

## THP9110 High Efficiency Wireless Power Receiver for 5W Applications

### Features

- Supports up to 5W
- Maximum current output up to 1A
- 92% AC to DC efficiency
- WPC-1.2.4 BPP compliant
- Integrated high efficiency full bridge synchronous rectifier and LDO
- Over-voltage, over-temperature, and over-current protection
- Supports I2C interface
- Supports Foreign Object Detection (FOD)
- QFN48 package (6mm×6mm)

### Typical Applications

- Mobile phones
- Tablet
- Wearable devices
- TWS headsets
- Smart devices

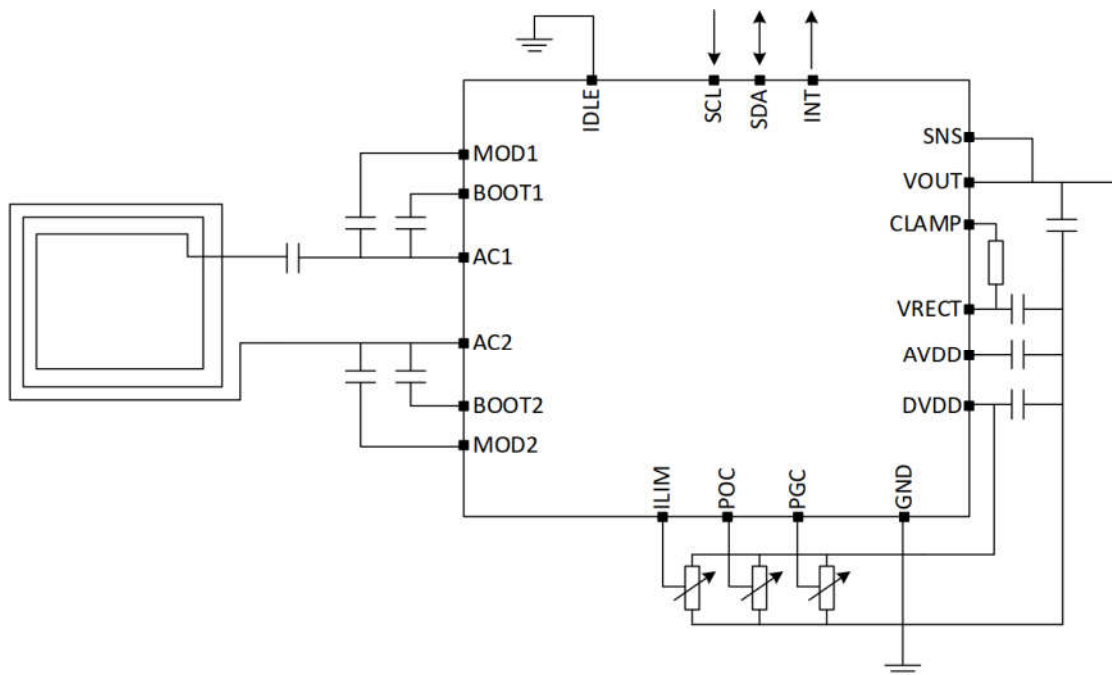
### Description

THP9110 is a high-efficient, Qi compliant wireless power receiver IC. The receiver integrated full bridge synchronous rectifier supporting application up to 5W with stable 5V output. The maximum current output of the receiver is 1A.

THP9110 features multiple protection mechanism including over-current protection, over-voltage protection, over-temperature protection to optimize security and stability of the design.

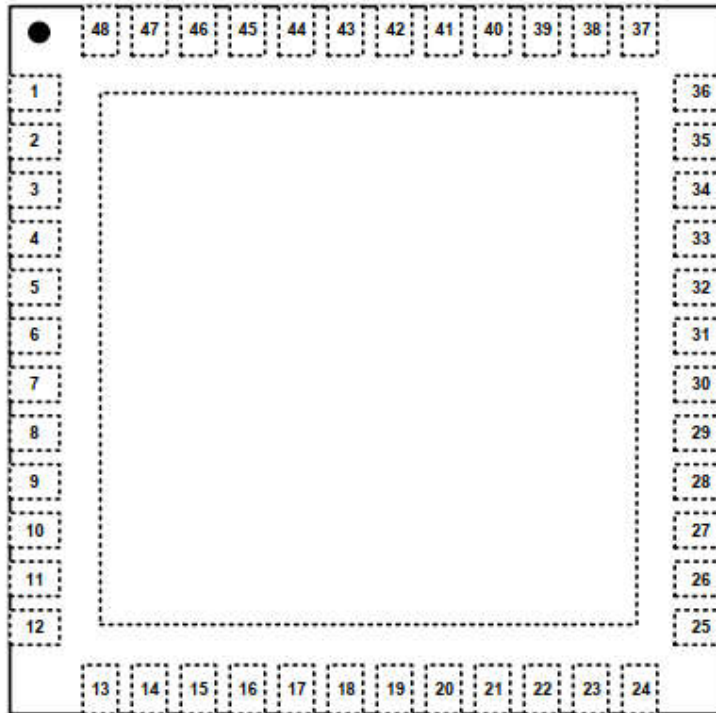
THP9110 require only minimized external components to achieve the advanced and high-efficient solution for wireless charging applications.

