27	0.072	40.83	0.364	172.87
2.30	0.790	170.02	2.383	54.65	0.074	40.43	0.365	171.46
2.40	0.791	168.28	2.297	52.68	0.078	40.49	0.365	171.47
2.50	0.787	166.13	2.216	50.29	0.079	40.14	0.362	170.35
2.60	0.789	164.32	2.161	48.22	0.084	39.04	0.368	170.59
2.70	0.785	161.82	2.080	45.62	0.087	37.82	0.365	168.67
2.80	0.781	160.26	2.014	43.73	0.089	35.77	0.368	168.15
2.90	0.790	157.97	1.982	41.42	0.092	36.24	0.373	167.53
3.00	0.785	156.36	1.934	39.43	0.096	35.76	0.368	167.48

**S-MAGN AND ANGLES**
 $V_{DS}=5V, I_{DS}=0.5I_{DSS}$ 

(GHz)	IS11I	∠ANG	IS21I	∠ANG	IS12I	∠ANG	IS22I	∠ANG
0.70	0.813	-123.01	7.231	105.37	0.034	46.83	0.170	-136.95
0.80	0.805	-131.28	6.524	99.90	0.035	45.34	0.183	-141.01
0.90	0.798	-138.59	5.973	95.56	0.037	43.94	0.186	-145.96
1.00	0.793	-144.68	5.464	90.88	0.040	42.73	0.193	-147.75
1.10	0.788	-150.52	5.022	86.66	0.042	42.30	0.199	-148.75
1.20	0.790	-154.88	4.667	83.43	0.043	43.74	0.205	-151.81
1.30	0.788	-159.51	4.351	79.39	0.044	41.95	0.205	-152.16
1.40	0.788	-163.52	4.064	76.38	0.046	42.40	0.217	-153.57
1.50	0.791	-167.06	3.833	73.20	0.048	42.93	0.222	-155.52
1.60	0.785	-170.83	3.602	69.90	0.049	43.39	0.224	-155.74
1.70	0.789	-173.75	3.415	66.98	0.051	42.59	0.230	-157.08
1.80	0.785	-176.28	3.224	64.49	0.052	42.94	0.237	-156.84
1.90	0.791	-179.01	3.089	61.64	0.055	43.14	0.247	-158.26
2.00	0.786	178.30	2.924	58.97	0.058	42.04	0.251	-159.44
2.10	0.783	176.23	2.797	56.71	0.059	42.29	0.254	-159.80
2.20	0.785	173.68	2.686	54.27	0.061	42.34	0.259	-158.82
2.30	0.783	171.30	2.584	51.51	0.063	42.05	0.263	-160.00
2.40	0.783	169.60	2.489	49.42	0.065	41.48	0.269	-159.37
2.50	0.780	167.40	2.391	46.84	0.067	41.31	0.269	-160.21
2.60	0.782	165.67	2.328	44.64	0.071	41.28	0.281	-160.04
2.70	0.778	163.14	2.245	41.93	0.073	41.12	0.279	-160.84
2.80	0.774	161.58	2.174	39.88	0.075	38.67	0.286	-161.38
2.90	0.784	159.37	2.131	37.44	0.077	39.47	0.294	-161.26
3.00	0.780	157.92	2.078	35.38	0.080	39.14	0.295	-160.85