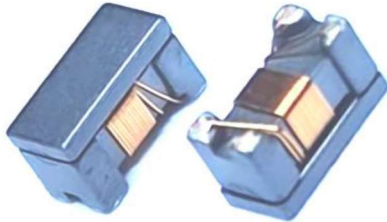




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Common Mode Choke — ECM32 Series



F Type



L Type

Application

- Power switch and servers.
- USB communication.
- Telecommunication applications.
- Panel link for LCD panels.
- Countering common mode noise affecting signals in high-speed lines.

Features

- 100% Lead (Pb)-Free and RoHS compliant.
- High common mode impedance at high frequency effects excellent noise suppression performance.

Parts Number Explanation

Example:

ECM	3216	F	500	F	T	W	Z
Product Type	Size (mm)	Application	Impedance Inductance	HSF	Package	Internal Code	Optional
Common Mode Choke	3216 3225	F type: Impedance L type: Inductance Products	F type: 500 : 50.00 Ω ±25% 900 : 90.00 Ω ±25% 101 : 100.0 Ω ±25% 222 : 2200 Ω ±25% L type: 110 : 11 uH +50/-30% 510 : 51 uH +50/-30% 101 : 100 uH +50/-30%	HSF Products (Hazardous Substance Free Products)	T : Taping		Z : Default Code



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■ Standard Electrical Specifications

Part No.	Z (Impedance) @100MHZ	DCR (1 Line)	IR	Rated Current (Vdc)	Irms (A)
	Ω	mΩ	MΩ	V	mA
	±25%	MAX	MIN	/	MAX
ECM3216F-500F-TWZ	50	250	10	50	400
ECM3216F-900F-TWZ	90	300	10	50	370
ECM3216F-161F-TWZ	160	400	10	50	340
ECM3216F-261F-TWZ	260	500	10	50	310
ECM3216F-601F-TWZ	600	800	10	50	260
ECM3216F-102F-TWZ	1000	1000	10	50	230
ECM3216F-222F-TWZ	2200	1200	10	50	200
ECM3225F-900F-TWZ	90	60	10	50	1000
ECM3225F-101F-TWZ	100	60	10	50	1000
ECM3225F-121F-TWZ	120	60	10	50	2000
ECM3225F-201F-TWZ	200	80	10	50	2000
ECM3225F-501F-TWZ	500	100	10	50	1000
ECM3225F-601F-TWZ	600	100	10	50	1000
ECM3225F-102F-TWZ	1000	100	10	50	1000
ECM3225F-122F-TWZ	1200	300	10	50	400
ECM3225F-142F-TWZ	1400	300	10	50	400



Common Mode Choke ECM32 Series Product Specifications

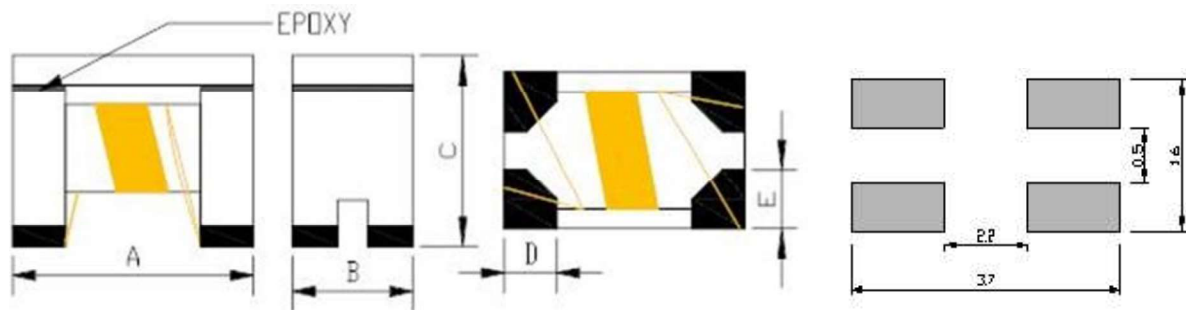
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Part No.	Inductance @100KHZ/0.1V	Common mode Impedance @10MHZ		DCR (1 Line)	IR	Rated Current (Vdc)	Irms
	uH	Ω		m Ω	M Ω	V	mA
	+50%/-30%	MIN	TYP	MAX	MIN	MAX	MAX
ECM3225L-110F-TWZ	11	300	550	400	10	50	300
ECM3225L-220F-TWZ	22	500	1100	500	10	50	250
ECM3225L-510F-TWZ	51	1000	2600	700	10	50	200
ECM3225L-101F-TWZ	100	2200	5100	1500	10	50	150

