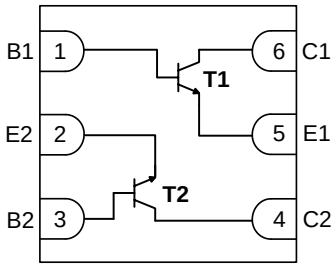
Features

■ Low voltage operation, low phase distortion transistor suited for DC-20GHz OSC applications.

■ Built-in 2 transistors with high isolation between each other.

■ Small Package : DFN 2mm×2mm×0.75mm

Package: DFN 2x2-6L
Mark: Y895TS



Function Block Diagram

Applications

■ High-Speed Switching Applications

■ Complementary driver for audio amplifiers

■ Oscillator/buffer amplifier and other applications.

Product Description

INNOTION's YPA895TS contains two high frequency GaAs HBT bipolar transistors. Each transistor is an excellent oscillator chip, featuring low 1/f noise and high immunity to pushing effects.The YPA895TS is housed inside a miniature 6-lead, 2mm×2mm×0.75mm, DFN package. it is ideal for all portable wireless applications where reducing board space is a prime consideration. Each transistor chip is independently mounted and easily configured for oscillator/buffer amplifier and other applications.

Ordering Information

Part Number	No. of Devices	Description	Container
YPA895TS	3000	RoHS compliant DFN2*2 surface mount package in tape and reel	7″ Tape and Reel

Absolute Maximum Ratings (TA =+25°C)

Characteristic	Symbol	Rating	Unit
Collector to Base Voltage	V_{CBO}	26	V
Collector to Emitter Voltage	V_{CEO}	14	V
Emitter to Base Voltage	V_{EBO}	7.8	V
Collector Current	I_C	50	mA
Total Power Dissipation	P_T	500	mW
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-65 to +150	°C

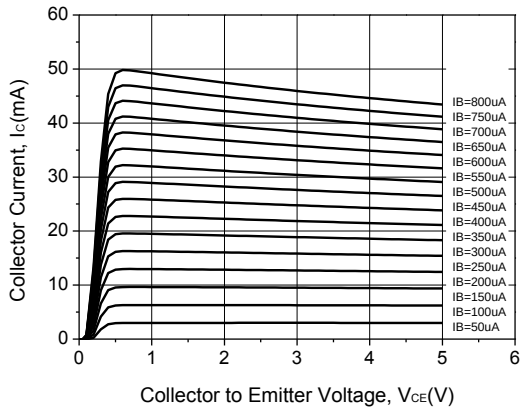
Caution!

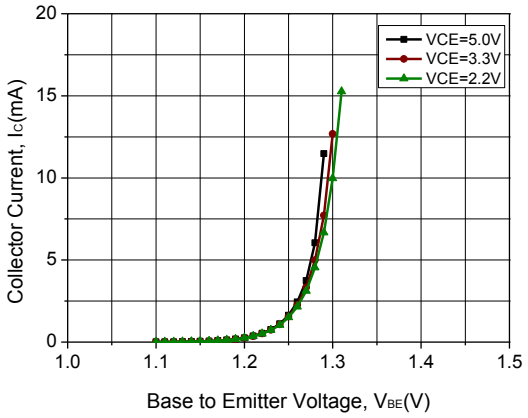
Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability.

