



**Fiserv Dual Interface  
EMV™ Test Card Set**

**Version 2.00**

**April 2021**

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## Revision History

Version	Date	Updated By	Revisions
1.00	December 22, 2020	B2PS	Initial document release
2.00	April 13, 2021	B2PS	<ul style="list-style-type: none"><li>• TC02 – introduction of longer Public Key Certificate, change of CA PK Index</li></ul>

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**CAUTION**

Multiple consecutive incorrect PIN entry attempts may result in the card being blocked. This is known as being 'PIN Blocked'.

If this occurs, it will no longer be possible to enter an Offline PIN which will cause all future transactions to be declined.

**\*\*\* It is not possible to unblock a 'PIN Blocked' card \*\*\***

## Fiserv Dual Interface Test Card Profiles

This Test Card Set contains two cards, defined as follows:

	Test Card 01	Test Card 02
<b>Brand</b>	Visa	Mastercard
<b>Type</b>	Credit	Credit
<b>AID</b>	A0000000031010	A0000000041010
<b>PAN</b>	4761 7390 0101 0119	5413 3300 8960 4111
<b>Expiry Date</b>	12/2022	12/2025
<b>Service Code</b>	201	201
<b>Interface</b>	Contact, Contactless, MSR	Contact, Contactless, MSR
<b>CVM</b>	<a href="#">See card definition</a>	<a href="#">See card definition</a>
<b>Approval Amount</b>	\$10.00	\$20.00
<b>Online / Offline</b>	Online Only	Online Only
<b>Issuer Country Code</b>	840 (USA)	840 (USA)
<b>Application Currency Code</b>	840 (USD)	840 (USD)
<b>Language</b>	'en' – English	'en' – English
<b>Application Confirmation</b>	No	No
<b>Card Purpose</b>	Contactless Visa	Contactless Mastercard
<b>Card Version</b>	v2.x	v3.x

## 1.1 Test Card 01 – Visa, Credit, English, USA, USD

A Visa credit card with Issuer Country Code of 'USA' and Currency Code of 'USD'.

The recommended transaction amount to generate a host approval is \$10.00

### 1.1.1 Cardholder Verification Method List

Cardholder Verification Method List ('0201 4204 1E04 0005 5E00 1F00')			
CVM	Verification Method	Conditions	If unsuccessful
1	Online PIN	Unattended Cash	Fail
2	Online PIN	Manual Cash	Next CVM
3	Signature (paper)	Manual Cash	Fail
4	Fail CVM Processing	Purchase with Cashback	Fail
5	Signature (paper)	Always	Next CVM
6	No CVM required	Always	Fail

### 1.1.2 Application Tag data (Contact Interface, online)

Tag	Element name	Data	v2.x
50	Application Label	56 69 73 61 20 43 72 65 64 69 74 - 'Visa Credit'	
57	Track 2 Equivalent Data	47 61 73 90 01 01 01 19 D2 21 22 01 11 75 89 89 38 90 0F	
5A	Application Primary Account Number (PAN)	47 61 73 90 01 01 01 19	
5F 20	Cardholder Name	44 49 20 54 65 73 74 2F 43 61 72 64 20 30 31 20 20 20 20 20 20 20 20 20 20 20 - 'DI Test/Card 01'	
5F 24	Application Expiration Date	22 12 31	
5F 25	Application Effective Date	xx xx xx	
5F 28	Issuer Country Code	08 40 - USA	
5F 2D	Language Preference	65 6E - 'en' (English)	
5F 30	Service Code	02 01	
5F 34	Application PAN Sequence Number	01	
82	Application Interchange Profile	18 00 BYTE 1: b7 - Offline SDA NOT supported b6 - Offline DDA NOT supported b5 - Cardholder verification supported b4 - Terminal risk mgmt to be performed b3 - Issuer authentication NOT supported via EXTERNAL AUTH command b1 - Combined DDA / GEN AC NOT supported BYTE 2: b8 - Use for Visa NOT supported b7 - Is NOT Mobile handset	
84	Dedicated File (DF) Name	A0 00 00 00 03 10 10	
8C	Card Risk Management Data Object List 1 (CDOL1)	9F 02 06 9F 03 06 9F 1A 02 95 05 5F 2A 02 9A 03 9C 01 9F 37 04	
8D	Card Risk Management Data Object List 2 (CDOL2)	8A 02 9F 02 06 9F 03 06 9F 1A 02 95 05 5F 2A 02 9A 03 9C 01 9F 37 04	
8E	Cardholder Verification Method (CVM) List	00 00 00 00 00 00 00 00 02 01 42 04 1E 04 00 05 5E 00 1F 00	
8F	Certification Authority Public Key Index	92	

