

EMC TEST REPORT For FCC

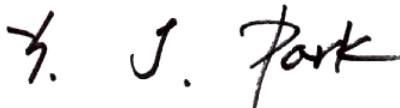


Test Report No. : CTK03-F045
Date of Issue : May 7, 2003
Model/Type No: : MemoRive USB
Kind of Product : USB Flash Memory Drive
Applicant : BMK Co.
Applicant Address : Room 201-2, #20-1, Banpo-1dong, Seocho-gu, Seoul,
137-041, Korea
Manufacturer : BMK Co.
Manufacturer Address : Room 201-2, #20-1, Banpo-1dong, Seocho-gu, Seoul,
137-041, Korea
Contact Person : Byung-Min Chung
Telephone : +82-2-535-0834
Received Date : April 28, 2003
Test period : Start: May 1, 2003 End: May 1, 2003
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

The test results presented in this report relate only to the object tested.

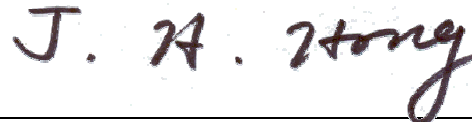
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Tested by



Joon Pak
EMC Test Engineer
Date: May 7, 2003

Reviewed by



James Hong
EMC Technical Manager
Date: May 7, 2003

REPORT REVISION HISTORY

| Date | Revision | Page No |
|-------------|---------------------|---------|
| May 7, 2003 | (CTK03-F045) Issued | All |
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1.0 General Product Description

1.0.1 Tested Equipment

- ☒ Unless otherwise indicated, all tests were conducted on Model MemoRive USB.
- ☐ Tests performed on Model _____ were considered to be representative of Model(s) _____.

1.0.2 Equipment Size, Mobility and Identification

Dimensions: 57.2 by 16.6 by 7.7 ☒ mm ☐ in
Mobility: ☒ Hand-Held ☒ Table-top ☐ Floor-standing
Serial No.: -

1.0.3 Electrical Ratings

Input: 4.75 – 5.25Vdc, 32-40mA
Output: Not applicable

1.0.4 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Voltage: 120V
Frequency: 60Hz

1.0.5 Clock & Other Frequencies Utilized

12MHz

1.1 Model Differences

Not applicable

1.2 Device Modifications

The following modifications were necessary for compliance: Not applicable

1.3 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

| Device | Manufacturer | Model No. | Serial No. | FCC ID or DoC |
|---------------|---------------------------|------------------|---------------|--------------------------|
| PC | Hewlett-packard | PD1068P | 0000VP250579 | DOC |
| Monitor | Samsung | PG17HS | P013H1N301661 | DOC |
| Printer | SEIKO EPSON CORP | Stylus Color 460 | BWCE136524 | DOC |
| USB Mouse(1) | PANWEST TECIING CO., LTD | Cyber Beetle | PM1F184039583 | DOC |
| USB Mouse(2) | PANWEST TECIING CO., LTD | Cyber Beetle | PM1F144009938 | DOC |
| Serial Mouse | Microsoft | BASM1 | 4476266-20000 | DOC |
| PS/2 Mouse | PANWEST TECIING CO., LTD | Cyber Beetle | PM1F144009915 | DOC |
| PS/2 Keyboard | SAN HAWK TECIING CO., LTD | KB120 | - | FCC TCB (D840902 MIC) |
| Headset(1) | CAMAC | CMK-C3 | - | - |
| Headset(2) | CAMAC | CMK-C3 | - | - |

