

Product Configuration Guide

CRYSTALS



- 32.768kHz Crystals
- Standard kHz Crystals
- MHz Crystals



EPSON

August 2022

NOTE: Use this updated PCS for all NEW crystal part numbers from May 2016



NEW CRYSTAL MICRO DEVICES Product Configuration Guide

EPSON

August 2022



Product Configuration System

32.768 kHz Crystal Unit

FCXXXXXX

32.768K - 90NN50KD5

1 Model
All kHz models

2 Frequency

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

- FC1610AN
- FC2012AN
- FC3215AN
- FC-13A
- FC-12M
- FC-135
- FC-135R

1	2	3	4	5	6	7	8
Model	Frequency	Load Cap	Frequency Tolerance	ESR	ESR Unit	Drive level	Tape & Reel
FCXXXXXX	32.768kHz	C5 = 12.5 pF 90 = 9.0 pF 70 = 7.0 pF	NN = +/-20 ppm AA = +/- 10 ppm	A5 = 150 kΩ 90 = 90 kΩ 70 = 70 kΩ 60 = 60 kΩ 50 = 50 kΩ	K = kΩ	A = 0.1 μW B = .25 μW C = 0.5 μW D = 1.0 μW	B = Bulk 0 = 1000pcs/reel 5 = 3000pcs/reel 7=5000pc/reel



August 2022

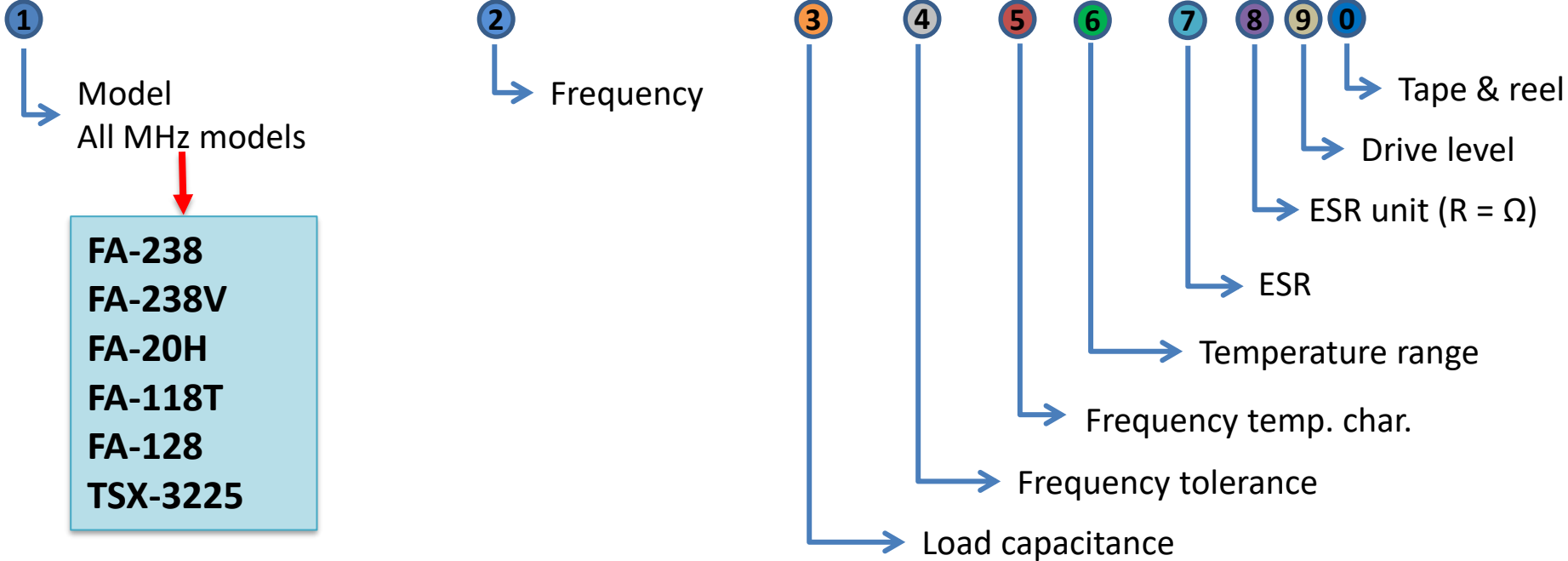
NOTES: The values listed above are common/standard values for kHz crystals; some combinations are not possible depending the specific model. Please contact you EEA representative for assistance to verify the part configuration or inquire about a certain value that is not listed above.

Product Configuration System



MHz Range Crystal Units

FAXXXXXX 38.40M – 60NNYYBA0RE5



- FA-238
- FA-238V
- FA-20H
- FA-118T
- FA-128
- TSX-3225

1 Model	3 Load cap	4 Frequency tolerance	5 Freq. temp. char.	6 Temp. range	7 8 ESR = Ω	9 Drive level	0 Tape & reel
FAXXXXXX	J0 = 18 pF	bb = +/-50 ppm	bb = +/-50 ppm	U = -20 to +75C	B0 = 200 Ω	E = 100 μW	B = Bulk
	C5 = 12.5 pF	NN = +/-20 ppm	NN = +/-20 ppm	N = -30 to +85C	A0 = 100 Ω	G = 200 μW	0 = 1000pcs/reel
	A0 = 10 pF	FF = +/-15 ppm	FF = +/-15 ppm	G = -40 to +85C	80 = 80 Ω		5 = 3000pcs/reel
	90 = 9.0 pF	AA = +/- 10 ppm	AA = +/- 10 ppm	H = -40 to 105C	60 = 60 Ω		8 = 6000 pcs/reel
	70 = 7.0 pF						

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

NOTE: This PCS applies to crystal part numbers before May 2016

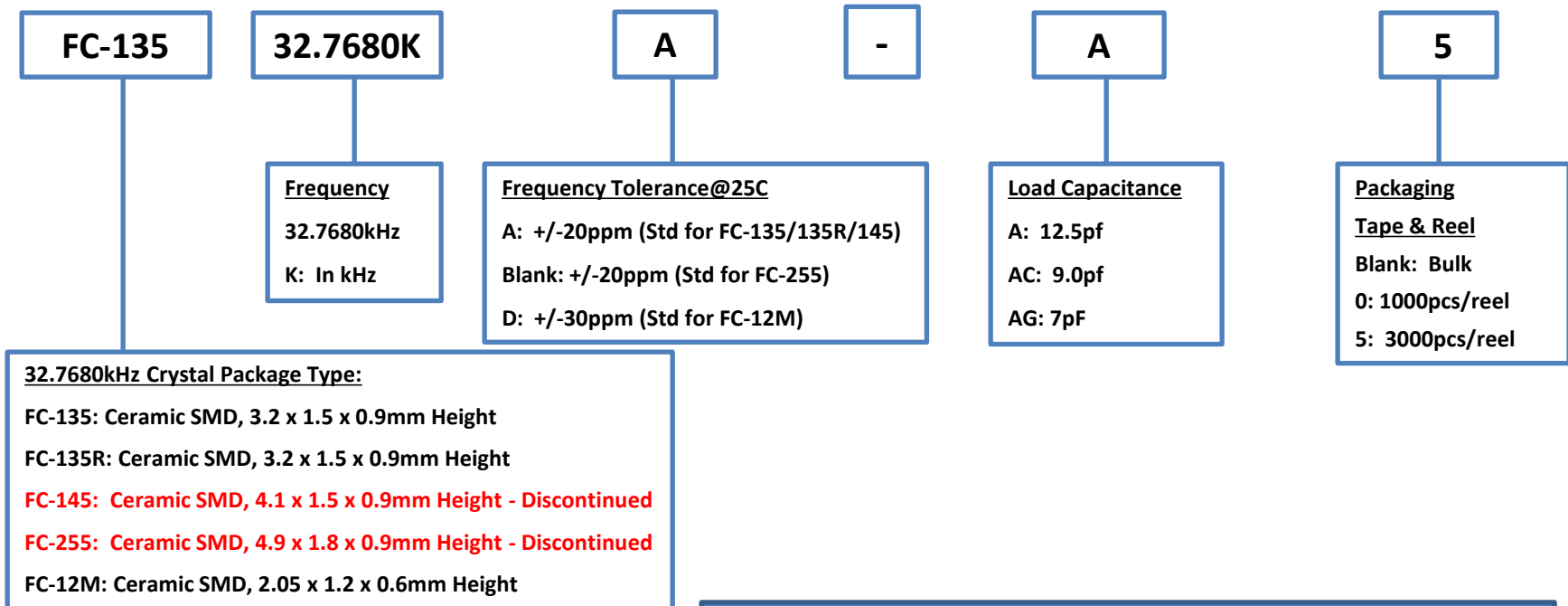
LEGACY CRYSTAL MICRO DEVICES Product Configuration Guide

