

APPLICATION NOTE #20
AR RF/MICROWAVE INSTRUMENTATION PRODUCTS THAT
PROVIDE 20 V/m CW OR PM AT A DISTANCE OF 1 METER ¹

The Amplifier / Antenna / Cell combinations shown in Table 1 provide various means of generating 20 V/m, CW or Pulse Modulated, inside a TEM Cell or ARCell, between the elements of an E-field generator, or at a distance of one meter from a radiating antenna, from 10 kHz to 40 GHz. This table is used in conjunction with the enclosed product selection flow chart and system diagrams. The appropriate combination of products is determined by first noting the physical size of the Device Under Test (DUT). The size of the test object determines the appropriate path taken on the flow chart. Follow the path that accommodates the maximum expected DUT size.

As an example, to test a device 14 inches or less on a side across the entire frequency band from 10 kHz to 40 GHz, select items 15, 16, 17, 18, 19, 20, and 21. If the test object is greater than 39 inches on a side, items 1, 2, 3, 4, 5, 6, and 7 would be appropriate.

When testing small objects, a TEM cell offers an economical solution in that it is used in lieu of both a radiating antenna and a shielded enclosure. For a test object 4 inches or less in height, select items 25 and 26. If the DUT is 2 inches or less in height, then items 27 and 28 can be used.

The TC1000A, TC2000C, TC3000A, and TC4000A ARCells offer semi-anechoic performance and also include built in field generators. ARCells offer convenient, cost effective alternatives to conventional susceptibility test systems consisting of a shielded room or anechoic chamber. With four enclosures to choose from, one can test devices from 12"/side to 39"/side from 10 kHz to 4.2 GHz. The maximum field level, frequency range, and test volume is cell dependent. See Application Note 34 for additional details on the ARCell.

To accurately determine field strength in the area of the DUT, a field monitor such as the AR RF/Microwave Instrumentation model FM7004 and an appropriate field probe are required. Contact the factory for specific recommendations.

The power amplifier recommendations that follow provide sufficient margin and should prove adequate to accommodate nominal system losses.