☒ Cable Description

| # | Description | Ferrited | Length (m) | Other Details |
|----|---------------------------------|----------|------------|------------------------|
| 1 | Printer Power Cable, Unshielded | No | 1.8 | Connect to AC Power |
| 2 | PC Power Cable, Unshielded | No | 1.8 | Connect to AC Power |
| 3 | Monitor Power Cable, Unshielded | No | 1.8 | Connect to AC Power |
| 4 | Printer Signal Cable, Shielded | Yes | 1.5 | Between PC and Printer |
| 5 | PS/2 Keyboard Cable, Shielded | No | 1.5 | Connect to PC |
| 6 | PS/2 Mouse Cable, Shielded | No | 1.5 | Connect to PC |
| 7 | EUT Direct plug in | - | - | Connect to PC |
| 8 | USB Mouse(1) Cable, Shielded | No | 1.5 | Connect to PC |
| 9 | LAN Cable, Unshielded | No | 3.0 | Between PC and LAN |
| 10 | Monitor Signal Cable, Shielded | Yes | 1.5 | Between PC and Monitor |
| 11 | Headset(1) Cable, Unshielded | No | 2.2 | Connect to PC |
| 12 | Headset(2) Cable, Unshielded | No | 2.2 | Connect to PC |
| 13 | USB Mouse(2) Cable, Shielded | No | 1.5 | Connect to PC |
| 14 | Serial Mouse Cable, Shielded | No | 2.0 | Connect to PC |
| 15 | Line In Cable, Unshielded | No | 1.5 | Connect to PC |

n/a = not available

1.4 Test Software

☒ Pinging



1.5 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

☐ Test program (H-Pattern)

☐ Standby

☒ Practice operation

☐ Test program (color bar)

☐ Test program (customer specific)

1.6 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.7 Test Facility

The measurement facility is located at 386-1, Ho-Dong, Yongin-City, Kyungki-Do, Korea 449-100. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

1.8 Measurement Procedure

Preliminary AC power line conducted emissions tests were performed shielded room. To find worst mode, several typical mode and typical cable position were tested. Final AC power line conducted emissions test was performed shielded room. (location is same as Preliminary test)






Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

Preliminary radiated emissions test were performed anechoic chamber (Distance of antenna and EUT was 3 m). To find worst mode, several typical mode and typical cable position were tested and peak level and frequency were recorded.

Final radiated emissions test was performed Open Area Test Site. Based on the preliminary tests of the EUT, final test was proceeded worst case test mode and cable configuration.

* Measurement procedures was In accordance with ANSI C63.4-1992 7.2.3, 7.2.4, 8.3.1.1, 8.3.1.2

1.9 Laboratory Accreditations and Listings

| Country | Agency | Scope of Accreditation | Logo |
|---------------|--------------|---|---|
| USA | FCC | 3 and 10 meter Open Area Test Sites to perform FCC Part 15/18 measurements. |  93250 |
| JAPAN | VCCI | 10 meter Open Area Test Site and one conducted site. |  R-948, C-986 |
| KOREA | MIC | 10 meter Open Area Test Site and EMS (ESD, RS, EFT/Burst, Surge) |  No. 51, KR0025 |
| International | KOLAS | EMC |  NO-119 |
| Europe | GLAS | EMC EN 55011, EN 55022, EN 55024, EN 61326, EN 50130-4, EN 50081-1, EN 50081-2, EN 50082-1, EN 50082-2, EN 61000-6-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11, EN 61000-3-2, EN 61000-3-3 |  No.13000796-02 |

2.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

☐ EN 50081-1:1992

☐ EN 55011:1998 +A1:1999

☐ Group 1

☐ Class A

☐ Group 2

☐ Class B

☐ EN 55013:1990 +A12:1994 +A13:1996 +A14:1999

☐ EN 55013:2001

☐ EN 55014-1:1993 +A1:1997 +A2:1999

☐ Household appliances and similar

☐ Portable tools

☐ Semiconductor devices

☐ EN 55014-1:2000

☐ EN 55014-2:1997

☐ EN 55015:1996 +A1:1997 +A2:1999

☐ EN 55015:2000

☐ EN 55020:1994 +A11:1996 +A13:1999 +A14:1999

☐ EN 55020:1994 +A11:1996 +A12:1999 +A13:1999 +A14:1999

☐ EN 55022:1994 +A1:1995 +A2:1997

☐ Class A

☐ Class B

☐ EN 55022:1998 +A1:2000

☐ Class A

☐ Class B

☐ EN 61000-3-2:1995 +A1:1998 +A2:1998

☐ EN 61000-3-2:1995 +A1:1998 +A2:1998 +A14:2000

☐ EN 61000-3-2:2000

☐ EN 61000-3-3:1995

☐ VCCI V-3/99.05 : 1999

☐ Class A

☐ Class B

☒ FCC Part 15 SUBPART B

☐ Class A

☒ Class B

☐ AS 3548 (1992)

