

Type-it® Fast SNP Probe PCR Kit

For accurate and reliable SNP genotyping using TaqMan® or TaqMan MGB™ probes

The Type-it Fast SNP Probe PCR Kit provides the ultimate solution for accurate SNP genotyping — even for difficult templates and low template amounts. Outstanding separation and tight allele clustering ensure high call rates and accurate, reproducible and reliable genotyping results. In addition, significantly reduced PCR run times are achieved on all cyclers with standard and rapid ramping rates, resulting in greater flexibility combined with substantial time and cost savings.

Advantages of the Type-it Fast SNP Probe PCR Kit:

- Outstanding separation of alleles for reliably high call rates
- Suitable for difficult SNP loci and also for low amounts of template
- Functionally verified using TaqMan SNP Genotyping Assays
- Up to 40% time savings due to the fast-cycling procedure
- Convenient master mix format and optimized protocol

Table 1. Suitable instruments

Supplier	Thermal cycler
Real-time PCR cyclers	QIAGEN® Rotor-Gene® Q
	ABI PRISM® 7900 (all series)
	Applied Biosystems® StepOne® and StepOnePlus®
	Applied Biosystems 7500 (all series)
	Applied Biosystems ViiA® 7
	Bio-Rad®: iCycler iQ®
	Bio-Rad: CFX™ series
	Roche®: LightCycler® 480
	Roche: LightCycler Nano
Agilent®: Mx3000P® and Mx3005P®	
Standard PCR cyclers	All cyclers in standard-ramping modes (e.g., GeneAmp® 9700)
	All cyclers in fast-ramping modes (e.g., GeneAmp 9800)

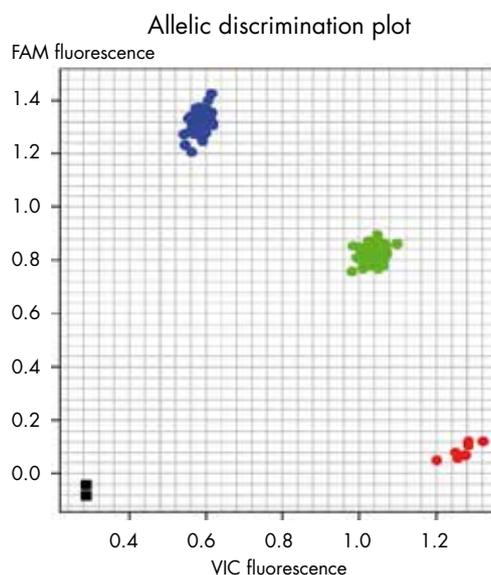
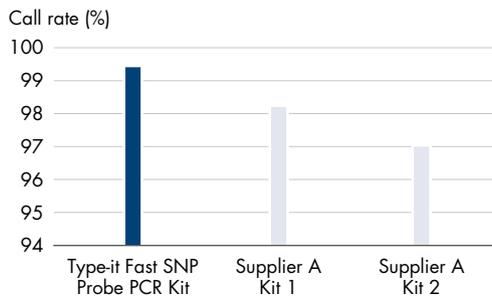


Figure 1. The Type-it Fast SNP Probe PCR Kit provides outstanding separation and tight allele clustering. Cluster plot analysis using a TaqMan MGB-based SNP genotyping assay and a panel of different genomic DNAs (10 ng each in 10 µl reactions) and two no-template controls (NTCs) using the StepOnePlus Real-Time PCR Instrument. Each dot represents one sample. **Black:** NTCs. **Blue:** homozygous DNAs for FAM™ fluorescence (T allele). **Green:** heterozygous samples. **Red:** homozygous for VIC® fluorescence (A allele).

Outstanding separation and tight allele clustering

The Type-it Fast SNP Probe PCR Kit is verified for best cluster resolution for unambiguous SNP allelic discrimination (Figure 1). It ensures fast, reliable, and easy-to-achieve results and is highly recommended for ▶



Kit	% Average call rate	% Error rates for individual SNPs
Type-it Fast SNP Probe PCR Kit	99.2	up to 1.7
Supplier A Kit 1	97.8	up to 8.3
Supplier A Kit 1	96.4	up to 10.0

Figure 2. Maximal success in automated allele calling.

