KAMAYA OHM

Spec. No.: RLP-K-HTS-0001 /12

Date: 2017. 4. 21

Data sheet

Title: METAL-PLATE CHIP RESISTOR; LOW OHM

Style: RLP16,20,32,63, MLP20,32,63

AEC-Q200 qualified

RoHS COMPLIANCE ITEM Halogen and Antimony Free

Note: • Stock conditions

Temperature: $+5^{\circ}\text{C} \sim +35^{\circ}\text{C}$ Relative humidity: $25\% \sim 75\%$

The period of guarantee: Within 2 year from shipmen t by the company.

Solderability shall be satisfied.

- Product specification contained in this data sheet are subject to change at any time without notice
- •If you have any questions or a Purchasing Specification for any quality Agreement is necessary, please contact our sales staff.



Hokkaido Research Center Approval by: T. Sannomiya Drawing by: M. Shibuya

No: RLP-K-HTS-0001

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Title: METAL-PLATE CHIP RESISTOR; LOW OHM

RLP16, 20, 32, 63, MLP20,32, 63 Page: 1/24

1. Scope

1.1 This data sheet covers the detail requirements for metal-plate chip resistor; low ohm, style of RLP16, 20, 32, 63, MLP20,32, 63.

1.2 Applicable documents

JIS C 5201-1: 2011, JIS C 5201-8: 2014, JIS C 5201-8-1: 2014 IEC60115-1: 2008, IEC60115-8: 2009, IEC60115-8-1: 2014

2. Classification

Type designation shall be the following form.

(Example)

1 Metal - plate chip resistor; low ohm

2 Size

RLP16	1608 size, 0.33W
RLP20	2012 size, 0.5W
RLP32	3216 size, 1W
RLP63	6332 size, 1W
MLP20	2012 size, 1W
MLP32	3216 size, 1.5W
MLP63	6332 size, 2W

3 Temperature coefficient of resistance

N	±70×10 ⁻⁶ /°C
K	±100×10 ⁻⁶ /°C
-(Dash)	±150×10 ⁻⁶ / °C

4 Rated resistance

1L50	1.5mΩ
R002	2mΩ

5 Tolerance on rated resistance

F	±1%
J	±5%

6 Packaging form

TP	Paper taping
TE	Embossed taping



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3. Rating

3.1 The ratings shall be in accordance with Table-1.

3.1.1 RLP series

Table-1(1)

Style	Rated dissipation	Rated current	Temperature	coefficient of	Rated resistance	Tolerance on rated	
Otylo	(W)	(A)	resistance		$(m\Omega)$	resistance	
		8.1	K	100	5		
RLP16	0.33	0.1	N	±70	3		
KLFIO	0.55	5.7	K	100	10		
		5.7	N	±70	10		
		15.8	K	100	2		
		15.6	N	±70	2		
		10.0	K	100	2		
		12.9	N	±70	3		
		44.4	K	100	4		
		11.1	N	±70			
			10.0	K	100	5	F(±1%)
		10.0	N	±70	5	J(±5%)	
RLP20	0.5	9.1	K	100	6		
1 (2, 20	0.0	9.1	N	±70	U		
		8.4	K	100	7		
		0.4	N	±70	/		
		7.0	K	100	8		
		7.9	N	±70			
		_	7.4	K	100	0	
		7.4	N	±70	9		
		7.0	K	100	10		
		7.0	N	±70	10		

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Table-1(2)

	1	1	Table		T									
Style	Rated dissipation	Rated current	Temperature coefficient of resistance (10 ⁻⁶ / °C)		Rated resistance	Tolerance on rated								
Otylo	(W)	(A)		(10 ⁻ °/°C)	$(m\Omega)$	resistance								
		31.6	-(Standard)	±150	1	_								
		31.0	K	±100	ı									
		22.3	K	±100	2									
		22.3	N	±70	2									
		18.2	K	±100	3									
		10.2	N	±70	S									
		15.8	K	±100	4									
		13.6	N	±70	4									
		111	K	±100	5									
		14.1	N	±70	5									
		12.0	K	±100	6									
		12.9	N	±70	6									
		11.9	K	±100	7	F(±1%) J(±5%)								
			N	±70										
RLP32	RLP32 1.0	11.1	K	±100	8									
KLP32	1.0		N	±70										
		10.5	K	±100	9									
			N	±70										
		10	K	±100										
		10	N	±70										
										9.5	K	±100	44	
		9.5	N	±70	11									
		9.1	K	±100	10									
		9.1	N	±70	12									
		0.7	K	±100	13									
		8.7	N	±70										
		8.4	K	±100	14									
			N	±70	14									
		0.4	K	±100	45									
		8.1	N	±70	15									

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Table-1(3)

	I	T	lable			1
Style	Rated dissipation	Rated current	Temperature	coefficient of	Rated resistance	Tolerance on rated
Otylo	(W)	(A)	resistance		(m Ω)	resistance
			-(Standard)	±150		
	2.0	44.7	K	±100	1	
			N	±70		
		22.3	K	±100	2	
		22.3	N	±70	۷	
		18.2	K	±100	3	
		10.2	N	±70	3	
		15.8	K	±100	4	
		13.0	N	±70	4	
		14.1	K	±100	5	
		14.1	N	±70	5	
		12.9	K	±100	6 7 8	
		12.9	N	±70		F(±1%) J(±5%)
		11.9 11.1	K	±100		
	10		N	±70		
RLP63			K	±100		
			N	±70		
	1.0	10.5	K	±100	9	
			N	±70	9	
		10	K	±100	10	
		10	N	±70	10	
		9.5	K	±100	11	
		9.5	N	±70		
		9.1	K	±100	12	
		9.1	N	±70	12	
		8.7	K	±100	13	
			N	±70		
		8.4	K	±100	14	
		0.4	N	±70	14	
		0.4	K	±100	1F	
		8.1	N	±70	15	

