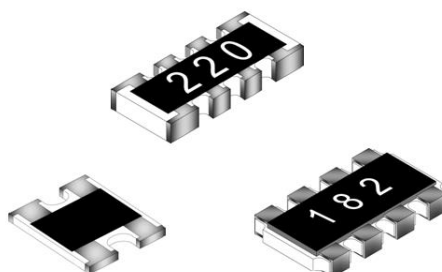




QRA-Series Automotive Array Chip Resistor Product Specifications

Document No.	S-10-12-21-09
Released Date	2024/12/19
Page No.	1/8

■ Automotive Array Chip Resistor — QRA Series



■ Application

- Automotive electronics
- Navigation equipment, TPMS
- Heating, Ventilating and Air conditioning
- Indoor lighting, Central door locking, Wiper module

■ Features

- Small size and light weight
- Reliability, high quality
- CCD visual quality inspection
- AEC-Q200 Compliance

■ Parts Number Explanation

Example:

QRA	024R	J	10R0	P	05	Z
Product Type	Size (Inch)	Resistor Tolerance	Resistor Value	Package	Quantity	Optional
QRA	022R(0402*2) 024R(0402*4) 034R(0603*4) 064R(1206*4)	F : ±1% J : ±5%	1R=1R00 10R=10R0 100R=100R 1K=1K00 1M=1M00	P : Paper Taping (034R) Q : Paper Taping (022R 、 024R) E : Embossed Taping	04 : 4000PCS 05 : 5000PCS 10 : 10000PCS	Z:default

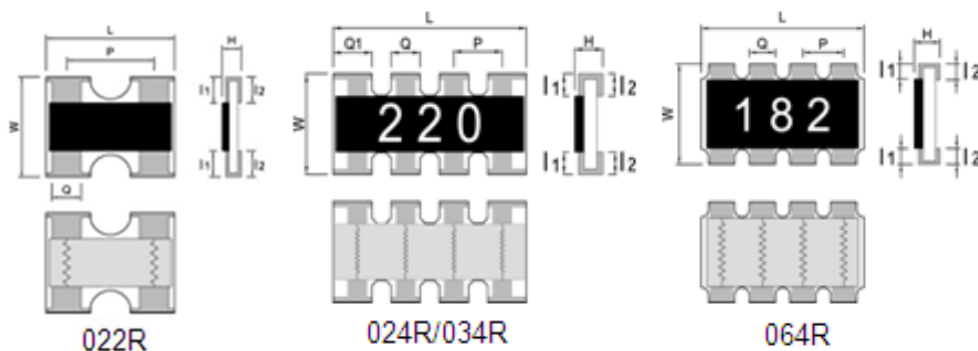
■ Standard Electrical Specifications

Type \ Item	Rating Power at 70℃	Max Working Voltage	Max Overload Voltage	T.C.R. (PPM/℃)	Resistance Range
					F(±1%)、J(±5%)
QRA022R	0.063 W	25V	50V	±400	$1\Omega \leq R < 10\Omega$
				±200	$10\Omega \leq R \leq 1M\Omega$
QRA024R	0.063 W	25V	50V	±400	$1\Omega \leq R < 10\Omega$
				±200	$10\Omega \leq R \leq 1M\Omega$
QRA034R	0.1 W	50V	100V	±400	$1\Omega \leq R < 10\Omega$
				±200	$10\Omega \leq R \leq 1M\Omega$
QRA064R	0.25 W	200V	400V	±400	$1\Omega \leq R < 10\Omega$
				±200	$10\Omega \leq R \leq 1M\Omega$

- For non-standard parts, please contact our sales dept.
- Operating Temperature Range : -55℃ ~ +155℃.

