Timing Matters
Epson is the world's premier supplier of timing devices.

EPSON
Learn More

EPSON TIMING DEVICES

Product Configuration Guide (PCS)

CONTENTS

- **Crystals** — **Pages 3 – 50**
  - **MHz and kHz Crystals** — **Pages 3 – 26**
  - **LEGACY MHz and kHz Crystals** — **Pages 27 - 50**
- **Simple Packaged Crystal Oscillators (SPXO)** — **Pages 51 - 94**
- **Programmable Oscillators (P-SPXO)** — **Pages 95 - 112**
- **Temp. Compensated Crystal Oscillators (TCXO)** — **Pages 114 - 131**
- **Real-Time Clocks (RTC)** — **Pages 132 - 146**
- **Voltage Controlled Crystal Oscillators (VCXO)** — **Pages 148 - 172**
- **SAW Oscillators** — **Pages 173 - 204**
- **Gyro Sensors** — **Pages 205 - 209**
- **Appendix** **(Crystal Load Cap Info)** — **Pages 210 - 211**

Extras:
Product Catalog w/ Datasheet – Crystal Master
Product Support Docs – Environmental, Packing Spec., Quality, Handling Precautions, etc.
Glossary – Definition of Terms
Technical Support in U.S. – Email TDTechSupport@ea.epson.com

Product Configuration Guide

CRYSTALS

EPSON

MHz and kHz CRYSTAL

NOTE: Applies to all Crystal part numbers created since May 2016

EPSON

Product Configuration System

32.768 kHz Crystal Unit

FC1610AN **32.768K** – **C5NN90KC5**

1. Model
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. ESR
6. ESR unit (K = kΩ)
7. Drive level
8. Tape & Reel

32.7680kHz Crystal Package Type:

1.60 x 1.00 x 0.5 mm

1 Model	**2 Frequency**	**3 Load Cap**	**4 Frequency Tolerance**	**5 ESR**	**6 ESR Unit**	**7 Drive level**	**8 Tape & Reel**
FC1610AN	32.768kHz	C5 = 12.5 pF 90 = 9.0 pF 70 = 7.0 pF 60 = 6.0 pF	NN = +/-20 ppm AA = +/- 10 ppm	90 = 90 kΩ	K = kΩ	C = 0.5 µW	B = Bulk 0 = 1000pcs/reel 5 = 3000pcs/reel 7 = 5000pc/reel

EPSON

NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

32.768 kHz Crystal Unit

FC1610BN **32.768K** – **C5NN60KCB**

1. Model
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. ESR
6. ESR unit (K = kΩ)
7. Drive level
8. Tape & Reel

32.7680kHz Crystal Package Type:

1.60 x 1.00 x 0.5 mm

1 Model
FC1610AN

2 Frequency
32.768kHz

3 Load Cap
C5 = 12.5 pF
90 = 9.0 pF

4 Frequency Tolerance
NN = +/-20 ppm

5 ESR
60 = 60 kΩ
- @ -40C to +85C
70 = 70kΩ
- @ -40 to +105C

6 ESR Unit
K = kΩ

7 Drive level
C = 0.5 µW

8 Tape & Reel
B = Bulk
0 = 1000pcs/reel
5 = 3000pcs/reel
7 = 5000pc/reel

EPSON

NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

32.768 kHz Crystal Unit

FC2012AN **32.768K** – **90NN50KCB**

1. Model
   - **32.7680kHz Crystal Package Type:**
   - **2.05 x 1.2 x 0.6 mm**
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. ESR
6. ESR unit (K = kΩ)
7. Drive level
8. Tape & Reel

1 Model	**2 Frequency**	**3 Load Cap**	**4 Frequency Tolerance**	**5 ESR**	**6 ESR Unit**	**7 Drive level**	**8 Tape & Reel**
FC2012AN	32.768kHz	C5 = 12.5 pF 90 = 9.0 pF 70 = 7.0 pF	NN = +/-20 ppm	60 = 60 kΩ - @-40 to +105C 50 = 50 kΩ - @-40 to +85C	K = kΩ	C = 0.5 µW	B = Bulk 0 =1000pcs/reel 5 = 3000pcs/reel 7=5000pc/reel

EPSON

NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

32.768 kHz Crystal Unit

FC2012SN **32.768K** – **90NN90KCB**

1. Model
   - **32.7680kHz Crystal Package Type:**
   - **2.05 x 1.2 x 0.6 mm**
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. ESR
6. ESR unit (K = kΩ)
7. Drive level
8. Tape & Reel

1 Model	2 Frequency	3 Load Cap	4 Frequency Tolerance	5 ESR	6 ESR Unit	7 Drive level	8 Tape & Reel
FC2012SN	32.768kHz	C5 = 12.5 pF 90 = 9.0 pF 70 = 7.0 pF	NN = +/-20 ppm	A0 = 100 kΩ - @-40 to +105C 90 = 90 kΩ - @-40 to +85C	K = kΩ	C = 0.5 µW	B = Bulk 0 = 1000pcs/reel 7 = 5000pcs/reel

EPSON

NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

32.768 kHz Crystal Unit

FC2012AA **32.768K** – **90NN70KCB**

1. Model
   - **32.7680kHz Crystal Package Type:**
   - **2.05 x 1.2 x 0.6 mm**
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. ESR
6. ESR unit (K = kΩ)
7. Drive level
8. Tape & Reel

1 Model	**2 Frequency**	**3 Load Cap**	**4 Frequency Tolerance**	**5 ESR**	**6 ESR Unit**	**7 Drive level**	**8 Tape & Reel**
FC2012AN	32.768kHz	C5 = 12.5 pF 90 = 9.0 pF 70 = 7.0 pF	NN = +/-20 ppm	70 = 70 kΩ -@-40 to +105C 75 = 75 kΩ -@-40 to +105C	K = kΩ	C = 0.5 µW	B = Bulk 7=5000pc/reel

EPSON

NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

32.768 kHz Crystal Unit

FC3215AN **32.768K** – **90NN50KCB**

1. Model
   - **32.7680kHz Crystal Package Type:**
   - **3.2 x 1.5 x 0.9 mm**
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. ESR
6. ESR unit (K = kΩ)
7. Drive level
8. Tape & Reel

1 Model	2 Frequency	3 Load Cap	4 Frequency Tolerance	5 ESR	6 ESR Unit	7 Drive level	8 Tape & Reel
FC3215AN	32.768kHz	C5 = 12.5 pF 90 = 9.0 pF 70 = 7.0 pF	NN = +/-20 ppm	60 = 60 kΩ - @-40 to +105C 50 = 50 kΩ - @-40 to +85C	K = kΩ	C = 0.5 µW	B = Bulk 0 = 1000pcs/reel 5 = 3000pcs/reel

EPSON

NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

32.768 kHz Crystal Unit

FC-135 **32.768K** – **90NN70KCB**

1 → Model

32.7680kHz Crystal Package Type:
3.2 x 1.5 x 0.9 mm

2 → Frequency

3 → Load capacitance

4 → Frequency tolerance

5 → ESR

6 → ESR unit (K = kΩ)

7 → Drive level

8 → Tape & Reel

1	2	3	4	5	6	7	8
Model	**Frequency**	**Load Cap**	**Frequency Tolerance**	**ESR**	**ESR Unit**	**Drive level**	**Tape & Reel**
FC-135	32.768kHz	C5 = 12.5 pF 90 = 9.0 pF 80 = 8.0 pF 70 = 7.0 pF 60 = 6.0 pF	NN = +/-20 ppm AA = +/-10 ppm	70 = 70 kΩ	K = kΩ	C = 0.5 µW	B = Bulk 0 = 1000pcs/reel 5 = 3000pcs/reel

EPSON

NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

32.768 kHz Crystal Unit

FC-135R **32.768K** – **90NN50KCB**

1. Model
   - **32.7680kHz Crystal Package Type:**
     3.2 x 1.5 x 0.9 mm
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. ESR
6. ESR unit (K = kΩ)
7. Drive level
8. Tape & Reel

1	2	3	4	5	6	7	8
Model FC-135R	**Frequency** 32.768kHz	**Load Cap** C5 = 12.5 pF 90 = 9.0 pF 70 = 7.0 pF 60 = 6.0 pF	**Frequency Tolerance** NN = +/-20 ppm AA = +/-10 ppm	**ESR** 50 = 50 kΩ	**ESR Unit** K = kΩ	**Drive level** C = 0.5 µW	**Tape & Reel** B = Bulk 0 = 1000pcs/reel 5 = 3000pcs/reel

EPSON

NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

32.768 kHz Crystal Unit

FC-12M **32.768K** – **90NN90KCB**

1. Model
   - **32.7680kHz Crystal Package Type:**
     2.05 x 1.2 x 0.6 mm
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. ESR
6. ESR unit (K = kΩ)
7. Drive level
8. Tape & Reel

1 Model	**2 Frequency**	**3 Load Cap**	**4 Frequency Tolerance**	**5 ESR**	**6 ESR Unit**	**7 Drive level**	**8 Tape & Reel**
FC-12M	32.768kHz	C5 = 12.5 pF 90 = 9.0 pF 70 = 7.0 pF 60 = 6.0 pF	NN = +/-20 ppm AA = +/-10 ppm	90 = 90 kΩ	K = kΩ	C = 0.5 µW	B = Bulk 0 = 1000pcs/reel 5 = 3000pcs/reel 7 = 5000pcs/reel

EPSON

NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

32.768 kHz Crystal Unit

FC-13A **32.768K** – **90NN70KCB**

1. Model
   - **32.7680kHz Crystal Package Type:**
     3.2 x 1.5 x 0.9 mm
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. ESR
6. ESR unit (K = kΩ)
7. Drive level
8. Tape & Reel

Non Promotional

1 **Model**	2 **Frequency**	3 **Load Cap**	4 **Frequency Tolerance**	5 **ESR**	6 **ESR Unit**	7 **Drive level**	8 **Tape & Reel**
FC-13A	32.768kHz	C5 = 12.5 pF 90 = 9.0 pF 70 = 7.0 pF 60 = 6.0 pF	NN = +/-20 ppm AA = +/-10 ppm	70 = 70 kΩ	K = kΩ	C = 1.0 µW	B = Bulk 0 = 1000pcs/reel 5 = 3000pcs/reel

EPSON

NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA2016AS 38.40M– 80AACCN80RG5

1 → Model

2 → Frequency

Crystal Package Type:

FA2016AS: 2.0 x 1.6 x 0.68 mm (w/ Thermistor)

3 → Load capacitance

4 → Frequency tolerance

5 → Frequency temp. char.

6 → Temperature range

7 → ESR

8 → ESR unit (R = Ω)

9 → Drive level

0 → Tape & reel

1 Model
FA2016AS

2 Frequency
38.4 MHz

3 Load cap
N0 = 20 pF
J0 = 18 pF
G0 = 16pF
F0 = 15pF
C5 = 12.5pF
C0 = 12 pF
A0 = 10 pF
90 = 9.0 pF
80 = 8.0 pF
70 = 7.0 pF
60 = 6.0 pF

4 Frequency tolerance
bb = +/-50 ppm
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm (STD)
ZZ = Others

5 Freq. temp. char.
bb = +/-50 ppm
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
CC = +/-12 ppm (STD)
AA = +/- 10 ppm
ZZ = Others

6 Temp. range
U = -20 to +75C
N = -30 to +85C
G = -40 to +85C
H = -40 to 105C
J = -40 to 125C

7 8 ESR = Ω
A5 = 150 Ω
A0 = 100 Ω
80 = 80 Ω
60 = 60 Ω
50 = 50 Ω

9 Drive level
E = 100 µW
G = 200 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
5 = 3000pcs/reel
7 = 5000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA-238 **25.00M** – **90NNYYB80RG5**

1 → Model

Crystal Package Type:
3.2 x 2.5 x 0.7 mm

2 → Frequency

3 → Load capacitance

4 → Frequency tolerance

5 → Frequency temp. char.

6 → Temperature range

7 → ESR

8 → ESR unit (R = Ω)

9 → Drive level

0 → Tape & reel

1 Model
FA-238

2 Frequency
16 ~ 50 MHz

3 Load cap
N0=20pF
J0 = 18 pF
G0 = 16 pF
C5 = 12.5 pF
C0 = 12 pF
A0 = 10 pF
90 = 9.0pF
80 = 8.0 pF
70 = 7.0 pF

4 Frequency tolerance
bb = +/-50 ppm
YY= +/-30 ppm
TT = +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm

5 Freq. temp. char.
bb = +/-50 ppm
YY= +/-30 ppm
TT = +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm

6 Temp. range
B = -20 to +70C
U = -20 to +75C
N = -30 to +85C
G = -40 to +85C
H = -40 to 105C

7 8 ESR = Ω
80 = 80 Ω
60 = 60 Ω
50 = 50 Ω
40 = 40 Ω

9 Drive level
G = 200 µW
E = 100 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
6 = 2000pcs/reel
5 = 3000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA-238A 24.00M – C0NNbbJ50RG0

1. Model
   - **Crystal Package Type:** 3.2 x 2.5 x 0.7 mm
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. Frequency temp. char.
6. Temperature range
7. ESR
8. ESR unit (R = Ω)
9. Drive level
0. Tape & reel

1 Model
FA-238A

2 Frequency
12 ~ 50 MHz

3 Load cap
N0=20pF
J0 = 18 pF
G0 = 16 pF
C5 = 12.5 pF
C0 = 12 pF
A0 = 10 pF
90 = 9.0pF
80 = 8.0 pF
70 = 7.0 pF

4 Frequency tolerance
bb = +/-50 ppm
YY= +/-30 ppm
TT = +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm

5 Freq. temp. char.
bb = +/-50 ppm
YY= +/-30 ppm
TT = +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm

6 Temp. range
B = -20 to +70C
U = -20 to +75C
N = -30 to +85C
G = -40 to +85C
H = -40 to 105C
J = -40 to 125C

7 8 ESR = Ω
120 = 120 Ω
80 = 80 Ω
60 = 60 Ω
50 = 50 Ω
40 = 40 Ω

9 Drive level
G = 200 µW
E = 100 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
6 = 2000pcs/reel
4 = 4000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA-238V 12.00M – 90NNYYBA0RG5

1 → Model

Crystal Package Type:
3.2 x 2.5 x 0.7 mm

2 → Frequency

3 → Load capacitance

4 → Frequency tolerance

5 → Frequency temp. char.

6 → Temperature range

7 → ESR

8 → ESR unit (R = Ω)

9 → Drive level

0 → Tape & reel

1 Model
FA-238V

2 Frequency
12 ~ 15.999 MHz

3 Load cap
N0 = 20 pF
J0 = 18 pF
F0 = 15 pF
C5 = 12.5 pF
C0 = 12 pF
A0 = 10 pF
90 = 9.0pF
80 = 8.0 pF
70 = 7.0 pF

4 Frequency tolerance
bb = +/-50 ppm
YY= +/-30 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm

5 Freq. temp. char.
bb = +/-50 ppm
YY= +/-30 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm

6 Temp. range
B = -20 to +70C
U = -20 to +75C
N = -30 to +85C
G = -40 to +85C
H = -40 to 105C

7 8 ESR = Ω
A0 = 100 Ω
80 = 80 Ω

9 Drive level
E = 100 µW
G = 200 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
5 = 3000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

TSX-3225 25.00M – 90NNYYU60RG5

1 → Model

Crystal Package Type:
3.2 x 2.5 x 0.6 mm

2 → Frequency

3 → Load capacitance

4 → Frequency tolerance

5 → Frequency temp. char.

6 → Temperature range

7 → ESR

8 → ESR unit (R = Ω)

9 → Drive level

0 → Tape & reel

1 Model
TSX-3225

2 Frequency
16 ~ 48 MHz

3 Load cap
Q0=22pF
N0 = 20 pF
J0 = 18 pF
G0 = 16pF
F0 = 15pF
C5 = 12.5pF
C0 = 12 pF
A0 = 10 pF
90 = 9.0 pF
80 = 8.0 pF
70 = 7.0 pF
D0= 13.0pF

4 Frequency tolerance
bb = +/-50 ppm
YY= +/-30 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm
77 =+/- 7ppm

5 Freq. temp. char.
bb = +/-50 ppm
YY= +/-30 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm

6 Temp. range
U = -20 to +75C
N = -30 to +85C
G = -40 to +85C
H = -40 to 105C

7 8 ESR = Ω
60 = 60 Ω
40 = 40 Ω

9 Drive level
E = 100 µW
G = 200 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
6 = 2000pcs/reel
5 = 3000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA-20H 25.00M – 60NNYYU80RE5

1. Model
   - **Crystal Package Type:** 2.5 x 2.0 x 0.55 mm
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. Frequency temp. char.
6. Temperature range
7. ESR
8. ESR unit (R = Ω)
9. Drive level
0. Tape & reel

1 Model
FA-20H

2 Frequency
12 ~ 54 MHz

3 Load cap
N0 = 20 pF
J0 = 18 pF
G0 = 16pF
F0 = 15pF
C0 = 12 pF
A0 = 10 pF
90 = 9.0 pF
80 = 8.0 pF
70 = 7.0 pF
60 = 6.0 pF

4 Frequency tolerance
bb = +/-50 ppm
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm

5 Freq. temp. char.
bb = +/-50 ppm
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm

6 Temp. range
U = -20 to +75C
N = -30 to +85C
G = -40 to +85C
H = -40 to 105C

7 8 ESR = Ω
A5 = 150 Ω
80 = 80 Ω
60 = 60 Ω
50 = 50 Ω
40 = 40 Ω

9 Drive level
E = 100 µW
G = 200 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
5 = 3000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA-128 **25.00M** – **60NNYYUA0RE5**

1. Model
   - **Crystal Package Type:** 2.0 x 1.6 x 0.5 mm
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. Frequency temp. char.
6. Temperature range
7. ESR
8. ESR unit (R = Ω)
9. Drive level
0. Tape & reel

1 Model
FA-128

2 Frequency
19.2 ~ 54 MHz

3 Load cap
N0 = 20 pF
J0 = 18 pF
G0 = 16pF
F0 = 15pF
C5 = 12.5pF
C0 = 12 pF
A0 = 10 pF
90 = 9.0 pF
80 = 8.0 pF
70 = 7.0 pF
60 = 6.0 pF

4 Frequency tolerance
bb = +/-50 ppm
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm

5 Freq. temp. char.
bb = +/-50 ppm
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm

6 Temp. range
U = -20 to +75C
N = -30 to +85C
G = -40 to +85C
H = -40 to 105C

7 8 ESR = Ω
A5 = 150 Ω
A0 = 100 Ω
80 = 80 Ω
60 = 60 Ω

9 Drive level
E = 100 µW
G = 200 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
5 = 3000pcs/reel
7 = 5000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA2016AA 40.00M – 80AAbbJ60RG7

1 → Model

2 → Frequency

Crystal Package Type:

FA2016AA: 2.0 x 1.6 x 0.5 mm

FA2016ASA: 2.0 x 1.6 x 0.5 mm (w/ Thermistor)

3 → Load capacitance

4 → Frequency tolerance

5 → Frequency temp. char.

6 → Temperature range

7 → ESR

8 → ESR unit (R = Ω)

9 → Drive level

0 → Tape & reel

1 Model
FA2016AA
FA2016ASA

2 Frequency
19.2 ~ 54 MHz

3 Load cap
N0 = 20 pF
J0 = 18 pF
G0 = 16pF
F0 = 15pF
C5 = 12.5pF
C0 = 12 pF
A0 = 10 pF
90 = 9.0 pF
80 = 8.0 pF
70 = 7.0 pF
60 = 6.0 pF

4 Frequency tolerance
bb = +/-50 ppm
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm
ZZ = Others

5 Freq. temp. char.
bb = +/-50 ppm
aa = +/- 40 ppm
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm
ZZ = Others

6 Temp. range
U = -20 to +75C
N = -30 to +85C
G = -40 to +85C
H = -40 to 105C
J = -40 to 125C

7 8 ESR = Ω
A5 = 150 Ω
A0 = 100 Ω
80 = 80 Ω
60 = 60 Ω

9 Drive level
E = 100 µW
G = 200 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
5 = 3000pcs/reel
7 = 5000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA-118T 25.00M – 60NNYYUA0RE5

1 → Model

Crystal Package Type:
1.6 x 1.2 x 0.35 mm

2 → Frequency

3 → Load capacitance

4 → Frequency tolerance

5 → Frequency temp. char.

6 → Temperature range

7 → ESR

8 → ESR unit (R = Ω)

9 → Drive level

0 → Tape & reel

1 Model
FA-118T

2 Frequency
24 ~ 54 MHz

3 Load cap
N0 = 20 pF
G0 = 16pF
C0 = 12 pF
A0 = 10 pF
90 = 9.0 pF
80 = 8.0 pF
70 = 7.0 pF
60 = 6.0 pF

4 Frequency tolerance
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm

5 Freq. temp. char.
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm

6 Temp. range
U = -20 to +75C
N = -30 to +85C
G = -40 to +85C
H = -40 to 105C

7 8 ESR = Ω
B0 = 200 Ω
A0 = 100 Ω
80 = 80 Ω
60 =60 Ω

9 Drive level
E = 100 µW
G = 200 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
5 = 3000pcs/reel
8 = 6000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA1612AS 38.40M– 80AACCN80RG7

1 → Model

2 → Frequency

Crystal Package Type:

FA1612AS: 1.6 x 1.2 x 0.65 mm (w/ Thermistor)

3 → Load capacitance

4 → Frequency tolerance

5 → Frequency temp. char.

6 → Temperature range

7 → ESR

8 → ESR unit (R = Ω)

9 → Drive level

0 → Tape & reel

1 Model
FA1612AS

2 Frequency
38.4 , 52 MHz

3 Load cap
N0 = 20 pF
J0 = 18 pF
G0 = 16pF
F0 = 15pF
C5 = 12.5pF
C0 = 12 pF
A0 = 10 pF
90 = 9.0 pF
80 = 8.0 pF
70 = 7.0 pF
60 = 6.0 pF

4 Frequency tolerance
bb = +/-50 ppm
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
AA = +/- 10 ppm (STD)
ZZ = Others

5 Freq. temp. char.
bb = +/-50 ppm
YY= +/-30 ppm
TT= +/-25 ppm
NN = +/-20 ppm
FF = +/-15 ppm
CC = +/-12 ppm (STD)
AA = +/- 10 ppm
ZZ = Others

6 Temp. range
U = -20 to +75C
N = -30 to +85C
G = -40 to +85C
H = -40 to 105C
J = -40 to 125C

7 8 ESR = Ω
A5 = 150 Ω
A0 = 100 Ω
80 = 80 Ω
60 = 60 Ω

9 Drive level
E = 100 µW
G = 200 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
5 = 3000pcs/reel
7 = 5000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA1210AN 32.00M – 80AAFFBA0REB

1. Model
   - **Crystal Package Type:** 1.0 x 0.8 x 0.3 mm
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. Frequency temp. char.
6. Temperature range
7. ESR
8. ESR unit (R = Ω)
9. Drive level
0. Tape & reel

1 Model
FA1210AN

2 Frequency
32 ~ 100 MHz

3 Load cap
60 = 7.0 pF
80 = 8.0 pF

4 Frequency tolerance
AA = +/- 10 ppm

5 Freq. temp. char.
YY = +/- 30 ppm
NN = +/-20 ppm
FF = +/-15 ppm

6 Temp. range
B = -20 to 70C
G = -40 to +85C

7 8 ESR = Ω
A0 = 100 Ω

9 Drive level
E = 100 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
5 = 3000pcs/reel

EPSON

June 2026

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System

MHz Range Crystal Units

FA1008AN 52.00M – 80AANNG60RGB

1. Model
2. Frequency
3. Load capacitance
4. Frequency tolerance
5. Frequency temp. char.
6. Temperature range
7. ESR
8. ESR unit (R = Ω)
9. Drive level
0. Tape & reel

Crystal Package Type:
1.0 x 0.8 x 0.3 mm

1 Model
FA1008AN

2 Frequency
40 ~ 100 MHz

3 Load cap
80 = 8.0 pF

4 Frequency tolerance
AA = +/- 10 ppm

5 Freq. temp. char.
NN = +/-20 ppm (-40 to +85C)
FF = +/-15 ppm (-30 to +85C)
AA = +/- 10 ppm (-20 to +75C)

6 Temp. range
G = -40 to +85C
H = -40 to 105C (Contact Epson)

7 8 ESR = Ω
60 = 60 Ω

9 Drive level
G = 200 µW

0 Tape & reel
B = Bulk
0 = 1000pcs/reel
5 = 3000pcs/reel

NOTES: The values listed above are common/standard values for MHz crystals; some combinations are not possible depending the specific model. Please contact you Epson representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

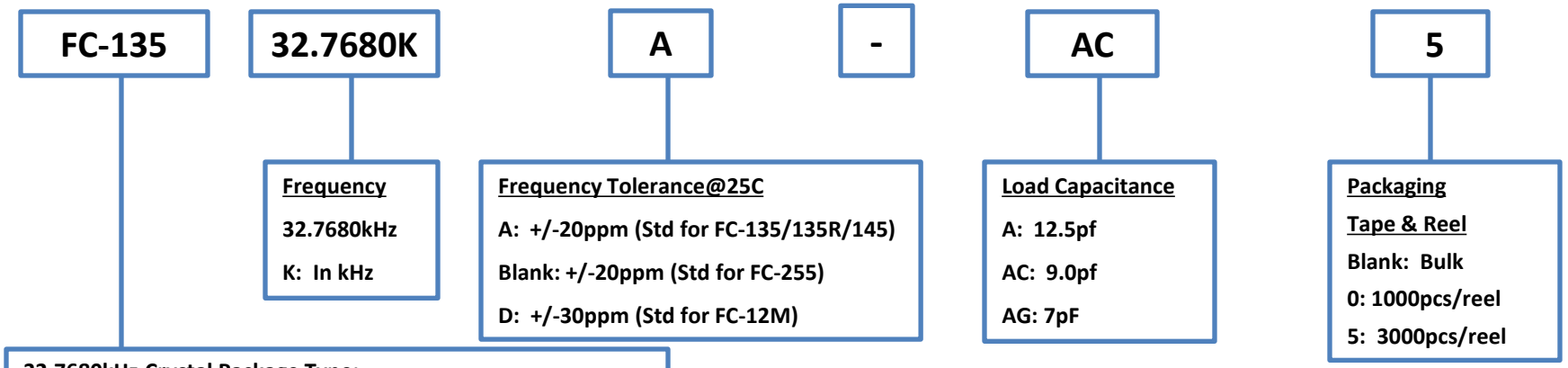
LEGACY - MHz and kHz CRYSTAL

NOTE: Applies to all Crystal part numbers created before May 2016

EPSON

Product Configuration System

kHz Range Crystal Units



NOTES:

1) This product configuration guide is applicable only to 32.7680kHz Crystals. For other frequencies, please reference the Standard kHz Crystal Product Configuration System.

2) If you require a load capacitance other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

32.768 kHz Crystal Unit with 0.35mm height for Smart Card

Discontinued

FC-12D	32.7680K	A	-	AC	5

32.7680kHz Crystal Package Type:
2.05x 1.2 x 0.35 t (mm)

Frequency
32.7680kHz
K: In kHz

Frequency Tolerance@25C
A: +/-20ppm

Load Capacitance
A: 12.5pf
AG: 7pF
AC: 9pF

Packaging
Tape & Reel
Blank: Bulk
0: 1000pcs/reel
5: 3000pcs/reel

NOTES:

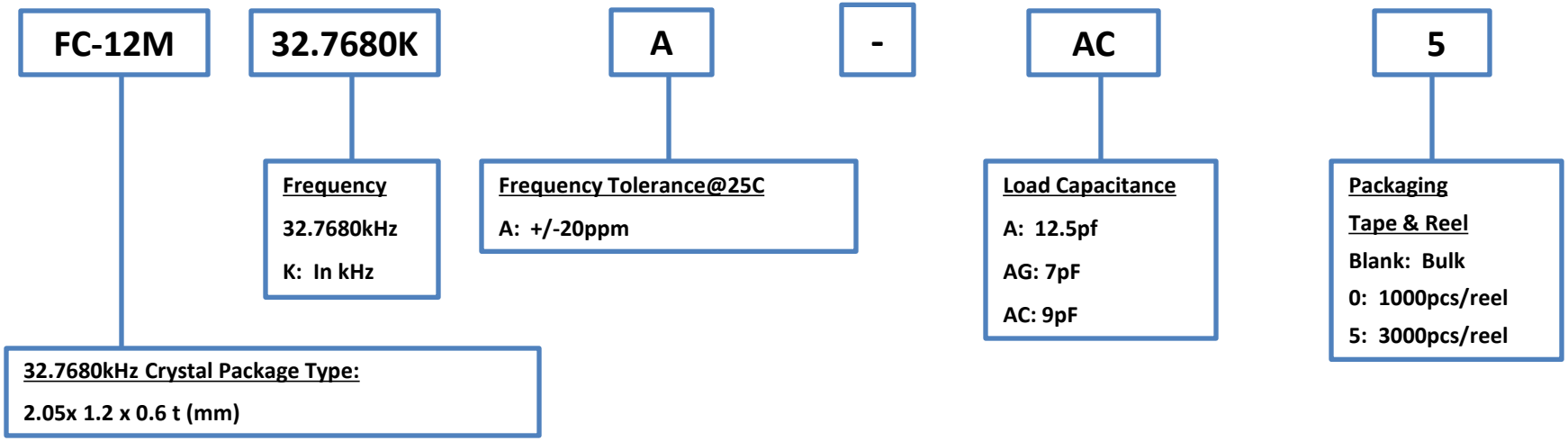
1) If your application for this part is not a Smart Card, please contact your Epson representative for assistance.

2) If you require a load capacitance other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

kHz Range Crystal Units



NOTES:

1) If you require a frequency or tolerance other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

kHz Range Crystal Units

Non Promotional

Supported for Existing Customers only. No New Designs

FC-13A	32.7680K	A	-	AC	5

FC-13A

32.7680kHz Crystal Package Type:

3.2 x 1.5 x 0.9 t (mm)

32.7680K

Frequency

32.7680kHz

K: In kHz

A

Frequency Tolerance@25C

A: +/-20ppm

D: +/-30ppm

B: +/-50ppm

AC

Load Capacitance

A: 12.5pf

AC: 9pF

5

Packaging

Tape & Reel

Blank: Bulk

0: 1000pcs/reel

5: 3000pcs/reel

NOTES:

1) This product configuration guide is applicable only to 32.7680kHz Crystals. For other frequencies, please reference the Standard kHz Crystal Product Configuration System.

2) If you require a load capacitance other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

kHz Range Crystal Units

Discontinued

FC-13F	32.7680K	A	-	AC	5

FC-13F

32.7680kHz Crystal Package Type:

3.2 x 1.5 x 0.55 t (mm)

32.7680K

Frequency

32.7680kHz

K: In kHz

A

Frequency Tolerance@25C

A: +/-20ppm

AC

Load Capacitance

AG: 7pf

A: 12.5pf

AC: 9pf

5

Packaging

Tape & Reel

Blank: Bulk

0: 1000pcs/reel

5: 3000pcs/reel

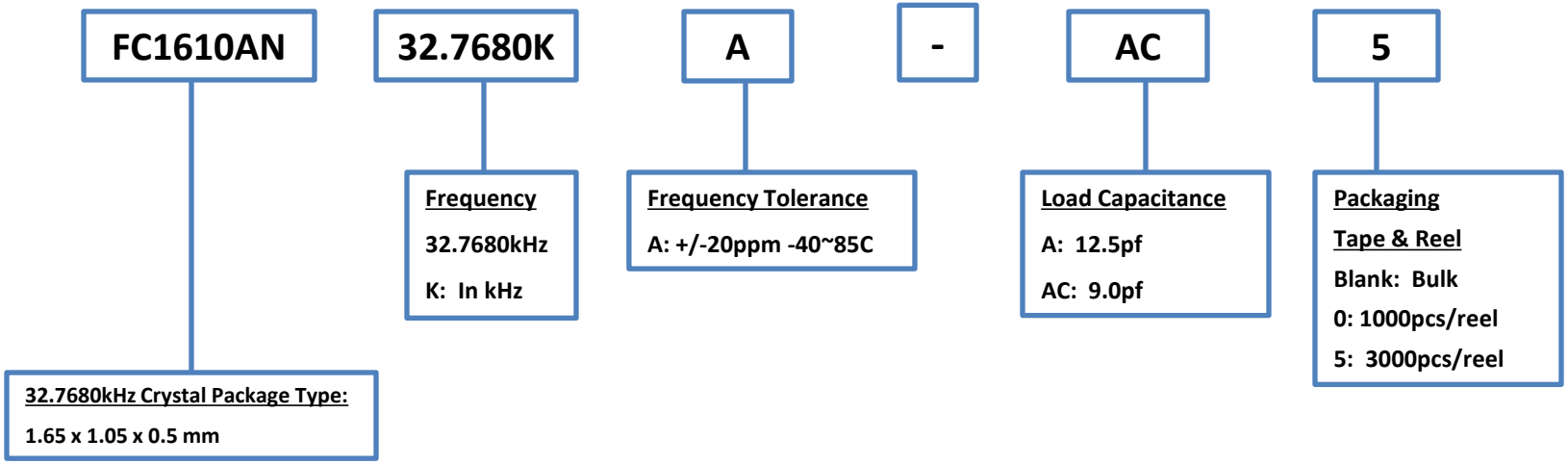
NOTES:

1) If you require a frequency or tolerance other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

kHz Range Crystal Unit



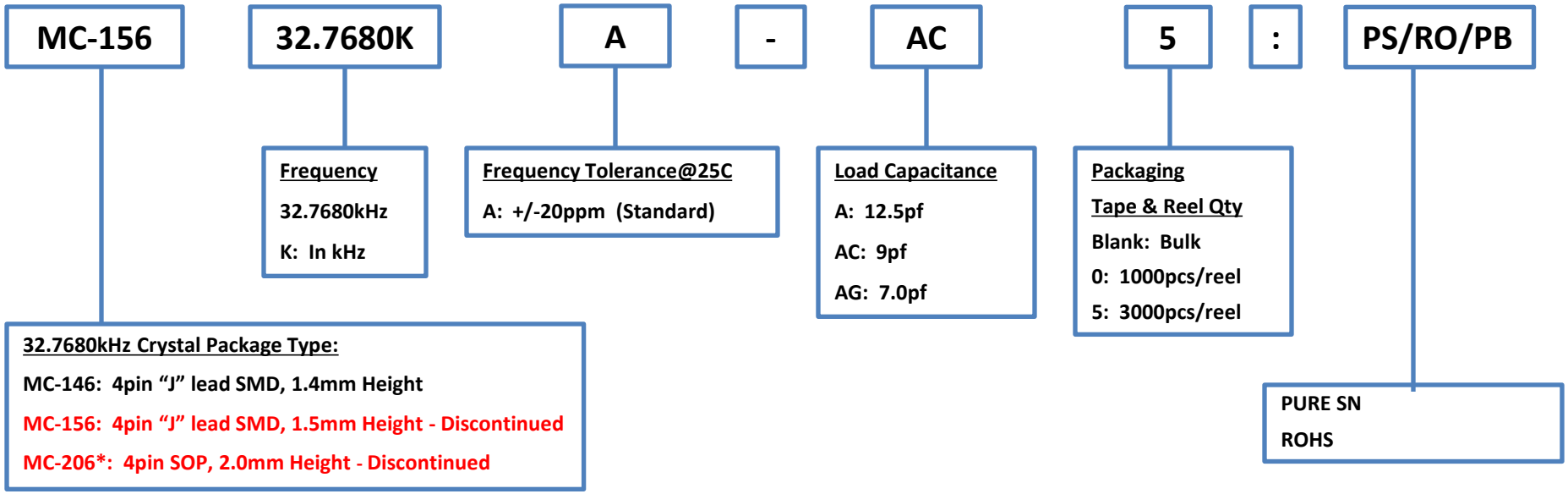
NOTES:

1) If you require a load capacitance other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

kHz Range Crystals Units



NOTES:

1) This product configuration guide is applicable only to 32.7680kHz Crystals. For other frequencies, please reference the Standard kHz Crystal Product Configuration System.

2) If you require a load capacitance other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

kHz Range Crystals Units

MC-306 | **76.8000K** | **A** | **-** | **AC** | **5** | **:** | **PS/RO/PB**

Frequency Range:

K: In kHz to 4 Decimal Places
FC-135: 32 ~ 77.5kHz
FC-255: 32 ~ 100kHz - Discontinued
C-2: 20~120KHz - Discontinued
C-4: 32~120 / 192KHz - Discontinued
MC-206*: 32 ~ 100kHz - Discontinued
MC-306: 20 ~ 120kHz
MC-405/406: 20 ~ 120kHz - Discontinued

Frequency Tolerance@25C

A: +/-20ppm
B: +/-50ppm
Blank: +/-100ppm

Load Capacitance

A: 12.5pF
AC: 9.0pF
AG: 7.0pF
E: 6.0pF

Packaging

C-2 / C-4
Blank: Bulk
Tape & Reel
MC 405/406
Blank: Bulk
0: 1000pcs/reel
MC-206/306 & FC-135/255
Blank: Bulk
0: 1000pcs/reel
5: 3000pcs/reel

Crystal Package Type:

C-2	2.0 x 6.0mm - Discontinued
C-4	1.5 x 5.0mm - Discontinued
FC-135:	3.2 x 1.5 x 0.9mm
FC-255	4.9 x 1.8 x 0.9mm - Discontinued
MC-206*:	4pin SOP, 2.0mm Ht. - Discontinued
MC-306	4pin "J" Lead SMD, 2.54mm Ht.
MC-405/406	4pin "J" Lead SMD, 3.6mm Ht. - Discontinued

Blank = Not RoHs Compliant
PB FREE (C-Type Series)
PURE SN & ROHS (MC Series)
FC-135/255 already RoHs Compliant, so above codes do not apply.

*MC-206: Not Recommended for New Designs

NOTES:

1) This product configuration guide is NOT applicable to 32.768kHz Crystals.
2) If you require a load capacitance other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

kHz Range Crystals Units

MC-405	32.7680K	T	-	AC	5	:	PS/RO/PB

32.7680kHz Crystal Package Type:

MC-306: 4pin "J" lead SMD, 2.54mm Height

MC-30A: 4pin "J" lead SMD, 2.54mm Height

MC-30AY: 4pin "J" lead SMD, 2.54mm Height - Discontinued

MC-405: 4pin "J" lead SMD, 3.6mm Height - Discontinued

MC-406: 4pin "J" lead SMD, 3.6mm Height - Discontinued

Frequency

32.7680kHz

K: In kHz

Frequency Tolerance@25C

Blank: +/-20ppm (Standard)

Load Capacitance

A: 12.5pf

AC: 9pf

E: 6pf

F: Series

K: 10pf

AG: 7.0pf

Packaging

Tape & Reel Qty

Blank: Bulk

0: 1000pcs/reel

5: 3000pcs/reel (MC-306 only)

PURE SN

ROHS

NOTES:

1) This product configuration guide is applicable only to 32.7680kHz Crystals. For other frequencies, please reference the Standard kHz Crystal Product Configuration System.

2) If you require a load capacitance other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

kHz Range Crystals Units

Discontinued

C-002RX	32.7680K	T	-	L	P	:	PS/RO/PB

32.7680kHz Crystal Pkg Type (diameter x length):

- C-001R: 3.1 x 8.0mm - Discontinued
- C-002RX: 2.0 x 6.0mm - Discontinued
- C-004R: 1.5 x 5.0mm - Discontinued
- C-005R: 1.2 x 4.6mm - Discontinued

Frequency
32.7680kHz
K: In kHz

Frequency Tolerance @25C
Blank : +/-20ppm (Std)

Load Capacitance
- A: 12.5pF
- AC: 9.0pF
- D: 22.0pF
- E: 6.0pF
- F: Series
- H: 32.0pF
- AG: 7.0pF

Packaging
Blank: Bulk

PB FREE

NOTES:

1) This product configuration guide is applicable only to 32.7680kHz crystals. For other frequencies, please refer to the Standard kHz Crystal Product Configuration System.

2) If you require a load capacitance other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

MHz Range Crystals Units

FA-118T

Crystal Package Type:
Ultra Miniature Low Profile
Ceramic SMD
1.6 X 1.2 X 0.35 mm

24.0000M

Frequency
24.000 ~ 54.000 MHz

D

Freq. Tolerance@25C
F: +/-10ppm
24 MHz<= F =< 40MHz
E: +/-15ppm
40MHz<F=<54MHz
D: +/-30ppm
All Freq. Range

30Y

-

AC

Load Capacitance:
AG: 7pF
AJ: 8pF
AC: 9pF
W: 12pF
C: 18pf

5

Tape & Reel Qty
Blank: Bulk
0: 1000pcs/reel
5: 3000pcs/reel
8: 6000pcs/reel

Freq. Temp Char Op Temp Range	All Freq Range	24MHz<=F<32MHz	32MHz<=F=<54MHz
-20C to +75C	+/-30ppm = 30Z	+/-12ppm = 12Z	+/-12ppm = 12Z
-30C to +85C	+/-30ppm = 30Y	+/-16ppm = 16Y	+/-15ppm = 15Y
-40C to +85C	+/-30ppm = 30X	+/-20ppm = 20X	+/-19ppm = 19X

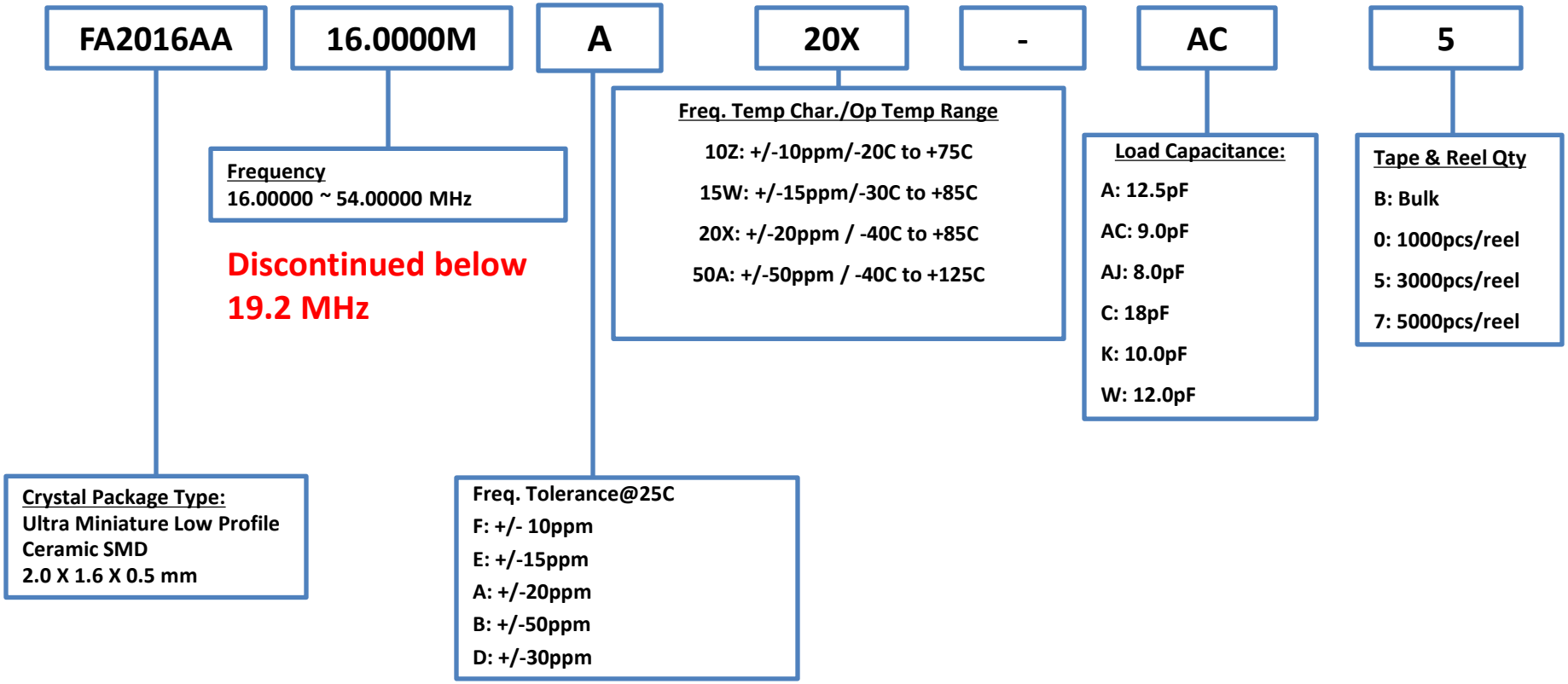
NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

MHz Range Crystal Units



NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

MHz Range Crystal Units

Not Recommended

FA2016AN	24.0000M	T	S	-	L	P

Crystal Package Type:
Ultra Miniature Low Profile
Ceramic SMD
2.0 X 1.6 X 0.5 mm

Frequency
24.00000 ~ 54.00000 MHz

Freq. Tolerance@25C
F: +/- 10ppm, 24<= F =<40MHz
E: +/-15ppm, 40<= F =<54MHz
D: +/-30ppm , All Freq. Range

Freq. Temp Char./Op Temp Range
10Z: +/-10ppm/-20C to +75C
30Z: +/-30ppm / -20C to +75C
14Y: +/-14ppm / -30C to +85C
50Y +/-50ppm / -30C to 85C

Load Capacitance:
A: 12.5pF
E: 6.pF
K: 10.0pF
W: 12.0pF

Tape & Reel Qty
B: Bulk
3: 250pcs/reel
0: 1000pcs/reel
5: 3000pcs/reel

NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

MHz Range Crystal Units

Discontinued

FA3225AA	20.000000M	B	50A	-	W	4

Crystal Package Type:
Ceramic SMD
3.2 X 2.5 X 1.0 mm

Frequency
8.0000 ~ 60.0000 MHz

Freq. Tolerance@25C
A: +/-20ppm
B: +/-50ppm
D: +/-30ppm

Freq. Temp Char./Op Temp Range
150M: +/-150ppm / -40C to +150C
50A: +/-50ppm / -40C to +125C

Load Capacitance:
A: 12.5pF
AC: 9.0pF
AJ: 8.0pF
C: 18pF
K: 10.0pF
W: 12.0pF

Tape & Reel Qty
B: Bulk
0: 1000pcs/reel
5: 3000pcs/reel
4: 4000pcs/reel

NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

MHz Range Crystals Units

FA-128	16.0000M	F	12Z	-	AC	0

Crystal Package Type:
Ultra Miniature Low Profile Ceramic SMD
FA-128: 2.0 X 1.6 X 0.5 mm
FA-128S: 2.0 x 1.6 x 0.9 mm - NRND
FA-2016AS: 2.0 x 1.6 x 0.65 mm

Frequency
16 ~ 54 MHz

Freq. Tolerance@25C
F: +/-10ppm
16 MHz<= F =< 40MHz
E: +/-15ppm
40MHz<F=<54MHz
D: +/-30ppm
All Freq. Range

Load Capacitance:
AC: 9pF
AS: 8.5pF
AJ: 8pF
B: 16pF
G: 20pF
W: 12pF

Tape & Reel Qty
B: Bulk
0: 1000pcs/reel
5: 3000pcs/reel

Freq. Temp Char Op Temp Range	All Freq Range	16MHz<=F=<20MHz	20MHz<F=54MHz
-20C to +75C	+/-20ppm = 20Z	+/-12ppm = 12Z	+/-10ppm = 10Z
-20C to +80C	+/-20ppm = 20K	+/-12ppm = 12K	+/-10ppm = 10K
-20C to +85C	+/-20ppm = 20P	+/-12ppm = 12P	+/-12ppm = 12P
- 30C to +70C	+/-28ppm = 28R	+/-17ppm = 17R	+/-14ppm = 14R
-30C to +75C	+/-28ppm = 28E	+/-17ppm = 17E	+/-14ppm = 14E
-30C to +80C	+/30ppm =30W	+/-17ppm = 17W	+/-14ppm = 14W
-30C to +85C	+/-30ppm =30Y	+/-17ppm = 17Y	+/-14ppm = 14Y
-30C to +85C	+/-50ppm =50Y	+/-17ppm = 17Y	+/-14ppm = 14Y
-40C to +85C	+/-40ppm = 40X	+/-22ppm = 22X	+/-20ppm = 20X

NOTE: 81Z = +8/-10ppm / -20C to +75C

NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

Product Configuration System

MHz Range Crystals Units

FA-20H	16.0000M	F	12V	-	AC	0

Crystal Package Type:
Ultra Miniature Low Profile
Ceramic SMD
2.5 X 2.0 X 0.55 mm

Frequency
12.000 ~ 54.0000MHz

Freq. Tolerance@25C
F: +/-10ppm
A: +/-20ppm
D: +/-30ppm
L: +11/-9ppm

Load Capacitance:
AC: 9pF
AS: 8.5pF
B: 16pF
G: 20pF
W: 12pF

Tape & Reel Qty
Blank: Bulk
0: 1000pcs/reel
5: 3000pcs/reel

Freq. Temp Char Op Temp Range	All Freq Range	16MHz<=F=<20MHz	20MHz<F=<54MHz
-20C to +70C	+/-20ppm = 20V	+/-12ppm = 12V	+/-10ppm = 10V
-20C to +70C	+/-30ppm = 30V	+/-12ppm = 12V	+/-10ppm = 10V
-20C to +75C	+/-20ppm = 20Z	+/-12ppm = 12Z	+/-10ppm = 10Z
-20C to +80C	+/-20ppm = 20K	+/-12ppm = 12K	+/-10ppm = 10K
-20C to +85C	+/-20ppm = 20P	+/-12ppm = 12P	+/-12ppm = 12P
- 30C to +70C	+/-28ppm = 28R	+/-17ppm = 17R	+/-14ppm = 14R
-30C to +75C	+/-28ppm = 28E	+/-17ppm = 17E	+/-14ppm = 14E
-30C to +80C	+/30ppm =30W	+/-17ppm = 17W	+/-14ppm = 14W
-30C to +85C	+/-30ppm =30Y	+/-17ppm = 17Y	+/-14ppm = 14Y
-30C to +85C	+/-50ppm =50Y	+/-17ppm = 17Y	+/-14ppm = 14Y
-40C to +85C	+/-40ppm = 40X	+/-22ppm = 22X	+/-20ppm = 20X

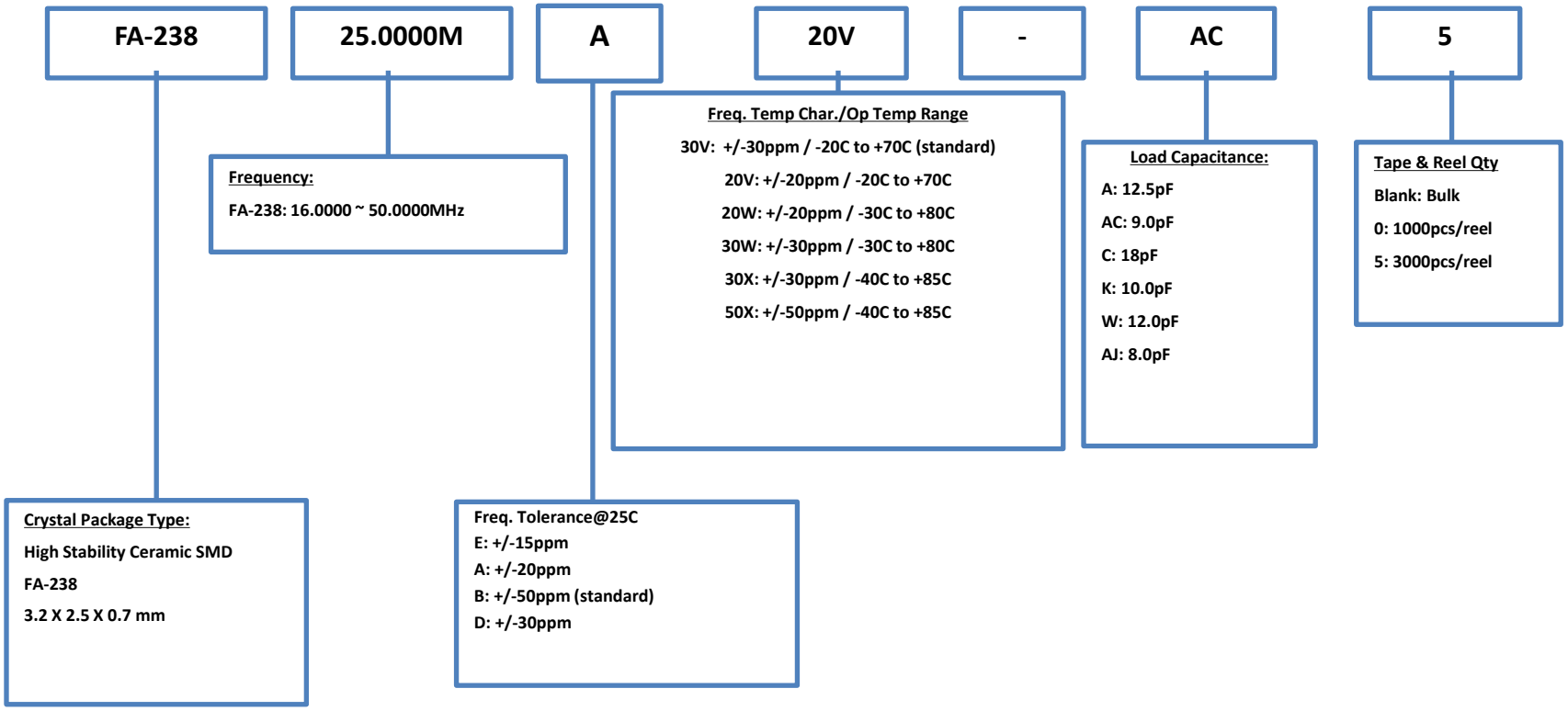
NOTE: **81Z** = +8/-10ppm / -20C to +75C

NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

Product Configuration System

MHz Range Crystal Units



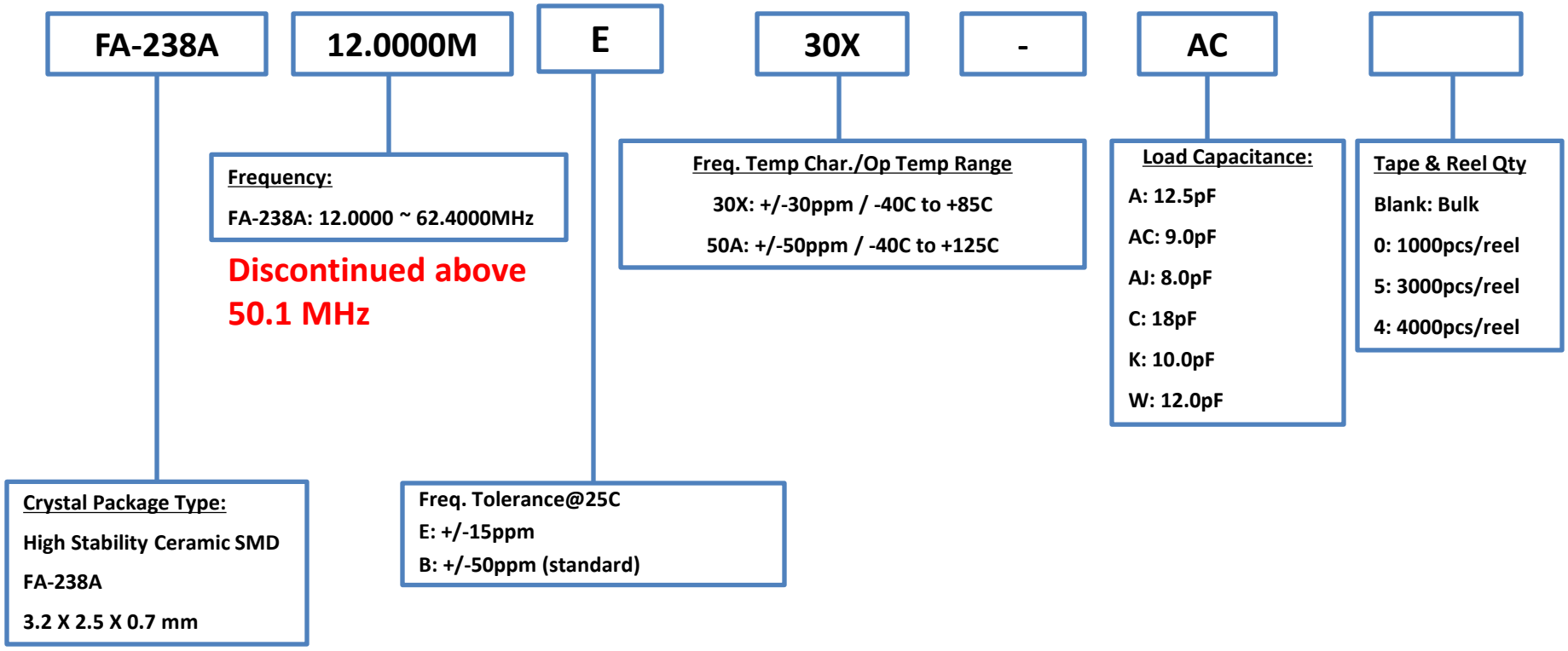
NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

MHz Range Crystal Units



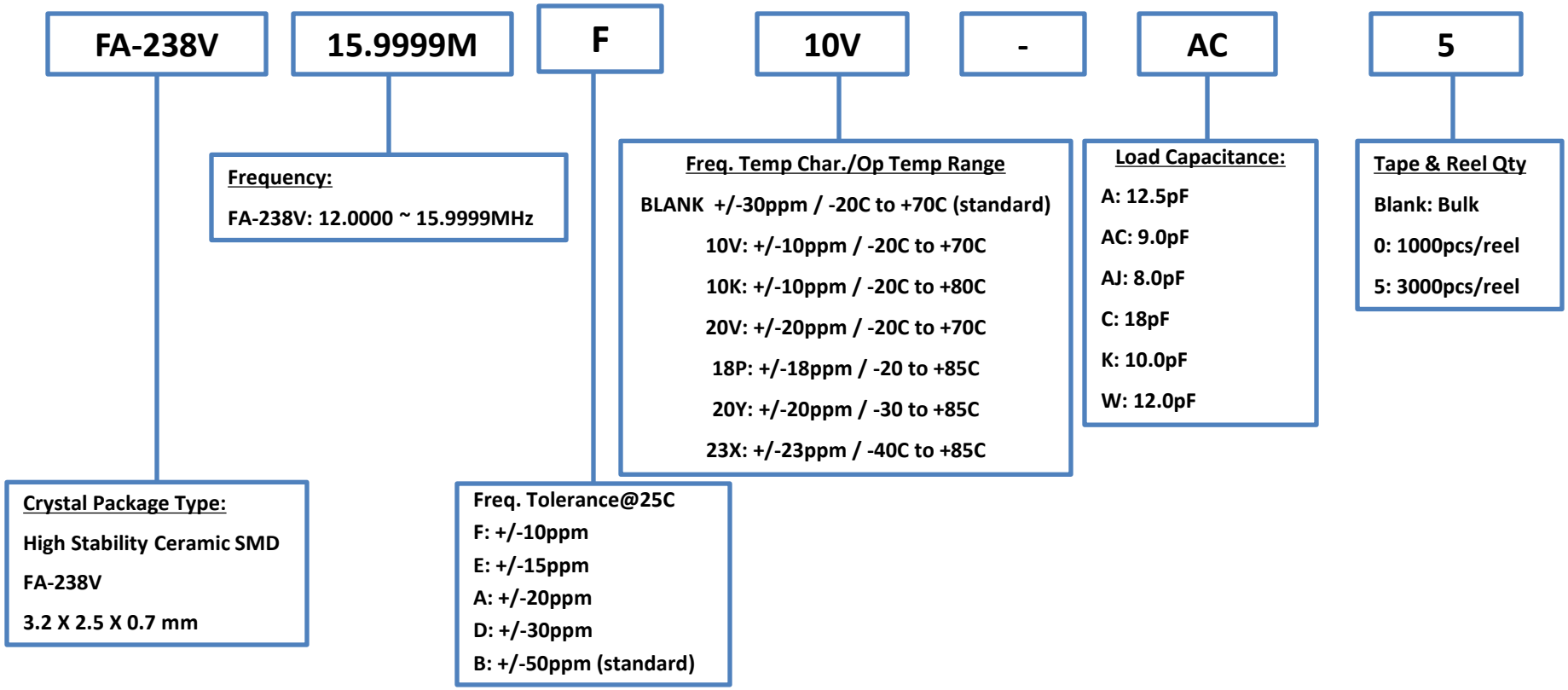
NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

MHz Range Crystal Units



NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

MHz Range Crystal Units

TSX-3225 | **16.0000M** | **F** | **10U** | **-** | **AC** | **0**

Crystal Package Type:
Miniature Size Low Profile Ceramic SMD
3.2 X 2.5 X 0.6 mm

Frequency
16.000 ~ 48.000 MHz

Freq. Tolerance@25C
F: +/-10ppm
E: +/-15ppm

Freq. Temp Char Op Temp Range	16MHz<=F=<26.99MHz	27MHz<F=<48MHz
-10C to 60C	+/-10ppm = 10U	+/-10ppm = 10U
-20C to +75C	+/-9ppm = 09Z	+/-9ppm = 09Z (for <40MHz)
-20C to +75C	+/-10ppm = 10Z	+/-10ppm = 10Z
-20C to +85C	+/-10ppm = 10P	+/-10ppm = 10P
-30C to +85C	+/-13ppm = 13Y	+/-15ppm = 15Y
-40C to +85C	+/-18ppm = 18X	+/-18ppm = 18X
-40C to +85C	+/-20ppm = 20X	+/-20ppm = 20X
-40C to +105C	+/-20ppm = 20G (for 20MHz and 24MHz only)	

Load Capacitance:
AC: 9pF
AJ: 8pF
AS: 8.5pF
B: 16pF
C: 18pF
W: 12pF

Tape & Reel Qty
Blank: Bulk
0: 1000pcs/reel
6: 2000pcs/reel

NOTES:

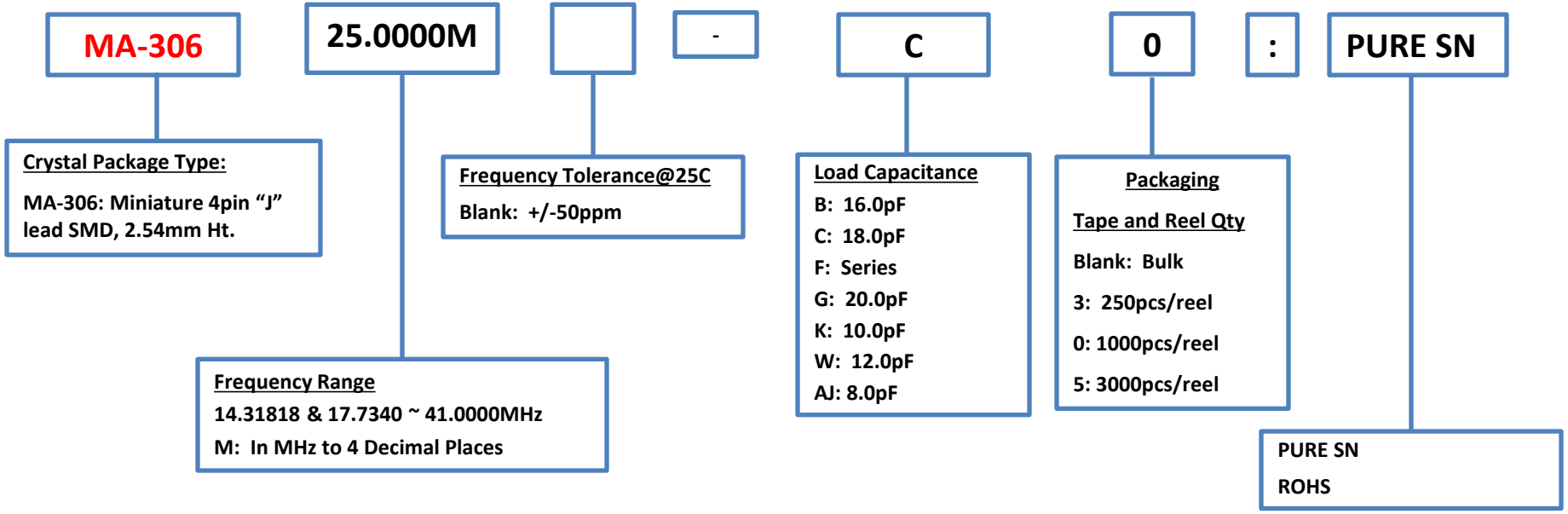
1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

MHz Range Crystal Units

Discontinued



NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

EPSON

Product Configuration System

MHz Range Crystal Units

Discontinued

MA-406	30.0000M		50X	-	A	0	:	PURE SN

Crystal Package Type:

MA-505: 4pin "J" lead SMD, 4.6mm Ht.

MA-506: 4pin "J" lead SMD, 4.6mm Ht.

MA-406: 4pin "J" lead SMD, 3.7mm Ht.

Frequency Range

M: In MHz to 4 Decimal Places

4.0000, 4.0320, 4.0960, 4.1900, 4.194304, 4.433619, 4.5000, 4.8000, 4.9152MHz

5.5000 ~ 64.0000MHz
Except 8.0001 ~ 8.1999MHz

26.0000~29.9999MHZ *

Frequency Tolerance@25C

Blank: +/-50ppm (Std)

Freq. Temp Char./Op Temp Range

Blank (Std): +/-30ppm / -20C to +70C (>5.5MHz)
+/-50ppm / -20C to +70C (<5.5MHz)

50X: +/-50ppm / -40C to +85C

Load Capacitance

A: 12.5pF
B: 16.0pF
C: 18.0pF
D: 22.0pF
F: Series
G: 20.0pF
H: 32.0pF
K: 10.0pF
W: 12.0pF
AB: 30.0pF
AD: 50.0pF
AJ: 8.0pF

Packaging

Tape & Reel Qty

Blank: Bulk

3: 250pcs/reel

0: 1000pcs/reel

PURE SN
ROHS

NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

2) For frequencies between 26.0000MHz and 29.9999MHz, please specify "(FUND)" at end of part number if fundamental mode required. Otherwise, 3rd Overtone is default.

EPSON

Product Configuration System

MHz Range Crystal Units

Discontinued

CA-301	30.0000M		-	A		:	PB FREE

Crystal Package Type:

CA-301: 3.1mm diameter metal can

Frequency Range

M: In MHz to 4 Decimal Places

4.0000, 4.0320, 4.0960, 4.1900, 4.194304, 4.433619, 4.5000, 4.8000, 4.9152MHz

5.5000 ~ 64.0000MHz
Except 8.0001 ~ 8.1999MHz

26.0000~29.9999MHZ *

Frequency Tolerance@25C

4.0000~5.5000MHz

Blank : +/-50ppm (Standard)

5.5001~64.0000MHz

Blank: +/-30ppm (Standard)

Load Capacitance

B: 16.0pF
C: 18.0pF
D: 22.0pF
F: Series
G: 20.0pF
H: 32.0pF
K: 10.0pF
W: 12.0pF
AB: 30.0pF
AD: 50.0pF
AJ: 8.0pF

Packaging

Blank: Bulk

PB FREE

NOTES:

1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your Epson representative for assistance.

2) For frequencies between 26.0000MHz and 29.9999MHz, please specify "(FUND)" at end of part number if fundamental mode required. Otherwise, 3rd Overtone is default.

EPSON

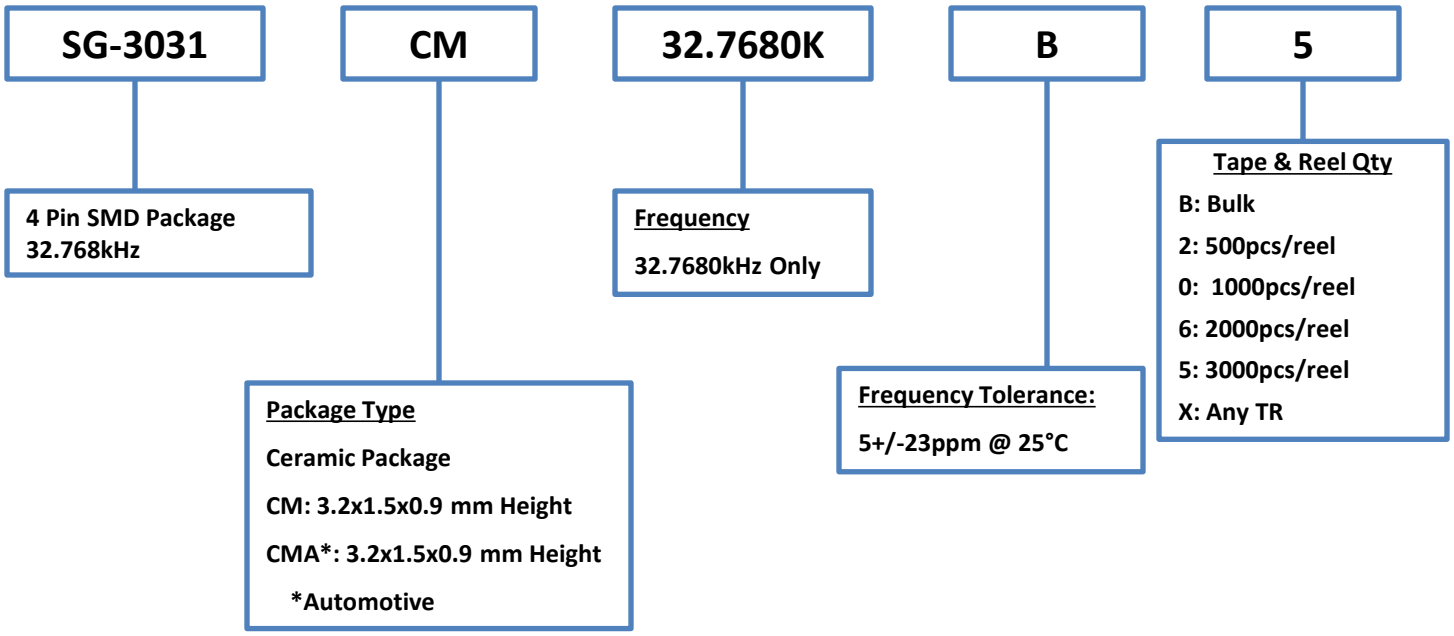
Product Configuration Guide

Simple Packaged Crystal Oscillators (SPXO)

EPSON

Product Configuration System

Crystal Oscillators - SPXO



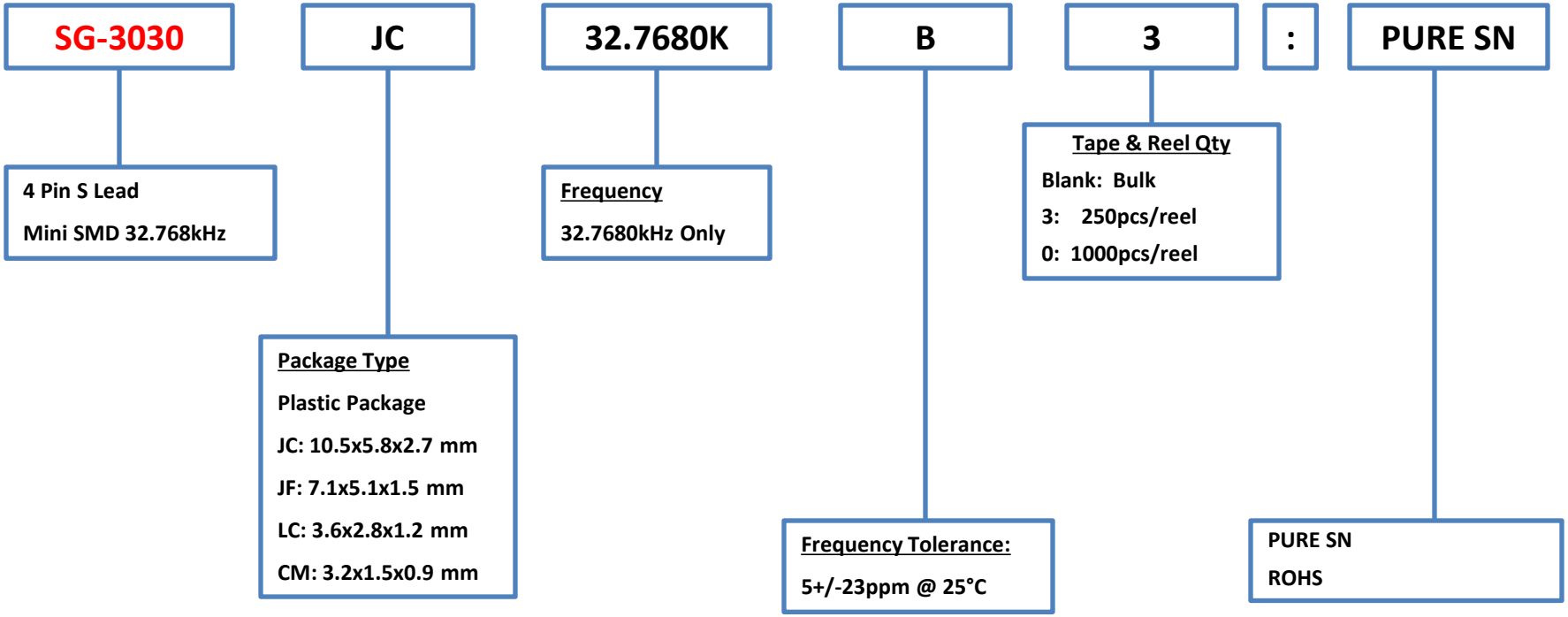
NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

Crystal Oscillators - SPXO

Discontinued



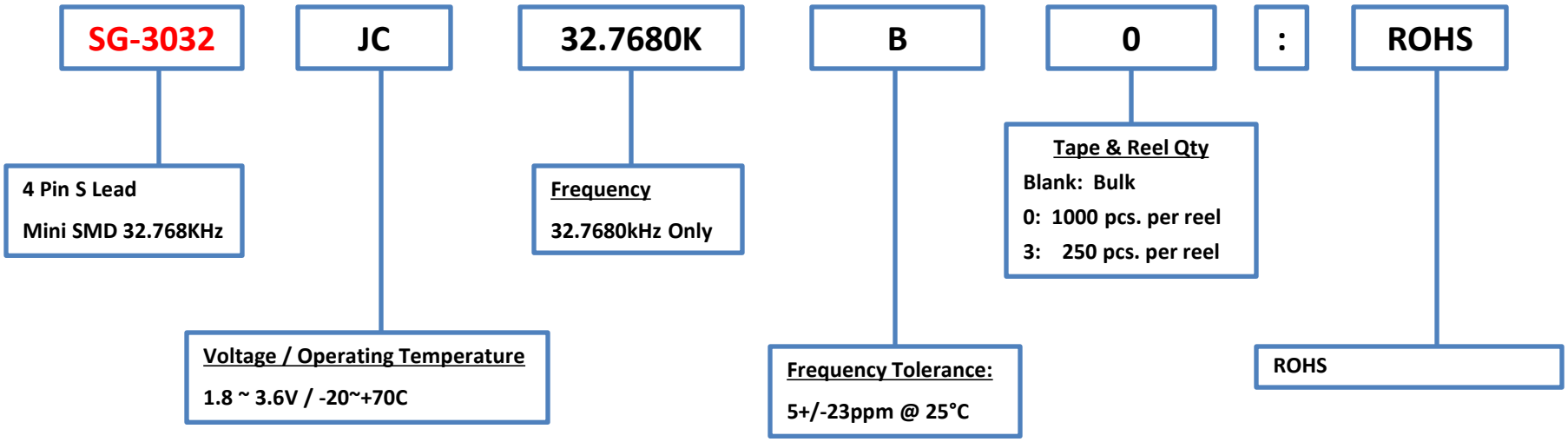
Note: All LC packages are RoHS Compliant, Pure SN

EPSON

Product Configuration System

Crystal Oscillators - SPXO

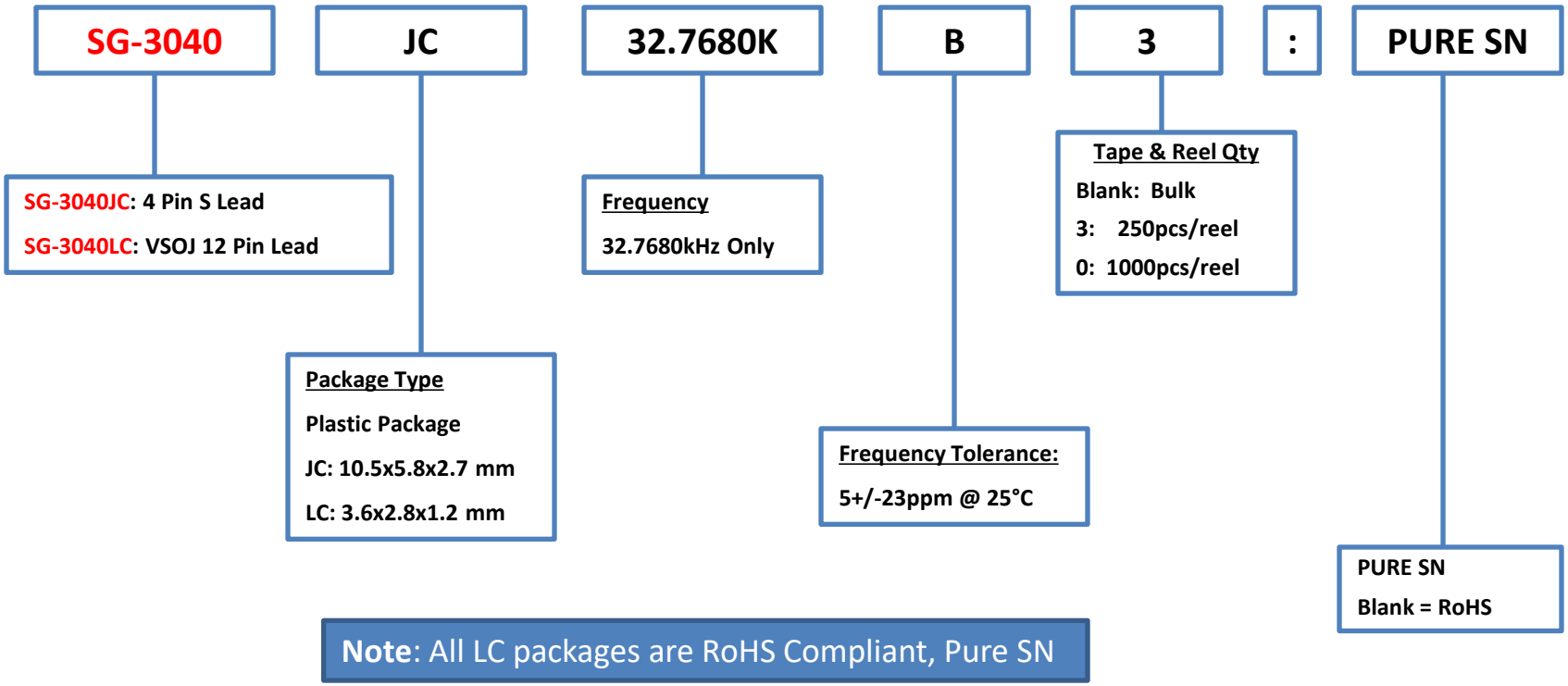
Discontinued



Product Configuration System

Crystal Oscillators - SPXO

Discontinued

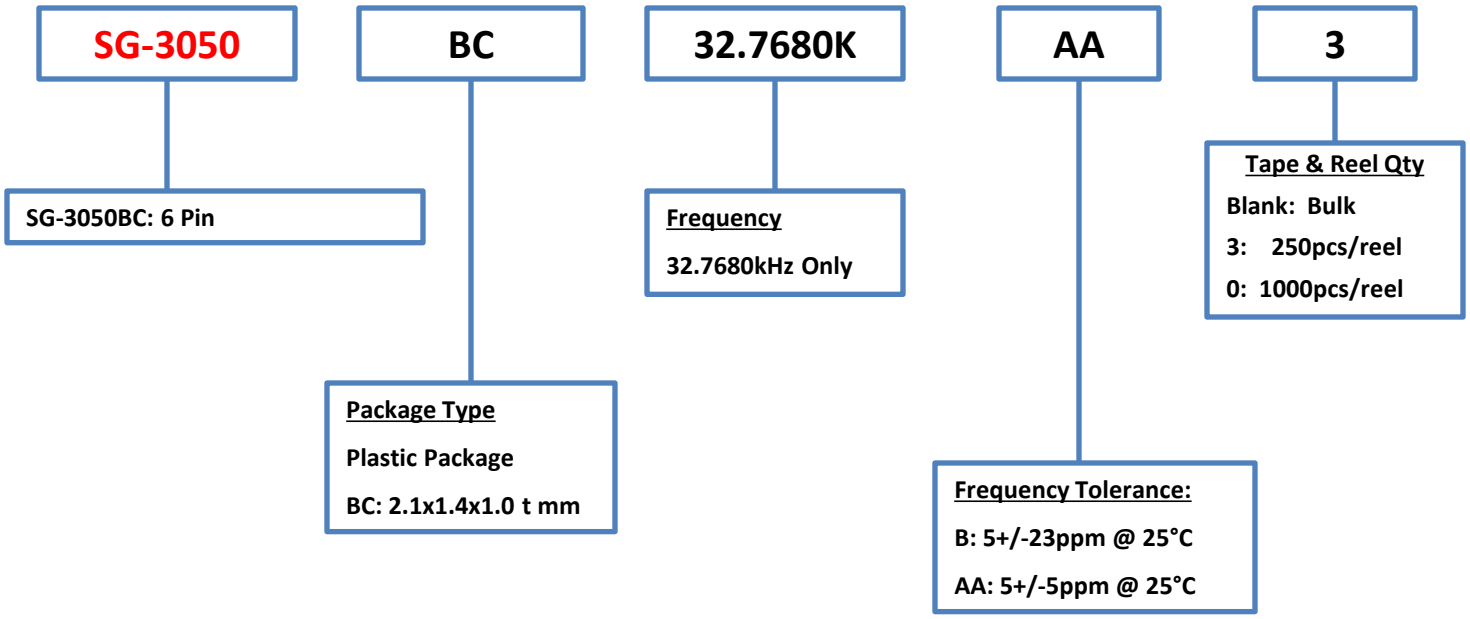


Note: All LC packages are RoHS Compliant, Pure SN

Product Configuration System

Crystal Oscillators - SPXO

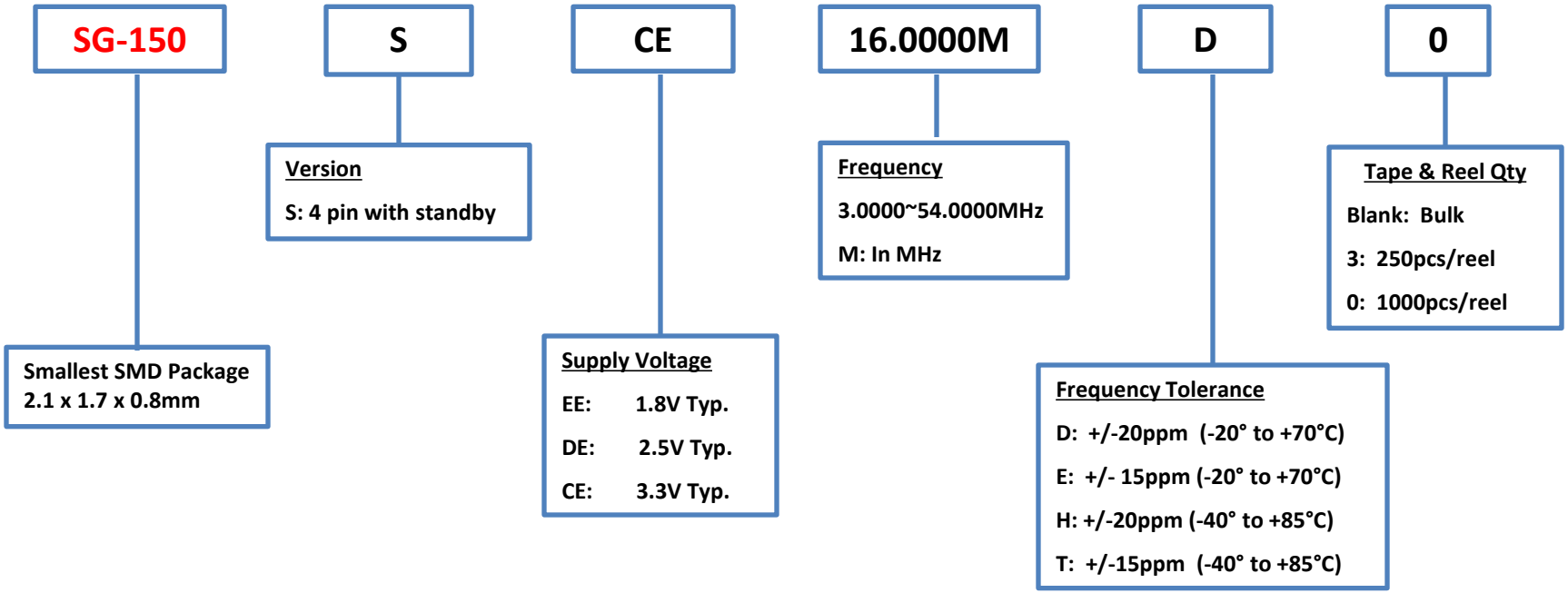
Discontinued



Product Configuration System

Crystal Oscillators - SPXO

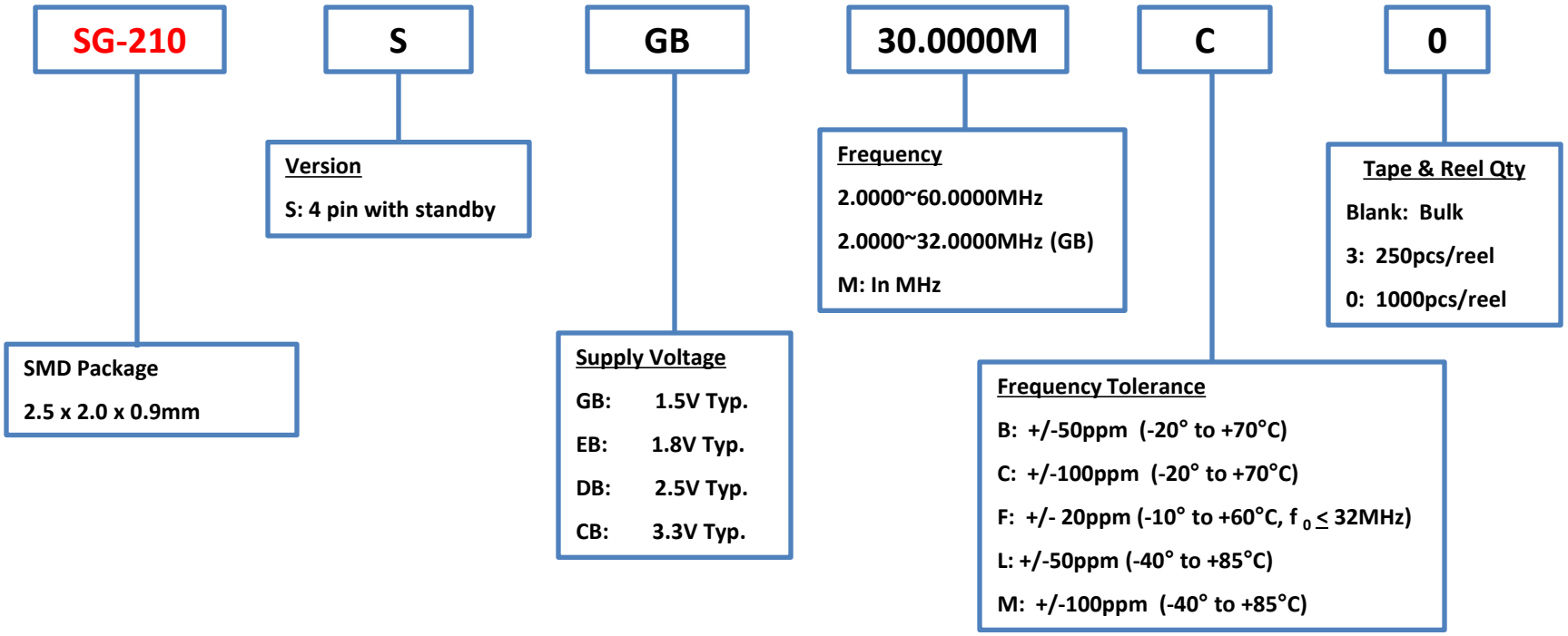
Discontinued



Product Configuration System

Crystal Oscillators - SPXO

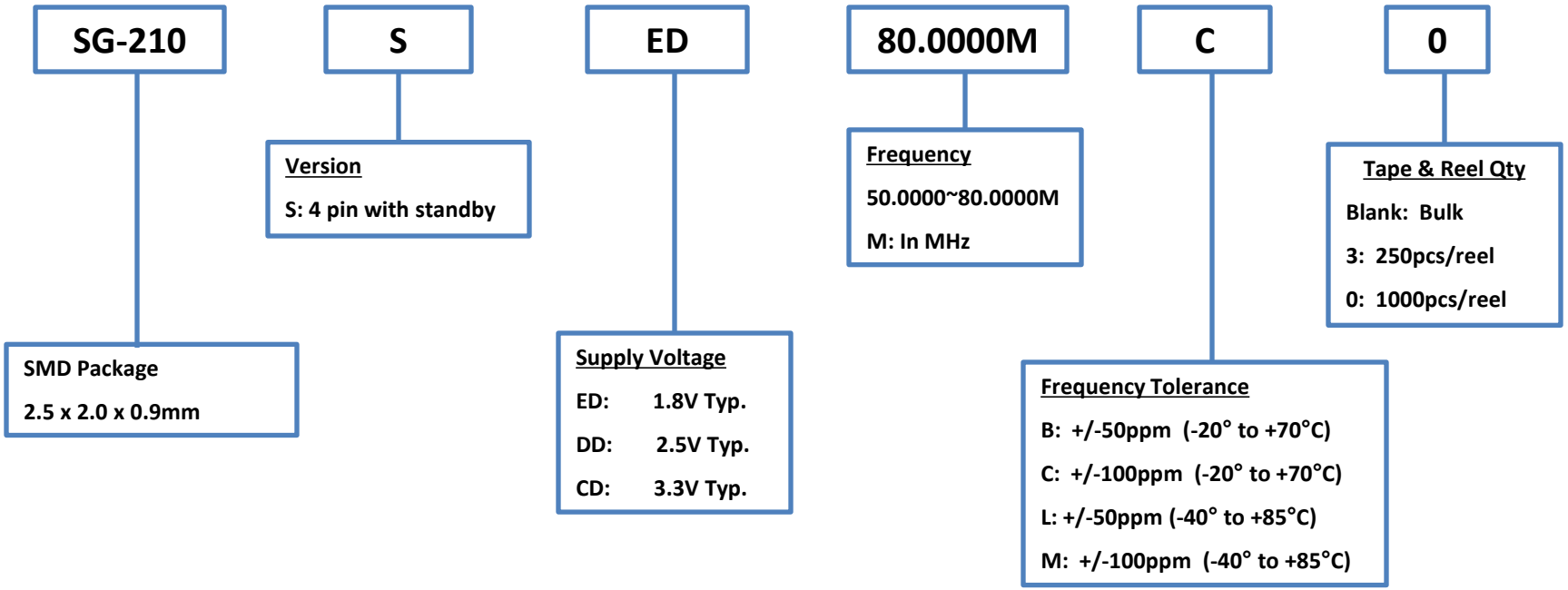
Discontinued



Product Configuration System

Crystal Oscillators - SPXO

Discontinued



Product Configuration System

Crystal Oscillators - SPXO

Discontinued

SG-210

SMD Package

2.5 x 2.0 x 0.9mm

S

Version

S: 4 pin with standby

EH

Supply Voltage

EH: 1.8V Typ.

DH: 2.5V Typ.

CH: 3.3V Typ.

125.0000M

Frequency

80.0000~170.0000M

Standard Frequency:
100MHz, 106.25MHz,
15MHz, 133.33MHz,
150MHz, 156.25MHz

M: In MHz

C

Frequency Tolerance

B: +/-50ppm (-20° to +70°C)

C: +/-100ppm (-20° to +70°C)

L: +/-50ppm (-40° to +85°C)

M: +/-100ppm (-40° to +85°C)

0

Tape & Reel Qty

Blank: Bulk

3: 250pcs/reel

0: 1000pcs/reel

Product Configuration System

Crystal Oscillators - SPXO

Discontinued

Consider SG2520CAA (std freq) Or SG-8101CGA

SG-210

SMD Package
2.5 x 2.0 x 0.9mm

S

Version
S: 4 pin with standby

EBA

Supply Voltage
EBA: 1.8V Typ.
DBA: 2.5V Typ.
CBA: 3.3V Typ.

60.0000M

Frequency
2.0000~60.0000M
M: In MHz

C

Frequency Tolerance
B: +/-50ppm (-20° to +70°C)
C: +/-100ppm (-20° to +70°C)
L: +/-50ppm (-40° to +85°C)
M: +/-100ppm (-40° to +85°C)
Y: +/-50ppm (-40° to +105°C)
W: +/-100ppm (-40° to +105°C)
Z: +/-100ppm (-40° to +125°C)
X: +/-150ppm (-40° to +125°C)

0

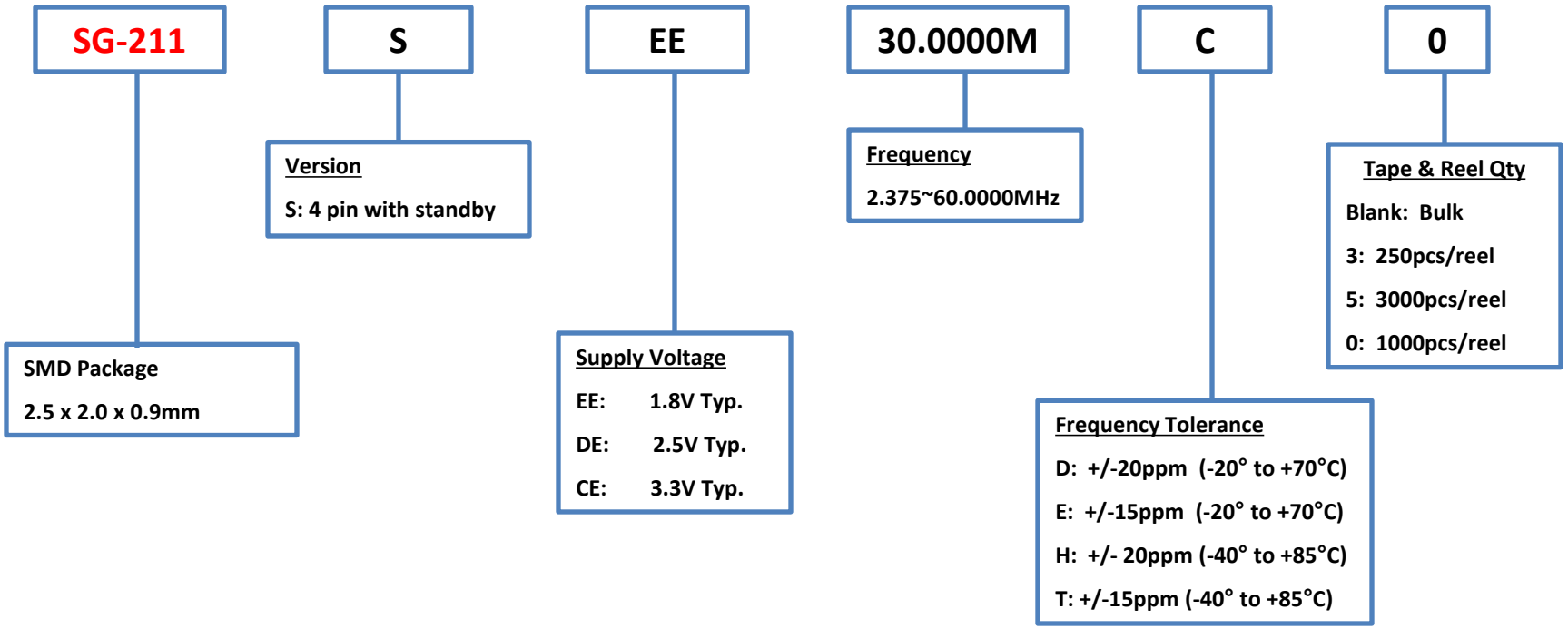
Tape & Reel Qty
Blank: Bulk
0: 1000pcs/reel

EPSON

Product Configuration System

Crystal Oscillators - SPXO

Discontinued



Product Configuration System

Crystal Oscillators - SPXO

Discontinued

SG-310

SMD Package

3.2 x 2.5 x 1.2mm

S

Version

S: 4 pin with standby

CF

Supply Voltage

EF: 1.8V Typ. (2.0000~48.0000MHz)
DF: 2.5V Typ. (2.0000~48.0000MHz)
CF: 3.3V Typ. (2.0000~48.0000MHz)
DN: 2.5V Typ. (3.0000~80.0000MHz)
CN: 3.3V Typ. (3.0000~80.0000MHz)

30.0000M

Frequency

2.0000~48.0000MHz (EF, DF, CF)
3.0000~80.0000MHz (DN, CN)
3.0001~62.5000MHz (DN, CN)**
M: In MHz

C

Frequency Tolerance

EF/DF/CF Versions:

B: +/-50ppm (-20° to +70°C)
C: +/-100ppm (-20° to +70°C)
M: +/-100ppm (-40° to +85°C)

DN/CN Versions:

B: +/-50ppm (-20° to +70°C)
C: +/-100ppm (-20° to +70°C)
M: +/-100ppm (-40° to +85°C)
D: +/-20ppm (-20° to +70°C, Vcc=+/-10%)**
S: +/- 25ppm (-20° to +70°C, Vcc=+/-10%)**
R: +/-25ppm (-30° to +85°C, Vcc=+/-10%)**
P: +/-20ppm (-30° to +85°C, Vcc=+/-5%)**
J: +/-25ppm (-40° to +85°C, Vcc=+/-5%) **

0

Tape & Reel Qty

Blank: Bulk
3: 250pcs/reel
0: 1000pcs/reel

This package also available in our SG-8018/SG-8101 programmable series.

EPSON

Product Configuration System

Crystal Oscillators - SPXO

Discontinued

SG-550	S	CF	30.0000M	C	0

SG-550
Smallest SMD Package
1.2mm max

S
Version
S: 4 pin with standby

CF
Supply Voltage
EF: 1.8V Typ. (2.0000~48.0000MHz)
DF: 2.5V Typ. (2.0000~48.0000MHz)
CF: 3.3V Typ. (2.0000~48.0000MHz)

30.0000M
Frequency
2.0000~48.0000MHz (EF, DF, CF)
M: In MHz

C
Frequency Tolerance
EF/DF/CF Versions:
B: +/-50ppm (-20° to +70°C)
M: +/-100ppm (-40° to +85°C)
L: +/-50ppm (-40° to +85°C)

0
Tape & Reel Qty
Blank: Bulk
3: 250pcs/reel
0: 1000pcs/reel

This package also available in our SG-8018/SG-8101 programmable series.

EPSON

Product Configuration System

Crystal Oscillators - SPXO

Discontinued

SG-710	E	CK	75.0000M	C	0

Oscillator Package Type
710:Ceramic SMD

Version
P: Output Enable (5V only)
E: Standby (3.3V only)

Frequency Range / Power Supply / Load
HK: 1.8 ~ 80.0MHz, 5V / CMOS
TK: 1.8 ~ 50.0MHz, 5V / TTL
CK: 1.8 ~ 125.0MHz, 3.3V / CMOS

Frequency
1.8000 ~ 125.000MHz

Frequency Tolerance
B: +/-50ppm / -10° to +70° C
C: +/-100ppm / -10° to +70° C
L: +/-50ppm / -40° to +85° C
M: +/-100ppm / -40° to +85° C
S: +/-25ppm / -10° to +70° C

Tape & Reel Qty
Blank: Bulk
0: 1000 pcs per reel
3: 250 pcs per reel

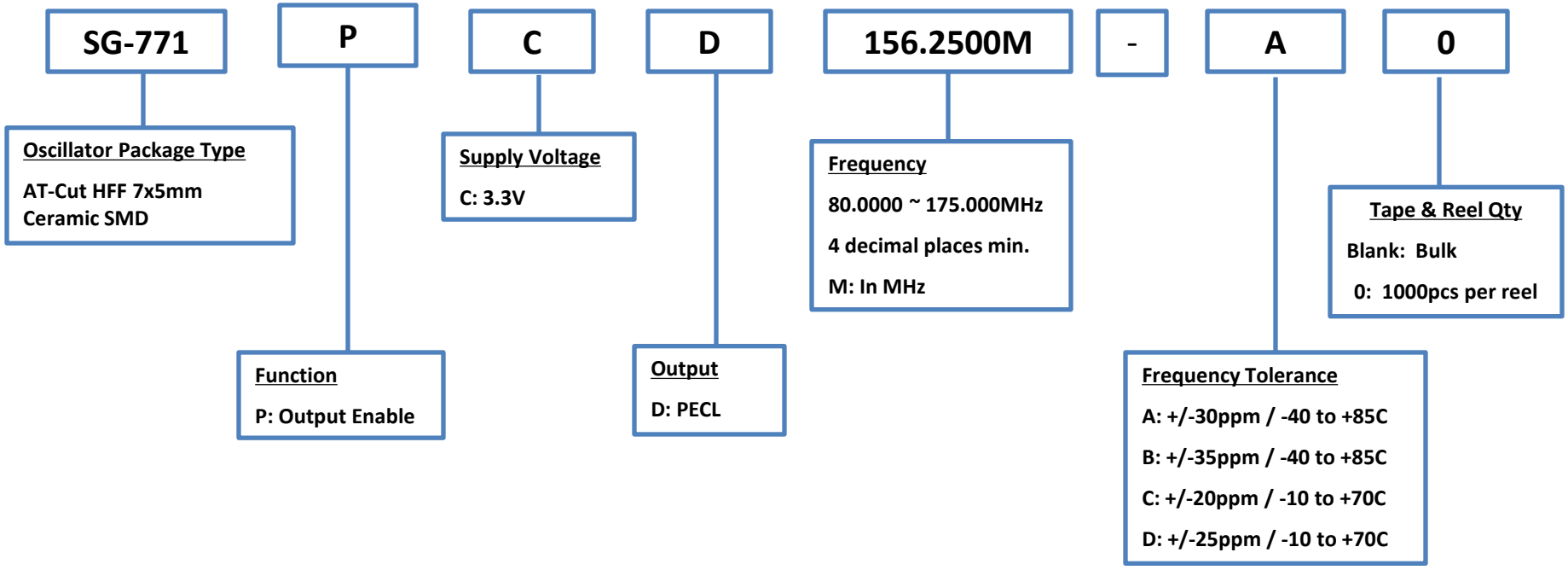
These packages also available in our SG-8018/SG-8101 programmable series.