Tag	Element name	Data	v2.x
90	Issuer Public Key Certificate	3C 96 F7 65 8F BC 29 A2 02 F1 91 46 BD E9 21 66 B0 F6 22 1B BC CB 02 E3 26 71 0B 9E 22 9D 16 FA E9 AD 0C 87 4C 06 85 91 6E 19 F0 E3 26 93 EE 20 1B CE 23 59 50 9A 6D 65 72 F8 EC 3F C3 73 12 6B 34 3F 9C B8 15 3D 61 B7 EA B2 D4 2D E1 9D 56 08 31 85 A0 3D D1 4C 26 8D 40 DF 08 35 C5 5E AB FA 38 ED 28 BC E4 2C D0 01 3D A9 4F 80 05 18 B7 53 C2 46 EF FB A0 8F D2 02 9B AD 5D FC F0 DA F0 7B 7D 80 1C 46 5F FD 25 2C 70 B9 21 53 B3 30 D9 5D CA 2F A1 FA AE 2D 01 68 A4 EA 8B 47 5C D8 05 DC 32 AA 96 4C 17 BF CD 2C D5 D0 30 9A B0 EA 76 1B	
92	Issuer Public Key Remainder	50 DA 20 DD A8 95 3B 69 3F ED 84 36 68 31 BA 1E EA 97 F7 8F 79 2A CF 8C B9 8F DF 01 49 A7 B7 8F DA 1C 49 67	
94	Application File Locator (AFL)	10 01 01 00 10 02 05 01 B0 01 01 00	
9F 07	Application Usage Control	FF 00 BYTE 1: b8 - Domestic cash trans. valid b7 - Int'l cash transactions valid b6 - Domestic goods valid b5 - International goods valid b4 - Domestic services valid b3 - International services valid b2 - ATMs valid b1 - non-ATM terminals valid BYTE 2: b8 - Domestic cashback NOT allowed b7 - International cashback NOT allowed	
9F 08	Application Version Number [VIS]	00 96	
9F 0D	Issuer Action Code - Default	B8 50 AC 88 00	
9F 0E	Issuer Action Code - Denial	00 00 00 00 00	
9F 0F	Issuer Action Code - Online	B8 70 9C 98 00	
9F 10	Issuer Application Data [VSDC]	xx xx 0A xx xx xx xx *	
9F 11	Issuer Code Table Index	01	
9F 12	Application Preferred Name	56 69 73 61 20 43 72 65 64 69 74 - 'Visa Credit'	
9F 13	Last Online Application Transaction Counter (ATC) Register	xx xx *	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 1F	Track 1 Discretionary Data	31 37 35 38 39 30 30 38 39 33 30 30 30 30 30 30 30 30 30 30 30 30 30 30	
9F 26	Application Cryptogram (AC)	xx xx xx xx xx xx xx xx *	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
9F 36	Application Transaction Counter (ATC)	xx xx *	
9F 44	Application Currency Exponent	02	
9F 46	ICC Public Key Certificate	23 F5 9C 1A CC 29 43 4F 34 DE 7D 13 6E 8A B3 3E BB 95 13 D0 65 99 BA 18 4B E7 42 41 B8 02 01 1F FF 1C 79 49 86 A7 3B 76	

Tag	Element name	Data	v2.x
		4B B8 E2 29 AD AB 65 E4 76 97 4A 71 34 02 B1 DC B3 D3 4C 8D 82 4B DE 4E 75 F6 19 77 44 3D D5 45 4A D4 F9 FC FB 0F 10 5D 0D 86 7D 9A FF A2 A7 7A 9B 68 A3 9F 27 56 35 7F BB 82 DE 59 9B 3A F1 12 76 3E 16 F8 01 E5 43 5C BE AB 8C F3 67 3F DB 31 5D 3B 56 77 BA F5 87 06 A0 7C 1E 9C E0 FF B4 97 36 69 A8 C8 2D 1E 10 77 91 29 05 94 D7 BA 3B 00 6E FF B1 9D 2C 22 3A 5B 36 13 CB 5B EE 31 6C A5 AD 49 0B 60 6E 4D AD 77	
9F 47	ICC Public Key Exponent	03	
9F 49	Dynamic Data Authentication Data Object List (DDOL)	9F 37 04	
9F 4A	Static Data Authentication Tag List	82	
9F 51	Application Currency Code [VSDC]	08 40 - USD	
9F 52	Application Default Action [VSDC VIS 1.5]	00 00 00 00 00 00	
9F 53	Consecutive Transaction Limit (International) [VSDC]	00	
9F 54	Cumulative Total Transaction Amount Limit [VSDC]	00 00 00 00 00 00	
9F 57	Issuer Country Code [VSDC]	08 40 - USA	
9F 58	Consecutive Transaction Counter Limit [VSDC]	00	
9F 59	Consecutive Transaction Counter Upper Limit [VSDC]	00	
9F 5C	Cumulative Total Transaction Amount Upper Limit [VSDC]	00 00 00 00 00 00	
9F 5E	Consecutive Transaction International Upper Limit [VSDC]	00	
9F 68	Card Additional Processes [qVSDC VCPS 2.1]	10 00 10 00	
9F 72	Consecutive Transaction Limit (International-Country) [VSDC]	00	
BF 55	Contactless Counters Data Template	DF 11 01 00 DF 21 01 00 DF 31 01 00	
BF 56	Counters Data Template	DF 11 01 02 DF 21 01 00 DF 31 01 00	
BF 57	International Counters Data Template	DF 11 01 00 DF 21 01 00 DF 31 01 00 DF 51 01 00 DF 61 01 00	
BF 58	Amounts Data Template	DF 11 06 00 00 00 00 00 00 DF 21 06 00 00 00 00 00 00 DF 31 06 00 00 00 00 00	
BF 5B	Application Internal Data Template	DF 01 02 00 00	

\* Tag value changes with card usage

### 1.1.3 Application Tag data (Contactless Interface, online)

Tag	Element name	Data	v2.x
50	Application Label	56 69 73 61 20 43 72 65 64 69 74	
57	Track 2 Equivalent Data	47 61 73 90 01 01 01 19 D2 21 22 01 11 75 89 89 38 90 0F	
5A	Application Primary Account Number (PAN)	47 61 73 90 01 01 01 19	
5F 24	Application Expiration Date	22 12 31	
5F 2D	Language Preference	65 6E - 'en' (English)	



Tag	Element name	Data	v2.x
5F 34	Application PAN Sequence Number	01	
82	Application Interchange Profile	00 00 BYTE 1: b7 - Offline SDA (online Auth) NOT supported b6 - Offline DDA NOT supported BYTE 2: b8 - MSD NOT supported b7 - Is Mobile handset b6 - Is Contactless transaction	
84	Dedicated File (DF) Name	A0 00 00 00 03 10 10	
8F	Certification Authority Public Key Index	92	
90	Issuer Public Key Certificate	3C 96 F7 65 8F BC 29 A2 02 F1 91 46 BD E9 21 66 B0 F6 22 1B BC CB 02 E3 26 71 0B 9E 22 9D 16 FA E9 AD 0C 87 4C 06 85 91 6E 19 F0 E3 26 93 EE 20 1B CE 23 59 50 9A 6D 65 72 F8 EC 3F C3 73 12 6B 34 3F 9C B8 15 3D 61 B7 EA B2 D4 2D E1 9D 56 08 31 85 A0 3D D1 4C 26 8D 40 DF 08 35 C5 5E AB FA 38 ED 28 BC E4 2C D0 01 3D A9 4F 80 05 18 B7 53 C2 46 EF FB A0 8F D2 02 9B AD 5D FC F0 DA F0 7B 7D 80 1C 46 5F FD 25 2C 70 B9 21 53 B3 30 D9 5D CA 2F A1 FA AE 2D 01 68 A4 EA 8B 47 5C D8 05 DC 32 AA 96 4C 17 BF CD 2C D5 D0 30 9A B0 EA 76 1B	
92	Issuer Public Key Remainder	50 DA 20 DD A8 95 3B 69 3F ED 84 36 68 31 BA 1E EA 97 F7 8F 79 2A CF 8C B9 8F DF 01 49 A7 B7 8F DA 1C 49 67	
94	Application File Locator (AFL)	10 04 07 00	
9F 10	Issuer Application Data [VSDC]	xx xx 0A xx xx xx xx *	
9F 13	Last Online Application Transaction Counter (ATC) Register	xx xx *	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 26	Application Cryptogram (AC)	xx xx xx xx xx xx xx xx *	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
9F 36	Application Transaction Counter (ATC)	xx xx *	
9F 38	Processing Options Data Object List (PDOL)	9F 66 04 9F 02 06 9F 03 06 9F 1A 02 95 05 5F 2A 02 9A 03 9C 01 9F 37 04	

