

PBR 5110/11/12

LPC Line Resistor Networks

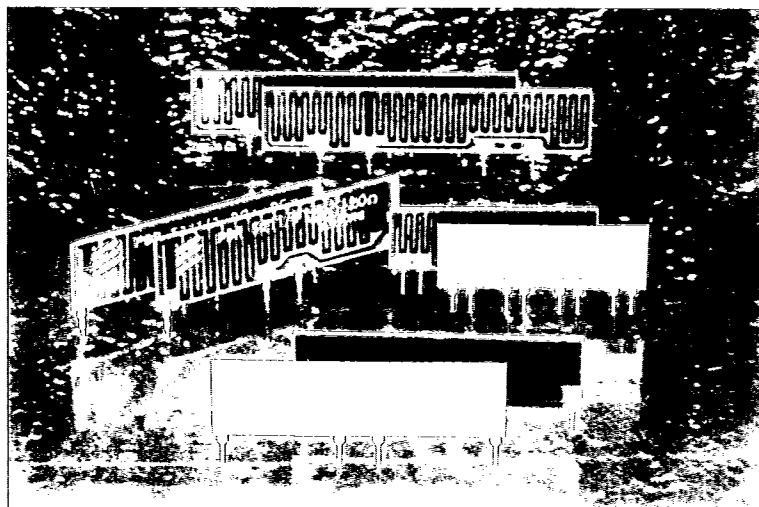
Description

Line protective components (LPC) PBR 5110/11/12 each consist of a ratio matched pair of thickfilm resistors with one resistor screened onto either side of a ceramic substrate. PBR 5110/11/12 is used in telephone line interface overvoltage protection networks, where the LPC resistors limit the current flow through voltage clamping devices such as diodes, transzorbs, silicon thyristor diode transient suppressors etc. The resistors will withstand multiple voltage/current surges of either polarity without failure and with little change in value or ratio match. When exposed to power cross conditions, the subjected resistor will break (fuse function) and open the circuit.

The PBR 5110/11/12 is constructed from non-flammable materials. Meets requirements as set forth in CCITT K20 or Bellcore LSSGR resp. TR-TSY-000057.

Key features

- Two ratio matched resistors in a single-in-line package
- Ratio match maintained after exposure to multiple surges
- Fuse function when exposed to power cross conditions
- Non-flammable materials
- Auto-insertable



Line Resistor Networks
PBR 5110/11/12

PBR 5110/11/12

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T-62-05

Absolute Maximum Ratings, general

Parameter	Min	Max	Unit
Temperature			
Storage temperature range	- 55	+ 125	°C
Operating temperature range	- 40	+ 100	°C
Power Cross			
Time to fail open (Conditions note 1)		1	s

Surge voltage

As specified below for resp. product. Definitions note 2.

Electrical Characteristics, general

Parameter	Conditions	Min	Typ	Max	Unit
Temp. coefficient of resistance	-55°C to +125°C	- 100		+ 500	ppm/°C
Ratio temp coeff.	-55°C to +125°C	- 50		+ 50	ppm/°C
Insulation resistance R1 to R2	500 V	1000			Mohm

1) Conditions: $T_{amb} = 25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ a.c. voltage = 100 Vrms, 50 Hz, 0 ohm series resistance

The fail condition is specified as:

If overload is applied to the circuit it will break the substrate and fail open. Resistance will be ≥ 1 Mohm.

2) Definitions and surge shapes according to IEC 60-2, section 4.

Rise time (tr) $1,67 \times (30-90\% \text{ of } V_p)$ Fall time (tf) $tr + \text{time to } 50\% \text{ of } V_p$ Rise time, fall time and peak voltage (V_p) are defined over the device under test (DUT)

PBR 5110

 $T_{amb} = 25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ unless otherwise stated.