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3.1.2 MLP series

Table-1(4)

Style	Rated dissipation	Rated current	Temperature coefficient of		Rated resistance	Tolerance on rated									
Style	(W)	(A)	resistance		(m Ω)	resistance									
		22.3	K	100	2										
		22.3	N	±70	2										
		18.2	K	100	3]									
		10.2	N	±70	S										
		15.8	K	100	4										
		15.6	N	±70	4										
		14.1	K	100	5										
		14.1	N	±70	5										
MLP20	1.0	40.0	K	100		F(±1%)									
IVILP20	1.0	12.9	N	±70	6	J(±5%)									
		44.0	K	100	7										
		11.9	N	±70	7										
		44.4	K	100	0										
		11.1	N	±70	8										
		40.5	K	100	0										
		10.5	N	±70	9										
		10	K	100	10										
			N	±70											
		38.7	-(Standard)	±150	1										
			N	±70											
		27.3	K	±100	2										
			N	±70											
		22.3	K	±100	3										
		22.3	N	±70											
			40.2	K	±100	4]								
		19.3	N	±70	4										
												47.0	K	±100	±100 _E
MIDOO	4.5	17.3	N	±70	5	F(±1%) J(±5%)									
MLP32	1.5	45.0	K	±100											
		15.8	N	±70	6										
		44.0	K	±100	7	•									
		14.6	N	±70	7										
		40.0	K	±100	_	1									
		13.6	N	±70	8										
			K	±100											
		12.9	N	±70	9										
		40.0	K	±100	40										
		12.2	N	±70	10										

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Table-1(5)

	Data dallarata atta	Detect a second	Table	. ,	Data dua sistemas	T-1													
Style	Rated dissipation	Rated current	Temperature coefficient of		Rated resistance $(m\Omega)$	Tolerance on rated													
	(W)	(A)		resistance (10 ⁻⁶ / °C)		resistance													
		63.2	K	100	0.5	J(±5%)													
		00.2	N	±70	0.5														
		36.5	K	100	1.5														
		30.3	N	±70	1.5														
		24.0	K	100	0														
		31.6	N	±70	2														
		00.0	K	100	0.5														
		28.2	N	±70	2.5														
		05.0	K	100	3														
		25.8	N	±70		F(±1%) J(±5%)													
		22.3	K	100	4														
NAI DOG	0.0		N	±70															
MLP63	2.0	2.0	K	100	5														
			N	±70															
		18.2	K	100	_														
			N	±70	6														
															40.0	K	100	_	
		16.9	N	±70	7														
			K	100	8														
		15.8	N	±70															
		14.9	K	100															
			N	±70	9														
			K	100															
		14.1	N N		10														
				IN .	±70														

Style	Isolation voltage (V)	Category temperature range (°C)
RLP16		
RLP20		
RLP32		
RLP63	100	<i>–</i> 55~+155
MLP20		
MLP32		
MLP63		

3.2 Climatic category

55/155/56 Lower category temperature –55 °C Upper category temperature +155 °C

Duration of the damp heat, steady state test 56days

3.3 Stability class

5% Limits for change of resistance:

-for long-term tests ±5%

-for short–term tests ±1%

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3.4 Derating

The derated values of dissipation at temperature in excess of 70 °C shall be as indicated by the following curve.

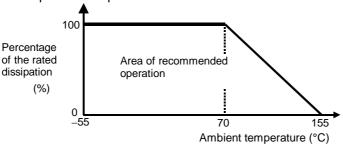


Figure-1 Derating curve

3.5 Rated voltage

d.c. or a.c. r.m.s. voltage calculated from the square root of the product of the rated resistance and the rated dissipation.

$$E = \sqrt{P \cdot R}$$

E: Rated voltage (V)

P: Rated dissipation (W)

R: Rated resistance (Ω)

3.6 Rated current

The rated current calculated from the square root of the quotient of the rated resistance and the rated dissipation.

$$I = \sqrt{P / R}$$

I: Rated current (A)

P: Rated dissipation (W)

R: Rated resistance (Ω)

The rated current shall be corresponding to rated voltage.

4. Packaging form

The standard packaging form shall be in accordance with Table-2.

