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# **DIRECT**

## **Electronics Tech.**

### **(AL)**

# **Aluminum Chassis Mount Resistors**

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## ▶ Product Introduction

### Low profile aluminum encased wire wound power resistors boost up high energy applications.

Ultra-thin aluminum housed resistance (AL) series, the external type can be divided into (ASQ) ship-shaped aluminum shell resistance, (ASP) low profile aluminum shell resistance, (Asz) trapezoidal aluminum shell resistance three kinds.

Aluminum alloy shell plate core technology, the structure of ultra-thin heat-resistant aluminum encased wirewound resistor (AL) series. Better heat transfer characteristics than conventional wire-wound power resistors, up to 58 types of mold, and suitable for installation and use in different environments.



Direct's flat core winding technology allows for aluminum chassis mount heat sinkable resistor affording a very low profile, and superior thermal transfer characteristics when compared to conventional power wirewound resistors.

(AL) Low Profile Aluminum Encased Series is durable, vibration-proof, dissipates heat well and low temperature coefficient with resistance varying in direct proportion.

The rugged structure, economic price aluminum housed resistor (AL) is easy to utilize and install, and suitable for a wide range applications. Key applications include industrial machinery resistor, load testing resistor, electric power distribution resistors, instruments, and automated control installations.

The (AL) series is RoHS compliant and lead free. For non-standard technical requirements and custom special applications, please contact us to discuss the details, or link to Direct official website "[High Power Resistors](#)" to get more information.

#### Construction:

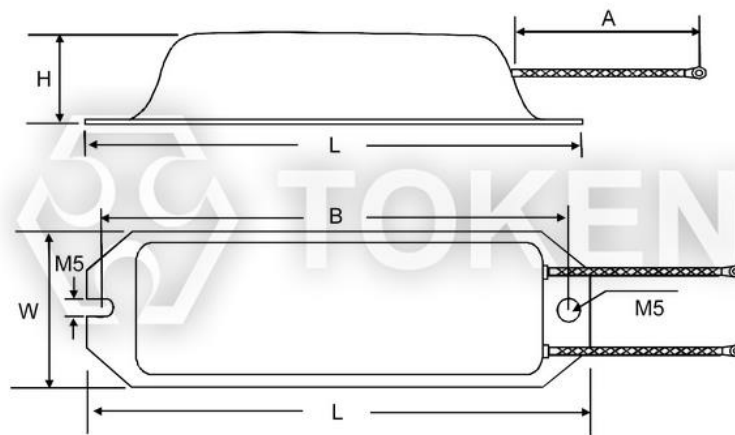
- Insulation is applied through a high-temperature process.
- An aluminum encased consists of an alloy metal coil-type resistance element assembled into an aluminum enclosure.
- After high-temperature anodization, the enclosure is filled with a special non-flammable cement paste and hardening.
- Since this component is embedded in the heat-proof cement, it is not affected by external mechanical force, and dusty environments.



