CTS Your Partner in Smart Solutions®

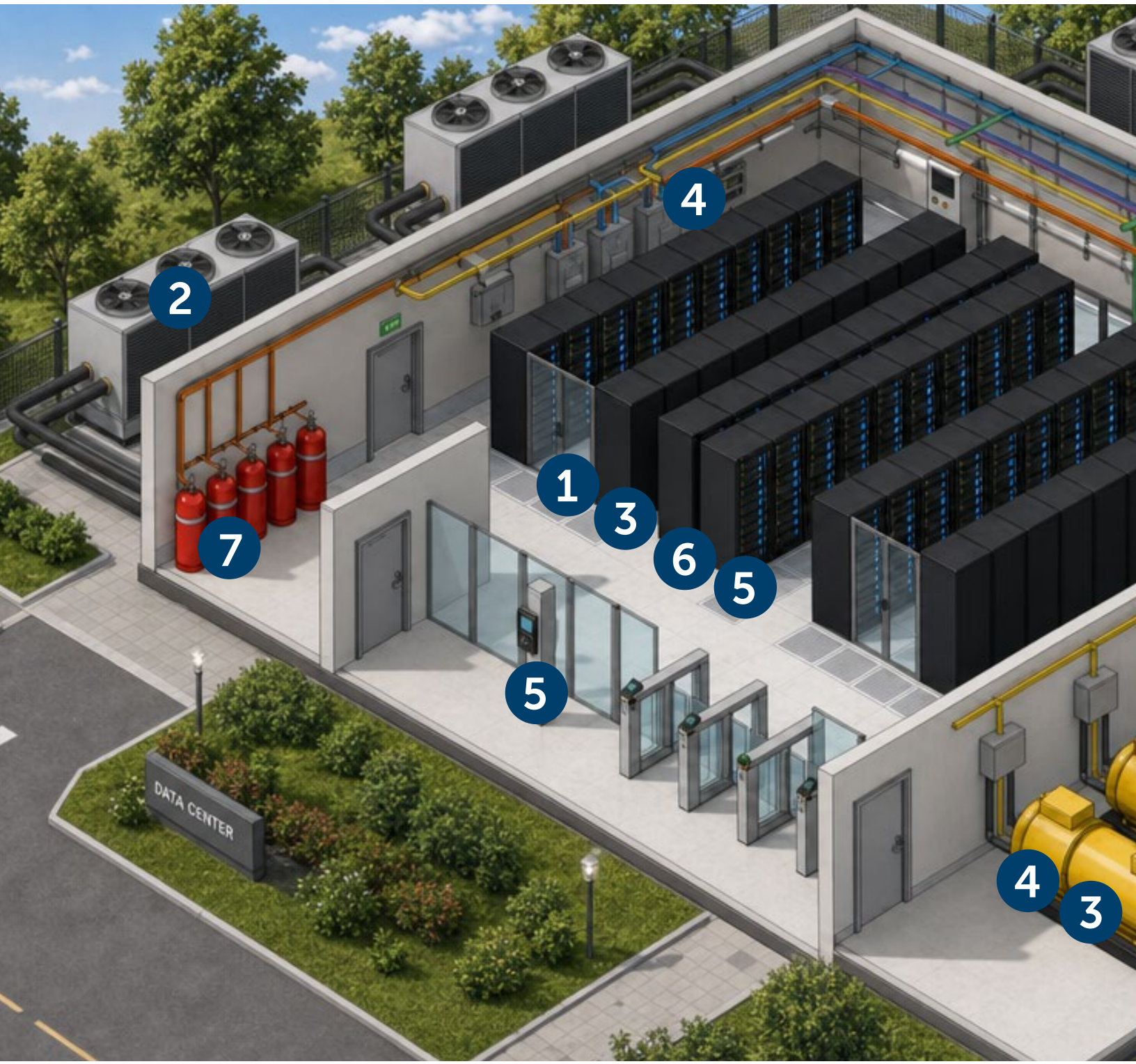


Data Center Infrastructure

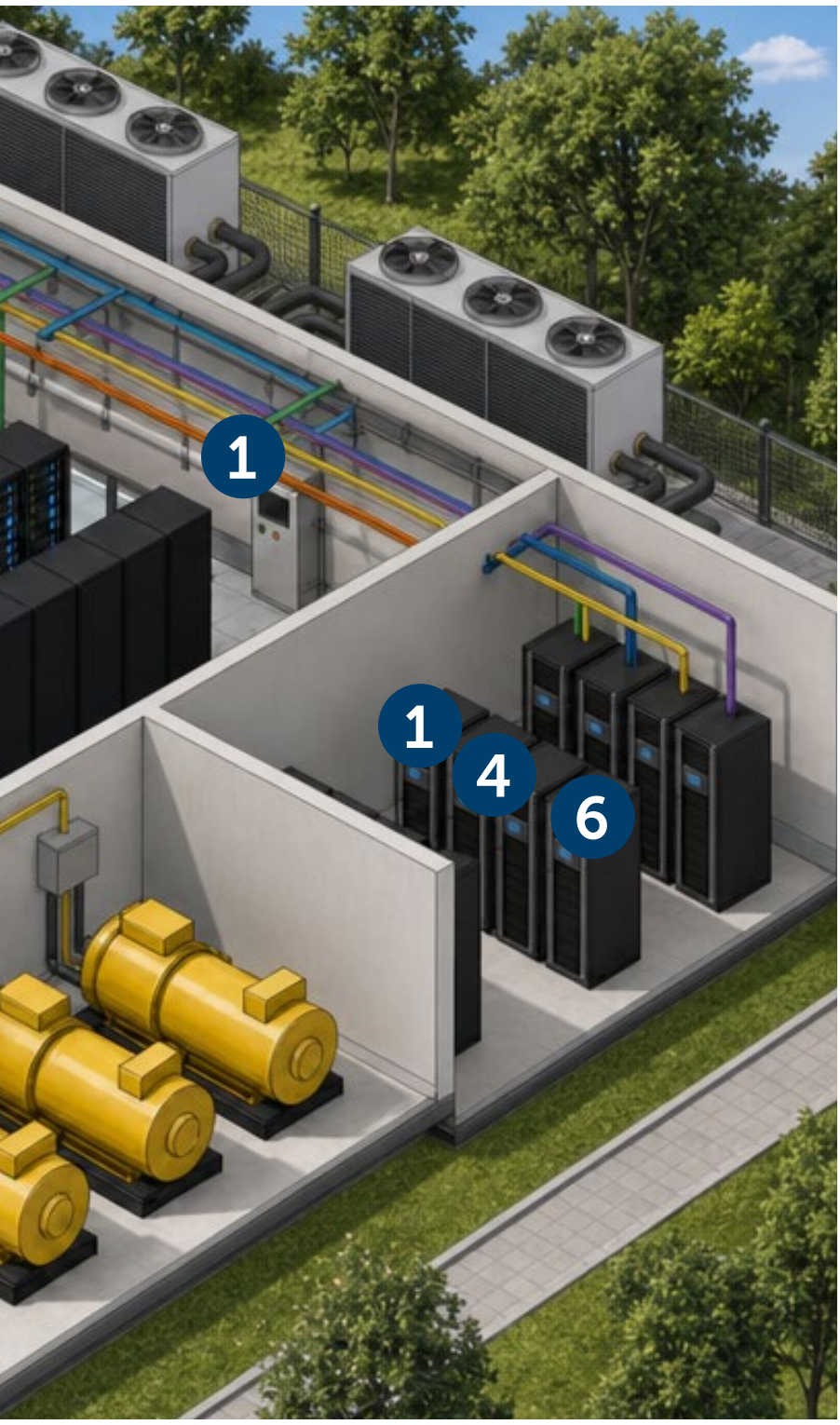
Application Review

www.ctscorp.com

Where can CTS Products be Found?



And so much more not visualized!



1. Server Equipment/Devices, Network Farm, and CPU's
2. Facility Temperature Control
3. Battery Management, Main Power and Back Up Power
4. Equipment Power Regulation
5. Timed Devices and Security Equipment
6. Equipment Temperature Control
7. Emergency Systems

Temperature Sensors

Our portfolio of temperature sensors encompasses all industry-standard design approaches including PTC and NTC thermistors, pure metal resistance temperature detectors (RTDs) and thermocouples.

