

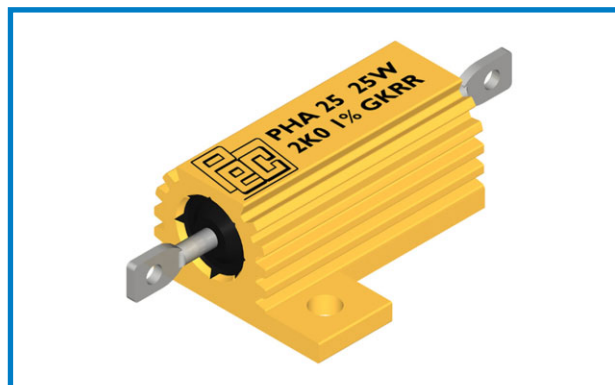


Aluminium Housed, Chassis Mount

Series PHA

Key Features

- External Aluminium Encasing.
- Power Rating 25W, 50W.
- Excellent Stability in Operation.
- Non-Inductive and Close Tolerance Types.
- All Welded Construction for Maximum Reliability.
- Moulded Construction for Excellent Environmental Protection
- Reference Standards
 - BS CECC 40203-001 • MIL-R-18546



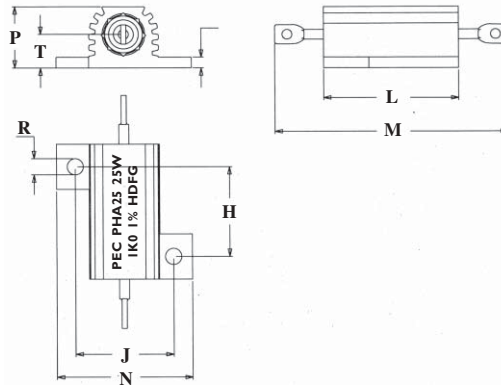
Electrical Specifications and Environmental Characteristics

Electrical Specifications	PHA25	PHA50
Tolerance	±0.05%, ±0.1%, ±0.25%, ±0.5%, ±1%, ±2%, ±3%, ±5%, ±10%	
TCR	For <10Ω : < ±100ppm/°C ; For >10Ω : < ±50ppm/°C	
Resistance Range	R051 - 20K	R010 - 100K
Dielectric Strength	2500 V	2500 V
Max.Working Voltage	550V	1250V
Surface Temp.Rise Mounted on a Std. Heat Sink in °C / Watt	4	2.9
Std. Heat Sink Area	535	535
Std. Heat Sink Thickness	1	1
Approx. Weight	12.5	29
Dissipation @25°C (With Heat Sink)	25	50
Dissipation @25°C (Without HeatSink)	12.5	20
Stability at Rated Power	±1%	±1%
CECC Style Reference	CA	DA
MIL - Style	RE70	RE75
Climatic Category	55/200/56	55/200/56

Performance Characteristics

Test Methods	Test Conditions	Test Limits
Endurance at Room Temperature	As per BS-CECC (1.5Hrs ON, 0.5Hrs OFF) for 1000Hrs.	ΔR < 1% + 0R05
Short Term Overload	5 x Rated Power or Isolation Voltage (Lesser of the two Voltages)	ΔR < 1% + 0R05
Robustness of Terminations	As per BS-CECC Clause 4.14.2, 20N Tensile Force	ΔR < 0.25% + 0R05
Resistance to Soldering Heat	As per BS-CECC Clause 4.15.2, 260°C, 10 Seconds	ΔR < 0.25% + 0R05
Rapid Change of Temperature	-55°C/200°C, 5 Cycles as per BS-CECC Clause 4.16	ΔR < 0.25% + 0R05
Bump	4000 Bumps at 40g as per BS-CECC Clause 4.17	ΔR < 0.25% + 0R05
Vibration	10Hz to 500Hz, 0.75mm Amplitude or 10g, 6 hrs	ΔR < 0.25% + 0R05
Damp Heat Steady State	90-95% RH, 40°C, 56 Days as per BS-CECC Clause 4.21	ΔR < 1% + 0R05

Dimensions



Do not Scale Drawings.
All dimensional tolerances in mm.

