

# 高精度金属皮膜抵抗器仕様書

## (LMFQ50Sシリーズ)

商品名 : 高精度金属皮膜抵抗器(0.5%・ $\pm 25$ ppm)

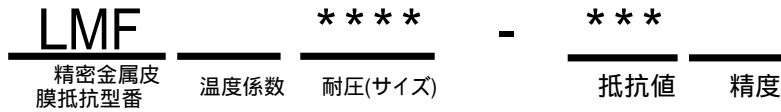
製品型番 : LMFQ50Sシリーズ(スモール1/2W)

### <製品特色>

- ・高精度金属皮膜抵抗器1/2Wスモールタイプ。
- ・精度補償範囲:  $\pm 0.5\%$ (精度補償範囲)/  $\pm 25$ ppm(温度係数)
- ・外觀寸法規格...本体:  $6\text{mm} \times 2.3\text{mm}$ (各 $\pm 0.2\text{mm}$ )/リード足: 両端各 $28\text{mm}$ (各 $\pm 2\text{mm}$ )
- ・フィルターetcの高精度定数用途、小信号オーディオ用途 他。



< 1:品番体系 >



温度係数	± ppm
N	100
H	50
Q	25

耐圧	W
25S	1/4
50S	1/2
100S	1

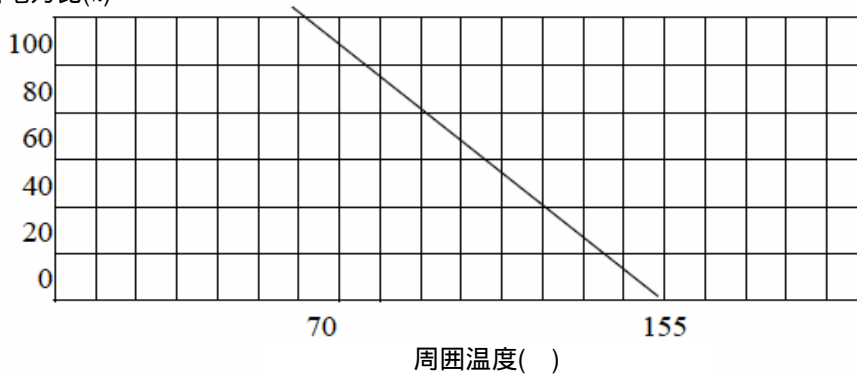
抵抗値	
10の桁	E24系列
1の桁	
10の乗数	0~5

精度	%
J	5
G	2
F	1
D	0.5

< 2:製品規格(耐圧・負荷軽減曲線) >

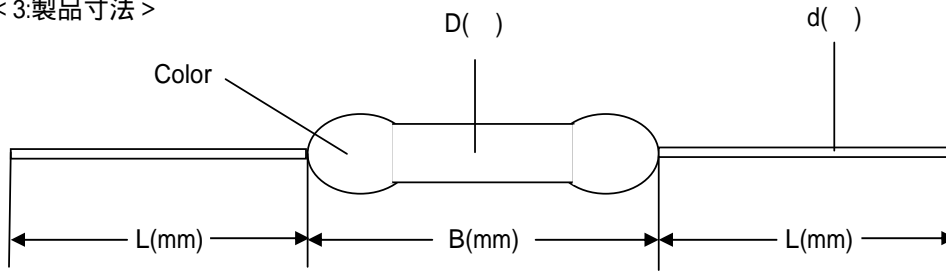
耐圧・サイズ	常用最大定格/絶対最大定格	抵抗値範囲
25S	200V/400V	10 ~ 1M
50S	250V/500V	10 ~ 1M
100S	350V/700V	10 ~ 1M

定格電力比(%)



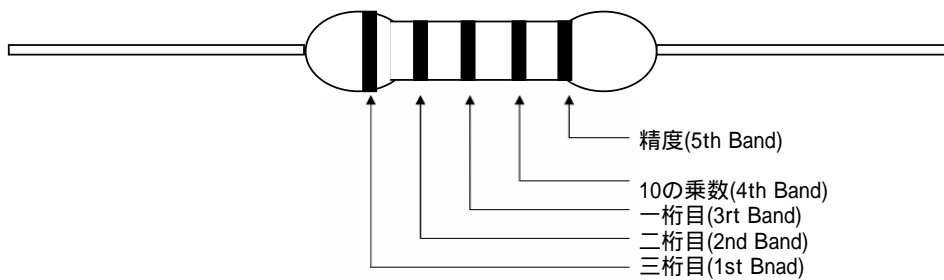
周囲温度70度以上にてご使用になられる場合は、上記グラフを参考の上で定格電力を落としてご利用下さい。

