

## Maximum Input Power Analysis of MMIC Amplifiers

### 1. Introduction

In many applications, amplifiers may be subjected to an unexpected abnormal operation by a various RF environment so that the amplifier can't work properly in a system. We made a test to provide a maximum input power level before our amplifier is damaged and fails to operate, which can be useful for user to achieve a safe system design.

### 2. Test Procedure

Tests were performed on 50 ohm matched an evaluation board with a load condition ( $Z_L = 50$  ohms) as follows.

Step 1:  $I_c$  and  $S_{21}$  measurement on a device before test.

Step 2: Testing the device with static RF  $P_{IN}$  (20 dBm, CW) for 16 hours.

Step 3:  $I_c$  and  $S_{21}$  measurement on the device after test.

- Failure criterion: 10% change in  $I_c$  and 1 dB change in  $S_{21}$ .

Step 4: Measuring a burnout level of the device as  $P_{IN}$  increases from 20 dBm to 30 dBm.

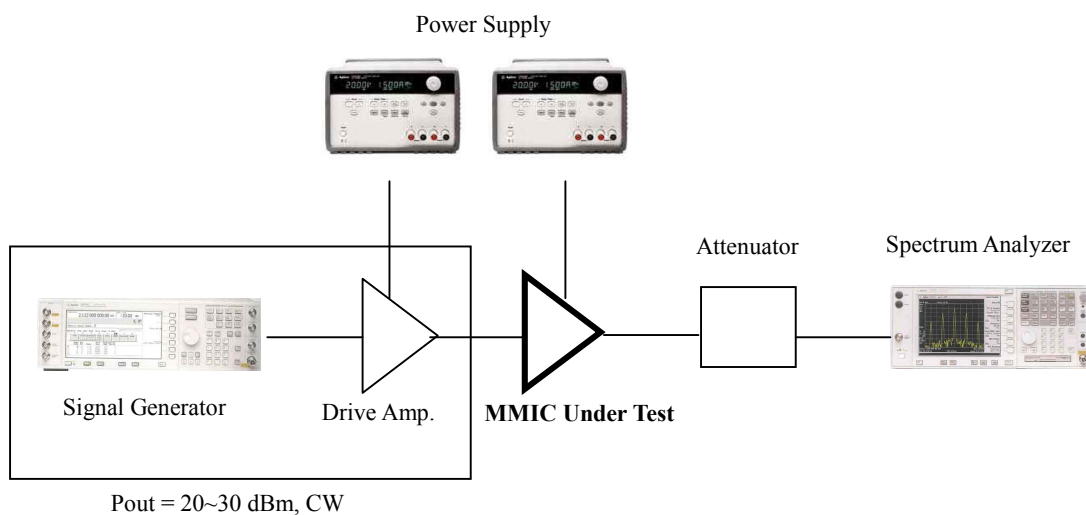


Fig 1. Test configuration (Step 4)

### 3. Test Results

Part Number	Test Freq. (MHz)	Before Test (Step 1)		After Test (Step 3)		Change		Burnout P <sub>IN</sub> level (dBm) (Step 4)
		I <sub>c</sub> (mA)	Gain (dB)	I <sub>c</sub> (mA)	Gain (dB)	I <sub>c</sub> (%)	Gain (dB)	
ASL13W	2000	66	13.17	68	13.15	3.0	-0.02	27
ASL19W	2000	84	13.48	83	13.56	1.2	+0.08	28
ASL19H	2000	76	14.48	76	14.48	0.0	0	30
ASL19D	2000	89	24.3	90	24.3	1.1	0	30
ASL226	1950	8	25.5	8	25.55	0.0	+0.05	28
ASL29W	2000	81	13.10	80	13.10	1.2	0	No Burnout
ASW101	2000	35	11.57	35	11.6	0.0	+0.03	No Burnout
ASW103	2000	43	11	43	11.08	0.0	+0.08	No Burnout
ASW204	2000	54	18.3	54	18.32	0.0	+0.02	24
ASW205	2000	69	20.93	69	20.95	0.0	+0.02	No Burnout
ASW212	2000	76	12.90	76	12.94	0.0	+0.04	No Burnout
ASW214	2000	53	17.95	53	18.00	0.0	+0.05	No Burnout
ASW215	2000	86	13.09	86	13.17	0.0	+0.08	No Burnout
ASW216	2000	82	11.72	82	11.89	0.0	+0.17	No Burnout
ASW301	2000	76	10.22	76	10.37	0.0	+0.15	No Burnout
ASW311	2000	152	12	152	12	0.0	0	27
ASW313	2000	103	16.33	103	16.30	0.0	+0.03	29
ASW314	900	115	16.24	115	16.35	0.0	+0.11	27
ASW318	2000	119	15.08	117	15.12	1.7	+0.04	28
ASW335	1950	119	15.08	117	15.12	1.7	+0.04	28
ASW338	1950	121	16.56	121	16.48	0.0	-0.08	26
ASX101	2000	42	15.02	42	15.01	0.0	-0.01	No Burnout
ASX201	2000	67	16.08	66	16.13	1.5	+ 0.05	No Burnout
ASX401	2000	298	12.58	299	12.57	0.3	-0.01	No Burnout
ASX415	2000	154	14.6	154	14.6	0	0	No Burnout
ASX501	2000	578	10.99	580	11.16	0.3	+0.15	No Burnout
ASX601	900	868	16.6	865	16.76	0.3	+0.16	29
ASX602	1840	625	12.63	622	12.76	0.5	+0.13	No Burnout
ASX420	2000	379	20.27	380	20.38	0.3	+0.11	29
ASX520	900	650	32.09	636	32.15	2.2	+0.06	No Burnout
ASX620	900	895	29.96	870	30.2	2.8	+0.24	No Burnout
ASX423	2000	406	23.58	402	23.64	1.0	+0.06	30



## *Maximum Input Power Analysis of ASB's MMIC Amplifiers*

ASX521	2000	893	20.18	893	20.26	0.0	-0.11	No Burnout
ASX621	2000	1161	19.35	1152	19.05	0.8	-0.20	No Burnout
AST20S	1950	48	13.3	48	13.4	0.0	+0.1	24