EPSON

Product Configuration System



kHz Range Crystal Units



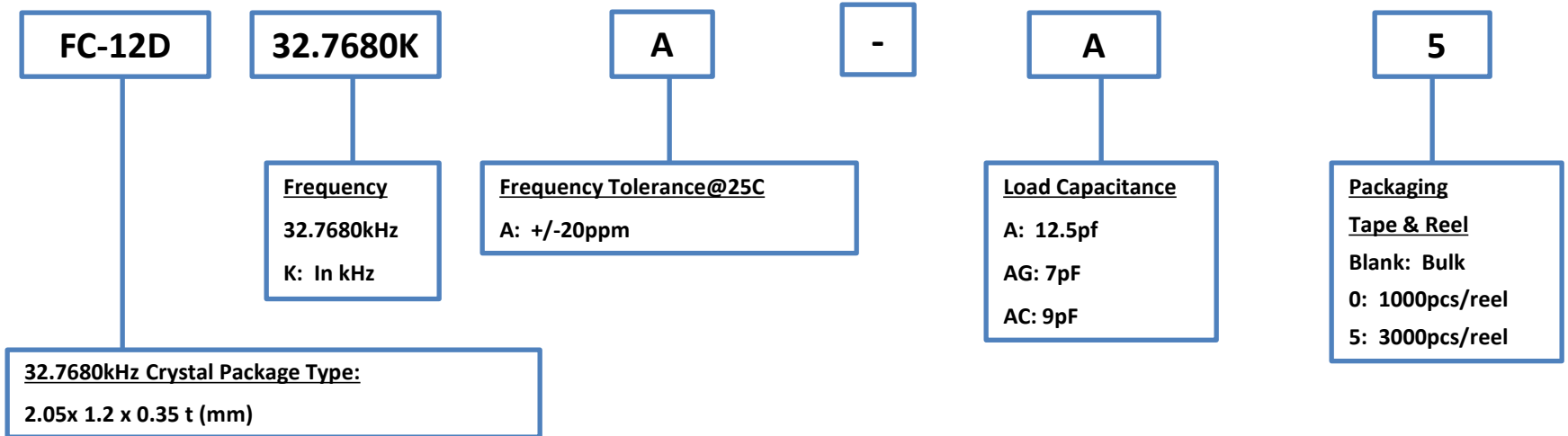
NOTES:

- 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 EEA representative for assistance.



Product Configuration System

32.768 kHz Crystal Unit with 0.35mm height for Smart Card



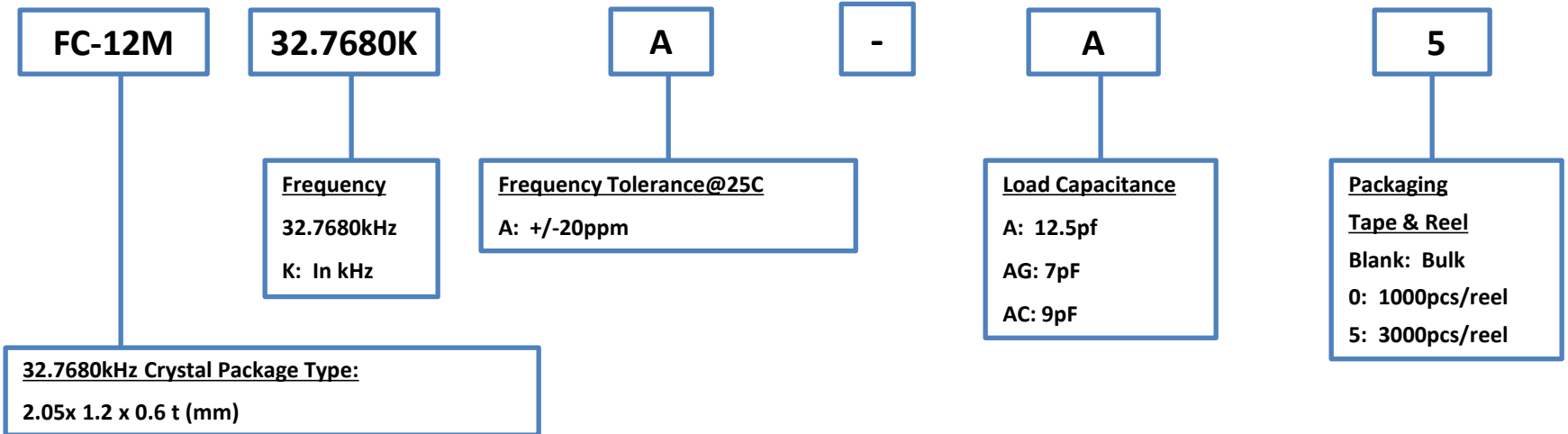
NOTES:

- 1) If your application for this part is not a Smart Card, please contact your EEA representative for assistance.
- 2) If you require a load capacitance other than the above listed, please contact your EEA representative for assistance.



Product Configuration System

kHz Range Crystal Units



NOTES:

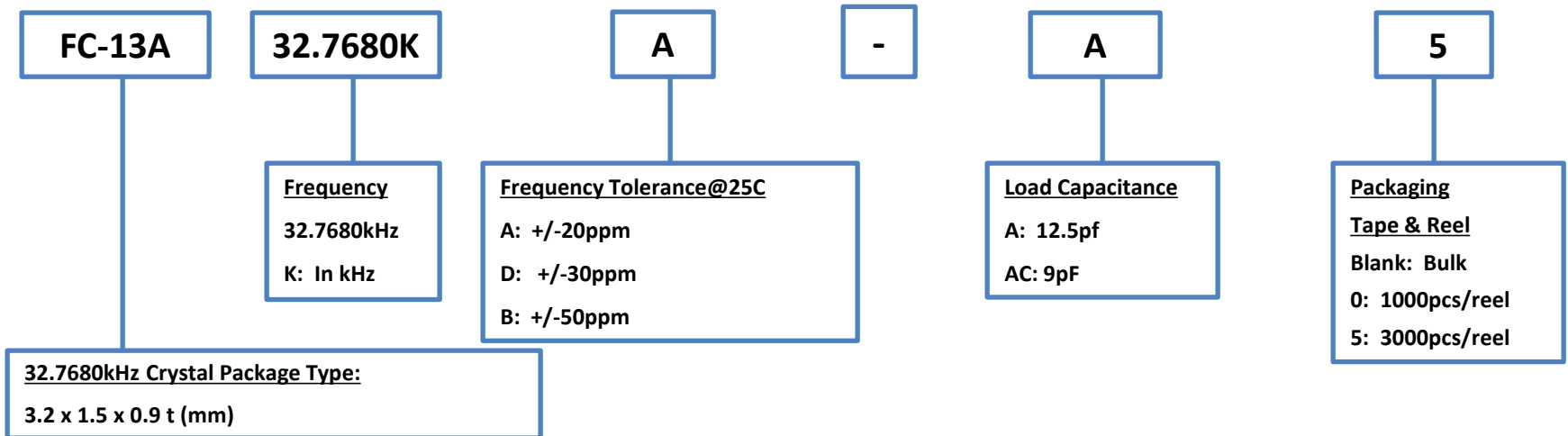
- 1) If you require a frequency or tolerance other than the above listed, please contact your EEA representative for assistance.

Product Configuration System



kHz Range Crystal Units

Non Promotional



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 EEA representative for assistance.