Table-2

Symbol	Packaging form		Standard packaging quantity / units	Application
TP	Paper taping	8mm width, 4mm pitches	5,000 pcs.	RLP16, 20, 32, MLP20,32
TF	Embossed taping	12mm width 4mm pitches	4 000 pcs	RI P63 MI P63

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5. Dimensions

5.1 The resistor shall be of the design and physical dimensions in accordance with Figure-2 and Table-3.

5.1.1 RLP series

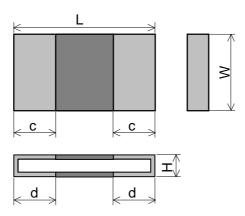


Figure-2

Table–3(1) Unit: mm

		1able=3(1)				Offic. Iffiff
Style	Rated resistance (m Ω)	L	W	Н	С	d
DI DAC	5	10.01	0.0.04	0.35±0.10	0.2±0.1	0.6±0.1
RLP16	10	1.6±0.1	0.8±0.1	0.3±0.1	0.2±0.1	0.3±0.1
	2			0.22±0.10	0.35±0.10	0.55±0.20
	3			0.45±0.10	0.35±0.10	0.75±0.20
	4			0.35±0.10	0.35±0.10	0.75±0.20
	5			0.35±0.10	0.35±0.10	0.6±0.2
RLP20	6	2.0±0.15	1.25±0.15	0.35±0.10	0.35±0.10	0.47±0.20
	7	1		0.22±0.10	0.35±0.10	0.75±0.20
	8	1		0.22±0.10	0.35±0.10	0.6±0.2
	9			0.22±0.10	0.35±0.10	0.52±0.20
	10			0.22±0.10	0.35±0.10	0.47±0.20
	1		1.6±0.15	0.32±0.15	1.1±0.25	1.1±0.25
	2			0.32±0.15	0.5±0.25	0.5±0.25
	3			0.35±0.10	0.7±0.25	1.3±0.25
	4			0.35±0.10	1.1±0.25	1.1±0.25
	5			0.35±0.10	1.0±0.25	1.0±0.25
	6			0.35±0.10	0.85±0.25	0.85±0.25
	7	3.2±0.15		0.35±0.10	0.7±0.25	0.7±0.25
RLP32	8			0.35±0.10	0.6±0.25	0.6±0.25
	9	0.2_0.10	110_0110	0.3±0.1	0.75±0.25	0.75±0.25
	10			0.28±0.10	0.5±0.25	0.5±0.25
	11			0.28±0.10	0.5±0.25	0.5±0.25
	12			0.22±0.10	0.65±0.25	0.65±0.25
	13			0.22±0.10	0.65±0.25	0.65±0.25
	14]		0.22±0.10	0.55±0.25	0.55±0.25
	15			0.22±0.10	0.5±0.25	0.5±0.25

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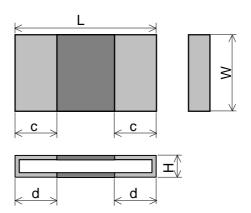


Table-3(2) Unit: mm Style W Rated resistance (m Ω) Н С d 3.2 ± 0.25 0.38±0.15 2.2±0.25 2.2±0.25 2 0.38±0.15 1.1±0.25 1.1±0.25 3 0.45±0.15 2.2±0.25 2.2±0.25 4 0.35±0.15 2.2±0.25 2.2±0.25 5 0.34 ± 0.15 1.95±0.25 1.95±0.25 6 0.34±0.15 1.75±0.25 1.75±0.25 7 0.35±0.15 1.4±0.25 1.4±0.25 1.1±0.25 RLP63 8 0.35±0.15 1.1±0.25 6.3 ± 0.25 3.1±0.25 0.35±0.15 9 0.8±0.25 0.8 ± 0.25 10 0.23±0.15 1.75±0.25 1.75±0.25 11 0.23 ± 0.15 1.75±0.25 1.75±0.25 12 0.23 ± 0.15 1.4±0.25 1.4±0.25 1.3±0.25 1.3±0.25 13 0.23±0.15 14 0.23±0.15 1.1±0.25 1.1±0.25 0.23±0.15 15 0.95±0.25 0.95±0.25

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5.1.2 MLP series

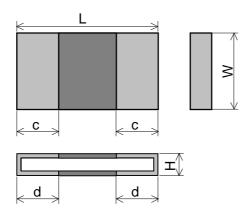


Table-3(3) Unit: mm

	// Pated resistance (m())		1	1	Offic friin	
Style	Rated resistance (m Ω)	L	W	Н	С	d
	2			0.22±0.10	0.35±0.10	0.55±0.20
	3			0.45±0.10	0.35±0.10	0.75±0.20
	4	2.0±0.15		0.35±0.10	0.35±0.10	0.7±0.2
	5			0.35±0.10	0.35±0.10	0.6±0.2
MLP20	6		1.25±0.15	0.35±0.10	0.35±0.10	0.47±0.20
	7			0.22±0.10	0.35±0.10	0.75±0.20
	8			0.22±0.10	0.35±0.10	0.6±0.2
	9			0.22±0.10	0.35±0.10	0.52±0.20
	10			0.22±0.10	0.3±0.1	0.47±0.20
	1		1.6±0.15	0.32±0.15	1.1±0.25	1.1±0.25
	2			0.32±0.15	0.5±0.25	0.5±0.25
MLP32	3	3.2±0.15		0.35±0.10	0.7±0.25	1.3±0.25
	4			0.35±0.10	1.1±0.25	1.1±0.25
	5			0.35±0.10	1.0±0.25	1.0±0.25
	6			0.35±0.10	0.85±0.25	0.85±0.25
	7			0.35±0.10	0.7±0.25	0.7±0.25
	8			0.35±0.10	0.6±0.25	0.6±0.25
	9			0.3±0.1	0.75±0.25	0.75±0.25
	10			0.28±0.10	0.5±0.25	0.5±0.25
	0.5			0.58±0.15	2.2±0.25	2.2±0.25
	1.5			0.38±0.15	1.5±0.25	1.5±0.25
	2			0.58±0.15	2.2±0.25	2.2±0.25
	2.5			0.45±0.15	2.4±0.25	2.4±0.25
MLP63	3			0.45±0.15	2.2±0.25	2.2±0.25
	4	62.025	24.025	0.34±0.15	2.2±0.25	2.2±0.25
	5	6.3±0.25	3.1±0.25	0.51±0.15	1.1±0.25	1.1±0.25
	6			0.5±0.15	1.1±0.25	1.1±0.25
	7			0.5±0.15	0.6±0.25	0.6±0.25
	8	1		0.35±0.15	1.1±0.25	1.1±0.25
	9			0.35±0.15	0.8±0.25	0.8±0.25
	10	1		0.35±0.15	0.5±0.25	0.5±0.25