☐ Class A

☐ Class B

2.1 Conducted Voltage Emissions

Test Date

May 1, 2003

Test Location

EMI-CE: Shielded Room

Test Instruments

| | | | |
|--|-----------------|--------|------------|
| <input checked="" type="checkbox"/> Field Strength Meter | Rohde & Schwarz | ESHS30 | 828144/002 |
|--|-----------------|--------|------------|

Test Accessories

| | | | |
|--|------|------------|------------|
| <input type="checkbox"/> LISN | EMCO | 3825/2 | 9206-1971 |
| <input checked="" type="checkbox"/> LISN | EMCO | 3825/2 | 9409-2246 |
| <input checked="" type="checkbox"/> LISN | EMCO | 3825/2 | 9607-2574 |
| <input checked="" type="checkbox"/> Control PC | HP | Vectra 500 | SG72000192 |

Frequency Range of Measurement

☒ 150 kHz to 30 MHz
☐ 450 kHz to 30 MHz
☐ _____

Instrument Settings

IF Band Width: 9 kHz

Test Results

The requirements are:

| | |
|---|--|
| <input checked="" type="checkbox"/> MET | minimum margin is 5.8 dBuV at 0.15 MHz |
| <input type="checkbox"/> NOT MET | limit exceeded by maximum of ____ dBuV at ____ MHz |
| <input type="checkbox"/> NOT APPLICABLE | |

Remarks

See Appendix A for test data.

2.2 Radiated Electric Field Emissions

Test Date

May 1, 2003

Test Location

- ☒ EMI-OATS: Testing was performed at a test distance of 10 m
☐ EMI-OATS: Testing was performed at a test distance of 3 m

Test Instruments

☒ Field Strength Meter Rohde & Schwarz ESVS30 826638/008

Test Accessories

| | | | |
|---|-----------------|---------|------------|
| <input checked="" type="checkbox"/> ULTRA Broadband Antenna | Rohde & Schwarz | HL562 | 361324/014 |
| <input type="checkbox"/> Biconical Antenna | Schwarzbeck | BBA9106 | 41-00201 |
| <input type="checkbox"/> Biconical Antenna | EMCO | 3110B | 9607-2564 |
| <input type="checkbox"/> Log-periodic Antenna | EMCO | 3146 | 9607-4567 |