▶ **ASQ Dimensions**

**Ship-Shaped Aluminum Housed Resistor (ASQ) Dimensions**

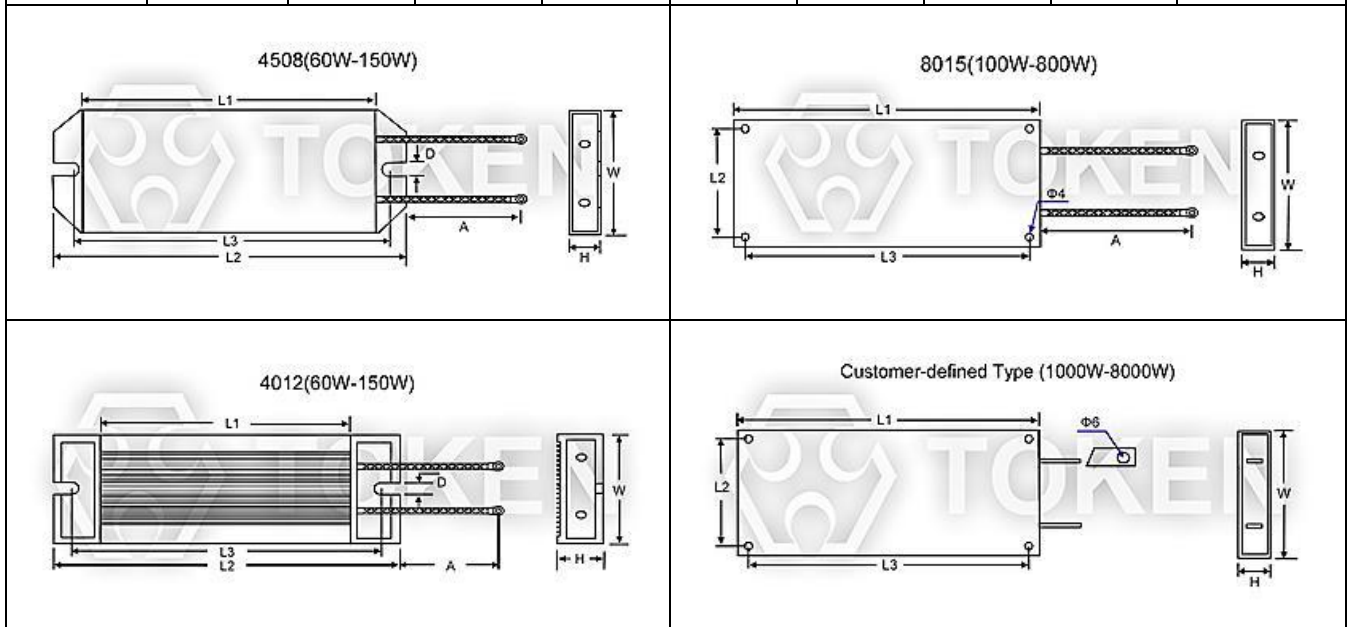
Wattage (W)	Dimensions (mm)					Resistance (Ω)
Rating	L±2	W±1	H±1	B±2	A±10	
<b>60W</b>	100	30	13	90	100	0.1Ω-100KΩ
<b>80W</b>	130	42	19	116	100	0.1Ω-100KΩ
<b>100W</b>	130	42	19	116	100	0.1Ω-100KΩ
<b>120W</b>	130	42	19	116	100	0.1Ω-100KΩ
<b>120W</b>	182	42	19	172	100	0.1Ω-33KΩ
<b>150W</b>	182	42	19	172	100	0.1Ω-33KΩ



► **ASP Dimensions**

**Low Profile Aluminum Shell Resistor (ASP) Dimensions**

Part Number	Wattage (W)	Dimensions (mm)							Resistance (Ω)
	Rating	W±1	H±1	L1±2	L2±2	L3±2	D±0.2	A±10	
ASP-4012	60W	40	12	75	100	85	5	150	0.1Ω-2KΩ
ASP-4508		45	8						
ASP-4012	80W	40	12	95	120	105	5	150	0.1Ω-3KΩ
ASP-4508		45	8						
ASP-4012	100W	40	12	95	120	105	5	150	0.1Ω-3KΩ
ASP-4508		45	8						
ASP-8015		80	15						
ASP-4012	120W	40	12	125	150	135	5	150	0.1Ω-5KΩ
ASP-4508		45	8						
ASP-8015		80	15						
ASP-4012	150W	40	12	190	215	200	5	150	0.1Ω-10KΩ
ASP-4508		45	8						
ASP-8015		80	15						
ASP-8015	200W	80	15	180	70	165		300	0.1Ω-10KΩ
ASP-8015	300W	80	15	210	70	195		300	0.1Ω-10KΩ
ASP-8015	400W	80	15	265	70	250		300	0.1Ω-10KΩ
ASP-8015	500W	80	15	330	70	315		300	0.1Ω-10KΩ
ASP-8015	600W	80	15	365	70	350		300	0.1Ω-10KΩ
ASP-8015	800W	80	15	415	70	400		300	0.1Ω-10KΩ

