

# The Quick EMV Solution

**Faster EMV Chip-Card Transaction Processing**



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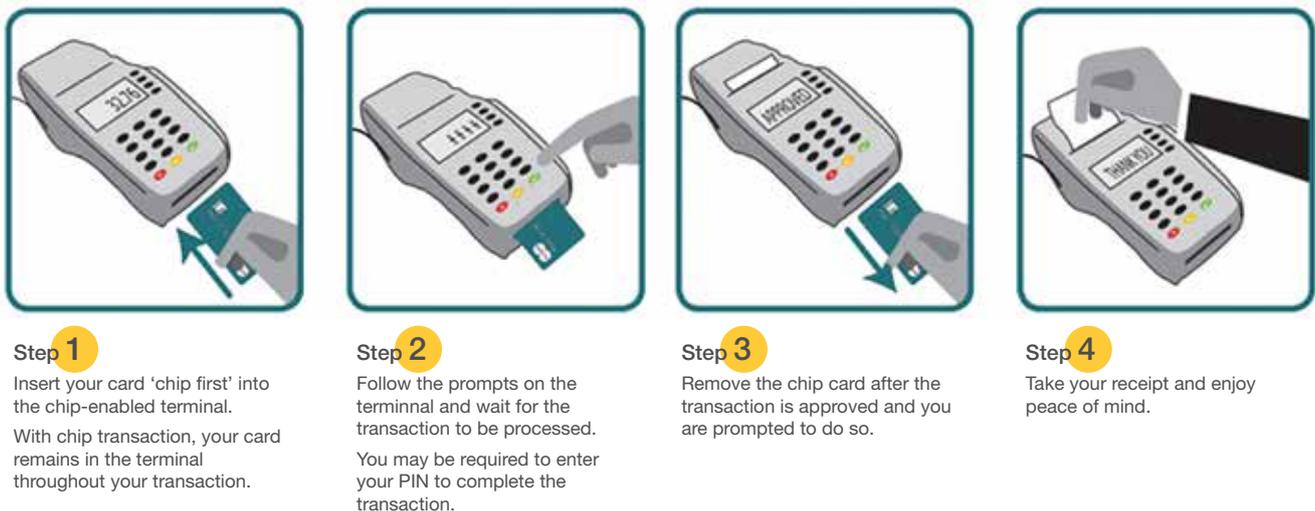
# 1 Introduction

Issuers around the world are adding computer chips to credit cards, and merchants are moving to EMV-compliant point-of-sale (POS) terminals to increase security and reduce card-present fraud resulting from counterfeit, lost and/or stolen cards. A payment transaction performed with an EMV card at a merchant's POS terminal takes relatively longer than a traditional magnetic-stripe card transaction.

Instead of the customary quick swipe of cards with magnetic strips, cardholders must now wait for a prompt to insert the chip card in the POS terminal reader, and then wait again for a prompt to remove the card (Figure 1). Unlike in other parts of the world, the EMV cards in North America and Latin America are issued with either zero or near-zero offline floor limits, which means that the vast majority of transactions are transmitted online for payment authorization regardless of the transaction value. This process can take anywhere between 10 to 39 seconds, depending on the configuration set for the chip card (by the issuer) and terminal (by the acquirer/payment processor).

The extra time required to authorize the chip-card transaction is causing concern among U.S. merchants and cardholders. For many merchants, particularly in the fast-food and grocery categories, these additional seconds are creating longer lines at the check-out counter and, consequently, increasing cardholder dissatisfaction.

Figure 1. Transaction steps for POS payment using an EMV chip-card reader



## 2 Quick EMV Card Processing

To provide a quicker, more familiar cardholder experience with EMV, MasterCard Inc. and Visa Inc. introduced a new software solution in Q2, 2016. The objectives of the solution are to:

- improve overall cardholder experience using EMV credit cards, reducing waiting time at merchant POS terminals; and
- help merchants avoid the costs of adding POS checkout lanes.

The solution design uses the principles of contactless, or 'tap-and-go', technology. This approach addresses both constraints of the previous chip-card transaction process and, at the same time, preserves the benefits of EMV authorization. More specifically, this solution means there is:

- no wait for final purchase amount to initiate EMV verification process;
- no need to have card inserted in reader until authorization response is available;
- an interaction time of < 2 seconds between terminal and card; and
- no change in transaction processing and routing.

In addition, customers can insert the card into the payment terminal before, during or after the checkout payment process—at their convenience. This feature provides the cardholder with control of the release of payment for multiple-product purchases, and can reduce the time to process the transaction. Card removal can occur as soon as the transaction cryptogram is processed by the POS terminal, regardless of the availability of the final purchase-transaction amount.