Tag	Element name	Data	v2.x
9F 46	ICC Public Key Certificate	6B BA FC 65 70 9D 5B E1 73 9D 52 06 33 ED 54 88 8E 16 68 1A 8A 4E 12 56 2A 9E 96 AA 46 AA 9D 94 27 93 59 D2 72 7A 27 86 7E F7 0D 35 D1 E9 72 8C 96 EE 12 E5 BD 06 43 0A E4 A7 27 F2 85 77 C1 AE 93 6D D7 69 E9 81 53 20 38 2E F2 3D 36 57 C5 7F DB D3 4B D8 F4 F0 FE 87 90 3F 35 DE 85 BA 42 F2 DF 79 94 E3 68 18 A9 8C B6 69 1F 2D 03 23 32 17 E1 7F 49 FF 4C 96 EC EC 6E 3E C6 67 2C 68 B6 DD F8 BD E5 45 43 B2 C7 05 27 57 1B 68 78 85 E3 09 C0 87 12 2C 41 A3 28 4D B0 30 1B 60 E6 83 46 1F 55 04 A1 D2 35 F6 93 9E F3 45 17 4C CB 62 58 50	
9F 47	ICC Public Key Exponent	03	
9F 51	Application Currency Code [VSDC]	08 40 - USD	
9F 52	Application Default Action [VSDC VIS 1.5]	00 00 00 00 00 00	
9F 53	Consecutive Transaction Limit (International) [VSDC]	00	
9F 54	Cumulative Total Transaction Amount Limit [VSDC]	00 00 00 00 00 00	
9F 57	Issuer Country Code [VSDC]	08 40 - USA	
9F 58	Consecutive Transaction Counter Limit [VSDC]	00	
9F 59	Consecutive Transaction Counter Upper Limit [VSDC]	00	
9F 5A	Application Program Identifier	31 08 40 08 40	
9F 5C	Cumulative Total Transaction Amount Upper Limit [VSDC]	00 00 00 00 00 00	
9F 5E	Consecutive Transaction International Upper Limit [VSDC]	00	
9F 68	Card Additional Processes [qVSDC VCPS 2.1]	10 00 10 00	
9F 69	Card Authentication Related Data [qVSDC]	01 00 00 00 00 00 00 BYTE 1: b8 - Online PIN NOT required b7 - Signature NOT required b6 - Do NOT go online if Offline Data Authentication fails and Reader is online capable b5 - Do NOT switch interface if Offline Data Authentication fails and Reader supports contact chip b4 - Do NOT go Online if Application Expired b3 - Do NOT switch interface for Cash Transactions b2 - Do NOT switch interface for Cashback Transactions b1 - Is valid for contactless ATM transactions BYTE 2: b8 - Consumer Device CVM NOT performed b7 - Card does NOT Support Issuer Update Processing at POS b2 - Is NOT valid at ATMs	

Tag	Element name	Data	v2.x
9F 6C	Card Transaction Qualifiers [qVSDC VCPS 2.1]	38 00 BYTE 1: b8 - Online PIN NOT required b7 - Signature NOT required b6 - Do go online if Offline Data Authentication fails and Reader is online capable b5 - Do switch interface if Offline Data Authentication fails and Reader supports contact chip b4 - Do go Online if Application Expired b3 - Do NOT switch interface for Cash Transactions b2 - Do NOT switch interface for Cashback Transactions b1 - Is valid for contactless ATM transactions BYTE 2: b8 - Consumer Device CVM NOT performed b7 - Card does NOT Support Issuer Update Processing at POS	
9F 6E	Form Factor Indicator [qVSDC]	20 70 00 00	
9F 72	Consecutive Transaction Limit (International-Country) [VSDC]	00	
BF 55	Contactless Counters Data Template	DF 11 01 00 DF 21 01 00 DF 31 01 00	
BF 56	Counters Data Template	DF 11 01 01 DF 21 01 00 DF 31 01 00	
BF 57	International Counters Data Template	DF 11 01 00 DF 21 01 00 DF 31 01 00 DF 51 01 00 DF 61 01 00	
BF 58	Amounts Data Template	DF 11 06 00 00 00 00 00 00 DF 21 06 00 00 00 00 00 00 DF 31 06 00 00 00 00 00	
BF 5B	Application Internal Data Template	DF 01 02 00 00	

\* Tag value changes with card usage

## 1.2 Test Card 02 – Mastercard, Credit, English, USA, USD

A Mastercard credit card with Issuer Country Code of 'USA' and Application Currency Code of 'USD'.

The recommended transaction amount to generate a host approval is \$20.00.