EPSON

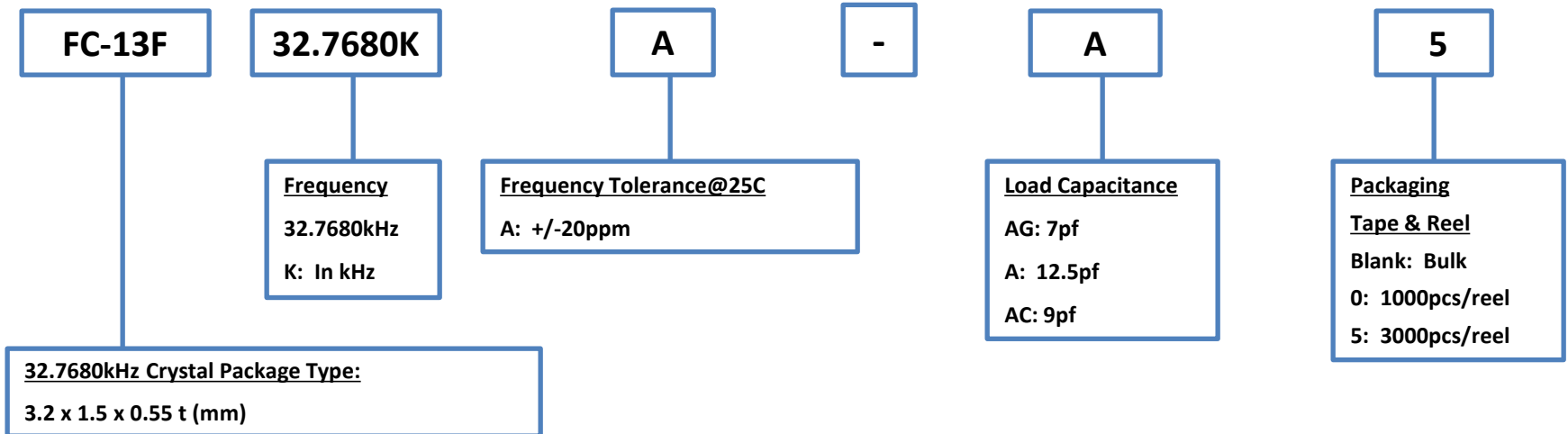
August 2022

Product Configuration System



kHz Range Crystal Units

Discontinued



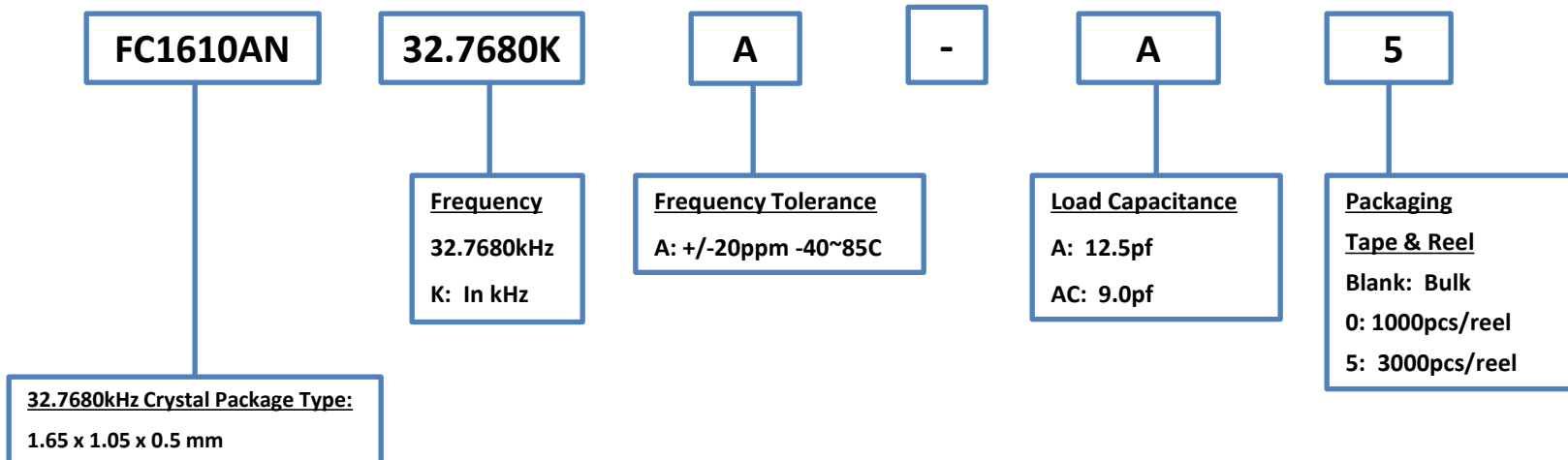
NOTES:

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

Product Configuration System



kHz Range Crystal Unit



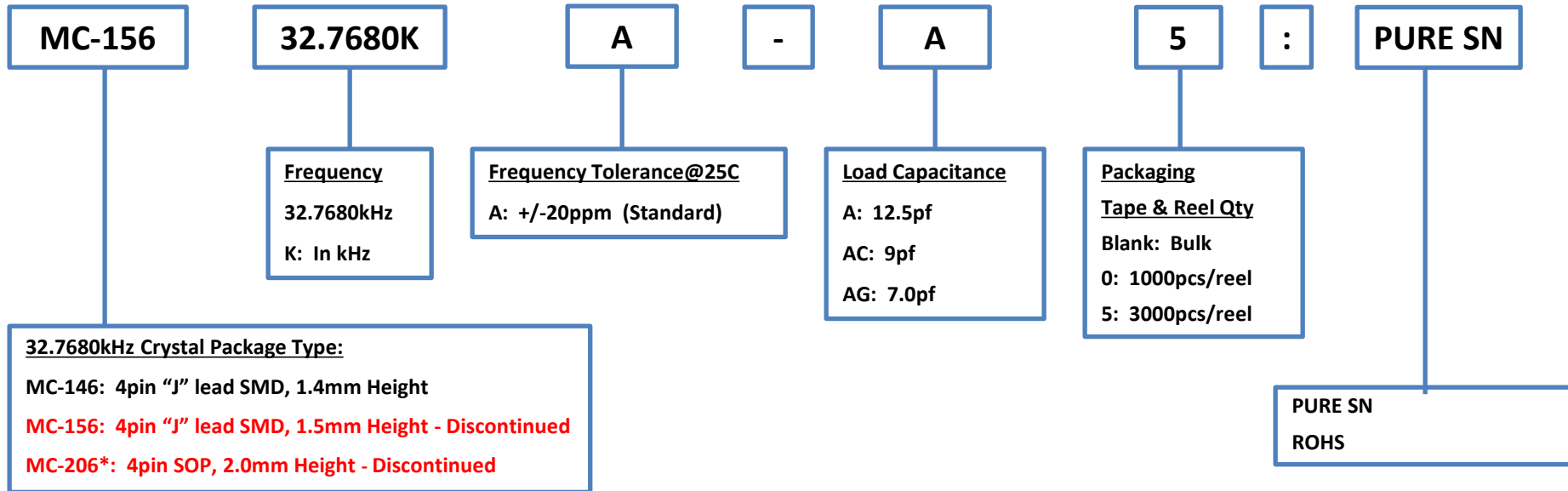
NOTES:

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

Product Configuration System



kHz Range Crystals Units



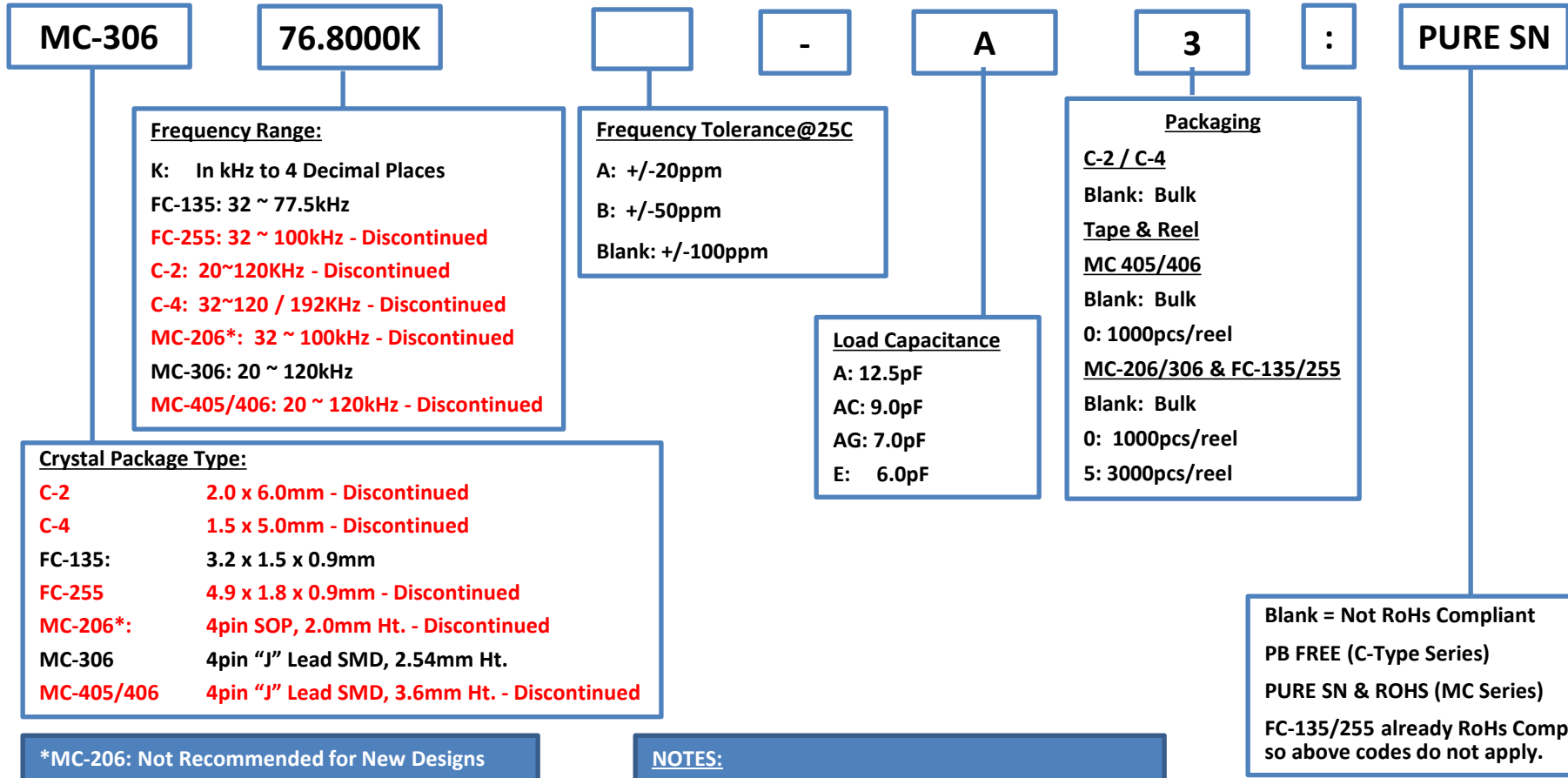
NOTES:

- 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 EEA representative for assistance.



Product Configuration System

kHz Range Crystals Units



NOTES:

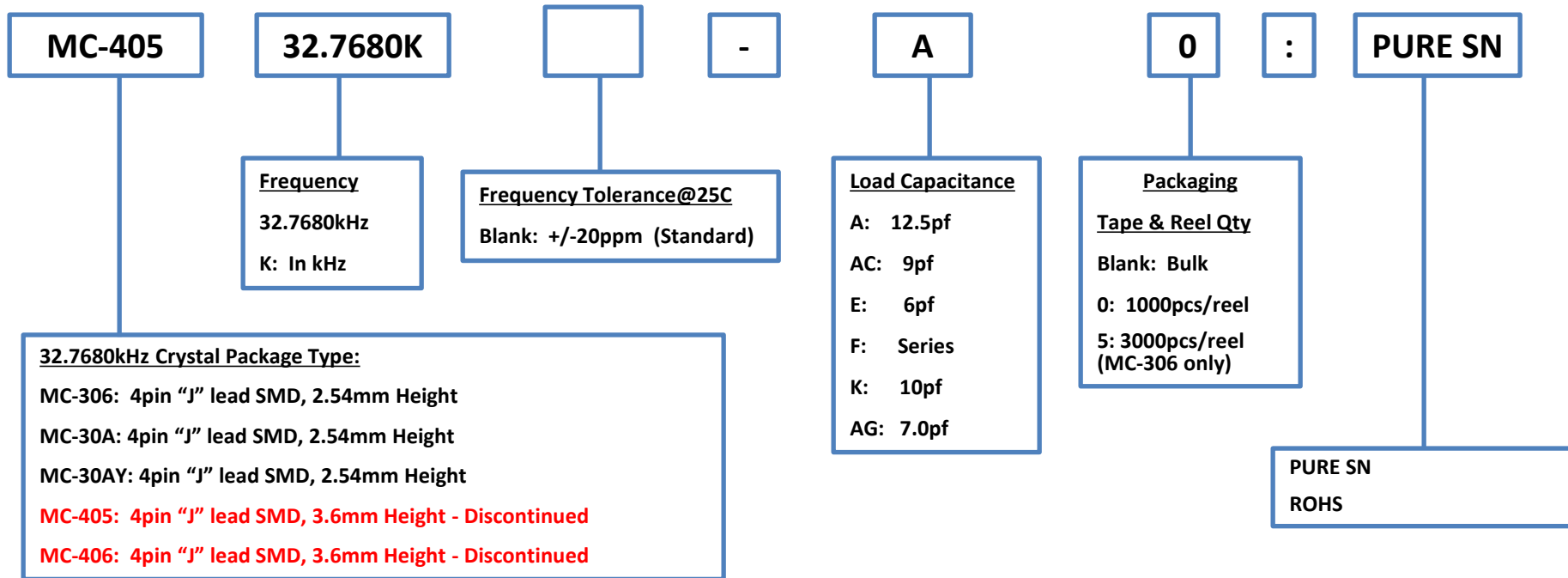
- 1) This product configuration guide is NOT applicable to 32.768kHz Crystals.
- 2) If you require a load capacitance other than the above listed, please contact your EEA representative for assistance.



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 EEA representative for assistance.

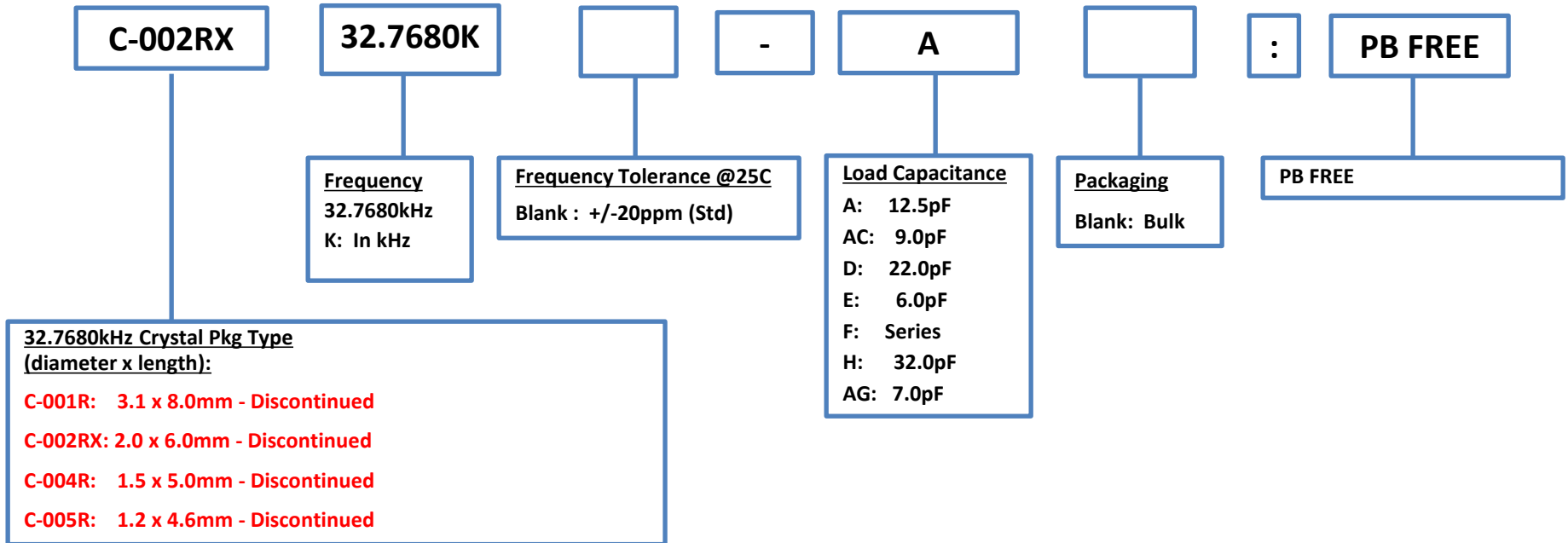


Product Configuration System



kHz Range Crystals Units

Discontinued



NOTES:

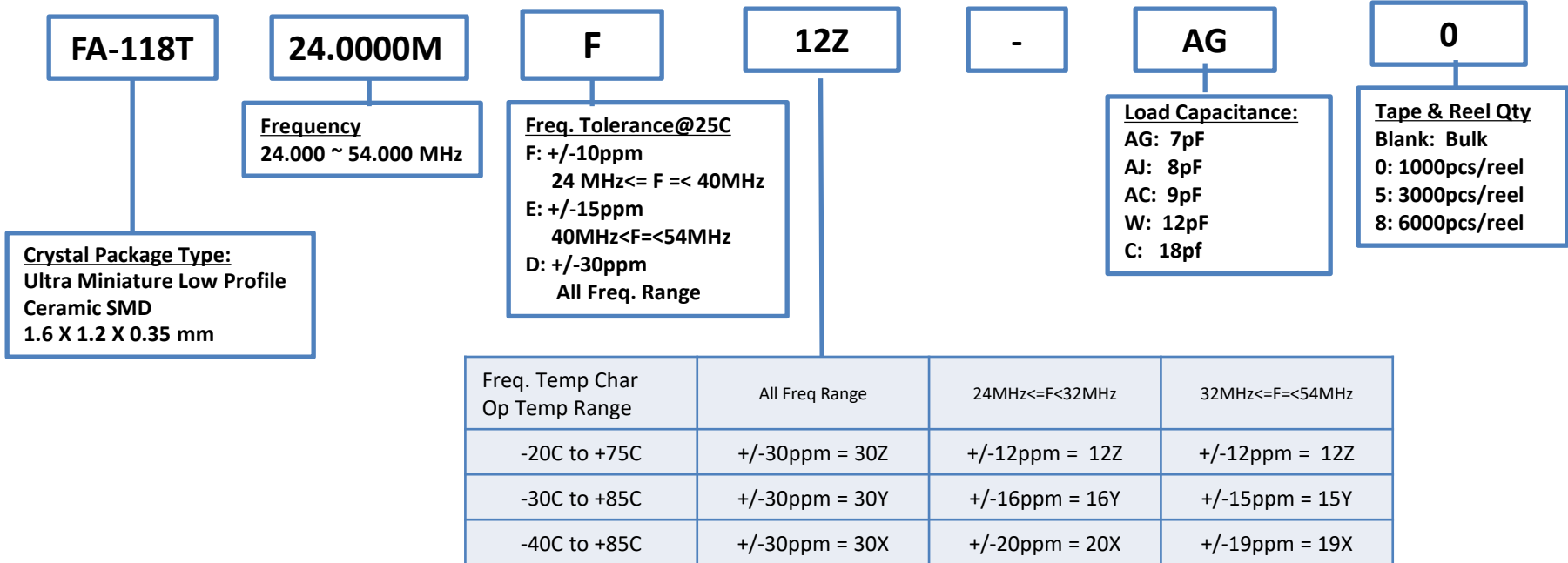
- 1) This product configuration guide is applicable only to 32.7680kHz crystals. For other frequencies, please refer to the Standard kHz Crystal Product Configuration System.
- 2) If you require a load capacitance other than the above listed, please contact your EEA representative for assistance.



Product Configuration System



MHz Range Crystals Units



NOTES:

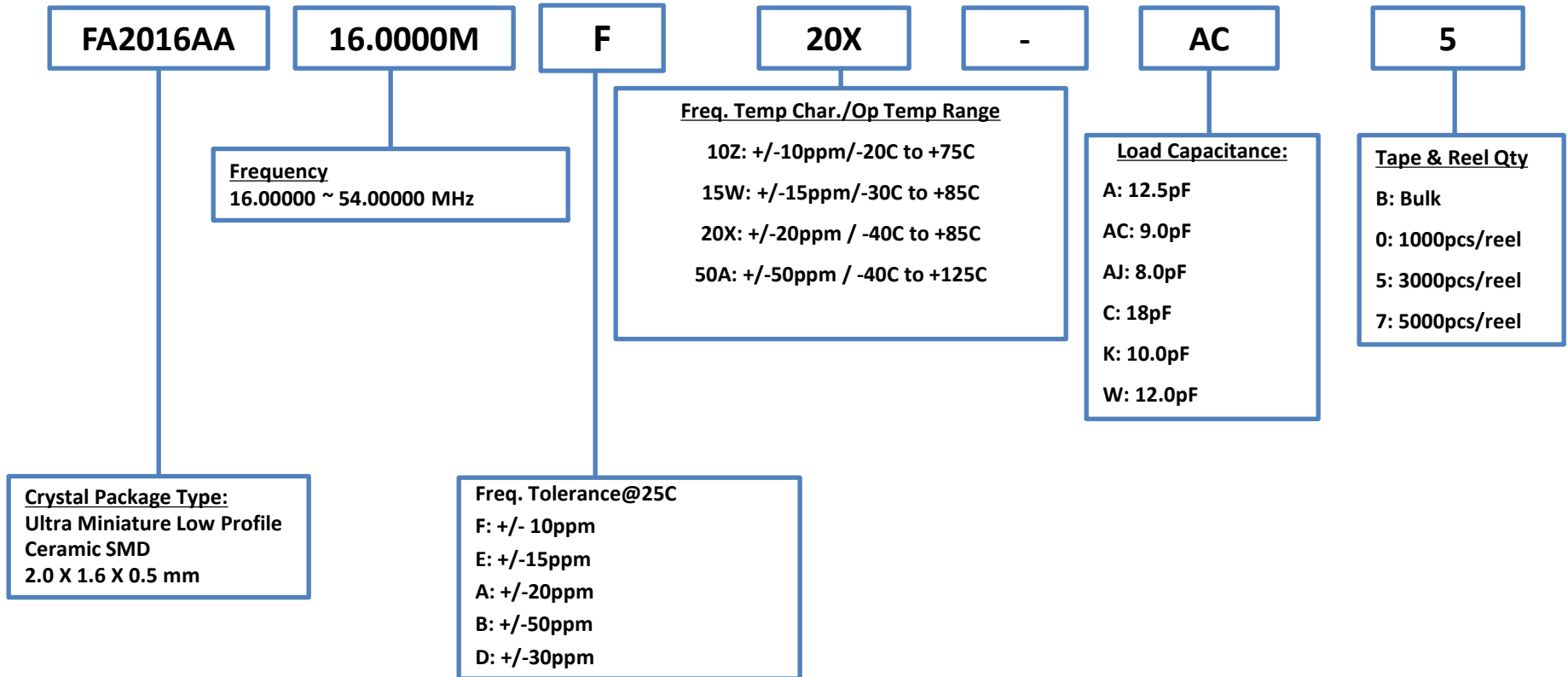
- 1) If you require frequency, tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your EEA representative for assistance.

Product Configuration System



MHz Range Crystal Units

Non Promotional



NOTES:

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

Product Configuration System



MHz Range Crystal Units

NRND

FA2016AN

24.0000M

F

10Z

-

K

5

Frequency
24.00000 ~ 54.00000 MHz

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

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

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

NOTES:

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

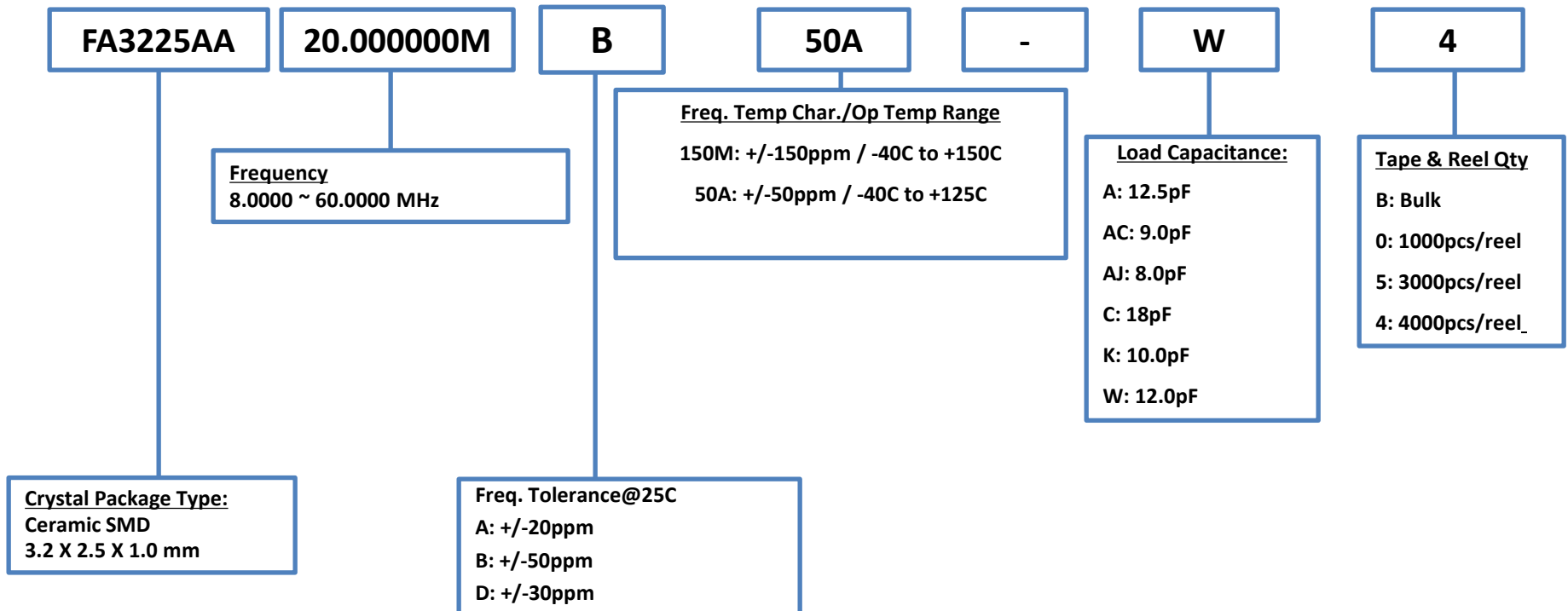


Product Configuration System



MHz Range Crystal Units

Non Promotional



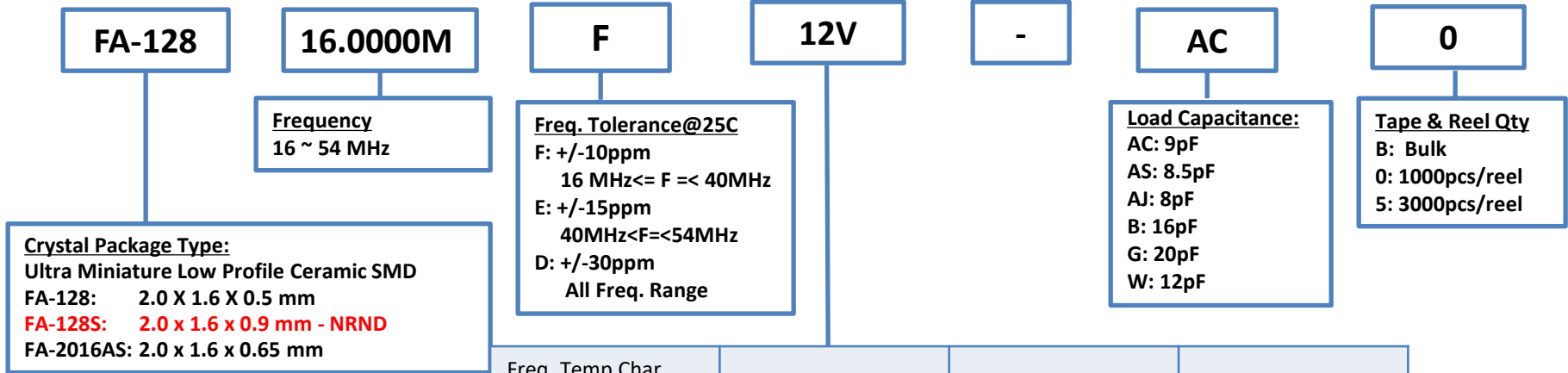
NOTES:

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

Product Configuration System



MHz Range Crystals Units



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

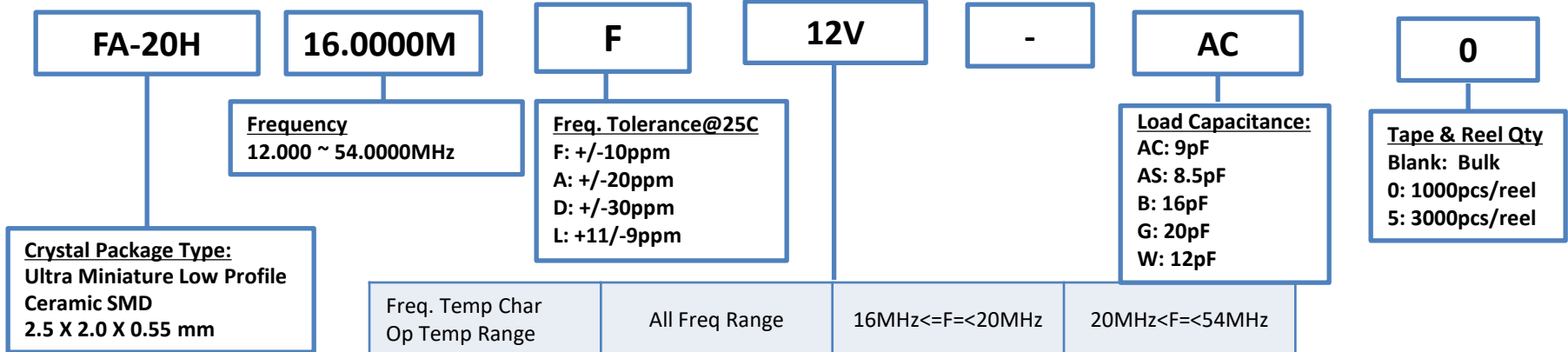


NOTES:
1) If you require frequency, tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your EEA representative for assistance.

Product Configuration System



MHz Range Crystals Units



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 EEA representative for assistance.

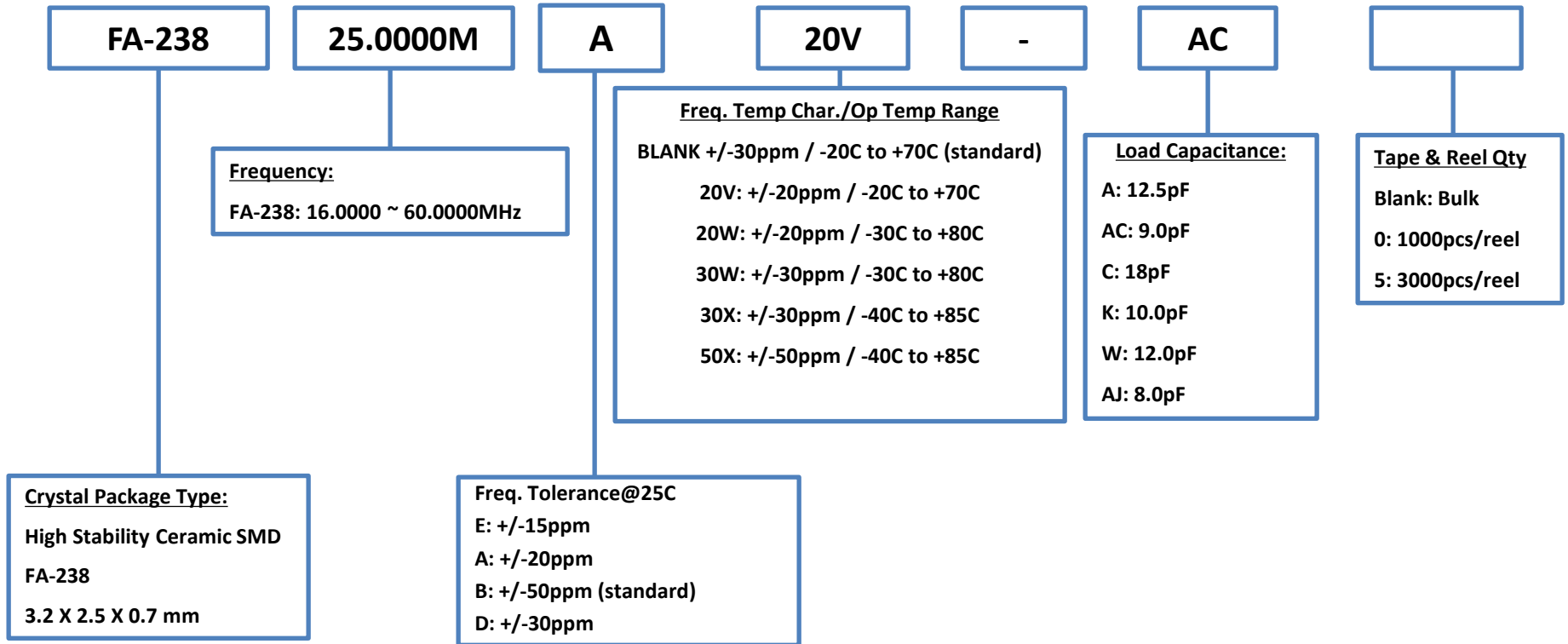


Product Configuration System



MHz Range Crystal Units

Non Promotional



NOTES:

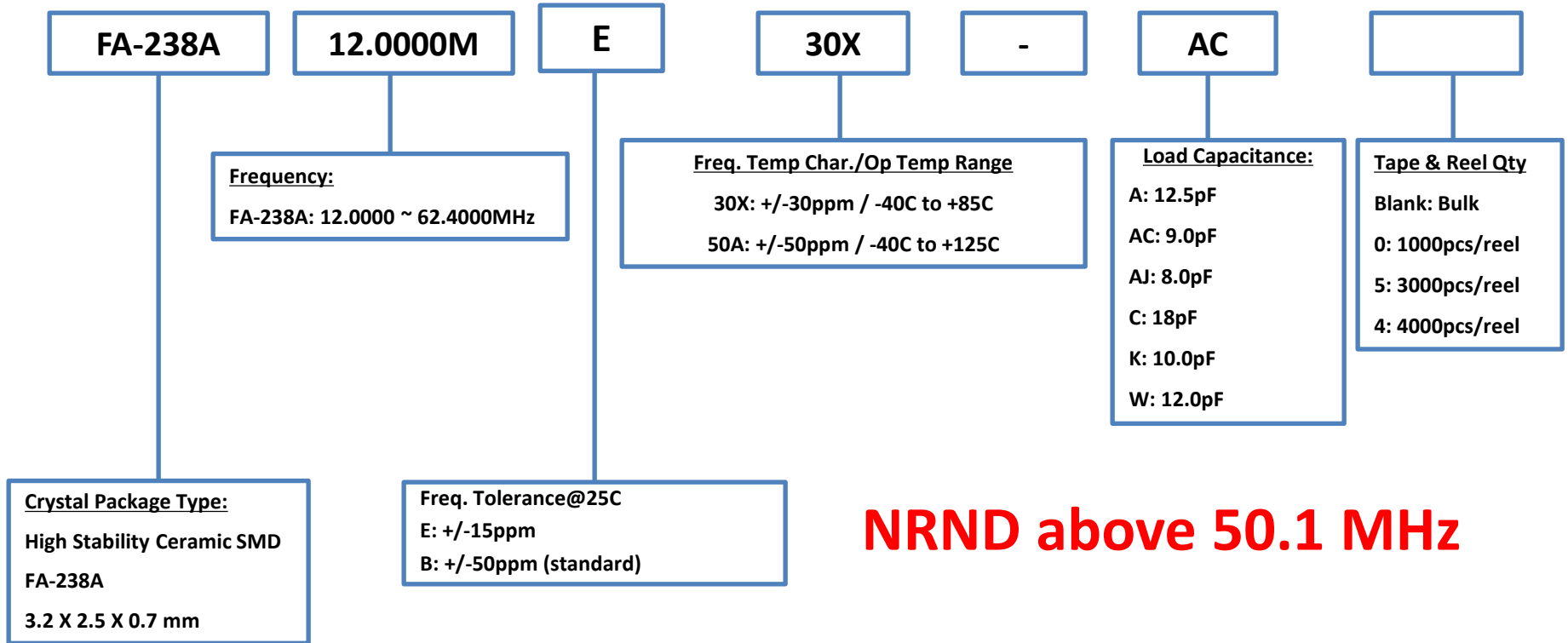
- 1) If you require frequency, tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your EEA representative for assistance.

EPSON

Product Configuration System



MHz Range Crystal Units



NRND above 50.1 MHz

NOTES:

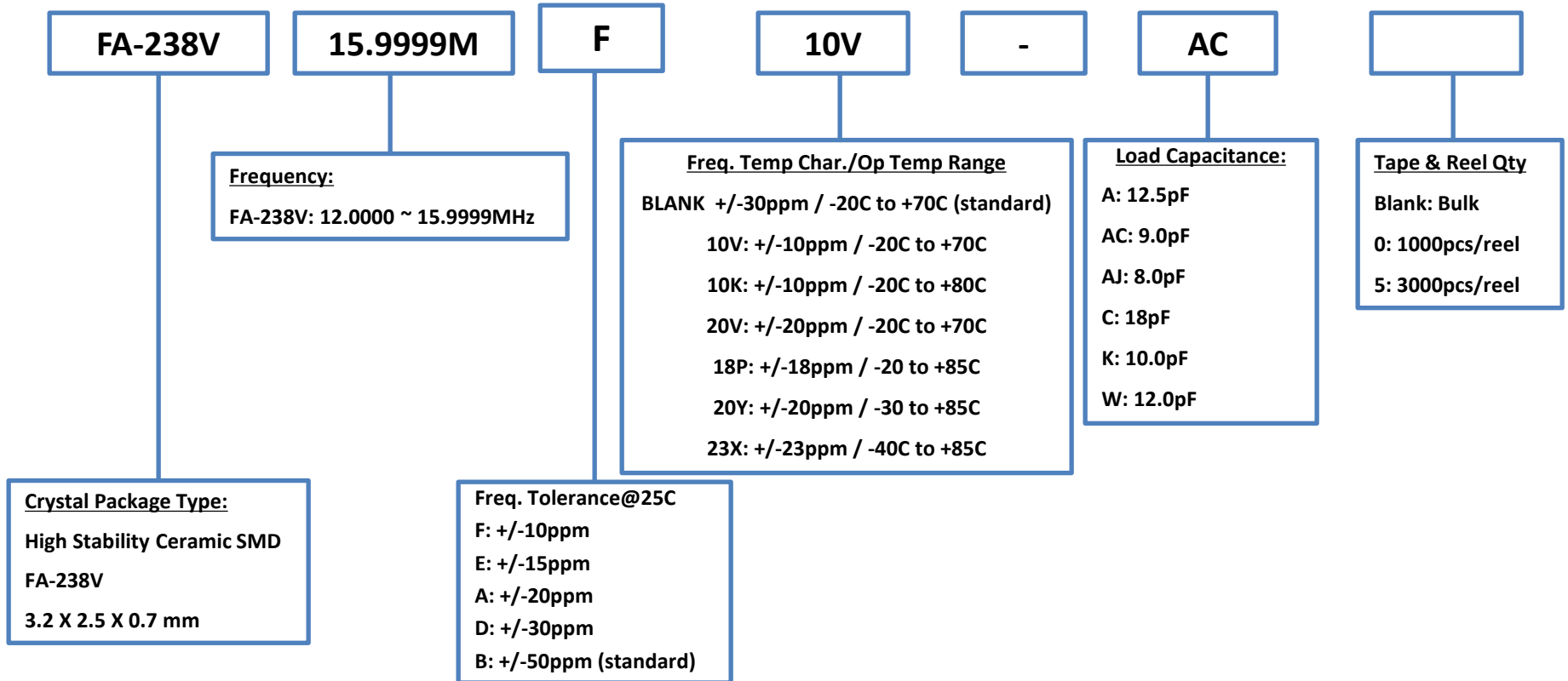
- 1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your EEA representative for assistance.



Product Configuration System



MHz Range Crystal Units



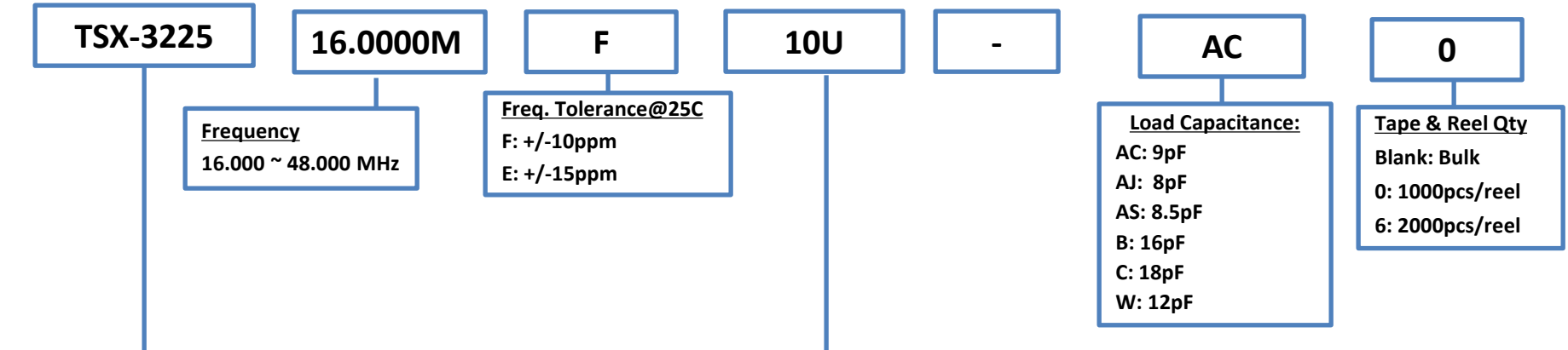
NOTES:
1) If you require frequency , tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your EEA representative for assistance.



