Digital PCR

QuantStudio™ Absolute Q™ Digital PCR system

Where consistency meets simplicity

Digital PCR, simplified

The Applied Biosystems™ QuantStudio™ Absolute Q™ Digital PCR System integrates all the necessary steps for digital PCR (dPCR)—compartmentalization, thermal cycling, and data acquisition into a single instrument. Simply pipet the reaction mixture into the Microfluidic Array Plate (MAP) and let the Absolute Q take care of the rest. You get the benefits of dPCR, with the familiar workflow of qPCR.

The benefits of dPCR and why they matter

The Absolute Q dPCR System provides the following benefits with elegant simplicity.

Rare target sensitivity

- Digital PCR excels in the ability to detect unique targets from more abundant wild types sequences
- Important for gene editing, oncology research, inherited diseases, cell and gene therapy, and more

Robustness against PCR inhibition

- Compartmentalization of samples also dilutes impurities that may inhibit PCR, making dPCR quite robust
- Important for environmental surveillance, wastewater monitoring for bacterial or viruses, or analysis of FFPE samples

High precision

- Accuracy and reproducibility of sample division into micro-reactions enables high precision by reducing variability caused by amplification efficiency or user error
- Important for gene expression analysis, copy number variation, CAR-T cell monitoring, and more

Quantification of low-abundance targets

- High sensitivity of dPCR, combined with TRUE background subtraction and false positive rejection make Absolute Q an excellent choice for confident ultra-low concentration targets
- Important for oncology research, liquid biopsy analysis, residual DNA quantification, pathogen detection, and more

Absolute quantification

- Compartmentalization into micro-reactions provides precise copy-number measurements without the need for standard curves
- Important for gene bioproduction, cell and gene therapy, viral titers, and more

Molecule-specific analysis

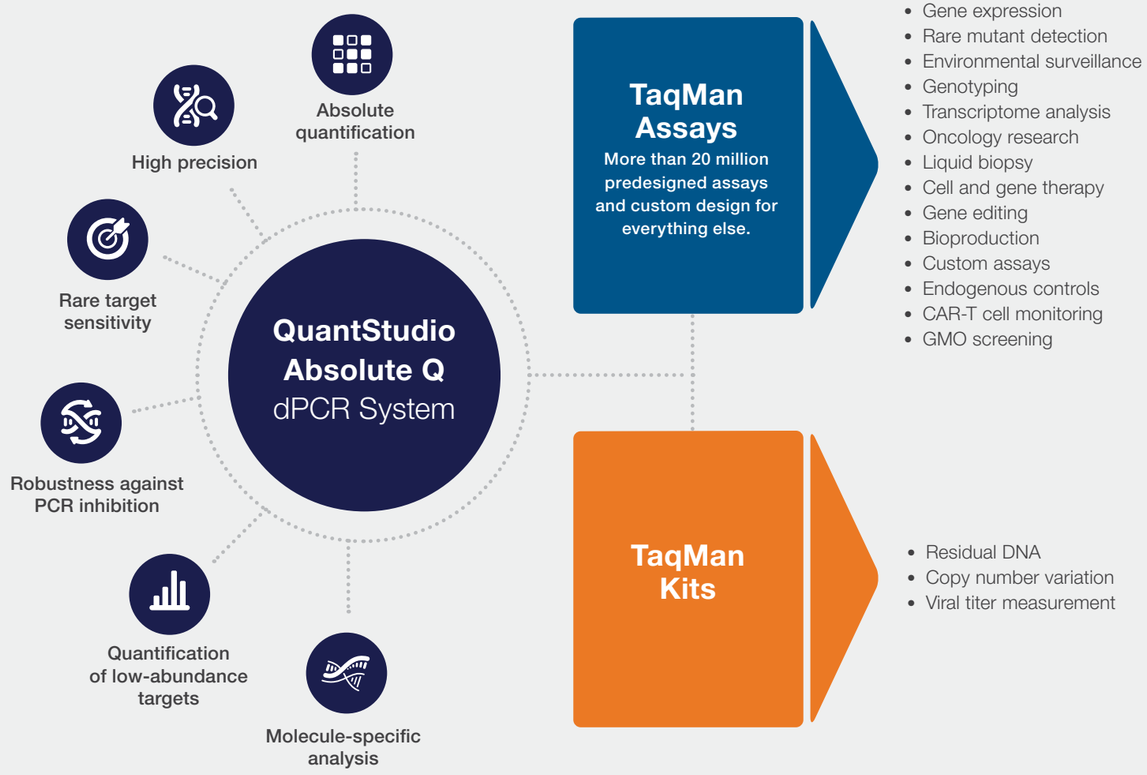
- Primer design is the only limitation on how specific your dPCR results can be. If you do it in qPCR, you can do it in dPCR too
- Important for cell and gene therapy, mRNA production, viral titer, and more

Precision with kits and assays for virtually every application

Digital PCR provides exceptional precision and versatility for diverse applications. Beyond its simple workflow, the QuantStudio™ Absolute Q™ Digital PCR System further elevates dPCR technology by leveraging Thermo Fisher Scientific's extensive portfolio of TaqMan™ Assays and Kits, enabling confident and seamless integration into virtually any research area and application.

