

### Ceramic Resonators, Chip Type (Thin Type)



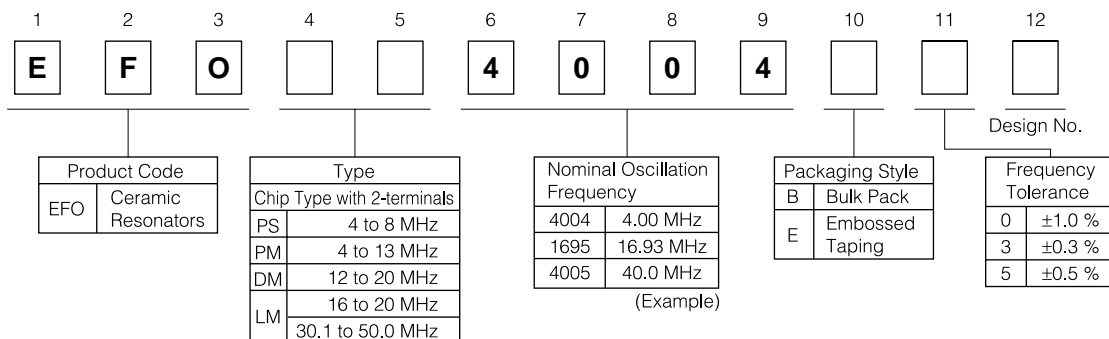
- Type: **PS** (4 to 8 MHz)
- Type: **PM** (4 to 13 MHz)
- Type: **DM** (12 to 20 MHz)
- Type: **LM** ( 16.0 to 20.0 MHz  
30.1 to 50.0 MHz )

#### ■ Features

- Encased in ceramic package
- High reliability against soldering heat and mechanical stress
- Moisture-proof sealing
- Low Profile Type (1.8 mm maximum in thickness)
- Designed for reflow soldering
- Flat-bottom plate for better mountings

#### ■ Precautions for Safety (See Page 218 to 219)

#### ■ Explanation of Part Numbers



#### ■ Ratings and Characteristics

Part Number		Oscillation Frequency (fo)	Loop Gain (G)	Temperature Characteristics
Bulk Pack	Embossed Taping			
EFOPS4004B5	EFOPS4004E5	4.00 MHz ±0.5 %	10 dB min.	Maximum frequency drift: ±1.0 %, -20 to 80 °C
EFOPS8004B5	EFOPS8004E5	8.00 MHz ±0.5 %		
EFOPM4004B5	EFOPM4004E5	4.00 MHz ±0.5 %	10 dB min.	Maximum frequency drift: ±0.3 %, -20 to 80 °C
EFOPM8004B5	EFOPM8004E5	8.00 MHz ±0.5 %		
EFOPM1005B5	EFOPM1005E5	10.00 MHz ±0.5 %	15 dB min.	Maximum frequency drift: ±1.0 %, -20 to 80 °C
EFOPM1205B5	EFOPM1205E5	12.00 MHz ±0.5 %		
EFODM1205B5	EFODM1205E5	12.00 MHz ±0.5 %	15 dB min.	Maximum frequency drift: ±1.0 %, -20 to 80 °C
EFODM2005B5	EFODM2005E5	20.00 MHz ±0.5 %		
EFOLM1605B5	EFOLM1605E5	16.00 MHz ±0.5 %	15 dB min.	Maximum frequency drift: ±1.0 %, -20 to 80 °C
EFOLM1695B5	EFOLM1695E5	16.93 MHz ±0.5 %		
EFOLM2005B5	EFOLM2005E5	20.00 MHz ±0.5 %	6 dB min.	Maximum frequency drift: ±0.3 %, -20 to 80 °C
EFOLM3205B5	EFOLM3205E5	32.00 MHz ±0.5 %		
EFOLM3385B5	EFOLM3385E5	33.868 MHz ±0.5 %		
EFOLM4005B5	EFOLM4005E5	40.00 MHz ±0.5 %		

