/\*---------------------------------------------------------------------------------------------------------\*/

/\* \*/

/\* Copyright © 2018 by Nuvoton Technology Corporation \*/

/\* All rights reserved \*/

/\* \*/

/\*---------------------------------------------------------------------------------------------------------\*/

/\* \*/

/\* NuMicro® 5W Wireless Charging Reference Design – N76E003 \*/

/\* \*/

/\*---------------------------------------------------------------------------------------------------------\*/

Introduction:

Nuvoton 5W wireless charging reference design is equipped with N76E003 series microcontroller and conforms to Wireless Power Consortium (WPC) Qi standard. This reference design implements all of the functions of the Qi standard and is compatible with Qi A11 Ver1.2.4 standard.

The N76E003 is based on 8051 architecture and equipped with rich peripherals that can be used to add further functionality.

It is compatible with Qi receivers and offers smart management of wireless power transmission. Besides dynamic power adjustment function has been added to enhance user satisfaction and ensure that charging will continue even when input power is low. And foreign object detect function is included to ensure user safety during charging. N76E003 receives and decodes the receiver signal then adjusts resonant circuit frequency of the PWM signal circuit to satisfy the needs to the transmitter.

There are some features of this reference design. It’s compatible with Qi A11 Ver1.2.4 standard. The input voltage of this reference design is fixed DC 5V and the output power is 5W. The frequency of coil is variable and PWM duty is fixed. The configuration of coil is single coil. Support dynamic charging power adjustments. Three protection function, foreign object detect, over temperature protection and over current protection is built in this reference design.

N76E003 features :

* 1T Enhance 8051, 16 MHz
* 18KB Flash / 1KB RAM
* 6 Channels 16-bit PWMx, Support Complementary Mode and Dead-Zone
* 12-bit ADC
* UART/I2C/SPI
* Operating Voltage : 2.4V ~ 5.5V
* Operating Temp：-40˚C ~ 105˚C

Reference Design Features:

* Input voltage is DC-5V
* 5W power output
* Dynamic charging power adjustments
* Adjustable coil frequency, fixed PWM duty cycle
* Single-Coil architecture
* FOD, OTP and over current protection
* Compatible with Qi A11 Ver1.2.4 standard

Related IC:

* N76E003

HW files of NVSP0019\_N76E003\_5W description:

.\ SCH\_NVSP0019\_SCH\_N76E003\_V1.1.pdf： Schematic pdf file

.\ SCH\_NVSP0019\_SCH\_N76E003\_V1.1.sch： Schematic file for Altium

.\ BOM\_NVSP0019\_BOM\_N76E003\_V1.1.xls： Bill of materials

.\ ASC\_NVSP0019\_PCB\_N76E003\_V1.1.asc： Layout file for PADS V9.5

.\ PCB\_NVSP0019\_PCB\_N76E003\_V1.1.pcb： PCB file for PADS or Protel

.\ GER\_NVSP0019\_N76E003\_V1.1.rar： PCB Gerber file