### 1.2.1 Cardholder Verification Method List

Cardholder Verification Method List ('4203 1E03 1F03')			
CVM	Verification Method	Conditions	If unsuccessful
1	Online PIN	Terminal supports CVM type	Next CVM
2	Signature (paper)	Terminal supports CVM type	Fail
3	No CVM required	Terminal supports CVM type	Fail

### 1.2.2 Application Tag data (Contact Interface, online)

Tag	Element name	Data	v3.x
50	Application Label	4D 61 73 74 65 72 63 61 72 64 -	

Tag	Element name	Data	v3.x
		'Mastercard'	
57	Track 2 Equivalent Data	54 13 33 00 89 60 41 11 D2 51 22 01 01 23 40 91 72 02 9F	
5A	Application Primary Account Number (PAN)	54 13 33 00 89 60 41 11	
5F 20	Cardholder Name	44 49 20 54 65 73 74 2F 43 61 72 64 20 30 32 20 20 20 20 20 20 20 20 20 20 20	
5F 24	Application Expiration Date	25 12 31	
5F 25	Application Effective Date	xx xx xx	
5F 28	Issuer Country Code	08 40 - USA	
5F 2D	Language Preference	65 6E - 'en' (English)	
5F 30	Service Code	02 01	
5F 34	Application PAN Sequence Number	01	
82	Application Interchange Profile	38 00 BYTE 1: b7 - Offline SDA NOT supported b6 - Offline DDA supported b5 - Cardholder verification supported b4 - Terminal risk mgmt to be performed b3 - Issuer authentication NOT supported via EXTERNAL AUTH command b1 - Combined DDA / GEN AC NOT supported BYTE 2: b8 - EMV Contactless NOT supported	
84	Dedicated File (DF) Name	A0 00 00 00 04 10 10	
87	Application Priority Indicator	01	
8C	Card Risk Management Data Object List 1 (CDOL1)	9F 02 06 9F 03 06 9F 1A 02 95 05 5F 2A 02 9A 03 9C 01 9F 37 04 9F 35 01 9F 45 02 9F 4C 08 9F 34 03 9F 21 03 9F 7C 14	
8D	Card Risk Management Data Object List 2 (CDOL2)	91 0A 8A 02 95 05 9F 37 04 9F 4C 08	
8E	Cardholder Verification Method (CVM) List	00 00 00 00 00 00 00 00 42 03 1E 03 1F 03	
8F	Certification Authority Public Key Index	EF	
90	Issuer Public Key Certificate	5B 2E 1F EF 4D 7D 2C 16 16 12 21 F7 97 2F E6 99 B7 82 44 E0 73 C8 AC 75 86 CE D1 76 EF 7B 93 AC 19 0B 05 70 40 E1 18 4F 2F 55 AC 70 D2 AA C3 94 BE 22 6A 26 50 D3 CA ED 90 60 88 C5 3A 88 B8 3C 46 1F 37 6D 89 10 B8 51 81 54 F3 08 EE ED 23 BC 15 7C FA BA 6E 51 26 9F 01 6D 59 FE 21 A6 F9 10 F2 85 13 0D EA F6 A4 78 BE 77 9D 2B AD 08 E1 2E D6 A5 93 71 5A 18 72 15 C5 63 28 1C B2 B7 2E 5B 14 05 5D 2D D8 30 4A C2 20 2E 53 96 D0 4C 5C 79 55 0B 4D E9 FA DA CB 35 F3 19 06 C5 A4 42 27 29 D6 A5 A8 F5 E1 4C B9 0D B7 05 49 4B 3D B1 0D E6 19 F3 B0 3E 64 96 FE 79 F4 6E 64 97 2A 46 34 A0 35 EF 7E 50 20 49 40 36 03 E0 BC FC 33 C3 87 BB 6D 72 CF F8 33 89 7E 81 F5 02 3F F4 D6 A9 CC 0C 89 E8 78 3F 07 B7 F0 55 3E 9D D3 59 B6 5B 62 3A F1 CE 27 8D 65 3C 37 07	

Tag	Element name	Data	v3.x
92	Issuer Public Key Remainder	14 3E 90 B8 B5 E6 2B E5 A9 0D 5A 4E F1 5C 77 40 4D 29 94 48 98 77 85 D7 E8 80 C2 CD	
94	Application File Locator (AFL)	08 02 04 01 18 01 01 00 20 01 01 00	
94	Application File Locator (AFL)	08 02 04 01 18 01 01 00 20 01 01 00	
9F 07	Application Usage Control	FF 00 BYTE 1: b8 - Domestic cash trans. valid b7 - Int'l cash transactions valid b6 - Domestic goods valid b5 - International goods valid b4 - Domestic services valid b3 - International services valid b2 - ATMs valid b1 - non-ATM terminals valid BYTE 2: b8 - Domestic cashback NOT allowed b7 - International cashback NOT allowed	
9F 08	Application Version Number	00 02	
9F 0D	Issuer Action Code - Default	B8 50 9C 80 00	
9F 0E	Issuer Action Code - Denial	00 00 00 00 00	
9F 0F	Issuer Action Code - Online	B8 70 9C 98 00	
9F 10	Issuer Application Data [M/Chip Advance]	xx 10 xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx *	
9F 11	Issuer Code Table Index	01	
9F 12	Application Preferred Name	4D 61 73 74 65 72 63 61 72 64 43 72 65 64 69 74 - 'MastercardCredit'	
9F 14	Counter 1 Lower Limit [Mastercard]	00	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 1F	Track 1 Discretionary Data	20 20	
9F 23	Counter 1 Upper Limit [Mastercard]	00	
9F 26	Application Cryptogram (AC)	xx xx xx xx xx xx xx xx *	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
9F 36	Application Transaction Counter (ATC)	xx xx *	
9F 42	Application Currency Code	08 40 - USD	
9F 44	Application Currency Exponent	02	
9F 46	ICC Public Key Certificate	A4 B9 E7 95 4D 48 32 E2 17 93 B1 7A D6 7B 26 2D 1B 9A EA B2 F0 05 F2 73 1C ED 21 8A 56 07 F1 6A 5D 85 67 51 3B A4 D1 27 57 A3 13 85 00 F0 DB 77 5C 87 FF 64 52 51 65 C8 0F 0D 29 47 75 22 73 25 06 4D BC C7 5C 10 7E 8B FE EE 8A 3B 96 A9 DB 5D 75 A8 B3 77 20 E1 48 28 57 44 F8 7B 93 20 99 20 CD EA 75 F0 02 39 F8 F4 00 27 BE D5 DD E8 F7 C9 E9 45 F8 72 6B BD DC 7E 65 8F C7 1C C7 74 EB 4D 90 68 2B 20 C6 21 AD 60 16 DE CF 5C 9B 4D 8D 30 4F 36 51 0E 3F F3 1E 4F B6 32 BC A8 2D D3 DB 01 BE 8B 15 43 D8 14 64 71 E3 44 FA 8A 47 24 5A 5A 1D 23 A0 D7	