Dimensions (mm)

Type	H	J	L		M	N	P	R		T		
	± 0.3	± 0.3	Max	Nom	Max	Nom	Max	Min	Nom	± 0.3	Max	Nom
PHA25	18.3	19.8	29.0	27.5	51.8	28.0	15.0	2.8	3.3	6.7	3.2	2.0
PHA50	39.7	21.4	51.0	50.0	72.5	30.0	17.0	2.8	3.3	7.9	3.2	2.3

Dimensions (Inches)

Type	H	J	L		M	N	P	R		T		
	± 0.012	± 0.012	Max	Nom	Max	Nom	Max	Min	Nom	± 0.012	Max	Nom
PHA25	0.72	0.78	1.142	1.082	2.039	1.102	0.59	0.110	0.129	0.283	0.126	0.079
PHA50	1.563	0.843	2.008	1.969	2.854	1.181	0.669	0.110	0.130	0.311	0.126	0.091

To Order - Please Specify

PEC Type.	Ohmic Value	Tolerance	Packing Style	Release Condition	Special Request If Any.
PHA25	0.1 Ohm » 0R1 / R10	1% » F	Bulk » B	Commercial » X	Standard » S
	1 Ohm » 1R0	2% » G		CECC » F	Others » M
	1 KOhm » 1K0	5% » J		MIL » M	Please Specify
	10.7 KOhm » 10K7	10% » K			

A Sample Part No.: **PHA25 1K0 FBXS**

Notes

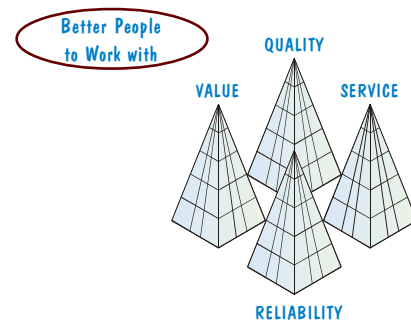
- On request we undertake tests for Batch Acceptance to a specified Reference Standard.
- The Derating Curve specifies the maximum allowable Power at a particular ambient temperature while ensuring that the maximum surface temperature remains within the designed limit.
- When the Resistor is subjected to a Pulse Load, please ensure that the *average* Power dissipated remains below the rated Power specified.
- Resistor performance with Pulse Loads will have to be application tested. Please utilise our Pulse Application Questionnaire for selecting a suitable type or for requesting any design-in assistance from us.

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To offer our products through regionally trusted services we have territory-wise and product-wise distribution, franchising, resale and private brand labelling arrangements. For cost-effective and enduring solutions to your needs, for tailored stocking/delivery scheduling, logistics and administrative support, please do not hesitate to contact us or any of our associated representatives, coordinators and product specialists.

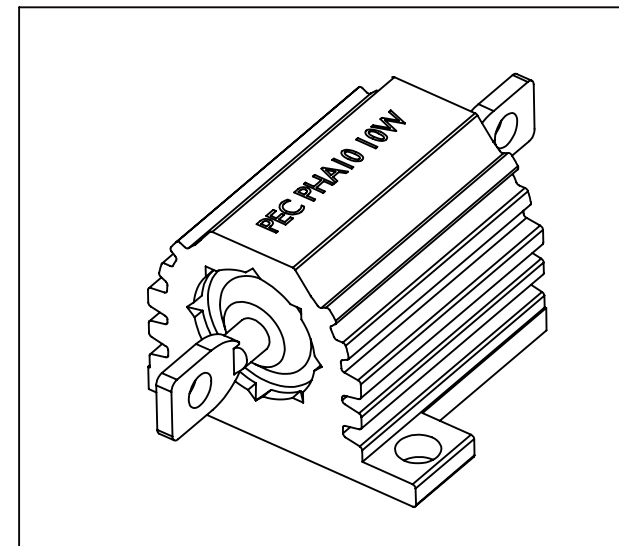


Thoughtful engineering and production by a well trained work-force, backed by strong design and development skills, enable us to maintain a level of manufacture and service recognised internationally.
At PEC we offer well-tuned customised support.

