Triple Extrusion

TIW-M

Special Transformer Winding Wire

Type of TIW-M

▶ **TIW-M(B), TIW-M(F) :** Reinforced Insulation Wire

▶ **TIW-M(LZ) :** Reinforced Insulation Litz Wire

The vantage points of TIW-M

▶ Miniaturize of Switching Transformer

- Exclusion of 'Creepage Distance' requirement and interleaved insulation bring epochal miniaturization.

▶ Excellent insulation quality

- Supreme UL grade of insulation : Reinforced Insulation
- The most advanced insulation type : Triple extrusion
- Electric Strength Test : 1. Straight Test : AC 3,000 V / 1 min above
  2. Twisted Test : AC 6,000 V / 1 min above

▶ Suitability for High-Frequency

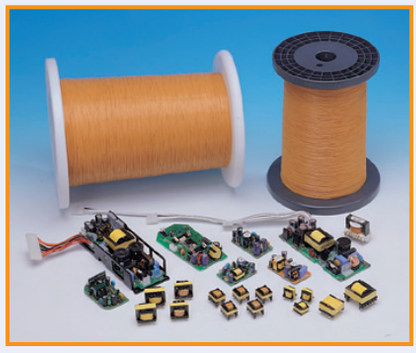
- Suitable for 30kHz above high frequency purpose
- Equalized electric quality with extrusion type
- Low dielectric constant
- Handling/Storage convenience – Superior physical strength and durability for abrasion

▶ Improved Productivity

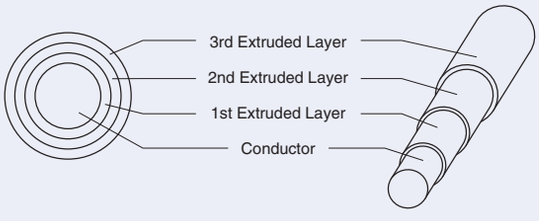
- Simple production processes : No barrier tape and interleaved insulation tape are required
- Solderability : Soldering can be conducted without removal of insulation layer

Authentic spec. for TIW-M

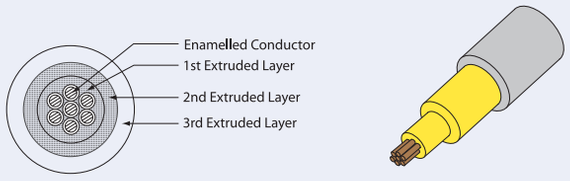
	TIW-M(B)	TIW-M(F)	TIW-M(LZ)
Insulation Grade	Reinforced Insulation		
Temp.Rating	130℃	155℃	130℃
Voltage Rating	1000Vrms(MAX.)		
Standard Color	Yellow	Pink	Yellow



TIW-M cross-sectional view



TIW-M(B), TIW-M(F)



TIW-M(LZ)

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Miniaturize of Switching Transformer

▶ SAFETY MODE

UL1950, UL1411
IEC 60950
CSA C222 No.950
BS 60950

→ Foundational prevention from electric hazard. Creepage Distance = 0, Removal of barrier tape, removal of 1st and 2nd interleaved insulation tapes.

→ Reinforced insulation (Triple insulation)

▶ SWITCHING MODE

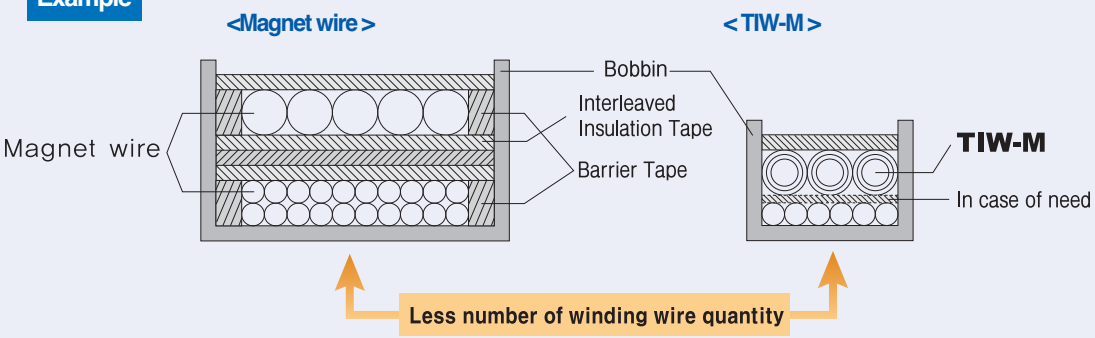
Switching Mode

→ Excellent high frequency waves quality and electrical quality of wire

→ Specification : Material, Formation, Processes

→ **TIW-M (Triple Insulated winding wire)**

Example



With removal of barrier tape and interleaved insulation tape, the size of transformer becomes 1/2 and the weight becomes 2/3 from M/W winding transformer.

