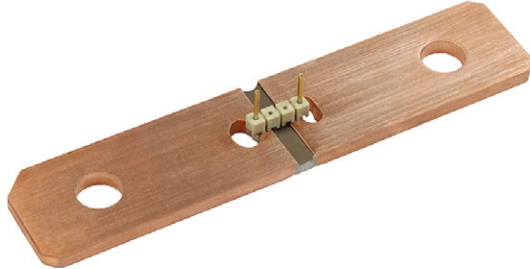


## Power Metal Strip® Shunt Resistor, Low TCR (Down to $< \pm 10 \text{ ppm}/^\circ\text{C}$ ), Very Low Value (Down to $15 \mu\Omega$ )



### FEATURES

- High power capability that enables current sensing to 1825 A
- Proprietary processing technique produces extremely low resistance values
- All welded construction
- Solid metal nickel-chrome alloy resistive element with unique design for low TCR (down to  $\pm 10 \text{ ppm}/^\circ\text{C}$ )
- Very low inductance ( $< 5 \text{ nH}$ )
- Low thermal EMF (as low as  $< 1.25 \mu\text{V}/^\circ\text{C}$ )
- AEC-Q200 qualified
- PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### LINKS TO ADDITIONAL RESOURCES



STANDARD ELECTRICAL SPECIFICATIONS						
GLOBAL MODEL	SIZE	POWER RATING $P_{70^\circ\text{C}}$ W	TOLERANCE $\pm \%$	RESISTANCE VALUE RANGE $\Omega$	RESISTANCE VALUES CURRENTLY AVAILABLE <sup>(1)</sup> $\Omega$	WEIGHT (typical) g
WSBE8518	8518	36	5	30 $\mu$ to 100 $\mu$	50 $\mu$ , 100 $\mu$	36
WSBE8536	8536	50	5	15 $\mu$ to 50 $\mu$	50 $\mu$	72

#### Note

<sup>(1)</sup> Other values may be available, contact factory

TECHNICAL SPECIFICATIONS			
PARAMETER	UNIT	RESISTOR CHARACTERISTICS	
		WSBE8518	WSBE8536
Temperature coefficient	ppm/ $^\circ\text{C}$ (-20 $^\circ\text{C}$ to +150 $^\circ\text{C}$ )	$\pm 10$ for all R-values	$\pm 10$ for all R-values
Operating temperature range <sup>(1)</sup>	$^\circ\text{C}$	-65 to +170	
Thermal EMF	$\mu\text{V}/^\circ\text{C}$	$< 1.25$	
Inductance	nH	$< 5$	
Maximum current rating	A	$(P/R)^{1/2}$	