Type	022R	024R	034R	064R
Jumper Rated Current	1A			2A

■ Type Dimension



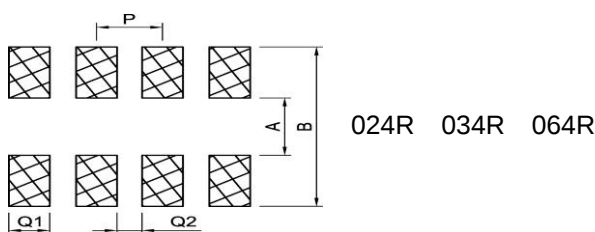
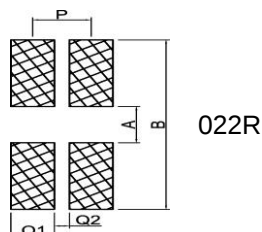
■ Dimension

Unit: mm

Type	L	W	H	I ₁	I ₂	P	Q	Q1
QRA022R	1.00±0.10	1.00±0.10	0.33±0.05	0.15±0.10	0.25±0.10	0.67±0.10	0.34±0.10	---
QRA024R	2.00±0.10	1.00±0.10	0.40±0.10	0.20±0.10	0.20±0.10	0.50±0.10	0.30±0.10	0.43±0.10
QRA034R	3.20±0.20	1.60±0.15	0.50±0.10	0.30±0.20	0.30±0.20	0.80±0.20	0.50±0.15	0.61±0.10
QRA064R	5.10±0.20	3.10±0.20	0.55±0.15	0.55±0.15	0.55±0.15	1.30±0.20	0.90±0.10	---

General Information

Recommend Land Pattern Design (For Reflow Soldering)



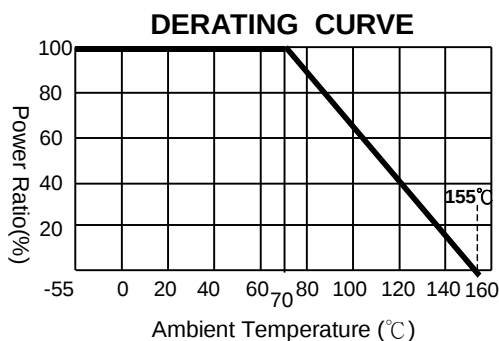
Dimension

Unit: mm

Item \ Type	022R	024R	034R	064R
A	0.50	0.50	1.00	2.00
B	2.00	2.00	2.60	4.75
P	0.67	0.50	0.80	1.30
Q1	0.33	0.28	0.40	0.90
Q2	0.34	0.22	0.40	0.375

Performance Characteristics

Power Derating Curve



Power rating or current rating is in the case based on continuous full-load at ambient temperature of 70°C. For operation at ambient temperature in excess of 70°C, the load should be derated in accordance with figure of derating Curve.

Voltage Rating or Current Rating

Resistance Range: $\geq 1\Omega$

Rated Voltage: The resistor shall have a DC continuous working voltage or a RMS AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined formula as following:

$$E(RCWV) = \sqrt{P \times R}$$

E=Rated voltage(V)

P=Power rating(W)

R=Nominal resistance(Ω)