Tag	Element name	Data	v3.x
		96 1F 73 52 30 E5 65 9C 05 7A 48 18 7A 72 7D 88 AB 94 DD 18 03 D2 70 07 96 30 C6 4E 30 D9 40 EE 07 B8 69 E0 CF 44 6B 77 3E 65 46 AD E0 E4 23 BB 5B A1 A3 9B 06 49 36 75 A7 8C C3 1F	
9F 47	ICC Public Key Exponent	03	
9F 49	Dynamic Data Authentication Data Object List (DDOL)	9F 37 04	
9F 4A	Static Data Authentication Tag List	82	
9F 4B	Signed Dynamic Application Data	43 20 A1 84 8B 6A D9 8A 8E 16 53 5E 30 BC 37 E2 58 30 CD 36 12 D4 43 C5 A3 BA E4 16 01 47 73 A4 C1 A1 66 92 76 5C 88 CB 41 60 72 F8 67 9A E0 E3 2B 0D 41 FF FF AE EB 47 43 0B F8 D5 12 18 99 F9 5B 79 44 00 9E 82 39 68 9E 7E D3 6F 12 3D 65 39 54 28 11 24 66 6B B1 93 1F 45 B4 3E 5B 4A AE 5D 38 32 0C 26 CE D2 0C 4C F5 0C 08 C6 60 F5 D5 27 A1 14 0A 1C 4E 52 72 01 82 26 E3 B6 90 D5 DF 0D EE E8 2F 41 BD D9 76 4E 29 93 32 0B 15 E2 8F E2 3D 83 E5 2D C4 84 51 7E D3 77 24 48 FC B4 C7 5D BB 74 5E 50 2C 00 BC 99 73 1E 81 73 BC 44 01 A7	
9F 4D	Transaction Log Entry	0B 0A	
9F 4F	Transaction Log Format	9F 27 01 9F 02 06 5F 2A 02 9A 03 9F 36 02 9F 52 06 DF 3E 01 9F 21 03 9F 7C 14	
9F 5D	Application Capabilities Information [M/Chip Advance]	01 00 00	
9F 6E	Third Party Data [Mastercard]	08 40 00 00 30 30 00	
9F 70	Protected Data Envelope 1 [M/Chip Advance]	20 20	
9F 71	Protected Data Envelope 2 [M/Chip Advance]	20 20	
9F 72	Protected Data Envelope 3 [M/Chip Advance]	20 20	
9F 73	Protected Data Envelope 4 [M/Chip Advance]	20 20	
9F 74	Protected Data Envelope 5 [M/Chip Advance]	20 20	
9F 75	Unprotected Data Envelope 1 [M/Chip Advance]	20 20	

Tag	Element name	Data	v3.x
9F 76	Unprotected Data Envelope 2 [M/Chip Advance]	20 20	
9F 77	Unprotected Data Envelope 3 [M/Chip Advance]	20 20	
9F 78	Unprotected Data Envelope 4 [M/Chip Advance]	20 20	
9F 79	Unprotected Data Envelope 5 [M/Chip Advance]	20 20	
9F 7E	Application Life Cycle Data [Mastercard]	03 10 0C 12 00 09 00 00 FF 00 04 00 00 02 60 00 00 38 4A 02 11 50 35 43 44 30 37 32 20	
C3	Card Issuer Action Code (Contact) - Decline [M/Chip Advance]	00 00 00	
C4	Card Issuer Action Code (Contact) - Default [M/Chip Advance]	06 58 00	
C5	Card Issuer Action Code (Contact) - Online [M/Chip Advance]	06 F8 00	
C6	PIN Try Limit [M/Chip Advance]	03	
C7	CDOL1 Related Data Length [Mastercard]	42	
C8	CRM Country Code [Mastercard]	08 40 - USA	
C9	Accumulator 1 Currency Code [Mastercard]	08 40 - USD	
CA	Accumulator 1 Lower Limit [Mastercard]	00 00 00 00 00 00	
CB	Accumulator 1 Upper Limit [Mastercard]	00 00 00 00 00 00	
CD	Card Issuer Action Code (Contactless) - Default [M/Chip Advance]	00 58 00	
CE	Card Issuer Action Code (Contactless) - Online [M/Chip Advance]	00 F8 00	
CF	Card Issuer Action Code (Contactless) - Decline [M/Chip Advance]	08 00 00	
D1	Accumulator 1 Currency Conversion Table [Mastercard]	08 40 00 01 00 08 40 00 01 00 08 40 00 01 00 08 40 00 01 00 08 40 00 01 00	
D3	Additional Check Table [Mastercard]	00 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	
D5	Application Control [M/Chip Advance]	8C 00 80 00 86 02	
D6	Default ARPC Response Code [M/Chip Advance]	00 12	
D7	Application Control [M/Chip Advance]	40 01 40 00 86 02	
D9	Application File Locator (Contactless)	08 01 01 00 10 01 01 01 18 01 01 00 20 01 02 00	
DE	Log Data Table [M/Chip Advance]	00 00 00 00 00 00 00 00 00	
DF 02	Security Limits Status (Contact) [M/Chip Advance]	00	
DF 11	Accumulator 1 Control (Contact) [M/Chip Advance]	C1	
DF 12	Accumulator 1 Control (Contactless) [M/Chip Advance]	C1	
DF 14	Accumulator 2 Control (Contact) [M/Chip Advance]	00	