EPSON

Product Configuration System

Crystal Oscillators - SPXO

Discontinued



Product Configuration System

Crystal Oscillators - SPXO

Discontinued

SG-770	S	D	D	156.2500M	-	L	0

Oscillator Package Type
AT-Cut HFF 7x5mm
Ceramic SMD

Function
S: Standby

Supply Voltage
C: 3.3V
D: 2.5V

Output
D: PECL

Frequency
50.000 ~ 230.000MHz
4 decimal places min.
M: In MHz

Frequency Tolerance
L: +/-50ppm / -40 to +85C
B: +/-50ppm / -20 to +70C
Q: +/-50ppm / 0 to +70C
P: +/-50ppm / -10 to +70C

Tape & Reel Qty
Blank: Bulk
0: 1000pcs per reel

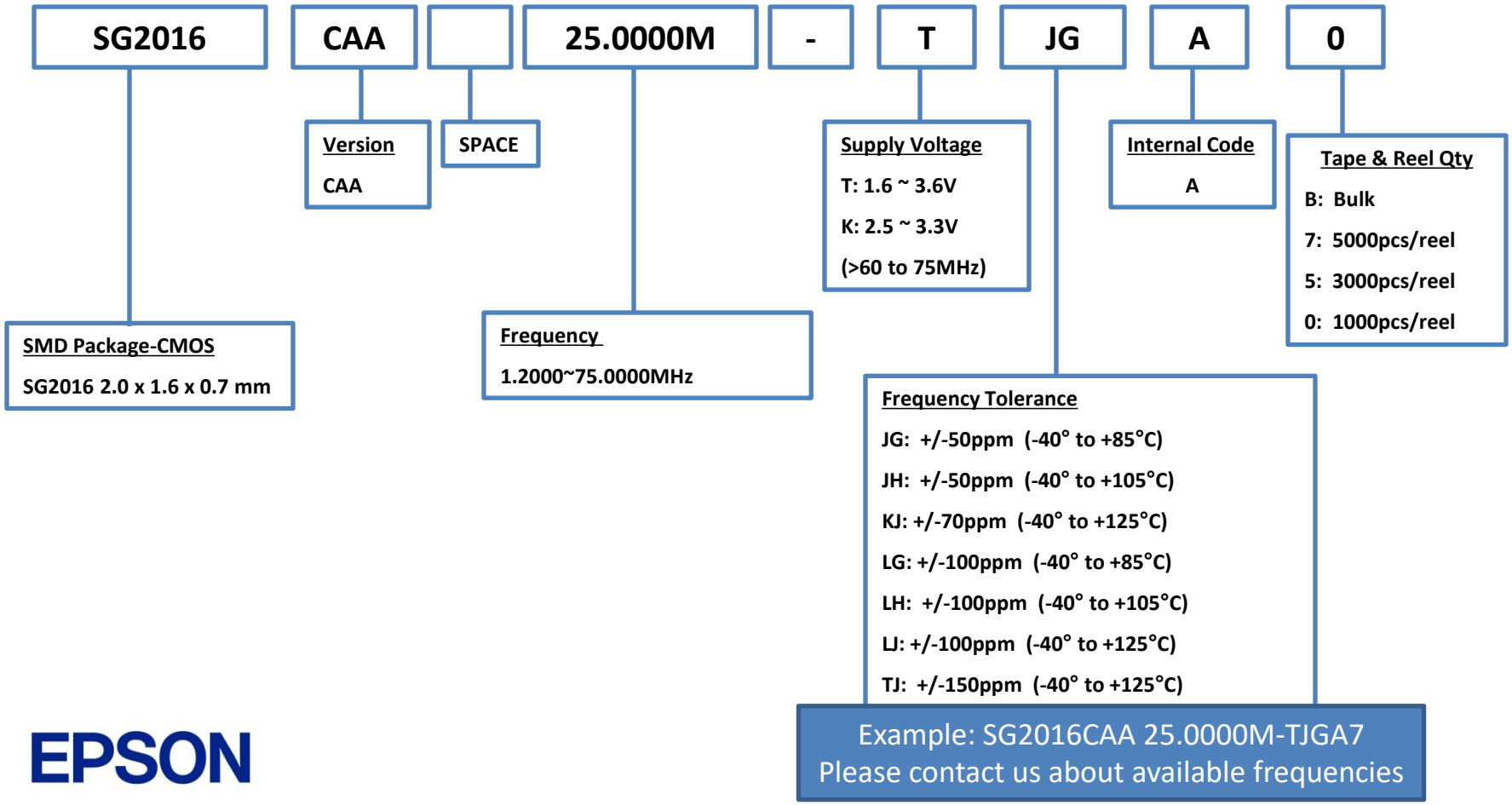
Replaces TCO-7116H1A

EPSON

Product Configuration System

Crystal Oscillators – SPXO, Automotive

(Conforms to AEC-Q200 Requirement)

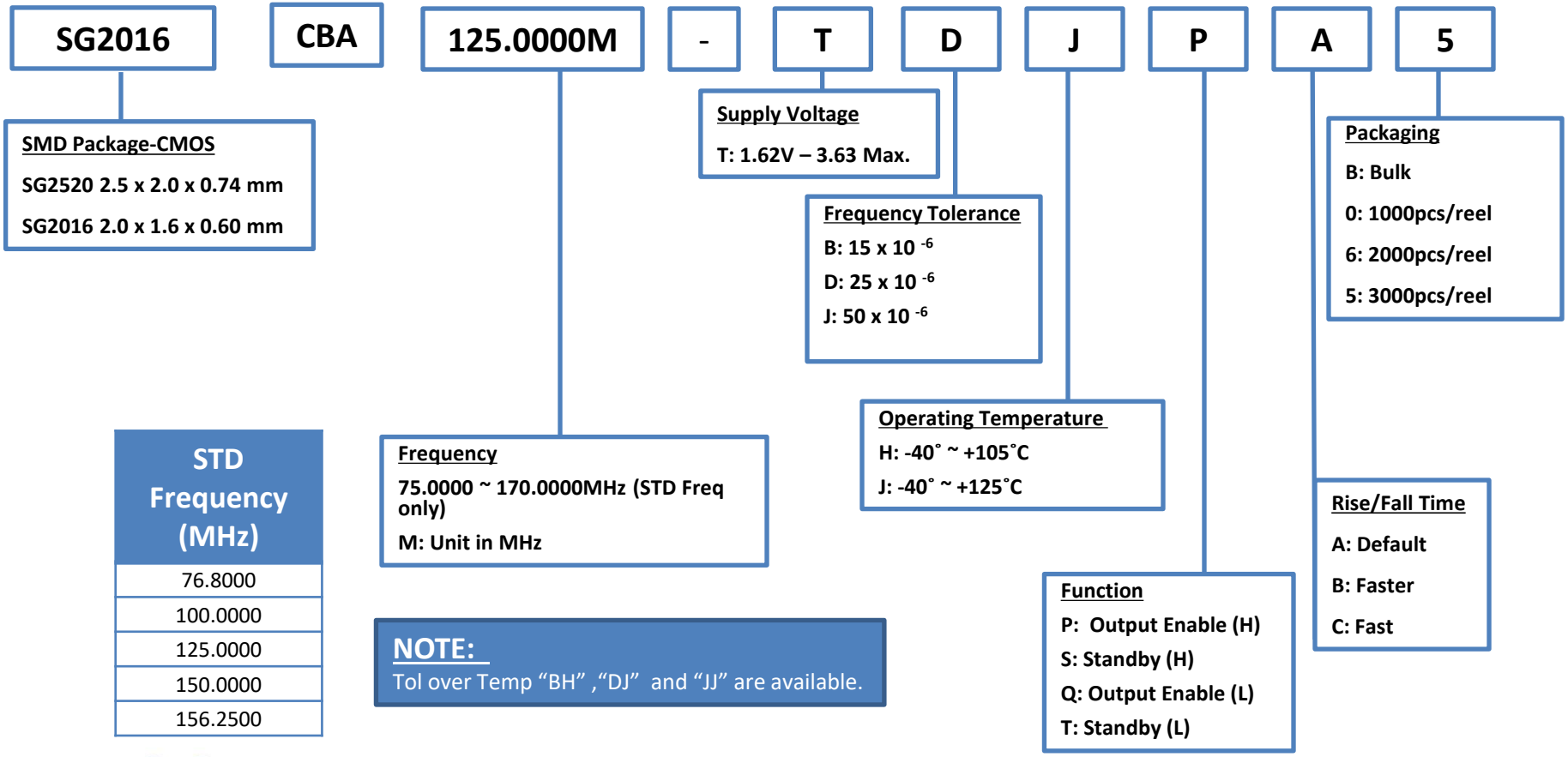


Example: SG2016CAA 25.0000M-TJGA7
Please contact us about available frequencies

EPSON

Product Configuration System

Crystal Oscillator (SPXO) – Low Jitter High Frequency

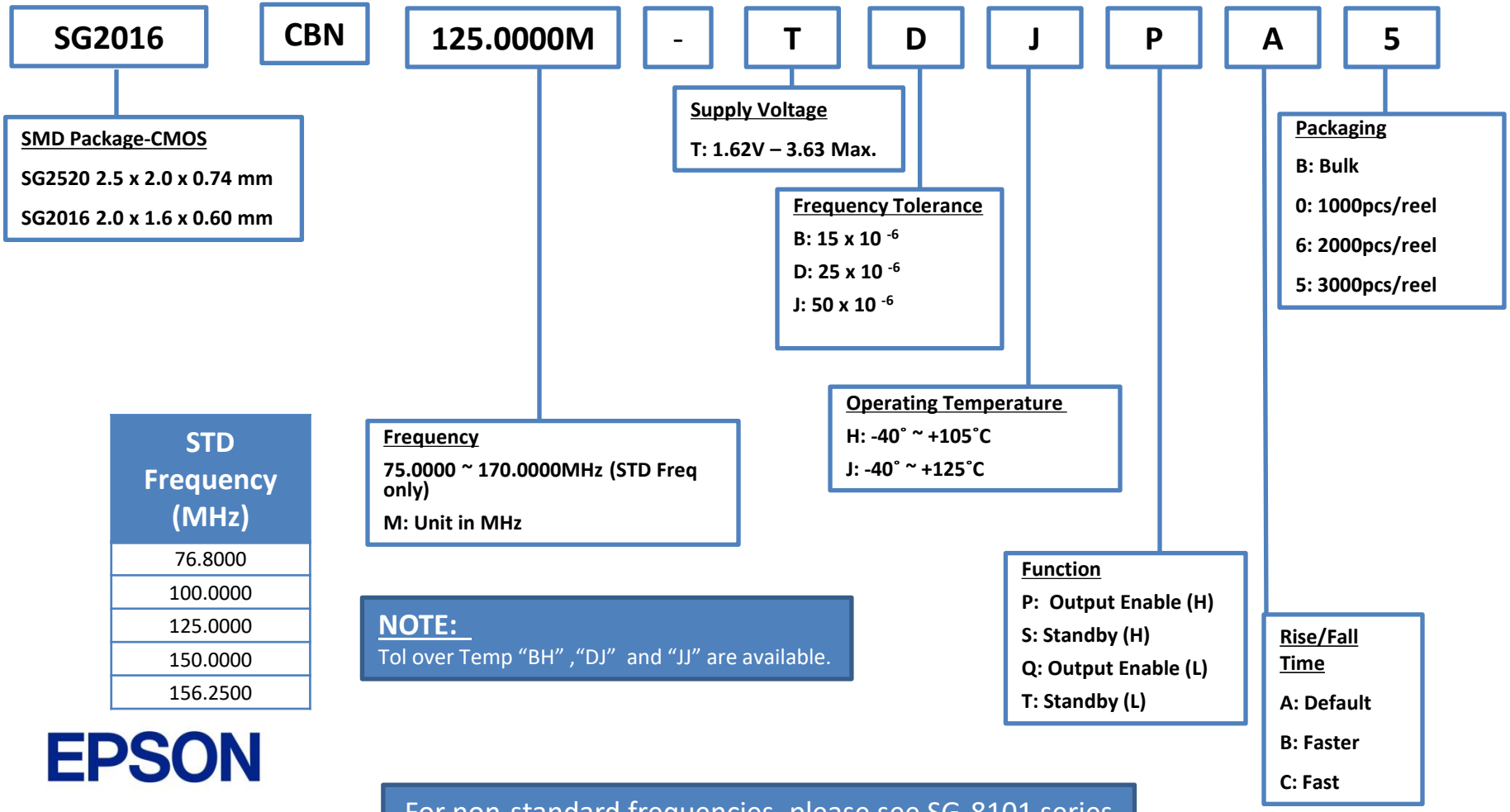


STD Frequency (MHz)
76.8000
100.0000
125.0000
150.0000
156.2500

For non-standard frequencies, please see SG-8201CGA/CJA series

Product Configuration System

Crystal Oscillator (SPXO) – Low Jitter High Frequency

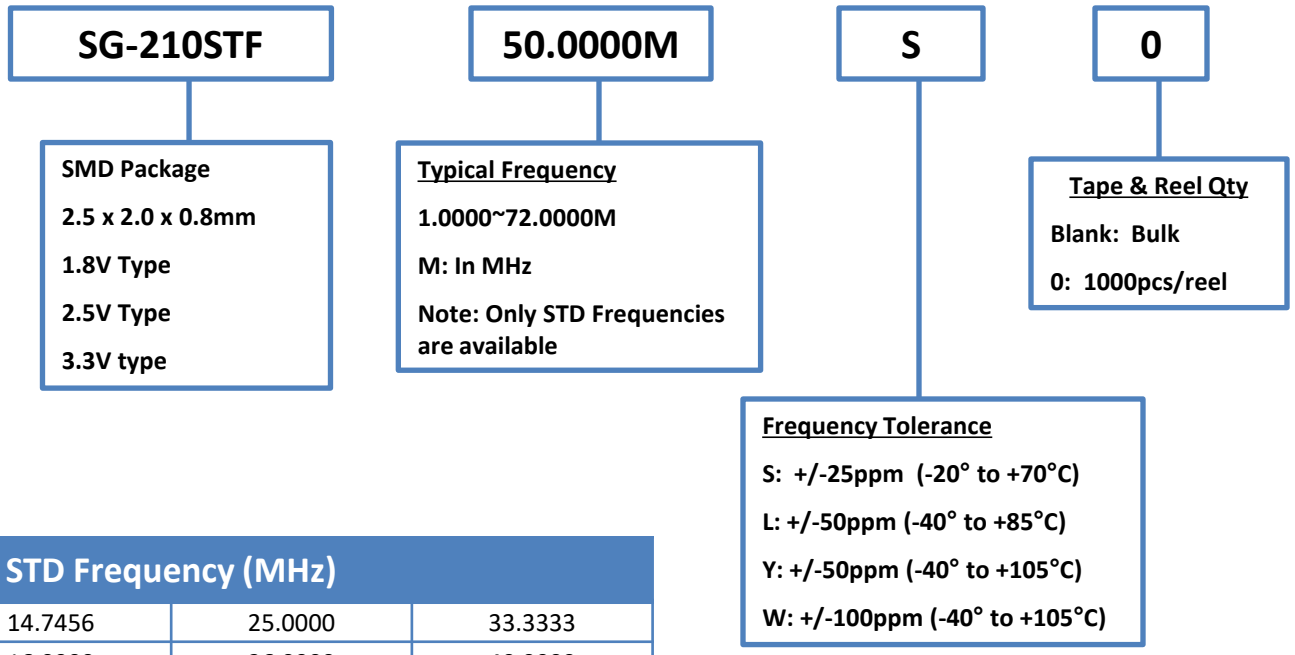


STD Frequency (MHz)
76.8000
100.0000
125.0000
150.0000
156.2500

For non-standard frequencies, please see SG-8101 series

Product Configuration System

Crystal Oscillators - SPXO



STD Frequency (MHz)			
4.0000	14.7456	25.0000	33.3333
8.0000	16.0000	26.0000	40.0000
10.0000	20.0000	27.0000	48.0000
12.0000	24.0000	32.0000	50.0000
12.2880	24.5760	33.3300	72.0000

For non-standard frequencies, please see SG-8018CG

Product Configuration System

Crystal Oscillators - SPXO

SG3225	CAN		25.0000M	-	T	JG	A	0

SMD Package-CMOS

SG7050 7.0 x 5.0 x 1.30 mm

SG5032 5.0 x 3.2 x 1.10 mm

SG3225 3.2 x 2.5 x 1.05 mm

SG2016 2.0 x 1.6 x 0.70 mm

Version

CAN

SPACE

Frequency

SG3225: 1.0000~75.0000MHz

Note: Only STD Frequencies are available

Supply Voltage

T: 1.6 ~ 3.6V

K: 2.5 ~ 3.3V

Frequency Tolerance*

DB: +/-25ppm (-20° to +70°C)

DG: +/-25ppm (-40° to +85°C)

JB: +/-50ppm (-20° to +70°C)

JG: +/-50ppm (-40° to +85°C)

JH: +/-50ppm (-40° to +105°C)

LG: +/-100ppm (-40° to +85°C)

LH: +/-100ppm (-40° to +105°C)

*** Bolded are STD**

Internal Code

A

Tape & Reel Qty

B: Bulk

5: 3000pcs/reel

0: 1000pcs/reel

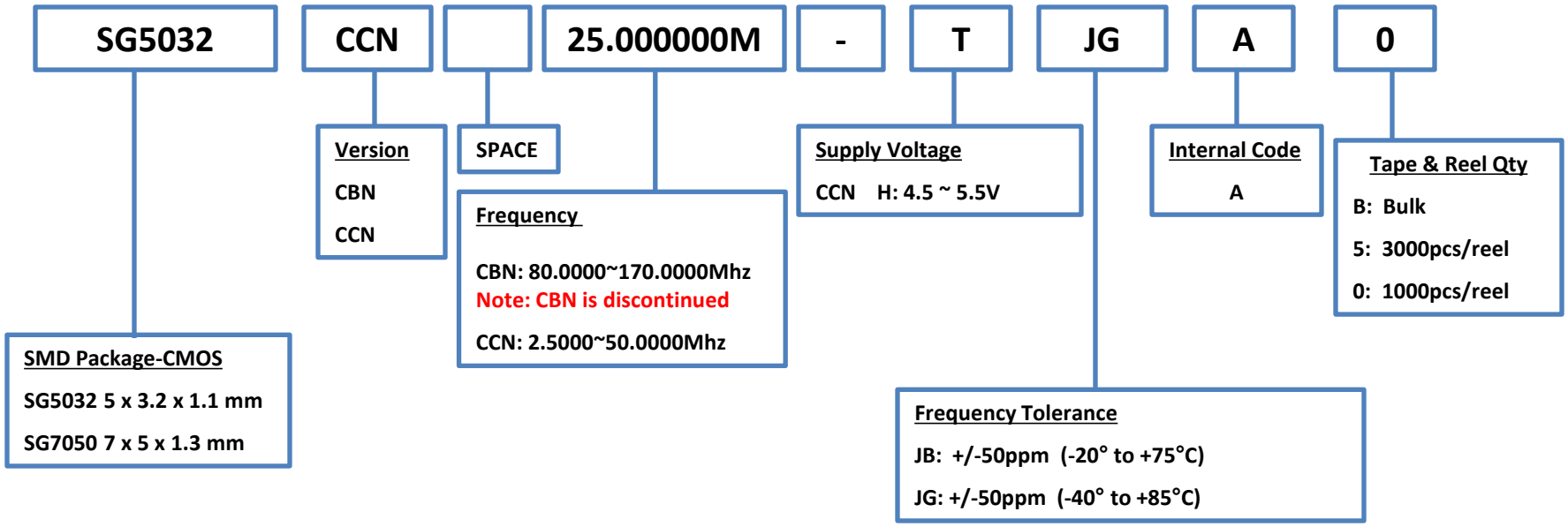
STD Frequency (MHz)			
4.0000	14.7456	25.0000	33.3333
8.0000	16.0000	26.0000	40.0000
10.0000	20.0000	27.0000	48.0000
12.0000	24.0000	32.0000	50.0000
12.2880	24.5760	33.3300	72.0000

Example: SG3225CAN 25.0000M-TJGA

For non-standard frequencies, please see SG-8018CE

Product Configuration System

Crystal Oscillators - SPXO



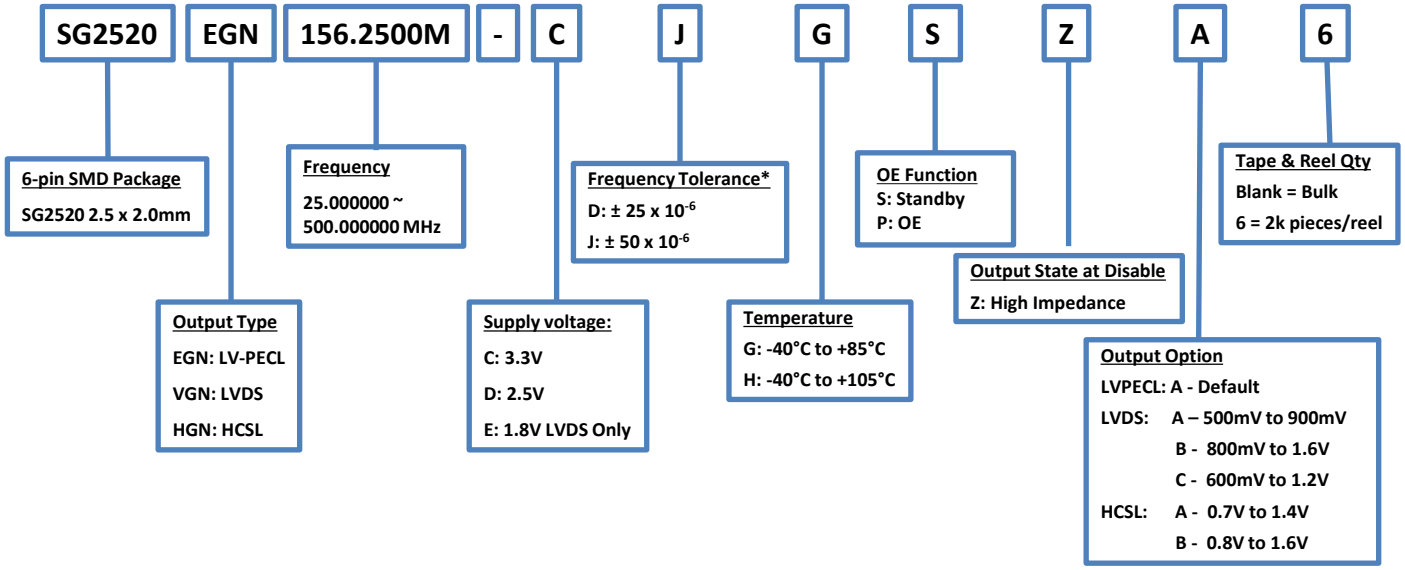
Example: SG5032CCN 25.0000M-TJGA

JH is not available

For non-standard frequencies, please see SG-8018

Product Configuration System

Crystal Oscillators - SPXO



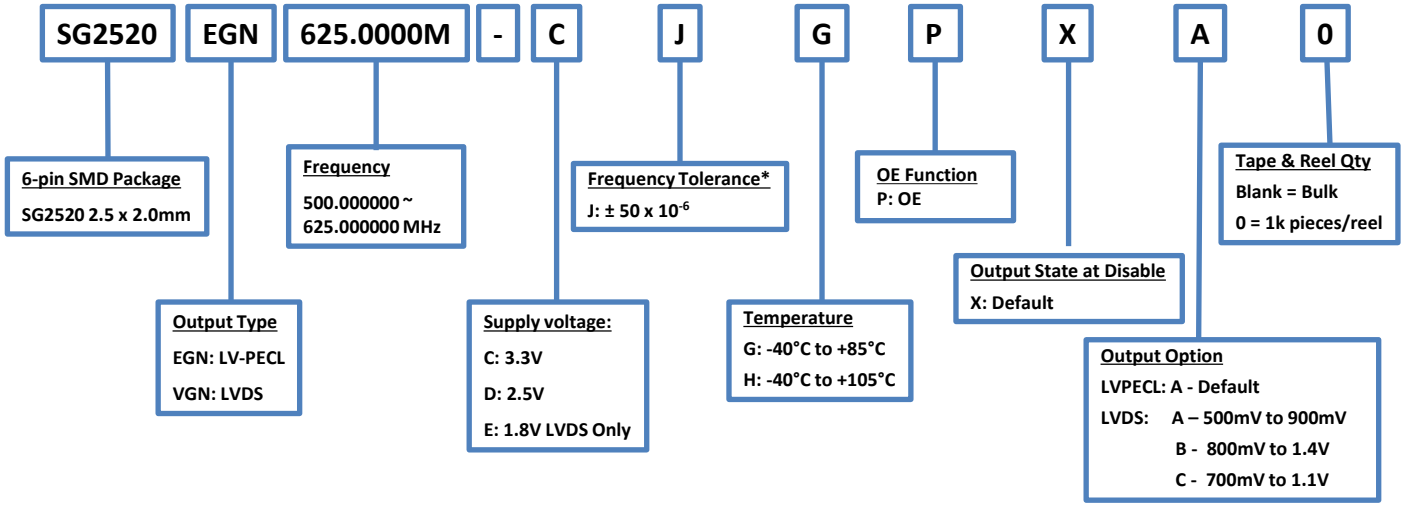
* Please contact SEC for availability for a given temperature range

EPSON

Note: All packages are RoHS Compliant

Product Configuration System

Crystal Oscillators - SPXO



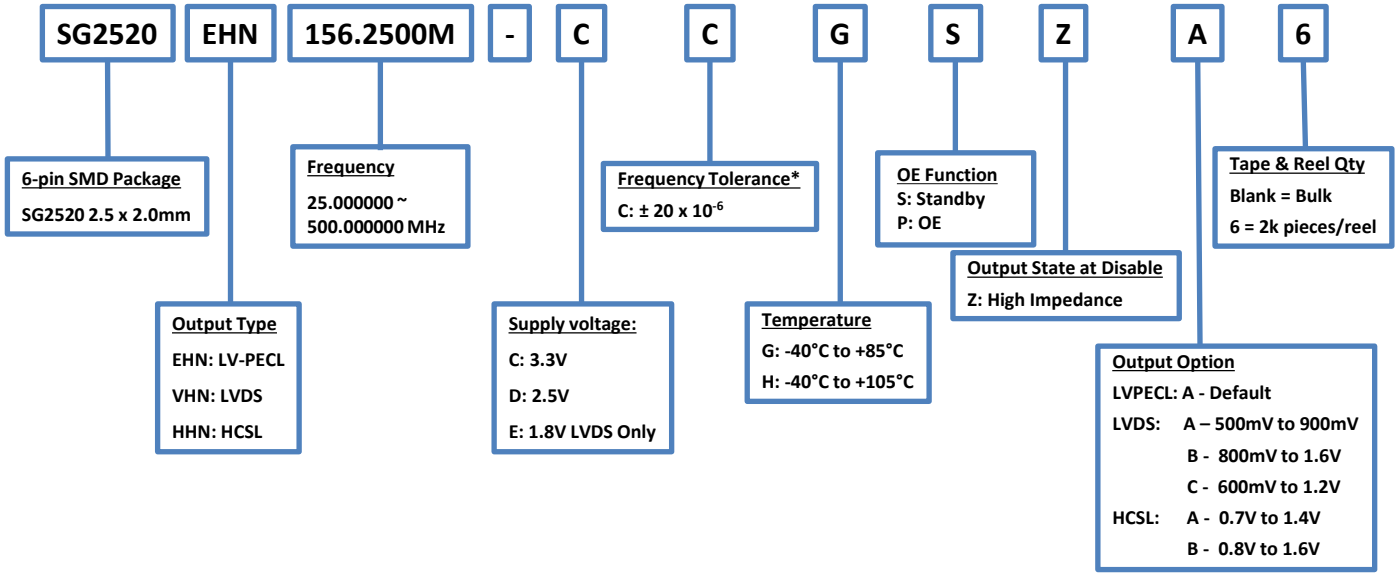
* Please contact SEC for availability for a given temperature range

EPSON

Note: All packages are RoHS Compliant

Product Configuration System

Crystal Oscillators - SPXO



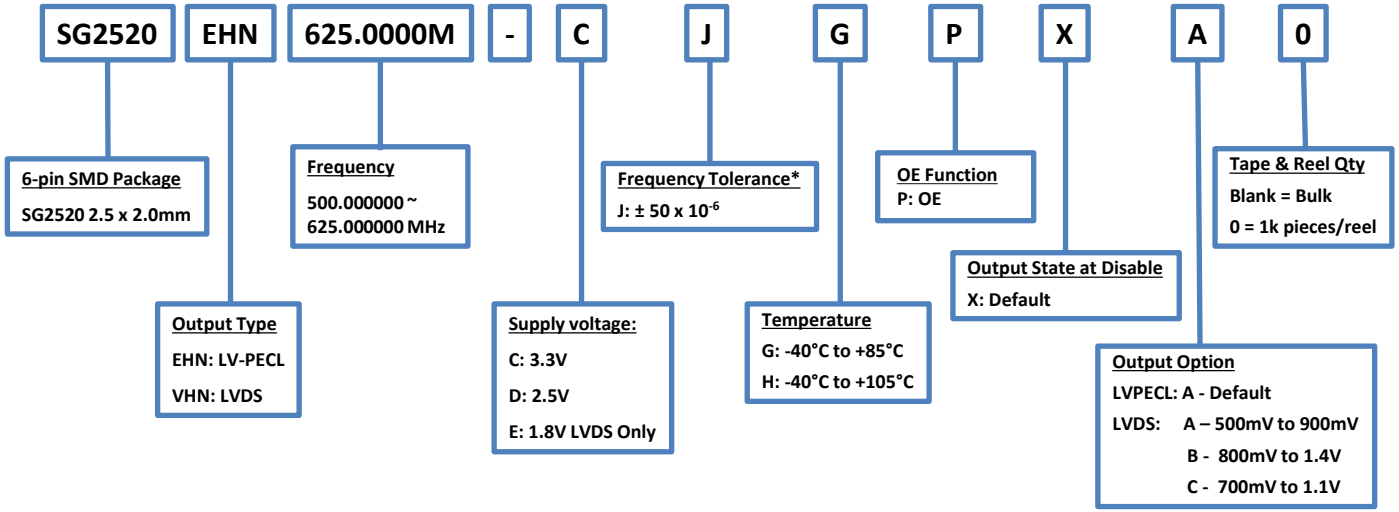
* Please contact SEC for availability for a given temperature range

EPSON

Note: All packages are RoHS Compliant

Product Configuration System

Crystal Oscillators - SPXO



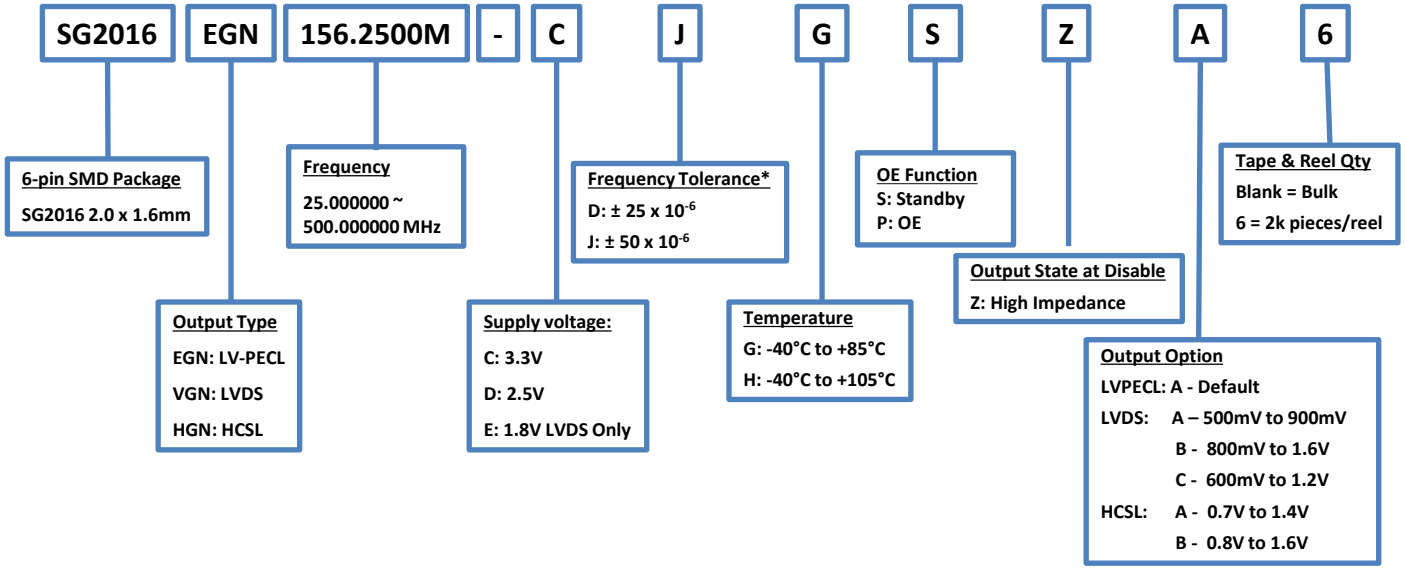
* Please contact SEC for availability for a given temperature range

EPSON

Note: All packages are RoHS Compliant

Product Configuration System

Crystal Oscillators - SPXO



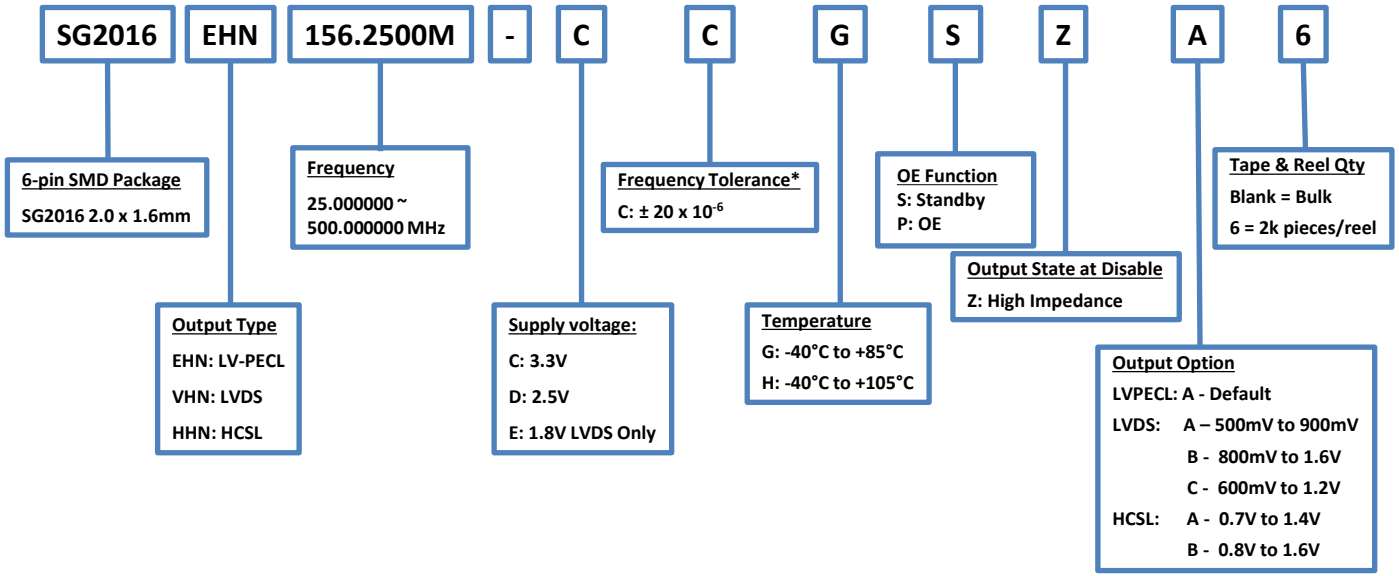
* Please contact SEC for availability for a given temperature range

EPSON

Note: All packages are RoHS Compliant

Product Configuration System

Crystal Oscillators - SPXO



* Please contact SEC for availability for a given temperature range

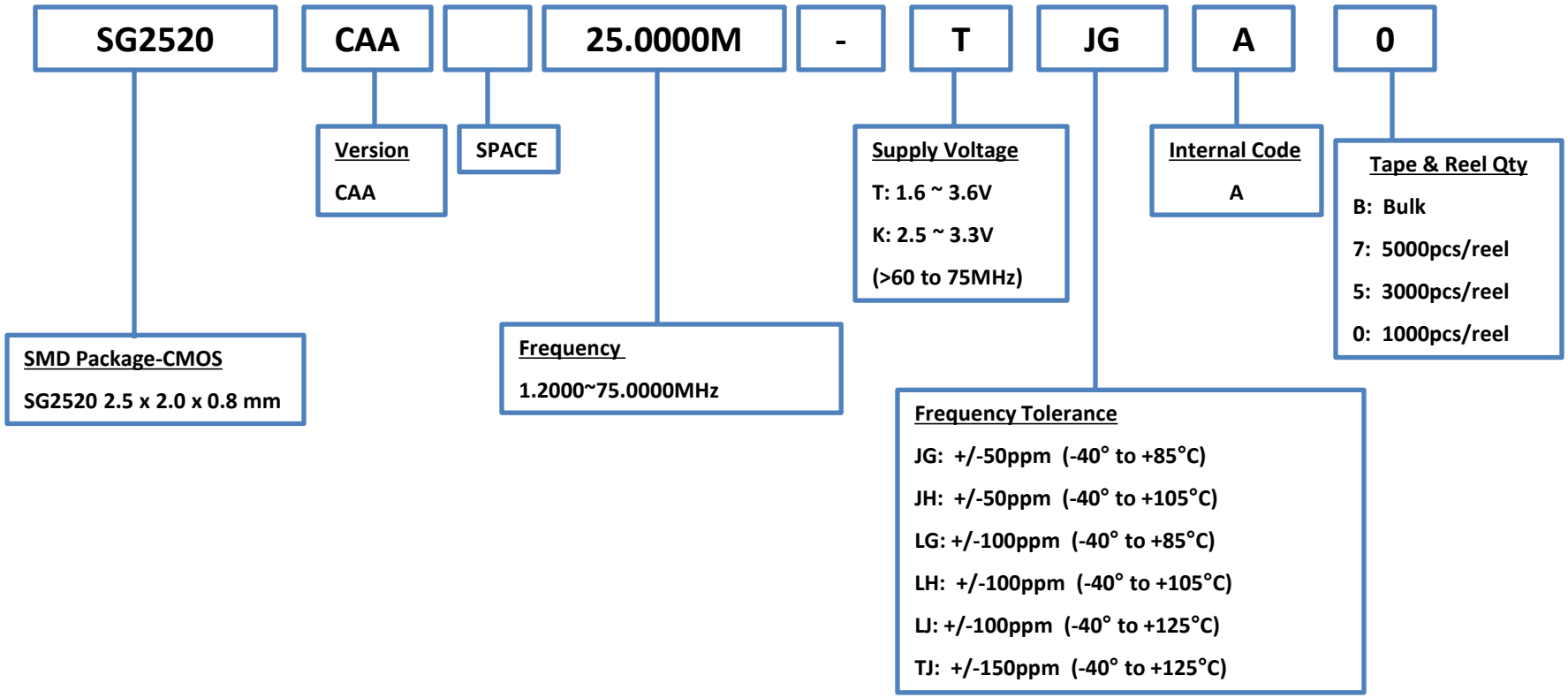
EPSON

Note: All packages are RoHS Compliant

Product Configuration System

Crystal Oscillators – SPXO, Automotive

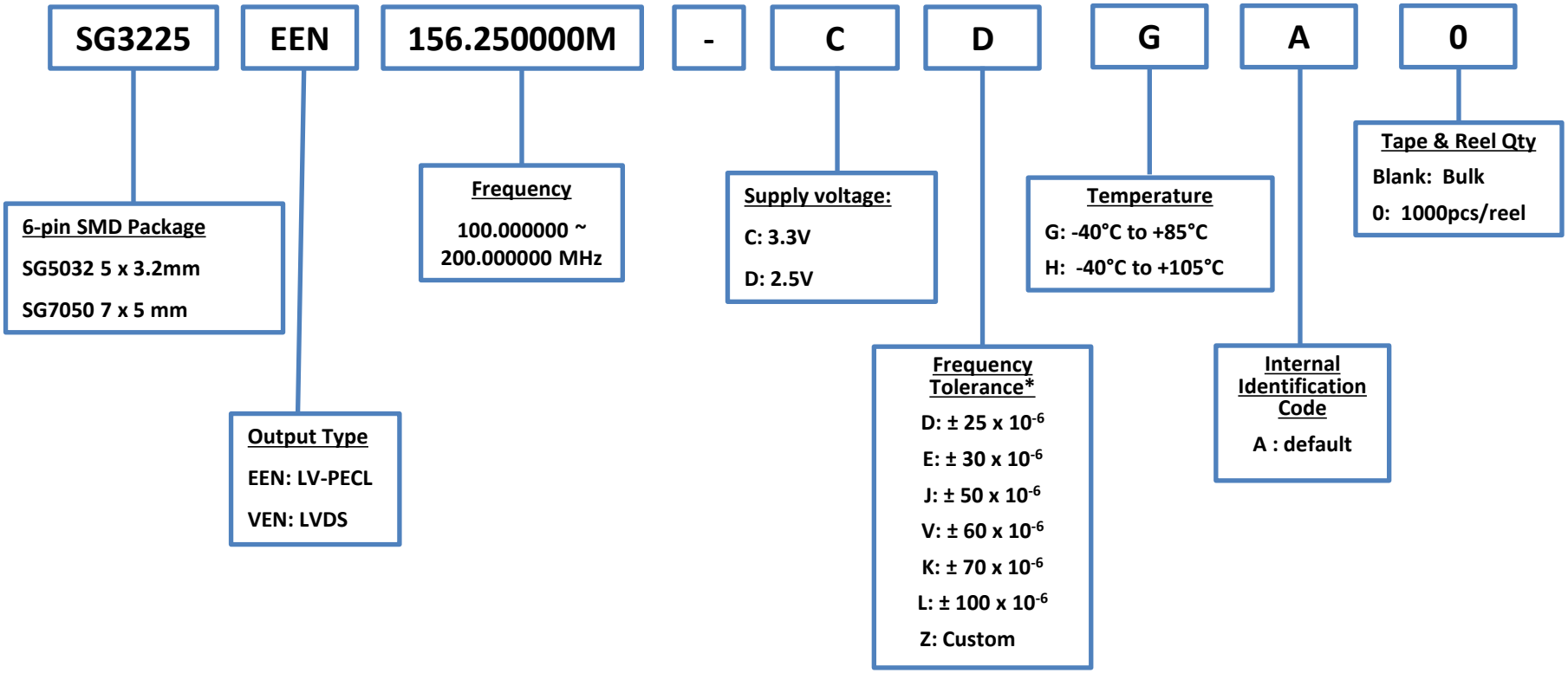
(Conforms to AEC-Q200 Requirement)



EPSON

Product Configuration System

Crystal Oscillators - SPXO



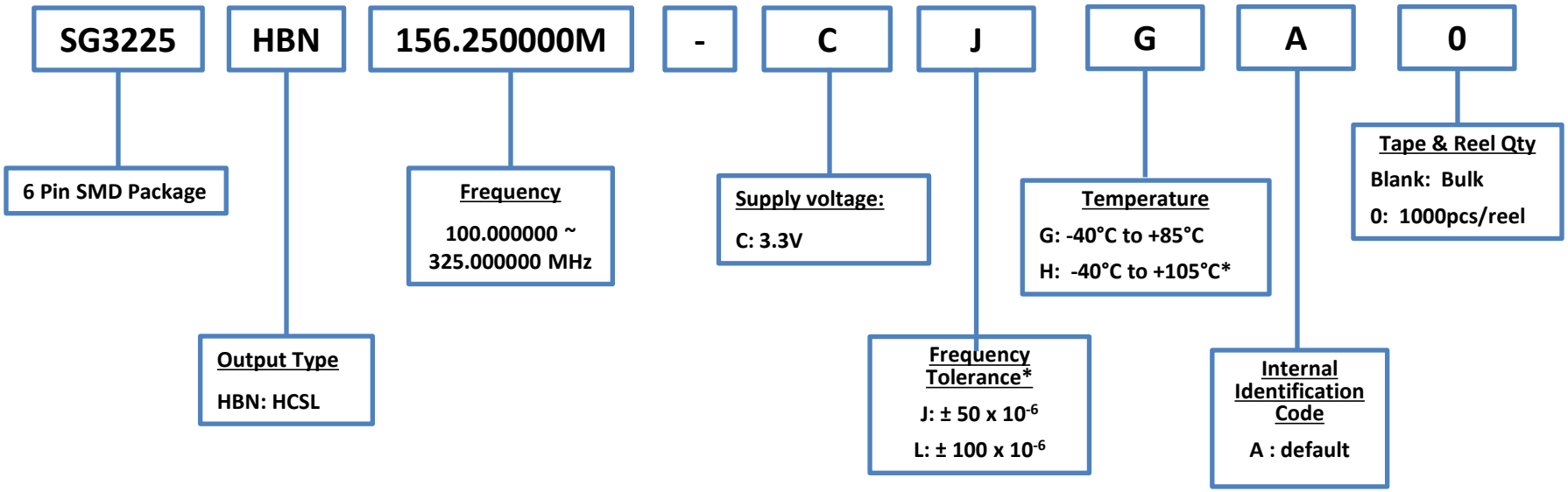
* Please contact SEC for availability for a given temperature range

EPSON

Note: All packages are RoHS Compliant

Product Configuration System

Crystal Oscillators - SPXO

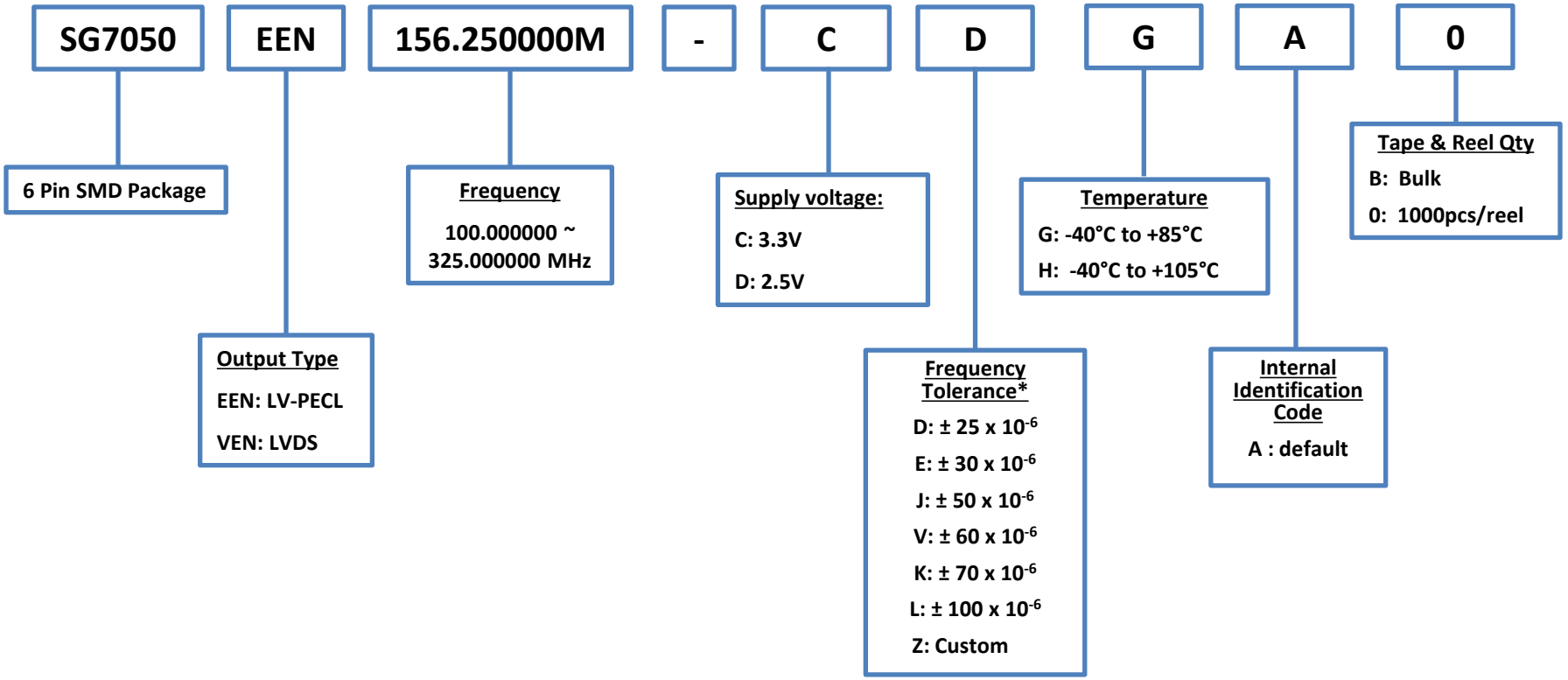


* Please contact SEC for availability for a given temperature range

Note: All packages are RoHS Compliant
*For 105C, contact Epson

Product Configuration System

Crystal Oscillators - SPXO



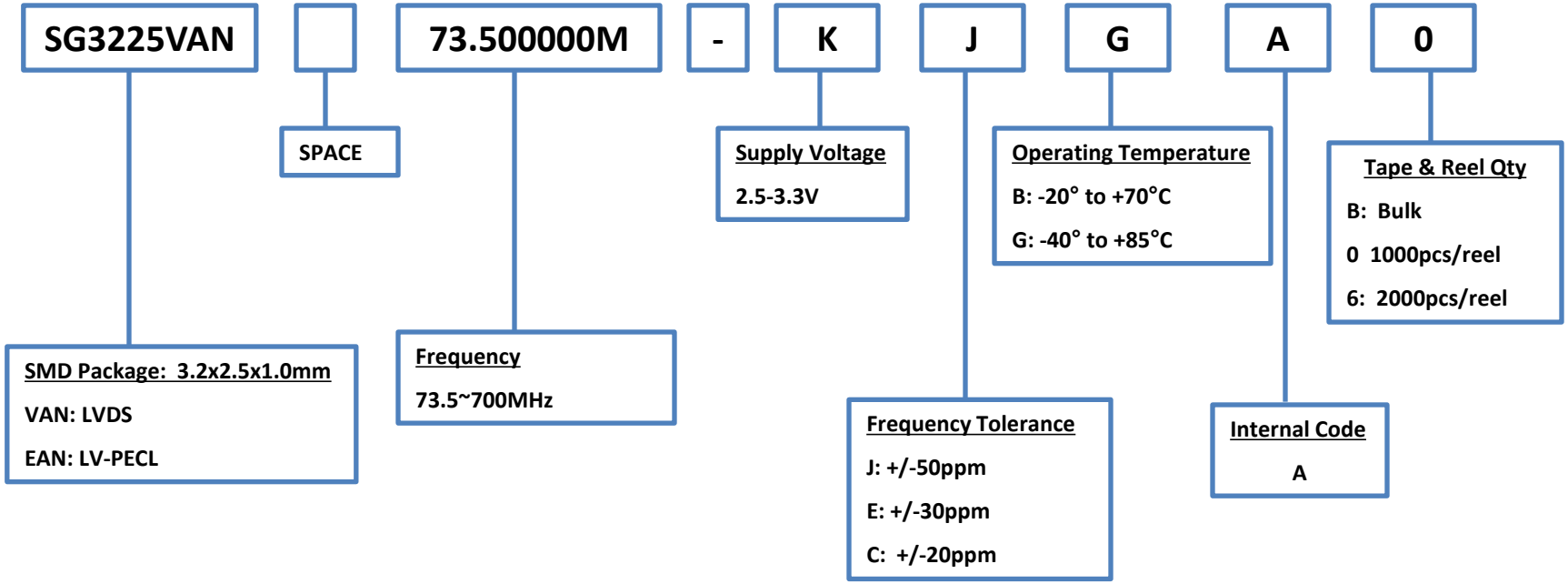
* Please contact SEC for availability for a given temperature range

Note: All packages are RoHS Compliant

Product Configuration System

Crystal Oscillators – SPXO

Output : LV-PECL, LVDS

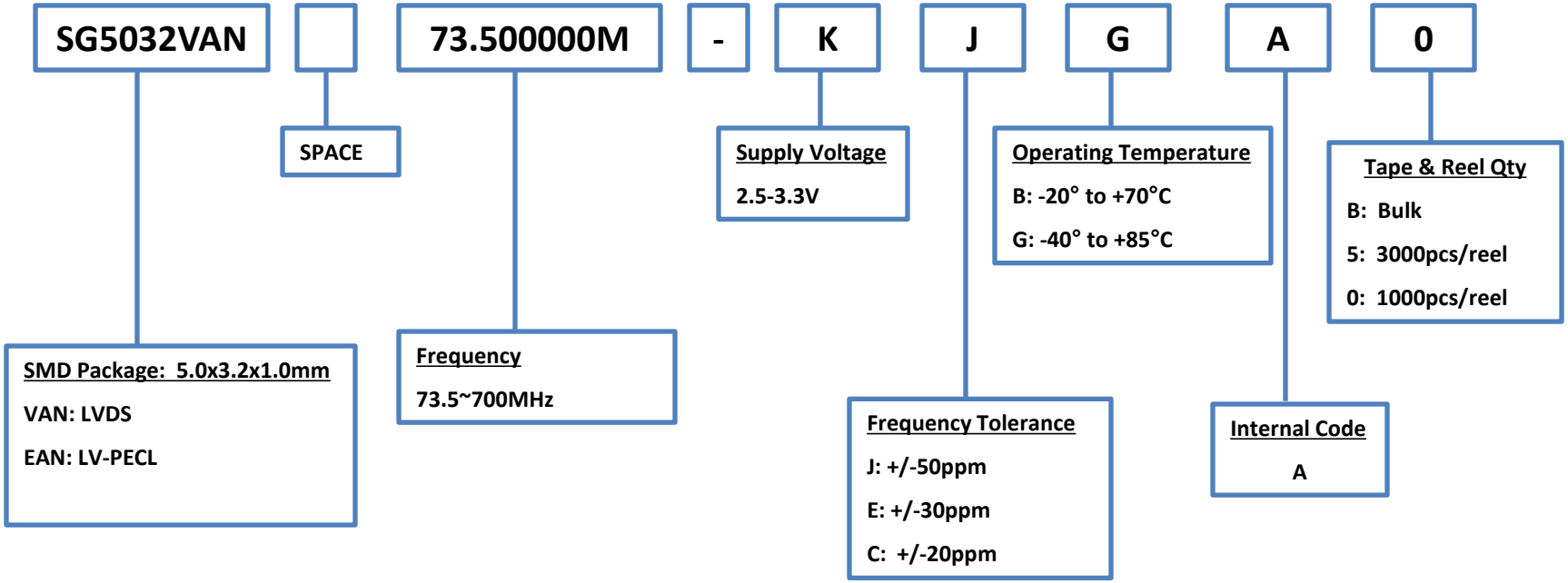


Example: SG3225EAN 73.500000M-KJGA
CG is not available

Product Configuration System

Crystal Oscillators – SPXO

Output : LV-PECL, LVDS

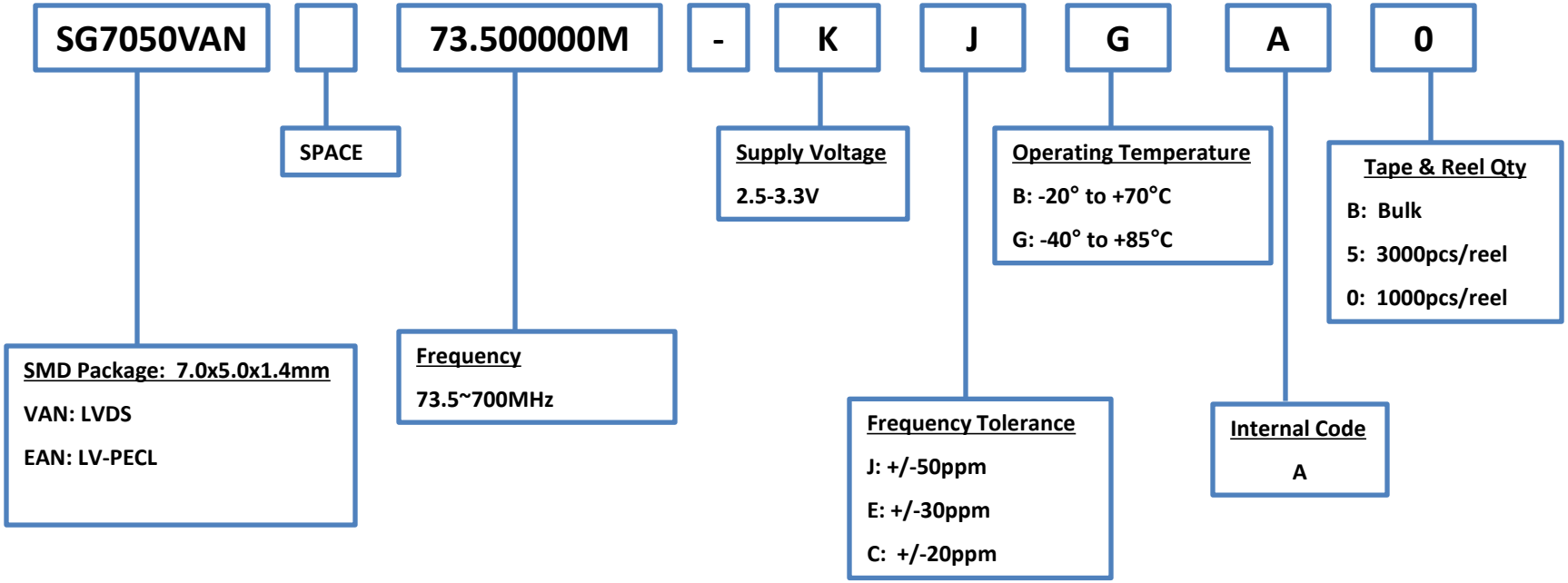


Example: SG5032EAN 73.500000M-KJGA
CG is not available

Product Configuration System

Crystal Oscillators – SPXO

Output : LV-PECL, LVDS

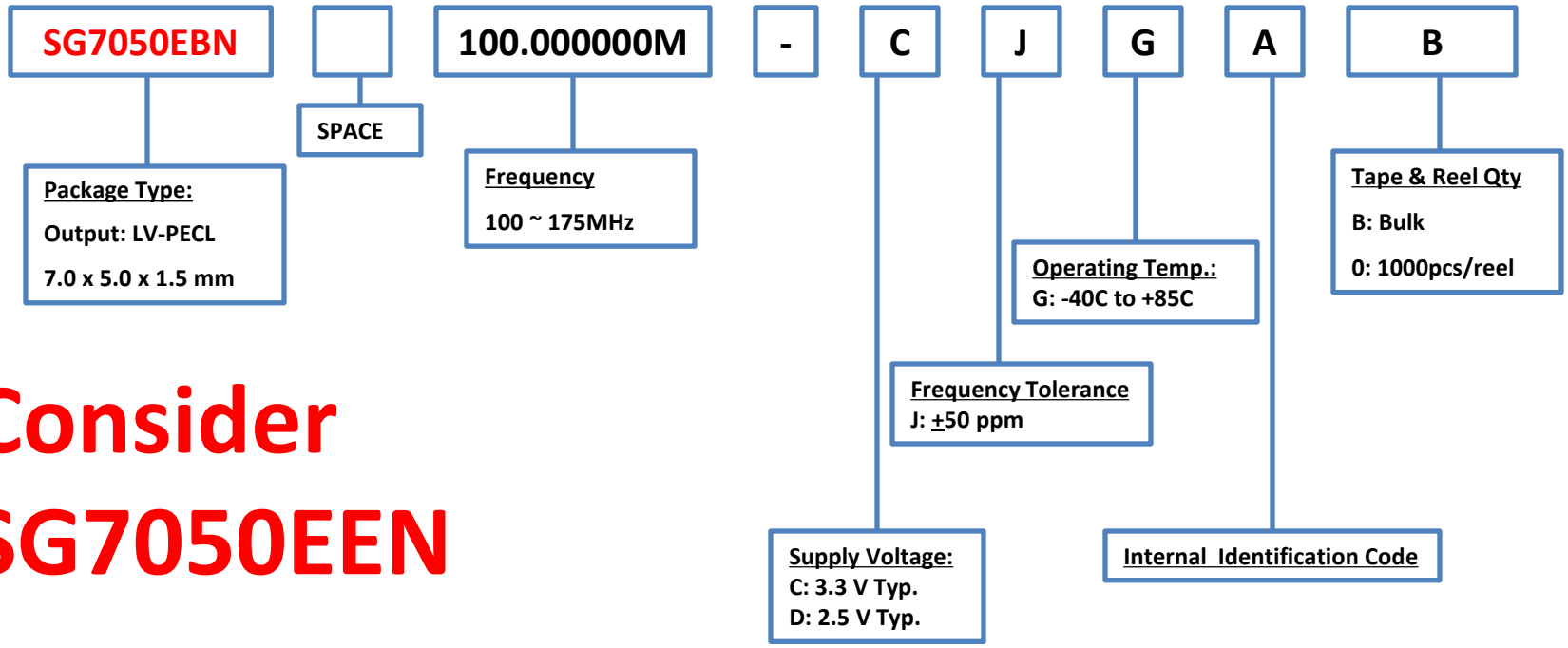


Example: SG7050EAN 73.500000M-KJGA
CG is not available

Product Configuration System

Crystal Oscillator - SPXO

Discontinued



Consider SG7050EEN

NOTE:

Please contact us for requirements not listed in this specification.