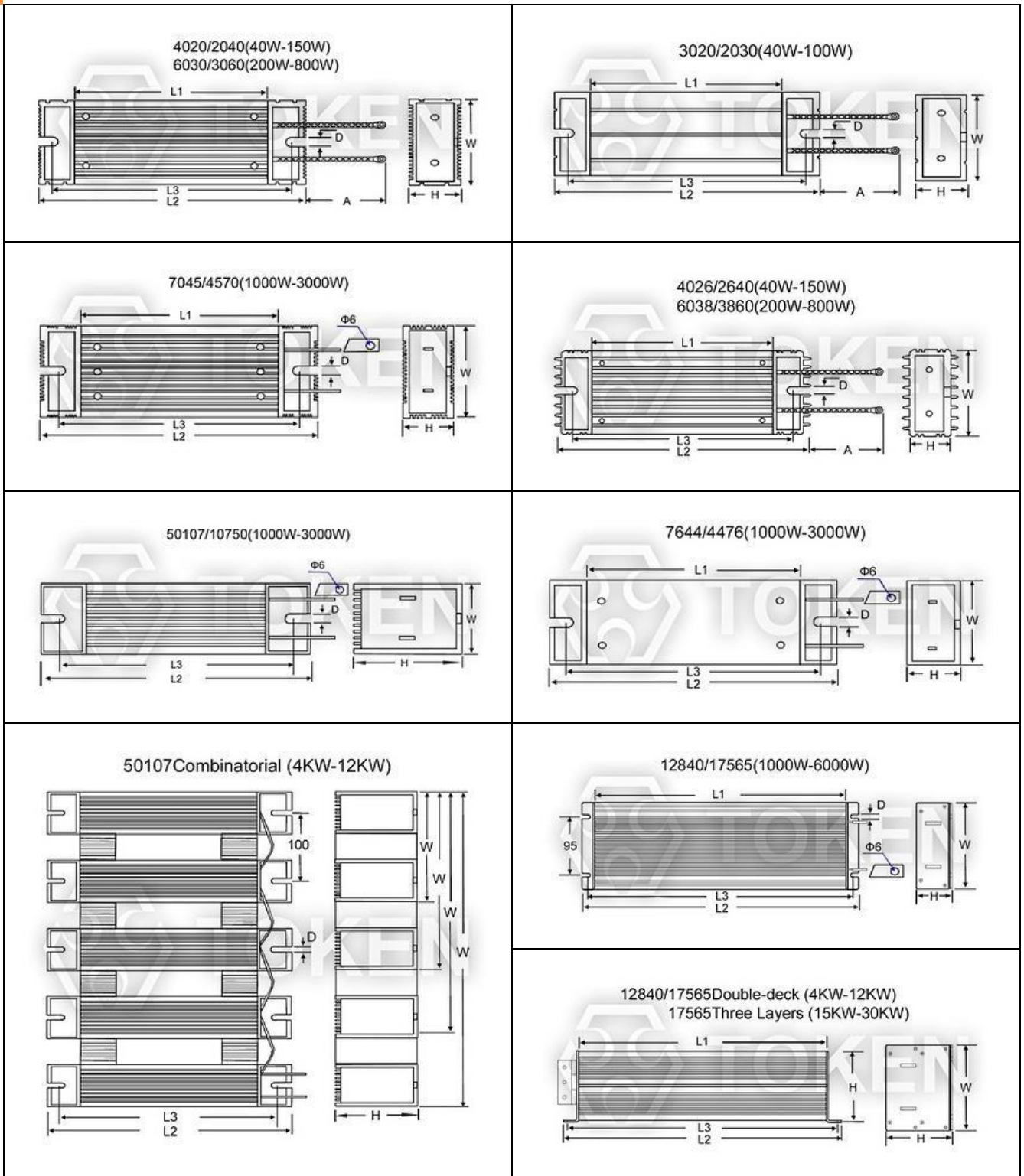


● **Remark:** ASP Ultra-thin aluminum shell resistor is the special electronic design for inverter, servo, CNC industry research and development of a high-power miniaturized exquisite electronic components. The thinnest thickness can reach 5mm and 7mm. Commonly used in 8mm, 12mm, 15mm and so on, ASP can be designed according to user requirements of the long and high dimensions, it has strong power, high heat dissipation, easy to install characteristics.