Maximum Ratings

Parameter	Min	Max	Unit
Surge voltage			
Surge voltage, long surge (tr/tf= 10/1000 μs)		286	V
Surge voltage, short surge (tr/tf= 1/2 μs)		430	V
Resistance drift after 10 surges with 10s time elapsed between each surge	- 1	+ 1	%
Power dissipation			
$T_{amb} = 100^{\circ}\text{C}$			
Per resistor		0.5	W
Per component		1.0	W

Electrical Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Nominal resistance value, $R1 = R2$			20		Ohm
Resistance tolerance		- 5		+ 5	%
Resistance ratio $R1/R2$			1		
Ratio tolerance		- 1		+1	%

Connections:

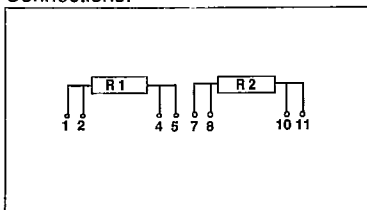


Fig. 1. Circuit diagram.

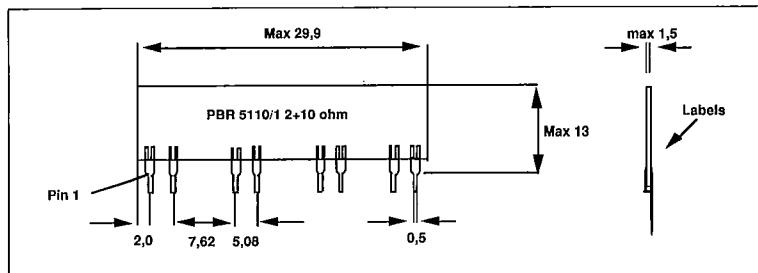


Fig. 2. Mechanical dimensions in mm.

PBR 5111/1
 $T_{amb} = 25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ unless otherwise stated.

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Maximum Ratings

Parameter	Min	Max	Unit
Surge voltage			
Surge voltage, long surge ($t_r/t_f = 10/1000 \mu\text{s}$)			
Surge voltage, short surge ($t_r/t_f = 1/2 \mu\text{s}$)		600	V
Resistance drift after 10 surges		1500	V
with 10s time elapsed between each surge	-1	1	%
Power dissipation			
$T_{amb} = 100^{\circ}\text{C}$			
Per resistor		1,0	W
Per component		2,0	W

Electrical Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Nominal resistance value, $R1 = R2$			20		ohm
Resistance tolerance		- 1		+ 1	%
Resistance ratio $R1/R2$			1		%
Ratio tolerance		- 1		+ 1	%

PBR 5111/2
 $T_{amb} = 25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ unless otherwise stated.

Maximum Ratings

Parameter	Min	Max	Unit
Surge voltage			
Surge voltage, long surge ($t_r/t_f = 10/1000 \mu\text{s}$)			
Surge voltage, short surge ($t_r/t_f = 1/2 \mu\text{s}$)		450	V
Resistance drift after 10 surges		665	V
with 10s time elapsed between each surge	-1	1	%
Power dissipation			
$T_{amb} = 100^{\circ}\text{C}$			
Per resistor		0,5	W
Per component		1,0	W

Electrical Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Nominal resistance value, $R1 = R2$			20		ohm
Resistance tolerance		- 1		+ 1	%
Resistance ratio $R1/R2$			1		%
Ratio tolerance		- 1		+ 1	%

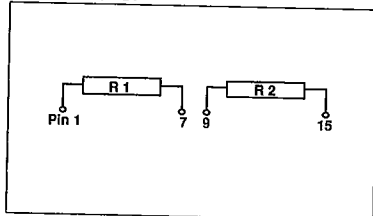
Connections:


Fig. 3. Circuit diagram.