#### Note

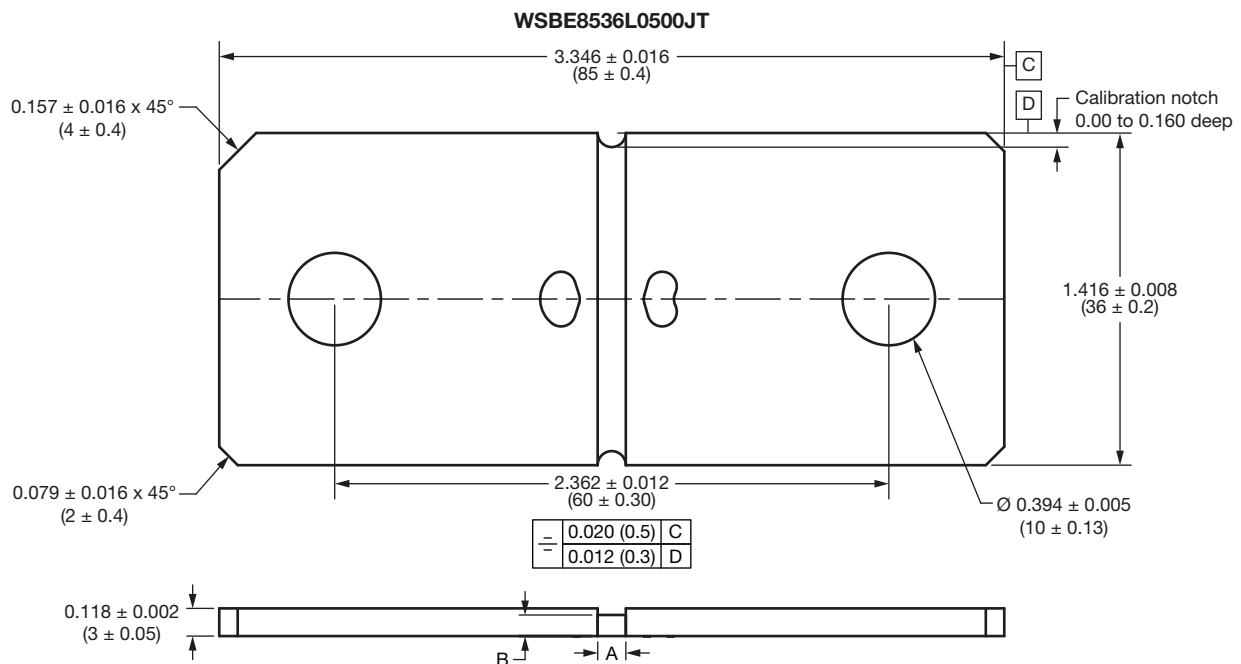
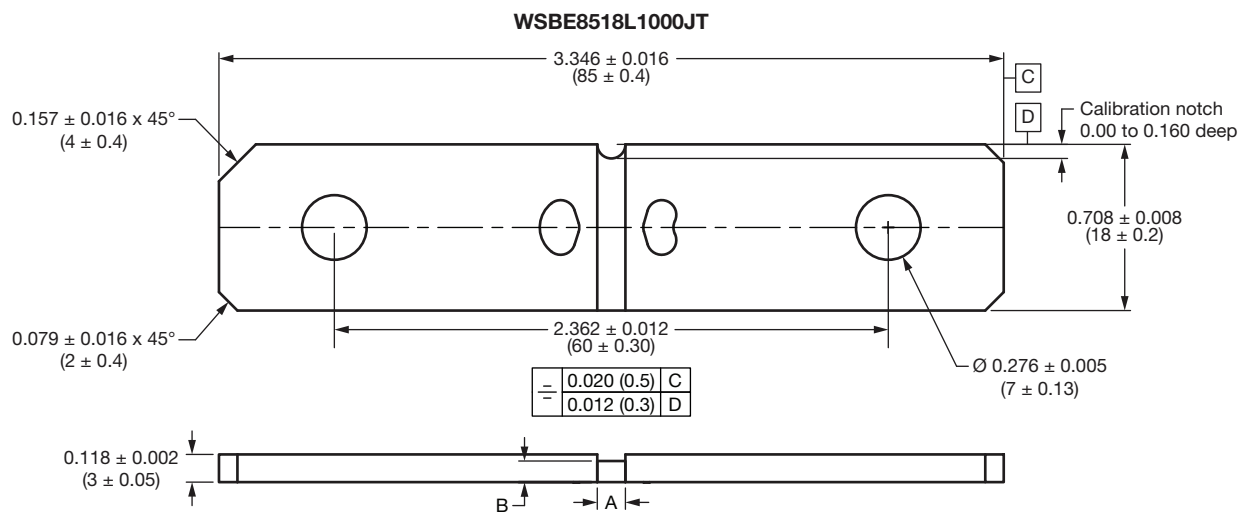
<sup>(1)</sup> Limited temperature range by connector molex® DV and DR -40  $^\circ\text{C}$  to +125  $^\circ\text{C}$

GLOBAL PART NUMBER INFORMATION																	
GLOBAL PART NUMBERING: WSBE8518L1000JTA2 (WSBE8518...A2, 0.0001 $\Omega$ , $\pm 5 \%$ , tray pack)																	
W	S	B	E	8	5	1	8	L	1	0	0	0	J	T	A	2	
GLOBAL MODEL				RESISTANCE VALUE				TOLERANCE CODE		PACKAGING CODE			CONNECTOR AND OPTIONS				
WSBE8518 WSBE8536				L = m $\Omega$ L1000 = 0.0001 $\Omega$				J = $\pm 5 \%$		K = bulk pack T = tray pack			See table				

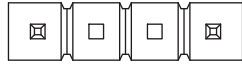
PATENT(S): [www.vishay.com/patents](http://www.vishay.com/patents)

This Vishay product is protected by one or more United States and international patents.

CONNECTOR AND OPTIONS		
CONNECTOR	NUMBER OF PINS / CODE	PLATING / CODE
A - Samtec® header	2 or 3	Blank = unplated P = tin plated
B - Samtec® shrouded	2 or 3	Blank = unplated P = tin plated
D - molex® Duraclik	V = vertical 7 pins A = vertical 7 pins NTC 10 kΩ B = vertical 7 pins NTC 100 kΩ	Blank = unplated P = tin plated D = unplated and DMC R = tin plated and DMC
D - molex® Duraclik	R = right angle 7 pins C = right angle 7 pins NTC 10 kΩ D = right angle 7 pins NTC 100 kΩ	Blank = unplated P = tin plated D = unplated and DMC R = tin plated and DMC

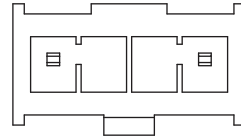
**DIMENSIONS** in inches (millimeters)


**CONNECTION OPTIONS**



Voltage sense pins in position 1 and 4,  
position 2 and 3 are blank.

