



## A Family of Resistors Capable of Handling More Thermal Cycles

### Features

- Enhanced solder joint reliability from thermal cycles
- Suitable for high-strength solders as well as SAC (Sn-Ag-Cu) solders
- Excellent high heat resistance and weather resistance due to metal glaze resistance film
- AEC-Q200 tested

### Applications

- Automotive
- Industrial
- Power Supply



Does your existing design require high heat shock resistance?

## High Solder Joint Reliability from Thermal Cycling

### Wide Terminal

WK73  
(WK73R, WK73S)  
includes higher power versions  
WG73  
WU73

### General Purpose

RK73B AT  
RK73H AT  
RK73Z AT

### High Precision

RK73G AT

### High Voltage

HV73V AT

### Anti-Surge

SG73 AT  
SG73G AT  
SG73S/P AT

### High Temperature

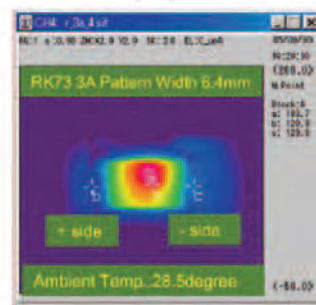
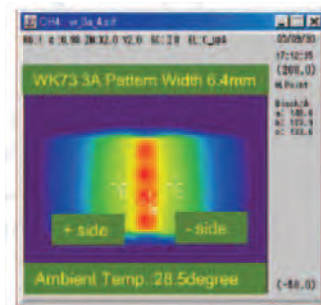
HSG73P AT

## Heat Dissipation: WK73 Compared to RK73

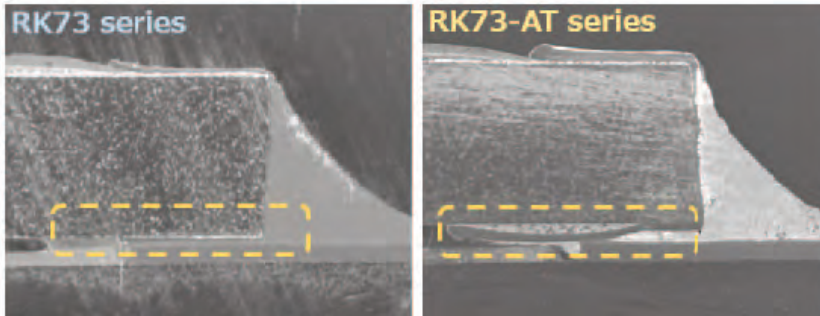
Wide Terminal Type (WK73)  
Heat Dissipation Image



Nominal Terminal Type (RK73)  
Heat Dissipation Image



# Crack Incidence in Thermal Shock Test by Solder Type: RK73 Series Compared to RK73-AT

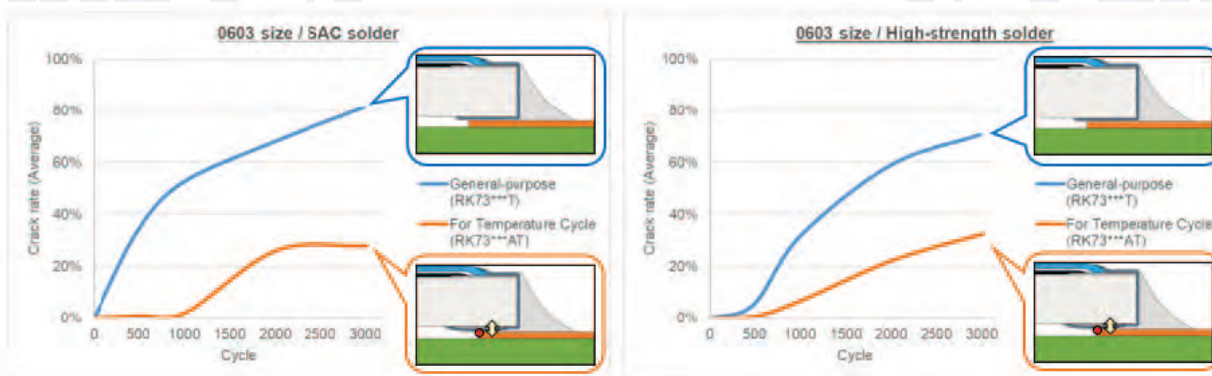


RK73-AT series is designed with a thicker bottom electrode compared to the general thick film products to suppress cracking and delamination caused by thermal shock

## Temperature Cycling Test Results

### Test Condition

- Product size: 0603 inch
- Test board: FR-4 t= 1.6mm
- Test condition: -55 to 155°C 30min 3,000 cycles



