

# **RENESAS SEMICONDUCTOR RELIABILITY REPORT**

GROUP : 78K0KA2-L  
DEVICE : Refer to Product List  
APPLICATION : Consumer / Industry

Quality Assurance Div.  
Renesas Electronics Corporation

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Table. Reliability test results (SOP)

| Test Items                             | Reference              | Test Conditions                      | Results<br>Failure/Size | Comment   |
|----------------------------------------|------------------------|--------------------------------------|-------------------------|-----------|
| High Temperature Operating Life (HTOL) | JESD22-A108            | Ta=125 °C, Vccmax, 1000 hrs          | 0/22                    |           |
| High Temperature Storage Life (HTSL)   | JESD22-A103            | Ta=150 °C, 1000 hrs                  | 0/22                    |           |
| Temperature Humidity bias (THB) (*1)   | JESD22-A101            | Ta=85 °C, RH=85 %, Vccmax, 1000 hrs  | 0/22                    |           |
| Temperature Cycling (TC) (*1)          | JESD22-A104            | Ta=-65 °C to 150 °C , 300 cycles     | 0/22                    |           |
| Latch-Up (LU)                          | JESD78                 | Pulse Current Injection, I=+/-150 mA | 0/3                     |           |
| Electrostatic discharge (ESD-HBM)      | JS-001                 | 1.5 kΩ, 100 pF, +/-2000 V, 1 time    | 0/3                     | Class: 2  |
| Electrostatic discharge (ESD-CDM)      | JESD22-C101            | +/-500V,1time                        | 0/3                     | Class: C2 |
| Solderability (SD)                     | J-STD-002              | 245 °C, 5 s, Solder coverage ≥95 %   | 0/5                     |           |
| Resistance to Soldering Heat (PC)      | JESD22-A113, J-STD-020 | MSL3(Moisture Sensitivity Level 3)   | 0/22                    |           |

\*1) With preconditioning per JESD22-A113, MSL 3

•It is tested to confirm that all the samples are satisfied with an individual product specification.

Note :

Basically qualification tests were performed using a representative product with the same wafer process and the same package structure .

Table. Reliability test results (QFN)

| Test Items                             | Reference              | Test Conditions                      | Results<br>Failure/Size | Comment   |
|----------------------------------------|------------------------|--------------------------------------|-------------------------|-----------|
| High Temperature Operating Life (HTOL) | JESD22-A108            | Ta=125 °C, Vccmax, 1000 hrs          | 0/22                    |           |
| High Temperature Storage Life (HTSL)   | JESD22-A103            | Ta=150 °C, 1000 hrs                  | 0/22                    |           |
| Temperature Humidity bias (THB) (*1)   | JESD22-A101            | Ta=85 °C, RH=85 %, Vccmax, 1000 hrs  | 0/22                    |           |
| Temperature Cycling (TC) (*1)          | JESD22-A104            | Ta=-65 °C to 150 °C , 300 cycles     | 0/22                    |           |
| Latch-Up (LU)                          | JESD78                 | Pulse Current Injection, I=+/-150 mA | 0/3                     |           |
| Electrostatic discharge (ESD-HBM)      | JS-001                 | 1.5 kΩ, 100 pF, +/-2000 V, 1 time    | 0/3                     | Class: 2  |
| Electrostatic discharge (ESD-CDM)      | JESD22-C101            | +/-500V,1time                        | 0/3                     | Class: C2 |
| Solderability (SD)                     | J-STD-002              | 245 °C, 5 s, Solder coverage ≥95 %   | 0/5                     |           |
| Resistance to Soldering Heat (PC)      | JESD22-A113, J-STD-020 | MSL3(Moisture Sensitivity Level 3)   | 0/22                    |           |

\*1) With preconditioning per JESD22-A113, MSL 3

•It is tested to confirm that all the samples are satisfied with an individual product specification.

Note :

Basically qualification tests were performed using a representative product with the same wafer process and the same package structure .

Table. Reliability test results (LGA)

| Test Items                             | Reference              | Test Conditions                      | Results Failure/Size | Comment   |
|----------------------------------------|------------------------|--------------------------------------|----------------------|-----------|
| High Temperature Operating Life (HTOL) | JESD22-A108            | Ta=125 °C, Vccmax, 1000 hrs          | 0/22                 |           |
| High Temperature Storage Life (HTSL)   | JESD22-A103            | Ta=150 °C, 1000 hrs                  | 0/22                 |           |
| Temperature Humidity bias (THB) (*1)   | JESD22-A101            | Ta=85 °C, RH=85 %, Vccmax, 1000 hrs  | 0/22                 |           |
| Temperature Cycling (TC) (*1)          | JESD22-A104            | Ta=-55 °C to 125 °C , 500 cycles     | 0/22                 |           |
| Latch-Up (LU)                          | JESD78                 | Pulse Current Injection, I=+/-150 mA | 0/3                  |           |
| Electrostatic discharge (ESD-HBM)      | JS-001                 | 1.5 kΩ, 100 pF, +/-2000 V, 1 time    | 0/3                  | Class: 2  |
| Electrostatic discharge (ESD-CDM)      | JESD22-C101            | +/-500V,1time                        | 0/3                  | Class: C2 |
| Resistance to Soldering Heat (PC)      | JESD22-A113, J-STD-020 | MSL3(Moisture Sensitivity Level 3)   | 0/22                 |           |

\*1) With preconditioning per JESD22-A113, MSL 3

•It is tested to confirm that all the samples are satisfied with an individual product specification.

Note :

Basically qualification tests were performed using a representative product with the same wafer process and the same package structure .

The failure rate of the device in an actual use condition can be estimated by the below procedure.

• **Equation for the failure rate estimation ( $\lambda$ )**

$$\lambda = \lambda_b \times \pi T \text{ (FIT)}$$

① Unique failure rate ( $\lambda_b$ )

$$\lambda_b = 8.19 \text{ FIT}$$

Unique failure rate at  $T_a = 55^\circ\text{C}$  using 60 % confidence level.

