KOA SPEER ELECTRONICS, INC.

Current Sense/Shunts

A Complete Family of Low Resistance Resistors

Features

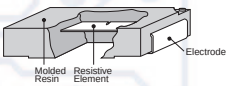
- SMD type of small size, low resistance resistors for current detection
- Low height suitable for use in small equipment such as mobile phone
- AEC-Q200 Qualified
- High reliability and performance with low T.C.R.

Applications

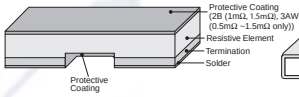
- Transportation
- Alternative Energy
- Power Supply
- Telecommunication
- Aerospace
- Medical Diagnostic Equipment

KOA Speer High Precision Lineup

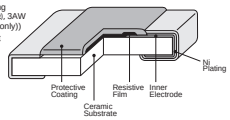
Molded
Size: 2010-4527
Resistance Range: 0.5m-360mΩ
Power Rating: 0.75-7W
SL, SLN, SLW, SLZ
SL07, TSL



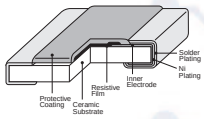
Metal Plate
Size: 0402-2512 (CSR 4324-5032)
Resistance Range: 0.2m-270mΩ
Power Rating: 0.25-5W
CSR, TLR
TLRH, TLRZ



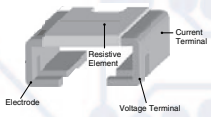
Thick Film
Size: 0201-2512
Resistance Range: 10m-10Ω
Power Rating: 0.1-2W
SR73, SR73 (HP)
SR73-RT, UR73, UR73V



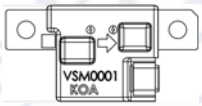
Wide Terminal
Size: 0508-1225
Resistance Range: 10m-9.76Ω
Power Rating: 0.75-4W
WK73S, WK73S-RT, WU73



Power Shunts
Size: 1216-2725
Resistance Range: 0.2m-1mΩ
Power Rating: 3-10W
PSF4, PSG4, PSL2

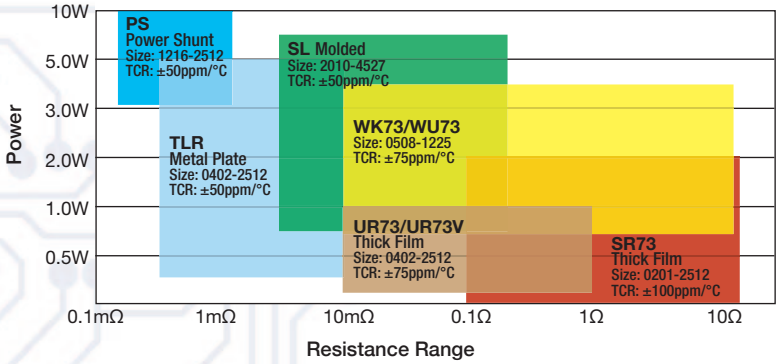


Shunt Current Sensor
Current Rating:
±200A, ±400A
VSM0001

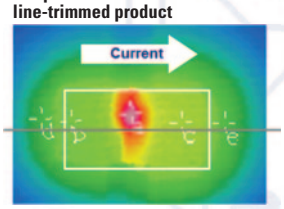


Current Sense/Power Shunt Performance Comparison

KOA Current Sense Resistor Lineup

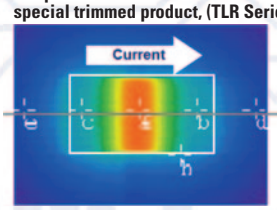


Temperature distribution of a line-trimmed product



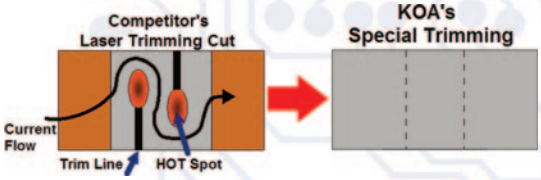
Hot spot is created in the center - close to the trimming cut

Temperature distribution of a special trimmed product, (TLR Series)



Hot spot is created symmetrically to the central axis. Resulting in better heat distribution for resistance stability

