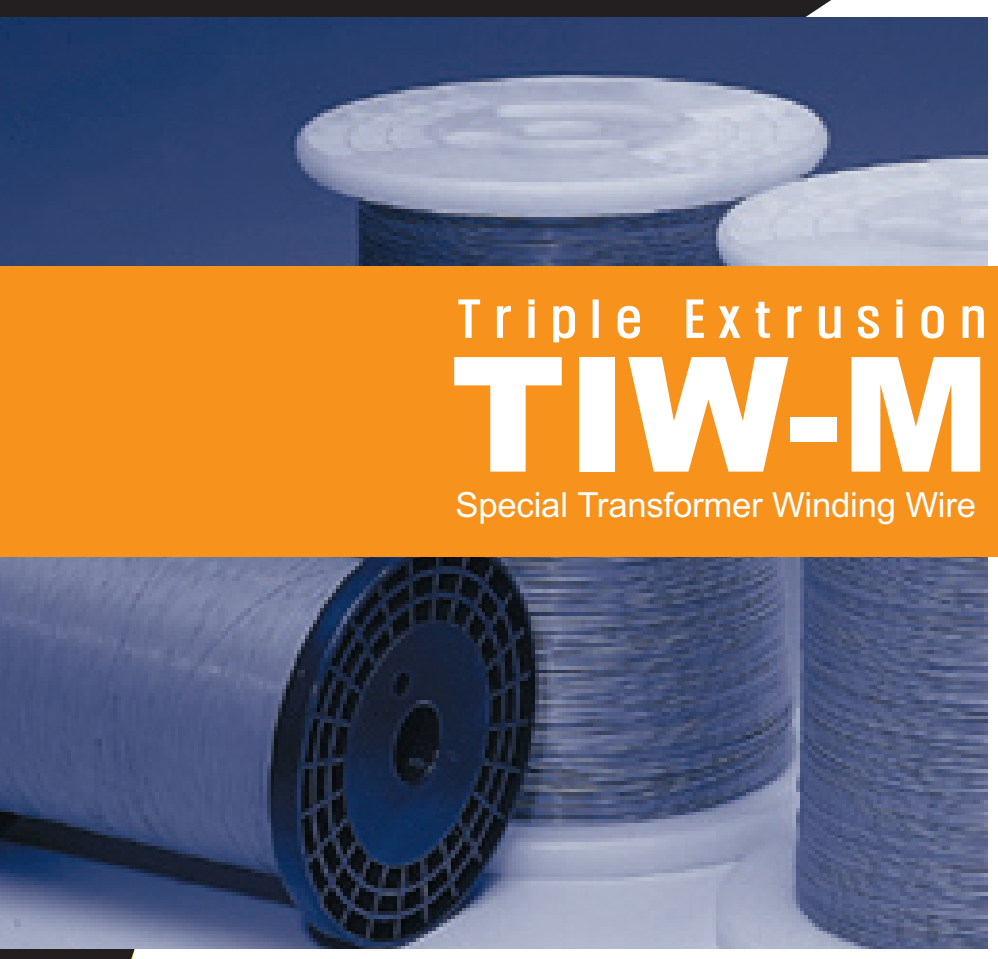




Catalog No. Rev.1



Triple Extrusion
TIW-M
Special Transformer Winding Wire

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

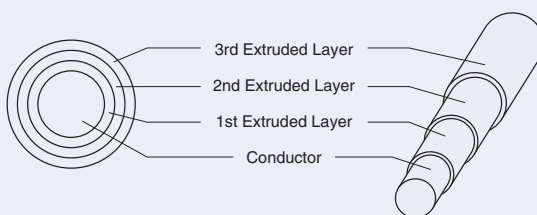
- Simple production processes : No barrier tape and interleaved insulation tape are required
- Solderability : Soldering can be conducted without removal of insulation layer

Authentic spec. for TIW-M

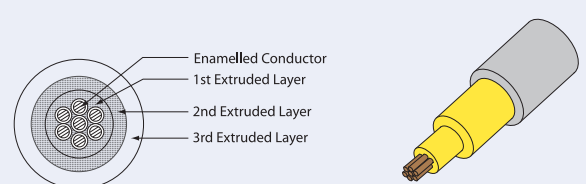
	TIW-M(B)	TIW-M(F)	TIW-M(LZ)
Insulation Grade	Reinforced Insulation		
Temp.Rating	130℃	155℃	130℃
Voltage Rating	1000Vrms(MAX.)		
Standard Color	Yellow	Pink	Yellow



