

Version:  
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# **DIRECT**

## **Electronics Tech.**

# **(DQ) Wave-Shape Ribbon-Wound Power Resistor**

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## ► Product Introduction

### Wave-Shape Ribbon-Wound Power Resistor Design Neutralizes Inductance Parasitoid

#### Features :

- Fixed, tapped styles, or adjustable type are available.
- Special terminals are available for unusual applications.
- Special tolerances, temperature coefficients, and resistance value can be specified.
- Ayrton Perry type non-inductive winding formats are available. See DQS Series when required.
- Standard resistance tolerance is H( $\pm 3\%$ ), J( $\pm 5\%$ ) and K( $\pm 10\%$ ). Closer tolerances are available upon request.
- The wire is spot welded to the terminal bands and then "fastened" onto the core with a silicone, cement, or vitreous enamel coating.
- Standard lug terminals available with or without terminal hardware. Single and double quick connect terminals can be specified.
- DQ Series Design allows for efficient heat dissipation at higher temperature ranges so the resistor is half the physical size of an equivalent rated roundwire resistor.

#### Applications :

- The Power Ribwound DQ Series is suitable for educational modeling applications, load testing, industrial machinery resistor, electric power distribution resistors, instruments, automation control installations, etc.
- Typical applications for roundwire (DQ) series in motor/motion control include areas such as lift trucks, overhead cranes, elevator resistors, arc and spot welders, battery charger resistors, machine tools, conveyor resistors, and UPS systems.

A tubular ceramic has two terminals, and is wound with a resistance element consisting of a wave-shaped alloy ribbon.

Terminal bands are spot welded after installation on the core and then a resistance-alloy ribbon wire is crimped and edge wound onto the core.

Non-flammable resin insulation is applied after cooling and drying through a temperature process and then the component mounts are attached.

The resistance value range is relatively low due to alloy material limitations; see the DR series if upper resistance values required.

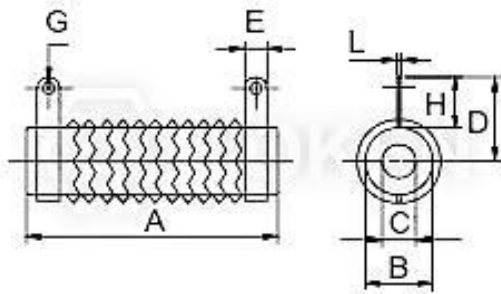
Power Wave-Shape Ribbon wound Resistor supports the use of numerous taps, has low impedance, and can be fabricated in various shapes to support a wide range of applications. The DQ Series is RoHS compliant and lead free. For custom specifications, or order individual replacement units, entire grids with various mounting configurations, please contact us to discuss the details. Or link to Direct official website "[High Power Resistors](http://www.direct-token.com)" to get more information.