KOA's Metal Plate LARGE Pulse Capability Due to NO Trim Lines



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Applications & Ratings

Molded

SL07, SL1, SL2, SLN2, SLZ, TSL: SMD type of small size, ultra-low resistance (3mΩ~) and high accuracy (±0.5%) resistor

Part Designation	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temperature	Resistance Range (Ω)*				T.C.R. (ppm/°C) Max.	Operating Temp. Range
				D: ±0.5% E24,E96***	F: ±1% E24,E96***	G: ±2% E24	J: ±5% E24		
SL07 (2010)	0.75W	70°C	145°C	—	5m - 100m	—	5m - 100m	0~200: R<11mΩ 0~150: R≧11mΩ	-55°C to +180°C
TSL1 (2512)	1W		125°C	10m - 100m	5m - 100m	—	5m - 100m	±180: R<15mΩ ±100: R≧15mΩ	
SL1 (2512)	1W		125°C	10m - 102m	5m - 102m	3m, 4m	3m - 100m	±180: R<15mΩ ±100: R≧15mΩ	
SL1 (2512) (TCR±50ppm)	1W		125°C	34.8m - 200m	34.8m - 200m	—	36m - 200m	±50ppm	
SL1 (2512) (TCR±75ppm)	1W		125°C	20m - 300m	20m - 300m	—	20m - 300m	±75ppm	
SL2 (4527)	2W		125°C	10m ~ 360m	5m ~ 360m	3m, 4m	3m ~ 360m	±180: R<11mΩ ±100: R≧11mΩ	
SLN2 (4527)	2W		105°C	5m - 200m	5m - 200m	—	5m - 200m	±110: R<10mΩ ±75: R≧10mΩ	
SLZ1** (2512)	—		140°C	0.5mΩ Max.	0.5mΩ Max.	0.5mΩ Max.	0.5mΩ Max.	4000 Max.	

* 3m, 4m, 5m, 6m, 7m, 8m, 9m also available inside each resistance range.
** SLZ1: Current rating: 44A.
*** SL07 and SL1 (T.C.R.: ±50ppm, 102mΩ=<R=<200mΩ) offer only E24 series.
If you're unsure whether to use "Rated Ambient Temperature" or "Rated Terminal Part Temperature," always give priority to the "Rated Terminal Part Temperature."
For more details on derating click here "*Derating Curves – Caution & Terms*."

SLW07, SLW1, SLN3, SLN5: Features a special electrode shape that easily absorbs thermal expansion and shrinkage stress

Part Designation	Power Rating	Resistance Range (Ω)*			T.C.R. (ppm/°C) Max.	Rated Terminal Part Temperature	Operating Temperature Range
		D: ±0.5% E24, E96***	F: ±1% E24, E96***	J: ±5% E24			
SLW07 (2010)	1W	—	5m - 100m		0~200: R≦10mΩ 0~150: R≧11mΩ	145°C	-55°C to +180°C
SLW1 (2512)	1.5W	10m - 100m	5m - 100m	3m - 100m	±180: R<15mΩ ±100: R≧15mΩ ±75: 20m≦R≦100mΩ ±50: 34.8m≦R≦100mΩ	120°C	
SLN3 (4527)	3W	5m - 200m			±180: 2.2m R<3mΩ ±110: R<10mΩ ±75: R≧10mΩ	105°C	
SLN5 (4527)	7W (5W)**	3m - 200m	2.2m - 200m	—		70°C (120°C)**	-65°C to +180°C

* 5m, 6m, 7m, 8m, 9mΩ are also available inside resistance range.
** In case the rated terminal part temperature is 120°C, the rated power shall be 5W.
*** SLW07 and SLN5 (2.2m-4.7mΩ) offer only E24 series.

