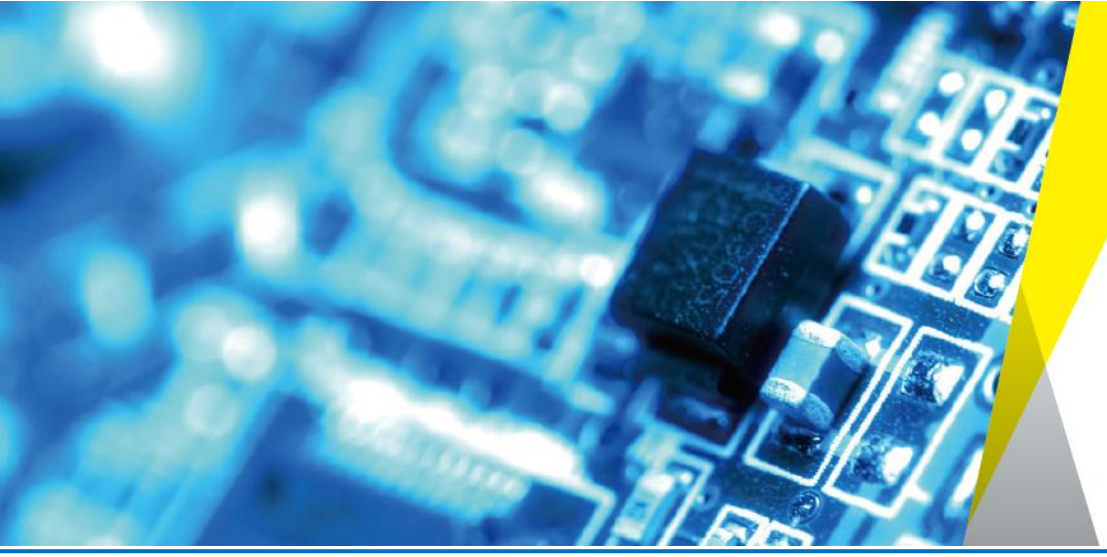

DATASHEET

Product Name	**Power Alloy Wire-wound Resistors**
Part Name	**QL、QR、QRZG Series**
File No.	**DIP-SP-050**

Uniroyal Electronics Global Co., Ltd.

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Manufacture Plant	Uniroyal Electronics Industry Co., Ltd.
	Aeon Technology Corporation
	Royal Electronic Factory (Thailand) Co., Ltd.
	Royal Technology (Thailand) Co., Ltd.

1. Scope

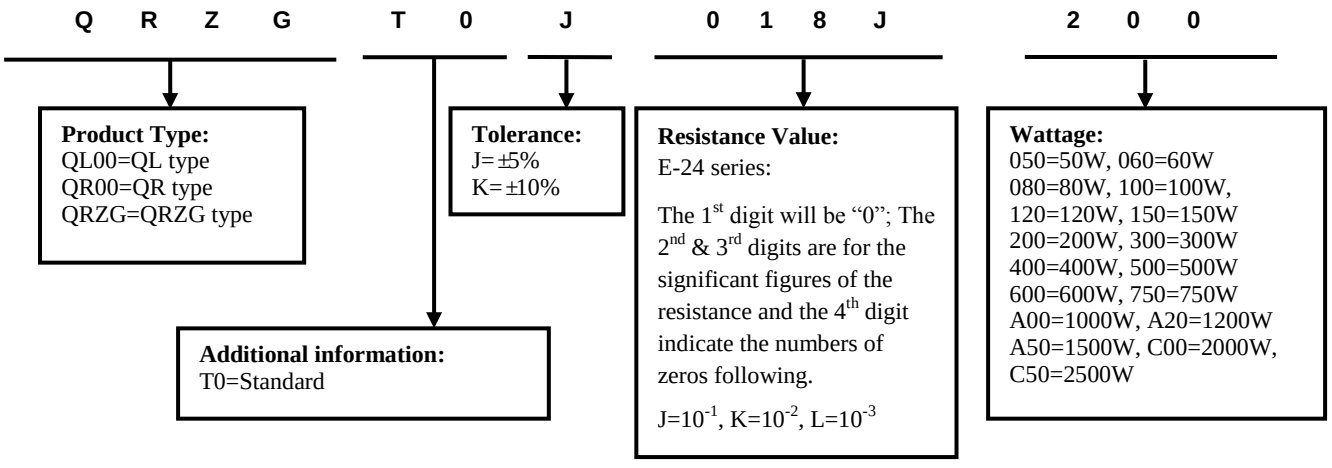
1.1 This datasheet is the characteristics of power alloy wire-wound Resistors manufactured by UNI-ROYAL.
1.2 Multi-terminal type & variable types available
1.3 Small in size but capable of carrying high power load
1.4 Resistance value unchanged after long use， good resistivity to short time overload
1.5 High resistivity to heat，small resistance temperature coefficient and the change in resistance with temperature being linear
1.6 Too low or high ohmic value can be supplied case to case basis
1.7 Adjustable &Multi-Resistor type is available
1.8 Non-inductive type is available
1.9 Compliant with RoHS directive.
1.10 Halogen free requirement.

