



**Dual Interface  
Test Card Set**

**Version 1.30**

**August, 2016**

**Powered by B2»**

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## Revision History

Version	Date	Updated By	Revisions
1.00	27-Oct-2014	B2PS	Document creation (6 Dual Interface (DI) cards descriptions)
1.10	28-Nov-14	B2PS	Document cleanup Added short card description Removed dynamic tags from tag lists`
1.11	30-Jan-15	B2PS	Corrected MasterCard & Visa PANs in Test Card Profiles Corrected Application Expiration Dates for MasterCard. Updated various EMV Tags for Test Card 06 (now v.1.10)
1.12	31-Mar-15	B2PS	Cosmetic changes Corrected Card 06 Contact Version Number
1.20	17-Nov-15	B2PS	All Visa cards converted to new VSDC cardstock. Visa tags updated. CVM list added for all cards.
1.30	26-Aug-16	B2PS	Correct format of CVM Table in Cards 01, 02 Tag 8E provided in CVM table for each card Transaction Values added TOC formatting adjusted for readability with new CVM Title page made consistent with other documents Layout made suitable for duplex printing Added PINBlock warning text

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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 \*\*\***

## Chapter 1 - B2 Dual Interface Test Card Profiles

Cards in the B2 Dual Interface (DI) Test Card Set have EMV Contact, EMV Contactless, MSD Contactless and magnetic stripe interfaces. Cards may be inserted, tapped or swiped.

All cards have the following attributes:

- **Interfaces:** Contact, Contactless, Magstripe
- **Language Preference:** English
- **Service Code:** 201
- **Issuer Country Code:** 840 – USA
- **Currency Code:** 840 – USD

Specific card details are as follows.

	DI Test Card 01	DI Test Card 03	DI Test Card 05
<b>Brand</b>	Visa	Visa	Visa
<b>Card Type</b>	Online Only	Online Preferred	Offline Preferred
<b>AID</b>	A0000000031010	A0000000031010	A0000000031010
<b>PAN</b>	4761 7390 0101 0119	4761 7390 0101 0119	4761 7390 0101 0119
<b>Expiry Date</b>	12/2022	12/2022	12/2022
<b>CVM</b>	<a href="#">See Card Definition</a>	<a href="#">See Card Definition</a>	<a href="#">See Card Definition</a>
<b>Approval Amount</b>	\$10.00	\$10.00	\$10.00
<b>PIN</b>	1234	1234	1234
<b>Card Version</b>	v1.20	v1.20	v1.20

	DI Test Card 02	DI Test Card 04	DI Test Card 06
<b>Brand</b>	MasterCard	MasterCard	MasterCard
<b>Card Type</b>	Online Only	Online Preferred	Offline Preferred
<b>AID</b>	A0000000041010	A0000000041010	A0000000041010
<b>PAN</b>	5413 3300 8960 4111	5413 3300 8960 4111	5413 3300 8960 4111
<b>Expiry Date</b>	12/2025	12/2025	12/2025
<b>CVM</b>	<a href="#">See Card Definition</a>	<a href="#">See Card Definition</a>	<a href="#">See Card Definition</a>
<b>Approval Amount</b>	\$20.00	\$20.00	\$20.00
<b>PIN</b>	4315	4315	4315
<b>Card Version</b>	v1.00	v1.00	v1.10

## 1.1 DI Test Card 01 - Visa, Online Only, PIN=1234

Visa (Online Only) Dual Interface card.

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

### 1.1.1 Cardholder Verification Method List – AID (A0000000031010)

Cardholder Verification Method List ('020142041E0400055E001F00')			
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 Visa (Online Only) Contact Interface

Tag	Element Name	Data	v1.20
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 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 ( 'DI Test/Card 01 ' )	
5F 24	Application Expiration Date	22 12 31	
5F 25	Application Effective Date	15 11 01	
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 [VSDC]	18 00	
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	v1.20
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 04 01 B0 01 01 00	
9F 07	Application Usage Control	FF 00	
9F 08	Application Version Number	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]	06 01 0A 03 A0 20 00	
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 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)	AD CD F6 A4 9C ED 55 8E	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
9F 36	Application Transaction Counter (ATC)	00 09	
9F 44	Application Currency Exponent	02	

Tag	Element Name	Data	v1.20
9F 46	ICC Public Key Certificate	3D C3 41 28 F7 CD F2 02 16 4E EF 36 7F 95 6C C0 28 B3 D7 4E 53 6B 7F BD C2 3E 3B 8A 7C EB 42 C6 CC EF 41 B6 D3 DF 9F 5F 18 0A 1E FE 5B 13 6D CC 8B 64 38 D1 45 D2 EC B0 2B 15 31 15 71 3D 6A 4E 19 C8 26 74 44 AE C4 D7 46 30 3C 29 61 8E F5 DD B5 AB 24 15 33 15 6D D9 63 2E BC 35 46 58 3A AE 1E F0 22 09 CC 6B 41 00 9A CE 9A 04 22 D8 8D 9D E7 0A 63 42 03 D9 0F 4D 04 D5 00 B5 A1 71 38 DB 18 B0 54 30 E7 67 DE 01 A5 78 BF A6 D2 DB 6C 71 DA 24 B1 8B 04 CA 9D 4B 14 3C B1 D4 57 8B 44 FB 5C 2E 66 21 00 83 5A 2A E7 F8 0C 14 03 30 51 D6	
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 01 DF 21 01 00 DF 31 01 00	
BF 57	International Counters Data Template	DF 11 01 01 DF 21 01 00 DF 31 01 00 DF 51 01 01 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 DF 31 06 00 00 00 00 00	
BF 5B	Application Internal Data Template	DF 01 02 00 00	



### 1.1.3 Visa (Online Only) Contactless Interface

Tag	Element Name	Data	v1.20
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 24	Application Expiration Date	22 12 31	
5F 2D	Language Preference	65 6E (‘en’ – English)	
5F 34	Application PAN Sequence Number	01	
82	Application Interchange Profile [VSDC]	00 00	
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 05 00	
9F 10	Issuer Application Data [VSDC]	06 01 0A 03 A0 00 00	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 26	Application Cryptogram (AC)	42 18 23 86 59 83 56 9A	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
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	v1.20
9F 46	ICC Public Key Certificate	05 80 23 C6 A9 EB 39 5B 00 75 4D 6A 86 F1 5D E5 E5 B6 83 64 FF 34 62 58 98 A8 47 B0 0E 95 A1 D8 78 25 A0 A9 7A 02 73 3A 4D 75 CD AE 9E 2B 5D 61 43 34 D0 04 42 70 A4 FE 4F 30 29 BC 2A 58 F3 4C 87 D9 BE DB 02 35 75 F3 1F 99 2C 88 13 4B 40 34 3A FC 7F C0 C2 9F 76 EF D3 76 7B B9 27 78 7E E9 90 80 E6 9B 04 CA 0E BC 63 26 3C 13 7F 43 9C 89 FC B2 99 1B 26 83 2E 19 DA 54 1B 79 AF CD 0F 78 06 1D CA CA 9D 72 A2 08 71 4C 00 D4 9D 95 33 54 03 9C 63 76 C0 75 85 C9 43 BA 5E 04 84 19 86 42 43 0C FC 8C E8 31 E4 CF 23 52 CA 0C 11 9D CF 64	
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 F0 8E AC 0E 38 00	
9F 6C	Card Transaction Qualifiers [qVSDC VCPS 2.1]	38 00	
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 01 DF 21 01 00 DF 31 01 00 DF 51 01 01 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 DF 31 06 00 00 00 00 00	
BF 5B	Application Internal Data Template	DF 01 02 00 00	

## 1.2 DI Test Card 02 - MasterCard, Online Only, PIN=4315

MasterCard (Online Only) Dual Interface card.