Applications & Ratings

Metal Plate

CSR: Four-Terminal, extremely low resistance and high precision tolerance

Part Designation	Power Rating	T.C.R. (ppm/°C) Max.	Resistance Range E-12	Resistance Tolerance	Rated Ambient Temperature	Operating Temperature Range
CSR1 (4324)	1W	±50	5mΩ - 50mΩ	D: ±0.5%,F: ±1%	+70°C	-55°C to +125°C
CSR2 (5032)	2W			F: ±1%		

TLR2A: High reliability and performance with T.C.R ±100x10^{-6}/K

Part Designation	Power Rating	T.C.R. (ppm/°C) Max.	Standard Resistance (Ω)	Resistance Tolerance	Rated Terminal Part Temperature	Operating Temperature Range
TLR2A (0805)	1W	±100	2m, 3m, 4m, 5m, 6m, 7m, 8m, 9m,10m	F: ±1%	105°C	-65°C to +155°C

TLR-2B, 2BN, 2H, 3AW: Ultra-low TCR (+50ppm/°C) and ultra-low resistance (0.5mΩ-20mΩ)

Part Designation	Power Rating	Rated Ambient Temperature	Rated Terminal Part Temperature	T.C.R. (ppm/°C) Max.	Standard Resistance (Ω)	Resistance Tolerance	Operating Temperature Range
TLR2B (1206)	0.5W	70°C	105°C	±50	2m,3m,4m,5m,6m,7m,8m,9m,10m, 11m,12m,13m,15m,16m,18m,20m	F: ±1%	-65°C to +155°C** -65°C to +170°C**
				±75	1m,1.5m,2m,3m,4m,5m,6m,7m,8m,9m, 10m,11m,12m,13m,15m,16m,18m,20m		
TLR2BN (1206)				±150	1m,1.5m,2m,3m,4m,5m,6m,7m,8m,10m, 11m,12m,13m,15m,16m,18m,20m		
TLR2H (2010)	1W	70°C	105°C	±50	1m,2m,3m,4m,5m, 6m,7m,8m,9m,10m	F: ±1%	-65°C to +155°C** -65°C to +170°C**
				±75			
				±150			
TLR3AW (2512)	2W	70°C	105°C	±50	2m,3m,4m,5m,6m,7m,8m,9m,10m	F: ±1%	-65°C to +155°C**
				±75	0.5m,0.68m,0.75m,0.82m,1m,1.5m, 2m*,3m,4m,5m,6m,7m,8m,9m,10m		
				±150			-65°C to +170°C**

* Contact factory for 2mΩ dimensions. ** Please reference High Temperature Performance Characteristics on our website.
If you're unsure whether to use "Rated Ambient Temperature" or "Rated Terminal Part Temperature," always give priority to the "Rated Terminal Part Temperature."
For more details on derating click here "*Derating Curves – Caution & Terms*."

TLR-2BW, 2BP, 2HW, 3AP, 3APS: Metal alloy that offers superior corrosion and heat resistance

Part Designation	Power Rating	T.C.R. (ppm/°C) Max.	Standard Resistance (Ω)	Resistance Tolerance	Rated Terminal Part Temperature	Operating Temperature Range
TLR2BW (1206)	1W	±50	2m,3m,4m,5m,6m,7m,8m, 9m,10m,11m,12m,13m, 15m,16m,18m,20m	F: ±1%	+120°C and less	-65°C to +170°C
		±75	0.5m,1m,1.5m,2m,3m,4m,5m, 6m,7m,8m,9m,10m,11m,12m, 13m,15m,16m,18m,20m			
TLR2BP (1206)	1.5W	±50	6m,7m,8m,9m,10m		+110°C and less	
			11m,12m,13m,15m,16m,18m,20m		+100°C and less	
		±75	6m,7m,8m,9m,10m		+110°C and less	
			11m,12m,13m,15m,16m,18m,20m		+100°C and less	
	2W	±50, ±75	5m		+110°C and less	
	3W	±50	2m,3m,4m		+110°C and less	
		±75	0.5m,1m,1.5m,2m,3m,4m			
TLR2HW (2010)	2W	±50	0.5m,1m,1.5m,2m,2.5m,3m, 4m,5m,6m,7m,8m,9m,10m		+120°C and less	
		±75				
TLR3AP (2512)	3W	±50	5m,6m,7m,8m,9m,10m		5m ~ 8m: +110°C and less 9m ~ 10m: +90°C and less	
		±75				
	5W	±50	2m,3m,4m		0.5m~1m, 2m~4m: +110°C and less 1.5m: +90°C and less	
		±75	0.5m,0.68m,0.75m,0.82m,1m,1.5m ,2m,3m,4m			
TLR3APS (2512)	3W	±50, ±75	2m, 3m		+110°C and less	