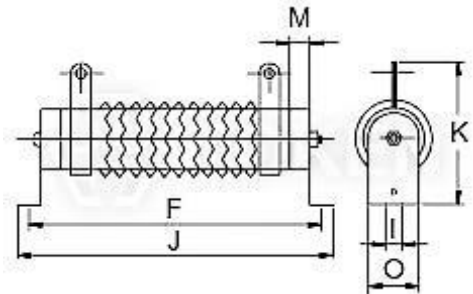
**DQ-A Dimensions**

**Dimensions Rib-Wound (DQ-A 75W ~ 2000W)**

Wattage Rating	Dimensions (Unit: mm)														Resistance Range
	A	B	C	D	E	F	G	H	I	J	K	L	M	O	
75W	110	25	16	30	8	150	5	18	6	166	58	1.2	6	27	1.5~8Ω
90W	90	28	18	32	8	130	5	19	6	146	60	1.2	6	27	1.5~9Ω
120W	110	28	18	32	8	150	5	19	6	166	60	1.2	6	27	2~12Ω
150W	140	28	18	32	8	180	5	19	6	196	60	1.2	6	27	2~15Ω
180W	160	28	18	32	8	200	5	19	6	216	60	1.2	6	27	3~18Ω
225W	195	28	18	32	8	235	5	19	6	251	60	1.2	6	27	3~23Ω
240W	185	35	24	36	10	225	5	19	8	245	76	1.6	6	34	5~24Ω
300W	210	35	24	36	10	250	5	19	8	274	76	1.6	6	34	5~30Ω
375W	210	40	25	38	12	250	5	20	8	274	78	1.6	6	34	6~38Ω
450W	260	40	25	38	12	300	5	20	8	320	78	1.6	6	34	6~45Ω
600W	330	40	25	38	12	370	5	20	8	395	78	1.6	6	34	7~60Ω
750W	330	50	35	50	12	380	6	25	9	400	100	1.6	8	40	8~75Ω
900W	400	50	35	50	12	450	6	25	9	470	100	1.6	8	40	8~90Ω
1000W	460	50	35	50	12	510	6	25	9	530	100	1.6	8	40	12~100Ω
1200W	460	60	40	55	15	515	6	30	10	535	110	1.6	10	50	12~120Ω
1500W	540	60	40	55	15	595	6	30	10	615	110	1.6	10	50	15~150Ω
2000W	650	65	42	62	15	702	6	30	10	722	115	1.6	10	50	15~200Ω



**(DQ-A) N - No Mount**



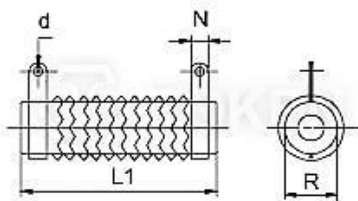
**(DQ-A) G - Horizontal Mount**



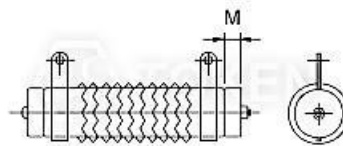
**DQ-B Dimensions**

**Dimensions Rib-Wound (DQ-B 30W ~ 20000W)**

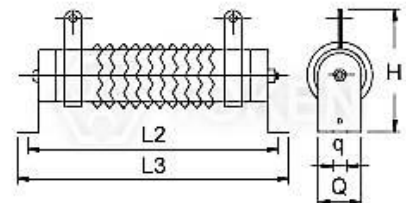
Wattage Rating	Dimensions (Unit: mm)										Resistance Range
	R	L1	L2	L3	H	N	d	M	q	Q	
30W	20	70	100	120	50	6	3.5	5	5	20	2~1KΩ
40W	20	87	115	137	50	6	3.5	5	5	20	2~1KΩ
50W	28	90	122	143	68	9	4.5	5.5	6	28	5~1KΩ
80W	28	90	122	143	68	9	4.5	5.5	6	28	5~2KΩ
100W	28	170	202	223	68	9	4.5	5.5	6	28	10~3KΩ
150W	28	215	247	268	68	9	4.5	5.5	6	28	10~3KΩ
200W	28	267	299	320	68	9	4.5	5.5	6	28	10~5KΩ
250W	28	267	299	320	68	9	4.5	5.5	6	28	10~5KΩ
300W	40	267	305	343	90	10	4.5	6	6	40	20~5KΩ
400W	40	330	367	406	90	10	4.5	6	6	40	20~5KΩ
500W	50	330	370	415	98	10	6	8.5	8	50	20~5KΩ
600W	50	330	370	415	98	10	6	8.5	8	50	20~5KΩ
700W	50	400	440	485	95	10	6	8.5	8	50	20~5KΩ
800W	70	300	331	362	135	15	8	-	8	70	40~500Ω
1000W	70	300	331	362	135	15	8	-	8	70	40~500Ω
1500W	70	415	446	477	135	15	8	-	8	70	40~500Ω
2000W	70	510	541	572	135	15	8	-	8	70	40~500Ω
2500W	70	600	631	662	135	15	8	-	8	70	40~500Ω
3000W	70	600	631	662	135	15	8	-	8	70	40~500Ω
4000W	100	430	468	521	155	15	8	-	8	100	40~500Ω
5000W	100	500	538	591	155	15	8	-	8	100.	40~500Ω
6000W	100	600	638	691	155	15	8	-	8	100.	40~500Ω
10000W	150	600	640	720	260	30	8	-	10	150	40~500Ω
12000W	150	660	700	780	260	30	8	-	10	150	40~500Ω
15000W	150	660	700	780	260	30	8	-	10	150	40~500Ω
20000W	150	1000	1040	1120	260	30	8	-	10	150	40~500Ω