② Temperature term ( $\pi T$ )

$$\pi T = \exp\{11600 \times E_a \times (1/(273+55) - 1/(273+T_a))\}$$

$E_a$  : Activation energy (eV)

$T_a$  : Ambient temperature ( $^\circ\text{C}$ )

$\pi T$  simplified chart as  $E_a = 0.7 \text{ eV}$

| $T_a$<br>( $^\circ\text{C}$ ) | 40   | 50   | 55 | 60   | 65   | 70   | 75   | 80   | 85   | 90    | 100   | 110   |
|-------------------------------|------|------|----|------|------|------|------|------|------|-------|-------|-------|
| $\pi T$                       | 0.31 | 0.68 | 1  | 1.45 | 2.08 | 2.95 | 4.15 | 5.77 | 7.96 | 10.88 | 19.82 | 34.99 |

• **MTTF ( Mean Time To Failure )**

$$MTTF = 1/\lambda$$

## Reference about Renesas package code

| Package type                    |     | Package code *1 |
|---------------------------------|-----|-----------------|
| Lead type plastic package       | QFP | PxQP            |
|                                 | SOP | PxSP            |
| Non-lead type plastic package   | QFN | PxQN            |
| Grid array type plastic package | BGA | PxBG            |
|                                 | LGA | PxLG            |

