SPECIFICATION

Brand	ZenithTek
Product Series Code	ZPWM - ML - Series
File Version	V1.3
Description	SMD Molding Power Inductor

Features

- High Rated Current.
- Low DC Resistance.
- High Frequency Range from 1MHz to 5MHz.
- Halogen Free, Lead Free, RoHS and REACH Compliance.

Applications

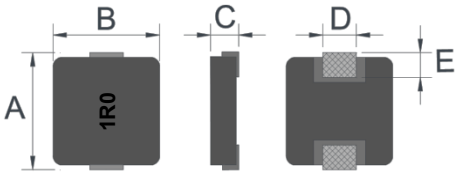
- DC to DC Converter.
- Computing, Mobile, Networking.
- IoT, Gaming, Audio Devices.
- Industrial PC, Storage Devices.

Product Identification

ZPWM	-	4012	M	L	-	1R0	M
1		2	3	4		5	6

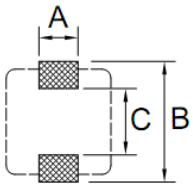
1. Product Code:
   ZPWM = ZenithTek Code.
2. Dimension Code:
   4012 = 4.4 * 4.2 * 1.2 mm.
3. Type Code:
   M = Molding Type.
4. Marking Code:
   L = Ink.
5. Inductance Code:
   1R0 = 1.0μH.
6. Tolerance Code:
   M = ±20%.

Dimension (Unit: mm)



Type	A	B	C(Max.)	D(Ref.)	E(Ref.)
ZPWM-4012	4.40±0.35	4.20±0.25	1.20	2.00	0.80
ZPWM-4020	4.40±0.35	4.20±0.25	2.00	2.00	0.80
ZPWM-5018	5.40±0.30	5.20±0.20	1.80	2.20	1.20
ZPWM-5030	5.40±0.30	5.20±0.30	3.00	2.20	1.20
ZPWM-6018	7.00±0.30	6.60±0.20	1.80	3.00	1.60
ZPWM-6025	7.00±0.30	6.60±0.20	2.40	3.00	1.60
ZPWM-6030	7.00±0.30	6.60±0.20	3.00	3.00	1.60
ZPWM-1040	11.50Max.	10.00±0.30	4.00	3.00	2.00

Land Pattern (Unit: mm)

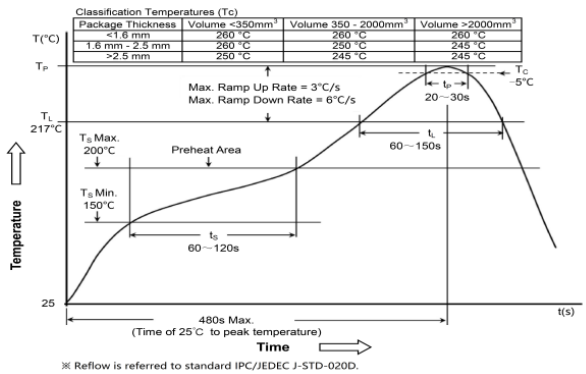


Type	A(Ref.)	B(Ref.)	C(Ref.)
ZPWM-4012	2.50	5.20	2.20
ZPWM-4020	2.50	5.20	2.20
ZPWM-5018	2.50	6.00	2.20
ZPWM-5030	2.50	6.00	2.20
ZPWM-6018	3.50	8.40	3.70
ZPWM-6025	3.50	8.40	3.70
ZPWM-6030	3.50	8.40	3.70
ZPWM-1040	4.10	13.60	5.40

Product Structure

Schematic

Reflow Heat Endurance



※ Reflow is referred to standard IPC/JEDEC J-STD-020D.

Operating & Storage Conditions

Operating Temp. : -55°C~+125°C (including self-temp. rise)
Storage Temp. : -55°C~+125°C (for PCBA)

Standard & Atmospheric Conditions

Ambient Temp. : 20°C±15°C / Relative Humidity : 65±20%.
If there may be any doubt on the result, measurement shall be made within the following limits :
Ambient Temp. : 25°C±5°C / Relative Humidity : 75±10%.

Test Equipment

LCR Meter : WK-3260B / DC Source : WK-3265B.
Micro ohm Meter : HIOKI-RM3545.
Caliper : Mitsutoyo 150mm.

