

## 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 please see [www.vishay.com/doc?99912](http://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 <sup>(1)</sup> $\Omega$	TOLERANCE $\pm$ %		
GWS 15	15	250	SL	9 x 45	4.3 to 20K	10, 5		
							30 to 15K	3
							220 to 20K	2
GWS 15 E	10				4.3 to 620	10, 5		
GWS 15 Ni					5.1 to 910	10, 5		
GWS 20	20	300	SL, SS	-	3.6 to 30K	10, 5		
							180 to 30K	2
							4.3 to 1K	10, 5
GWS 20 E	15				5.1 to 1.3K	10, 5		
GWS 20 Ni								
GWS 25	25	300	SL, SS	13 x 55	3.6 to 39K	10, 5		
							30 to 20K	3
							91 to 39K	2
GWS 25 E	18				5.1 to 1.3K	10, 5		
GWS 25 Ni					6.8 to 1.8K	10, 5		
GWS 35	30	400	SL, SS	-	5.1 to 47K	10, 5		
							56 to 47K	2
							6.8 to 1.6K	10, 5
GWS 35 E	22				8.2 to 2.4K	10, 5		
GWS 35 Ni								
GWS 50	40	400	SL, SS, SB, FST	16 x 63	3.3 to 62K	10, 5		
							33 to 24K	3
						100 to 62K	2	
GWS 50 E	30			16 x 63	8.2 to 2K	10, 5		
GWS 50 Ni						10 to 3K	10, 5	
GWS 75	65	800	SL, SS, SB, FST	16 x 100	7.5 to 130K	10, 5		
							15 to 39K	3
							30 to 130K	2
GWS 75 E	45				18 to 3.9K	10, 5		
GWS 75 Ni					22 to 6.2K	10, 5		
GWS 100	80	600	SS, SSB, SB, FST	24 x 100	6.8 to 110K	10, 5		
							20 to 51K	3
							75 to 110K	2
GWS 100 E	60				13 to 5.1K	10, 5		
GWS 100 Ni					24 to 6.8K	10, 5		



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

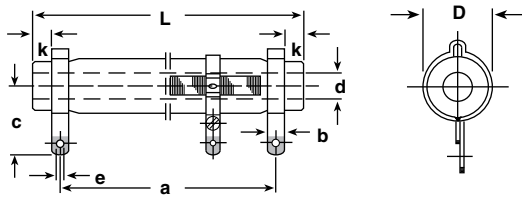
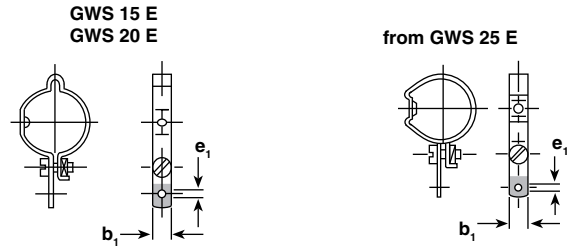
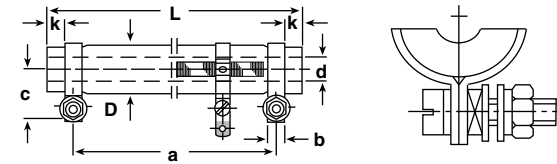
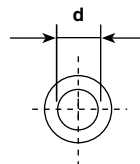
Notes