QRA-Series Automotive Array Chip Resistor Product Specifications

Document No. S-10-12-21-09

Released Date 2024/12/19

Page No. 4/8

■ Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	At 25°C / -55°C and 25°C / +155°C, 25°C is the reference temperature	As Spec
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	2.5 times RCWV or Max. Overload voltage whichever is less for 5 seconds.	±1 : ±(1.0%+0.05Ω) ±5 : ±(2.0%+0.1Ω)
Leaching	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1	260±5°C for 30 seconds.	>95% Coverage
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	260±5°C for 10 seconds.	±1 : ±(0.5%+0.05Ω) ±5 : ±(1.0%+0.05Ω)
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	Apply 100VDC for 1 minute.	≥ 10GΩ
Temperature Cycling	JESD22 Method JA-104	1000 Cycles (-55°C to +125°C) Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme.	1% : ±(0.5%+0.05Ω) 5% : ±(1.0%+0.10Ω)
Resistance to Solvent	MIL-STD-202 Method 215	Add Aqueous wash chemical - OKEM Clean or equivalent.	1% : ±(0.5%+0.05Ω) 5% : ±(0.5%+0.05Ω)
Biased Humidity	MIL-STD-202 Method 103	1,000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24±4 hours after test conclusion.	1% : ±(1.0%+0.05Ω) 5% : ±(3.0%+0.05Ω)
High Temperature Exposure (Storage)	MIL-STD-202 Method 108	1000 hrs. @ T=155°C. Unpowered. Measurement at 24±4 hours after test conclusion.	1% : ±(0.5%+0.05Ω) 5% : ±(2.0%+0.05Ω)
Operational Life	MIL-STD-202 Method 108	Condition D Steady State TA=125°C at derated power. Measurement at 24±4 hours after test conclusion.	1% : ±(1.0%+0.05Ω) 5% : ±(3.0%+0.10Ω)
External Visual	MIL-STD-883 Method 2009	Electrical test not required. Inspect device construction, marking and workmanship.	—
Mechanical Shock	MIL-STD-202 Method 213	Wave Form : Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration(D) is 6(ms)	±1 : ±(1.0%+0.05Ω) ±5 : ±(2.0%+0.1Ω)
Vibration	MIL-STD-202 Method 204	5 g's for 20 min., 12 cycles each of 3 orientations. Note: Test from 10-2000 Hz	±1 : ±(1.0%+0.05Ω) ±5 : ±(2.0%+0.1Ω)
ESD	AEC-Q200-002 or ISO/DIS 10605	Human body model : 1KV	±(3%+0.05Ω)
Solderability	J-STD-002	(1) 4 hrs 155°C dry heat (2) 245±5°C 3 sec.	±1 : ±(0.5%+0.05Ω) ±5 : ±(1.0%+0.05Ω)
Terminal Strength (SMD)	AEC Q200-006	Pressurizing force for 60 seconds : 8N	No broken
Bending Strength	JIS-C-5201-1 4.33 IEC-60115-1 4.33	Bending once for 5 seconds D : 022R、024R、034R=5mm 064R=3mm	1% and below : ±(1.0%+0.05Ω) 2%、5% : ±(1.0%+0.05Ω)

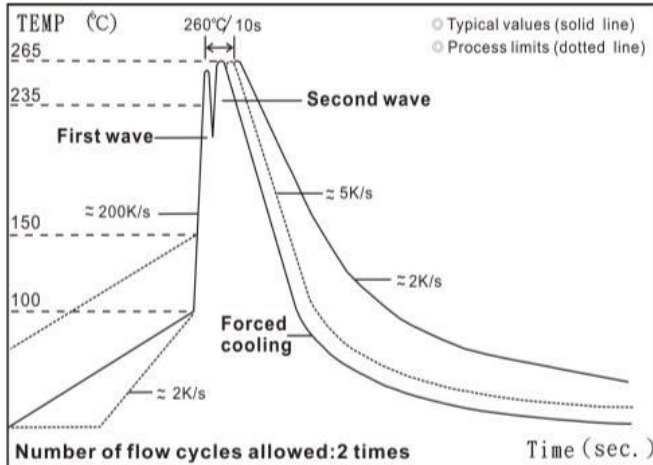


QRA-Series Automotive Array Chip Resistor Product Specifications

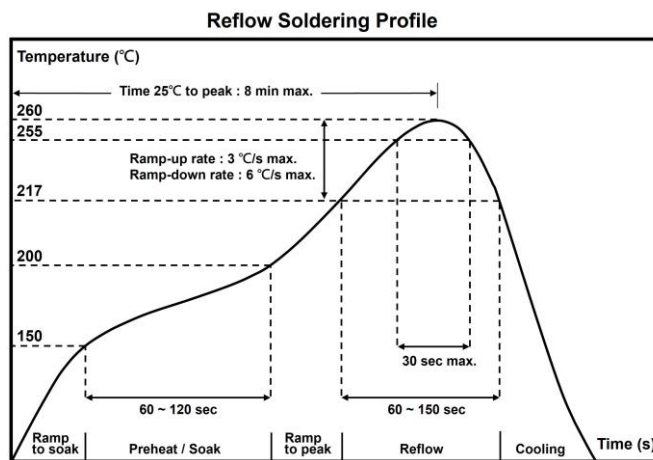
Document No.	S-10-12-21-09
Released Date	2024/12/19
Page No.	5/8