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File Version	V1.3
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Electrical Characteristic

Part Number	Inductance (μH)@0A	Tolerance (%)	Test Frequency (KHz)/1V/0A	DCR (mΩ/Typ.)	DCR (mΩ/Max.)	Heat Rating Current IDC(Amp./Typ.)	Saturation Current Isat(Amp./Typ.)
ZPWM-4012ML-R47☐	0.47	±20	100	19.0	21.0	6.00	6.80
ZPWM-4012ML-1R0☐	1.00	±20	100	43.0	47.0	4.50	5.50
ZPWM-4012ML-2R2☐	2.20	±20	100	79.4	83.5	2.75	3.50
ZPWM-4012ML-4R7☐	4.70	±20	100	175.0	195.0	1.80	2.80

Note 1: Tolerance Code: M= ±20%.
Note 2: All test data is referenced to 25°C ambient.
Note 3: Operating Temperature Range -55°C to +125°C.
Note 4: Typical Heat Rating DC Current would cause an approximately ΔT of 40°C.
Note 5: Typical Saturation DC Current would cause L0 to drop approximately 30%.
Note 6: The Part temperature (ambient + ΔT) should not exceed 125°C under worst case operating conditions.
Note 7: Circuit design, component placement, PWB trace size and thickness, airflow and other cooling provisions all effect the part temperature. Part temperature should be verified in the end application.

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ZPWM-4020ML-R22☐	0.22	±20	100	6.0	6.6	9.50	12.50
ZPWM-4020ML-R47☐	0.47	±20	100	12.5	14.0	7.50	9.50
ZPWM-4020ML-R68☐	0.68	±20	100	16.0	18.0	7.00	9.00
ZPWM-4020ML-1R0☐	1.00	±20	100	24.0	27.0	6.00	7.00
ZPWM-4020ML-1R5☐	1.50	±20	100	38.0	46.0	5.00	6.00
ZPWM-4020ML-2R2☐	2.20	±20	100	52.0	58.0	4.50	5.00
ZPWM-4020ML-3R3☐	3.30	±20	100	74.0	87.0	3.30	4.00
ZPWM-4020ML-4R7☐	4.70	±20	100	92.0	105.0	2.80	3.00
ZPWM-4020ML-6R8☐	6.80	±20	100	160.0	175.0	2.40	2.50
ZPWM-4020ML-100☐	10	±20	100	256.0	282.0	1.60	2.20

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ZPWM-5018ML-R47☐	0.47	±20	100	7.7	9.0	10.50	15.50
ZPWM-5018ML-1R0☐	1.00	±20	100	15.0	17.0	8.00	9.00
ZPWM-5018ML-1R5☐	1.50	±20	100	21.0	26.0	7.50	9.00
ZPWM-5018ML-2R2☐	2.20	±20	100	30.0	35.0	5.00	6.50
ZPWM-5018ML-3R3☐	3.30	±20	100	52.0	58.0	4.50	5.00
ZPWM-5018ML-4R7☐	4.70	±20	100	78.0	85.0	3.50	4.00
ZPWM-5018ML-6R8☐	6.80	±20	100	107.0	120.0	2.80	3.40
ZPWM-5018ML-100☐	10	±20	100	140.0	155.0	2.50	3.00

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ZPWM-5030ML-R20☐	0.20	±20	100	3.5	3.9	14.00	14.50
ZPWM-5030ML-R47☐	0.47	±20	100	7.4	8.5	11.00	12.00
ZPWM-5030ML-R68☐	0.68	±20	100	11.0	12.0	9.00	11.50
ZPWM-5030ML-1R0☐	1.00	±20	100	13.0	14.0	8.50	11.00
ZPWM-5030ML-1R5☐	1.50	±20	100	20.0	25.0	8.20	8.50
ZPWM-5030ML-2R2☐	2.20	±20	100	25.0	29.0	7.00	7.50
ZPWM-5030ML-3R3☐	3.30	±20	100	32.0	38.0	5.50	6.00
ZPWM-5030ML-4R7☐	4.70	±20	100	50.0	60.0	4.50	5.00
ZPWM-5030ML-6R8☐	6.80	±20	100	75.0	90.0	3.50	4.00
ZPWM-5030ML-100☐	10	±20	100	110.0	125.0	3.20	3.50

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ZPWM-6018ML-R68☐	0.68	±20	100	10.0	12.0	9.50	17.00
ZPWM-6018ML-1R0☐	1.00	±20	100	13.0	16.0	8.50	14.00
ZPWM-6018ML-2R2☐	2.20	±20	100	28.0	35.0	7.00	8.00
ZPWM-6018ML-4R7☐	4.70	±20	100	56.0	62.0	4.00	5.00
ZPWM-6018ML-6R8☐	6.80	±20	100	101.0	110.0	3.00	4.50
ZPWM-6018ML-100☐	10	±20	100	140.0	155.0	2.30	2.50
ZPWM-6018ML-220☐	22	±20	100	310.0	350.0	1.80	2.30

