



## 409 SERIES

### 8-Inch Premium High Performance Duplex Ceiling Loudspeakers

- **409-8E**, 8 ohm, 32 watts (EIA RS-426-A)
- **409-ST**, with 4 watt multi-tap transformer-(15700)
- **409-4T**, with 4 watt multi-tap transformer-(15704)
- **409-8T**, with 8 watt multi-tap transformer-(15708)
- **409-16T**, with 16 watt multi-tap transformer-(15716)
- **409-32T**, with 32 watt multi-tap transformer-(15732)
- High efficiency: 97 dB for 1W @ 1M
- Maximum SPL: 112 dB for 32W @ 1M
- Frequency response: 85 Hz - 18 kHz
- Wide dispersion
- Dual magnet construction

#### Description

The Altec Lansing 409 series Duplex® loudspeaker systems are two-way loudspeakers with 8-inch low-frequency cones and high-temperature voice-coil assemblies coaxially mounted with wide-dispersion cone tweeters. The dual magnet construction allows each speaker to be structurally, magnetically, electrically and mechanically independent of the other. The 409 series utilize a single section crossover network, centered at 2500Hz and providing 6dB of attenuation for each element outside its operating range.

The 409-8E is an 8 ohm, 32 watt speaker. The 409-ST (with 15700 transformer) and the 409-4T (with 15704 transformer) both offer a selection of 0.5, 1, 2 and 4W. The 409-8T (with 15708 transformer) offers a selection of 1, 2, 4 and 8W. The 409-16T (with 15716 transformer) offers 2, 4, 8 and 16W and the 409-32T (with 15732 transformer) offers a 4, 8, 16, 32W selection.

#### Architect's and Engineer's Specifications

##### 409 SERIES DUPLEX LOUDSPEAKERS

The loudspeaker shall be a Duplex® type with a 8-inch low-frequency cone and a high-temperature voice coil assembly coaxially mounted with a wide dispersion cone tweeter. The Duplex® loudspeaker shall meet the following criteria. AES power rating shall be 32 watts of band limited pink noise (85 Hz to 18 kHz, 6 dB crest factor). Frequency response, uniform from 85 Hz to 18 kHz. Pressure sensitivity, 97 dB SPL at 1 meter (95 dB at 4 feet) on axis with one watt of band-limited pink noise from f 3 kHz (ref. 20 uPa). Minimum impedance, 6.0 ohms. The loudspeaker shall be 8.13 in (20.6 diameter and .in ( \_cm) deep and shall weigh \_lbs ( \_kg). For dimensions see page 6.

The Duplex® loudspeakers shall be Altec Lansing models 409-8E, 409-ST (with 15700 transformer), 409-4T (with 15704 transformer), 409-8T (with 15708 transformer), 409-16T (with 15716 transformer) and the 409-32T (with 15732 transformer).

#### Notes on Measurement Conditions

1. Pink noise signal, one Watt calculated using  $E2/Z_{min}$ , 3.16 measurement distance referred to one meter.
2. On-axis, one Watt calculated using  $E2/Z_{min}$ , 3.16 meter measurement distance referred to one meter, low frequencies corrected for anechoic chamber error.
3. This system rating patterned after the A.E.S method for individual driver, where the test signal is pink noise with a 6dB crest factor over the bandwidth of the system, with power calculated using the  $E2/Z_{min}$ , for two hours.
4. This measurement made under the same conditions as Pressure Sensitivity, but at rated power, and takes into account any power compression effects due to nonlinearities in the system.
5. Distortion components invalid above 10kHz. The distortion at any given frequency may be found by graphically taking the difference between the fundamental and harmonic, and adding the number of Decibels which the harmonic has been raised on the graph and apply the formula: Percent Distortion =  $100 \times 10^{-(\text{difference in dB}/20)}$

## 409 SERIES 8-Inch Premium High Performance Duplex Ceiling Loudspeakers

### 409 THEILE-SMALL PARAMETERS

Free Air Resonance, fs:	90 Hz
Equivalent Volume	
Compliance, Vas:	0.61 ft.3
Total Q, Qts:	1.54
Electrical Q, Qes:	1.78
Mechanical Q, Qms:	11.53
Volume Displacement, VD	1.95 in <sup>3</sup>
Reference Efficiency:	0.71%