Applications & Ratings

TLRH: Carrier metal plate inside, resistor of high radiation of heat structure (3AW, 3AP)

Part Designation	Power Rating	T.C.R. ($x10^{-6}$/K)	Resistance Range (Ω) F: ±1% (E12)	Rated Terminal Part Temperature	Operating Temperature Range
TLRH 2A (0805)	0.25W	±75	56m~100m	+105°C	-65°C~+155°C
	0.33W		33m ~ 50m		
	0.50W		12m ~ 27m		
TLRH 3AW (2512)	2.0W	±75	10m~22m		-65°C~+170°C
		±50	24m~270m		
TLRH 3AP (2512)	4.0W	±50	40m, 47m, 50m~120m		
	5.0W	±50	18m, 20m, 22m, 25m~39m	85°C	
		±75	6m, 7m, 8m, 9m, 10m, 12m		

TLRZ: Low height suitable for use of small equipment such as mobile phone

Part Designation	Current Rating	Standard Resistance (Ω)	Rated Terminal Part Temperature	Operating Temperature Range
TLRZ1E (0402)	10A	0.5m max.	105°C and less	-65°C to +170°C
TLRZ1J (0603)	26A	0.2m max.	105°C and less	
TLRZ2A (0805)	31.6A	0.2m max.	105°C and less	
TLRZ2B (1206)	50A	0.2m max.	105°C and less	

Applications & Ratings

Thick Film

SR73: Current detecting resistors for power supply, motor circuits, etc.

Part Designation	Power Rating @ 70°C	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (ppm/°C) Max.	Resistance Range			
					E-24, E-96 (D±0.5%)	E-24, E-96 (F±1%)	E-24 (G±2%)	E-24 (J±5%)
SR731H (0201)	0.1W	70°C	—	0 ~ +400	—	1Ω - 10Ω*	—	0.27Ω - 10Ω*
				0 ~ +500		—		0.18Ω - 0.24Ω*
SR731E (0402)	0.166W	70°C	125°C	±200	—	0.51Ω - 10Ω*	0.51Ω - 10Ω	0.51Ω - 10Ω
				±300	—	0.2Ω - 0.47Ω*	0.2Ω - 0.47Ω	0.2Ω - 0.47Ω
				±500	—	0.1Ω - 0.18Ω*	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω
SR731J (0603)	0.2W	70°C	125°C	±200	—	1.02Ω - 10Ω	1.1Ω - 10Ω	1.1Ω - 10Ω
	0.25W	70°C	125°C	±200	—	0.1Ω - 1Ω	0.1Ω - 1Ω	0.1Ω - 1Ω
SR732A (0805)	0.33W	70°C	125°C	±100	0.15Ω - 10Ω	0.1Ω - 10Ω	—	—
				±200	—	—	0.1Ω - 10Ω	0.1Ω - 10Ω
				±500	—	—	—	0.051Ω - 0.091Ω
				±800	—	—	—	0.030Ω - 0.047Ω
	0.5W**	70°C	105°C	±100	0.15Ω - 10Ω	0.1Ω - 10Ω	—	—
				±200	—	—	0.1Ω - 10Ω	0.1Ω - 10Ω
				±500	—	—	—	0.051Ω - 0.091Ω
				±800	—	—	—	0.030Ω - 0.047Ω
SR732B (1206)	0.33W	70°C	125°C	±100	0.15Ω - 10Ω	0.1Ω - 10Ω	—	—
				±200	—	—	0.1Ω - 10Ω	0.1Ω - 10Ω
				±500	—	—	—	0.056Ω - 0.091Ω
				±800	—	—	—	0.030Ω - 0.051Ω
	0.5W**	70°C	110°C	±100	0.15Ω - 10Ω	0.1Ω - 10Ω	—	—
				±200	—	—	0.1Ω - 10Ω	0.1Ω - 10Ω
				±500	—	—	—	0.056Ω - 0.091Ω
				±800	—	—	—	0.030Ω - 0.051Ω
SR732E (1210)	0.5W	70°C	125°C	±100	—	0.1Ω - 10Ω	—	—
				±200	—	—	0.1Ω - 10Ω	0.047Ω - 10Ω
				±500	—	—	—	0.036Ω - 0.043Ω
				±1000	—	—	—	0.024Ω - 0.033Ω
	0.66W**	70°C	110°C	±100	—	0.1Ω - 10Ω	—	—
				±200	—	—	0.1Ω - 10Ω	0.047Ω - 10Ω
				±500	—	—	—	0.036Ω - 0.043Ω
				±1000	—	—	—	0.024Ω - 0.033Ω
SR732H/W2H (2010)	0.75W	70°C	125°C	±100	—	0.1Ω - 10Ω	—	—
				±200	—	—	0.1Ω - 10Ω	0.1Ω - 10Ω
				±500	—	—	—	0.056Ω - 0.091Ω
				±800	—	—	—	0.033Ω - 0.051Ω
SR733A/W3A (2512)	1W	70°C	125°C	±100	—	0.1Ω - 10Ω	—	—
				±200	—	—	0.1Ω - 10Ω	0.1Ω - 10Ω
				±500	—	—	—	0.056Ω - 0.091Ω
				±800	—	—	—	0.039Ω - 0.051Ω

