

CITIZEN

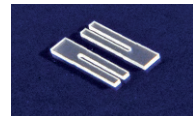
CITIZEN FINDEVICE CRYSTAL PRODUCTS



CITIZEN FINDEVICE – CRYSTAL PRODUCTS



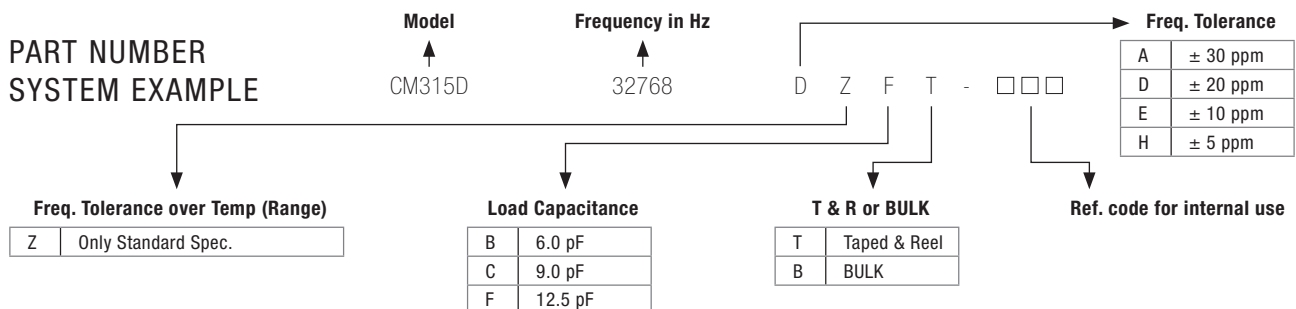
CRYSTAL BLANKS	
Nominal Frequency	±3.2 [MHz] ~ 155 [MHz] 83rd Overtone
Cutting angle accuracy	±30 [seconds] ~ ±2 [minutes]
Blanke Size	0.8 x 0.4 ~ 8.0 x 2.5 [mm]
Shape	Convex, Bevel, Mesa and Flat plate type
Finishing of surface	#3000-Etching, #4000-Etching, Polish



CRYSTAL DEVICES – TUNING FORK CRYSTAL UNITS





Model	Image	SIZE [MAX. mm]	FREQ. RANGE [KHZ]	TYPE
CFS-145		∅: 1,5 x H: 5.1	32.768	Cylinder / Through hole
CFS-206		∅: 2.1 x H: 6.2	32.768	Cylinder / Through hole
CFV-206		∅: 2.1 x H: 6.2	30 ~ 100	Cylinder / Through hole
CMR200T		∅: 2.1 x H: 6.2	32.768	Cylinder / Lead formed SMD
CMJ206T		L: 8.6 x W: 2.7 x H: 2.4	32.768	Cylinder / With jacket SMD
CM250C		L: 8.0 x W: 3.8 x H: 2.55	30 ~ 100	Plastic mold / SMD
CM200C		L: 8.0 x W: 3.8 x H: 2.55	32.768	Plastic mold / SMD
CM130		L: 7.0 x W: 1.5 x H: 1.4	32.768	Plastic mold / SMD
CM519		L: 5.05 x W: 1.95 x H: 1.0	32.768	Ceramic package / SMD
CM415		L: 4.2 x W: 1.6 x H: 0.9	32.768	Ceramic package / SMD
CM315D		L: 3.3 x W: 1.6 x H: 0.9	32.768	Ceramic package / SMD
CM315DL		L: 3.3 x W: 1.6 x H: 0.9	32.768	Low ESR Ver. of CM315D (50 kΩ Max.)
CM315E		L: 3.3 x W: 1.6 x H: 0.9	32.768	3 pads / Li cover connected to GND
CM2012H		L: 2.15 x W: 1.3 x H: 0.6	32.768	Ceramic package / SMD
CM1610H		L: 1.7 x W: 1.1 x H: 0.5	32.768	Ceramic package / SMD

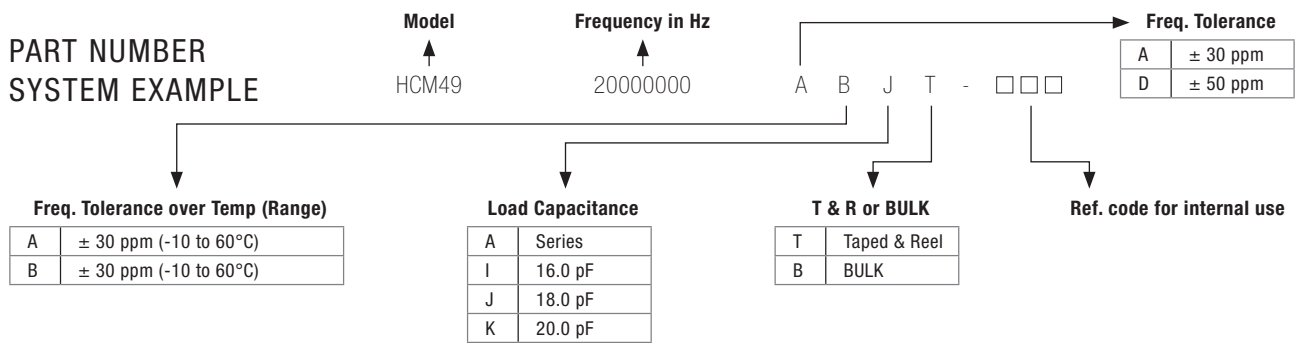
PART NUMBER SYSTEM EXAMPLE






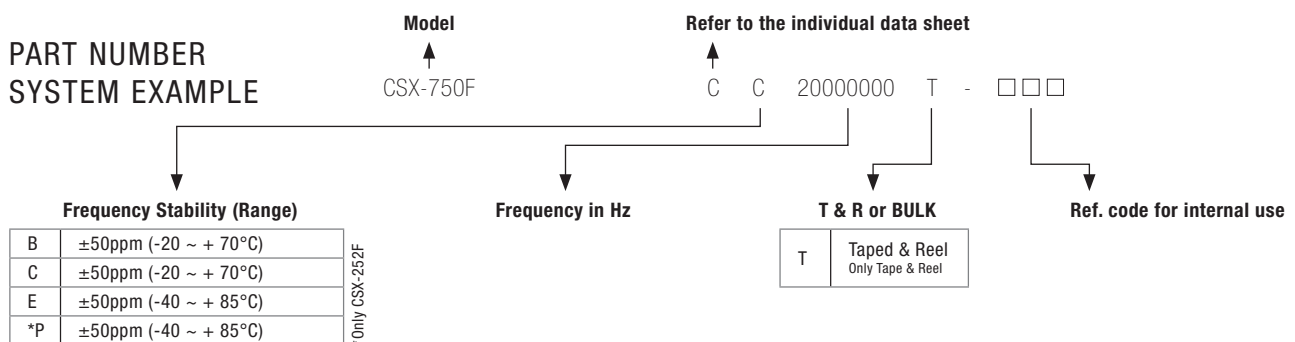
CITIZEN FINDEVICE – CRYSTAL PRODUCTS



MODEL	SIZE [MAX. mm]	FREQ. RANGE [MHz]	TYPE
AT-CUT CRYSTAL UNITS			
HC-49/U-S		L: 11.5 x W: 4.66 x H: 3.5 3.5 ~ 50.0	Metal can / Through hole
HCM49		L: 12.8 x W: 4.9 x H: 4.3 3.5 ~ 50.0	Metal can / SMD
CM309E		L: 11.7 x W: 4.8 x H: 3.7 4.0 ~ 60.0	Plastic mold / SMD
CS325S		L: 3.3 x W: 2.6 x H: 0.7 12.0 ~ 54.0	Ceramic package / SMD



MODEL	SIZE [MAX. mm]	FREQ. RANGE [MHz]	TYPE
CRYSTAL OSCILLATOR UNITS			
SSX-750P		L: 7.2 x W: 5.2 x H: 1.6 1.0 ~ 125.0	Ceramic package / SMD
CSX-750F		L: 7.2 x W: 5.2 x H: 1.6 1.0 ~ 125.0	Ceramic package / SMD Low voltage Version
CSX-252F		L: 2.6 x W: 2.1 x H: 0.9 0.032768 ~ 60.0	Ceramic package / SMD Programmable



TUNING FORK CRYSTAL UNIT (Cylinder Type)

RoHS compliant / Pb free

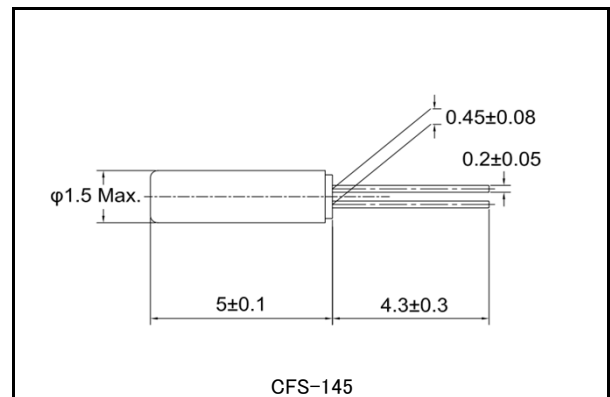
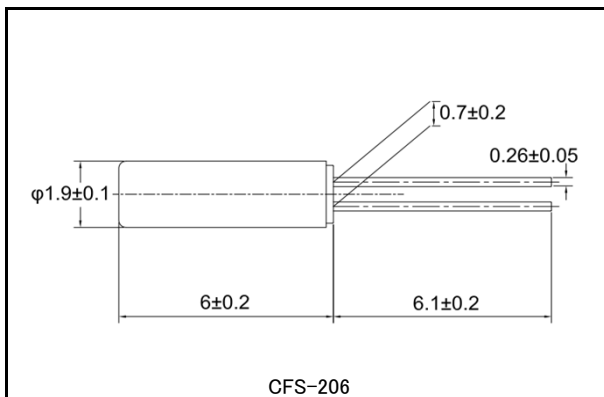
CFS-206 · CFS-145



■ FEATURES

- Frequency range : 32.768kHz
- External dimensions (mm)
CFS-206 Φ : 2.0 x L : 6.2
CFS-145 Φ : 1.5 x L : 5.1
- Applications
Watch / Clock / Security devices /
Consumer products

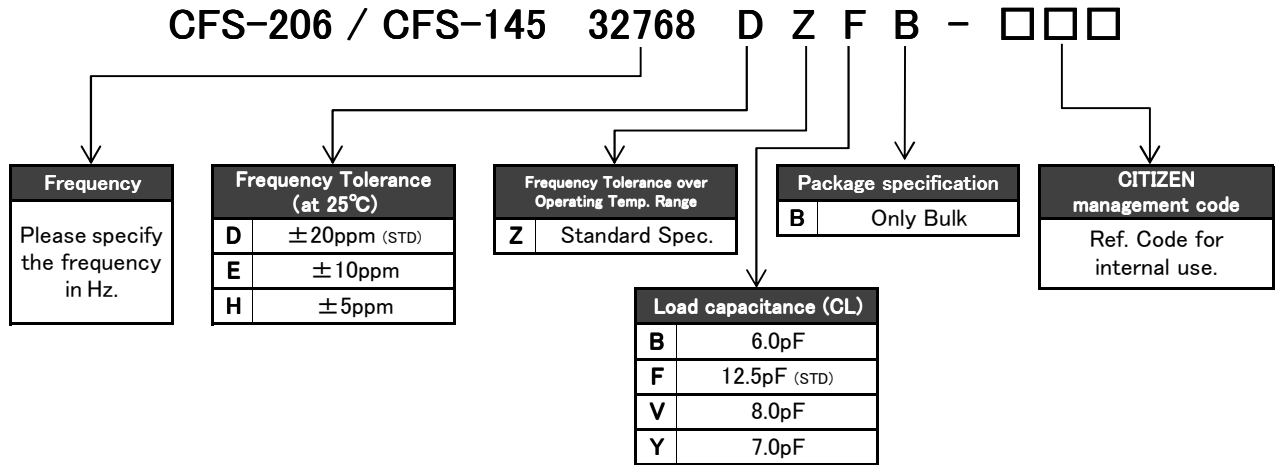
■ DIMENSION [mm]



■ STANDARD SPECIFICATIONS

Item	Model	CFS-206	CFS-145	Conditions
Nominal Frequency	f_0	32.768kHz		
Frequency Tolerance	$\Delta f/f_0$	$\pm 5\text{ppm} / \pm 10\text{ppm} / \pm 20\text{ppm}$		at 25°C
Load capacitance	C_L	6.0pF / 7.0pF / 8.0pF / 12.5pF		Please specify your requirement
Operating Temperature Range	T_{OPR}	-20°C ~ +70°C		
Storage Temperature Range	T_{STR}	-40°C ~ +85°C		
Turnover Temperature	T_M	25°C ± 5°C		
Temperature Coefficient	β	$-0.034 \pm 0.006 \text{ppm}/^\circ\text{C}^2$		
Motional (series) resistance	R_1	35K Ω Max.	40K Ω Max.	at 25°C
Level of drive	DL	1 μ W Max.		
Aging (first year)	$\Delta f/f_0$	$\pm 3\text{ppm}$ Max.		25°C ± 3°C
Shunt capacitance	C_0	1.2pF Typ.	1.0pF Typ.	

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]

CFS-206



22 : Manufacture's ID Code

y : The last digit of production year

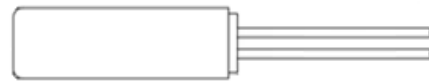
m : Production month (See Table.1)

: Production Lot No.

Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

CFS-145



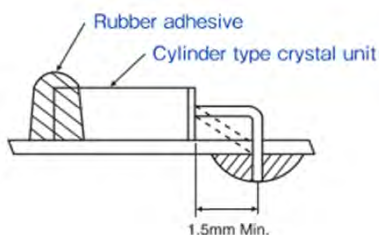
No marking

■ Handling Notes

Mounting

Soldering the body of cylinder type crystal unit must be strictly avoided as it may cause significant deterioration in characteristics of the product.

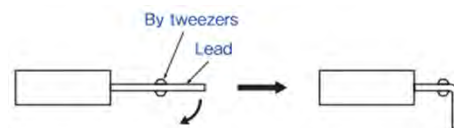
Rubber adhesive is recommended for mounting.



Bending Lead

Hold the body of crystal unit by hand, and the part to be bent with tweezers leaving more than 1.5mm of lead from the body case. (3.0mm is recommended)

Bend the lead 90° holding with the tweezers. Pulling the lead strongly may crack the hermetic seal glass at the root of the lead and may cause the airtightness and the characteristics to deteriorate.



TUNING FORK CRYSTAL UNIT (Cylinder Type)

RoHS compliant / Pb free

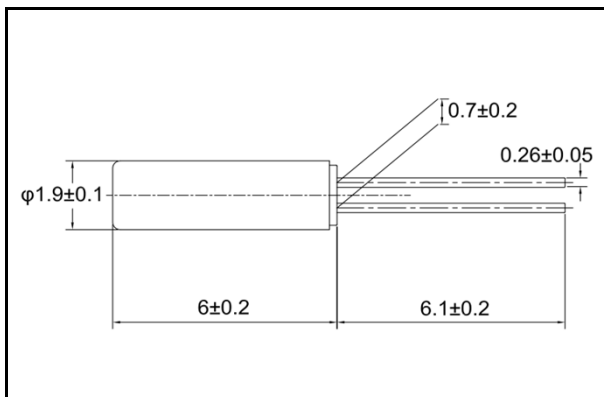
CFV-206



■ FEATURES

- Frequency range : 30 ~ 100kHz
- External dimensions (mm)
Φ : 2.0 x L : 6.2
- Applications
Radio-controlled clock /
Communication devices

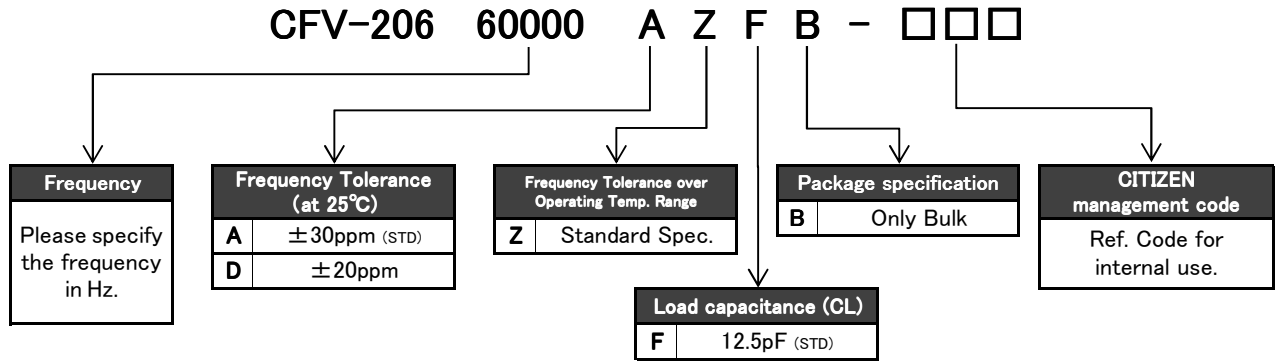
■ DIMENSION [mm]



■ STANDARD SPECIFICATIONS

Item	Model	CFV-206	Conditions
Nominal Frequency	f_0	30kHz ~ 100kHz	Please contact us for frequencies available
Frequency Tolerance	$\Delta f/f_0$	$\pm 20\text{ppm} / \pm 30\text{ppm}$	at 25°C
Load capacitance	C_L	12.5pF	
Operating Temperature Range	T_{OPR}	-20°C ~ +70°C	
Storage Temperature Range	T_{STR}	-40°C ~ +85°C	
Turnover Temperature	T_M	25°C±5°C	
Temperature Coefficient	β	$-0.034 \pm 0.006\text{ppm}/^\circ\text{C}^2$	
Motional (series) resistance	R_1	50K Ω Max.	at 25°C
Level of drive	D_L	1 μW Max.	
Aging (first year)	$\Delta f/f_0$	$\pm 5\text{ppm}$ Max.	25°C±3°C
Shunt capacitance	C_0	0.8pF ~ 1.7pF Typ.	Depend on frequency

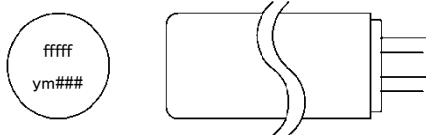
■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]

CFV-206



f : Frequency in Hz unit

y : The last digit of production year

m : Production month (See Table.1)

: Production Lot No.

Table.1

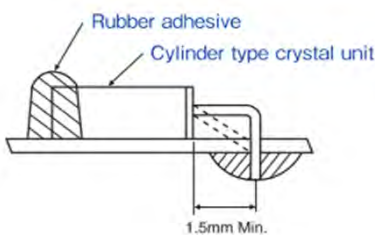
Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

■ Handling Notes

Mounting

Soldering the body of cylinder type crystal unit must be strictly avoided as it may cause significant deterioration in characteristics of the product.

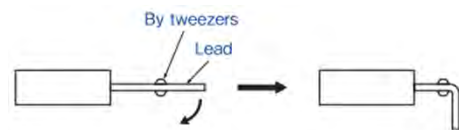
Rubber adhesive is recommended for mounting.



Bending Lead

Hold the body of crystal unit by hand, and the part to be bent with tweezers leaving more than 1.5mm of lead from the body case. (3.0mm is recommended)

Bend the lead 90° holding with the tweezers. Pulling the lead strongly may crack the hermetic seal glass at the root of the lead and may cause the airtightness and the characteristics to deteriorate.



TUNING FORK CRYSTAL UNIT (SMD · Cylinder Type)

RoHS compliant / Pb free

CMR200T

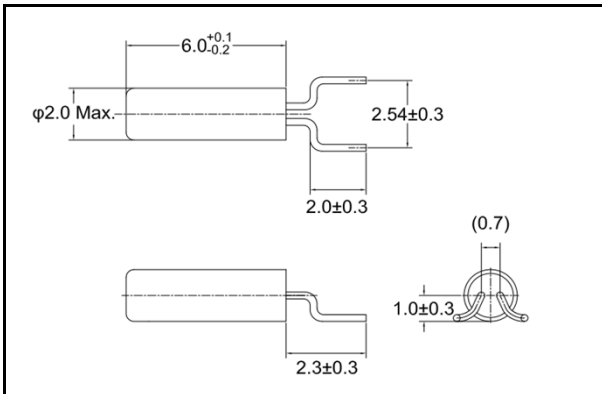
2,000pcs/reel



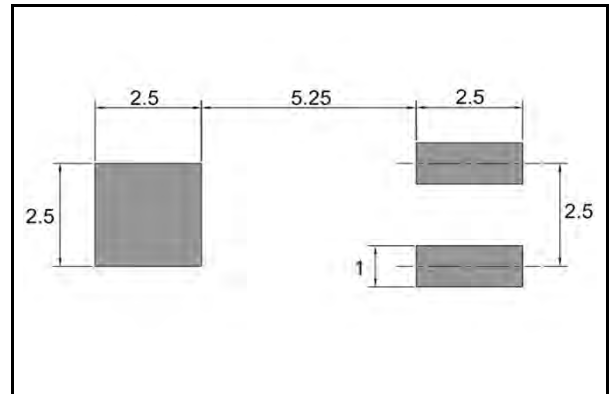
■ FEATURES

- Reflowable cylinder type
- Frequency range : 32.768kHz
- External dimensions (mm)
Φ : 2.0 x L : 6.1
- Applications
Smart Meters / Consumer products

■ DIMENSION [mm]



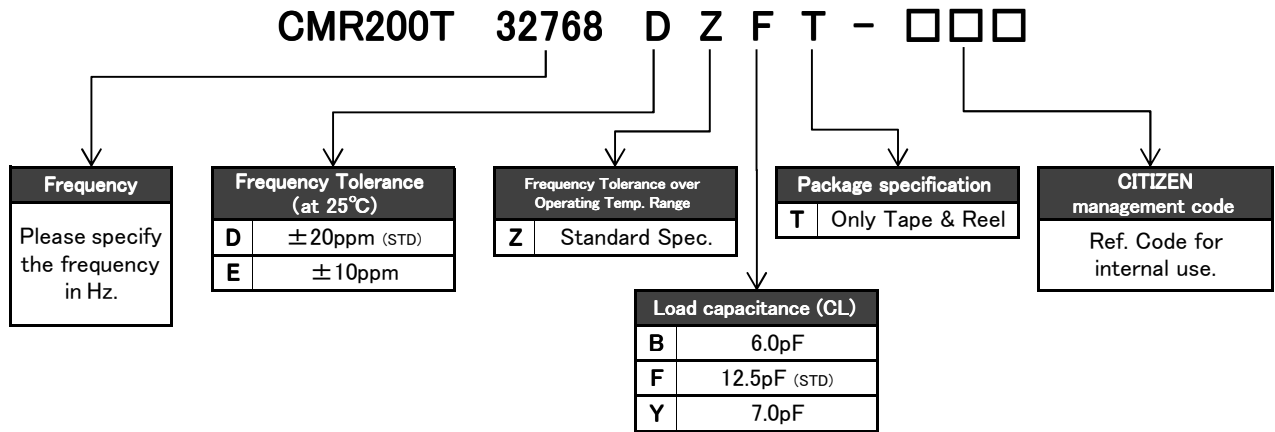
■ SOLDER PAD LAYOUT [mm]



■ STANDARD SPECIFICATIONS

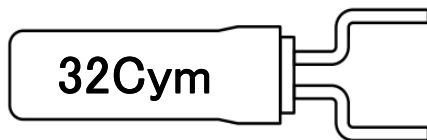
Item	Model	CMR200T	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	$\pm 10\text{ppm} / \pm 20\text{ppm}$	at 25°C
Load capacitance	C_L	6.0pF / 7.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C±5°C	
Temperature Coefficient	β	-0.034±0.006ppm/°C ²	
Motional (series) resistance	R_1	50K Ω Max.	at 25°C
Level of drive	D_L	1 μW Max.	
Aging (first year)	$\Delta f/f_0$	±3ppm Max.	25°C±3°C
Shunt capacitance	C_0	1.35pF Typ.	