EPSON

Product Configuration System

Crystal Oscillators - SPXO

Discontinued

SG-615	P	CW	66.6667M	C	3	:	PURE SN

Oscillator Package Type
- 531: 8 pin plastic DIP
- 615: 4 pin "J" lead SMD
- 636: 4 pin "J" lead mini SMD
- 645: Plastic 5x7mm

Version
- P: Output Enable
- S: Standby Function

Function Description
- HW: 5.0V CMOS
- TW: 5.0V TTL
- CW: 3.3V CMOS

Frequency

5V, HW/TW
- SG-531 B Stability 55.0001~66.666MHz
- SG-531 C Stability 55.0001~135MHz
- SG-615 B Stability 55.0001~66.666MHz
- SG-615 C Stability 55.0001~135MHz
- SG-636 B Stability 32.0001~39.9999MHz
- SG-636 C Stability 32.0001~135MHz
- SG-645 B Stability 32.0001~39.9999MHz
- SG-645 C Stability 32.0001~135MHz

3.3V, CW
- SG-531 B/C/M Stability 55.0001~135MHz
- SG-615 B/C/M Stability 26.0001~135MHz
- SG-636 B/C Stability 32.0001~135MHz
- SG-645 B/C/M Stability 32.0001~135MHz

These packages also available in our SG-8002 programmable series.

Frequency Tolerance
- B: +/-50ppm / -20 to +70C
- C: +/-100ppm / -20 to +70C

M: +/-100ppm/-40~+85C

Available in 3.3V to 135MHz, SG-51/531 & SG-615

(NOT available in SG-636)

Tape & Reel Qty
- Blank: Bulk
- 0: 1000pcs per reel
- 3: 250pcs per reel

(Except SG-51/531)

SG-51/531 Series

Blank: Stick 25/35

- PURE SN
- ROHS

EPSON

Product Configuration System

Crystal Oscillators - SPXO

Discontinued

SG-636	P	H	41.0000M	C	3	:	ROHS

SG-636 — Oscillator Package Type:
4 pin "J" lead mini SMD

P — Version
P: Output Enable
S: Standby Function

H — Frequency Range (Load)

TF:	2.21675~41.0MHz	5V /Fund /50pF CMOS /10TTL
CE:	2.21675~40.0MHz	3.3V /Fund /30pF CMOS
DE:	2.21675~40.0MHz	2.5V /Fund /15pF CMOS
H:	41.001~70.0MHz	5V /O/T /15pF CMOS

41.0000M — Frequency
4 decimal places min.
M: In MHz

C — Frequency Tolerance
C: +/-100ppm / -20 to +70C

3 — Tape & Reel Qty
Blank: Bulk
0: 1000pcs per reel
3: 250pcs per reel

:

ROHS
ROHS

These packages also available in our SG-8002 programmable series.

Product Configuration System

Crystal Oscillators - SPXO

Discontinued

SG-615	P	TJ	30.0000M	C	0	:	PURE SN

SG-615

51: 14 pin plastic DIP

531: 8 pin plastic DIP

615: 4 pin "J" lead SMD

P

Version

P: 4 pin with O/E

TJ

Frequency Range (Load)

Blank: 1.0250 ~ 26.0MHz (10TTL or 50pF CMOS load)

TJ: 26.0001 ~ 66.6667MHz (5TTL)

H: 26.0001 ~ 66.6667MHz (50pF CMOS load)

30.0000M

Frequency

1.0250~66.6667MHz

M: In MHz to 4 decimal places

C

Frequency Tolerance

B: +/-50ppm / -20 to +70C, except 55.0~66.6667MHz

C: +/-100ppm / -20 to +70C

0

Tape & Reel Qty

SG-615 Series

Blank: Bulk

0: 1000pcs per reel

3: 250pcs per reel

SG-51 Series

S: 25pcs/stick

SG-531 Series

S: 35pcs/stick

:

PURE SN

PURE SN

ROHS

These packages also available in our SG-8002 programmable series.

EPSON

Product Configuration System

Crystal Oscillators - SPXO

Discontinued

SG-615	P	CN	30.0000M	C	0	:	PURE SN

SG-615
- 615: 4 pin "J" lead SMD
- 531: 8 pin plastic DIP

P
- Version
- P: 4 pin with O/E

CN
- Supply Voltage / Frequency Range
- CG: 3.3V / 1.5000 ~ 26.0000MHz
- CN: 3.3V / 26.0001 ~ 66.667MHz (SG-615 only)

30.0000M
- Frequency
- 1.5000~66.6667MHz
- M: In MHz

C
- Frequency Tolerance
- C: +/-100ppm (-20° to +70°C)
- B: +/-50ppm (-20° to +70°C)
- M: +/-100ppm (-40° to +85°C)

0
- Tape & Reel Qty
- Blank: Bulk
- 0: 1000pcs per reel
- 3: 250pcs per reel

PURE SN
- PURE SN
- ROHS

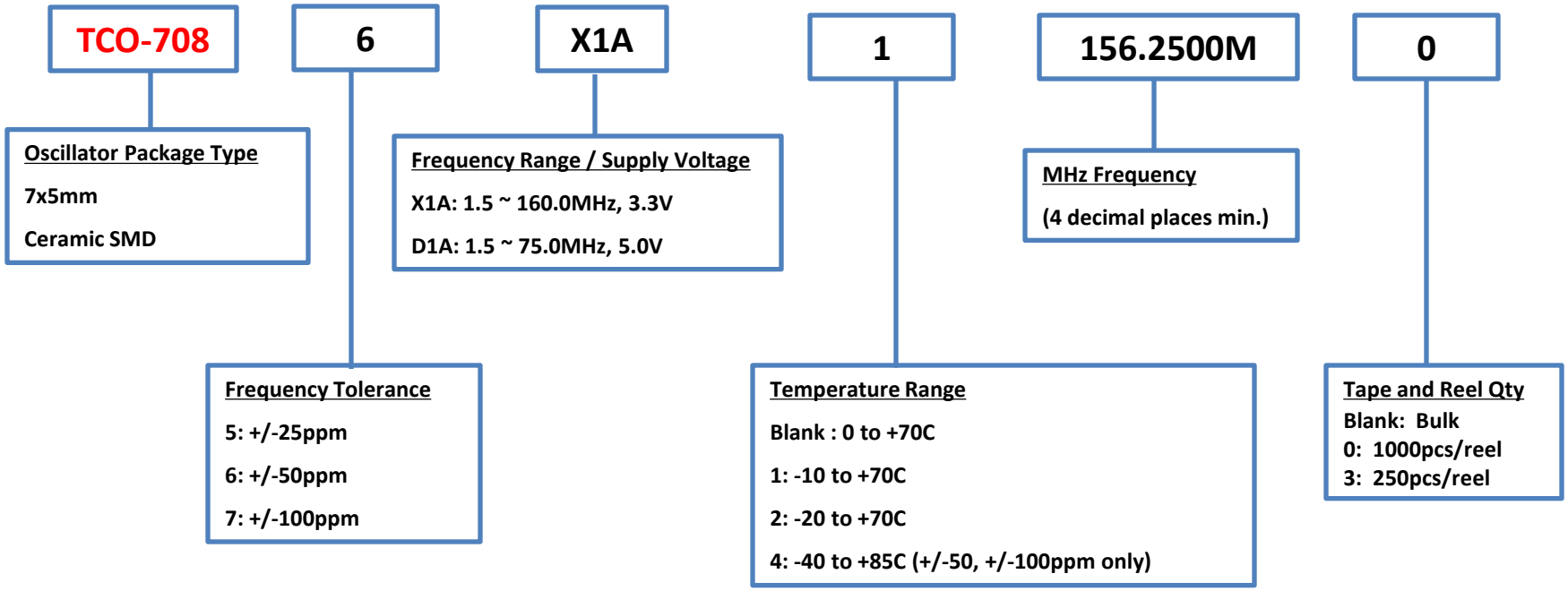
These packages also available in our SG-8002 programmable series.

EPSON

Product Configuration System

Crystal Oscillators - SPXO

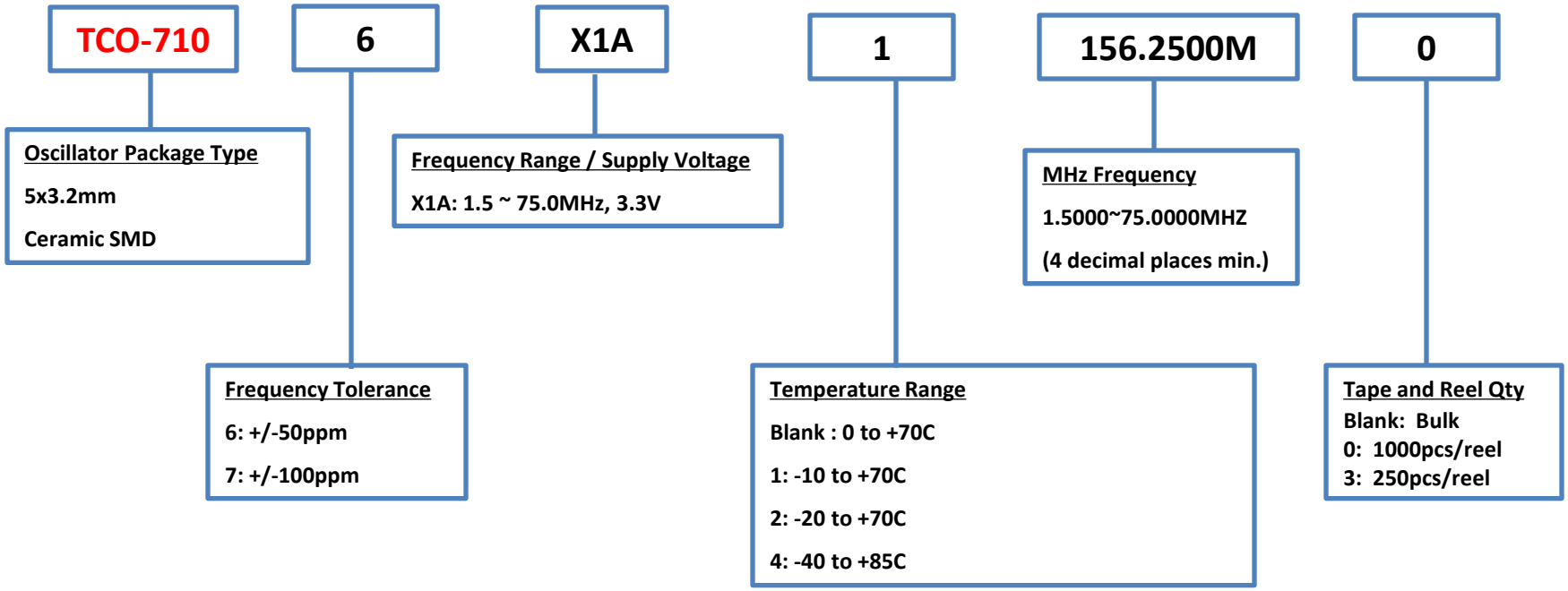
Discontinued



Product Configuration System

Crystal Oscillators - SPXO

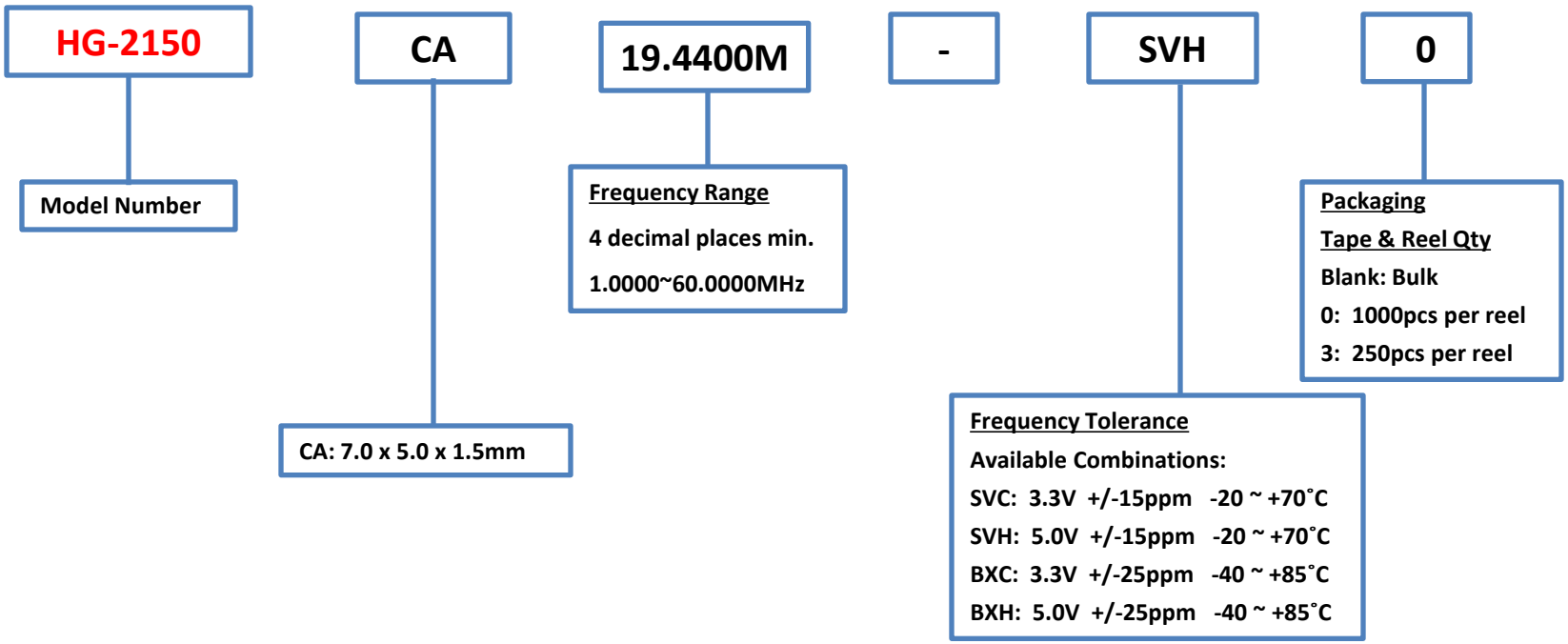
Discontinued



Product Configuration System

Crystal Oscillators - High Stability

Discontinued



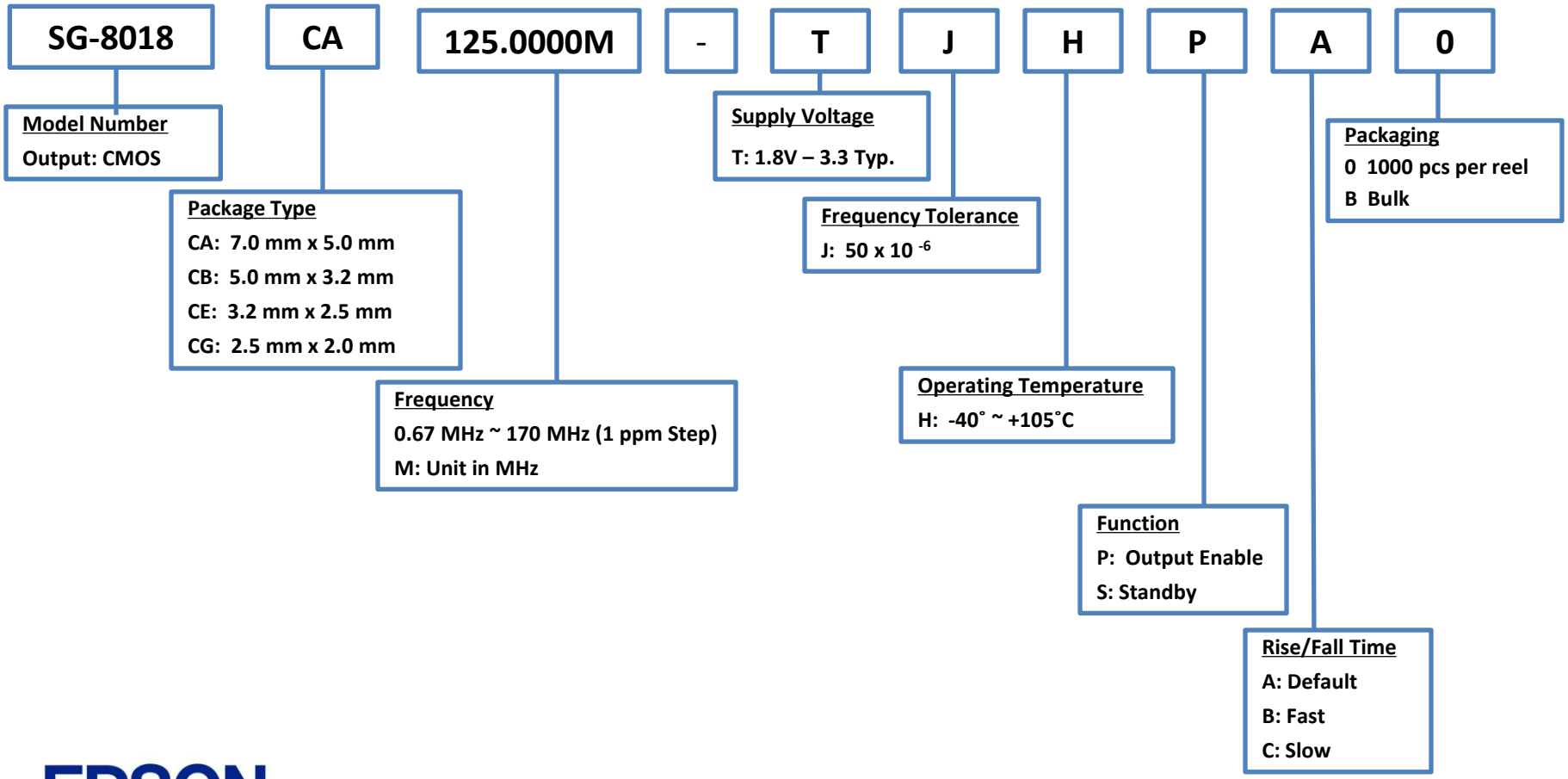
Product Configuration Guide

Programmable Oscillators (P-SPXO)

EPSON

Product Configuration System

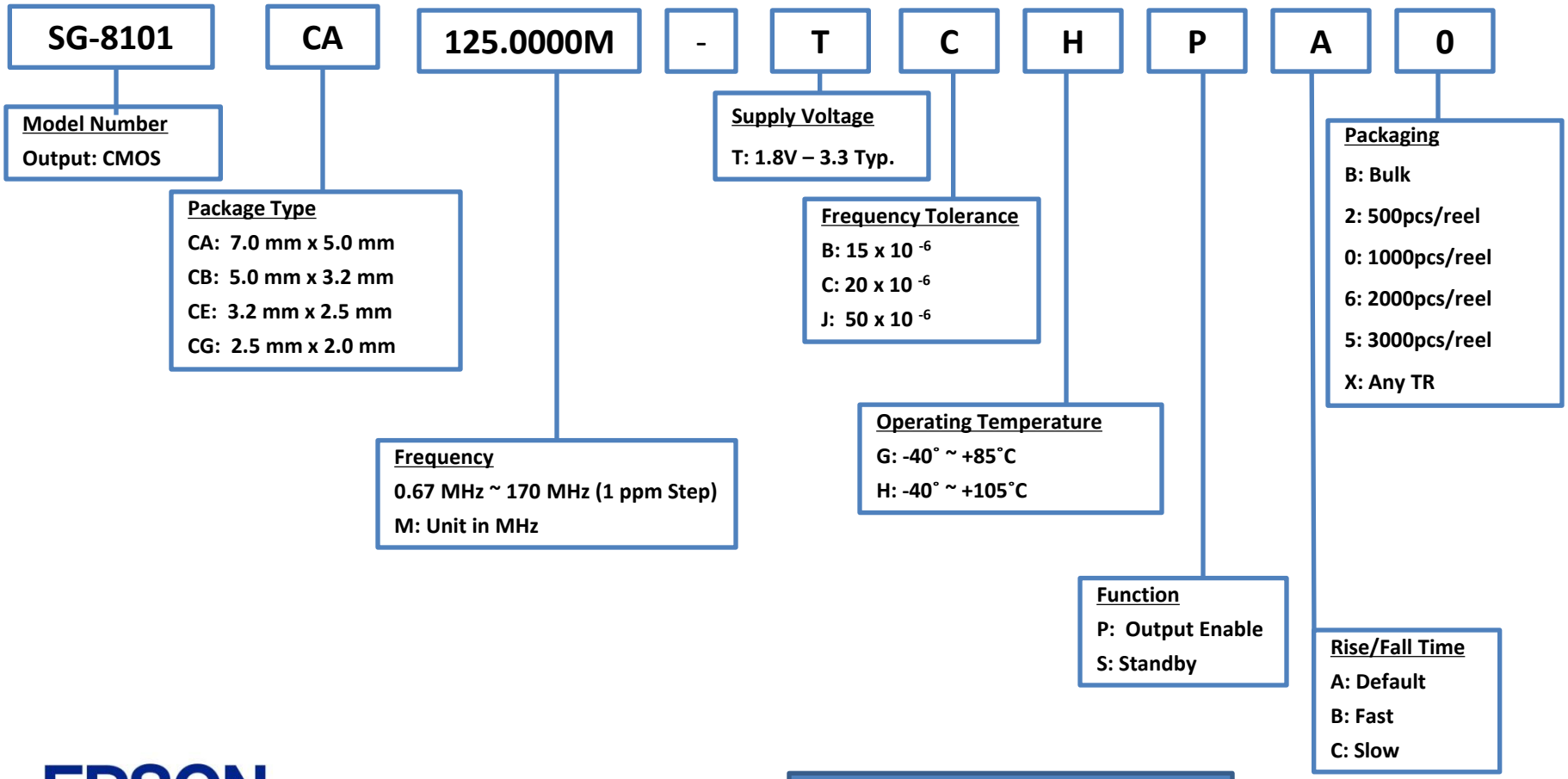
Crystal Oscillator (SPXO) – Programmable



EPSON

Product Configuration System

Crystal Oscillator (SPXO) – Programmable, High Performance



NOTE:
See next page for available combinations

Product Configuration System

Crystal Oscillator (SPXO) – Programmable, High Performance

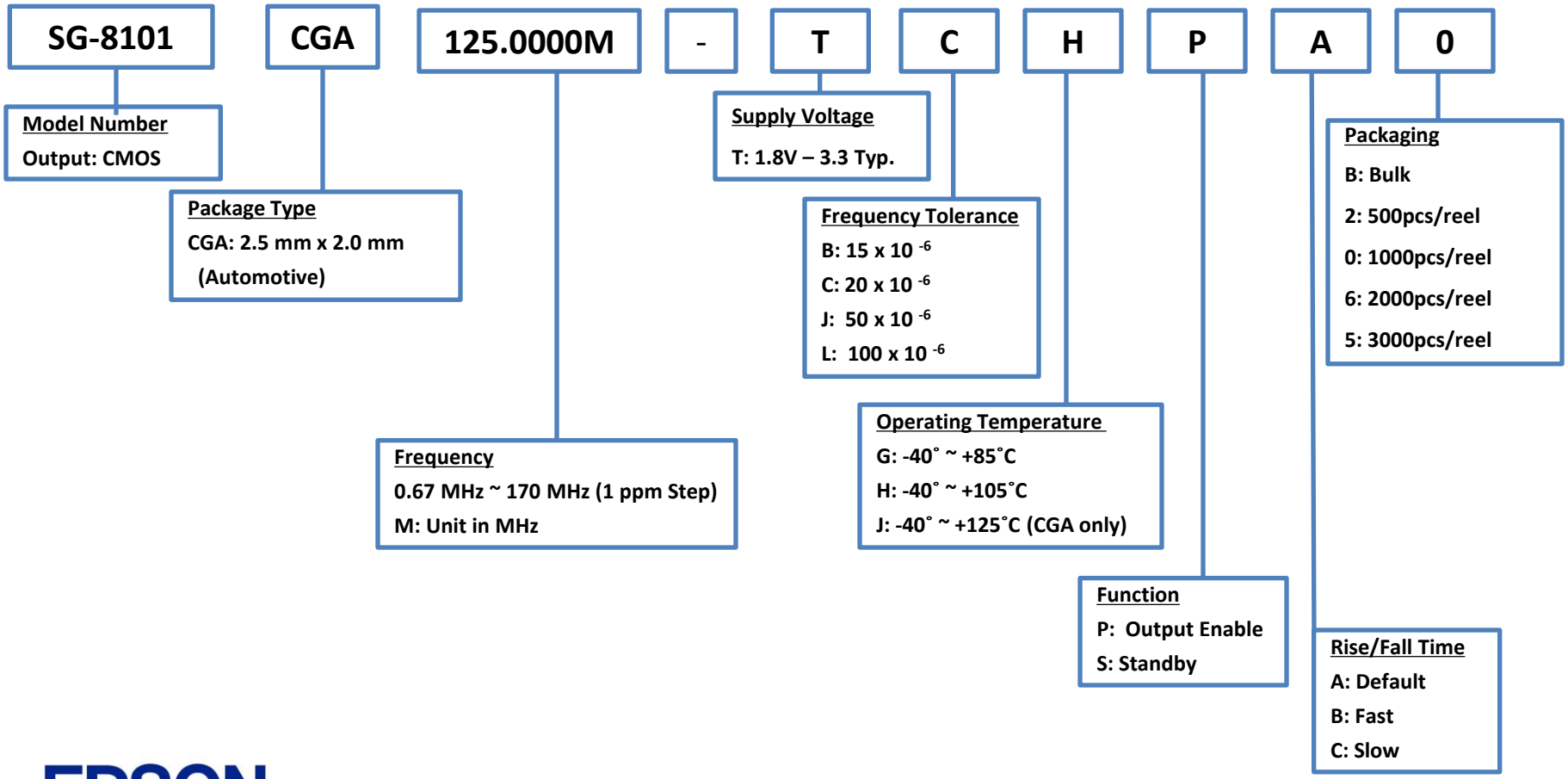
SG-8101 Available Combinations

Available combination		CA: 7.0 mm x 5.0 mm			CB: 5.0 mm x 3.2 mm			CE: 3.2 mm x 2.5 mm			CG: 2.5 mm x 2.0 mm		
Frequency tolerance		B: 15 x 10^{-6}	C: 20 x 10^{-6}	J: 50 x 10^{-6}	B: 15 x 10^{-6}	C: 20 x 10^{-6}	J: 50 x 10^{-6}	B: 15 x 10^{-6}	C: 20 x 10^{-6}	J: 50 x 10^{-6}	B: 15 x 10^{-6}	C: 20 x 10^{-6}	J: 50 x 10^{-6}
Operating temperature	G: -40 °C ~ +85 °C	✓			✓			✓			✓		
	H: -40 °C ~ +105 °C		✓	✓		✓	✓		✓	✓		✓	✓

EPSON

Product Configuration System

Crystal Oscillator (SPXO) – Programmable, High Performance, Automotive (AECQ100)



NOTE:
For Automotive SG-8101CGA, stability "JJ" (+/-50ppm -40/125C) and "LJ" (+/-100ppm -40/125C) are available. See previous slide for other possible combination.

Product Configuration System

Crystal Oscillators - Programmable

Discontinued

SG-8002	JA	32.0000M	-	P	H	C	L0	:	PURE SN

Model Number

Package Type
- DB: Plastic 19.8x7.6mm (SG-51 Type) - Discontinued
- DC: Plastic 13.7x7.6mm (SG-531 Type) - Discontinued
- JA: Plastic 14.0x9.8mm (SG-615 Type) - Discontinued
- JC: Plastic 10.5x5.8mm (SG-636 Type) - Discontinued
- JF: Plastic 7.1x5.1mm (SG-645 Type) - Discontinued
- CA: Ceramic 7.0x5.0mm (SG-710 Type) - NRND
- LB: NPO 5.0x3.2mm (SG-550 Type) - Discontinued
- CE : Ceramic 3.2x2.5mm (SG-310 Type) - NRND
- LA: NPO 3.2x2.5mm (SG-350 Type) * - Discontinued

Output Frequency
- 1.0 ~ 125MHz:
- M: Unit in MHz

Function
- P: OE
- S: ST

Power Supply (Vdd) Duty Level
- H: 5.0V, CMOS (50% Vdd)
- T: 5.0V, TTL (1.4V)
- C: 3.3V, CMOS (50% Vdd)

Frequency Stability / Op Temp
- B: +/-50ppm -20˚ ~ +70˚C
- C: +/-100ppm -20˚ ~ +70˚C
- M: +/-100ppm -40˚ ~ +85˚C

Packaging
- Tape and Reel (except DB & DC)
- L0: 1000pcs per reel
- B: Bulk

Stick (DB Only)
- S: 25pcs/stick

Stick (DC Only)
- S: 35pcs/stick

DB/DC/JA/JC/JF Only
- PURE SN
- ROHS

*SG-8002LA & SG-8002DB:
Not Recommended for New Designs

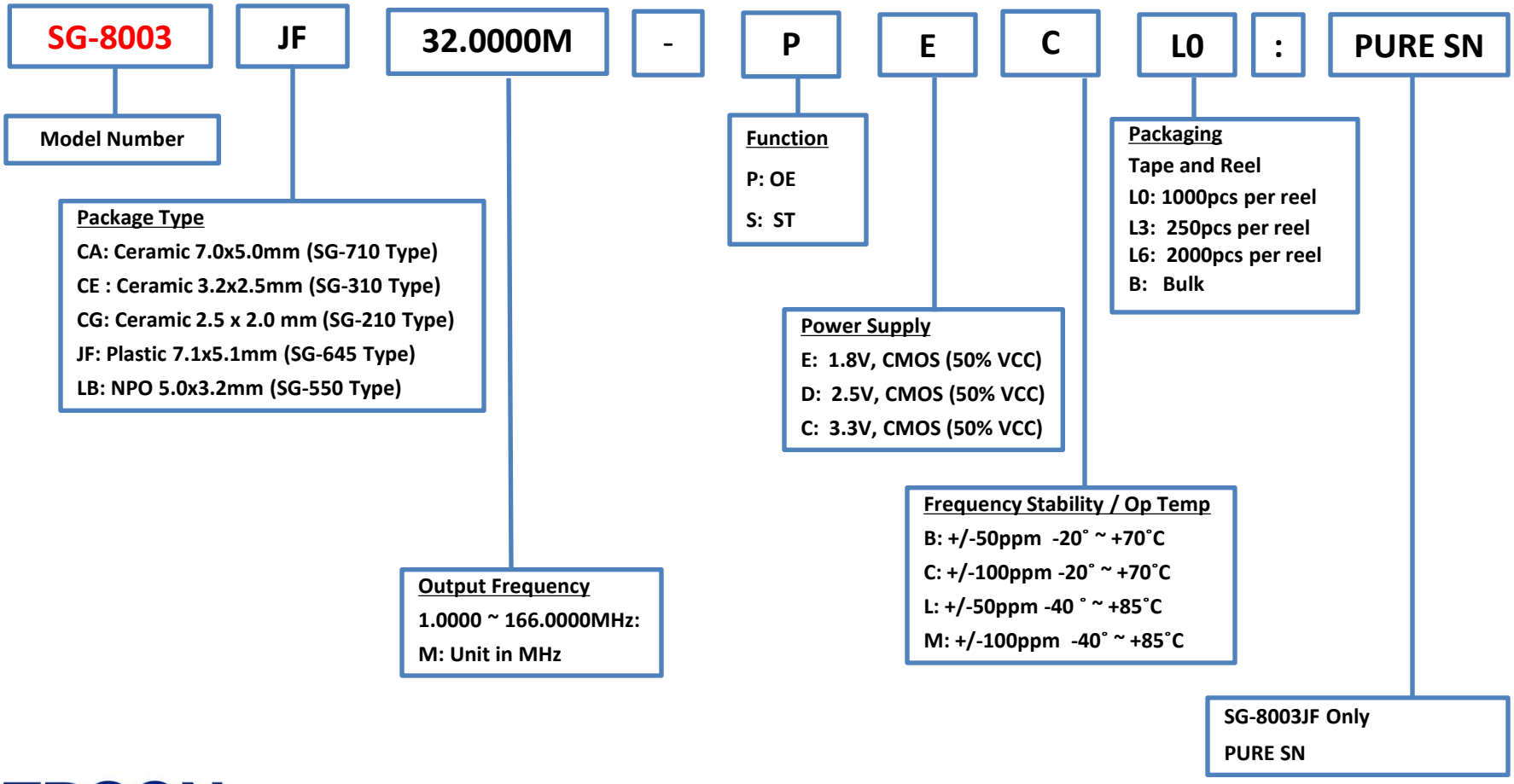
NOTE:
Complete PB Free:
SG-8002CA/CE
SG-8002LA/LB

EPSON

Product Configuration System

Crystal Oscillators - Programmable

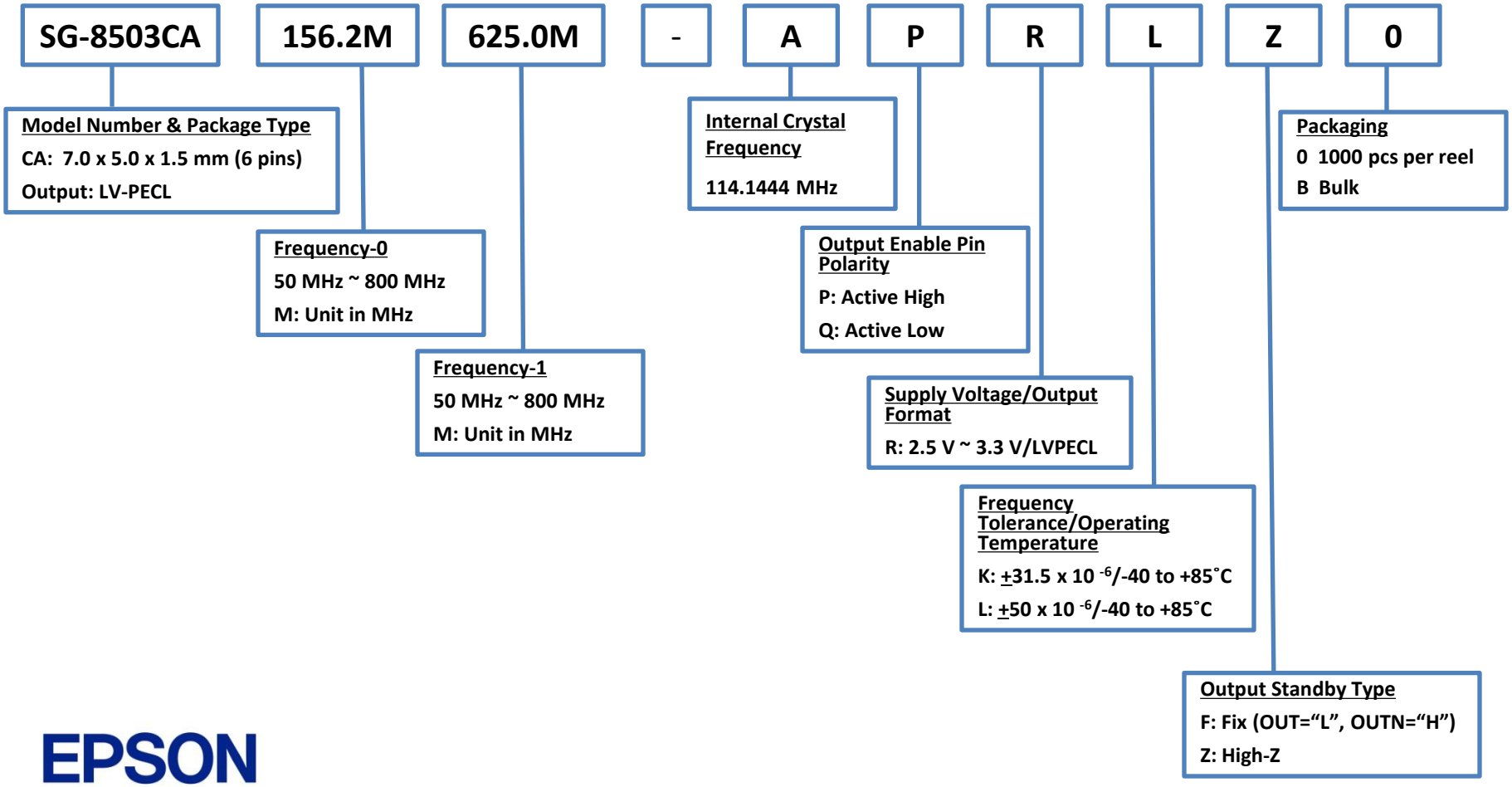
Discontinued



Product Configuration System

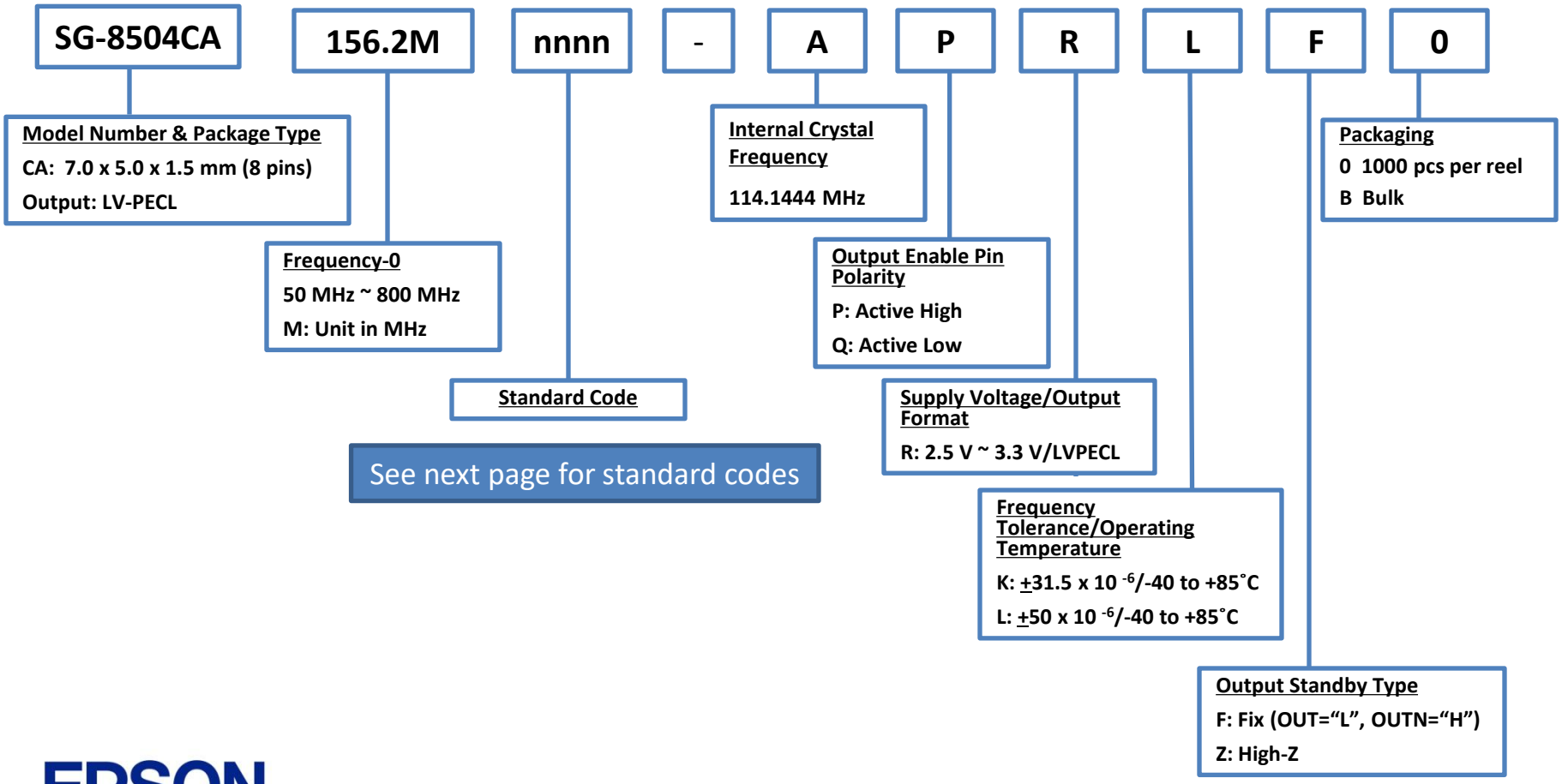
Dual Selectable Crystal Oscillator (SPXO)

Programmable (Dual Frequencies Available)



Product Configuration System

Quad Selectable Crystal Oscillator (SPXO)
Programmable (Quad Frequencies Available)



Product Configuration System

Quad Selectable Crystal Oscillator (SPXO)

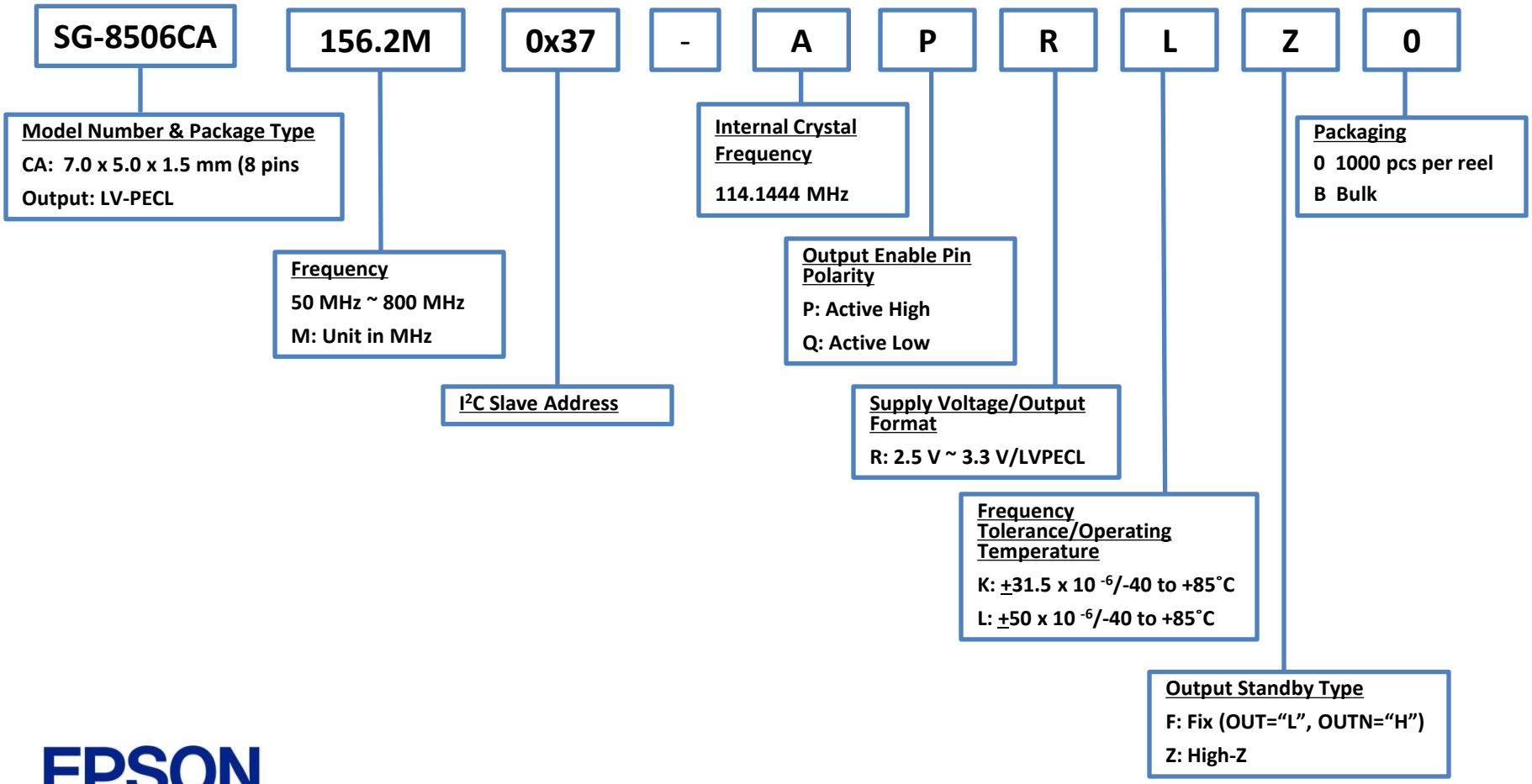
Programmable (Quad Frequencies Available)

SG-8504 Standard Codes

Standard Code ('nnnn')	Frequency 0	Frequency 1	Frequency 2	Frequency 3
0007	75.00000	100.00000	150.00000	250.00000
0008	62.50000	125.00000	156.25000	250.00000
0009	106.25000	159.37500	212.50000	425.00000
0010	100.00000	133.33333	166.66666	200.00000
0011	100.00000	125.00000	156.25000	312.50000

Product Configuration System

User Programmable I²C Crystal Oscillator (SPXO)

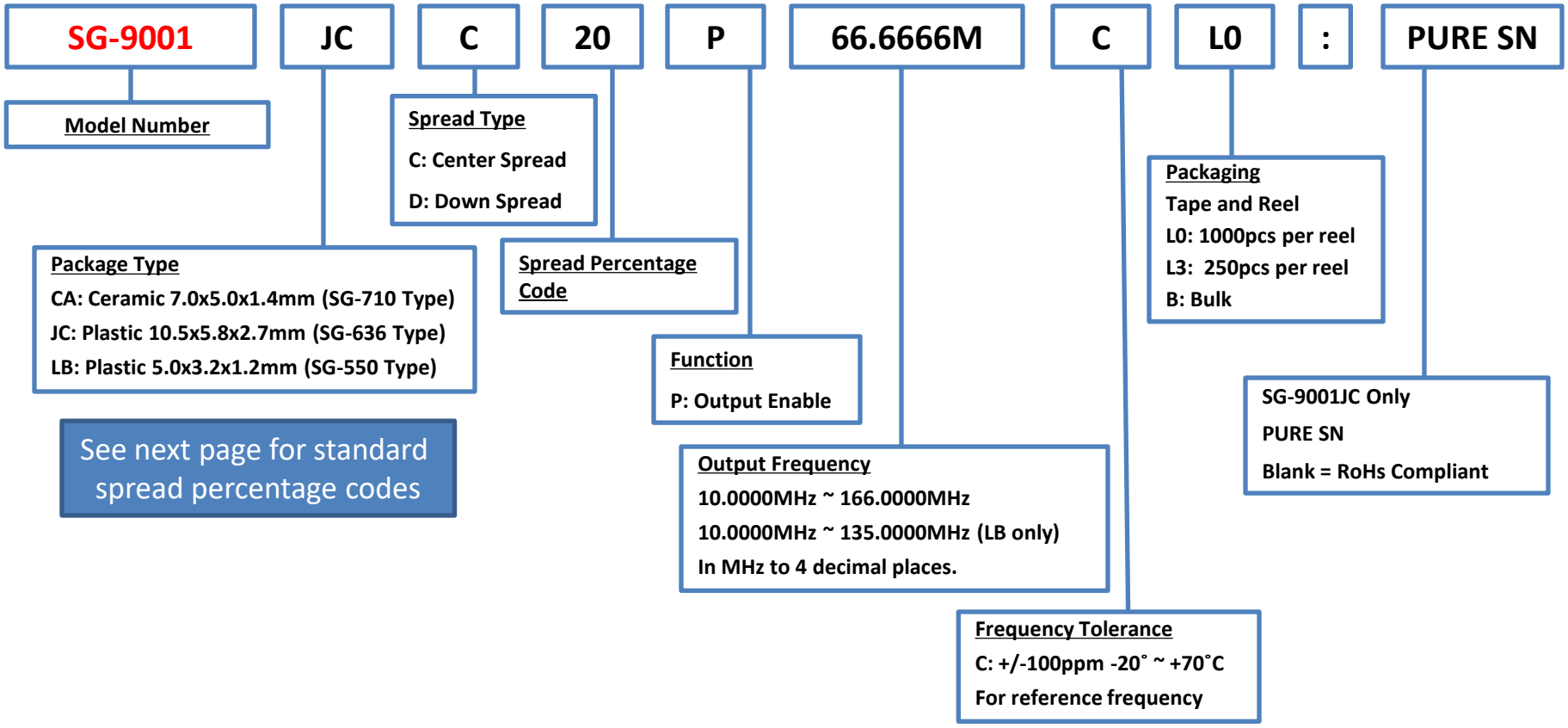


EPSON

Product Configuration System

Crystal Oscillators - Spread Spectrum

Discontinued



See next page for standard spread percentage codes

NOTES:
SG-9001CA & SG-9001LB: Complete PB FREE
SG-9001JC: RoHS COMPLIANT

Spread Rate Options

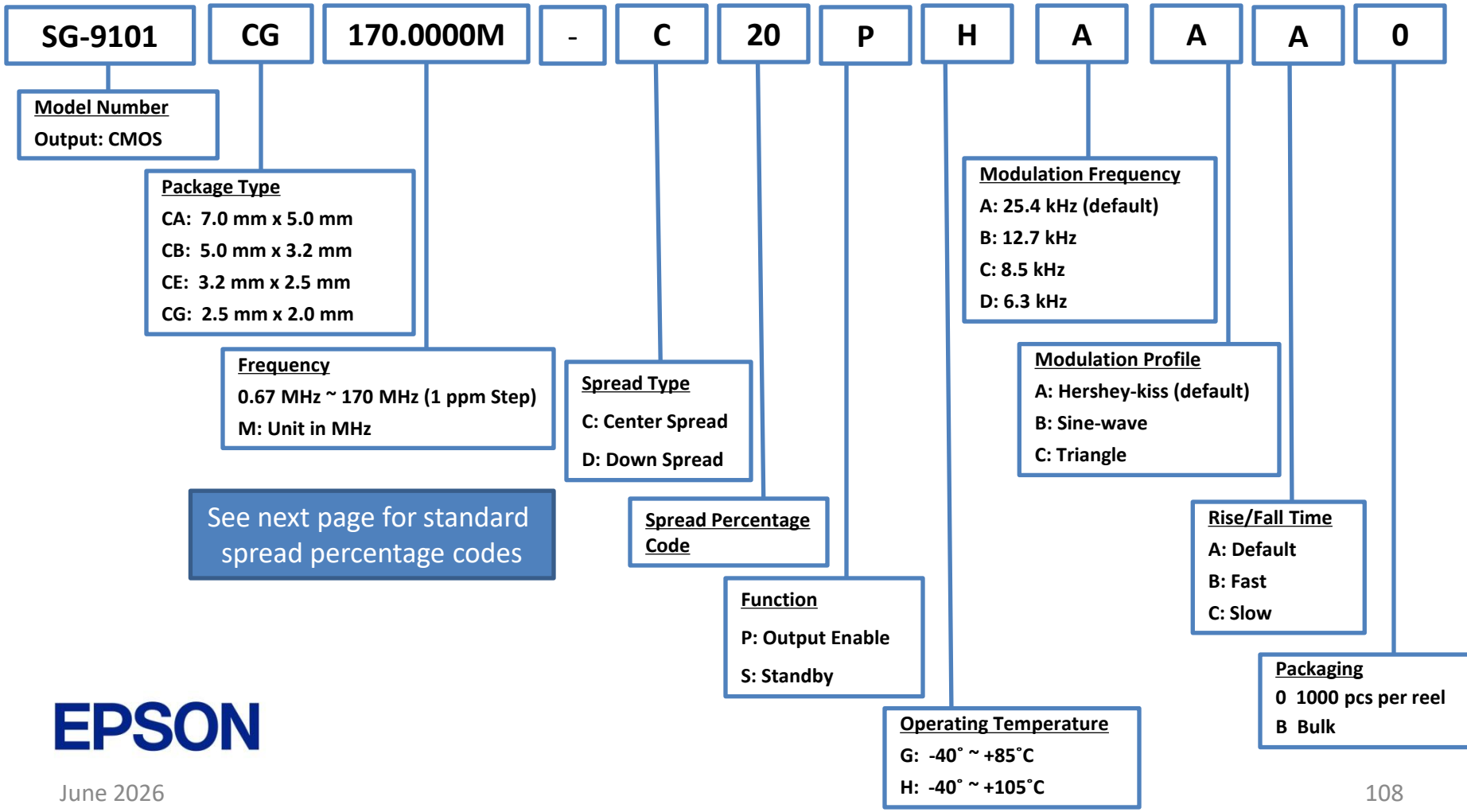
SG-9001

Center Spread		Down Spread	
Product Configuration Code	Spread Rate %	Product Configuration Code	Spread Rate %
C02	+/- 0.25	D05	- 0.5
C05	+/- 0.5	D10	- 1.0
C07	+/- 0.75	D15	- 1.5
C10	+/- 1.0	D20	- 2.0
C15	+/- 1.5	D30	- 3.0
C20	+/- 2.0	D40	- 4.0