Figure 2. New 'contactless' chip-card transaction process



## 3 Quick EMV Solution Functionality

### 3.1 MasterCard and Visa Versions

Both global leaders—Visa and MasterCard—have announced their versions of this solution separately to speed up the in-store transactions initiated with EMV credit or debit cards. Visa has partnered with VeriFone, a leading global terminal provider, to build and integrate their Quick Chip solution with Visa's POS-terminal product range. Vantiv, the leading payment processor, is studying the deployment of MasterCard's M/Chip Fast solution in the market.

Either of these solutions is compatible with other card brands, hence acquirers/merchants can opt to procure either of these solution and utilize it for supporting all card brands. Visa specification would work with Visa cards as well as other cards e.g. MasterCard, Amex etc. as long as that brand is ready for the new EMV specification. Acquirers will not require the deployment of a specific solution for a given card brand.

Initially, the Quick EMV solution will be available in the U.S. at Walmart; this national retailer plans to upgrade its brick-and-mortar locations to support Visa's solution before the 2016 holiday season.

### 3.2 Quick EMV Processing Description

The functionality of the software enabling the new contactless EMV chip-card payment process is described, step-by-step, below.

1. As soon as the card is inserted into the reader, the chip transaction may begin and payment application requests the date to perform an online authorization from EMV kernel using either final amount (if known) or by taking a pre-authorization amount. Pre-authorized amount can be zero or some constant value.
2. Card and EMV kernel perform standard EMV processing to select application/initiate application (including cardholder choice or confirmation of the application, if applicable), data authentication, cardholder verification, terminal decision and other risk-management checks.
3. Card provides EMV kernel data for an online authorization request, including ARQC. EMV kernel provides chip data to payment application for online authorization request. In order to allow the card to be removed from the payment terminal in advance of the authorization response, payment application sets the authorization response code tag '8A' = Z3 (Terminal unable to go online) to complete EMV processing.
4. The payment application completes the EMV processing and prompting to remove the card.



5. Until the final amount is available, the payment application temporarily stores the authorization data from EMV kernel. The data saved for the online authorization request until the final amount is known - same as for a standard EMV transaction. Once the final amount is available, that value will be placed into non-chip data element (field 04) and EMV chip data will be placed in chip data (field 55) to send the authorization online to issuer.
6. Issuer system uses field 04 (Transaction Amount) as the actual transaction amount for approval and use field 55 tag '9F02' (Amount Authorized) for cryptogram validation.
7. Issuer/card network sends the transaction response and terminal display appropriate message.

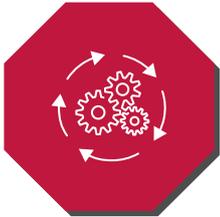
**NOTE: Issuer Authentication Process**

If the chip-card is removed from the terminal before the issuer response is received, the script from the issuer or Issuer Authentication (ARPC) will not be processed. Issuer Authentication is used by some issuers in support of offline transactions. Failure to receive the ARPC will result in the card being required to go online on next card usage. In other words, if payment from the EMV card gets processed using this new solution, then on next transaction attempt (at EMV enabled merchant location) the EMV card transaction will go online for authorization. This solution is NOT recommended for regions where acquirers intend to support Offline EMV transactions.



# 4 Recommended Merchant Applications

The new Quick EMV solution is highly recommended for retailers and quick-serve operators/merchants with lower-price, commodity products such as:



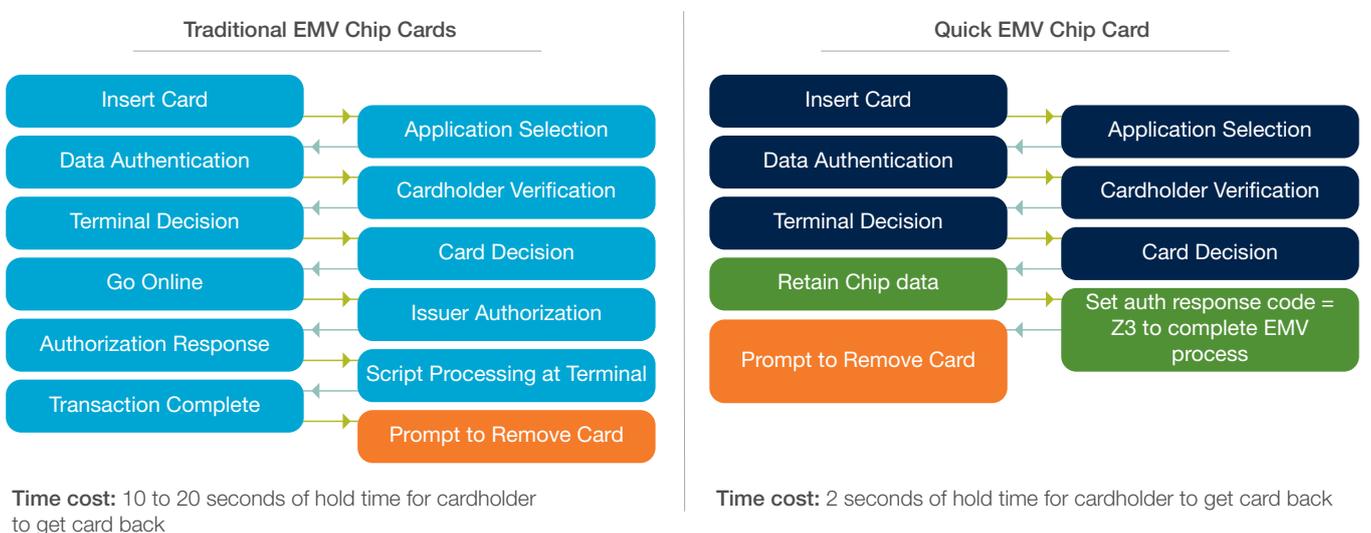
- cafeterias and fast-food restaurants;
- movie theatres;
- “big-box” retailers;
- grocery stores;
- super markets; and
- public-transportation services.

Merchants with big ticket, or high-priced, product transactions are not recommended applications for the Quick EMV system, considering the potential risk of fraud due to the abbreviated Issuer Authentication process (see Section 3.2)

Exhibit 4.1 Quick EMV Solution Impact on Payment Ecosystem

Acquirers/Terminal Providers	<ul style="list-style-type: none"> <li>• Integration of new solution on existing terminals and payment application</li> <li>• End-to-end testing before new software rollout</li> <li>• Training for Merchants and Support staff</li> </ul>
Merchants	<ul style="list-style-type: none"> <li>• Requires only a simple software update to the POS terminal or point of sale system.</li> <li>• May be performed remotely (if supported by acquirer/processor infrastructure)</li> </ul>
Cardholders	<ul style="list-style-type: none"> <li>• Faster, more convenient purchase checkout experience with ‘contactless’ EMV/ chip-card transaction</li> </ul>
Issuers	<ul style="list-style-type: none"> <li>• No impact</li> </ul>

Exhibit 4.2 Comparison: Tradition EMV vs. Quick EMV Processing



# 5 Payment Industry Benefits

The Quick EMV technology is apparently compatible with payment chips within existing mobile phones and contactless NFC retail terminals. Among the benefits specific to payment industry businesses:

**Faster Checkout** — New application will reduce overall time to complete the transactions process. Cardholders no longer have to keep the card in the terminal for the entire transaction time.

**Simple Implementation** — Quick Chip requires a payment application software update that can be easily downloaded to the payment terminal. Once installed, the technology will work with all cardholder verification methods, including signature and PIN, and does not require the merchant to make any changes to its routing or transaction handling.

**No additional Certification** — As this solution does not require any changes in standard EMV processing or in Kernel, there is no need to perform additional certification with VISA or MasterCard for already EMV certified terminal application.

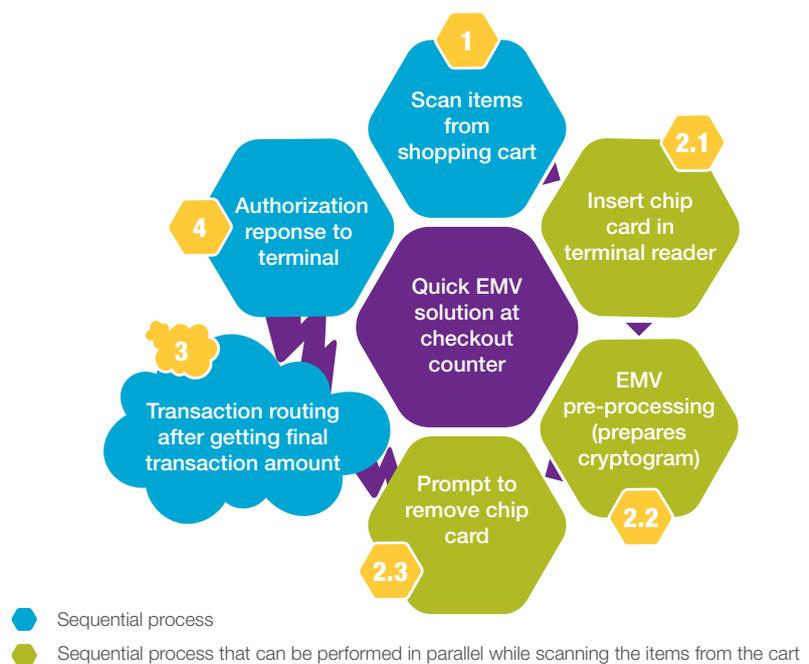
**Zero cost on usage** — Acquirer, Processor, and card networks can use this specification or solution free of charge.