■ Recommended Customer Soldering Parameters

■ Wave solder Temperature condition



■ Solder reflow Temperature condition



■ Rework temperature (hot air equipment) : 350°C, 3~5seconds

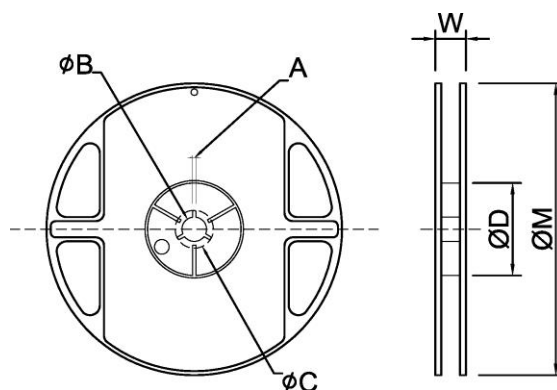
■ Recommended reflow methods

IR, vapor phase oven, hot air oven

If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements

■ Appendix For SMD Chip Resistor

● Packaging Information

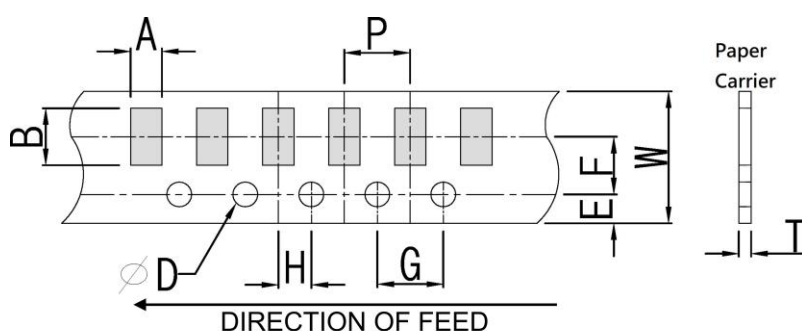


■ Dimension

Unit: mm

Type	Size	A	ϕB	ϕC	ϕD	W	ϕM
022R/024R	7"	10K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0
034R	7"	5K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0
064R	7"	4K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	16.0±2.0

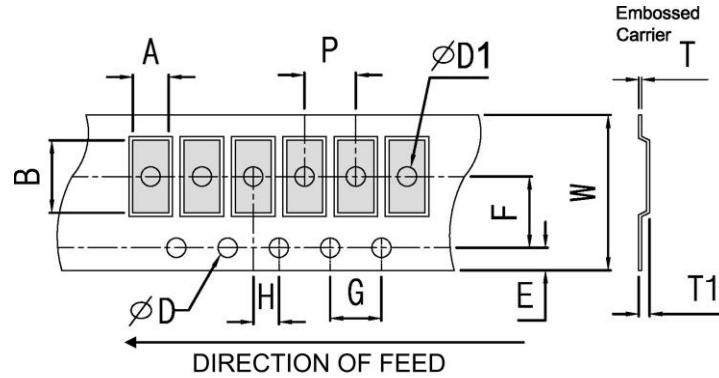
■ Tapping Specification



■ Dimension

Unit: mm

Packaging	Type	A	B	W	E	F	G	H	T	ϕD	P
Paper Type	022R	1.25±0.1	1.25±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.45±0.1	1.50 +0.10 -0	2.0±0.1
	024R	1.20±0.1	2.20±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.60±0.1		
	034R	1.90±0.2	3.50±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1		4.0±0.1