\*1. First four digit

Table. Product list

| No | Group     | Product part number           | Package code | No  | Group     | Product part number           | Package code |
|----|-----------|-------------------------------|--------------|-----|-----------|-------------------------------|--------------|
| 1  | 78K0KA2-L | UPD78F0560MC(R)-CAA-AX        | PLSP0020*    | 51  | 78K0KA2-L | UPD78F0565MC-XXX-CAA-E2-AX    | PLSP0020*    |
| 2  | 78K0KA2-L | UPD78F0560MC(R)-XXX-CAA-AX    | PLSP0020*    | 52  | 78K0KA2-L | UPD78F0566MC(R)-XXX-CAA-AX    | PLSP0020*    |
| 3  | 78K0KA2-L | UPD78F0560MC(R)-XXX-CAA-E1-AX | PLSP0020*    | 53  | 78K0KA2-L | UPD78F0566MC(R)-XXX-CAA-E1-AX | PLSP0020*    |
| 4  | 78K0KA2-L | UPD78F0560MC(R)-XXX-CAA-E2-AX | PLSP0020*    | 54  | 78K0KA2-L | UPD78F0566MC(R)-XXX-CAA-E2-AX | PLSP0020*    |
| 5  | 78K0KA2-L | UPD78F0560MC(S)-CAA-AX        | PLSP0020*    | 55  | 78K0KA2-L | UPD78F0566MC(S)-XXX-CAA-AX    | PLSP0020*    |
| 6  | 78K0KA2-L | UPD78F0560MC(S)-XXX-CAA-AX    | PLSP0020*    | 56  | 78K0KA2-L | UPD78F0566MC(S)-XXX-CAA-E1-AX | PLSP0020*    |
| 7  | 78K0KA2-L | UPD78F0560MC(S)-XXX-CAA-E1-AX | PLSP0020*    | 57  | 78K0KA2-L | UPD78F0566MC(S)-XXX-CAA-E2-AX | PLSP0020*    |
| 8  | 78K0KA2-L | UPD78F0560MC(S)-XXX-CAA-E2-AX | PLSP0020*    | 58  | 78K0KA2-L | UPD78F0566MC-CAA-AX           | PLSP0020*    |
| 9  | 78K0KA2-L | UPD78F0560MC-CAA-AX           | PLSP0020*    | 59  | 78K0KA2-L | UPD78F0566MC-CAA-E1-AX        | PLSP0020*    |
| 10 | 78K0KA2-L | UPD78F0560MC-CAA-E1-AX        | PLSP0020*    | 60  | 78K0KA2-L | UPD78F0566MC-XXX-CAA-AX       | PLSP0020*    |
| 11 | 78K0KA2-L | UPD78F0560MC-XXX-CAA-AX       | PLSP0020*    | 61  | 78K0KA2-L | UPD78F0566MC-XXX-CAA-E1-AX    | PLSP0020*    |
| 12 | 78K0KA2-L | UPD78F0560MC-XXX-CAA-E1-AX    | PLSP0020*    | 62  | 78K0KA2-L | UPD78F0566MC-XXX-CAA-E2-AX    | PLSP0020*    |
| 13 | 78K0KA2-L | UPD78F0560MC-XXX-CAA-E2-AX    | PLSP0020*    | 63  | 78K0KA2-L | UPD78F0567MC(R)-CAA-AX        | PLSP0020*    |
| 14 | 78K0KA2-L | UPD78F0561MC(R)-CAA-AX        | PLSP0020*    | 64  | 78K0KA2-L | UPD78F0567MC(R)-XXX-CAA-AX    | PLSP0020*    |
| 15 | 78K0KA2-L | UPD78F0561MC(R)-CAA-E1-AX     | PLSP0020*    | 65  | 78K0KA2-L | UPD78F0567MC(R)-XXX-CAA-E1-AX | PLSP0020*    |
| 16 | 78K0KA2-L | UPD78F0561MC(R)-XXX-CAA-AX    | PLSP0020*    | 66  | 78K0KA2-L | UPD78F0567MC(R)-XXX-CAA-E2-AX | PLSP0020*    |
| 17 | 78K0KA2-L | UPD78F0561MC(R)-XXX-CAA-E1-AX | PLSP0020*    | 67  | 78K0KA2-L | UPD78F0567MC(S)-CAA-AX        | PLSP0020*    |
| 18 | 78K0KA2-L | UPD78F0561MC(R)-XXX-CAA-E2-AX | PLSP0020*    | 68  | 78K0KA2-L | UPD78F0567MC(S)-XXX-CAA-AX    | PLSP0020*    |
| 19 | 78K0KA2-L | UPD78F0561MC(S)-CAA-AX        | PLSP0020*    | 69  | 78K0KA2-L | UPD78F0567MC(S)-XXX-CAA-E1-AX | PLSP0020*    |
| 20 | 78K0KA2-L | UPD78F0561MC(S)-CAA-E1-AX     | PLSP0020*    | 70  | 78K0KA2-L | UPD78F0567MC(S)-XXX-CAA-E2-AX | PLSP0020*    |
| 21 | 78K0KA2-L | UPD78F0561MC(S)-XXX-CAA-AX    | PLSP0020*    | 71  | 78K0KA2-L | UPD78F0567MC-CAA-AX           | PLSP0020*    |
| 22 | 78K0KA2-L | UPD78F0561MC(S)-XXX-CAA-E1-AX | PLSP0020*    | 72  | 78K0KA2-L | UPD78F0567MC-XXX-CAA-AX       | PLSP0020*    |
| 23 | 78K0KA2-L | UPD78F0561MC(S)-XXX-CAA-E2-AX | PLSP0020*    | 73  | 78K0KA2-L | UPD78F0567MC-XXX-CAA-E1-AX    | PLSP0020*    |
| 24 | 78K0KA2-L | UPD78F0561MC-CAA-AX           | PLSP0020*    | 74  | 78K0KA2-L | UPD78F0567MC-XXX-CAA-E2-AX    | PLSP0020*    |
| 25 | 78K0KA2-L | UPD78F0561MC-XXX-CAA-AX       | PLSP0020*    | 75  | 78K0KA2-L | UPD78F0560K8(R)-3B4-E3-AX     | PWQN0032*    |
| 26 | 78K0KA2-L | UPD78F0561MC-XXX-CAA-E1-AX    | PLSP0020*    | 76  | 78K0KA2-L | UPD78F0560K8(R)-3B4-E4-AX     | PWQN0032*    |
| 27 | 78K0KA2-L | UPD78F0561MC-XXX-CAA-E2-AX    | PLSP0020*    | 77  | 78K0KA2-L | UPD78F0560K8(R)-XXX-3B4-E3-AX | PWQN0032*    |
| 28 | 78K0KA2-L | UPD78F0562MC(R)-CAA-AX        | PLSP0020*    | 78  | 78K0KA2-L | UPD78F0560K8(R)-XXX-3B4-E4-AX | PWQN0032*    |
| 29 | 78K0KA2-L | UPD78F0562MC(R)-CAA-E1-AX     | PLSP0020*    | 79  | 78K0KA2-L | UPD78F0560K8(S)-3B4-E3-AX     | PWQN0032*    |
| 30 | 78K0KA2-L | UPD78F0562MC(R)-XXX-CAA-AX    | PLSP0020*    | 80  | 78K0KA2-L | UPD78F0560K8(S)-3B4-E4-AX     | PWQN0032*    |
| 31 | 78K0KA2-L | UPD78F0562MC(R)-XXX-CAA-E1-AX | PLSP0020*    | 81  | 78K0KA2-L | UPD78F0560K8(S)-XXX-3B4-E3-AX | PWQN0032*    |
| 32 | 78K0KA2-L | UPD78F0562MC(R)-XXX-CAA-E2-AX | PLSP0020*    | 82  | 78K0KA2-L | UPD78F0560K8(S)-XXX-3B4-E4-AX | PWQN0032*    |
| 33 | 78K0KA2-L | UPD78F0562MC(S)-CAA-AX        | PLSP0020*    | 83  | 78K0KA2-L | UPD78F0560K8-3B4-AX           | PWQN0032*    |
| 34 | 78K0KA2-L | UPD78F0562MC(S)-XXX-CAA-AX    | PLSP0020*    | 84  | 78K0KA2-L | UPD78F0560K8-3B4-E3-AX        | PWQN0032*    |
| 35 | 78K0KA2-L | UPD78F0562MC(S)-XXX-CAA-E1-AX | PLSP0020*    | 85  | 78K0KA2-L | UPD78F0560K8-3B4-E4-AX        | PWQN0032*    |
| 36 | 78K0KA2-L | UPD78F0562MC(S)-XXX-CAA-E2-AX | PLSP0020*    | 86  | 78K0KA2-L | UPD78F0560K8-XXX-3B4-E3-AX    | PWQN0032*    |
| 37 | 78K0KA2-L | UPD78F0562MC-CAA-AX           | PLSP0020*    | 87  | 78K0KA2-L | UPD78F0560K8-XXX-3B4-E4-AX    | PWQN0032*    |
| 38 | 78K0KA2-L | UPD78F0562MC-CAA-E1-AX        | PLSP0020*    | 88  | 78K0KA2-L | UPD78F0561K8(R)-3B4-AX        | PWQN0032*    |
| 39 | 78K0KA2-L | UPD78F0562MC-XXX-CAA-AX       | PLSP0020*    | 89  | 78K0KA2-L | UPD78F0561K8(R)-3B4-E1-AX     | PWQN0032*    |
| 40 | 78K0KA2-L | UPD78F0562MC-XXX-CAA-E1-AX    | PLSP0020*    | 90  | 78K0KA2-L | UPD78F0561K8(R)-3B4-E2-AX     | PWQN0032*    |
| 41 | 78K0KA2-L | UPD78F0562MC-XXX-CAA-E2-AX    | PLSP0020*    | 91  | 78K0KA2-L | UPD78F0561K8(R)-3B4-E3-AX     | PWQN0032*    |
| 42 | 78K0KA2-L | UPD78F0565MC(R)-XXX-CAA-AX    | PLSP0020*    | 92  | 78K0KA2-L | UPD78F0561K8(R)-3B4-E4-AX     | PWQN0032*    |
| 43 | 78K0KA2-L | UPD78F0565MC(R)-XXX-CAA-E1-AX | PLSP0020*    | 93  | 78K0KA2-L | UPD78F0561K8(R)-XXX-3B4-AX    | PWQN0032*    |
| 44 | 78K0KA2-L | UPD78F0565MC(R)-XXX-CAA-E2-AX | PLSP0020*    | 94  | 78K0KA2-L | UPD78F0561K8(R)-XXX-3B4-E1-AX | PWQN0032*    |
| 45 | 78K0KA2-L | UPD78F0565MC(S)-XXX-CAA-AX    | PLSP0020*    | 95  | 78K0KA2-L | UPD78F0561K8(R)-XXX-3B4-E2-AX | PWQN0032*    |
| 46 | 78K0KA2-L | UPD78F0565MC(S)-XXX-CAA-E1-AX | PLSP0020*    | 96  | 78K0KA2-L | UPD78F0561K8(R)-XXX-3B4-E3-AX | PWQN0032*    |
| 47 | 78K0KA2-L | UPD78F0565MC(S)-XXX-CAA-E2-AX | PLSP0020*    | 97  | 78K0KA2-L | UPD78F0561K8(R)-XXX-3B4-E4-AX | PWQN0032*    |
| 48 | 78K0KA2-L | UPD78F0565MC-CAA-AX           | PLSP0020*    | 98  | 78K0KA2-L | UPD78F0561K8(S)-3B4-AX        | PWQN0032*    |
| 49 | 78K0KA2-L | UPD78F0565MC-XXX-CAA-AX       | PLSP0020*    | 99  | 78K0KA2-L | UPD78F0561K8(S)-3B4-E1-AX     | PWQN0032*    |
| 50 | 78K0KA2-L | UPD78F0565MC-XXX-CAA-E1-AX    | PLSP0020*    | 100 | 78K0KA2-L | UPD78F0561K8(S)-3B4-E2-AX     | PWQN0032*    |

