The IDT Consumer Products Advantage

WIRELESS POWER
REAL-TIME INTERCONNECT
RF PRODUCTS
Who We Are

Integrated Device Technology, Inc. develops system-level solutions that optimize its customers’ applications. IDT’s market-leading products in RF, high performance timing, memory interface, real-time interconnect, wireless power, and SmartSensors are among the company’s broad array of complete mixed-signal solutions for the communications, computing, consumer, automotive and industrial segments.

These products are used for a wide variety of consumer solutions, as well as 4G and 5G infrastructure, network communications, and cloud data centers.

The IDT Consumer Product Advantage

IDT serves the consumer market by providing solutions for mobile devices, health and fitness, wearables, personal electronics, and white goods.

IDT’s innovative timing, wireless power, and RF solutions enable customers to develop mobile and personal electronic products with innovative features, improved performance, and extended battery life.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Differentiator</th>
<th>Application Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>5P35023</td>
<td>VersaClock 3S Programmable Clock</td>
<td>Consolidates multiple devices in a single package</td>
<td>Handheld consumer, home entertainment, white goods, etc.</td>
</tr>
<tr>
<td>P9027LP-R, P9235A-R</td>
<td>3W Wireless Power Reference Kit</td>
<td>Ultra-compact design for low power applications</td>
<td>Smartwatches, health and fitness, headphones and accessories, electronic toys</td>
</tr>
<tr>
<td>P9025AC-R, P9038-R</td>
<td>5W Wireless Power Reference Kit</td>
<td>Turnkey solution for rapid prototyping</td>
<td>Electric shavers, wireless headphones, video/audio remotes, portable medical equipment, gaming PC peripherals</td>
</tr>
<tr>
<td>P9242-R, P9221-R</td>
<td>15W Wireless Power Reference Kit</td>
<td>Industry best-in-class efficiency, Qi certified design</td>
<td>Charging stations, tablets, PC peripherals, smartphone fast charge docks</td>
</tr>
</tbody>
</table>
Consumer Solutions

We are always looking for ways to differentiate our products and exceed customer expectations by delivering the latest and coolest features. IDT has a host of compact consumer products ideal for the next generation, and we look forward to applying our technology in your designs for tomorrow’s consumer products.

Wireless Power

IDT is the leader in wireless power with industry leading efficiency combined with system level integration and compact solution size.

The availability of turnkey reference solutions in the range of 1-15W enables customers to rapidly prototype and integrate wireless power in the end customer product with minimal effort.

Real-Time Interconnect

IDT is the world’s leading provider of clock ICs and offers the industry’s broadest product portfolio of clock timing solutions to synchronize and connect the elements that comprise consumer applications.

RF Products

IDT offers high-performance and full-featured RF products that deliver exceptional performance in compact packages. The portfolio includes mixers, amplifiers, switches, VGAs, DSAs, modulators, demodulators, and wideband voltage variable attenuators.
Wireless Power

IDT’s highly integrated transmitter ICs are designed for use in fixed and portable charging bases, while the ultra-compact, low-power receiver ICs are targeted at portable devices and accessories. With variations in input voltages, wireless power standards support, and coil types/numbers, IDT’s wireless power solutions are suitable for a wide range of consumer applications.

Wireless Power Transmitters

- 1 to 15 W power transfers
- WPC certified
- Support for various coil configurations
- Embedded 32-bit ARM® processor in some devices
- Low external component count
- Selectable LED pattern

Wireless Power Receivers

- Single-chip solutions supporting 1 to 15 W applications
- No over-voltage clamping capacitors required
- Embedded 32-bit ARM® processor in some devices offer high level of programmability
- WPC certified

Wireless Power Design-in Support Tools

Wireless charging technology is complex, and wireless power ICs are no exception. For this reason, IDT complements its solutions with reference designs, support tools, and design-in documentation – making the daunting task of designing-in a wireless power IC as easy and fast as possible.
Wireless Power Applications

While smartphones dominate today’s wireless power application landscape, usage in other markets is becoming commonplace. Wireless power is a ubiquitous feature in the consumer market.