ALUMINIUM HOUSED, CHASSIS MOUNT WIRE WOUND RESISTOR

Key Features

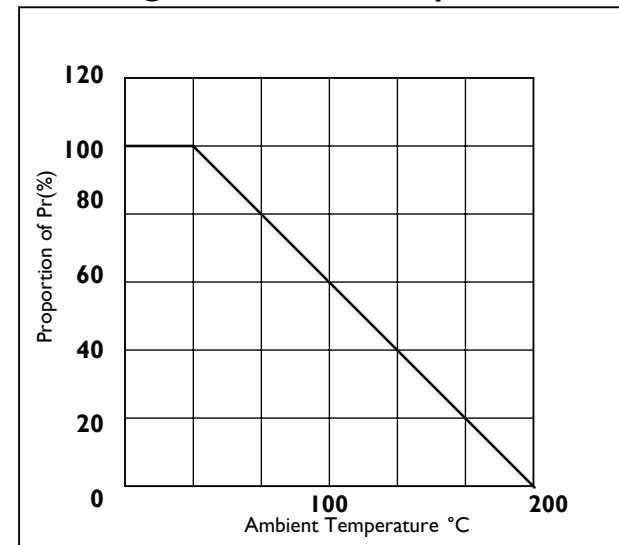
- External Aluminium Casing
- Power Rating 10W, 15W
- Excellent stability in Operation
- Non-Inductive and Close Tolerance Types
- All Welded Construction for Excellent Reliability
- Moulded Construction for Excellent Environmental Protection
- RoHS Compliant
- Reference Standards
 - BS CECC 40203-001



Electrical Specifications and Environmental Characteristics:

Electrical Specifications	PHA 10	PHA 15
TCR	For $\geq 5\Omega$ to $\leq 10\Omega$: $< \pm 100\text{ppm}/^\circ\text{C}$; For $> 10\Omega$: $\pm 50\text{ppm}/^\circ\text{C}$	
Tolerance	$\pm 0.05\%$, $\pm 0.1\%$, $\pm 0.25\%$, $\pm 0.5\%$, $\pm 1\%$, $\pm 2\%$, $\pm 3\%$, $\pm 5\%$, $\pm 10\%$	
Resistance Range	0R01-10K	0R01-20K
Dielectric Strength AC PEAK	1400V	1400V
Max. Working Voltage	150V	250V
Surface Temp. Rise Mounted on Std. Heat Sink in $^\circ\text{C}/\text{Watt}$	16	10
Std. Heat Sink Area	410	410
Std. Heat sink Thickness	1	1
Approx. Weight(g)	3.6	5.6
Dissipation @25 $^\circ\text{C}$ (With Heat Sink)	10	15
Dissipation @25 $^\circ\text{C}$ (Without Heat Sink)	5.5	8
Stability at Rated Power	$\pm 1\%$	$\pm 1\%$
CECC Style Reference	AA	BA
MIL-Style	RE60	RE65
Climatic Category	55/200/56	55/200/56

Derating for Ambient Temperature



This publication provides indicative information. A contract for supply or purchase should be jointly agreed to separately. Errors and Omissions excepted (E&OE). Specifications are subject to change.

HYBRID: INCH (METRIC) METRIC (INCH) INCH METRIC
 GENERAL LIMITS (AS APPLICABLE) - UNLESS OTHERWISE SPECIFIED

<input type="checkbox"/> ALL DIMENSIONS IN	INCHES	MILLIMETRES	<input type="checkbox"/> DRAWING PRACTICE TO BIS
<input type="checkbox"/> TOL. ON LINEAR DIMENSIONS WITH NO DECIMAL DIGIT	± 0.04	± 1.0	
<input type="checkbox"/> TOL. ON LINEAR DIMENSIONS WITH ONE DECIMAL DIGIT	± 0.02	± 0.5	
<input type="checkbox"/> TOL. ON LINEAR DIMENSIONS WITH TWO DECIMAL DIGITS	± 0.01	± 0.25	
<input type="checkbox"/> TOL. ON ANGLES	$\angle \pm 2^\circ$	$\angle \pm 2^\circ$	