2. Part No. System

The standard Part No. includes 14 digits with the following explanation:
2.1 For Cement Fixed Resistors, these 4 digits are to indicate the product type but if the product type has only 3digits, the 4th digit will be "0"
Example: QL00=QL type ; QR00=QR Type; QRZG=QRZG Type
2.2 5th~6th digits: T0= Standard
2.3 The 7th digit is to denote the Resistance Tolerance. The following letter code is to be used for indicating the standard Resistance Tolerance.
J=±5% K= ±10%
2.4 The 8th to 11th digits is to denote the Resistance Value.
2.4.1For the standard resistance values of E-24 series, the 8th digit is "0",the 9th & 10th digit are to denote the significant figures of the resistance and the 11th digit is the numbers of zeros following.
Example:
0120=12Ω 0273=27KΩ
2.5 The 12th, 13th & 14th digits.
2.5.1 The 12th to the 14th digits are to denote the actual wattage of the products.
Example: 050=50W 100 = 100W A00=1000W

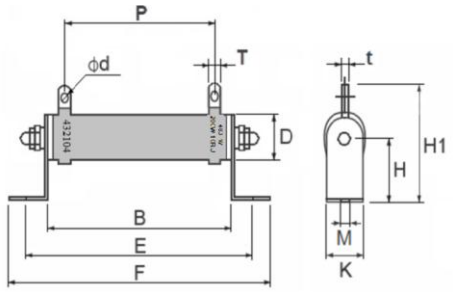
3. Ordering Procedure

(Example: QRZG 200W ±5% 1.8Ω B/B)