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Part Number	Inductance (μH)@0A	Tolerance (%)	Test Frequency (KHz)/1V/0A	DCR (mΩ/Typ.)	DCR (mΩ/Max.)	Heat Rating Current IDC(Amp./Typ.)	Saturation Current Isat(Amp./Typ.)
ZPWM-6025ML-R33☐	0.33	±20	100	3.5	4.1	18.00	24.50
ZPWM-6025ML-R47☐	0.47	±20	100	4.5	5.1	15.00	22.00
ZPWM-6025ML-R56☐	0.56	±20	100	5.5	6.5	13.00	17.00
ZPWM-6025ML-R68☐	0.68	±20	100	6.2	7.0	12.00	16.00
ZPWM-6025ML-1R5☐	1.50	±20	100	17.0	20.0	9.00	13.50
ZPWM-6025ML-3R3☐	3.30	±20	100	31.0	39.0	5.50	8.50
ZPWM-6025ML-6R8☐	6.80	±20	100	57.0	70.0	4.00	6.00
ZPWM-6025ML-100☐	10	±20	100	92.0	101.0	3.10	4.00

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ZPWM-6030ML-R10☐	0.10	±20	100	0.9	1.2	32.00	56.00
ZPWM-6030ML-R22☐	0.22	±20	100	2.5	3.0	24.00	34.00
ZPWM-6030ML-R33☐	0.33	±20	100	3.0	3.5	21.00	25.00
ZPWM-6030ML-R47☐	0.47	±20	100	3.5	4.1	18.00	20.00
ZPWM-6030ML-R56☐	0.56	±20	100	3.9	4.5	16.50	18.00
ZPWM-6030ML-R68☐	0.68	±20	100	4.8	5.3	16.00	17.00
ZPWM-6030ML-1R0☐	1.00	±20	100	6.7	7.4	12.00	15.00
ZPWM-6030ML-1R5☐	1.50	±20	100	10.6	12.1	12.00	14.00
ZPWM-6030ML-2R2☐	2.20	±20	100	13.5	15.0	9.50	10.00
ZPWM-6030ML-3R3☐	3.30	±20	100	18.0	22.0	8.50	9.50
ZPWM-6030ML-4R7☐	4.70	±20	100	28.0	33.0	6.00	6.50
ZPWM-6030ML-6R8☐	6.80	±20	100	42.5	48.0	5.00	6.00
ZPWM-6030ML-100☐	10	±20	100	62.0	67.0	4.50	5.50
ZPWM-6030ML-150☐	15	±20	100	104.0	115.0	3.00	4.50
ZPWM-6030ML-220☐	22	±20	100	180.0	200.0	2.30	3.00
ZPWM-6030ML-330☐	33	±20	100	280.0	310.0	2.00	2.50

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ZPWM-1040ML-R15☐	0.15	±20	100	0.5	0.65	45.0	75.0
ZPWM-1040ML-R22☐	0.22	±20	100	0.6	0.8	38.0	50.0
ZPWM-1040ML-R30☐	0.30	±20	100	0.95	1.1	35.0	50.0
ZPWM-1040ML-R36☐	0.36	±20	100	1.05	1.2	30.0	50.0
ZPWM-1040ML-R47☐	0.47	±20	100	1.5	1.7	30.0	40.0
ZPWM-1040ML-R56☐	0.56	±20	100	1.6	1.8	25.0	33.0
ZPWM-1040ML-R68☐	0.68	±20	100	2.1	2.4	23.0	30.0
ZPWM-1040ML-R80☐	0.80	±20	100	2.6	2.7	23.0	29.0
ZPWM-1040ML-1R0☐	1.00	±20	100	2.8	3.2	21.0	30.0
ZPWM-1040ML-1R5☐	1.50	±20	100	3.8	4.2	16.0	26.0
ZPWM-1040ML-2R2☐	2.20	±20	100	6.0	7.0	12.0	18.0
ZPWM-1040ML-3R3☐	3.30	±20	100	10.0	11.8	11.0	16.0
ZPWM-1040ML-4R7☐	4.70	±20	100	17.0	20.0	9.0	15.0
ZPWM-1040ML-6R8☐	6.80	±20	100	22.0	25.0	8.5	12.0
ZPWM-1040ML-8R2☐	8.20	±20	100	25.0	27.0	8.0	9.0
ZPWM-1040ML-100☐	10	±20	100	27.0	30.0	7.8	8.5
ZPWM-1040ML-150☐	15	±20	100	40.0	45.0	6.5	7.0
ZPWM-1040ML-220☐	22	±20	100	58.0	66.0	5.0	5.5
ZPWM-1040ML-330☐	33	±20	100	85.0	92.0	4.4	5.0
ZPWM-1040ML-470☐	47	±20	100	130.0	145.0	3.3	3.5
ZPWM-1040ML-680☐	68	±20	100	178.0	195.0	2.5	3.0