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5.2 Net weight (Reference)

Style	Rated resistance (m Ω)	Net weight (mg)
RLP16	5	2
RLP16	10	2
RLP20	2,4 to 10	3 7
KLP20	3 1	
		12
	2	11
	3	11
	4	12
	5	11
	6	11
	7	11
RLP32	8	10
	9	9
	10	9
	11	9
	12	8
	13	7
	14	7
	15	6
	1	50
		42
	<u>2</u> 3	57
	4	43
	5	43
	6	41
	7	42
RLP63	8	41
	9	40
	10	30
	11	30
	12	26
	13	26
	14	26
	15	26

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5.2 Net weight (Reference)

Style	Rated resistance (m Ω)	Net weight (mg)
MLP20	2,4 to 10	3
IVILEZU	3	7
	1	12
	2	11
	3	11
	4	12
MLP32	5	11
IVILI 32	6	11
	7	11
	8	10
	9	9
	10	9
	0.5	90
	1.5	47
	2	77
	2.5	63
MLP63	3	63
	4	48
IVILFOS	5	64
	6	55
	7	55
	8	43
	9	40
	10	41

6. Marking

The Rated resistance of RLP16 should not be marked standard.

6.1 RLP63, MLP63

The rated resistance shall be marked in 4 characters consisting of 3 figures and a letter and marked on over coat side.

(Example) "R010"
$$\rightarrow$$
 0.01 [Ω] \rightarrow 10 [m Ω]

"1L50"
$$\rightarrow$$
 0.0015 [Ω] \rightarrow 1.5 [m Ω]

6.2 RLP20, 32, MLP20, 32

The rated resistance shall be marked in combination of two figures and underlines and marked on over coat side.

(Example) "
$$\underline{05}$$
" \rightarrow 0.005 [Ω] \rightarrow 5 [m Ω]

"
$$\underline{10}$$
" \rightarrow 0.01 [Ω] \rightarrow 10 [m Ω]

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7. Performance

7.1 The standard condition for tests shall be in accordance with Sub-clause 4.2, JIS C 5201–1: 2011.

7.2 The performance shall be satisfied in Table-4.

Table-4(1)

			Table-4	. ,			
No.	Test items	C	condition of test (JIS C 52	201–1)		Performance requirements
1	Visual examination	Sub-clause	e 4.4.1				As in 4.4.1
		Checked by	y visual examina	ation.			The marking shall be legible, as
							checked by visual examination.
2	Dimension	Sub-clause	e 4.4.2				As specified in Table-3 of this
							specification.
	Resistance		value shall be			ounting	As in 4.5.2
		the substra	te of the followin	g condit	ion.		The resistance value shall
			b a				correspond with the rated
		Current terminal	Curi	rent ninal			resistance taking into account the specified tolerance.
		terrimai			:Copper	clad	specified tolerarice.
		Vo	Itage terminal		:Solder		
					Unit	t:mm	
		Chilo	Resistance		L		
		Style	value(m Ω)	а	b	С	
		RLP16	5	0.6	0.9	0.9	
		IXLI IO	10	1.0	0.6	0.5	
		RLP20	2,3	0.5	1.1	1.36	
			4 to 10	0.8	0.95		
			1	1.0	1.45		
			2	2.1	0.9		
		RLP32	3	0.8	1.55	1.7	
			5 and 6	1.0 1.4	1.45 1.25		
			7 to 15	2.1	0.9		
			1	1.5	3.0	4.0	
			2	4.0	1.8	4.0	
		RLP63	3, 4	1.8	2.9		
			5	2.4	2.6	3.5	
			6 to 15	4.0	1.8		
		MI DOO	2,3	0.5	1.1	4.00	
		MLP20	4 to 10	0.8	0.95	1.36	
			1	1.0	1.45		
			2	2.1	0.9		
		MLP32	3	0.8	1.55	1.7	
		WILL OL	4	1.0	1.45		
			5 and 6	1.4	1.25		
			7 to 10	2.1	0.9		
		MLP63	0.5,2 to 4	1.8	2.9	3.5	
			1.5, 5 to 10	4.0	1.8		
			of copper clad: 0	ม.บรอmn	1		
		4-Terminal method Measurement current: 1(A)					
			measuring app		orrespon	dina to	
			hm Mater (1A)				
		CORPOR					

RLP16, 20, 32, 63, MLP20,32, 63 14/24 Page:

Table-4(2)