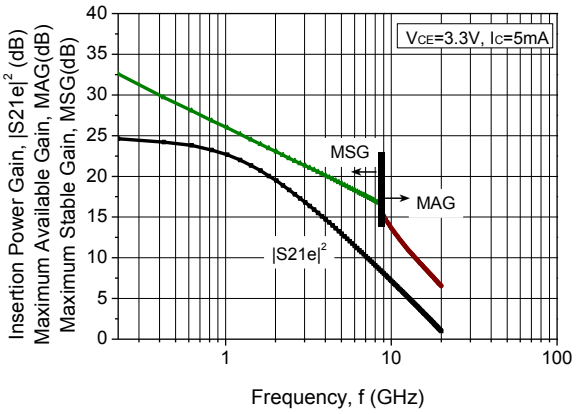
Electrical Specifications@25℃

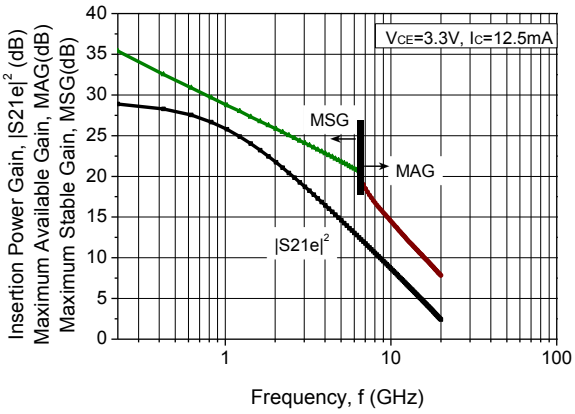
Parameter	Symbol	Specification			Unit	Condition
		Min.	Typ.	Max.		
Collector Cutoff Current	I_{CBO}			600	nA	V_{CB} = 10 V, I_E = 0
Emitter Cutoff Current	I_{EBO}			600	nA	V_{EB} = 2.2 V, I_C = 0
DC Current Gain	h_{FE}	50	55	60		V_{CE} = 2.2V, I_C = 5 mA
Transition Frequency	f_T		30		GHz	V_{CE} = 3V, I_C = 10mA
	fmax		45		GHz	V_{CE} = 3V, I_C = 10mA
Insertion Power Gain	$\|S_{21e}\|^2$		14.7		dB	V_{CE} = 3.3 V, I_C= 5 mA, f = 4 GHz
Insertion Power Gain	$\|S_{21e}\|^2$		16.5		dB	V_{CE} = 3.3 V, I_C=12.5mA, f = 4 GHz
Insertion Power Gain	$\|S_{21e}\|^2$		11.5		dB	V_{CE} = 5V, I_C = 5 mA, f = 5.8GHz
Insertion Power Gain	$\|S_{21e}\|^2$		14.6		dB	V_{CE} = 5 V, I_C = 12.5 mA, f = 5.8 GHz
Noise Figure	NF		1.2	1.5	dB	V_{CE} = 2.2 V, I_C = 5 mA, f = 2 GHz