TaqMan™ chemistry, proven by more than 296,000 peer-reviewed publications

- Gold standard 5' nuclease qPCR assays providing high specificity, sensitivity, and reproducibility
- More than 20 million predesigned assays
- Coverage for more than 30 species
- Multiple locations per transcript available



Download at **thermofisher.com/dpcr**

Intelligently integrated

dPCR overcomes variability and low accuracy by eliminating the need for a standard curve. The QuantStudio™ Absolute Q™ Digital PCR System consists of just one instrument, consolidating all steps required into a single plate and transforming a multi-step multi-instrument workflow into a familiar one-step, qPCR-like workflow that can deliver results in as little as 90 minutes.

Absolute potential

A modern implementation of dPCR, capable of getting the most from your precious samples and supporting innovative applications.

Rare target results you can trust

- True background subtraction and false positive rejection make Absolute Q an excellent choice for confident ultra-low concentration targets

Achieve the sensitivity you need

- 20K micro-chambers per reaction with >99% accepted per reaction
- Digitally pool thousands of microchambers across reactions and plates to boost sensitivity

Precision over a broad dynamic range

- ±10% precision
- 5 logs dynamic range

Multiplex up to four optical channels

- Blue (FAM™ dye)
- Green (HEX™ dye, VIC™ dye)
- Yellow (ABY™ dye)
- Dark red (Cy5™ dye, JUN™ dye)

Fingertip access

QuantStudio Absolute Q software has been designed with the intention of enhancing productivity and helping to minimize the likelihood of user error.

Improved efficiency

- Faster analysis with streamlined setup and pre-set thresholding

Enhanced analysis features

- Automated steps removes bias to aid interpretation of important metrics with integrated calculations

Informative quality control tools

- Deeper insights and simple report generation

Scalable support for batch and study analysis

- Group samples from multiple plates to analyze and report results with one click

Flexible configurations

Scale your digital PCR with efficiency and ease with **Applied Biosystems™ QuantStudio™ Absolute Q™ AutoRun dPCR Suite**. Easy-to-use walk-away workflow support lets you reclaim your valuable time.

Learn more at **thermofisher.com/autorun**

Continue learning

Still not sure how dPCR fits into your research or how it complements endpoint PCR and qPCR? Our eBook covers how all three PCR technologies work together.

Access our eBook at **thermofisher.com/pcrebook**

TaqMan™ chemistry for dPCR

The QuantStudio™ Absolute Q™ Digital PCR system and master mixes are powered by trusted TaqMan technology, which means that if you can do your analysis with qPCR, you can do it with dPCR.

Spend your time generating results with TaqMan assays and kits, not designing and optimizing assays

- Simple, fast and dependable with proven 5' nuclease and probe-based technology
- More than 20 million expertly designed, preoptimized, performance guaranteed* assays
- **Custom design tool** and **Custom dPCR assay design services** options to support new and innovative targets
- Endogenous controls for common housekeeping genes

Species	Number of pre-designed assays
Human (*H. sapiens*)	>330,000
Mouse and Rat	>409,000
Other vertebrates, bacteria, viruses, plants, and more	>2,000,000
Summary	**>2,800,000**

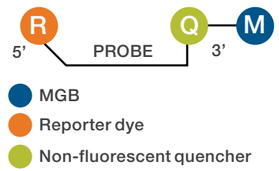
Enabling technology

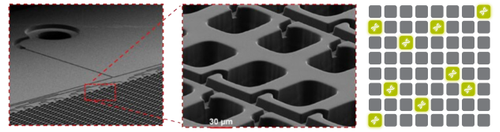
Proprietary **microfluidic array plate MAP technology** is at the heart of the Absolute Q dPCR System and its ability to deliver reliable consistency.

Your sample is pipetted into the MAP16 plate, a microinjection molded plate, where it remains, unmoved, for compartmentalization, thermal cycling, and data acquisition.