Product Configuration System



MHz Range Crystal Units



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

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 +105C	+/-20ppm = 20G (for 20MHz and 24MHz only)	

NOTES:

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

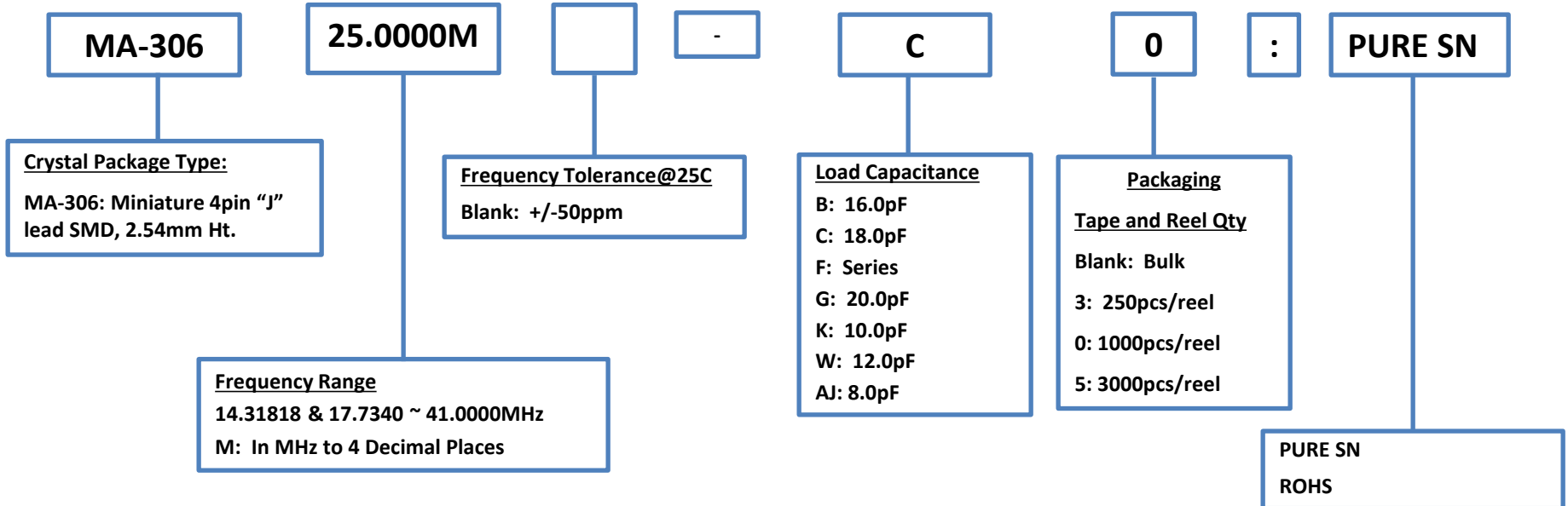


Product Configuration System



MHz Range Crystal Units

Discontinued



NOTES:

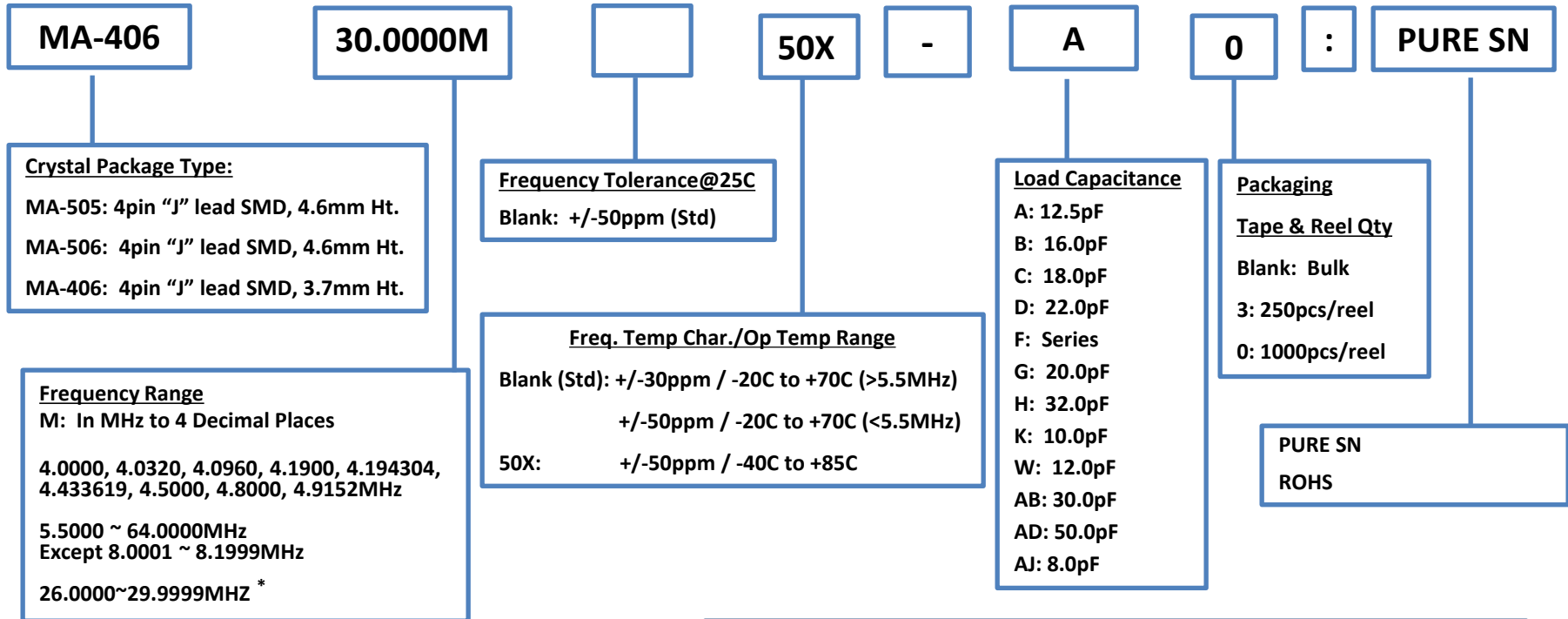
- 1) If you require frequency, tolerance, frequency temperature characteristics over temperature and load capacitance values other than the above listed, please contact your EEA representative for assistance.

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 EEA 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.

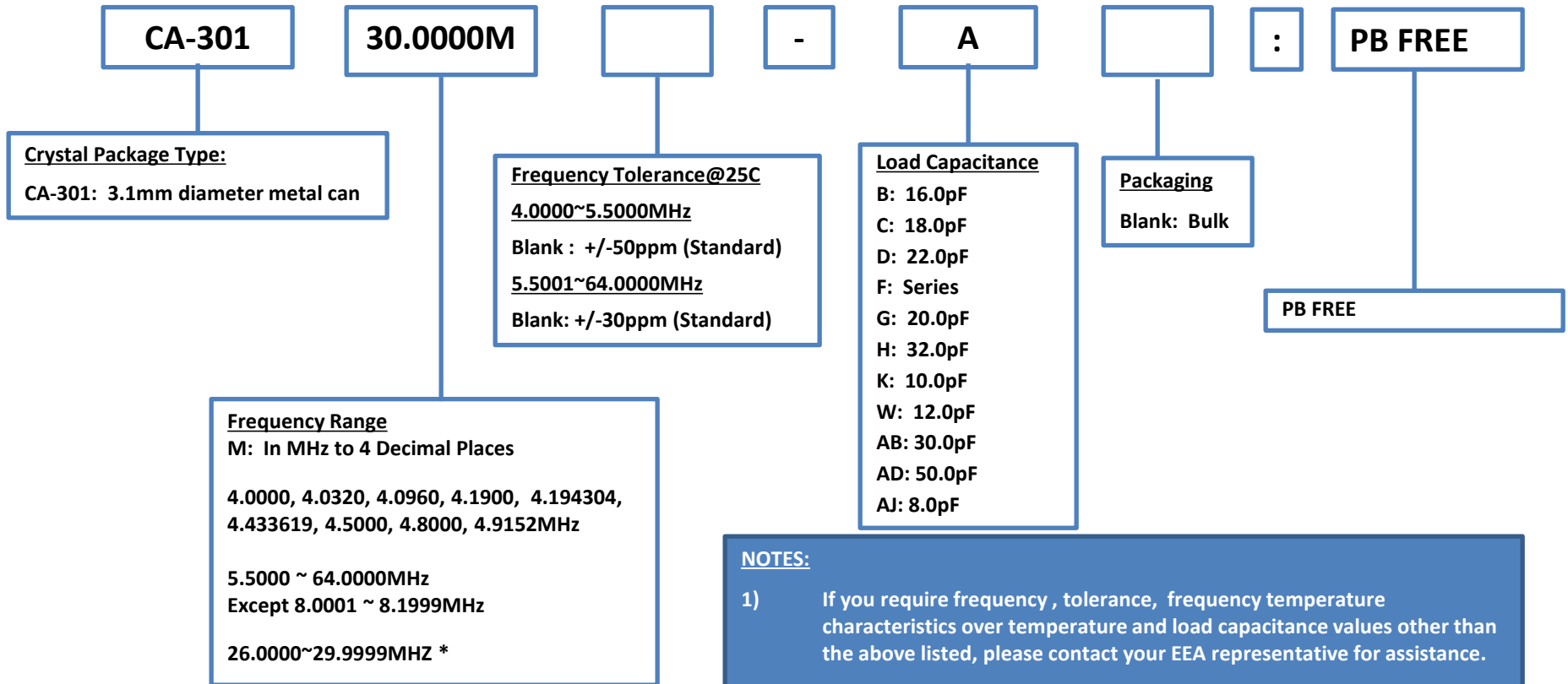


Product Configuration System



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 EEA 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.



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