Special Transformer Winding Wire

Insulation Grade	Wire formation	Reference
Basic Insulation	One layer of extruding or 2 layers of Taping	
Supplementary Insulation	2 layers of extruding or 2 layers of Taping	
Reinforced Insulation	3 layers of extruding or 3 layers of Taping	TIW-M : 3 layer extruding

TIW-M is usable for following items

▶ SMPS(Switching Mode Power Supply)

- Multi-power supply system for electric equipment

▶ Battery Charger for Smart Phone

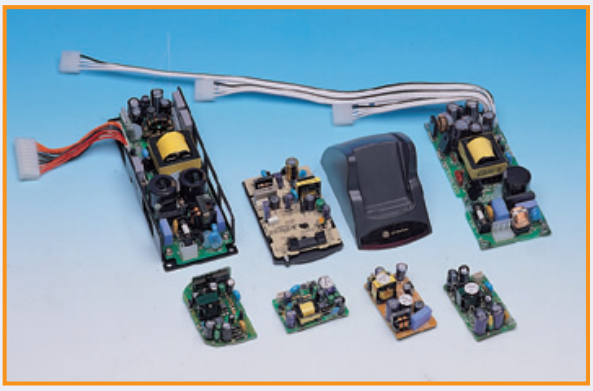
▶ Adapter

- Exterior Multi-power supply system for electric equipment

▶ Laptop computer and Game set

▶ Digital camera

▶ Other electric items



TIW-M(B), TIW-M(F)

Triple Extrusion
TIW-M
Special Transformer Winding Wire

Relative Specification for TIW-M(B), (F)

Certification organization	UL	CSA	TUV	NEMKO	VDE	BSI	EIS
Applied Spec.	• UL1950 • UL2353 • UL1411 • UL60950-1	• C22.2 NO.1-98 NO.66-1988 NO.223-M91 NO.60950-00	• EN60950-1 • EN60065	• IEC60950 • EN60950	• EN60950-1 • EN60065 • EN61558-1 • EN60601-1	• EN60950-1 • EN60065	• CIS. 04 • HITACHI • HIS-8B

Standard Spec. for TIW-M

Construction				Break down Voltage	Conductor resistance (20℃)	Length	BOBBIN SIZE	Weight
Conductor		Overall Diameter	Max. Dia.					
Diameter	Tolerance							
(mm)	(mm)	(mm)	(mm)	(V)	(Ω/㎞)	(m)	-	(kg)
0.20	±0.008	0.360~0.400~0.420	0.430	6000	607.6	6000	PT-10	2.9
0.23	±0.008	0.410~0.430~0.450	0.460	6000	465.5	6000	PT-10	3.5
0.25	±0.008	0.430~0.450~0.470	0.480	6000	382.5	6000	PT-10	4.0
0.28	±0.008	0.460~0.480~0.500	0510	6000	307.3	6000	PT-10	4.7
0.30	±0.010	0.480~0.500~0.520	0.540	6500	262.9	5000	PT-10	4.5
0.35	±0.010	0.530~0.550~0.570	0.600	6500	191.2	5000	PT-10	5.7
0.40	±0.010	0.580~0.600~0.620	0.660	7000	145.3	5000	PT-15	7.3
0.45	±0.010	0.630~0.650~0.670	0.710	7000	114.2	5000	PT-15	8.9
0.50	±0.010	0.680~0.700~0.720	0.760	7000	91.43	4000	PT-15	8.7
0.55	±0.020	0.720~0.750~0.780	0.810	7000	78.15	4000	PT-15	10.3
0.60	±0.020	0.770~0.800~0.830	0.860	7000	65.26	3000	PT-15	9.1
0.65	±0.020	0.820~0.850~0.880	0.910	7000	55.31	3000	PT-15	10.5
0.70	±0.020	0.870~0.900~0.930	0.960	7000	47.47	3000	PT-25	12.2
0.75	±0.020	0.920~0.950~0.980	1.010	7000	41.19	3000	PT-25	13.8
0.80	±0.020	0.970~1.000~1.030	1.060	7000	36.08	3000	PT-25	15.5
0.85	±0.020	1.020~1.050~1.080	1.110	7000	31.87	2000	PT-25	11.9
0.90	±0.020	1.070~1.100~1.130	1.160	7000	28.35	2000	PT-25	13.1
0.95	±0.020	1.120~1.150~1.180	1.210	7000	25.38	2000	PT-25	14.5
1.00	±0.030	1.170~1.200~1.230	1.260	7000	23.33	2000	PT-25	15.9

* Length can be modified by request.

