

## NU1651

# NU1651: High Efficiency, High Integration Wireless Power Receiver and Transmitter

## 1 Features

- Integrated 38V High-efficiency Synchronous Rectifier.
- Integrated LDO to Provide Regulated Output Programmable VOUT from 3.5V to 30V with 8mV resolution.
- Low Dropout of LDO.
- Integrated Full Bridge Inverter and PWM Controller for transmitter.
- 1.8V Reference Voltage Output.
- V5V0 Power Supply Path Management: Internal LDO or External VDD.
- Ultra-Low Quiescent Current in SLEEP mode: < 15uA.
- Robust and Quick-responsive OVP, OCP, OTP, OPP and SCP.
- High Accuracy Current Sense, Accuracy is 0.05%.
- 8 Channel, 15bit ADC.
- Integrated 16MHz 32Bit MCU Core.
- 400kHz I<sup>2</sup>C Interface.
- In-system Programmability.
- Build-in Bi-directional Communications: ASK/FSK Modulation and ASK/FSK Demodulation.
- Integrated Q Factor Measurement.
- Programmable FOD Gain and Offset.
- INT Output.
- 72-WCSP 3.24mm x 3.64mm, 0.4mm pitch.

## 2 Applications

- WPC 15W EPP Compliant Receiver with Maximum 70W Received Power.
- WPC 5W BPP Compliant Transmitter with Maximum 15W Transmit Power.
- Smartphones, Power Bank.
- Medical, Industrial and Consumer Equipment.

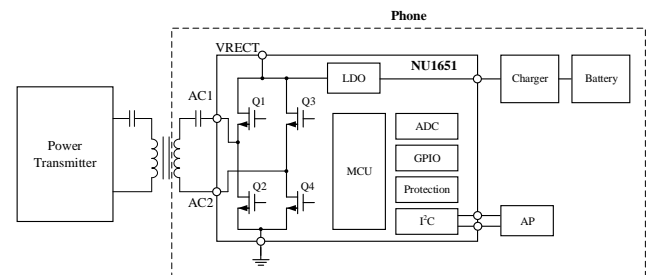
## 3 Descriptions

NU1651 is a highly integrated and efficient wireless power receiver and suitable for up to 70W output power application. It integrates a synchronous rectifier and a programmable low drop-out regulator. The regulator can provide a wide range regulated voltage. NU1651 can conduct bi-directional communication with a transmitter system through ASK and FSK. The communication is compliant with WPC.

NU1651 can also be operated as a transmitter (Tx) to charge another receiver. Only a few external components are needed and maximum 15W power can be transferred.

NU1651's flexibility is provided by an on-chip 32Bit MCU which can customize and optimize the device for various applications and custom needs. The programmability includes output power, bidirectional communication scheme, system protection, status reporting and error reporting.

NU1651 also includes standard protection functions such as input under-voltage lockout, short-circuit protection, over-voltage protection, over-current protection, over-power protection and over-temperature protection. These protections further enhance the reliability of the system solution.

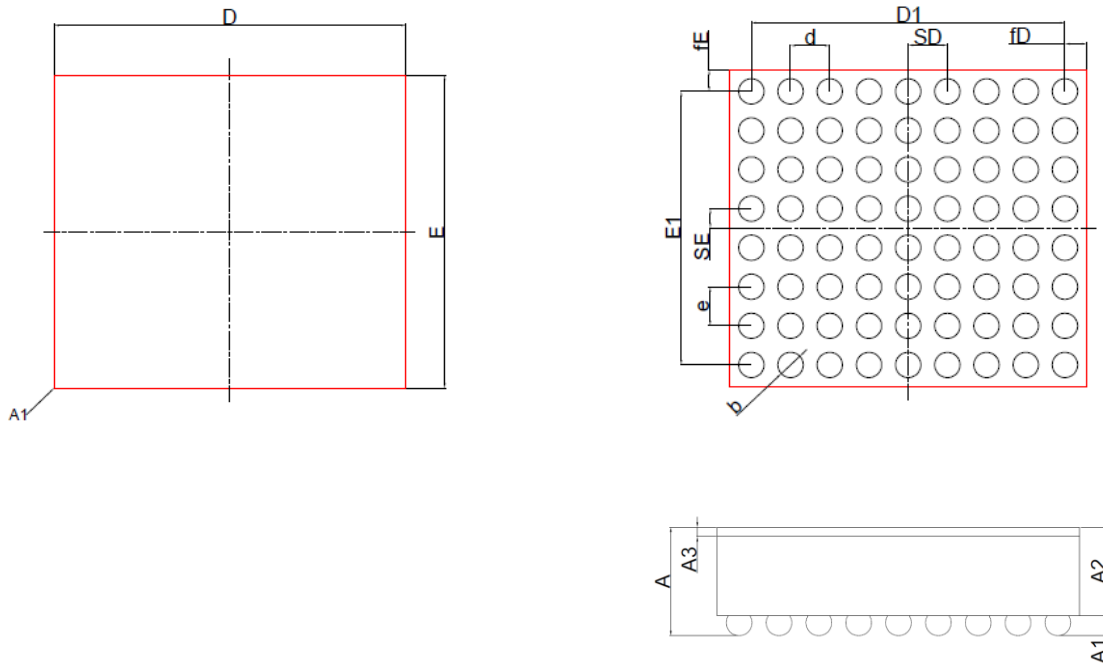


**Simplified Application Diagram**

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## 10 Package Information

Orderable Device	Status	Package Type	Package Drawing	Pins	Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp <sup>©</sup>	Device Marking
NU1651WY YB	MP	WCSP	WYY	72	Green (RoHS & No Sb/Br)	Cu/Sn Ag Cu	Level-2	-40 to 125	1651



**Figure 15. Marking side view, Bump side view and side view of package outline**

SYMBOL	Dimensions in Millimeters		
	MIN	TYP	MAX
A	0.527	0.570	0.613
A1	0.170	0.195	0.220
A2	0.357	0.375	0.393
A3	0.037	0.040	0.043
b	0.235	0.260	0.285
D	3.615	3.640	3.665
D1	-	3.200	-
E	3.215	3.240	3.265
E1	-	2.800	-

e	-	0.400	-
d	-	0.400	-
SE	-	0.200	-
SD	-	0.400	-
fD	-	0.220	-
fE	-	0.220	-

## 12 Revision History

Date	Version	Changes
2021.02	V1.0	Release Version.

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