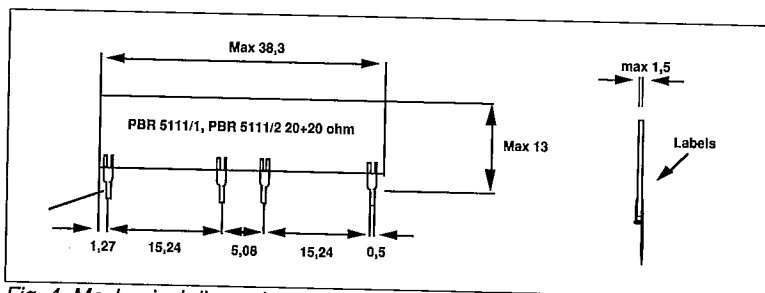


Fig. 4. Mechanical dimensions in mm.

PBR 5110/11/12

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T-62-05

PBR 5112

 $T_{amb} = 25^{\circ}\text{C} \pm 2^{\circ}\text{C}$ unless otherwise stated.

Maximum Ratings

Parameter	Min	Max	Unit
Surge Voltage			
Surge voltage, long surge ($tr/tf = 10/1000 \mu\text{s}$)		1000	V
Surge voltage, short surge ($tr/tf = 1/10 \mu\text{s}$)		2500	V
Resistance drift after 100 surges with 60s time elapsed between each surge	- 2	+ 2	%
Power Dissipation			
$T_{amb} = 70^{\circ}\text{C}$		3.0	W
Per resistor		3.0	W
Per component			

Electrical Characteristics

Parameter	Conditions	Min	Typ	Max	Unit
Nominal resistance value, $R1 = R2$			40		ohm
Resistance tolerance		- 2		+ 2	%
Resistance Ratio $R1/R2$			1		%
Ratio tolerance		- 0.5		+ 0.5	%

The network withstands 34W (50Hz) for 1 second with a maximum relative change in resistance of $\pm 2.0\%$ and no greater change in the ratio than $\pm 0.5\%$.

Connections:

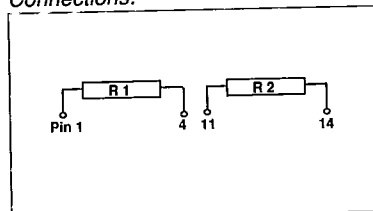


Fig. 5. Circuit diagram.

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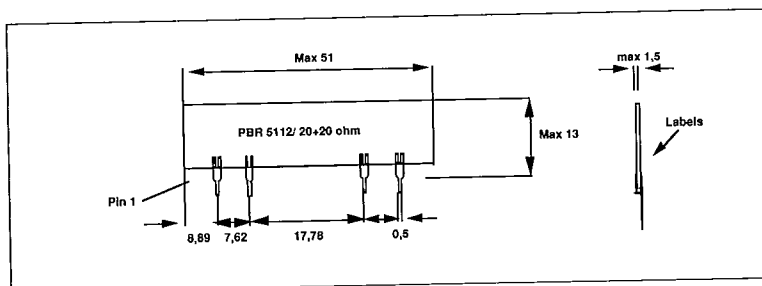


Fig. 6. Mechanical dimensions in mm.

Quality Specifications

The LPC is delivered at the following AQL level for powercross and surge voltage:

AQL = 1.0, level S-3, IEC 410, MIL-STD 105D.

All other parameters AQL = 0.65%, Category IEC 40/125/56 in applicable parts.

Verification according to IEC 68-2.

Pins

Connector grid 2.54 mm.

Marking

Each LPC is marked with:

- * The Ericsson Logotype
- * The product number

* Code of manufacture:
Plant, year and week.

Ordering Information

Products may be ordered according to the following part numbers.

Part number	Description
PBR 5110X	2 x 10 Ohm
PBR 5111/1X	2 x 20 Ohm
PBR 5111/2X	2 x 20 Ohm
PBR 5112X	2 x 40 Ohm

X = Packaging: K or T.

K = Individually fixed in plastic boxes.
The length of the connector pins are $3.2 \text{ mm} \pm 0.2 \text{ mm}$.

T = Tape according to IEC 286-2 standard which also defines the length of the pins.