

Vitreous Wirewound Resistors with Lugs



FEATURES

- Complete welded construction
- Ceramic core
- High quality vitreous coating
- Available in adjustable = "E" or non inductive design = "Ni"
- Lugs with various termination styles suitable for soldering or bolt connection
- TCR 100 ppm/K to 180 ppm/K
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

STANDARD ELECTRICAL SPECIFICATIONS						
MODEL	POWER RATING $P_{40^\circ\text{C}}$ W	LIMITING VOLTAGE	TERMINAL	DIMENSIONS DIN 41432	RESISTANCE RANGE ⁽¹⁾ Ω	TOLERANCE $\pm$ %
GWS 15	15	250	SL	8 x 45	4.3 to 20K	5, 10
					30 to 15K	3
					220 to 20K	2
GWS 15 E	10	250	SL	8 x 45	4.3 to 620	5, 10
GWS 15 Ni					5.1 to 910	
GWS 20	20				3.6 to 30K	5, 10
GWS 20 E	15	300	SL, SS	10 x 50	180 to 30K	2
GWS 20 Ni					4.3 to 1K	5, 10
					5.1 to 1.3K	
GWS 25	25	300	SL, SS	13 x 55	3.6 to 39K	5, 10
					30 to 20K	3
					91 to 39K	2
GWS 25 E	18	300	SL, SS	13 x 55	5.1 to 1.3K	5, 10
GWS 25 Ni					6.8 to 1.8K	
GWS 35	30	400	SL, SS	13 x 62	5.1 to 47K	5, 10
					56 to 47K	2
					6.8 to 1.6K	5, 10
GWS 35 E	22	400	SL, SS	13 x 62	8.2 to 2.4K	
GWS 35 Ni						
GWS 50	40	400	SL, SS, SB, FST	16 x 63	3.3 to 62K	5, 10
					33 to 24K	3
					100 to 62K	2
GWS 50 E	30	400	SL, SS, SB, FST	16 x 63	8.2 to 2K	5, 10
GWS 50 Ni					10 to 3K	
GWS 75	65	800	SL, SS, SB, FST	16 x 100	7.5 to 130K	5, 10
					15 to 39K	3
					30 to 130K	2
GWS 75 E	45	800	SL, SS, SB, FST	16 x 100	18 to 3.9K	5, 10
GWS 75 Ni					22 to 6.2K	
GWS 100	80	600	SS, SSB, SB, FST	24 x 100	6.8 to 110K	5, 10
					20 to 51K	3
					75 to 110K	2
GWS 100 E	60	600	SS, SSB, SB, FST	24 x 100	13 to 5.1K	5, 10
GWS 100 Ni					24 to 6.8K	



STANDARD ELECTRICAL SPECIFICATIONS

MODEL	POWER RATING $P_{40^{\circ}\text{C}}$ W	LIMITING VOLTAGE	TERMINAL	DIMENSIONS DIN 41432	RESISTANCE RANGE ⁽¹⁾ Ω	TOLERANCE $\pm \%$		
GWS 220	160	1250	SS, SSB, SB, FST	24 x 165	13 to 160K	5, 10		
					30 to 100K	3		
GWS 220 E	120				56 to 160K	2		
GWS 220 Ni		30 to 10K		5, 10				
		51 to 16K						
GWS 300	300	2500		24 x 265	24 to 300K	5, 10		
					51 to 150K	3		
GWS 300 E	200				110 to 300K	2		
GWS 300 Ni					56 to 20K	5, 10		
					100 to 30K			
GWS 500	500				3000	34 x 330	39 to 270K	5, 10
							100 to 240K	3
GWS 500 E	300	75 to 270K		2				
		100 to 36K		5, 10				
GWS 30/100	150	1600		34 x 100	9.1 to 100K	5, 10		
					27 to 100K	2		
GWS 30/100 E	110				22 to 8.2K	5, 10		
GWS 30/133	200	2300		34 x 133	13 to 160K	5, 10		
					27 to 160K	2		
GWS 30/133 E	130				36 to 13K	5, 10		