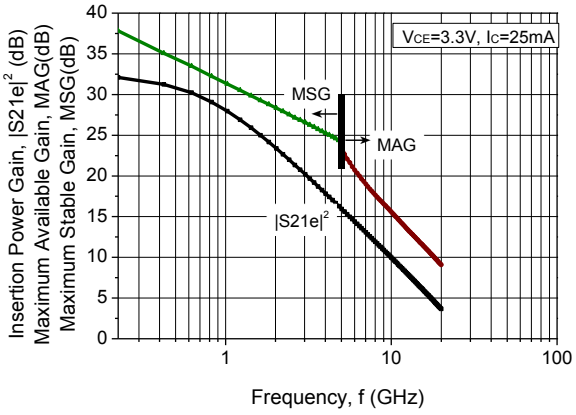
Typical Performance Data of T1

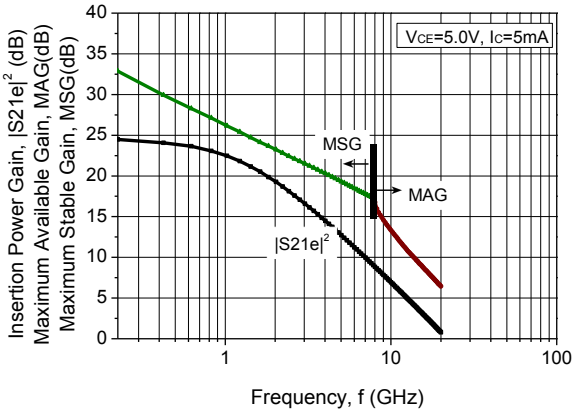


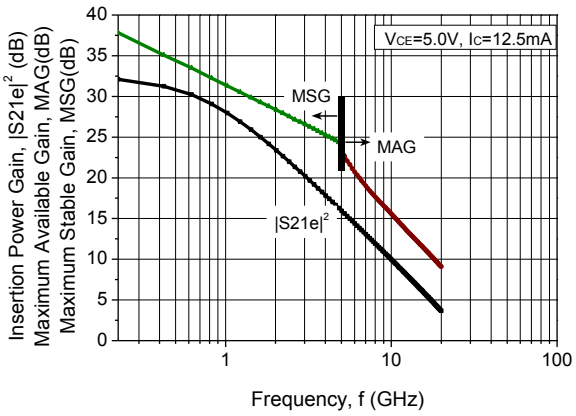


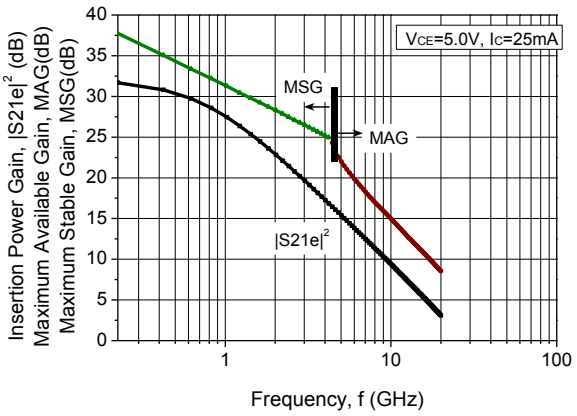












Typical Scattering Parameters

YPA895TS T1
V_{CE} = 3.3V, I_C = 5 mA

Frequency	S11		S21		S12		S22		K	MAG[1]
GHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang		dB
0.200	0.749	-19.5	17.016	169.7	0.009	78.6	0.984	-6.7	0.066	32.59
0.600	0.753	-50.9	15.487	153.1	0.024	65.1	0.917	-17.3	0.085	28.08
1.000	0.753	-76.0	13.569	139.8	0.034	52.2	0.821	-24.8	0.145	25.96
1.400	0.757	-94.8	11.665	129.6	0.041	43.4	0.732	-29.7	0.191	24.51
1.800	0.759	-108.5	10.051	121.9	0.046	36.1	0.659	-32.6	0.248	23.44
2.200	0.765	-119.1	8.797	115.9	0.048	31.3	0.605	-34.3	0.287	22.61
2.600	0.765	-127.3	7.760	111.0	0.050	27.2	0.561	-35.1	0.341	21.88
3.000	0.768	-133.4	6.916	107.0	0.051	24.3	0.529	-35.5	0.389	21.30
3.400	0.771	-138.8	6.250	103.7	0.052	22.1	0.502	-35.7	0.433	20.79
3.800	0.773	-143.0	5.673	100.8	0.053	20.5	0.482	-35.9	0.478	20.30
4.200	0.774	-146.6	5.205	98.3	0.053	19.3	0.467	-35.9	0.523	19.88
4.600	0.775	-149.4	4.795	96.0	0.054	18.0	0.456	-36.0	0.568	19.48
5.000	0.775	-151.8	4.438	93.9	0.055	17.0	0.447	-36.2	0.613	19.10
5.400	0.775	-153.9	4.130	92.1	0.055	16.1	0.440	-36.5	0.658	18.76
5.800	0.776	-155.7	3.864	90.3	0.055	15.4	0.434	-36.8	0.701	18.43
6.200	0.776	-157.4	3.629	88.7	0.056	14.7	0.430	-37.2	0.746	18.14
6.600	0.776	-158.7	3.414	87.2	0.056	14.1	0.426	-37.7	0.793	17.84
7.000	0.776	-160.0	3.227	85.7	0.056	13.5	0.423	-38.2	0.837	17.58
7.400	0.776	-161.1	3.058	84.3	0.057	13.1	0.420	-38.7	0.884	17.32
7.800	0.776	-162.1	2.905	83.0	0.057	12.6	0.419	-39.3	0.928	17.09
8.200	0.776	-163.0	2.767	81.7	0.057	12.4	0.417	-39.9	0.969	16.85
8.600	0.777	-163.8	2.642	80.4	0.058	12.2	0.417	-40.6	1.006	16.13