No	Test items	Condition of test (JIS C 5201–1)	Performance requirements
3		, ,	No breakdown or flash over
3	Voltage proof	Sub-clause 4.7	INO DIEAKOOWITOI IIASTI OVEI
		Method: 4.6.1.4(See Figure–5)	
		Test voltage: Alternating voltage with a peak value	
		of 1.42 times the insulation voltage.	
		Duration: 60 s±5 s	R≥1 GΩ
		Insulation resistance	R≥ 1 G52
		Test voltage: Insulation voltage Duration: 1 min.	
4	Coldorobility	Sub-clause 4.17	As in 4.17.4.5
4	Solderability		The terminations shall be covered
		Without aging	
		Flux: The resistors shall be immersed in a	with a smooth and bright solder
		non-activated soldering flux for 2 s.	coating.
		Bath temperature: 235 °C±5 °C	
	.	Immersion time: 2 s±0.5 s	
5	Mounting	Sub-clause 4.31	
		Substrate material: Epoxide woven glass	
		Test substrate: RLP16: Figure-3-1	
	Overload (in the case of a factors)	RLP20, MLP20 Figure-3-2	
	(in the mounted state)	RLP32 MLP32 Figure-3-3	
		RLP63, MLP63 Figure-3-4	
		Sub-clause 4.13	
		The applied voltage shall be 2.5 times the rated	
		voltage or the current corresponding to.	
		Duration: 2 s	Nie delle de see ee
		Visual examination	No visible damage
	Calcant resistance of the	Resistance	$\Delta R \leq \pm 1\%$
	Solvent resistance of the	Sub-clause 4.30	Legible marking
	marking	Solvent: 2-propanol	
		Solvent temperature: 23 °C±5 °C	
		Method 1	
		Rubbing material: cotton wool	
		Without recovery	
6	Mounting	Sub-clause 4.31	
		Substrate material: Epoxide woven glass	
		Test substrate: Figure-4	
	Bound strength of the end	Sub-clause 4.33	
	face plating	Bent value: 3mm(RLP16, 20, 32, MLP20, 32)	
		1 mm(RLP63, MLP63)	
		Resistance	ΔR ≤ ±1%
	Final measurements	Sub-clause 4.33.6	
		Visual examination	No visible damage

RLP16, 20, 32, 63, MLP20,32, 63 15/24 Page:

Table-4(3)

			1able-4(3)	·
No	Test iter		Condition of test (JIS C 5201–1)	Performance requirements
7	Resistance to heat	soldering	Sub-clause 4.18 (JEITA RC-2144 2.3.2) Substrate material: Epoxide woven glass Test substrate: Figure-3-1 T ₁ :Pre-heat minimum temp.:150±5 °C T ₂ :Pre-heat maximum temp.:180±5 °C T ₃ :Soldering temp.:220 °C T ₄ :Peak temp.:250 °C t ₁ :Pre-heat duration:120±5 s t ₂ :Soldering duration:60 to 90 s t ₃ :Peak duration(T ₄ -5°C):20 to 40 s Pre-reflow soldering: 1 time (Initial measurements) Reflow soldering: 3 times T ₄ T ₃ T ₂ T ₁	
	Component resistance	solvent	Visual examination Resistance Sub-clause 4.29 Solvent: 2-propanol Solvent temperature: 23 °C±5 °C Method 2 Recovery: 48 h Visual examination Resistance	No visible damage $\Delta R \leq \pm 1\%$ No visible damage $\Delta R \leq \pm 1\%$
8	Mounting Adhesion		Sub-clause 4.31 Substrate material: Epoxide woven glass Test substrate: Figure–3–1 Sub-clause 4.32 Force: 5 N Duration: 10 s±1 s	
	Rapid change te	emperature	Visual examination Sub-clause 4.19 Lower category temperature:-55 °C Upper category temperature:+155 °C Duration of exposure at each temperature: 30 min. Number of cycles: 5 cycles. Visual examination Resistance	No visible damage $\label{eq:local_problem} \begin{tabular}{ll} No visible damage \\ $\Delta R \le \pm 1\% \end{tabular}$

No: RLP-K-HTS-0001 /12

METAL-PLATE CHIP RESISTOR; LOW OHM

RLP16, 20, 32, 63, MLP20,32, 63 16/24 Page:

Table-4(4)

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No	Test items	Condition of test (JIS C 5201–1)	Performance requirements
9	Climatic sequence	Sub-clause 4.23	
	-Dry heat	Sub-clause 4.23.2	
		Test temperature: +155 °C	
		Duration: 16 h	
	–Damp heat, cycle	Sub-clause 4.23.3	
	(12+12hour cycle)	Test method: 2	
	First cycle	Test temperature: 55 °C	
		[Severity(2)]	
	-Cold	Sub-clause 4.23.4	
		Test temperature –55 °C	
		Duration: 2h	
	–Damp heat, cycle	Sub-clause 4.23.6	
	(12+12hour cycle)	Test method: 2	
	Remaining cycle	Test temperature: 55 °C	
		[Severity (2)]	
		Number of cycles: 5 cycles	
	-D.C. load	Sub-clause 4.23.7	
		The applied current shall be the rated current.	
		Duration: 1 min.	No visible damage
		Visual examination	ΔR≤±5%
		Resistance	4.12070
10	Mounting	Sub-clause 4.31	
		Substrate material: Epoxide woven glass	
		Test substrate: RLP16: Figure-3-1	
		RLP20, MLP20 Figure-3-2	
		RLP32 MLP32 Figure-3-3	
	Endurance at 70 °C	RLP63, MLP63 Figure-3-4	
	Endurance at 70 C	Sub-clause 4.25.1	
		Ambient temperature: 70 °C±2 °C	
		Duration: 1000 h	
		The current shall be applied in cycles of 1.5 h on	
		and 0.5 h.	
		The applied current shall be the rated current	
		Examination at 48 h, 500 h and	
		1000 h:	No visible damage
		Visual examination	$\Delta R \le \pm 5\%$
44	NA - vetic e	Resistance	<u> </u>
11	Mounting	Sub-clause 4.31	
		Substrate material: Epoxide woven glass	
	Movieties of resistance 19	Test substrate: Figure–3–1	As to Table 4
	Variation of resistance with	Sub-clause 4.8	As in Table–1
	temperature	+20 °C / +155 °C	

