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	Hicomo	PART	NO.			ECN #	REV		DESCRIPTION		DRAWN	DATE	CHECKD	DATE	APPRVD	DATE
	nacomp		MCRE0000	Series		-	A		RELEASED		Kiran	07/05/09	Suresh	07/05/09	Farnell	21/05/09
Dimens	ion:		0	_ ($\overline{\mathbf{O}}$											
		L	Dime	nsions : Millii	metres											
Туре	Power Rating (W)	Maximun D	n Maximum L	d ±0.05	H ±3											
MC	1/8	1.85	3.5	0.45	28											
				Dimensions	: Millimetre	s										
Rating	S		MC	1												
Datada	Type			_												
Rated p	ower		0.125W at 70°C	-												
Maximu	m overload voltage		2007													
Dielectr	ic withstanding volta	age	400V													
Rated a	mbient temperature	9	70°C	_												
Operatii	ng temperature ran	ge -	55 °C to +155°C	-												
Resista	nce tolerance	·	±5%	-												
Resista	nce range		1.1M Ω to 1M Ω													
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	PART NO.			REVISIONS						
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	MCRE0000 Series	-	А	RELEASED	Kiran	07/05/09	Suresh	07/05/09	Farnell	21/05/09

Power Rating:

Resistors shall have a power rating based on continuous full load operation at an ambient temperature of 70°C. For temperature in excess of 70°C, the load shall be derated.

Voltage Rating:

Resistors shall have a rated direct-current (DC) 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 = $\sqrt{P \times R}$

Were: RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (volt)

P = Power rating (watt)

R = Nominal resistance (ohm)

In no case shall the rated DC or RMS AC continuous working voltage be greater than the applicable maximum value.



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Nominal Resistance: Effective figures of nominal resistance shall be in accordance with E-24 series, and resistance tolerance

Construction:



Item Number	Name	Material
1	Basic body	Rod type ceramics
2	Resistance film	Carbon film
3	End cap	Steel (tin plated iron surface)
4	Lead wire	Annealed copper wire coated with tin
5	Joint	By welding
6	Coating	Insulated epoxy resin (colour: beige)
7	Colour code	Epoxy resin

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Characteristics

Characteristics	Lim	its					Test Methods	(JIS C 5201-1)			
DC resistance	Must be within the sp	ecified tolerar	nce	The limit of erro (Sub-clause 4.5	or of measur 5)	ing ap	paratus shall not ex	ceed allowable range or	5% oʻ	f resistance tolerand	;e
Insulation resistance	Insulation resistance minimum	10,000MΩ		Resistors shall wrapped closely specified in the (Sub-clause 4.6	be clamped y around the above list fo 3)	in the body or 60 +	trough of a 90° met of the resistor. After +10/-0 seconds.	allic V-block or foil metho that shall be tested at D	od use C pot	e a metal foil shall b tential respectively	e
Dielectric withstanding voltage	No evidence of flash damage, arcing or in down	over mechanic sulation break	al	Resistors shall wrapped closel specified in the (Sub-clause 4.7	be clamped y around the above list fo 7)	in the body or 60 +	trough of a 90° met of the resistor. After 10/-0 seconds.	allic V-block or foil metho that shall be tested at D	od use IC pot	e a metal foil shall b tential respectively	e
	Resistance Range	TCR (PPN	l/°C)	Natural register		nor to	moratura dagraa a	patierado			
	≤10Ω	0 to ±35	50	R2-R1/R1(t2-t1) x 10 ⁶ (PPN	µerter ∕I/°C)	ilperature degree ce	entigrade			
Temperature coefficient	11Ω to 99K	0 to -45	50	R1: Resistance	value at roo	om ten	nperature (t1)				
	100K to 1M	0 to -70	0	R2: Resistance	value at roo	om ten	nperature plus 100°	C (t2)			
	1.1M to 10M	0 to -15	00	(Sub-clause 4.8	3)						
Short time overload	Resistance change r ±(1% + 0.05Ω) maxin evidence of mechani	ate is num with no cal damage		Permanent resi (Sub-clause 4.1	stance char I3)	ige aft	er the application of	a potential of 2.5 times F	RCWN	/ for 5 seconds	
Terminal strength	No evidence of mech	nanical damag	e	Direct load: Resistance to a leads. Twist test: Terminal leads rotated through rotations. (Sub-clause 4.1	i 2.5kg direc shall be ber 360° about 16)	t load t throu the or	for 10 seconds in th ugh 90° at a point of iginal axis of the be	e direction of the longitur about 6mm from the boo nt terminal in alternating	dinal a dy of t direct	axis of the terminal the resistor and sha ion for a total of 3	II be
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Characteristics