**Fraud Prevention** — Provides the same EMV level of security for online authorizations, including the cryptogram.

**Works with existing chip cards** — New solution will be download in terminal. Existing active EMV card can be used without any change.



Figure 3. Quick EMV contactless chip-card checkout payment process

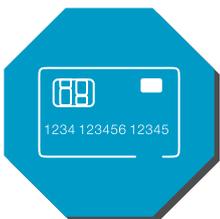
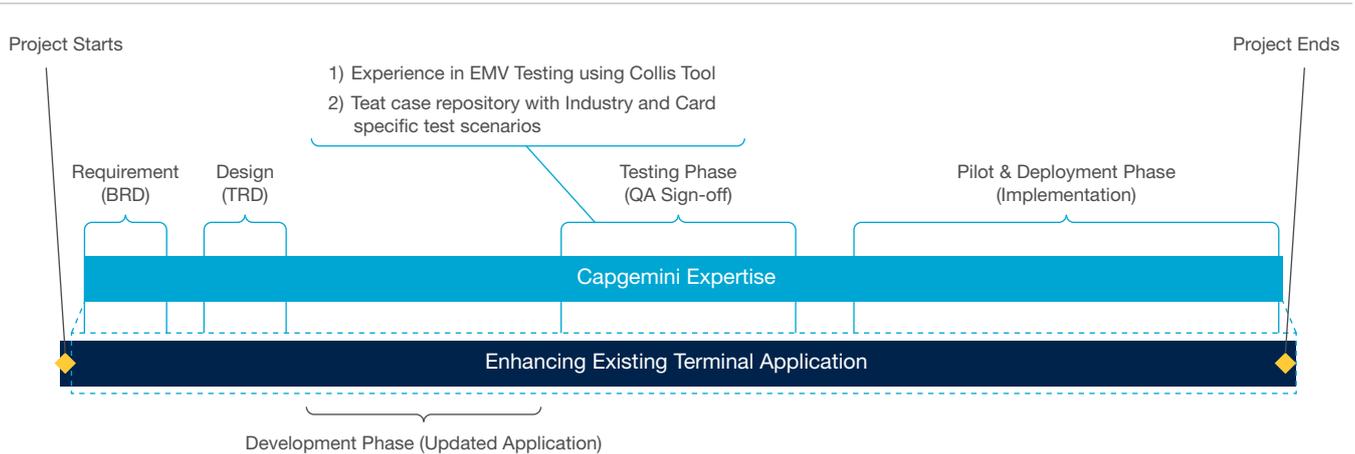


## 6 Capgemini Services

To get the new solution, acquirer or payment processor will need to bear the cost of development and test the solution by incorporating the change in their existing running POS software application. While the software changes are simple to incorporate, testing is a bit complex as it requires expertise in testing terminal applications and it involves use of an EMV testing tool. It is of the utmost importance for the acquirer bank or payment processor to implement the new Quick EMV solution only after conducting in-depth testing that covers all possible use-case scenarios

Capgemini has the experience and expertise to assist with terminal application projects. EMV testing is a specialty and a Capgemini strength. Development of the terminal application is typically done in-house by the acquirer or the terminal manufacturer.

Figure 4. High-level project plan: Quick EMV Implementation and Testing Services



## 7 Summary and References



The new Quick EMV chip-card payment solution improves the consumer's transaction experience by introducing relatively minor changes to the POS checkout terminal. Merchants who want to provide a fast, reliable, and secure checkout experience for their customers—and a trouble-free POS system implementation for their staff—should contact their payment processor or acquiring bank.

For more information, visit these websites:

1. "Visa Speeds Up Checkout Times," Visa Inc. April 19, 2016 News Release.  
<http://investor.visa.com/news/news-details/2016/Visa-Speeds-Up-Checkout-Times/default.aspx>
2. "Visa chip technology: confidence in a smarter world," Visa Inc.  
<https://www.visa.com/chip/personal/security/chip-technology/index.jsp>

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