Notes:

- All test data is referenced to 25 °C ambient.
- Operating temperature range - 40 °C to + 125 °C.
- Irms (A): DC current (A) that will cause an approximate ΔT of 40 °C (reference ambient temperature is 25 °C).
- The part temperature (ambient + temp rise) should not exceed 125 °C under worst case operating conditions.
Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions.
all affect the part temperature. Part temperature should be verified in the end application.

■ Dimensions



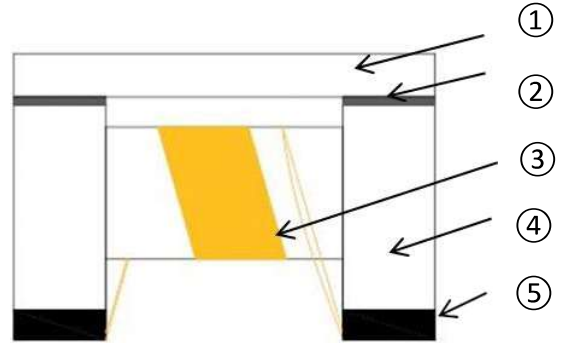
Recommend Land Pattern

Unit: mm

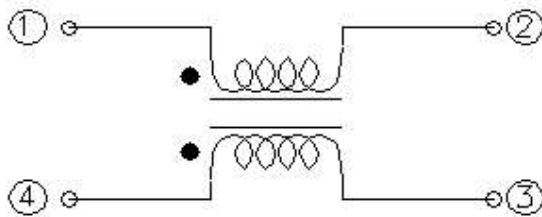
Type	A	B	C	D Typ.	E Typ.	L	H	G1	G2
ECM3216F	3.20 ±0.20	1.60 ±0.20	1.80 ±0.20	0.60	0.60	3.7	1.6	2.2	0.5
ECM3225F	3.20 ±0.20	2.50 ±0.20	2.20 ±0.20	0.75	0.90	3.7	2.5	2.0	0.6
ECM3225L	3.20 ±0.20	2.50 ±0.20	2.20 ±0.20	0.75	0.90	3.7	2.5	2.0	0.6

Structure and Components

Symbol	Components	Material name
①	LID	Ni-Zn Ferrite
②	EPOXY	Epoxy Resin
③	WIRE	Enameled copper wire
④	CORE	Ni-Zn Ferrite
⑤	Electrode structure	Ag + Ni + Sn plating

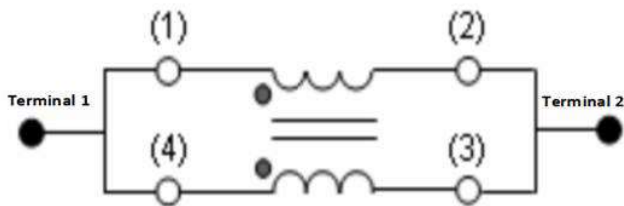


Schematic Diagram

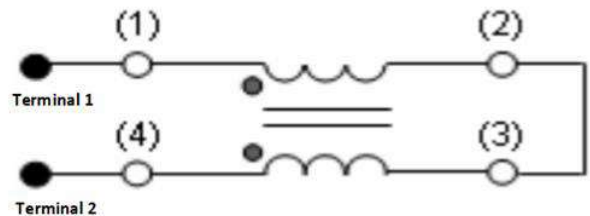


Measuring Circuits 2Line

1) Common mode :