Average automated allele call rates for a panel of different DNAs were analysed using 6 different TaqMan MGB-based SNP genotyping assays and 1 ng of genomic DNA from each of the 60 samples. PCR was performed with the indicated products in 384-well plates in a 5 µl reaction volume. Allelic discrimination plate read was performed on a 7900HT. The Type-it Fast SNP Probe PCR Kit consistently resulted in the highest call rates and the lowest error rates.

typical genotyping applications such as candidate gene studies, drug-target validation, disease association studies, and population genetics. The Type-it Fast SNP Probe PCR Kit enables reliable SNP genotyping — well-separated allele clusters and dense clustering of identical alleles are achieved, resulting in high call rates even with challenging targets or difficult SNP loci. Error rates are minimized and automatic allele call rates are significantly higher compared to other SNP genotyping kits available (Figure 2), thereby lowering the risk of experimental failure and resulting in significant time and cost savings by minimizing the number of samples that need to be re-tested.

High call rates even for low amounts of template

Sample materials may be limiting in genotyping studies, for example, when large numbers of SNPs need to be analyzed or when working with sample materials such as biopsies or FFPE tissue. The Type-it Fast SNP Probe PCR Kit overcomes these limitations and optimal results are achieved even when using low amounts of template DNA. Dense clusters are obtained — even with 1 ng of template DNA — when compared to SNP genotyping kits from other suppliers (Figure 3).