PART NUMBERING SYSTEM



*Please contact us for specifications available.

Part Marking [standard]



32C : Manufacture's ID Code

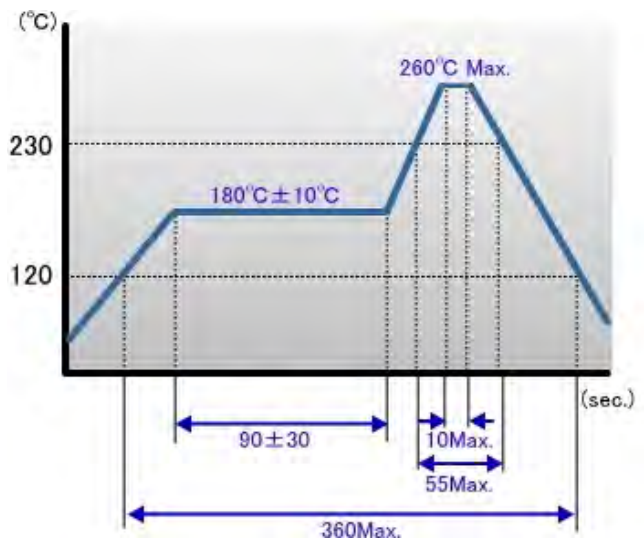
y : The last digit of production year

m : Production month (See Table.1)

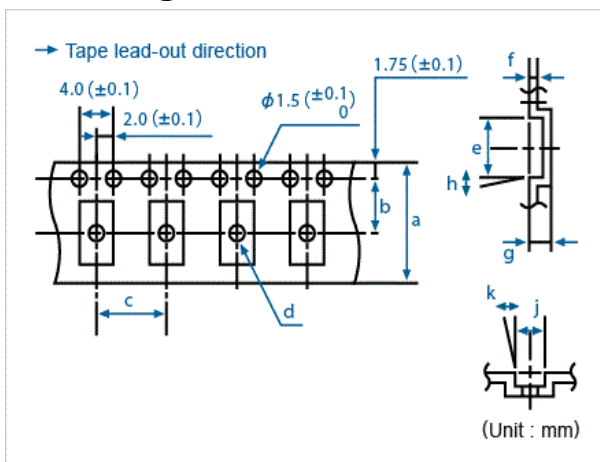
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

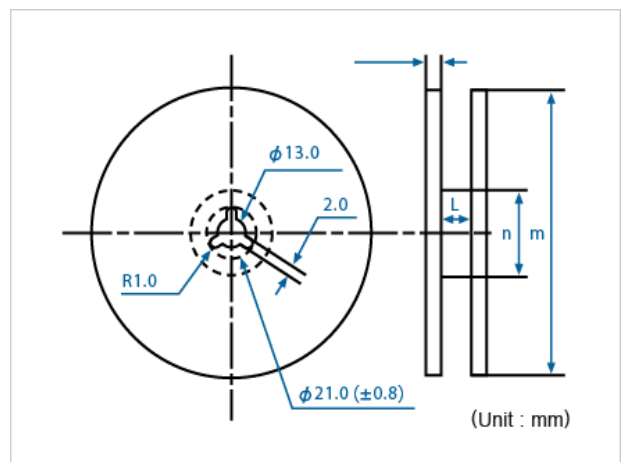
Reflow profile



Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d(φ)	e	f	g	h	j	k	l	m(φ)	n(φ)
2,000	16.0	7.5	8.0	-	9.4	0.3	2.15	-	5.0	-	17.5	330	100

Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Jacket Type)

RoHS compliant / Pb free

CMJ206T

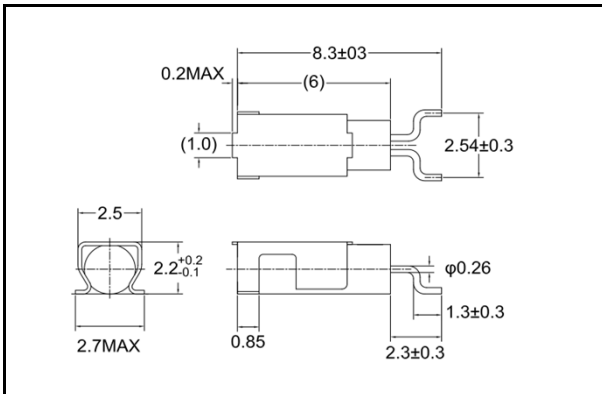
3,000pcs/reel



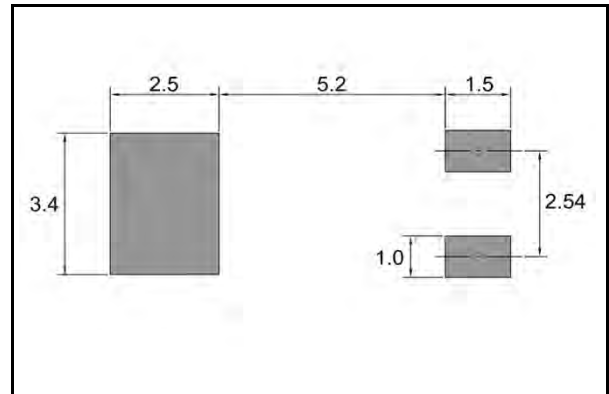
■ FEATURES

- Reflowable cylinder type
- Frequency range : 32.768kHz
- External dimensions (mm)
L : 8.6 x W : 2.7 x H : 2.4
- Applications
Smart Meters / Consumer products

■ DIMENSION [mm]



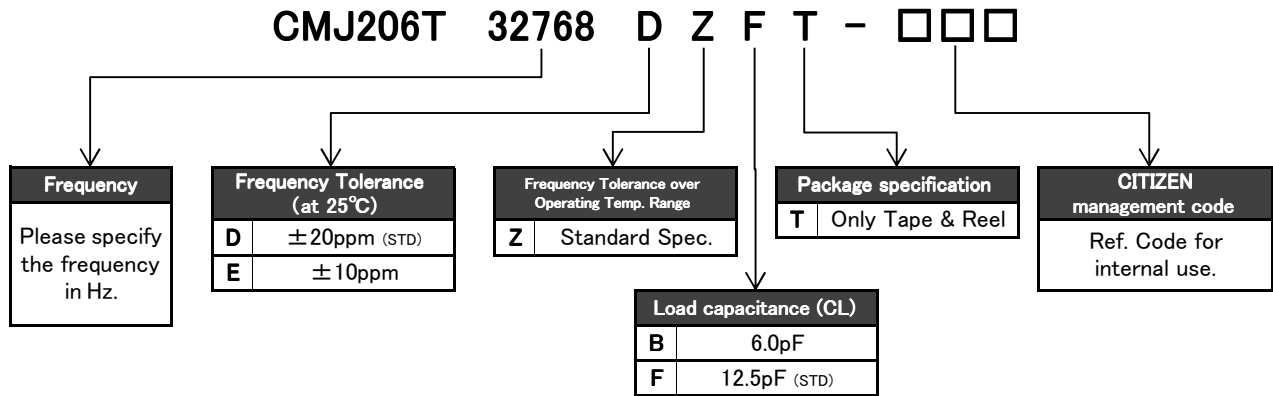
■ SOLDER PAD LAYOUT [mm]



■ STANDARD SPECIFICATIONS

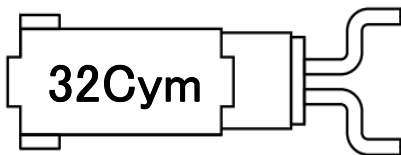
Item	Model	CMJ206T	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	$\pm 10\text{ppm} / \pm 20\text{ppm}$	at 25°C
Load capacitance	C_L	6.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C±5°C	
Temperature Coefficient	β	-0.034±0.006ppm/°C ²	
Motional (series) resistance	R_1	50K Ω Max.	at 25°C
Level of drive	D_L	1 μW Max.	
Aging (first year)	$\Delta f/f_0$	±3ppm Max.	25°C±3°C
Shunt capacitance	C_0	1.35pF Typ.	

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]



32C : Manufacture's ID Code

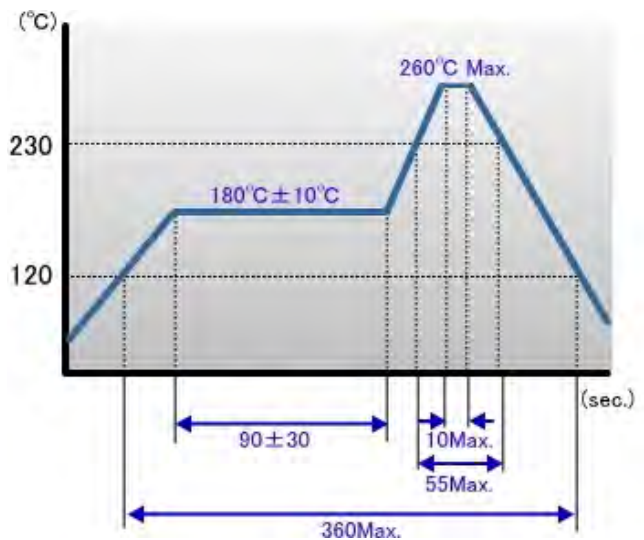
y : The last digit of production year

m : Production month (See Table.1)

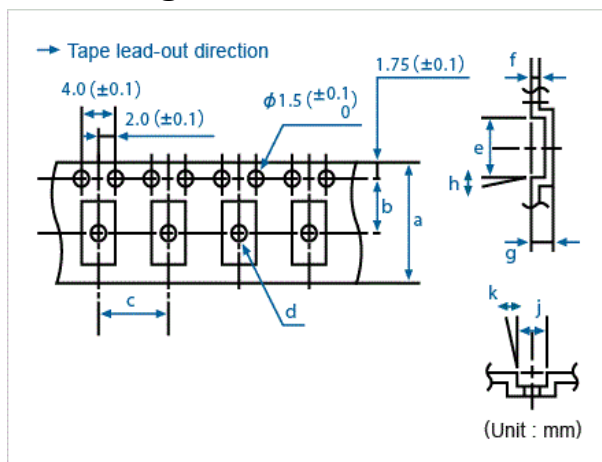
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

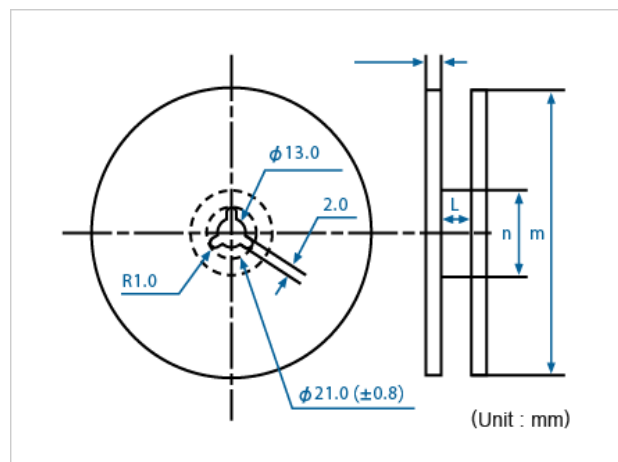
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	16.0	9.2	8.0	-	9.5	0.3	2.1	-	3.0	5°	17.5	330	100

Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Plastic Package)

RoHS compliant

CM200C

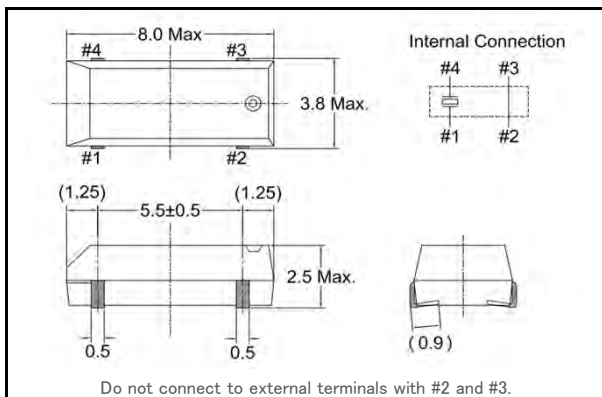
3,000pcs/reel



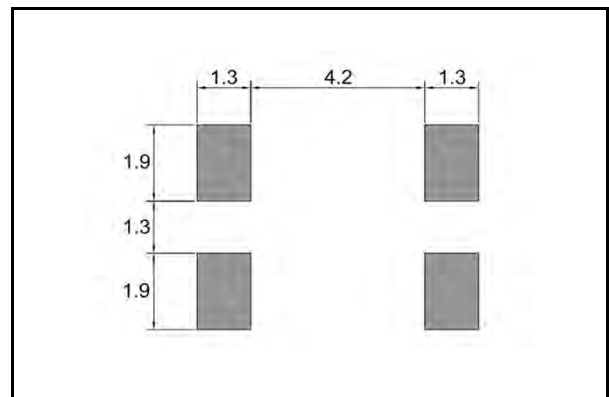
FEATURES

- Frequency range : 32.768kHz
- External dimensions (mm)
L : 8.0 x W : 3.8 x H : 2.55
- Applications
Smart Meters / Consumer products

DIMENSION [mm]



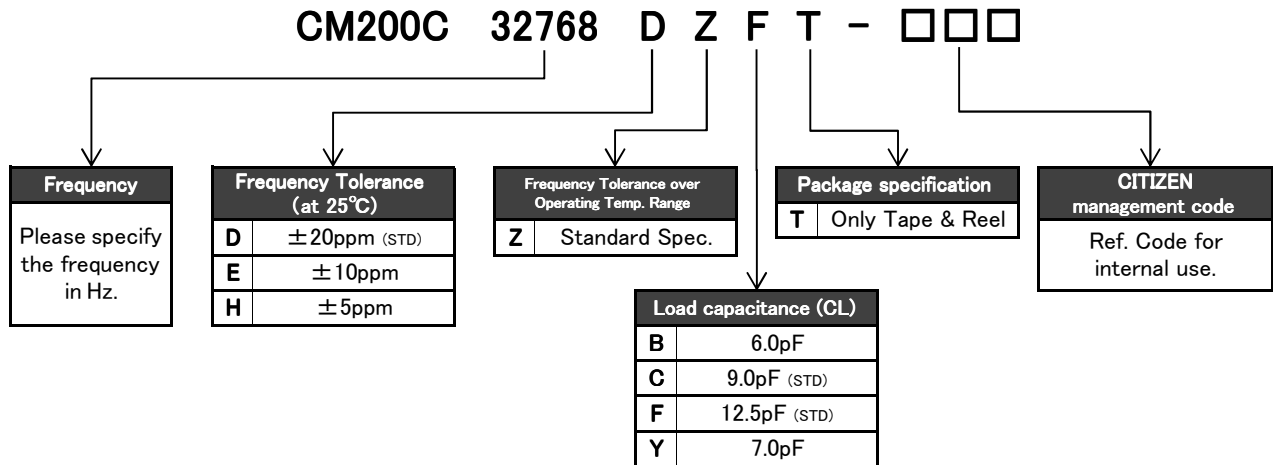
SOLDER PAD LAYOUT [mm]



STANDARD SPECIFICATIONS

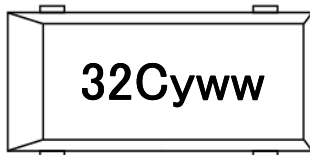
Item	Model	CM200C	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	$\pm 5\text{ppm} / \pm 10\text{ppm} / \pm 20\text{ppm}$	at 25°C
Load capacitance	C_L	6.0pF / 7.0pF / 9.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C ± 5°C	
Temperature Coefficient	β	$-0.034 \pm 0.006\text{ppm}/^\circ\text{C}^2$	
Motional (series) resistance	R_1	50K Ω Max.	at 25°C
Level of drive	DL	1 μW Max.	
Aging (first year)	$\Delta f/f_0$	$\pm 3\text{ppm}$ Max.	25°C ± 3°C
Shunt capacitance	C_0	1.35pF Typ.	

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]

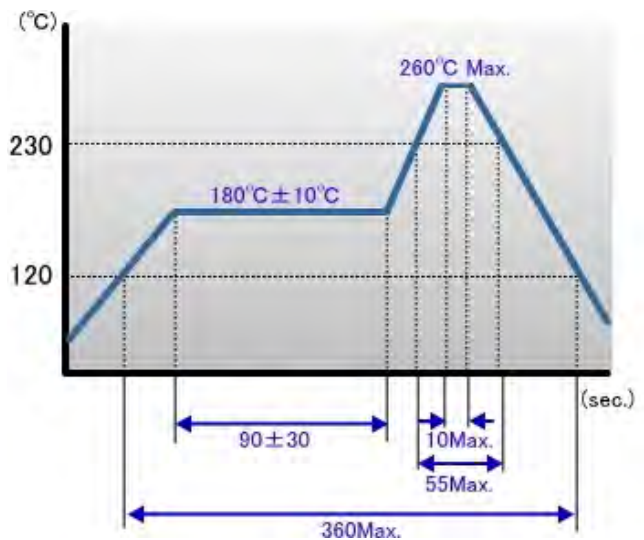


32C : Manufacturer's ID Code

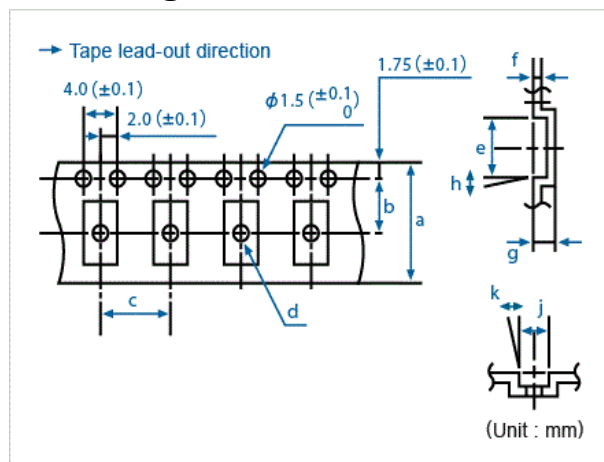
y : The last digit of production year

w : Production week code

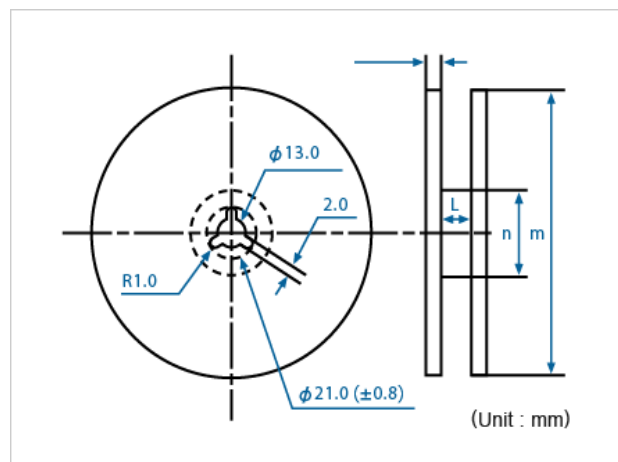
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	16.0	7.5	8.0	1.6	8.3	0.3	2.70	5°	4.05	5°	17.5	330	100

Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Plastic Package)

RoHS compliant

CM250C

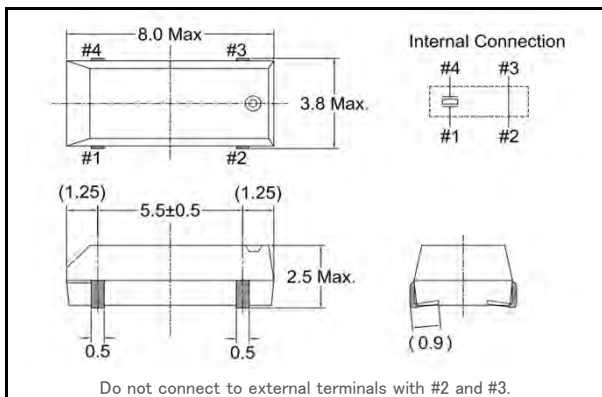
3,000pcs/reel



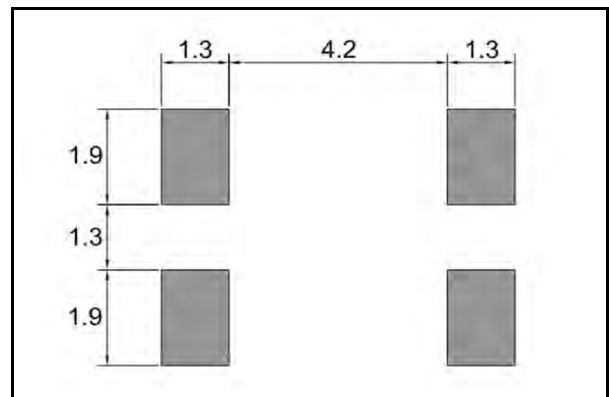
FEATURES

- Frequency range : 30 ~ 100kHz
- External dimensions (mm)
L : 8.0 x W : 3.8 x H : 2.55
- Applications
Communication devices

DIMENSION [mm]



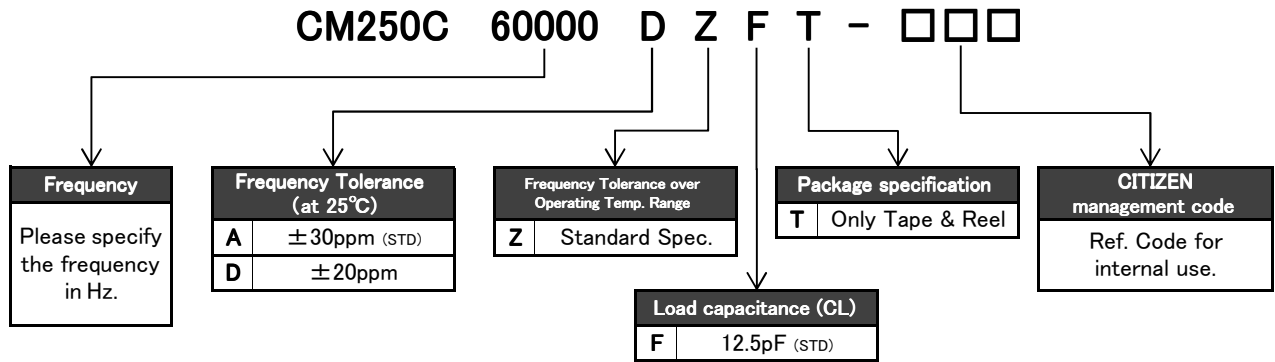
SOLDER PAD LAYOUT [mm]



STANDARD SPECIFICATIONS

Item	Model	CM250C	Conditions
Nominal Frequency	f_0	30kHz ~ 100kHz	Please contact us for frequencies available
Frequency Tolerance	$\Delta f/f_0$	$\pm 20\text{ppm} / \pm 30\text{ppm}$	at 25°C
Load capacitance	C_L	12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C ± 5°C	
Temperature Coefficient	β	-0.034 ± 0.006ppm/°C ²	
Motional (series) resistance	R_1	50K Ω Max.	at 25°C
Level of drive	D_L	1 μW Max.	
Aging (first year)	$\Delta f/f_0$	± 5ppm Max.	25°C ± 3°C
Shunt capacitance	C_0	0.8pF ~ 1.7pF Typ.	