► **ASZ Dim. Figures**

**Trapezoidal Aluminum Encased Resistor (ASZ) Dimension Figures**



● Notice: All dimensions might be changed or modified, please refer to last updating specification.

**ASZ Dim. Tables**
**Trapezoidal Aluminum Housed Wirewound Resistor (ASZ) Dimension Table**

Part Number	Wattage (W)	Dimensions (Unit: mm)							Resistance (Ω)	Remark	
	Rating	W±1	H±1	L1±2	L2±2	L3±2	D±0.2	A±10			
ASZ-4020	40W	40	20	60	90	75	5	300	0.1Ω-100KΩ	W and H Vertical Interchangeable	
ASZ-4026			26								
ASZ-3020			30								
ASZ-4020	60W	40	20	85	115	100	5	300	0.1Ω-100KΩ	W and H Vertical Interchangeable	
ASZ-4026			26								
ASZ-3020			30								
ASZ-4020	80W	40	20	110	140	125	5	300	0.1Ω-33KΩ	W and H Vertical Interchangeable	
ASZ-4026			26								
ASZ-3020			30								
ASZ-4020	100W	40	20	110	140	125	5	300	0.1Ω-33KΩ	W and H Vertical Interchangeable	
ASZ-4026			26								
ASZ-3020			30								
ASZ-4020	120W	40	20/26	155	185	170	5	300	0.1Ω-33KΩ	W and H Vertical Interchangeable high current Terminal chip	
ASZ-4026	150W										
ASZ-6030 ASZ-6038	200W	60	30/38	130	165	150	5	300	0.1Ω-33KΩ		
	250W			180	215	200	5	300	0.1Ω-33KΩ		
	300W			230	265	250	5	300	0.1Ω-33KΩ		
	400W			300	335	320	5	300	0.1Ω-56KΩ		
	500W			300	335	320	5	300	0.1Ω-33KΩ		
	600W			300	335	320	5	300	0.1Ω-33KΩ		
800W	330	365	350	5	300	0.1Ω-33KΩ					
ASZ-7045	1000W	70	45	300	335	320	5	300	0.1Ω-33KΩ		W and H Vertical Interchangeable with high current terminal chip
ASZ-50107		50	107								
ASZ-7644		76	44								
ASZ-12840		128	40								
ASZ-7045	1200W	70	45	365	400	385	5	Terminal chip	0.1Ω-33KΩ		W and H Vertical Interchangeable
ASZ-50107		50	107								
ASZ-7644		76	44								
ASZ-12840		128	40							180	
ASZ-7045	1500W	70	45	415	450	435	5	Terminal chip	0.1Ω-15KΩ	W and H Vertical Interchangeable	
ASZ-50107		50	107								
ASZ-7644		76	44								
ASZ-12840		128	40								210
ASZ-7045	2000W	70	45	465	500	485	5	Terminal chip	0.1Ω-15KΩ	W and H Vertical Interchangeable	
ASZ-50107		50	107								
ASZ-7644		76	44								
ASZ-12840		128	40								230
ASZ-7045	2500W	70	45	515	550	535	5	Terminal chip	0.1Ω-12KΩ	W and H Vertical Interchangeable	
ASZ-50107		50	107								
ASZ-7644		76	44								
ASZ-12840		128	40								260
ASZ-7045	3KW	70	45	565	600	585	5	Terminal chip	0.1Ω-12KΩ	W and H Vertical Interchangeable	
ASZ-50107		50	107								
ASZ-7644		76	44								
ASZ-17565		175	65								300
ASZ-50107×2	4KW	150	107	465	500	485	5	Terminal chip	0.1Ω-10KΩ	50107×2 Combinations	
ASZ-17565		175	65	400	444	422	6				



