



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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Ceramic Resonators, Chip Type (2 Array Type)

Type: **EFOP**

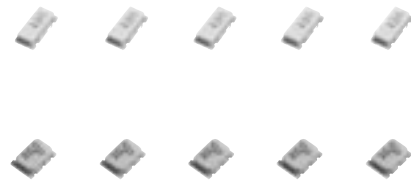
Type: **EFOD**

Type: **EFOPS**

Type: **EFOPM**

Type: **EFODM**

Type: **EFOLM**



■ Features

- Encased in a ceramic package
- High reliability against soldering heat and mechanical stress
- Moisture-proof sealing
- 1.2 mm maximum in thickness (PS/PM/DM/LM)
- Designed for reflow soldering
- Flat-bottom plate for better mounting
- RoHS compliant

■ Recommended Applications

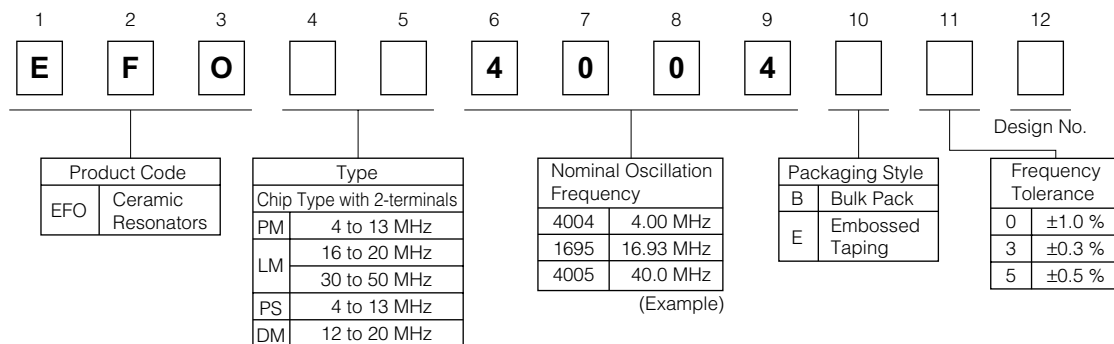
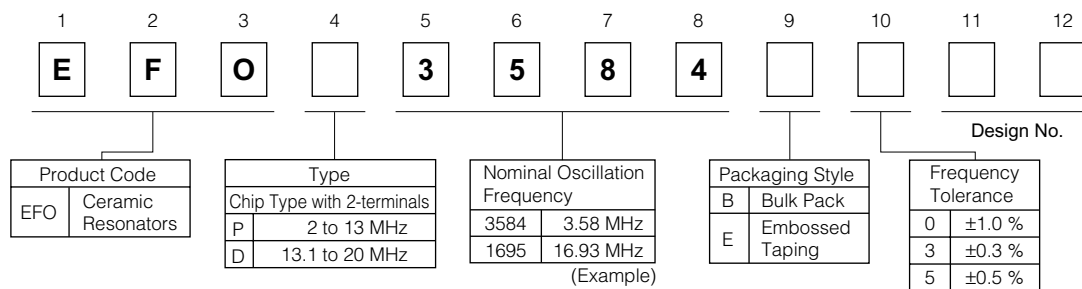
- Clock generator for microprocessors
- Carrier circuit between telecommunication equipment (Telephone to telephone, personal computer to printer)

■ Handling Precautions (See Page 175 to 176)

■ Packaging Specifications

See Page 174, 177

■ Explanation of Part Numbers



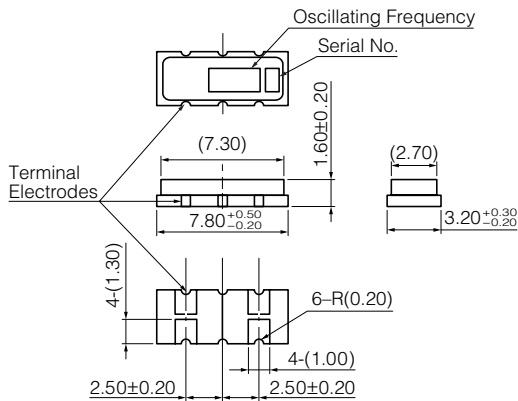
Part Number	Frequency range (MHz)	Frequency Temperature Characteristics (-20 to +80 °C)	Attached Capacitors (Reference)
EFOP	2.00 to 8.39	±0.3 %	33 pF
	8.40 to 13.0	±1.0 %	
EFOD	13.1 to 20.0	±1.0 %	33 pF
EFOPS	4.00 to 8.39	±0.6 %	21 pF
	8.40 to 13.0	±1.0 %	
EFOPM	4.00 to 8.39	±0.3 %	33 pF
	8.40 to 13.0	±1.0 %	
EFODM	12.0 to 20.0	±1.0 %	18 pF
EFOLM	16.0 to 20.0	±1.0 %	10 pF
	30.0 to 50.0	±0.3 %	