Table. Product list

MCR-22-0652

| No  | Group     | Product part number           | Package code | No  | Group     | Product part number           | Package code |
|-----|-----------|-------------------------------|--------------|-----|-----------|-------------------------------|--------------|
| 101 | 78K0KA2-L | UPD78F0561K8(S)-3B4-E3-AX     | PWQN0032*    | 161 | 78K0KA2-L | UPD78F0565K8-XXX-3B4-E1-AX    | PWQN0032*    |
| 102 | 78K0KA2-L | UPD78F0561K8(S)-3B4-E4-AX     | PWQN0032*    | 162 | 78K0KA2-L | UPD78F0565K8-XXX-3B4-E2-AX    | PWQN0032*    |
| 103 | 78K0KA2-L | UPD78F0561K8(S)-XXX-3B4-AX    | PWQN0032*    | 163 | 78K0KA2-L | UPD78F0565K8-XXX-3B4-E3-AX    | PWQN0032*    |
| 104 | 78K0KA2-L | UPD78F0561K8(S)-XXX-3B4-E1-AX | PWQN0032*    | 164 | 78K0KA2-L | UPD78F0565K8-XXX-3B4-E4-AX    | PWQN0032*    |
| 105 | 78K0KA2-L | UPD78F0561K8(S)-XXX-3B4-E2-AX | PWQN0032*    | 165 | 78K0KA2-L | UPD78F0566K8(R)-3B4-AX        | PWQN0032*    |
| 106 | 78K0KA2-L | UPD78F0561K8(S)-XXX-3B4-E3-AX | PWQN0032*    | 166 | 78K0KA2-L | UPD78F0566K8(R)-3B4-E1-AX     | PWQN0032*    |
| 107 | 78K0KA2-L | UPD78F0561K8(S)-XXX-3B4-E4-AX | PWQN0032*    | 167 | 78K0KA2-L | UPD78F0566K8(R)-3B4-E2-AX     | PWQN0032*    |
| 108 | 78K0KA2-L | UPD78F0561K8-3B4-AX           | PWQN0032*    | 168 | 78K0KA2-L | UPD78F0566K8(R)-3B4-E3-AX     | PWQN0032*    |
| 109 | 78K0KA2-L | UPD78F0561K8-3B4-E1-AX        | PWQN0032*    | 169 | 78K0KA2-L | UPD78F0566K8(R)-3B4-E4-AX     | PWQN0032*    |
| 110 | 78K0KA2-L | UPD78F0561K8-3B4-E2-AX        | PWQN0032*    | 170 | 78K0KA2-L | UPD78F0566K8(R)-XXX-3B4-AX    | PWQN0032*    |
| 111 | 78K0KA2-L | UPD78F0561K8-3B4-E3-AX        | PWQN0032*    | 171 | 78K0KA2-L | UPD78F0566K8(R)-XXX-3B4-E1-AX | PWQN0032*    |
| 112 | 78K0KA2-L | UPD78F0561K8-3B4-E4-AX        | PWQN0032*    | 172 | 78K0KA2-L | UPD78F0566K8(R)-XXX-3B4-E2-AX | PWQN0032*    |
| 113 | 78K0KA2-L | UPD78F0561K8-XXX-3B4-AX       | PWQN0032*    | 173 | 78K0KA2-L | UPD78F0566K8(R)-XXX-3B4-E3-AX | PWQN0032*    |
| 114 | 78K0KA2-L | UPD78F0561K8-XXX-3B4-E1-AX    | PWQN0032*    | 174 | 78K0KA2-L | UPD78F0566K8(R)-XXX-3B4-E4-AX | PWQN0032*    |
| 115 | 78K0KA2-L | UPD78F0561K8-XXX-3B4-E2-AX    | PWQN0032*    | 175 | 78K0KA2-L | UPD78F0566K8(S)-3B4-AX        | PWQN0032*    |
| 116 | 78K0KA2-L | UPD78F0561K8-XXX-3B4-E3-AX    | PWQN0032*    | 176 | 78K0KA2-L | UPD78F0566K8(S)-3B4-E1-AX     | PWQN0032*    |
| 117 | 78K0KA2-L | UPD78F0561K8-XXX-3B4-E4-AX    | PWQN0032*    | 177 | 78K0KA2-L | UPD78F0566K8(S)-3B4-E2-AX     | PWQN0032*    |
| 118 | 78K0KA2-L | UPD78F0562K8(R)-3B4-AX        | PWQN0032*    | 178 | 78K0KA2-L | UPD78F0566K8(S)-3B4-E3-AX     | PWQN0032*    |
| 119 | 78K0KA2-L | UPD78F0562K8(R)-3B4-E1-AX     | PWQN0032*    | 179 | 78K0KA2-L | UPD78F0566K8(S)-3B4-E4-AX     | PWQN0032*    |
| 120 | 78K0KA2-L | UPD78F0562K8(R)-3B4-E3-AX     | PWQN0032*    | 180 | 78K0KA2-L | UPD78F0566K8(S)-XXX-3B4-AX    | PWQN0032*    |
| 121 | 78K0KA2-L | UPD78F0562K8(R)-3B4-E4-AX     | PWQN0032*    | 181 | 78K0KA2-L | UPD78F0566K8(S)-XXX-3B4-E1-AX | PWQN0032*    |
| 122 | 78K0KA2-L | UPD78F0562K8(R)-XXX-3B4-AX    | PWQN0032*    | 182 | 78K0KA2-L | UPD78F0566K8(S)-XXX-3B4-E2-AX | PWQN0032*    |
| 123 | 78K0KA2-L | UPD78F0562K8(R)-XXX-3B4-E3-AX | PWQN0032*    | 183 | 78K0KA2-L | UPD78F0566K8(S)-XXX-3B4-E3-AX | PWQN0032*    |
| 124 | 78K0KA2-L | UPD78F0562K8(R)-XXX-3B4-E4-AX | PWQN0032*    | 184 | 78K0KA2-L | UPD78F0566K8(S)-XXX-3B4-E4-AX | PWQN0032*    |
| 125 | 78K0KA2-L | UPD78F0562K8(S)-3B4-AX        | PWQN0032*    | 185 | 78K0KA2-L | UPD78F0566K8-3B4-AX           | PWQN0032*    |
| 126 | 78K0KA2-L | UPD78F0562K8(S)-3B4-E3-AX     | PWQN0032*    | 186 | 78K0KA2-L | UPD78F0566K8-3B4-E1-AX        | PWQN0032*    |
| 127 | 78K0KA2-L | UPD78F0562K8(S)-3B4-E4-AX     | PWQN0032*    | 187 | 78K0KA2-L | UPD78F0566K8-3B4-E2-AX        | PWQN0032*    |
| 128 | 78K0KA2-L | UPD78F0562K8(S)-XXX-3B4-E3-AX | PWQN0032*    | 188 | 78K0KA2-L | UPD78F0566K8-3B4-E3-AX        | PWQN0032*    |
| 129 | 78K0KA2-L | UPD78F0562K8(S)-XXX-3B4-E4-AX | PWQN0032*    | 189 | 78K0KA2-L | UPD78F0566K8-3B4-E4-AX        | PWQN0032*    |