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

### 1.2.1 Cardholder Verification Method List – AID (A0000000041010)

Cardholder Verification Method List ('42031E031F03')			
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 MasterCard (Online Only) Contact Interface

Tag	Element Name	Data	v1.00
50	Application Label	4D 61 73 74 65 72 43 61 72 64 ( <b>'MasterCard'</b> )	
57	Track 2 Equivalent Data	54 13 33 00 89 60 41 11 D1 61 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 ( <b>'DI Test/Card 02       '</b> )	
5F 24	Application Expiration Date	25 12 31	
5F 25	Application Effective Date	15 01 01	
5F 28	Issuer Country Code	08 40 ( <b>USA</b> )	
5F 2D	Language Preference	65 6E ( <b>'en' – English</b> )	
5F 30	Service Code	02 01	
5F 34	Application PAN Sequence Number	01	
82	Application Interchange Profile [M/Chip, PayPass]	38 00	
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	
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	FA	

Tag	Element Name	Data	v1.00
90	Issuer Public Key Certificate	18 89 B9 97 E6 FC E8 4B 4A E7 AB 87 43 1C BD B3 DF 8C 1D 5A 55 A7 F6 0D 29 59 AF 3A 51 04 E7 58 83 17 ED 74 08 66 68 CF 1A 05 47 84 F7 49 3C 6D 74 7F A7 96 EC 14 D3 33 A6 8E C7 E0 08 62 95 9A 0B D0 F0 48 20 80 B7 1A C1 B7 62 5B 1B 8B 1F 35 A6 69 19 99 BA 78 F5 92 E2 3F 95 E9 96 09 D1 08 CF 1C 0E 30 8A 8B F6 4F BD E8 37 D3 CE 13 8A 50 DC 50 AF 4B 41 EE 53 D9 8A 11 B6 A8 1D DD 44 CC 43 0C 1E F3 BB 9D 1D 75 A0 2F AA 9C 81 4A FC 58	
92	Issuer Public Key Remainder	D3 52 41 07	
94	Application File Locator (AFL)	08 02 04 01 18 01 01 00 20 01 01 00	
9F 07	Application Usage Control	FF 00	
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 11	Issuer Code Table Index	01	
9F 12	Application Preferred Name	4D 61 73 74 65 72 43 61 72 64 43 72 65 64 69 74 ( <b>'MasterCardCredit'</b> )	
9F 14	Lower Consecutive Offline Limit	00	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 1F	Track 1 Discretionary Data	20 20	
9F 23	Upper Consecutive Offline Limit	00	
9F 32	Issuer Public Key Exponent	03	
9F 42	Application Currency Code	08 40 ( <b>USA</b> )	
9F 44	Application Currency Exponent	02	
9F 46	ICC Public Key Certificate	0D 98 C8 DE CF 34 E5 66 F2 B3 7C 84 6F 94 AC F2 51 9B 7E 5E BA 81 16 FD 1B 40 33 EA 5E A7 6C B4 ED 31 CE 13 E1 8E 73 37 89 77 3A 59 59 96 D3 C0 2B 45 B1 79 DA 5B AC 8B EE 6B 93 7F 5B CC 16 63 E7 27 14 28 35 1F 52 14 5E 46 60 FA 78 DB A6 0A 2D 82 41 D4 A2 82 15 64 33 66 12 98 99 63 C6 E2 DC F6 2E 22 74 F7 C1 75 EF 14 65 66 05 4F E2 AB	
9F 47	ICC Public Key Exponent	03	

Tag	Element Name	Data	v1.00
9F 48	ICC Public Key Remainder	7C 08 42 79 FF 1D 84 88 2D F0 3C 11 07 D9 DD 4B 01 B8 66 6A 51 A7 14 B8 D2 4B 5F 18 89 95 9C D1 1F CC 66 22 42 B8 88 54 E4 53	
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	DF 31 E1 AC F8 10 9A F3 85 14 D9 3D 67 FB 10 BC 3C 3E EB 35 63 F2 6D 6E 7F A4 A0 E6 C4 6D 86 DC 79 B4 0A 41 67 30 4F B8 DD 5A FA AD 25 9F 17 1D 93 EB 64 55 27 CB 06 FB A1 9C 54 0D 2E 47 4D 07 58 81 7C D3 0E 4E FF D0 64 BF B3 83 B9 F7 4E 7F BB 6C EA 4E 7E 04 EC 71 A4 E8 C4 A7 1F D1 D7 6E 4C 50 1B E2 C8 07 72 8F B0 99 5B 61 51 B2 38 BD	
9F 4F	Transaction Log Format	9F 27 01 9F 02 06 5F 2A 02 9A 03 9F 36 02 9F 52 06	
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 - Decline [MasterCard]	00 00 00	
C4	Card Issuer Action Code - Default [MasterCard]	06 58 00	
C5	Card Issuer Action Code - Online [MasterCard]	06 F8 00	
C7	CDOL1 Related Data Length [MasterCard]	2B	
C8	CRM Country Code [MasterCard]	08 40 (USA)	
C9	CRM Currency Code [M/Chip4]	08 40 (USD)	
CA	Lower Cumulative Offline Transaction Amount [M/Chip]	00 00 00 00 00 00	
CB	Upper Cumulative Offline Transaction Amount [M/Chip]	00 00 00 00 00 00	
D1	Currency Conversion Table [M/Chip]	08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00	
D3	Additional Check Table [MasterCard]	00 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF	
D5	Application Control [M/Chip]	C4 01	
D6	Default ARPC Response Code [M/Chip4]	00 12	
DF 02	Security Limits Status [MasterCard]	00	

### 1.2.3 MasterCard (Online Only) Contactless Interface

Tag	Element Name	Data	v1.00
50	Application Label	4D 61 73 74 65 72 43 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	14 10 01	
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 [M/Chip, PayPass]	19 80	
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	
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	FA	
90	Issuer Public Key Certificate	18 89 B9 97 E6 FC E8 4B 4A E7 AB 87 43 1C BD B3 DF 8C 1D 5A 55 A7 F6 0D 29 59 AF 3A 51 04 E7 58 83 17 ED 74 08 66 68 CF 1A 05 47 84 F7 49 3C 6D 74 7F A7 96 EC 14 D3 33 A6 8E C7 E0 08 62 95 9A 0B D0 F0 48 20 80 B7 1A C1 B7 62 5B 1B 8B 1F 35 A6 69 19 99 BA 78 F5 92 E2 3F 95 E9 96 09 D1 08 CF 1C 0E 30 8A 8B F6 4F BD E8 37 D3 CE 13 8A 50 DC 50 AF 4B 41 EE 53 D9 8A 11 B6 A8 1D DD 44 CC 43 0C 1E F3 BB 9D 1D 75 A0 2F AA 9C 81 4A FC 58	
92	Issuer Public Key Remainder	D3 52 41 07	
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	
9F 08	Application Version Number	00 02	
9F 0D	Issuer Action Code - Default	B4 70 84 00 00	