* 1H, 1E (F: ±1%) E-24 values only. Operating Temp: -55C to +125°C (SR731H only), -55°C to +150°C.

**Please use the derating curve based on the terminal part temperature. Rated voltage = $\sqrt{\text{power ratings x resistance value}}$ or max. working voltage, whichever is lower.

If you're unsure whether to use "Rated Ambient Temperature" or "Rated Terminal Part Temperature," always give priority to the "Rated Terminal Part Temperature."

For more details on derating click here "*Derating Curves – Caution & Terms*."

SR73 High Power: High accuracy and current detection in power supplies, motor circuits, etc.

Part Designation	Power Rating @ 70°C	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (ppm/°C) Max.	Resistance Range			
					E-24, E-96 (D±0.5%)	E-24, E-96 (F±1%)	E-24 (G±2%)	E-24 (J±5%)
SR733A2/W3A2 (2512)	2W**	70°C	95°C	±100	—	0.1Ω - 10Ω	—	—
				±200	—	—	0.1Ω - 10Ω	0.1Ω - 10Ω
				±500	—	—	—	0.056Ω - 0.091Ω
				±800	—	—	—	0.039Ω - 0.051Ω

Operating Temp: -55C to +150°C

**Please use the derating curve based on the terminal part temperature. Rated voltage = $\sqrt{\text{Power ratings x resistance value}}$ or max. working voltage, whichever is lower.

If you're unsure whether to use "Rated Ambient Temperature" or "Rated Terminal Part Temperature," always give priority to the "Rated Terminal Part Temperature."

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Applications & Ratings

SR73-RT: Anti-sulfuration, high reliability and performance with resistance tolerance ±1.0, T.C.R. ±100x10^{-6}/K

Part Designation	Power Rating	Rated Ambient Temperature	Rated Terminal Part Temp.	T.C.R. (ppm/°C) Max.	Resistance Range			Operating Temperature Range
					F (±1%) E-24, E-96[1]	G (±2%) E-24	J (±5%) E-24	
SR731ERT (0402)	0.166W	70°C	125°C	±200	1Ω - 10Ω	1Ω - 10Ω	1Ω - 10Ω	-55°C to +155°C
SR731JRT (0603)	0.2W	70°C	125°C	±200	0.2Ω - 10Ω	0.2Ω - 10Ω	0.2Ω - 10Ω	
				±300	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω	
SR732ART (0805)	0.33W	70°C	125°C	±100	0.47Ω - 10Ω	—	—	
				±200	0.2Ω - 0.43Ω	0.2Ω - 10Ω	0.2Ω - 10Ω	
				±250	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω	
	0.5W*	70°C	105°C	±100	0.47Ω - 10Ω	—	—	
				±200	0.2Ω - 0.43Ω	0.2Ω - 10Ω	0.2Ω - 10Ω	
				±250	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω	
SR732BRT (1206)	0.33W	70°C	125°C	±100	0.47Ω - 10Ω	—	—	
				±200	0.2Ω - 0.43Ω	0.2Ω - 10Ω	0.2Ω - 10Ω	
				±250	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω	
	0.5W*	70°C	110°C	±100	0.47Ω - 10Ω	—	—	
				±200	0.2Ω - 0.43Ω	0.2Ω - 10Ω	0.2Ω - 10Ω	
				±250	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω	0.1Ω - 0.18Ω	
SR732ERT (1210)	0.5W	70°C	125°C	±100	0.43Ω - 10Ω	—	—	
				±200	0.2Ω - 0.39Ω	0.2Ω - 10Ω	0.2Ω - 10Ω	
				±250	—	—	0.1Ω - 0.18Ω	
	0.66W*	70°C	110°C	±100	0.43Ω - 10Ω	—	—	
				±200	0.2Ω - 0.39Ω	0.2Ω - 10Ω	0.2Ω - 10Ω	
				±250	—	—	0.1Ω - 0.18Ω	