■ PART NUMBERING SYSTEM



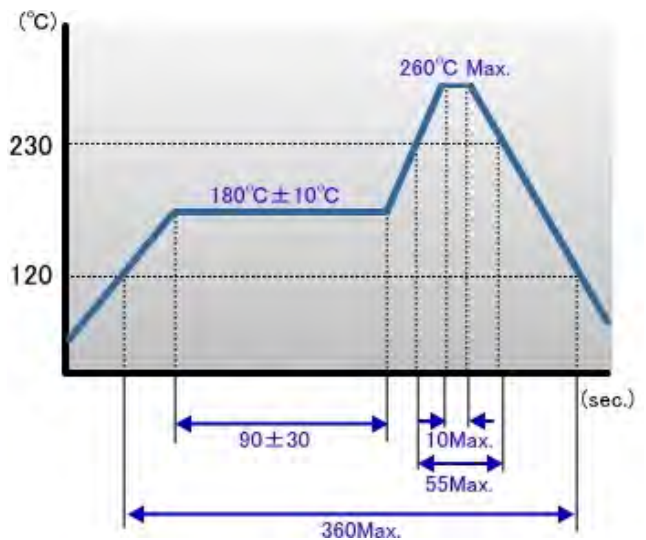
*Please contact us for specifications available.

■ Part Marking [standard]

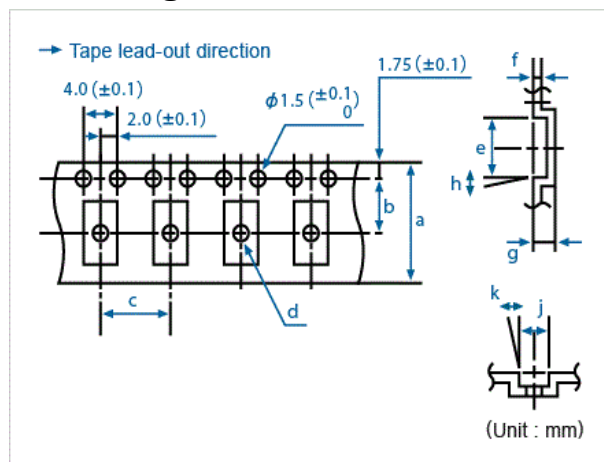


- * : Manufacturer's ID Code
- y : The last digit of production year
- w : Production week code

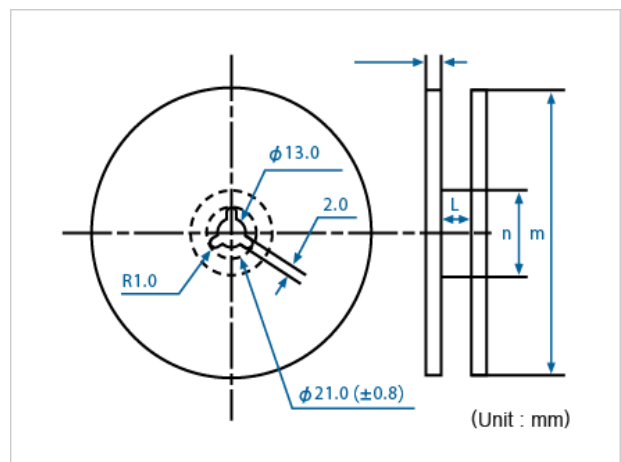
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	16.0	7.5	8.0	1.6	8.3	0.3	2.70	5°	4.05	5°	17.5	330	100

Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Plastic Package)

RoHS compliant

CM130

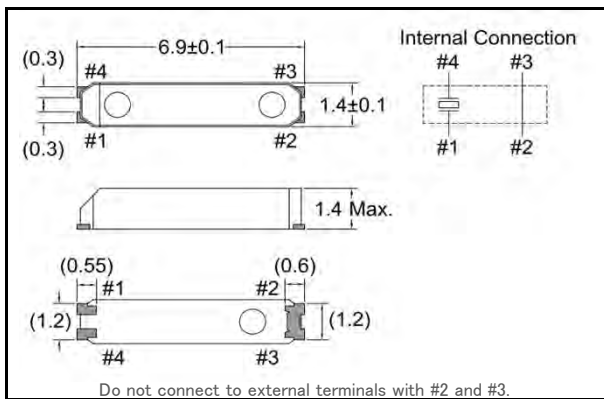
3,000pcs/reel



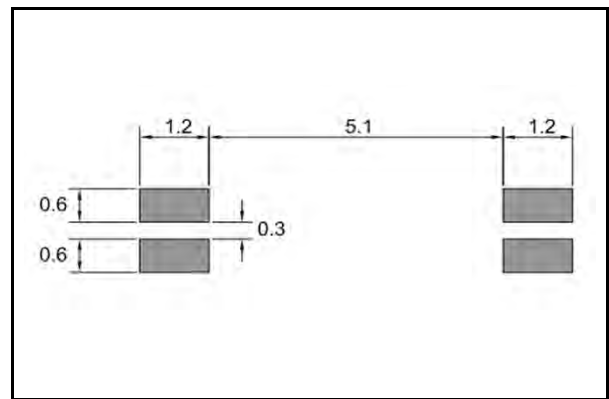
■ FEATURES

- Frequency range : 32.768kHz
- External dimensions (mm)
L : 7.0 x W : 1.5 x H : 1.4
- Applications
Small mobile devices / Consumer products

■ DIMENSION [mm]



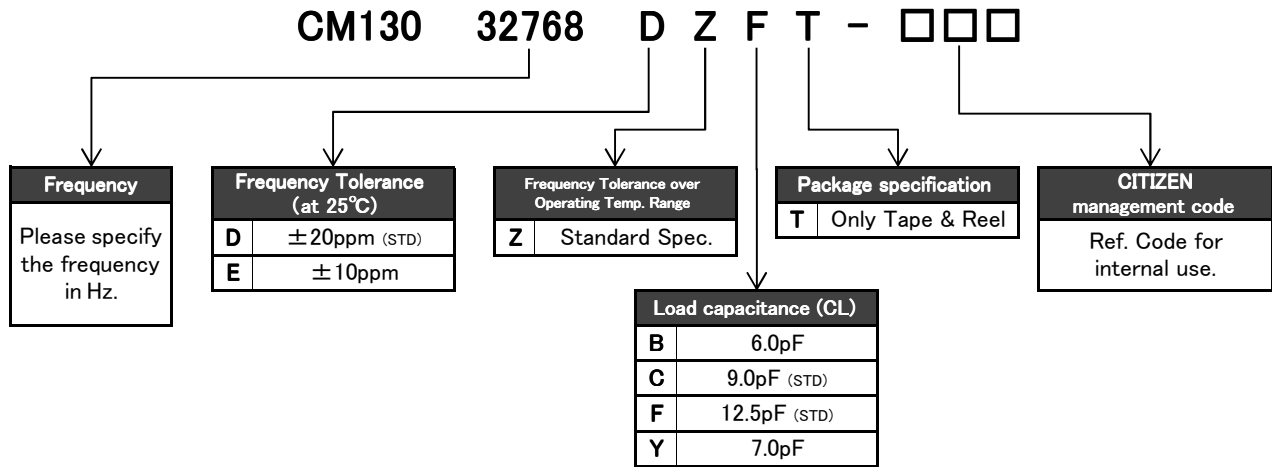
■ SOLDER PAD LAYOUT [mm]



■ STANDARD SPECIFICATIONS

Item	Model	CM130	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	$\pm 10\text{ppm} / \pm 20\text{ppm}$	at 25°C
Load capacitance	C_L	6.0pF / 7.0pF / 9.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C±5°C	
Temperature Coefficient	β	-0.04ppm/°C ² Max.	
Motional (series) resistance	R_1	65KΩ Max.	at 25°C
Level of drive	D_L	1.0 μW Max.	
Aging (first year)	$\Delta f/f_0$	±3ppm Max.	25°C±3°C
Shunt capacitance	C_0	0.8pF Typ.	

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]



32C : Manufacture's ID Code

y : The last digit of production year

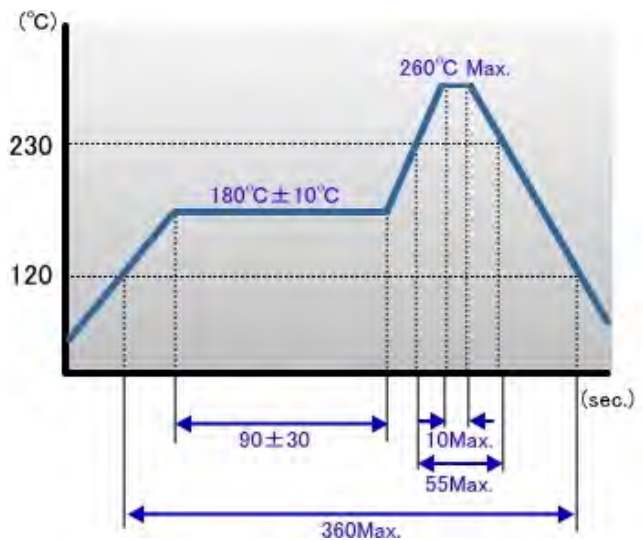
m : Production month (See Table.1)

* : CL Code B: 6.0pF
 C: 9.0pF
 Y: 7.0pF
 Φ: 12.5pF

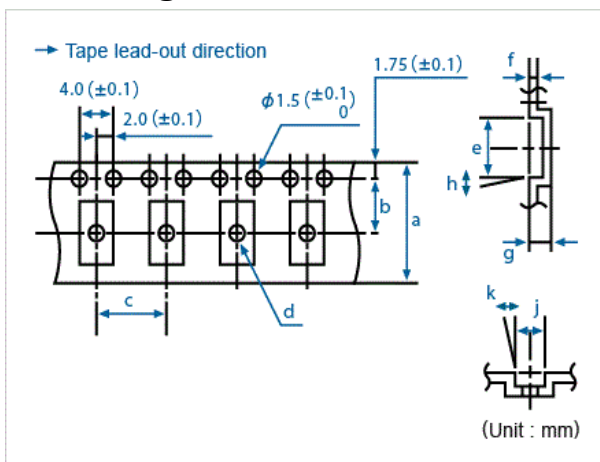
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

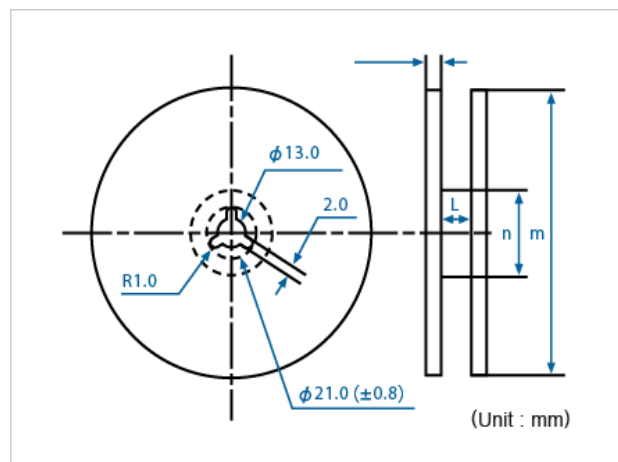
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d(φ)	e	f	g	h	j	k	l	m(φ)	n(φ)
3,000	16.0	7.5	4.0	1.0	7.2	0.3	1.4	5°	1.55	5°	17.0	180	50

Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Ceramic Package)

RoHS compliant / Pb free

CM519

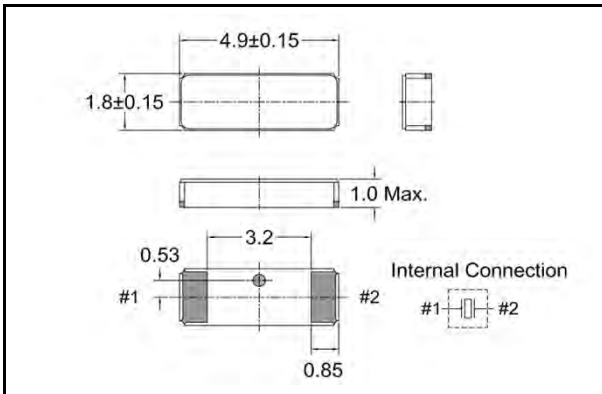
3,000pcs/reel



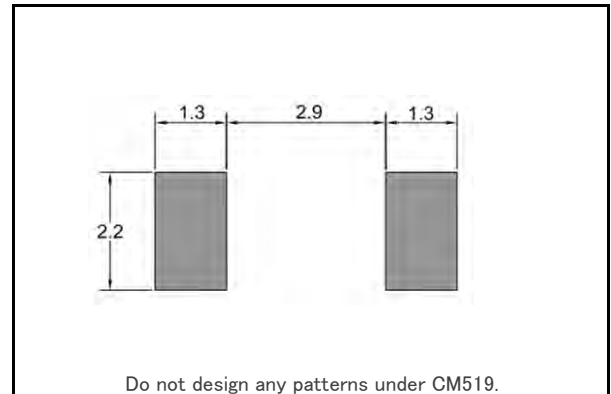
■ FEATURES

- Frequency range : 32.768kHz
- External dimensions (mm)
L : 5.05 x W : 1.95 x H : 1.0
- Applications
Consumer products

■ DIMENSION [mm]



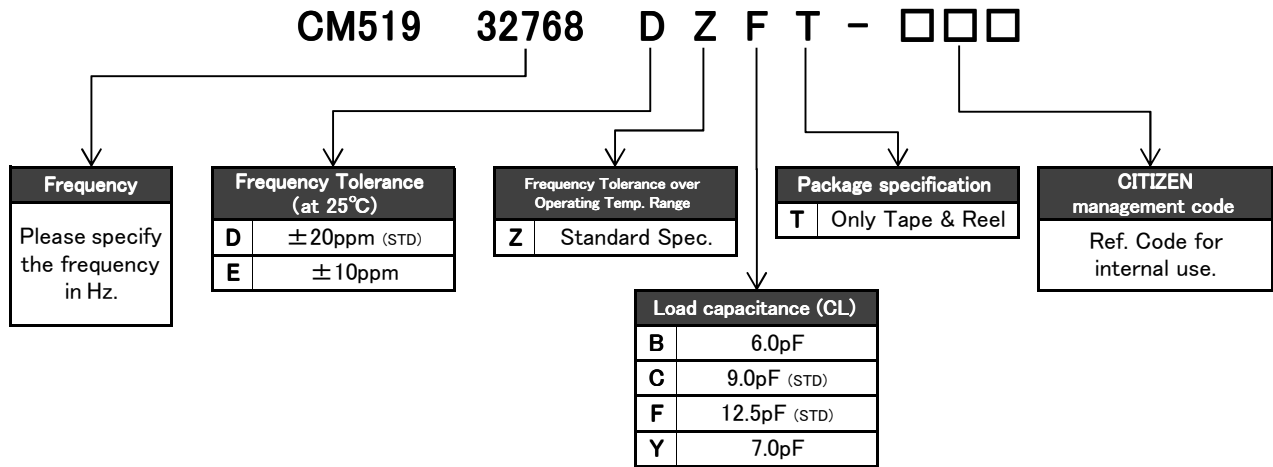
■ SOLDER PAD LAYOUT [mm]



■ STANDARD SPECIFICATIONS

Item	Model	CM519	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	$\pm 10\text{ppm} / \pm 20\text{ppm}$	at 25°C
Load capacitance	C_L	6.0pF / 7.0pF / 9.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C±5°C	
Temperature Coefficient	β	-0.034±0.006ppm/°C ²	
Motional (series) resistance	R_1	70KΩ Max.	at 25°C
Level of drive	D_L	1 μW Max.	
Aging (first year)	$\Delta f/f_0$	±3ppm Max.	25°C±3°C
Shunt capacitance	C_0	1.35pF Typ.	

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]

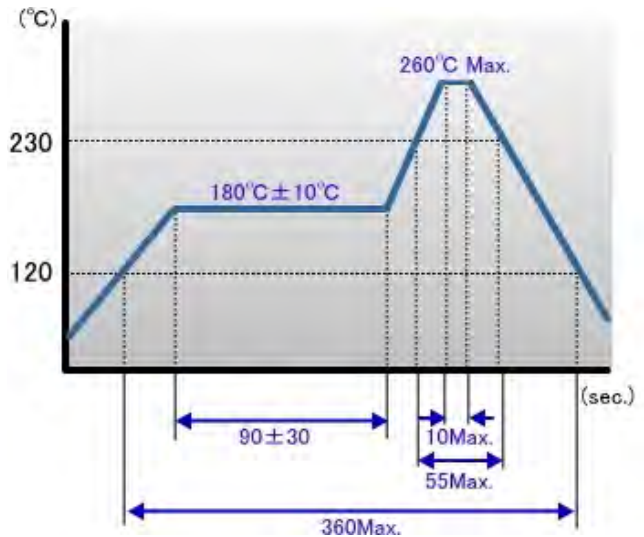


- C : Manufacture's ID Code
- y : The last digit of production year
- m : Production month (See Table.1)
- # : Production Lot No.

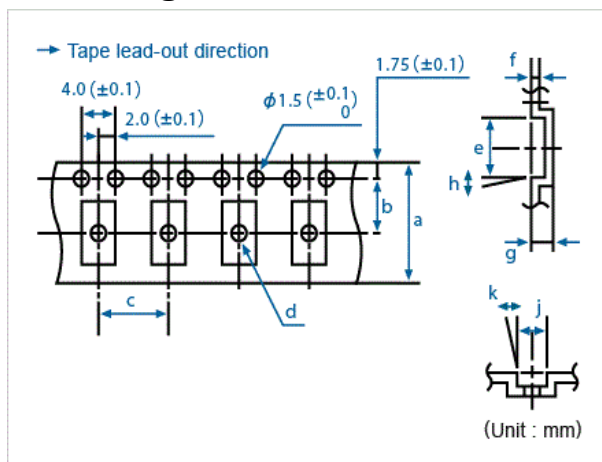
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

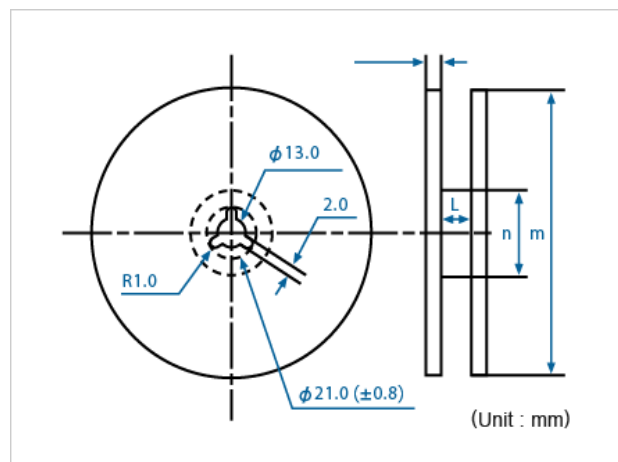
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	12.0	5.5	4.0	1.0	5.3	0.3	1.1	5°	2.1	5°	13.0	180	60

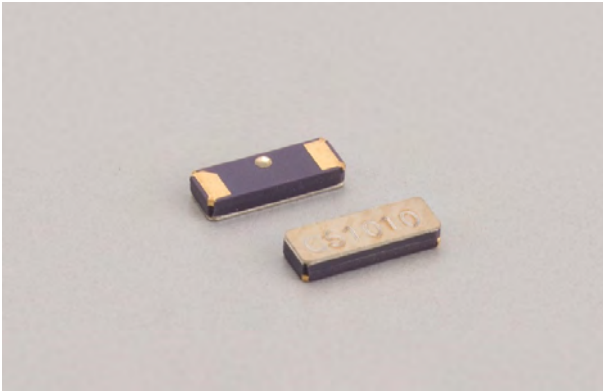
Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Ceramic Package)

RoHS compliant / Pb free

CM415

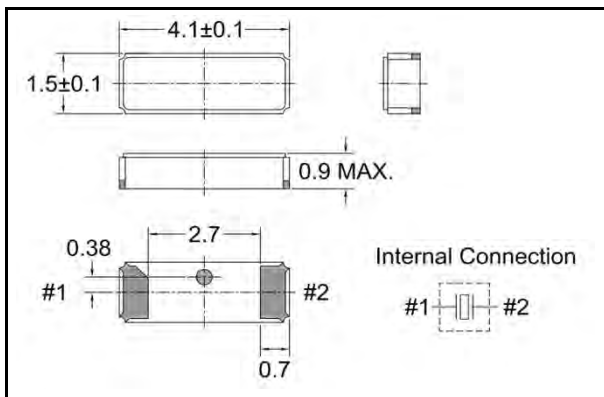
3,000pcs/reel



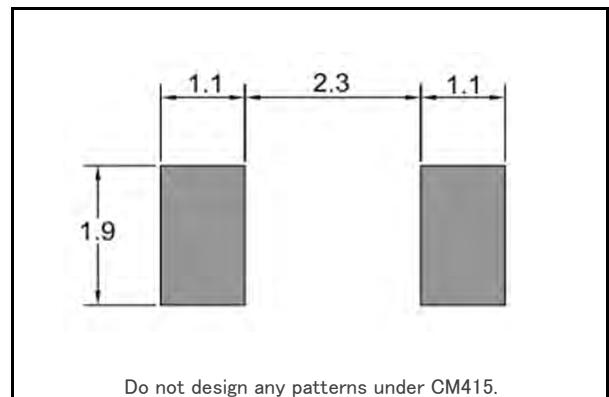
FEATURES

- Frequency range : 32.768kHz
- External dimensions (mm)
L : 4.2 x W : 1.6 x H : 0.9
- Applications
Consumer products

DIMENSION [mm]



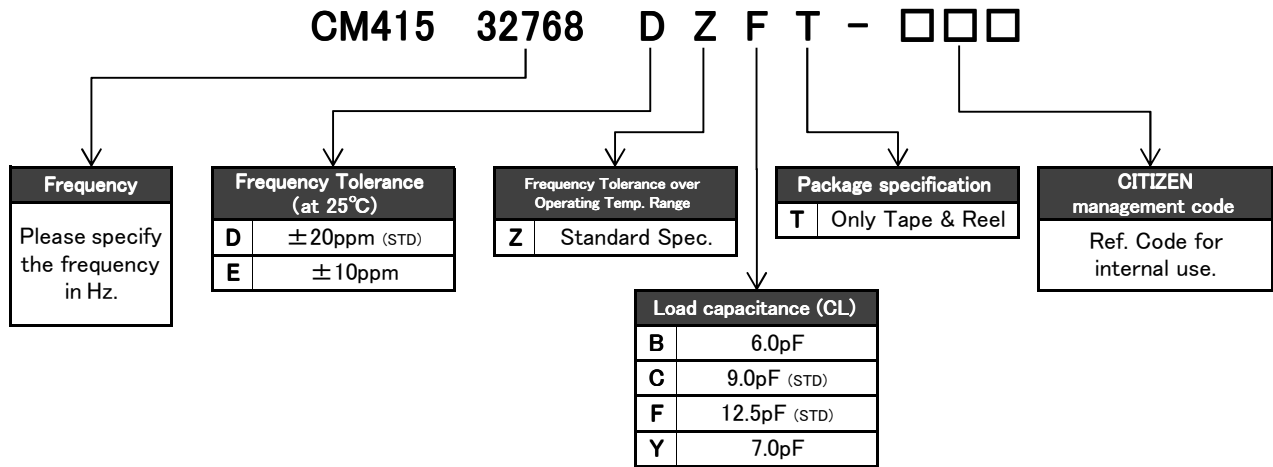
SOLDER PAD LAYOUT [mm]



STANDARD SPECIFICATIONS

Item	Model	CM415	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	$\pm 10\text{ppm} / \pm 20\text{ppm}$	at 25°C
Load capacitance	C_L	6.0pF / 7.0pF / 9.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C±5°C	
Temperature Coefficient	β	-0.034±0.006ppm/°C ²	
Motional (series) resistance	R_1	70KΩ Max.	at 25°C
Level of drive	D_L	1 μW Max.	
Aging (first year)	$\Delta f/f_0$	±3ppm Max.	25°C±3°C
Shunt capacitance	C_0	1.10pF Typ.	

