What is claimed is:

1. A device for radio frequency (RF) voltage limiting, the device comprising: an analog limiter, a sensing circuit, a digital controller and a digital limiter, wherein

the analog limiter is configured to limit a voltage of an RF input to a predetermined safe range during power-off or power-up until a disable control signal is received from the digital controller, and provide a shunting current and a limiting voltage to the sensing circuit;

the sensing circuit is configured to sense a plurality of shunting currents provided by the analog limiter in sequence, determine a value of each bit of a preset current sensing code based on a corresponding sensed shunting current, send the generated value of each bit to the digital controller, sense the limiting voltage provided by the analog limiter after the value of each bit of the preset current sensing code has been determined, compare the sensed limiting voltage with a plurality of predetermined reference voltage ranges, generate a voltage comparison signal based on the comparison results and send the generated voltage comparison signal to the digital controller;

the digital controller is configured to generate a control bit based on the value of each bit of the preset current sensing code to control the digital limiter to perform RF limiting function by a corresponding limiting unit, determine which voltage range the limiting voltage provided by the analog limiter is within based on the voltage comparison signal, and send a disable control signal to the analog limiter when the limiting voltage is within a predetermined acceptable voltage range; and the digital limiter is configured to perform the RF limiting function by the corresponding limiting unit based on the control bit received from the digital controller.

2. The device according to claim 1, wherein the sensing circuit includes a current-sensing circuit part, a voltage-sensing circuit part and a comparator with a sensing circuit input terminal and a reference input terminal,

wherein the current-sensing circuit part is configured to sense the plurality of shunting currents provided by the analog limiter in sequence, and provide each of the sensed shunting currents to the sensing circuit input terminal of the comparator;

the voltage-sensing circuit part is configured to sense the limiting voltage provided by the analog limiter, and provide the sensed limiting voltage to the sensing circuit input terminal of the comparator; and

the comparator is configured to determine a value of each bit of a preset current sensing code based on a corresponding sensed shunting current, send the generated value of each bit to the digital controller, compare the limiting voltage with a plurality of predetermined reference voltage ranges, generate a voltage comparison signal based on the comparison results and send the generated voltage comparison signal to the digital controller.

3. The device according to claim 2, wherein the comparator is further configured to determine a value of each bit of a preset current sensing code based on a comparison result between a corresponding sensed shunting current and a corresponding predetermined reference current value, wherein each bit of the preset current sensing code is associated with a different predetermined reference current value controlled by the digital controller; and

the digital controller is further configured to control adjustment of the corresponding predetermined reference current value based on a next bit of the preset current sensing code to be determined by the sensing circuit.

4. The device according to claim 2, wherein the sensing circuit is further configured to determine a value of each bit of a preset current sensing code based on a comparison result between a corresponding predetermined ratio of a corresponding sensed shunting current and a predetermined reference current value, wherein each bit of the preset current sensing code is associated with a different predetermined ratio controlled by the digital controller; and

the digital controller is further configured to control adjustment of the corresponding predetermined ratio of the corresponding sensed shunting current based on a next bit of the preset current sensing code to be determined by the sensing circuit.

5. The device according to claim 2, wherein the comparator further comprises a reference current value generator connecting to the reference input terminal of the comparator, configured to adjust the corresponding predetermined reference current value based on a current value adjustment control signal sent from the digital controller.

6. The device according to claim 2, wherein the comparator further comprises a reference voltage value generator connecting to the reference input terminal of the comparator, configured to adjust the predetermined reference voltage ranges provided to the reference input terminal based on a voltage value adjustment control signal sent from the digital controller.

7. The device according to claim 1, wherein the digital controller is further configured to determine whether the sensed limiting voltage matches with a predetermined knee point, and when the sensed limiting voltage does not match with the predetermined knee point, control the analog limiter to adjust at least one parameter of the analog limiter to shift the sensed limiting voltage to match with the predetermined knee point.