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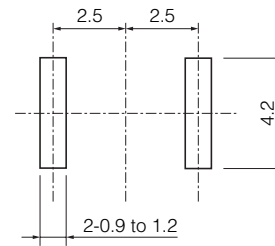
■ Dimensions in mm (not to scale)

Recommended Land Dimensions

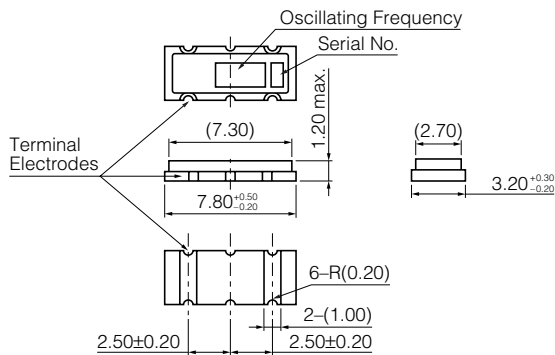
[Type EFOP].....2.0 to 13.0 MHz



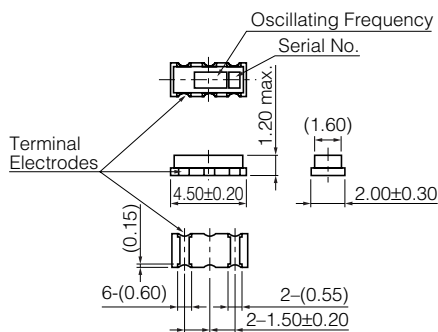
[Type EFOP, EFOPM]



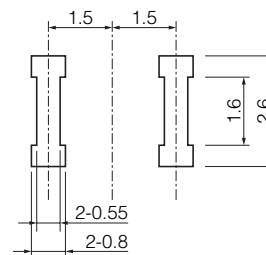
[Type EFOPM].....4.0 to 13.0 MHz



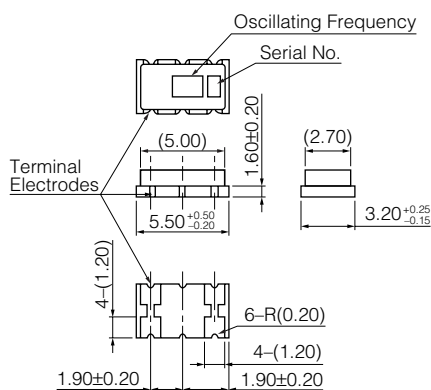
[Type EFOPS].....4.0 to 13.0 MHz



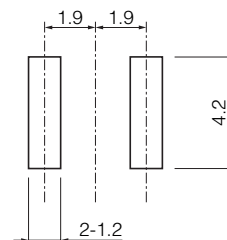
[Type EFOPS]



[Type EFOD].....13.1 to 20.0 MHz



[Type EFOD]

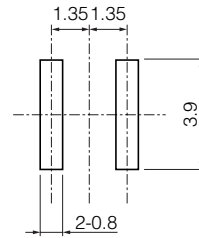
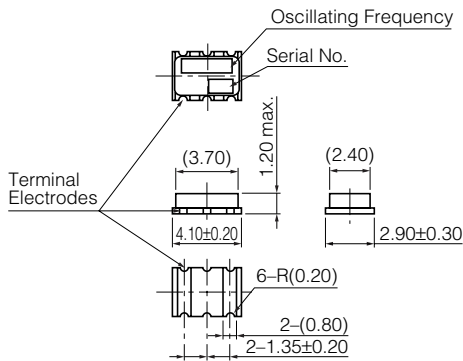


■ Dimensions in mm (not to scale)

Recommended Land Dimensions

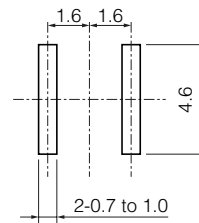
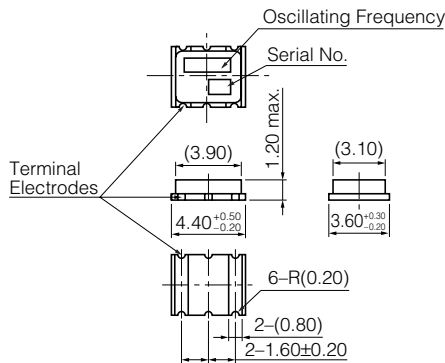
[Type EFODM].....12.0 to 20.0MHz