2) Differential mode :

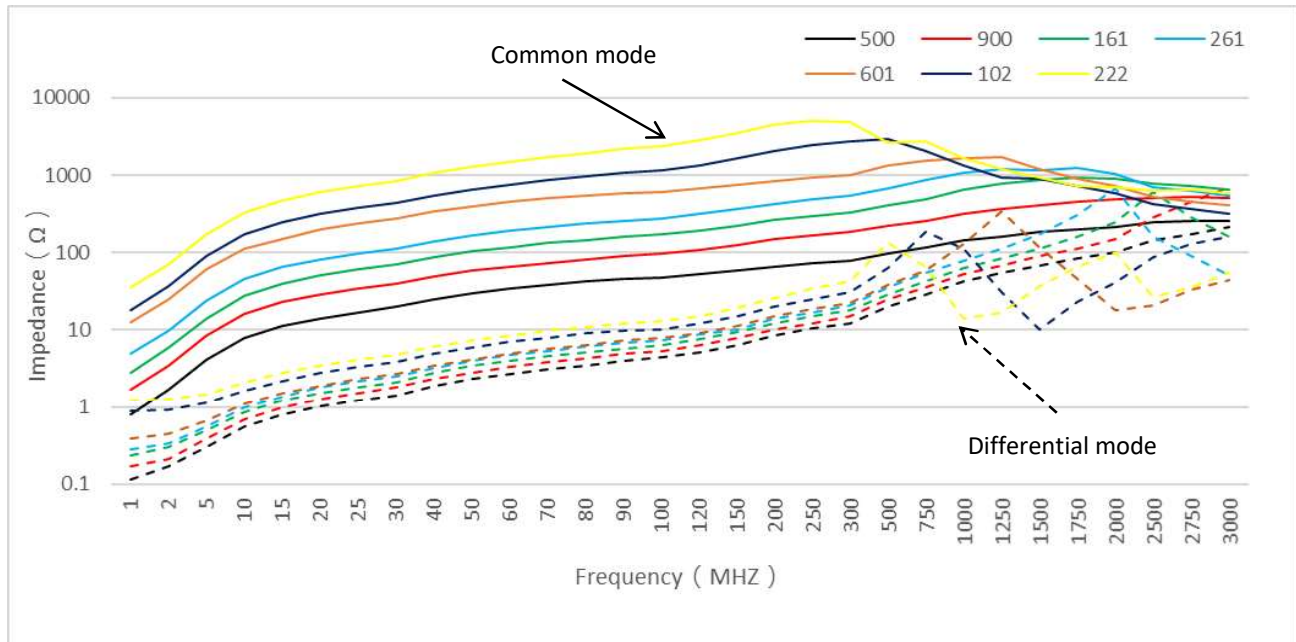




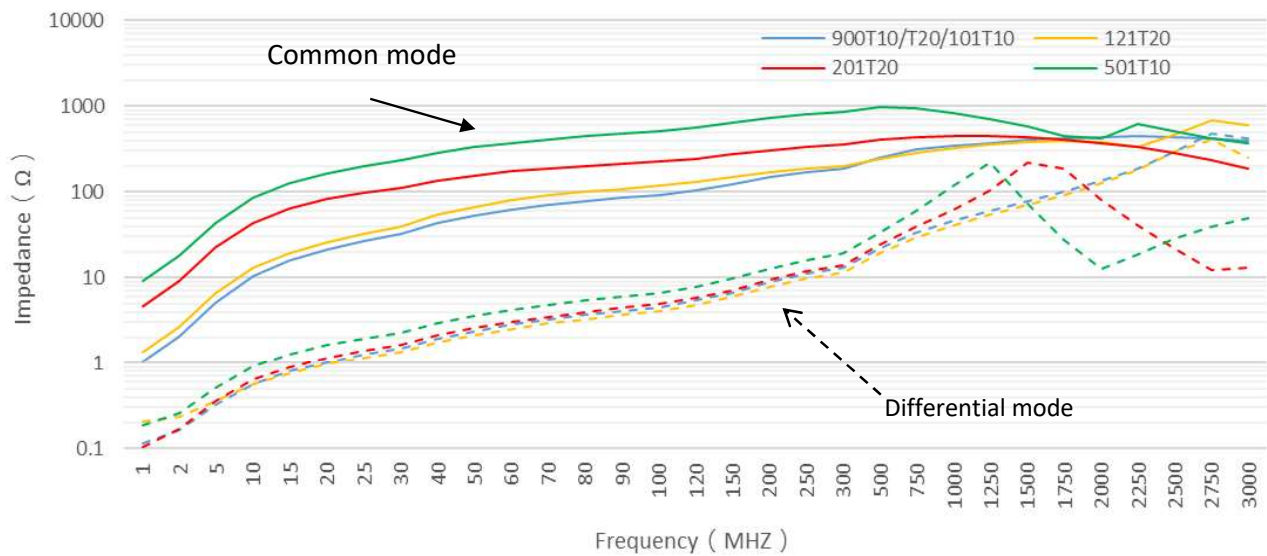
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■ Typical impedance vs. frequency : ECM3216F