Notes

- (1) Resistance value to be selected for $\pm 10 \%$ tolerance from E12 and for $\pm 5 \%$, $\pm 3 \%$, and $\pm 2 \%$ from E24
- For available "Mounting Accessories for Resistors", please see: www.vishay.com/doc?21015

PART NUMBER AND PRODUCT DESCRIPTION

Part Number: GWS01531009KLX000

G	W	S	0	1	5	3	1	0	0	9	K	L	X	0	0	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

MODEL	VARIANT/ TERMINAL	VALUE	TOLERANCE CODE	PACKAGING CODE	SPECIAL
GWS015 = GWS 15 GWS020 = GWS 20 GWS025 = GWS 25 GWS035 = GWS 35 GWS050 = GWS 50 GWS075 = GWS 75 GWS100 = GWS 100 GWS220 = GWS 220 GWS300 = GWS 300 GWS500 = GWS 500 GWSN84 = GWS 30/100 GWSN91 = GWS 30/133	3 = SL 4 = SS 5 = SB 6 = SSB 7 = FST 8 = E SL 9 = E SS A = E SB B = E SSB C = E FST D = Ni SL E = Ni SS F = Ni SB G = Ni SSB H = Ni FST I = SWI SL J = SWI SS K = SWI SB L = SWI SSB M = SWI FST Z = Value overflow (BV)	3 digit value 1 digit multiplier MULTIPLIER 8 = $\cdot 10^{-2}$ 9 = $\cdot 10^{-1}$ 0 = $\cdot 10^0$ 1 = $\cdot 10^1$ 2 = $\cdot 10^2$ 3 = $\cdot 10^3$	G = $\pm 2.0 \%$ H = $\pm 3.0 \%$ J = $\pm 5.0 \%$ K = $\pm 10.0 \%$	LX = Loose pack, without quantity ZX = Special pack (with BV #), without quantity	000 = Standard 3 digit code = Special version ⁽²⁾

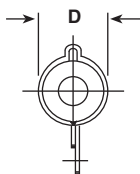
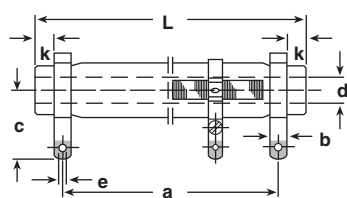
Product Description: GWS 15 SL 10R 10 % LX

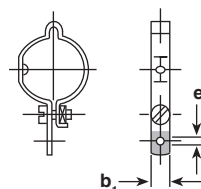
GWS 15	SL	10R	10 %	LX
MODEL ⁽³⁾	VARIANT/TERMINAL ⁽³⁾	VALUE ⁽³⁾	TOLERANCE CODE ⁽³⁾	PACKAGING DESCRIPTION ⁽⁴⁾

Notes

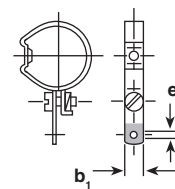
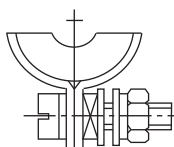
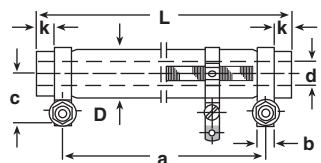
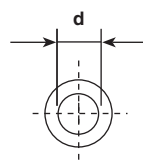
- (2) For special variants, special winding, or NI version, please contact: ww1resistors@vishay.com
- (3) See "Part Number" above
- (4) See "Packaging Code" above

DIMENSIONS in millimeters [inches]