### Limited Warranty

Altec Lansing products are guaranteed against malfunction due to defects in materials or workmanship for a specified period, as noted in the individual product-line statement(s) below, or in the individual product data sheet or owner's manual, beginning with the date of original purchase. If such malfunction occurs during the specified period, the product will be repaired or replaced (at our option) without charge. The product will be returned to the customer prepaid. Exclusions and Limitations: The Limited Warranty does not apply to: (a) exterior finish or appearance; (b) certain specific items described in the individual product-line

statement(s) below, or in the individual product data sheet or owner's manual; (c) malfunction resulting from use or operation of the product other than as specified in the product data sheet or owner's manual; (d) malfunction resulting from misuse or abuse of the product; or (e) malfunction occurring at any time after repairs have been made to the product by anyone other than EVI Audio Service or any of its authorized service representatives. Obtaining Warranty Service: To obtain warranty service, a customer must deliver the product, prepaid, to EVI Audio Service or any of its authorized service representatives together with proof of purchase of the product in the form of a bill of sale or receipted invoice. A list of authorized service representatives is available from EVI Audio Service at 600 Cecil Street, Buchanan, MI 49107 (800/234-6831 or FAX 616/695-4743). Incidental and Consequential Damages Excluded: Product repair or replacement and return to the customer are the only remedies provided to the customer. Altec Lansing shall not be liable for any incidental or consequential damages including, without limitation, injury to persons or property or loss of use. Some states do not allow

the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. Other Rights: This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Altec Lansing Speakers and Speaker Systems are guaranteed against malfunction due to defects in materials or workmanship for a period of five (5) years from the date of original purchase. The Limited Warranty does not apply to burned voice coils or malfunctions such as cone and/or coil damage resulting from improperly designed enclosures. Altec Lansing active electronics associated with the speaker systems are guaranteed for three (3) years from the date of original purchase. Additional details are included in the Uniform Limited Warranty statement.

For warranty repair or service information, contact the service repair department at: 616/695-6831 or 800/685-2606.

For technical assistance, contact Technical Support at 800/234-6831 or 616/695-6831, M-F, 8:00 a.m. to 5:00 p.m. Eastern Standard Time.

Specifications subject to change without notice.