■ Typical impedance vs. frequency: ECM3225F (900 ~ 501)

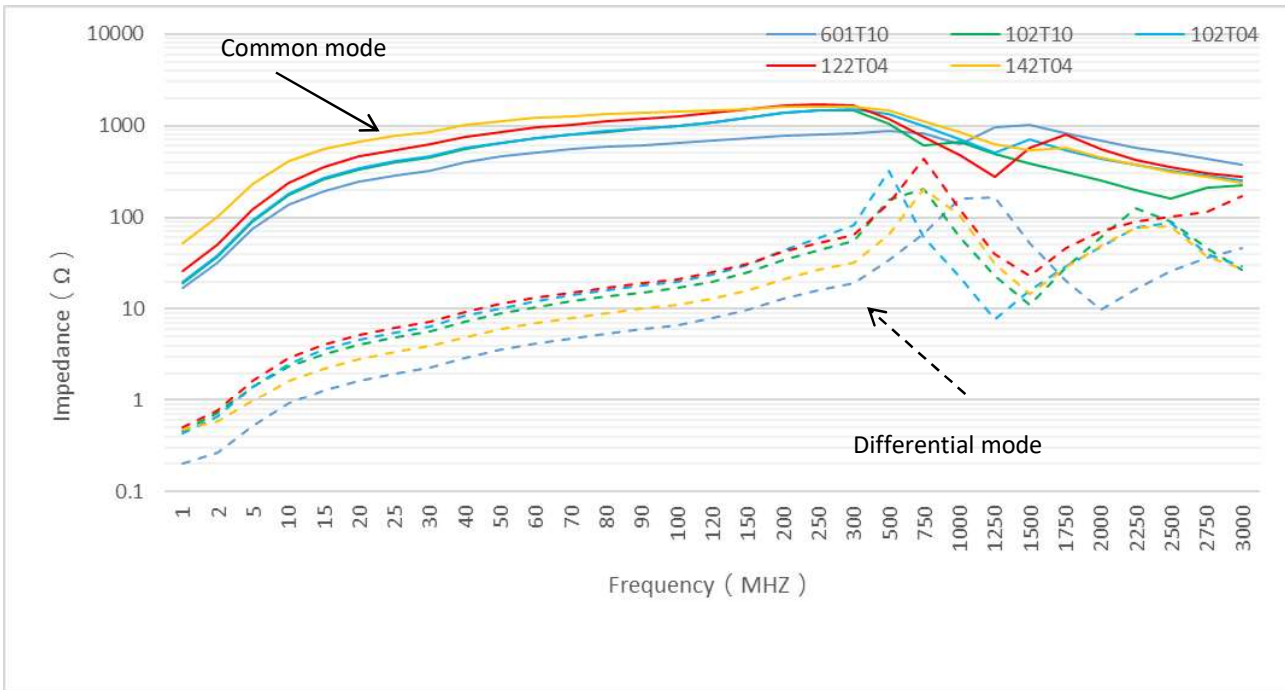




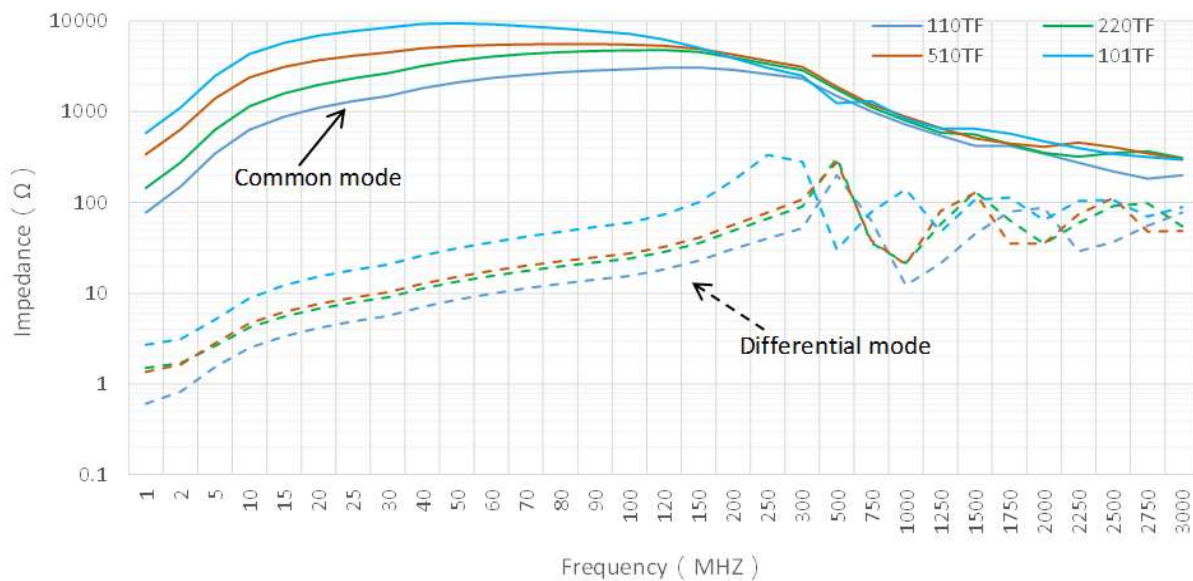
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Typical impedance vs. frequency: ECM3225F (601 ~ 142)



Typical impedance vs. frequency: ECM3225L





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● Reliability test and requirement

Items	Requirements	Test Methods and Remarks
Operating life	1. No visible mechanical damage. 2. Impedance change: Within $\pm 20\%$. 3. Insulation resistance: 10M Ω min.	1. Reflow 2 times. 2. Temperature: 155 ± 2 $^{\circ}\text{C}$.
Resistance to Soldering Heat	1. No visible mechanical damage 2. Impedance change: Within $\pm 20\%$	1. Solder on PCB to Reflow test Peak Temp. 260 ± 5 $^{\circ}\text{C}$ 5~10 secs, Cycles: 2 times Re-flowing Profile: Please refer to Fig-1. 2. Test board thickness: 1.5mm 3. Test board material: glass epoxy resin 4. The specimen shall be stored at standard atmospheric conditions for 1 hour, after which the measurement shall be made product showed no damage under microscope. <p style="text-align: center;">Fig-1</p>
High Temperature	1. No visible mechanical damage 2. Insulation resistance: 10M Ω min 3. Impedance change: Within $\pm 20\%$	1. Temperature: 125 ± 2 $^{\circ}\text{C}$ 2. Duration: 1000 hours The specimen shall be stored at standard atmospheric conditions for 1 hour, after which the measurement shall be made.
Steady damp-heat	1. No visible mechanical damage 2. Insulation resistance: 10M Ω min. 3. Impedance change: Within $\pm 20\%$	1. Temperature: 85 $^{\circ}\text{C}$ 2. Humidity: 85% RH 3. Duration: 1000 hours 4. The specimen shall be stored at standard atmospheric conditions for 1 hour, after which the measurement shall be made.
Mechanical Vibration	1. No visible mechanical damage 2. Impedance change: Within $\pm 20\%$	1. Frequency: 10HZ~55HZ~10HZ/Min Cycles 2. Amplitude: 1.5 mm 3. Directions: X, Y, Z 4. Time: 2 hours in each direction (total of 6 hours)