SL TERMINALS

ADJUSTABLE LUGS

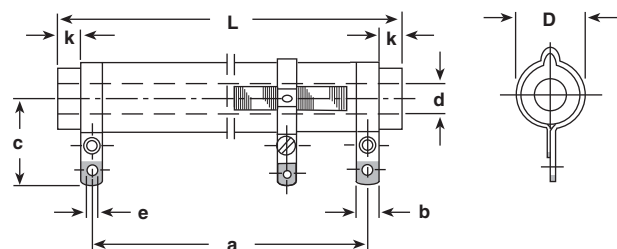
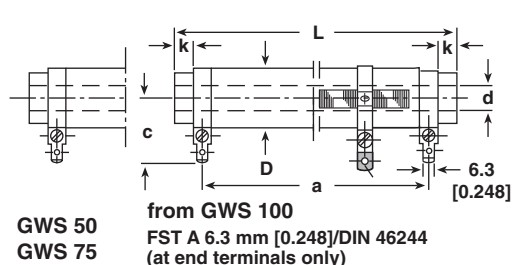
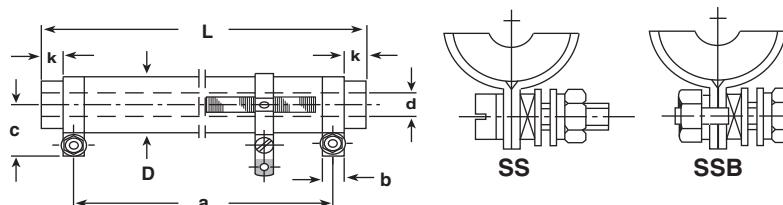
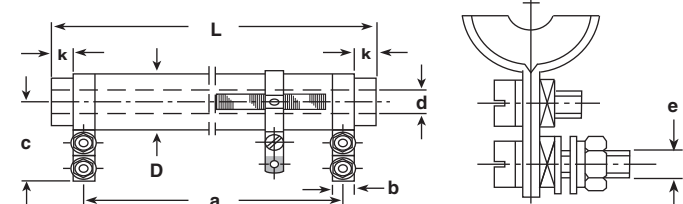
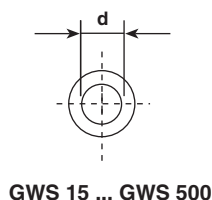
GWS 15 E
GWS 20 E


from GWS 25 E


SS TERMINALS

CORE SECTION


MODEL	GWS 15 GWS 15 E GWS 15 Ni	GWS 20 GWS 20 E GWS 20 Ni		GWS 25 GWS 25 E GWS 25 Ni		GWS 35 GWS 35 E GWS 35 Ni	
TERMINAL	SL	SL	SS	SL	SS	SL	SS
D	7.5 ± 0.5 [0.295 ± 0.020]	9.5 ± 0.5 [0.374 ± 0.020]		11.8 ± 0.8 [0.465 ± 0.031]		11.8 ± 0.8 [0.465 ± 0.031]	
L	45 ± 1.5 [1.772 ± 0.059]	50 ± 1.5 [1.969 ± 0.059]		55 ± 1.5 [2.165 ± 0.059]		62 ± 2 [2.441 ± 0.079]	
a ± 2 [a ± 0.079]	36 [1.417]	39 [1.535]	40 [1.575]	43 [1.693]	44 [1.732]	50 [1.969]	51 [2.008]
b	4 [0.157]	4 [0.157]	5 [0.197]	4 [0.157]	5 [0.197]	4 [0.157]	5 [0.197]
b ₁	4 [0.157]	4 [0.157]	4 [0.157]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]
c	15.5 [0.610]	18 [0.709]	10.5 [0.413]	19 [0.748]	11.5 [0.453]	19 [0.748]	11.5 [0.453]
d	2.6 [0.102]	3.5 [0.138]	3.5 [0.138]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]
e	1.5 [0.059]	2 [0.079]	M3 x 16	2 [0.079]	M3 x 16	2 [0.079]	M3 x 16
e ₁	2.8 [0.110]	2.8 [0.110]	2.8 [0.110]	2.8 [0.110]	2.8 [0.110]	2.8 [0.110]	2.8 [0.110]
k	2.5 [0.098]	3.5 [0.138]	2.5 [0.098]	4 [0.157]	3 [0.118]	4 [0.157]	3 [0.118]
Mass (g)	6	8		13		15	