| 130 | 78K0KA2-L | UPD78F0562K8-3B4-AX           | PWQN0032*    | 190 | 78K0KA2-L | UPD78F0566K8-XXX-3B4-AX       | PWQN0032*    |
| 131 | 78K0KA2-L | UPD78F0562K8-3B4-E3-AX        | PWQN0032*    | 191 | 78K0KA2-L | UPD78F0566K8-XXX-3B4-E1-AX    | PWQN0032*    |
| 132 | 78K0KA2-L | UPD78F0562K8-3B4-E4-AX        | PWQN0032*    | 192 | 78K0KA2-L | UPD78F0566K8-XXX-3B4-E2-AX    | PWQN0032*    |
| 133 | 78K0KA2-L | UPD78F0562K8-XXX-3B4-E3-AX    | PWQN0032*    | 193 | 78K0KA2-L | UPD78F0566K8-XXX-3B4-E3-AX    | PWQN0032*    |
| 134 | 78K0KA2-L | UPD78F0562K8-XXX-3B4-E4-AX    | PWQN0032*    | 194 | 78K0KA2-L | UPD78F0566K8-XXX-3B4-E4-AX    | PWQN0032*    |
| 135 | 78K0KA2-L | UPD78F0565K8(R)-3B4-AX        | PWQN0032*    | 195 | 78K0KA2-L | UPD78F0567K8(R)-3B4-AX        | PWQN0032*    |
| 136 | 78K0KA2-L | UPD78F0565K8(R)-3B4-E1-AX     | PWQN0032*    | 196 | 78K0KA2-L | UPD78F0567K8(R)-3B4-E1-AX     | PWQN0032*    |
| 137 | 78K0KA2-L | UPD78F0565K8(R)-3B4-E2-AX     | PWQN0032*    | 197 | 78K0KA2-L | UPD78F0567K8(R)-3B4-E2-AX     | PWQN0032*    |
| 138 | 78K0KA2-L | UPD78F0565K8(R)-3B4-E3-AX     | PWQN0032*    | 198 | 78K0KA2-L | UPD78F0567K8(R)-3B4-E3-AX     | PWQN0032*    |
| 139 | 78K0KA2-L | UPD78F0565K8(R)-3B4-E4-AX     | PWQN0032*    | 199 | 78K0KA2-L | UPD78F0567K8(R)-3B4-E4-AX     | PWQN0032*    |
| 140 | 78K0KA2-L | UPD78F0565K8(R)-XXX-3B4-AX    | PWQN0032*    | 200 | 78K0KA2-L | UPD78F0567K8(R)-XXX-3B4-AX    | PWQN0032*    |
| 141 | 78K0KA2-L | UPD78F0565K8(R)-XXX-3B4-E1-AX | PWQN0032*    | 201 | 78K0KA2-L | UPD78F0567K8(R)-XXX-3B4-E1-AX | PWQN0032*    |
| 142 | 78K0KA2-L | UPD78F0565K8(R)-XXX-3B4-E2-AX | PWQN0032*    | 202 | 78K0KA2-L | UPD78F0567K8(R)-XXX-3B4-E2-AX | PWQN0032*    |
| 143 | 78K0KA2-L | UPD78F0565K8(R)-XXX-3B4-E3-AX | PWQN0032*    | 203 | 78K0KA2-L | UPD78F0567K8(R)-XXX-3B4-E3-AX | PWQN0032*    |
| 144 | 78K0KA2-L | UPD78F0565K8(R)-XXX-3B4-E4-AX | PWQN0032*    | 204 | 78K0KA2-L | UPD78F0567K8(R)-XXX-3B4-E4-AX | PWQN0032*    |
| 145 | 78K0KA2-L | UPD78F0565K8(S)-3B4-AX        | PWQN0032*    | 205 | 78K0KA2-L | UPD78F0567K8(S)-3B4-AX        | PWQN0032*    |
| 146 | 78K0KA2-L | UPD78F0565K8(S)-3B4-E1-AX     | PWQN0032*    | 206 | 78K0KA2-L | UPD78F0567K8(S)-3B4-E1-AX     | PWQN0032*    |
| 147 | 78K0KA2-L | UPD78F0565K8(S)-3B4-E2-AX     | PWQN0032*    | 207 | 78K0KA2-L | UPD78F0567K8(S)-3B4-E2-AX     | PWQN0032*    |
| 148 | 78K0KA2-L | UPD78F0565K8(S)-3B4-E3-AX     | PWQN0032*    | 208 | 78K0KA2-L | UPD78F0567K8(S)-3B4-E3-AX     | PWQN0032*    |
| 149 | 78K0KA2-L | UPD78F0565K8(S)-3B4-E4-AX     | PWQN0032*    | 209 | 78K0KA2-L | UPD78F0567K8(S)-3B4-E4-AX     | PWQN0032*    |
| 150 | 78K0KA2-L | UPD78F0565K8(S)-XXX-3B4-AX    | PWQN0032*    | 210 | 78K0KA2-L | UPD78F0567K8(S)-XXX-3B4-AX    | PWQN0032*    |
| 151 | 78K0KA2-L | UPD78F0565K8(S)-XXX-3B4-E1-AX | PWQN0032*    | 211 | 78K0KA2-L | UPD78F0567K8(S)-XXX-3B4-E1-AX | PWQN0032*    |
| 152 | 78K0KA2-L | UPD78F0565K8(S)-XXX-3B4-E2-AX | PWQN0032*    | 212 | 78K0KA2-L | UPD78F0567K8(S)-XXX-3B4-E2-AX | PWQN0032*    |
| 153 | 78K0KA2-L | UPD78F0565K8(S)-XXX-3B4-E3-AX | PWQN0032*    | 213 | 78K0KA2-L | UPD78F0567K8(S)-XXX-3B4-E3-AX | PWQN0032*    |
| 154 | 78K0KA2-L | UPD78F0565K8(S)-XXX-3B4-E4-AX | PWQN0032*    | 214 | 78K0KA2-L | UPD78F0567K8(S)-XXX-3B4-E4-AX | PWQN0032*    |
| 155 | 78K0KA2-L | UPD78F0565K8-3B4-AX           | PWQN0032*    | 215 | 78K0KA2-L | UPD78F0567K8-3B4-AX           | PWQN0032*    |
| 156 | 78K0KA2-L | UPD78F0565K8-3B4-E1-AX        | PWQN0032*    | 216 | 78K0KA2-L | UPD78F0567K8-3B4-E1-AX        | PWQN0032*    |
| 157 | 78K0KA2-L | UPD78F0565K8-3B4-E2-AX        | PWQN0032*    | 217 | 78K0KA2-L | UPD78F0567K8-3B4-E2-AX        | PWQN0032*    |
| 158 | 78K0KA2-L | UPD78F0565K8-3B4-E3-AX        | PWQN0032*    | 218 | 78K0KA2-L | UPD78F0567K8-3B4-E3-AX        | PWQN0032*    |
| 159 | 78K0KA2-L | UPD78F0565K8-3B4-E4-AX        | PWQN0032*    | 219 | 78K0KA2-L | UPD78F0567K8-3B4-E4-AX        | PWQN0032*    |
| 160 | 78K0KA2-L | UPD78F0565K8-XXX-3B4-AX       | PWQN0032*    | 220 | 78K0KA2-L | UPD78F0567K8-XXX-3B4-AX       | PWQN0032*    |