Tag	Element name	Data	v3.x
DF 15	Accumulator 2 Control (Contactless) [M/Chip Advance]	00	
DF 16	Accumulator 2 Currency Code [Mastercard]	09 99	
DF 17	Accumulator 2 Currency Conversion Table [Mastercard]	09 99 00 01 00 09 99 00 01 00 09 99 00 01 00 09 99 00 01 00 09 99 00 01 00	
DF 18	Accumulator 2 Lower Limit [Mastercard]	00 00 00 00 00 00	
DF 19	Accumulator 2 Upper Limit [Mastercard]	00 00 00 00 00 00	
DF 1A	Counter 1 Control (Contact) [M/Chip Advance]	C1	
DF 1B	Counter 1 Control (Contactless) [M/Chip Advance]	C1	
DF 1D	Counter 2 Control (Contact) [M/Chip Advance]	00	
DF 1E	Counter 2 Control (Contactless) [M/Chip Advance]	00	
DF 1F	Counter 2 Lower Limit [Mastercard]	00	
DF 21	Counter 2 Upper Limit [Mastercard]	00	
DF 22	MTA CVM (Contact) [M/Chip Advance]	00 00 00 00 00 00	
DF 23	MTA CVM (Contactless) [M/Chip Advance]	00 00 00 00 00 00	
DF 24	MTA Currency Code [M/Chip Advance]	09 99	
DF 25	MTA NoCVM (Contact) [M/Chip Advance]	00 00 00 00 00 00	
DF 26	MTA NoCVM (Contactless) [M/Chip Advance]	00 00 00 00 00 00	
DF 27	Number Of Days Offline Limit [M/Chip Advance]	00 00	
DF 28	Accumulator 1 CVR Dependency Data (Contact) [M/Chip Advance]	00 00 00	
DF 29	Accumulator 1 CVR Dependency Data (Contactless) [M/Chip Advance]	00 00 00	
DF 2A	Accumulator 2 CVR Dependency Data (Contact) [M/Chip Advance]	00 00 00	
DF 2B	Accumulator 2 CVR Dependency Data (Contactless) [M/Chip Advance]	00 00 00	
DF 2C	Counter 1 CVR Dependency Data (Contact) [M/Chip Advance]	00 00 00	
DF 2D	Counter 1 CVR Dependency Data (Contactless) [M/Chip Advance]	00 00 00	
DF 2E	Counter 2 CVR Dependency Data (Contact) [M/Chip Advance]	00 00 00	
DF 2F	Counter 2 CVR Dependency Data (Contactless) [M/Chip Advance]	00 00 00	
DF 30	Interface Enabling Switch [M/Chip Advance]	03	
DF 35	Security Limits Status (Contactless) [M/Chip Advance]	00	
DF 37	Security Limits Status Common [M/Chip Advance]	00	
DF 3C	CVR Issuer Discretionary Data (Contact) [M/Chip Advance]	00	
DF 3D	CVR Issuer Discretionary Data (Contactless) [M/Chip Advance]	00	
DF 3F	Read Record Filter (Contact) [M/Chip Advance]	00 00 00 00	
DF 40	Read Record Filter (Contactless) [M/Chip Advance]	08 03 03 00	
DF 41	DS Management Control [M/Chip Advance]	20	



\* Tag value changes with card usage

### 1.2.3 Cardholder Verification Method List (Contactless)

Cardholder Verification Method List ('4203 1E03 1F03')			
CVM	Verification Method	Conditions	If unsuccessful
1	Online PIN	Terminal supports CVM type	Next CVM
2	Signature (paper)	Terminal supports CVM type	Fail
3	No CVM required	Terminal supports CVM type	Fail

### 1.2.4 Application Tag data (Contactless Interface, online)

Tag	Element name	Data	v3.x	
50	Application Label	4D 61 73 74 65 72 63 61 72 64 - 'Mastercard'		
56	Track 1 Equivalent Data [Mastercard]	42 35 34 31 33 33 33 30 30 38 39 36 30 34 31 31 31 5E 20 2F 5E 32 35 31 32 32 30 31 30 30 30 30 30 30 30 30 30 30 30 20 20 20 20 20 30 30 30 20 20 20 20 30		
57	Track 2 Equivalent Data	54 13 33 00 89 60 41 11 D2 51 22 01 01 23 40 91 72 02 9F		
5A	Application Primary Account Number (PAN)	54 13 33 00 89 60 41 11		
5F 24	Application Expiration Date	25 12 31		
5F 25	Application Effective Date	xx xx xx		
5F 28	Issuer Country Code	08 40 - USA		
5F 2D	Language Preference	65 6E - 'en' (English)		
5F 34	Application PAN Sequence Number	01		
82	Application Interchange Profile	19 80 BYTE 1: b7 - Offline SDA NOT supported b6 - Offline DDA NOT supported b5 - Cardholder verification supported b4 - Terminal risk mgmt to be performed b3 - Issuer authentication NOT supported via EXTERNAL AUTH command b1 - Combined DDA / GEN AC supported BYTE 2: b8 - EMV Contactless supported		
84	Dedicated File (DF) Name	A0 00 00 00 04 10 10		
87	Application Priority Indicator	01		
8C	Card Risk Management Data Object List 1 (CDOL1)	9F 02 06 9F 03 06 9F 1A 02 95 05 5F 2A 02 9A 03 9C 01 9F 37 04 9F 35 01 9F 45 02 9F 4C 08 9F 34 03 9F 21 03 9F 7C 14		
8D	Card Risk Management Data Object List 2 (CDOL2)	91 0A 8A 02 95 05 9F 37 04 9F 4C 08		
8E	Cardholder Verification Method (CVM) List	00 00 00 00 00 00 00 00 42 03 1E 03 1F 03		
8F	Certification Authority Public Key Index	EF		