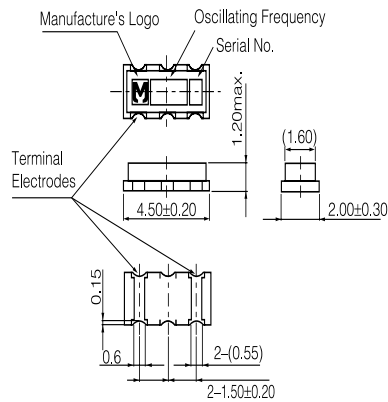
- Operating Temperature Range: -20 to 80 °C

Note:  
Also available are types other than above standard products in the frequency range of 3 to 50.0 MHz.  
Please contact us for more information.

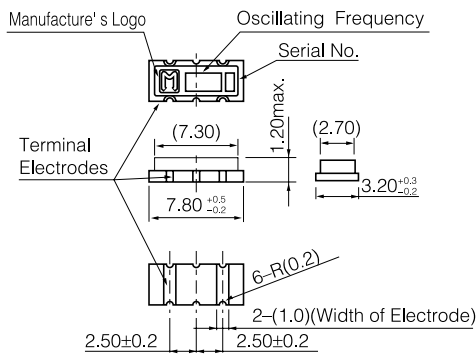
■ Dimensions in mm (not to scale)

● Bulk

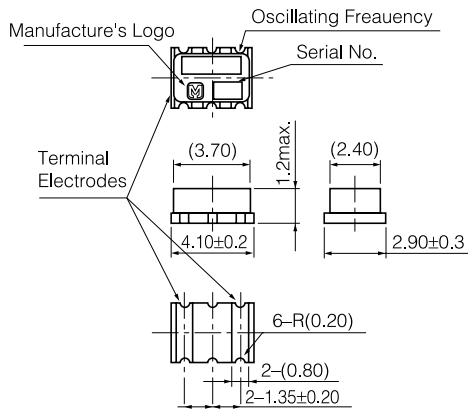
[Type PS] EFOPS□□□□B□



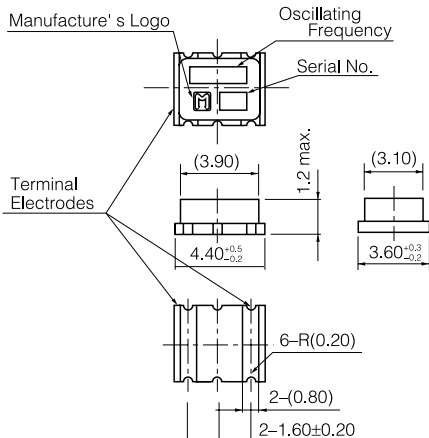
[Type PM] EFOPM□□□□B□



[Type DM] EFODM□□□□B□

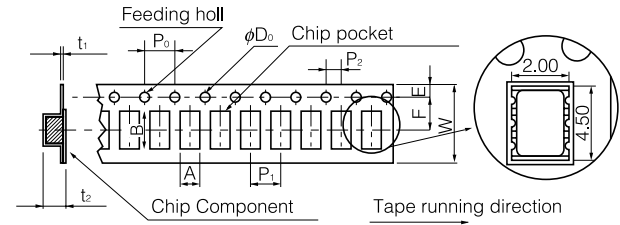


[Type LM] EFOLM□□□□B□



● Embossed Taping

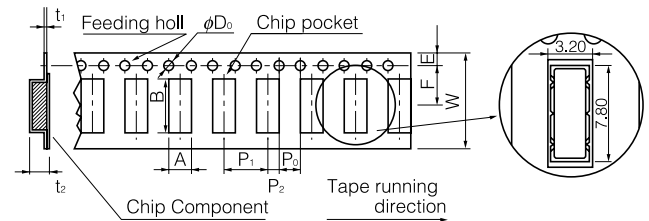
EFOPS□□□□E□



Dim.	A	B	W	F	E	P <sub>1</sub>
(mm)	2.6±0.2	5.1±0.2	12.0±0.3	5.5±0.1	1.75±0.10	4.0±0.1

Dim.	P <sub>2</sub>	P <sub>0</sub>	φD <sub>0</sub>	t <sub>1</sub>	t <sub>2</sub>
(mm)	2.0±0.1	4.0±0.1	1.5 <sup>+0.1</sup> <sub>0</sub>	0.6 max.	3.0 max.