### Typical Application Circuit



## 1 Pin Assignments

### 1.1 Pin Assignments



TOP VIEW

### 1.2 Pin Descriptions

Pin	Name	Type	Description
<b>1,2,12,15</b>	NC		NC
<b>3</b>	INT	Digital output	Interrupt flag pin. Open-drain output. Pulling this pin to logic Low to activate.
<b>4</b>	SCL	Digital input	Serial clock line.
<b>5</b>	SDA	Digital I/O	Serial data line.
<b>6</b>	RFU0	Analog input	Reserved for internal use. Must connect to GND.
<b>7</b>	ILIM	Analog input	Programmable over-current limit pin.
<b>8</b>	POC	Analog input	Packet offset calibration pin used for Foreign Object Detection.
<b>9</b>	PGC	Analog input	Packet gain calibration pin used for Foreign Object Detection.
<b>10</b>	RFU1	Analog output	Reserved for internal use. Keep the pin floating.
<b>11</b>	IDLE	Analog input	Pulling this pin to logic high to turn receiver to idle mode. Set low to enable the chip.
<b>13</b>	MOD2	Analog output	Signal modulation pin. Connect 47nF capacitor to AC2
<b>14,26,27,28,29,30,31,32,33,34,35,46</b>	GND	GND	Ground.
<b>16,17,44,45</b>	VOUT	Analog output	LDO output. Connect 20uF capacitor to

			GND.
<b>18,19,42,43</b>	VRECT	Analog output	Regulated output voltage pin. Connect 30uF capacitor to GND.
<b>20</b>	SNS	Analog input	Connect to VOUT.
<b>21</b>	PD	Analog output	Low level output when idle.
<b>22</b>	DVDD	Analog output	Internal 1.8V LDO output. Connect 1uF capacitor to GND.
<b>23</b>	BOOT2	Analog output	Boost capacitor for internal rectifier. Connect 15uF capacitor to AC2.
<b>24,25</b>	AC2	Analog input	AC input. Connect to the Rx coil.
<b>36,37</b>	AC1	Analog input	AC input. Connect to the Rx coil.
<b>38</b>	BOOT1	Analog output	Boost capacitor for internal rectifier. Connect 15uF capacitor to AC1.
<b>39</b>	AVDD	Analog output	Internal 5V LDO output. Connect 1uF connector to GND.
<b>40</b>	RFU2	Analog input	Reserved for internal use.
<b>41</b>	TS	Analog input	Temperature sensor input pin. The chip shutdown when TS is lower than 0.2V.
<b>47</b>	CLAMP	Analog output	Clamping circuit. Connect 36Ω resistor to VRECT.
<b>48</b>	MOD1	Analog output	Signal modulation output. Connect 47nF capacitor to AC1.

## 2 Reliability Characteristic

It may permanently damage the THP9110 if exceed the maximum rating in below table.

Pin	Minimum	Maximum	Unit
AC1, AC2, MOD1, MOD2	-0.3	20	V
CLAMP, VRECT, IDLE, PD	-0.3	24	V
DVDD	-0.3	2	V
ILIM, PGC, POC, SCL, SDA, INT, TS, AVDD	-0.3	6	V
BOOT1, BOOT2	-0.3	AC1+5, AC2+5	V
VOUT, SNS	-0.3	17	V
CLAMP	-	1	A
AC1, AC2	-	2.5	A