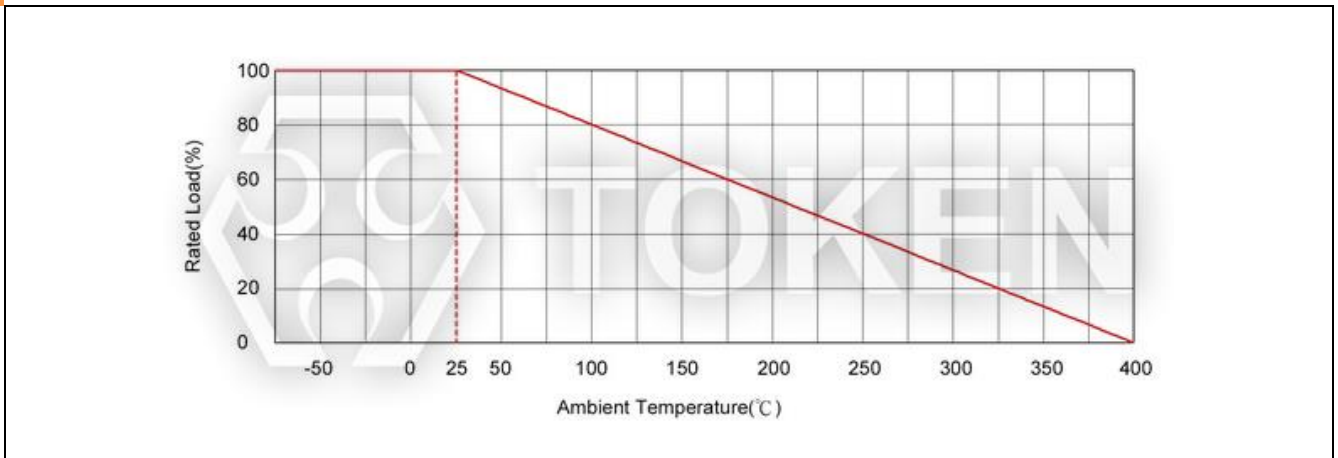
**Aluminum Encased Wire wound Resistors**

Part Number	Wattage (W)	Dimensions (Unit: mm)							Resistance (Ω)	Remark
	Rating	W±1	H±1	L1±2	L2±2	L3±2	D±0.2	A±10		
ASZ-50107×2	5KW	150	107	515	550	535	5	Terminal chip	0.1Ω-10KΩ	50107×2 Combinations
ASZ-17565		175	65	500	544	522	6			
ASZ-50107×3	6KW	250	107	465	500	485	5	Terminal chip	0.1Ω-10KΩ	50107×3 Combinations
ASZ-50107×2		150	107	515	550	535	5			50107×2 Combinations
ASZ-17565		175	65	600	644	622	6			
ASZ-50107×4	8KW	350	107	465	500	485	5	Terminal chip	0.1Ω-10KΩ	50107×4 Combinations
ASZ-17565×2		175	130	450	494	472	6			17565×2 Combinations
ASZ-50107×5	10KW	450	107	465	500	485	5	Terminal chip	0.1Ω-10KΩ	50107×5 Combinations
ASZ-17565×2		175	130	550	594	572	6			17565×2 Combinations
ASZ-50107×5	12KW	450	107	515	550	535	5	Terminal chip	0.1Ω-10KΩ	50107×5 Combinations
ASZ-17565×2		175	130	600	644	622	6			17565×2 Combinations
ASZ-17565×3	15KW	175	195	450	494	472	6			17565×3 Combinations
ASZ-17565×3	20KW	175	195	500	544	522	6			17565×3 Combinations
ASZ-17565×3	25KW	175	195	550	594	572	6			17565×3 Combinations
ASZ-17565×3	30KW	175	195	600	644	622	6			17565×3 Combinations