EPSON

Product Configuration System

Crystal Oscillator (SPXO) – Programmable, Spread Spectrum



Spread Rate Options

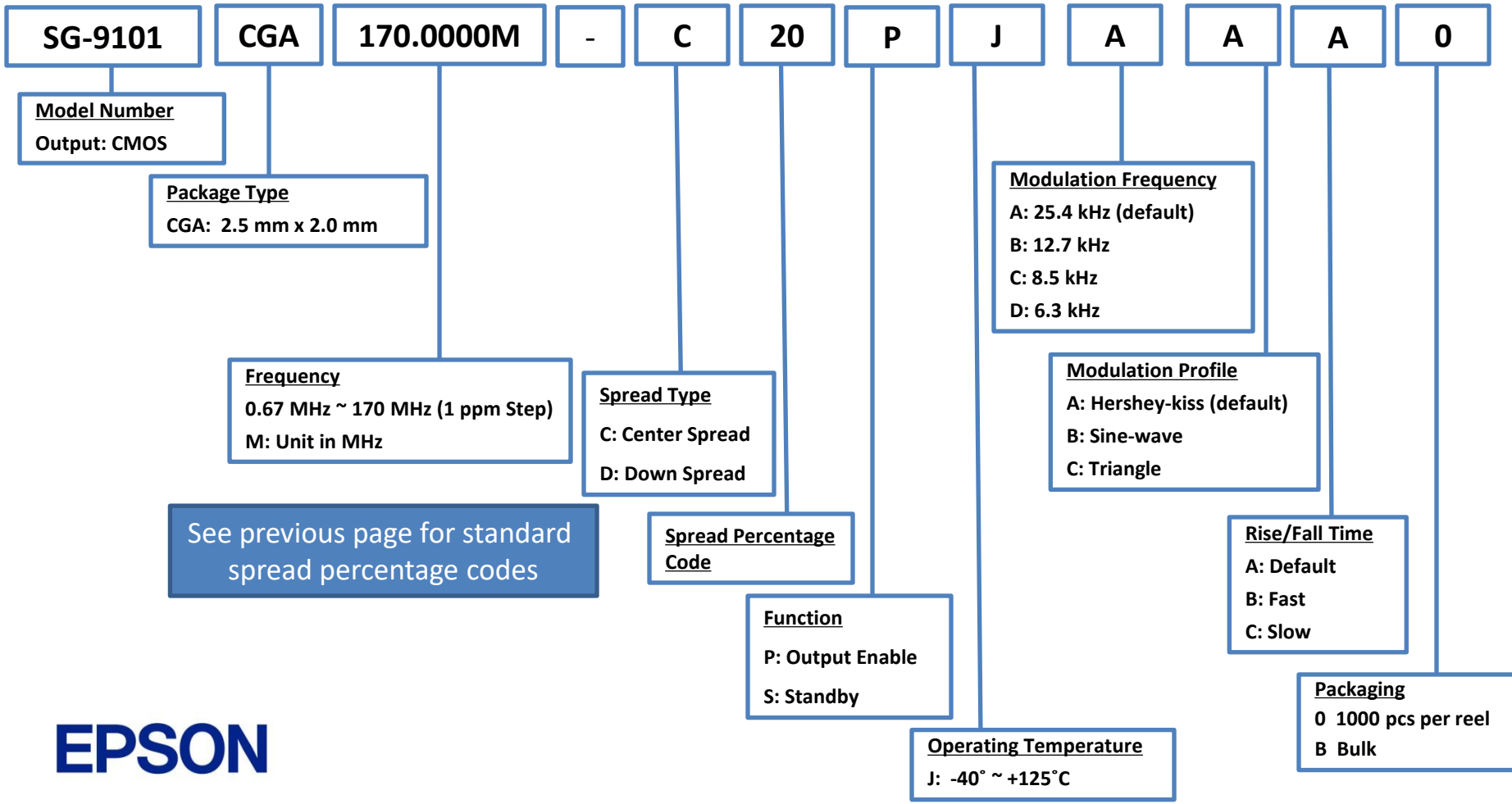
SG-9101

Center Spread		Down Spread	
Product Configuration Code	Spread Rate %	Product Configuration Code	Spread Rate %
C02	+/- 0.25	D05	- 0.5
C05	+/- 0.5	D10	- 1.0
C07	+/- 0.75	D15	- 1.5
C10	+/- 1.0	D20	- 2.0
C15	+/- 1.5	D30	- 3.0
C20	+/- 2.0	D40	- 4.0

EPSON

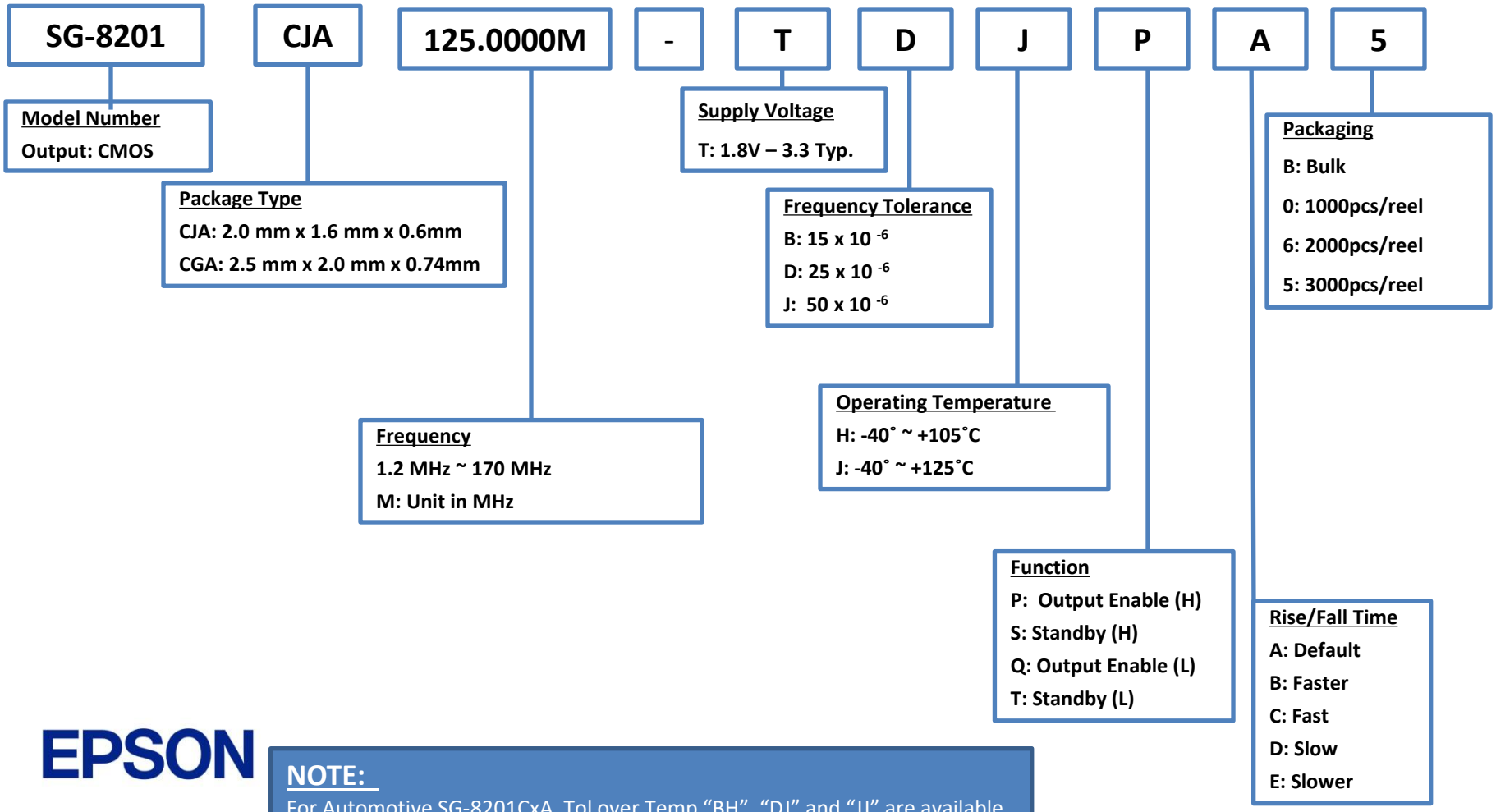
Product Configuration System

Crystal Oscillator (SPXO) – Programmable, Spread Spectrum, Automotive (AECQ100)



Product Configuration System

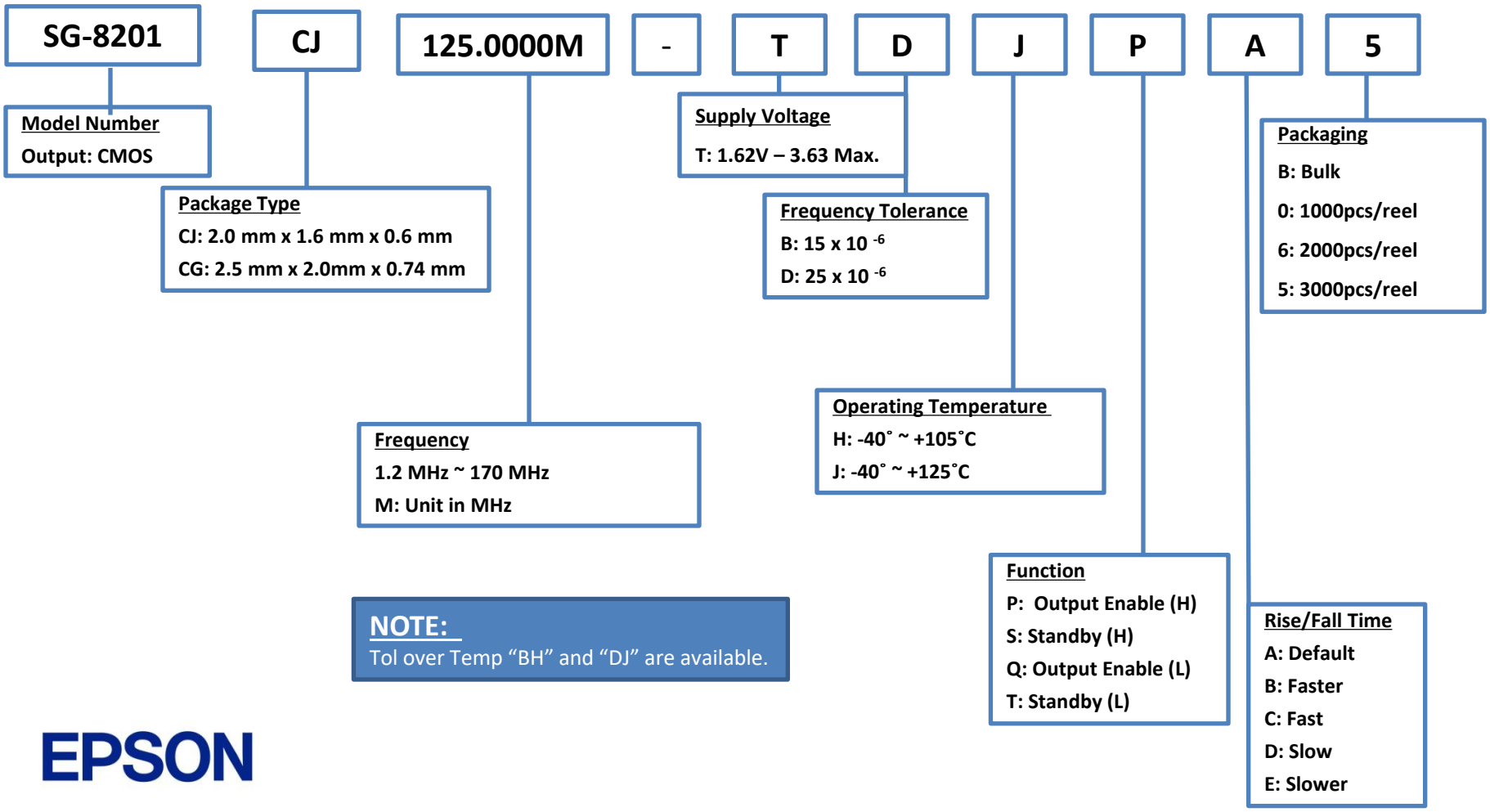
Crystal Oscillator (SPXO) – Programmable, Low Jitter, Automotive (AEC-Q100)



NOTE:
For Automotive SG-8201CxA, Tol over Temp "BH", "DJ" and "JJ" are available.

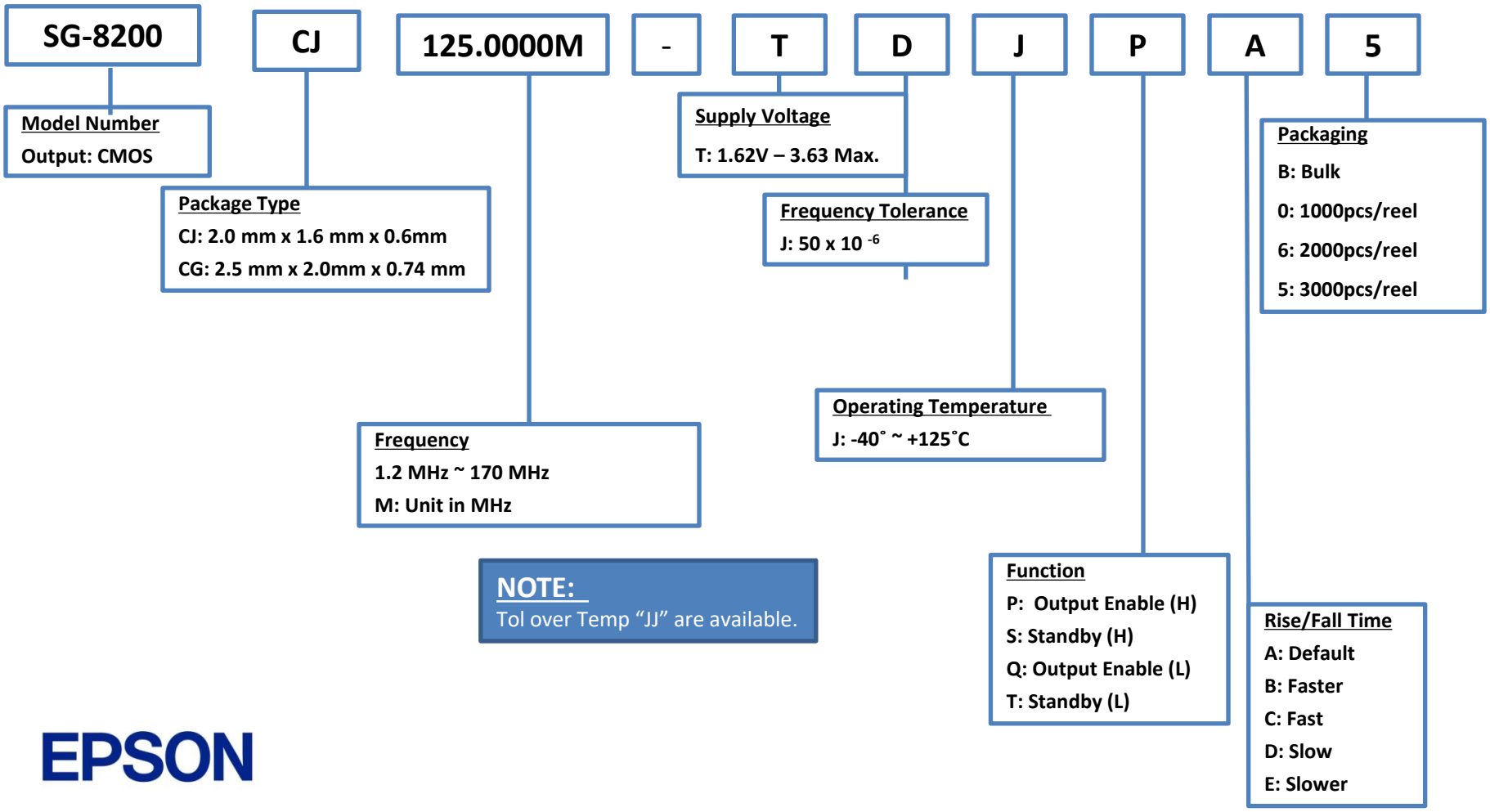
Product Configuration System

Crystal Oscillator (SPXO) – Programmable & Low Jitter



Product Configuration System

Crystal Oscillator (SPXO) – Programmable & Low Jitter



EPSON

Product Configuration Guide

Temperature Compensated Crystal Oscillators (TCXO)

EPSON

Product Configuration System

32.7680kHZ TCXO

TG-3541CE

Base Model	Pkg.
TG-3541CE TG-3541CEA* *Automotive	3.2 x 2.5 x 1.0 mm 10 PIN Ceramic

32.7680K

Frequency

32.7680kHz Only

XA

Frequency Temp Char

XA=

+/-1.9PPM 0°C to 50°C

+/-3.4PPM -40°C to 85°C

+/-8.0ppm 85°C to 105°C

XB=

+/-3.8PPM 0°C to 50°C

+/-5.0PPM -40°C to 85°C

+/-8.0ppm 85°C to 105°C

0

Tape & Reel Qty

B: Bulk

0: 1000pcs/reel

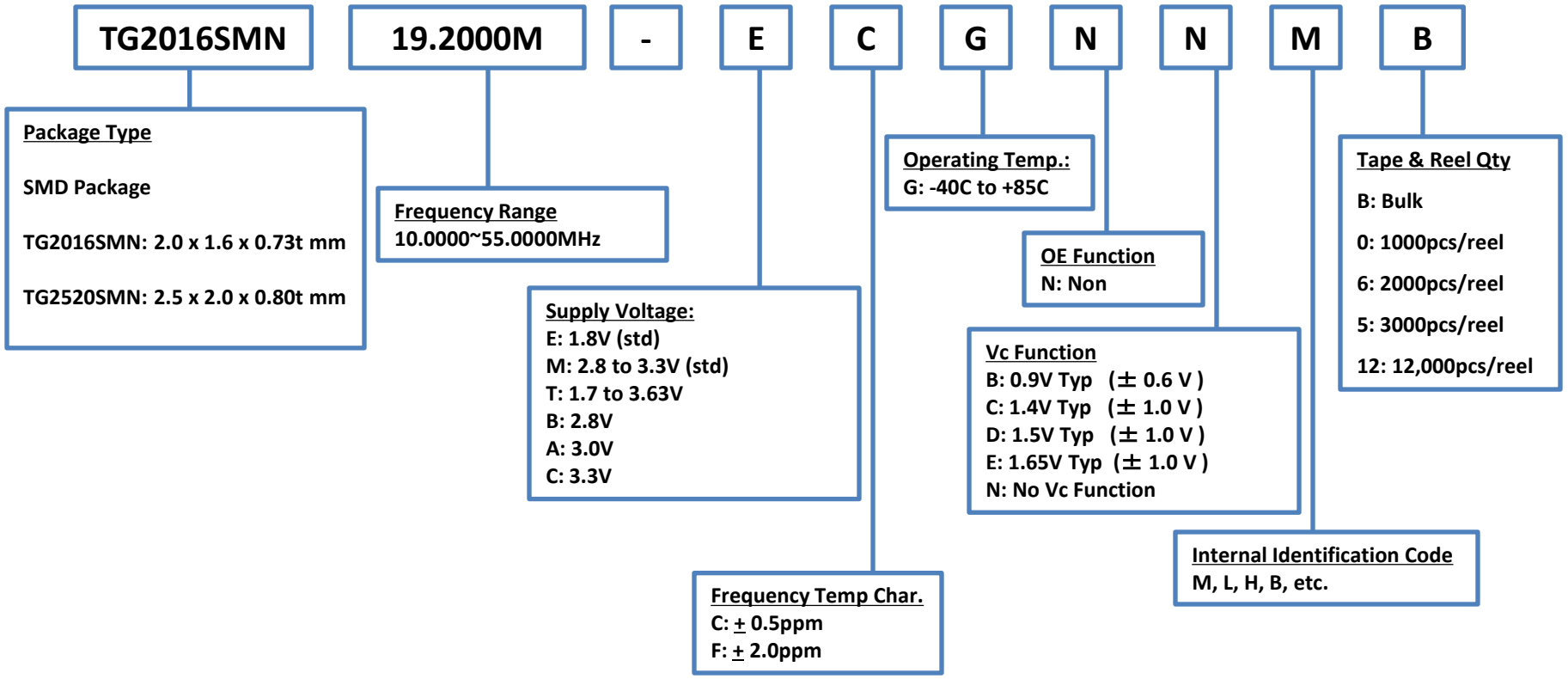
6: 2000pcs/reel

NOTE:

Please contact Epson for requirements not listed in this specification.

Product Configuration System

TCXO/VC-TCXO High Stability

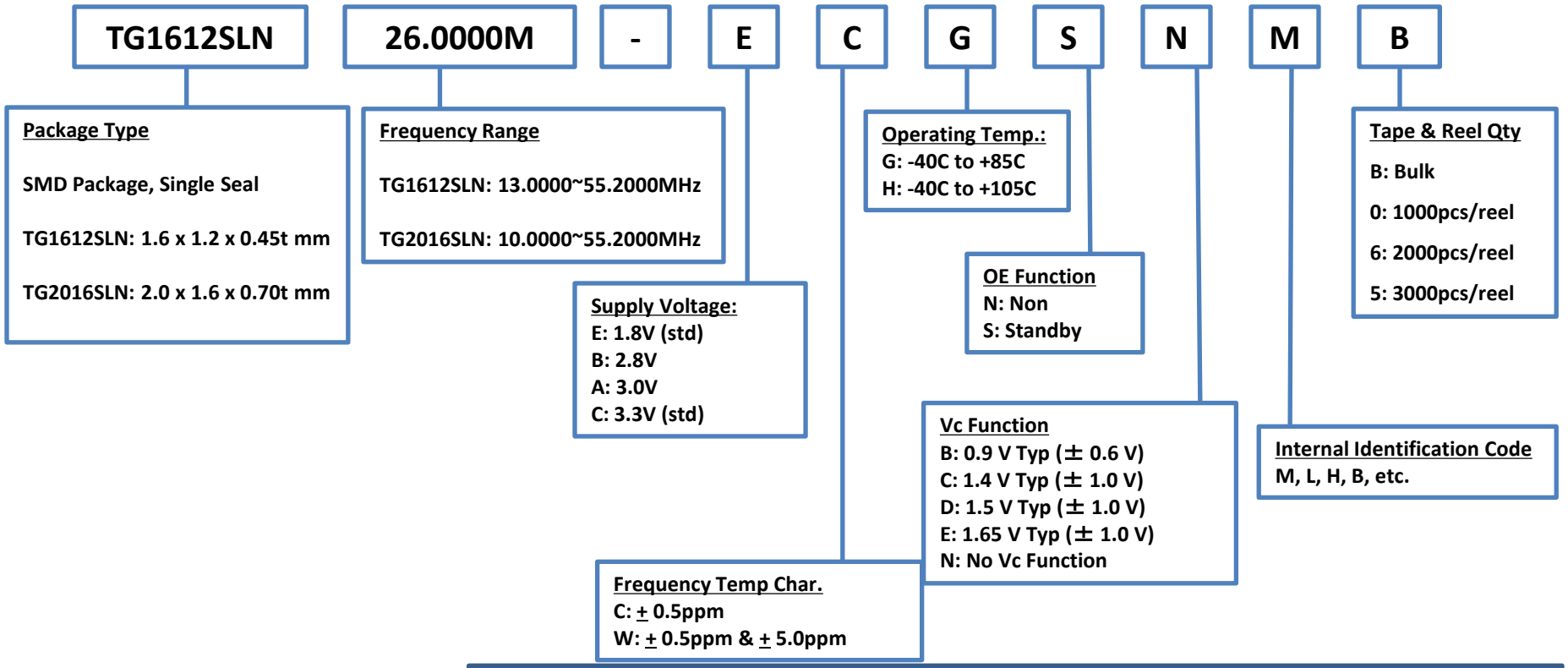


NOTE:

Please contact us for requirements not listed in this specification. Not all combination are possible.

Product Configuration System

TCXO/VC-TCXO High Stability



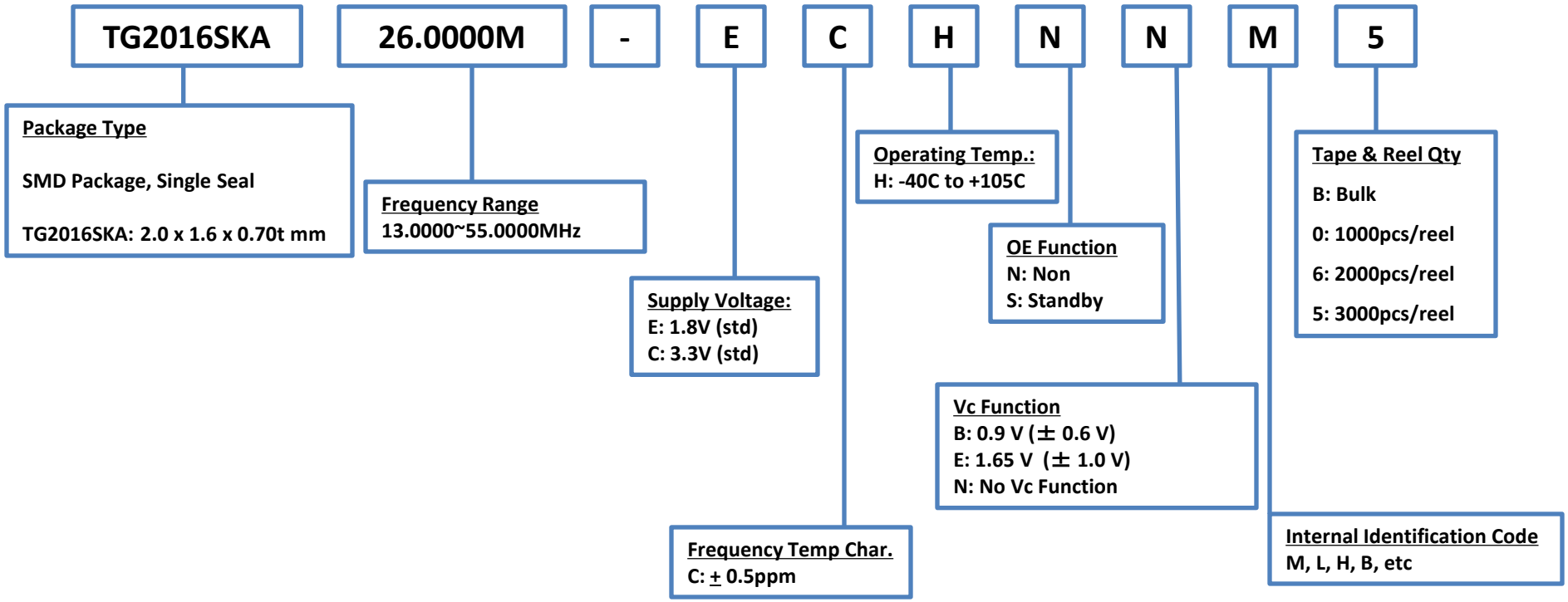
NOTE:
Stability "CG" (+/-0.5ppm -40/85C) , "WH" (+/- 0.5 & +/-5.0ppm -40/105C) are available.
For stability +/-0.5ppm -40/105C, please see TG2016SKA with stability "CH"

Please contact us for requirements not listed in this specification. Not all combination are possible.

EPSON

Product Configuration System

TCXO/VC-TCXO High Stability for Automotive

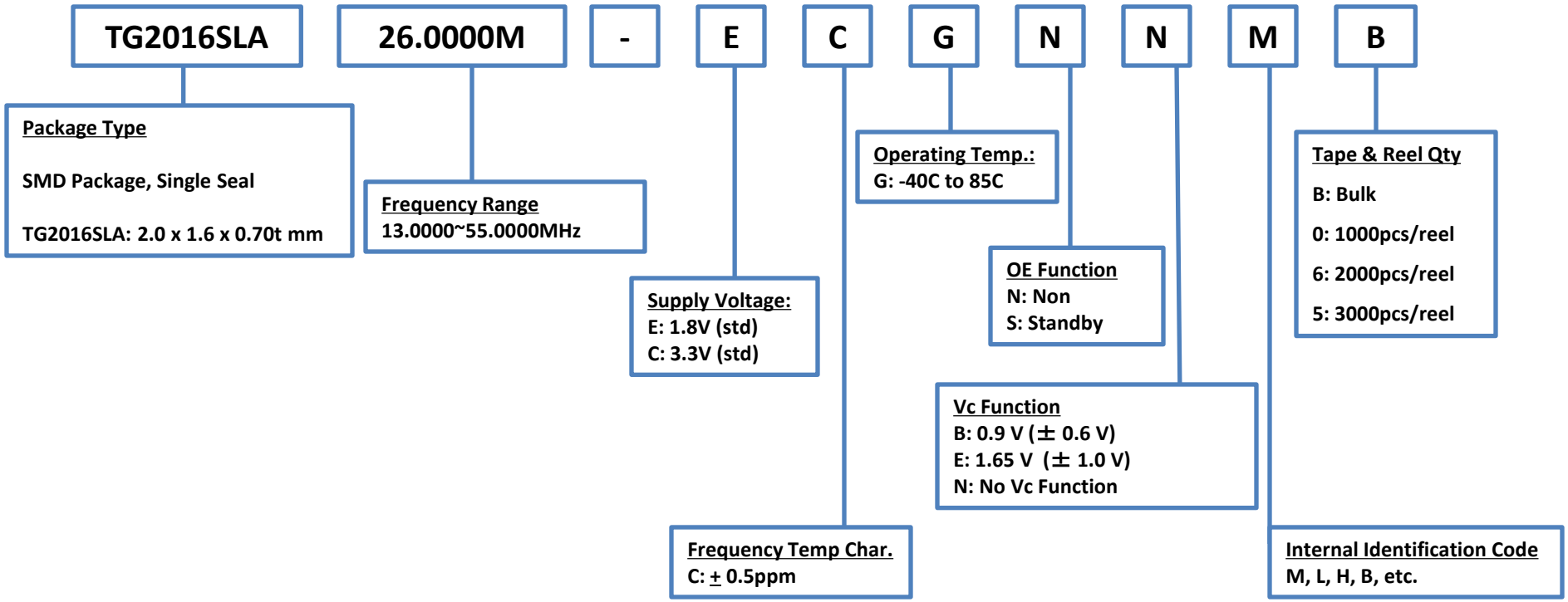


NOTE:

Please contact us for requirements not listed in this specification. Not all combination are possible.

Product Configuration System

TCXO/VC-TCXO High Stability for Automotive



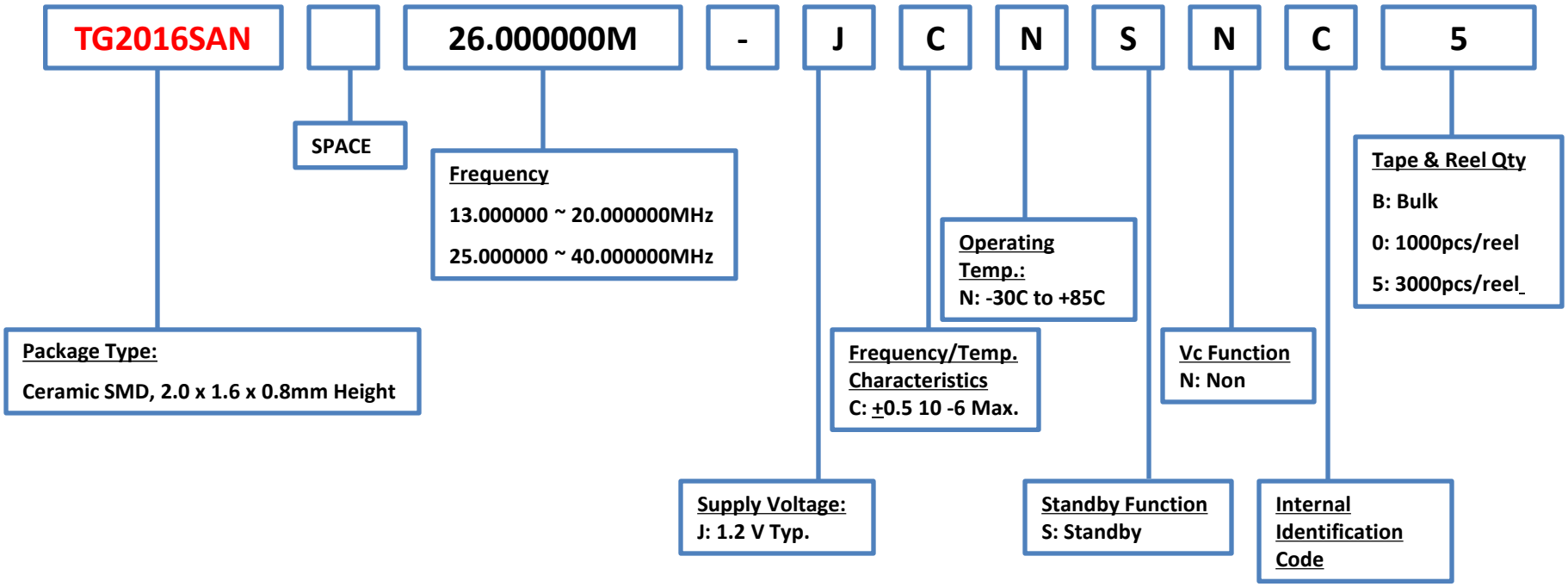
NOTE:
Stability "CG" (+/-0.5ppm -40/85C) are available. For stability +/-0.5ppm -40/105C, please see TG2016SKA with stability "CH"

Please contact us for requirements not listed in this specification. Not all combination are possible.

Product Configuration System

TCXO

Discontinued

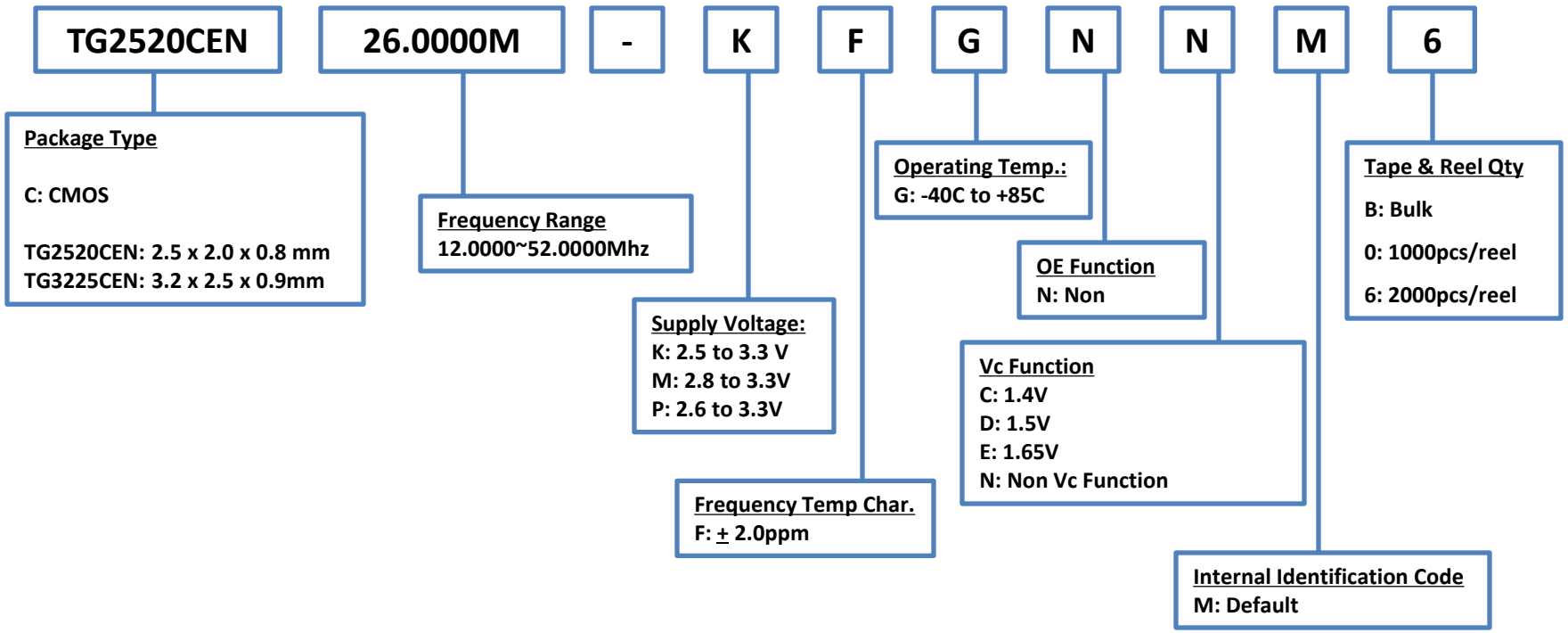


NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

TCXO/VC-TCXO High Stability



NOTE:

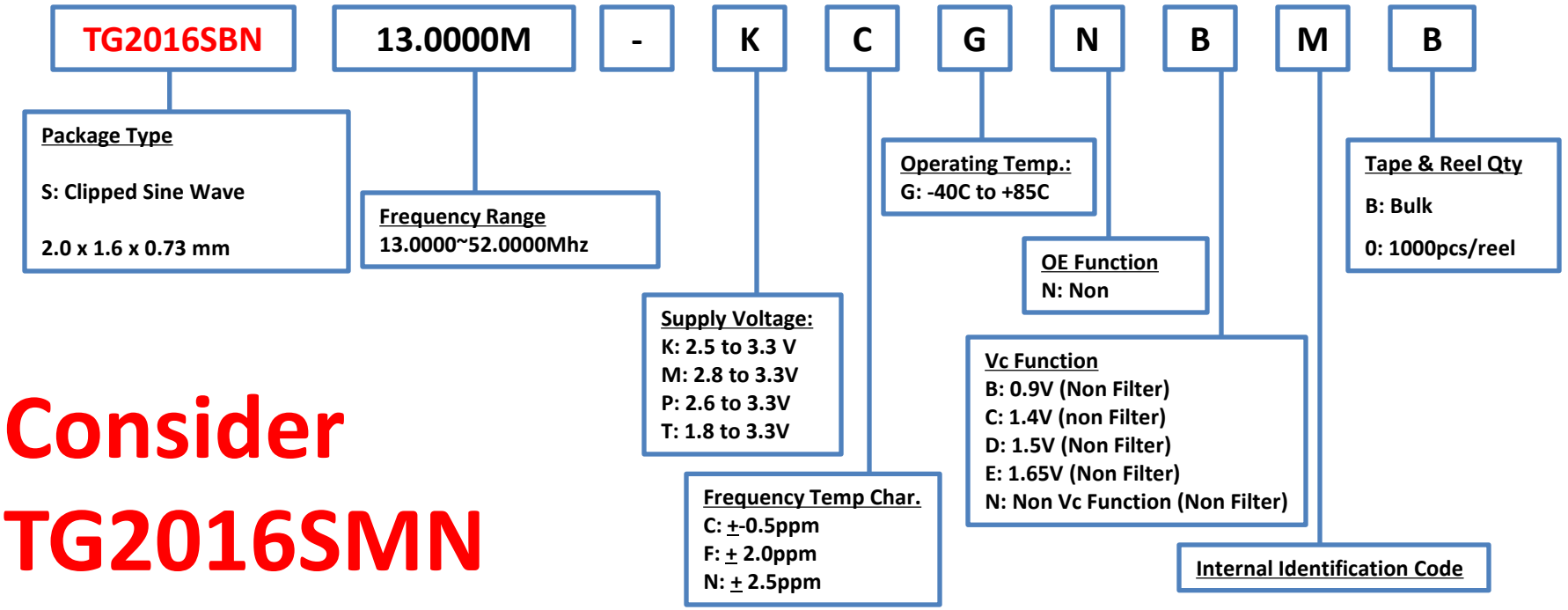
Please contact Epsonfor requirements not listed in this specification.

EPSON

Product Configuration System

TCXO/VC-TCXO High Stability

Discontinued



Consider TG2016SMN

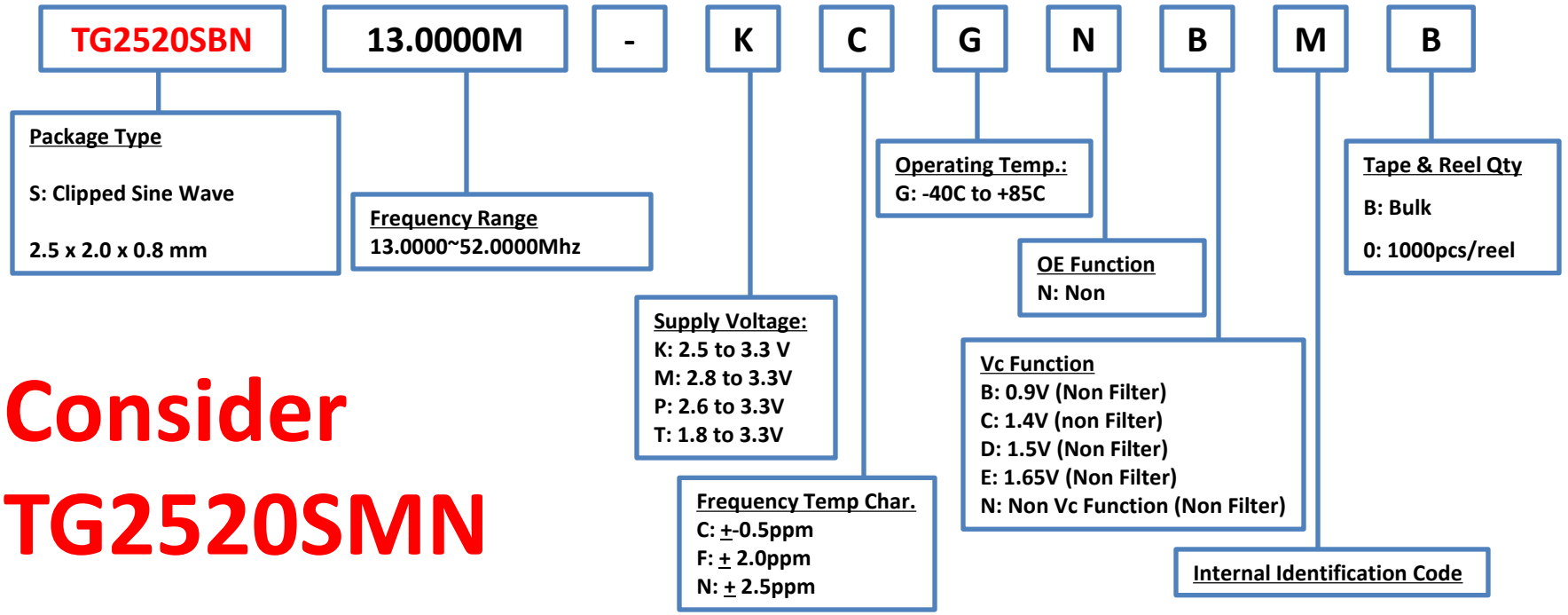
NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

TCXO/VC-TCXO High Stability

Discontinued



Consider TG2520SMN

NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

TCXO

TG-5006CJ	-	xxx	19.2000M

Package Type:
TG-5006CJ - 2.0 X 1.6 X 0.8 mm
TG-5006CG - 2.5 X 2.0 X 0.9 mm
TG-5006CE – 3.2 X 2.5 X 1.0 mm

TG-5035CJ - 2.0 X 1.6 X 0.8 mm
TG-5035CG - 2.5 X 2.0 X 0.9 mm
TG-5035CE – 3.2 X 2.5 X 1.0 mm

TG-5031CJ - 2.0 X 1.6 X 0.8 mm
TG-5021CG - 2.5 X 2.0 X 0.9 mm
TG-5021CE - 3.2 X 2.5 X 1.0 mm

Specification Code:
Issued by Epson after reviewing customer requirements

Frequency
TG-5006CJ/CG/CE: 13 ~ 52MHz
STD Freqs: 16.367667, 16.368, 16.369, 19.2, 26, 38.4MHz

TG-5035CE: 10 ~ 40 MHz
TG-5035CJ/CG/: 13 ~ 52MHz
STD Freqs: 13, 16.368, 16.369, 19.2, 26, 38.4MHz

TG-5031CJ/TG-5021CG: 13 ~ 52MHz
TG-5021CE: 10 ~ 40MHz
STD Freqs: 13, 19.2, 26, 38.4MHz

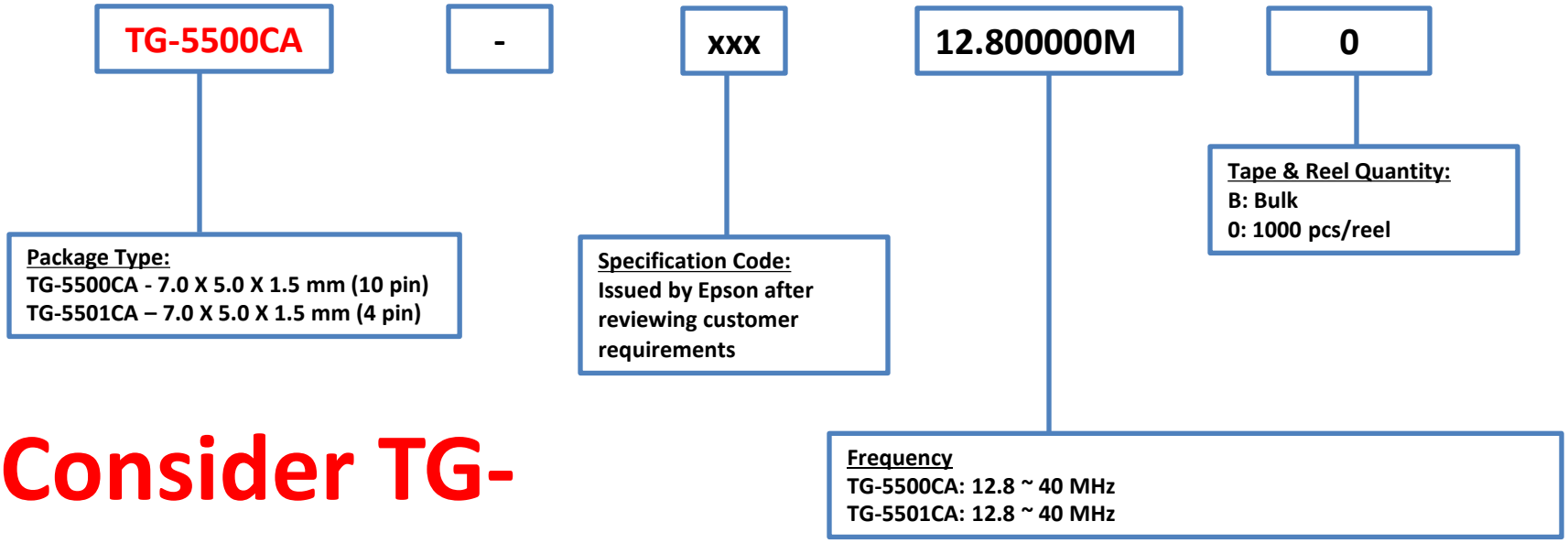
NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

TCXO/VC-TCXO
Ultra High Stability

Discontinued



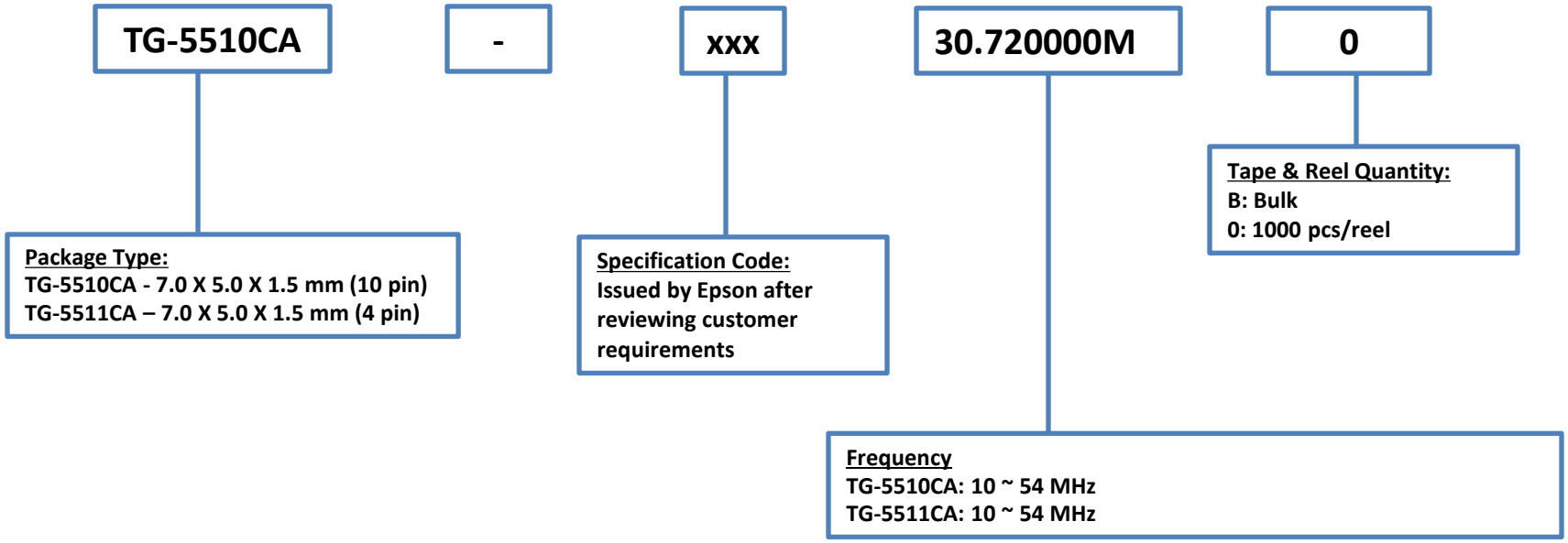
Consider TG-5510CA

NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

TCXO/VC-TCXO
Ultra High Stability

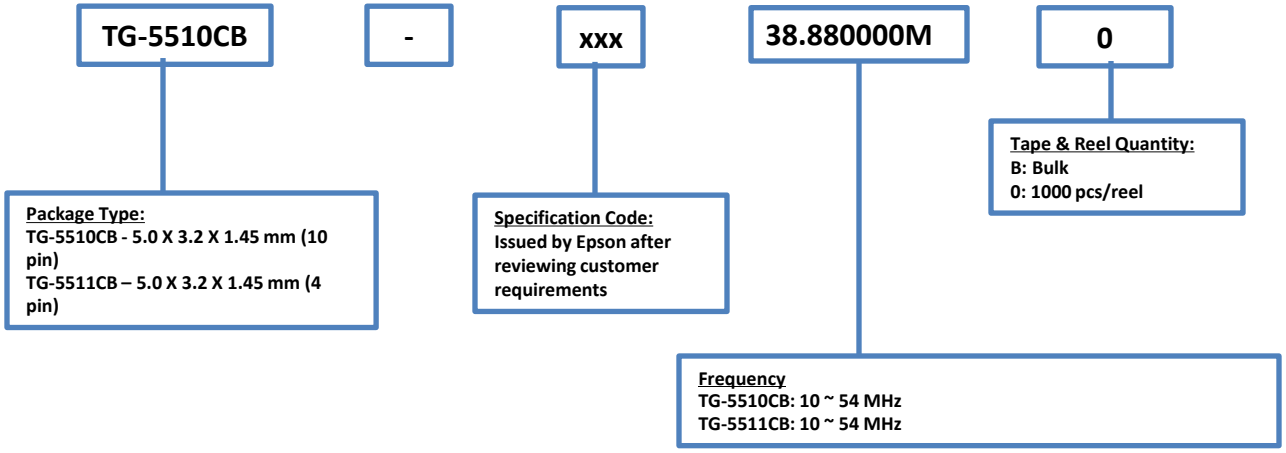


NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

TCXO/VC-TCXO
Ultra High Stability



EPSON

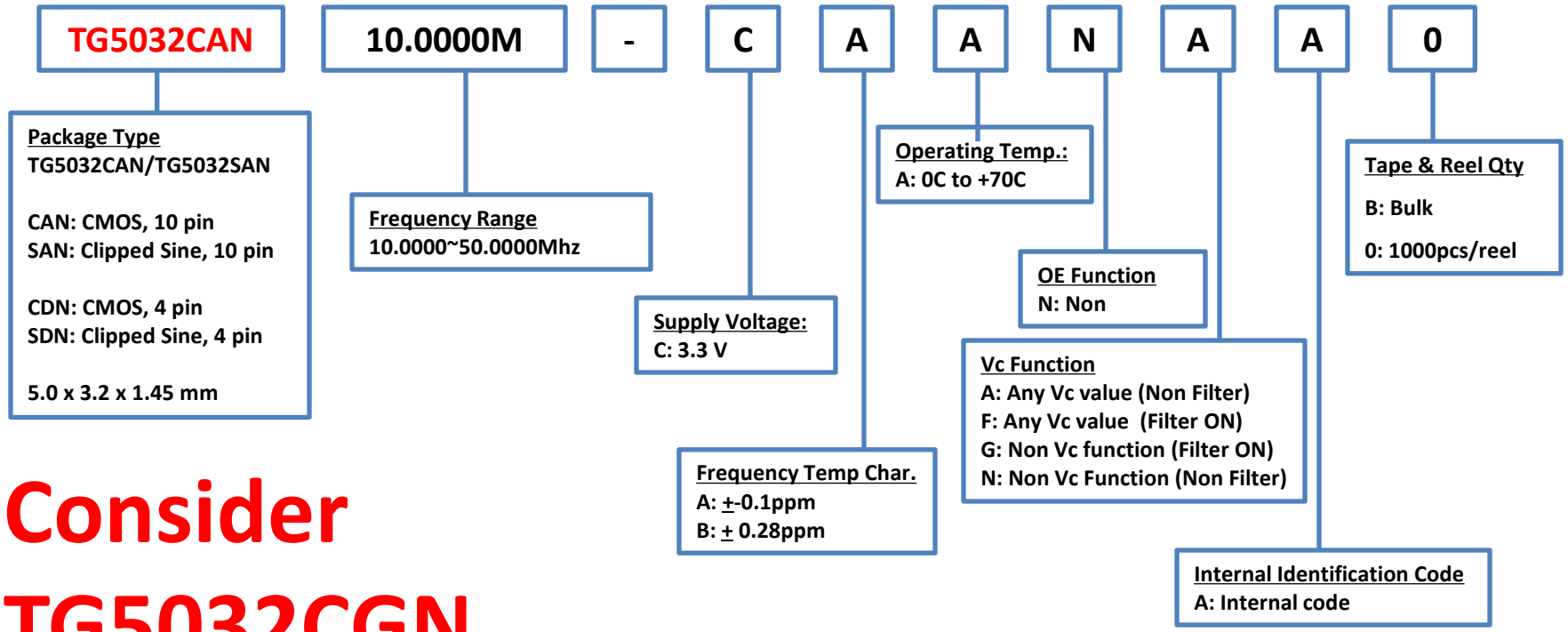
NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

TCXO/VC-TCXO Ultra High Stability

Discontinued



Consider TG5032CGN

EPSON

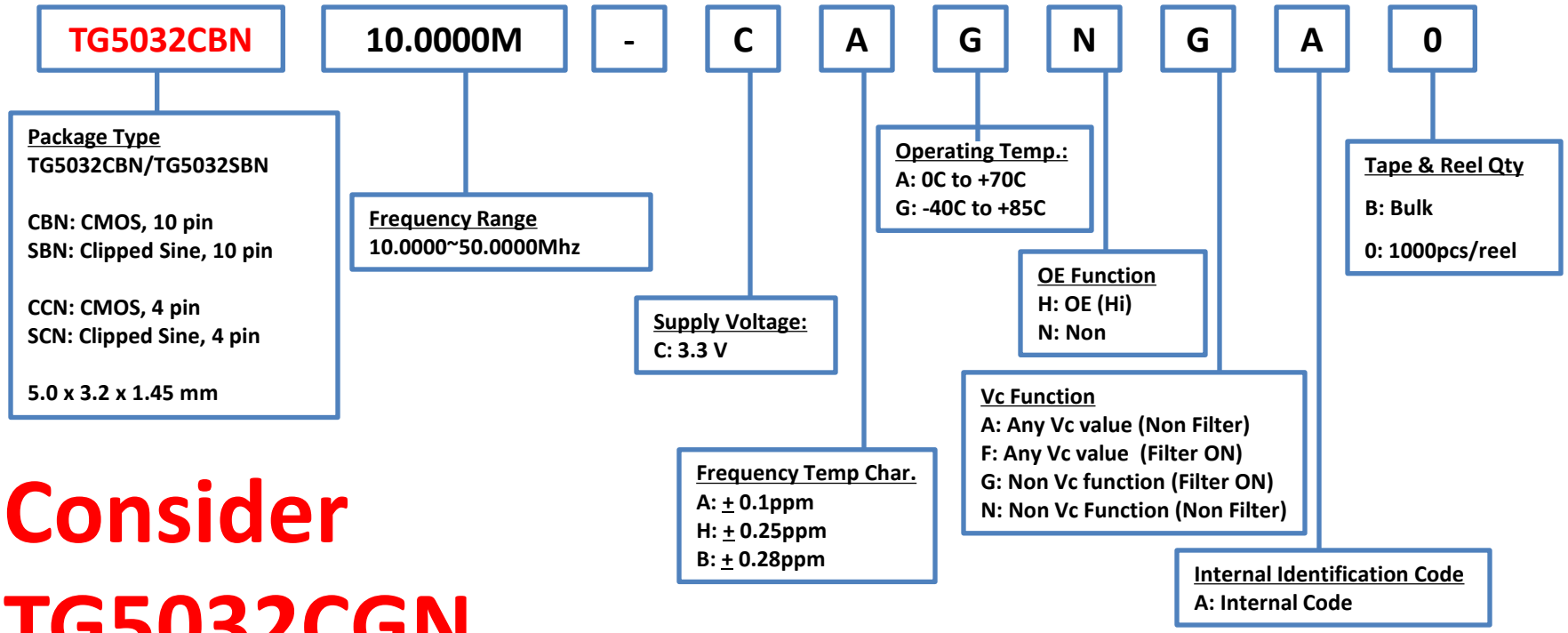
June 2026

NOTE:
Please contact us for requirements not listed in this specification.