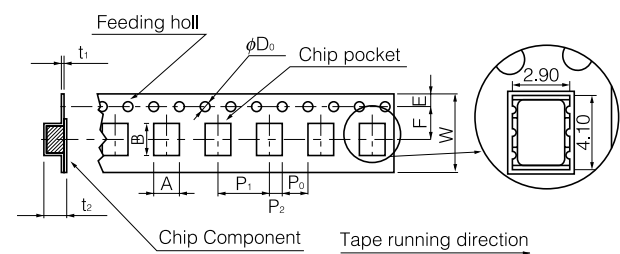
EFOPM□□□□E□



Dim.	A	B	W	F	E	P <sub>1</sub>
(mm)	3.7±0.2	8.3±0.2	16.0±0.3	7.5±0.1	1.75±0.10	8.0±0.1

Dim.	P <sub>2</sub>	P <sub>0</sub>	φD <sub>0</sub>	t <sub>1</sub>	t <sub>2</sub>
(mm)	2.0±0.1	4.0±0.1	1.5 <sup>+0.1</sup> <sub>0</sub>	0.3	3.5 max.

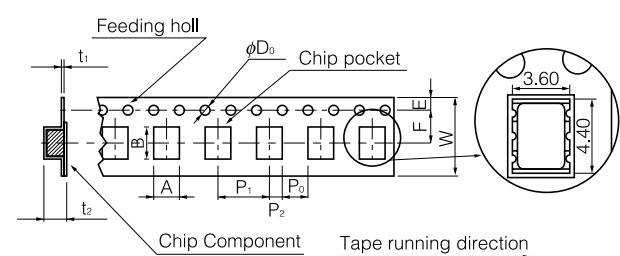
EFODM□□□□E□



Dim.	A	B	W	F	E	P <sub>1</sub>
(mm)	3.4±0.2	4.6±0.2	12.0±0.3	5.5±0.1	1.75±0.10	8.0±0.1

Dim.	P <sub>2</sub>	P <sub>0</sub>	φD <sub>0</sub>	t <sub>1</sub>	t <sub>2</sub>
(mm)	2.0±0.1	4.0±0.1	1.5 <sup>+0.1</sup> <sub>0</sub>	0.6 max.	3.0 max.

EFOLM□□□□E□

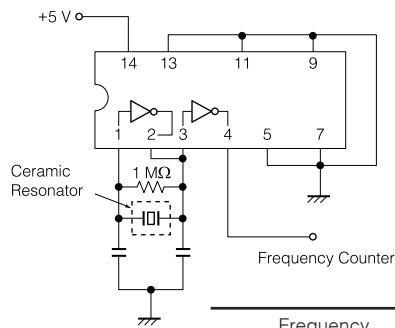


Dim.	A	B	W	F	E	P <sub>1</sub>
(mm)	4.1±0.2	4.9±0.2	12.0±0.3	5.5±0.1	1.75±0.10	8.0±0.1

Dim.	P <sub>2</sub>	P <sub>0</sub>	φD <sub>0</sub>	t <sub>1</sub>	t <sub>2</sub>
(mm)	2.0±0.1	4.0±0.1	1.5 <sup>+0.1</sup> <sub>0</sub>	0.6 max.	3.0 max.