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Reliability Test

No.	Item	Specification	Test Method
1	Temperature Shock.	Appearance: No damage. Inductance: within ±10% of initial.	Temperature: -55±2℃~+125±2℃ Kept for 30 minutes. Transition time : 5 minutes. 100 Cycles.
2	Humidity Resistance.	Appearance: No damage. Inductance: within ±10% of initial.	Temperature: 40±2℃. Relative Humidity: 90%. Duration: 500 +4/-0 hours.
3	High Temperature Resistance.	Appearance: No damage. Inductance: within ±10% of initial.	Temperature: 125±2℃. Duration: 1000 +4/-0 hours.
4	Low Temperature Resistance.	Appearance: No damage. Inductance: within ±10% of initial.	Temperature: -55±2℃. Duration: 1000 +4/-0 hours.
5	Vibration test.	Appearance: No damage. Inductance: within ±10% of initial.	Oscillation Frequency: 10Hz to 55Hz to 10Hz in 60 seconds as a period. Total amplitude: 1.5mm. Testing Time: a period of 2 hours in each 3 mutually perpendicular directions (total of 6 hours).
6	Solderability Heat test.	Appearance: No damage. Inductance: within ±10% of initial.	Solder temperature: 260 +0/-5℃. Duration: 5 sec. Allowed reflow time: 2 times.
7	Solderability test.	90% or more of electrode area shall be coated by new solder.	Preheating: 160℃,60sec. Solder temperature: 245±5℃. Duration : 5 sec.
8	Flexure Strength.	No visible mechanical damage.	Flexure: 2mm. Pressurizing Speed: 0.5mm/sec. Keep time: 30±1sec.
9	Terminal Strength.	No visible mechanical damage.	Reflow 2 times. Force: 10N，Keep time: 5 sec，X,Y directs.

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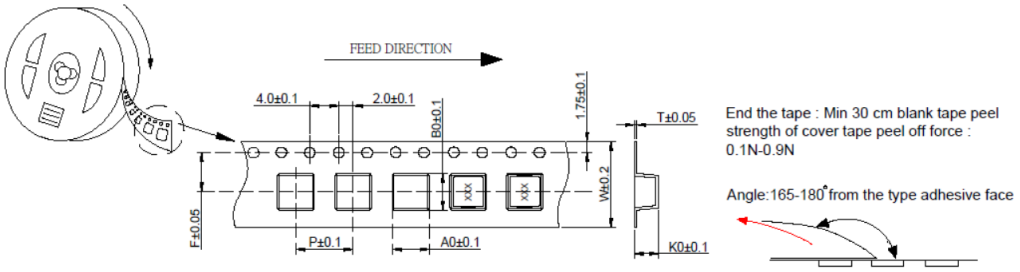
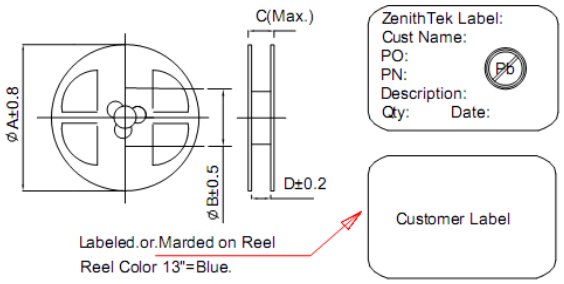
Package

Taping Dimension (mm)



Size(mm)	W	P	A0	B0	K0	T	F
ZPWM-4012ML	12.00	8.00	4.50	4.80	1.40	0.35	5.50
ZPWM-4020ML	12.00	8.00	4.50	4.80	2.50	0.35	5.50
ZPWM-5018ML	12.00	8.00	5.70	5.90	2.30	0.35	5.50
ZPWM-5030ML	12.00	8.00	5.70	5.90	3.60	0.35	5.50
ZPWM-6018ML	16.00	12.00	7.20	7.50	2.30	0.35	7.50
ZPWM-6025ML	16.00	12.00	7.20	7.50	2.80	0.35	7.50
ZPWM-6030ML	16.00	12.00	7.20	7.50	3.60	0.35	7.50
ZPWM-1040ML	24.00	16.00	10.70	12.00	4.50	0.35	11.50

Reel Dimension (mm)



Size(mm)	A	B	C	D	Reel/Size	Qty./Size
ZPWM-4012ML	330	100	16.5	12.5	13”	3000 Pcs
ZPWM-4020ML	330	100	16.5	12.5	13”	3000 Pcs
ZPWM-5018ML	330	100	16.5	12.5	13”	2000 Pcs
ZPWM-5030ML	330	100	16.5	12.5	13”	2000 Pcs
ZPWM-6018ML	330	100	20.5	16.5	13”	1500 Pcs
ZPWM-6025ML	330	100	20.5	16.5	13”	1500 Pcs
ZPWM-6030ML	330	100	20.5	16.5	13”	1500 Pcs
ZPWM-1040ML	330	100	28.5	24.5	13”	500 Pcs

Box Dimension (mm)