TIW-M cross-sectional view



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



TIW-M(LZ)

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)

TIW-M
 (Triple Insulated winding wire)

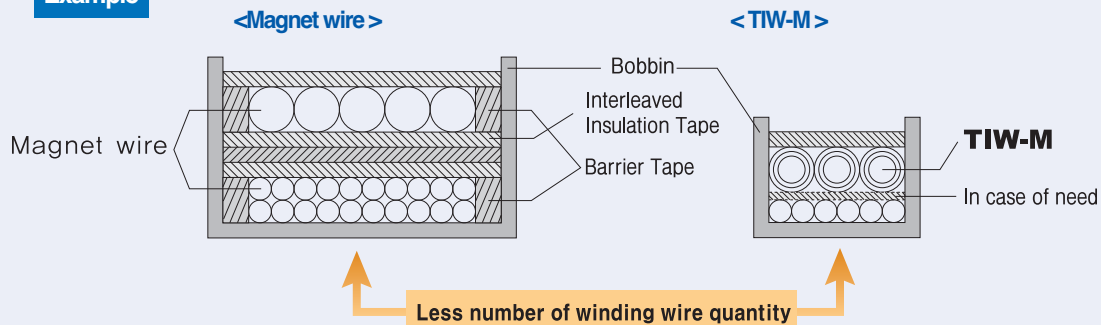
▶ SWITCHING MODE

Switching Mode

Excellent high frequency waves quality and electrical quality of wire

Specification :
 Material,
 Formation, Processes

Example



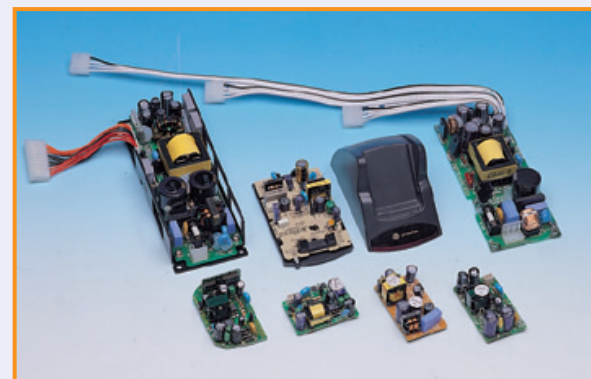
With removal of barrier tape and interleaved insulation tape, the size of transformer becomes 1/2 and the weight becomes 2/3 from M/W winding transformer.

Special Transformer Winding Wire

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

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**



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

Certification organization	UL	CSA	TUV	NEMKO	VDE	BSI	EIS
Applied Spec.	<ul style="list-style-type: none"> UL1950 UL2353 UL1411 UL60950-1 	<ul style="list-style-type: none"> C22.2 NO.1-98 NO.66-1988 NO.223-M91 NO.60950-00 	<ul style="list-style-type: none"> EN60950-1 EN60065 	<ul style="list-style-type: none"> IEC60950 EN60950 	<ul style="list-style-type: none"> EN60950-1 EN60065 EN61558-1 EN60601-1 	<ul style="list-style-type: none"> EN60950-1 EN60065 	<ul style="list-style-type: none"> CIS. 04 HITACHI HIS-8B

Standard Spec. for TIW-M

Construction				Break down Voltage (V)	Conductor resistance (20°C) (Ω/km)	Length (m)	BOBBIN SIZE	Weight (kg)
Conductor		Overall Diameter (mm)	Max. Dia. (mm)					
Diameter (mm)	Tolerance (mm)							
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	0.510	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 °C	4 seconds
0.45-0.70mm		6 seconds
0.75-1.00mm		8 seconds

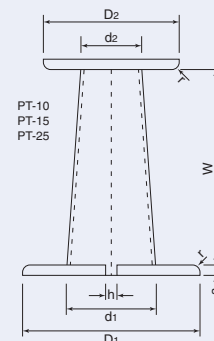
TIW-M(B,F,LZ)

► **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	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	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	1000±1.5	25.0



Relative Specification for TIW-M(LZ)

Certification organization	UL	VDE
Applied Spec	<ul style="list-style-type: none"> • UL1950 • UL60950-1 • UL60601-1 • UL2353 	<ul style="list-style-type: none"> • 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°C)	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	7	0.84	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			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 °C	8 seconds
7/0.20 - 7/0.30mm		10 seconds



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