[Type EFODM]

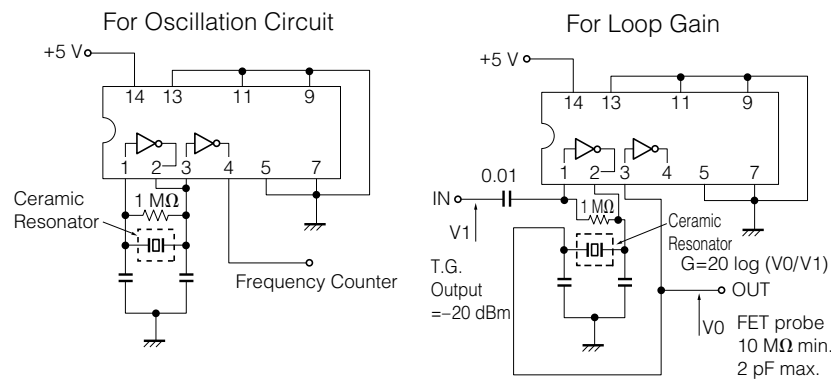


[Type EFOLM].....16.0 to 20.0, 30.0 to 50.0 MHz

[Type EFOLM]

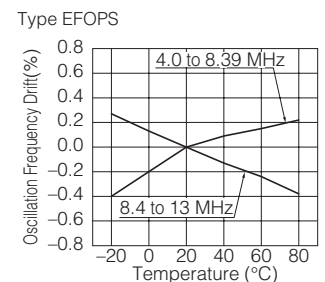
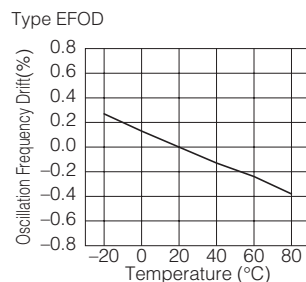
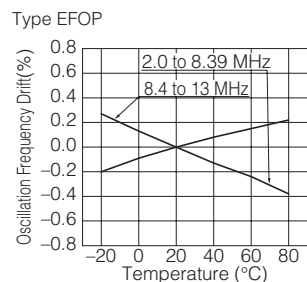


■ Test Circuits Diagram



Frequency	IC
2.00 to 8.39 MHz	μPD4069UBC, TC4069UBP or similar
8.40 to 50.0 MHz	μPD74HCU, TC74HCU04AP or similar

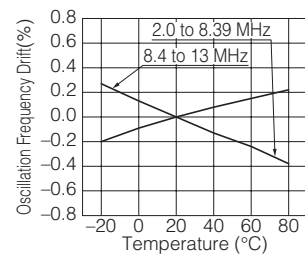
■ Typical Characteristics Temperature Characteristics



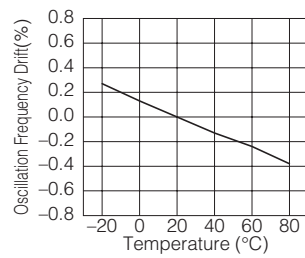
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Typical Characteristics Temperature Characteristics

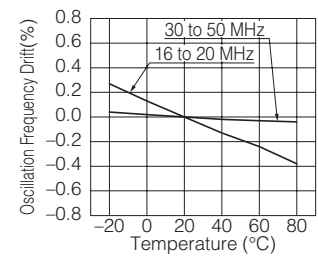
Type EFOPM



Type EFODM



Type EFOLM



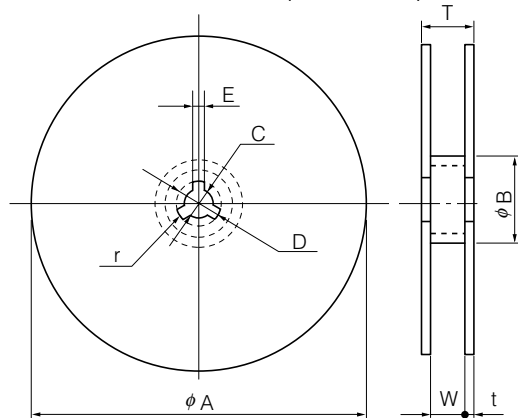
Packaging Specifications

Supplied in bulk or taped & reel packing style

Standard Packing Quantity

Type	Embossed Taping	Bulk
EFOP, EFOPM	2500 pcs./reel	500 pcs./bag
EFOPS	2000 pcs./reel	
EFOD, EFODM, EFOLM	1000 pcs./reel	

