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| ExpressPay Certificate Guide |
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| **V-1.0.1**  **2022-4-21** |

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**Draft**

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# 

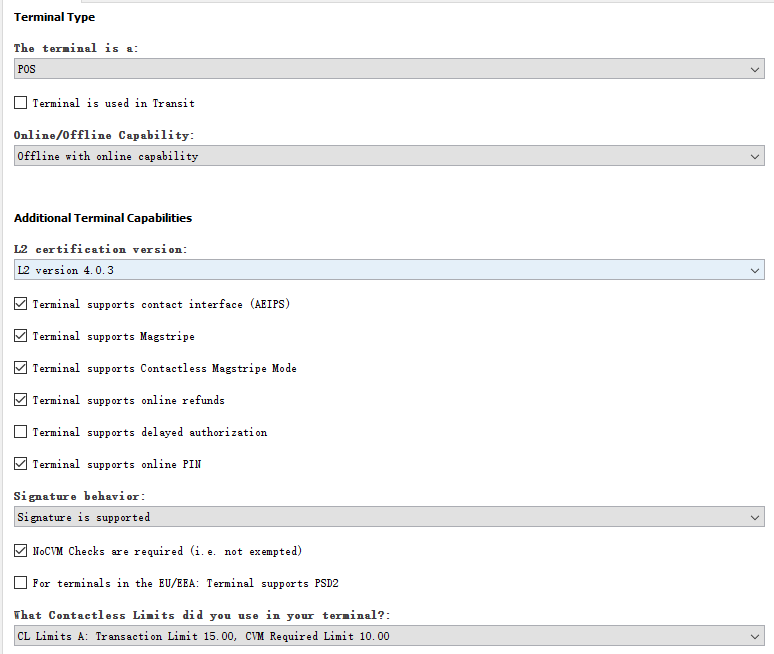
# 1 Introduction

This document details the terminal capabilities, parameter settings, test casse usage, etc. Help developers perform Paywave certification.

Normally, the certification body will provide us with a TSE file. We just need to import the TSE file into Colis, and the test case will be automatically generated.

In this document, we will use a sample TSE file for generating test cases.

## Terminal configuration



# 2 Terminal AID and CAPK configuration

## AID

AID list:

**a00000002501**

AID detail for source code configuration:

{

"ddol": "9f3704",

"aid": "a00000002501",

"appVerNum": "0001",

"asi": 0,

"contactlessCvmLimit": 1000,

"contactlessFloorLimit": 1200,

"contactlessTransLimit": 1500,

"floorLimit": 0,

"maxTargetPercent": 99,

"onlinePinCap": 1,

"tacDefault": "DC50FC9800",

"tacDenial": "0010000000",

"tacOnline": "DE00FC9800",

"targetPercent": 99,

"threshold": 0,

"transLimit": 4000

}

## CAPK

{

"arithInd": 1,

"capkIdx": 14,

"checkSum": "a7266abae64b42a3668851191d49856e17f8fbcd",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "aa94a8c6dad24f9ba56a27c09b01020819568b81a026be9fd0a3416ca9a71166ed5084ed91ced47dd457db7e6cbcd53e560bc5df48abc380993b6d549f5196cfa77dfb20a0296188e969a2772e8c4141665f8bb2516ba2c7b5fc91f8da04e8d512eb0f6411516fb86fc021ce7e969da94d33937909a53a57f907c40c22009da7532cb3be509ae173b39ad6a01ba5bb85",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 3,

"checkSum": "8708a3e3bbc1bb0be73ebd8d19d4e5d20166bf6c",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "b0c2c6e2a6386933cd17c239496bf48c57e389164f2a96bff133439ae8a77b20498bd4dc6959ab0c2d05d0723af3668901937b674e5a2fa92ddd5e78ea9d75d79620173cc269b35f463b3d4aaff2794f92e6c7a3fb95325d8ab95960c3066be548087bcb6ce12688144a8b4a66228ae4659c634c99e36011584c095082a3a3e3",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 15,

"checkSum": "a73472b3ab557493a9bc2179cc8014053b12bab4",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "c8d5ac27a5e1fb89978c7c6479af993ab3800eb243996fbb2ae26b67b23ac482c4b746005a51afa7d2d83e894f591a2357b30f85b85627ff15da12290f70f05766552ba11ad34b7109fa49de29dcb0109670875a17ea95549e92347b948aa1f045756de56b707e3863e59a6cbe99c1272ef65fb66cbb4cff070f36029dd76218b21242645b51ca752af37e70be1a84ff31079dc0048e928883ec4fadd497a719385c2bbbebc5a66aa5e5655d18034ec5",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 16,

"checkSum": "c729cf2fd262394abc4cc173506502446aa9b9fd",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

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"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 4,

"checkSum": "fdd7139ec7e0c33167fd61ad3cadbd68d66e91c5",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

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"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 101,

"checkSum": "894c5d08d4ea28bb79dc46cead998b877322f416",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

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}, {

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"capkIdx": 151,

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"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "e178ffe834b4b767af3c9a511f973d8e8505c5fcb2d3768075ab7cc946a955789955879aaf737407151521996dfa43c58e6b130eb1d863b85dc9ffb4050947a2676aa6a061a4a7ae1edb0e36a697e87e037517eb8923136875ba2ca1087cba7ec7653e5e28a0c261a033af27e3a67b64bba26956307ec47e674e3f8b722b3ae0498db16c7985310d9f3d117300d32b09",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 152,

"checkSum": "d4dba428cf11d45baeb0a35caea8007ad8ba8d71",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "d31a7094fb221cba6660fb975aafea80db7bb7eafd7351e748827ab62d4aeeccfc1787fd47a04699a02db00d7c382e80e804b35c59434c602389d691b9ccd51ed06be67a276119c4c10e2e40fc4eddf9df39b9b0bdee8d076e2a012e8a292af8efe18553470639c1a032252e0e5748b25a3f9ba4cfcee073038b061837f2ac1b04c279640f5bd110a9dc665ed2fa6828bd5d0fe810a892dee6b0e74ce8863bde08fd5fd61a0f11fa0d14978d8ced7dd3",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 153,

"checkSum": "94790d020f4f692d59289f36451872078005b63b",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

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"rid": "a000000025"

}, {

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"capkIdx": 193,

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"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "e69e319c34d1b4fb43aed4bd8bba6f7a8b763f2f6ee5ddf7c92579a984f89c4a9c15b27037764c58ac7e45efbc34e138e56ba38f76e803129a8ddeb5e1cc8c6b30cf634a9c9c1224bf1f0a9a18d79ed41ebcf1be78087ae8b7d2f896b1de8b7e784161a138a0f2169ad33e146d1b16ab595f9d7d98be671062d217f44eb68c68640c7d57465a063f6bac776d3e2dac61",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 194,

"checkSum": "8e748296359a7428f536adda8e2c037e2b697ef6",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "b875002f38ba26d61167c5d440367604ad38df2e93d8ee8da0e8d9c0cf4cc5788d11dea689e5f41d23a3da3e0b1fa5875ae25620f5a6bccee098c1b35c691889d7d0ef670eb8312e7123fcc5dc7d2f0719cc80e1a93017f944d097330edf945762fee62b7b0ba0348228dbf38d4216e5a67a7ef74f5d3111c44aa31320f623cb3c53e60966d6920067c9e082b746117e48e4f00e110950ca54da3e38e5453bd5544e3a6760e3a6a42766ad2284e0c9af",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 195,

"checkSum": "12f1790cb0273dc73c6e70784bc24c12e8db71f6",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "b93182abe343dfbf388c71c4d6747dcdec60367fe63cfaa942d7d323e688d0832836548bf0edff1edeeb882c75099ff81a93fa525c32425b36023ea02a8899b9bf7d7934e86f997891823006ceaa93091a73c1fde18abd4f87a22308640c064c8c027685f1b2db7b741b67ab0de05e870481c5f972508c17f57e4f833d63220f6ea2cfbb878728aa5887de407d10c6b8f58d46779ecec1e2155487d52c78a5c03897f2bb580e0a2bbde8ea2e1c18f6aaf3eb3d04c3477deab88f150c8810fd1ef8eb0596866336fe2c1fbc6bec22b4fe5d885647726db59709a505f75c49e0d8d71bf51e4181212be2142ab2a1e8c0d3b7136cd7b7708e4d",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 199,

"checkSum": "6221e0c726bac8f8ac25f8f93b811d1ffd4c131c",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "cd237e34e0299de48f1a2c94f478fe972896011e1ca6ab462b68fe0f6109c9a97c2dbeea65932cde0625138b9f162b92979daab019d3b5561d31eb2d4f09f12f927ea8f740ce0e87154965505e2272f69042b15d57ccc7f771919123978283b3cce524d9715207bf5f5ad369102176f0f7a78a6deb2bff0edce165f3b14f14d0035b2756861fe03c43396ed002c894a3",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 200,

"checkSum": "33bd7a059fab094939b90a8f35845c9dc779bd50",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "bf0cfced708fb6b048e3014336ea24aa007d7967b8aa4e613d26d015c4fe7805d9db131ced0d2a8ed504c3b5ccd48c33199e5a5bf644da043b54dbf60276f05b1750fab39098c7511d04babc649482ddcf7cc42c8c435bab8dd0eb1a620c31111d1aaaf9af6571eebd4cf5a08496d57e7abdbb5180e0a42da869ab95fb620eff2641c3702af3be0b0c138eaef202e21d",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 201,

"checkSum": "8e8dff443d78cd91de88821d70c98f0638e51e49",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "b362db5733c15b8797b8ecee55cb1a371f760e0bedd3715bb270424fd4ea26062c38c3f4aaa3732a83d36ea8e9602f6683eecc6baff63dd2d49014bde4d6d603cd744206b05b4bad0c64c63ab3976b5c8caaf8539549f5921c0b700d5b0f83c4e7e946068baaab5463544db18c63801118f2182efcc8a1e85e53c2a7ae839a5c6a3cabe73762b70d170ab64afc6ca482944902611fb0061e09a67acb77e493d998a0ccf93d81a4f6c0dc6b7df22e62db",

"rid": "a000000025"

}, {

"arithInd": 1,

"capkIdx": 202,

"checkSum": "6bda32b1aa171444c7e8f88075a74fbfe845765f",

"expireDate": "20201231",

"exponent": "03",

"hashInd": 1,

"modulus": "c23ecbd7119f479c2ee546c123a585d697a7d10b55c2d28bef0d299c01dc65420a03fe5227ecdecb8025fbc86eebc1935298c1753ab849936749719591758c315fa150400789bb14fadd6eae2ad617da38163199d1bad5d3f8f6a7a20aef420adfe2404d30b219359c6a4952565ccca6f11ec5be564b49b0ea5bf5b3dc8c5c6401208d0029c3957a8c5922cbde39d3a564c6debb6bd2aef91fc27bb3d3892beb9646dce2e1ef8581effa712158aaec541c0bbb4b3e279d7da54e45a0acc3570e712c9f7cdf985cfafd382ae13a3b214a9e8e1e71ab1ea707895112abc3a97d0fcb0ae2ee5c85492b6cfd54885cdd6337e895cc70fb3255e3",

"rid": "a000000025"

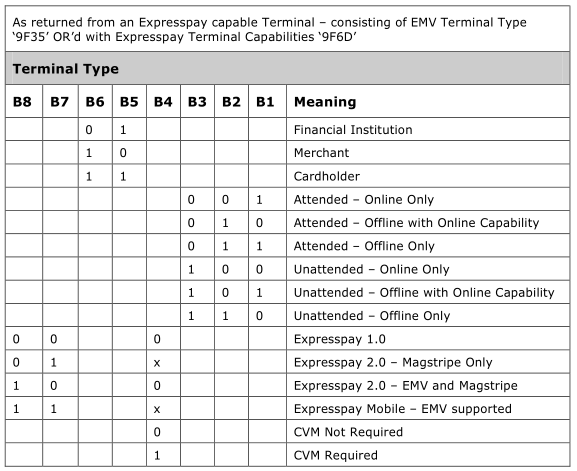
}

**Note:** capkIdx is int type in above list. For example 239(int) = 0xEF(Hexadecimal)

## Related EMV tags

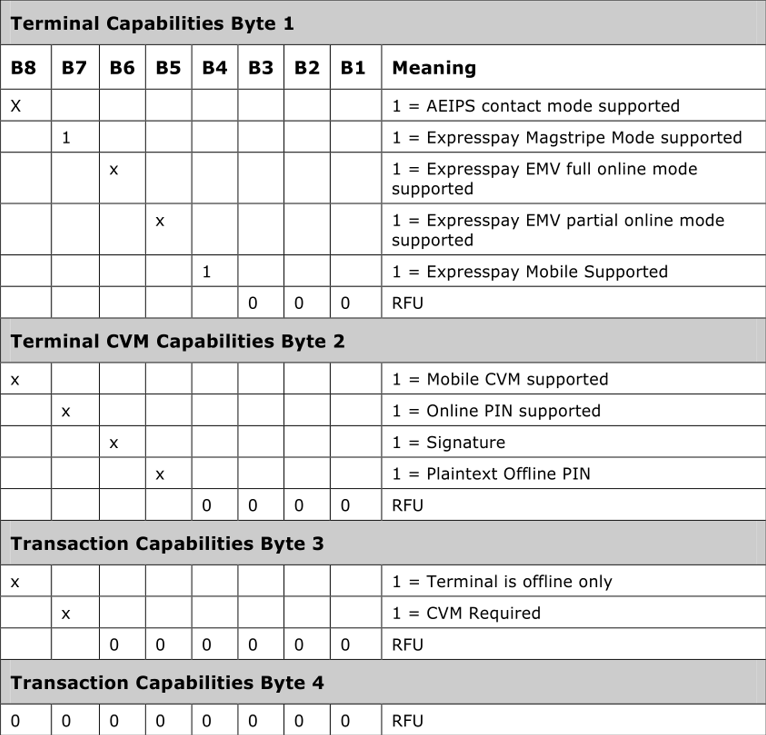
Terminal Type – Modified

Send in GPO command



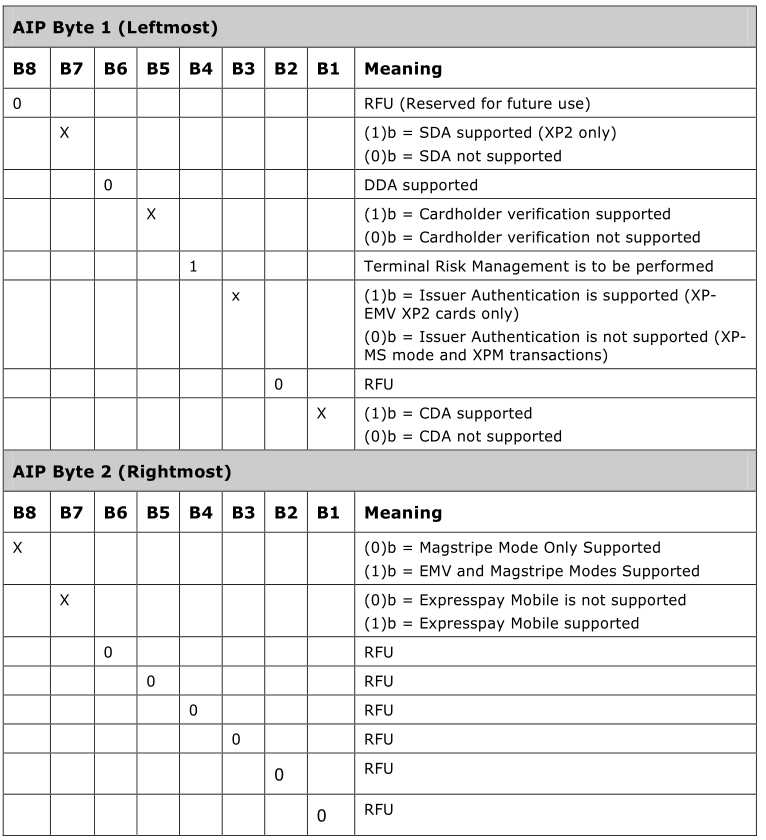
9F6E : Enhanced Contactless Reader Capabilities

Send with unmodified 9F35 in GPO command.