# 409 SERIES 8-Inch Premium High Performance Duplex Ceiling Loudspeakers

Figure 1—Frequency Response

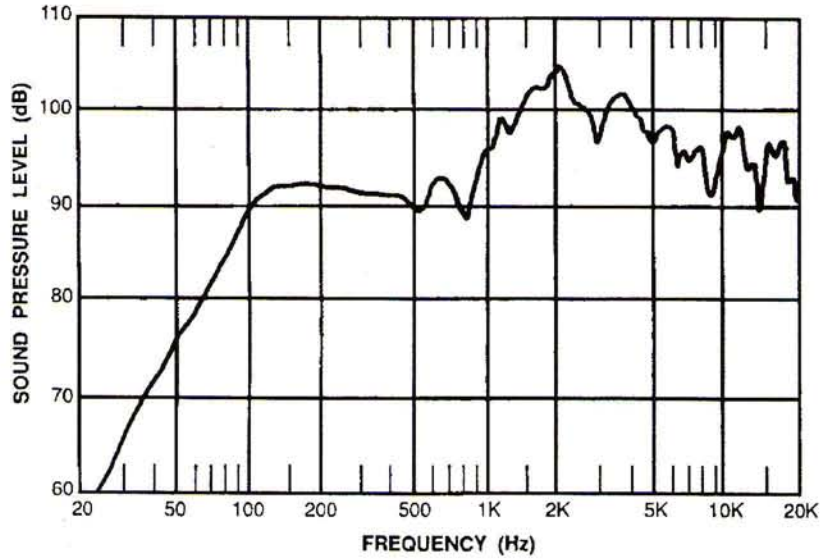
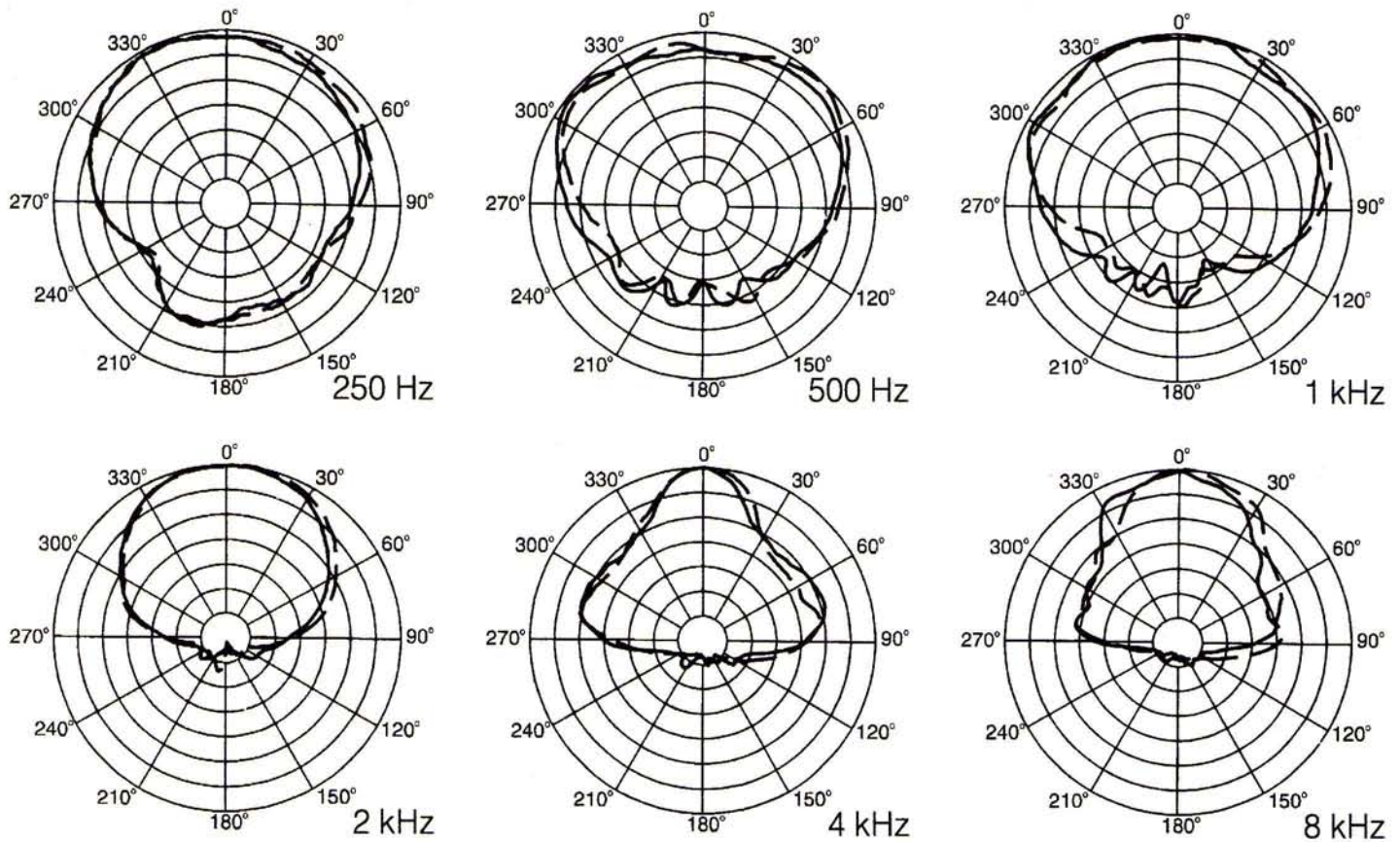