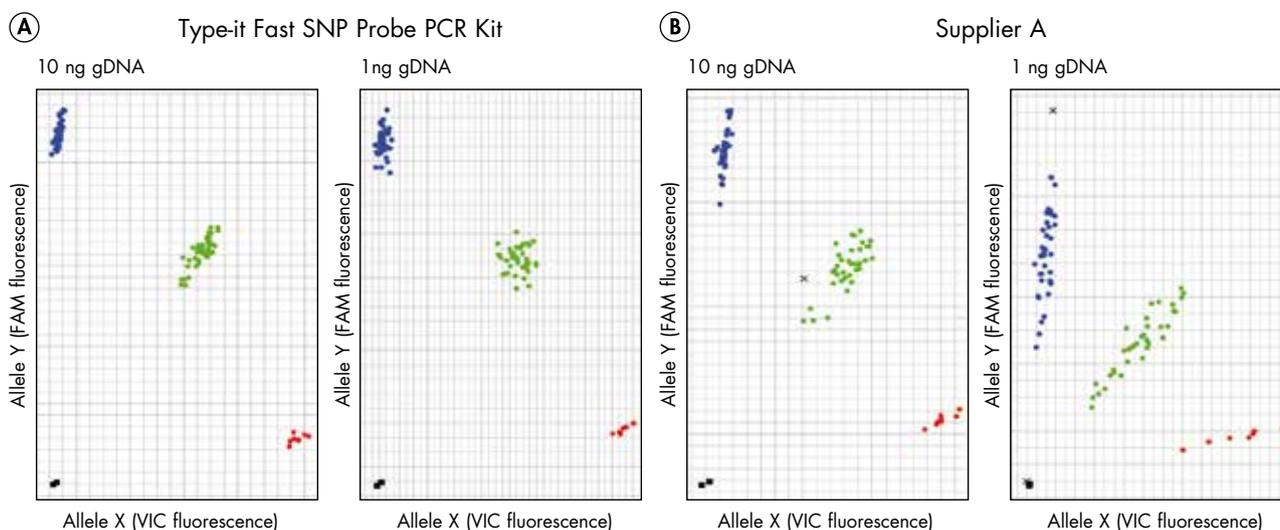


Figure 3. Reliable SNP genotyping even when using small template amounts. Allelic discrimination plot performed with a panel of 80 different genomic DNAs (10 ng or 1 ng each in 5 µl reactions) using either the **A** Type-it Fast SNP Probe PCR Kit or **B** a genotyping master mix from Supplier A. Even when using low amounts of template, tight clustering and reliable results were observed and the Type-it Fast SNP Probe PCR Master Mix outperformed the master mix from Supplier A. PCR was performed with a TaqMan SNP genotyping assay for rs 951134 (aryl-hydrocarbon receptor repressor gene) and two no-template controls (NTCs) and analyzed on a 7900HT. **Black:** NTCs. **Blue:** homozygous DNAs for FAM fluorescence (T allele). **Green:** heterozygous samples. **Red:** homozygous for VIC fluorescence (A allele). Data analyzed with 98% confidence interval.

Optimized Type-it Fast SNP Probe PCR Master Mix

The Fast SNP Genotyping PCR Master Mix is based on highly specific HotStarTaq® Plus DNA Polymerase and a newly developed SNP genotyping PCR buffer system, both of which enable highly specific probe binding and consistently strong fluorescent signals. The unique composition of the Type-it Fast SNP Genotyping PCR Master Mix provides highly stringent and specific binding of the allele-specific probe (match probe). Compared to other commercially available SNP genotyping master mix chemistries, wider and clearer separation of allele clusters is obtained (Figure 4). Additives such as Q-Solution® for difficult SNP loci and Q-Bond® for fast cycling (see below) also contribute to the reliability of the Type-it Fast SNP Probe PCR Kit. The 2x master mix also contains optimized concentrations of dNTPs, as well as ROX™ passive dye.

Suitable for difficult SNP loci

SNPs located in GC-rich regions or regions of high secondary structure are difficult to amplify using conventional genotyping PCR solutions. The Type-it Fast SNP Probe PCR Kit contains

Table 2. Type-it Fast SNP Probe PCR Kit features

Type-it Fast SNP Probe PCR Kit contents	Features
2x Master Mix format*	Developed for SNP genotyping with TaqMan MGB probes Dedicated for use with all cyclers suitable for SNP genotyping
HotStarTaq Plus DNA Polymerase	Fast and easy reaction setup at room temperature Highly specific amplification even with low template amounts
Type-it Fast SNP Probe PCR Buffer	Wide separation of genotype clusters Tight allele clusters and high allele calling rates Increased specificity in probe binding Fast cycling feature including Q-Bond
Q-Solution	Tighter clusters and higher signals in scatter plot analysis for highly GC-rich SNP loci Can further improve suboptimal allele calling

* Including ROX reference dye, dNTPs and MgCl₂.

the innovative additive Q-Solution, which helps overcome these limitations resulting in strong signals and tight clusters in scatter plot analysis independent of the target structure. Q-Solution improves the amplification of difficult templates by modifying the melting behavior of DNA and enables reliable results when SNP loci are located in GC-rich DNA or in regions of high secondary structure.

Fast-cycling procedure for straightforward results

The fast-cycling procedure increases throughput by reducing PCR run times by up to 40%. This is due to innovative Q-Bond technology (patent pending), which is also used successfully in several other QIAGEN PCR Kits. Q-Bond increases the affinity of DNA polymerase for short single-stranded DNA, significantly reducing primer and probe annealing time. The successful completion of each PCR cycle is assured, just as if standard cycling procedures were performed.