**(DQ-B) N - No Mount**



**(DQ-B) Z - Vertical Mount**



**(DQ-B) G - Horizontal Mount**



**Introduction**

**Introduction (DQ\*N)**

**Rib-Wound Power Non-Inductive Resistor (DQ\*N)** applies Ayrton Perry winding method to compensate residual inductance and to allow for efficient heat dissipation at higher temperature ranges, so the resistor is half the physical size of an equivalent rated round wire wound DR resistors.

**Non-Inductance :**

- Ayrton Perry non-inductive winding is applied. When required add "N" to the part number.

**Resistance Tolerance :**

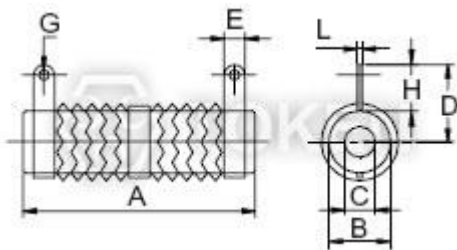
- K(±10%), J(±5%), H(±3%)

The power DQ\*N wave-ribbon resistor is lead-free and RoHS compliant. Please contact us for details with your specific needs.

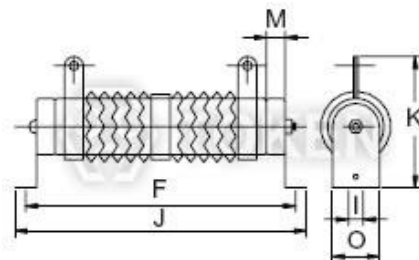
**DQAN 75W~2000W**

**Dimensions (DQAN 75W ~ 2000W)**

Wattage Rating	Dimensions (Unit: mm)														Resistance Range
	A	B	C	D	E	F	G	H	I	J	K	L	M	O	
75W	110	25	16	30	8	150	5	18	6	166	58	1.2	6	27	1.5~8Ω
90W	90	28	18	32	8	130	5	19	6	146	60	1.2	6	27	1.5~9Ω
120W	110	28	18	32	8	150	5	19	6	166	60	1.2	6	27	2~12Ω
150W	140	28	18	32	8	180	5	19	6	196	60	1.2	6	27	2~15Ω
180W	160	28	18	32	8	200	5	19	6	216	60	1.2	6	27	3~18Ω
225W	195	28	18	32	8	235	5	19	6	251	60	1.2	6	27	3~23Ω
240W	185	35	24	36	10	225	5	19	8	245	76	1.6	6	34	5~24Ω
300W	210	35	24	36	10	250	5	19	8	274	76	1.6	6	34	5~30Ω
375W	210	40	25	38	12	250	5	20	8	274	78	1.6	6	34	6~38Ω
450W	260	40	25	38	12	300	5	20	8	320	78	1.6	6	34	6~45Ω
600W	330	40	25	38	12	370	5	20	8	395	78	1.6	6	34	7~60Ω
750W	330	50	35	50	12	380	6	25	9	400	100	1.6	8	40	8~75Ω
900W	400	50	35	50	12	450	6	25	9	470	100	1.6	8	40	8~90Ω
1000W	460	50	35	50	12	510	6	25	9	530	100	1.6	8	40	12~100Ω
1200W	460	60	40	55	15	515	6	30	10	535	110	1.6	10	50	12~120Ω
1500W	540	60	40	55	15	595	6	30	10	615	110	1.6	10	50	15~150Ω
2000W	650	65	42	62	15	702	6	30	10	722	115	1.6	10	50	15~200Ω