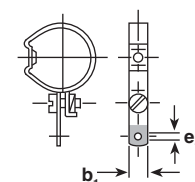
DIMENSIONS in millimeters [inches]

SL TERMINALS

FST TERMINALS

SS AND SSB TERMINALS

SB TERMINALS

CORE SECTION


GWS 15 ... GWS 500

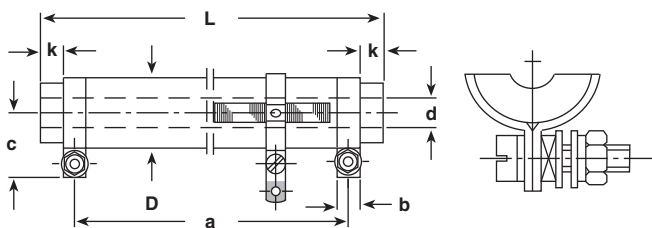
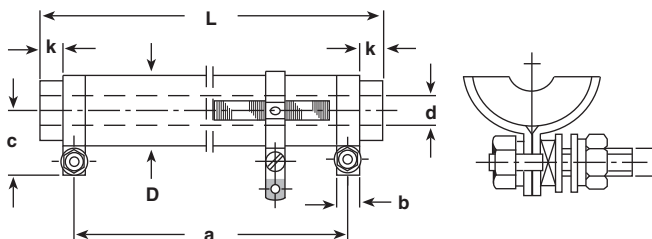
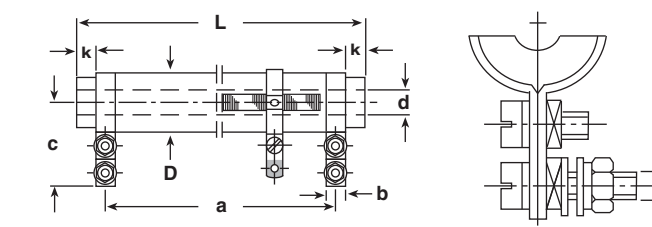
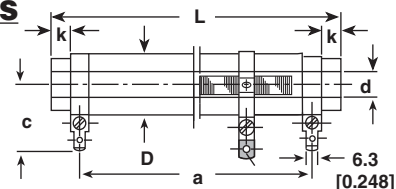
ADJUSTABLE LUGS