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

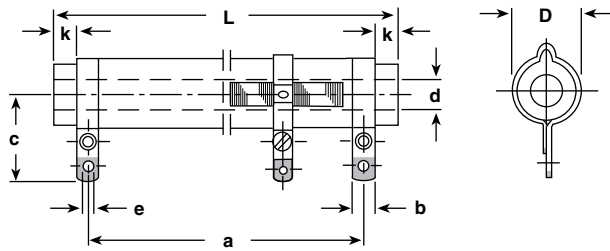
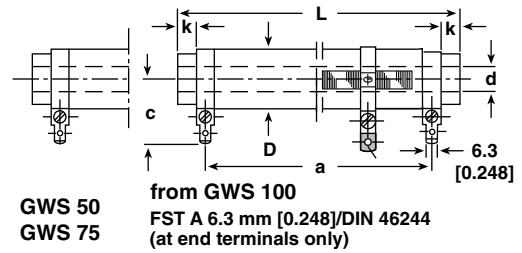
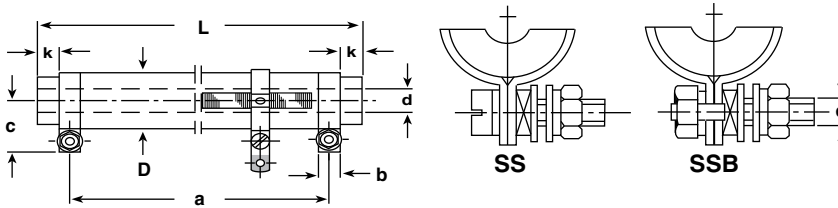
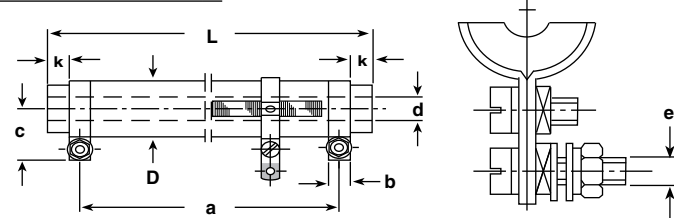
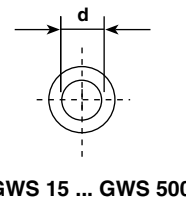
PART NUMBER AND PRODUCT DESCRIPTION																
Part Number: GWS01531009KLX000																
G	W	S	0	1	5	3	1	0	0	9	K	L	X	0	0	0
MODEL		VARIANT/ TERMINAL		VALUE		TOLERANCE CODE		PACKAGING CODE		SPECIAL						
<b>GWS015</b> = GWS 15 <b>GWS020</b> = GWS 20 <b>GWS025</b> = GWS 25 <b>GWS035</b> = GWS 35 <b>GWS050</b> = GWS 50 <b>GWS075</b> = GWS 75 <b>GWS100</b> = GWS 100 <b>GWS220</b> = GWS 220 <b>GWS300</b> = GWS 300 <b>GWS500</b> = GWS 500 <b>GWSN84</b> = GWS 30/100 <b>GWSN91</b> = GWS 30/133		<b>3</b> = SL <b>4</b> = SS <b>5</b> = SB <b>6</b> = SSB <b>7</b> = FST <b>8</b> = E SL <b>9</b> = E SS <b>A</b> = E SB <b>B</b> = E SSB <b>C</b> = E FST <b>D</b> = Ni SL <b>E</b> = Ni SS <b>F</b> = Ni SB <b>G</b> = Ni SSB <b>H</b> = Ni FST <b>I</b> = SWI SL <b>J</b> = SWI SS <b>K</b> = SWI SB <b>L</b> = SWI SSB <b>M</b> = SWI FST <b>Z</b> = Value overflow (BV)		<b>3 digit value</b> <b>1 digit multiplier</b> <b>MULTIPLIER</b> <b>8</b> = $\times 10^{-2}$ <b>9</b> = $\times 10^{-1}$ <b>0</b> = $\times 10^0$ <b>1</b> = $\times 10^1$ <b>2</b> = $\times 10^2$ <b>3</b> = $\times 10^3$		<b>G</b> = $\pm 2.0 \%$ <b>H</b> = $\pm 3.0 \%$ <b>J</b> = $\pm 5.0 \%$ <b>K</b> = $\pm 10.0 \%$		<b>LX</b> = Loose pack, without quantity <b>ZX</b> = Special pack (with BV #), without quantity		The 5 digit BV number will be encoded using a 36 character code. This code contains numbers 0...9 and letters A...Z (36 characters total) and allows to encode at least 46 655 five digit BV numbers. <b>000</b> = Standard						
Product Description: GWS 15 SL 10R 10 % LX																
GWS 15		SL		10R		10 %		LX								
MODEL (2)		VARIANT/TERMINAL (2)		VALUE (2)		TOLERANCE CODE (2)		PACKAGING DESCRIPTION (3)								