(DQAN) N - No Mount



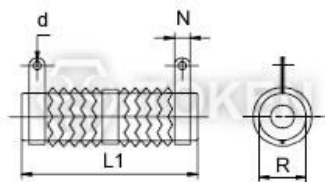
(DQAN) G - Horizontal Mount



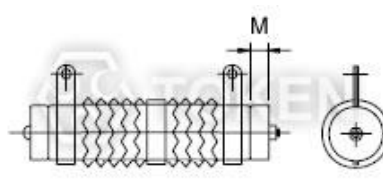
**► DQBN 30W~20000W**

**Dimensions (DQBN 30W ~ 20000W)**

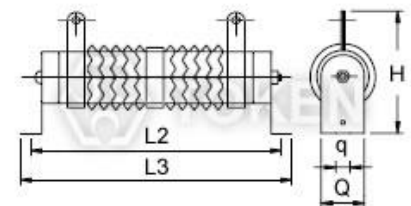
Wattage Rating	Dimensions (Unit: mm)										Resistance Range
	R	L1	L2	L3	H	N	d	M	q	Q	
30W	20	70	100	120	50	6	3.5	5	5	20	2~1KΩ
40W	20	87	115	137	50	6	3.5	5	5	20	2~1KΩ
50W	28	90	115	143	68	9	4.5	5.5	6	27	5~1KΩ
80W	28	90	115	143	68	9	4.5	5.5	6	27	5~2KΩ
100W	28	170	195	223	68	9	4.5	5.5	6	27	10~3KΩ
150W	28	215	240	268	68	9	4.5	5.5	6	27	10~3KΩ
200W	28	267	292	320	68	9	4.5	5.5	6	27	10~5KΩ
250W	28	267	292	320	68	9	4.5	5.5	6	27	10~5KΩ
300W	40	267	300	343	90	10	4.5	6	6	39	20~5KΩ
400W	40	330	365	406	90	10	4.5	6	6	39	20~5KΩ
500W	50	330	365	415	98	10	6	8.5	8	49	20~5KΩ
600W	50	330	365	415	98	10	6	8.5	8	49	20~5KΩ
700W	50	400	435	485	95	10	6	8.5	8	49	20~5KΩ
800W	70	300	320	362	138	15	8	-	8	69	40~500Ω
1000W	70	300	320	362	138	15	8	-	8	69	40~500Ω
1500W	70	415	435	477	138	15	8	-	8	69	40~500Ω
2000W	70	510	530	572	138	15	8	-	8	69	40~500Ω
2500W	70	600	620	662	138	15	8	-	8	69	40~500Ω
3000W	70	600	620	662	138	18	8	-	8	69	40~500Ω
4000W	100	430	450	521	155	15	8	-	8	99	40~500Ω
5000W	100	500	620	691	155	15	8	-	8	99	40~500Ω
6000W	100	600	720	791	155	15	8	-	8	99	40~500Ω
10000W	150	600	625	720	350	30	8	-	10	150	40~500Ω
12000W	150	660	685	780	350	30	8	-	10	150	40~500Ω
15000W	150	660	685	780	350	30	8	-	10	150	40~500Ω
20000W	150	1000	1030	1120	350	30	8	-	10	150	40~500Ω



**(DQBN) N - No Mount**



**(DQBN) Z - Vertical Mount**



**(DQBN) G - Horizontal Mount**

## Specifications

### Specifications (DQ)

Test Item	Test Methods	Characteristics
Resistance tolerance	JIS-C-5202 5-1	Resistance      Nominal      Tolerance 1≤R                  1>R                  ±5%(J) ±10%(K)
Temperature coefficient	JIS-C-5202 5-2	±400PPM/°C MAX
Load rating	JIS-C-5202 5-4	ΔR/R≤ ±(0.5%+0.1Ω) Surface temperature up 350°C MAX
Short-term overload	JIS-C-5202 5-5 500% rated wattage 5 seconds	Free of appearance or structural irregularity ΔR/R≤ ±(2%+0.1Ω)
Insulation resistance	JIS-C-5202 5-6 500VDC	100MΩ min
Dielectric withstanding voltage	JIS-C-5202 5-7 1000VDC 1 minute Between terminal and anchor stand	Free of appearance or structural irregularity ΔR/R≤ ±(0.1%+0.05Ω)
Terminal strength	JIS-C-5202 6-1 8kg 30 seconds	Free of appearance or structural irregularity
Vibration	JIS-C-5202 6-3 1.5m/m 10 ~ 50 ~ 10 Hz/min X-Y-Z 2 hours each	Free of appearance or structural irregularity Surface coating crack ΔR/R≤ ±(1%+0.05Ω)
Thermal shock	JIS-C-5202 7-3 Room temp 30 minutes ON-55°C 15 minutes OFF	Free of structural irregularity ΔR/R≤ ±(1%+0.05Ω)
Humidity	JIS-C-5202 7-5 40°C 90%RH 240 hours	Free of appearance or structural irregularity Surface coating crack ΔR/R≤ ±(3%+0.1Ω)
Load life	JIS-C-5202 7-10 90 minutes ON - 30 minutes OFF500 hours	Free of appearance or structural irregularity Surface coating crack ΔR/R≤ ±(5%+0.1Ω)
Flame retardation	JIS-C-5202 7-13-3-2 100% - 600% rated wattage load	US UL-94 flame retardation test V-0 grade noncombustible
REMARKS:	1. Resistance and resistance tolerance were tested in-house with micro resistance meter. 2. Coating refers to UL-certified data provided by supplier	