Rated voltage = $\sqrt{\text{Power rating x resistance value}}$ or max. working voltage, whichever is lower.

[1] The nominal resistance value for SR731E (1Ω~10Ω), SR731J, 2A, 2B (0.1Ω~0.43Ω) and SR732E (0.1Ω~0.39Ω) is in E24.

* Please use the derating curve based on the terminal part temperature.

If you're unsure whether to use "Rated Ambient Temperature" or "Rated Terminal Part Temperature," always give priority to the "Rated Terminal Part Temperature."

For more details on derating click here "*Derating Curves – Caution & Terms*."

UR73: Very low resistance, high precision reliability

Part Designation	Power Rating	Rated Ambient Temperature	Rated Terminal Part Temp.	T.C.R. (ppm/°C) Max.	Resistance Range	Operating Temperature Range
					F (±1%) E-24, 25mΩ, 50mΩ	
UR73D1E* (0402)	0.125W	70°C	—	±100	30mΩ - 100mΩ	-55°C to +125°C
				±500	24mΩ - 27mΩ	
UR73D1J (0603)	0.25W	70°C	80°C	±100	47mΩ - 100mΩ	
				±200	30mΩ - 43mΩ	
				±300	10mΩ - 27mΩ	
UR73D2A (0805)	0.33W	70°C	90°C	±250	10mΩ - 30mΩ	
UR732A (0805)	0.33W	70°C	100°C	±100	47mΩ - 100mΩ	
				±250	33mΩ - 43mΩ	
UR73D2B (1206)	0.5W	70°C	85°C	±200	10mΩ - 27mΩ	
UR732B (1206)	0.5W	70°C	85°C	±100	47mΩ - 100mΩ	
				±200	30mΩ - 43mΩ	
UR73D2H (2010)	0.75W	70°C	90°C	±100	33mΩ - 100mΩ	
				±250	10mΩ - 30mΩ	
UR73D3A (2512)	1W	70°C	95°C	±100	33mΩ - 100mΩ	
				±250	10mΩ - 30mΩ	

Rated voltage = $\sqrt{P \cdot R}$

If you're unsure whether to use "Rated Ambient Temperature" or "Rated Terminal Part Temperature," always give priority to the "Rated Terminal Part Temperature."

For more details on derating click here "*Derating Curves – Caution & Terms*."

• Please inquire before use.

Applications & Ratings

UR73V: High reliability and performance with T.C.R ±75x10^{-6}/K

Part Designation	Power[1] Rating	Rated Ambient Temperature	Rated Terminal Part Temp.	T.C.R. (X10^{-6}/K)	Resistance Range (Ω) E24 &25m, 50m[2,3]	Resistance Tolerance	Operating Temperature Range
UR73V 2A (0805)	0.5W	70°C	100°C	±75	39m~100m	F: ±1%	-55°C to +155°C
UR73VD 2A (0805)	0.5W	70°C	100°C	0~+250	10m~11m		
				0~+150	12m~13m		
				±75	15m~36m		
UR73V 2B (1206)	0.5W	70°C	125°C	±75	33m~75m		
				±100	30m, 82m~100m		
	1W[4]	70°C	95°C	±75	33m~75m		
				±100	30m, 82m~100m		
UR73VD 2B (1206)	0.5W	70°C	125°C	0~+250	10m~11m		
				±75	12m~27m		
	1W[4]	70°C	95°C	0~+250	10m,11m		
				±75	12m~27m		
UR73VH 2B (1206)	1W[4]	70°C	125°C	±100	100m~1Ω		

[1] Rated voltage = √(Power rating x resistance value. [2] 25mΩ and 50mΩ available. [3] E96 is available in UR73VH.