20 V/m CW OR PM AT A DISTANCE OF 1 METER ¹

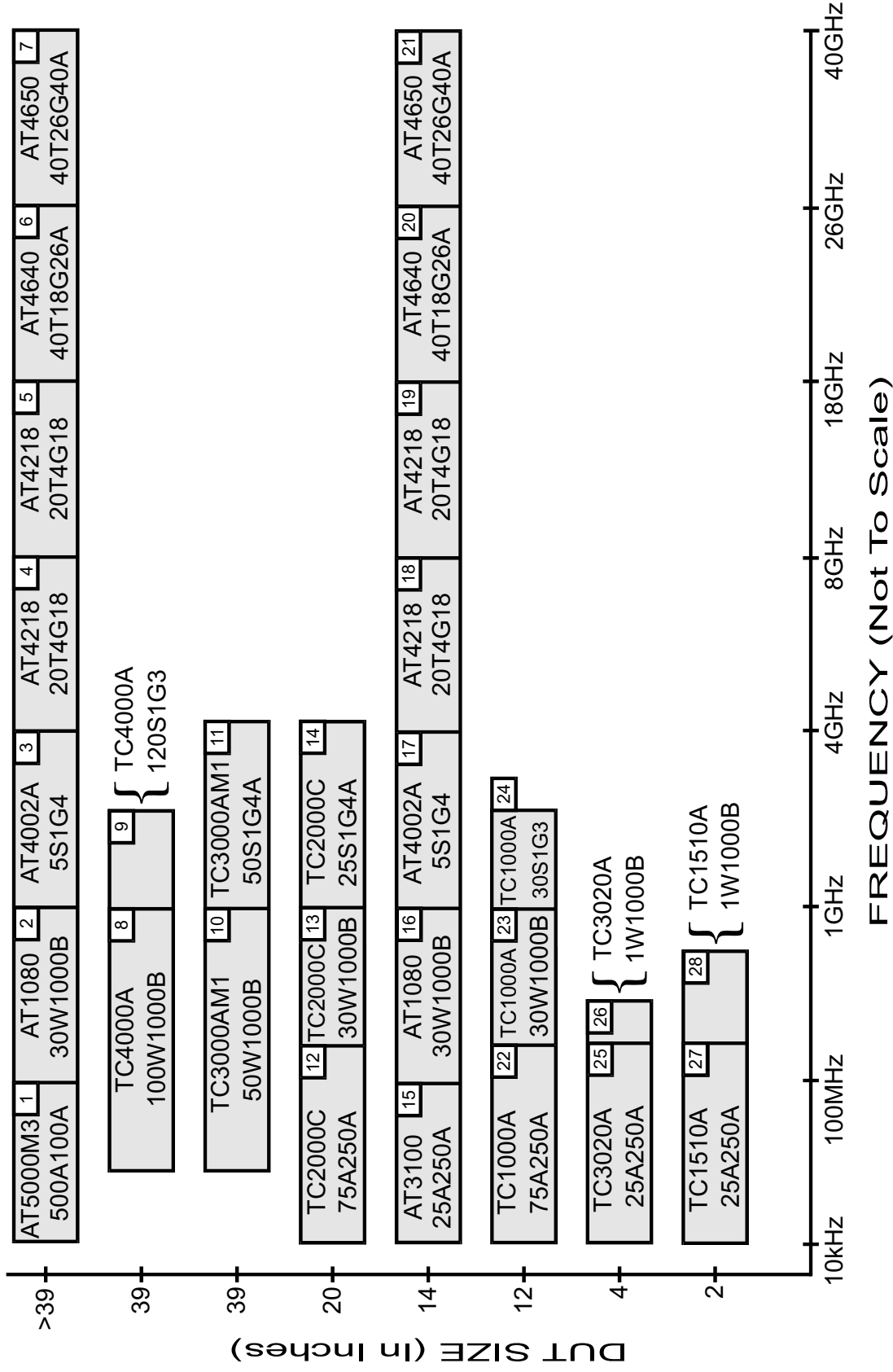
ITEM ²	FREQUENCY	AMPLIFIER	ANTENNA or CELL	DUT PLACEMENT
1	10 kHz – 100 MHz	500A100A	AT5000M3	1 meter
2	100 MHz – 1 GHz	30W1000B	AT1080	1 meter
3	1 GHz – 4 GHz	5S1G4	AT4002A	1 meter
4	4 GHz – 8 GHz	20T4G18	AT4218	3 meters
5	8 GHz – 18 GHz	20T4G18	AT4218	3 meters
6	18 GHz – 26 GHz	40T18G26A	AT4640	3 meters
7	26 GHz – 40 GHz	40T26G40A	AT4650	3 meters
8	27 MHz – 1 GHz	100WI000B	TC4000A	3 meters
9	1 GHz - 2.7 GHz	120S1G3	TC4000A	3 meters
10	27 MHz – 1 GHz	50W1000B	TC3000A	> 1 meter
11	1 GHz - 2.7 GHz	50S1G4A	TC3000A	> 1 meter
12	10 kHz – 250 MHz	75A250A	TC2000C	< 1 meter
13	250 MHz – 1 GHz	30W1000B	TC2000C	< 1 meter
14	1 GHz – 4.2 GHz	25S1G4A	TC2000C	< 1 meter
15	10 kHz – 100 MHz	25A250A	AT3100	Between Elements
16	100 MHz – 1 GHz	30W1000B	AT1080	1 meter
17	1 GHz – 4 GHz	5S1G4	AT4002A	1 meter
18	4 GHz – 8 GHz	20T4G18	AT4218	3 meters
19	8 GHz – 18 GHz	20T4G18	AT4218	3 meters
20	18 GHz – 26 GHz	40T18G26A	AT4640	3 meters
21	26 GHz – 40 GHz	40T26G40A	AT4650	3 meters
22	10 kHz – 250 MHz	75A250A	TC1000A	< 1 meter
23	250 MHz – 1 GHz	30W1000B	TC1000A	< 1 meter
24	1 GHz – 2.7 GHz	30S1G3	TC1000A	< 1 meter
25	10 kHz – 250 MHz	25A250A	TC3020A	Center of Cell
26	250 MHz – 375 MHz	1W1000B	TC3020A	Center of Cell
27	10 kHz – 250 MHz	25A250A	TC1510A	Center of Cell
28	250 MHz – 750 MHz	1W1000B	TC1510A	Center of Cell

Table 1

¹ The RF fields generated by the products recommended in this application note are either CW or pulse modulated, and occur at a distance of one meter unless otherwise noted. If the application mandates amplitude modulation, additional amplifier power is required to produce undistorted, linear fields. Call Application Engineering at 800-933-8181 for details.

² The Item numbers match the Block numbers on the enclosed Product Selection Flow Chart.

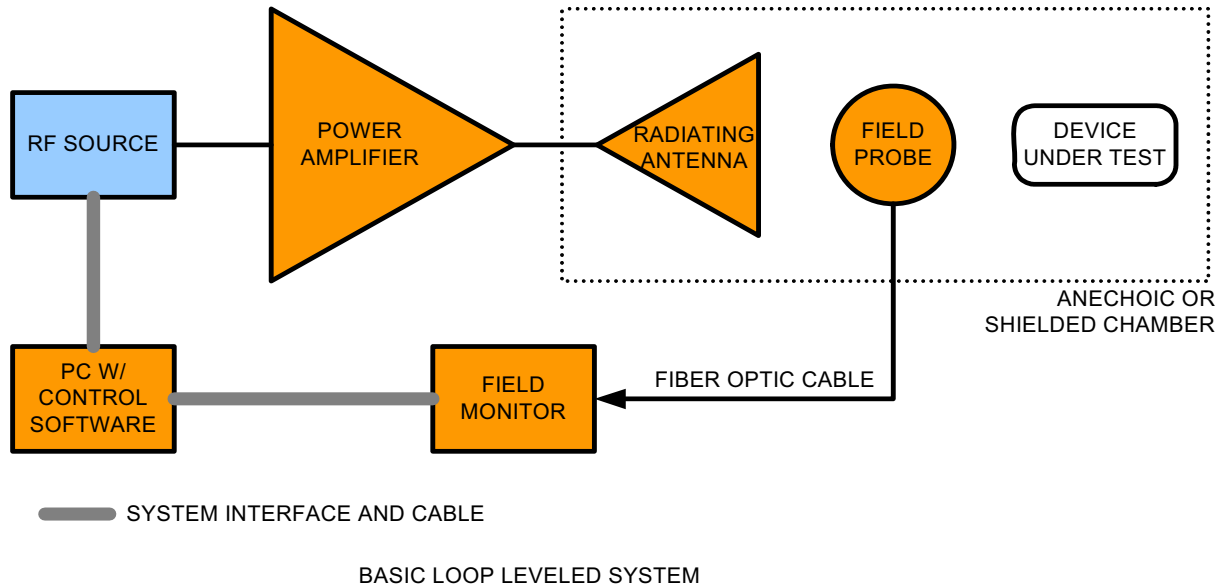
20V/m CW or PM @ 1M* Amplifier/Antenna/Cell Selection Chart