Frequency Range of Measurement

30 MHz to 1 GHz

Instrument Settings

IF Band Width: 120 kHz

Test Results

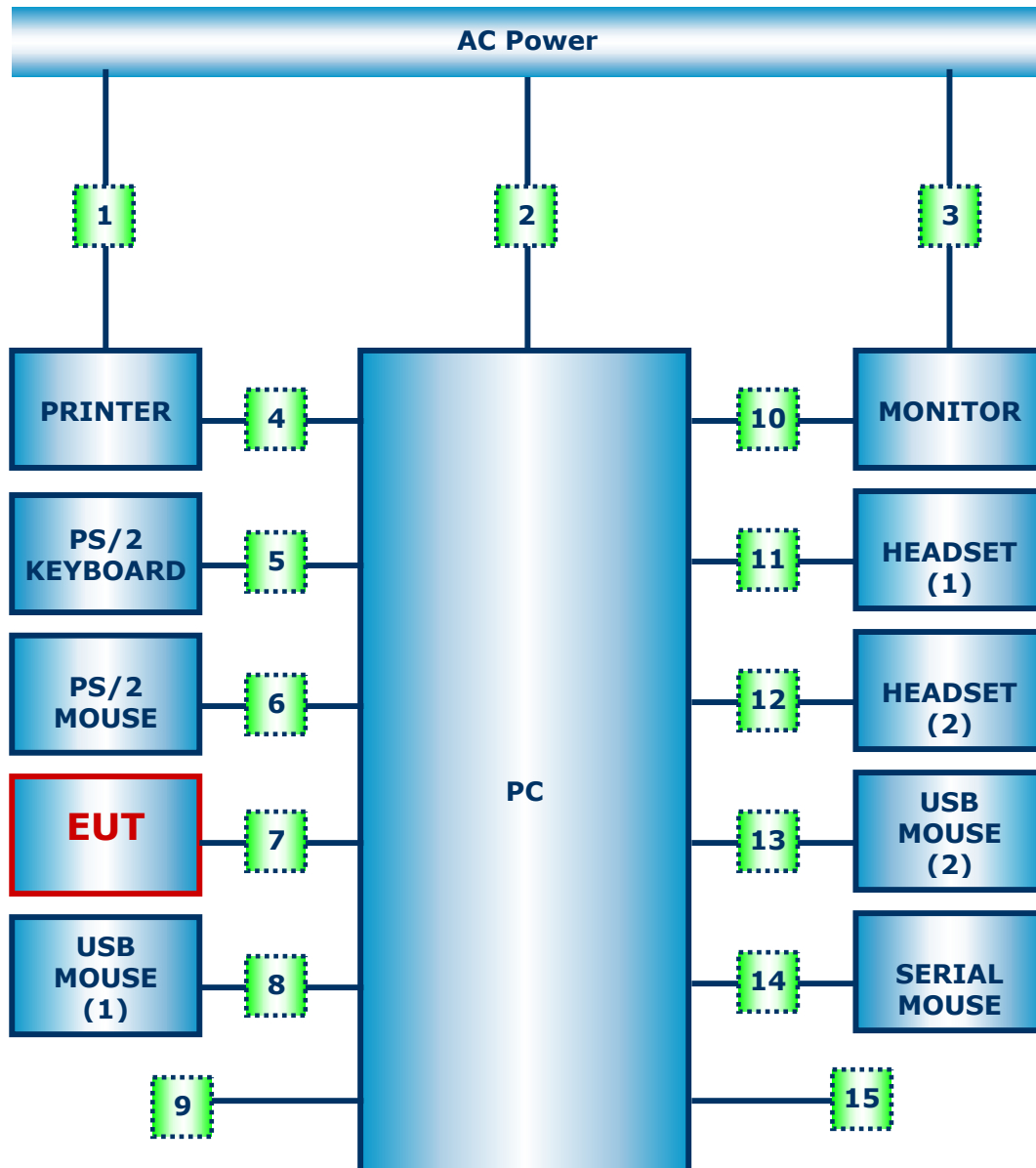
The requirements are:

- ☒ MET minimum margin is 3.2 dB (uV/m) at 130.62 MHz
☐ NOT MET limit exceeded by maximum of ____ dB(uV/m) at ____ MHz
☐ NOT APPLICABLE