Tag	Element Name	Data	v1.00
9F 0E	Issuer Action Code - Denial	00 00 00 00 00	
9F 0F	Issuer Action Code - Online	B4 70 84 80 00	
9F 11	Issuer Code Table Index	01	
9F 12	Application Preferred Name	4D 61 73 74 65 72 43 61 72 64 43 72 65 64 69 74 ( <b>MasterCardCredit</b> )	
9F 14	Lower Consecutive Offline Limit	00	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 23	Upper Consecutive Offline Limit	00	
9F 32	Issuer Public Key Exponent	03	
9F 46	ICC Public Key Certificate	6C 7A 20 26 36 89 3F EF D5 3A B1 6E AB CB 1F FB A9 16 4E BF 82 83 35 24 A5 90 97 70 2A 10 5E DC 65 4B 2C FF FE FE C5 4B C0 57 B3 B4 DA E0 2A 44 AF 73 3E 88 61 AD 8C 9B E3 FE C4 86 61 AD 23 F2 7D 3D 50 F7 68 46 62 C0 56 1A 51 9B 64 F7 6A 16 52 44 7C 3D D4 C5 C4 25 A3 C3 44 1F 01 59 80 3D 57 4C 9C 1C 68 87 9A B7 26 B3 0D B0 3C D0 9F F9	
9F 47	ICC Public Key Exponent	03	
9F 48	ICC Public Key Remainder	5B 27 06 FF EF 40 56 51 51 38 C4 65 FD 34 66 3C AC 3C A8 97 14 A2 57 FA FC 69 D6 E7 51 FE 65 C1 77 49 19 57 BF FD 4F 2F AA 59	
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	
9F 60	Offline Balance [M/Chip4]	B0 95	
9F 61	CVC3track2 [MasterCard]	89 B2	
9F 62	PCVC3track1 [MasterCard]	00 00 00 38 00 00	
9F 63	PUNATCtrack1 [MasterCard]	00 00 00 00 E0 E0	
9F 64	NATCtrack1 [MasterCard]	03	
9F 65	PCVC3track2 [MasterCard]	00 0E	
9F 66	PUNATCtrack2 [MasterCard]	0E 70	
9F 67	NATCtrack2 [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 [PayPass M/Chip]	08 40 00 00 30 30 00	

Tag	Element Name	Data	v1.00
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	
C3	Card Issuer Action Code - Decline [MasterCard]	00 00 00	
C4	Card Issuer Action Code - Default [MasterCard]	06 58 00	
C5	Card Issuer Action Code - Online [MasterCard]	06 F8 00	
C7	CDOL1 Related Data Length [MasterCard]	2B	
C8	CRM Country Code [MasterCard]	08 40 (USA)	
C9	CRM Currency Code [M/Chip4]	08 40 (USD)	
CA	Lower Cumulative Offline Transaction Amount [M/Chip]	00 00 00 00 00 00	
CB	Upper Cumulative Offline Transaction Amount [M/Chip]	00 00 00 00 00 00	
CD	Card Issuer Action Code - Default [PayPass M/Chip]	00 58 00	
CE	Card Issuer Action Code - Online [PayPass M/Chip]	00 F8 00	
CF	Card Issuer Action Code - Denial [PayPass M/Chip]	08 00 00	
D1	Currency Conversion Table [M/Chip]	08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 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]	C4 00	
D6	Default ARPC Response Code [M/Chip4]	00 12	
D7	Application Control [PayPass M/Chip]	40 00 40	
DF 02	Security Limits Status [MasterCard]	00	



### 1.3 DI Test Card 03 - Visa, Online Preferred, PIN=1234

Visa (Online Preferred) Dual Interface card.

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

#### 1.3.1 Cardholder Verification Method List – AID (A0000000031010)

Cardholder Verification Method List ('42014403410342031E031F03')			
CVM	Verification Method	Conditions	If unsuccessful
1	Online PIN	Unattended cash	Next CVM
2	Offline PIN	Terminal supports CVM type	Next CVM
3	Offline Plaintext PIN	Terminal supports CVM type	Next CVM
4	Online PIN	Terminal supports CVM type	Next CVM
5	Signature (paper)	Terminal supports CVM type	Fail
6	No CVM required	Terminal supports CVM type	Fail

#### 1.3.2 Visa (Online Preferred) Contact Interface

Tag	Element Name	Data	v1.20
50	Application Label	56 69 73 61 20 43 72 65 64 69 74 ( <b>'Visa Credit'</b> )	
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 33 20 20 20 20 20 20 20 20 20 20 20 ( <b>'DI Test/Card 03       '</b> )	
5F 24	Application Expiration Date	22 12 31	
5F 25	Application Effective Date	15 11 01	
5F 28	Issuer Country Code	08 40 ( <b>USA</b> )	
5F 2D	Language Preference	65 6E ( <b>'en' – English</b> )	
5F 30	Service Code	02 01	
5F 34	Application PAN Sequence Number	01	
82	Application Interchange Profile [VSDC]	38 00	
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 42 01 44 03 41 03 42 03 1E 03 1F 03	

Tag	Element Name	Data	v1.20
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 01 01 00 10 02 04 01 B0 01 01 00	
9F 07	Application Usage Control	FF 00	
9F 08	Application Version Number	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 BC 98 00	
9F 10	Issuer Application Data [VSDC]	06 01 0A 03 A0 B0 02	
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	00 00	
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)	2A E9 3E F1 D2 A3 95 F4	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
9F 36	Application Transaction Counter (ATC)	00 0B	
9F 44	Application Currency Exponent	02	

Tag	Element Name	Data	v1.20
9F 46	ICC Public Key Certificate	89 A9 27 92 6C AA 35 D0 2F 88 EC BD 22 3C B4 83 C9 33 4F 25 CB 4F 49 56 D6 BF 30 D4 D0 A9 3D 16 69 CC 5D F3 99 CA 6F 62 23 74 07 AA 75 2E 8C 1A 47 AB 03 F3 03 D1 DD FF B3 12 5E 19 AD C6 D5 DE 7A 91 78 91 03 3F AC 0D 24 4C 62 9C 7E 17 63 5E F4 69 F7 3D 7F BA 8C D8 DC BA 9B EE 52 84 19 03 28 9E 98 16 F9 D9 06 96 A0 AA A4 25 11 8C 2D 01 D9 41 B4 9D 0D 32 13 37 EE C8 20 68 08 8B 57 2B 45 86 A2 85 E4 DE FA 54 A8 69 B7 51 48 27 C4 74 59 FE 6E 21 FB 08 BA 92 E1 E1 23 B9 5A 26 86 FD A4 70 99 32 00 12 09 C0 51 84 42 E9 87 B6 3E CE	
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	68 E1 73 9C 18 1C 91 77 83 A9 18 3A 82 F6 52 45 18 D1 DC 26 95 E3 D5 EB 59 F6 B0 BF 3C DD 03 E2 CB F9 31 96 2A 70 7D 75 11 EA A9 4B 7C 2F 50 B1 30 32 73 BF 84 53 B5 5C 65 EC B0 37 50 BF F9 8F 43 52 98 29 5D 02 8E AF 71 AA C9 98 4D E8 6E D7 F7 41 36 32 77 73 74 A7 20 2B C1 38 7D E9 EC DA 94 F0 C6 B4 99 B2 19 B4 A1 E9 FE 05 09 12 53 6C 83 5E 63 79 AE 9A B4 08 B8 63 24 F9 4B 37 55 82	
9F 51	Application Currency Code [VSDC]	08 40	
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]	0A	
9F 5C	Cumulative Total Transaction Amount Upper Limit [VSDC]	00 00 00 05 00 00	
9F 5E	Consecutive Transaction International Upper Limit [VSDC]	0A	
9F 68	Card Additional Processes [qVSDC VCPS 2.1]	10 00 D0 00	