9.000	0.777	-164.6	2.527	79.2	0.058	12.1	0.416	-41.3	1.044	15.12
9.400	0.777	-165.3	2.423	78.0	0.058	11.7	0.416	-41.9	1.082	14.43
9.800	0.777	-166.0	2.325	76.8	0.059	11.4	0.417	-42.7	1.117	13.88
10.200	0.777	-166.6	2.234	75.7	0.059	11.2	0.417	-43.5	1.154	13.38
10.600	0.777	-167.2	2.151	74.6	0.060	11.0	0.418	-44.2	1.189	12.93
11.000	0.777	-167.7	2.073	73.4	0.060	10.4	0.419	-45.0	1.224	12.51
11.400	0.776	-168.2	2.000	72.3	0.061	10.0	0.419	-45.9	1.262	12.09
11.800	0.776	-168.6	1.930	71.3	0.061	9.5	0.420	-46.8	1.301	11.70
12.200	0.776	-169.0	1.866	70.2	0.061	9.2	0.422	-47.6	1.341	11.33
12.600	0.776	-169.3	1.805	69.2	0.062	8.8	0.424	-48.4	1.381	10.99
13.000	0.776	-169.7	1.750	68.2	0.062	8.5	0.425	-49.3	1.419	10.67
13.400	0.776	-170.1	1.697	67.2	0.062	8.4	0.427	-50.1	1.454	10.37
13.800	0.776	-170.4	1.647	66.2	0.062	8.1	0.428	-51.0	1.490	10.08
14.200	0.776	-170.7	1.600	65.3	0.063	7.8	0.430	-51.8	1.525	9.79
14.600	0.776	-171.0	1.555	64.3	0.063	7.4	0.434	-52.7	1.550	9.55
15.000	0.776	-171.3	1.513	63.3	0.063	7.1	0.435	-53.7	1.590	9.27
15.400	0.776	-171.5	1.474	62.3	0.064	6.7	0.437	-54.6	1.615	9.03
15.800	0.776	-171.8	1.434	61.3	0.064	6.4	0.438	-55.5	1.645	8.78
16.200	0.776	-172.0	1.398	60.4	0.064	5.8	0.441	-56.4	1.684	8.54
16.600	0.776	-172.2	1.364	59.4	0.065	5.6	0.444	-57.2	1.704	8.32
17.000	0.775	-172.4	1.330	58.5	0.065	5.1	0.447	-58.0	1.737	8.09
17.400	0.775	-172.6	1.299	57.6	0.065	4.7	0.449	-58.8	1.774	7.87
17.800	0.775	-172.8	1.268	56.6	0.066	4.4	0.452	-59.7	1.799	7.66
18.200	0.775	-173.0	1.239	55.7	0.066	3.6	0.455	-60.6	1.831	7.44
18.600	0.775	-173.1	1.210	54.8	0.066	3.2	0.457	-61.7	1.869	7.24
19.000	0.774	-173.3	1.185	53.8	0.067	2.6	0.462	-62.5	1.889	7.05
19.400	0.774	-173.4	1.158	53.0	0.067	1.6	0.464	-63.4	1.943	6.82
19.800	0.774	-173.5	1.134	52.1	0.067	1.7	0.467	-64.3	1.977	6.64
20.000	0.775	-173.6	1.121	51.6	0.067	1.3	0.467	-64.7	1.998	6.54