Figure 2—Polar Response



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Figure 3—Impedance

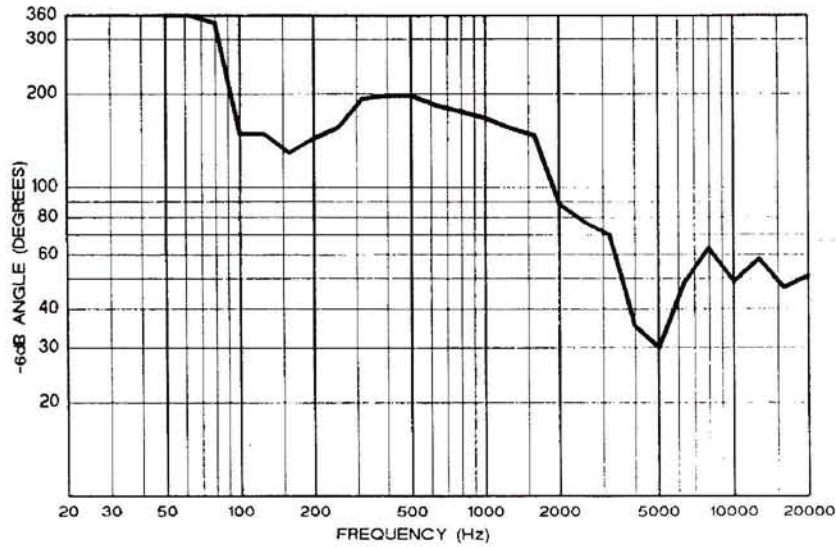


Figure 4—Beamwidth

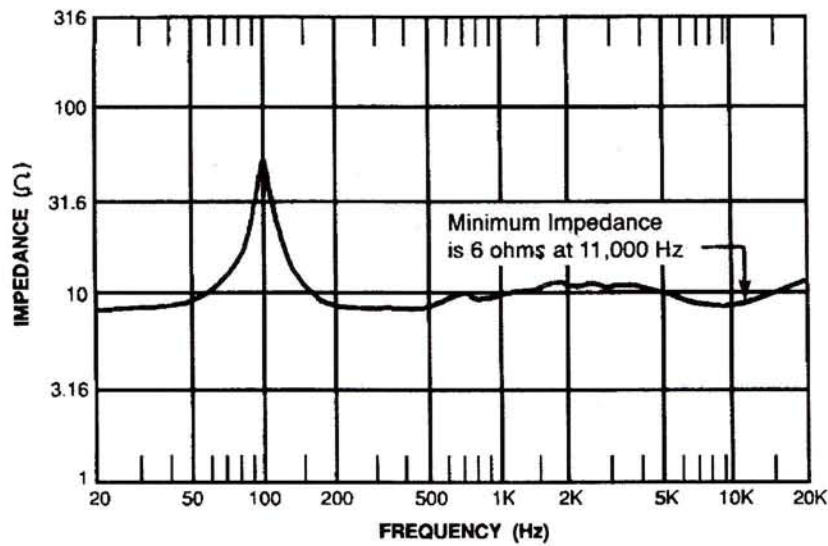
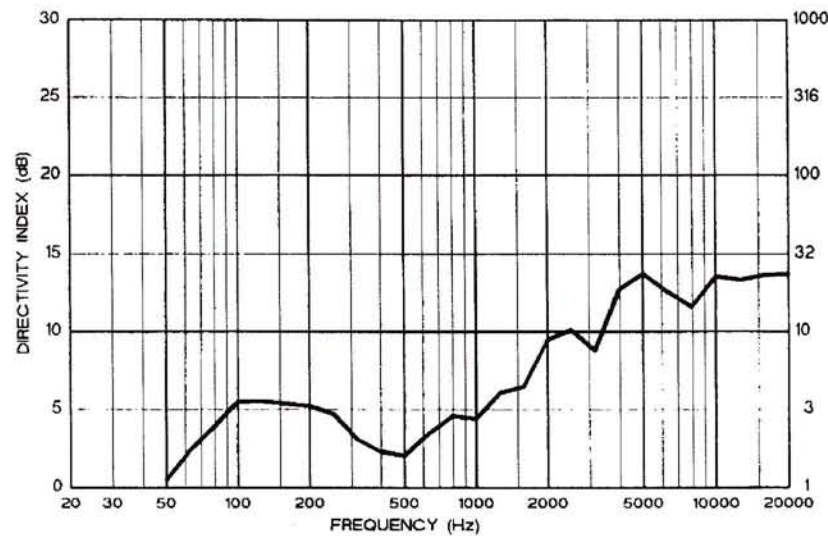


Figure 5—Directivity



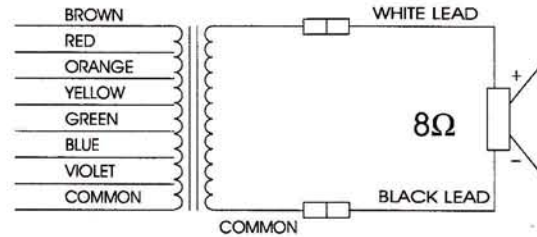
409 SERIES 8-Inch Premium High Performance Duplex Ceiling Loudspeakers