Tag	Element Name	Data	v1.20
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 0A	
BF 56	Counters Data Template	DF 11 01 02 DF 21 01 00 DF 31 01 0A	
BF 57	International Counters Data Template	DF 11 01 02 DF 21 01 00 DF 31 01 0A DF 51 01 02 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 05 00 00	
BF 5B	Application Internal Data Template	DF 01 02 00 00	

### 1.3.3 Visa (Online Preferred) Contactless Interface

Tag	Element Name	Data	v1.20
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 24	Application Expiration Date	22 12 31	
5F 2D	Language Preference	65 6E (‘en’ – English)	
5F 34	Application PAN Sequence Number	01	
82	Application Interchange Profile [VSDC]	20 00	
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	

Tag	Element Name	Data	v1.20
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 05 00	
9F 10	Issuer Application Data [VSDC]	06 01 0A 03 A0 00 00	
9F 13	Last Online Application Transaction Counter (ATC) Register	00 00	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 26	Application Cryptogram (AC)	F1 AE 05 8C 08 BF A6 DC	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
9F 36	Application Transaction Counter (ATC)	00 08	
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	
9F 46	ICC Public Key Certificate	1E 53 8F 62 D3 F3 11 78 6C 43 DC 4D 07 98 E0 12 E5 EF DD 88 D2 78 D4 CC 0D 17 A5 50 C3 9E E2 F9 F5 76 A1 43 3B 0C 2B 40 5E 14 A5 BE 0C D5 A6 B6 C6 29 81 30 F1 09 91 29 4D AB 27 E3 DB 9A DC 03 B2 93 E1 18 35 6E 6F 38 EE 04 4E C6 17 CF DB 6D 5D A6 36 E9 7B 0B 16 B8 01 48 A3 02 95 DB 44 D7 DA A2 49 5E 8A 5E F2 85 29 ED 6C 79 72 ED FC 37 D0 59 47 BF 58 7E 09 6A AD 68 BC 5E C8 1A A2 88 BF C4 B9 E1 A4 45 30 0C C1 41 8A 35 AB D3 1A DD 6A DF C8 02 BE C4 40 A4 B1 6C 38 1E 6D EA F3 D5 C4 01 D4 1D 3F 91 C7 45 2E B8 82 73 02 91 C4 98	
9F 47	ICC Public Key Exponent	03	
9F 4B	Signed Dynamic Application Data	6B B5 F4 9A 46 CD 3E 98 20 A0 4B 6D FC 0D 43 61 A9 B5 28 A7 E5 7C FC 70 2A A0 58 4A F9 77 61 1B E2 79 AA 02 53 F2 3F 67 35 CF 27 E2 F0 03 23 CE DE EA 23 20 CF D2 53 18 49 A2 6A 56 FD ED 90 6F FF E2 E8 93 07 EF 28 A7 14 D4 B5 DC 13 6A 66 03 86 B8 27 6D 12 53 D2 10 64 30 49 85 72 36 25 42 2B DB AE 80 5E 7F 3D EE 13 75 22 80 11 C6 C7 0E B1 B8 9C 8B B1 EE 6F E8 85 A8 EA 77 1B 79 0A B8	
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	

Tag	Element Name	Data	v1.20
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]	0A	
9F 5A	Application Program Identifier	31 08 40 08 40	
9F 5C	Cumulative Total Transaction Amount Upper Limit [VSDC]	00 00 00 05 00 00	
9F 5E	Consecutive Transaction International Upper Limit [VSDC]	0A	
9F 68	Card Additional Processes [qVSDC VCPS 2.1]	10 00 D0 00	
9F 69	Card Authentication Related Data [qVSDC]	01 90 5A B8 E6 38 00	
9F 6C	Card Transaction Qualifiers [qVSDC VCPS 2.1]	38 00	
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 0A	
BF 56	Counters Data Template	DF 11 01 01 DF 21 01 00 DF 31 01 0A	
BF 57	International Counters Data Template	DF 11 01 01 DF 21 01 00 DF 31 01 0A DF 51 01 01 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 05 00 00	
BF 5B	Application Internal Data Template	DF 01 02 00 00	
BF 5B	Application Internal Data Template	DF 01 02 00 00	

## 1.4 DI Test Card 04 - MasterCard, Online Preferred, PIN=4315

MasterCard (Online Preferred) Dual Interface card.

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

### 1.4.1 Cardholder Verification Method List – AID (A0000000041010)

Cardholder Verification Method List ('42014403410342031E031F03')			
CVM	Verification Method	Conditions	If unsuccessful
1	Online PIN	Unattended cash	Next CVM
2	Offline PIN	Terminal supports CVM type	Next CVM
3	Offline Plaintext PIN	Terminal supports CVM type	Next CVM
4	Online PIN	Terminal supports CVM type	Next CVM
5	Signature (paper)	Terminal supports CVM type	Fail
6	No CVM required	Terminal supports CVM type	Fail

### 1.4.2 MasterCard (Online Preferred) Contact Interface

Tag	Element Name	Data	v1.00
50	Application Label	4D 61 73 74 65 72 43 61 72 64 ( <b>'MasterCard'</b> )	
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 34 20 20 20 20 20 20 20 20 20 20 20 ( <b>'DI Test/Card 04       '</b> )	
5F 24	Application Expiration Date	25 12 31	
5F 25	Application Effective Date	15 01 01	
5F 28	Issuer Country Code	08 40 ( <b>USA</b> )	
5F 2D	Language Preference	65 6E ( <b>'en' – English</b> )	
5F 30	Service Code	02 01	
5F 34	Application PAN Sequence Number	01	
82	Application Interchange Profile [M/Chip, PayPass]	38 00	
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	
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 01 44 03 41 03 42 03 1E 03 1F 03	
8F	Certification Authority Public Key Index	FA	

Tag	Element Name	Data	v1.00
90	Issuer Public Key Certificate	18 89 B9 97 E6 FC E8 4B 4A E7 AB 87 43 1C BD B3 DF 8C 1D 5A 55 A7 F6 0D 29 59 AF 3A 51 04 E7 58 83 17 ED 74 08 66 68 CF 1A 05 47 84 F7 49 3C 6D 74 7F A7 96 EC 14 D3 33 A6 8E C7 E0 08 62 95 9A 0B D0 F0 48 20 80 B7 1A C1 B7 62 5B 1B 8B 1F 35 A6 69 19 99 BA 78 F5 92 E2 3F 95 E9 96 09 D1 08 CF 1C 0E 30 8A 8B F6 4F BD E8 37 D3 CE 13 8A 50 DC 50 AF 4B 41 EE 53 D9 8A 11 B6 A8 1D DD 44 CC 43 0C 1E F3 BB 9D 1D 75 A0 2F AA 9C 81 4A FC 58	
92	Issuer Public Key Remainder	D3 52 41 07	
94	Application File Locator (AFL)	08 02 04 01 18 01 01 00 20 01 01 00	
9F 07	Application Usage Control	FF 00	
9F 08	Application Version Number	00 02	
9F 0D	Issuer Action Code - Default	B8 50 BC 80 00	
9F 0E	Issuer Action Code - Denial	00 00 00 00 00	
9F 0F	Issuer Action Code - Online	B8 70 BC 98 00	
9F 11	Issuer Code Table Index	01	
9F 12	Application Preferred Name	4D 61 73 74 65 72 43 61 72 64 43 72 65 64 69 74 ( <b>MasterCardCredit</b> )	
9F 14	Lower Consecutive Offline Limit	00	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 1F	Track 1 Discretionary Data	20 20	
9F 23	Upper Consecutive Offline Limit	00	
9F 32	Issuer Public Key Exponent	03	
9F 42	Application Currency Code	08 40 ( <b>USD</b> )	
9F 44	Application Currency Exponent	02	
9F 46	ICC Public Key Certificate	12 62 F0 CC 72 C9 32 CB 9E A2 6B 57 03 EA 2B C8 73 BD 46 65 55 79 F8 2F 1F 84 D7 7F 9D 82 B0 6E 9B 48 0D F9 90 0C 25 60 66 60 14 CB 88 B6 AF 08 55 33 3A 1D 75 BB D2 F8 47 83 B3 A5 3D 04 4D 4F F8 DA DD 2D 4F 79 6F 6F 37 55 8C 1B B5 2E 87 8A 39 B7 EC 35 22 F6 92 09 8D 86 75 5A 95 D5 0B 6E 8A 99 52 94 E9 41 4E 87 99 D5 08 B3 91 3D 23 48	
9F 47	ICC Public Key Exponent	03	