Note:

1. Gain Calculations:

$MAG = \frac{|S_{21}|}{|S_{12}|}\left(K \pm \sqrt{K^2 - 1}\right)$ When K≤1， MAG is undefined and MSG values are used. MSG = $\frac{|S_{21}|}{|S_{12}|}$, $K = \frac{1 + |\Delta|^2 - |S_{11}|^2 - |S_{22}|^2}{2|S_{12}S_{21}|}$, $\Delta = S_{11}S_{22} - S_{21}S_{12}$

MAG = Maximum Available Gain

MSG = Maximum Stable Gain

YPA895TS T1
VCE = 3.3V, IC = 12.5 mA

Frequency	S11		S21		S12		S22		K	MAG[1]
GHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang		dB
0.200	0.593	-30.9	27.834	166.2	0.008	73.0	0.966	-10.1	0.106	35.38
0.600	0.651	-74.6	23.837	145.4	0.019	57.0	0.847	-24.8	0.118	30.88
1.000	0.700	-102.5	19.451	130.9	0.026	43.9	0.709	-33.5	0.179	28.72
1.400	0.730	-120.0	15.887	121.0	0.029	34.9	0.601	-37.9	0.248	27.31
1.800	0.750	-131.5	13.239	114.1	0.031	29.1	0.526	-39.9	0.313	26.25
2.200	0.763	-139.5	11.299	109.0	0.032	25.1	0.474	-40.5	0.373	25.42
2.600	0.770	-145.4	9.790	105.0	0.033	22.5	0.436	-40.7	0.436	24.68
3.000	0.776	-149.9	8.632	101.8	0.034	20.5	0.409	-40.5	0.500	24.08
3.400	0.780	-153.5	7.708	99.1	0.034	19.1	0.388	-40.3	0.563	23.54
3.800	0.783	-156.3	6.950	96.8	0.034	18.1	0.372	-40.1	0.623	23.04
4.200	0.785	-158.6	6.329	94.8	0.035	17.5	0.361	-39.9	0.682	22.59
4.600	0.787	-160.5	5.808	93.0	0.035	17.0	0.352	-39.9	0.738	22.18
5.000	0.788	-162.1	5.360	91.4	0.036	16.4	0.346	-40.0	0.797	21.79
5.400	0.789	-163.4	4.978	89.9	0.036	15.8	0.341	-40.0	0.857	21.44
5.800	0.790	-164.7	4.644	88.5	0.036	15.8	0.337	-40.4	0.906	21.08
6.200	0.790	-165.7	4.352	87.1	0.036	15.6	0.335	-40.8	0.964	20.78
6.600	0.790	-166.6	4.091	85.9	0.037	15.2	0.332	-41.2	1.019	19.62
7.000	0.791	-167.4	3.861	84.7	0.037	15.0	0.330	-41.8	1.077	18.49
7.400	0.791	-168.1	3.654	83.6	0.037	14.6	0.328	-42.3	1.135	17.68
7.800	0.791	-168.8	3.469	82.5	0.037	14.6	0.328	-42.9	1.191	17.03
8.200	0.792	-169.4	3.302	81.4	0.038	14.7	0.328	-43.5	1.242	16.47
8.600	0.792	-169.9	3.150	80.4	0.038	14.7	0.327	-44.2	1.283	15.98
9.000	0.793	-170.4	3.009	79.4	0.038	15.0	0.328	-45.0	1.328	15.52
9.400	0.793	-170.9	2.883	78.4	0.039	14.7	0.328	-45.7	1.372	15.07
9.800	0.793	-171.3	2.765	77.4	0.039	14.7	0.329	-46.5	1.412	14.66
10.200	0.793	-171.8	2.656	76.4	0.040	14.6	0.330	-47.2	1.451	14.27
10.600	0.793	-172.1	2.554	75.5	0.040	14.4	0.332	-48.0	1.494	13.88
11.000	0.793	-172.5	2.460	74.5	0.041	14.2	0.333	-48.9	1.531	13.52
11.400	0.793	-172.8	2.372	73.6	0.041	13.8	0.334	-49.8	1.573	13.16
11.800	0.792	-173.1	2.289	72.7	0.041	13.3	0.336	-50.7	1.621	12.81
12.200	0.792	-173.4	2.212	71.8	0.042	13.0	0.337	-51.5	1.666	12.47
12.600	0.792	-173.6	2.139	71.0	0.042	12.7	0.339	-52.4	1.716	12.16
13.000	0.792	-173.8	2.073	70.1	0.042	12.5	0.342	-53.2	1.758	11.86
13.400	0.792	-174.1	2.009	69.3	0.042	12.6	0.343	-54.1	1.796	11.58
13.800	0.792	-174.3	1.949	68.5	0.043	12.3	0.345	-54.9	1.839	11.30
14.200	0.792	-174.5	1.892	67.6	0.043	11.9	0.347	-55.8	1.877	11.03
14.600	0.792	-174.7	1.838	66.8	0.043	11.8	0.351	-56.7	1.903	10.79
15.000	0.792	-174.9	1.788	66.0	0.044	11.5	0.352	-57.8	1.954	10.53
15.400	0.792	-175.0	1.741	65.0	0.044	11.3	0.355	-58.7	1.972	10.30
15.800	0.792	-175.2	1.694	64.2	0.045	11.0	0.357	-59.7	2.010	10.05
16.200	0.792	-175.4	1.649	63.4	0.045	10.5	0.360	-60.5	2.053	9.82
16.600	0.792	-175.5	1.609	62.6	0.045	10.2	0.363	-61.3	2.074	9.60
17.000	0.791	-175.7	1.569	61.8	0.046	9.6	0.367	-62.1	2.113	9.37
17.400	0.791	-175.8	1.531	61.0	0.046	9.3	0.369	-62.9	2.162	9.16
17.800	0.791	-175.9	1.495	60.2	0.046	8.9	0.373	-63.8	2.184	8.95
18.200	0.791	-176.0	1.460	59.4	0.047	8.2	0.375	-64.7	2.221	8.73
18.600	0.791	-176.1	1.426	58.6	0.046	7.7	0.378	-65.7	2.273	8.53
19.000	0.790	-176.3	1.395	57.8	0.047	7.0	0.383	-66.6	2.291	8.34
19.400	0.789	-176.3	1.364	57.0	0.047	5.9	0.385	-67.5	2.363	8.11
19.800	0.790	-176.4	1.335	56.3	0.047	6.1	0.388	-68.4	2.405	7.93
20.000	0.790	-176.4	1.319	55.8	0.047	5.8	0.389	-68.7	2.428	7.84