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Figure 6—Wiring

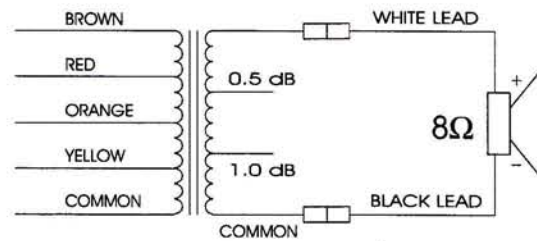
## 409-ST

Table 1	25 V	70 V	100 V
4.0 W	BROWN	YELLOW	GREEN
2.0 W	RED	GREEN	BLUE
1.0 W	ORANGE	BLUE	VIOLET
0.5 W	YELLOW	VIOLET	N/A
COMMON	BLACK	BLACK	BLACK
8 ohms Common	White Black	White Black	White Black



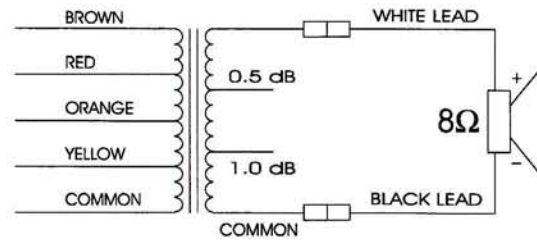
## 409-4T

Table 2	70 V	100 V
4.0 W	BROWN	RED
2.0 W	RED	ORANGE
1.0 W	ORANGE	YELLOW
0.5 W	YELLOW	N/A
COMMON	BLACK	BLACK
8 ohms Common	White Black	White Black



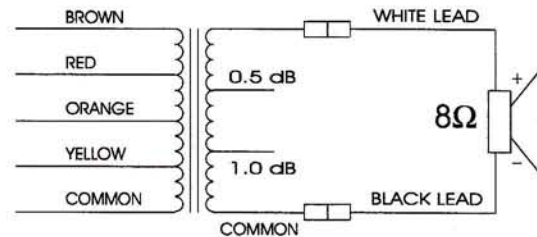
## 409-8T

Table 3	70 V	100 V
8.0 W	BROWN	RED
4.0 W	RED	ORANGE
2.0 W	ORANGE	YELLOW
1.0 W	YELLOW	N/A
COMMON	BLACK	BLACK
8 ohms Common	White Black	White Black



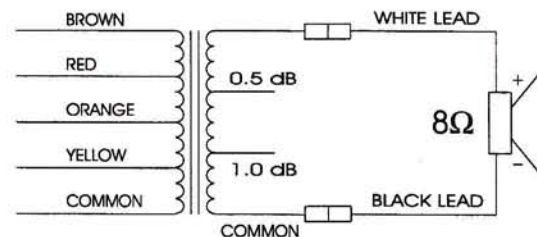
## 409-16T

Table 4	70 V	100 V
16.0 W	BROWN	RED
8.0 W	RED	ORANGE
4.0 W	ORANGE	YELLOW
2.0 W	YELLOW	N/A
COMMON	BLACK	BLACK
8 ohms Common	White Black	White Black