TT-3 / TT-S NTC Thermistor



Features and Benefits

- NTC thermistor sensor
- Compact epoxy-coated design
- Fast response time
- Tight resistance & Beta tolerance
- Custom wire options
- -50°C to +150°C operating range

Application Areas

- Server & storage systems – PCB/board temperature, component monitoring, power electronics, localized thermal protection

TT-5 NTC Microchip Thermistor



Features and Benefits

- Extremely compact design
- Fast response time
- Epoxy-filled moisture protection
- Custom tube & wire options
- -40°C to +125°C operating range

Application Areas

- Servers, networking & communications equipment – localized component and ambient temperature monitoring

6035 Air & Gas Temperature Probe



Features and Benefits

- Designed for air temperature measurement
- Stainless-steel protective housing
- NTC or RTD sensing options
- Low thermal mass design
- Fast response time

Application Areas

- Cooling & HVAC systems – hot/cold aisle monitoring, air-handler monitoring, airflow zones and cooling control

6004 Air & Gas Temperature Probe



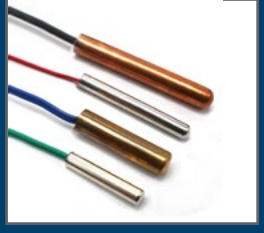
Features and Benefits

- Stainless-steel flange housing
- NTC, RTD, or thermocouple options
- Easy flange mounting
- IP68 waterproof rated
- -40°C to +125°C operating range

Application Areas

- CRAC/CRAH units, ducts and cooling infrastructure – supply/return air temperature monitoring

6005 Liquid Temperature Probe



Features and Benefits

- NTC, RTD, or thermocouple options
- Stainless-steel & custom housings
- Moisture-resistant design
  Custom cable & termination options
- -40°C to +125°C operating range

Application Areas

- Liquid cooling / CDU systems – coolant supply/return temperature, cold plates and cooling loops



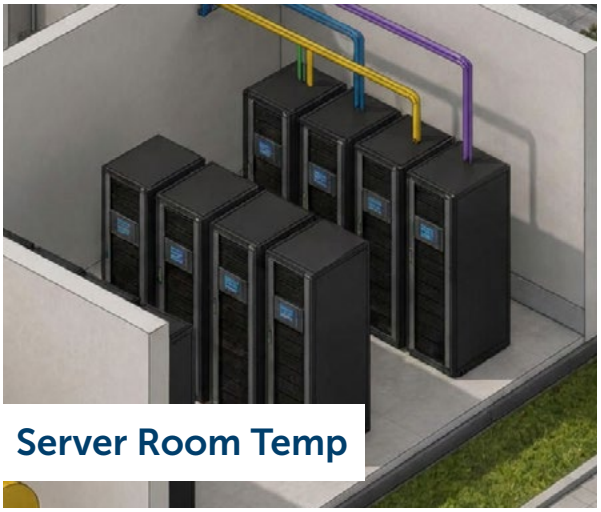
HVAC Systems



Facility Temp



Equipment Temp



Server Room Temp



Fire Temp Sensing

Encoders and Potentiometers

CTS optical and mechanical rotary encoders deliver precise digital output for manual adjustment and control interfaces, with long rotational life and non-contacting designs suited to frequent-use environments.

CTS trimmer and rotary potentiometers provide repeatable analog adjustment for calibration and manual control functions, built with carbon composition, conductive plastic, or wire wound elements for a wide range of environments

Series 291 / 291A Optical Encoders



Features and Benefits

- Non-contacting optical design for long rotational life (rated to millions of cycles)
- Clean A/B quadrature output for accurate direction and speed detection
- Optional integrated momentary switch and detentes
- Multiple resolution, cable, and voltage options

Application Areas

- Manual adjustment controls on rack management panels, KVM/ console switches, and industrial HMI interfaces used to configure or monitor data center equipment.

Series 288 Rotary Encoders



Features and Benefits

- 2-bit binary or 4-bit gray code output
- Optional detents and integrated switch
- Operating range -25°C to +100°C

Application Areas

- Local configuration dials on control modules and test/monitoring instrumentation within server and network racks.