Note:

1.Gain Calculations:

$MAG = \frac{|S_{21}|}{|S_{12}|}\left(K \pm \sqrt{K^2 - 1}\right)$ When K≤1， MAG is undefined and MSG values are used. MSG = $\frac{|S_{21}|}{|S_{12}|}, K = \frac{1 + |\Delta|^2 - |S_{11}|^2 - |S_{22}|^2}{2|S_{12}S_{21}|}, \Delta = S_{11}S_{22} - S_{21}S_{12}$

MAG = Maximum Available Gain

MSG = Maximum Stable Gain

YPA895TS T1
VCE = 3.3V, IC = 25 mA

Frequency	S11		S21		S12		S22		K	MAG[1]
GHz	Mag	Ang	Mag	Ang	Mag	Ang	Mag	Ang		dB
0.200	0.430	-48.7	40.308	163.1	0.007	72.1	0.950	-13.6	0.092	37.82
0.600	0.589	-99.6	32.430	139.4	0.015	51.3	0.779	-31.6	0.148	33.49
1.000	0.685	-124.5	25.003	124.8	0.019	37.8	0.614	-40.8	0.232	31.28
1.400	0.733	-138.2	19.744	115.6	0.020	30.6	0.504	-44.8	0.312	29.85
1.800	0.758	-146.8	16.133	109.5	0.021	25.8	0.432	-46.3	0.395	28.78
2.200	0.773	-152.4	13.585	105.1	0.022	23.0	0.386	-46.6	0.474	27.94
2.600	0.781	-156.6	11.672	101.8	0.022	20.6	0.350	-46.3	0.558	27.16
3.000	0.787	-159.7	10.231	99.0	0.023	19.5	0.328	-46.0	0.640	26.56
3.400	0.791	-162.1	9.088	96.8	0.023	18.6	0.310	-45.6	0.723	26.01
3.800	0.795	-164.0	8.168	94.9	0.023	18.4	0.296	-45.4	0.795	25.47
4.200	0.797	-165.5	7.419	93.2	0.023	18.1	0.287	-45.1	0.875	25.03
4.600	0.799	-166.8	6.799	91.7	0.024	18.0	0.280	-45.0	0.941	24.59
5.000	0.801	-167.9	6.266	90.3	0.024	18.1	0.275	-45.2	1.008	23.61
5.400	0.801	-168.9	5.814	89.0	0.024	17.9	0.271	-45.2	1.081	22.08
5.800	0.802	-169.7	5.417	87.8	0.025	17.7	0.268	-45.5	1.144	21.13
6.200	0.803	-170.4	5.073	86.7	0.025	17.9	0.267	-46.0	1.209	20.35
6.600	0.803	-171.1	4.766	85.6	0.025	17.6	0.265	-46.4	1.274	19.63
7.000	0.803	-171.6	4.496	84.6	0.025	17.8	0.263	-47.1	1.338	19.00
7.400	0.803	-172.1	4.253	83.6	0.025	17.6	0.263	-47.6	1.417	18.39
7.800	0.804	-172.5	4.036	82.7	0.026	17.8	0.262	-48.3	1.469	17.88
8.200	0.804	-172.9	3.840	81.8	0.026	18.2	0.262	-49.0	1.534	17.40
8.600	0.805	-173.3	3.663	80.9	0.026	18.3	0.263	-49.6	1.580	16.95