PART NUMBERING SYSTEM



*Please contact us for specifications available.

Part Marking [standard]



C : Manufacture's ID Code

y : The last digit of production year

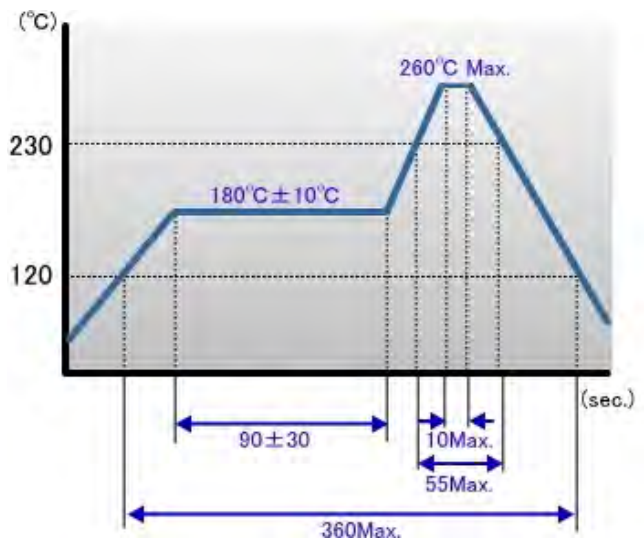
m : Production month (See Table.1)

: Production Lot No.

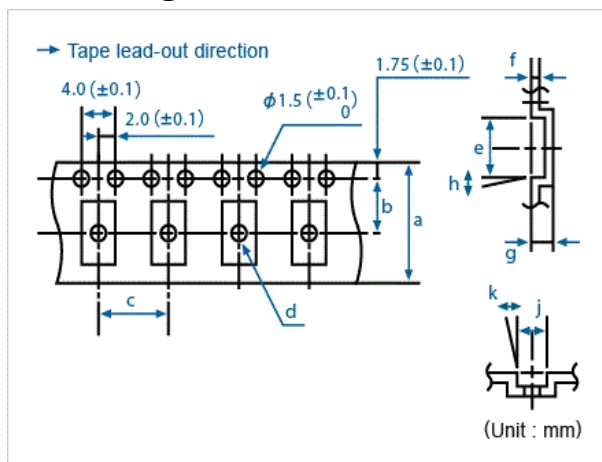
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

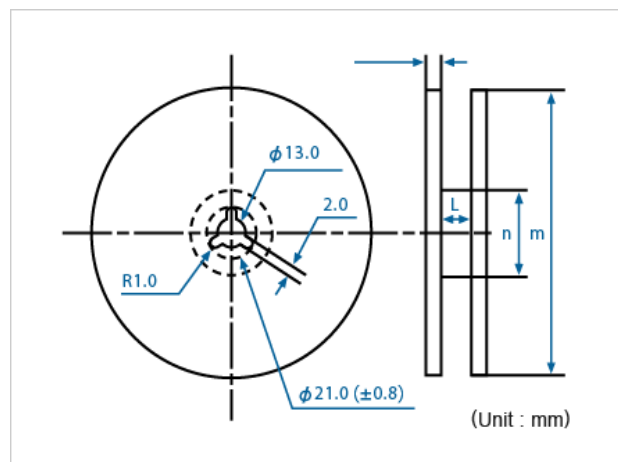
Reflow profile



Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	12.0	5.5	4.0	1.0	4.5	0.3	1.0	5°	1.9	5°	13.0	180	60

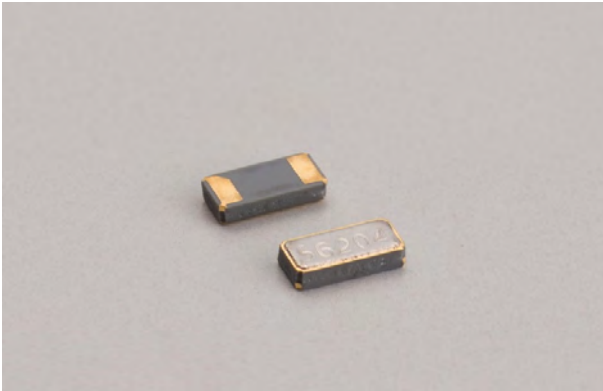
Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Ceramic Package)

RoHS compliant / Pb free

CM315D

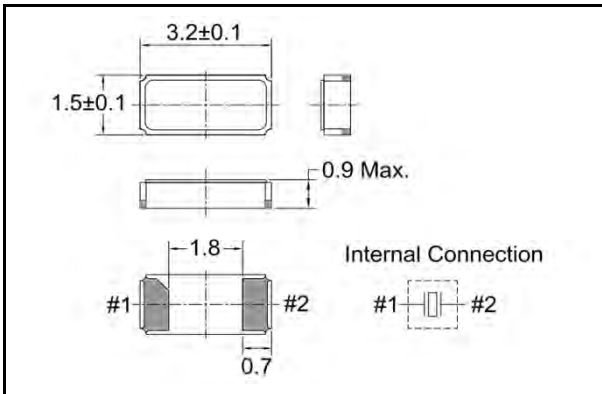
3,000pcs/reel



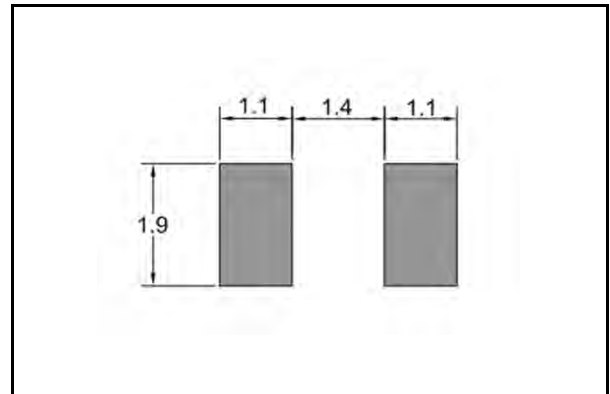
FEATURES

- Frequency range : 32.768kHz
- External dimensions (mm)
L : 3.3 x W : 1.6 x H : 0.9
- Applications
Smart Meters / Small mobile devices / Consumer products

DIMENSION [mm]



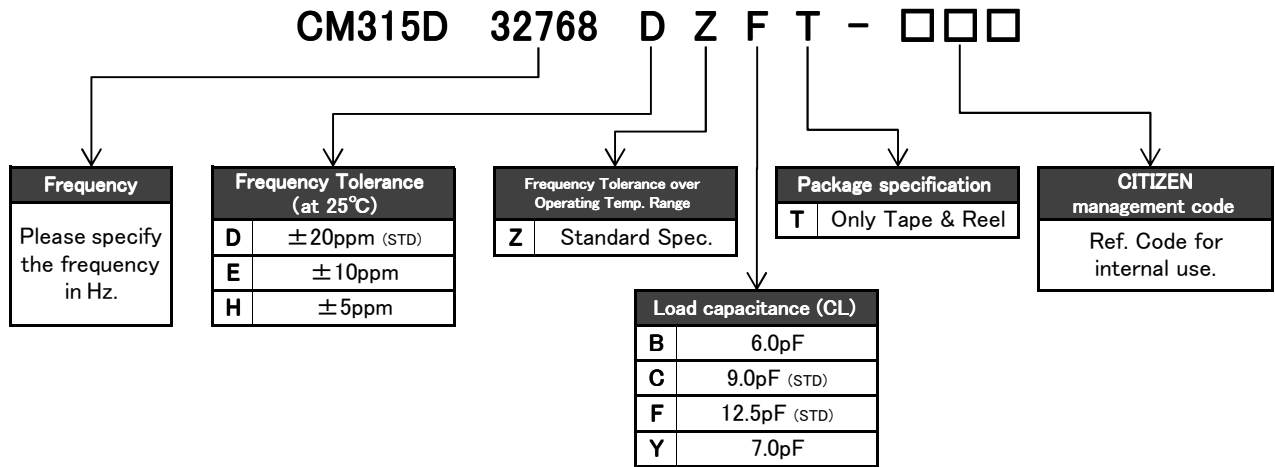
SOLDER PAD LAYOUT [mm]



STANDARD SPECIFICATIONS

Item	Model	CM315D	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	$\pm 5\text{ppm} / \pm 10\text{ppm} / \pm 20\text{ppm}$	at 25°C
Load capacitance	C_L	6.0pF / 7.0pF / 9.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C±5°C	
Temperature Coefficient	β	-0.034±0.006ppm/°C ²	
Motional (series) resistance	R_1	70KΩ Max.	at 25°C
Level of drive	D_L	1 μW Max.	
Aging (first year)	$\Delta f/f_0$	±3ppm Max.	25°C±3°C
Shunt capacitance	C_0	0.95pF Typ.	

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]



y : The last digit of production year

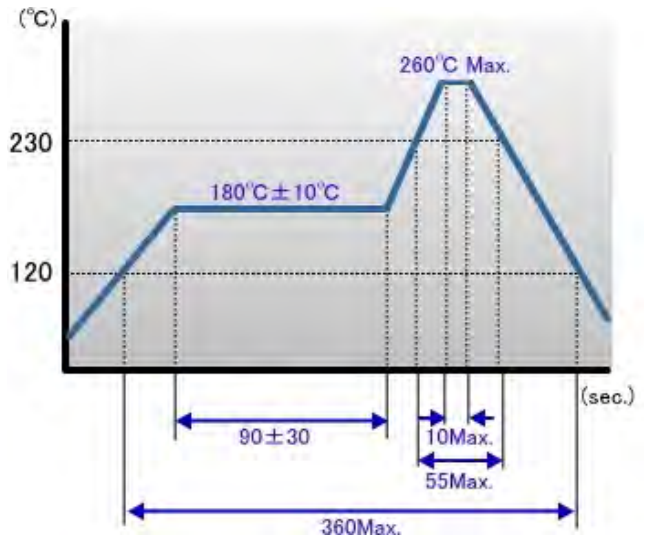
m : Production month (See Table.1)

: Production Lot No.

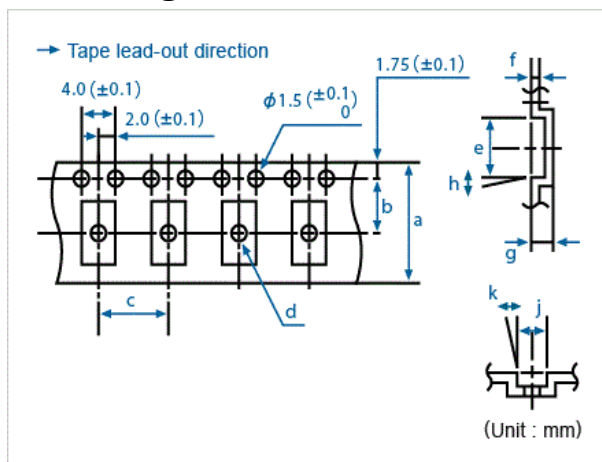
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

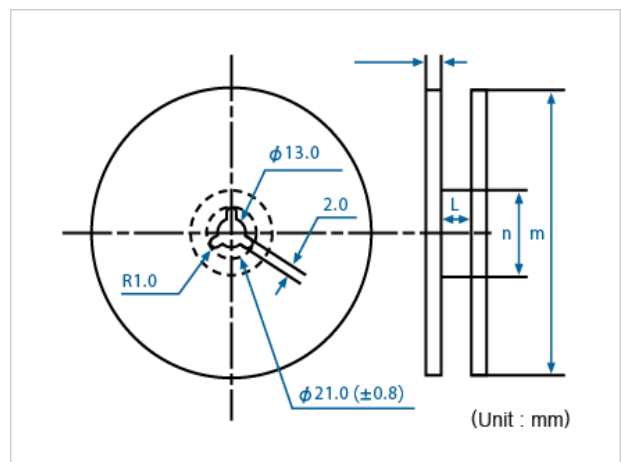
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	12.0	5.5	4.0	1.0	3.6	0.3	1.0	5°	1.9	5°	13.0	180	60

Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Ceramic Package)

RoHS compliant / Pb free

CM315DL

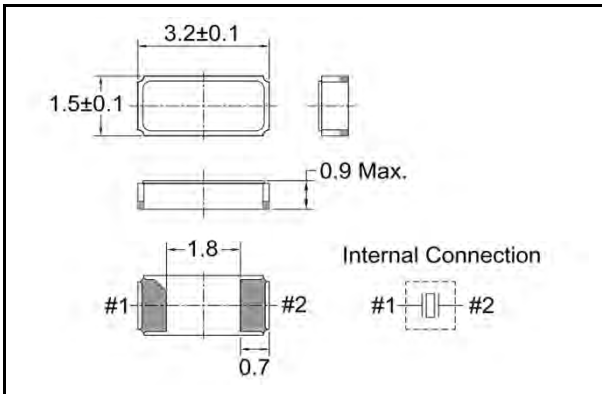
3,000pcs/reel



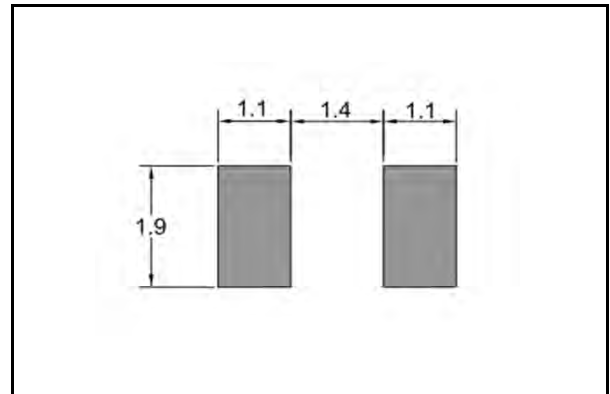
FEATURES

- Low ESR type
- Frequency range : 32.768kHz
- External dimensions (mm)
L : 3.3 x W : 1.6 x H : 0.9
- Applications
Smart Meters / Small mobile devices / Consumer products

DIMENSION [mm]



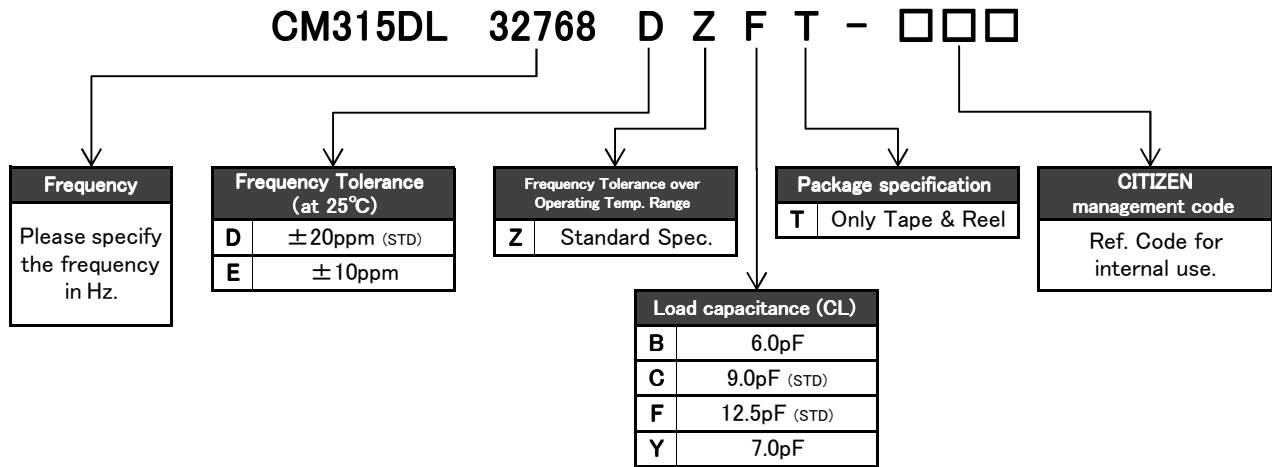
SOLDER PAD LAYOUT [mm]



STANDARD SPECIFICATIONS

Item	Model	CM315DL	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	$\pm 10\text{ppm} / \pm 20\text{ppm}$	at 25°C
Load capacitance	C_L	6.0pF / 7.0pF / 9.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C±5°C	
Temperature Coefficient	β	-0.034±0.006ppm/°C ²	
Motional (series) resistance	R_1	50K Ω Max.	at 25°C
Level of drive	D_L	0.5 μW Max.	
Aging (first year)	$\Delta f/f_0$	±3ppm Max.	25°C±3°C
Shunt capacitance	C_0	1.30pF Typ.	

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]

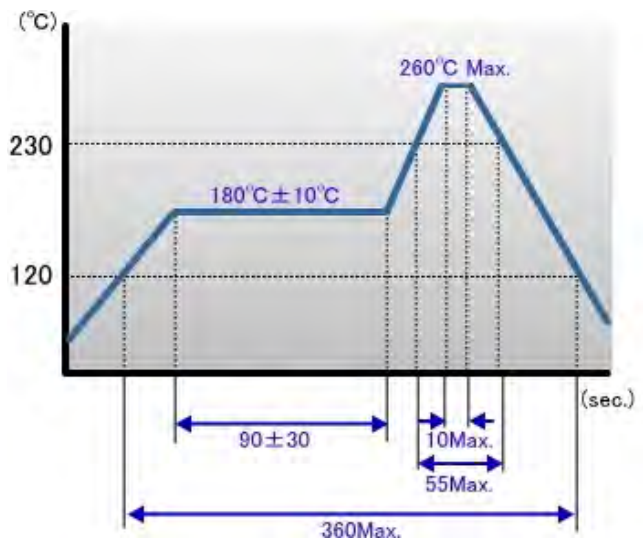


- y : The last digit of production year
- m : Production month (See Table.1)
- L : Manufacture's ID Code
- # : Production Lot No.

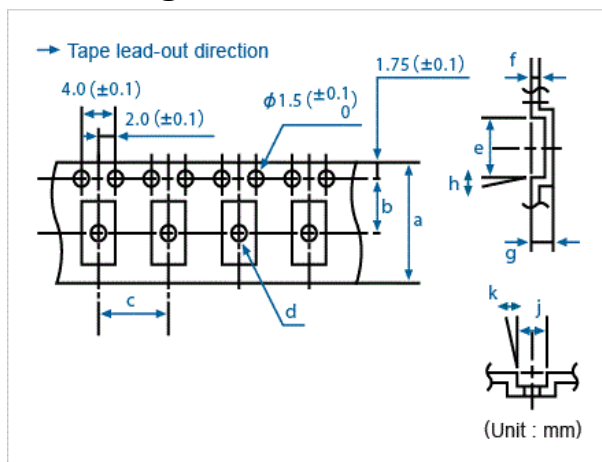
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

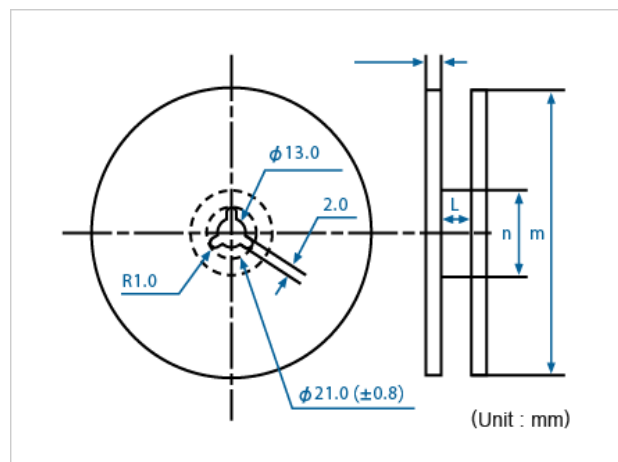
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	12.0	5.5	4.0	1.0	3.6	0.3	1.0	5°	1.9	5°	13.0	180	60

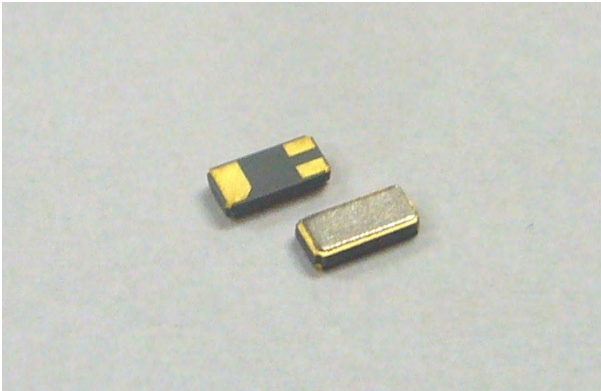
Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Ceramic Package)

RoHS compliant / Pb free

CM315E

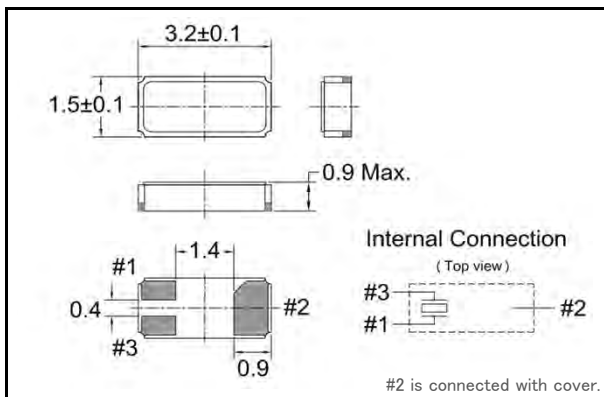
3,000pcs/reel



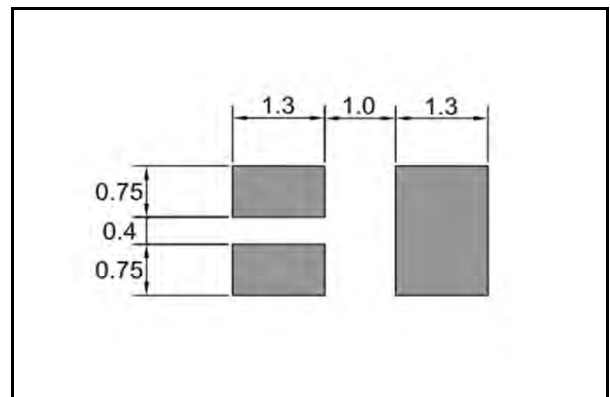
■ FEATURES

- Metal Lid GND connected
EMI reduced type
- Frequency range : 32.768kHz
- External dimensions (mm)
L : 3.3 x W : 1.6 x H : 0.9
- Applications
Smart Meters / Small communication devices /
Consumer products

■ DIMENSION [mm]



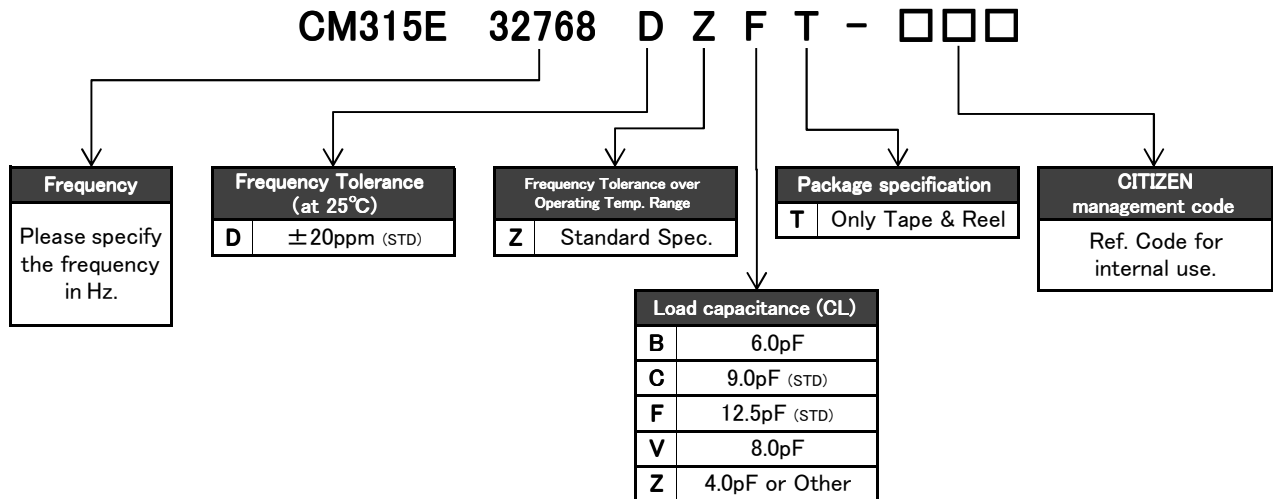
■ SOLDER PAD LAYOUT [mm]



■ STANDARD SPECIFICATIONS

Item	Model	CM315E	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	± 20 ppm	at 25°C
Load capacitance	C_L	4.0pF / 6.0pF / 8.0pF / 9.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C±5°C	
Temperature Coefficient	β	-0.034±0.006ppm/°C ²	
Motional (series) resistance	R_1	70KΩ Max.	at 25°C
Level of drive	D_L	1 μW Max.	
Aging (first year)	$\Delta f/f_0$	± 3 ppm Max.	25°C±3°C
Shunt capacitance	C_0	0.75pF Typ.	