Notes

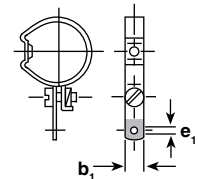
- (2) See "Part Number" above
- (3) See "Packaging Code" above

**DIMENSIONS**
**SL TERMINALS**

**ADJUSTABLE LUGS**

**SS TERMINALS**

**CORE SECTION**


MODEL	DIMENSIONS in millimeters [inches]							
	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
DIMENSION								
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 <sub>1</sub>	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 <sub>1</sub>	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	

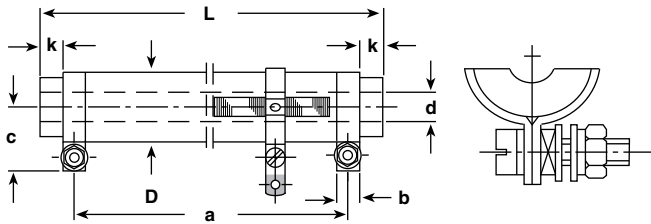
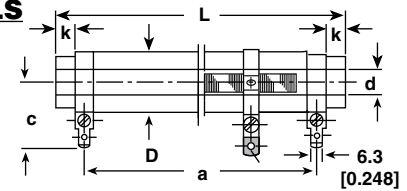
**DIMENSIONS (continued)**
**SL TERMINALS**