Remarks

See Appendix A for test data

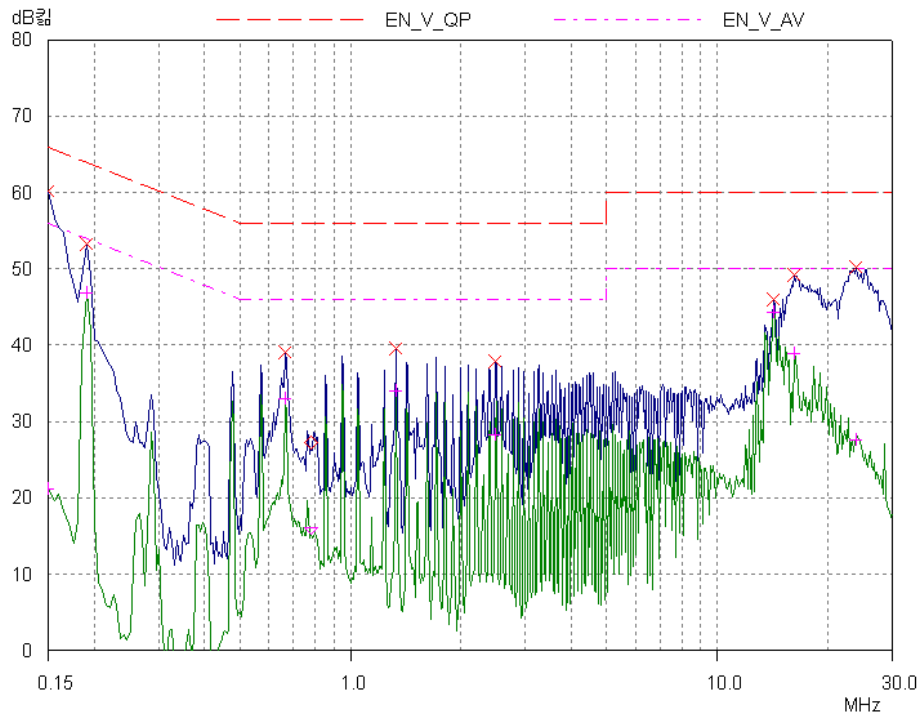
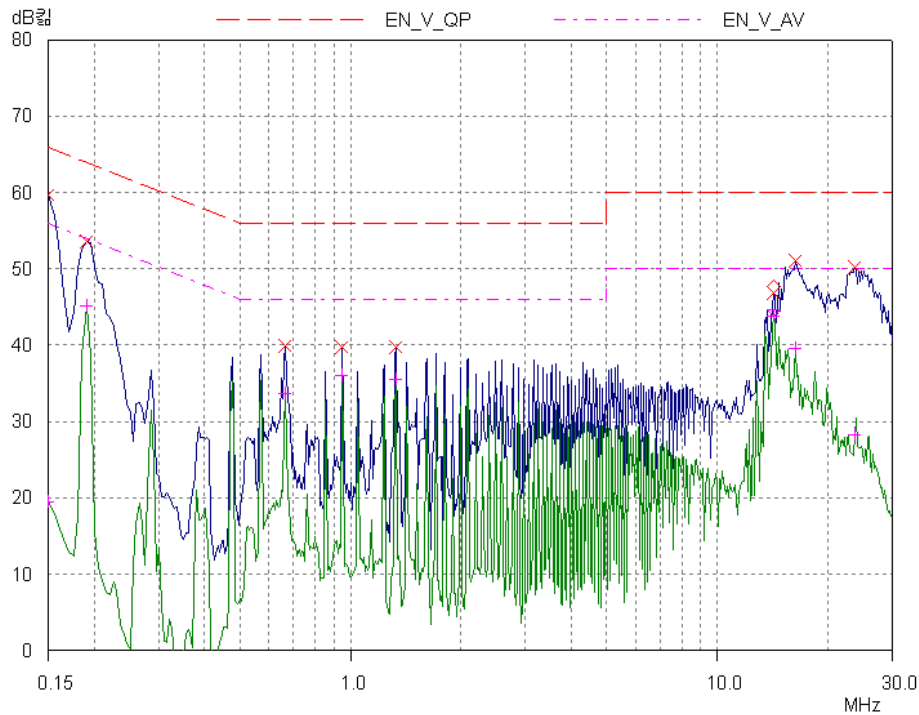
Configuration



APPENDIX A – TEST DATA

Conducted Voltage Emissions (Quasi-Peak reading)

