Wireless charging for consumer

Introducing a new cost effective system solution to ensure excellent user experience

www.infineon.com/wirelesscharging
Key enabling products for your transmitter and adapter solution:

- Low and mid voltage power MOSFETs – OptiMOS™ and IR MOSFET™
- Driver ICs – EiceDRIVER™
- Microcontrollers – XMC™
- High voltage power MOSFETs – CoolMOS™ CE/P7
- PWM/flyback controllers and integrated power stage ICs – CoolSET™
- Synchronous rectification ICs and MOSFETs – OptiMOS™

Choose Infineon to solve your application requirements:

- High performance MOSFETs, ICs and MCU at optimum price/performance ratio thanks to cost-effective packages and leading, reliable and mature silicon technology
- High power density in small designs: Enabling the lowest switching and conduction losses in smallest packages for MOSFETs and power stage
- Smallest possible package size (2 x 2, 3 x 3 half-bridge) for low power MOSFETs 30 V-250 V
- Highest efficiency: In hard switching topologies, enjoy low switching losses thanks to low input and output capacitances

Infineon is working on its own medium voltage GaN technology and will bring it to the market with a significant performance increase over silicon MOSFETs at the same level of reliability.

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Wireless charging uses electromagnetic fields to transfer power from a transmitter to a receiver application to charge the according battery. This erases the need of physical connectors and cables to transfer power – one of many benefits of this technology.

The wireless charging market is dominated by two standards: inductive (Qi) and resonant (resonant AirFuel). Infineon offers solutions for both standards and is an active member of the leading wireless charging alliances the Wireless Power Consortium (WPC) and AirFuel.

Solutions from Infineon

<table>
<thead>
<tr>
<th>Various adapters/chargers</th>
<th>Wireless charging pads/sockets</th>
<th>Wireless charging receivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC-DC adapters</td>
<td>Transmitters (Tx)</td>
<td>Receivers (Rx)</td>
</tr>
</tbody>
</table>

Standards are required for wireless charging

<table>
<thead>
<tr>
<th>Qi (inductive)</th>
<th>Inductive AirFuel (PMA)</th>
<th>Resonant AirFuel (A4WP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 kHz-300 kHz</td>
<td>100 kHz-300 kHz</td>
<td>6.78 MHz</td>
</tr>
</tbody>
</table>

www.infineon.com/wirelesscharging
Infineon offerings for inductive solutions (Qi & inductive AirFuel)

Adapter

Wireless charging transmitter

Transmitter (Tx)

Pre-regulators (if needed)

Half-bridge or full-bridge inverter

XMC™ microcontroller & digital control ICs

Driver

Selection coil 1

Selection coil 2

Selection coil N

Wireless charging receiver

Receiver 1 (Rx) embedded in end application, e.g. smartphone, wearable, power tool

Receiver 2 (Rx)

Receiver N (Rx)

Voltage | Package | Part number | Rds(on) (max.) @ Vgs 4.5 V [mΩ]
--- | --- | --- | ---
Inverter | 30 V | SuperSO8 | BSC0996NS
| | | BSC0993ND | 7.0
| | PQFN 3.3 x 3.3 | BSZ0589NS | 4.4
| | | BSZ0994NS | 8.6
| | PQFN 2 x 2 | IRFHS8342PbF | 25
| | | IRLHS6342PbF | 15.5

Coil selection switch

Voltage | Package | Part number | Rds(on) (max.) @ Vgs 4.5 V [mΩ]
--- | --- | --- | ---
| 20 V | PQFN 2 x 2 | IRLHS6242PbF | 11.7 (= 2.5 V drive capable)
| 25 V | | IRFHS8242PbF | 21.0
| 30 V | | IRFHS8342PbF | 25.0
| | PQFN 3.3 x 3.3 | BSZ0994NS | 8.6

Microcontroller

XMC1302 or XMC1404 or XMC4108
Infineon offerings for resonant solutions (Resonant AirFuel)

Class D – full-bridge

Please note
Class D full-bridge topology shown here, products also suitable for class D half-bridge topology