Smartphones
Wearables
Furniture
Accessories
Entertainment
PC Peripherals
Wireless Power Reference Kits

IDT’s turnkey wireless power kits make integrating wireless charging easy, affordable and practical for a broad range of consumer electronics. The transmitter and receiver reference kits deliver plug-and-play ease of integration, enabling engineers to incorporate wireless charging capabilities into their designs in a matter of hours.

≤3W Wireless Power Reference Solution
- Complete wireless power solution for 3W power applications
  - Kit includes both: transmitter and receiver
- Delivers up to 3W power
- Low BOM cost and count
- Up to 80% efficiency
- Optional LED & audio indicators
- Three different coil pairs support various applications

5W Wireless Power Reference Solution
- WPC baseline power profile certified
- 80% DC to DC efficiency
- Optimized 2-layer PCB reference layout
- Programmable foreign object detection (FOD)
- Easy PCB breakaway for retrofitting

15W Wireless Power Reference Solution
- Complete wireless power solution for 15W applications
- WPC extended power profile certified
- Low component count
- 87% DC to DC efficiency
- Programmable foreign object detection (FOD)
- Optimized 2-layer PCB reference layout
- Easy PCB breakaway for retrofitting

<table>
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<tr>
<th>Part Number</th>
<th>Product Description</th>
<th>WPC Qi Certified</th>
</tr>
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<tbody>
<tr>
<td>WP3W-RK</td>
<td>Reference Solution for ≤3W Applications</td>
<td>N/A</td>
</tr>
<tr>
<td>P9025AC-R-EVK</td>
<td>5W Reference Solution (Receiver)</td>
<td>Yes</td>
</tr>
<tr>
<td>P9038-R-EVK</td>
<td>5W Reference Solution (Transmitter)</td>
<td>Yes</td>
</tr>
<tr>
<td>P9221-R-EVK</td>
<td>15W Reference Solution (Receiver)</td>
<td>Yes</td>
</tr>
<tr>
<td>P9242-R-EVK</td>
<td>15W Reference Solution (Transmitter)</td>
<td>Yes</td>
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Real-Time Interconnect

IDT is the world’s leading provider of silicon timing devices and offers the industry’s broadest product portfolio of clock timing solutions to synchronize and connect the elements that comprise consumer applications. IDT’s system solution approach benefits consumer products through reduced board area and lower power. Innovations such as integrated crystals allow IDT devices to replace multiple crystals in a design, simplifying clock trees and easing design complexity. In addition, factory programmable options and clock solution customization address unique customer requirements.

With a clock IC portfolio 10 times greater than any other supplier, IDT is in a unique position to address the needs of virtually any application.
Silicon Timing Portfolio Overview

Clock Distribution

Widest Selection of Densities and I/Os
- Fanout Buffers
- Zero Delay Buffers
- JESD204B Buffers
- Frequency Translation
- Dividers & Multipliers
- Clock Multiplexers

Clock Generation

Best-In-Class Performance
- PLL Synthesizers
- RF Synthesizers
- Clock Generators
- VCXO + Clock Generators
- Digitally Controlled Oscillators
- Oscillators

Jitter Attenuation and Synchronization

Network Grade Performance
- Jitter Attenuators and Translators
- RF Converter Clocks
- Synchronous Ethernet
- IEEE 1588

Less Board Space

Integrated Crystals
Simplifies Clock Design

Lower Power
Replaces Multiple Crystals
VersaClock® 3S Family Overview

FEATURES AND BENEFITS
- Low power configurable clock generator
- Best in class performance and flexibility
- Up to 8 outputs simultaneously
- Frequency range up to 500MHz
- Spread spectrum, power down, output enable
- Integrated NVM for one time programmability
- Space efficient packaging in 20-QFN and 24-QFN

Key Features | Advantages | Benefits
--- | --- | ---
Proactive Power Saving (PPS) | Reduces STBY power w/ fast wake | Helps extend backup battery life
Dynamic Frequency Control (DFC) | Frequency vs. power optimization | Assists in optimizing performance and battery life balancing
Performance-Power Balancing (PPB) | Adjustable jitter vs. power | System performance and battery life optimization
Overshoot Reduction Technology (ORT) | Smooth frequency transitions | Prevents frequency overshoot that can cause system issues
Oscillators

**IDT's oscillators offer designers a reliable and economical timing solution.**

The XL and XU Family of devices from IDT are low phase noise crystal-based PLL oscillators supporting a large range of frequencies and output waveform types. These devices are available in multiple package sizes as well as temperature grades.