Series 06TR / 09TR Trimmer Potentiometers



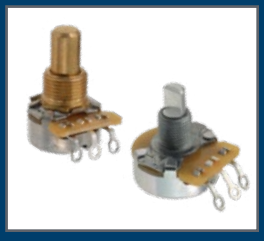
Features and Benefits

- Compact plastic-housing construction
- Self-extinguishable materials available (UL 94 V-0)
- Through-hole and SMD mounting options

Application Areas

- Voltage-reference calibration and analog signal trimming on power supply and control boards within servers and PDUs.

Series 270 / 450 Rotary Potentiometers



Features and Benefits

- Single, tandem, and concentric shaft options
- Optional integrated power switch
- Panel seal available; low-noise output
- Wide resistance range (500 Ω – 2 MΩ)

Application Area

- Manual analog controls on panel-mounted equipment, such as fan speed or threshold adjustment dials on cooling and HVAC control units.



Server Racks



Control Boards



Power Supply Control



HVAC Analog Controls



HVAC Control Units

Current Sensors and Modules

CTS designs AC and DC current sensors using advanced Hall-effect technology, enabling real-time rack-level power management, power supply monitoring, and energy optimization across the data center's power path.

Busbar Mount Current Sensors



Features and Benefits

- Direct busbar mounting for high-current power distribution
- Accuracy as tight as 1%
- Customizable calibration and analog output range

Application Areas

- Rack-level and PDU busbar power monitoring for real-time load management and energy optimization.

PCB Mount Current Sensors



Features and Benefits

- Board-mount and stand-alone package options
- Standard and custom current ranges with custom calibration
- Accuracy as tight as 1%

Application Areas

- Power supply monitoring within server power modules, PDUs, and UPS systems.

Clamp-On Current Sensors



Features and Benefits

- Contactless installation; no cable cutting required
- Soft ferromagnetic shield with high linearity and low hysteresis
- Isolated, non-intrusive current measurement

Application Areas

- Retrofit power monitoring and diagnostics on existing rack and PDU circuits without service interruption.

Battery Monitoring System



Features and Benefits

- Multi-parameter monitoring for complex power systems
- High thermal stability, precision resistance
- Optimized for battery/backup power monitoring

Application Areas

- UPS and backup battery monitoring, improving battery life and safe, long-lasting operation of critical power systems.



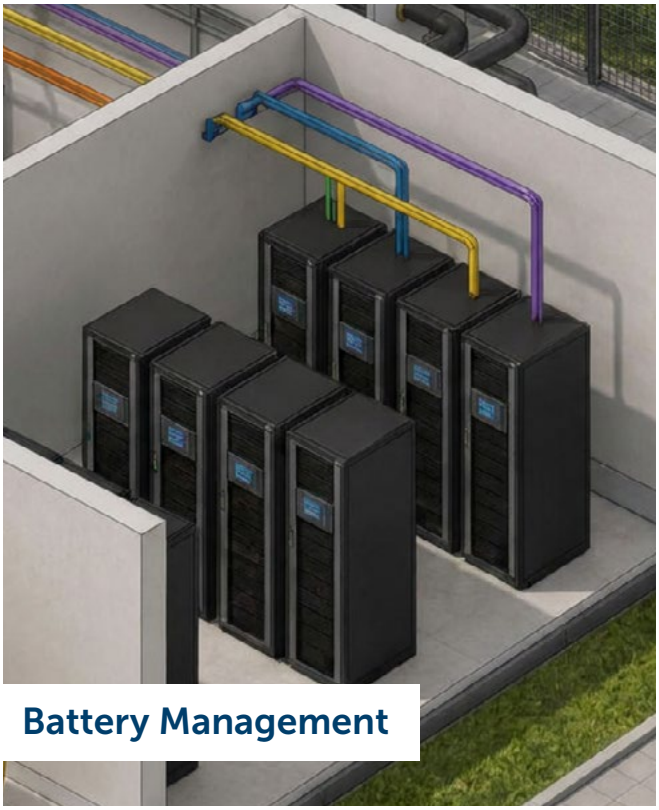
Server Currents



Facility Power Control



Generator Power Control

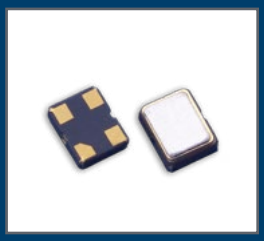


Battery Management

Frequency Control Products

Data centers rely on accurate timing and resilient performance. CTS provides industry-leading XO, VCXO, TCXO, OCXO, and RTC solutions that reduce jitter, improve synchronization, and support continuous operation across critical computing and networking systems.