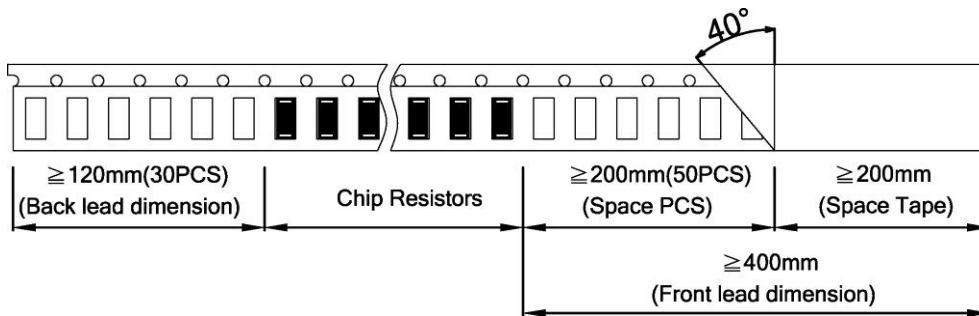
Dimension

Unit: mm

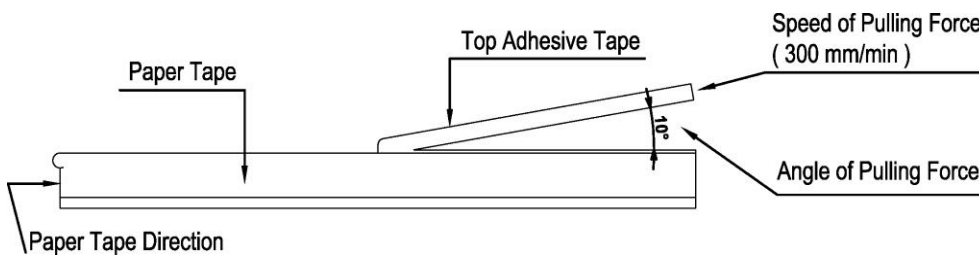
Packaging	Type	A	B	W	E	F	G	H	T	ØD	ØD1	T1	P
Embossed Type	064R	3.55±0.2	5.55±0.2	12±0.3	1.75±0.1	5.5±0.05	4.0±0.1	2.0±0.05	0.25±0.1	+0.10 -0	+0.25 -0	0.85±0.15	4.0±0.1

Packing Material Data/Storage Data

Front & Back Lead Dimension



Top Adhesive Peel Off Strength : 10~70g



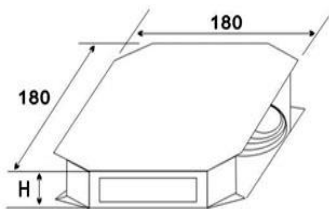


QRA-Series Automotive Array Chip
Resistor Product Specifications

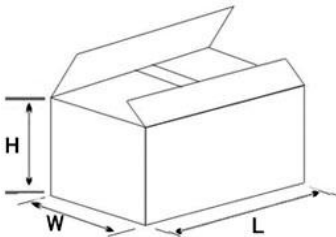
Document No.	S-10-12-21-09
Released Date	2024/12/19
Page No.	8/8

■ Package

Inner Box Size	
Reel	Size H(mm)
1	13
2	24
3	36
5	60
10	113



External Box Size			
Contain (Kpcs)	Length (mm)	Width (mm)	Height (mm)
25K	180	180	60
50K	180	180	110
150K	430	200	200
300K	400	400	200



■ Storage Data :

Storage time at the environment temp: 25±5℃ & humidity: 60±20% is valid for two years.

■ Product Testing Method:

Our products are tested with our company’s tapping & testing equipments by using four-feet probe to touch at the back of both electrodes. Supposed different testing points or methods are requested, please advise beforehand and customized-made production is available.