With a patented one-time program (OTP) memory allowing for infinite memory shelf life, the devices can be accurately programmed from 16kHz to 1500MHz with frequency resolution down to 1Hz accuracy. The configuration capability of these devices allows for fast delivery times for both sample and large manufacturing orders.

**KEY FEATURES**

- Available in HCMOS, LVPECL, LVDS, and HCSL outputs
- XU Family has 300fs typ. RMS phase jitter (12kHz - 20MHz), reduces overall system noise and meets next-generation networking and communications requirements
- The XL family has 750fs typ RMS Phase Jitter (12kHz - 20MHz) with extremely low cost meeting the requirements of 1G/10G Ethernet, 2G/4G/8G Fibre Channel, 1.5G/3G/6G SAS/SATA, 10G Infiniband, PCI Express® Gen1/Gen2
- Frequency Stability: ± 20ppm, ± 25ppm, ± 50ppm, or ± 100ppm
- Fast lead times for custom frequencies from 16kHz to 1.5GHz
- Industry-standard packages (3.2 x 2.5 mm, 5 x 3.2 mm, 7 x 5 mm) and pin-outs
- The XU and XL from IDT have the performance, price, and delivery to meet your design requirements

<table>
<thead>
<tr>
<th><strong>Package Options</strong></th>
<th>XU SERIES</th>
<th>XL SERIES</th>
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<tbody>
<tr>
<td>5 x 3.2 mm, 7 x 5 mm</td>
<td>3.2 x 2.5 mm, 5 x 3.2 mm, 7 x 5 mm</td>
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<table>
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<tr>
<th><strong>Voltage Options</strong></th>
<th>XU SERIES</th>
<th>XL SERIES</th>
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<tbody>
<tr>
<td>1.8V, 2.5V, 3.3V</td>
<td>2.5V, 3.3V</td>
<td></td>
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<thead>
<tr>
<th><strong>Phase Jitter (12kHz - 20MHz)</strong></th>
<th>XU SERIES</th>
<th>XL SERIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 400fs</td>
<td>&lt; 1ps</td>
<td></td>
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<tr>
<th><strong>Outputs</strong></th>
<th>XU SERIES</th>
<th>XL SERIES</th>
</tr>
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<tbody>
<tr>
<td>LVDS, LVPECL, HCSL, HCMOS</td>
<td>LVDS, LVPECL, HCMOS</td>
<td></td>
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<tr>
<th><strong>Frequency Range</strong></th>
<th>XU SERIES</th>
<th>XL SERIES</th>
</tr>
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<tbody>
<tr>
<td>0.016 - 1500 MHz</td>
<td>0.75 - 1350 MHz</td>
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<tr>
<th><strong>Delivery</strong></th>
<th>XU SERIES</th>
<th>XL SERIES</th>
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<tr>
<td>Samples in 2 weeks</td>
<td>Samples in 2 weeks</td>
<td></td>
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Radio Frequency (RF) Solutions

IDT’s RF products are designed with a “smart silicon” approach that includes unique and patented circuit techniques to differentiate them from the competition. These innovative products support a wide range of consumer applications:

- DOCSIS 3.1 CATV set-top boxes and Consumer Premise Equipment (CPE)
- Low Power Wide Area Network (LPWAN) equipment supporting the Internet of Things
- Drones
- Mobile and 2-way radios
- Wireless security

All of this technology is unique to IDT, is highly desired by equipment vendors, and is protected by patents.

**IDT RF Solutions:**

- Enable green networks with minimal power consumption
- Scale from Macros to Small Cells
- Improve reliability
- Improve data throughput
- Enable the internet of things

Can be found in 3G/4G systems in **every part of the world**
Global Strength, Local Focus

IDT is headquartered in Silicon Valley – the heart and soul of technical innovation. Our global locations place design and sales support wherever our customers happen to be, whether in the Americas, Europe or Asia.

idt.com