Dimensions for Reel in mm (not to scale)



[Type EFOP, EFOPM]

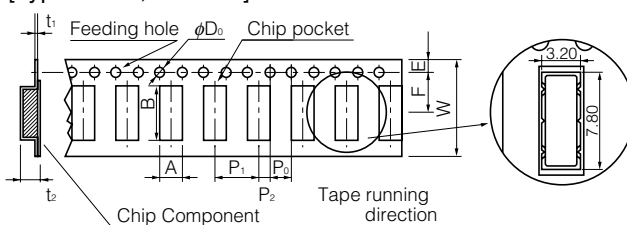
Dim. (mm)	ϕA	ϕB	C	D	E
	330 \pm 5	80 min.	13.0 \pm 0.5	21.0 \pm 0.8	2.0 \pm 0.5
Dim. (mm)	W	T	t	r	
	16.4 $^{+2.0}_0$	22.4 max.	3 max.	1.0	

[Type EFOPS, EFOD, EDODM, EFOLM]

Dim. (mm)	ϕA	ϕB	C	D	E
	180 \pm 5	60 min.	13.0 \pm 0.5	21.0 \pm 0.8	2.0 \pm 0.5
Dim. (mm)	W	T	t	r	
	12.4 $^{+2.0}_0$	18.4 max.	3 max.	1.0	

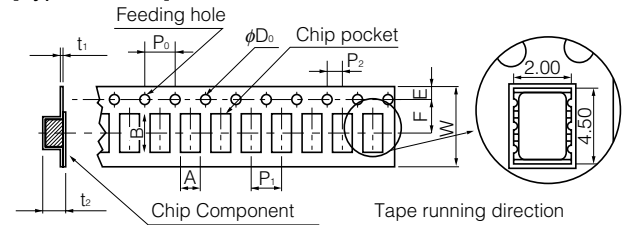
Embossed Taping

[Type EFOP, EFOPM]



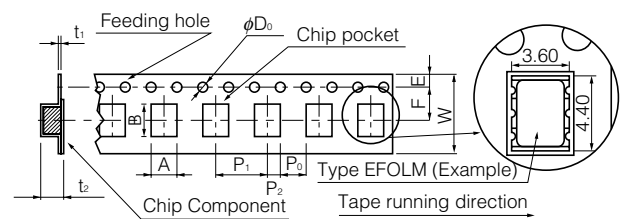
Dim. (mm)	A	B	W	F	E	P ₁
	3.7 \pm 0.2	8.3 \pm 0.2	16.0 \pm 0.3	7.5 \pm 0.1	1.75 \pm 0.10	8.0 \pm 0.1
Dim. (mm)	P ₂	P ₀	ϕD_0	t ₁	t ₂	
	2.0 \pm 0.1	4.0 \pm 0.1	1.5 $^{+0.1}_0$	0.3	3.5 max.	

[Type EFOPS]



Dim. (mm)	A	B	W	F	E	P ₁
	2.6 \pm 0.2	5.1 \pm 0.2	12.0 \pm 0.3	5.5 \pm 0.1	1.75 \pm 0.10	4.0 \pm 0.1
Dim. (mm)	P ₂	P ₀	ϕD_0	t ₁	t ₂	
	2.0 \pm 0.1	4.0 \pm 0.1	1.5 $^{+0.1}_0$	0.6 max.	3.0 max.	

[Type EFOD, EFODM, EFOLM]



Dim. (mm)	A	B	W	F	E	P ₁
	①	②	12.0 \pm 0.3	5.5 \pm 0.1	1.75 \pm 0.10	8.0 \pm 0.1
Dim. (mm)	P ₂	P ₀	ϕD_0	t ₁	t ₂	
	2.0 \pm 0.1	4.0 \pm 0.1	1.5 $^{+0.1}_0$	0.6 max.	3.0 max.	

Dim. (mm)	A	B
	①	②
Type EFOD	3.7 \pm 0.2	6.0 \pm 0.2
Type EFODM	3.4 \pm 0.2	4.6 \pm 0.2
Type EFOLM	4.1 \pm 0.2	4.9 \pm 0.2

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