► **Performance Specifications**

**Derating Curve**



**Aluminum Housed Wirewound Heating Power resistor -Electrical characteristic**

Test Item	Test Methods	Characteristics
Resistance tolerance	JIS-C-5202-5.1	Resistance Nominal Tolerance B(±0.1%), D(±0.5%), F(±1%), G(±2%), J(±5%), K(±10%)
Temperature coefficient	JIS-C-5202-5.2	±100~250 PPM/°C
Power rating load	JIS-C-5202-5.4, 40°C, rated power, 1 Hour	$\Delta R/R \leq \pm(3\%+0.1\Omega)$
Short-term overload	JIS-C-5202-5.5, 5 × rated power 5 seconds	Free of appearance or structural irregularity $\Delta R/R \leq \pm(2\%+0.1\Omega)$
Insulation resistance	JIS-C-5202-5.6 1000VDC	100MΩ Min.
Dielectric withstanding voltage	JIS-C-5202-5.7 2000VDC 1 minute	Free of appearance or structural irregularity $\Delta R/R \leq \pm(0.1\%+0.1\Omega)$
Terminal strength	JIS-C-5202-6.1 The lead line diameter less than 1.5 20N, the diameter more than 1.5 40N, terminal is 20N. End sheet (copper end/stainless steel end sheet) 40N	Free of appearance or structural irregularity
Vibration	JIS-C-5202-6.3 1.5m/m 10~50~10Hz/min X-Y-Z 2 hours each.	Free of appearance or structural irregularity Surface coating crack
Humidity	JIS-C-5202-7.5 40°C±2°C 90%-95%RH 240 hours	Free of appearance or structural irregularity Surface coating crack $\Delta R/R \leq \pm(3\%+0.1\Omega)$
Load life	JIS-C-5202-7.10 Rated power, 90 minutes ON - 30 minutes OFF 500 hours	Free of appearance or structural irregularity Surface coating crack $\Delta R/R \leq \pm(3\%+0.1\Omega)$
Flame retardation	JIS-C-5202-7.12.3.2 100% - 600% rated power load 5 minutes	US UL-94 flame retardation test V-0 grade noncombustible





**Order Codes**

**Ship-Shaped Aluminum Housed Resistors - (ASQ) Order Code**

ASQ	60W	10R	F	N
Type	Rated Power (W)	Resistance Value ( $\Omega$ )	Resistance Tolerance (%)	Inductance
ASQ	60W~150W	0.1 $\Omega$ -100K $\Omega$	B $\pm$ 0.1%	Inductance
			D $\pm$ 0.5%	N Non-Inductance
			F $\pm$ 1%	
			G $\pm$ 2%	
			J $\pm$ 5%	
			K $\pm$ 10%	

**Low Profile Aluminum Shell Resistors - (ASP) Order Code**

ASP-4012	60W	10R	F	N
Type	Rated Power (W)	Resistance Value ( $\Omega$ )	Resistance Tolerance (%)	Inductance
ASP-4012	60W-150W	0.1 $\Omega$ -10K $\Omega$	B $\pm$ 0.1%	Inductance
ASP-4508	60W-150W		D $\pm$ 0.5%	N Non-Inductance
ASP-8015	100W-800W		F $\pm$ 1%	
			G $\pm$ 2%	
			J $\pm$ 5%	
			K $\pm$ 10%	

ASZ-3020	40W	10R	F		N		
Type	Rated Power (W)	Resistance Value (Ω)	Resistance Tolerance (%)		Inductance		
ASZ-3020	40W-100W	0.1Ω-100KΩ	B	±0.1%	N	Inductance	
ASZ-4020	40W-150W		D	±0.5%		Non-Inductance	
ASZ-4026	40W-150W		0.1Ω-56KΩ	F	±1%		
ASZ-6030	200W-800W	0.1Ω-33KΩ		G	±2%		
ASZ-6038	200W-800W		0.1Ω-12KΩ	J	±5%		
ASZ-7045	1000W-3000W			0.1Ω-10KΩ	K	±10%	
ASZ-7644	1000W-3000W	0.1Ω-10KΩ					
ASZ-12840	1000W-2500W						
ASZ-50107	1000W-3000W						
ASZ-17565	3000W-6KW						
ASZ-17565 Combinations	8000W-30KW						
	4000W-12KW						
ASZ-50107 Combinations	800W-8000W						
Customer Customization							

## ► 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.