### ESD information

Test Model	Pins	Ratings	Unit
HBM	All	2	kV
CDM	All	500	V

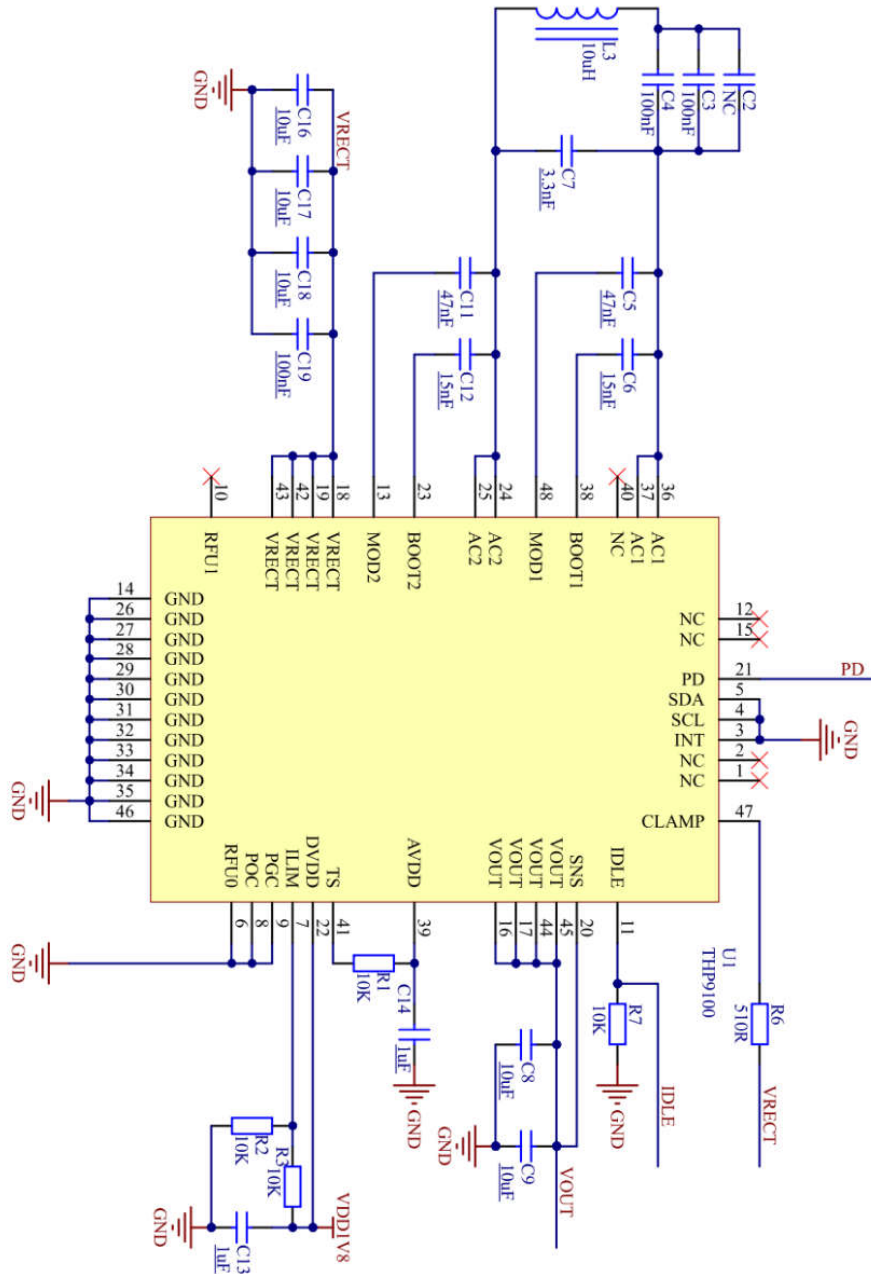
### Temperature information

Parameters	Minimum	Maximum	Unit
Operating temperature	-5	105	°C
Storage temperature	-40	150	°C