Tag	Element Name	Data	v1.00
9F 48	ICC Public Key Remainder	3B AE F6 9B 2A 18 7F 02 8F 87 DA 4A 29 77 6D 68 E0 6C 6F 48 2B 00 FB 11 3F E0 52 15 83 19 3E F8 AD F5 85 E1 A7 6E D0 9F A5 D1	
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	EF E8 25 D7 78 D4 5F 0C 1A 57 15 DD 0B 22 29 9F 01 6D BE D0 6D BD 1B 62 A9 59 8A 2F 21 8A 29 20 0B 1D 97 8E 23 E5 2F 19 0E BD 5B A6 70 7D EE 2B 21 88 AD 9C 62 CE D8 61 EA 45 C5 A6 06 59 41 06 82 F2 38 FE 8F 7D CB 71 1F 5E 52 C0 F1 D8 3B B4 1D E3 3C 8D 6F 57 05 28 5A 90 4E E3 DA 51 E7 37 59 5C DA E2 55 09 D7 C7 44 0E 4F A6 7F 12 17 1C	
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	
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 - Decline [MasterCard]	00 00 00	
C4	Card Issuer Action Code - Default [MasterCard]	19 50 00	
C5	Card Issuer Action Code - Online [MasterCard]	39 FB 00	
C7	CDOL1 Related Data Length [MasterCard]	2B	
C8	CRM Country Code [MasterCard]	08 40 (USA)	
C9	CRM Currency Code [M/Chip4]	08 40 (USD)	
CA	Lower Cumulative Offline Transaction Amount [M/Chip]	00 00 00 00 00 00	
CB	Upper Cumulative Offline Transaction Amount [M/Chip]	00 00 00 05 00 00	
D1	Currency Conversion Table [M/Chip]	08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00	
D3	Additional Check Table [MasterCard]	00 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF	
D5	Application Control [M/Chip]	CC 00	
D6	Default ARPC Response Code [M/Chip4]	00 12	
DF 02	Security Limits Status [MasterCard]	00	

### 1.4.3 MasterCard (Online Preferred) Contactless Interface

Tag	Element Name	Data	v1.00
50	Application Label	4D 61 73 74 65 72 43 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 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	14 10 01	
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 [M/Chip, PayPass]	19 80	
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	
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 1E 03 42 03 1F 03	
8F	Certification Authority Public Key Index	FA	
90	Issuer Public Key Certificate	18 89 B9 97 E6 FC E8 4B 4A E7 AB 87 43 1C BD B3 DF 8C 1D 5A 55 A7 F6 0D 29 59 AF 3A 51 04 E7 58 83 17 ED 74 08 66 68 CF 1A 05 47 84 F7 49 3C 6D 74 7F A7 96 EC 14 D3 33 A6 8E C7 E0 08 62 95 9A 0B D0 F0 48 20 80 B7 1A C1 B7 62 5B 1B 8B 1F 35 A6 69 19 99 BA 78 F5 92 E2 3F 95 E9 96 09 D1 08 CF 1C 0E 30 8A 8B F6 4F BD E8 37 D3 CE 13 8A 50 DC 50 AF 4B 41 EE 53 D9 8A 11 B6 A8 1D DD 44 CC 43 0C 1E F3 BB 9D 1D 75 A0 2F AA 9C 81 4A FC 58	
92	Issuer Public Key Remainder	D3 52 41 07	
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	
9F 08	Application Version Number	00 02	
9F 0D	Issuer Action Code - Default	B4 50 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 11	Issuer Code Table Index	01
9F 12	Application Preferred Name	4D 61 73 74 65 72 43 61 72 64 43 72 65 64 69 74 ( <b>'MasterCardCredit'</b> )
9F 14	Lower Consecutive Offline Limit	00
9F 17	Personal Identification Number (PIN) Try Counter	03
9F 23	Upper Consecutive Offline Limit	00
9F 27	Cryptogram Information Data (CID)	00
9F 32	Issuer Public Key Exponent	03
9F 46	ICC Public Key Certificate	46 A6 9C 97 04 C3 39 9F 9B 62 76 1C 22 A9 15 5D 18 A9 50 7F D0 65 77 F5 10 21 29 FC 08 8B 3B BA 6A 14 5E E4 FA AF 3A 49 8C 21 DA C6 DE A1 36 0A 2B 99 81 C2 CE B5 7E 10 D1 FF 49 4A 49 EA 94 30 A8 B4 D8 22 9C 24 FF 44 FD D5 56 52 A9 52 78 20 7D 05 D6 0D 8A 1F DE 7D 74 87 96 88 59 ED C9 18 EC 4A CA 7C 1B D3 99 41 F2 E3 C7 C5 05 1A CF 3B
9F 47	ICC Public Key Exponent	03
9F 48	ICC Public Key Remainder	3B AE F6 9B 2A 18 7F 02 8F 87 DA 4A 29 77 6D 68 E0 6C 6F 48 2B 00 FB 11 3F E0 52 15 83 19 3E F8 AD F5 85 E1 A7 6E D0 9F A5 D1
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
9F 60	Offline Balance [M/Chip4]	A1 C7
9F 61	CVC3track2 [MasterCard]	C4 09
9F 62	PCVC3track1 [MasterCard]	00 00 00 38 00 00
9F 63	PUNATCtrack1 [MasterCard]	00 00 00 00 E0 E0
9F 64	NATCtrack1 [MasterCard]	03
9F 65	PCVC3track2 [MasterCard]	00 0E
9F 66	PUNATCtrack2 [MasterCard]	0E 70
9F 67	NATCtrack2 [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 [PayPass M/Chip]	08 40 00 00 30 30 00

<b>9F 7E</b>	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
<b>C3</b>	Card Issuer Action Code - Decline [MasterCard]	00 00 00
<b>C4</b>	Card Issuer Action Code - Default [MasterCard]	19 50 00
<b>C5</b>	Card Issuer Action Code - Online [MasterCard]	39 FB 00
<b>C7</b>	CDOL1 Related Data Length [MasterCard]	2B
<b>C8</b>	CRM Country Code [MasterCard]	08 40 (USA)
<b>C9</b>	CRM Currency Code [M/Chip4]	08 40 (USD)
<b>CA</b>	Lower Cumulative Offline Transaction Amount [M/Chip]	00 00 00 00 00 00
<b>CB</b>	Upper Cumulative Offline Transaction Amount [M/Chip]	00 00 00 05 00 00
<b>CD</b>	Card Issuer Action Code - Default [PayPass M/Chip]	00 58 00
<b>CE</b>	Card Issuer Action Code - Online [PayPass M/Chip]	00 F8 00
<b>CF</b>	Card Issuer Action Code - Denial [PayPass M/Chip]	00 00 00
<b>D1</b>	Currency Conversion Table [M/Chip]	08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00
<b>D3</b>	Additional Check Table [MasterCard]	00 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
<b>D5</b>	Application Control [M/Chip]	CC 00
<b>D6</b>	Default ARPC Response Code [M/Chip4]	00 12
<b>D7</b>	Application Control [PayPass M/Chip]	40 00 40
<b>DF 02</b>	Security Limits Status [MasterCard]	00

## 1.5 DI Test Card 05 - Visa, Offline Preferred, PIN=1234

Visa (Offline Preferred) Dual Interface card.