< 3: 製品寸法 >



耐圧・サイズ	L	B	D	d	Color
25S	28 ± 2.0	3.2 ± 0.2	1.8 ± 0.2	0.43	水色
50S	27 ± 2.0	6.0 ± 0.2	2.3 ± 0.2	0.45	水色
100S	26 ± 2.0	9.0 ± 0.2	3.2 ± 0.2	0.6	水色

< 4: 抵抗値表記方法 >



Color	1 st Band	2 nd Band	3 rt Band	4th Band	5 th Band
Black	0	0	0	10 <sup>0</sup>	
Brown	1	1	1	10 <sup>1</sup>	±1%
Red	2	2	2	10 <sup>2</sup>	± 2%
Orange	3	3	3	10 <sup>3</sup>	
Yellow	4	4	4	10 <sup>4</sup>	
Green	5	5	5	10 <sup>5</sup>	±0.5%
Blue	6	6	6	10 <sup>6</sup>	
Violet	7	7	7	10 <sup>7</sup>	
Grey	8	8	8	10 <sup>8</sup>	
White	9	9	9	10 <sup>9</sup>	
Gold				10 <sup>-1</sup>	± 5%
Silver				10 <sup>-2</sup>	

< 5:Technical Data-Sheet >

ITEM (STANDARD)	PERFORMANCE AND/OR QUALITY ACCEPTANCE	TEST METHOD
Current noise	$R_X < 100\text{Kohm}$ $0.2$ $100\text{ Kohm} \leq R_X \leq 1\text{Mohm}$ $0.4 \mu\text{ v/V}$ $1\text{Mohm} < R_X$ $0.6 \mu\text{ v/V}$	Use resistor noise tester model 315B Quean-tech laboratories INC.U.S.A.
Resistance value Vs Temperature Characteristics	$100(N) \cdot 50(H) \cdot Q(25)\text{ppm/}$	Measure resistance( $R_o$ ohm)at room temperature( $T_o$ °C) Measure again the same at 100°C higher than room temperature $\text{PPM} = \frac{R - R_o}{R_o} \times \frac{10^6}{(T_o + 100) - T_o}$
Short time overload	The resistance variation shall be with in $\pm(0.5\%+0.05\text{ohm})$ and there shall be no mechanical breakage	Apply DC voltage 2.5times the rated voltage for 5 seconds The leave at room temperature for 30 minutes then measure Max overload voltage 0.50W – 700V(DC)
Insulation resistance	10,000M ohm or more	Lay the resistor on 90° angle metal V block apply 100V DC between resistor lead and V block for one Minute And measure
voltage endurance	The resistance variation shall be with in $\pm(0.5\%+0.05\text{ohm})$ and there shall be no mechanical breakage	lay the resistor on the 90° angle metal V block and apply rated AC voltage for one Minute .Test voltage 0.25W – 500V(AC) 0.50W – 700V(AC)
Intermittent overload	Resistance variation variation shall be With in $\pm(0.5\%+0.05\text{ohm})$	Apply AC voltage 4 times the rated voltage for 1 second and rest for 25 seconds and repeat this cycle for 10.000±200 times leave resistor 30 minutes at room temperature after test and measure. Maximum voltage for intermittent overload .0.50W – 700V(AC)