Table. Product list

MCR-22-0652

| No  | Group     | Product part number          | Package code | No  | Group     | Product part number          | Package code |
|-----|-----------|------------------------------|--------------|-----|-----------|------------------------------|--------------|
| 221 | 78K0KA2-L | UPD78F0567K8-XXX-3B4-E1-AX   | PWQN0032*    | 281 | 78K0KA2-L | UPD78F0562FC-XXX-2N2-E1-A    | PWLG0025*    |
| 222 | 78K0KA2-L | UPD78F0567K8-XXX-3B4-E2-AX   | PWQN0032*    | 282 | 78K0KA2-L | UPD78F0562FC-XXX-2N2-E2-A    | PWLG0025*    |
| 223 | 78K0KA2-L | UPD78F0567K8-XXX-3B4-E3-AX   | PWQN0032*    | 283 | 78K0KA2-L | UPD78F0562FC-XXX-2N2-E3-A    | PWLG0025*    |
| 224 | 78K0KA2-L | UPD78F0567K8-XXX-3B4-E4-AX   | PWQN0032*    | 284 | 78K0KA2-L | UPD78F0562FC-XXX-2N2-E4-A    | PWLG0025*    |
| 225 | 78K0KA2-L | UPD78F0560FC(S)-2N2-A        | PWLG0025*    | 285 | 78K0KA2-L | UPD78F0565FC(S)-2N2-A        | PWLG0025*    |
| 226 | 78K0KA2-L | UPD78F0560FC(S)-2N2-E1-A     | PWLG0025*    | 286 | 78K0KA2-L | UPD78F0565FC(S)-2N2-E1-A     | PWLG0025*    |
| 227 | 78K0KA2-L | UPD78F0560FC(S)-2N2-E2-A     | PWLG0025*    | 287 | 78K0KA2-L | UPD78F0565FC(S)-2N2-E2-A     | PWLG0025*    |
| 228 | 78K0KA2-L | UPD78F0560FC(S)-2N2-E3-A     | PWLG0025*    | 288 | 78K0KA2-L | UPD78F0565FC(S)-2N2-E3-A     | PWLG0025*    |
| 229 | 78K0KA2-L | UPD78F0560FC(S)-2N2-E4-A     | PWLG0025*    | 289 | 78K0KA2-L | UPD78F0565FC(S)-2N2-E4-A     | PWLG0025*    |
| 230 | 78K0KA2-L | UPD78F0560FC(S)-XXX-2N2-A    | PWLG0025*    | 290 | 78K0KA2-L | UPD78F0565FC(S)-XXX-2N2-A    | PWLG0025*    |
| 231 | 78K0KA2-L | UPD78F0560FC(S)-XXX-2N2-E1-A | PWLG0025*    | 291 | 78K0KA2-L | UPD78F0565FC(S)-XXX-2N2-E1-A | PWLG0025*    |
| 232 | 78K0KA2-L | UPD78F0560FC(S)-XXX-2N2-E2-A | PWLG0025*    | 292 | 78K0KA2-L | UPD78F0565FC(S)-XXX-2N2-E2-A | PWLG0025*    |
| 233 | 78K0KA2-L | UPD78F0560FC(S)-XXX-2N2-E3-A | PWLG0025*    | 293 | 78K0KA2-L | UPD78F0565FC(S)-XXX-2N2-E3-A | PWLG0025*    |
| 234 | 78K0KA2-L | UPD78F0560FC(S)-XXX-2N2-E4-A | PWLG0025*    | 294 | 78K0KA2-L | UPD78F0565FC(S)-XXX-2N2-E4-A | PWLG0025*    |
| 235 | 78K0KA2-L | UPD78F0560FC-2N2-A           | PWLG0025*    | 295 | 78K0KA2-L | UPD78F0565FC-2N2-A           | PWLG0025*    |
| 236 | 78K0KA2-L | UPD78F0560FC-2N2-E1-A        | PWLG0025*    | 296 | 78K0KA2-L | UPD78F0565FC-2N2-E1-A        | PWLG0025*    |
| 237 | 78K0KA2-L | UPD78F0560FC-2N2-E2-A        | PWLG0025*    | 297 | 78K0KA2-L | UPD78F0565FC-2N2-E2-A        | PWLG0025*    |
| 238 | 78K0KA2-L | UPD78F0560FC-2N2-E3-A        | PWLG0025*    | 298 | 78K0KA2-L | UPD78F0565FC-2N2-E3-A        | PWLG0025*    |
| 239 | 78K0KA2-L | UPD78F0560FC-2N2-E4-A        | PWLG0025*    | 299 | 78K0KA2-L | UPD78F0565FC-2N2-E4-A        | PWLG0025*    |
| 240 | 78K0KA2-L | UPD78F0560FC-XXX-2N2-A       | PWLG0025*    | 300 | 78K0KA2-L | UPD78F0565FC-XXX-2N2-A       | PWLG0025*    |
| 241 | 78K0KA2-L | UPD78F0560FC-XXX-2N2-E1-A    | PWLG0025*    | 301 | 78K0KA2-L | UPD78F0565FC-XXX-2N2-E1-A    | PWLG0025*    |
| 242 | 78K0KA2-L | UPD78F0560FC-XXX-2N2-E2-A    | PWLG0025*    | 302 | 78K0KA2-L | UPD78F0565FC-XXX-2N2-E2-A    | PWLG0025*    |
| 243 | 78K0KA2-L | UPD78F0560FC-XXX-2N2-E3-A    | PWLG0025*    | 303 | 78K0KA2-L | UPD78F0565FC-XXX-2N2-E3-A    | PWLG0025*    |
| 244 | 78K0KA2-L | UPD78F0560FC-XXX-2N2-E4-A    | PWLG0025*    | 304 | 78K0KA2-L | UPD78F0565FC-XXX-2N2-E4-A    | PWLG0025*    |
| 245 | 78K0KA2-L | UPD78F0561FC(S)-2N2-A        | PWLG0025*    | 305 | 78K0KA2-L | UPD78F0566FC(S)-2N2-A        | PWLG0025*    |
| 246 | 78K0KA2-L | UPD78F0561FC(S)-2N2-E1-A     | PWLG0025*    | 306 | 78K0KA2-L | UPD78F0566FC(S)-2N2-E1-A     | PWLG0025*    |
| 247 | 78K0KA2-L | UPD78F0561FC(S)-2N2-E2-A     | PWLG0025*    | 307 | 78K0KA2-L | UPD78F0566FC(S)-2N2-E2-A     | PWLG0025*    |
| 248 | 78K0KA2-L | UPD78F0561FC(S)-2N2-E3-A     | PWLG0025*    | 308 | 78K0KA2-L | UPD78F0566FC(S)-2N2-E3-A     | PWLG0025*    |
| 249 | 78K0KA2-L | UPD78F0561FC(S)-2N2-E4-A     | PWLG0025*    | 309 | 78K0KA2-L | UPD78F0566FC(S)-2N2-E4-A     | PWLG0025*    |