**A2 Series - Samtec®**



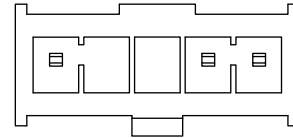
Voltage sense pins in position 1 and 4,  
position 2 and 3 are blank.

**B2 Series - Samtec®**



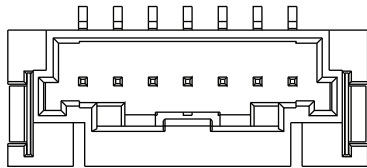
Voltage sense pins in position 1 and 4,  
ground pin in position 5,  
position 2 and 3 are blank.

**A3 Series - Samtec®**

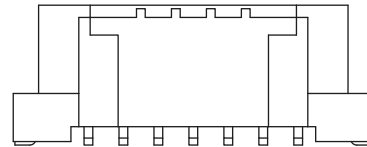


Voltage sense pins in position 1 and 4,  
ground pin in position 5,  
position 2 and 3 are blank.

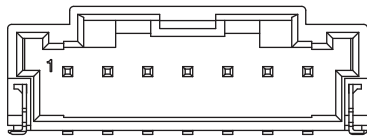
**B3 Series - Samtec®**



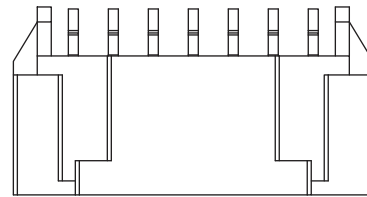
**DV Series - molex®**



**DV Series - molex®**



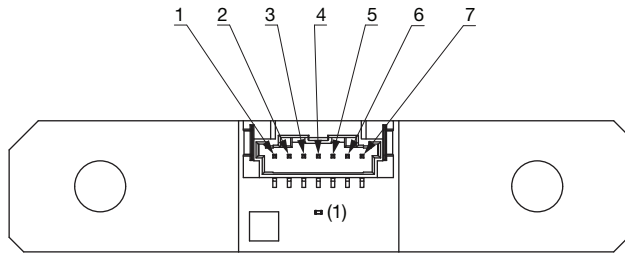
**DR Series - molex®**



**DR Series - molex®**

**Notes**

- Connection options are examples. Other configurations available upon request (links to external website)
  - [A series connector](#) - modified with the middle two pins removed
  - [B series connector](#) - modified with the middle two pins removed
  - [B series female connector](#)
  - [Connector specifications datasheet](#)
  - [Duraclik vertical \(DV - 7 pin\)](#)
  - [Duraclik right angle \(DR - 7 pin\)](#)
- [Reference Designs | Vishay](#) - click for the landing page of all Vishay provided reference designs

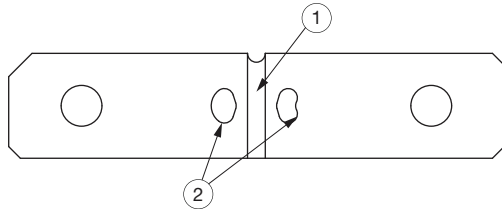
**molex® CONNECTOR LAYOUT**


CONNECTOR PIN	SIGNAL
1	GND
2	NTC 1N
3	SHUNT 2N
4	SHUNT 1N
5	SHUNT 1P
6	SHUNT 2P
7	NTC 1P

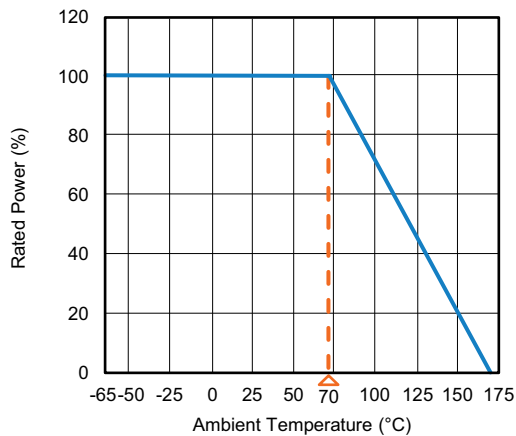
**Note**

 (1) NTCS0603E3103FLT [www.vishay.com/doc?29056](http://www.vishay.com/doc?29056)