ITEM (STANDARD)	PERFORMANCE AND/OR QUALITY ACCEPTANCE	TEST METHOD								
Terminal strength	Resistance variation shall be with in $\pm(0.5\%+0.05\text{ohm})$ also there shall be on mechanical breakage	Pull test: apply 1kg force to the lead in the direction of lead axis for $30\pm 5$ seconds. Bend test: apply 500g at $90^\circ$ angle against the direction of lead axis then bend the lead $90^\circ$ angle and bend back the lead to mabe it straight then bend the bend the lead $90^\circ$ to the opposite direction)								
Vibration (Low Frequency)	Resistance variation shall be With in $\pm(1\%+0.05\text{ohm})$ and there shall be no mechanical breakage	Apply 1.5mm amplitude vibration to there directions perpendicular to each other 2 hours each total 6 hours. vibrating frequency is 10HZ – 55HZ – 10HZ cycle in in one minute and repeat cycle								
Heat resistively against soldering	Resistance variation shall be With in $\pm(0.5\%+0.05\text{ohm})$ also there shall be no mechanical breakage	Dip the lead into a solder bath having a temperature of $350^\circ\text{C}\pm 10^\circ\text{C}$ up to $4\pm 0.8\text{mm}$ from the body of the resistor and hold it for $3\pm 0.5$ seconds leave the resistor at room temperature 3 hours after after test ,then measure								
Solder ability	More than 95% of the surface of the lead Shall be covered by new solder after the Leads are dipped in the solder	Dip the lead into a solder bath having a temperature of $230^\circ\text{C}\pm 5^\circ\text{C}$ up to $4\pm 0.8\text{mm}$ from the body of the resistor and hold it for $5\pm 0.5$ seconds then inspect								
Temperature cycle	Resistance variation shall be With in $\pm(0.5\%+0.05\text{ohm})$ also there shall be no mechanical breakage	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Sequence</td> <td style="width: 25%; text-align: center;">1</td> <td style="width: 25%; text-align: center;">2</td> <td style="width: 25%; text-align: center;">3</td> <td style="width: 25%; text-align: center;">4</td> </tr> </table>	Sequence	1	2	3	4			
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		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Temperature-</td> <td style="width: 25%; text-align: center;"><math>55^\circ\text{C}</math></td> <td style="width: 25%; text-align: center;"><math>25^\circ\text{C}</math></td> <td style="width: 25%; text-align: center;"><math>155^\circ\text{C}</math></td> <td style="width: 25%; text-align: center;"><math>25^\circ\text{C}</math></td> </tr> </table>	Temperature-	$55^\circ\text{C}$	$25^\circ\text{C}$	$155^\circ\text{C}$	$25^\circ\text{C}$			
		Temperature-	$55^\circ\text{C}$	$25^\circ\text{C}$	$155^\circ\text{C}$	$25^\circ\text{C}$				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">Time</td> <td style="width: 25%; text-align: center;">30</td> <td style="width: 25%; text-align: center;">10 – 15</td> <td style="width: 25%; text-align: center;">30</td> <td style="width: 25%; text-align: center;">10-15</td> </tr> <tr> <td></td> <td style="text-align: center;"><small>Min.</small></td> <td style="text-align: center;"><small>Min.</small></td> <td style="text-align: center;"><small>Min.</small></td> <td style="text-align: center;"><small>Min.</small></td> </tr> </table>	Time	30	10 – 15	30	10-15		<small>Min.</small>	<small>Min.</small>	<small>Min.</small>	<small>Min.</small>
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	<small>Min.</small>	<small>Min.</small>	<small>Min.</small>	<small>Min.</small>						
<p>One cycle consist 1-2-3-4 described above test for continuous 5 cycles and leave at room temperature for 1 hour after test, then measure</p>										

ITEM (STANDARD)	PERFORMANCE AND/OR QUALITY ACCEPTANCE	TEST METHOD
Humidity load test	Resistance variation be With in $\pm(1.5\%+0.05\text{ohm})$ also there shall be no mechanical breakage	In temperature chamber having temperature $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ , relative humidity 90-95%, apply rated voltage 1.5hour and shut voltage 0.5 hour repeat this cycle for 1000 hours,leave in room temperature for 1hour after test,then measure
Load test	The variation of the resistance shall be With in $\pm(1.5\%+0.05\text{ohm})$ also there shall be no mechanical breakage	In the constant temperature chamber having temperature $70^{\circ}\text{C}\pm 2^{\circ}\text{C}$ , apply rated DC voltage for 1.5hour and shut voltage for 0.5 hour and repeat this cycle for 1000 hours,Leave in room temperature 1hour after test.Then measure