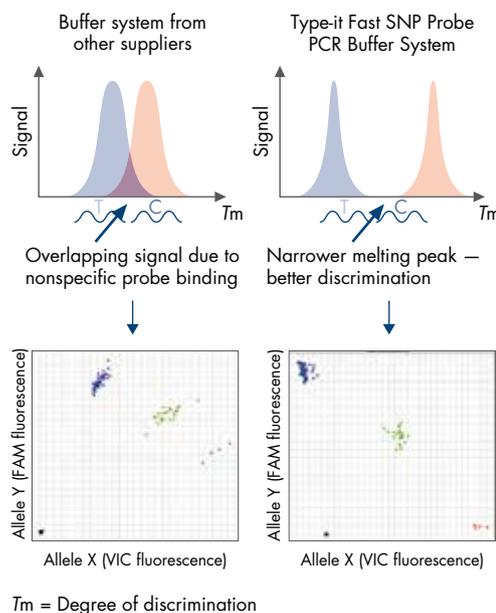


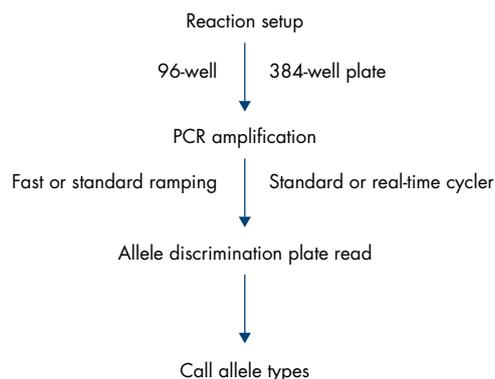
Figure 4. Highly specific probe binding due to the unique SNP genotyping buffer system. Buffer systems from other suppliers used for SNP genotyping often show poorer separation of allele clusters due to nonspecific binding of the mismatch probe. The Type-it Fast SNP Probe Buffer System provides increased discrimination by narrowing the probe melting temperature window, thereby reducing nonspecific binding of the mismatch probe. Wide and clear separation of allele clusters is obtained.

Increased throughput and flexibility

For increased throughput using the Type-it Fast SNP Probe PCR Kit, the PCR step of a SNP genotyping experiment can be performed on either a standard thermal cycler or a real-time PCR instrument and is compatible with standard as well as fast-ramping modes. Room-temperature handling ensures greater flexibility for either bench-top or automated reaction setup. Samples can be stored after reaction setup before the PCR cycling and after the PCR step prior to plate-read analysis on a real-time instrument.

Different kit formats are available and are suited for liquid handling options, further supporting every need a modern lab may have. Regardless of throughput needs, the Type-it Fast SNP Probe PCR Master Mix provides reliable data on any cycler, resulting in increased flexibility to meet different throughput needs, saving time and costs.

Genotyping workflow using the Type-it Fast SNP Probe PCR Kit



Ordering Information

Product	Contents	Cat. no.
Type-it Fast SNP Probe PCR Kit (100)	For 100 x 25 µl reactions: 2x Type-it Fast SNP Probe PCR Master Mix,* 5x Q-Solution, RNase-Free Water	206042
Type-it Fast SNP Probe PCR Kit (800)	For 800 x 25 µl reactions: 6 x 1.7 ml 2x Type-it Fast SNP Probe PCR Master Mix,* 5x Q-Solution, RNase-Free Water	206045
Type-it Fast SNP Probe PCR Kit (4000)	For 4000 x 25 µl reactions: 2 x 25 ml 2x Type-it Fast SNP Probe PCR Master Mix,*† 5x Q-Solution, RNase-Free Water	206047

* Master mix contains HotStarTaq *Plus* DNA Polymerase, with optimized concentration of MgCl₂, dNTPs, ROX dye, and Q-Solution.

† Master mix supplied in 2 individual tubes.

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at www.qiagen.com or can be requested from QIAGEN Technical Services or your local distributor.

Order online at www.qiagen.com/goto/PCR.

Trademarks: QIAGEN®, Sample to Insight®, HotStarTaq®, Q-Bond®, Q-Solution®, Rotor-Gene®, Type-it® (QIAGEN Group); ABI PRISM®, Applied Biosystems®, FAM™, GeneAmp®, ROX™, StepOne®, StepOnePlus®, VIC®, ViiA® (Thermo Fisher Scientific Inc.); Agilent®, Mx3000P®, Mx3005P® (Agilent Technologies); BioRad®, iCycler iQ®, CFX™ (Bio-Rad Laboratories, Inc.); MGB™ (Epoch Biosciences); Roche®, LightCycler® (Roche Group).

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