* The numbered cells represent either Amplifier / Antenna or Amplifier / Cell combinations. The actual distance from the field generator to the DUT may vary from 1 meter. See Table 1 for details.

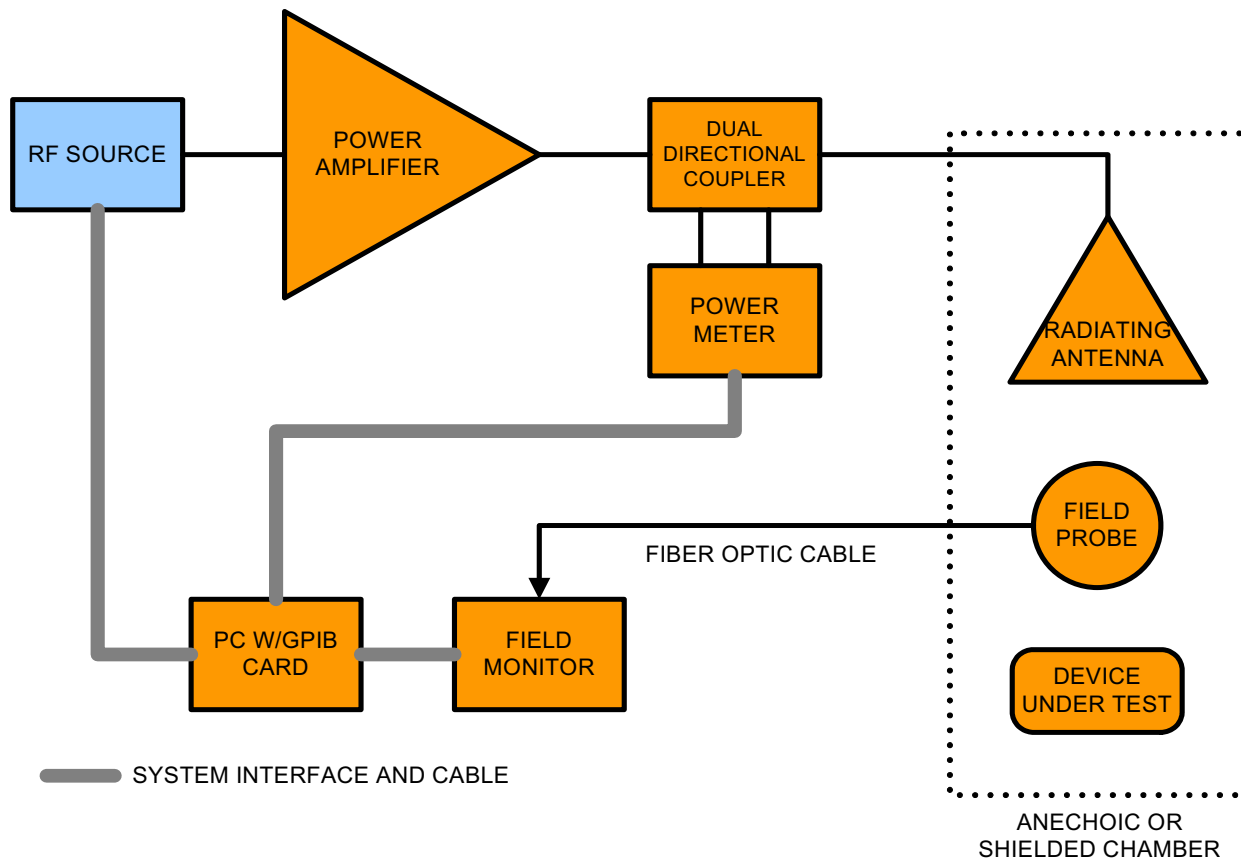
Typical Pre-Compliance Radiated Immunity Test Systems

(Use in applications that call for "loop leveled" or "real-time leveled")



Full Compliance Radiated Immunity Test Systems

(Use in applications that call for "substitution method" testing)



Fully Automated Multi-Band System

Full Compliance Radiated Immunity Test Systems

(Use in applications that call for "substitution method" testing)