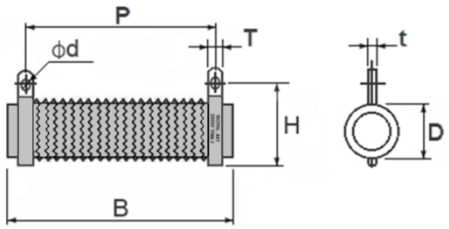
4. Ratings & Dimension

4.1 QL Type:



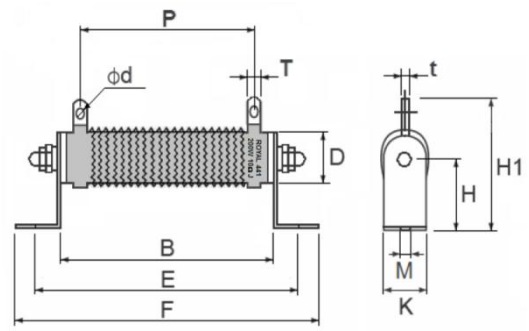
Rate Power (W)	B±2	E±5	F±3	D±2	H±1	H1±3	M±0.5	K±1	P±3	T±0.5	t±0.5	Ød±0.5	Resistance Range	Tolerance
QL 50W	102	124	146	28	28	61	6.5	28	76	8	1.8	4.5	0.1Ω~25KΩ	±5% ±10%
QL 60W	102	124	146	28	28	61	6.5	28	76	8	1.8	4.5	0.1Ω~30KΩ	
QL 80W	152	174	196	28	28	61	6.5	28	126	8	1.8	4.5	0.1Ω~40KΩ	
QL 100W	182	204	226	28	28	61	6.5	28	156	8	1.8	4.5	1Ω~50KΩ	
QL 120W	182	204	226	28	28	61	6.5	28	156	8	1.8	4.5	1Ω~60KΩ	
QL 150W	195	217	239	40	41	81	8	40	179	10	1.8	5.5	1Ω~70KΩ	
QL 200W	195	217	239	40	41	81	8	40	179	10	1.8	5.5	10Ω~100KΩ	
QL 300W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	10Ω~150KΩ	
QL 400W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	16Ω~150KΩ	
QL 500W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	21Ω~150KΩ	
QL 600W	345	367	389	40	41	81	8	40	329	10	1.8	5.5	21Ω~150KΩ	
QL 750W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	76Ω~180KΩ	
QL 1,000W	300	325	350	60	60	119	8.5	60	279	15	2	6.5	101Ω~200KΩ	
QL 1,200W	415	440	465	60	60	119	8.5	60	394	15	2	6.5	101Ω~250KΩ	
QL 1,500W	415	440	465	60	60	119	8.5	60	394	15	2	6.5	121Ω~250KΩ	
QL 2,000W	510	535	560	60	60	119	8.5	60	489	15	2	6.5	121Ω~300KΩ	
QL 2,500W	600	625	650	60	60	119	8.5	60	577	15	2	6.5	121Ω~360KΩ	

4.2 QR Type:



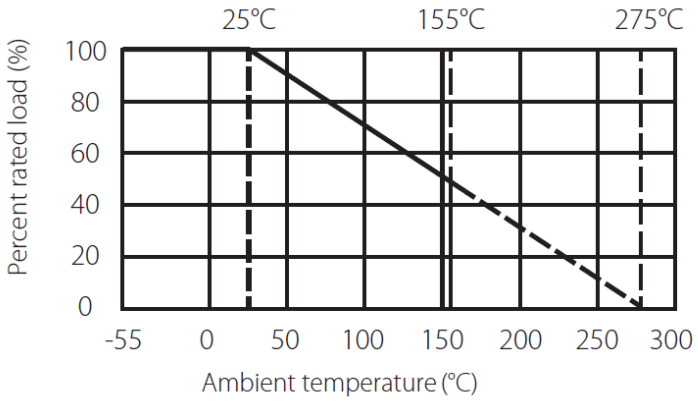
Rate Power (W)	B±2	D±2	H±1	P±3	T±0.5	t±0.5	Ød±0.5	Resistance Range	Tolerance
QR 200W	195	40	62	179	10	1.8	5.5	0.4Ω~9.1Ω	±5% ±10%
QR 300W	282	40	62	266	10	1.8	5.5	0.5Ω~9.1Ω	
QR 400W	282	40	62	266	10	1.8	5.5	0.8Ω~15Ω	
QR 500W	316	50	82	294	16	1.8	6.5	1Ω~20Ω	
QR 600W	345	40	62	329	10	1.8	5.5	1Ω~20Ω	
QR 750W	316	50	82	294	16	1.8	6.5	1Ω~75Ω	
QR 1,000W	300	60	94	279	15	2.0	6.5	1Ω~100Ω	
QR 1,200W	415	60	94	394	15	2.0	6.5	1Ω~100Ω	
QR 1,500W	415	60	94	394	15	2.0	6.5	1Ω~120Ω	
QR 2,000W	510	60	94	489	15	2.0	6.5	1Ω~120Ω	
QR 2,500W	600	60	94	577	15	2.0	6.5	1Ω~120Ω	