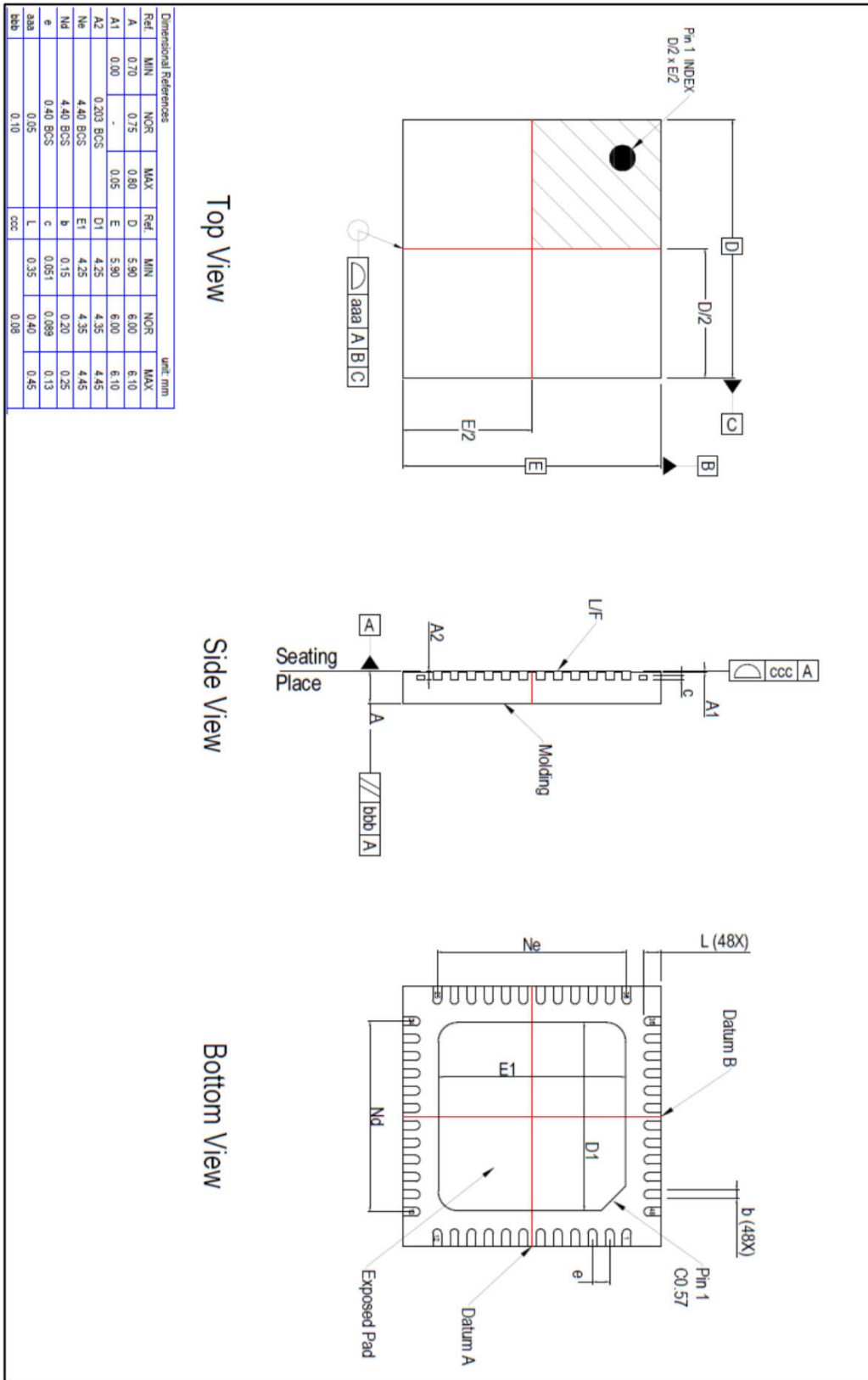
## 3 Electrical Characteristic

Symbol	Description	Conditions	Min	Typ	Max	Unit
<b>Under-voltage Lock-out (UVLO)</b>						
$V_{UVLO}$	UVLO Rising	Rising voltage on VRECT		3		V
$V_{UVLO\_HYS}$	UVLO Hysteresis	VRECT failing		150		mV
<b>Over-voltage protection (OVP)</b>						
$V_{OVP}$	DC Over-Voltage Protection			17		V
$V_{OVP-HYS}$	Over-Voltage Hysteresis	Falling voltage on VRECT		1		V
<b>Quiescent current</b>						
$I_{active}$	Active Quiescent Current	IDLE = Low or no load; VRECT = 5.5V		3		mA
$I_{sd}$	Shut Down Current	IDLE = high; VRECT = 5.5V			100	uA
<b>VDD voltage</b>						
$V_{DVDD}$	DVDD Voltage	IDVDD=10mA ,CDVDD=1uF	1.62	1.8	1.98	V
$V_{AVDD}$	AVDD Voltage	IAVDD=10mA ,CAVDD=1uF	4.5	5	5.5	V
<b>LDO</b>						
$I_{OUT\_MAX}$	Maximum Output Current			1.3		A
$V_{OUT\_MAX}$	Maximum Output Voltage			5		v
<b>ADC</b>						
<b>N</b>	Resolution			12		Bit
$f_s$	Sampling Rate			67.5		kSa/s
<b>Channel</b>	Number of Channels			8		
$V_{in-fs}$	Full-Scale Input Voltage			2.1		V
<b>IDLE PIN</b>						
$V_{IH}$	Input Threshold High		2			V
$V_{IL}$	Input Threshold Low				0.25	V
<b>I2C interface</b>						
$f_{scl}$	Clock Frequency			400		kHz
<b>Thermal shutdown</b>						
$T_{SD}$	Thermal shutdown			140		°C
$T_{SD-HYS}$	Thermal Hysteresis shutdown			20		°C

## 4 Typical application



## 5 Package



6 Distributor contact

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