[4] Please keep the resistor operating according to the derating curve of the terminal part temperature based on the specified power rating.

If you're unsure whether to use "Rated Ambient Temperature" or "Rated Terminal Part Temperature," always give priority to the "Rated Terminal Part Temperature."

For more details on derating click here "*Derating Curves – Caution & Terms*."

WK73S: High reliability and performance with T.C.R ±100x10^{-6}/K, resistance tolerance ±0.5%

Part Designation	Power Rating[1]	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (X 10^{-6}/K)	Resistance Range (Ω) D±0.5% E-24/E-96	Resistance Range (Ω) F±1% E-24/E-96	Resistance Range (Ω) J±5% E-24	Operating Temp. Range
WK73S2A (0508)	1.25W	70°C	125°C	±100	—	1 - 9.76	1 - 9.1	-55°C to +155°C
				0~+200	—	30m - 976m	30m - 910m	
				0~+300	—	20m - 29.4m	20m - 27m	
WK73S2B (0612)	1.5W	70°C	125°C	±100	430m - 9.76	430m - 9.76	430m - 9.1	
				±200	—	30m - 422m	30m - 390m	
				±800	—	—	10m - 27m	
WK73S2H (1020)	3W	70°C	125°C	±100	—	220m - 9.76	220m - 9.1	
				±200	—	27m - 215m	27m - 220m	
				±800	—	—	10m - 24m	
WK73S3A (1225)	4.0W	70°C	125°C	±100	—	360m - 9.76	360m - 9.1	
				±200	—	33m - 357m	33m - 330m	
				±300	—	22m - 32.4m	22m - 30m	
				±800	—	—	10m - 20m	

Rated voltage = √(Power rating x resistance value)

[1] If the terminal part temperature exceeds the rated terminal part temperature, even if it is below the rated ambient temperature, apply the derating curve for the terminal part temperature.

If any questions arise whether to use the "Rated Ambient Temperature" or the "Rated Terminal Part Temperature", please give priority to the "Rated Terminal Part Temperature."

For more details on derating click here, "*Derating Curves – Caution & Terms*."

Applications & Ratings

WK73S-RT: Excellent anti-sulfuration characteristic due to using high sulfuration-proof inner top electrode material

Part Designation	Power Rating[1]	Rated Ambient Temperature	Rated Terminal Part Temperature	T.C.R. (X 10^{-6}/K)	Resistance Range (Ω) D±0.5% E-24/E-96	Resistance Range (Ω) F±1% E-24/E-96	Resistance Range (Ω) J±5% E-24	Maximum Working Voltage	Maximum Overload Voltage	Operating Temperature Range
WK73S2A (0508)	1.25W	70°C	125°C	±100	—	1 ~ 9.76	1 ~ 9.1	200V	400V	-55°C to +155°C
WK73R2A (0508)	0.75W	70°C	125°C	±100	20.5k ~ 1M	20.5k ~ 1M	22k ~ 1M			
	1.0W			±100	10 ~ 20k	10 ~ 20k	10 ~ 20k			
WK73S2B (0612)	1.5W	70°C	125°C	±100	—	1 ~ 9.76	1 ~ 9.1			
				±150	—	0.3 ~ 0.976	0.3 ~ 0.91			
WK73R2B (0612)	0.75W	70°C	125°C	±100	—	10 ~ 9.76k	10 ~ 9.1k			
				±200	—	10k ~ 1M	10k ~ 1M			
	1.5W			±100	—	10 ~ 9.76k	10 ~ 9.1k			
WK73S2H (1020)	3W	70°C	125°C	±100	—	1 ~ 9.76	1 ~ 9.1	200V	400V	
				±200	—	0.2 ~ 0.976	0.2 ~ 0.91			
WK73R2H (1020)	2W	70°C	125°C	±100	—	10 ~ 430k	10 ~ 430k			
				±200	—	432k - 1M	470k - 1M			
WK73S3A (1225)	4.0W	70°C	125°C	±100	—	1 ~ 9.76	1 ~ 9.1	200V	400V	
WK73R3A (1225)	3W	70°C	125°C	±100	—	10 ~ 330k	10 ~ 330k			
				±200	—	332k - 1M	360k - 1M			