| 250 | 78K0KA2-L | UPD78F0561FC(S)-XXX-2N2-A    | PWLG0025*    | 310 | 78K0KA2-L | UPD78F0566FC(S)-XXX-2N2-A    | PWLG0025*    |
| 251 | 78K0KA2-L | UPD78F0561FC(S)-XXX-2N2-E1-A | PWLG0025*    | 311 | 78K0KA2-L | UPD78F0566FC(S)-XXX-2N2-E1-A | PWLG0025*    |
| 252 | 78K0KA2-L | UPD78F0561FC(S)-XXX-2N2-E2-A | PWLG0025*    | 312 | 78K0KA2-L | UPD78F0566FC(S)-XXX-2N2-E2-A | PWLG0025*    |
| 253 | 78K0KA2-L | UPD78F0561FC(S)-XXX-2N2-E3-A | PWLG0025*    | 313 | 78K0KA2-L | UPD78F0566FC(S)-XXX-2N2-E3-A | PWLG0025*    |
| 254 | 78K0KA2-L | UPD78F0561FC(S)-XXX-2N2-E4-A | PWLG0025*    | 314 | 78K0KA2-L | UPD78F0566FC(S)-XXX-2N2-E4-A | PWLG0025*    |
| 255 | 78K0KA2-L | UPD78F0561FC-2N2-A           | PWLG0025*    | 315 | 78K0KA2-L | UPD78F0566FC-2N2-A           | PWLG0025*    |
| 256 | 78K0KA2-L | UPD78F0561FC-2N2-E1-A        | PWLG0025*    | 316 | 78K0KA2-L | UPD78F0566FC-2N2-E1-A        | PWLG0025*    |
| 257 | 78K0KA2-L | UPD78F0561FC-2N2-E2-A        | PWLG0025*    | 317 | 78K0KA2-L | UPD78F0566FC-2N2-E2-A        | PWLG0025*    |
| 258 | 78K0KA2-L | UPD78F0561FC-2N2-E3-A        | PWLG0025*    | 318 | 78K0KA2-L | UPD78F0566FC-2N2-E3-A        | PWLG0025*    |
| 259 | 78K0KA2-L | UPD78F0561FC-2N2-E4-A        | PWLG0025*    | 319 | 78K0KA2-L | UPD78F0566FC-2N2-E4-A        | PWLG0025*    |
| 260 | 78K0KA2-L | UPD78F0561FC-XXX-2N2-A       | PWLG0025*    | 320 | 78K0KA2-L | UPD78F0566FC-XXX-2N2-A       | PWLG0025*    |
| 261 | 78K0KA2-L | UPD78F0561FC-XXX-2N2-E1-A    | PWLG0025*    | 321 | 78K0KA2-L | UPD78F0566FC-XXX-2N2-E1-A    | PWLG0025*    |
| 262 | 78K0KA2-L | UPD78F0561FC-XXX-2N2-E2-A    | PWLG0025*    | 322 | 78K0KA2-L | UPD78F0566FC-XXX-2N2-E2-A    | PWLG0025*    |
| 263 | 78K0KA2-L | UPD78F0561FC-XXX-2N2-E3-A    | PWLG0025*    | 323 | 78K0KA2-L | UPD78F0566FC-XXX-2N2-E3-A    | PWLG0025*    |
| 264 | 78K0KA2-L | UPD78F0561FC-XXX-2N2-E4-A    | PWLG0025*    | 324 | 78K0KA2-L | UPD78F0566FC-XXX-2N2-E4-A    | PWLG0025*    |
| 265 | 78K0KA2-L | UPD78F0562FC(S)-2N2-A        | PWLG0025*    | 325 | 78K0KA2-L | UPD78F0567FC(S)-2N2-A        | PWLG0025*    |
| 266 | 78K0KA2-L | UPD78F0562FC(S)-2N2-E1-A     | PWLG0025*    | 326 | 78K0KA2-L | UPD78F0567FC(S)-2N2-E1-A     | PWLG0025*    |
| 267 | 78K0KA2-L | UPD78F0562FC(S)-2N2-E2-A     | PWLG0025*    | 327 | 78K0KA2-L | UPD78F0567FC(S)-2N2-E2-A     | PWLG0025*    |
| 268 | 78K0KA2-L | UPD78F0562FC(S)-2N2-E3-A     | PWLG0025*    | 328 | 78K0KA2-L | UPD78F0567FC(S)-2N2-E3-A     | PWLG0025*    |
| 269 | 78K0KA2-L | UPD78F0562FC(S)-2N2-E4-A     | PWLG0025*    | 329 | 78K0KA2-L | UPD78F0567FC(S)-2N2-E4-A     | PWLG0025*    |
| 270 | 78K0KA2-L | UPD78F0562FC(S)-XXX-2N2-A    | PWLG0025*    | 330 | 78K0KA2-L | UPD78F0567FC(S)-XXX-2N2-A    | PWLG0025*    |
| 271 | 78K0KA2-L | UPD78F0562FC(S)-XXX-2N2-E1-A | PWLG0025*    | 331 | 78K0KA2-L | UPD78F0567FC(S)-XXX-2N2-E1-A | PWLG0025*    |
| 272 | 78K0KA2-L | UPD78F0562FC(S)-XXX-2N2-E2-A | PWLG0025*    | 332 | 78K0KA2-L | UPD78F0567FC(S)-XXX-2N2-E2-A | PWLG0025*    |
| 273 | 78K0KA2-L | UPD78F0562FC(S)-XXX-2N2-E3-A | PWLG0025*    | 333 | 78K0KA2-L | UPD78F0567FC(S)-XXX-2N2-E3-A | PWLG0025*    |
| 274 | 78K0KA2-L | UPD78F0562FC(S)-XXX-2N2-E4-A | PWLG0025*    | 334 | 78K0KA2-L | UPD78F0567FC(S)-XXX-2N2-E4-A | PWLG0025*    |
| 275 | 78K0KA2-L | UPD78F0562FC-2N2-A           | PWLG0025*    | 335 | 78K0KA2-L | UPD78F0567FC-2N2-A           | PWLG0025*    |
| 276 | 78K0KA2-L | UPD78F0562FC-2N2-E1-A        | PWLG0025*    | 336 | 78K0KA2-L | UPD78F0567FC-2N2-E1-A        | PWLG0025*    |
| 277 | 78K0KA2-L | UPD78F0562FC-2N2-E2-A        | PWLG0025*    | 337 | 78K0KA2-L | UPD78F0567FC-2N2-E2-A        | PWLG0025*    |
| 278 | 78K0KA2-L | UPD78F0562FC-2N2-E3-A        | PWLG0025*    | 338 | 78K0KA2-L | UPD78F0567FC-2N2-E3-A        | PWLG0025*    |
| 279 | 78K0KA2-L | UPD78F0562FC-2N2-E4-A        | PWLG0025*    | 339 | 78K0KA2-L | UPD78F0567FC-2N2-E4-A        | PWLG0025*    |
| 280 | 78K0KA2-L | UPD78F0562FC-XXX-2N2-A       | PWLG0025*    | 340 | 78K0KA2-L | UPD78F0567FC-XXX-2N2-A       | PWLG0025*    |