Characteristics		Limits					Test Meth	nods	(JIS C 5201-1)			
Solderability	95% cov	erage minimum		The area covered with a new, smooth clear pinholes. Test temperature of solder Dwell time in solder (Sub-clause 4.17)			smooth clean, s der : 2 : 2	hiny 45°C to 3	and continuous surface ±3°C seconds	e free fro	om concentrated	
Soldering temperature reference	Electrical Without c (95% cov	characteristics shall be s listinct deformation in app erage minimum)	atisfied. earance.	The leads i shall be cho Wave sold Pre Sug Par Hand sold Har Dwo	mmersed inf ecked. ering condi -heat Igestion solc k temperatu ering condi id Soldering ell time in sc	tion: (2 ler temp re tion: bit tem lder	r bath to 3.2 to cycles maxim i 11 perature : 2 : 2 perature : 3 : 3	4.8m um) 00 to 35 to 60°C 80 ± ² +1/-(m from the body. Perm 120°C, 30 ±5 seconds 255°C, 10 seconds ma 10°C 0 seconds	anent r aximum	esistance change	
Resistance to soldering heat	Resistan maximun damage	the change rate is $\pm(1\% + 1)$ with no evidence of mec	0.05Ω) hanical	Permanent solder for 3 (Sub-clause	resistance o ±0.5 secon e 4.18)	change ds	when leads imn	nerse	ed to 3.2 to 4.8 mm fron	n the bo	ody in 350°C ±10°	С
				Resistance	change afte	r contin	uous 5 cycles f	or du	ty shown below:			
				Step	Tem	peratur	e		Time			
	Resistan	ce change rate is ±(1% +	0.05Ω)	1	-55	°C ±3°C	:	3	0 minutes			
Temperature cycling	maximun damage	with no evidence of mec	hanical	2	Room t	empera	ture	10 te	o 15 minutes			
	aamago			3	155	°C ±2°C	;	3	0 minutes			
				4	Room t	empera	ture	10 te	o 15 minutes			
				(Sub-clause	e 4.19)							
	1											
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Characteristics

			Test Methods (JIS C 5201-1)						
esistance change aximum	rate is ±(1	% + 0.05Ω)	55Hz, 3 planes 2 hours each Total amplitude = 1.5mm (Sub-clause 4.22)						
Resistance Va	alue	ΔR/R	Resistance change after 1000 hours operating at RCWV with duty cycle of (1.5 hours "on", 0.5 hour						
Normal	<100K0	±3%	"off") in a humidity test chamber controlled at 40°C ±2°C and 90 to 95% relative humidity						
Туре	<100R32 =	±5%	(Sub-clause 4.24.2.1)						
Resistance Va	alue	∆R/R	Permanent resistance change after 1000 hours operating at RCWV with duty cycle of (1.5 hours "on",						
Normal	<56KΩ	±2%	0.5 hour "off") at 70°C ±2°C ambient						
Туре	≥56KΩ	±3%	(Sub-clause 4.23.1)						
o deterioration of arkings	protective of	coatings and	Specimens shall be immersed in a bath of trichloroethane completely for 3 minutes with ultrasonic (Sub-clause 4.30)						
	sistance change ximum Resistance Va Normal Type Resistance Va Normal Type deterioration of rkings	sistance change rate is $\pm(1)$ ximum Resistance Value Normal Type Topological Resistance Value Normal Type Science.com deterioration of protective or rkings	sistance change rate is ±(1% + 0.05Ω) ximum Resistance Value ΔR/R Normal <100KΩ $\frac{\pm 3\%}{\pm 5\%}$ Resistance Value ΔR/R Normal <56KΩ $\pm 2\%$ Type ≥56KΩ $\pm 3\%$ deterioration of protective coatings and trkings						