Clock Oscillators HCMOS



Features and Benefits

Models: 616/620/625/632/CHT/CA Series

- Frequency: 1-250MHz
- Packages: Down to 1.6x1.2mm
- Low phase noise fundamental & 3rd overtone crystal designs.
- Tight Frequency stability to ±20 ppm.
- Extended Operating temperature to -55°C to +125°C [CHT/CA Series].

Application Areas

- FPGA timing reference
- Microcontroller clock source
- Board-level synchronization
- Physical server platforms
- Wireless base stations
- Storage controller systems

Differential Clock Oscillators LVDS/LVEPECL/HCSL



Features and Benefits

Models: 626/633/653/655/637/638/642H/643H/645H/647H/CC Series

- Frequency: 13.5–200MHz, Up to 2.1GHz with Advanced PLL
- Package: 2.5x2.0mm
- Ultra-low phase noise/jitter, 5.0x3.2mm, down to 100fs.
- Native Differential outputs for high-speed signal integrity (73fs typical for 655).
- Direct reference clocking with sub-picosecond performance.
- Frequency stability down to ±25 ppm.

Application Areas

- 10G/40G/100G Ethernet platforms
- SyncE (Synchronous Ethernet) equipment
- PCIe Gen 5/Gen 6 reference designs
- Enterprise routing and switching systems
- High-reliability point-to-point clock distribution
- Core network infrastructure applications

VCXO HCMOS/LVDS/LVEPECL



Features and Benefits

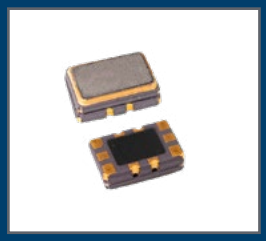
Models: 353/357, 315/317, 345/347, 375/377, CV Series

- Frequency: 1-250MHz, Up to 2.1GHz with Advanced PLL
- Package: 5.0x3.2mm
- High-Frequency Fundamental (HFF) Design.
- Exceptional phase jitter, down to 50fs.
- HCMOS, LVDS, LVPECL logic architectures.
- Flexible absolute pull ranges (APR).

Application Areas

- Phase-locked loop (PLL) timing
- PLL clock refinement
- Optical networking equipment
- SyncE clock distribution
- 10G/40G/100G transmission networks
- Test and measurement systems
- Cloud infrastructure timing applications

TCXO, VCTCXO CLPPED SINE/HCMOS



Features and Benefits

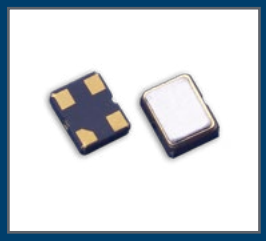
Models: 516/517, 520/521, 525/526, 531/532, 535/536, 580/581

- Frequency: 5-52MHz
- Package: 2.0x1.6mm
- High-Precision Analog Compensation Engine.
- Stratum 3 performance.
- Tight frequency stability down to ±0.1 ppm.
- Extended operating temperature Range, -40°C to +105°C.
- Optional Voltage Control for precision frequency tuning.

Application Areas

- Stratum 3 synchronization nodes
- SyncE timing infrastructure
- IEEE 1588 network timing
- PLL clock management
- Edge computing platforms
- High-density network systems

Real-Time Clock TCXO



Features and Benefits

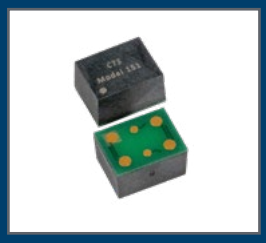
Models: TC20/TC25/TC32, TCLP25/ TCLP32, TT32

- Frequency: 32.768kHz
- Package: 2.0x1.6mm
- Low-power real-time clock reference
- Stability down to ±5 ppm for TT32.
- Ultra Low power 3.7 µA [Max]
- Optimized for low phase noise/jitter with fundamental crystal.