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]



y : The last digit of production year

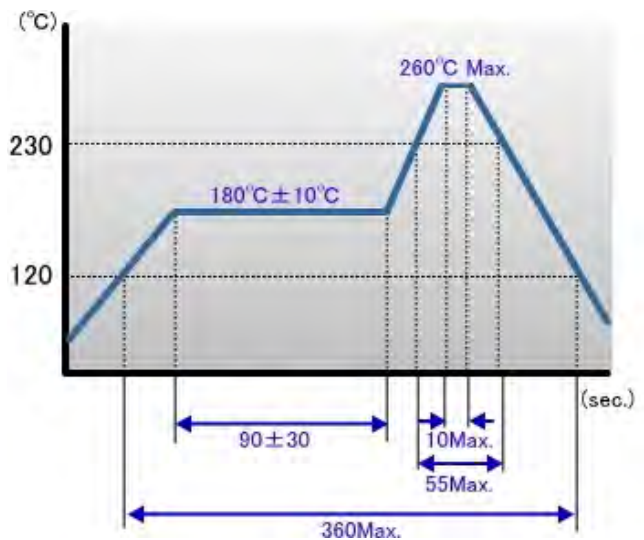
m : Production month (See Table.1)

: Production Lot No.

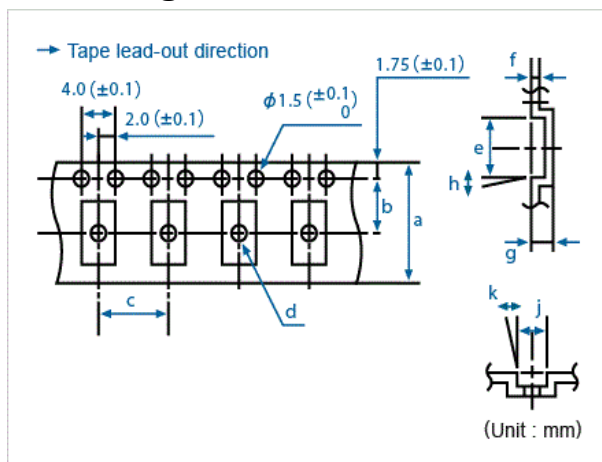
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

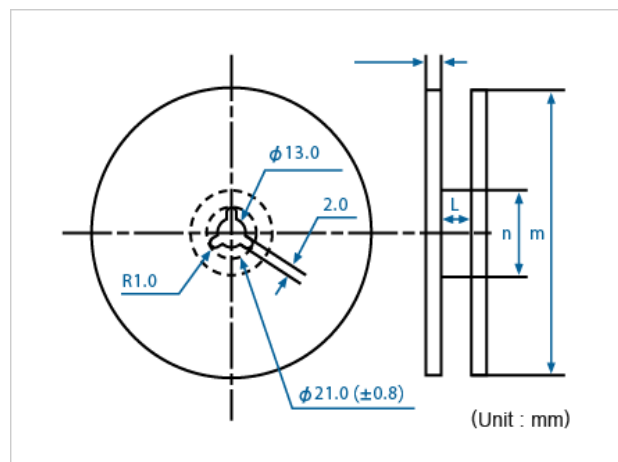
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	12.0	5.5	4.0	1.0	3.6	0.3	1.0	5°	1.9	5°	13.0	180	60

Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Ceramic Package)

RoHS compliant / Pb free

CM2012H

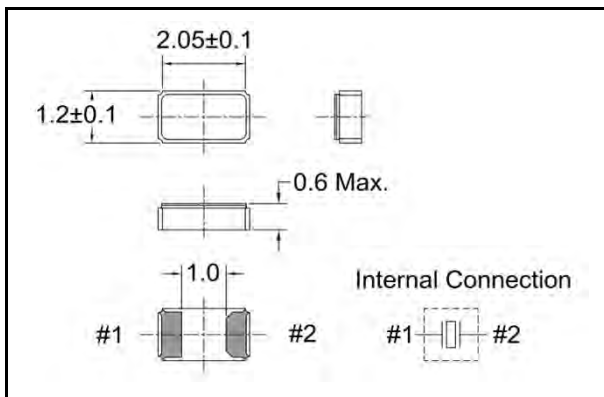
3,000pcs/reel



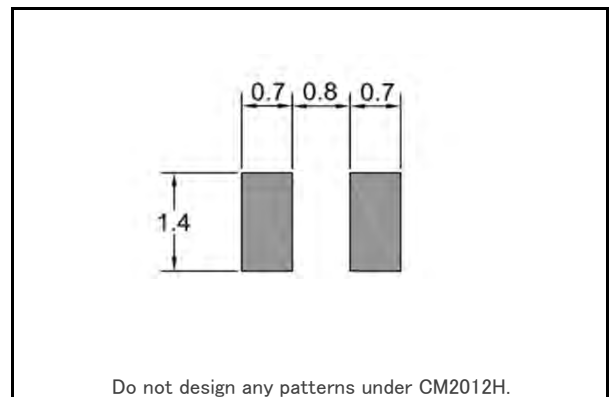
■ FEATURES

- Frequency range : 32.768kHz
- External dimensions (mm)
L : 2.15 x W : 1.3 x H : 0.6
- Applications
Small communication devices

■ DIMENSION [mm]



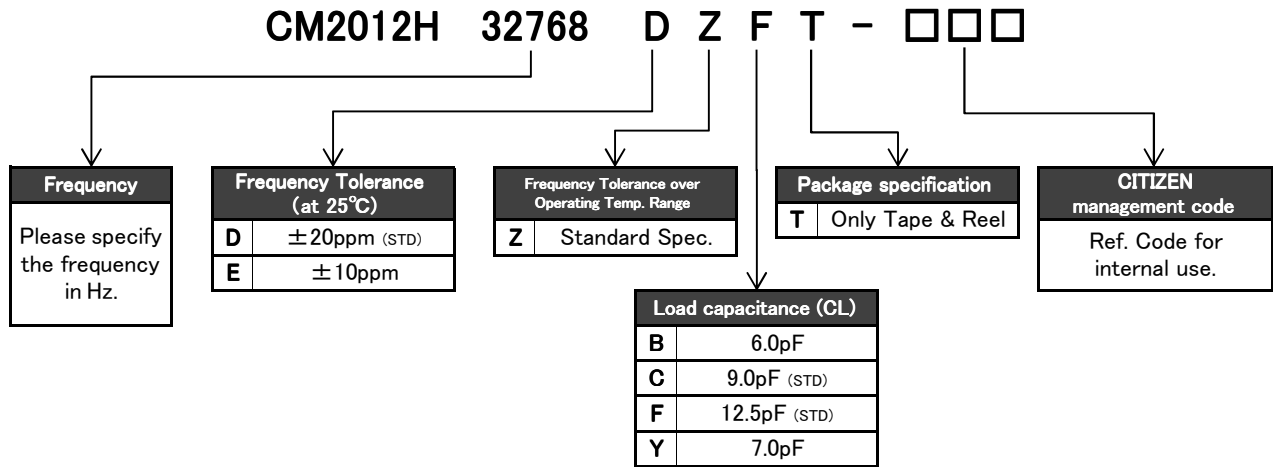
■ SOLDER PAD LAYOUT [mm]



■ STANDARD SPECIFICATIONS

Item	Model	CM2012H	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	$\pm 10\text{ppm} / \pm 20\text{ppm}$	at 25°C
Load capacitance	C_L	6.0pF / 7.0pF / 9.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C±5°C	
Temperature Coefficient	β	-0.033±0.003ppm/°C ²	
Motional (series) resistance	R_1	70KΩ Max.	at 25°C
Level of drive	D_L	1.0 μW Max.	
Aging (first year)	$\Delta f/f_0$	±3ppm Max.	25°C±3°C
Shunt capacitance	C_0	1.3pF Typ.	

■ PART NUMBERING SYSTEM



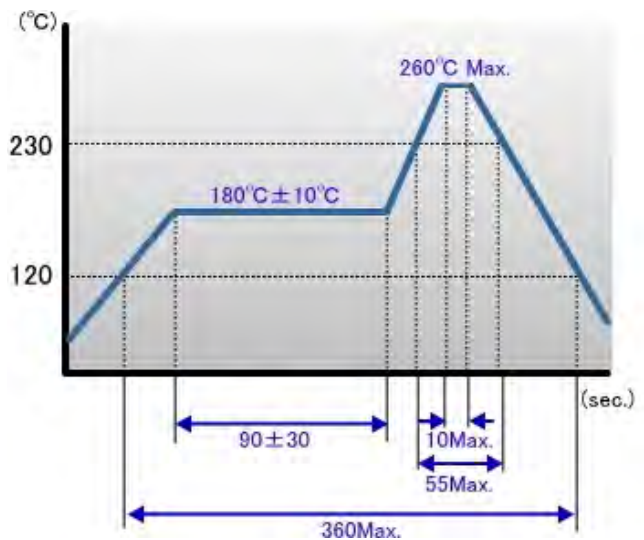
*Please contact us for specifications available.

■ Part Marking [standard]

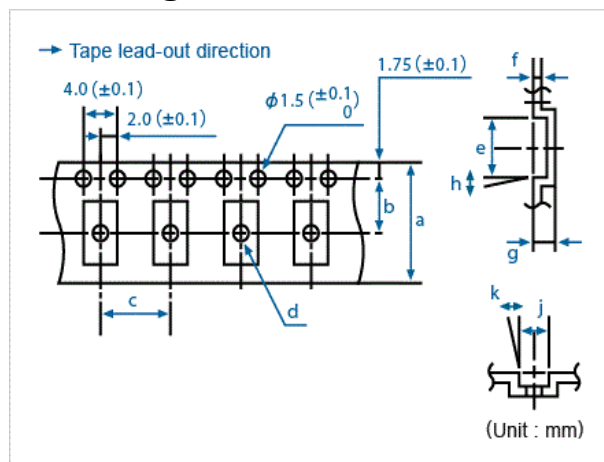


- C : Manufacture's ID Code
- y : The last digit of production year
- w : Production week code
- * : CL Code
 - B: 6.0pF
 - C: 9.0pF
 - F: 12.5pF
 - Y: 7.0pF

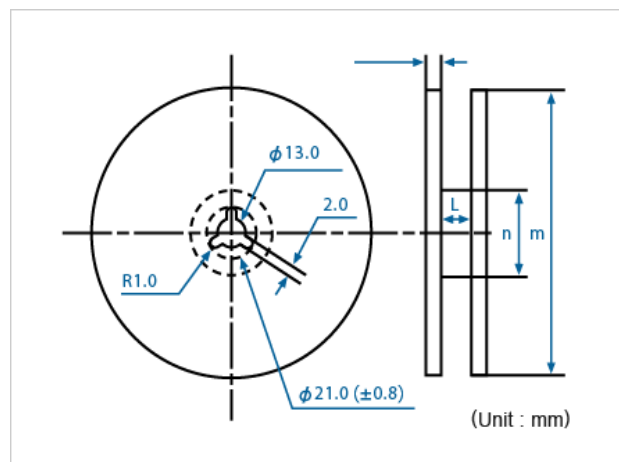
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	8.0	3.5	4.0	1.0	2.25	0.23	0.8	5°	1.4	5°	9.0	180	60

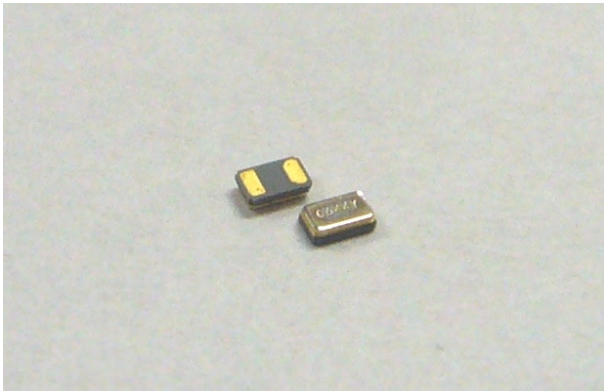
Rev.1

TUNING FORK CRYSTAL UNIT (SMD · Ceramic Package)

RoHS compliant / Pb free

CM1610H

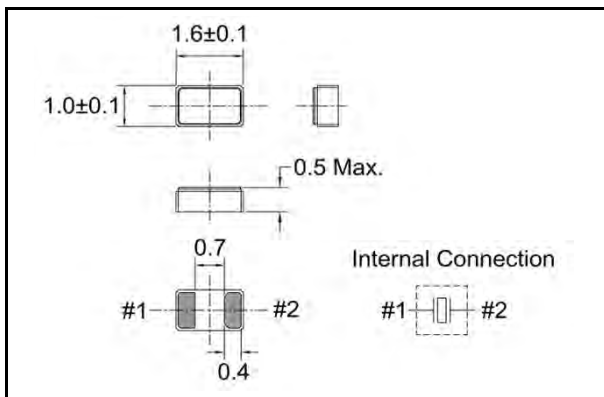
5,000pcs/reel



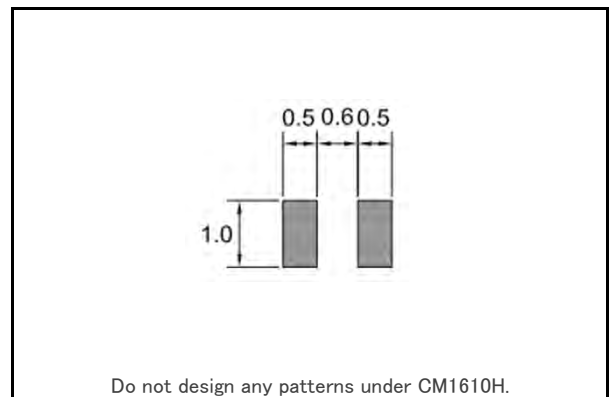
■ FEATURES

- Ultra-lightweight microminiature TF Crystal units SMD type
- Frequency range : 32.768kHz
- External dimensions (mm)
L : 1.6 x W : 1.0 x H : 0.5
- Applications
Small communication devices

■ DIMENSION [mm]



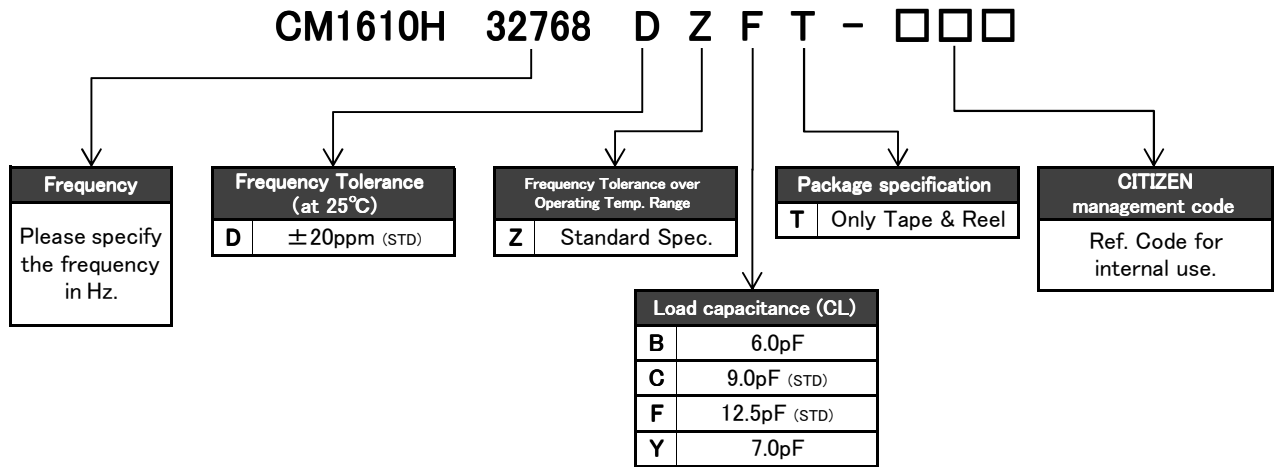
■ SOLDER PAD LAYOUT [mm]



■ STANDARD SPECIFICATIONS

Item	Model	CM1610H	Conditions
Nominal Frequency	f_0	32.768kHz	
Frequency Tolerance	$\Delta f/f_0$	± 20 ppm	at 25°C
Load capacitance	C_L	6.0pF / 7.0pF / 9.0pF / 12.5pF	Please specify your requirement
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Turnover Temperature	T_M	25°C \pm 5°C	
Temperature Coefficient	β	(-0.036 \pm 10%) ppm/°C ²	
Motional (series) resistance	R_1	90K Ω Max.	at 25°C
Level of drive	D_L	0.5 μ W Max.	
Aging (first year)	$\Delta f/f_0$	± 3 ppm Max.	25°C \pm 3°C
Shunt capacitance	C_0	1.2pF Typ.	

■ PART NUMBERING SYSTEM



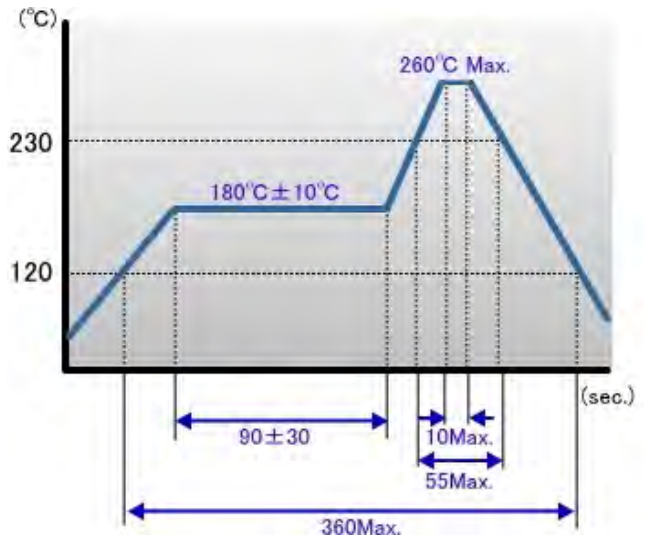
*Please contact us for specifications available.

■ Part Marking [standard]

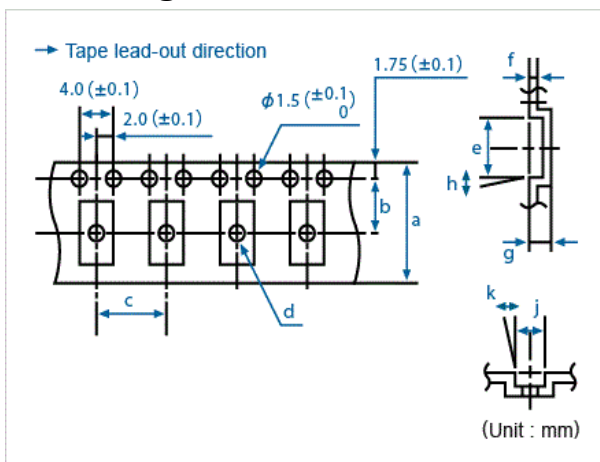


- C : Manufacture's ID Code
- y : The last digit of production year
- w : Production week code
- * : CL Code
 - B: 6.0pF
 - C: 9.0pF
 - F: 12.5pF
 - Y: 7.0pF

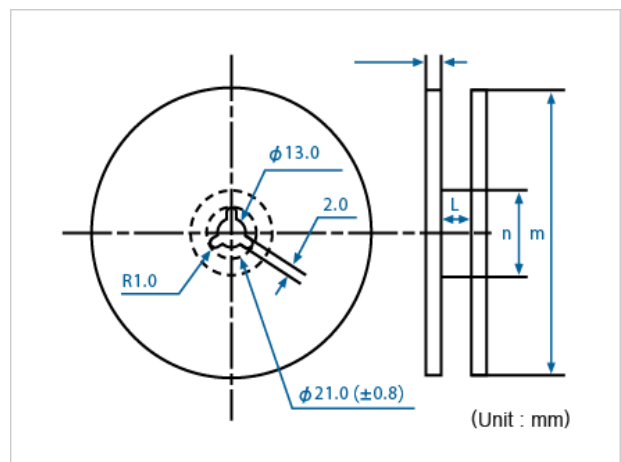
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
5,000	8.0	3.5	4.0	0.5	1.8	0.23	0.6	5°	1.2	5°	9.0	180	60

Rev.1

AT-CUT CRYSTAL UNIT (Metal-can Type)

RoHS compliant

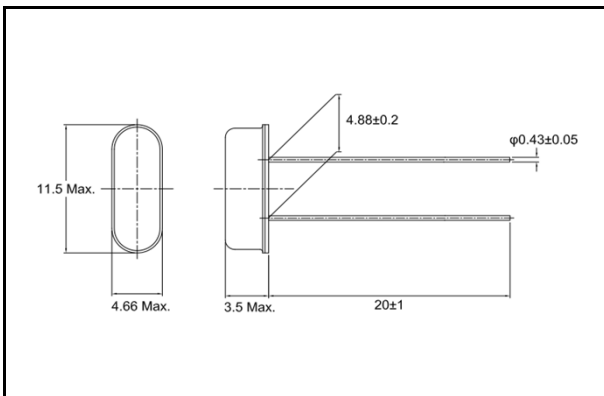
HC-49/U-S



■ FEATURES

- Frequency range : 3.5 ~ 50.0MHz
- External dimensions (mm)
L : 11.5 x W : 4.66 x H : 3.5
- Applications
Consumer products

■ DIMENSION [mm]



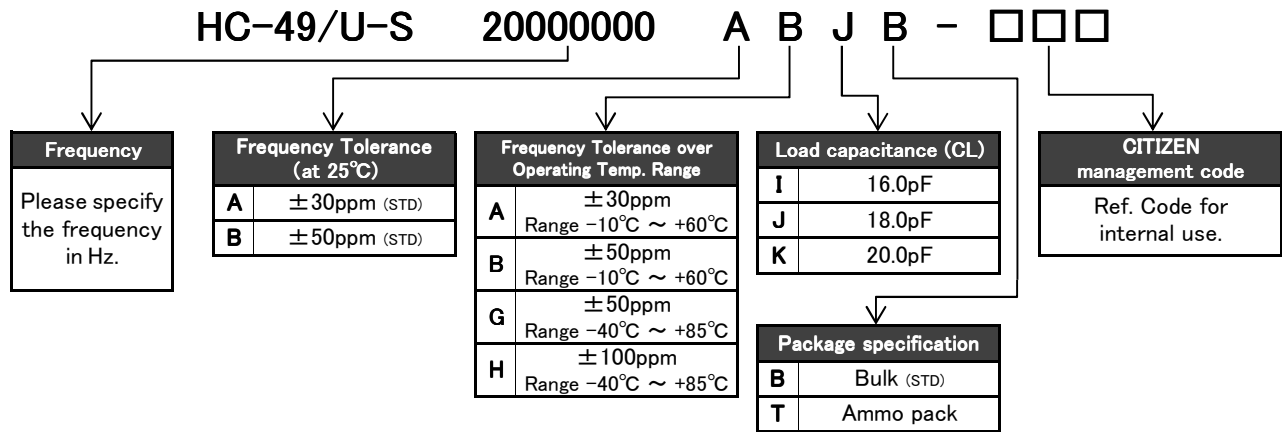
■ STANDARD SPECIFICATIONS

Item	Model	HC-49/U-S	Conditions
Nominal Frequency	f_0	3.5MHz ~ 30.0MHz (Fundamental) 30.0MHz ~ 50.0MHz (3rd Overtone)	Please contact us for frequencies available
Frequency Tolerance	$\Delta f/f_0$	± 30 ppm	at 25°C
Frequency Tolerance over Operating Temperature Range	$\Delta f/f_0$	below 6.0MHz: ± 50 ppm above 6.0MHz: ± 30 ppm	-10°C ~ +60°C
Operating Temperature Range	T _{OPR}	-20°C ~ +70°C	
Storage Temperature Range	T _{STR}	-40°C ~ +85°C	
Motional (series) resistance	R ₁	Refer to the following table	at 25°C
Load capacitance	C _L	Fundamental: 10.0pF ~ ∞ 3rd Overtone: 5.0pF ~ ∞	Please specify your requirement
Shunt capacitance	C ₀	7.0pF Max.	
Level of drive	D _L	100 μW	
Insulation Resistance	I _R	500MΩ Min.	DC100V ± 15V
Aging (first year)	$\Delta f/f_0$	± 5 ppm Max.	25°C ± 3°C

■ MOTIONAL (SERIES) RESISTANCE (R₁)

Freq. Range (MHz)	3.5 ≤ f ₀ < 4.0	4.0 ≤ f ₀ < 6.0	6.0 ≤ f ₀ < 10.0	10.0 ≤ f ₀ < 14.0	14.0 ≤ f ₀ < 30.0	30.0 ≤ f ₀ < 36.0	36.0 ≤ f ₀ ≤ 50.0
Mode	Fundamental	Fundamental	Fundamental	Fundamental	Fundamental	3rd Overtone	3rd Overtone
R ₁	200Ω Max.	150Ω Max.	100Ω Max.	80Ω Max.	50Ω Max.	140Ω Max.	100Ω Max.