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Package</th>
<th>Part number</th>
<th>$R_{ds(on)}$ (max.) @ $V_{gs} 4.5$ V [mΩ]</th>
<th>$Q_{typ}$</th>
<th>$C_{os typ}$</th>
<th>Topology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverter 20 V</td>
<td>PQFN 2 x 2 Dual</td>
<td>IRLHS6376PbF</td>
<td>48.0</td>
<td>2.8</td>
<td>~120</td>
<td>Class D</td>
</tr>
<tr>
<td></td>
<td>PQFN 3.3 x 3.3 Dual</td>
<td>BSZ0909ND</td>
<td>18.5</td>
<td>2.0</td>
<td>220</td>
<td>Class D</td>
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<tr>
<td></td>
<td>PQFN 3.3 x 3.3</td>
<td>BSZ0506NS</td>
<td>4.4</td>
<td>5.7</td>
<td>260</td>
<td>Class D</td>
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<tr>
<td></td>
<td></td>
<td>BSZ065N03LS</td>
<td>6.9</td>
<td>5.2</td>
<td>270</td>
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<tr>
<td></td>
<td></td>
<td>IRL60HS118</td>
<td>19.0</td>
<td>4.5</td>
<td>118</td>
<td>Class D</td>
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<tr>
<td></td>
<td></td>
<td>IRL80HS120</td>
<td>32.0</td>
<td>3.5</td>
<td>68</td>
<td>Class D/E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IRL100HS121</td>
<td>42.0</td>
<td>2.7</td>
<td>62</td>
<td>Class D/E</td>
</tr>
</tbody>
</table>

Driver ICs
- EiceDRIVER™ 2EDL71*
- EiceDRIVER™ 1EDN

Microcontroller
- XMC1302 or XMC1404 or XMC4108

* coming soon
Infineon offerings for resonant solutions (Resonant AirFuel)

Class E – single-ended

Please note:
Class E single-ended topology shown here, products also suitable for class E differential topology

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Package</th>
<th>Part number</th>
<th>$R_{DS(on)}$ (max.) @ $V_{GS}$ 4.5 V [mΩ]</th>
<th>$Q_{t}$ typical</th>
<th>$C_{ss}$ typical</th>
<th>Topology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inverter MOSFETs</td>
<td>80 V</td>
<td>PQFN 2 x 2</td>
<td>IRL80HS120</td>
<td>32.0</td>
<td>3.5</td>
<td>68</td>
</tr>
<tr>
<td>100 V</td>
<td>PQFN 3 x 3</td>
<td>IRL100HS121*</td>
<td>42.0</td>
<td>2.7</td>
<td>62</td>
<td>Class D/E</td>
</tr>
<tr>
<td>150 V</td>
<td>BSZ900N15NS3</td>
<td>75**</td>
<td>4.1**</td>
<td>46</td>
<td>Class E</td>
<td></td>
</tr>
<tr>
<td>200 V</td>
<td>BSZ900N20NS3</td>
<td>78**</td>
<td>7.2**</td>
<td>52</td>
<td>Class E</td>
<td></td>
</tr>
<tr>
<td>250 V</td>
<td>BSZ22DN20NS3</td>
<td>200**</td>
<td>3.5**</td>
<td>24</td>
<td>Class E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BSZ42DN25NS3</td>
<td>375**</td>
<td>3.6**</td>
<td>21</td>
<td>Class E</td>
<td></td>
</tr>
</tbody>
</table>

Driver ICs

| EiceDRIVER™ 2EDL71* |
| EiceDRIVER™ 1EDN |

Microcontroller

| XMC1302 or XMC1404 or XMC4108 |

* coming soon
** @VGS = 8 V
Highlight products for wireless charging

**BSZ0909ND**
Half-bridge handles
PQFN 3 x 3 package

**IRL60/80/100**
Fast switching logic level
half-bridge driver

**EiceDRIVER™ 2EDL71**
OptiMOS™ 5 PQFN 2 x 2 for
half-bridge and full-bridge topologies

**EiceDRIVER™ 1EDN**
OptiMOS™ 5 PQFN 2 x 2 for
half-bridge and full-bridge topologies

Wireless charging selection tool

This is our Infineon solution.
Please hover over each block with your mouse to see the recommended products.

- **Application**
- **Power range**
- **Standard**
- **Topology**
- **Solution**

Additiona information
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