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

### 1.5.1 Cardholder Verification Method List – AID (A0000000031010)

Cardholder Verification Method List ('42014403410342031E031F03')			
CVM	Verification Method	Conditions	If unsuccessful
1	Online PIN	Unattended cash	Next CVM
2	Offline PIN	Terminal supports CVM type	Next CVM
3	Offline Plaintext PIN	Terminal supports CVM type	Next CVM
4	Online PIN	Terminal supports CVM type	Next CVM
5	Signature (paper)	Terminal supports CVM type	Fail
6	No CVM required	Terminal supports CVM type	Fail

### 1.5.2 Visa (Offline Preferred) Contact Interface

Tag	Element Name	Data	v1.20
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 35 20 20 20 20 20 20 20 20 20 20 20 (‘DI Test/Card 05 ’)	
5F 24	Application Expiration Date	22 12 31	
5F 25	Application Effective Date	15 11 01	
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 [VSDC]	38 00	
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 42 01 44 03 41 03 42 03 1E 03 1F 03	
8F	Certification Authority Public Key Index	92	

Tag	Element Name	Data	v1.20
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 04 01 B0 01 01 00	
9F 07	Application Usage Control	FF 00	
9F 08	Application Version Number	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 BC 98 00	
9F 10	Issuer Application Data [VSDC]	06 01 0A 03 A0 B0 02	
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 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)	2A E9 3E F1 D2 A3 95 F4	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
9F 44	Application Currency Exponent	02	

Tag	Element Name	Data	v1.20
9F 46	ICC Public Key Certificate	97 09 D7 B8 8A 53 59 CE 97 BD 97 4D A5 D0 40 51 08 7C ED CC B9 5C 03 50 6E 40 0D F6 BD 55 C1 55 BB 79 29 A9 6D 9F 2C 87 A3 C1 06 78 EA 7C C5 B4 76 E8 3C A6 8A 2F 31 CC F2 48 6C 21 18 BE 5F 44 29 A7 5A DE FD 91 BB 11 AC BE 36 A9 5F AD 52 49 1B 5D 21 0C 0A C3 E5 D9 9A E1 54 03 9D 81 4F 5B 23 C3 E4 01 61 A9 61 80 E2 C1 7B F7 13 02 6B E7 3B 74 7D 43 83 8B 84 6B 4D 66 59 F8 2C 9F 09 02 B1 CD E4 AF 44 2B 7E 8E B8 7D 17 19 6A 74 0A 86 43 22 E1 45 A1 C2 E0 88 88 FD 88 28 49 DE 2A DB CF BC ED 21 08 06 FF 85 D4 A1 FA B8 B2 3E A1 D8	
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	5F 84 DA 05 58 4C F7 E7 61 2D 92 26 27 1B 60 D9 9B 4B 66 B4 36 BE EA D3 77 6D 45 CD 31 B8 8B 28 48 CE DC B3 29 77 36 7F CF D6 25 8A 64 25 AC 82 BD 46 F2 93 8A 46 2E 0B 04 66 16 75 DB 5D AF 51 55 90 80 48 26 4F 3F B0 FB EC 2E E1 E0 C4 65 00 7C 82 AA 7B F5 F8 C3 8C BC 24 ED 42 99 7D 0A A7 9B E0 82 11 E2 77 8D 8C E7 65 FA 67 FB AC 55 6C C6 FD 89 EE CC 78 35 44 BE 2A D1 83 3E 7D 78 35	
9F 51	Application Currency Code [VSDC]	08 40	
9F 52	Application Default Action [VSDC VIS 1.5]	80 30 00 00 00 00	
9F 53	Consecutive Transaction Limit (International) [VSDC]	07	
9F 54	Cumulative Total Transaction Amount Limit [VSDC]	00 00 00 00 20 00	
9F 57	Issuer Country Code [VSDC]	08 40	
9F 58	Consecutive Transaction Counter Limit [VSDC]	05	
9F 59	Consecutive Transaction Counter Upper Limit [VSDC]	10	
9F 5C	Cumulative Total Transaction Amount Upper Limit [VSDC]	00 00 00 00 50 00	
9F 5E	Consecutive Transaction International Upper Limit [VSDC]	10	
9F 68	Card Additional Processes [qVSDC VCPS 2.1]	4E 00 F0 00	
9F 72	Consecutive Transaction Limit (International-Country) [VSDC]	07	

Tag	Element Name	Data	v1.20
BF 55	Contactless Counters Data Template	DF 11 01 02 DF 21 01 05 DF 31 01 10	
BF 56	Counters Data Template	DF 11 01 02 DF 21 01 05 DF 31 01 10	
BF 57	International Counters Data Template	DF 11 01 02 DF 21 01 07 DF 31 01 10 DF 51 01 09 DF 61 01 07	
BF 58	Amounts Data Template	DF 11 06 00 00 00 00 10 04 DF 21 06 00 00 00 00 20 00 DF 31 06 00 00 00 00 50 00	
BF 5B	Application Internal Data Template	DF 01 02 00 00	

### 1.5.3 Visa (Offline Preferred) Contactless Interface

Tag	Element Name	Data	v1.20
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 24	Application Expiration Date	22 12 31	
5F 2D	Language Preference	65 6E (‘en’ – English)	
5F 34	Application PAN Sequence Number	01	
82	Application Interchange Profile [VSDC]	20 00	
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 05 00	