## Order Codes

### Order Codes (DQ)

DQA	1500W	100R	K	G			
Part Number	Rated Power (W)	Resistance Value		Resistance Tolerance (%)		Assembly Method	
DQA	75W~2000W	0R1	0.1Ω	H	±3%	N	No mount.
DQB	30W~20000W	1R	1Ω	J	±5%	C	Clip mount.
DQAN	75W~2000W	10R	10Ω	K	±10%	G	Horizontal mount.
DQBN	30W~20000W	12R	12Ω			Z	Vertical mount.
		100R	100Ω				

## ► General Information

### Benefits & Features

Providing design engineers with an economical resistor with high quality performance, Direct Electronics offers industry grade power wire wound devices.

Direct provide terminal blocks, thermal switches, fusing, fans, junction boxes, screened or solid bottom plates, conduit knockouts, and customer specified requirements. For large applications a welded frame construction is utilized to provide a robust design for power resistor mounting in both indoor and outdoor environments.

Products range from large capacity metal clad, nonflammable fixed and adjustable, wave ribbon wire-wound, slide, starter, box type, to nonflammable flat type. Direct extends a complete line for both military and commercial applications.

### Utilization Notes

1. Smoke emitted from non-flammable resistors on initial use in powered circuits is a normal phenomenon and the component can be safely utilized.
2. All resistors manufactured by Direct Electronics Industry Corporation comply with the U.S. UL-94 non- flammability test, Class V-0, a continuous combustion period of zero seconds.
3. Never use organic solvents to clean non-flammable resistors.
4. Non-flammable resistors cannot be utilized in oil.
5. Non-flammable resistors cannot be used in high frequency machinery because of the inductance produced by the windings. A suitable type of resistor must be selected. Contact us for details.
6. In applications where resistors are subject to intermittent current surges and spikes, be sure in advance that the components selected are capable of withstanding brief durations of increased load.
7. Do not exceed the recommended usable load. Resistors must use within the rated voltage range to prevent the shortening of service life and/or failure of the wound resistance elements.
8. Minimum load. Resistors must be utilized at 1/10 or more of the rated voltage to prevent poor conductance due to oxidation build-up.
9. Although the hardness exceeds that of a 3H pencil lead, do not nick the resistor coating with screw drivers or other pointed objects.
10. Avoid touching non-flammable resistors in operation; the surface temperature ranges from approximately 350°C ~ 400°C when utilized at the full rated value. Maintaining a surface temperature of 200°C or less will extend resistor service life.
11. Keep temperature from rising by choosing a resistor with a higher rated capacity; do not use a component having the exact load value required. For considerations of safety in extended period applications, the resistor rating should be more than four times higher than the actual wattage involved, but never use a resistor at less than 25% of its rated power.
12. Application and Placement: Wire-wound resistors use different gauges of wire as resistance elements. Sometimes the gauge is extremely thin (finer than a strand of human hair) and very susceptible to breakage in environments containing salts, ash, dust and corrosives. Avoid utilization in such environments. Do not install in dusty areas because the accumulation will cause shorts and poor conductance.