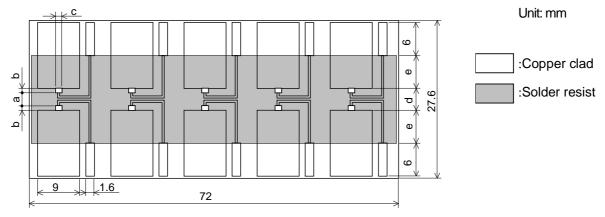
RLP16, 20, 32, 63, MLP20,32, 63 Page: 17/24

Table-4(5)

No	Test items	Condition of test (JIS C 5201–1)	Performance requirements
		,	i enormance requirements
12	Mounting	Sub-clause 4.31	
		Substrate material: Epoxide woven glass	
		Test substrate: Figure–3–1	
	Damp heat, steady state	Sub-clause 4.24	
		Ambient temperature: 40 °C±2 °C	
		Relative humidity: 93 ⁺² ₋₃ %	
		Without current applied.	
		Visual examination	No visible damage
			Legible marking
		Resistance	ΔR ≤ ±5%
13	Dimensions (detail)	Sub-clause 4.4.3	As in Table-4
	Mounting	Sub-clause 4.31	
		Substrate material: Epoxide woven glass	
		Test substrate: Figure–3–1	
	Endurance at upper	Sub-clause 4.25.3	
	category temperature	Ambient temperature:155 °C±2 °C	
		Duration: 1000 h	
		Examination at 48 h, 500 h and	
		1000 h:	
		Visual examination	No visible damage
		Resistance	ΔR ≤ ±5%

RLP16, 20, 32, 63, MLP20,32, 63 Page: 18/24

8. Test substrate



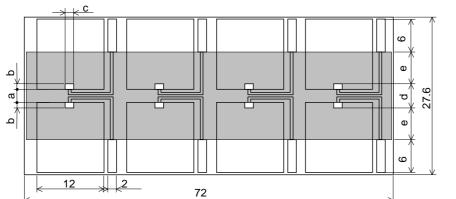
Style	Rated resistance (m Ω)	а	b	С	d	е
· · · · · · · · · · · · · · · · · · ·	5	0.6	0.9	0.0	0.0	0.0
RLP16	10	1.0	0.6	0.9	2.2	6.2
RLP20	2,3	0.5	1.1	1.36	2.7	5.95
KLP20	4 to 10	8.0	0.95	1.30	2.7	5.95
	1	1.0	1.45			
	2	2.1	0.9			
RLP32	3	0.8	1.55	1.7	3.9	5.35
INLF 32	4	1.0	1.45	1.7	3.9	3.33
	5 and 6	1.4	1.25			
	7 to 15	2.1	0.9			
	1	1.5	3.05			
	2	4.0	1.8			
RLP63	3, 4	1.8	2.9	3.5	7.6	3.5
	5	2.4	2.6			
	6 to 15	4.0	1.8			
MLP20	2,3	0.5	1.1	1.36	2.7	5.95
IVILPZU	4 to 10	8.0	0.95	1.30	2.7	5.95
	1	1.0	1.45			
	2	2.1	0.9			
MLDOO	3	0.8	1.55	1.7	2.0	E OE
MLP32	4	1.0	1.45	1./	3.9	5.35
	5 and 6	1.4	1.25			
	7 to 10	2.1	0.9			
MIDGO	0.5, 2 to 4	1.8	2.9	2.5	7.6	2.5
MLP63	1.5, 5 to 10	4.0	1.8	3.5	7.6	3.5

Figure-3-1 RLP16, 20, 32, 63, MLP20,32, 63 TEST SUBSTRATE

Remark: Material: Epoxy resin based as glass fabric(Specified in JIS C 6484).

Thickness: 1.6mm Thickness of copper clad: 0.035mm

RLP16, 20, 32, 63, MLP20,32, 63 Page: 19/24



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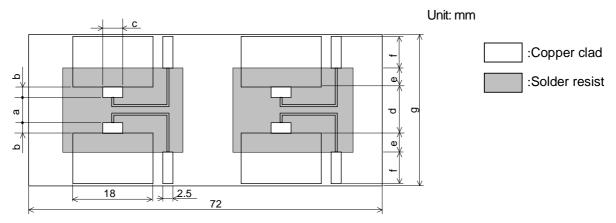
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Style	Rated resistance (m Ω)	а	b	С	d	е
RLP20	2,3	0.5	1.1		2.7	5.95
	4 to 10	0.8	0.95	1.26		
MLP20	2,3	0.5	1.1	1.36		
	4 to 10	0.8	0.95			

Figure-3-2 RLP20, MLP20 TEST SUBSTRATE

Remark: Material: Epoxy resin based as glass fabric(Specified in JIS C 6484).