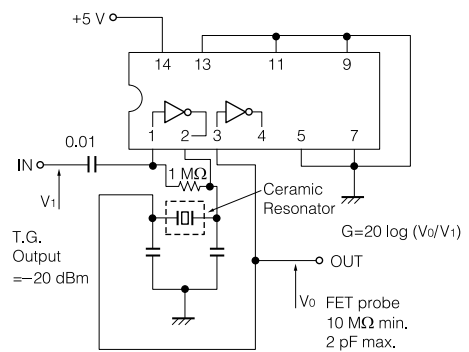
### Test Circuits Diagram

For Oscillation Circuit

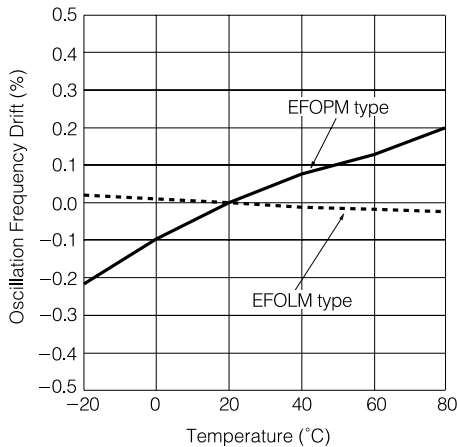


Frequency	IC
3.00 to 8.38 MHz	μPD 4069UBC
8.4 to 13.0 MHz	μPD 74HCU04
16.0 to 20.0 MHz	
30.1 to 50.0 MHz	

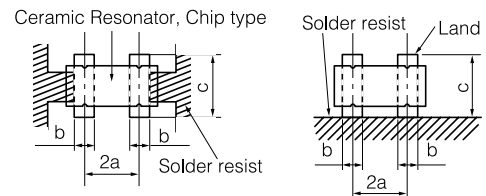
For Loop Gain



### Typical Characteristics



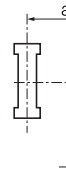
### Recommended Land Dimensions (Type PM/LM)



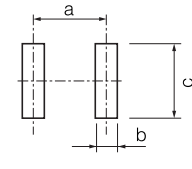
	Type PM	Type LM
a	2.5	1.6
b	0.9 to 1.2	0.7 to 1.0
c	3.8 to 4.7	4.2 to 5.1

(mm)

#### ● Type EFOPS



#### ● Type EFODM



	Type SS	Type BM
a	3.0	1.35
b	0.55	0.8
c	0.8	—
d	2.6	3.9
e	1.6	—

(mm)

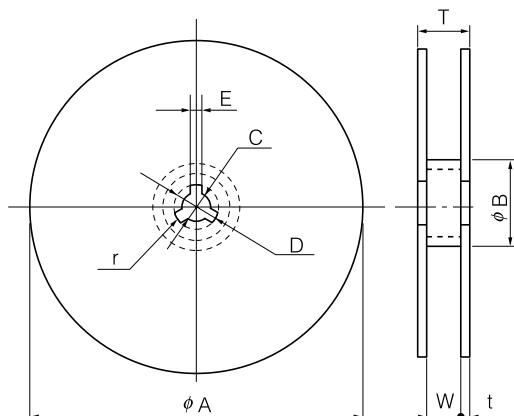
### Packaging Specifications

Supplied in bulk or taped & reel packing style

#### ● Standard Packing Quantity

Type	Embossed Taping	Bulk
PM	2500 pcs./reel	500 pcs./bag
PS	2000 pcs./reel	500 pcs./bag
LM, Dm	1000 pcs./reel	500 pcs./bag

#### ● Dimensions for Reel in mm (not to scale)



#### [Type PM]

Dim.	φA	φB	C	D	E
(mm)	330±5	80 min.	13.0±0.5	21.0±0.8	2.0±0.5
Dim.	W	T	t	r	
(mm)	16.4 <sup>+2.0</sup> <sub>0</sub>	22.4 max.	3 max.	1.0	

#### [Type LM, PS, DM]

Dim.	φA	φB	C	D	E
(mm)	180±5	60 min.	13.0±0.5	21.0±0.8	2.0±0.5
Dim.	W	T	t	r	
(mm)	12.4 <sup>+2.0</sup> <sub>0</sub>	18.4 max.	3 max.	1.0	