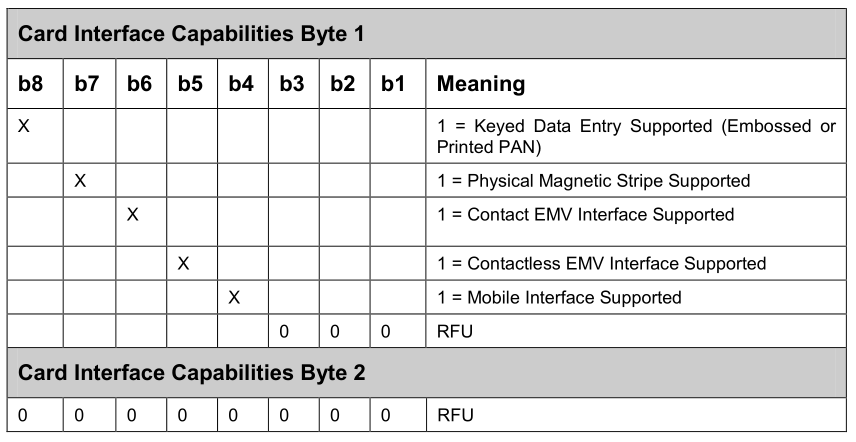
82: application interchange profile

Returned from GPO response



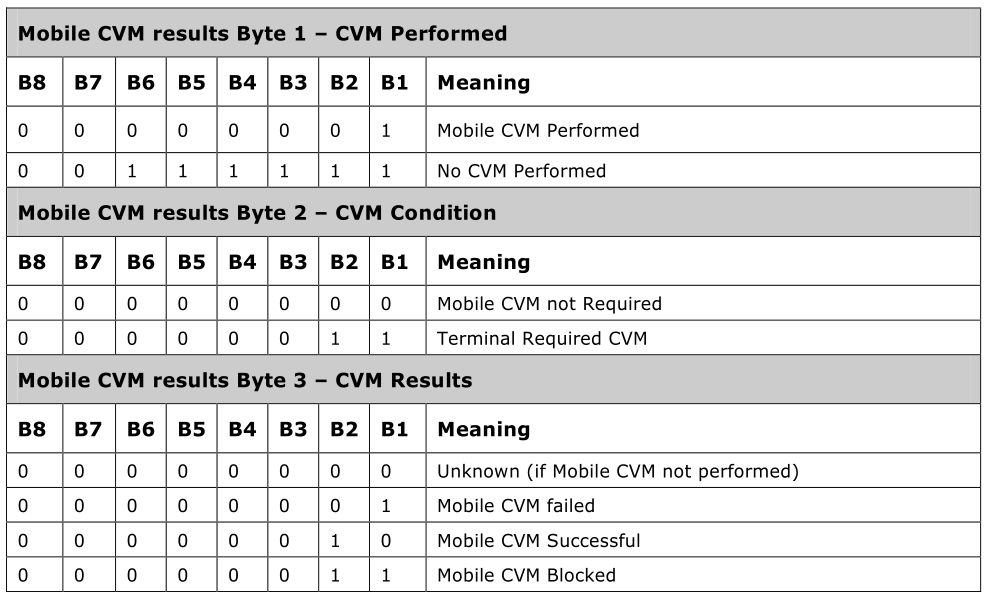
9F70: Card Interface Capabilities

Returned from read record command



9F71: Mobile CVM Results

Returned from GPO command

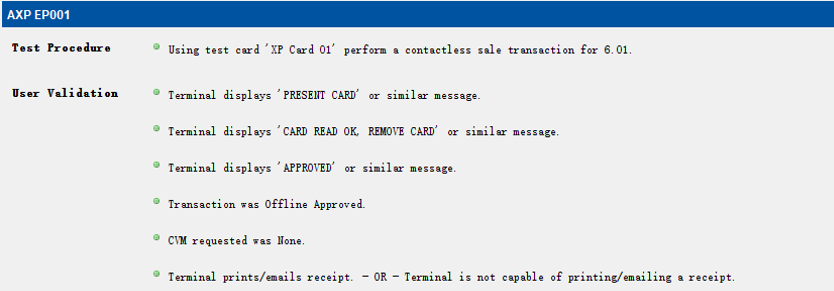


# 3 Test cases

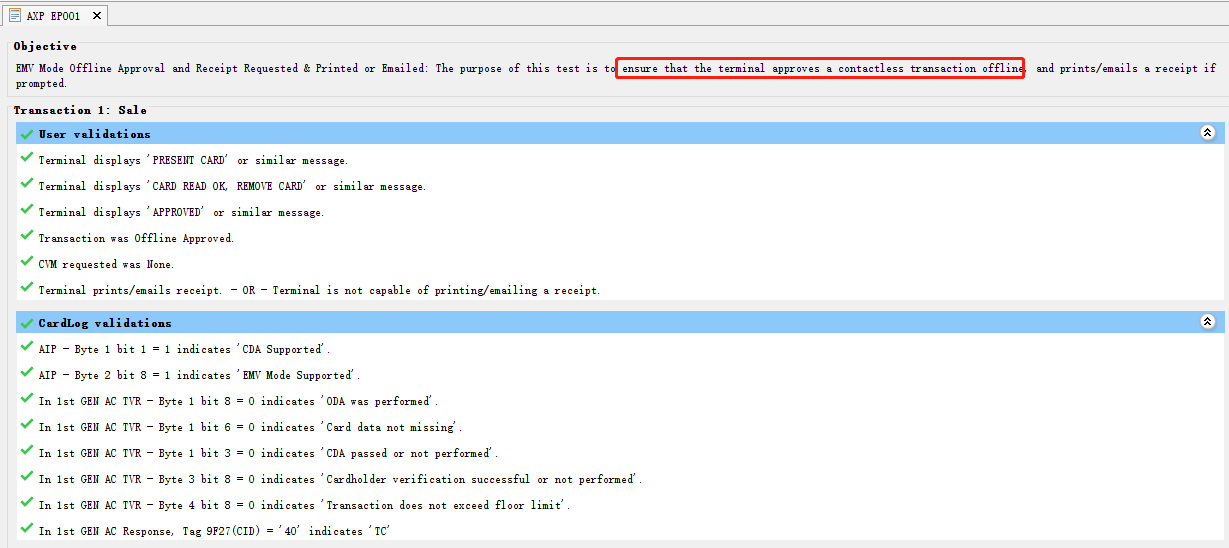
## Global Expresspay EP4.0 3.0

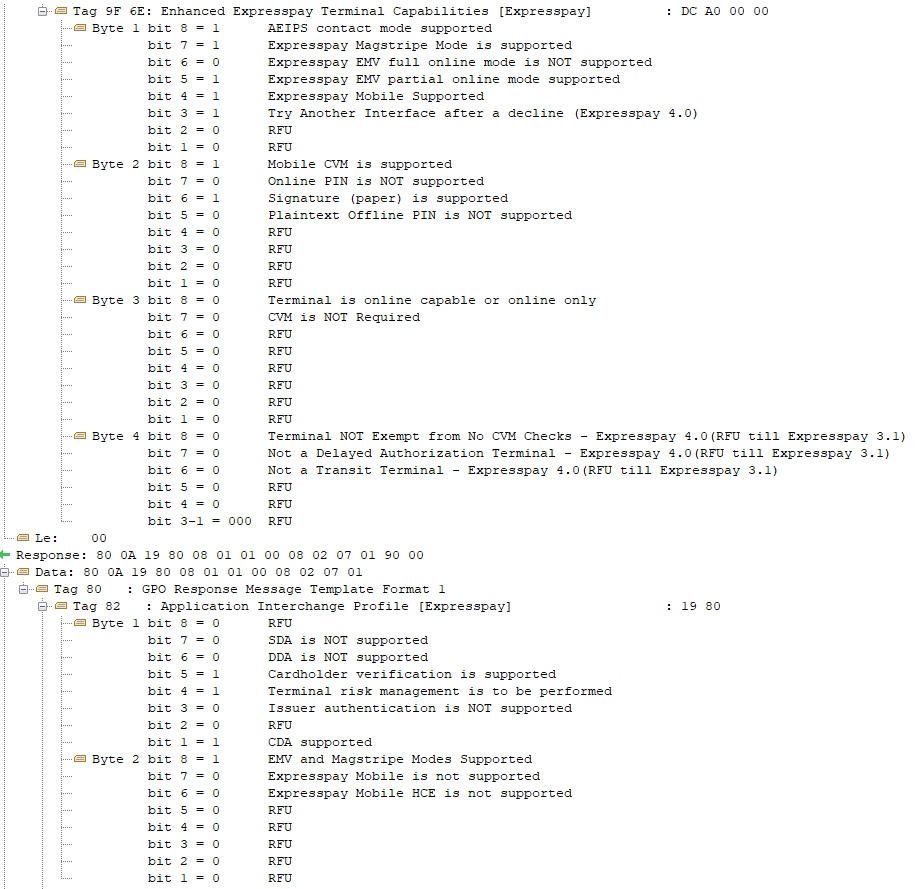
### AXP EP001

Enter amount 6.01

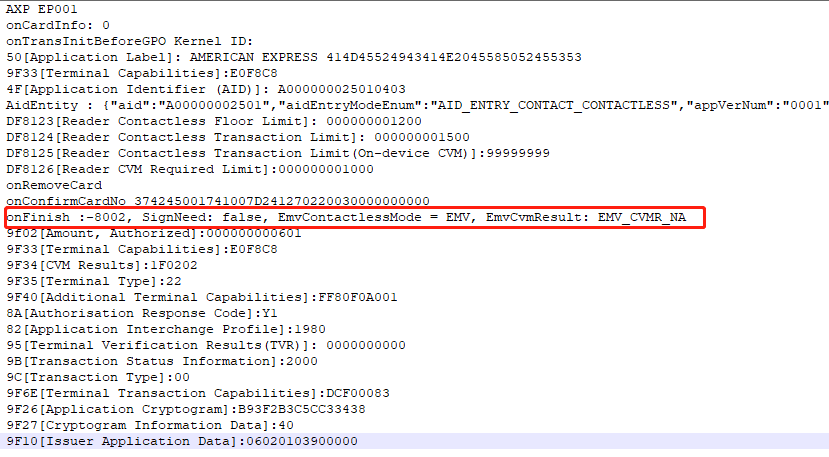


Test Report:



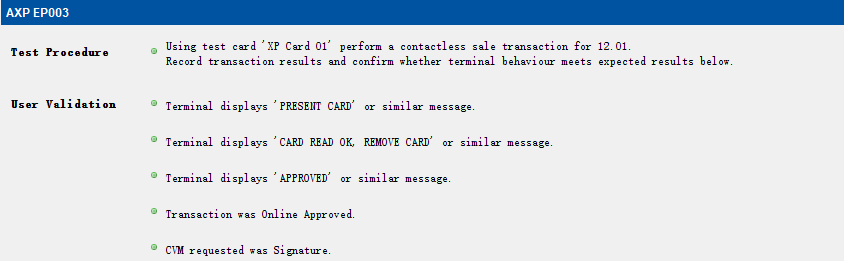


Android logcat:

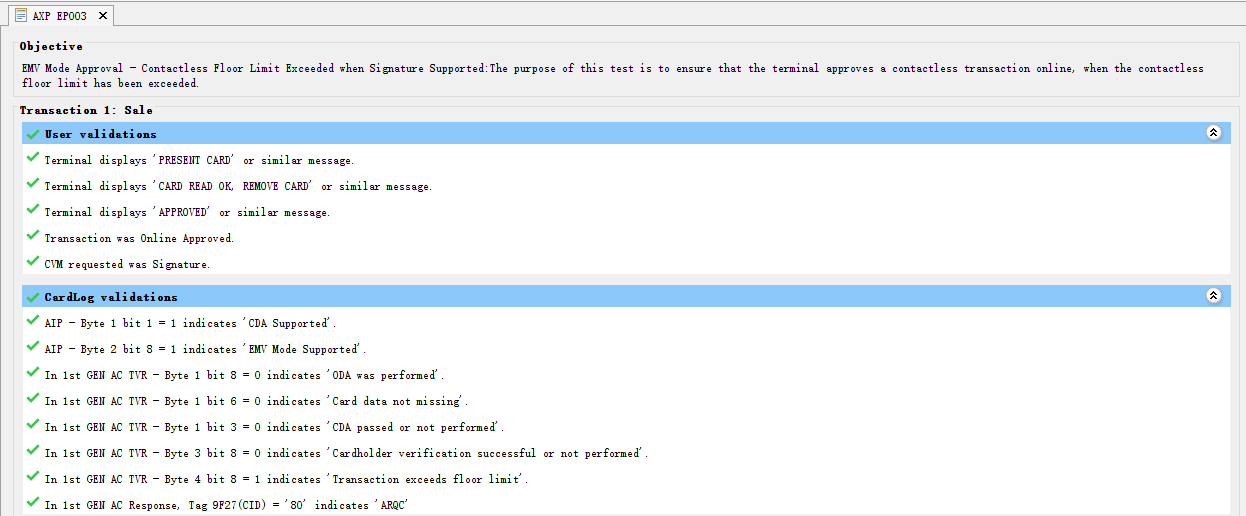


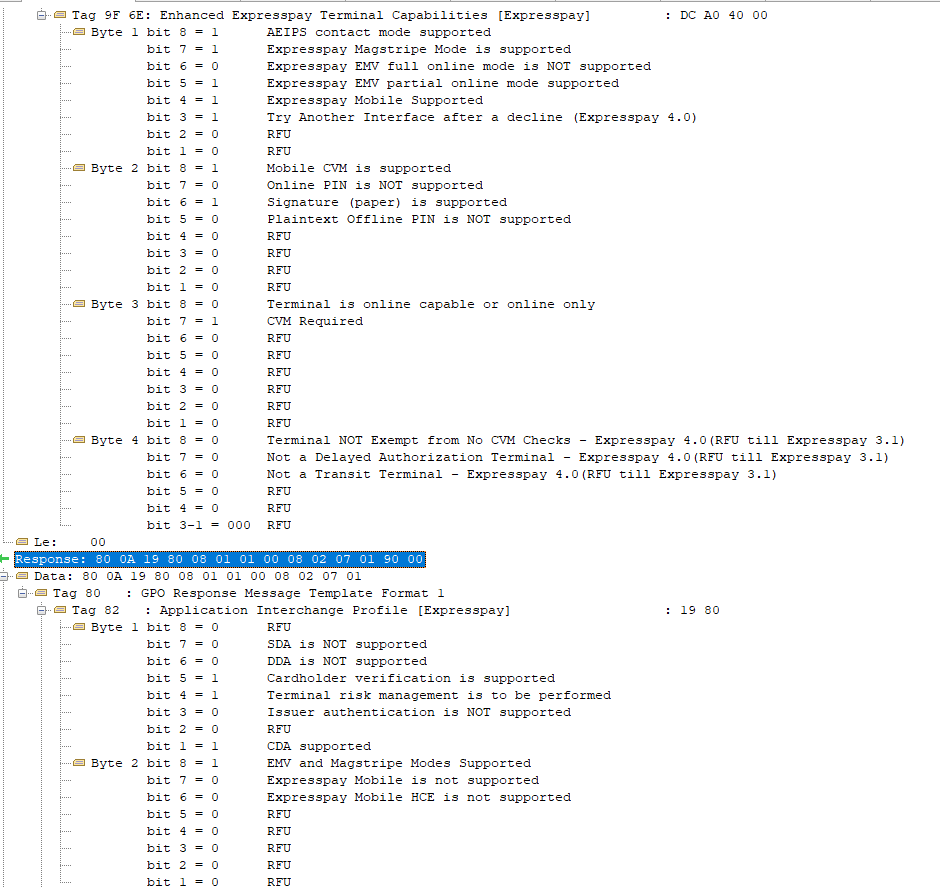
### AXP EP003

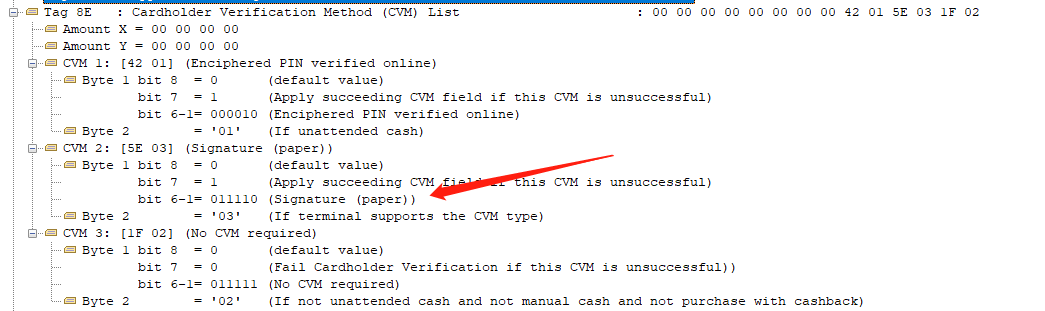
Enter amount 12.01



Test Report:



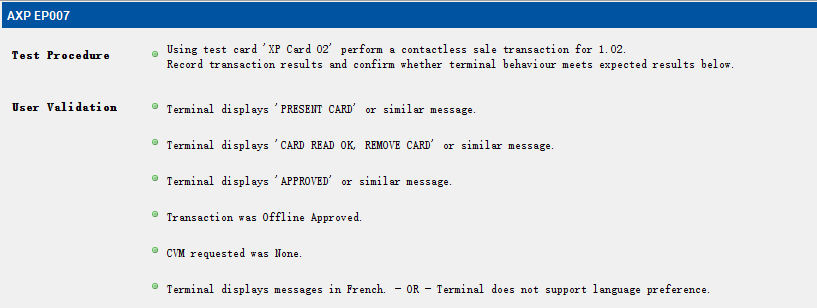




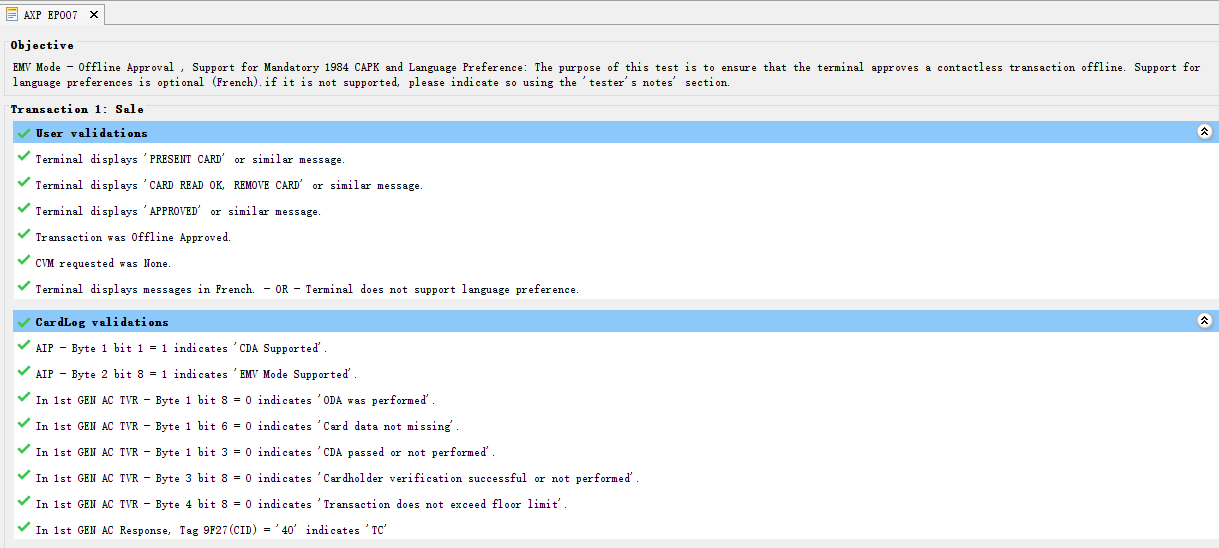
Android Logcat:

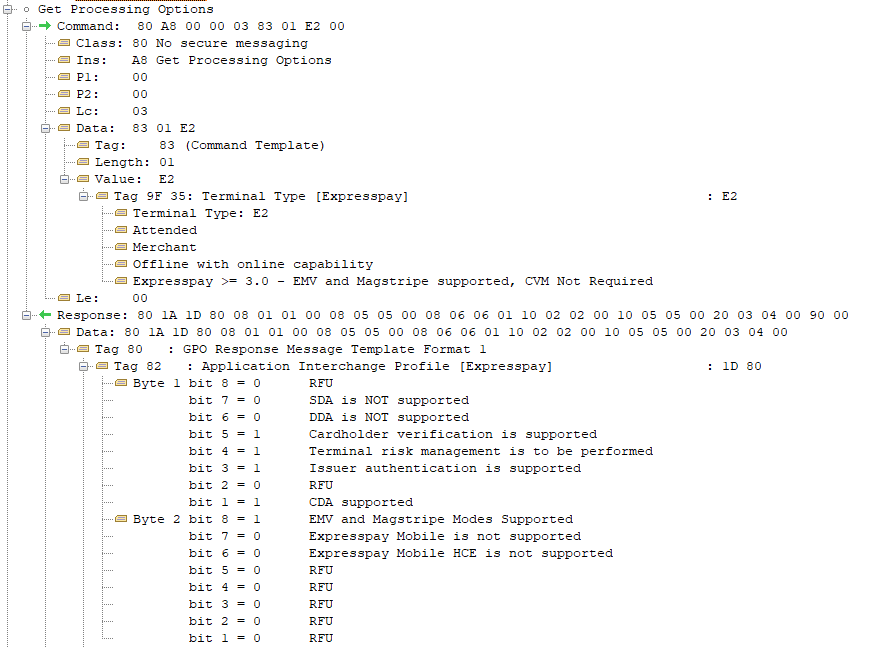


### AXP EP007

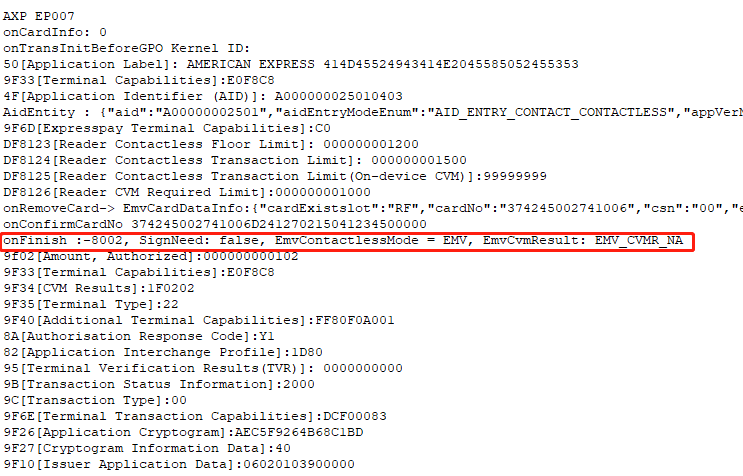


Test Report:



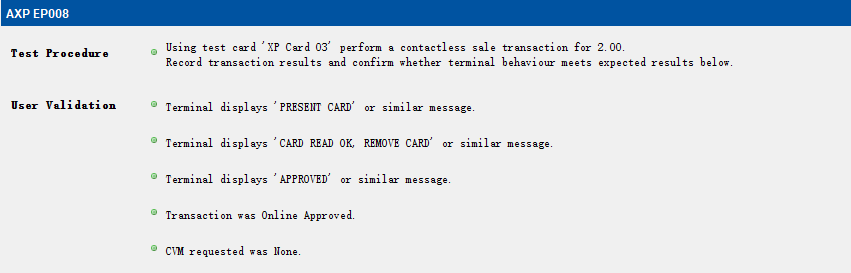


Android Logcat:

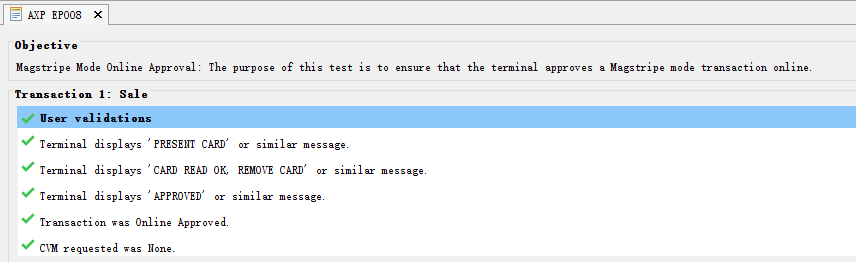


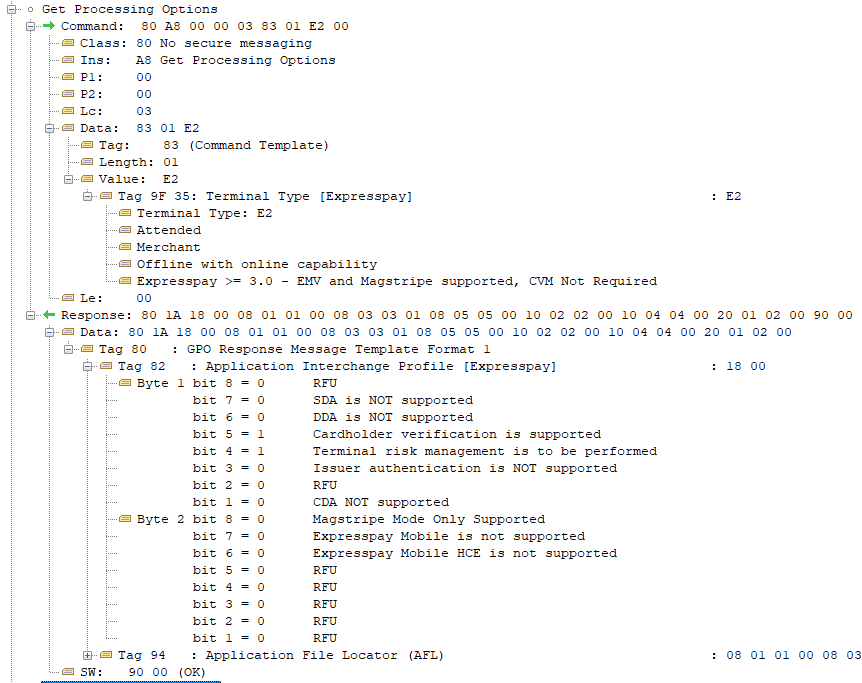
### AXP EP008

Enter amount 2.00



Test Report:



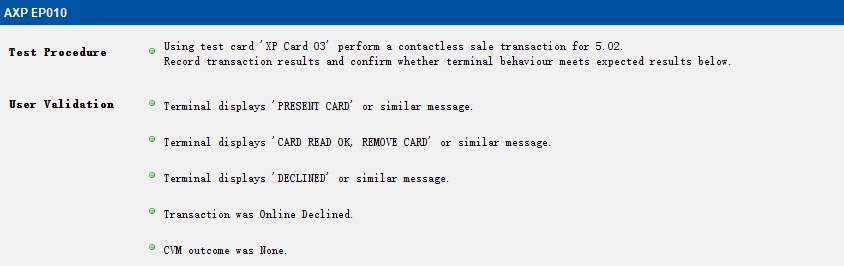


Android Logcat:

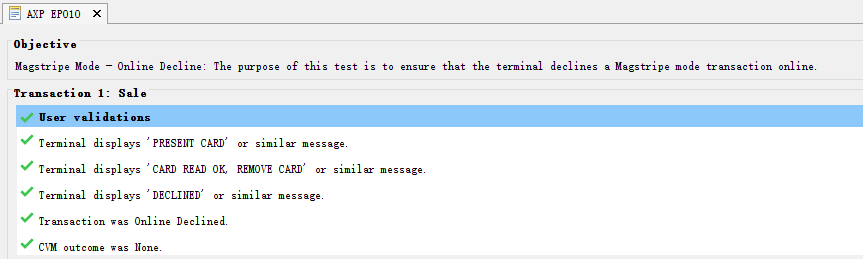


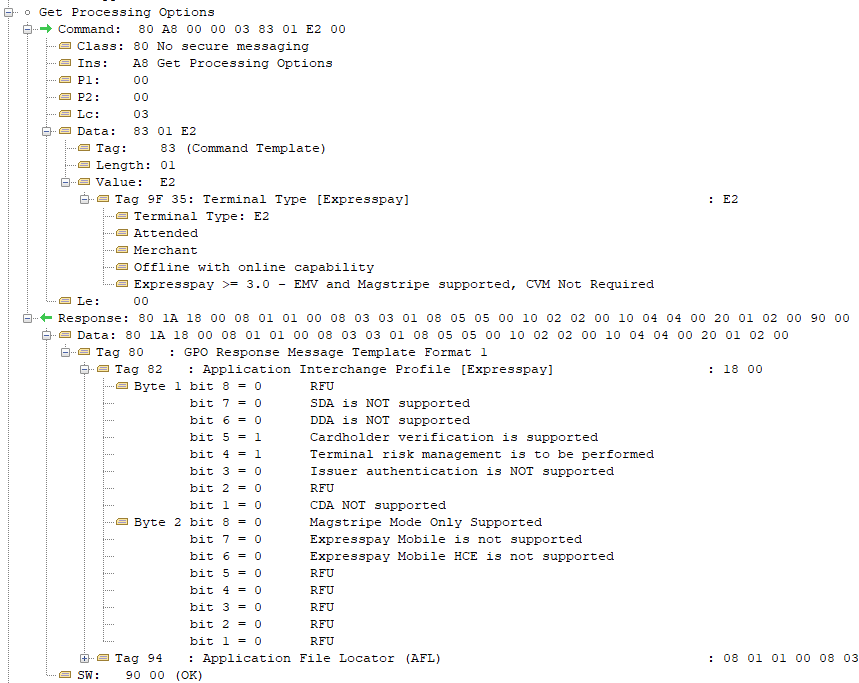
### AXP EP010

Enter Amount 5.01



Test Report:



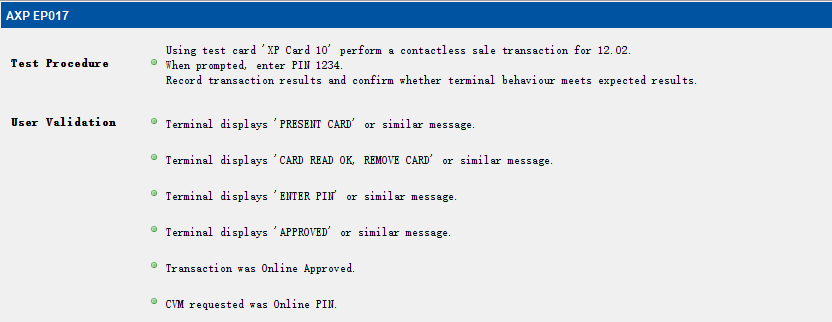


Android logcat:

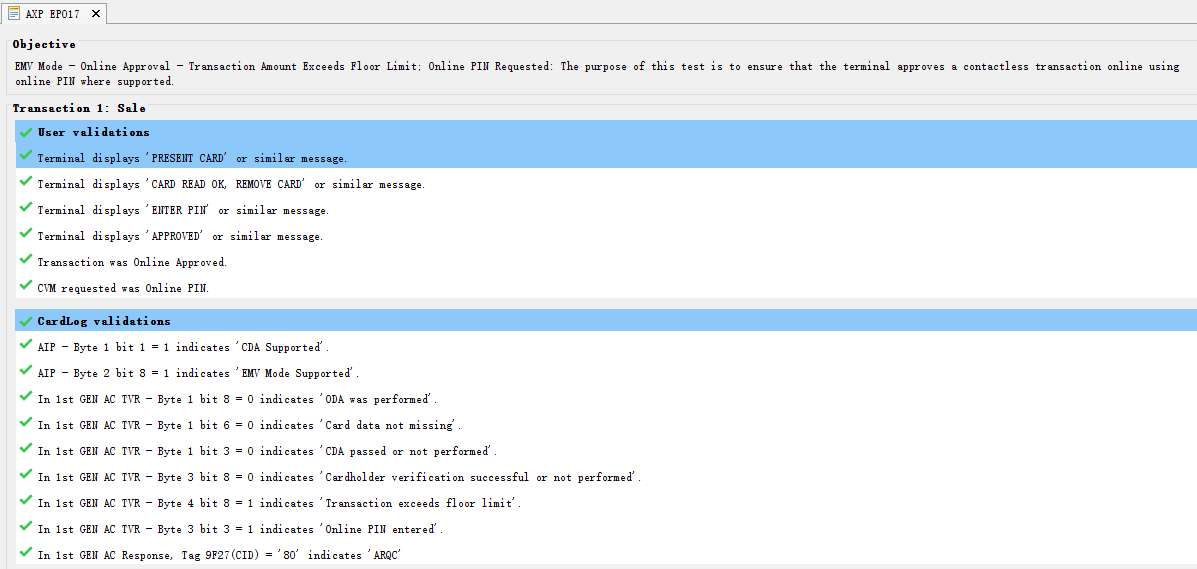


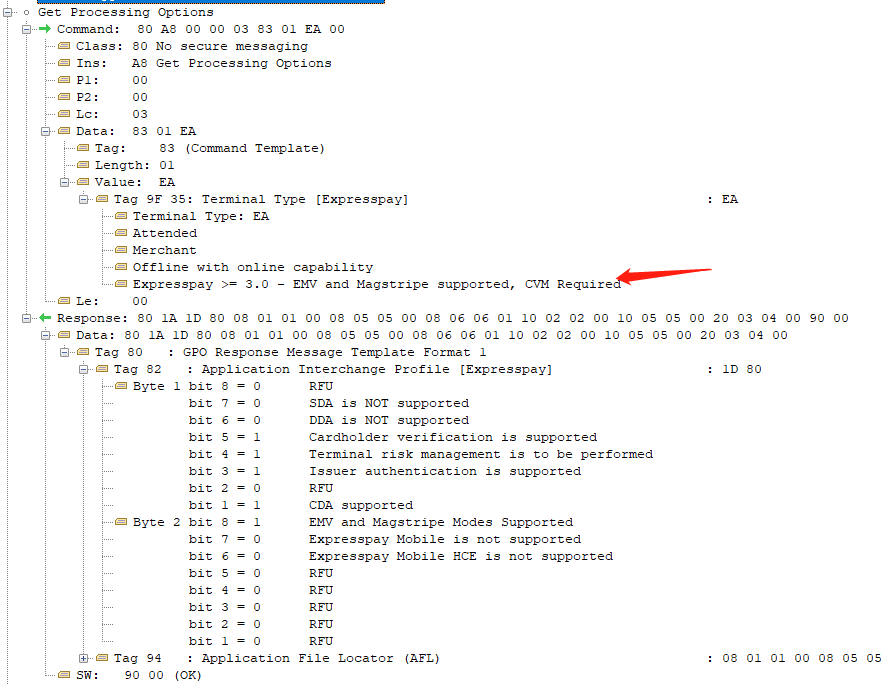
### AXP EP017

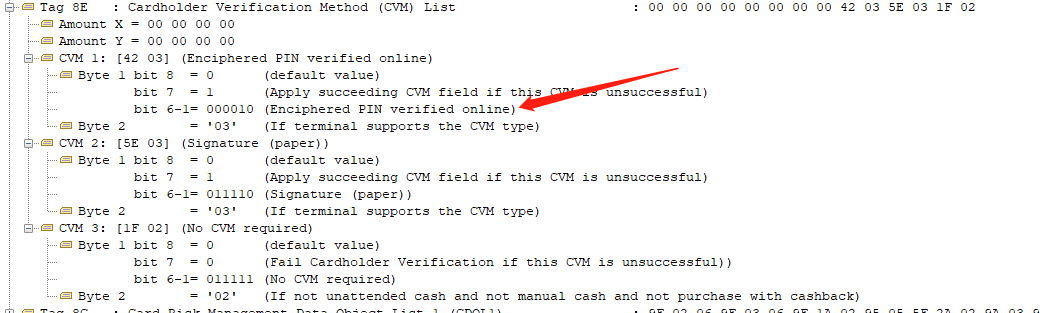
Enter amount 12.02



Test Report:





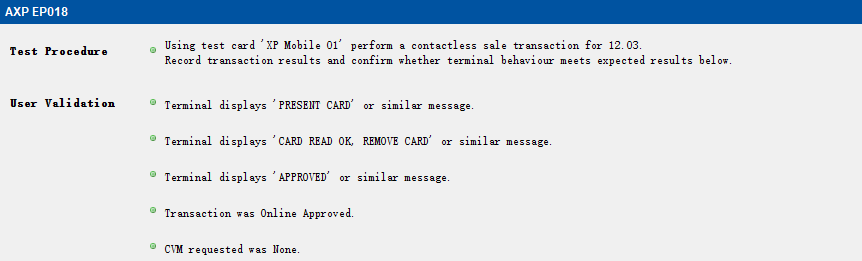


Android logcat:

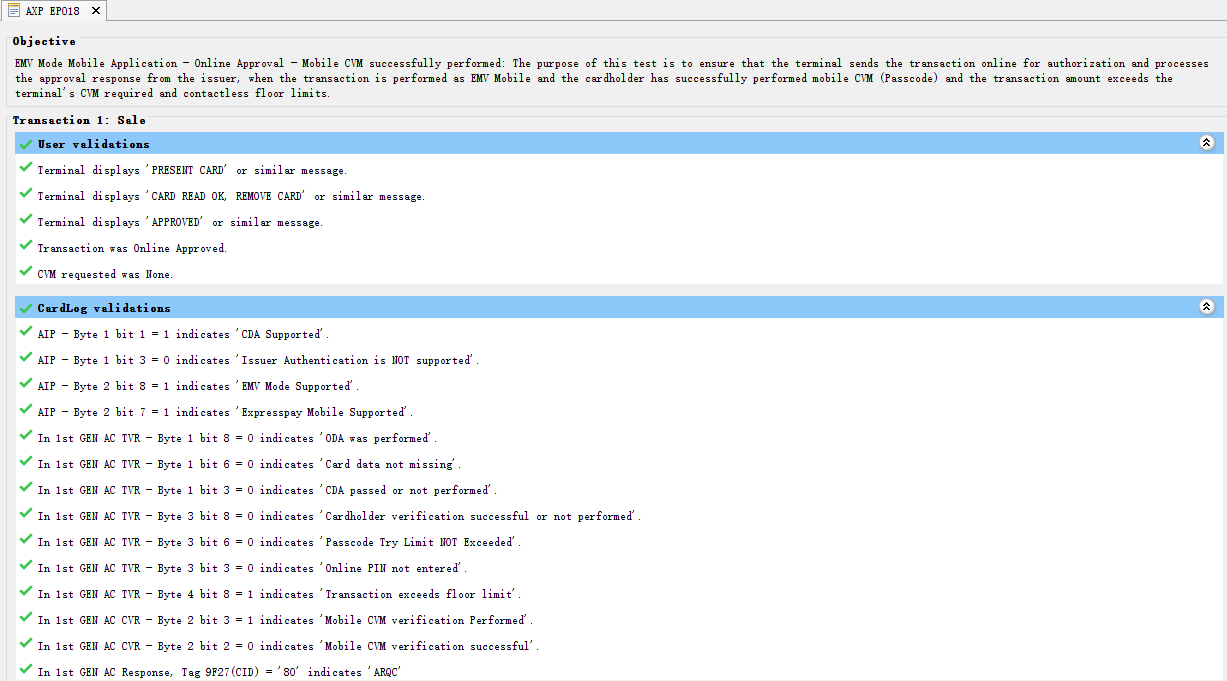


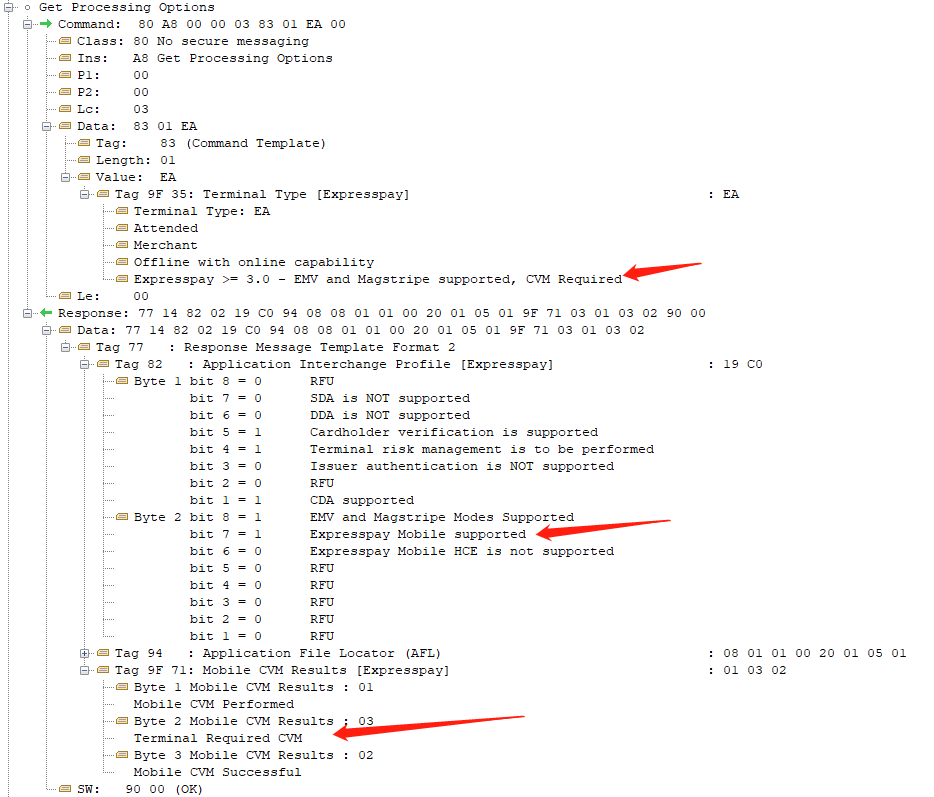
### AXP EP018

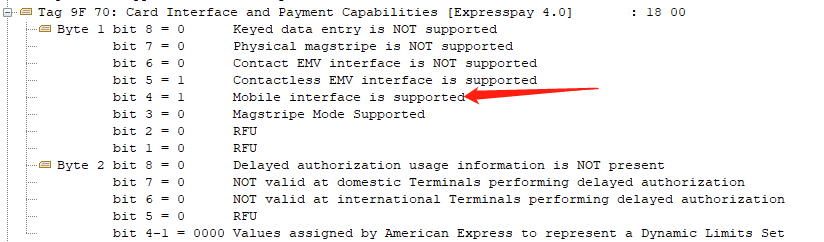
Enter amount 12.03



Test report:





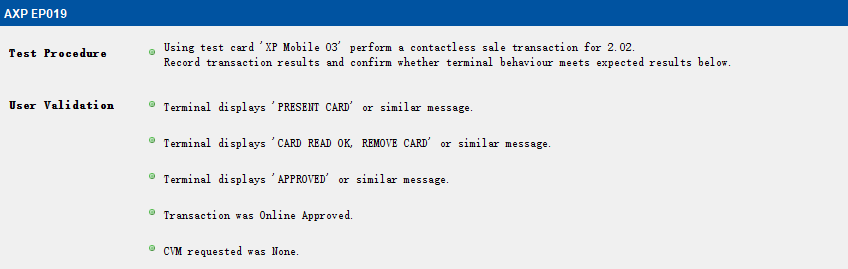


Android logcat:

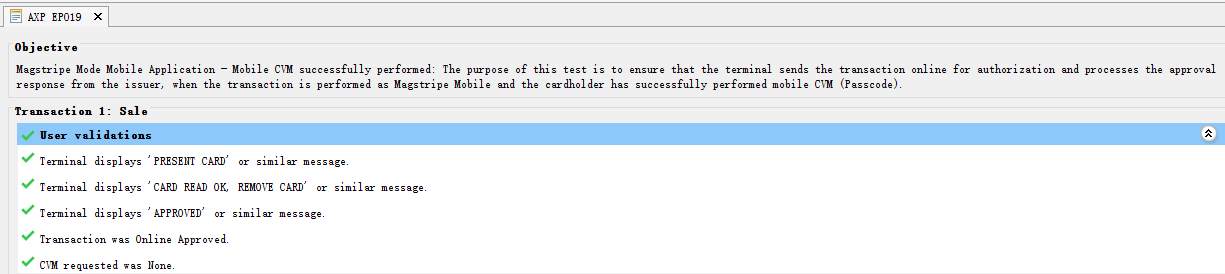


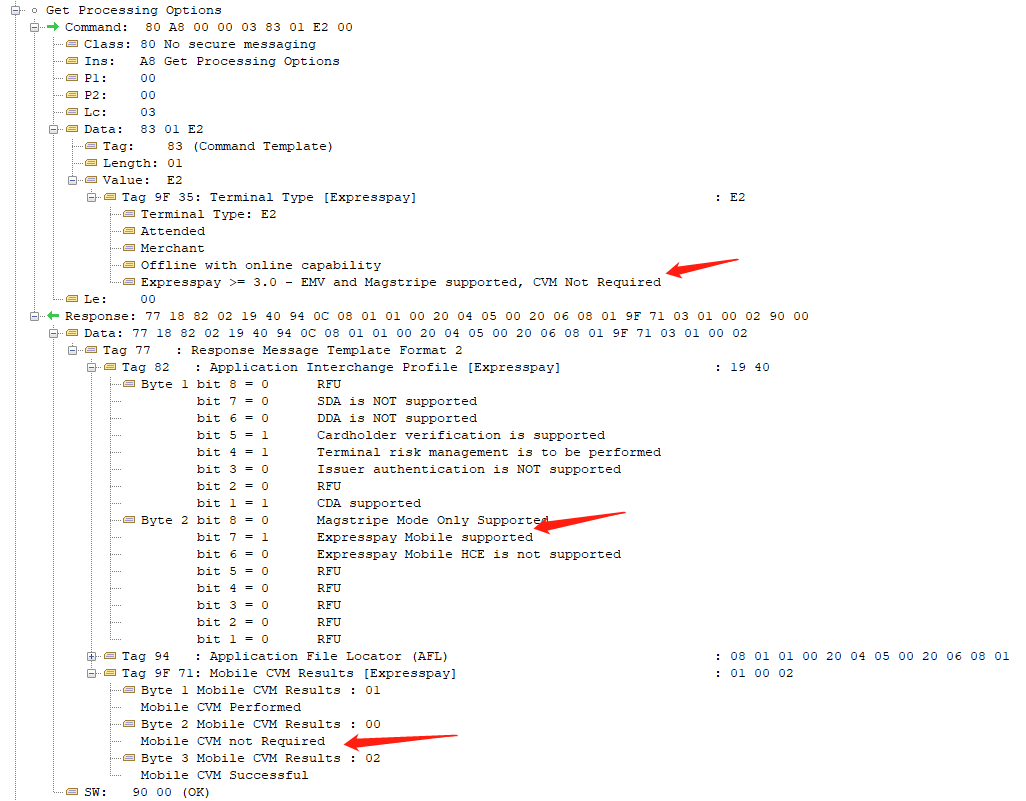
### AXP EP019

Enter amount 2.02



Test Report:



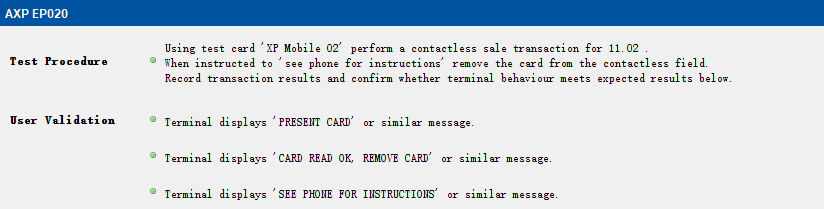


Android logcat:

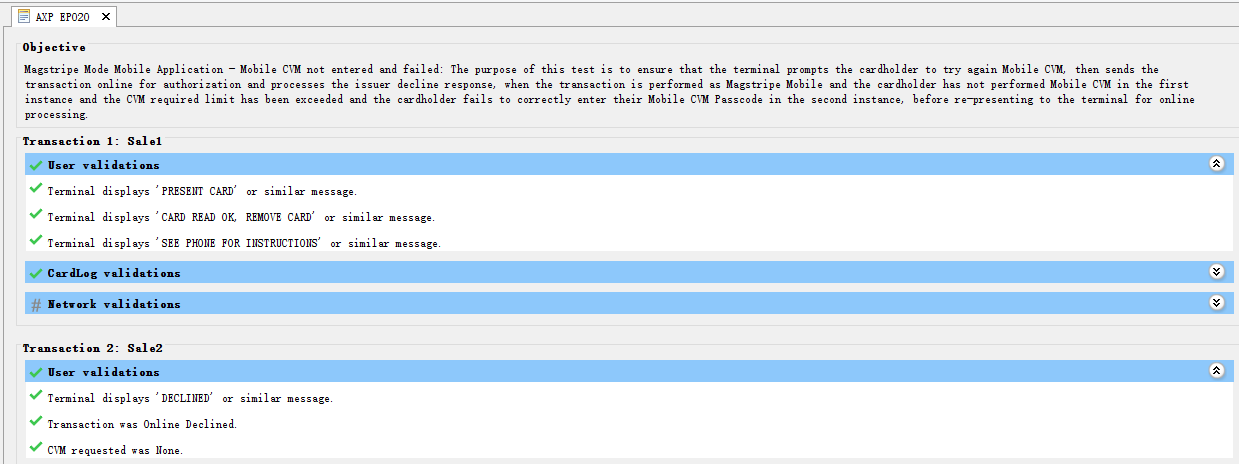


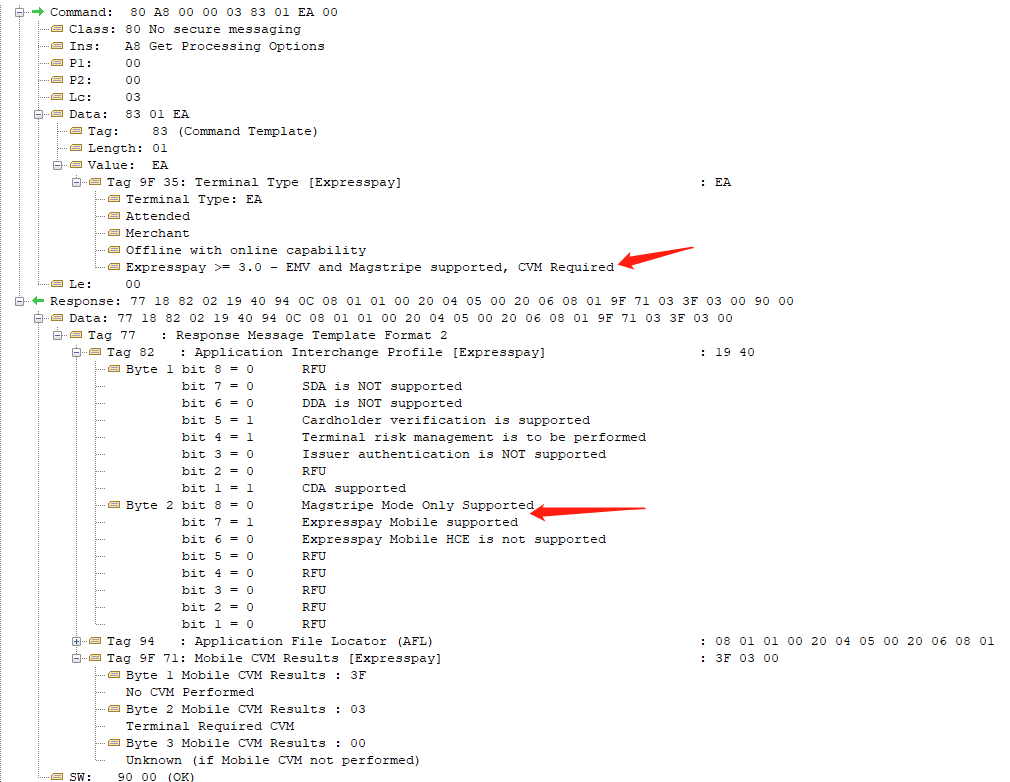
### AXP EP020

Enter amount 11.02

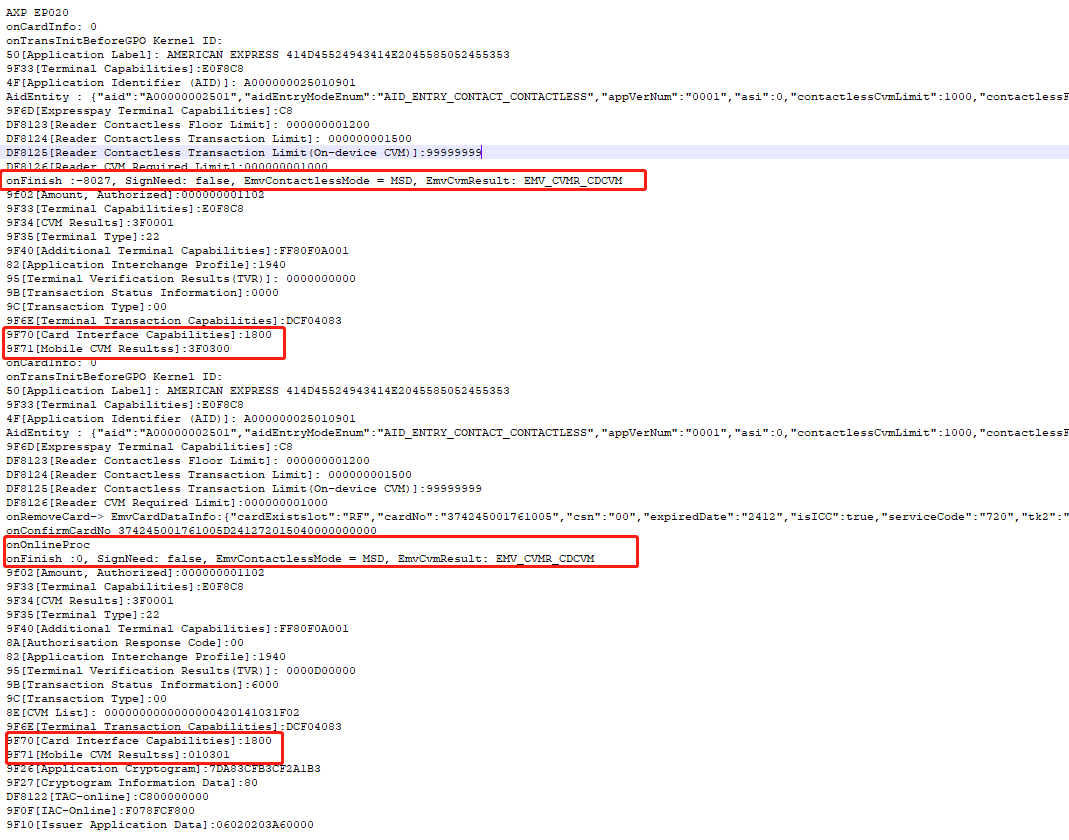


Test report:



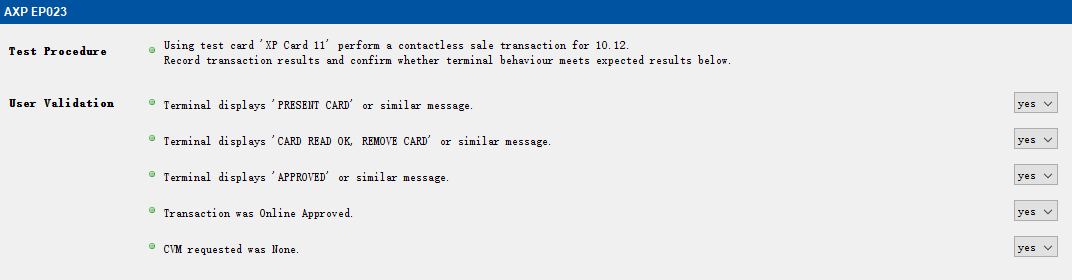


Android logcat:

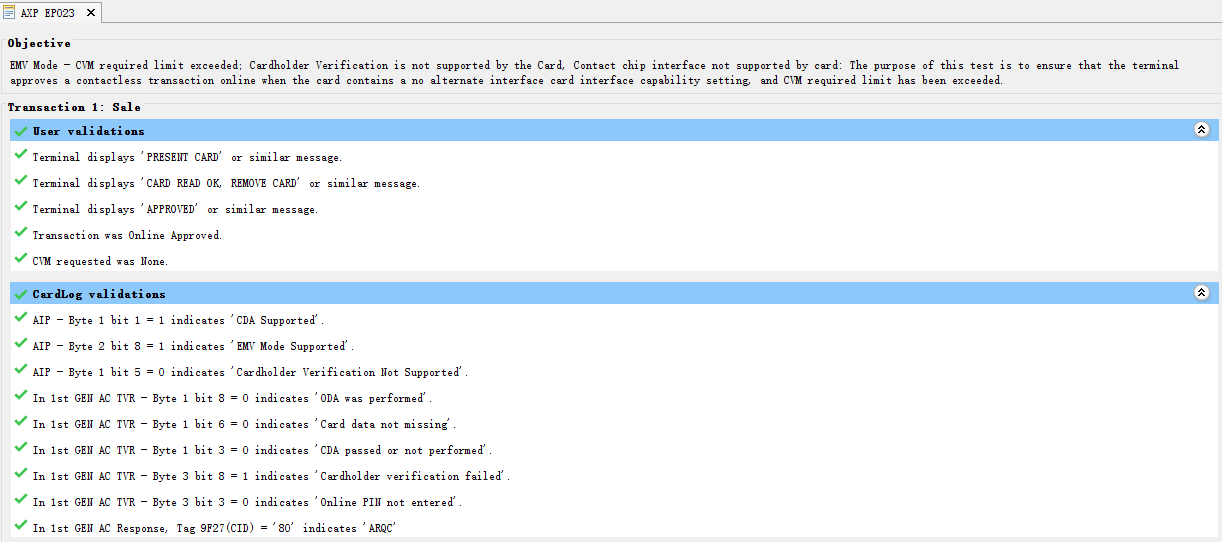


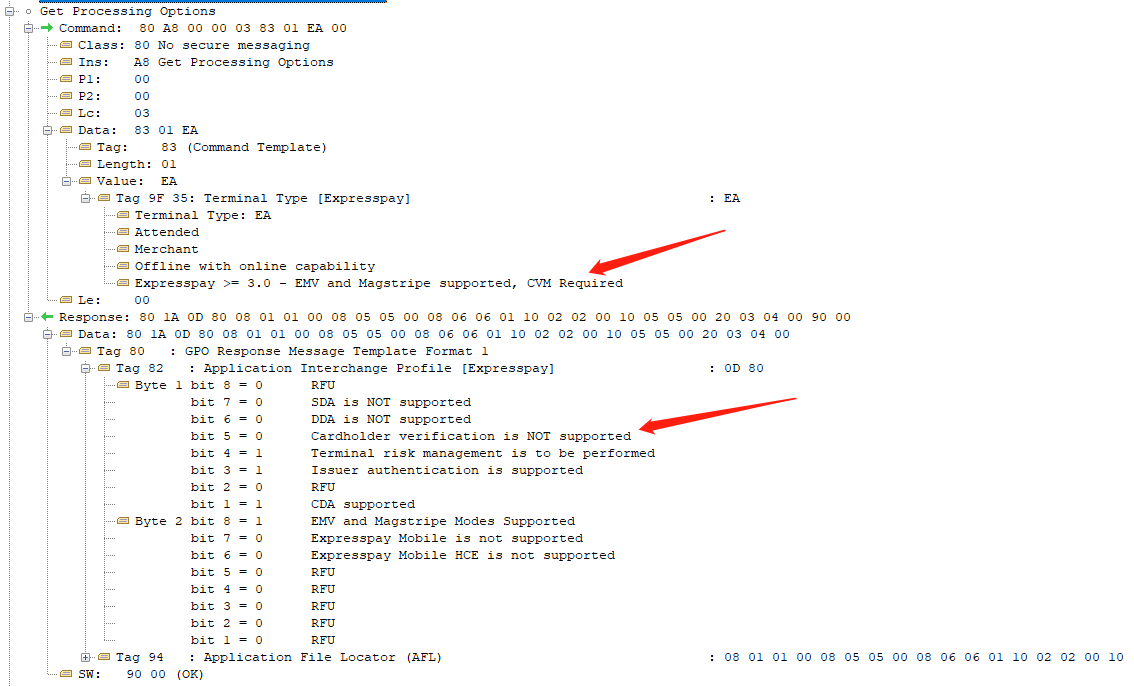
### AXP EP023

Enter amount 10.02:

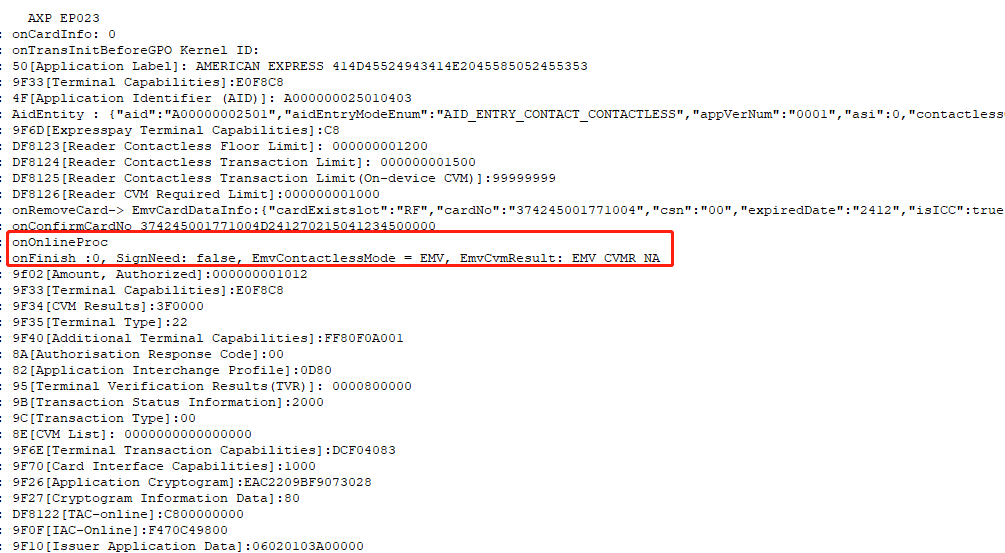


Test report :



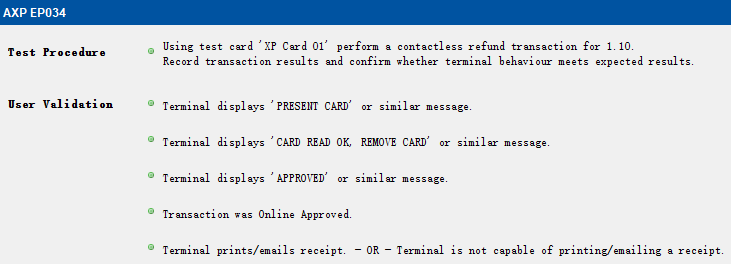


Android logcat:

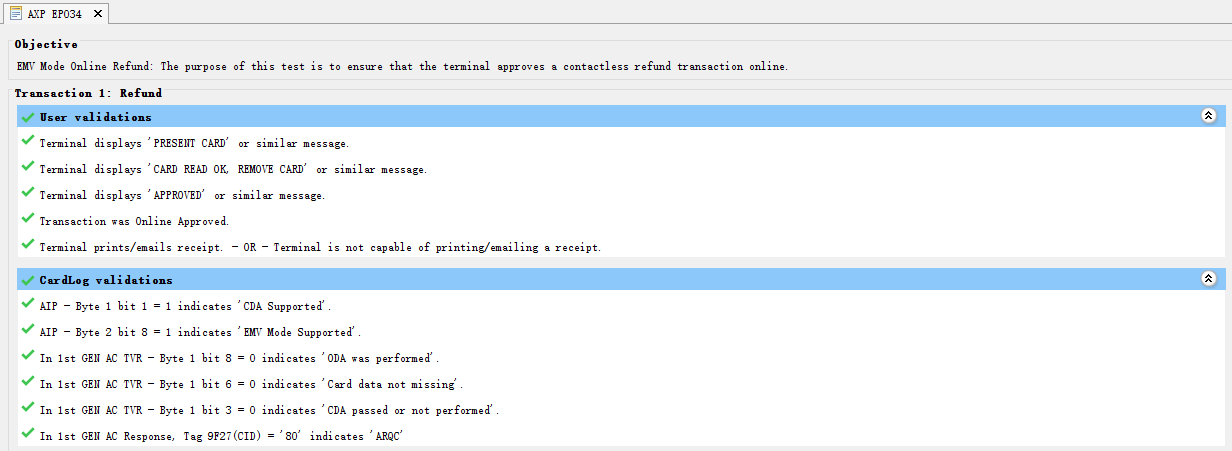


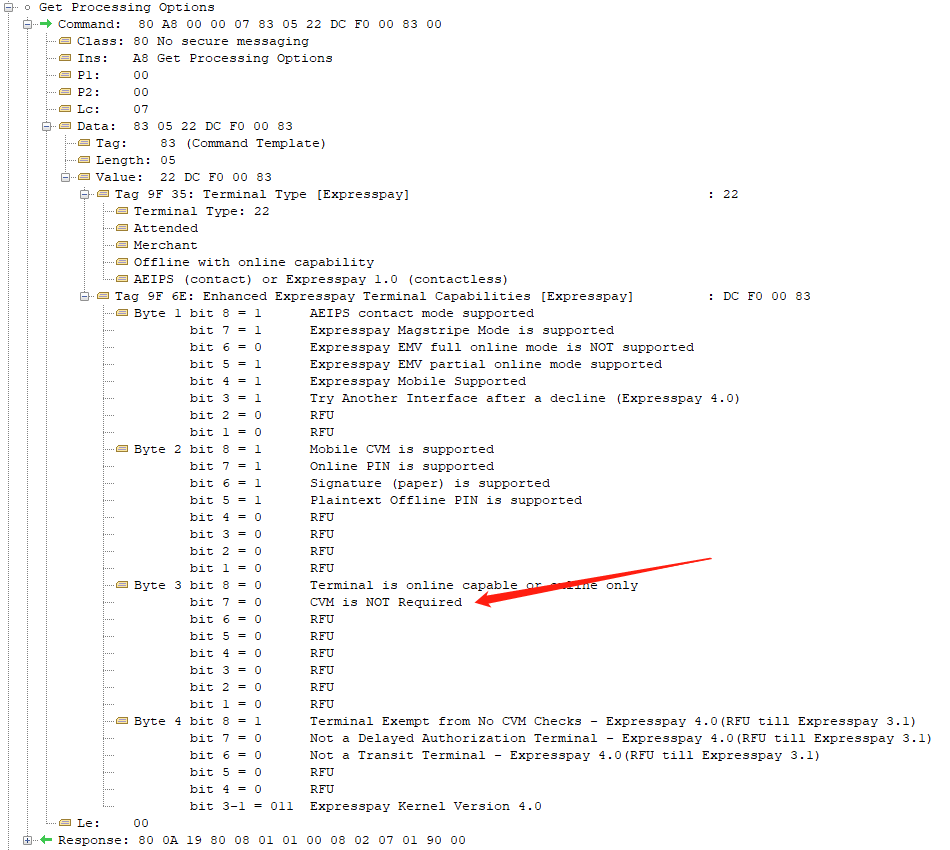
### AXP EP034

Enter refund amount 1.10:

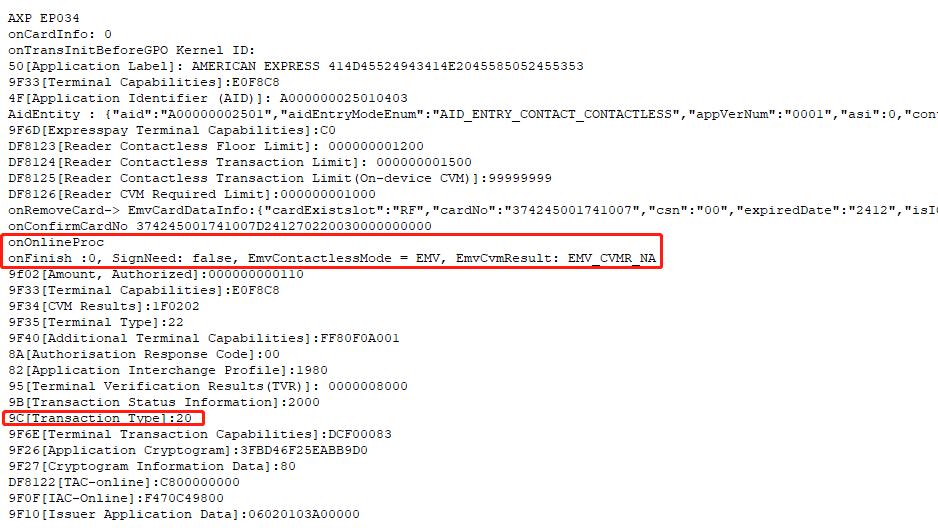


Test Report:



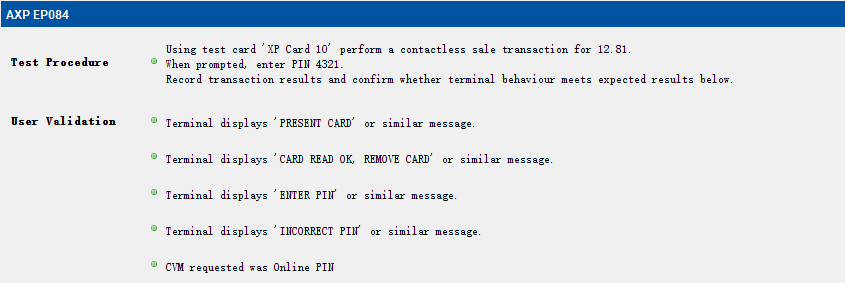


Android logcat:

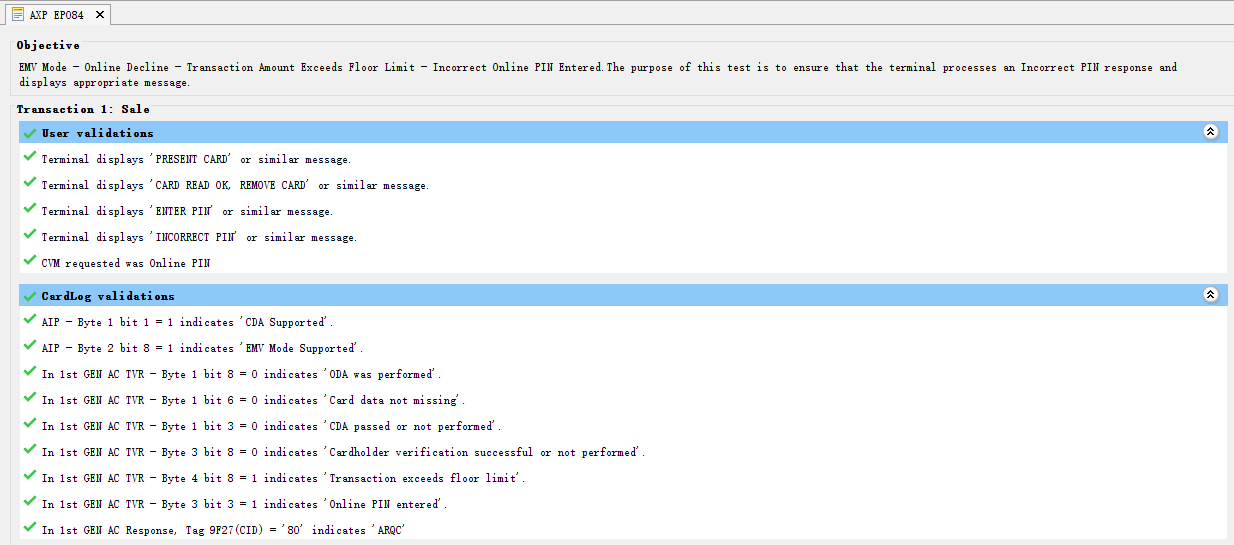


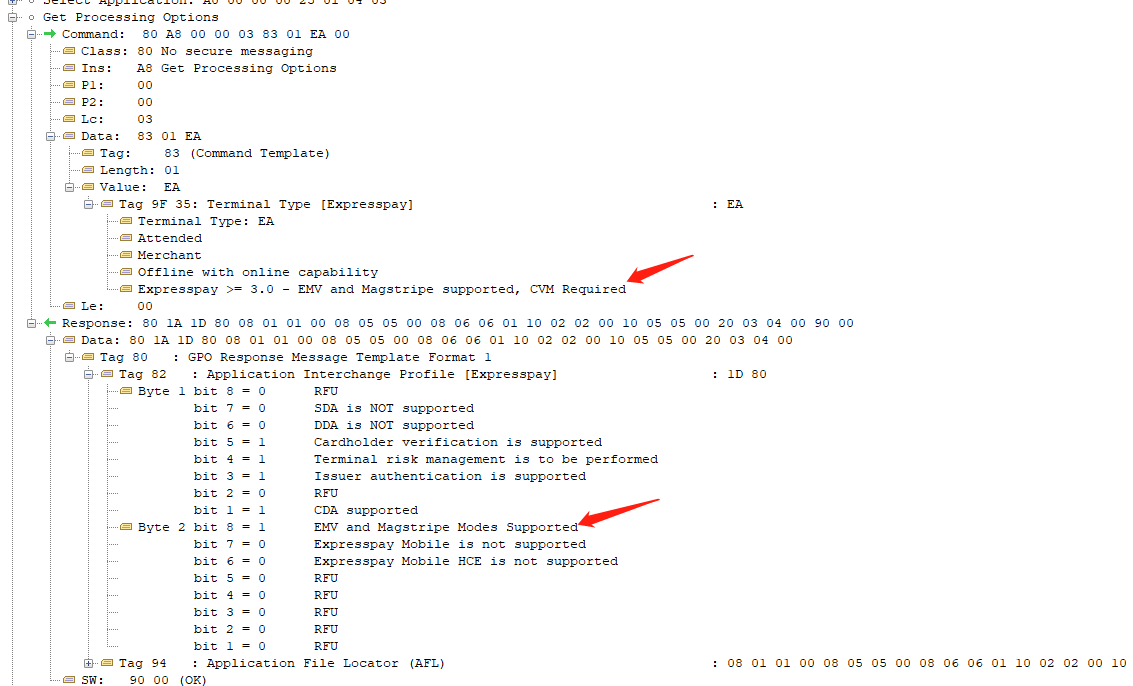
### AXP EP084

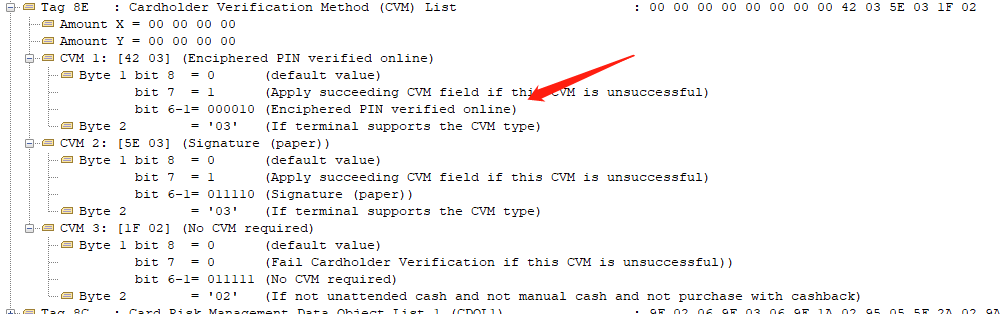
Enter amount 12.81



Test report:





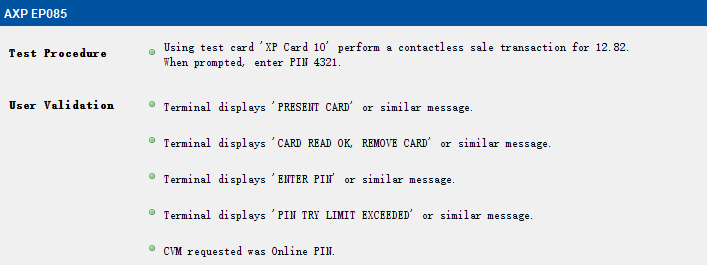


Android logcat:

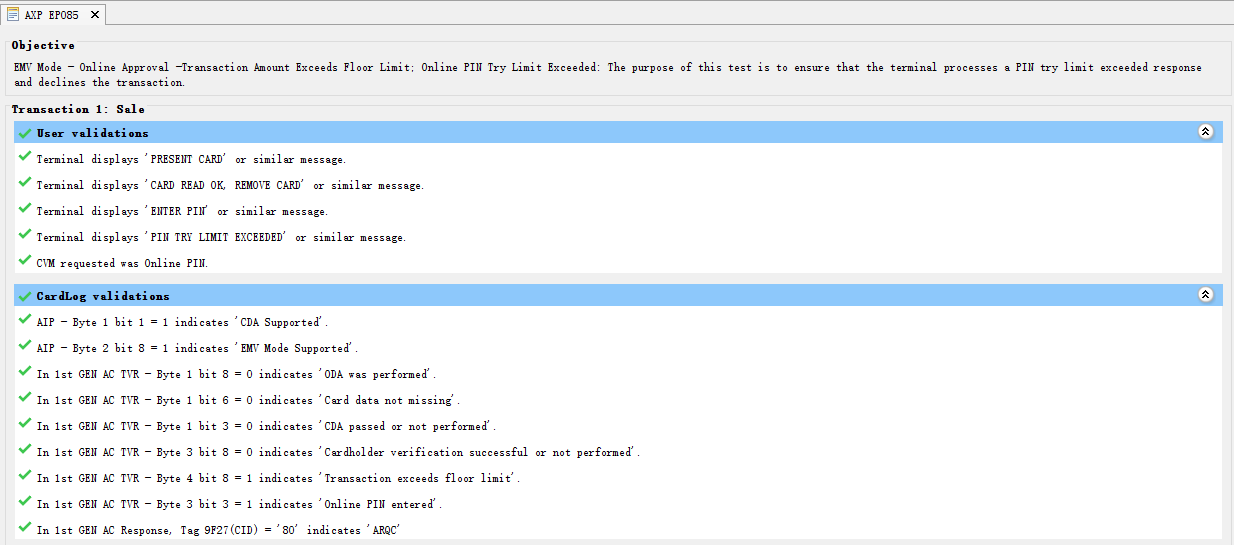


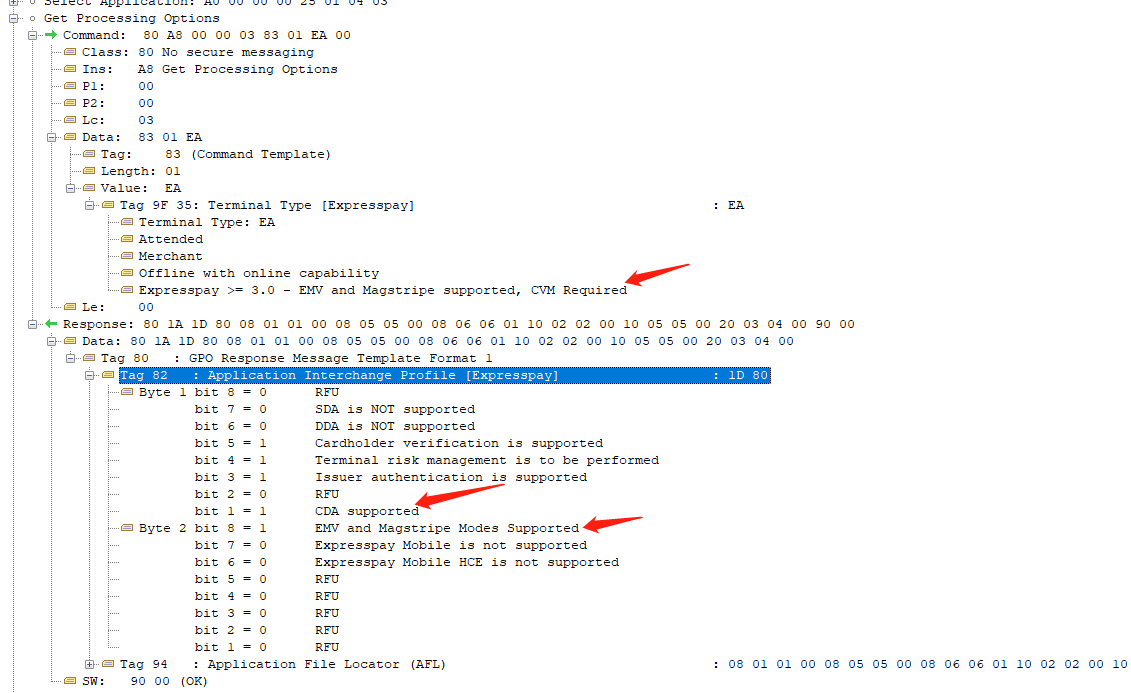
### AXP EP085

Enter amount 12.82:



Test report:



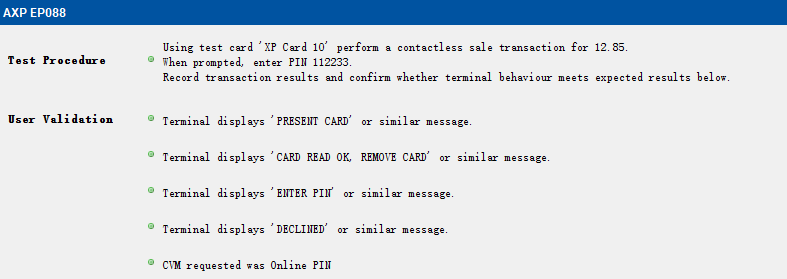


Android logcat:

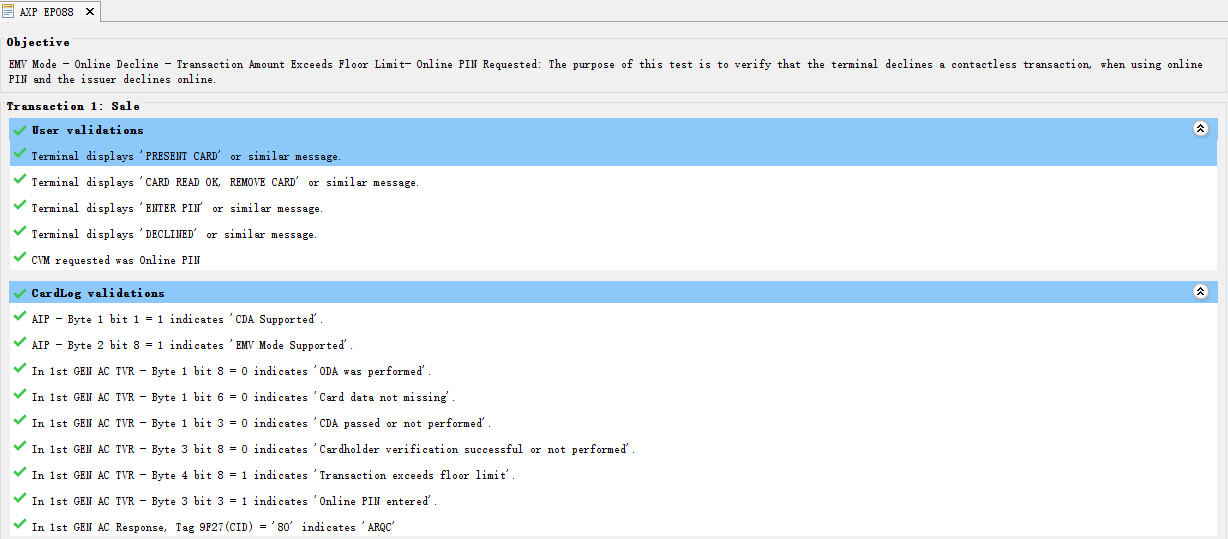


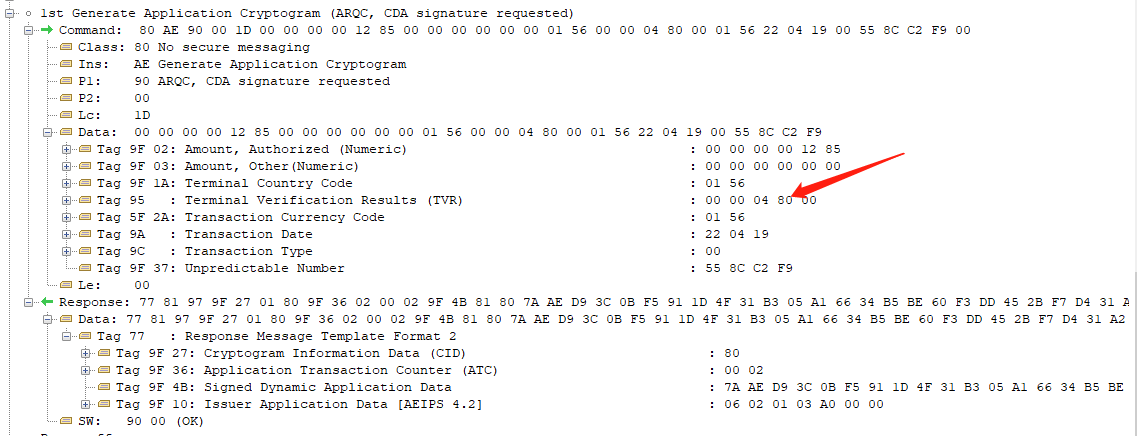
### AXP EP088

Enter amount 12.85



Test report:



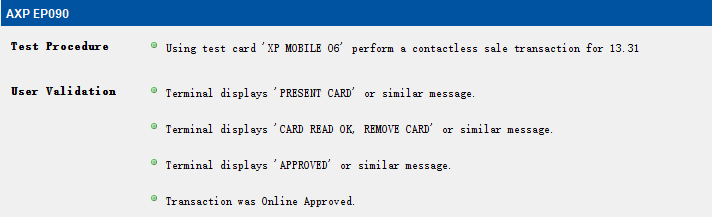


Android logcat:

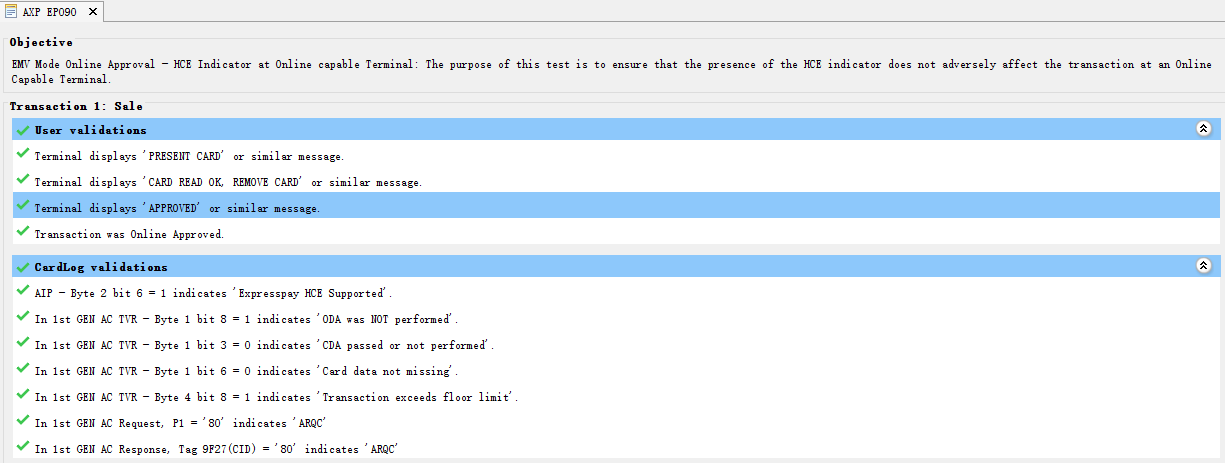


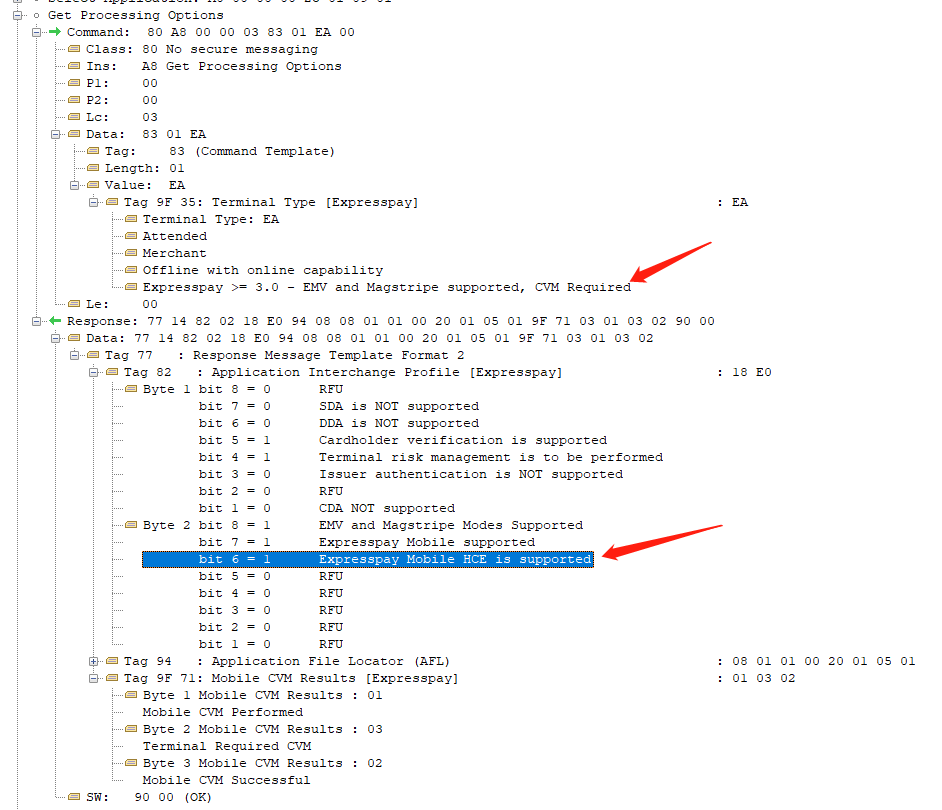
### AXP EP090

Enter amount 13.31

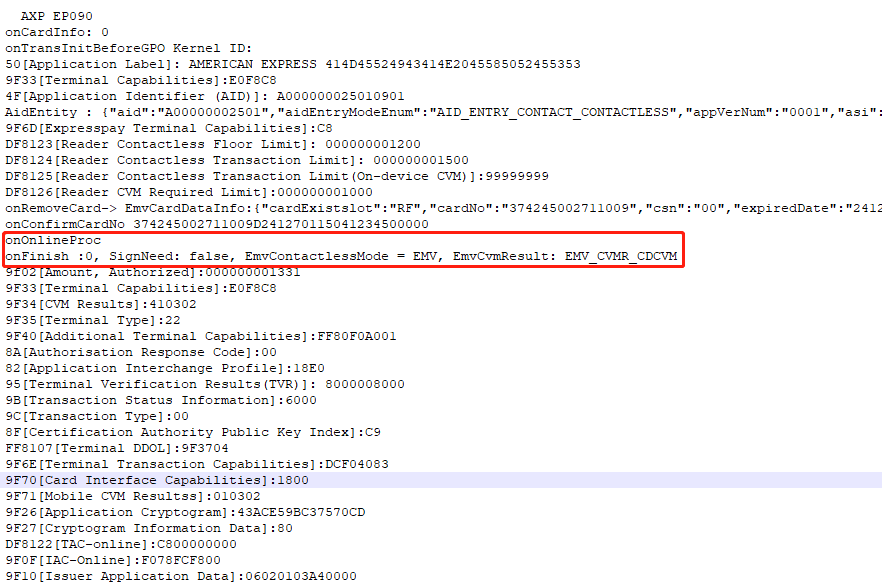


Test report:



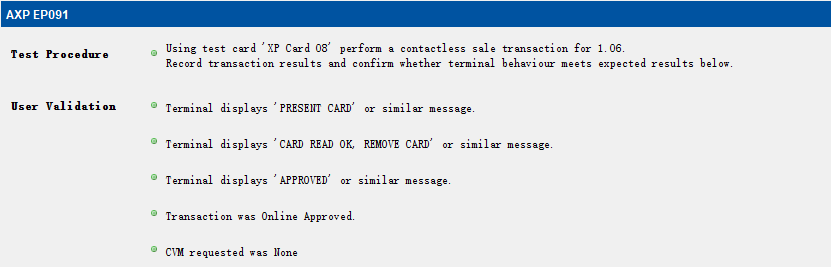


Android logcat:

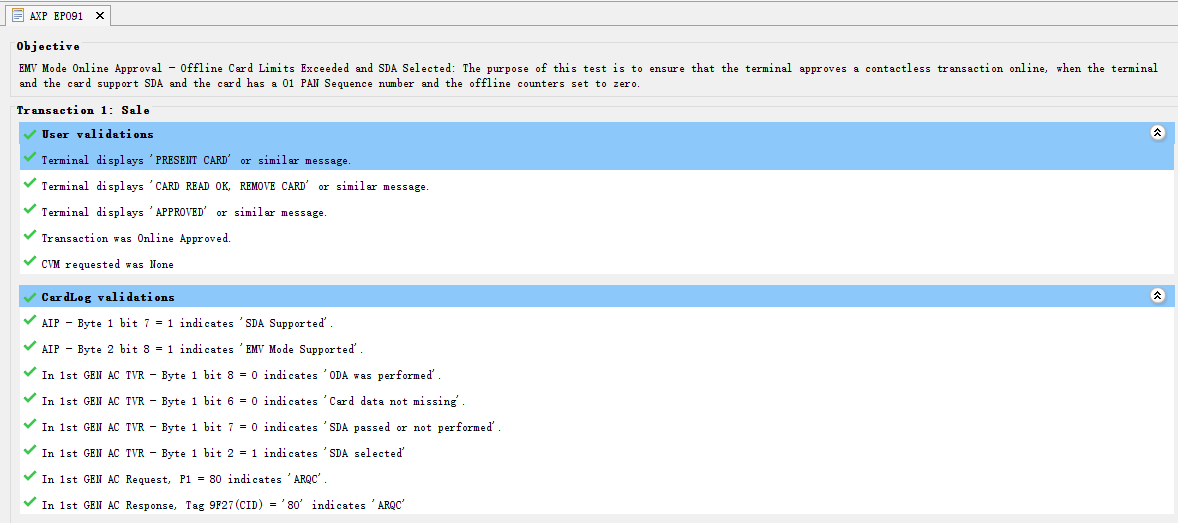


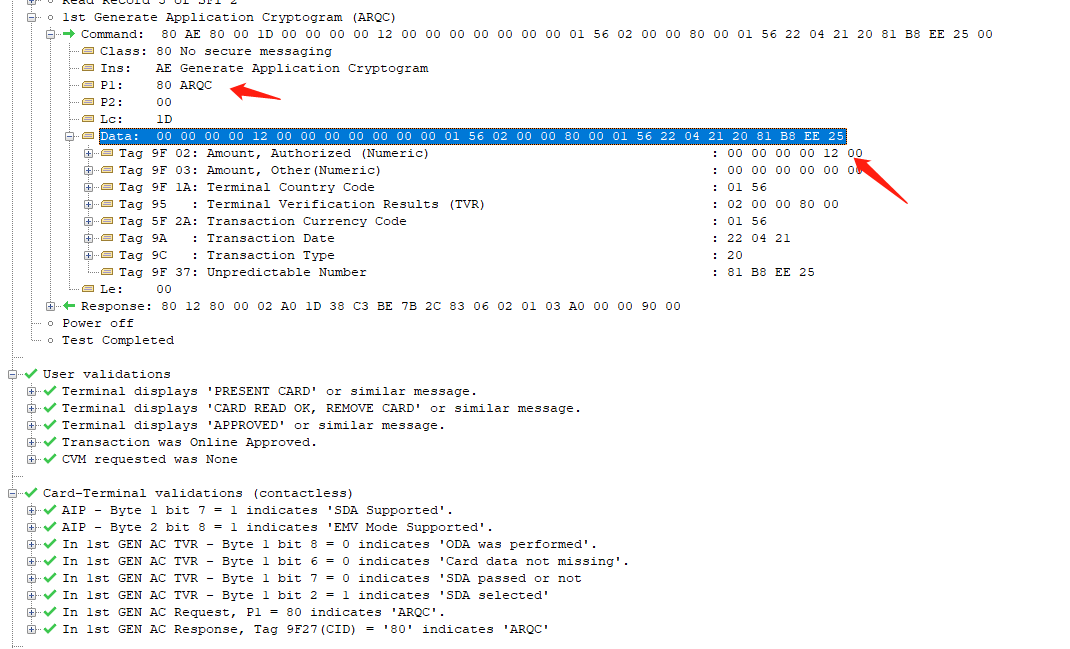
### AXP EP091

Enter amount 1.06



Test report:





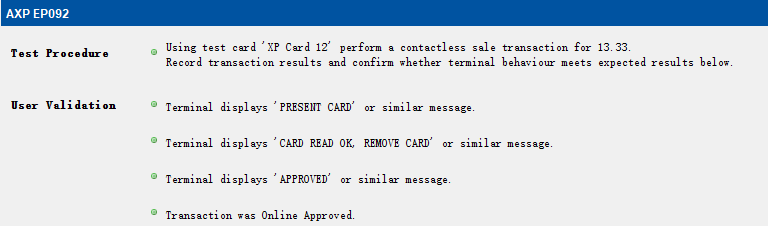
Android logcat:



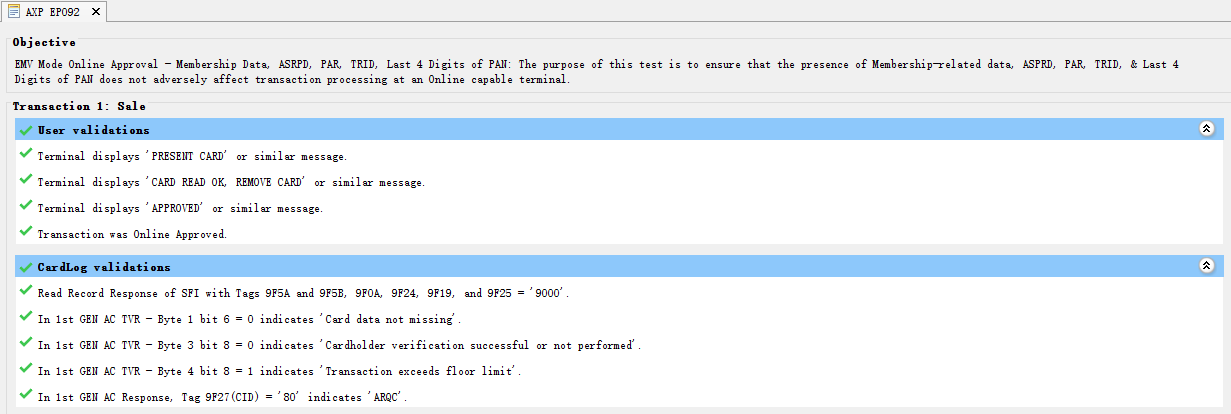
Note: request ARQC casued by SDA selected even floow limit not exceeded.