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Items	Requirements	Test Methods and Remarks
Thermal Shock	<ol style="list-style-type: none"> 1. No visible mechanical damage 2. Impedance change: Within $\pm 20\%$ 	<ol style="list-style-type: none"> 1. Temperature and time: -40°C for 30 ± 3 min \rightarrow 125°C for 30 ± 3 min, please refer to Fig-2 2. Transforming interval: Max. 3 Min 3. Tested cycle: 1000 cycles 4. The specimen shall be stored at standard atmospheric conditions for 1 hour, after which the measurement shall be made. <p style="text-align: center;">Fig-2</p> <p>The diagram shows a temperature profile with a horizontal dashed line for 'Ambient Temperature'. The profile consists of a ramp up to 125°C, a dwell of 30 ± 3 min, a ramp down to -40°C, a dwell of 30 ± 3 min, a ramp up to 'Ambient Temperature', a dwell of 30 ± 3 min, and a final ramp down. A transition time of 3 Min (max.) is indicated between the -40°C dwell and the next ramp.</p>
Salt Spray	<ol style="list-style-type: none"> 1. No visible mechanical damage 2. Impedance change: Within $\pm 20\%$ 	<ol style="list-style-type: none"> 1. Salt concentration: $(5 \pm 1) \%$ (mass percent) 2. pH value: 6.5 - 7.2 3. Temperature: $35 \pm 2^{\circ}\text{C}$ 4. Humidity: 85% 5. Time: 24 hours in normal temperature and humidity for 1 ~ 2 hours, testing inductance, the inductance value change can not be more than before test $\pm 10\%$.
Terminal strength	No visible mechanical damage	<ol style="list-style-type: none"> 1. The electrode of the inductor is soldered to the PCB, to Fig-3 Then apply a force in the direction of the arrow. 2. 10N force. 3. Keep time: $10(\pm 1)$ s, The first three tests were OK, and the force was applied until the peak value of the product peeling. The test speed was set in the range of 3 ~ 8mm/min. <p style="text-align: center;">Fig-3</p> <p>The diagram shows a cross-section of the test setup. A 'Pressure' applicator is shown with a downward arrow, pressing on a 'Product' which is mounted on a 'Substrate'. The entire assembly is held by a 'Test board fixture'.</p>