DISTRIBUTION
 Ch. Ex. MR Hd. D/G
 G. Ref. QA SE
 MM QC Prodn.
 CM D/G EM

PROJECT REFERENCE, PART No. AND / OR DRAWING ID

FIRST ANGLE PROJECTION

PRECISION ELECTRONIC COMPONENTS MFG. CO.
 HYDERABAD, INDIA
 Ph. +91 (0)40 2712 0283 Email. engg@pecccomponents.com



ZONE	REF.	DRAWING / PART ID	DESCRIPTION	MATERIAL	NO. OFF.
MATERIAL AND SPECIFICATION		PROCESS SPECIFICATION / FINISH SPECIFICATION / HEAT TREATMENT / PROTECTIVE TREATMENT			
ZONE	ISSUE	DATE	ALTERATION REF.		

DESIGN REDESIGN	Not Applicable
DRAWN REDRAWN	NTR
CHECKED RECHECKED	VR
STRESSED RESTRESSED	Not Applicable
APPROVED REAPPROVED	VR

SOFTWARE AND CAD FILE REFERENCE	TITLE
WEIGHT metric (FPS)	SCALE
ESTIMATE	
ACTUAL	

ALUMINIUM HOUSED, CHASSIS MOUNT WIRE WOUND RESISTOR

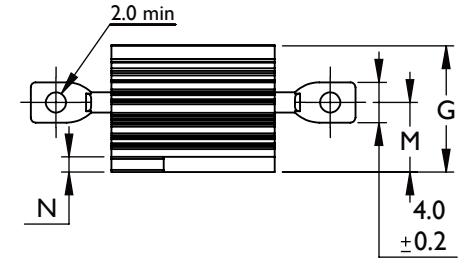
DRAWING / PART ID AND REV. SHEET 1 of 1 SIZE A4

PHA10-PHA15

Physical Data

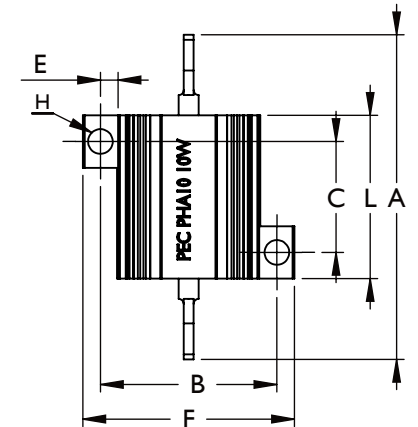
Dimensions mm (inches)

Type	A	B	C	E	F	G	H	L	M	N
	Max	±0.3	±0.3	Min	Max	Max	Dia ±0.2	Max	±0.5	Max
PHA10	30.0 (1.181)	12.4 (0.488)	11.3 (0.444)	1.9 (0.074)	17.0 (0.669)	9.0 (0.354)	2.4 (0.094)	17.0 (0.669)	4.3 (0.169)	1.8 (0.070)
PHA15	36.5 (1.437)	15.9 (0.625)	14.3 (0.562)	1.9 (0.074)	21.0 (0.826)	11.0 (0.433)	2.4 (0.094)	21.0 (0.826)	5.2 (0.204)	2.2 (0.070)



Performance Characteristics:

Test Methods	Test Conditions	Test Limits
Endurance at Room Temperature	As per BS-CECC (1.5Hrs ON, 0.5 Hrs OFF) for 1000 Hrs	Δ R<1%+0R05
Short Term OverLoad	5 x Rated Power or Isolation Voltage(Lesser of the two Voltages)	Δ R<1%+0R05
Robustness of Termination	As per BS-CECC Clause 4.14.2, 20N Tensile Force	Δ R<0.25%+0R05
Resistance to Soldering Heat	As per BS-CECC Clause 4.15.2, 260°C, 10 Seconds	Δ R<0.25%+0R05
Rapid Change of Temperature	-55°C/200°C, 5 Cycles as per BS-CECC Clause 4.16	Δ R<0.25%+0R05
Bump	4000 Bumps at 40g as per BS-CECC Clause 4.17	Δ R<0.25%+0R05
Vibration	10Hz to 500Hz, 0.75mm Amplitude or 10g, 6 hrs	Δ R<0.25%+0R05
Damp Heat Steady State	90-95% RH, 40°C, 56 Days as per BS-CECC Clause 4.21	Δ R<1%+0R05
Insulation Resistance	1GΩ Min	