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]



f : The first 4 digits of Frequency including the decimal point

C : Manufacture's ID Code

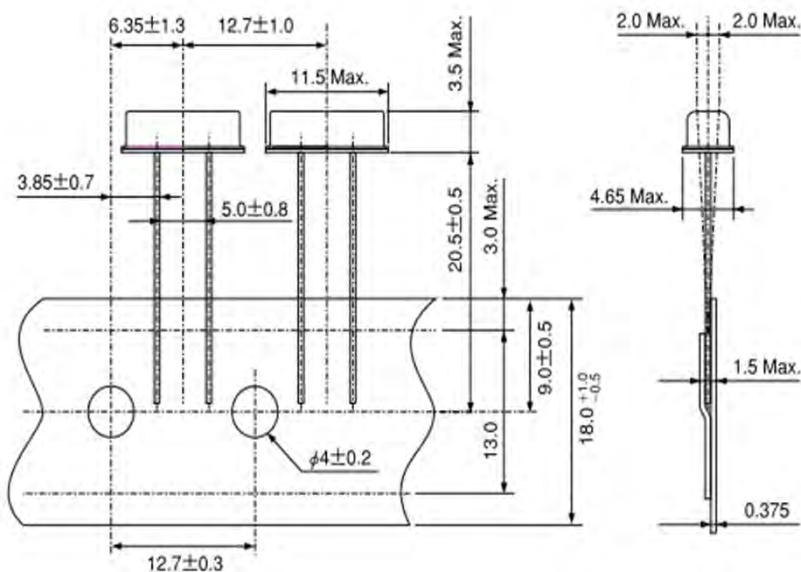
y : The last digit of production year

m : Production month (See Table.1)

Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

■ Taping dimension : 2,000pcs/Ammo pack [mm]



Rev.1

AT-CUT CRYSTAL UNIT (SMD · Metal-can Type)

RoHS compliant

HCM49

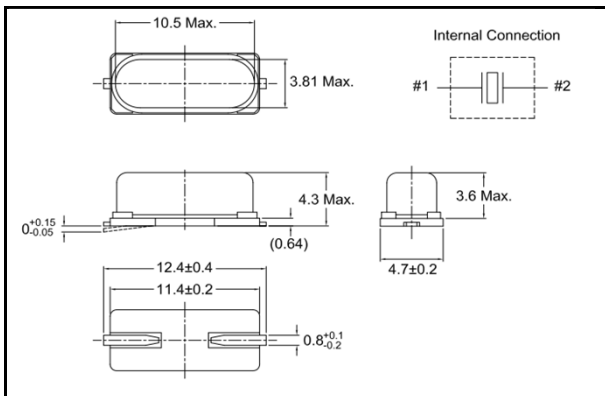
1,000pcs/reel



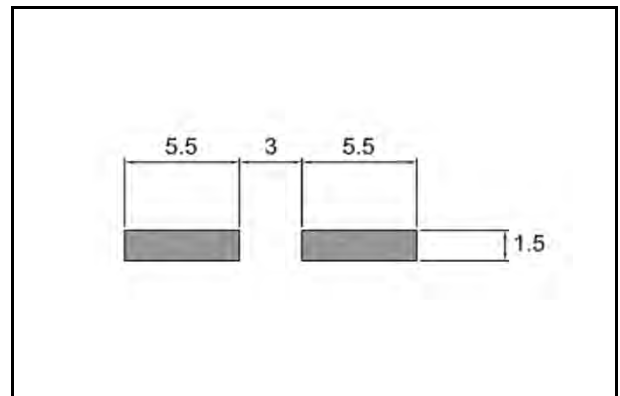
■ FEATURES

- Frequency range : 3.5 ~ 50.0MHz
- External dimensions (mm)
L : 12.8 x W : 4.9 x H : 4.3
- Applications
Consumer products

■ DIMENSION [mm]



■ SOLDER PAD LAYOUT [mm]



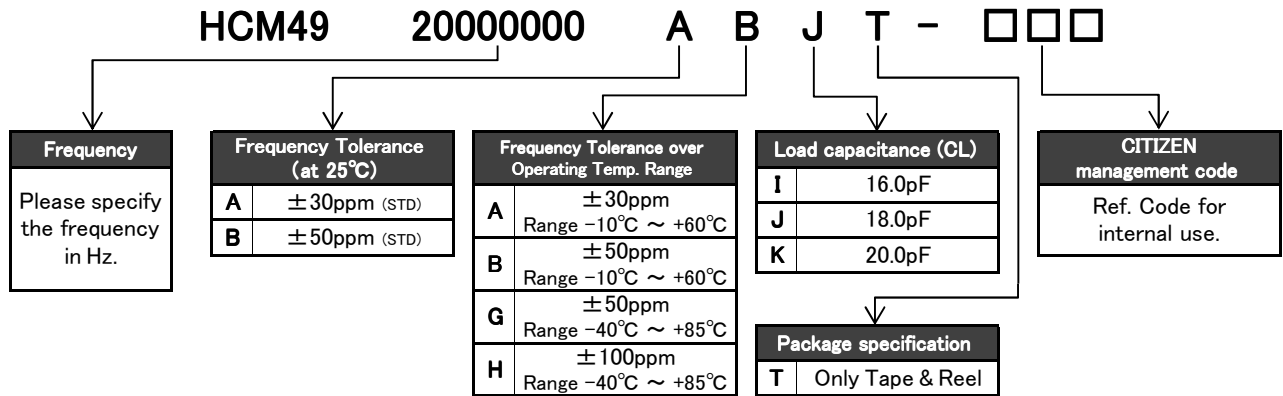
■ STANDARD SPECIFICATIONS

Item	Model	HCM49	Conditions
Nominal Frequency	f_0	3.5MHz ~ 30.0MHz (Fundamental) 30.0MHz ~ 50.0MHz (3rd Overtone)	Please contact us for frequencies available
Frequency Tolerance	$\Delta f/f_0$	±30ppm	at 25°C
Frequency Tolerance over Operating Temperature Range	$\Delta f/f_0$	below 6.0MHz: ±50ppm above 6.0MHz: ±30ppm	-10°C ~ +60°C
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Motional (series) resistance	R_1	Refer to the following table	at 25°C
Load capacitance	C_L	Fundamental: 10.0pF ~ ∞ 3rd Overtone: 5.0pF ~ ∞	Please specify your requirement
Shunt capacitance	C_0	7.0pF Max.	
Level of drive	D_L	100 μW	
Insulation Resistance	I_R	500MΩ Min.	DC100V ± 15V
Aging (first year)	$\Delta f/f_0$	±5ppm Max.	25°C ± 3°C

■ MOTIONAL (SERIES) RESISTANCE (R₁)

Freq. Range (MHz)	3.5 ≤ f ₀ < 4.0	4.0 ≤ f ₀ < 6.0	6.0 ≤ f ₀ < 10.0	10.0 ≤ f ₀ < 14.0	14.0 ≤ f ₀ < 30.0	30.0 ≤ f ₀ < 36.0	36.0 ≤ f ₀ ≤ 50.0
Mode	Fundamental	Fundamental	Fundamental	Fundamental	Fundamental	3rd Overtone	3rd Overtone
R ₁	200Ω Max.	150Ω Max.	100Ω Max.	80Ω Max.	50Ω Max.	140Ω Max.	100Ω Max.

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]



f : The first 4 digits of Frequency including the decimal point

C : Manufacture's ID Code

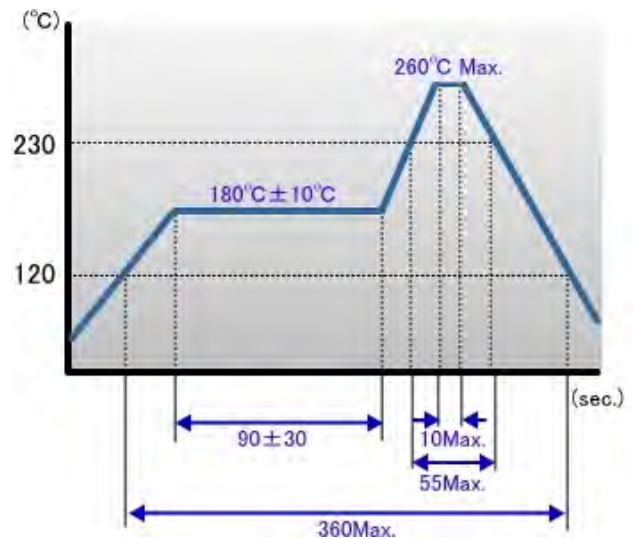
y : The last digit of production year

m : Production month (See Table.1)

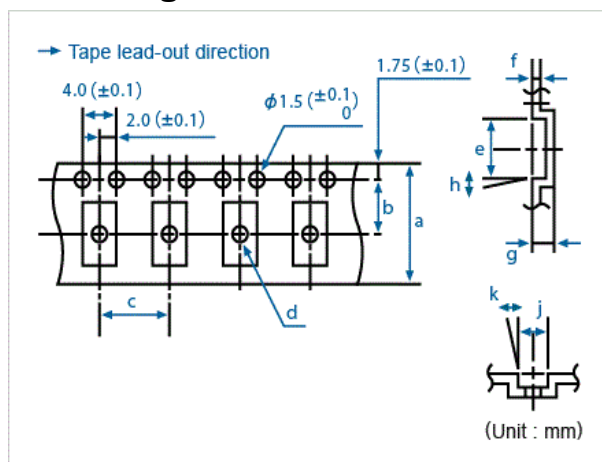
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

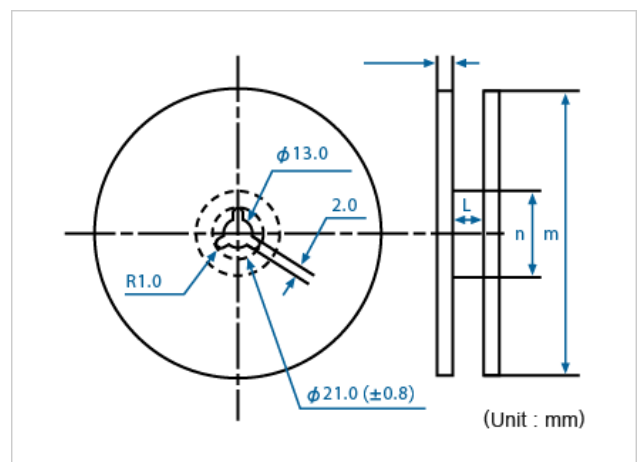
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d(φ)	e	f	g	h	j	k	l	m(φ)	n(φ)
1,000	24.0	11.5	12.0	2.0	14.1	0.4	4.2	5°	6.5	5°	25.5	330	80

Rev.1

AT-CUT CRYSTAL UNIT (SMD · Plastic Package)

RoHS compliant

CM309E

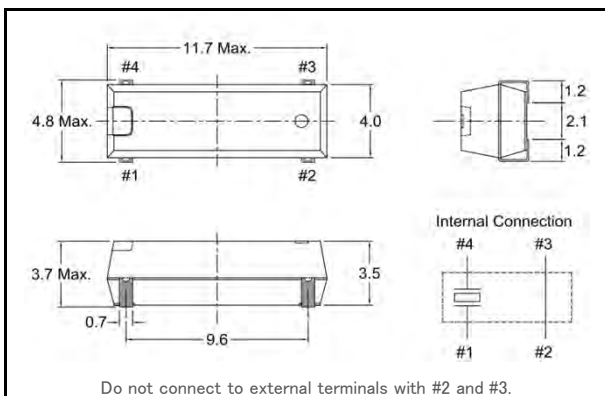
1,000pcs/reel



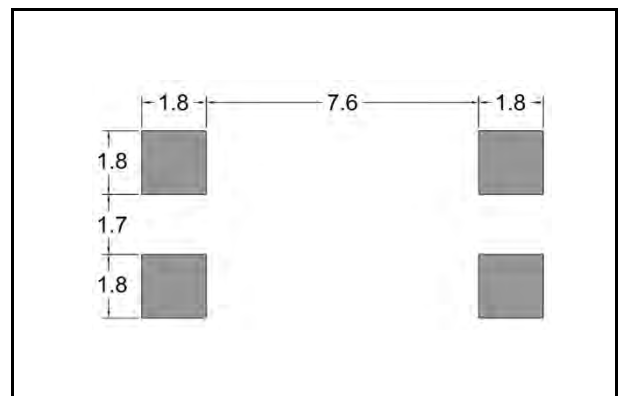
■ FEATURES

- Frequency range : 4.0 ~ 64.0MHz
- External dimensions (mm)
L : 11.7 x W : 4.8 x H : 3.7
- Applications
Consumer products

■ DIMENSION [mm]



■ SOLDER PAD LAYOUT [mm]



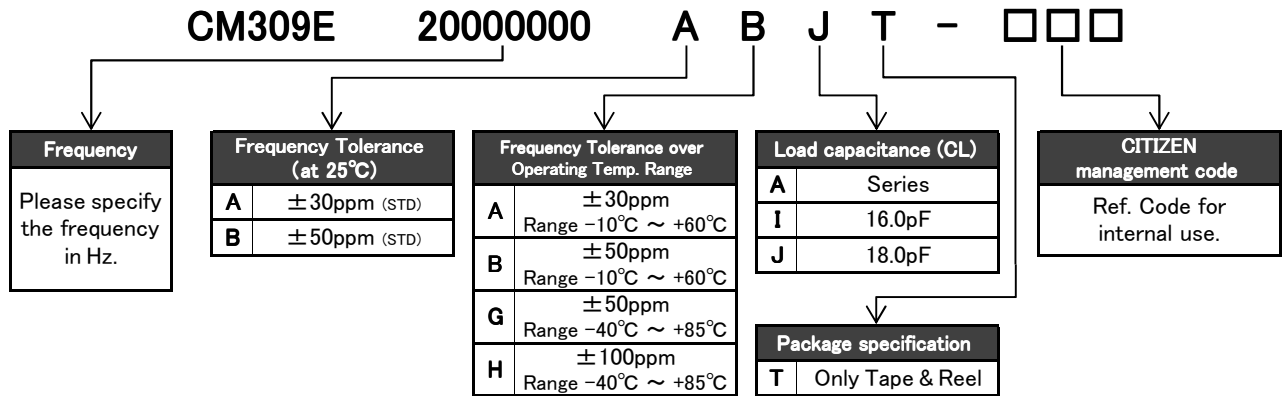
■ STANDARD SPECIFICATIONS

Item	Model	CM309E	Conditions
Nominal Frequency	f_0	4.0MHz ~ 29.999MHz (Fundamental) 30.0MHz ~ 64.0MHz (3rd Overtone)	Please contact us for frequencies available
Frequency Tolerance	$\Delta f/f_0$	$\pm 30\text{ppm}$	at 25°C
Frequency Tolerance over Operating Temperature Range	$\Delta f/f_0$	below 5.5MHz: $\pm 50\text{ppm}$ above 5.5MHz: $\pm 30\text{ppm}$	-10°C ~ +60°C
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Motional (series) resistance	R_1	Refer to the following table	at 25°C
Load capacitance	C_L	16.0pF / 18.0pF / Series	Please specify your requirement
Shunt capacitance	C_0	5.0pF Max.	
Level of drive	DL	2mW Max.	
Insulation Resistance	I_R	500MΩ Min.	DC100V ± 15V
Aging (first year)	$\Delta f/f_0$	$\pm 5\text{ppm Max.}$	25°C ± 3°C

■ MOTIONAL (SERIES) RESISTANCE (R₁)

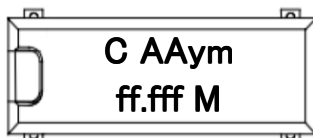
Freq. Range (MHz)	$4.0 \leq f_0 < 5.5$	$5.5 \leq f_0 < 6.0$	$6.0 \leq f_0 < 10.0$	$10.0 \leq f_0 < 12.0$	$12.0 \leq f_0 < 16.0$	$16.0 \leq f_0 < 30.0$	$30.0 \leq f_0 < 36.0$	$36.0 \leq f_0 < 64.0$
Mode	Fundamental	Fundamental	Fundamental	Fundamental	Fundamental	Fundamental	3rd Overtone	3rd Overtone
R ₁	150Ω Max.	100Ω Max.	80Ω Max.	60Ω Max.	50Ω Max.	40Ω Max.	100Ω Max.	80Ω Max.

PART NUMBERING SYSTEM



*Please contact us for specifications available.

Part Marking [standard]

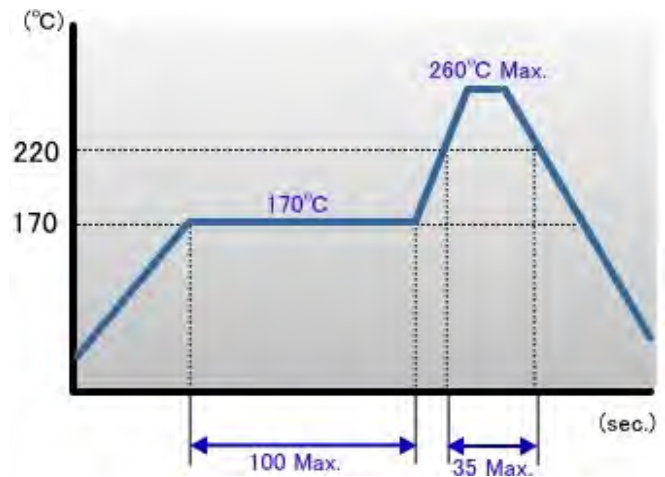


- C AA : Manufacture's ID Code
- y : The last digit of production year
- m : Production month (See Table.1)
- ff.fff : Frequency
- M : MHz

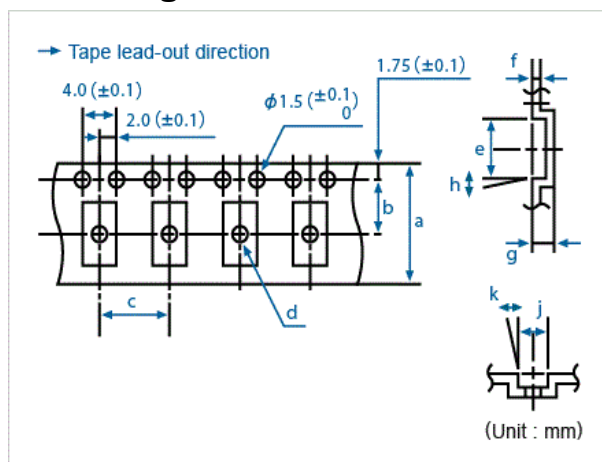
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

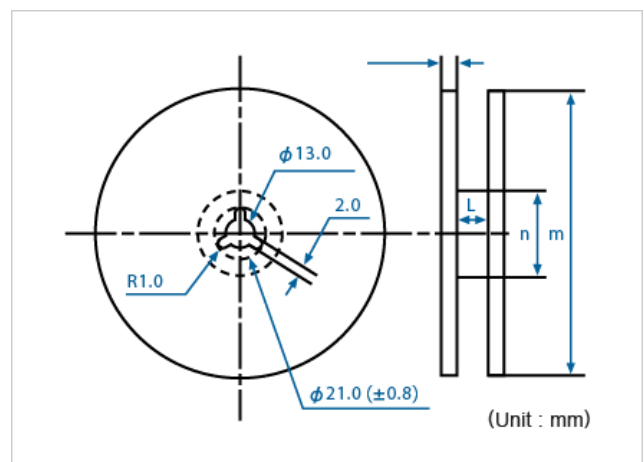
Reflow profile



Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

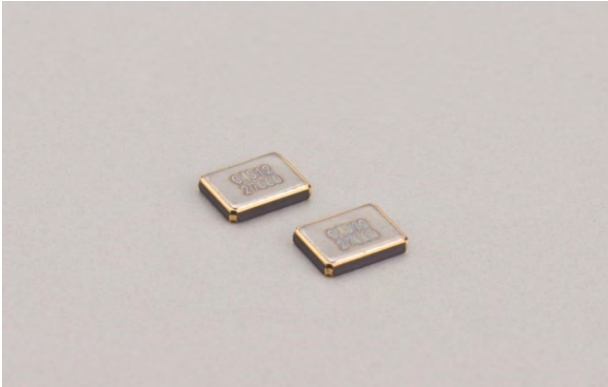
Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
1,000	24.0	11.5	12.0	1.5	11.9	0.4	4.0	5°	4.9	5°	25.5	330	100

AT-CUT CRYSTAL UNIT (SMD · Ceramic Package)