9.000	0.806	-173.7	3.498	80.0	0.027	18.8	0.263	-50.4	1.620	16.54
9.400	0.806	-174.0	3.350	79.1	0.027	18.7	0.264	-51.1	1.664	16.13
9.800	0.806	-174.3	3.212	78.3	0.028	19.0	0.265	-51.9	1.706	15.75
10.200	0.806	-174.6	3.085	77.4	0.028	18.5	0.267	-52.7	1.755	15.38
10.600	0.806	-174.9	2.965	76.6	0.028	18.4	0.269	-53.5	1.798	15.01
11.000	0.806	-175.2	2.854	75.7	0.029	18.3	0.271	-54.4	1.834	14.67
11.400	0.806	-175.4	2.751	74.9	0.029	18.0	0.272	-55.4	1.883	14.32
11.800	0.805	-175.6	2.655	74.1	0.030	17.4	0.274	-56.3	1.929	13.99
12.200	0.805	-175.8	2.566	73.3	0.030	17.0	0.276	-57.2	1.980	13.67
12.600	0.805	-176.0	2.481	72.6	0.030	16.7	0.278	-57.9	2.036	13.36
13.000	0.805	-176.1	2.403	71.8	0.030	16.8	0.281	-58.8	2.078	13.08
13.400	0.805	-176.3	2.328	71.1	0.031	16.7	0.283	-59.7	2.123	12.80
13.800	0.805	-176.4	2.259	70.4	0.031	16.6	0.285	-60.5	2.167	12.53
14.200	0.805	-176.6	2.192	69.6	0.031	16.2	0.287	-61.5	2.214	12.26
14.600	0.805	-176.7	2.129	68.9	0.032	15.9	0.292	-62.3	2.235	12.02
15.000	0.805	-176.9	2.071	68.2	0.032	15.7	0.293	-63.5	2.295	11.76
15.400	0.805	-177.0	2.015	67.4	0.032	15.5	0.295	-64.4	2.303	11.54
15.800	0.805	-177.1	1.960	66.6	0.033	15.0	0.298	-65.3	2.346	11.29
16.200	0.805	-177.2	1.908	65.9	0.033	14.6	0.301	-66.2	2.400	11.05
16.600	0.805	-177.4	1.861	65.2	0.033	14.2	0.305	-66.9	2.410	10.85
17.000	0.805	-177.5	1.814	64.5	0.034	13.5	0.308	-67.6	2.449	10.62
17.400	0.805	-177.5	1.770	63.8	0.034	13.1	0.311	-68.4	2.512	10.40
17.800	0.804	-177.6	1.728	63.0	0.034	12.5	0.315	-69.2	2.527	10.19
18.200	0.804	-177.7	1.687	62.4	0.034	11.8	0.318	-70.2	2.577	9.97
18.600	0.804	-177.8	1.647	61.7	0.034	11.2	0.321	-71.2	2.638	9.77
19.000	0.803	-177.9	1.611	60.9	0.035	10.5	0.326	-72.1	2.653	9.58
19.400	0.803	-177.9	1.575	60.3	0.035	9.2	0.328	-73.0	2.743	9.35
19.800	0.803	-178.0	1.542	59.6	0.035	9.4	0.331	-73.8	2.790	9.17
20.000	0.803	-178.0	1.523	59.2	0.035	9.1	0.332	-74.1	2.821	9.07