Use of MAP technology offers significant advantages over other dPCR sample digitization methods:

- Confidence in sensitivity with advanced false positive rejection and true background subtraction
- >95% input analyzed; <5% wasted sample
- Superior **consistency** and accuracy with >99% of available microchambers filled
- Simple workflow that is compatible with TaqMan assays and qPCR workflows





The Mix

PCR cannot happen without a polymerase enzyme and master mix. The Absolute Q System uses dPCR master mixes formulated using trusted polymerases, reverse transcriptases, and other components.

Absolute Q™ Universal DNA Digital PCR Master Mix (5X)
- Compatible with over 20 million TaqMan assays and kits
- 72-hour room temperature stability for convivence and improved automation

Absolute Q™ 1-step RT-dPCR Master Mix (4X)
- Support for RNA-based applications

* Terms and conditions apply. For complete details, click here.

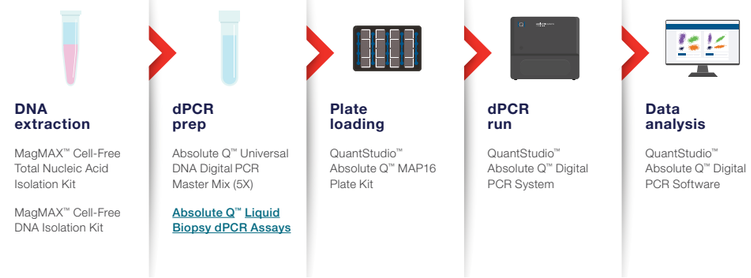
Research in oncology and liquid biopsy—an example application

Cell-free DNA (cfDNA), released from necrotic and apoptotic cells, is a valuable potential source of tumor-derived DNA. Because cfDNA can be obtained from liquid biopsies, it represents a noninvasive way to identify and track oncogenic mutations and other cancer-related biomarkers. Characterizing cfDNA found in liquid biopsies helps researchers detect cancer, quantify tumor burden, and measure and monitor therapeutic response.

Digital PCR (dPCR), with its high sensitivity, is better suited for rare target detection compared to conventional methods. It can precisely quantify cfDNA and circulating tumor DNA (ctDNA), which are usually present in low concentrations. dPCR can not only detect rare targets, but also distinguish rare targets from more abundant wild type counterparts with similar sequences.

- Absolute quantification
- High precision
- Rare target sensitivity
- Rare target sensitivity
- Quantification of low-abundance targets
- Molecule-specific analysis

Example workflow



DNA extraction
MagMAX™ Cell-Free Total Nucleic Acid Isolation Kit
MagMAX™ Cell-Free DNA Isolation Kit

dPCR prep
Absolute Q™ Universal DNA Digital PCR Master Mix (5X)
Absolute Q™ Liquid Biopsy dPCR Assays

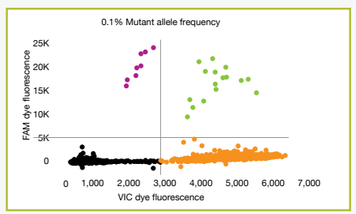
Plate loading
QuantStudio™ Absolute Q™ MAP16 Plate Kit

dPCR run
QuantStudio™ Absolute Q™ Digital PCR System

Data analysis
QuantStudio™ Absolute Q™ Digital PCR Software

The Absolute Q System workflow, for this and other applications, is familiar and very similar to a qPCR workflow where you prep your sample, load it into your plate, and let a single instrument take care of the rest.

Familiar, qPCR-like workflow
Single instrument
No plate movement or transfers
Saves time and valuable resources
Reduced potential error sources



A demonstration of the ability of the QuantStudio Absolute Q dPCR System to detect mutant KRAS p.G12V alleles (purple dots) against a background of 99.9% wild type KRAS alleles (green dots) using the KRAS 520 assay and (orange dots) using the KRAS 520 assay. Green dots represent dPCR microchambers positive for both alleles.

Download at **thermofisher.com/dpcrapplications**

Services and support you can count on

Maximize system uptime, reduce repair costs and turnaround time, extend the life of your instrument, and help keep it running at peak performance with a comprehensive service plan.