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Painting Method: Welding point, terminal and lead wire, is permissible to be exposed without the outer coated cover. The extent should be within 1/2 of the angle.



Marking: Resistor:

Resistor shall be marked with colour coding, colours shall be in accordance with JIS C 0802.



Specification Table

	Description	Wattage (mW)	Resistance Value	Part Number							
			1R	MCRE000001							
			1R2	MCRE000002	7						
	Carbon Film Resistor	125	1R5	MCRE000003	7						
			1R8	MCRE000004							
			2R2	MCRE000005							
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S	pecifica	ation	Table	
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	Description	Wattage (mW)	Resistance Value	Part Number							
			2R7	MCRE000006	1						
			3R3	MCRE000007							
			3R9	MCRE000008							
			4R7	MCRE000009							
			5R6	MCRE000010							
			6R8	MCRE000011							
			8R2	MCRE000012							
			10R	MCRE000013							
			12R	MCRE000014							
			15R	MCRE000015							
	Carbon Film Resistor	125	18R	MCRE000016							
			22R	MCRE000017							
			27R	MCRE000018							
			33R	MCRE000019	1						
			39R	MCRE000020							
			47R	MCRE000021							
			56R	MCRE000022							
			68R	MCRE000023							
			82R	MCRE000024							
			100R	MCRE000025							
			120R	MCRE000026							
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Specification Table

n	Wattage (mW)	Resistance Value	Part Number						
		150R	MCRE000027						
		180R	MCRE000028						
		220R	MCRE000029						
		270R	MCRE000030						
		330R	MCRE000031						
		390R	MCRE000032						
		470R	MCRE000033						
		560R	MCRE000034						
		680R	MCRE000035						
		820R	MCRE000036						
arbon Film Resistor	125	1K	MCRE000037						
		1K2	MCRE000038						
		1K5	MCRE000039						
		1K8	MCRE000040						
		2K2	MCRE000041						
		2K7	MCRE000042						
		3K3	MCRE000043						
		3К9	MCRE000044						
		4K7	MCRE000045						
		5K6	MCRE000046						
		6K8	MCRE000047						
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Specification Table

Description	Wattage (mW)	Resistance Value	Part Number							
		8K2	MCRE000048	-						
		10K	MCRE000049	-						
		12K	MCRE000050	-						
		15K	MCRE000051	-						
		18K	MCRE000052	-						
		22K	MCRE000053	-						
		27K	MCRE000054	-						
		33K	MCRE000055							
		39K	MCRE000056							
		47K	MCRE000057							
Carbon Film Resistor	125	56K	MCRE000058							
		68K	MCRE000059							
		82K	MCRE000060							
		100K	MCRE000061							
		120K	MCRE000062							
		150K	MCRE000063							
		180K	MCRE000064							
		220K	MCRE000065	-						
		270K	MCRE000066	-						
		330K	MCRE000067	-						
		390K	MCRE000068							
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	MCRE0000 Series	ECN #	REV	DESCRIPTION	DRAWN	DATE	CHECKD	DATE	APPRVD	DATE		
		-	А	RELEASED	Kiran	07/05/09	Suresh	07/05/09	Farnell	21/05/09		

Specification Table

Description	Wattage (mW)	Resistance Value	Part Number
		470K	MCRE000069
		560K	MCRE000070
Carbon Film Resistor	125	680K	MCRE000071
		820K	MCRE000072
		1M	MCRE000073

http://www.farnell.com

http://www.newark.com

http://www.cpc.co.uk

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