Tag	Element name	Data	v3.x
90	Issuer Public Key Certificate	5B 2E 1F EF 4D 7D 2C 16 16 12 21 F7 97 2F E6 99 B7 82 44 E0 73 C8 AC 75 86 CE D1 76 EF 7B 93 AC 19 0B 05 70 40 E1 18 4F 2F 55 AC 70 D2 AA C3 94 BE 22 6A 26 50 D3 CA ED 90 60 88 C5 3A 88 B8 3C 46 1F 37 6D 89 10 B8 51 81 54 F3 08 EE ED 23 BC 15 7C FA BA 6E 51 26 9F 01 6D 59 FE 21 A6 F9 10 F2 85 13 0D EA F6 A4 78 BE 77 9D 2B AD 08 E1 2E D6 A5 93 71 5A 18 72 15 C5 63 28 1C B2 B7 2E 5B 14 05 5D 2D D8 30 4A C2 20 2E 53 96 D0 4C 5C 79 55 0B 4D E9 FA DA CB 35 F3 19 06 C5 A4 42 27 29 D6 A5 A8 F5 E1 4C B9 0D B7 05 49 4B 3D B1 0D E6 19 F3 B0 3E 64 96 FE 79 F4 6E 64 97 2A 46 34 A0 35 EF 7E 50 20 49 40 36 03 E0 BC FC 33 C3 87 BB 6D 72 CF F8 33 89 7E 81 F5 02 3F F4 D6 A9 CC 0C 89 E8 78 3F 07 B7 F0 55 3E 9D D3 59 B6 5B 62 3A F1 CE 27 8D 65 3C 37 07	
92	Issuer Public Key Remainder	14 3E 90 B8 B5 E6 2B E5 A9 0D 5A 4E F1 5C 77 40 4D 29 94 48 98 77 85 D7 E8 80 C2 CD	
94	Application File Locator (AFL)	08 01 01 00 10 01 01 01 18 01 01 00 20 01 02 00	
9F 07	Application Usage Control	FF 00 BYTE 1: b8 - Domestic cash trans. valid b7 - Int'l cash transactions valid b6 - Domestic goods valid b5 - International goods valid b4 - Domestic services valid b3 - International services valid b2 - ATMs valid b1 - non-ATM terminals valid BYTE 2: b8 - Domestic cashback NOT allowed b7 - International cashback NOT allowed	
9F 08	Application Version Number	00 02	
9F 0D	Issuer Action Code - Default	B4 70 84 00 00	
9F 0E	Issuer Action Code - Denial	00 00 00 00 00	
9F 0F	Issuer Action Code - Online	B4 70 84 80 00	
9F 10	Issuer Application Data [M/Chip Advance]	xx 11 xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx *	
9F 11	Issuer Code Table Index	01	
9F 12	Application Preferred Name	4D 61 73 74 65 72 63 61 72 64 43 72 65 64 69 74 - 'MastercardCredit'	
9F 14	Counter 1 Lower Limit [Mastercard]	00	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 23	Counter 1 Upper Limit [Mastercard]	00	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
9F 36	Application Transaction Counter (ATC)	xx xx *	
9F 42	Application Currency Code	08 40 - USD	

Tag	Element name	Data	v3.x
9F 44	Application Currency Exponent	02	
9F 46	ICC Public Key Certificate	00 15 D8 34 83 32 C3 59 59 A3 1A CE 3C D5 42 1F 77 90 A9 25 17 44 FE 03 13 49 20 0E 4D EF D6 0B 77 6B C2 40 AE DD 7B 93 5B 16 A3 C1 B9 4B 7E 6F 8C 5A F8 F8 6E 9D 0A 13 EE 63 CA F2 7F 15 B0 25 38 10 0A D8 D1 8F BB 32 34 82 2B 86 4D AD 1B 36 AF 46 03 75 A0 03 A9 43 30 32 6A 9C D0 41 BA D9 85 38 95 AC 82 E1 25 99 55 55 2C 15 47 7E 3A 39 D0 33 1B CA 4C BE 63 B3 81 F7 FD 06 30 3C 30 7E 13 D6 F8 26 14 C3 67 6B 1B 90 4C 30 7E A4 D3 D9 C1 87 D1 B9 92 11 BE 6C FA 66 DA BE 1E 27 20 6B F2 45 19 E9 1F 4B 47 9A EF 02 5A 2C 82 32 CE BE 75 5A D2 D1 A2 4A E2 8B 13 BF 6B 8A D8 B5 3E 1E E6 97 D0 FF EC 07 28 9E E3 62 B4 01 DA 22 B9 F5 3B C5 0D 84 25 BE 96 33 EE 70 1B C8 9D 7A BF BB 31 85 B0 31 CC 72 62 DF 18 3A 2A C5 B6 6B 1E BC	
9F 47	ICC Public Key Exponent	03	
9F 4A	Static Data Authentication Tag List	82	
9F 4D	Transaction Log Entry	0B 0A	
9F 4F	Transaction Log Format	9F 27 01 9F 02 06 5F 2A 02 9A 03 9F 36 02 9F 52 06 DF 3E 01 9F 21 03 9F 7C 14	
9F 5D	Application Capabilities Information [M/Chip Advance]	01 00 00	
9F 60	CVC3track1 [Mastercard]	D5 55	
9F 61	CVC3track2 [Mastercard]	DB 5E	
9F 62	Track 1 Bitmap for CVC3 (PCVC3 Track 1) [Mastercard]	00 00 00 38 00 00	
9F 63	Track 1 Bitmap for UN and ATC (PUNATC Track 1) [Mastercard]	00 00 00 00 E0 E0	
9F 64	Track 1 Number of ATC Digits (NATC Track 1) [Mastercard]	03	
9F 65	Track 2 Bitmap for CVC3 (PCVC3 Track 2) [Mastercard]	00 0E	
9F 66	Track 2 Bitmap for UN and ATC (PUNATC Track 2) [Mastercard]	0E 70	
9F 67	Track 2 Number of ATC Digits (NATC Track 2) [Mastercard]	03	
9F 6B	Track 2 Equivalent Data [Mastercard]	54 13 33 00 89 60 41 11 D2 51 22 01 00 00 40 00 00 00 0F	
9F 6C	Application Version [Mastercard]	00 01	
9F 6E	Third Party Data [Mastercard]	08 40 00 00 30 30 00	
9F 7E	Application Life Cycle Data [Mastercard]	03 10 0C 12 00 09 00 00 FF 00 04 00 00 02 60 00 00 38 4A 02 11 50 35 43 44 30 37 32 20	