Thickness: 1.6mm Thickness of copper clad: 0.035mm



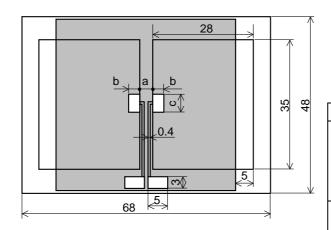
Style	Rated resistance (m Ω)	а	b	С	d	е	f	g
	1	1.0	1.45		3.9	5.35	11.68	39
	2	2.1	0.9				6.0	27.6
RLP32	3	0.8	1.55	1.7			0.0	27.0
KLP32	4	1.0	1.45				11.68	39
	5 and 6	1.4	1.25				6.0	27.6
	7 to 15	2.1	0.9				0.0	27.0
	1	1.0	1.45		3.9	5.35	11.68	39
	2	2.1	0.9				6.0	27.6
MLP32	3	0.8	1.55	1.7			0.0	27.0
	4	1.0	1.45	1.7			11.68	39
	5 and 6	1.4	1.25				6.0	27.6
	7 to 10	2.1	0.9				0.0	21.0

Figure-3-3 RLP32, MLP32 TEST SUBSTRATE

Remark: Material: Epoxy resin based as glass fabric(Specified in JIS C 6484).

Thickness: 1.6mm Thickness of copper clad: 0.07mm

RLP16, 20, 32, 63, MLP20,32, 63 Page: 20/24



Unit: mm :Copper clad :Solder resist

No: RLP-K-HTS-0001

Style	Rated resistance (m Ω)	а	b	С
RLP63	1	2.0	3.0	4.0
	2	4.0	1.8	
	3, 4	1.8	2.9	3.5
	5	2.4	2.6	3.3
	6 to 15	4.0	1.8	
MLP63	0.5, 2 to 4	1.8	2.9	3.5
	1.5, 5 to 10	4.0	1.8	ა.ე

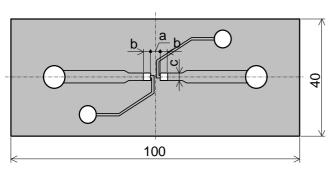
Figure-3-4 RLP63, MLP63 TEST SUBSTRATE

Remark: Material: Epoxy resin based as glass fabric(Specified in JIS C 6484).

Thickness: 1.6mm Thickness of copper clad: 0.07mm

Remark: In the case of connection by connector, the connecting terminals are gold plated.

However, the plating is not necessary when the connection is made by soldering.

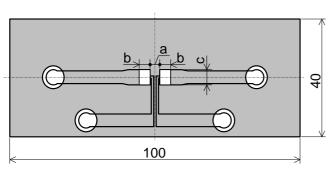


Unit: mm :Copper clad :Solder resist

Style	Style Rated resistance (mΩ)		b	С	
	5	0.6	0.9	0.0	
RLP16	10	1.0	0.6	0.9	
DI DOO	2,3	0.5	1.1	1.36	
RLP20	4 to 10	0.8	0.95		
	1	1.0	1.45		
	2	2.1	0.9	1.7	
RLP32	3	8.0	1.55		
KLP32	4	1.0	1.45		
	5 and 6	1.4	1.25		
	7 to 15	2.1	0.9		
MLP20	2,3	0.5	1.1	1.36	
IVILP20	4 to 10	8.0	0.95	1.30	
	1	1.0	1.45		
	2	2.1	0.9		
MLP32	3	0.8	1.55	1.7	
IVILPOZ	-P32 4		1.45	1.7	
	5 and 6	1.4	1.25		
	7 to 10	2.1	0.9		

RLP16, 20, 32, MLP20 32 BOUND STRENGTH OF THE END FACE PLATING TEST SUBSTRATE

RLP16, 20, 32, 63, MLP20,32, 63 Page: 21/24



Unit: mm					
	:Copper clad				
	:Solder resist				

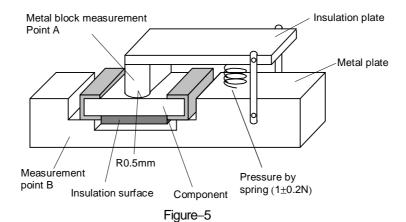
Style	Rated resistance (m Ω)	а	b	С
	1	1.5	3.05	4.0
	2	4.0	1.8	
RLP63	3, 4	1.8	2.9	3.5
	5	2.4	2.6	
	6 to 15	4.0	1.8	
MIDES	0.5, 2 to 4	1.8	2.9	3.5
MLP63	1.5, 5 to 10	4.0	1.8	3.5

RLP 63, MLP63 BOUND STRENGTH OF THE END FACE PLATING TEST SUBSTRATE

Figure-4

Remark. Material: Epoxy resin based as glass fabric(Specified in JIS C 6484).

Thickness: 1.6mm Thickness of copper clad: 0.035mm



Product specification contained in this data sheet are subject to change at any time without notice.

RLP16, 20, 32, 63, MLP20,32, 63 Page: 22/24

9. Taping

- 9.1 Applicable documents JIS C 0806-3: 2014, EIAJ ET-7200C: 2010
- 9.2 Taping dimensions
- 9.2.1 Paper taping (8mm width, 4mm pitches)

Taping dimensions shall be in accordance with Figure-6 and Table-5.