Tag	Element Name	Data	v1.20
9F 10	Issuer Application Data [VSDC]	06 01 0A 03 A0 00 00	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 26	Application Cryptogram (AC)	F1 AE 05 8C 08 BF A6 DC	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
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	
9F 46	ICC Public Key Certificate	03 3C 21 10 1E A6 A8 47 4A D0 24 68 D7 F7 B1 F4 DC 1F B0 E8 71 92 ED 43 03 01 D4 2F 62 DC 5E 0D 9B 3C 50 58 10 85 5E BE 6D AE D6 A9 FA C3 FA E6 EB 06 C7 B1 5D 8B 75 63 26 AA A0 A1 D5 92 F3 D2 6E C4 BB 14 1F 4D 83 15 38 CB F7 95 88 C2 04 DE 9E A4 05 38 CA 92 87 47 1A 36 81 E8 84 1E 08 72 36 C7 16 44 B0 60 2C D9 33 0B 2D 6B BE D4 A7 45 CC 61 63 10 18 1E D9 45 50 FD A2 40 1C 59 03 01 96 47 9F 8F 16 5E 9F 67 FB 8C 05 65 0D F9 6E 2A E0 FA E6 5F 8C 66 4D FC 1E A6 8B C3 70 0D 15 35 BE 8E 4C 22 8F 91 B8 7B 21 7B 64 6A 83 6A A7 18	
9F 47	ICC Public Key Exponent	03	
9F 4A	Static Data Authentication Tag List	82	
9F 4B	Signed Dynamic Application Data	70 5B 25 06 CA ED 47 D5 15 8D AC 23 32 E9 20 B6 E2 61 C2 83 51 80 7A 2A E3 27 22 9C DD 72 8D 4A B0 AF F8 8C AE 6A 93 FD 96 C7 29 DB 85 95 E8 0B 91 54 27 43 9F 80 85 14 13 1C C1 FA 9F 42 67 21 89 5B 79 76 87 25 02 82 A4 45 37 67 BA 0B 4F 54 D2 BA 86 86 4D 90 FD 99 D4 A5 A2 CB F8 D0 8A 85 05 86 BB 6E C4 49 70 C9 AB 49 EB 00 42 95 C8 C0 C6 22 82 83 79 5D 11 B3 81 86 4B 48 2D 45 E7 F4	
9F 51	Application Currency Code [VSDC]	08 40 (USD)	
9F 52	Application Default Action [VSDC VIS 1.5]	80 30 00 00 00 00	
9F 53	Consecutive Transaction Limit (International) [VSDC]	07	
9F 54	Cumulative Total Transaction Amount Limit [VSDC]	00 00 00 00 20 00	
9F 57	Issuer Country Code [VSDC]	08 40 (USA)	
9F 58	Consecutive Transaction Counter Limit [VSDC]	05	
9F 59	Consecutive Transaction Counter Upper Limit [VSDC]	10	

Tag	Element Name	Data	v1.20
9F 5A	Application Program Identifier	31 08 40 08 40	
9F 5C	Cumulative Total Transaction Amount Upper Limit [VSDC]	00 00 00 00 50 00	
9F 5E	Consecutive Transaction International Upper Limit [VSDC]	10	
9F 68	Card Additional Processes [qVSDC VCPS 2.1]	4E 00 F0 00	
9F 69	Card Authentication Related Data [qVSDC]	01 3A E0 61 29 38 00	
9F 6C	Card Transaction Qualifiers [qVSDC VCPS 2.1]	38 00	
9F 6E	Form Factor Indicator [qVSDC]	20 70 00 00	
9F 72	Consecutive Transaction Limit (International-Country) [VSDC]	07	
BF 55	Contactless Counters Data Template	DF 11 01 02 DF 21 01 05 DF 31 01 10	
BF 56	Counters Data Template	DF 11 01 01 DF 21 01 05 DF 31 01 10	
BF 57	International Counters Data Template	DF 11 01 01 DF 21 01 07 DF 31 01 10 DF 51 01 08 DF 61 01 07	
BF 58	Amounts Data Template	DF 11 06 00 00 00 00 10 04 DF 21 06 00 00 00 00 20 00 DF 31 06 00 00 00 50 00	
BF 5B	Application Internal Data Template	DF 01 02 00 00	

## 1.6 DI Test Card 06 - MasterCard, Offline Preferred, PIN=4315

MasterCard (Offline Preferred) Dual Interface card.

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

### 1.6.1 Cardholder Verification Method List – AID (A0000000041010)

Cardholder Verification Method List ('42014403410342031E031F03')			
CVM	Verification Method	Conditions	If unsuccessful
1	Online PIN	Unattended cash	Next CVM
2	Offline PIN	Terminal supports CVM type	Next CVM
3	Offline Plaintext PIN	Terminal supports CVM type	Next CVM
4	Online PIN	Terminal supports CVM type	Next CVM
5	Signature (paper)	Terminal supports CVM type	Fail
6	No CVM required	Terminal supports CVM type	Fail

### 1.6.2 MasterCard (Offline Preferred) Contact Interface

Tag	Element Name	Data	v1.10
50	Application Label	4D 61 73 74 65 72 43 61 72 64 ( <b>'MasterCard'</b> )	
57	Track 2 Equivalent Data	54 13 33 00 89 60 41 11 D1 61 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 36 20 20 20 20 20 20 20 20 20 20 20 ( <b>'DI Test/Card 06     '</b> )	
5F 24	Application Expiration Date	25 12 31	
5F 25	Application Effective Date	15 01 01	
5F 28	Issuer Country Code	08 40 ( <b>USA</b> )	
5F 2D	Language Preference	65 6E ( <b>'en' – English</b> )	
5F 30	Service Code	02 01	
5F 34	Application PAN Sequence Number	01	
82	Application Interchange Profile [M/Chip, PayPass]	38 00	
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	
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 01 44 03 41 03 42 03 1E 03 1F 03	
8F	Certification Authority Public Key Index	FA	

Tag	Element Name	Data	v1.10
90	Issuer Public Key Certificate	18 89 B9 97 E6 FC E8 4B 4A E7 AB 87 43 1C BD B3 DF 8C 1D 5A 55 A7 F6 0D 29 59 AF 3A 51 04 E7 58 83 17 ED 74 08 66 68 CF 1A 05 47 84 F7 49 3C 6D 74 7F A7 96 EC 14 D3 33 A6 8E C7 E0 08 62 95 9A 0B D0 F0 48 20 80 B7 1A C1 B7 62 5B 1B 8B 1F 35 A6 69 19 99 BA 78 F5 92 E2 3F 95 E9 96 09 D1 08 CF 1C 0E 30 8A 8B F6 4F BD E8 37 D3 CE 13 8A 50 DC 50 AF 4B 41 EE 53 D9 8A 11 B6 A8 1D DD 44 CC 43 0C 1E F3 BB 9D 1D 75 A0 2F AA 9C 81 4A FC 58	
92	Issuer Public Key Remainder	D3 52 41 07	
94	Application File Locator (AFL)	08 02 04 01 18 01 01 00 20 01 01 00	
9F 07	Application Usage Control	FF 00	
9F 08	Application Version Number	00 02	
9F 0D	Issuer Action Code - Default	B8 50 BC 80 00	
9F 0E	Issuer Action Code - Denial	00 00 00 00 00	
9F 0F	Issuer Action Code - Online	B8 70 BC 98 00	
9F 11	Issuer Code Table Index	01	
9F 12	Application Preferred Name	4D 61 73 74 65 72 43 61 72 64 43 72 65 64 69 74 ( <b>'MasterCardCredit'</b> )	
9F 14	Lower Consecutive Offline Limit	03	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 1F	Track 1 Discretionary Data	20 20	
9F 23	Upper Consecutive Offline Limit	05	
9F 32	Issuer Public Key Exponent	03	
9F 42	Application Currency Code	08 40 ( <b>USD</b> )	
9F 44	Application Currency Exponent	02	
9F 46	ICC Public Key Certificate	31 6A CF C5 82 78 CA 18 ED 4D 4B 4B 35 5C C0 8A 40 FB E4 03 D0 78 90 D0 3C 0A FC A1 CB A7 1F DF FB 16 DF A5 D3 F5 AD 71 6C 82 D7 CE 05 03 E2 61 70 CC F1 2E 41 1C A3 D0 57 E8 CF B8 2E CF E5 23 C5 95 87 A2 DB 62 FD 76 A4 2E C4 12 B9 FF A2 96 E6 18 38 25 A2 D2 67 2D E2 E6 75 93 6C 3F 48 B6 47 8F A9 DF D6 29 E9 F3 34 EC 78 0E 8E 5B 3B B8	
9F 47	ICC Public Key Exponent	03	