Product Configuration System

TCXO/VC-TCXO Ultra High Stability

Discontinued



Consider TG5032CGN

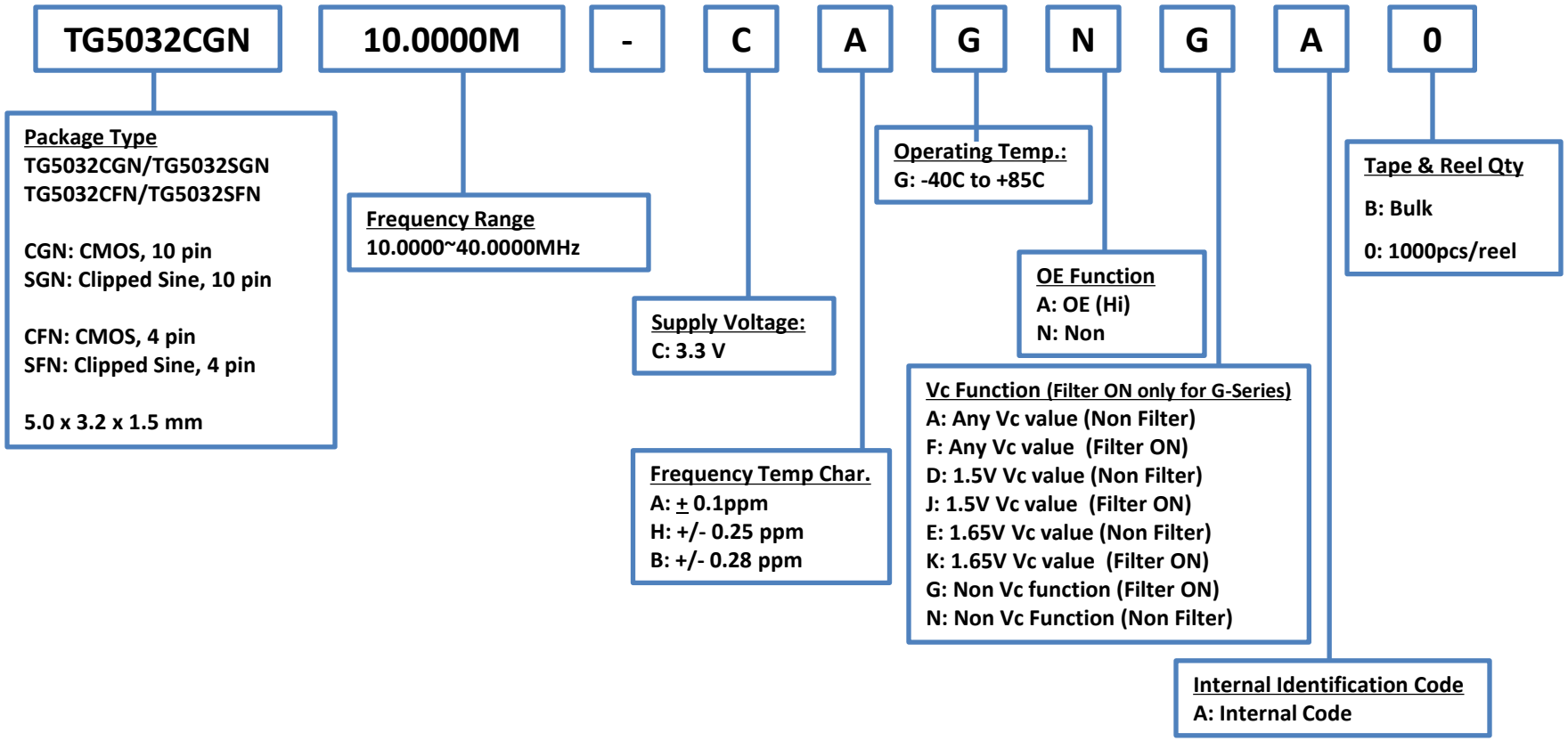
EPSON

June 2026

NOTE:
Please contact us for requirements not listed in this specification.

Product Configuration System

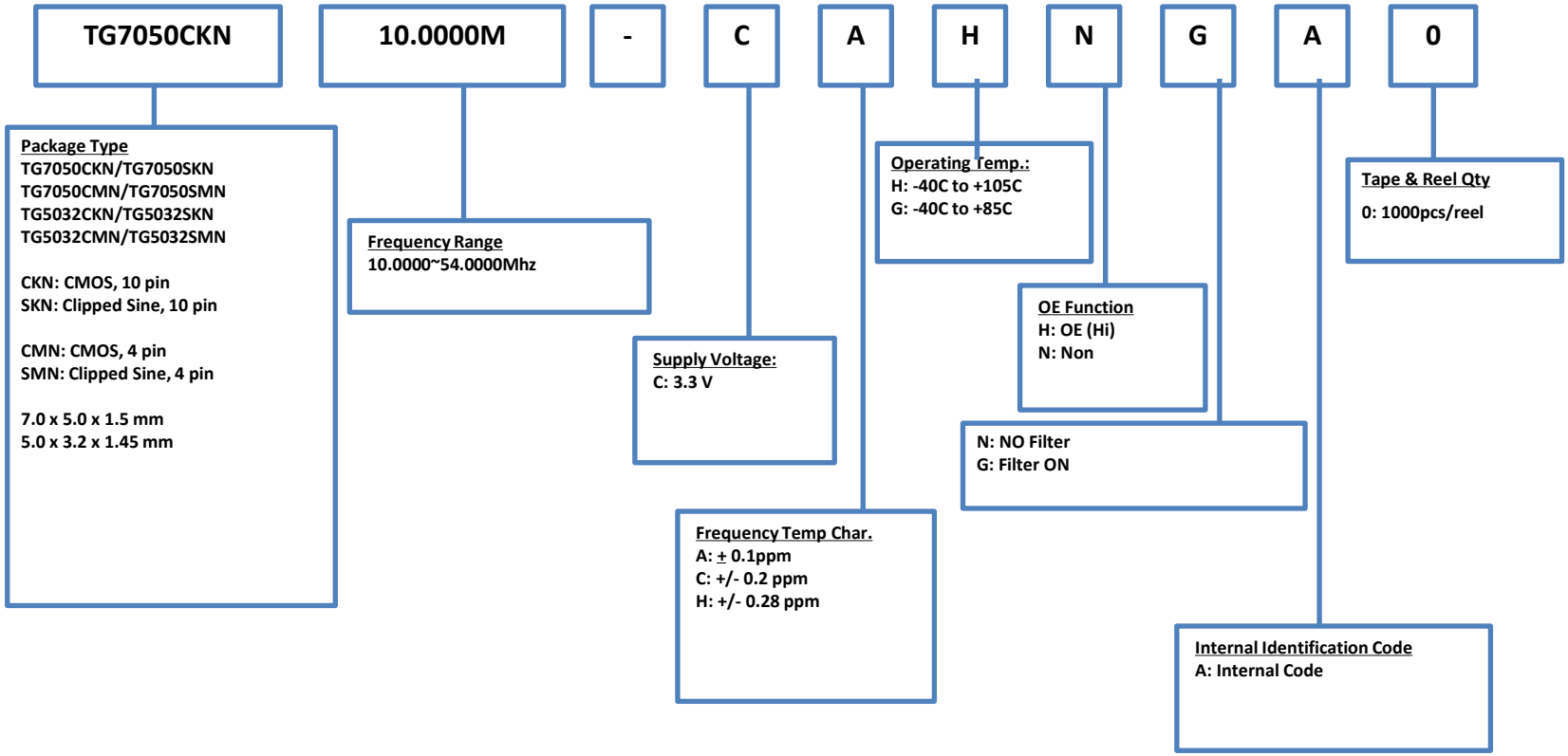
TCXO/VC-TCXO Ultra High Stability



NOTE:
Please contact us for requirements not listed in this specification.

Product Configuration System

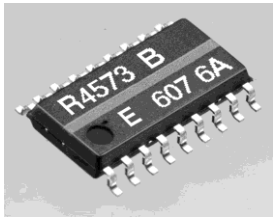
TCXO/VC-TCXO Ultra High Stability

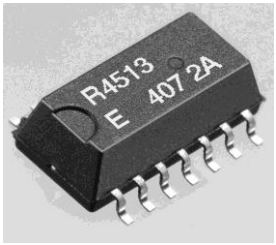


NOTE:
Please contact us for requirements not listed in this specification.

Product Configuration Guide

Real-Time Clocks (RTC)





EPSON

Product Configuration System

Real Time Clock Modules – I²C-Bus

RX8901CE

Base Model	Pkg.
RX8901CE	3.2 x 2.5 x 1.0 mm 10 PIN Ceramic

XS

Frequency Temp Char
XS: +/-3.0PPM at -40 to 85°C +/-5.0PPM at 85 to 105°C XB: +/-5.0PPM at -40 to 85°C +/-8.0PPM at 85 to 105°C

A0

Feature Options
A0: Pin 4 – FOUT B0: Pin 4 – EVIN3

6

Tape & Reel Qty
B: Bulk 6: 2kpc/reel

Examples:

RX8901CE XB A06

RX8901CE XS B06

NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

Real Time Clock Modules – SPI-Bus

RX4901CE

Base Model	Pkg.
RX4901CE	3.2 x 2.5 x 1.0 mm 10 PIN Ceramic

XS

Frequency Temp Char
XS: +/-3.0PPM at -40 to 85°C +/-5.0PPM at 85 to 105°C XB: +/-5.0PPM at -40 to 85°C +/-8.0PPM at 85 to 105°C

A0

Feature Options
A0: 3-Wire SPI Pin 4 – FOUT B0: 3-Wire SPI Pin 4 – EVIN3 C0: 4-Wire SPI Pin 4 – FOUT D0: 4-Wire SPI Pin 4 – EVIN3

6

Tape & Reel Qty
B: Bulk
6: 2kpc/reel

Examples:

RX4901CE XB A06

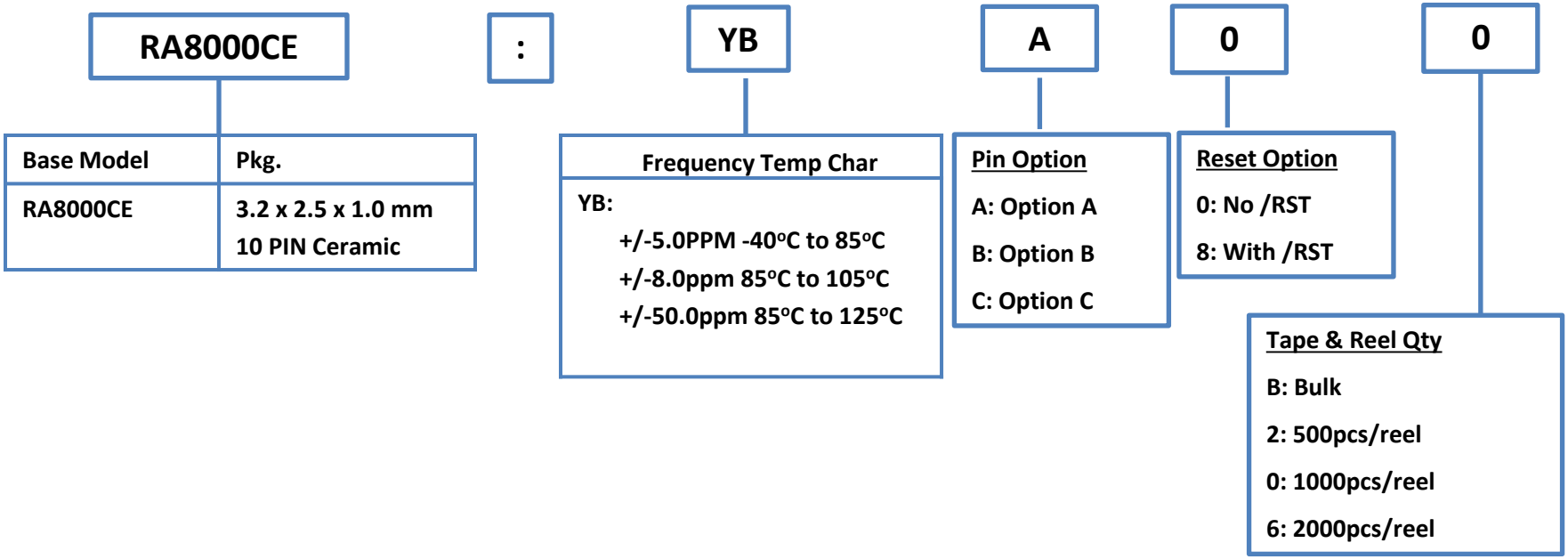
RX4901CE XS B06

NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

Real Time Clock Modules – I²C-Bus, Automotive (AEC-Q100)

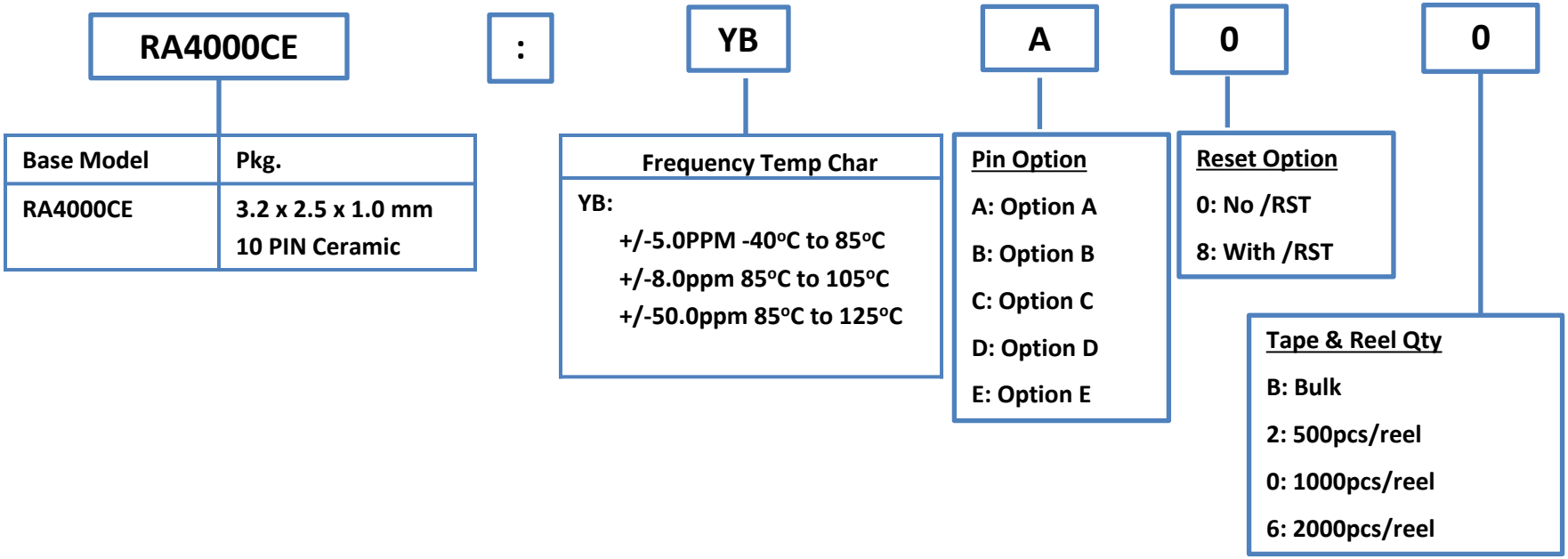


NOTE:

Please contact us for requirements not listed in this specification. Refer to DS for Pin and Reset options

Product Configuration System

Real Time Clock Modules – SPI-Bus, Automotive (AEC-Q100)

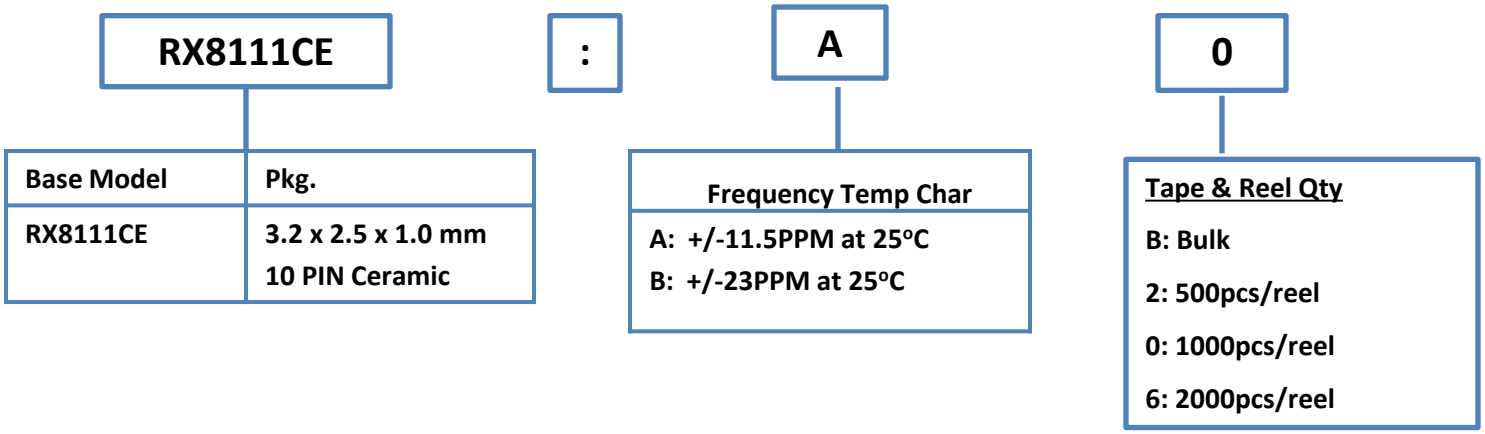


NOTE:

Please contact us for requirements not listed in this specification. Refer to DS for Pin and Reset options

Product Configuration System

Real Time Clock Modules – I²C-Bus



NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

Real Time Clock Modules – SPI

RX4111CE : **A** **0**

Base Model	Pkg.
RX4111CE	3.2 x 2.5 x 1.0 mm 10 PIN Ceramic

Frequency Temp Char
A: +/-11.5PPM at 25°C
B: +/-23PPM at 25°C

Tape & Reel Qty

B: Bulk

2: 500pcs/reel

0: 1000pcs/reel

6: 2000pcs/reel

NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

Real Time Clock Modules – I²C-Bus

RX8804CE : **XA** **0**

Base Model	Pkg.
RX8804CE RA8804CE* *Automotive AEC-Q100	3.2 x 2.5 x 1.0 mm 10 PIN Ceramic

Frequency Temp Char

XA:
- +/-1.9PPM 0°C to 50°C
- +/-3.4PPM -40°C to 85°C
- +/-8.0ppm 85°C to 105°C

XB:
- +/-1.9PPM 0°C to 50°C
- +/-5.0PPM -40°C to 85°C
- +/-8.0ppm 85°C to 105°C

Tape & Reel Qty

B: Bulk

2: 500pcs/reel

0: 1000pcs/reel

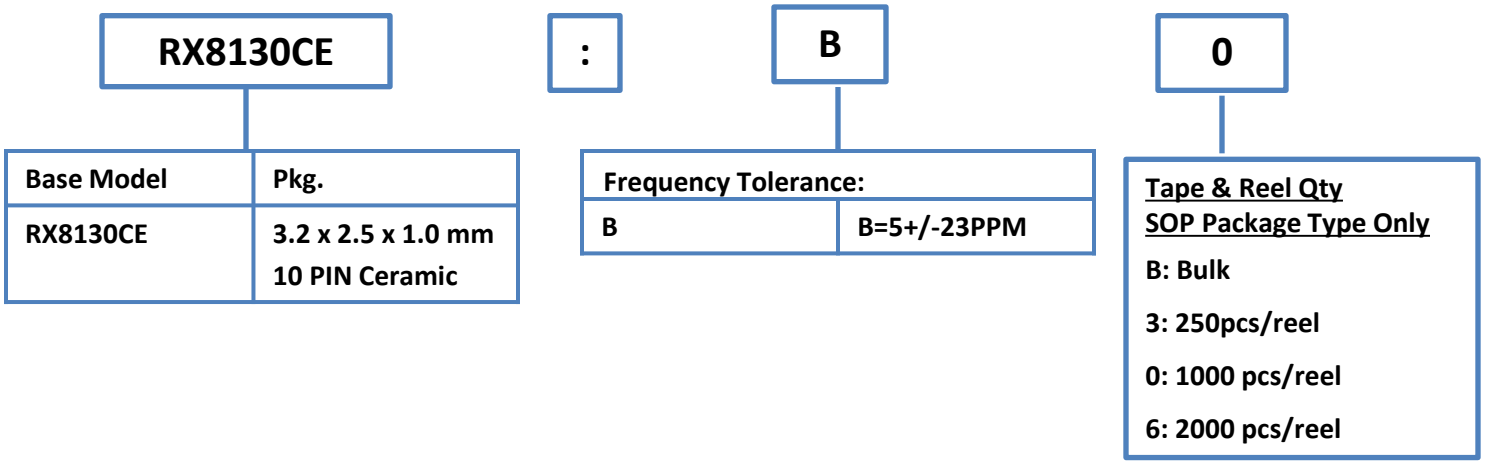
6: 2000pcs/reel

NOTE:

Please contact us for requirements not listed in this specification.

Product Configuration System

Real Time Clock Modules – I²C-Bus



Product Configuration System

Real Time Clock Modules – Serial (3 Wire & 4 Wire)

RA-4565SA : **B** **0** : **PURE SN**

Base Model	Pkg.	Status
RA-4565SA*	SOP 14 PIN	Discontinued
RA-4574SA	SOP 14 PIN	Discontinued
RTC-4543SA	SOP 14 PIN	Discontinued
RTC-4543SB	SOP 18 PIN	Discontinued
RTC-4574JE	VSOJ 20 PIN	Discontinued
RTC-4574SA	SOP 14 PIN	Discontinued
RTC-4701JE	VSOJ 20 PIN	Discontinued
RTC-4701NB	SON 22 PIN	Discontinued
RTC-9701JE	VSOJ 20 PIN	Discontinued
RX-4581NB	SON 22 PIN	Discontinued

Frequency Tolerance:	
RA-4565SA*	B=5+/-23PPM
RA-4574SA*	B=5+/-23PPM
RTC-4543SA	A=5+/-12PPM B=5+/-23PPM
RTC-4543SB	A=5+/-12PPM B=5+/-23PPM
RTC-4574JE	B=5+/-23PPM
RTC-4574SA	B=5+/-23PPM
RTC-4701JE	B=5+/-23PPM
RTC-4701NB	B=5+/-23PPM
RTC-9701JE	B=5+/-23PPM
RX-4581NB	B=5+/-23PPM

Tape & Reel Qty
SOP Package Type Only
Blank: Bulk
0: 1000 pcs. per reel
DIP Package Type Only
S: 25pcs/Stick

PURE SN
ROHS

Discontinued

Note:
SA packages in “PURE SN” is DISCONTINUED but “RoHS “ is ACTIVE.
Model P/N in RED font = DISCONTINUED
*Automotive AEC-Q200

EPSON

Product Configuration System

Real Time Clock Modules – Serial (3 Wire & 4 Wire)

RX-4571SA : **B** **0** : **PURE SN**

Base Model	Pkg.	Status
RTC-4574NB	SON 22 PIN	Discontinued
RX-4045NB	SON 22 PIN	Discontinued
RX-4045SA	SOP 14 PIN	Active
RX-4574LC	VSOJ 12 PIN	Discontinued
RX-4575LC	VSOJ 12 PIN	Discontinued
RX-4571LC	VSOJ 12 PIN	Active
RX-4571NB	SON 22 PIN	Discontinued
RX-4571SA	SOP 14 PIN	Active
RX-4801SA	SOP 14 PIN	Discontinued
RX-4803SA	SOP 14 PIN	Active
RX-4803LC	VSOJ 12 PIN	Active

Frequency Tolerance (Ta =+25 °C):	
RTC-4574NB	B=5+/-23PPM
RX-4045NB, RX-4045SA	AA=5+/-5PPM AC=0+/-5PPM
RX-4574LC	B=5+/-23PPM
RX-4575LC	B=5+/-23PPM
RX-4571LC	B=5+/-23PPM
RX-4571NB	B=5+/-23PPM
RX-4571SA	B=5+/-23PPM
RX-4801SA	Over -40 to +85 °C UB=+/-5PPM
RX-4803SA, RX-4803LC	Over -40 to +85 °C UA=+/-3.4PPM UB=+/-5PPM

Tape & Reel Qty
SOP Package Type Only
Blank: Bulk
0: 1000 pcs. per reel
DIP Package Type Only
S: 25pcs/Stick (EOL)

PURE SN
Blank : Already RoHS Compliant

Note:
All LC packages are already RoHS Compliant with “PURE SN”.
LC packages with ”PURE SN” are DISCONTINUED
*RX-4575LC - Sn-Ag Plating NOT PURE SN
Model P/N in RED font = DISCONTINUED

EPSON

Product Configuration System

Real Time Clock Modules – I²C-Bus

RX-8571SA : B 0 : PURE SN

Base Model	Pkg.	Status
RA-8565SA*	SOP 14 PIN	Discontinued
RX-8025NB	SON 22 PIN	Discontinued
RX-8025SA	SOP 14 PIN	Active
RX-8564LC	VSOJ 12 PIN	Discontinued
RX-8571SA	SOP 14 PIN	Active
RX-8571NB	SON 22 PIN	Discontinued
RX-8571LC	VSOJ 12 PIN	Active
RX-8581JE	VSOJ 20 PIN	Discontinued
RX-8581NB	SON 22 PIN	Discontinued
RX-8581SA	SON 14 PIN	Discontinued
RX-8731LC	VSOJ 12 PIN	Active

Frequency Tolerance:	
RA-8565SA*	B=5+/-23PPM
RX-8025NB	AA=5+/-5PPM
RX-8025SA	AA=5+/-5PPM
RX-8564LC	B=5+/-23PPM
RX-8571SA	B=5+/-23PPM
RX-8571NB	B=5+/-23PPM
RX-8571LC	B=5+/-23PPM
RX-8581JE	B=5+/-23PPM
RX-8581NB	B=5+/-23PPM
RX-8581SA	B=5+/-23PPM
RX-8731LC	B=5+/-23PPM

Tape & Reel Qty
SOP Package Type Only
Blank: Bulk
0: 1000 pcs. per reel
DIP Package Type Only
S: 25pcs/Stick (EOL)

PURE SN
Blank : Already RoHS Compliant

Note:
All LC packages are already RoHS Compliant with "PURE SN"
Model P/N in RED font = DISCONTINUED
*Automotive AEC-Q200

EPSON

Product Configuration System

Real Time Clock Modules – I²C-Bus

RA-8581SA : B 0 : PURE SN

Base Model	Pkg.	Status
RA-8581SA*	SOP 14 PIN	Discontinued
RTC-8564JE	VSOJ 20 PIN	Discontinued
RTC-8564NB	SON 22 PIN	Discontinued
RX8010SJ	SOP 8 PIN	Active
RA4803SA* RA8803SA*	SOP 14 PIN SOP 14 PIN	Active
RX8900SA RA8900SA*	SOP 14 PIN	Active
RX8900CE RA8900CE*	3.2x2.5mm 10 PIN Ceramic	Active

Frequency Tolerance:	
RA-8581SA*	B=5+/-23PPM
RTC-8564JE	B=5+/-23PPM
RTC-8564NB	B=5+/-23PPM
RX8010SA	B=5+/-23PPM
RX4803SA RA4803SA* RX8803SA	UA= +/-3.4PPM -40°C to 85°C UB= +/-5.0PPM -40°C to 85°C UC=+/- 5PPM -30°C to 70°C AA=5+/-5PPM 25°C
RX8900SA RA8900SA* and RX8900CE RA8900CE*	UA=+/-3.4PPM -40°C to 85°C UB=+/-5PPM -40°C to 85°C UC=+/-5PPM -30°C to 70°C

Tape & Reel Qty
SOP Package Type Only
B: Bulk
0: 1000 pcs. per reel

Blank : CE Package
RX8010SJ: PURE SN
RA4803SA: PURE SN
RX8803SA: PURE SN
RX8900SA: PURE SN
RA-8581SA: ROHS or PURE SN
RTC-8564JE: ROHS
RTC-8564NB: ROHS or PURE SN

Note:
Model P/N in RED font = DISCONTINUED
*Automotive AEC-Q200

EPSON

Product Configuration System

Real Time Clocks – Parallel 4-bit

Discontinued

RTC-7301SF : **B** **0** : **PURE SN**

Base Model	Pkg.
RTC-7301SF	SSOP 24PIN
RTC-7301DG	DIP 18PIN

Frequency Tolerance:	
RTC-7301SF	B=5+/-23PPM
RTC-7301DG	B=5+/-23PPM

Tape & Reel Qty
SOP Package Type Only
Blank: Bulk
0: 1000 pcs. per reel
DIP Package Type Only
S: 25pcs/Stick

PURE SN
ROHS

Note:
Model P/N in RED font = DISCONTINUED

EPSON

Product Configuration System

Real Time Clocks – Parallel 4-bit

Discontinued

RTC-72423A **0** **:** **PURE SN**

Base Model	Pkg.	Freq. Tolerance
RTC-62421A	DIP 18PIN	+/-10ppm
RTC-62421B	DIP 18PIN	+/-50ppm
RTC-72421A	DIP 18PIN	+/-10ppm
RTC-72421B	DIP 18PIN	+/-50ppm
RTC-72423A	SSOP 24PIN	+/-20ppm
RTC-72423B	SSOP 24PIN	+/-50ppm

Tape & Reel Qty
SOP Package Type Only
Blank: Bulk
0: 1000 pcs. per reel
DIP Package Type Only
S: 25pcs/Stick

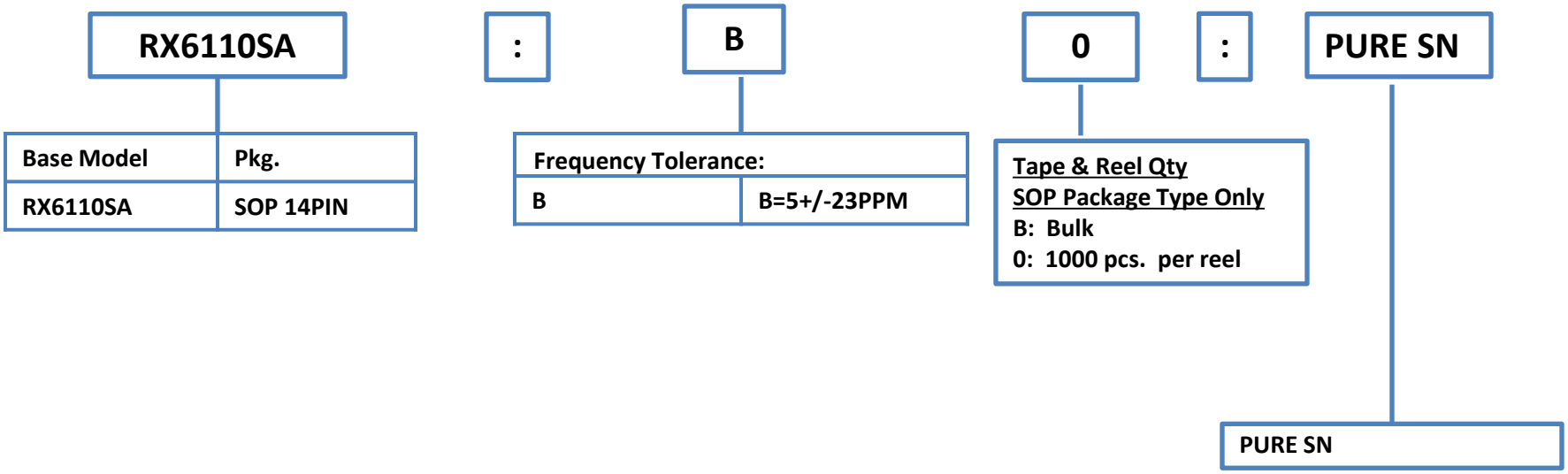
PURE SN
ROHS

Note:
Model P/N in RED font = DISCONTINUED

EPSON

Product Configuration System

Real Time Clock Modules – I²C-Bus and SPI



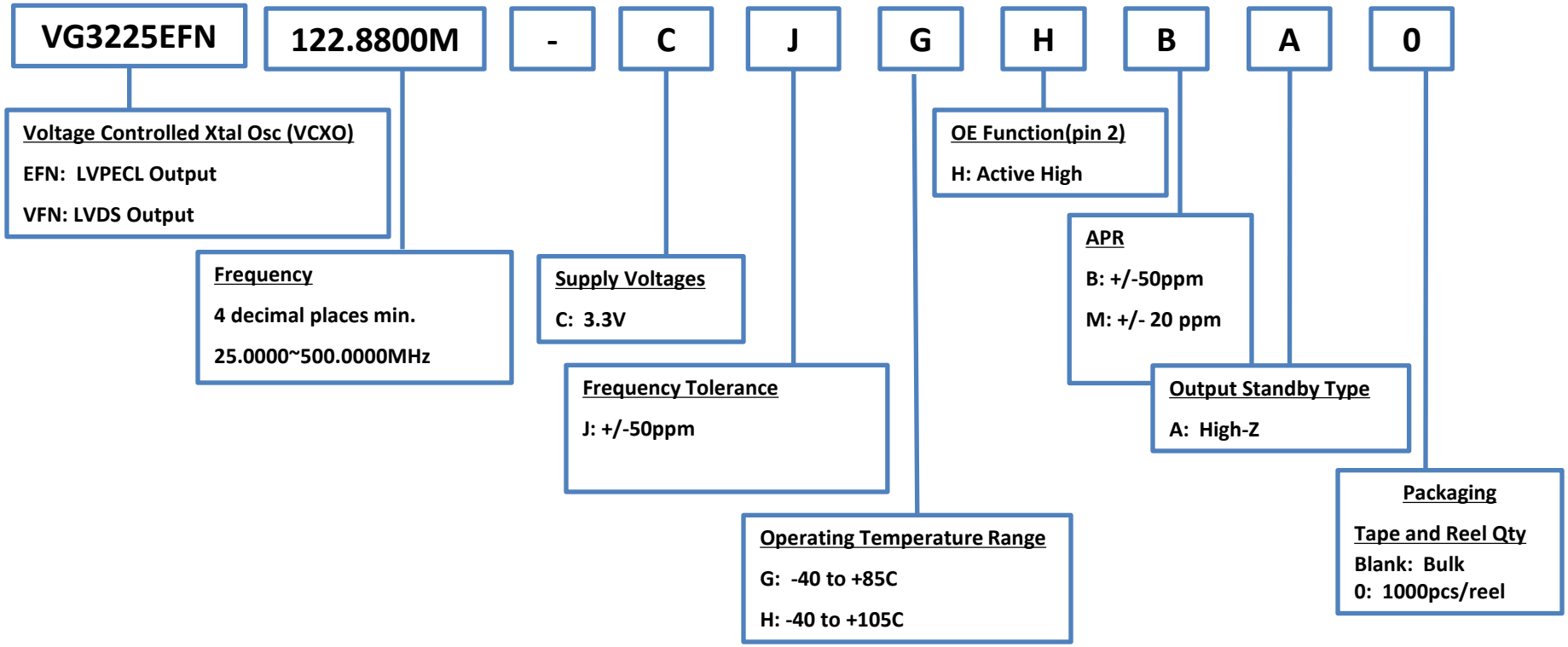
Product Configuration Guide

Voltage Controlled Crystal Oscillators (VCXO)

EPSON

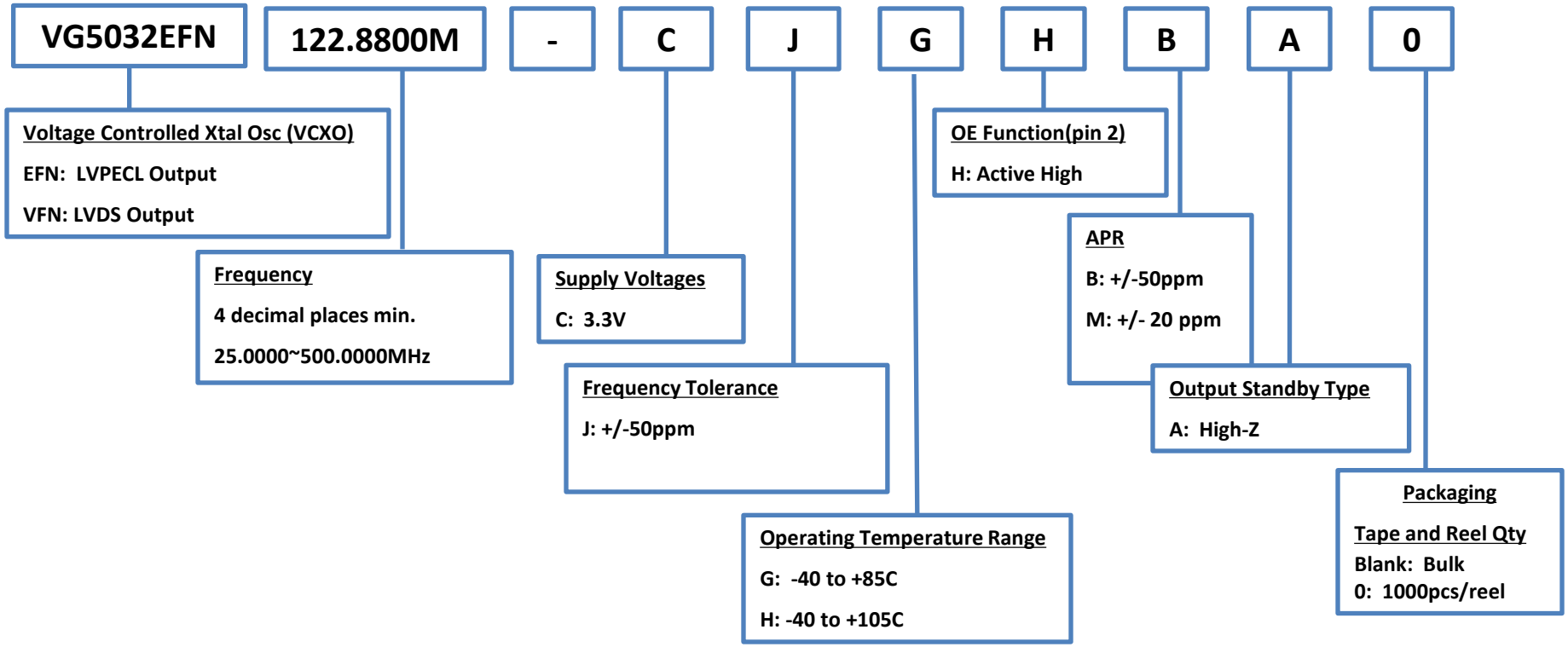
Product Configuration System

Oscillators - VCXO



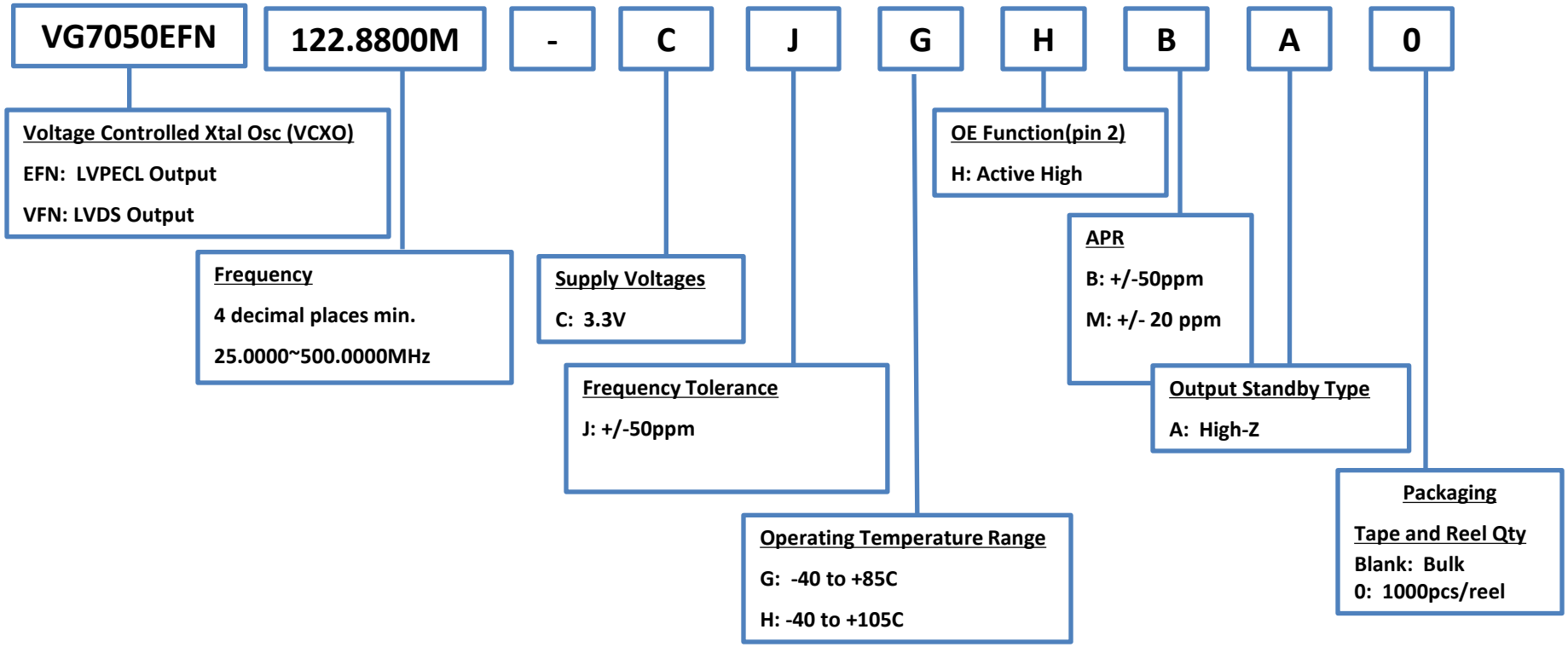
Product Configuration System

Oscillators - VCXO



Product Configuration System

Oscillators - VCXO



Product Configuration System

Oscillators - VCXO

Discontinued

VG-1201CA	16.0000M	—	T	A	N	C	0

Voltage Controlled Xtal Osc (VCXO)
CA: 7x5mm 6 pin Ceramic

Frequency
4 decimal places min.
1.0000~80.0000MHz

Output Enable Pin Assignment
T: #2 Pin Output Enable (OE)
F: #5 Pin Output Enable (OE)

Frequency Tolerance
A: +/-20ppm (-20 ~ +70˚C)
B: +/-25ppm (-40 ~ + 85˚C)

Pull Range/Output Freq. Range
G= +/-50 X 10^{-6}
60MHz to 80.0000 MHz
K= +/-75 X 10^{-6}
41MHz to 80.0000 MHz
N = +/-100 x 10^{-6}
1 MHz to 40.9999 MHz

Supply Voltages
C: 3.3V
H: 5.0V

Packaging
Tape and Reel Qty
Blank: Bulk
0: 1000pcs/reel

CODE	STABILITY	OPERATING TEMP.	PULL RANGE	OUTPUT FREQ.
ANC / ANH	+/-20PPM	-20C to +70˚C	+/-100PPM	1MHz to 40.9999MHz
AKC / AKH	+/-20PPM	-20C to +70˚C	+/-75PPM	41MHz to 80.0000MHz
BNC / BNH	+/-25PPM	-40C to +85˚C	+/-100PPM	1MHz to 40.9999MHz
BKC / BKH	+/-25PPM	-40C to +85˚C	+/-75PPM	41MHz to 80.0000MHz

EPSON

Product Configuration System

Oscillators - VCXO

Not Recommended

VG-4231CA	12.2880M	-	T	D	R	C	0

Voltage Controlled Xtal Osc (VCXO)

CA: 7x5mm 6 pin Ceramic

Frequency

1.0000~60.0000MHz

4 decimal places min.

