This compact reference design, based on the NXP NXQ1TXA1 wireless charging transmitter controller, delivers exceptional efficiency and a very low standby power in the smallest available footprint. Integrating the NXP NT3H1201 NTAG I²C solution provides the option to add exciting features. Powered by the NXP GreenChip TEA1720 high efficiency SMPS controller this reference design becomes a highly optimized wireless charging solution.

**KEY FEATURES**
- A1/A10 transmitter according to Qi standard version 1.1.2
- Optimized BOM with low component count
- Small controller package: HVQFN33 (7 x 7 mm)
- Advanced digital ASK processing
- Foreign object detection (FOD)
- Over-temperature protection
- Status indications by LED and buzzer
- Optional NFC “tap to power on” feature

**KEY BENEFITS**
- High efficiency and low standby power
- Zero-power standby enabled by NXP’s NTAG NFC technology
- Low component count
- Reliable interoperability
- Safe operation (FOD)
- Optional smart NFC features like Bluetooth pairing, user settings and automatic URL redirect

**APPLICATIONS**
- Wireless audio accessories like Bluetooth speakers
- Office desks and other work setups
- Professional office desk accessories
- Shop and kiosk furniture for client smartphone charging

The NXP 19 V Qi A1/A10 reference design is a highly optimized solution that gives consumers a better way to charge their battery-operated devices, without using cords, connectors, or electrical plugs. Any wireless charging-enabled device can use the same charging pad, and the pad can be integrated into office furniture, charging kiosks, and other systems.

The reference design delivers exceptional efficiency with a significantly lower component count than comparable 19 V wireless charging solutions. By adding smart NFC enhancements, it enables advanced use cases like zero-power standby, automatic Bluetooth pairing, user-defined charger settings, and many more.
The design provides a transmitted output power of over 7 W to enable a 5 W wireless charger receiver output to the battery, and uses advanced digital ASK signal processing to ensure reliable interoperability with a low component count. The design is based on the NXP NXQ1TXA1 wireless charging transmitter controller, which is housed in an HVQFN33 package that measures just 7 x 7 mm, along with the full-featured NXP NT3H1201 NTAG IC NFC device, the GreenChip NWP2081 half bridge driver, and the NX2020N2 low Rds-on Trench MOSFETs.

The digitally optimized ASK and FOD processing guarantees reliable communication with the receiver, and protects against heat caused by foreign objects, as specified by the latest version of the Qi A1/A0 standard (V1.1.2). Powered by the NXP GreenChip TEA1720 SMPS in the 19 V supply unit of this Qi A1/A10 wireless charging transmitter design enables a high efficiency wireless charging solution with a very low standby power.

**NXQ1TXA1 pin assignment**

```plaintext
EN_NFC  7  18
TAG_FD  10  11
NFC_SCL  1  17
NFC_SDA  9  18
RESET  2  16
LP_VSUP  8  17
PWR_ON  6  18
VDD1  29  18
VDD2  29  18
GND  4  18
GND  33  18

Demodulator  23
HB_CTRL  15
Monitor  24
UI_CTRL  26
Controller  21

Power CTRL  12
Power  9
Mode select  30
SEL1  1
SEL2  3
SEL3  20
OPT1  27
OPT2  28

CL_MON  22
EN_HB  16
PWM  17
ISNS  21
NFC  24
VSNS  26
BUZ  12
LED1  19
LED2  28

NXQ1TXA1
```
Qi A1/A10 Reference Design Block Diagram

**Key NXP components**

<table>
<thead>
<tr>
<th>Product</th>
<th>Package</th>
<th>Dimensions</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NXQ1TXA1</td>
<td>HVQFN33</td>
<td>7.0 x 7.0 x 0.85 mm</td>
<td>Qi A1/A10 TX controller</td>
</tr>
<tr>
<td>NWP2081</td>
<td>SO8</td>
<td>4.0 x 5.0 x 1.75 mm</td>
<td>Half Bridge Driver</td>
</tr>
<tr>
<td>NX2020N2</td>
<td>SOT1220</td>
<td>2.0 x 2.0 x 0.65 mm</td>
<td>MOSFET</td>
</tr>
<tr>
<td>NT3H1201</td>
<td>XQFN8</td>
<td>1.6 x 1.6 x 0.5 mm</td>
<td>NTAG IC, NFC Forum Type 2 Tag</td>
</tr>
<tr>
<td>BAS101S</td>
<td>SOT23</td>
<td>3.0 x 2.5 x 1.1 mm</td>
<td>Diode for AM demodulation</td>
</tr>
<tr>
<td>TEA1720</td>
<td>SO8</td>
<td>4.0 x 5.0 x 1.75 mm</td>
<td>12W Switched Mode Power Supply (SMPS) controller</td>
</tr>
</tbody>
</table>