
Application of IT-M7700 Series in Harmonic Simulation of Home Appliance Industry

Abstract

With the development of power electronic technology, various power electronic devices and switch power supply products have been widely used. However, technology development also caused serious pollution to the electricity environment, a large number of harmonics have been generated in the city power network, which has caused more and more serious harm to the power system, industry, transportation and household electricity products. All countries in the world have paid enough attention to the harmonic problems, some of them have formulated standards and regulations to limit the harmonic in power systems and electrical equipment.

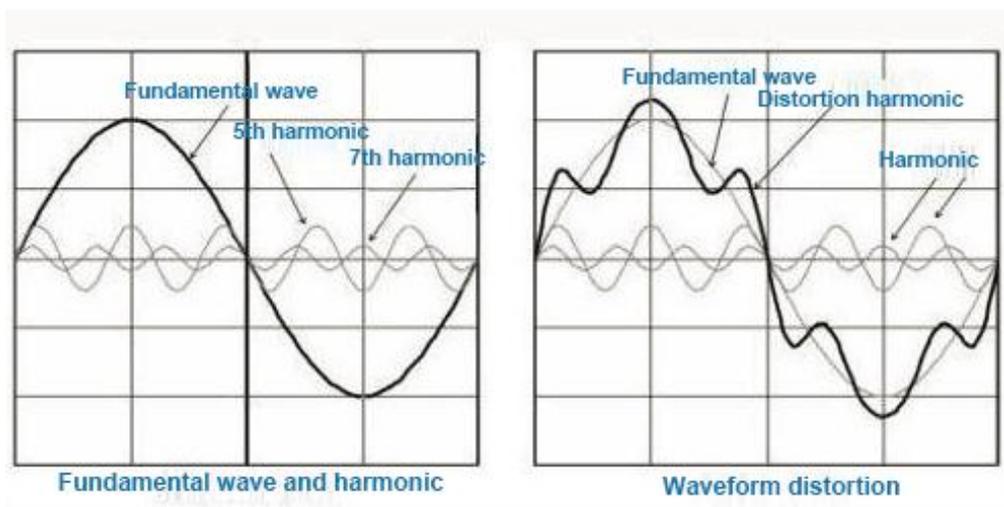


Figure 1 harmonic diagram

Application

Some customers require realizing voltage harmonic simulation as shown in the table below, 40 times of voltage simulation is realized at 110V/220V 50-60 Hz. Using IT-M7700 upper computer software to perform harmonic simulation, and then a schematic diagram can be generated on the software as shown in figure 3. The oscillograph of the actual output voltage waveform of IT-M7700 AC power supply ac source is shown in figure 4. In addition, the voltage drop and the voltage offset of the amplitude can also be performed on the basis of this voltage harmonic simulation.

Odd harmonic number	Harmonic quantity	Harmonic Angle	Even harmonic number	Harmonic quantity	Harmonic Angle
1	100%		2	5%	0 °
3	9%	180 °	4	2%	0 °
5	12%	180 °	6	1.50%	0 °
7	10%	180 °	8	1.50%	0 °
9	4%	180 °	10	1.50%	0 °
11	7%	180 °	12	1.50%	0 °
13	7%	180 °	14	1.50%	0 °
15	3%	0 °	16	1.50%	0 °
17	6%	180 °	18	1.50%	0 °
19	6%	180 °	20	1.50%	0 °
21	2%	0 °	22	1.50%	0 °
23	6%	180 °	24	1.50%	0 °
25	6%	0 °	26	1.50%	0 °
27	2%	0 °	28	1.50%	0 °
29	5%	180 °	30	1.50%	0 °
31	3%	0 °	32	1.50%	0 °
33	2%	0 °	34	1.50%	0 °
35	3%	0 °	36	1.50%	0 °
37	3%	0 °	38	1.50%	0 °
39	2%	0 °	40	1.50%	0 °

Figure 2 Harmonic standards for the home appliance industry



Figure 3 IT-M7700 harmonic simulation diagram



Figure 4 IT-M7700 harmonic analog oscilloscope diagram

In addition, IT-M7700 AC power supply also supports AC+DC mode to realize DC voltage offset simulation, sets the start/stop phase angle of output waveform, Surge/Trap function. Then we can also make a sequence change of harmonic simulation, trap and dc voltage offset in list mode. For example, in the harmonic simulation each period of 90°us level trap drop, and voltage offset is made on this basis, as shown in figure 5 below.

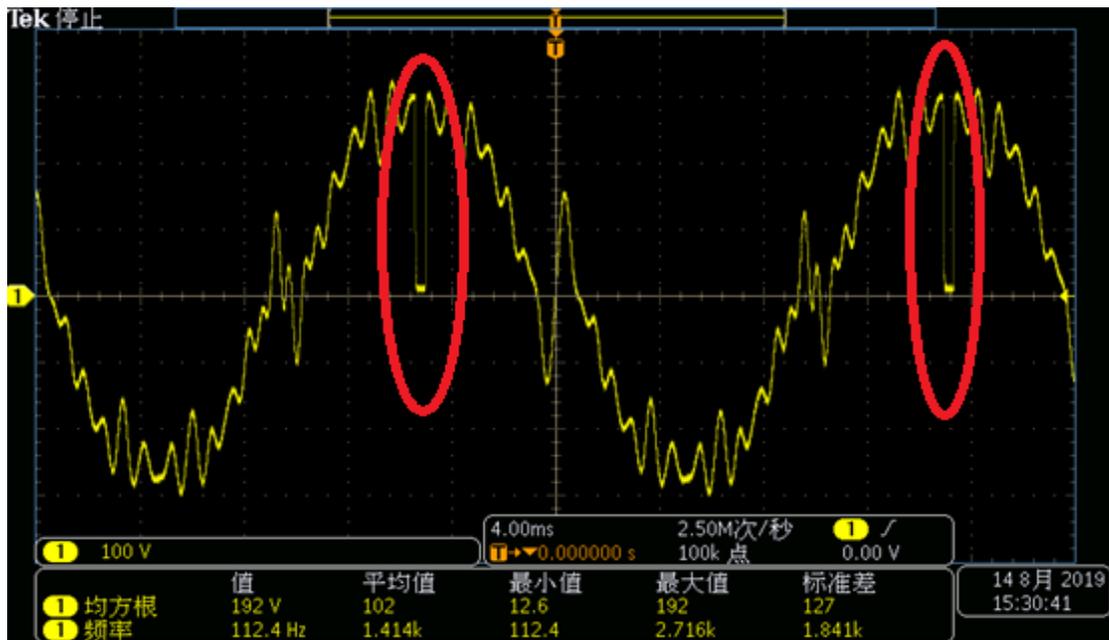


Figure 5 IT-M7700 harmonic analog oscilloscope diagram