Output Enable Pin Assignment

T: #2 Pin Output Enable, 50Kohm min. input impedance

F: #5Pin Output Enable, 50Kohm min. input impedance

Z: #2pin Output Enable, 10Mohm min. input impedance

M: #5pin Output Enable, 10Mohm min. input impedance

Frequency Tolerance

D: +/-35ppm (-20 ~ +70˚C)

G: +/-50ppm (-40 ~ + 85˚C)

Freq Control Range

R: +/-130 X 10^{-6}

Supply Voltage

C: 3.3V

H: 5.0V

Packaging

Tape and Reel Qty

Blank: Bulk

0: 1000pcs/reel

Available Combinations

TDRC / TDRH / FDRC / FDRH
TGRC / TGRH / FGRC / FGRH

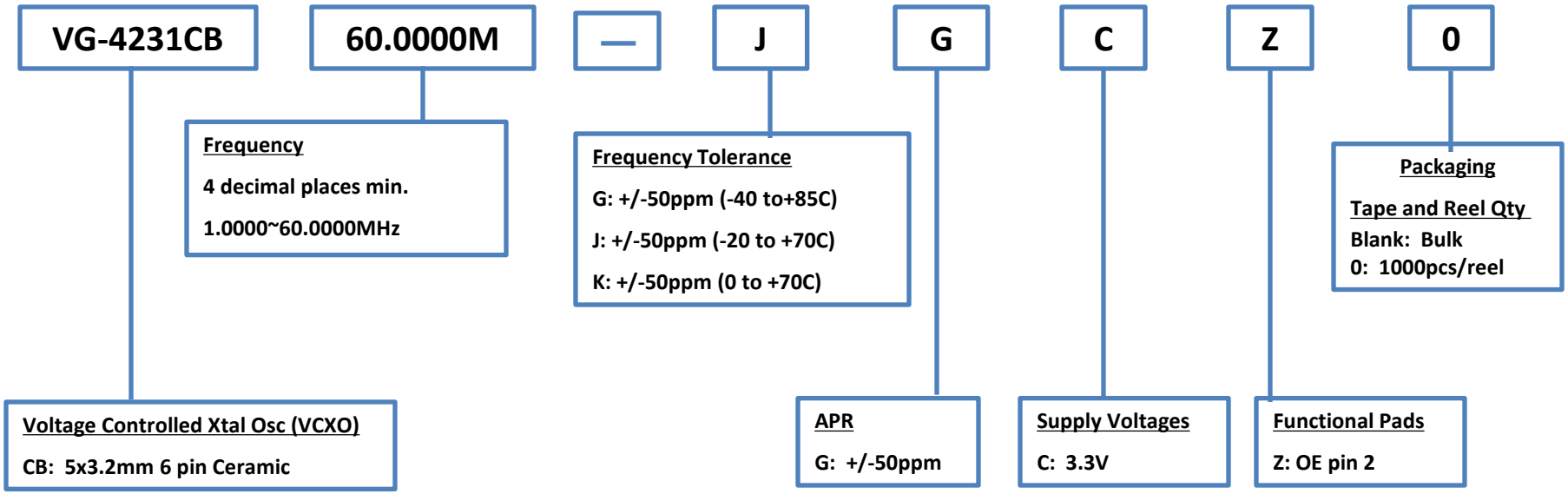
NOTE:

Output Enable Pin Assignment Z and M are not available with Supply Voltage H (5.0V)

Product Configuration System

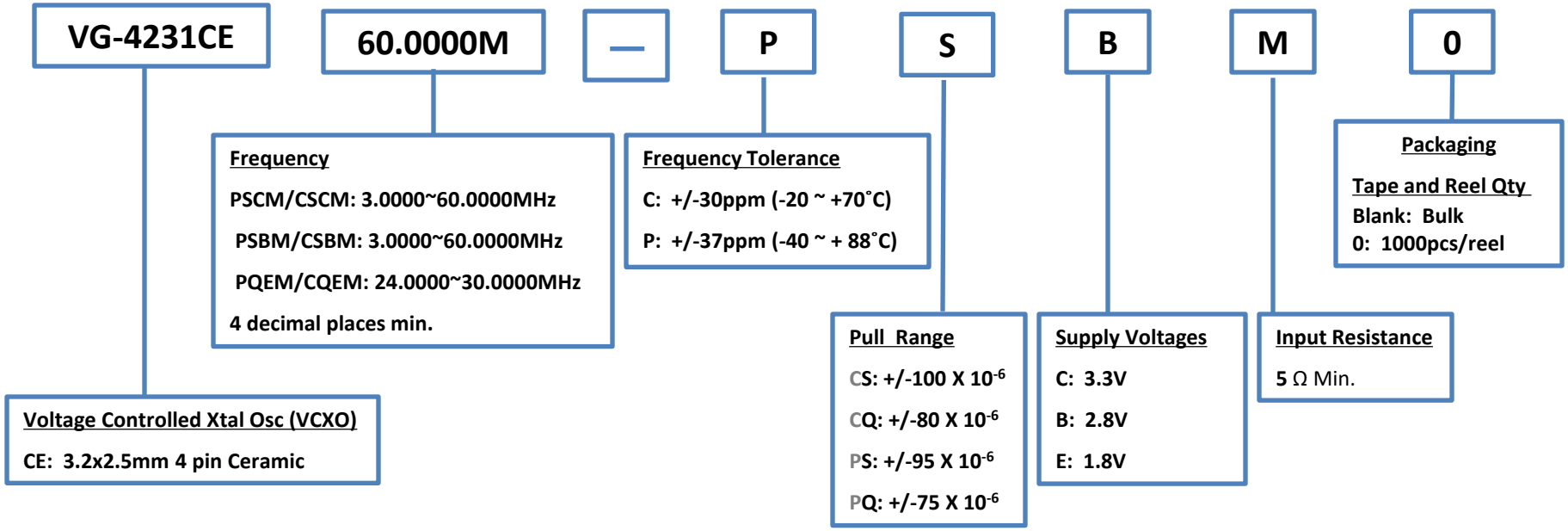
Oscillators - VCXO

Discontinued



Product Configuration System

Oscillators - VCXO



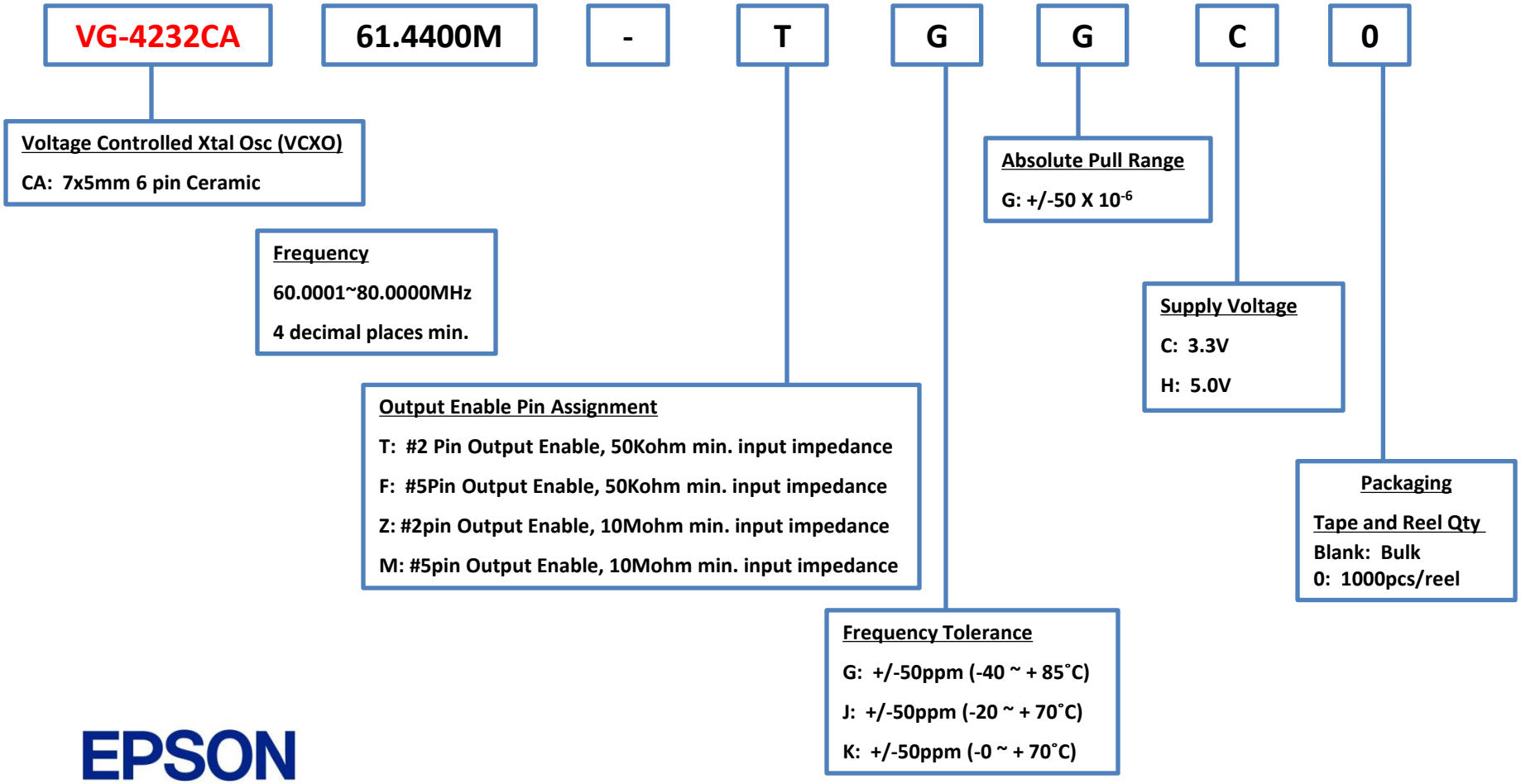
CODE		Frequency Tolerance	Temperature Range	Absolute Pull Range
CSCM / CSBM/CQEM	C	+/-30 x 10^{-6}	-20 ˚C to + 70˚C	S : +/-100 x 10^{-6} / Q : +/-80 x 10^{-6}
PSCM/PSBM/PQEM	P	+/-37 X 10^{-6}	-40˚C to + 85˚C	S : +/-95 x 10^{-6} / Q : +/-75 x 10^{-6}

EPSON

Product Configuration System

Oscillators - VCXO

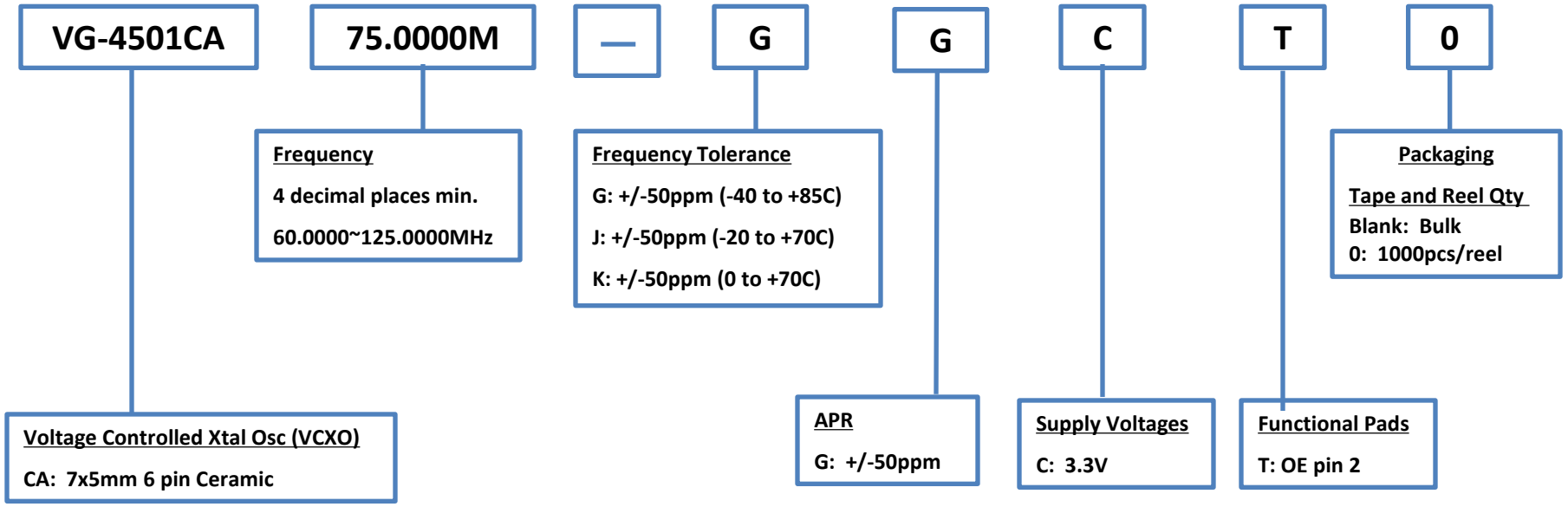
Discontinued



Product Configuration System

Oscillators - VCXO

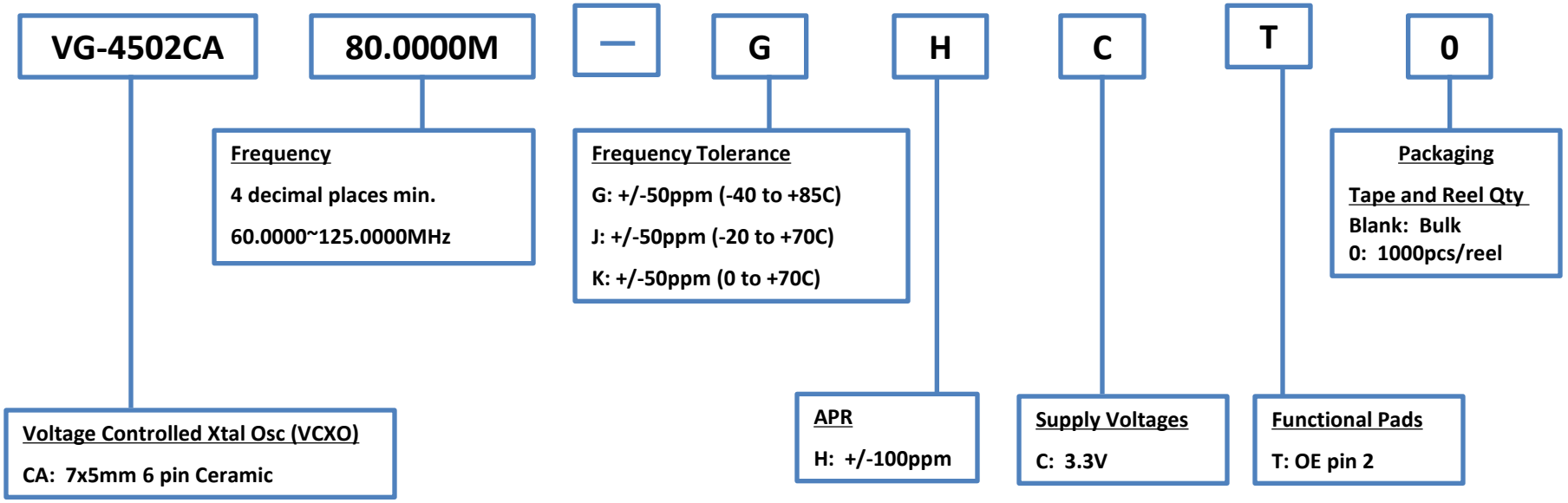
Not Recommended



Product Configuration System

Oscillators - VCXO

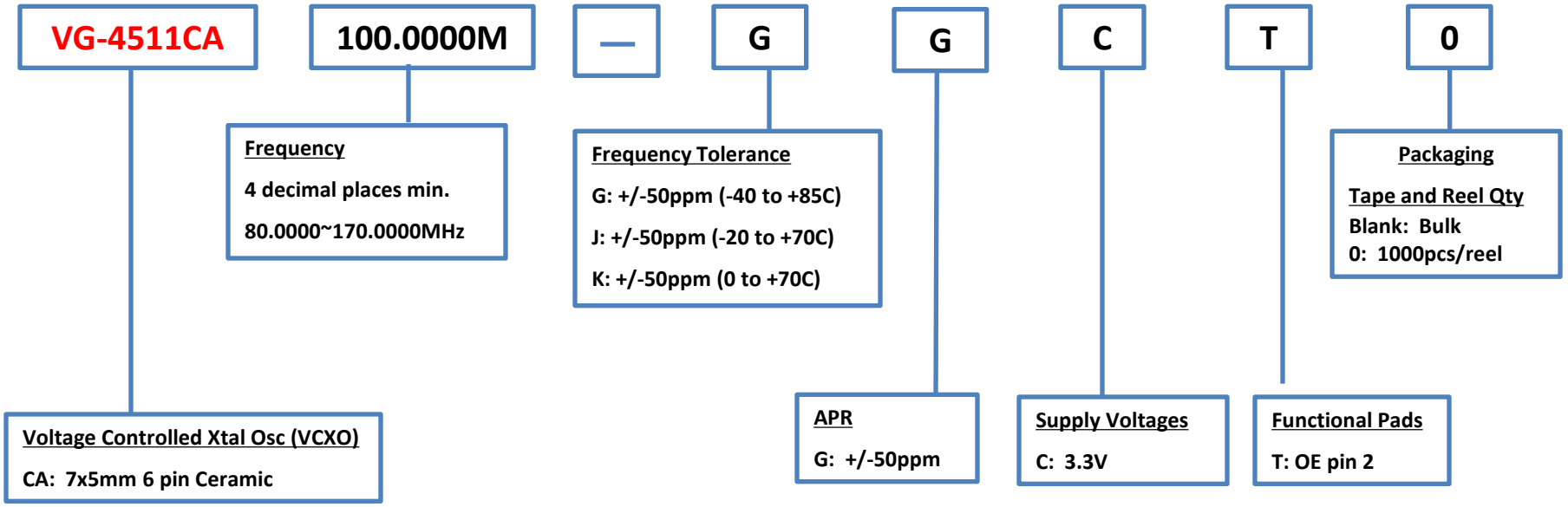
Not Recommended



Product Configuration System

Oscillators - VCXO

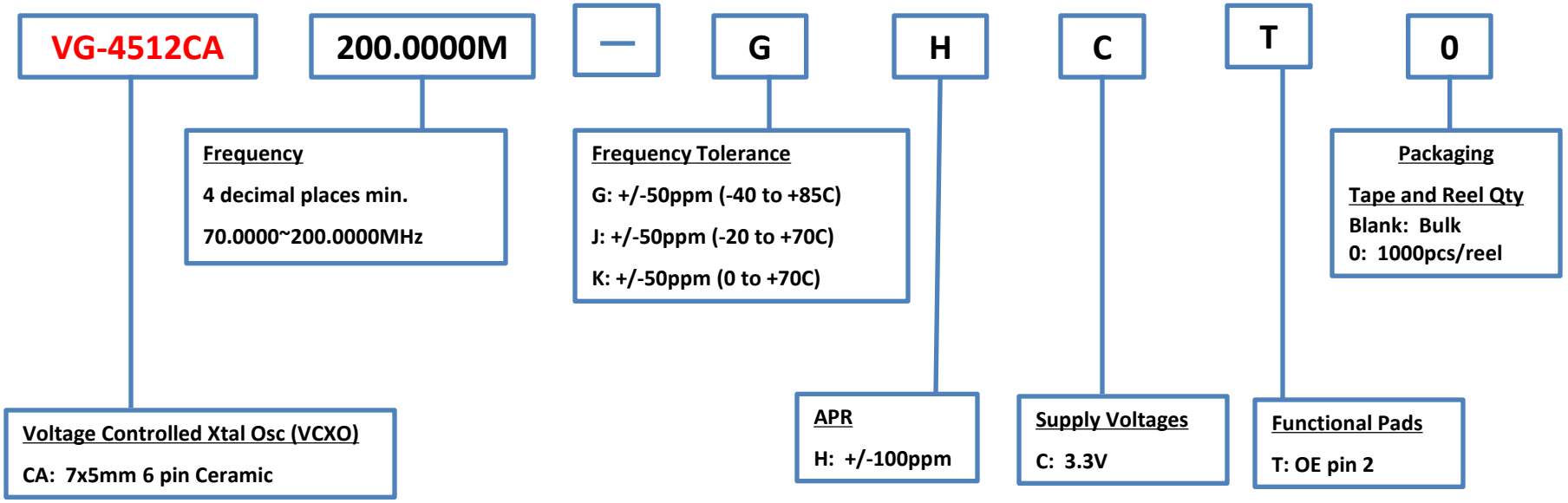
Discontinued



Product Configuration System

Oscillators - VCXO

Discontinued



Product Configuration System

Oscillators - VCXO

Discontinued

VG-4513CA	200.0000M	-	G	H	C	T	0

VG-4513CA

Voltage Controlled Xtal Osc (VCXO)

CA: 7x5mm 6 pin Ceramic

200.0000M

Frequency

4 decimal places min.

100.0000~500.0000MHz

G

Operating Temperature Range

G: -40 to +85C

J: -20 to +70C

K: 0 to +70C

H

APR

F: +/-30ppm

G: +/-50ppm

*H: +/-100ppm

*Only 120MHz ≤ f_0 ≤ 200MHz are available

C

Supply Voltages

C: 3.3V

T

OE Function(pin 2)

T: Active High

L: Active Low

0

Packaging

Tape and Reel Qty

Blank: Bulk

0: 1000pcs/reel

NOTE:

Standard Frequencies Offered: 100M, 122.88M, 125M, 148.351M, 148.5M, 153.6M, 155.52M, 156.25M, 200M

Please contact us for requirements not listed in this specification.

Product Configuration System

Oscillators - VCXO

Discontinued

VG-4513CB	200.0000M	-	G	H	C	T	0

Voltage Controlled Xtal Osc (VCXO)

CA: 5x3.2mm 6 pin Ceramic

Frequency

4 decimal places min.

100.0000~500.0000MHz

Operating Temperature Range

G: -40 to +85C

J: -20 to +70C

K: 0 to +70C

APR

F: +/-30ppm

G: +/-50ppm

*H: +/-100ppm

*Only 120MHz ≤ f_0 ≤ 200MHz are available

Supply Voltages

C: 3.3V

OE Function(pin 2)

T: Active High

L: Active Low

Packaging

Tape and Reel Qty

Blank: Bulk

0: 1000pcs/reel

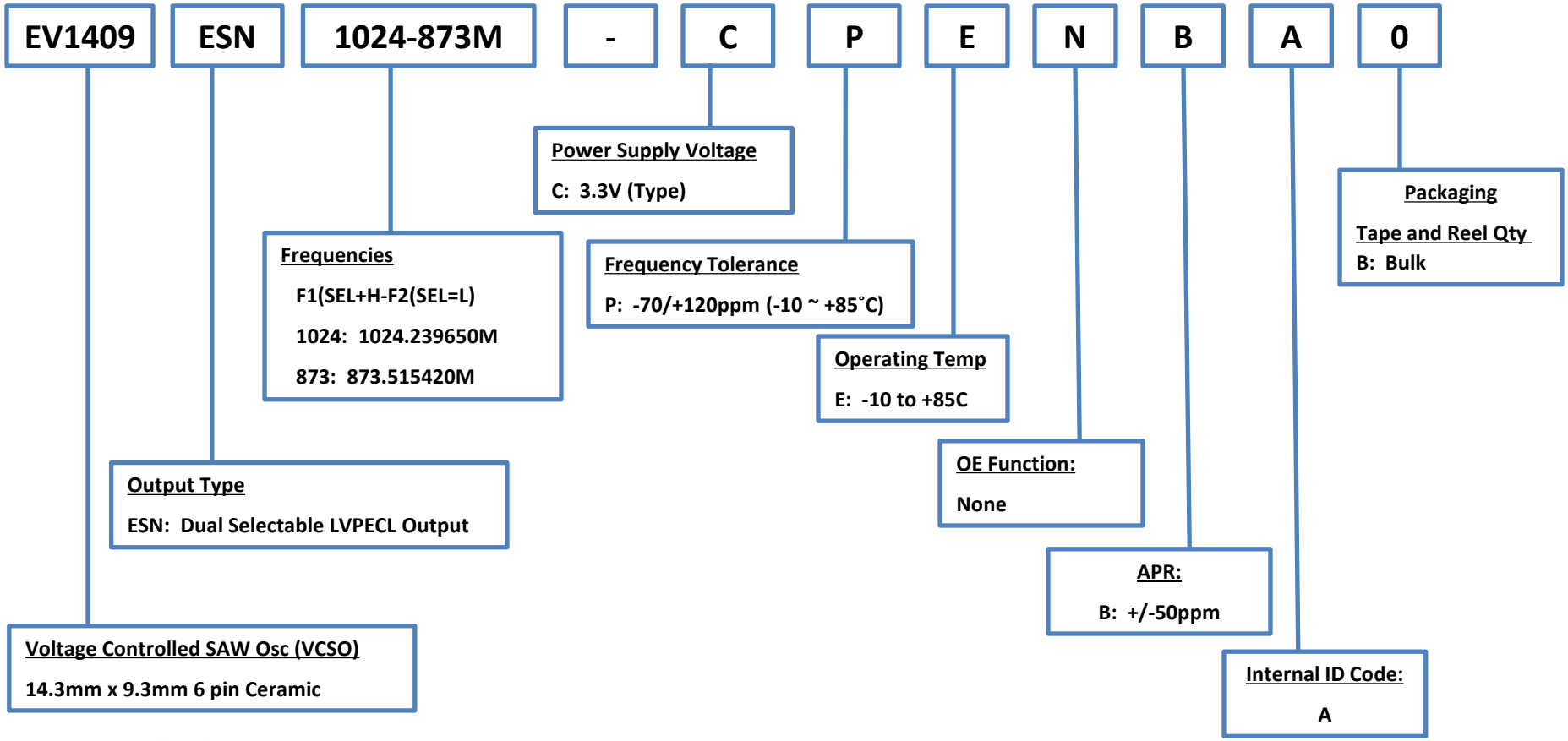
NOTE:

Standard Frequencies Offered: 122.88M, 153.6M

Please contact us for requirements not listed in this specification.

Product Configuration System

Oscillators - VCSO



Product Configuration System

Oscillators - VCSO

EV-9100JG

Voltage Controlled Saw Osc (VCSO)
13.9 x 9.8(max.) x 4.7(max.) mm

800.0000M

Frequency
800.0000 ~ 2500.000 MHz

-

CPGUA

LV-PECL / Sine Wave	Operating Temp. Range	Absolute Pull Range
CPGUA / CSGUA	-10C to +85C	+/-50PPM Min. *1
CPGVA / CSGVA	-20C to +85C	
CPGMA / CSGMA	-40C to +85C	

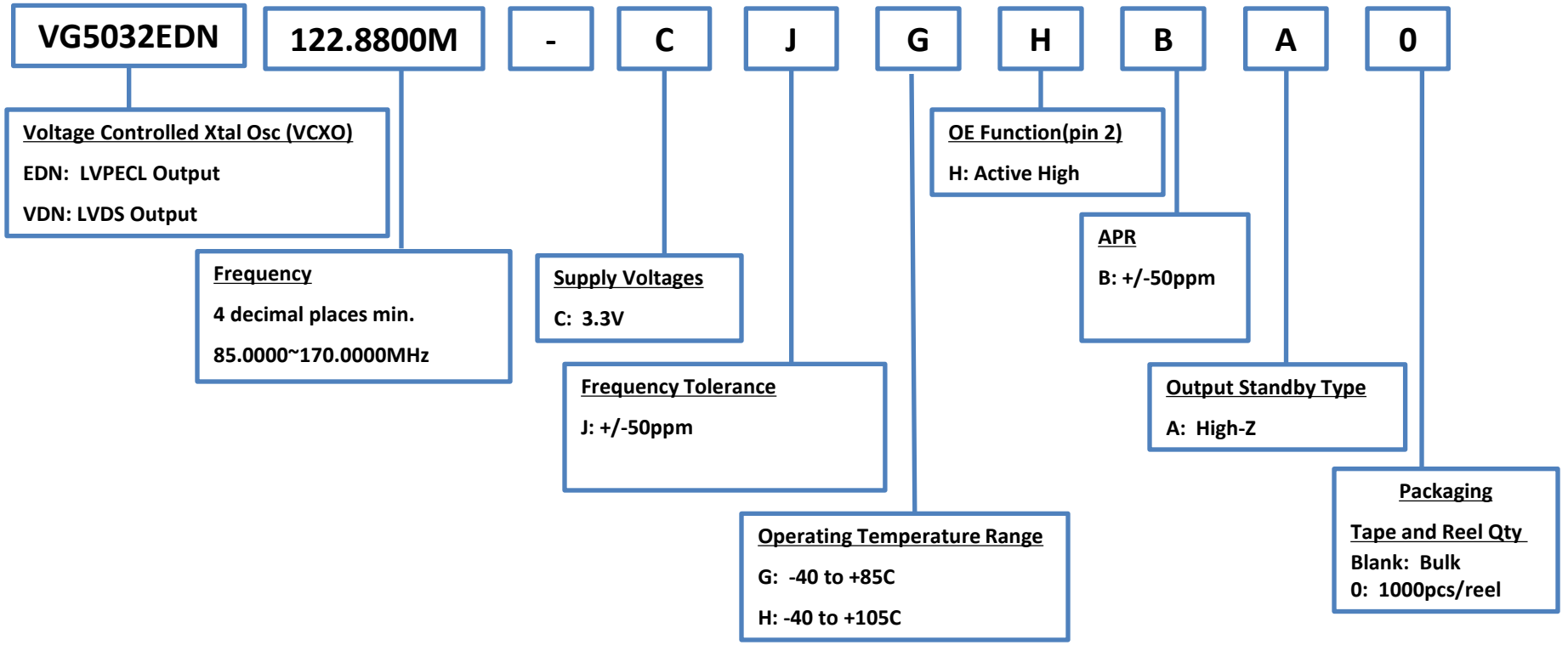
0

Tape & Reel Qty
Blank: Bulk
0: 1000pcs/reel

***1 NOTE**: Absolute Pull Range = Frequency Control Range – Frequency Tolerance

Product Configuration System

Oscillators - VCXO



NOTE:

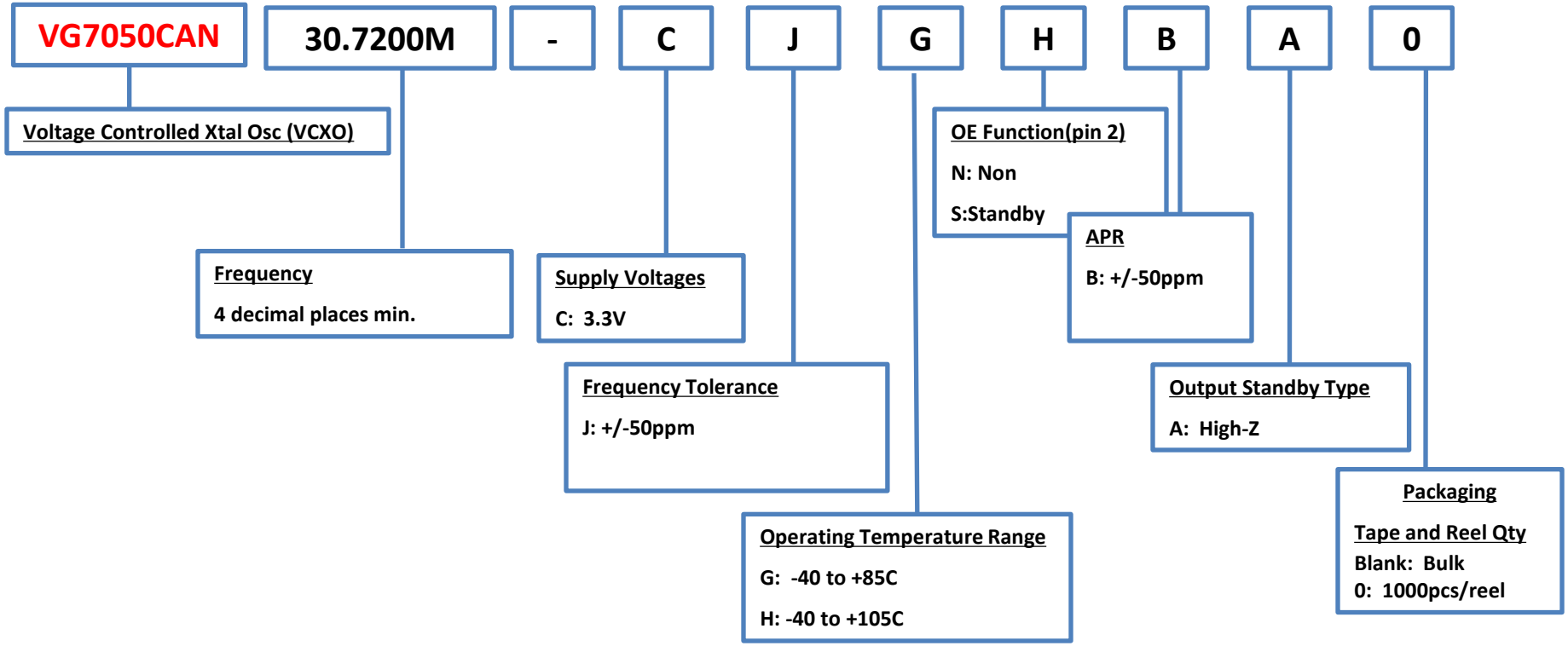
Standard Frequencies Offered: 122.88M

Please contact us for requirements not listed in this specification.

Product Configuration System

Oscillators - VCXO

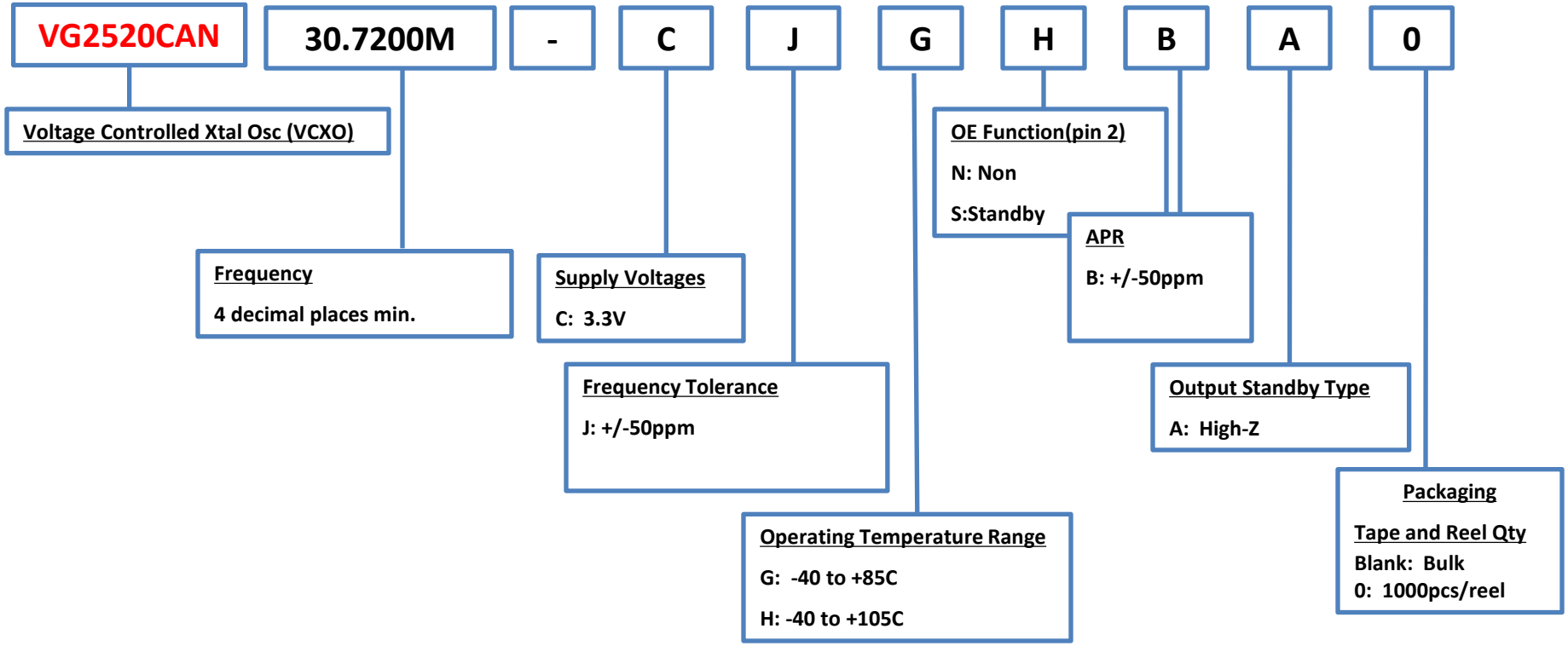
Discontinued



Product Configuration System

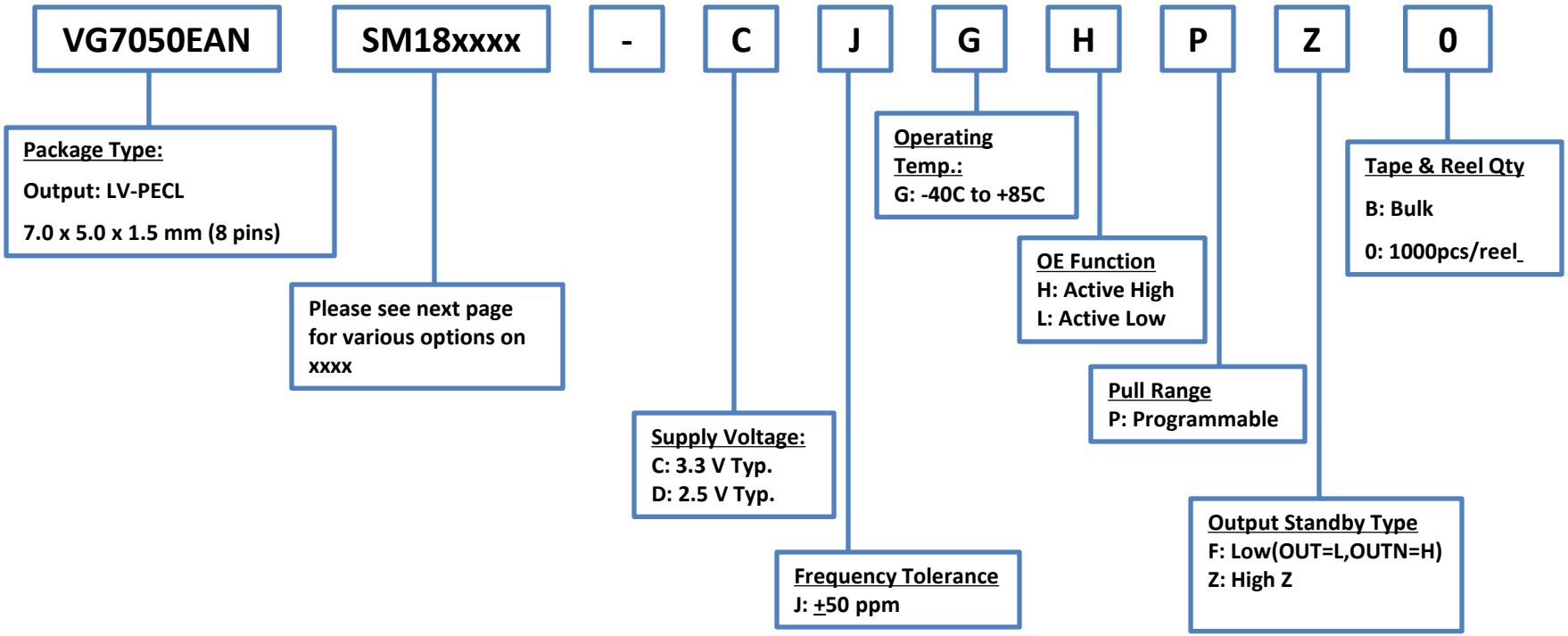
Oscillators - VCXO

Discontinued



Product Configuration System

Programmable Voltage Controlled Oscillator (VCXO)



NOTE:

Frequency Range: 50~800MHz

Please contact us for requirements not listed in this specification.

Product Configuration System

Programmable Voltage Controlled Oscillator (VCXO)

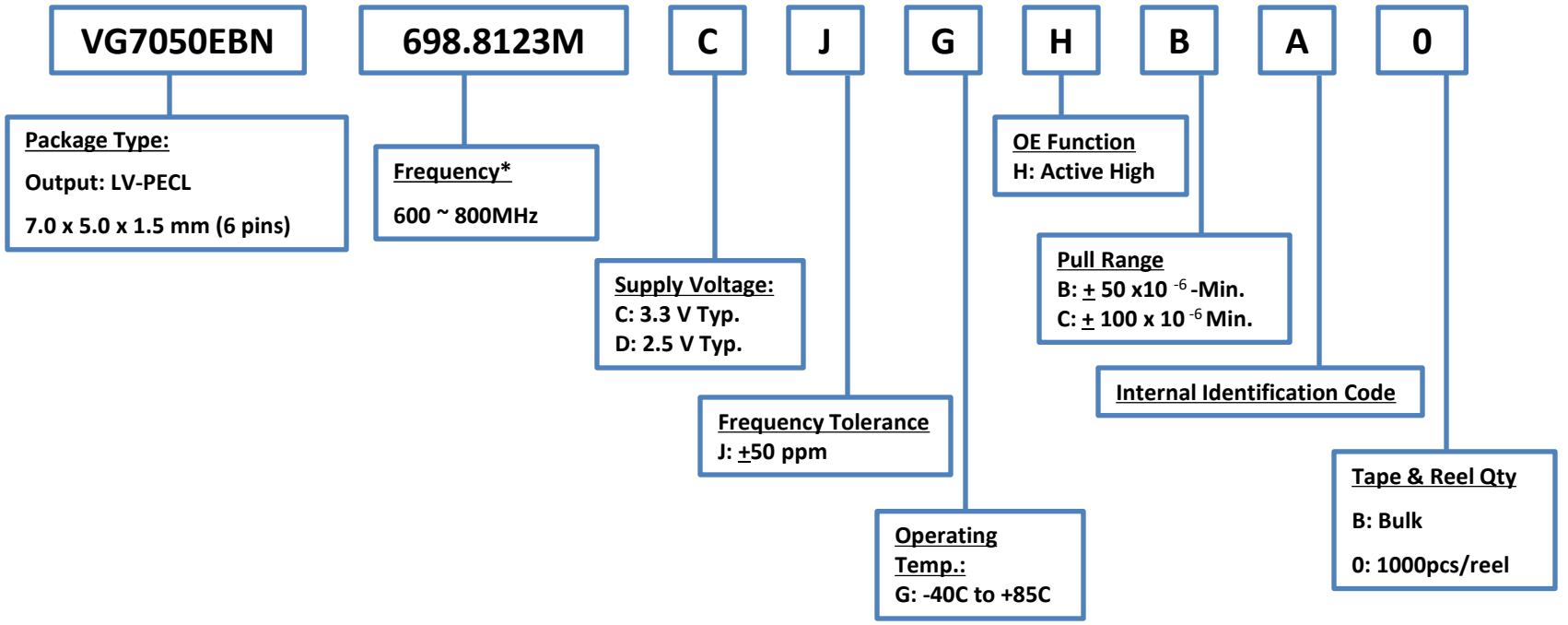
VG7050EAN

Part Number	Start-up frequency [MHz]	APR			Supply Voltage	OE function	Output Standby Type
		Max	Initial	Vc range			
VG7050EAN-SM18T001-CJGHPZ	622.080000	180	100	1.65+/-1.25	3.3V	Active high	Hi-Z
VG7050EAN-SM18T002-DJGHPZ				1.25+/-1.00	2.5V		
VG7050EAN-SM18T003-CJGLPZ				1.65+/-1.35	3.3V	Active low	
VG7050EAN-SM18T004-DJGLPZ				1.25+/-1.00	2.5V		
VG7050EAN-SM18T005-CJGHPF				1.65+/-1.35	3.3V	Active high	Low (OUT=L,OUTN=H)
VG7050EAN-SM18T006-DJGHPF				1.25+/-1.00	2.5V		
VG7050EAN-SM18T007-CJGLPF				1.65+/-1.35	3.3V	Active low	
VG7050EAN-SM18T008-DJGLPF				1.25+/-1.00	2.5V		
VG7050EAN-SM18T009-CJGHPZ	156.250000	180	100	1.65+/-1.25	3.3V	Active high	Hi-Z
VG7050EAN-SM18T010-DJGHPZ				1.25+/-1.00	2.5V		

-If customer wants startup frequency other than 622.08MHz or 156.25MHz, please contact us for a custom part.
-Customer can always change the output frequency with the I2C (from 50MHz to 800MHz)

Product Configuration System

Programmable Voltage Controlled Oscillator (VCXO)



NOTE:

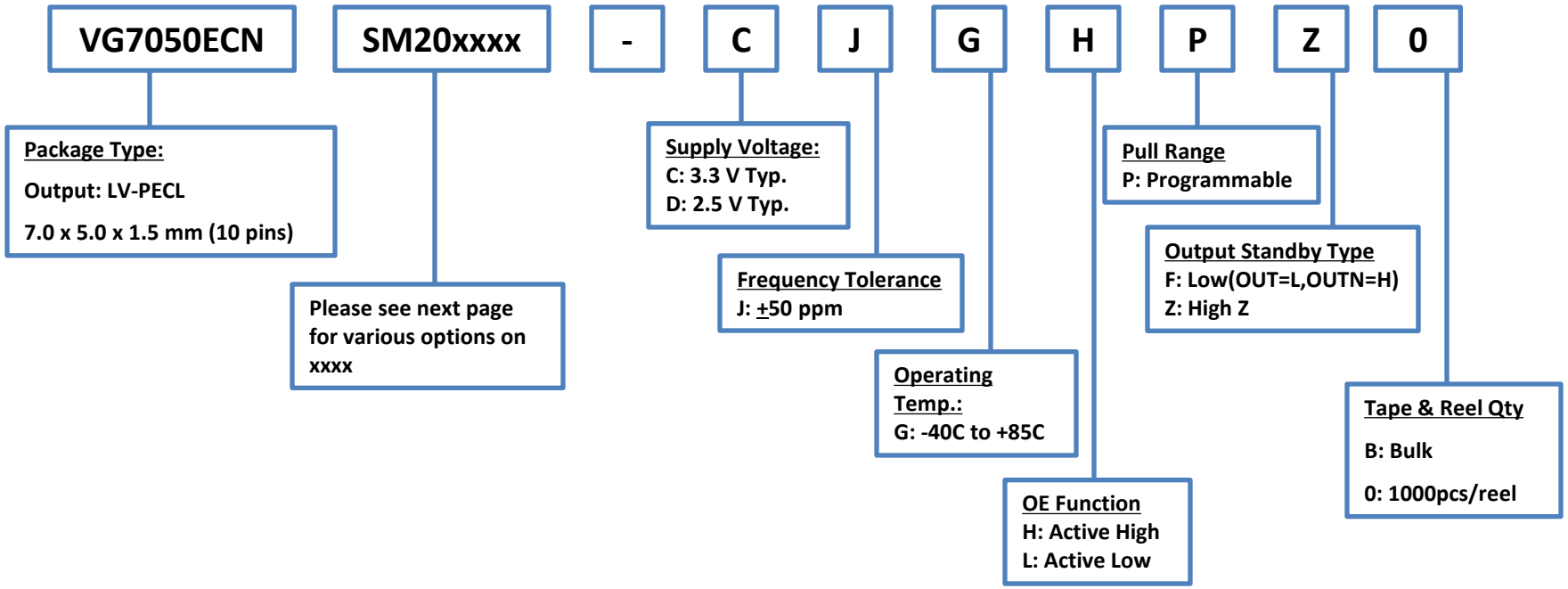
Standard Frequencies: 698.8123MHz,753.6211MHz,794.7278MHz

Please contact us for requirements not listed in this specification.

EPSON

Product Configuration System

Programmable Voltage Controlled Oscillator (VCXO)



NOTE:

Frequency Range: 50~800MHz

Please contact us for requirements not listed in this specification.

Product Configuration System

Programmable Voltage Controlled Oscillator (VCXO)

VG7050ECN

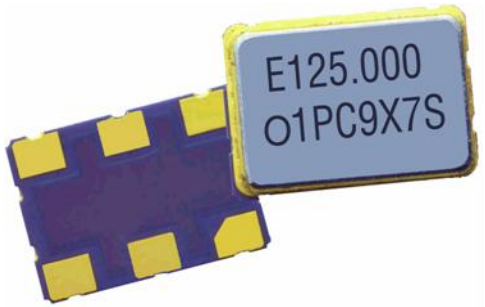
Part Number	Start-up frequency [MHz]				APR			Supply	OE	Output
	frequency 1	frequency 2	frequency 3	frequency 4	Max	Initial	Vc range	Voltage	function	Standby Type
VG7050ECN-SM20T001-CJGHPZ	622.080000	644.531250	669.326582	693. 482991	180	100	1.65+/-1.25	3.3V	Active high	Hi-Z
VG7050ECN-SM20T002-DJGHPZ							1.25+/-1.00	2.5V		
VG7050ECN-SM20T003-CJGLPZ							1.65+/-1.35	3.3V	Active low	
VG7050ECN-SM20T004-DJGLPZ							1.25+/-1.00	2.5V		
VG7050ECN-SM20T005-CJGHPF							1.65+/-1.35	3.3V	Active high	Low (OUT=L,OUTN=H)
VG7050ECN-SM20T006-DJGHPF							1.25+/-1.00	2.5V		
VG7050ECN-SM20T007-CJGLPF							1.65+/-1.35	3.3V	Active low	
VG7050ECN-SM20T008-DJGLPF							1.25+/-1.00	2.5V		

-If customer wants different startup frequencies, please contact us for a custom part.

-Customer can always change the output frequencies with the I2C (from 50MHz to 800MHz)

Product Configuration Guide

SAW OSCILLATORS

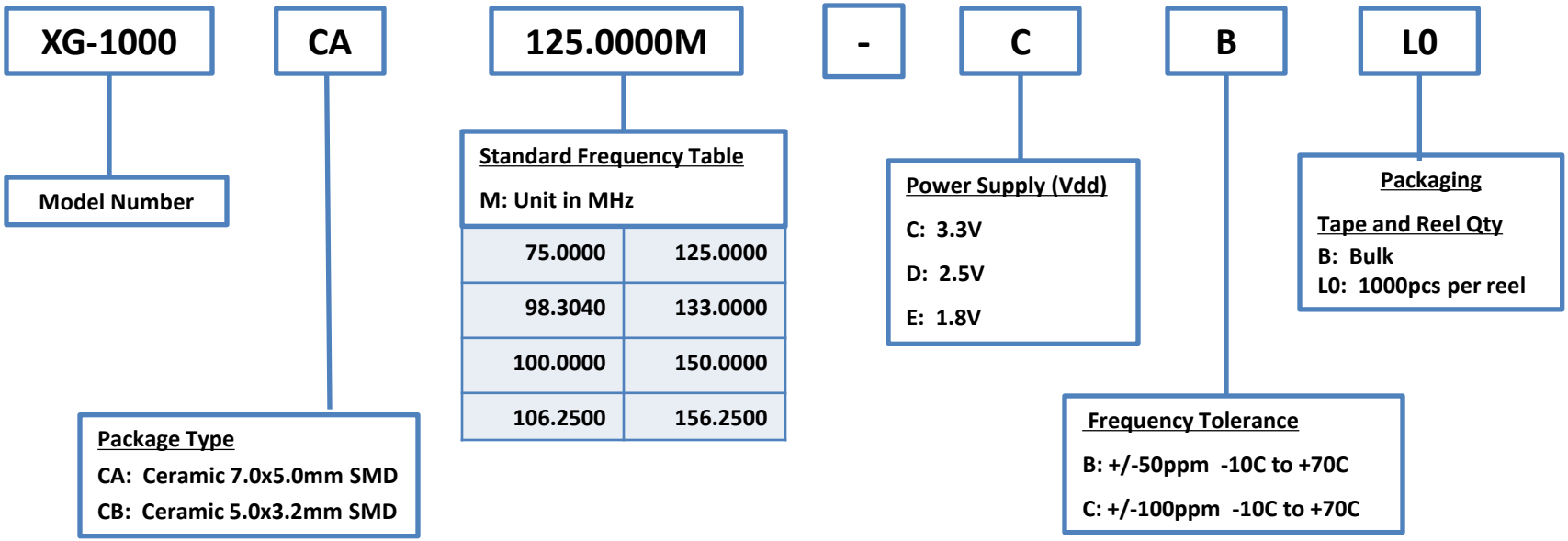


EPSON

Product Configuration System

Crystal Oscillators – Low Jitter (SAW)

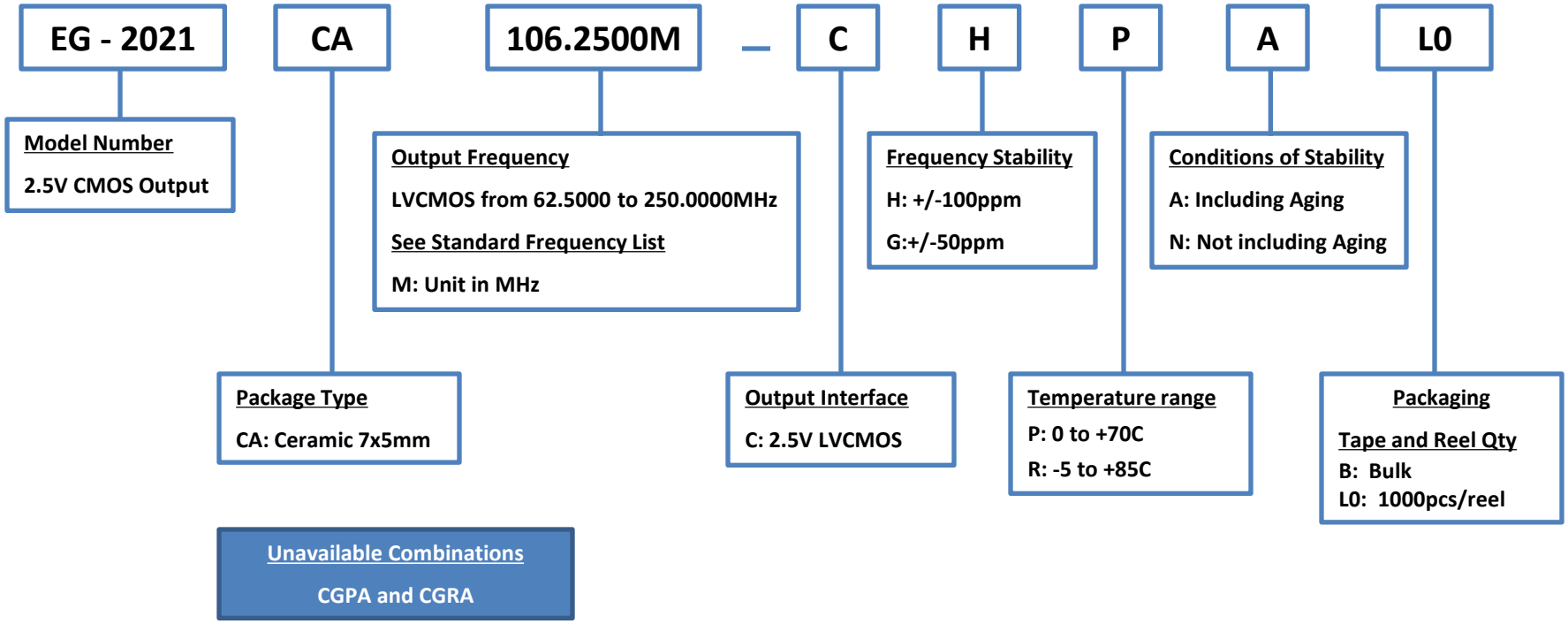
Not Recommended



Product Configuration System

Crystal Oscillators – Low Jitter (SAW)

Not Recommended



Standard Frequencies

EG-2021CA (2.5V CMOS)

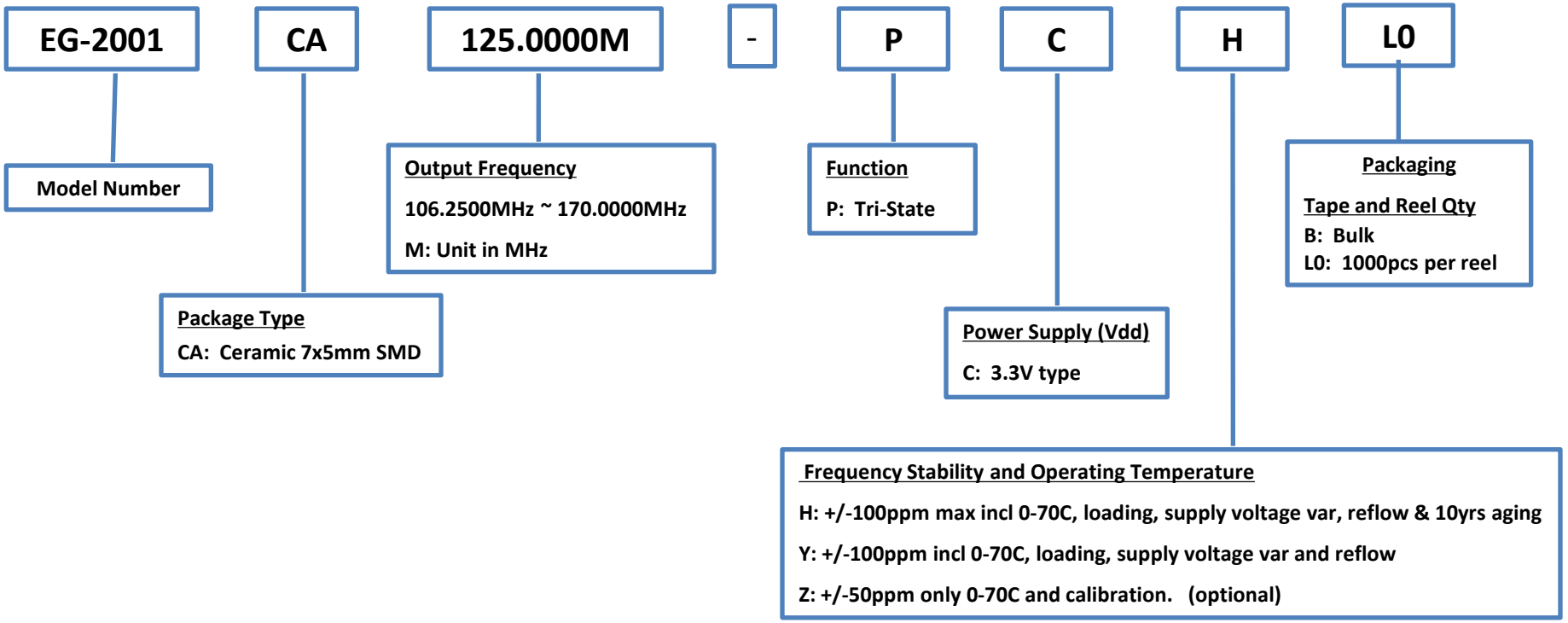
62.5000	125.0000
66.5000	133.0000
75.0000	150.0000
78.1250	156.2500
90.0000	250.0000
98.3040	
100.0000	
106.2500	
108.0000	
124.4160	

EPSON

Product Configuration System

Crystal Oscillators – Low Jitter (SAW)

Not Recommended



Standard Frequencies

EG-2001 (3.3V CMOS)