from GWS 25 E

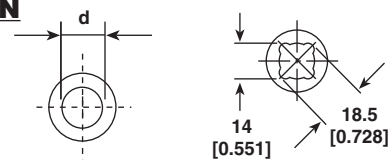


MODEL	GWS 50 GWS 50 E GWS 50 Ni				GWS 75 GWS 75 E GWS 75 Ni				GWS 100 GWS 100 E GWS 100 Ni				GWS 220 GWS 220 E GWS 220 Ni			
TERMINAL	SL	SS	SB	FST	SL	SS	SB	FST	SS	SSB	SB	FST	SS	SSB	SB	FST
D	14.8 ± 0.8 [0.583 ± 0.031]				14.8 ± 0.8 [0.583 ± 0.031]				22.3 ± 1.3 [0.878 ± 0.051]				22.3 ± 1.3 [0.878 ± 0.051]			
L	62 ± 2 [2.441 ± 0.079]				100 ± 2 [3.937 ± 0.079]				100 ± 2 [3.937 ± 0.079]				165 ± 2 [6.496 ± 0.079]			
a ± 2 [a ± 0.079]	50 [1.969]	51 [2.008]	51 [2.008]	48 [1.890]	86 [3.386]	87 [3.425]	87 [3.425]	84 [3.307]	72 [2.835]				136 [5.354]			
b	4 [0.157]	5 [0.197]	5 [0.197]	6.3 [0.248]	4 [0.157]	5 [0.197]	5 [0.197]	6.3 [0.248]	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]
b ₁	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]
c	20.5 [0.807]	13 [0.512]	23 [0.906]	23.5 [0.925]	20.5 [0.807]	13 [0.512]	23 [0.906]	23.5 [0.925]	18.5 [0.728]	18.5 [0.728]	29.5 [1.161]	27 [1.063]	18.5 [0.728]	18.5 [0.728]	29.5 [1.161]	27 [1.063]
d	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	5.5 [0.217]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]
e	2 [0.079]	M3 x 16			2 [0.079]	M3 x 16			M4 x 20			-	M4 x 20			-
e ₁	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]
k	4 [0.157]	3 [0.118]	3 [0.118]	3 [0.118]	5 [0.197]	4 [0.157]	4 [0.157]	4 [0.157]	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	10.5 [0.413]	10.5 [0.413]	10.5 [0.413]	10.5 [0.413]
Mass (g)	25				40				92				135			

DIMENSIONS in millimeters [inches]

SS TERMINALS

SSB TERMINALS

SB TERMINALS

FST TERMINALS


FST A 6.3 mm [0.248]/DIN 46244
(at end terminals only)

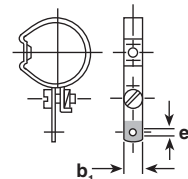
CORE SECTION


GWS 15 ... GWS 500

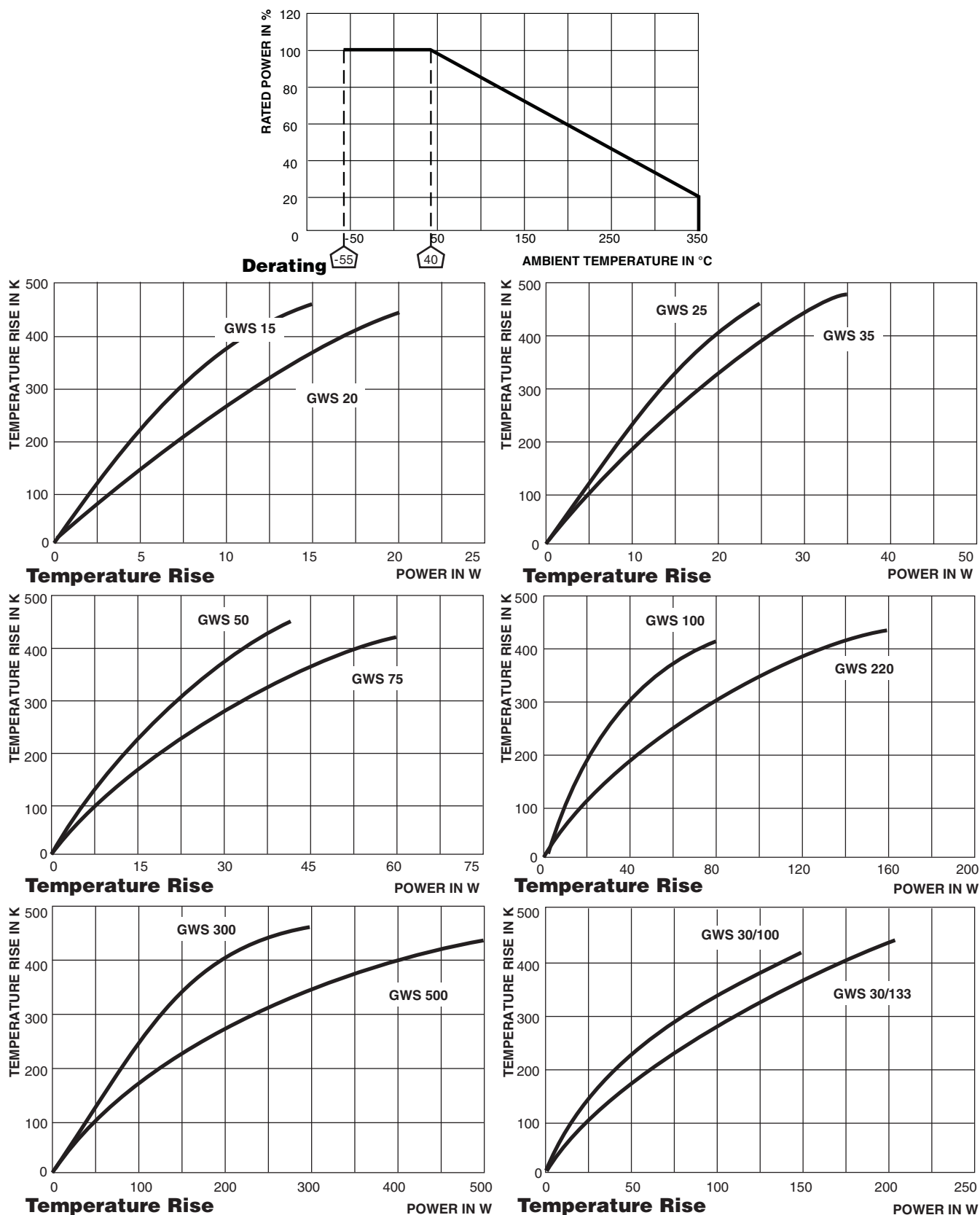
GWS 30/ ...