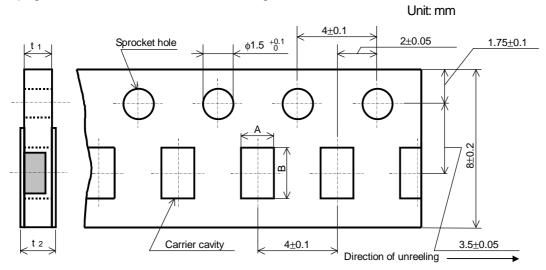
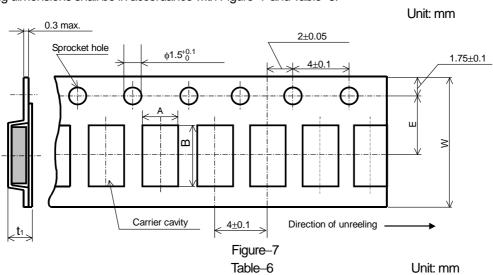


Figure-6

	Unit: mm				
Style	Α	В	t 1	t 2	
RLP16	1.15±0.15	1.9 ± 0.2	0.6±0.1	0.8max.	
RLP20	1.65±0.15	2.5±0.2	0.6±0.1	0.8max.	
MLP20	1.03±0.15	2.5±0.2	0.6±0.1	U.OITIAX.	
RLP32	2.00±0.15	3.6±0.2	0.6±0.1	0.8max.	
MLP32	2.00±0.13	3.0±0.2	0.0±0.1	U.omax.	

9.2.2 Embossed taping (12mm width, 4mm pitches)

Taping dimensions shall be in accordance with Figure-7 and Table-6.



		Unit: mm				
	Style	Α	В	W	Е	t 1
ſ	RLP63	3.6±0.2	6.9±0.2	12.0±0.3	5.5±0.05	1.1±0.15
ſ	MLP63	3.0±0.∠	0.9±0.∠	12.0±0.3	5.5±0.05	1.1±0.15

RLP16, 20, 32, 63, MLP20,32, 63 Page: 23/24

- 1). The cover tapes shall not cover the sprocket holes.
- 2). Tapes in adjacent layers shall not stick together in the packing.
- 3). Components shall not stick to the carrier tape or to the cover tape.
- 4). Pitch tolerance over any 10 pitches ±0.2mm.
- 5). The peel strength of the top cover tape shall be with in 0.1N to 0.5N on the test method as shown in the following RLP16, 20, 32, MLP20, 32: Figure–8, RLP63, MLP63: Figure–9.
- 6). When the tape is bent with the minimum radius for (RLP16, 20, 32, MLP20, 32: 25mm, RLP63, MLP63: 30mm) the tape shall not be damaged and the components shall maintain their position and orientation in the tape.
- 7). In no case shall there be two or more consecutive components missing.

 The maximum number of missing components shall be one or 0.1%, whichever is greater.

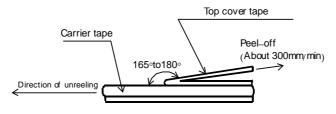


Figure-8

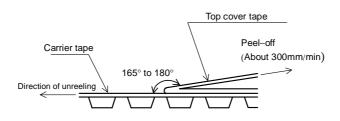


Figure-9

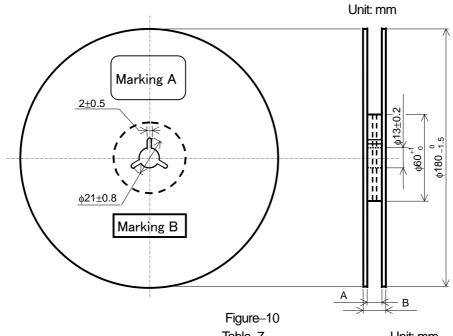
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Title: METAL-PLATE CHIP RESISTOR; LOW OHM

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9.3 Reel dimension

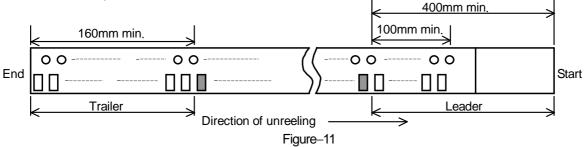
Reel dimensions shall be in accordance with the following Figure–10 and Table–7. Plastic reel (Based on EIAJ ET–7200C)



	9		
	Table-7		Unit: mm
Style	Α	В	Note
RLP16, 20, 32, MLP20,32	9 +1.0	11.4±1.0	Injection molding
NEF 10, 20, 32, WEF 20,32	9 0	13±1.0	Vacuum forming
RLP63, MLP63	13 ^{+1.0}	17±1.0	Vacuum forming

Note: Marking label shall be marked on a place of Marking A or two place of Marking A and B.

9.4 Leader and trailer tape.



10. Marking on package

The label of a minimum package shall be legibly marked with follows.

10.1 Marking A

(1) Classification

(Style, Temperature coefficient of resistance, Rated resistance, Tolerance on rated resistance, Packaging form)

(2) Lot number (3) Quantity (4) Manufacturer's name or trade mark (5) Others

10.2 Marking B (KAMAYA Control label)

单击下面可查看定价,库存,交付和生命周期等信息

>>Kamaya(釜屋电机)