**FST TERMINALS**

**SS AND SSB TERMINALS**

**SB TERMINALS**

**CORE SECTION**

**ADJUSTABLE LUGS**

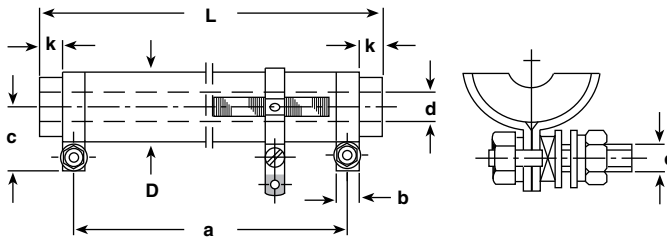
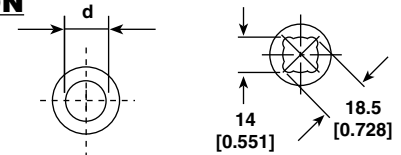
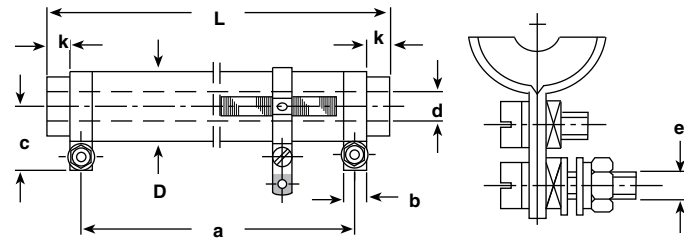
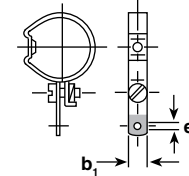
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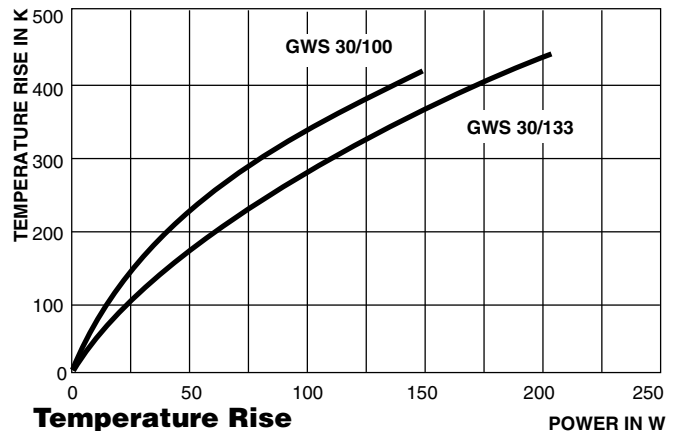
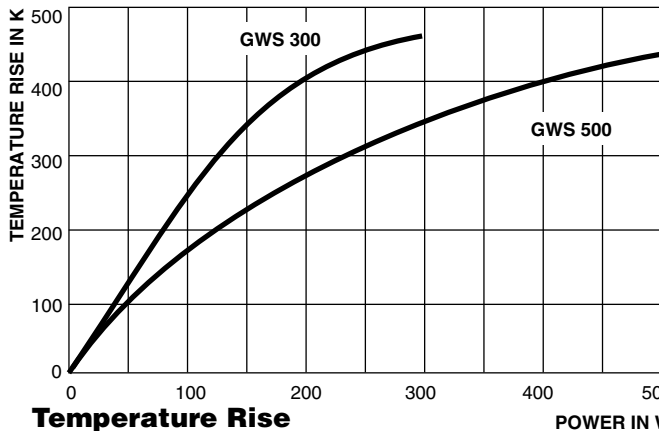
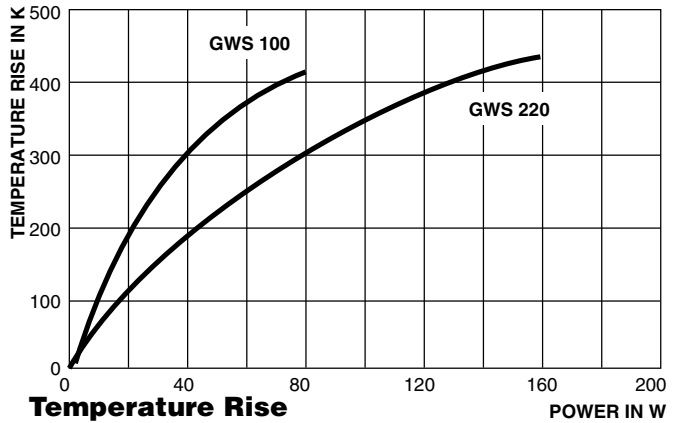
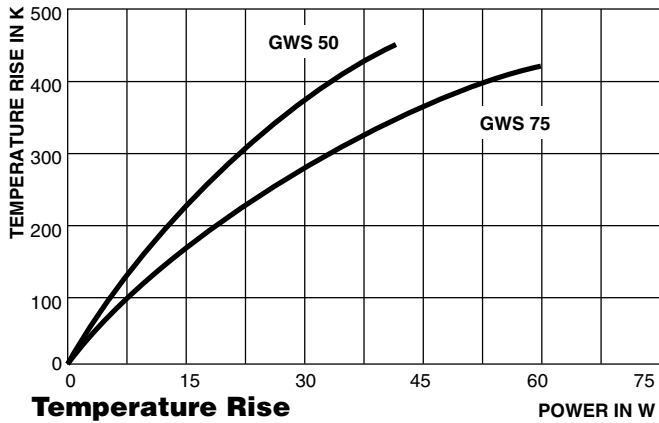
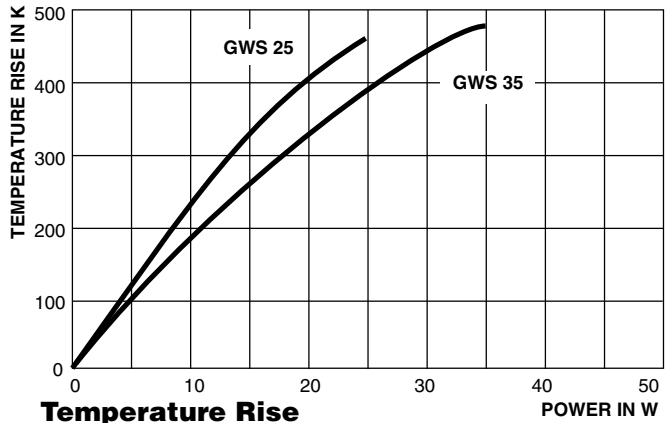
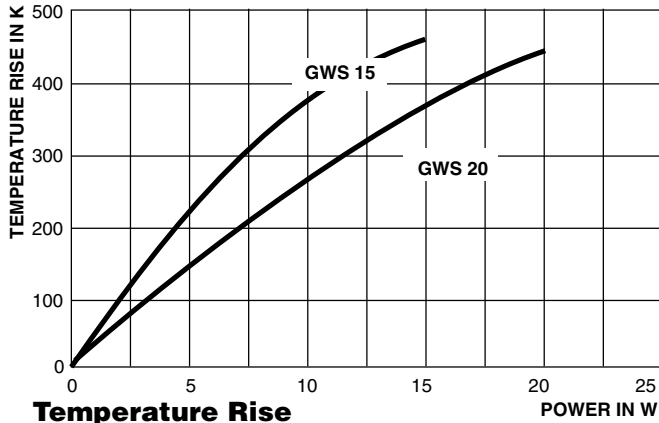
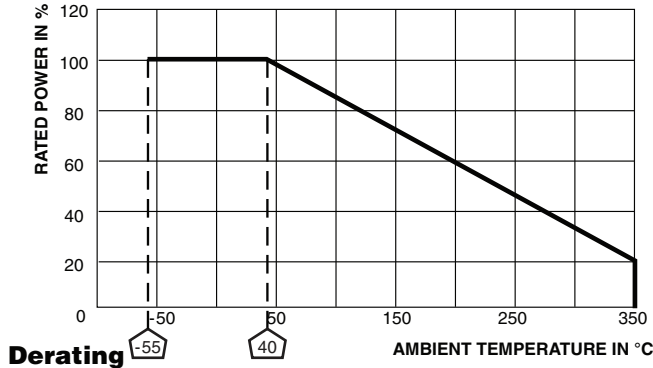
MODEL	DIMENSIONS in millimeters [inches]																
	GWS 50 GWS 50 E GWS 50 Ni				GWS 75 GWS 75 E GWS 75 Ni				GWS 100 GWS 100 E GWS 100 Ni				GWS 220 GWS 220 E GWS 220 Ni				
TERMINAL	SL	SS	SB	FST	SL	SS	SB	FST	SL	SSB	SB	FST	SS	SSB	SB	FST	
DIMENSION																	
D	14.8 ± 0.8 [0.583 ± 0.031]				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 <sub>1</sub>	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 <sub>1</sub>	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** (continued)

**SS TERMINALS**

**FST TERMINALS**

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

**SSB TERMINALS**

**CORE SECTION**

**GWS 15 ... GWS 500    GWS 30/ ...**
**SB TERMINALS**

**ADJUSTABLE LUGS** from GWS 25 E


MODEL	DIMENSIONS in millimeters [inches]															
	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
DIMENSION																
<b>D</b>	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]			
<b>L</b>	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]			
<b>a ± 2</b> [a ± 0.079]	235 [9.252]				280 [11.024]				85 [3.346]				118 [4.646]			
<b>b</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]
<b>b1</b>	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]
<b>c</b>	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]
<b>d</b>	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]
<b>e</b>	M4 x 20				M4 x 20				M4 x 20				M4 x 20			
<b>e1</b>	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]
<b>k</b>	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]
<b>Mass (g)</b>	238				425				183				265			





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## 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.**