4.3 QRZG Type:



Rate Power (W)	B ±2	E ±5	F ±3	D ±2	H ±1	H1 ±3	M ±0.5	K ±1	P ±3	T ±0.5	t ±0.5	Ød ±0.5	Resistance Range	Tolerance
QRZG 200W	195	217	239	40	41	81	8	40	179	10	1.8	5.5	0.4Ω~9.1Ω	±5% ±10%
QRZG 300W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	0.5Ω~9.1Ω	
QRZG 400W	282	304	326	40	41	81	8	40	266	10	1.8	5.5	0.8Ω~15Ω	
QRZG 500W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	1Ω~20Ω	
QRZG 600W	345	367	389	40	41	81	8	40	329	10	1.8	5.5	1Ω~20Ω	
QRZG 750W	316	338	360	50	45	101	8	50	294	16	1.8	6.5	1Ω~75Ω	
QRZG 1,000W	300	325	350	60	60	119	8.5	60	279	15	2.0	6.5	1Ω~100Ω	
QRZG 1,200W	415	440	465	60	60	119	8.5	60	394	15	2.0	6.5	1Ω~100Ω	
QRZG 1,500W	415	440	465	60	60	119	8.5	60	394	15	2.0	6.5	1Ω~120Ω	
QRZG 2,000W	510	535	560	60	60	119	8.5	60	489	15	2.0	6.5	1Ω~120Ω	
QRZG 2,500W	600	625	650	60	60	119	8.5	60	577	15	2.0	6.5	1Ω~120Ω	

5. Derating Curve



5.1 Voltage rating:

Resistors shall have a rated direct-current (AC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating, as determined from the following formula:

$$RCWV = \sqrt{P \times R}$$

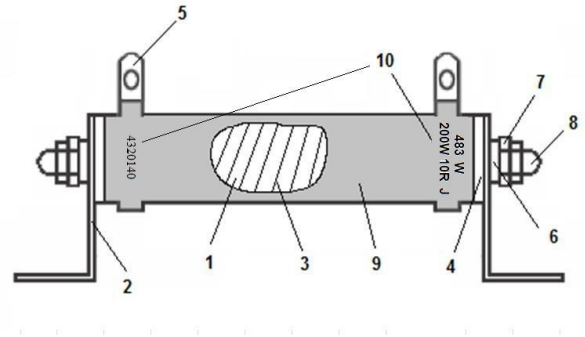
Where: RCWV = rated dc or RMS ac continuous working voltage at commercial-line frequency and waveform (VOLT.)

P = power rating (WATT.)

R= nominal resistance (OHM)

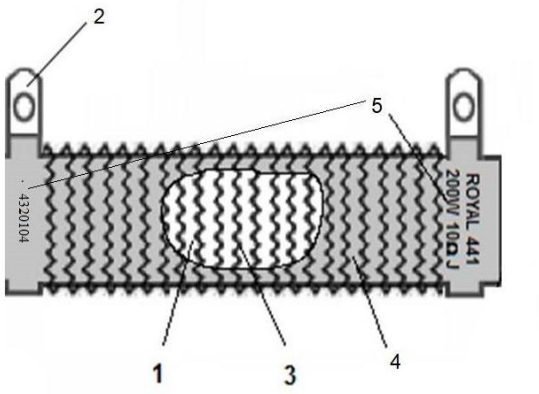
6. Construction :

6.1 QL Type:



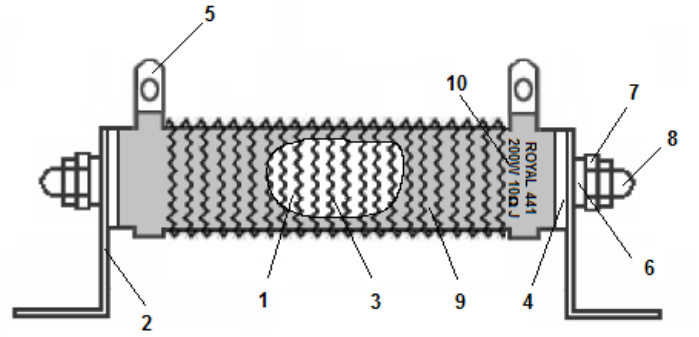
No.	Name	Material
1	Basic Body	Tube Type Ceramic
2	Terminal Support L	Stainless Steel
3	Resistance Wire	Resistance wire Alloy
4	Ceramic/ Mica	50W~120W Ceramic Ring ≥150W Mica
5	Terminal Ring	Stainless Steel
6	Spring Washer	Stainless Steel
7	Hex Nut	Stainless Steel
8	Cap Nut	Stainless Steel
9	Coating	Insulated & Non-Flame paint (Color: Green)
10	Marking	Marking Ink