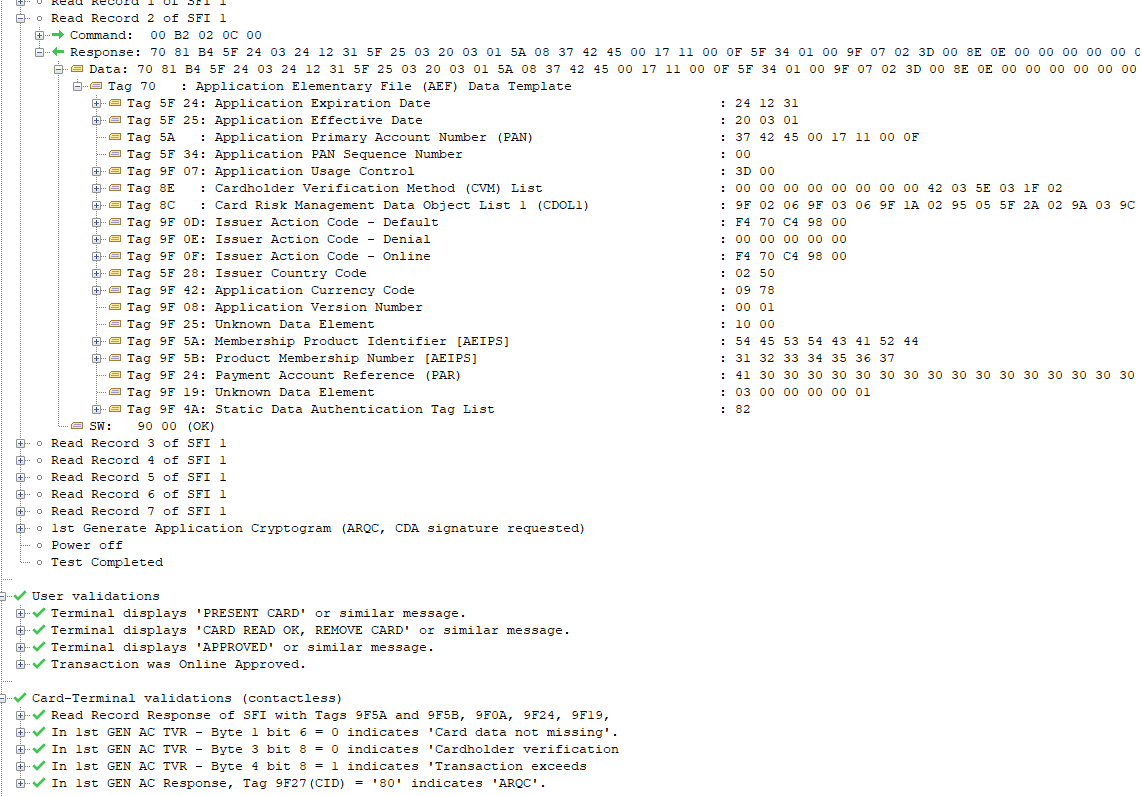
### AXP EP092

Enter amount 13.33



Test report:



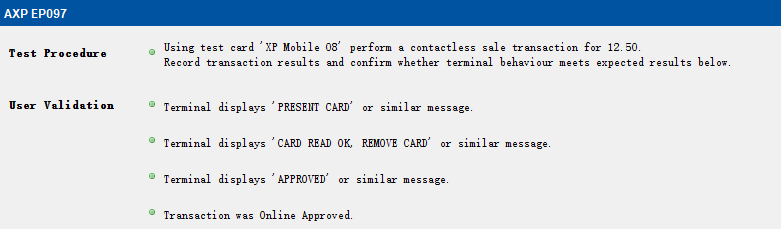


Android logcat:

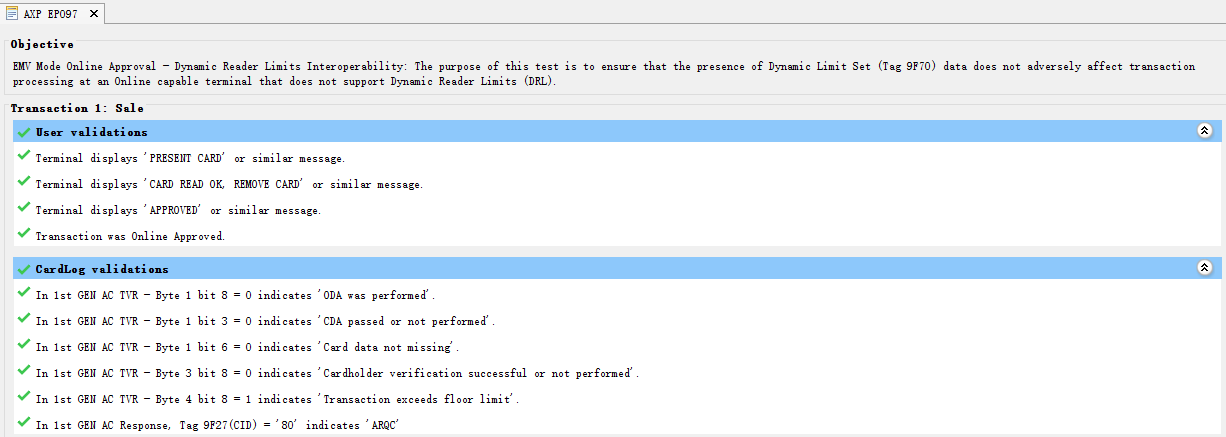


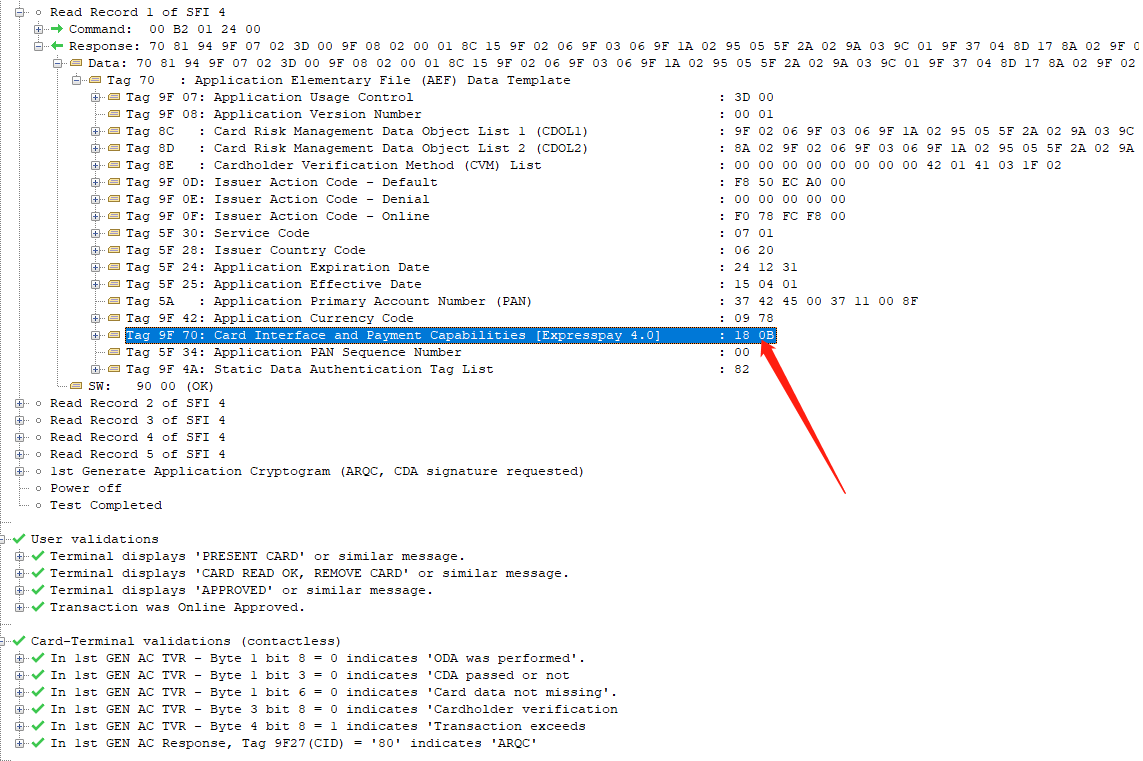
### AXP EP097

Enter amount 12.50



Test report:





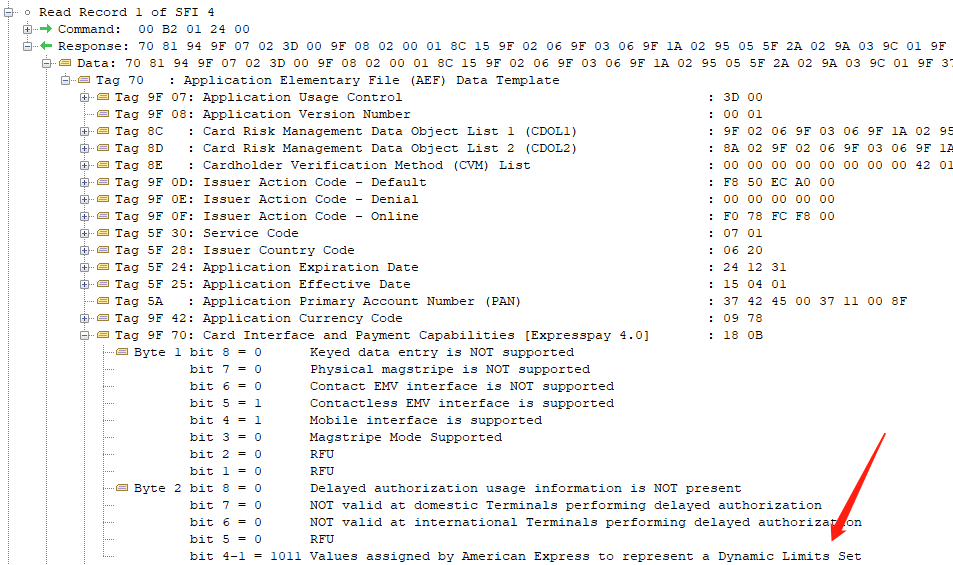
Android logcat:



# 4 FAQ

## 4.1 How to identify the card is DRL supported ?

Check tag 9F70 byte 2.



## 4.2 How to set DRL for expresspay ?

DynamicReaderLimitEntity defaultDynamicReaderLimitEntity = new DynamicReaderLimitEntity();

defaultDynamicReaderLimitEntity.setAppProgID(new byte[]{(byte) 0xFF});

defaultDynamicReaderLimitEntity.setDrlSupport(false);

defaultDynamicReaderLimitEntity.setReaderCVMReqLimit(ByteUtils.hexString2ByteArray("000000001000"));

defaultDynamicReaderLimitEntity.setReaderContactlessTransLimit(ByteUtils.hexString2ByteArray("000000001500"));

defaultDynamicReaderLimitEntity.setReaderContactlessFloorLimit(ByteUtils.hexString2ByteArray("000000001200"));

List<DynamicReaderLimitEntity> dynamicReaderLimitEntities = new ArrayList<>();

//used for EP094,EP095

DynamicReaderLimitEntity dynamicReaderLimitEntity = new DynamicReaderLimitEntity();

dynamicReaderLimitEntity.setAppProgID(new byte[]{(byte) 0x06});

dynamicReaderLimitEntity.setReaderCVMReqLimit(ByteUtils.hexString2ByteArray("000000000200"));

dynamicReaderLimitEntity.setReaderContactlessTransLimit(ByteUtils.hexString2ByteArray("000000000700"));

dynamicReaderLimitEntity.setReaderContactlessFloorLimit(ByteUtils.hexString2ByteArray("000000000400"));

dynamicReaderLimitEntities.add(dynamicReaderLimitEntity);

//used for EP096

dynamicReaderLimitEntity = new DynamicReaderLimitEntity();

dynamicReaderLimitEntity.setAppProgID(new byte[]{(byte) 0x0B});

dynamicReaderLimitEntity.setReaderCVMReqLimit(ByteUtils.hexString2ByteArray("000000000200"));

dynamicReaderLimitEntity.setReaderContactlessTransLimit(ByteUtils.hexString2ByteArray("000000000300"));

dynamicReaderLimitEntity.setReaderContactlessFloorLimit(ByteUtils.hexString2ByteArray("000000000100"));

dynamicReaderLimitEntities.add(dynamicReaderLimitEntity);

//default drl will replace all expresspay aid limits even card doesn’t support drl

int ret = emvHandler2.setDynamicReaderLimitListForExpressPay(defaultDynamicReaderLimitEntity, dynamicReaderLimitEntities);

Log.d(TAG, "setDynamicReaderLimitListForExpressPay : " + ret);

## 4.3 how does kenrel perform this cvm processing?

We assume that card AIP byte 1 bit 5 indicates cardholder verification supported has been set and terminal configure mobile cvm, online pin, signature supported on 9F6E.

If entered amount is smaller than cvm limit then 9F6E byet 3 bit 7 will be set to 0 and CVM result should be CVMR\_NA

Else If entered amount is greater or equal to cvm limit then 9F6E byte 3 bit 7 will be set 1 and perform following processing:

1. check whetehr 9F71 mobile cvm result returned from GPO and byte1 indicate mobile CVM performed successfully, finally the cvm result should be CVMR\_CDCVM
2. check tag 8E and identify mutually supported cvm. If online pin selected then cvm result shall be CVMR\_ONLINEPIN, if signature selected then cvm result shall be CVMR\_SIGNATURE

## 4.4 When kernel will return SdkResult.Emv\_Plz\_See\_Phone?

If entered amount is greater then cvm limit then 9F6E byte 3 bit 7 will be set to 1 indicated cvm required, but 9F71 mobile cvm result returned from GPO indicatged no cvm performed then kernel will return this -8027 guide you to see phone handle this mobile cvm. Finally search card again and startemvprocess to finsih this transaction.

## 4.5 How to handle this SdkResult.Emv\_Plz\_See\_Phone EP020?