NAME	EXPLANATION	START POSITION	NUMBER OF DIGITS	CODE
Lot number	Traceable to raw material	1	9	TM123456-
Drawing number	Customization of part/unique ID/DMC	10	7	1234567
Measured resistance	Actual resistance ( $\mu\Omega$ ) measured from connector	17	7	R51.10-
Date code	Year / month / day	24	6	250816
Shift identifier	What shift produced the part	30	1	C


 $R_{th}$  = thermal resistance = (hotspot - terminal temperature) / applied power

- ① Hotspot = highest temperature of resistance element
- ② Terminal temperature = average temperature of region

**DERATING**


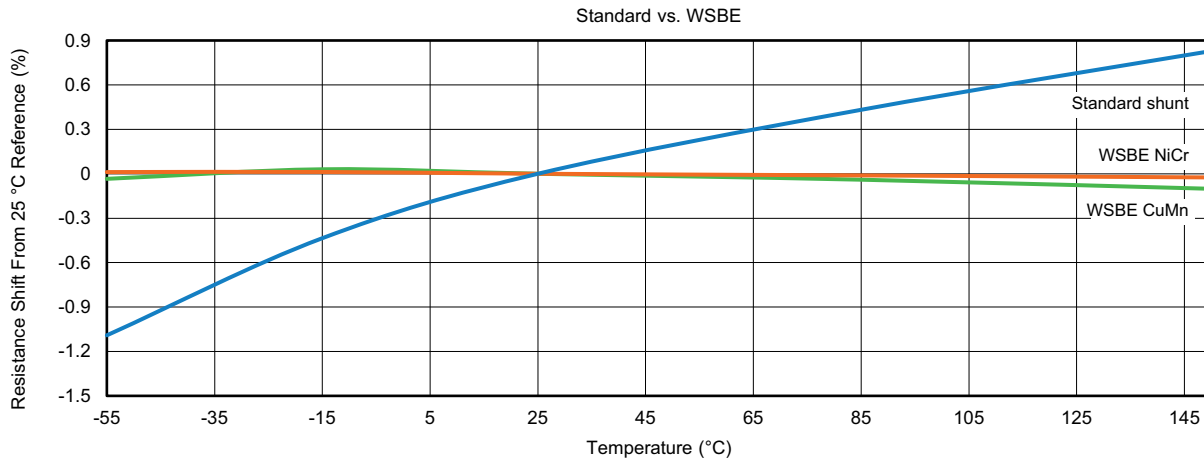
SIZE	RESISTANCE VALUE ( $\mu\Omega$ )	ELEMENT MATERIAL	A REF.	B REF.	THERMAL RESISTANCE $R_{th}$ (°C/W)
8518	100	NiCr	0.120 (3.05)	0.090 (2.29)	0.9
8518	50	CuMn	0.160 (4.06)	0.050 (1.27)	0.8
8536	50	NiCr	0.120 (3.05)	0.090 (2.29)	0.5

 TOLERANCES ON DECIMALS  
 $.xxx \pm 0.005 [x \pm 0.1]$ 

UNLESS OTHERWISE LISTED



**TCR COMPARISON**



PERFORMANCE		
TEST	CONDITIONS OF TEST	TEST LIMITS
Thermal shock	-55 °C to +150 °C, 1000 cycles, 15 min at each extreme	± 0.5 % $\Delta R$
Short time overload	5 x rated power for 5 s	± 0.5 % $\Delta R$
Low temperature storage	-65 °C for 24 h	± 0.2 % $\Delta R$
High temperature exposure	1000 h at +170 °C	± 1.0 % $\Delta R$
Bias humidity	+85 °C, 85 % RH, 10 % bias, 1000 h	± 0.5 % $\Delta R$
Mechanical shock	100 g's for 6 ms, 5 pulses	± 0.2 % $\Delta R$
Vibration	Frequency varied 10 Hz to 2000 Hz in 1 min, 3 directions, 12 h	± 0.2 % $\Delta R$
Load life	1000 h at +70 °C, 1.5 h "ON", 0.5 h "OFF"	± 1.0 % $\Delta R$
Moisture resistance	MIL-STD-202, method 106, 0 % power, 7b not required	± 0.2 % $\Delta R$

LINKS TO RELATED DOCUMENTS	
<b>TECHNICAL NOTES</b>	
The Benefit of Using a Three Sense Pin Design on Battery / Meter Shunt Resistors	<a href="http://www.vishay.com/doc?30381">www.vishay.com/doc?30381</a>
<b>WHITE PAPERS</b>	
Temperature Coefficient of Resistance for Current Sensing	<a href="http://www.vishay.com/doc?30405">www.vishay.com/doc?30405</a>
<b>REFERENCE DESIGNS</b>	
HV-IBSS-CANFD	<a href="http://www.vishay.com/doc?15003">www.vishay.com/doc?15003</a>



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