

April 19, 2024

Mr. Manoj Kunhi Purayil  
Vortex Engineering Pvt. Ltd.  
6th, No.1, IITM RESEARCH PARK  
No. 6B, Kanagam, Tharamani  
Chennai 600113  
India

**Re: EMVCo Letter of Approval - Contact Terminal Level 2**

**EMV Application Kernel: Swave EMV Kernel Version Swave\_Abrantix\_EMV Kernel\_2.0\_2024**

**Approval Number(s):**  
**2-05381-1-1C-FIMI-0424-4.4a**  
**2-05381-1-1P-FIMI-0424-4.4a**  
**2-05381-1-1OS-FIMI-0424-4.4a**

The EMV Application Kernel has been tested on the following terminal

**Terminal: Vortex FiSST**  
**PinPad: 1P = Shenzhen Zhengtong Electronics Co Ltd - ZT598, H50 - PIN pad is valid for configuration(s): 1C**  
**Operating System: 1OS = Linux Version 6.1**

**Renewal Date: 21-Mar-2028**

**Report ID** Session 1: **B23REP00-103 Version 1.0 - Silicomp India Private Limited (doing business as FIME India)**

**Kernel Checksum:**

9E97E7A8D1BFE62190028F22F8618DDD405E7727

**Configurations Checksums:**

Config	Vendor Config ID	Terminal	Checksum
1C	config001	14	FB14953D4BA22753D37D83D302F9BA1EB823524D

**PIN Pads Checksums:**

PinPad	Checksum
1P	NA

Dear Mr. Purayil:

EMVCo, LLC ("EMVCo"), a Delaware limited liability company, has received your request for Level 2 terminal type approval for the EMV Application Kernel identified above (hereafter referred to as the "Application"). In connection with your request, we have reviewed all test file number(s) listed above.

After assessing such file(s), EMVCo has found reasonable evidence that the submitted samples of the above referenced Application sufficiently conform to EMV Integrated Circuit Card Specifications for Payment Systems, Version 4.4 of October 2022.

EMVCo hereby grants your Application EMVCo Type Approval for Terminal Level 2, based on the requirements stated in the EMV 4.4 Specifications. Please note that EMVCo may publish this letter and publicly identify your Application as an approved Application, including in EMVCo's published list of approved Applications.

EMVCo's grant to your Application is subject to and specifically incorporates (i) the General Terms and Conditions to the Letter of Approval enclosed as Exhibit A, and (ii) the Specific Terms and Conditions to the Letter of Approval attached hereto as Attachment 1. Because EMVCo's grant is subject to such limitations, including certain events of termination, you and any third parties should confirm that such approval is current and has not been terminated by referring to the list of approved Applications published on the EMVCo website ([www.emvco.com](http://www.emvco.com)).

Please note that EMVCo makes certain logos available for use in connection with an Application that has received EMVCo approval. To obtain permission to use the "EMV Approved" certification mark, please contact EMVCo to request a license agreement.

***This Letter of Approval is valid while the approval number is posted on the EMVCo website.***

EMVCo, LLC, a Delaware limited liability company

By:

Name: Frédéric Fortin

Title: EMVCo Terminal Testing Group Chair

<b>Terminal Capabilities</b>	<b>1C</b>									
<b>Card Data Input Capability</b>										
Terminal Type	14									
Manual Key Entry	No									
Magnetic Stripe	No									
IC with Contacts	Yes									
<b>CVM Capability</b>										
Plaintext PIN	No									
Online Enciphered PIN	Yes									
Signature (Paper)	No									
Offline Enciphered PIN (RSA)	No									
No CVM	No									
Biometric	No									
Offline Finger	No									
Online Finger	No									
Offline Facial	No									
Online Facial	No									
Offline Palm	No									
Online Palm	No									
Offline Iris	No									
Online Iris	No									
Offline Voice	No									
Online Voice	No									
<b>Security Capability</b>										
SDA & DDA	No									
Card Capture	No									
CDA	No									
<b>Transaction Type Capability</b>										
Tran Type - Cash	Yes									
Tran Type - Goods	Yes									
Tran Type - Services	Yes									
Tran Type - Cash Back	No									
Tran Type - Inquiry	Yes									
Tran Type - Transfer	Yes									
Tran Type - Payment	Yes									
Tran Type - Admin	No									
Tran Type - Cash Deposit	Yes									
<b>Terminal Data Input Capability</b>										
Keypad	Yes									
Numeric Keys	Yes									
Alpha and Special Character Keys	No									
Command Keys	Yes									
Function Keys	Yes									

(continued)	1C									
<b>Terminal Data Output Capability</b>										
Print, Attendant	No									
Print, Cardholder	Yes									
Display, Attendant	No									
Display, Cardholder	Yes									
Code Table 10	No									
Code Table 9	No									
Code Table 8	No									
Code Table 7	No									
Code Table 6	No									
Code Table 5	No									
Code Table 4	No									
Code Table 3	No									
Code Table 2	Yes									
Code Table 1	Yes									
<b>Application Selection</b>										
PSE	Yes									
Cardholder Confirmation	Yes									
Preferred display order	No									
Partial AID Selection	Yes									
Multi language	No									
EMV Language Selection method	No									
Common Character Set	Yes									
<b>Data Authentication</b>										
MAX CA Public key										
Exponents										
Revocation of Issuer PK Certificate	No									
Certificate Revocation List Format										
Default DDOL	No									
Manual act. when CA PK loading fails	No									
CA PK verified with check sum	No									
<b>Cardholder Verification Method</b>										
Bypass PIN Entry	No									
Subsequent Bypass PIN Entry	No									
Get Data for PIN Try Counter	No									
Fail CVM	Yes									
Amount known before CVM proces.	Yes									
<b>Terminal Risk Management</b>										
Floor Limit Checking	Yes									
Random Transaction Selection	Yes									
Velocity Checking	No									
Transaction Log	No									
Exception File	No									
TRM irrespective of AIP setting (expected behavior)	Yes									

(continued)	1C									
<b>Terminal Action Analysis</b>										
Terminal Action Codes supported	Yes									
TAC can be deleted or disabled	Yes									
How does offline only Terminal process Default Action Codes?	N/A									
How does online only terminal process TAC/IAC-Default when unable to go online?	Skipped									
<b>Completion Processing</b>										
Forced Online	No									
Forced Acceptance	No									
Advices	No									
Voice Referrals Initiated by Issuer	No									
Batch Data Capture	No									
Online Data Capture	Yes									
Default TDOL	Yes									
Default TDOL not configured	No									
<b>Exception Handling</b>										
POS Entry Mode										
<b>Miscellaneous</b>										
Amount and PIN on same keypad	Yes									
ICC/Magstripe Reader Combined	No									
If Combined, is Magstripe read first?	No									
Supports account type selection	No									
Supports 'on fly' script processing	No									
Issuer Script device limit > 128 bytes	Yes									
If limit > 128, value supported?	256									
Internal Date Management	Yes									
Does the terminal support Receipt?	Yes									

**Attachment 1**  
**Specific Terms and Conditions to the Letter of Approval**

Restriction:

**None**