Application Areas

- Real-time clock (RTC) timing
- Data logger platforms
- Telematics and tracking systems
- Battery-backed timing subsystems
- Low-power synchronization applications
- Continuous system operation timing

OCXO SINE/HCMOS



Features and Benefits

Models: 151, 152, 139, 1499, 197 Series

- Frequency: 10-50MHz
- Package: 7.0x5.0mm
- Ultra-low phase noise floor reaching down to -170 dBc/Hz.
- Stratum 3E performance.
- Stability down to ±0.2 ppb.
- Low G-sensitivity engineering down to 0.3 ppb/G.

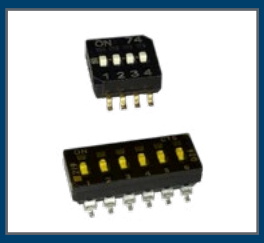
Application Areas

- Enterprise network timing
- Stratum 3E synchronization
- High-performance instrumentation
- Packet-based telecom networks
- High-availability cloud platforms
- Rubidium clock replacement applications

DIP, Rotary & Tactile Switches

CTS DIP switches provide low-cost means of manual circuit and hardware configuration on server boards, networking equipment, and control modules. Available in piano, slide, and rotary actuation styles across through-hole and surface-mount packages

Series 218 & 219
SMD DIP switches



Features and Benefits

- Compact, half-pitch design for space-constrained boards
- SPST/SPDT/DPST/3PST circuit options
- Gold or tin-plated contacts; gull-wing or J-bend terminals
- Optimized for ESD protection and automated board-wash processes

Application Areas

- Address configuration functions
- Server motherboard systems
- Blade server modules
- Networking equipment platforms
- Compact board-space applications

Series 220 & 221
Rotary DIP switches



Features and Benefits

- Hexadecimal or Binary Coded Decimal (BCD) output
- Surface-mount or through-hole mounting
- Compact rotary footprint for dense boards

Application Areas

- Node addressing functions
- Hardware identification settings
- Rack controller platforms
- PLC and SCADA systems
- Management control modules

Series
193 / 194 / 206 / 208
Piano / slide DIP switches



Features and Benefits

- Broad range of positions (1–12)
- Through-hole and surface-mount variants
- Improved oxidation resistance on select products

Application Areas

- Configuration control
- Server boards
- Power supplies
- Control panels
- Long-term stability
- Reliable settings retention



Server Hardware



Security Hardware



Emergency Hardware



Connectivity Hardware



Control Panel Hardware

Components by Engineering Need

Use this quick sourcing matrix to identify the CTS product family that fits your data center design requirement and the specifications to review first.

Engineering Need	Recommended CTS Product	Common Data Center Use	Key Specs to Evaluate
Precision timing	CTS Oscillators	Servers, switches, storage systems, CPUs, GPUs, and ASICs	Frequency, stability, jitter, package size
Power monitoring	CTS Current Sensors	Power distribution units, power supplies, and rack-level monitoring	Current range, isolation, accuracy, response time
Thermal management	CTS Temperature Sensors	Cooling systems, server racks, airflow zones, and thermal control	Operating range, accuracy, response time
EMI suppression	CTS EMI Filters	Power lines, signal paths, high-speed digital systems, and control electronics	Attenuation, voltage rating, current rating, compliance requirements
Hardware configuration	CTS DIP Switches	Server boards, networking hardware, control modules, and configuration settings	Positions, pitch, actuation style, lifecycle
Signal conditioning	CTS Resistor Networks	Mixed-signal circuits, voltage division, analog conditioning, and compact board designs	Resistance value, tolerance, package, power rating



Why Choose CTS for Data Center Solutions?

Component Expertise
Proven experience in sensing, frequency control, and passive components.

Customization
Application-specific component solutions for specialized requirements.

OEM Trust
Trusted by leading organizations in computing and networking markets.

Infrastructure Ready
Solutions engineered for reliability, density, and performance.

Your Partner in Smart Solutions®

CTS is a leading designer and manufacturer of products that Sense, Connect, and Move. We manufacture sensors, actuators, and electronic components in North America, Europe, and Asia, and provide solutions to OEMs in the aerospace & defense, medical, industrial, communications, information technology, and transportation industries.

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