To Order- Please Specify

PEC Type.	Ohmic Value	Tolerance	Packing Style	Release Condition	Special Request If Any.
PHA 10	0.1 Ohm - 0R1/R10 1 Ohm - 1R0 1K Ohm - 1K0 10.7 KOhm - 10K7	1% - F 2% - G 5% - J 10% - K	Bulk - B	Commercial - X CEEC - F MIL - M	Standard - S Others -M Please specify

A Sample part No : PHA10-1K0-FBXS

This publication provides indicative information. A contract for supply or purchase should be jointly agreed to separately. Errors and Omissions excepted (E&OE). Specifications are subject to change

All dimensions are in mm

<input type="checkbox"/> HYBRID: INCH (METRIC) <input type="checkbox"/> METRIC (INCH) <input type="checkbox"/> INCH <input checked="" type="checkbox"/> METRIC GENERAL LIMITS (AS APPLICABLE) - UNLESS OTHERWISE SPECIFIED		DISTRIBUTION <input type="checkbox"/> Ch. Ex. <input type="checkbox"/> MR <input type="checkbox"/> Hd. D/G <input type="checkbox"/> G. Ref. <input type="checkbox"/> QA <input checked="" type="checkbox"/> SE <input checked="" type="checkbox"/> MM <input type="checkbox"/> QC <input checked="" type="checkbox"/> Prodn. <input type="checkbox"/> CM <input type="checkbox"/> D/G <input type="checkbox"/> EM		PROJECT REFERENCE, PART No. AND / OR DRAWING ID		FIRST ANGLE PROJECTION		PRECISION ELECTRONIC COMPONENTS MFG. CO. HYDERABAD, INDIA Ph. +91 (0)40 2712 0283 Email. engg@peccomponents.com			
<input type="checkbox"/> ALL DIMENSIONS IN INCHES <input type="checkbox"/> MILLIMETRES <input type="checkbox"/> TOL. ON LINEAR DIMENSIONS WITH NO DECIMAL DIGIT ±0.04 ±1.0 <input type="checkbox"/> TOL. ON LINEAR DIMENSIONS WITH ONE DECIMAL DIGIT ±0.02 ±0.5 <input type="checkbox"/> TOL. ON LINEAR DIMENSIONS WITH TWO DECIMAL DIGITS ±0.01 ±0.25 <input type="checkbox"/> TOL. ON ANGLES ∠ ±2° ∠ ±2°		<input type="checkbox"/> DRAWING PRACTICE TO BIS		DESIGN REDESIGN Not Applicable DRAWN REDRAWN NTR 17/09/2013 CHECKED RECHECKED VR 17/09/2013 STRESSED RESTRESSED Not Applicable APPROVED REAPPROVED VR 17/09/2013		SOFTWARE AND CAD FILE REFERENCE TITLE WEIGHT metric (FPS) SCALE ESTIMATE ACTUAL		DRAWING / PART ID AND REV. SHEET 1 of 1 SIZE A4 ALUMINIUM HOUSED, CHASSIS MOUNT WIRE WOUND RESISTOR PHA10-PHA15			
ZONE	REF.	DRAWING / PART ID	DESCRIPTION	MATERIAL	NO. OFF	ZONE	ISSUE	DATE	ALTERATION REF.	ZONE	ISSUE
MATERIAL AND SPECIFICATION				PROCESS SPECIFICATION / FINISH SPECIFICATION / HEAT TREATMENT / PROTECTIVE TREATMENT							