Note:

1.Gain Calculations:

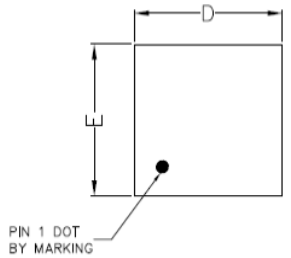
$MAG = \frac{|S_{21}|}{|S_{12}|}\left(K \pm \sqrt{K^2 - 1}\right)$ When K≤1， MAG is undefined and MSG values are used. MSG = $\frac{|S_{21}|}{|S_{12}|}, K = \frac{1 + |\Delta|^2 - |S_{11}|^2 - |S_{22}|^2}{2|S_{12}S_{21}|}, \Delta = S_{11}S_{22} - S_{21}S_{12}$

MAG = Maximum Available Gain

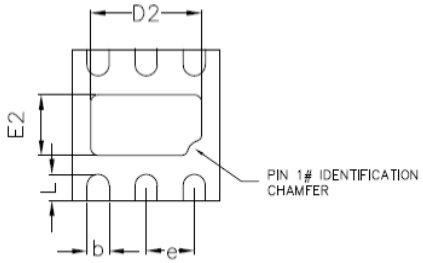
MSG = Maximum Stable Gain

Package Diagram

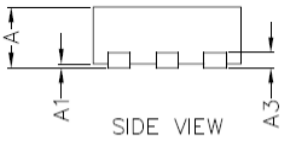
(Units: millimeters)



TOP VIEW



BOTTOM VIEW



SIDE VIEW

COMMON DIMENSIONS(MM)			
PKG.	W:VERY VERY THIN		
REF.	MIN.	NOM.	MAX
A	0.70	0.75	0.80
A1	0.00	–	0.05
A3	0.2 REF.		
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D2	1.35	1.50	1.60
E2	0.65	0.80	0.90
L	0.25	0.35	0.45
b	0.25	0.30	0.35
e	0.65 Bsc		