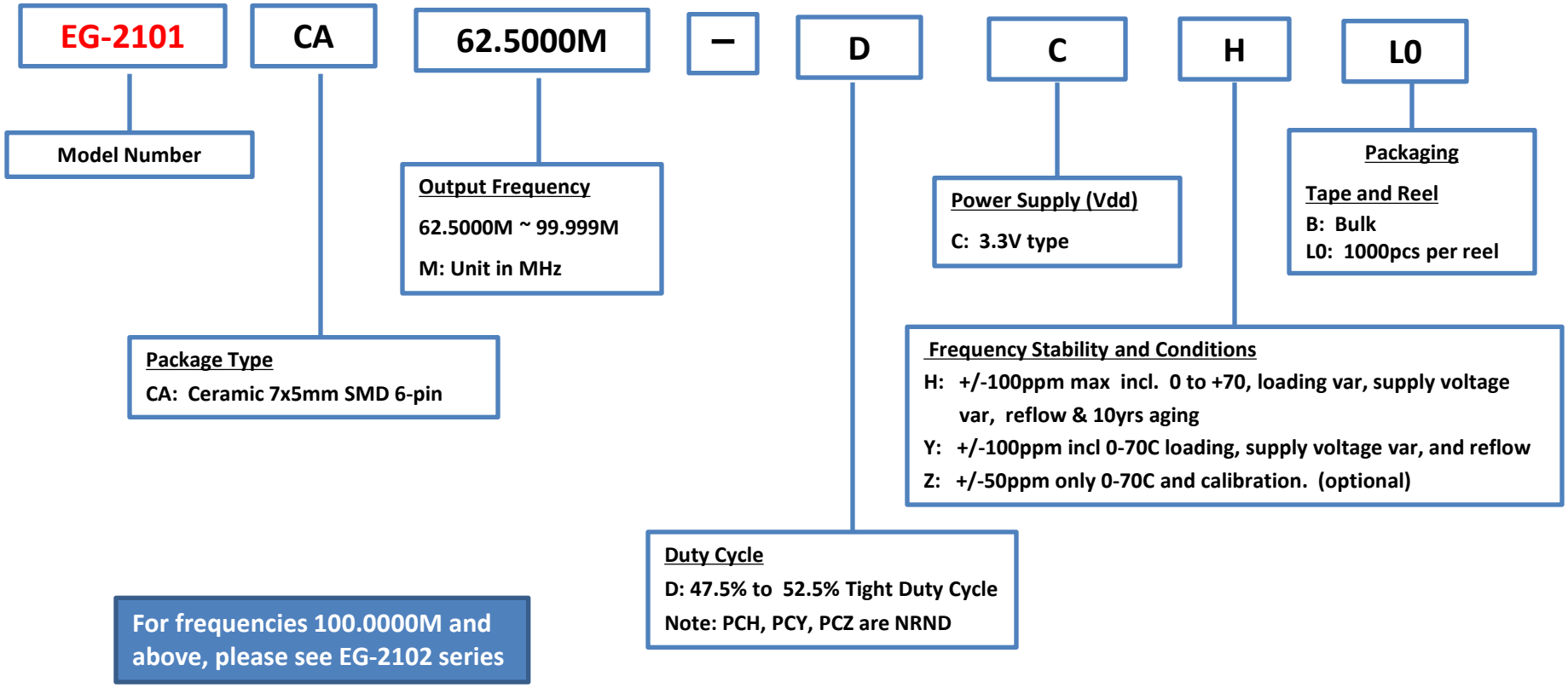
106.2500	155.5200
108.0000	156.2500
125.0000	159.3750
128.0000	160.0000
132.8125	161.1328
133.0000	166.0000
133.3333	166.6285
135.0000	166.6667
143.0000	167.3316
150.0000	

EPSON

Product Configuration System

Crystal Oscillators – Low Jitter (SAW)

Discontinued



For frequencies 100.0000M and above, please see EG-2102 series

EPSON

Standard Frequencies

EG-2101

EG-2101CA DCx	
62.5000	79.6875
64.0000	80.0000
66.4063	80.5664
66.5000	83.0000
66.6667	83.3143
67.5000	83.3333
71.5000	83.6658
75.0000	87.5000
77.7600	90.0000
78.1250	

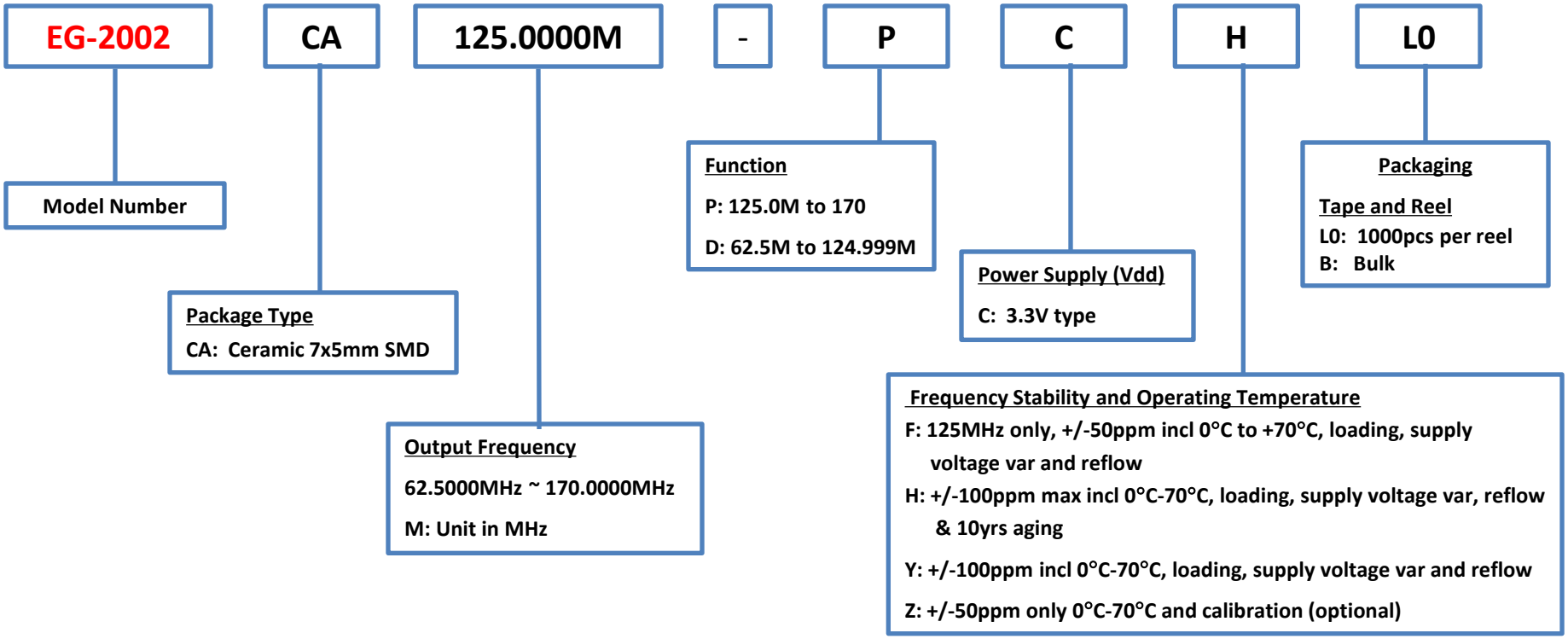
For frequencies 100.0000M and above, please see EG-2102 series

EPSON

Product Configuration System

Crystal Oscillators – Low Jitter (SAW)

Discontinued



Standard Frequencies

EG-2002 (LVTTL)

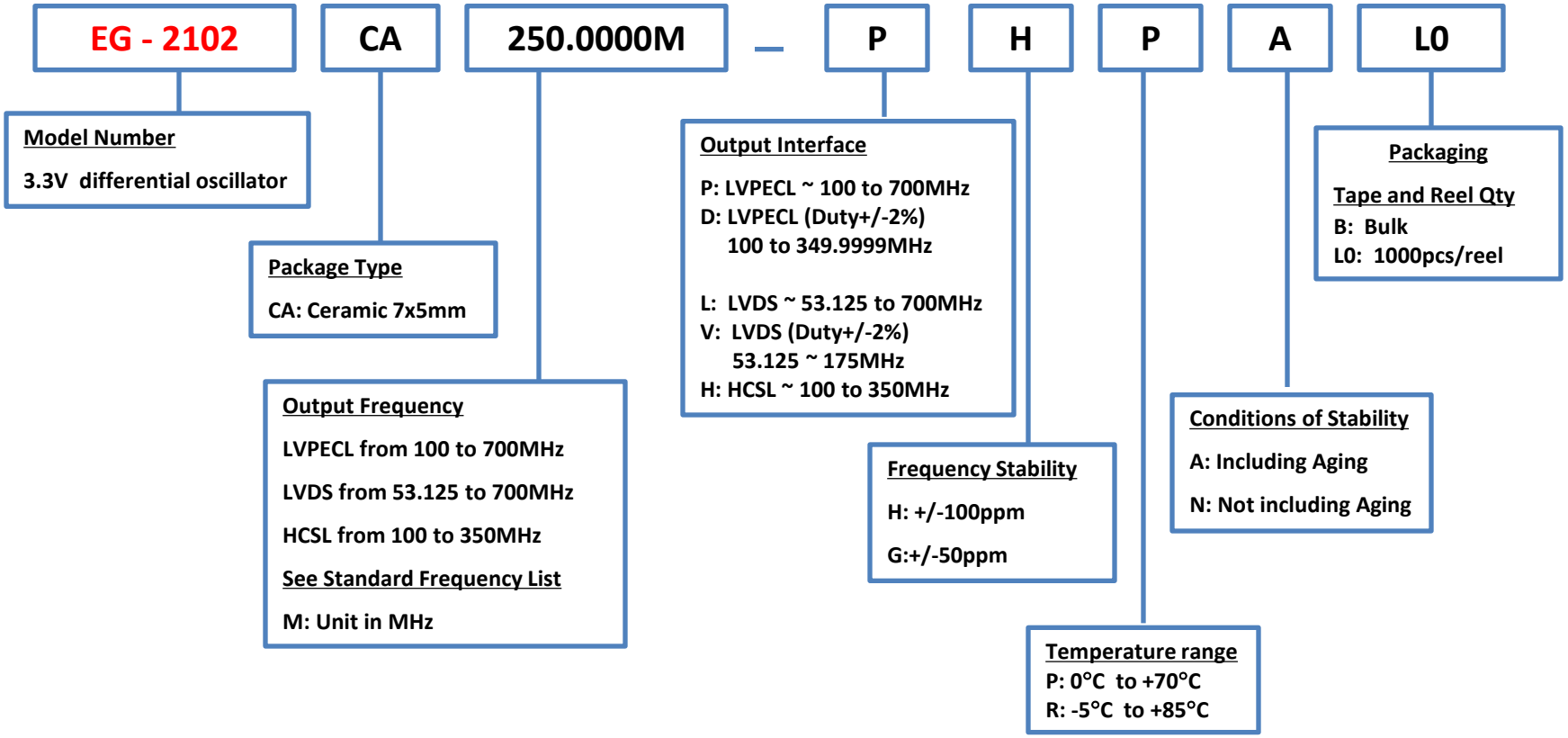
EG-2002CA DCx		EG-2002CA PCx	
62.5000	80.5664	125.0000	161.1328
64.0000	83.0000	128.0000	166.0000
66.4063	83.3143	132.8125	166.6286
66.5000	83.3333	133.0000	166.6667
66.6667	83.6658	133.3333	167.3316
67.5000	87.5000	135.0000	
71.5000	90.0000	143.0000	
75.0000	100.0000	150.0000	
77.7600	106.2500	155.5200	
78.1250		156.2500	
79.6875		159.3750	
80.0000		160.0000	

EPSON

Product Configuration System

Crystal Oscillators – Low Jitter (SAW)

Discontinued



Unavailable Combinations

xGRA

For xGPA & xGRN
please contact EPSON

Available Combinations

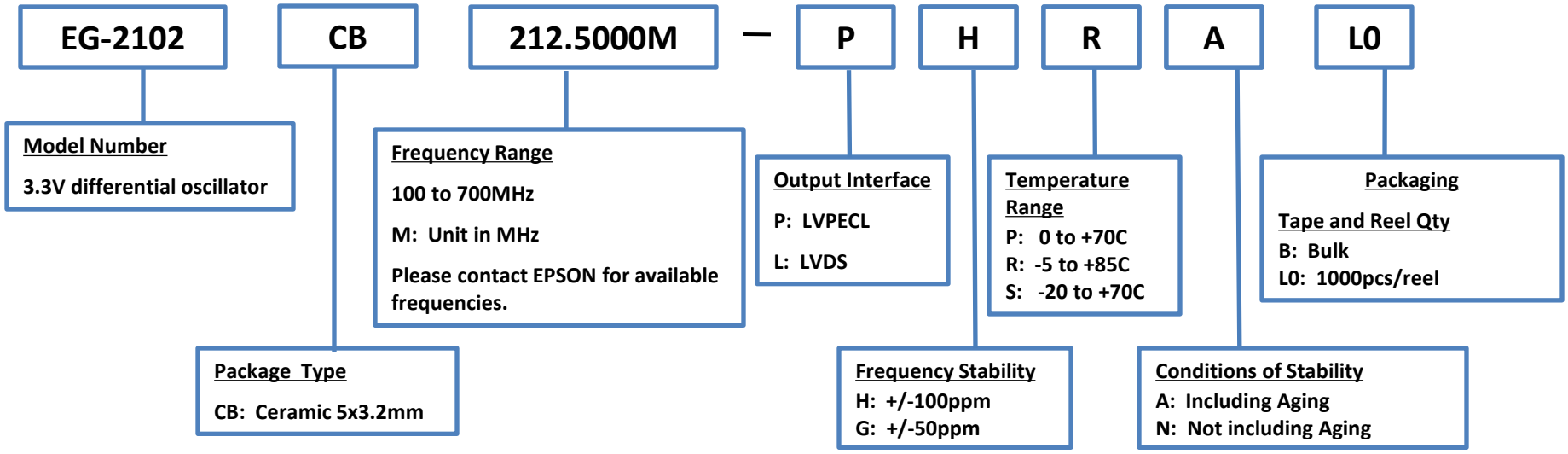
xHPA xHPN xHRA

xHRN xGPN

EPSON

Product Configuration System

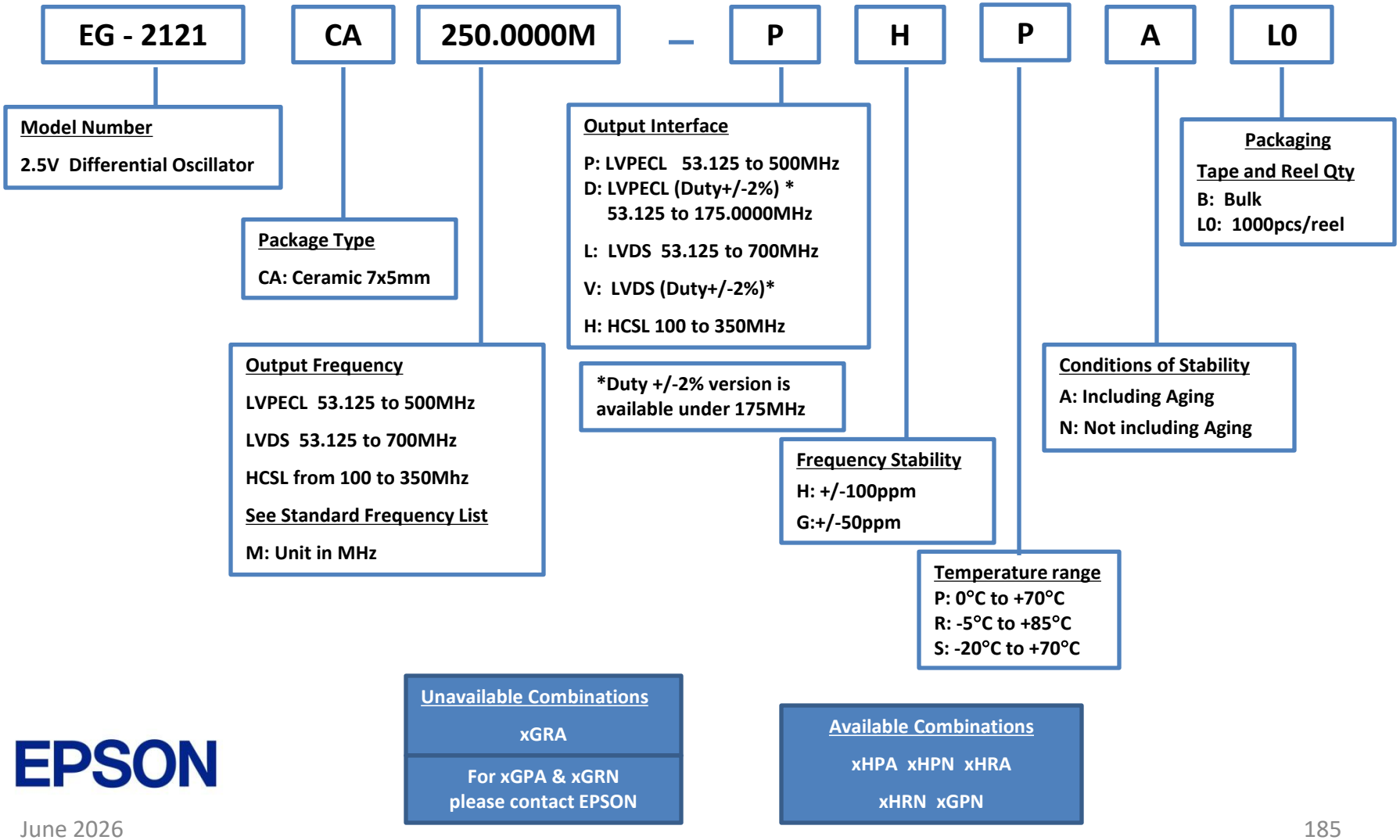
Crystal Oscillators – Low Jitter (SAW)



Product Configuration System

Crystal Oscillators – Low Jitter (SAW)

Not Recommended



EPSON

Standard Frequencies

EG-2121 P (LVPECL)

53.1250 *	97.6563	195.3125	390.6250
62.5000 *	98.3040	196.6080	393.2160
66.6667 *	100.0000	200.0000	400.0000
75.0000 *	106.2500	212.5000	425.0000
78.1250 *	124.4160	248.8320	497.6640
79.6875 *	125.0000	250.0000	500.0000
80.0000 *	132.8125	265.6250	
87.5000 *	133.0000	266.0000	
	148.3517	296.7033	
	150.0000	300.0000	
	150.8072	301.6144	
	155.5200	311.0400	
	156.2500	312.5000	
	159.3750	318.7500	
	161.1328	322.2657	
	164.3555	328.7110	
	166.6286	333.2572	
	167.3317	334.6633	
	173.3708	346.7415	
	175.0000	350.0000	
* Frequency only available for xHPA and xHPN			

Standard Frequencies

EG-2121 L (LVDS)

53.1250 *	97.6563	195.3125	390.6250
62.5000 *	98.3040	196.6080	393.2160
66.6667 *	100.0000	200.0000	400.0000
75.0000 *	106.2500	212.5000	425.0000
78.1250 *	124.4160	248.8320	497.6640
79.6875 *	125.0000	250.0000	500.0000
80.0000 *	132.8125	265.6250	531.2500
87.5000 *	133.0000	266.0000	532.0000
	148.3517	296.7033	593.4066
	150.0000	300.0000	600.0000
	150.8072	301.6144	603.2288
	156.2500	312.5000	625.0000
	159.3750	318.7500	637.5000
	161.1328	322.2656	644.5313
	164.3555	328.7109	657.4219
	166.6286	333.2571	666.5143
	167.3316	334.6633	669.3266
	173.3707	346.7415	693.4830
	175.0000	350.0000	700.0000
* Frequency only available for xHPA and xHPN			

Standard Frequencies

EG-2121 (HCSL)

-	195.3125
-	196.6080
100.0000	200.0000
106.2500	212.5000
124.4160	248.8320
125.0000	250.0000
132.8125	265.6250
133.0000	266.0000
148.3517	296.7033
150.0000	300.0000
150.8072	301.6144
155.5200	311.0400
156.2500	312.5000
159.3750	318.7500
161.1328	322.2656
164.3555	328.7109
166.6286	333.2571
167.3316	334.6633
173.3707	346.7415
175.0000	350.0000

Standard Frequencies

EG-2102P (LVPECL)

-	195.3125	390.6250
-	196.6080	393.2160
100.0000	200.0000	400.0000
106.2500	212.5000	425.0000
124.4160	248.8320	497.6640
125.0000	250.0000	500.0000
132.8125	265.6250	531.2500
133.0000	266.0000	532.0000
148.3517	296.7033	593.4066
150.0000	300.0000	600.0000
150.8072	301.6144	603.2288
155.5200	311.0400	622.0800
156.2500	312.5000	625.0000
159.3750	318.7500	637.5000
161.1328	322.2656	644.5313
164.3555	328.7109	657.4219
166.6286	333.2571	666.5143
167.3316	334.6633	669.3266
173.3707	346.7415	693.4830
175.0000	350.0000	700.0000

Standard Frequencies

EG-2102 L (LVDS)

53.1250 *	97.6563	195.3125	390.6250
62.5000 *	98.3040	196.6080	393.2160
66.6667 *	100.0000	200.0000	400.0000
75.0000 *	106.2500	212.5000	425.0000
78.1250 *	124.4160	248.8320	497.6640
79.6875 *	125.0000	250.0000	500.0000
80.0000 *	132.8125	265.6250	531.2500
87.5000 *	133.0000	266.0000	532.0000
	148.3517	296.7033	593.4066
	150.0000	300.0000	600.0000
	150.8072	301.6144	603.2288
	155.5200	311.0400	622.0800
	156.2500	312.5000	625.0000
	159.3750	318.7500	637.5000
	161.1328	322.2656	644.5313
	164.3555	328.7109	657.4219
	166.6286	333.2571	666.5143
	167.3316	334.6633	669.3266
	173.3707	346.7415	693.4830
	175.0000	350.0000	700.0000

* Frequency only available for xHPA and xHPN

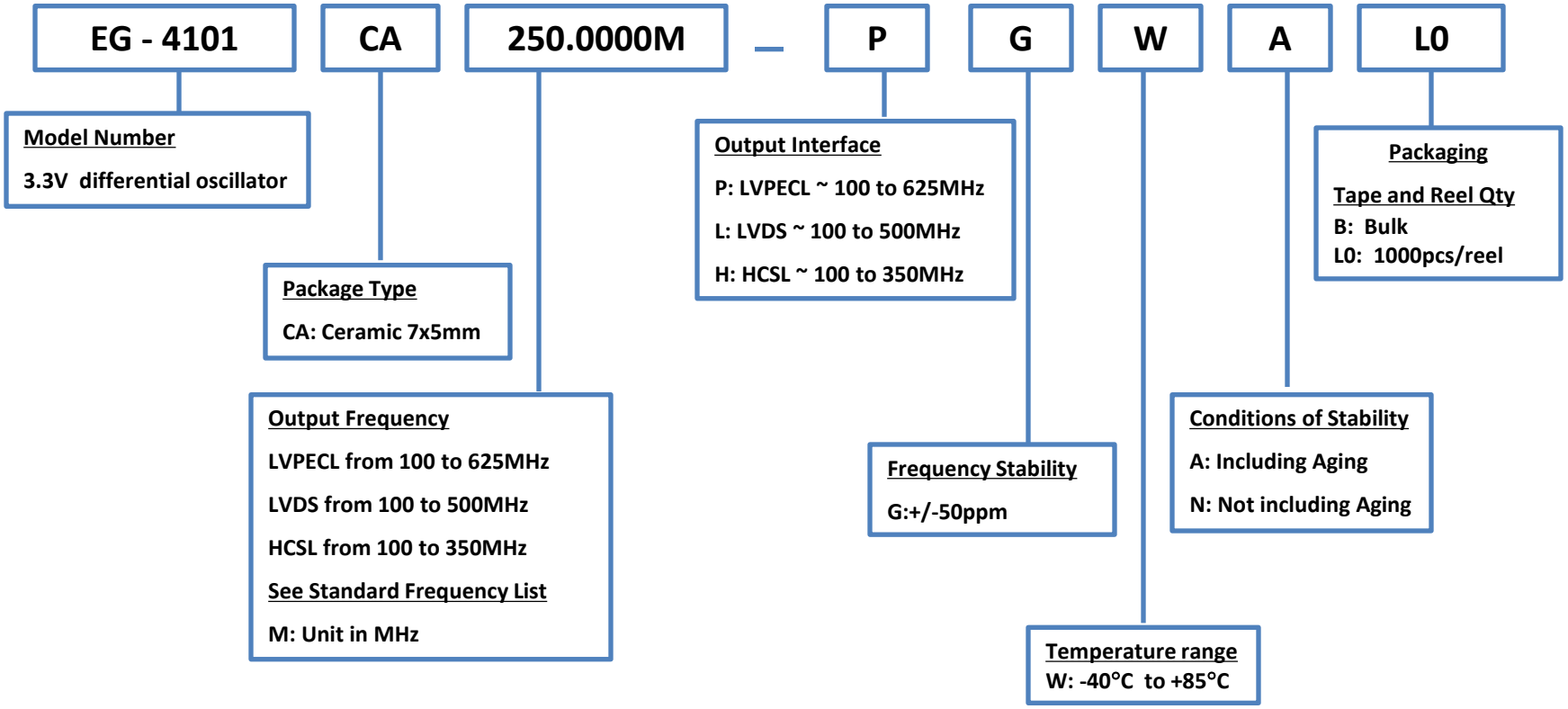
Standard Frequencies

EG-2102P (HCSL)

-	195.3125
-	196.6080
100.0000	200.0000
106.2500	212.5000
124.4160	248.8320
125.0000	250.0000
132.8125	265.6250
133.0000	266.0000
148.3517	296.7033
150.0000	300.0000
150.8072	301.6144
155.5200	311.0400
156.2500	312.5000
159.3750	318.7500
161.1328	322.2656
164.3555	328.7109
166.6286	333.2571
167.3316	334.6633
173.3707	346.7415
175.0000	350.0000

Product Configuration System

Crystal Oscillators – Low Jitter (SAW)



Standard Frequencies

EG-4101 (LVPECL)

100.0000	400.0000	
106.2500	425.0000	
121.1090	484.4360	
133.0000	532.0000	
140.0000	560.0000	
140.6665	562.6660	
156.2500	625.0000	
161.1320		
168.0407		
170.0000		
200.0000		
212.5000		
242.2180		
266.0000		
280.0000		
281.3330		
312.5000		
322.2640		
336.0814		
340.0000		

EPSON

Standard Frequencies

EG-4101 (LVDS)

100.0000	400.0000	
106.2500	425.0000	
121.1090	484.4360	
133.0000		
140.0000		
140.6665		
156.2500		
161.1320		
168.0407		
170.0000		
200.0000		
212.5000		
242.2180		
266.0000		
280.0000		
281.3330		
312.5000		
322.2640		
336.0814		
340.0000		

EPSON

Standard Frequencies

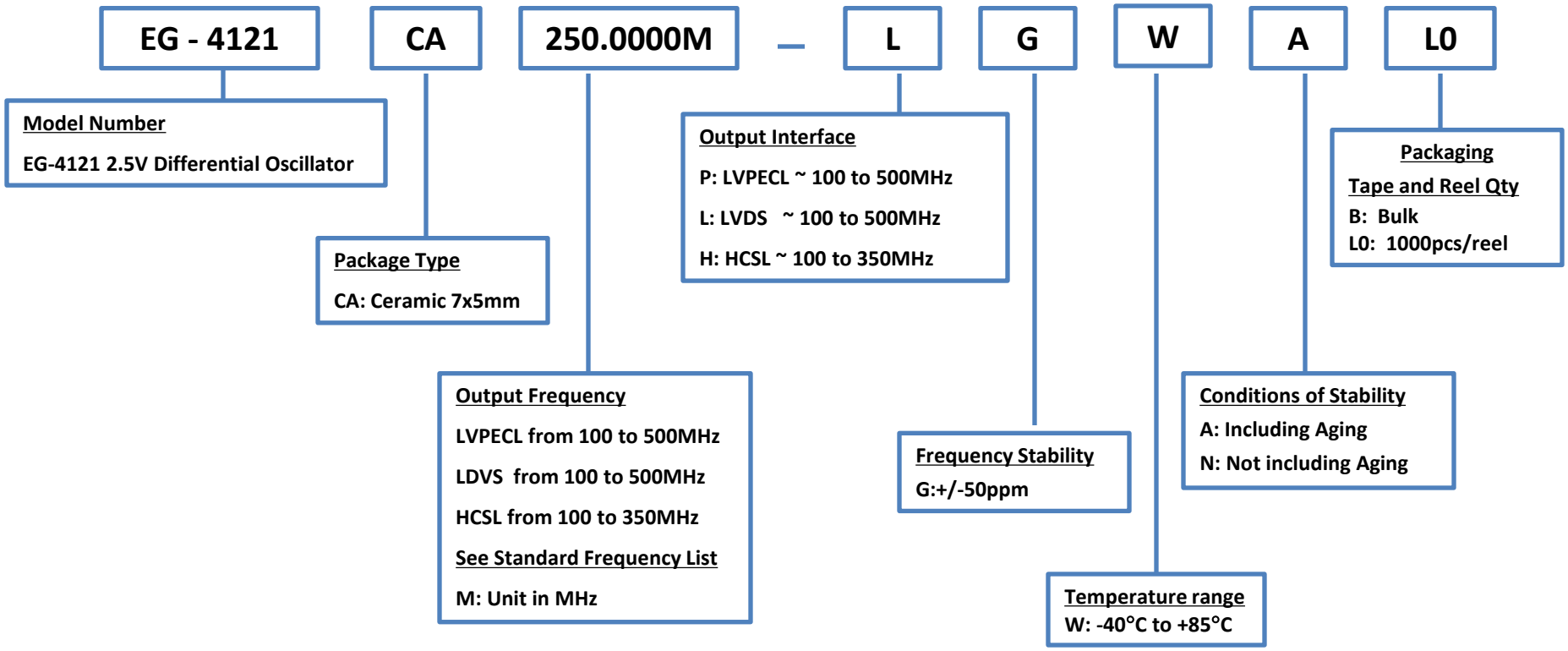
EG-4101 (HCSL)

100.0000		
106.2500		
121.1090		
133.0000		
140.0000		
140.6665		
156.2500		
161.1320		
168.0407		
170.0000		
200.0000		
212.5000		
242.2180		
266.0000		
280.0000		
281.3330		
312.5000		
322.2640		
336.0814		
340.0000		

EPSON

Product Configuration System

Crystal Oscillators – Low Jitter (SAW)



Standard Frequencies

EG-4101 (LVPECL)

100.0000	400.0000	
106.2500	425.0000	
121.1090	484.4360	
133.0000		
140.0000		
140.6665		
156.2500		
161.1320		
168.0407		
170.0000		
200.0000		
212.5000		
242.2180		
266.0000		
280.0000		
281.3330		
312.5000		
322.2640		
336.0814		
340.0000		

EPSON

Standard Frequencies

EG-4101 (LVDS)

100.0000	400.0000	
106.2500	425.0000	
121.1090	484.4360	
133.0000		
140.0000		
140.6665		
156.2500		
161.1320		
168.0407		
170.0000		
200.0000		
212.5000		
242.2180		
266.0000		
280.0000		
281.3330		
312.5000		
322.2640		
336.0814		
340.0000		

EPSON

Standard Frequencies

EG-4101 (HCSL)

100.0000		
106.2500		
121.1090		
133.0000		
140.0000		
140.6665		
156.2500		
161.1320		
168.0407		
170.0000		
200.0000		
212.5000		
242.2180		
266.0000		
280.0000		
281.3330		
312.5000		
322.2640		
336.0814		
340.0000		

EPSON

High-Frequency Applications for SAW Oscillators

- 75.000M Serial ATA/SAS
- 98.304M 1394b
- 100.000M PCI-Express, Serial ATA
- 106.250M Fibre Channel
- 125.000M 1GbEthernet; ISCSI, Infiniband, Hypertransport, PCI-express
- 133.000M Bus/Mem Clock, CPU
- 133.333M FB DIMM
- 150.000M Serial ATA, Serial SCSI
- 155.520M SONET OC-48
- 156.250M 10GbEthernet XAUI
- 159.375M 10GbFibre Channel XAUI
- 161.132M 10GbEthernet SERDES
- 164.355M 10GbFibre Channel SERDES
- 166.000M Bus/Mem Clock
- 200.000M Bus/Mem Clock
- 212.500M 4G Fibre Channel, 8Gb Fibre Channel, FCoE
- 250.000M Infiniband, High Speed Bus
- 312.500M 10GbE
- 500.000M High Speed Bus
- 622.080M SONET OC-192
- 625.000M 10GbEthernet XAUI, High Speed Bus
- 644.531M 10GbEthernet SERDES
- 669.326M SONET OC-192 Digital Wrapper

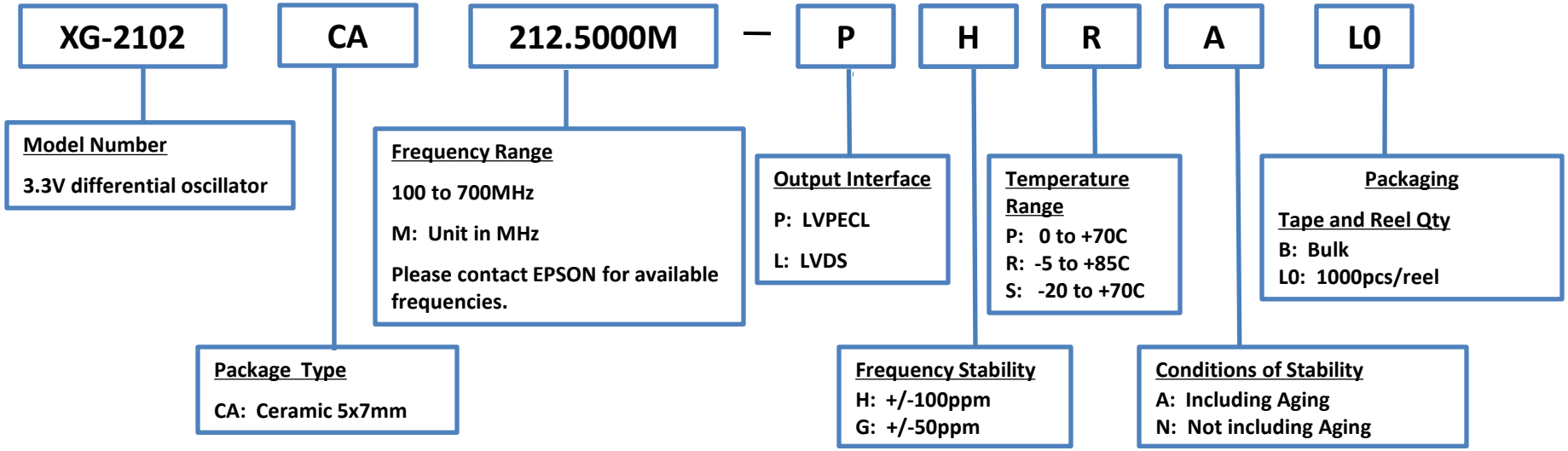
High Frequency Oscillator Applications

XO / SO (MHz)			VCXO / VCSO (MHz)		
Fibre Channel	FC-2 FC-4/-8 FC-10	106.2 212.5 / 425 159.375	SONET	OC-3/12 OC-3/12	19.44* 38.88*
Ethernet	GigE 10 GigE/Infiniband XAUI XAUI2 10 GigE PHY	125 125 / 250 156.25 312.5 161.1328 322.2656 644.5312		OC-3/12/48 OC-3 w/ FEC w/ FEC OC-6 w/ FEC w/ FEC OC-12 w/ FEC w/ FEC OC-48	77.76* 155.52* 166.6286 167.3316 311.04* 333.2572 334.6632 622.08 666.5144 669.3264 2488.32
PCI-Express	Phase 1 Phase 2 Phase 3	100 200 400			
Storage	SATA 1 SATA 2 SAS 1 SAS 2	75 / 150 150 / 300 75 / 150 150 / 300			
Computer	Bus / Mem Clock	100 / 125 / 133.33 / 166.66 200 / 266.67			* XO / SO also

Product Configuration System

Crystal Oscillators – Low Jitter (SAW)

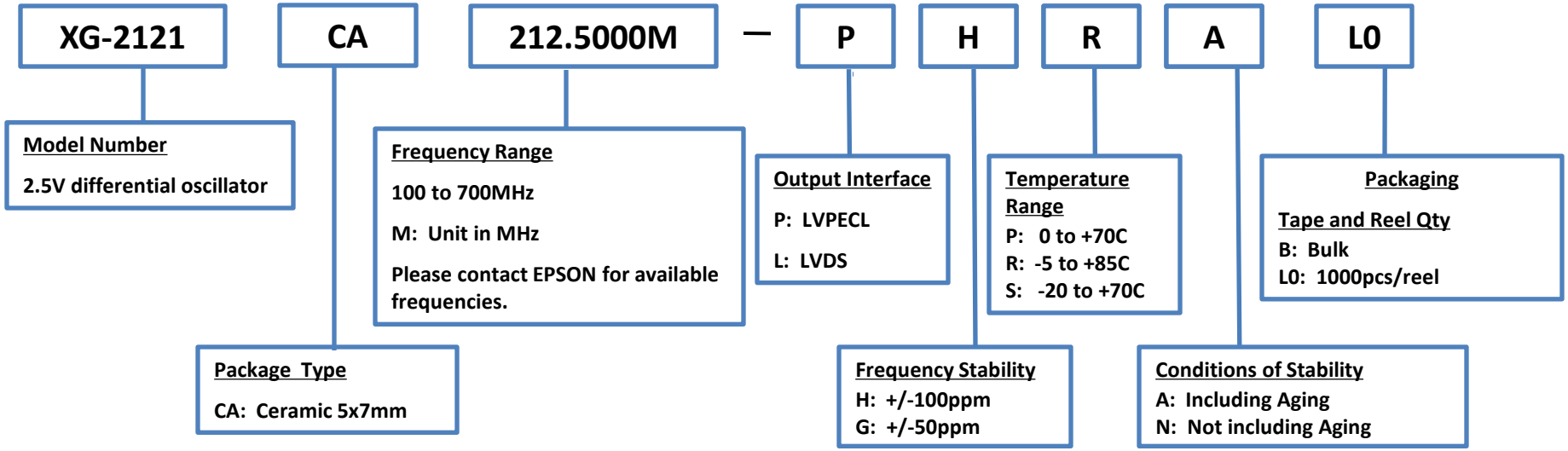
Not Recommended



Product Configuration System

Crystal Oscillators – Low Jitter (SAW)

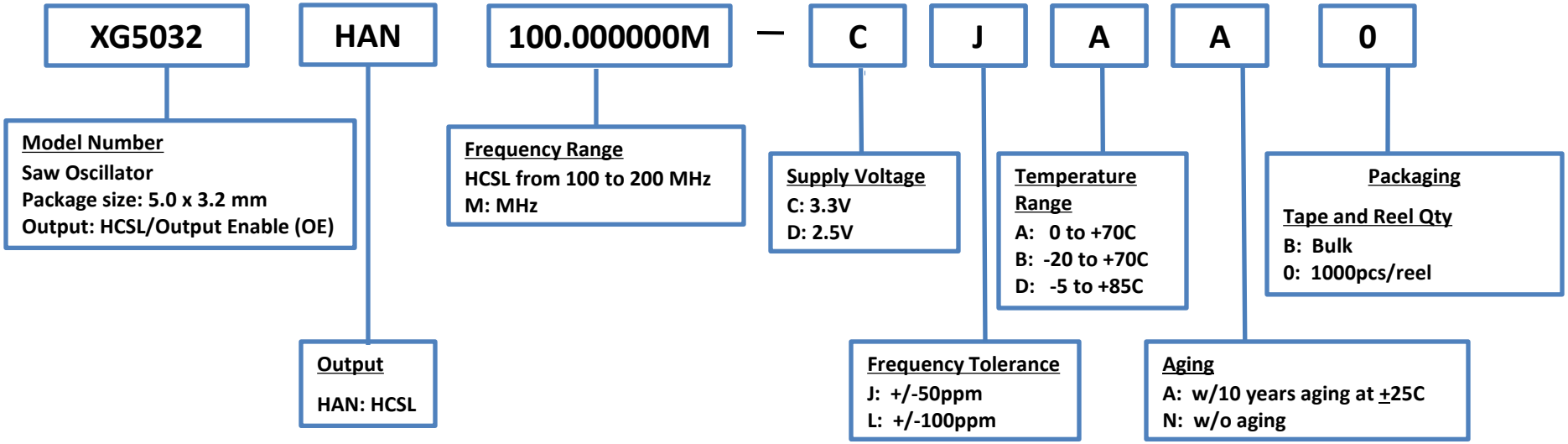
Not Recommended



Product Configuration System

Low-Jitter SAW Oscillator (SPSO)

Not Recommended



Unavailable Combinations

JDA and JBA

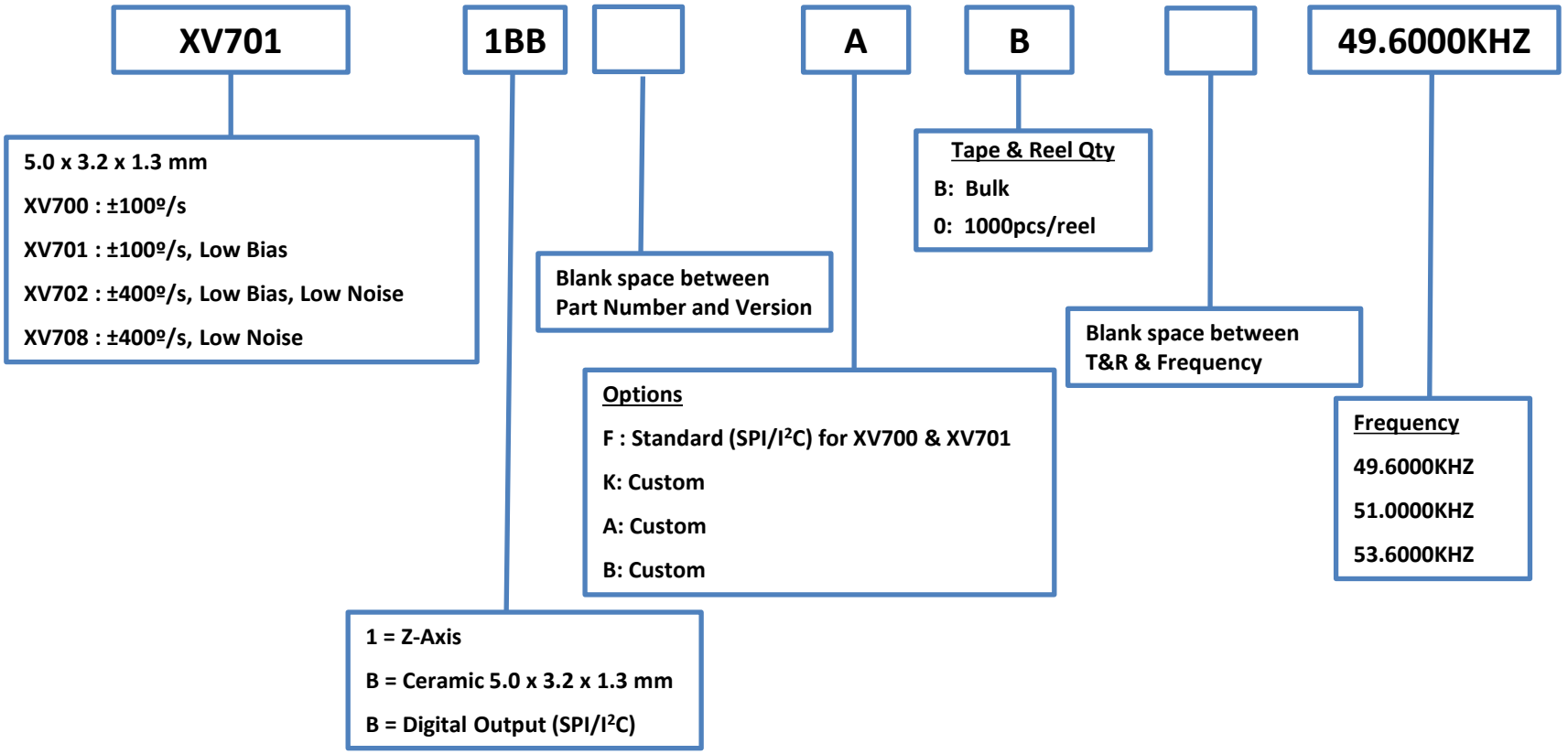
Product Configuration Guide

GYRO Sensors

EPSON

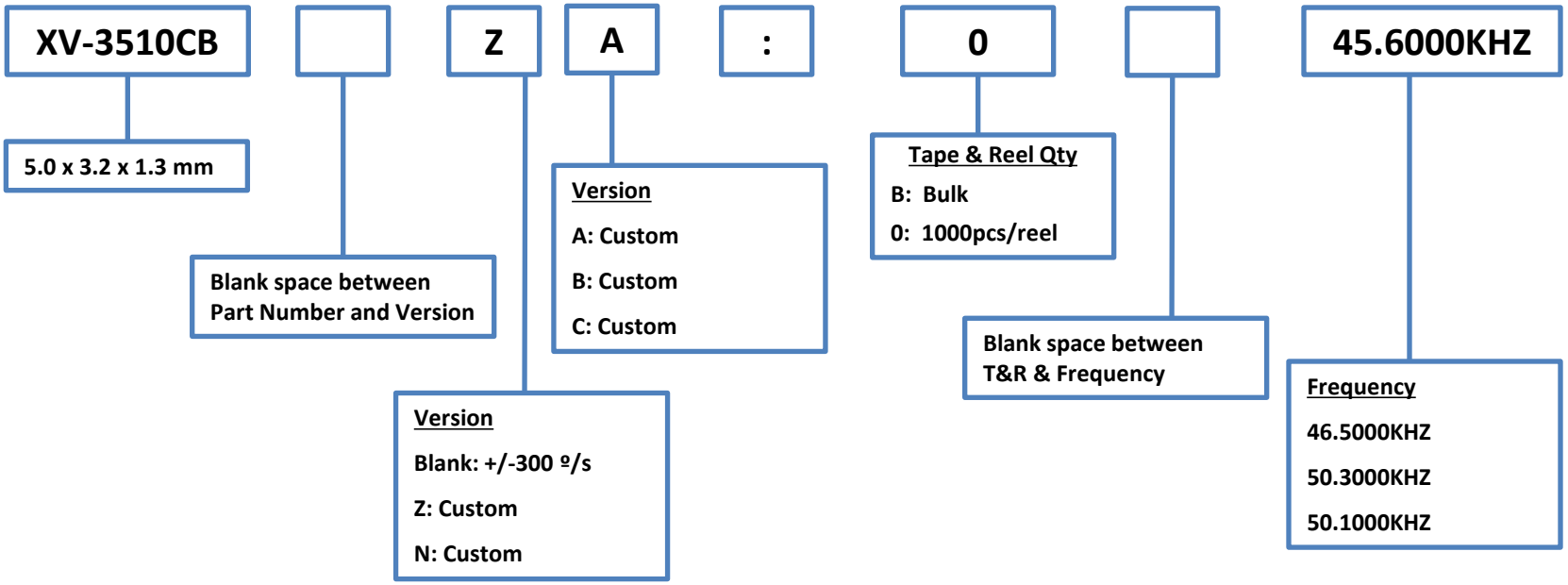
Product Configuration System

Gyro Sensor – Digital Output



Product Configuration System

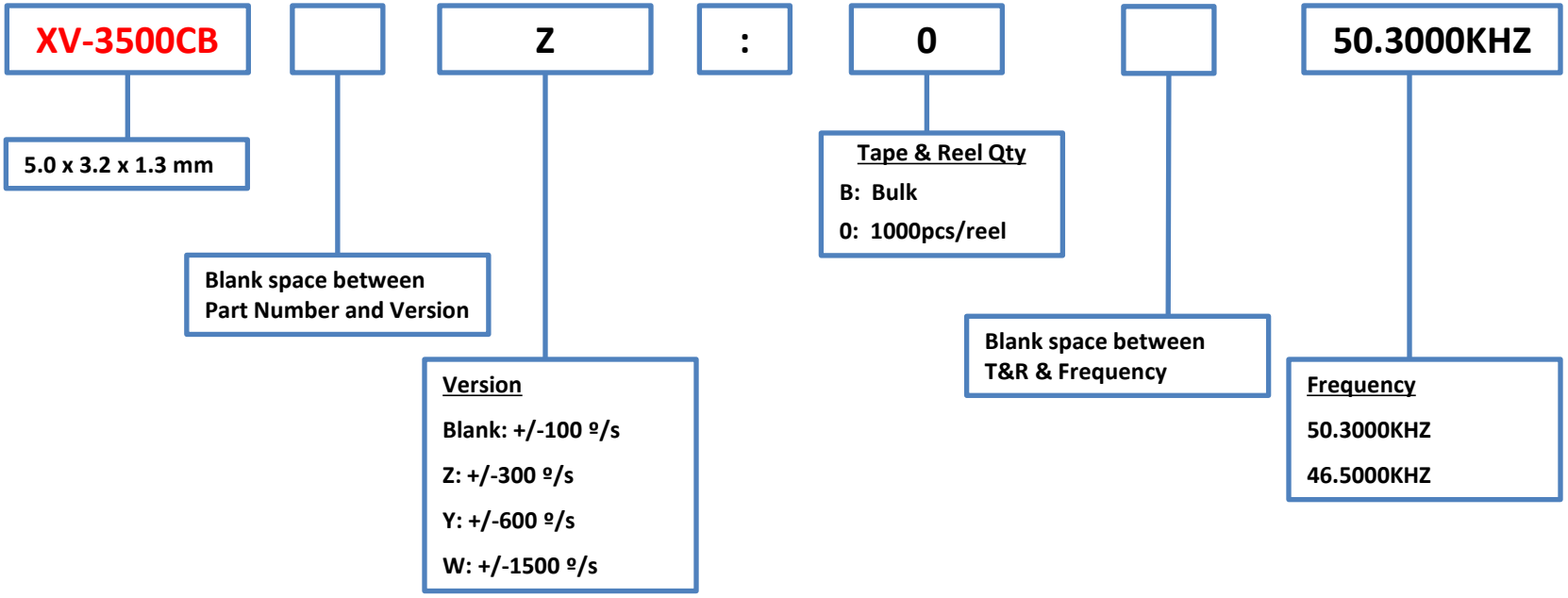
Gyro Sensor – Analog Output



Product Configuration System

Gyro Sensor – Analog Output

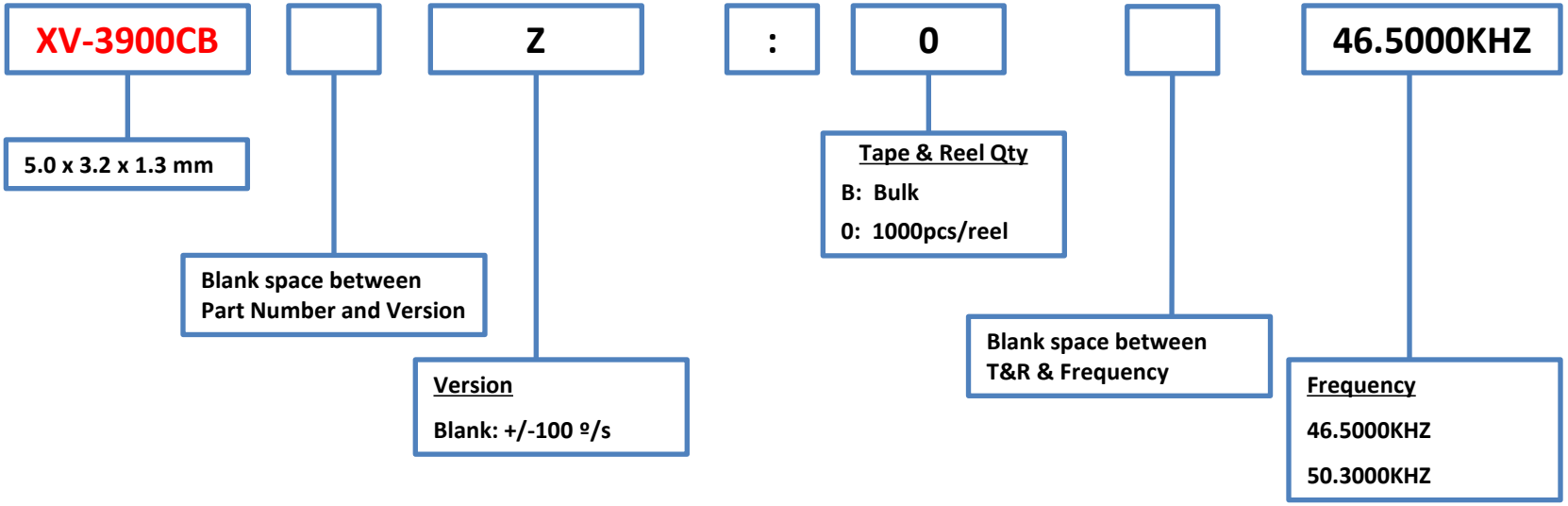
Discontinued



Product Configuration System

Gyro Sensor – Analog Output

Discontinued



Product Configuration Guide

Appendix

EPSON

Product Configuration System

Crystal Units Load Cap Codes and Values (as of March 2014)

Load Cap Code	Load Cap Value
AZ	3.5
VJ	4.0
EE	4.4
AT	4.8
X	5.0
JJ	5.4
E	6.0
FF	6.4
DD	6.5
VC	6.7
AG	7.0
AR	7.1
JK	7.4
VB	7.6
AN	7.8
AJ	8.0
AS	8.5
CC	8.7
GG	8.8
AC	9.0
AM	9.2

Load Cap Code	Load Cap Value
AL	9.5
S	9.6
VF	9.8
K	10.0
HH	10.4
AK	10.5
AP	10.7
P	11.0
AY	11.2
AW	11.5
W	12.0
A	12.5
T	13.0
N	13.5
Y	14.0
VH	14.5
R	15.0
B	16.0
AV	17.0
C	18.0
L	18.3

Load Cap Code	Load Cap Value
J	18.5
AQ	19.0
G	20.0
AF	21.5
D	22.0
AU	22.5
AE	22.9
AH	23.0
V	24.0
AI	25.0
Z	26.0
AA	27.0
Q	28.0
AB	30.0
H	32.0
I	33.0
U	47.0
AD	50.0
M	100.0
F	Series