8. The device according to claim 1, wherein the digital controller is further configured to obtain from a preset lookup table, a sensitivity control value, frame delay timing (FDT) control value and a load modulation control value based on the sensed limiting voltage and send the obtained values to an amplitude shift keying (ASK) modulation unit to control ASK modulation and demodulation.

9. The device according to claim 1, wherein the analog limiter includes a rectifier connected to the sensing circuit and configured to provide the limiting voltage to the sensing circuit, two transistors configured to limit a voltage of a radio frequency (RF) input to a predetermined safe range during power-off or power-up, and

a limiting voltage generation unit connected to the sensing circuit to provide the plurality of shunting currents in sequence to the sensing circuit, and disable the analog limiter if the disable control signal is received from the digital controller.

10. A method for radio frequency (RF) voltage limiting, implemented by a device including an analog limiter, a sensing circuit, a digital controller and a digital limiter, the method comprising:

limiting, by the analog limiter, a voltage of an RF input to a predetermined safe range during power-off or power-up;

sensing, by the sensing circuit, a plurality of shunting currents provided by the analog limiter in sequence, determining a value of each bit of a preset current sensing code based on a corresponding sensed shunting current, each bit associated with a predetermined reference current value, and sending the generated value of each bit to the digital controller;

generating, by the digital controller, a control bit based on the value of each bit of the preset current sensing code to control the digital controller to perform RF limiting function by a corresponding limiting unit;

sensing, by the sensing circuit, a limiting voltage provided by the analog limiter after the value of each bit of the preset current sensing code has been determined; comparing, by the sensing circuit, the sensed limiting voltage with a plurality of predetermined reference voltage ranges, generating a voltage comparison signal based on the comparison results and sending the generated voltage comparison signal to the digital controller;

determining, by the digital controller, the limiting voltage provided by the analog limiter based on the voltage comparison signal, generating a disable control signal when the limiting voltage is within a predetermined acceptable voltage range, and sending the generated disable control signal to the analog limiter; and

stopping, by the analog limiter, limiting the voltage of the RF input after receiving the disable control signal from the digital controller.

11. The method according to claim 10, wherein determining the value of each bit of the preset current sensing code further comprises:

determining a value of each bit of a preset current sensing code based on a comparison result between a corresponding sensed shunting current and a corresponding predetermined reference current value,

wherein each bit of the preset current sensing code is associated with a different predetermined reference current value controlled by the digital controller;

wherein the method further comprises: controlling, by the digital controller, adjustment of the corresponding predetermined ratio of the corresponding sensed shunting current based on a next bit of the preset current sensing code to be determined by the sensing circuit.

12. The method according to claim 11, further comprising:

adjusting, by the sensing circuit, the corresponding predetermined reference current value based on a current value adjustment control signal sent from the digital controller.

13. The method according to claim 11, the method further comprising:

adjusting, by the sensing circuit, the predetermined reference voltage range provided to a reference input terminal based on a voltage value adjustment control signal sent from the digital controller.

14. The method according to claim 10, wherein determining the value of each bit of the preset current sensing code further comprises:

determining a value of each bit of a preset current sensing code based on a comparison result between a corresponding predetermined ratio of a corresponding sensed shunting current and a predetermined reference current value, wherein each bit of the preset current sensing code associated with a different predetermined ratio controlled by the digital controller;

wherein the method further comprises: controlling, by the digital controller, adjustment of the corresponding predetermined ratio of the corresponding sensed shunting current based on a next bit of the preset current sensing code to be determined by the digital controller.

15. The method according to claim 10, further comprising:

determining, by the digital controller, whether the sensed limiting voltage matches with a predetermined knee point; and when the sensed limiting voltage does not match with the predetermined knee point, controlling, by the digital controller, the analog limiter to adjust at least one parameter of the analog limiter to shift the sensed limiting voltage to match with the predetermined knee point.

16. The method according to claim 10, further comprising:

obtaining, by the digital controller, from a preset lookup table, a sensitivity control value, a frame delay timing (FDT) control value and a load modulation control value based on the sensed limiting voltage and

sending the obtained values to an amplitude shift keying (ASK) modulation unit to control ASK modulation and demodulation.