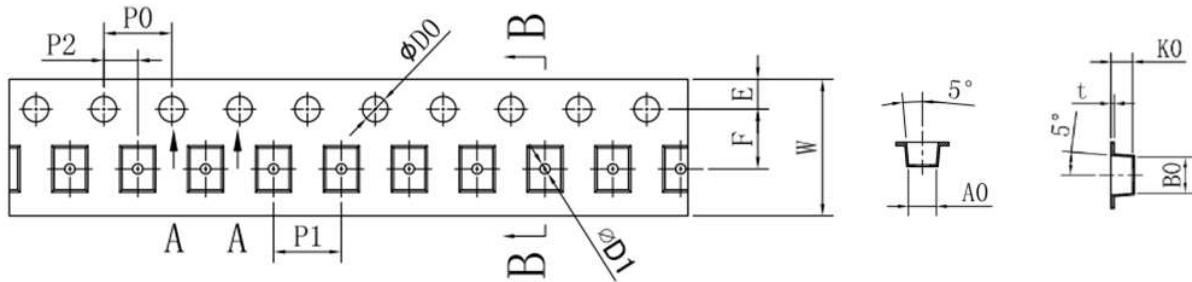


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■ Packaging Information

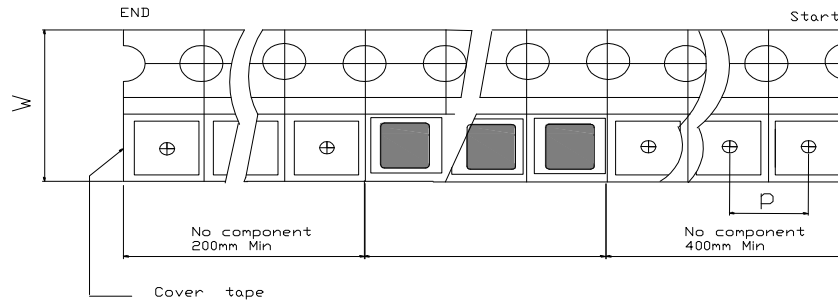
(1) Tape Packaging Dimensions (Unit : mm)



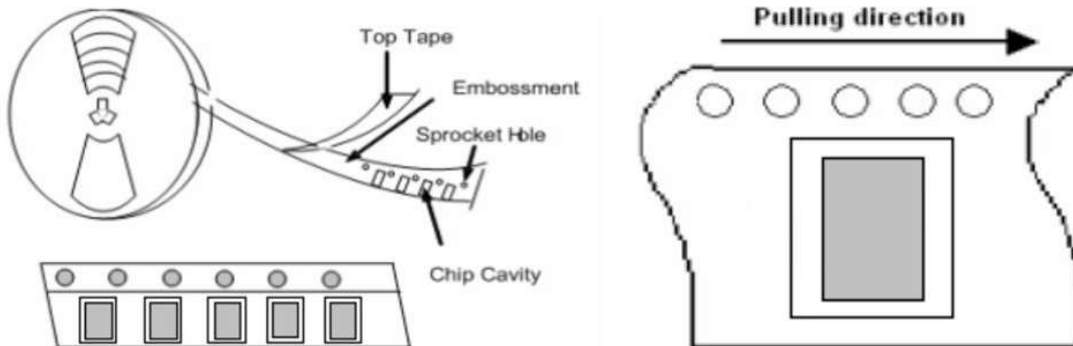
Unit : mm

Type	Tape dimensions (mm)											
	W	P1	A0	B0	K0	t	E	F	P2	D0	D1	P0
ECM3216F	8.00 ±0.10	4.00 ±0.10	1.88 ±0.10	3.53 ±0.10	1.95 ±0.10	0.22 ±0.05	1.75 ±0.10	3.50 ±0.10	2.00 ±0.10	1.55 ±0.05	0.80 ±0.05	4.00 ±0.10
ECM3225F	8.00 ±0.10	4.00 ±0.10	2.85 ±0.10	3.65 ±0.10	2.55 ±0.10	0.26 ±0.05	1.75 ±0.10	3.50 ±0.10	2.00 ±0.10	1.55 ±0.05	0.60 ±0.05	4.00 ±0.10
ECM3225L	8.00 ±0.10	4.00 ±0.10	2.85 ±0.10	3.65 ±0.10	2.55 ±0.10	0.26 ±0.05	1.75 ±0.10	3.50 ±0.10	2.00 ±0.10	1.55 ±0.05	0.60 ±0.05	4.00 ±0.10

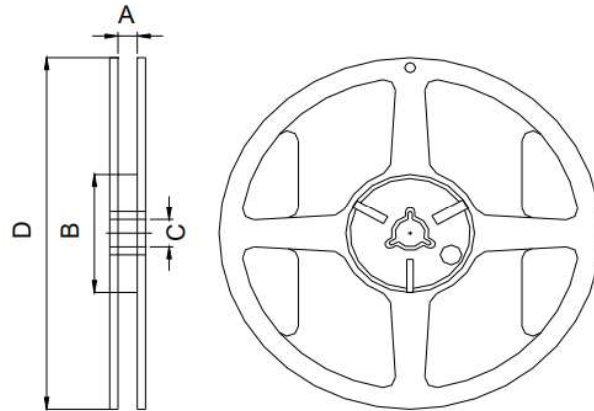
(2) Leader and blank portion



(3) Taping Drawings (Unit: mm)