6.2 QR Type:



No.	Name	Material
1	Basic Body	Rod Type Ceramics
2	Terminal Rating	Stainless Steel
3	Resistance Wire	Resistance wire Alloy
4	Coating	Insulated & Non-Flame paint (Color: Green)
5	Marking	Marking Ink

6.3 QRZG Type:



No.	Name	Material
1	Basic Body	Tube Type Ceramic
2	Terminal Support L	Stainless Steel
3	Resistance Wire	Resistance wire Alloy
4	Mica	Mica
5	Terminal Ring	Stainless Steel
6	Spring Washer	Stainless Steel
7	Hex Nut	Stainless Steel
8	Cap Nut	Stainless Steel
9	Coating	Insulated & Non-Flame paint (Color: Green)
10	Marking	Marking Ink

7. Performance Specification

Characteristic	Limits	Test Methods (GB/T5729&JIS-C-5201&IEC60115-1)
Temperature Coefficient	≧20Ω: ±300PPM/℃ ＜20Ω: ±400PPM/℃	4.8 Natural resistance changes per temp. Degree centigrade $\frac{R_2-R_1}{R_1(t_2-t_1)} \times 10^6$ (PPM/℃) R_1: Resistance Value at room temperature （t_1）; R_2: Resistance at test temperature （t_2） t_1: +25 ℃ or specified room temperature t_2: Test temperature（+125℃）
Short-time overload	Resistance change rate is: ±(2%+0.05Ω)Max. With no evidence of mechanical damage.	4.13 Permanent resistance change after the application of a potential of 2.5 times RCWV or Max.Overload Votage whichever less for 5 seconds.
Terminal strength	Resistance change rate is: ±(1%+0.05Ω) Max. With no evidence of mechanical damage	Ual:45N ,30 seconds
Resistance to soldering heat	Resistance change rate is: ±(1%+0.05Ω) Max. With no evidence of mechanical damage	4.18 Permanent resistance change when leads immersed to a point 2.0-2.5mm from the body in 260℃±5°℃ solder for 10±1 seconds.

Humidity (Steady state)	Resistance change rate is: ±(5%+0.05Ω)Max. With no evidence of mechanical damage.	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40±2℃ and 90~95%RH relative humidity
Load life	Resistance change rate is: ±(5%+0.05Ω)Max. With no evidence of mechanical damage.	4.25.1 Permanent Resistance change after 1000 hours operating at RCWV or Max. Working Voltage whichever less with duty cycle of 1.5 hours “ON”，0.5 hour “OFF” at 25±2℃ ambient.

8. Note

8.1. UNI-ROYAL recommend products store in warehouse with temperature between 15 to 35℃ under humidity between 25 to 75%RH. Even under storage conditions recommended above, solder ability of products will be degraded stored over 1 year old.

8.2. Cartons must be placed in correct direction which indicated on carton, otherwise the reel or wire will be deformed.

8.3. Storage conditions as below are inappropriate:

a. Stored in high electrostatic environment

b. Stored in direct sunshine, rain, snow or condensation.

c. Exposed to sea wind or corrosive gases, such as Cl_2, H_2S, NH_3, SO_2, NO_2, Br etc.

8. Record

Version	Description	Page	Date	Amended by	Checked by
1	First version	1~6	Mar.20, 2018	Haiyan Chen	Nana Chen
2	Modify characteristic	4~5	Feb.26, 2019	Haiyan Chen	Yuhua Xu
3	Modify characteristic	5	Nov.20,2020	Song Nie	Yuhua Xu
4	Modify the temperature coefficient test conditions	4	Nov.07, 2022	Haiyan Chen	Yuhua Xu
5	Add the QW type	1~6	May.15, 2023	Haiyan Chen	Yuhua Xu
6	Cancel load life in humidity test Modify the load life test conditions	5	Sep.28, 2024	Haiyan Chen	Yuhua Xu
7	1. Modify Ordering Procedure ;Dimension; Derating Curve ;Resistance Range ;Performance Specification 2. Add the Construction	2~4 6~7 5~6	Jul.08, 2025	Haiyan Chen	Yuhua Xu