Tag	Element name	Data	v3.x
C3	Card Issuer Action Code (Contact) - Decline [M/Chip Advance]	00 00 00	
C4	Card Issuer Action Code (Contact) - Default [M/Chip Advance]	06 58 00	
C5	Card Issuer Action Code (Contact) - Online [M/Chip Advance]	06 F8 00	
C6	PIN Try Limit [M/Chip Advance]	03	
C7	CDOL1 Related Data Length [Mastercard]	42	
C8	CRM Country Code [Mastercard]	08 40 - USA	
C9	Accumulator 1 Currency Code [Mastercard]	08 40 - USD	
CA	Accumulator 1 Lower Limit [Mastercard]	00 00 00 00 00 00	
CB	Accumulator 1 Upper Limit [Mastercard]	00 00 00 00 00 00	
CD	Card Issuer Action Code (Contactless) - Default [M/Chip Advance]	00 58 00	
CE	Card Issuer Action Code (Contactless) - Online [M/Chip Advance]	00 F8 00	
CF	Card Issuer Action Code (Contactless) - Decline [M/Chip Advance]	08 00 00	
D1	Accumulator 1 Currency Conversion Table [Mastercard]	08 40 00 01 00 08 40 00 01 00 08 40 00 01 00 08 40 00 01 00 08 40 00 01 00	
D3	Additional Check Table [Mastercard]	00 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF	
D5	Application Control [M/Chip Advance]	8C 00 80 00 86 02	
D6	Default ARPC Response Code [M/Chip Advance]	00 12	
D7	Application Control [M/Chip Advance]	40 01 40 00 86 02	
DF 02	Security Limits Status (Contact) [M/Chip Advance]	00	

\* Tag value changes with card usage

## Chapter 2 - ASCII Character Conversion Chart

Dec	Bin	Hex	Char	Dec	Bin	Hex	Char	Dec	Bin	Hex	Char
00	00000000	00	<b>NUL</b>	44	00101100	2C	,	88	01011000	58	<b>X</b>
01	00000001	01	<b>SOH</b>	45	00101101	2D	-	89	01011001	59	<b>Y</b>
02	00000010	02	<b>STX</b>	46	00101110	2E	.	90	01011010	5A	<b>Z</b>
03	00000011	03	<b>ETX</b>	47	00101111	2F	/	91	01011011	5B	[
04	00000100	04	<b>EOT</b>	48	00110000	30	<b>0</b>	92	01011100	5C	\
05	00000101	05	<b>ENQ</b>	49	00110001	31	<b>1</b>	93	01011101	5D	]
06	00000110	06	<b>ACK</b>	50	00110010	32	<b>2</b>	94	01011110	5E	^
07	00000111	07	<b>BEL</b>	51	00110011	33	<b>3</b>	95	01011111	5F	_
08	00001000	08	<b>BS</b>	52	00110100	34	<b>4</b>	96	01100000	60	`
09	00001001	09	<b>HT</b>	53	00110101	35	<b>5</b>	97	01100001	61	<b>a</b>
10	00001010	0A	<b>LF</b>	54	00110110	36	<b>6</b>	98	01100010	62	<b>b</b>
11	00001011	0B	<b>VT</b>	55	00110111	37	<b>7</b>	99	01100011	63	<b>c</b>
12	00001100	0C	<b>FF</b>	56	00111000	38	<b>8</b>	100	01100100	64	<b>d</b>
13	00001101	0D	<b>CR</b>	57	00111001	39	<b>9</b>	101	01100101	65	<b>e</b>
14	00001110	0E	<b>SO</b>	58	00111010	3A	:	102	01100110	66	<b>f</b>
15	00001111	0F	<b>SI</b>	59	00111011	3B	;	103	01100111	67	<b>g</b>
16	00010000	10	<b>DLE</b>	60	00111100	3C	<	104	01101000	68	<b>h</b>
17	00010001	11	<b>DC1</b>	61	00111101	3D	=	105	01101001	69	<b>i</b>
18	00010010	12	<b>DC2</b>	62	00111110	3E	>	106	01101010	6A	<b>j</b>
19	00010011	13	<b>DC3</b>	63	00111111	3F	?	107	01101011	6B	<b>k</b>
20	00010100	14	<b>DC4</b>	64	01000000	40	@	108	01101100	6C	<b>l</b>
21	00010101	15	<b>NAK</b>	65	01000001	41	<b>A</b>	109	01101101	6D	<b>m</b>
22	00010110	16	<b>SYM</b>	66	01000010	42	<b>B</b>	110	01101110	6E	<b>n</b>
23	00010111	17	<b>ETB</b>	67	01000011	43	<b>C</b>	111	01101111	6F	<b>o</b>
24	00011000	18	<b>CAN</b>	68	01000100	44	<b>D</b>	112	01110000	70	<b>p</b>
25	00011001	19	<b>EM</b>	69	01000101	45	<b>E</b>	113	01110001	71	<b>q</b>
26	00011010	1A	<b>SUB</b>	70	01000110	46	<b>F</b>	114	01110010	72	<b>r</b>
27	00011011	1B	<b>ESC</b>	71	01000111	47	<b>G</b>	115	01110011	73	<b>s</b>
28	00011100	1C	<b>FS</b>	72	01001000	48	<b>H</b>	116	01110100	74	<b>t</b>
29	00011101	1D	<b>GS</b>	73	01001001	49	<b>I</b>	117	01110101	75	<b>u</b>
30	00011110	1E	<b>RS</b>	74	01001010	4A	<b>J</b>	118	01110110	76	<b>v</b>
31	00011111	1F	<b>US</b>	75	01001011	4B	<b>K</b>	119	01110111	77	<b>w</b>
32	00100000	20	<b>SP</b>	76	01001100	4C	<b>L</b>	120	01111000	78	<b>x</b>
33	00100001	21	<b>!</b>	77	01001101	4D	<b>M</b>	121	01111001	79	<b>y</b>
34	00100010	22	<b>"</b>	78	01001110	4E	<b>N</b>	122	01111010	7A	<b>z</b>
35	00100011	23	<b>#</b>	79	01001111	4F	<b>O</b>	123	01111011	7B	{
36	00100100	24	<b>\$</b>	80	01010000	50	<b>P</b>	124	01111100	7C	
37	00100101	25	<b>%</b>	81	01010001	51	<b>Q</b>	125	01111101	7D	}
38	00100110	26	<b>&amp;</b>	82	01010010	52	<b>R</b>	126	01111110	7E	~
39	00100111	27	<b>'</b>	83	01010011	53	<b>S</b>	127	01111111	7F	<b>DEL</b>
40	00101000	28	<b>(</b>	84	01010100	54	<b>T</b>				
41	00101001	29	<b>)</b>	85	01010101	55	<b>U</b>				
42	00101010	2A	<b>*</b>	86	01010110	56	<b>V</b>				
43	00101011	2B	<b>+</b>	87	01010111	57	<b>W</b>				