Table. Product list

MCR-22-0652

| No  | Group     | Product part number       | Package code | No  | Group | Product part number | Package code |
|-----|-----------|---------------------------|--------------|-----|-------|---------------------|--------------|
| 341 | 78K0KA2-L | UPD78F0567FC-XXX-2N2-E1-A | PWLG0025*    | 401 |       |                     |              |
| 342 | 78K0KA2-L | UPD78F0567FC-XXX-2N2-E2-A | PWLG0025*    | 402 |       |                     |              |
| 343 | 78K0KA2-L | UPD78F0567FC-XXX-2N2-E3-A | PWLG0025*    | 403 |       |                     |              |
| 344 | 78K0KA2-L | UPD78F0567FC-XXX-2N2-E4-A | PWLG0025*    | 404 |       |                     |              |
| 345 |           |                           |              | 405 |       |                     |              |
| 346 |           |                           |              | 406 |       |                     |              |
| 347 |           |                           |              | 407 |       |                     |              |
| 348 |           |                           |              | 408 |       |                     |              |
| 349 |           |                           |              | 409 |       |                     |              |
| 350 |           |                           |              | 410 |       |                     |              |
| 351 |           |                           |              | 411 |       |                     |              |
| 352 |           |                           |              | 412 |       |                     |              |
| 353 |           |                           |              | 413 |       |                     |              |
| 354 |           |                           |              | 414 |       |                     |              |
| 355 |           |                           |              | 415 |       |                     |              |
| 356 |           |                           |              | 416 |       |                     |              |
| 357 |           |                           |              | 417 |       |                     |              |
| 358 |           |                           |              | 418 |       |                     |              |
| 359 |           |                           |              | 419 |       |                     |              |
| 360 |           |                           |              | 420 |       |                     |              |
| 361 |           |                           |              | 421 |       |                     |              |
| 362 |           |                           |              | 422 |       |                     |              |
| 363 |           |                           |              | 423 |       |                     |              |
| 364 |           |                           |              | 424 |       |                     |              |
| 365 |           |                           |              | 425 |       |                     |              |
| 366 |           |                           |              | 426 |       |                     |              |
| 367 |           |                           |              | 427 |       |                     |              |
| 368 |           |                           |              | 428 |       |                     |              |
| 369 |           |                           |              | 429 |       |                     |              |
| 370 |           |                           |              | 430 |       |                     |              |
| 371 |           |                           |              | 431 |       |                     |              |
| 372 |           |                           |              | 432 |       |                     |              |
| 373 |           |                           |              | 433 |       |                     |              |
| 374 |           |                           |              | 434 |       |                     |              |
| 375 |           |                           |              | 435 |       |                     |              |
| 376 |           |                           |              | 436 |       |                     |              |
| 377 |           |                           |              | 437 |       |                     |              |
| 378 |           |                           |              | 438 |       |                     |              |
| 379 |           |                           |              | 439 |       |                     |              |
| 380 |           |                           |              | 440 |       |                     |              |
| 381 |           |                           |              | 441 |       |                     |              |
| 382 |           |                           |              | 442 |       |                     |              |
| 383 |           |                           |              | 443 |       |                     |              |
| 384 |           |                           |              | 444 |       |                     |              |
| 385 |           |                           |              | 445 |       |                     |              |
| 386 |           |                           |              | 446 |       |                     |              |
| 387 |           |                           |              | 447 |       |                     |              |
| 388 |           |                           |              | 448 |       |                     |              |
| 389 |           |                           |              | 449 |       |                     |              |
| 390 |           |                           |              | 450 |       |                     |              |
| 391 |           |                           |              | 451 |       |                     |              |
| 392 |           |                           |              | 452 |       |                     |              |
| 393 |           |                           |              | 453 |       |                     |              |
| 394 |           |                           |              | 454 |       |                     |              |
| 395 |           |                           |              | 455 |       |                     |              |
| 396 |           |                           |              | 456 |       |                     |              |
| 397 |           |                           |              | 457 |       |                     |              |
| 398 |           |                           |              | 458 |       |                     |              |
| 399 |           |                           |              | 459 |       |                     |              |
| 400 |           |                           |              | 460 |       |                     |              |