RoHS compliant / Pb free

CS325S

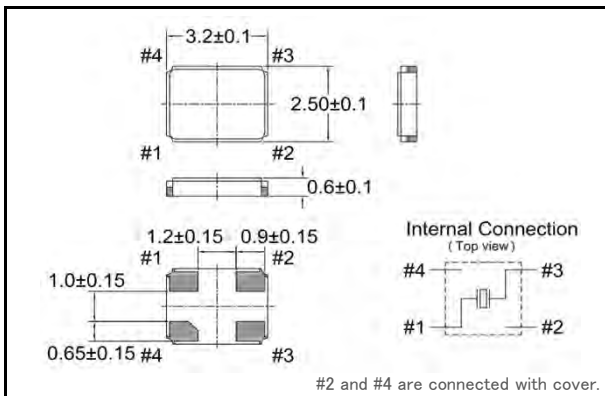
3,000pcs/reel



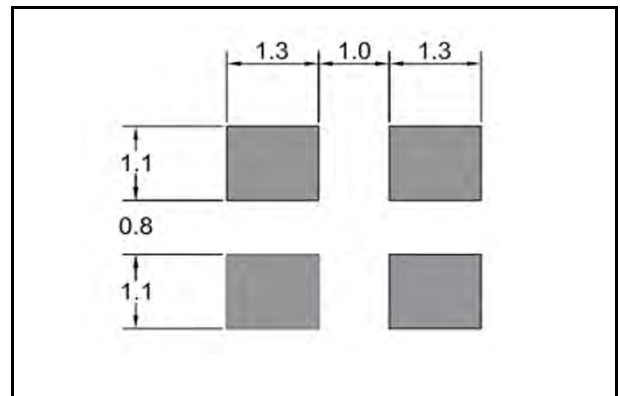
■ FEATURES

- Ultra-lightweight microminiature AT Crystal units SMD type
- Frequency range : 12.0 ~ 54.0MHz
- External dimensions (mm)
L : 3.3 x W : 2.6 x H : 0.7
- Applications
Small mobile devices / Consumer products

■ DIMENSION [mm]



■ SOLDER PAD LAYOUT [mm]



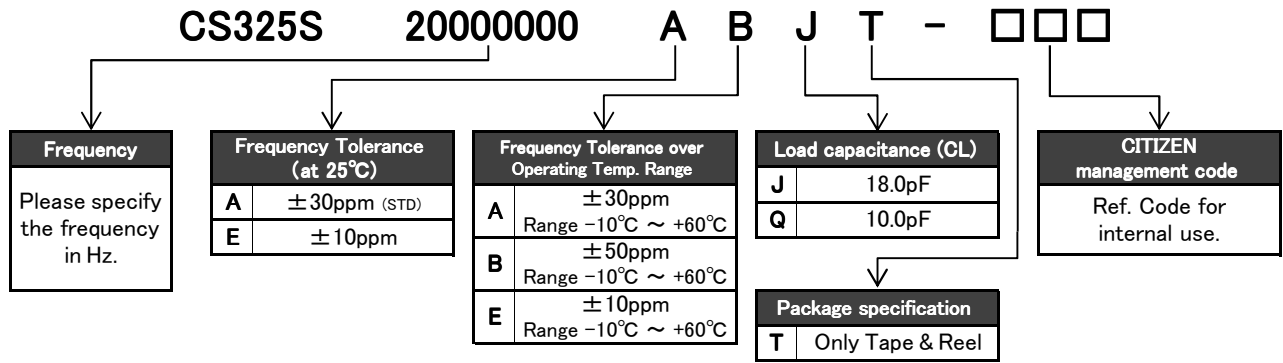
■ STANDARD SPECIFICATIONS

Item	Model	CS325S	Conditions
Nominal Frequency	f_0	12.0MHz ~ 54.0MHz (Fundamental)	Please contact us for frequencies available
Frequency Tolerance	$\Delta f/f_0$	±30ppm	at 25°C
Frequency Tolerance over Operating Temperature Range	$\Delta f/f_0$	±30ppm	-10°C ~ +60°C
Operating Temperature Range	T_{OPR}	-40°C ~ +85°C	
Storage Temperature Range	T_{STR}	-55°C ~ +125°C	
Motional (series) resistance	R_1	Refer to the following table	at 25°C
Load capacitance	C_L	10.0pF ~ ∞	Please specify your requirement
Shunt capacitance	C_0	5.0pF Max.	
Level of drive	DL	100 μW Max.	
Insulation Resistance	I_R	500MΩ Min.	DC100V ± 15V
Aging (first year)	$\Delta f/f_0$	±5ppm Max.	25°C ± 3°C

■ MOTIONAL (SERIES) RESISTANCE (R1)

Freq. Range (MHz)	$12.0 \leq f_0 < 16.0$	$16.0 \leq f_0 < 20.0$	$20.0 \leq f_0 < 30.0$	$30.0 \leq f_0 < 54.0$
R_1	150 Ω Max.	120 Ω Max.	80 Ω Max.	50 Ω Max.

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]

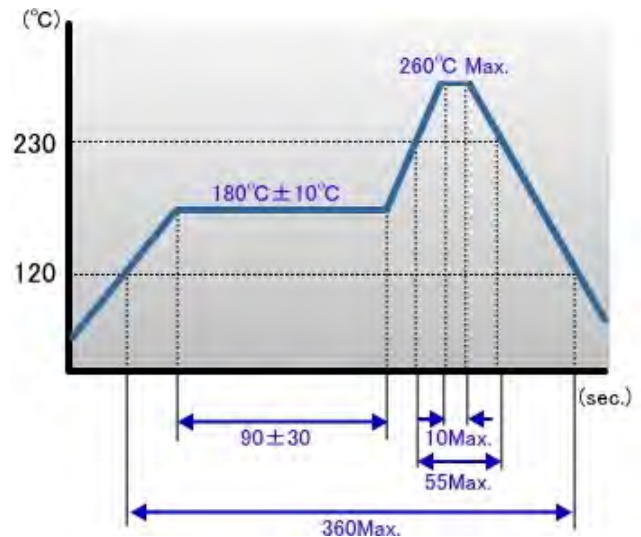


- C : Manufacture's ID Code
- y : The last digit of production year
- m : Production month (See Table.1)
- # : Production Lot No.
- f : The first 4 digits of Frequency including the decimal point

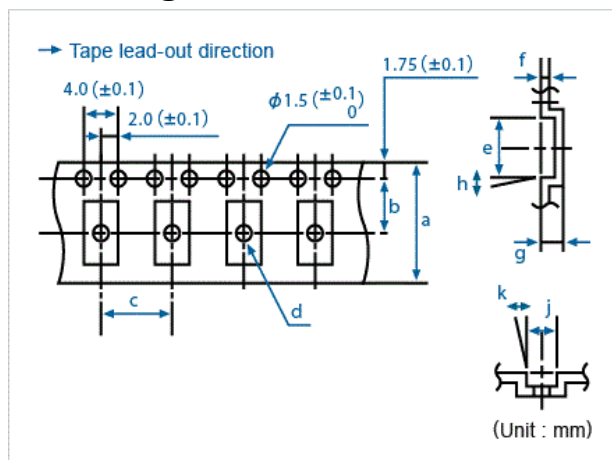
Table.1

Month	Jan	Feb	...	Sep	Oct	Nov	Dec
Code	1	2	...	9	X	Y	Z

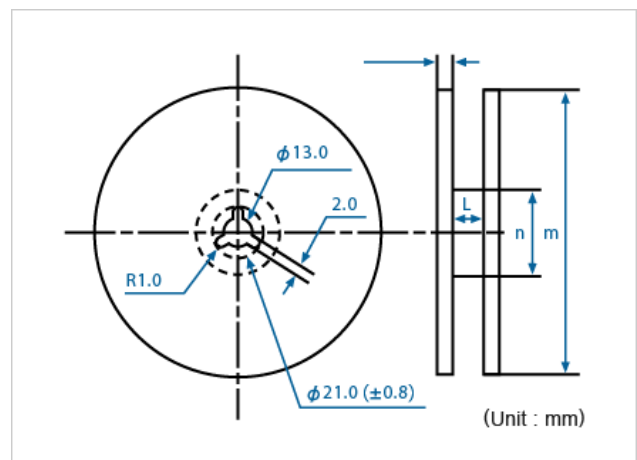
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

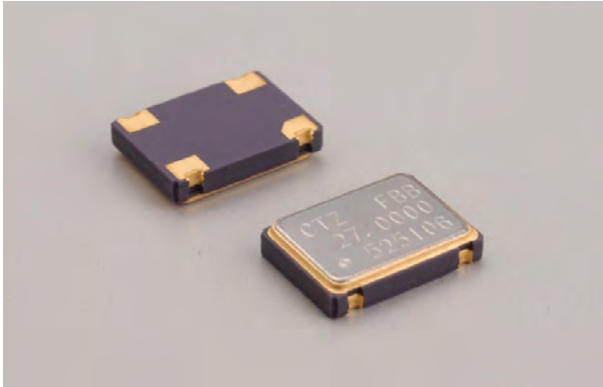
Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	8.0	3.5	4.0	1.1	3.5	0.25	0.75	5°	2.8	-	11.4	180	60

CRYSTAL CLOCK OSCILLATORS (SMD · Ceramic Package)

RoHS compliant

CSX-750F

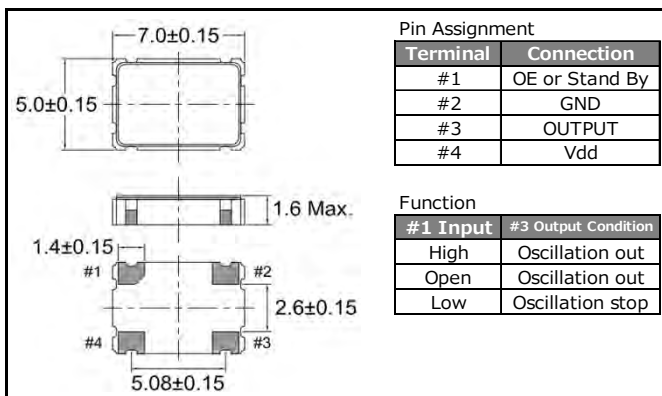
1,000pcs/reel



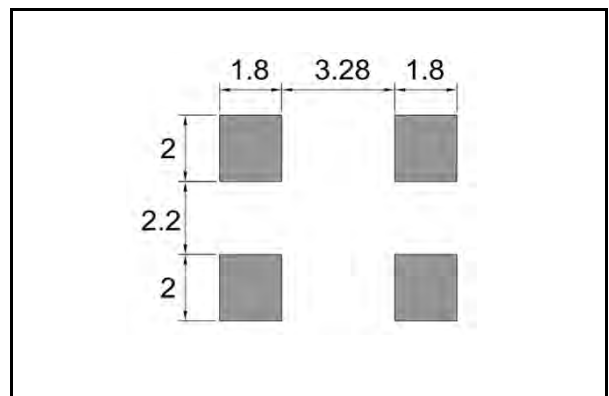
■ FEATURES

- Frequency range : 1.0 ~ 80.0MHz
- External dimensions (mm)
L : 7.2 x W : 5.2 x H : 1.6
- Applications
Consumer products

■ DIMENSION [mm]



■ SOLDER PAD LAYOUT [mm]

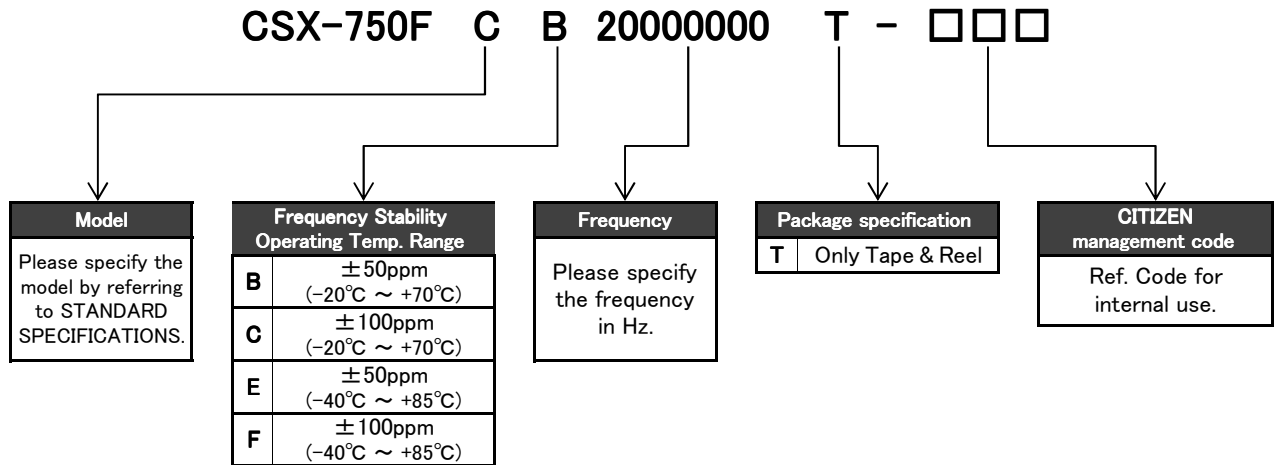


■ STANDARD SPECIFICATIONS

*Model is determined by selection of OE/ST functions, frequency stability, and supply voltage.

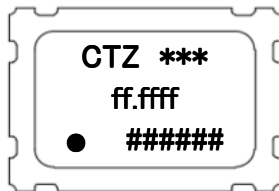
Item	Model	OE	CSX-750FC (*)		CSX-750FB (*)		CSX-750FJ (*)
		STAND-BY					
Frequency Range			1.8432~39.999MHz	40.000~75.000MHz	1.8432~39.999MHz		40.000~80.000MHz
Supply Voltage			Vdd: 5.0V±0.5V		Vdd: 3.3V±0.3V		
Frequency Stability		(*)	B: ±50ppm(-20°C ~ +70°C), C: ±100ppm(-20°C ~ +70°C) E: ±50ppm(-40°C ~ +85°C), F: ±100ppm(-40°C ~ +85°C)				
Operating Temperature Range			-20°C ~ +70°C / (-40°C ~ +85°C)				
Storage Temperature Range			-55°C ~ +125°C				
Current consumption			25mA Max.	45mA Max.	15mA Max.		25mA Max.
Duty	TTL level (1.4V)		40~60%		—		
	CMOS level (1/2 Vdd)				45~55%		
Output Voltage	V _{OH}				0.9Vdd Min.		
	V _{OL}		0.4V Max.		0.1Vdd Max.		
Output Load	TTL		10TTL Max.		—		
	CMOS		50pF Max.		30pF Max.		
Rise and Fall Time			8 nsec Max.	6 nsec Max.	8 nsec Max.		6 nsec Max.
Start-up time			4 msec Max.	10 msec Max.	4 msec Max.		10 msec Max.
Input Voltage	V _{IH}		2.0V Min.				0.7Vdd Min.
	V _{IL}		0.8V Max.		0.4V Max.		0.3Vdd Max.
Disable current			10mA Max.	20mA Max.	5mA Max.		—
Stand-by current			—				10 μA Max.

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]



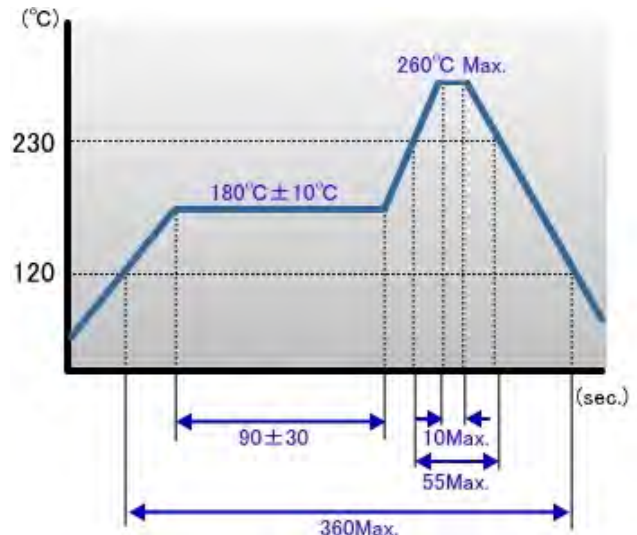
CTZ : Manufacture's ID Code

* : Model

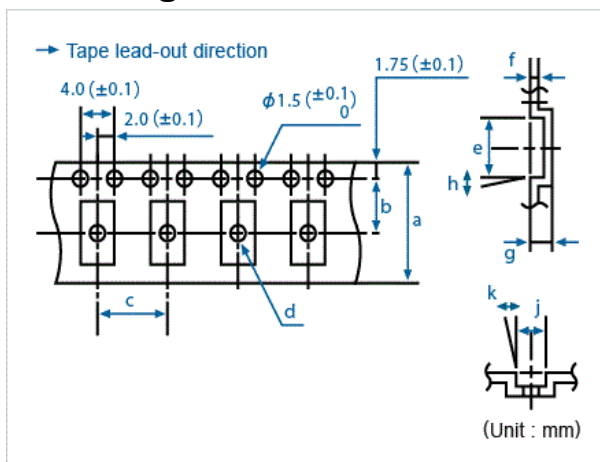
f : Frequency

: Production Lot No.

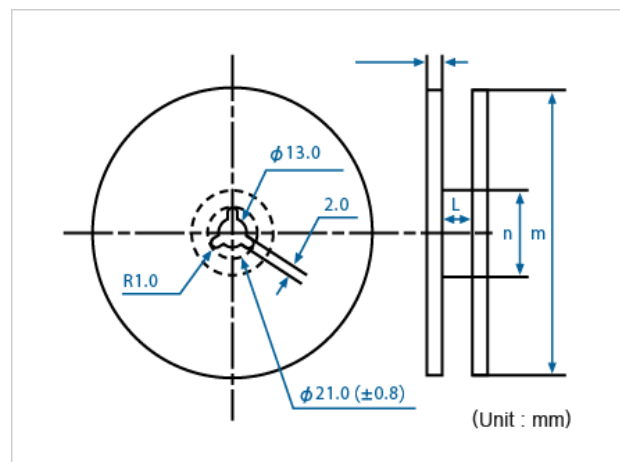
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

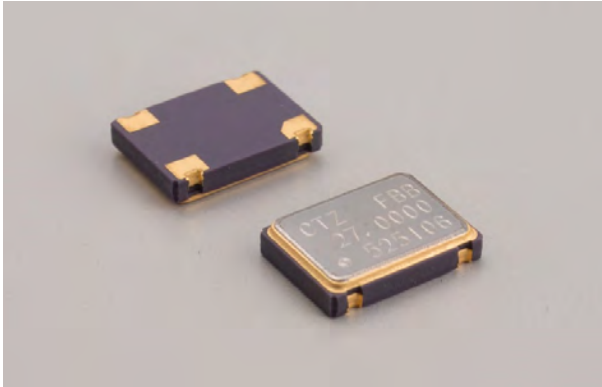
Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
1,000	16.0	7.5	8.0	1.5	7.4	0.3	1.9	5°	5.4	5°	16.0	180	62

CRYSTAL CLOCK OSCILLATORS (SMD · Ceramic Package)

RoHS compliant

CSX-750F (Low Voltage Ver.)

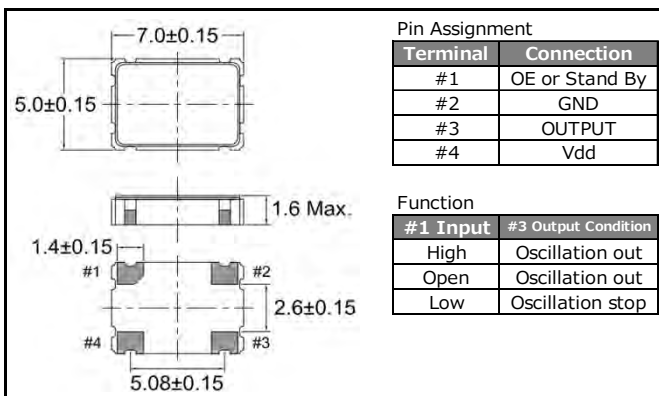
1,000pcs/reel



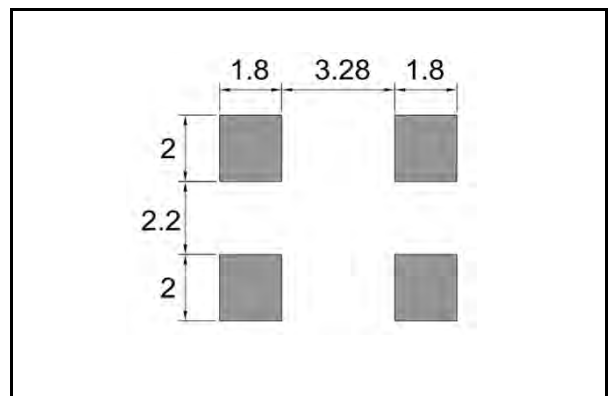
■ FEATURES

- Low current consumption type
- Frequency range : 1.0 ~ 39.9MHz
- External dimensions (mm)
L : 7.2 x W : 5.2 x H : 1.6
- Applications
Consumer products

■ DIMENSION [mm]



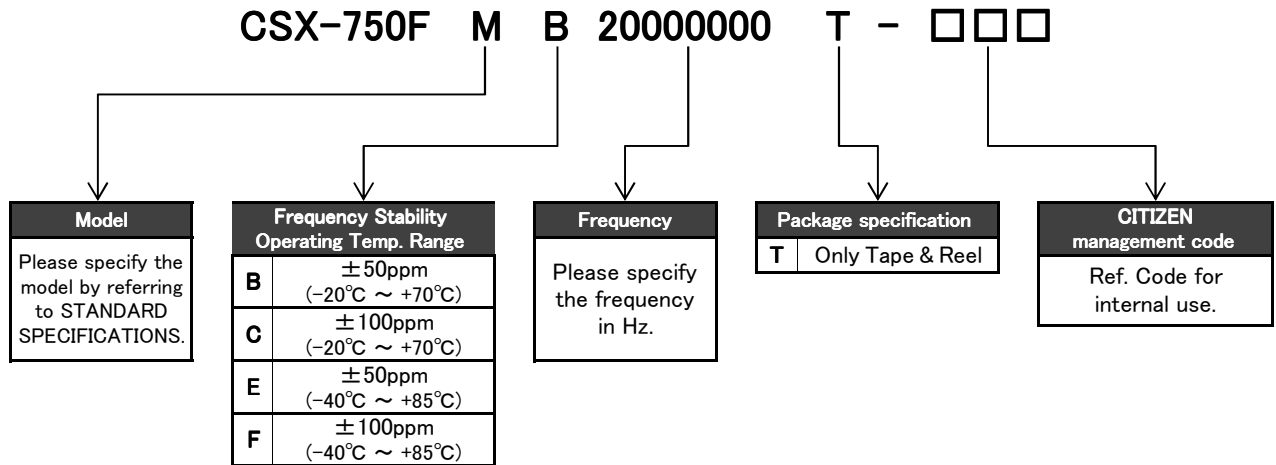
■ SOLDER PAD LAYOUT [mm]



■ STANDARD SPECIFICATIONS

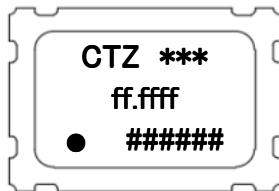
Item	Model	OE			
		STAND-BY	CSX-750FM (*)	CSX-750FH (*)	CSX-750FN (*)
Frequency Range			1.8432MHz~39.999MHz		
Supply Voltage			Vdd: 1.8V±0.2V	Vdd: 2.5V±0.2V	Vdd: 2.8V±0.2V
Frequency Stability	(*)		B: ±50ppm(-20°C ~ +70°C), C: ±100ppm(-20°C ~ +70°C) E: ±50ppm(-40°C ~ +85°C), F: ±100ppm(-40°C ~ +85°C)		
Operating Temperature Range			-20°C ~ +70°C / (-40°C ~ +85°C)		
Storage Temperature Range			-55°C ~ +125°C		
Current consumption			2.5mA Max.	3.0mA Max.	3.2mA Max.
Duty	TTL level (1.4V)		-		
	CMOS level (1/2 Vdd)		45~55%		
Output Voltage	V _{OH}		0.9Vdd Min.		
	V _{OL}		0.1Vdd Max.		
Output Load	TTL		-		
	CMOS		15pF Max.		
Rise and Fall Time			8 nsec Max.		
Start-up time			4 msec Max.		
Input Voltage	V _{IH}		0.8Vdd Min.		
	V _{IL}		0.2Vdd Max.		
Disable current			-		
Stand-by current			10 μA Max.		