ADJUSTABLE LUGS

from GWS 25 E



MODEL	GWS 300 GWS 300 E GWS 300 Ni				GWS 500 GWS 500 E				GWS 30/100 GWS 30/100 E				GWS 30/133 GWS 30/133 E			
TERMINAL	SS	SSB	SB	FST	SS	SSB	SB	FST	SS	SSB	SB	FST	SS	SSB	SB	FST
D	22.3 ± 1.3 [0.878 ± 0.051]				32.5 ± 1.5 [1.280 ± 0.059]				32.5 ± 1.5 [1.280 ± 0.059]				32.5 ± 1.5 [1.280 ± 0.059]			
L	265 ± 4 [10.433 ± 0.157]				330 ± 5 [12.992 ± 0.197]				100 ± 2.5 [3.937 ± 0.098]				133 ± 3 [5.236 ± 0.118]			
a ± 2 [a ± 0.079]	235 [9.252]				280 [11.024]				85 [3.346]				118 [4.646]			
b	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]	8 [0.315]	8 [0.315]	8 [0.315]	6.3 [0.248]
b1	5 [0.197]	5 [0.197]	5 [0.197]	5 [0.197]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]	8 [0.315]
c	18.5 [0.728]	18.5 [0.728]	29.5 [1.161]	27 [1.063]	23.5 [0.925]	23.5 [0.925]	35 [1.378]	31.5 [1.240]	23.5 [0.925]	23.5 [0.925]	35 [1.430]	31.5 [1.240]	23.5 [0.925]	23.5 [0.925]	35 [1.378]	31.5 [1.240]
d	10 [0.394]	10 [0.394]	10 [0.394]	10 [0.394]	18.5 [0.728]	18.5 [0.728]	18.5 [0.728]	18.5 [0.728]	14 [0.551]	14 [0.551]	14 [0.551]	14 [0.551]	14 [0.551]	14 [0.551]	14 [0.551]	14 [0.551]
e	M4 x 20				M4 x 20				M4 x 20				M4 x 20			
e1	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	3.2 [0.126]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]	4.2 [0.165]
k	11 [0.433]	11 [0.433]	11 [0.433]	11 [0.433]	21 [0.827]	21 [0.827]	21 [0.827]	21 [0.827]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]	3.5 [0.138]
Mass (g)	238				425				183				265			





Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.