Instrument service plans

Keep your instruments up and running

- **Expert support and maintenance:** Gain access to Thermo Fisher's knowledgeable and experienced technical support team, ensuring your instruments are always in optimal condition
- **Remote support solutions:** Resolve issues remotely in minutes, not days, up to 70% of the time, minimizing downtime
- **Cost savings and faster recovery:** Benefit from predictable maintenance costs and get back up and running 2x faster with priority service and rapid response times

Qualification services

Keep your instruments compliant

- **Expedited qualification:** Achieve one-day qualification for most instruments
- **Comprehensive compliance documentation:** Receive complete documentation to assist in meeting regulatory requirements and industry standards
- **Regular reviews:** Schedule regular qualification reviews to ensure continuous compliance and verify instrument performance

Consulting services

Keep launching new molecular tests

- **Faster and cost-effective validations:** Complete your analytical validations up to 75% faster at half the cost of doing them in-house
- **Proven track record:** Benefit from our experience with over 400 validations completed to date
- **Global compliance support:** Ensure compliance with complex and ever-changing global requirements

Educational services

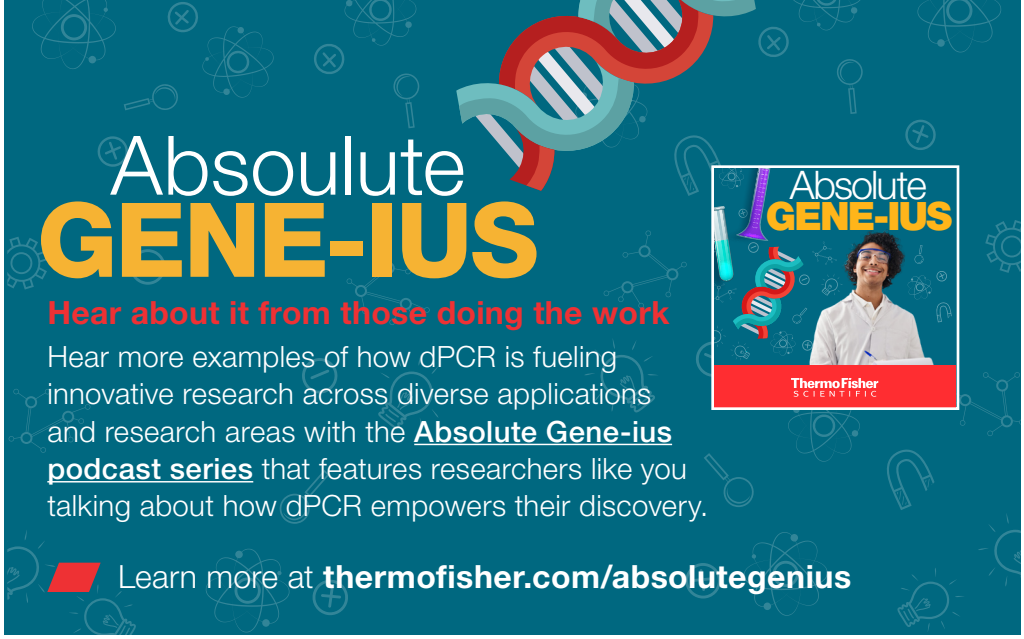
Keep learning

- **Expertise and credibility:** Learn from trained professionals with Thermo Fisher's trusted and high-quality education service team
- **Custom-tailored training:** Receive comprehensive and practical knowledge specifically designed to meet your unique needs and applications
- **Flexible learning environment:** Benefit from a versatile learning experience, utilizing advanced resources and technologies to fit your schedule and preferences

For the QuantStudio Absolute Q Digital PCR System, the AB Assurance service plan helps take the guesswork out of facilitating instrument uptime, from issue prevention to quick resolution. All parts, labor, and travel costs are included for standard repairs, and the annual planned maintenance makes it easy to stay on top of instrument care.

With features like SmartStart Orientation, you'll be set up for success. Led by professional trainers, the on-site orientation provides interactive education that includes application-specific lectures, hands-on experiment preparation, instrument and software setup, and basic data analysis.

Explore our services and support solutions at **thermofisher.com/instrumentservices**



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Dig in, when you're ready for more

Let your appetite for more information and knowledge about dPCR be the only limiting reagents in your learning equation. Explore the exciting set of articles, application notes, videos, and webinars, for those new to dPCR and those using it daily.

Access resources at **thermofisher.com/dpcreducation**

Ordering information

Description	Contents	Cat. no
QuantStudio™ Absolute Q™ Digital PCR System	(see website)	A52864
Absolute Q™ Universal DNA dPCR Master Mix (5X)	Single tube containing ready-to-use, 5X-concentrated dPCR master mix; sufficient for 200 dPCR reactions	A72710
Absolute Q™ 1-Step RT dPCR Master Mix (4X)	Single tube containing ready-to-use, 4X-concentrated master mix for 1-step RT-dPCR	A55146
QuantStudio™ Absolute Q™ MAP16 Plate Kit	12X 16-well micro injection-molded plates for use with the QuantStudio Absolute Q Digital PCR System	A52865

Learn more at **thermofisher.com/absoluteq**