(4) Reel Dimensions (Unit : mm)



Type	A	B	C	D
ECM3216F	9.50 ±1.0	60.0 ±1.0	13.0 ±0.2	178.0 ±1.0
ECM3225F	9.50 ±1.0	60.0 ±1.0	13.0 ±0.2	178.0 ±1.0
ECM3225L	9.50 ±1.0	60.0 ±1.0	13.0 ±0.2	178.0 ±1.0

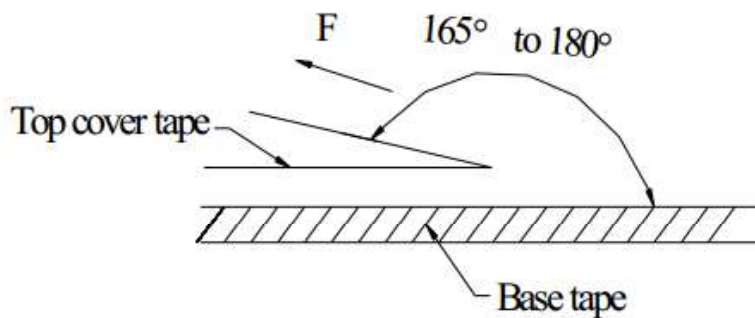
(5) Packaging Quantity (PCS)

Type	Standard Quantity		
	Reel	Inner box	Carton box
ECM3216F	2000 pcs / reel	5 Reel / box (10000 pcs)	10 Middle boxes, (100,000 pcs)
ECM3225F	1500 pcs / reel	5 Reel / box (7500 pcs)	10 Middle boxes, (75,000 pcs)
ECM3225L	1500 pcs / reel	5 Reel / box (7500 pcs)	10 Middle boxes, (75,000 pcs)

(5) Peel force of top cover tape

The peel speed shall be about 300mm/minute.

The peel force of top cover tape shall be between 10 to 100 gf



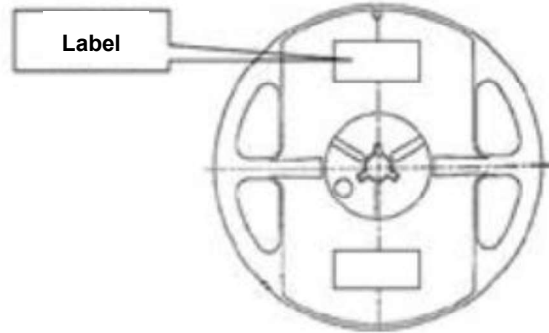


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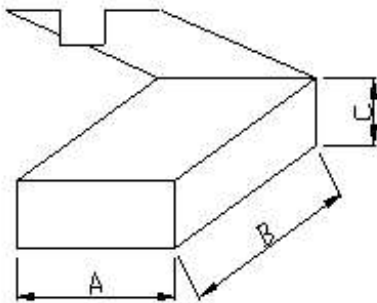
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(6) Reel Label

- Label on the reel
 - Everohms part Number.
 - Lot Number
 - Quantity
 - Description.
- Shipping Label
 - Customer's part Number
 - Manufacturer's part Number
 - Quantity
 - date code

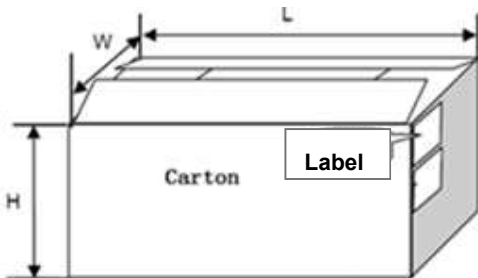


(7) Inner Box



Packaging Type	A (mm)	B (mm)	C (mm)
Inner box	188	195	67

(8) Carton



Packaging Type	L (mm)	W (mm)	H (mm)
Carton	390	350	215