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]



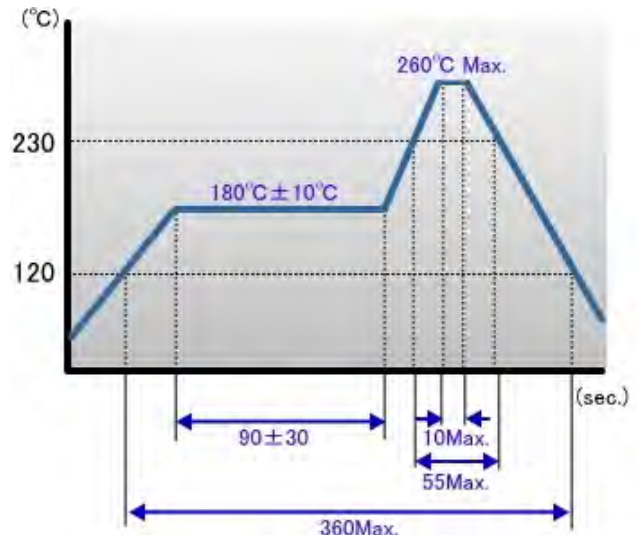
CTZ : Manufacture's ID Code

*** : Model

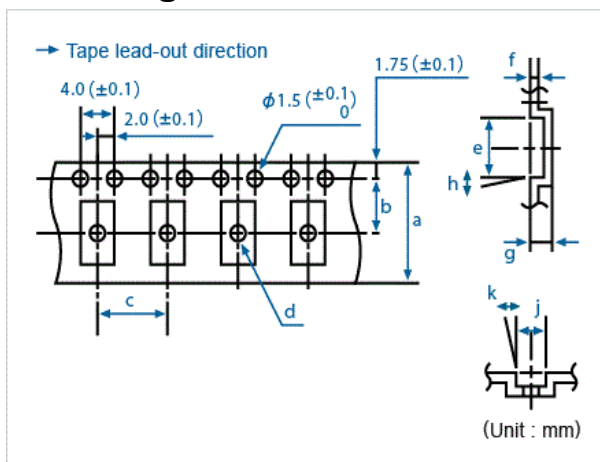
f : Frequency

: Production Lot No.

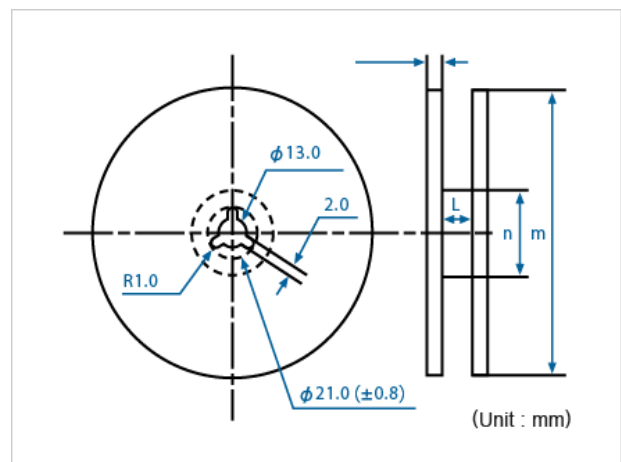
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
1,000	16.0	7.5	8.0	1.5	7.4	0.3	1.9	5°	5.4	5°	16.0	180	62

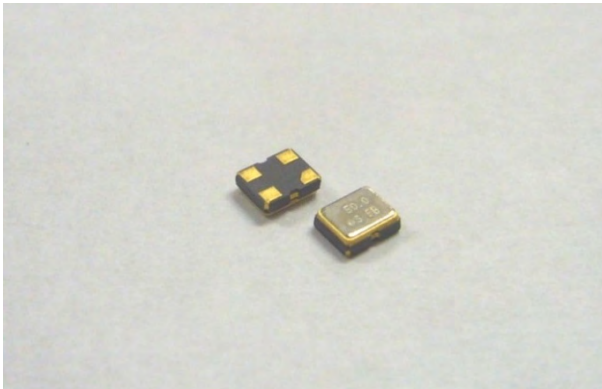
Rev.1

CRYSTAL CLOCK OSCILLATORS (SMD · Ceramic Package)

RoHS compliant / Pb free

CSX-252F

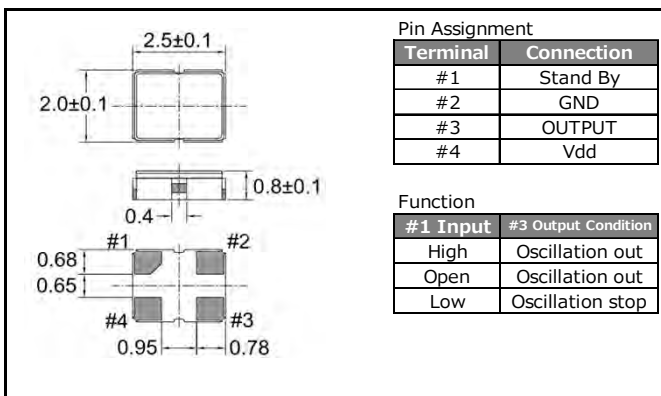
3,000pcs/reel



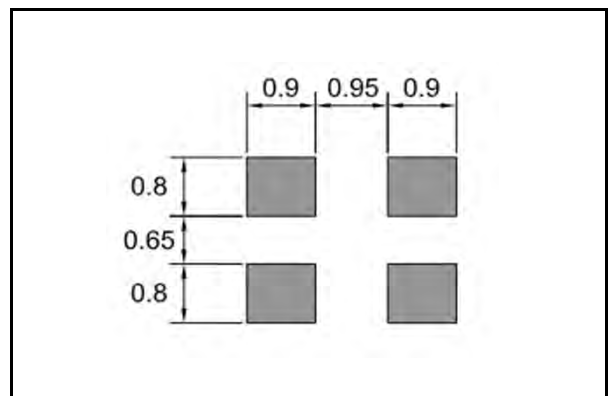
FEATURES

- Low current consumption type
- Frequency range : 1.0 ~ 39.9MHz
- External dimensions (mm)
L : 2.6 x W : 2.1 x H : 0.9
- Applications
Small mobile devices / Consumer products

DIMENSION [mm]



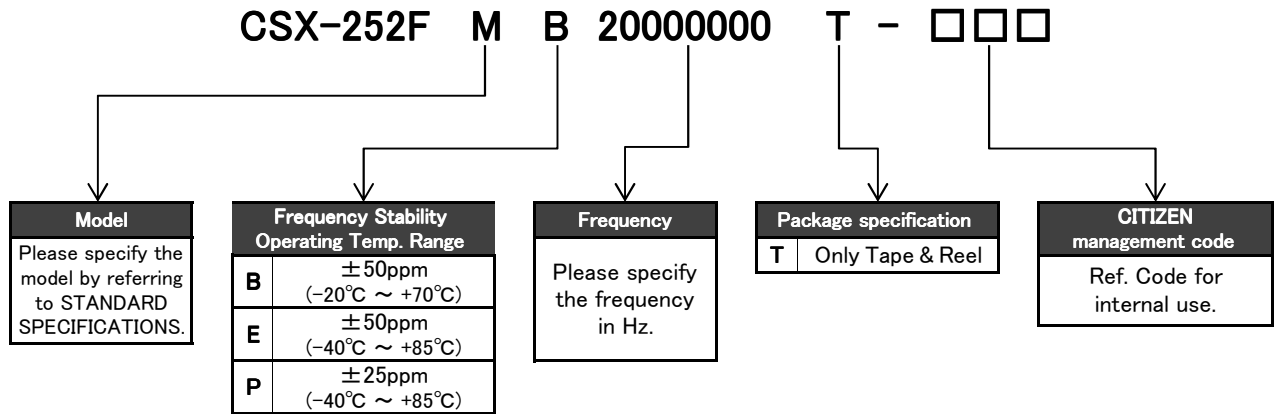
SOLDER PAD LAYOUT [mm]



STANDARD SPECIFICATIONS

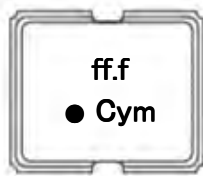
Item	Model	OE				
		STAND-BY	CSX-252FM(*)	CSX-252FH(*)	CSX-252FJ(*)	CSX-252FA(*)
Frequency Range			32.768kHz, 2.000MHz ~ 60.000MHz			
Supply Voltage			1.8V±5%	2.5V±5%	3.3V±0.3V	1.8V ~ 3.3V
Frequency Stability	(*)		B: ±50ppm(-20°C ~ +70°C), E: ±50ppm(-40°C ~ +85°C) P: ±25ppm(-40°C ~ +85°C) *Only 32.768kHz			
Operating Temperature Range			-20°C ~ +70°C / (-40°C ~ +85°C)			
Storage Temperature Range			-45°C ~ +90°C			
Current consumption			2.5mA Max: ~30MHz	4.5mA Max: ~19MHz	6mA Max: ~19MHz	
			3.0mA Max: ~40MHz	5.5mA Max: ~40MHz	7mA Max: ~40MHz	
			3.5mA Max: ~60MHz	6.5mA Max: ~60MHz	8mA Max: ~60MHz	
Duty	TTL level (1.4V)		-			
	CMOS level (1/2 Vdd)		45% ~ 55%			
Output Voltage	V _{OH}		0.9Vdd Min.			
	V _{OL}		0.1Vdd Max.			
Output Load	TTL		-			
	CMOS		15pF Max.			
Rise and Fall Time CMOS (20%Vdd ↔ 80%Vdd)			10nsec Max.			
Start-up time			10msec Max. (Time at minimum operating voltage to be 0sec.)			
Input Voltage (ST)	V _{IH}		0.7Vdd Min.			
	V _{IL}		0.2Vdd Max.			
Disable current			-			
Stand-by current			50 μA Max.			

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]



f : The first 4 digits of Frequency including the decimal point

C : Manufacture's ID Code

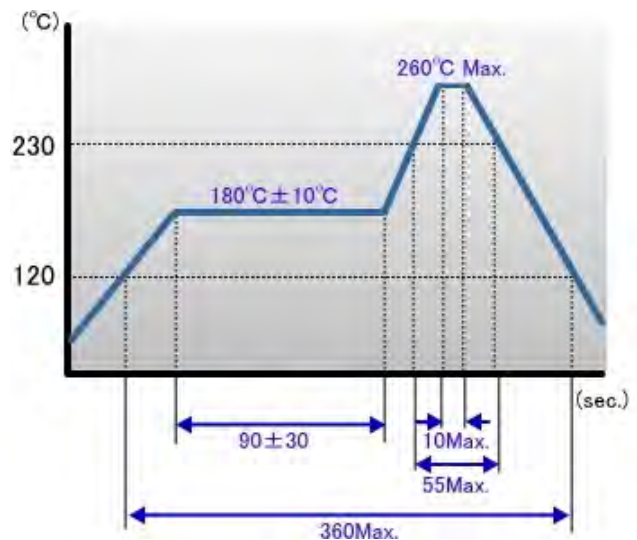
y : The last digit of production year

m : Production month (See Table.1)

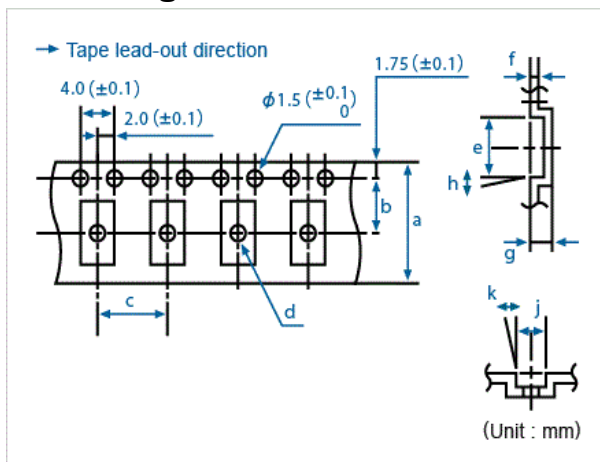
Table.1

Month	Jan	Feb	Mar	...	Oct	Nov	Dec
Code	A	B	C	...	J	K	L

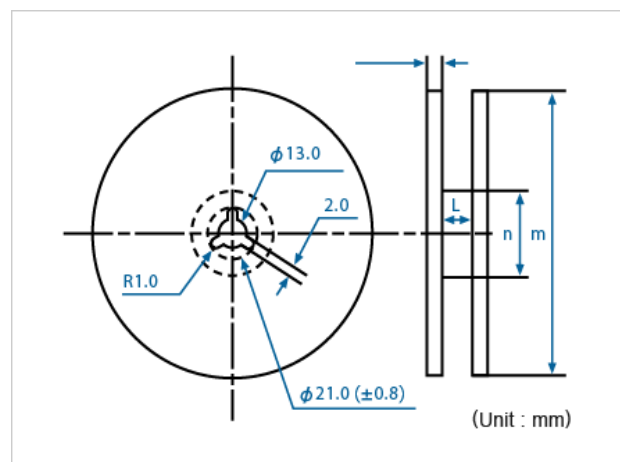
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

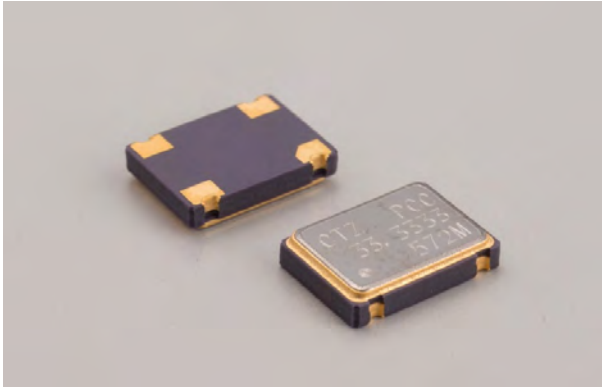
Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
3,000	8.0	3.5	4.0	1.1	2.7	0.25	1.15	5°	2.25	5°	9.0	180	60

PROGRAMMABLE OSCILLATORS (SMD · Ceramic Package)

RoHS compliant / Pb free

SSX-750P

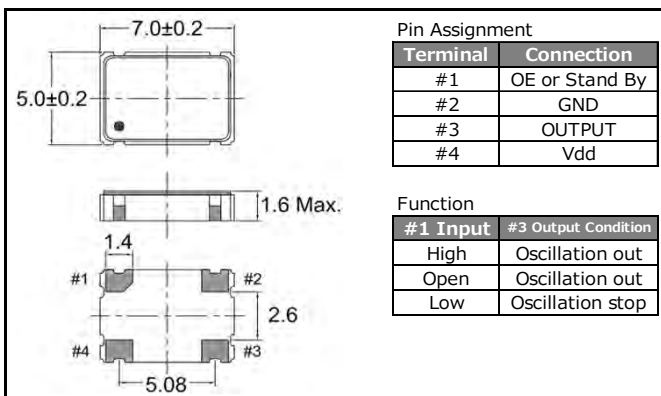
2,000pcs/reel



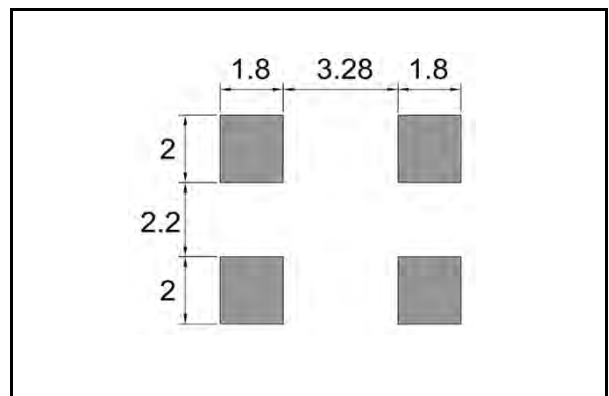
FEATURES

- Programmable type
- Frequency range : 1.0 ~ 125MHz
- External dimensions (mm)
L : 7.2 x W : 5.2 x H : 1.6
- Applications
Consumer products

DIMENSION [mm]



SOLDER PAD LAYOUT [mm]

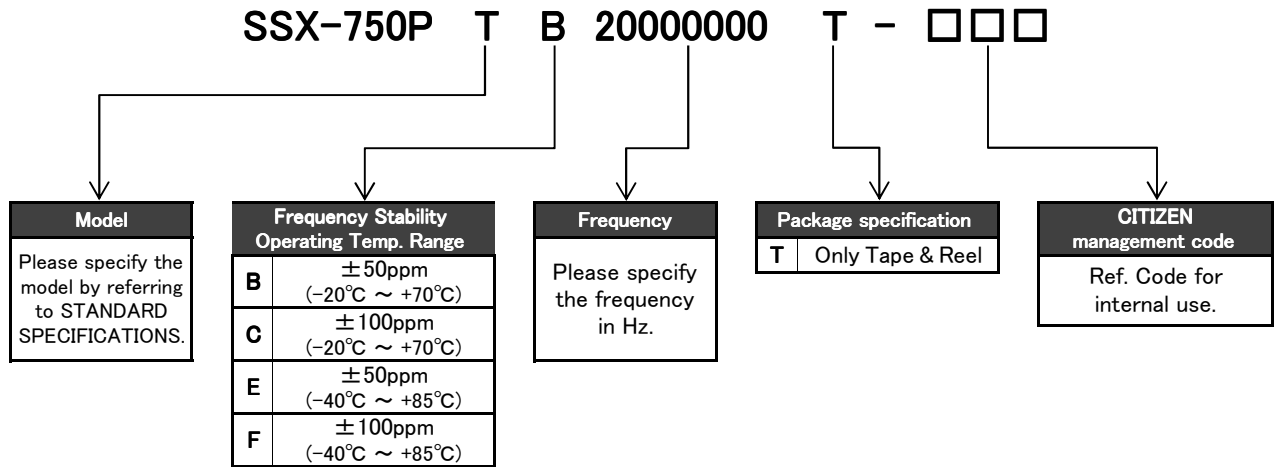


STANDARD SPECIFICATIONS

*Model is determined by selection of OE/ST functions, frequency stability, and supply voltage.

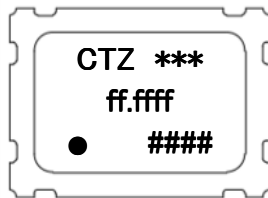
Item	Model	OE	SSX-750PT (*)	SSX-750PC (*)	SSX-750PB (*)
		STAND-BY	SSX-750PK (*)	SSX-750PD (*)	SSX-750PJ (*)
Frequency Range	1.000MHz ~ 125.000MHz				
Supply Voltage	Vdd: 5.0V±0.5V			Vdd: 3.3V±0.3V	
Frequency Stability	(*)	B: ±50ppm(-20°C ~ +70°C), C: ±100ppm(-20°C ~ +70°C) E: ±50ppm(-40°C ~ +85°C), F: ±100ppm(-40°C ~ +85°C)			
Operating Temperature Range	-20°C ~ +70°C / (-40°C ~ +85°C)				
Storage Temperature Range	-55°C ~ +125°C				
Current consumption	45mA Max.			28mA Max.	
Duty	TTL level (1.4V)	40~60%		—	
	CMOS level (1/2 Vdd)	—		40~60%	
Output Voltage	V _{OH}	Vdd-0.4V Min.			
	V _{OL}	0.4V Max.			
Output Load	TTL	5TTL Max.		—	
	CMOS	—		25pF Max.	15pF Max.
Rise and Fall Time	4 nsec Max.				
Start-up time	10 msec Max.				
Input Voltage	V _{IH}	2.0V Min.			0.7Vdd Min.
	V _{IL}	0.8V Max.			0.2Vdd Max.
Disable current	30mA Max.			16mA Max.	
Stand-by current	50 μA Max.				

■ PART NUMBERING SYSTEM



*Please contact us for specifications available.

■ Part Marking [standard]



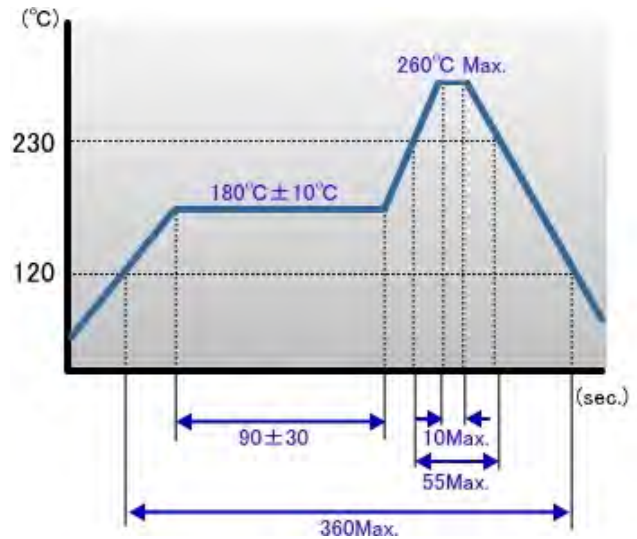
CTZ : Manufacture's ID Code

*** : Model

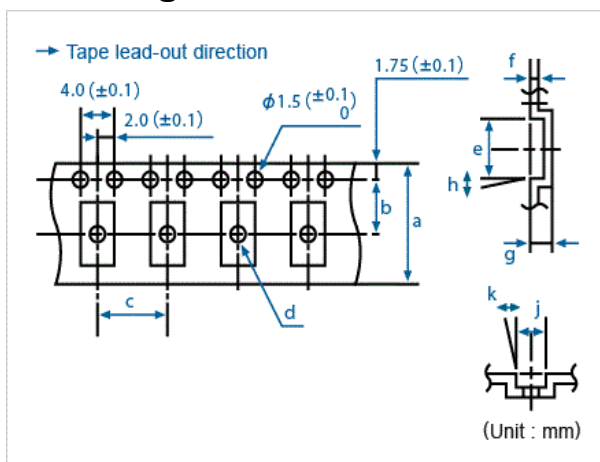
f : Frequency

: Production Lot No.

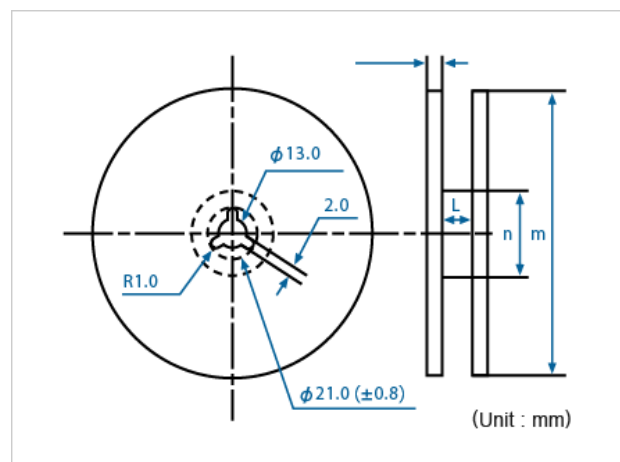
■ Reflow profile



■ Packing



Conforming to JIS C 0806 TB1208NEIAJ and RC-1009B TE1208N



Conforming to JIS C 0806 R12R and EIAJ RC-1009B R15

Q'ty/reel	a	b	c	d (φ)	e	f	g	h	j	k	l	m (φ)	n (φ)
2,000	16.0	7.5	8.0	1.55	7.4	0.3	2.0	5°	5.4	5°	17.5	254	100

Rev.1

BÜROS IN EUROPA

Deutschland
Nagold (Zentrale)

Österreich

Frankreich

Spanien

Italien

Ungarn

Bulgarien

Rumänien

Schweiz

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