Tag	Element Name	Data	v1.10
9F 48	ICC Public Key Remainder	01 8C F8 2C CD EB 72 91 43 FB 84 FA 30 E4 92 C0 46 57 70 11 85 C7 AF 29 B1 60 22 DF C6 51 17 8D 72 1D 0E CA AB 9E 5E 8B A3 C9	
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	B0 80 9B CF 96 6C CB 24 E0 E7 6A E9 0B EE 8D 7B 18 C8 AA 98 22 63 D4 84 44 3D 86 CD 0D 78 83 A2 AF A8 CC 9E FB 0D 6F A2 DF B7 25 12 54 6B 94 82 A6 3B 60 4D 8A 71 B1 C2 DE BA EB E7 21 3A F7 7D 50 36 2E 69 84 83 48 F5 5A D7 D6 B1 02 6A 00 DF BB DB 89 4B 58 30 62 DF F8 54 20 A8 05 BC 68 BB DB E9 05 DB 31 B6 32 36 CC 85 8D 9A 80 D2 54 94	
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	
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 - Decline [MasterCard]	00 00 00	
C4	Card Issuer Action Code - Default [MasterCard]	19 50 00	
C5	Card Issuer Action Code - Online [MasterCard]	39 FB 00	
C7	CDOL1 Related Data Length [MasterCard]	2B	
C8	CRM Country Code [MasterCard]	08 40 (USA)	
C9	CRM Currency Code [M/Chip4]	08 40 (USD)	
CA	Lower Cumulative Offline Transaction Amount [M/Chip]	00 00 00 02 00 00	
CB	Upper Cumulative Offline Transaction Amount [M/Chip]	00 00 00 05 00 00	
D1	Currency Conversion Table [M/Chip]	08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00	
D3	Additional Check Table [MasterCard]	00 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF	
D5	Application Control [M/Chip]	CC 00	
D6	Default ARPC Response Code [M/Chip4]	00 12	
D7	Application Control (PayPass M/Chip)	40 01 40	
DF 02	Security Limits Status [MasterCard]	00	

### 1.6.3 MasterCard (Offline Preferred) Contactless Interface

Tag	Element Name	Data	v1.10
50	Application Label	4D 61 73 74 65 72 43 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	15 01 01	
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 [M/Chip, PayPass]	19 80	
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	
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 1E 03 42 03 1F 03	
8F	Certification Authority Public Key Index	FA	
90	Issuer Public Key Certificate	18 89 B9 97 E6 FC E8 4B 4A E7 AB 87 43 1C BD B3 DF 8C 1D 5A 55 A7 F6 0D 29 59 AF 3A 51 04 E7 58 83 17 ED 74 08 66 68 CF 1A 05 47 84 F7 49 3C 6D 74 7F A7 96 EC 14 D3 33 A6 8E C7 E0 08 62 95 9A 0B D0 F0 48 20 80 B7 1A C1 B7 62 5B 1B 8B 1F 35 A6 69 19 99 BA 78 F5 92 E2 3F 95 E9 96 09 D1 08 CF 1C 0E 30 8A 8B F6 4F BD E8 37 D3 CE 13 8A 50 DC 50 AF 4B 41 EE 53 D9 8A 11 B6 A8 1D DD 44 CC 43 0C 1E F3 BB 9D 1D 75 A0 2F AA 9C 81 4A FC 58	
92	Issuer Public Key Remainder	D3 52 41 07	
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	
9F 08	Application Version Number	00 02	
9F 0D	Issuer Action Code - Default	B4 50 84 00 00	

Tag	Element Name	Data	v1.10
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)	01 11 A0 40 03 24 00 00 01 02 00 00 00 00 00 00 00 FF	
9F 11	Issuer Code Table Index	01	
9F 12	Application Preferred Name	4D 61 73 74 65 72 43 61 72 64 43 72 65 64 69 74 ( <b>MasterCardCredit</b> )	
9F 14	Lower Consecutive Offline Limit	03	
9F 17	Personal Identification Number (PIN) Try Counter	03	
9F 23	Upper Consecutive Offline Limit	05	
9F 27	Cryptogram Information Data (CID)	80	
9F 32	Issuer Public Key Exponent	03	
9F 46	ICC Public Key Certificate	43 96 54 56 A4 82 A4 99 18 1F 40 AF 5B 95 B7 04 82 67 18 4B B9 28 D5 00 FF 18 DF F0 B6 9D 24 BC 27 47 1C E2 A4 10 C3 4F 99 C7 D8 97 6B 84 33 42 E8 62 68 7A 37 D2 27 AA 45 03 2F 91 03 5A 93 C7 C3 1D 6F 7E C1 A5 C0 1D 64 32 0B BF 37 1A CA 24 72 2D 64 84 EA 98 62 FA 68 A8 8B 6D 2A 4B 2A B8 5A D2 16 B3 6E 36 D8 68 B5 88 1A 9E B8 52 9E 26	
9F 47	ICC Public Key Exponent	03	
9F 48	ICC Public Key Remainder	98 19 20 E5 30 16 BE 36 24 15 30 9B 0E 6E BD 96 62 20 E1 98 FF 1F A3 51 33 7B 85 53 53 F2 A4 17 58 4B 54 56 65 9C 71 62 03 05	
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	
9F 60	Offline Balance [M/Chip4]	50 58	
9F 61	CVC3track2 [MasterCard]	D1 C6	
9F 62	PCVC3track1 [MasterCard]	00 00 00 38 00 00	
9F 63	PUNATCtrack1 [MasterCard]	00 00 00 00 E0 E0	
9F 64	NATCtrack1 [MasterCard]	03	
9F 65	PCVC3track2 [MasterCard]	00 0E	
9F 66	PUNATCtrack2 [MasterCard]	0E 70	
9F 67	NATCtrack2 [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	

Tag	Element Name	Data	v1.10
9F 6E	Third Party Data [PayPass M/Chip]	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	
C3	Card Issuer Action Code - Decline [MasterCard]	00 00 00	
C4	Card Issuer Action Code - Default [MasterCard]	19 50 00	
C5	Card Issuer Action Code - Online [MasterCard]	39 FB 00	
C7	CDOL1 Related Data Length [MasterCard]	2B	
C8	CRM Country Code [MasterCard]	08 40 (USA)	
C9	CRM Currency Code [M/Chip4]	08 40 (USD)	
CA	Lower Cumulative Offline Transaction Amount [M/Chip]	00 00 00 02 00 00	
CB	Upper Cumulative Offline Transaction Amount [M/Chip]	00 00 00 05 00 00	
CD	Card Issuer Action Code - Default [PayPass M/Chip]	00 58 00	
CE	Card Issuer Action Code - Online [PayPass M/Chip]	00 F8 00	
CF	Card Issuer Action Code - Denial [PayPass M/Chip]	00 00 00	
D1	Currency Conversion Table [M/Chip]	08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00 08 40 00 00 00	
D3	Additional Check Table [MasterCard]	00 00 00 FF FF FF FF FF FF FF FF FF FF FF FF FF FF	
D5	Application Control [M/Chip]	CC 00	
D6	Default ARPC Response Code [M/Chip4]	00 12	
D7	Application Control [PayPass M/Chip]	40 01 40	
DF 02	Security Limits Status [MasterCard]	00	



## 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>				