| Frequency [MHz] | Correction Factor | | Line | Quasi-peak | | | | Average | | | |
|--------------------|----------------------|-------|------|-----------------|-------------------|------------------|----------------|-----------------|-------------------|------------------|----------------|
| | LISN | Cable | | Limit [dBuV] | Reading [dBuV] | Result [dBuV] | Margin [dB] | Limit [dBuV] | Reading [dBuV] | Result [dBuV] | Margin [dB] |
| 0.15 | 2.2 | 0.1 | N | 66.0 | 57.9 | 60.2 | 5.8 | 56.0 | 18.9 | 21.2 | 34.8 |
| 0.15 | 2.2 | 0.1 | L | 66.0 | 57.4 | 59.7 | 6.3 | 56.0 | 17.1 | 19.4 | 36.6 |
| 0.19 | 1.7 | 0.1 | N | 64.0 | 51.5 | 53.3 | 10.7 | 54.0 | 45.1 | 46.9 | 7.1 |
| 0.19 | 1.7 | 0.1 | L | 64.0 | 51.9 | 53.7 | 10.4 | 54.0 | 43.4 | 45.2 | 8.9 |
| 0.67 | 0.5 | 0.1 | L | 56.0 | 39.4 | 40.0 | 16.0 | 46.0 | 33.1 | 33.7 | 12.3 |
| 0.67 | 0.5 | 0.1 | N | 56.0 | 38.4 | 39.0 | 17.0 | 46.0 | 32.4 | 33.0 | 13.0 |
| 0.95 | 0.3 | 0.1 | L | 56.0 | 39.3 | 39.7 | 16.3 | 46.0 | 35.6 | 36.0 | 10.0 |
| 1.33 | 0.3 | 0.1 | L | 56.0 | 39.3 | 39.7 | 16.3 | 46.0 | 35.1 | 35.5 | 10.5 |
| 1.33 | 0.3 | 0.1 | N | 56.0 | 39.1 | 39.5 | 16.5 | 46.0 | 33.7 | 34.1 | 11.9 |
| 2.47 | 0.3 | 0.1 | N | 56.0 | 37.4 | 37.8 | 18.2 | 46.0 | 27.9 | 28.3 | 17.7 |
| 14.16 | 0.4 | 0.2 | N | 60.0 | 45.4 | 46.0 | 14.0 | 50.0 | 43.6 | 44.2 | 5.8 |
| 14.22 | 0.4 | 0.2 | L | 60.0 | 46.2 | 46.8 | 13.2 | 50.0 | 43.1 | 43.7 | 6.3 |
| 16.17 | 0.4 | 0.2 | N | 60.0 | 48.6 | 49.2 | 10.8 | 50.0 | 38.2 | 38.8 | 11.2 |
| 16.23 | 0.4 | 0.2 | L | 60.0 | 50.5 | 51.1 | 8.9 | 50.0 | 38.9 | 39.5 | 10.5 |
| 23.59 | 0.5 | 0.4 | L | 60.0 | 49.3 | 50.2 | 9.8 | 50.0 | 27.4 | 28.3 | 21.7 |
| 23.73 | 0.5 | 0.4 | N | 60.0 | 49.4 | 50.3 | 9.7 | 50.0 | 26.6 | 27.5 | 22.5 |



Radiated Electric Field Emissions (Quasi-Peak reading)

| Frequency [MHz] | Reading [dBuV/m] | Pol. | Height [m] | Correction Factor | | Limits [dBuV/m] | Result [dBuV/m] | Margin [dB] |
|--------------------|---------------------|------|---------------|----------------------|-------|--------------------|--------------------|----------------|
| | | | | Antenna | Cable | | | |
| 84.73 | 15.7 | V | 1.0 | 8.7 | 1.8 | 30.0 | 26.2 | 3.8 |
| 114.46 | 13.0 | V | 1.0 | 9.5 | 2.0 | 30.0 | 24.5 | 5.5 |
| 130.62 | 15.8 | H | 4.0 | 8.8 | 2.2 | 30.0 | 26.8 | 3.2 |
| 140.00 | 16.1 | H | 4.0 | 8.0 | 2.4 | 30.0 | 26.5 | 3.5 |
| 145.48 | 14.6 | H | 4.0 | 7.8 | 2.4 | 30.0 | 24.8 | 5.2 |
| 374.05 | 12.2 | H | 1.5 | 12.8 | 3.9 | 37.0 | 28.9 | 8.1 |
| 480.46 | 11.1 | V | 2.1 | 15.2 | 4.4 | 37.0 | 30.7 | 6.3 |
| 643.14 | 1.1 | V | 2.4 | 17.6 | 5.5 | 37.0 | 24.2 | 12.8 |
| 745.32 | 1.7 | V | 2.2 | 19.0 | 6.1 | 37.0 | 26.8 | 10.2 |