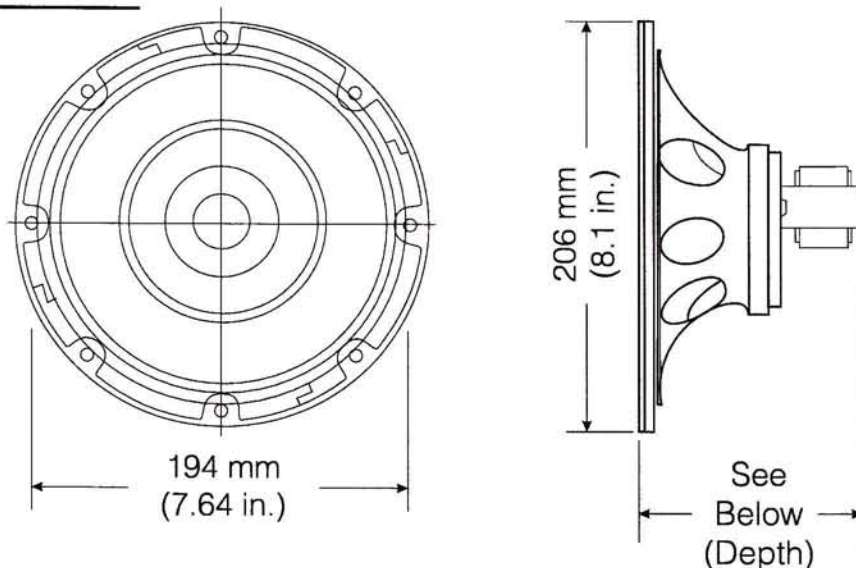
## 409-32T

Table 5	70 V	100 V
32.0 W	BROWN	RED
16.0 W	RED	ORANGE
8.0 W	ORANGE	YELLOW
4.0 W	YELLOW	N/A
COMMON	BLACK	BLACK
8 ohms Common	White Black	White Black



# 409 SERIES 8-Inch Premium High Performance Duplex Ceiling Loudspeakers

Figure 7—Dimensions



## Specifications

### System Type:

Two-way, full range, Duplex® loudspeaker system.

### Pressure sensitivity:

97 dB SPL (1W,500Hz – 3kHz, re: 20µPa, see note 1).

### Frequency Response:

85 Hz - 18 kHz (see Figure 1, Note 2)

### Power Handling:

32 watts, 85 Hz – 18 kHz, AES method (see note 3).

### Maximum Long Term Output:

112 dB SPL (32 watts input, 1m, re:20µPa, see note 4).

### Impedance:

6.0 ohms minimum at 11 kHz. 8.0 ohms nominal.

### Components:

8 inch, high efficiency, low frequency driver with a coaxially mounted, 2.5 inch cone tweeter.

### Crossover Network:

Two-way at 2500 Hz with 6dB per octave tweeter protection.

### Input Terminals:

0.212 inch push-on type connectors.

## Accessories:

### Grilles:

5281-W, 5281-S, 5282-W, 5284-W

### Enclosures:

5183-X, 5184-X, 5184-E, 5184-N

## Dimensions,

**Diameter:** 206.5 mm (8.13 in.)

### Depth:

**409-8E:** 83 mm (3.25 in.)

**409-ST:** 98 mm (3.86 in.)

**409-4T:** 105 mm (4.13 in.)

**409-8T:** 114 mm (4.50 in.)

**409-16T:** 124 mm (4.86 in.)

**409-32T:** 137 mm (5.38 in.)

## Net Weight:

**409-SE:** 2.8 lbs (1.3 kg)

**409-ST:** 3.1 lbs (1.4 kg)

**409-4T:** 3.3 lbs (1.5 kg)

**409-ST:** 4.0 lbs (1.8 kg)

**409-16T:** 4.5 lbs (2.0 kg)

**409-32T:** 5.0 lbs (2.3 kg)

## Shipping Weight:

**409-SE:** 3.3 lbs (1.5 kg)

**409-ST:** 3.6 lbs (1.6 kg)

**409-4T:** 3.8 lbs (1.7 kg)

**409-ST:** 4.5 lbs (2.0 kg)

**409-16T:** 5.0 lbs (2.3 kg)

**409-32T:** 5.5 lbs (2.5 kg)

## Finish:

Black

## Specifications - Transformers

### Frequency Response:

#### 15700:

100 Hz to 10 kHz, +/-1 dB

#### 15704, 15708, 15716, 15732:

50 Hz to 15kHz, +/-1 dB

### Insertion Loss:

#### 15700:

1.0 dB

#### 15704, 15708, 15716, 15732:

0.5 dB

### Secondary Impedance:

8 ohms (all)

### Primary Impedances and

### Power Drawn, nominal 70v:

15700	15708	15716	15732
15704			
10000Ω	5000Ω	2500Ω	1250Ω
0.5 W	1.0 W	2.0 W	4.0 W
5000Ω	2500Ω	1250Ω	625Ω
1.0 W	2.0 W	4.0 W	8.0 W
2500Ω	1250Ω	625Ω	312Ω
2.0 W	4.0 W	8.0 W	16W
1250Ω	625Ω	312Ω	156Ω
4.0W	8.0W	16W	32W

### Connection Type:

Bunch tinned wires for soldering or crimping.



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