Suggested Soldering Temperature

Conductor Diameter	Soldering Temperature	Soldering Time
0.20-0.40mm	420±5℃	4 seconds
0.45-0.70mm		6 seconds
0.75-1.00mm		8 seconds

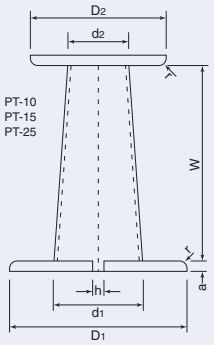
TIW-M(B,F,LZ)

▶ Applicable color

Standard : Yellow(B, LZ), Pink(F)

▶ Bobbin Size

Spool	Flange Diameter (mm)		Barrel Diameter (mm)		Inside Width (mm)	Flance Thickness (mm)	Bore Diameter (mm)	Spool Net Weight (g)	Standard Net Weight (kg)
	D1	D2	d1	d2					
PT-10	180±0.5	160±0.5	110±0.5	96±0.5	200±0.4	15±0.2	26± $^{0.5}_{0}$	520±5	10.0
PT-15	200±0.5	180±0.5	110±0.5	96±0.5	200±0.4	15±0.2	30± $^{0.5}_{0}$	740±10	15.0
PT-25	230±0.5	215±0.5	130±0.5	110±0.5	250±0.4	15±0.2	30± $^{0.5}_{0}$	1000±1.5	25.0



Relative Specification for TIW-M(LZ)

Certification organization	UL	VDE
Applied Spec	• UL1950 • UL60950-1 • UL60601-1 • UL2353	• EN60950-1 • EN600065 • EN60601-1 • EN61558-2-16

Standard Spec. for TIW-M

SIZE (mm)	Conductor			Number of Strands	Dimension of the wire		Min. Dielectric Breakdown Voltage	Max. Conductor resistance (Ω / km at 20℃)	Standard Length (m)
	Diameter (mm)	Tolerance (mm)	Min. Film Thickness (mm)		Min. Film Thickness (mm)	Target Overall Diameter (mm)			
7/0.10	0.10	± 0.008	0.003			0.504~0.524~0.544	6000	346.9	5500
7/0.11	0.11	± 0.008	0.003			0.534~0.554~0.574	6000	285.2	4500
7/0.12	0.12	± 0.008	0.004			0.570~0.590~0.610	6000	238.4	3500
7/0.13	0.13	± 0.008	0.004			0.600~0.620~0.640	6000	202.4	3500
7/0.14	0.14	± 0.008	0.004			0.630~0.650~0.670	6000	173.8	3000
7/0.15	0.15	± 0.008	0.004			0.660~0.680~0.700	6000	151.1	3000
7/0.16	0.16	± 0.008	0.005			0.696~0.716~0.736	6000	132.4	3000
7/0.17	0.17	± 0.008	0.005			0.726~0.746~0.766	6000	117.0	2500
7/0.18	0.18	± 0.008	0.005			0.756~0.776~0.796	6000	104.2	2000
7/0.19	0.19	± 0.008	0.005			0.786~0.806~0.826	6000	93.34	2000
7/0.20	0.20	± 0.008	0.005	7	0.84	0.816~0.836~0.856	6000	84.10	2000
7/0.21	0.21	± 0.008	0.005			0.846~0.866~0.886	6000	76.18	2000
7/0.22	0.22	± 0.008	0.005			0.876~0.896~0.916	6000	69.96	4500
7/0.23	0.23	± 0.008	0.006			0.912~0.932~0.952	6000	63.91	4000
7/0.24	0.24	± 0.008	0.006			0.942~0.962~0.982	6000	58.61	4000
7/0.25	0.25	± 0.008	0.006			0.972~0.992~1.012	6000	53.94	3500
7/0.26	0.26	± 0.010	0.006			1.002~1.022~1.042	6000	49.81	3500
7/0.27	0.27	± 0.010	0.006			1.032~1.052~1.072	6000	46.13	3500
7/0.28	0.28	± 0.010	0.006			1.062~1.082~1.102	6000	42.85	3000
7/0.29	0.29	± 0.010	0.006			1.092~1.112~1.132	6000	39.91	3000
7/0.30	0.30	± 0.010	0.007			1.128~1.41~1.168	6000	37.01	2500

Suggested Soldering Temperature

Conductor Diameter	Soldering Temperature	Soldering Time
7/0.10 - 7/0.19mm	420 ± 5℃	8 seconds
7/0.20 - 7/0.30mm		10 seconds