Rated voltage = $\sqrt{\text{Power rating x resistance value}}$ or max. working voltage, whichever is lower.
[1] When using Power Rating, please use the derating curves based on the terminal part temperature.
If any questions should arise whether to use the "Rated Ambient Temperature" or the "Rated Terminal Part Temperature", please give priority to the "Rated Terminal Part Temperature."
For more details on derating click here "*Derating Curves – Caution & Terms*."

WU73: High reliability and performance with T.C.R ±75x10^{-6}/K, resistance tolerance ±1%

Part Designation	Power Rating	Rated Ambient Temperature	Rated Terminal Part Temperature	T.C.R. (X 10^{-6}/K)	Resistance Range (Ω) E-24, 25m, 50m[1]	Resistance Tolerance	Operating Temperature Range
WU732B (0612)	1.0W	70°C	115°C	±100	10m~12m	F: ±1%	-55°C to +155°C
				±75	13m~27m		
				±100	30m~100m		
WU732B15 (0612)	1.5W[2]	70°C	95°C	±100	10m~12m	F: ±1%	-55°C to +155°C
				±75	13m~27m		
				±100	30m~100m		

Rated voltage = $\sqrt{\text{Power rating x resistance value}}$. [1] 25mΩ and 50mΩ are available.
[2] If you want to use at rated power use the derating curve based on the terminal part temperature.
If you're unsure whether to use "Rated Ambient Temperature" or "Rated Terminal Part Temperature," always give priority to the "Rated Terminal Part Temperature."
For more details on derating click here "*Derating Curves – Caution & Terms*."

Applications & Ratings

Power Shunts

PSF4/PSG4: Correcter electric current detection is possible to 4-terminal construction

Part Designation	Power Rating (Current Rating)	T.C.R. (ppm/°C) Max.	Resistance Range	Resistance Tolerance	Rated Terminal Part Temperature	Operating Temperature Range
PSF4 (1216)	5W (100A)	±50	0.5mΩ	F: ±1%	130°C	-65°C to +175°C
	3W (54A)		1mΩ			
PSG4 (2725)	10W(141A)		0.5mΩ		75°C	

PSL2: Ultra low resistance, suitable for large current sensing

Part Designation	Power Rating (Current Rating)	T.C.R. (ppm/°C) Max.	Resistance Range	Resistance Tolerance	Rated Terminal Part Temperature	Operating Temperature Range
PSL2 (2512)	9W (212A)	250±100	0.2mΩ	F: ±1%	75°C	-65°C to +175°C
	8W (163A)	±175	0.3mΩ			
	8W (126A)	±115	0.5mΩ			

VSM0001: Large current detection via shunt resistor

Absolute Maximum Rating

Parameter		Min	Max	Unit	Condition
Supply Voltage		—	5.5	V	
Rated Current (DC)	VSM0001 — A400A	−400	400	A	See derating curve
	VSM0001 — A200A	−200	200	A	
Maximum Current (≤ 1 sec)		−600	600	A	
Operating Temperature		−40	105	°C	
Rated Terminal Part Temperature		—	105	°C	Temperature of the screw fastening part

Current Sense Selection Guide

Category	KOA	Panasonic	Rohm	SEI	TT Electronics	Vishay	Yageo
Metal Plate	TLR/TLRH/SL	ERJ-MS ERJ-M1W	PMR/PSR	CSM/CSNL CSR/CSRN CSRF/CSS CSSH	ULR/LRC/LRF LR/ LRMA	WSL/WSL_18/ WSLP/WSR	PR/PA/PE
Thick Film	SR73/UR73	ERJ (low ohm)	MCR/UCR	CSR/CSRN	LRCS/LVC	RCWE/RCWL RCWP	RL/PT
Wide Termination	WK73	ERJA/ERJB	LTR	CSRN1225	WHPC/LRF3W SC3	RCL CRCW1218	RC1218
Power Shunt	PS		PSR	HCSK		WSL/WSLP WSK	