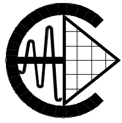

EXCELICS SEMICONDUCTOR, INC.

S-Parameter Uniformity

Data was measured on EPA040A devices, from 1 to 26GHz. Devices were assembled in a microstrip test fixture. S-parameters include bond wires. Devices were biased at 8V, half Idss. Consequently this data includes not only variations in device characteristics, but also variations due to bias point, assembly, and measurement repeatability. Data at worst case point is presented here.

Within a wafer: Comparing 5 samples from 5 different areas in one wafer:

S21 magnitude ±0.5dB
S12 magnitude ±0.5dB
S11 magnitude ±0.01
S11 phase ±9 deg
S22 magnitude ±.03
S22 phase ±7 deg

Wafer to wafer: Comparing 8 samples from the same area in different wafers processed over a one year period:

S21 magnitude ±1.0 dB
S12 magnitude ±2.5dB
S11 magnitude ±0.02
S11 phase ±9 deg
S22 magnitude ±.05
S22 phase ±7 deg

Total variation over 32 different samples from several areas on 8 different wafers processed over a one year period:

	Freq (GHz)	**Magnitude**		**Phase**	
		Mean	***Std Dev***	***Mean***	***Std Dev***
S11	2	.943	.009	-65.2	5.8
	10	.790	.009	-158.9	6.4
	18	.853	.014	157.3	6.2
S21	2	8.32	.803	137.9	3.1
	10	3.23	.217	61.9	2.7
	18	1.81	.110	7.0	2.0
S12	2	.036	.003	57.2	2.6
	10	.057	.008	13.6	2.6
	18	.061	.007	-2.9	6.2
S22	2	.609	.029	-19.6	2.4
	10	.391	.043	-65.5	5.6
	18	.330	.037	-144.6	10.9