## Market Trend of Flat Chip Resistor for Temperature Cycle



# Applications & Ratings

## Wide Terminal Thick Film

### WK73R

Part Designation	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (X 10 <sup>-6</sup> /K)	Resistance Range (Ω)			Maximum Working Voltage	Maximum Overload Voltage	Operating Temp. Range
					D±0.5% E-24/E-96	F±1% E-24/E-96	J±5% E-24			
WK73R1E	0.33W <sup>1</sup>	70°C	125°C	±100	—	10 - 1M	10 - 1M	75V	100V	-55°C to +155°C
WK73R1J	0.5W <sup>1</sup>	70°C	125°C	±100	—	10 - 1M	10 - 1M	150V	200V	
WK73R2A	0.75W <sup>1</sup>	70°C	125°C	±100	—	20.5k - 1M	22k - 1M	200V	400V	
	1.0W <sup>1</sup>	70°C	125°C	±100	—	10 - 20k	10 - 20k			
WK73R2B	0.75W	70°C	125°C	±100	10 - 1M	10 - 1M	10 - 1M	200V	400V	
	1.0W <sup>1</sup>	70°C	115°C	±100	10 - 9.76k	10 - 9.76k	10 - 9.1k			
WK73R2H	1.0W	70°C	125°C	±100	—	10 - 430k	10 - 430k	200V	400V	
				±200	—	432k - 1M	470k - 1M			
WK73R3A	1.5W	70°C	125°C	±100	—	10 - 330k	10 - 330k	200V	400V	
				±200	—	332k - 1M	360k - 1M			
	2.0W <sup>1</sup>	70°C	115°C	±100	—	10 - 330k	10 - 330k			
				±200	—	332k - 1M	360k - 1M			

### WK73R (High Power)

Part Designation	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (X 10 <sup>-6</sup> /K)	Resistance Range (Ω)			Maximum Working Voltage	Maximum Overload Voltage	Operating Temp. Range
					D±0.5% E-24/E-96	F±1% E-24/E-96	J±5% E-24			
WK73R2B15	1.5W <sup>1</sup>	70°C	95°C	±100	10 - 9.76k	10 - 9.76k	10 - 9.1k	200V	400V	-55°C to +155°C
WK73R2H2	2.0W <sup>1</sup>	70°C	95°C	±100	—	10 - 430k	10 - 430k	200V	400V	
				±200	—	432k - 1M	470k - 1M			
WK73R3A3	3.0W <sup>1</sup>	70°C	95°C	±100	—	10 - 330k	10 - 330k	200V	400V	
				±200	—	332k - 1M	360k - 1M			

## Wide Terminal Current Sense

### WK73S

Part Designation	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (X 10 <sup>-6</sup> /K)	Resistance Range (Ω)			Operating Temp. Range
					D±0.5% E-24/E-96	F±1% E-24/E-96	J±5% E-24	
WK73S2A	1.0W <sup>1</sup>	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	0.75W	70°C	125°C	±100	430m - 9.76	430m - 9.76	430m - 9.1	
				±200	—	30m - 422m	30m - 390m	
				±800	—	—	10m - 27m	
	1.0W <sup>1</sup>	70°C	115°C	±100	430m - 9.76	430m - 9.76	430m - 9.1	
				±200	—	30m - 422m	30m - 390m	
				±800	—	—	10m - 27m	
WK73S2H	1.0W	70°C	125°C	±100	—	220m - 9.76	220m - 9.1	
				±200	—	27m - 215m	27m - 200m	
				±800	—	—	10m - 24m	
WK73S3A	1.5W	70°C	125°C	±100	—	360m - 9.76	360m - 9.1	
				±200	—	33m - 357m	33m - 330m	
				±300	—	22m - 32.4m	22m - 30m	
	2.0W <sup>1</sup>	70°C	115°C	±800	—	—	10m - 20m	
				±100	—	360m - 9.76	360m - 9.1	
				±200	—	33m - 357m	33m - 330m	
±300	—	22m - 32.4m	22m - 30m					
±800	—	—	10m - 20m					

<sup>1</sup> If you want to use at rated power use derating curves based on the terminal part temperature

# Applications & Ratings

## Wide Terminal Current Sense

### WK73S (High Power)

Part Designation	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	T.C.R. (X 10 <sup>-6</sup> /K)	Resistance Range (Ω)			Operating Temp. Range
					D±0.5% E-24/E-96	F±1% E-24/E-96	J±5% E-24	
WK73S2B15	1.5W <sup>1</sup>	70°C	95°C	±100	430m - 9.76	430m - 9.76	430m - 9.1	-55°C to +155°C
					—	30m - 422m	30m - 390m	
					—	—	10m - 27m	
WK73S2H2	2.0W <sup>1</sup>	70°C	95°C	±100	—	220m - 9.76	220m - 9.1	
					—	27m - 215m	27m - 200m	
					—	—	10m - 24m	
WK73S3A3	3.0W <sup>1</sup>	70°C	95°C	±100	—	360m - 9.76	360m - 9.1	
					—	33m - 357m	33m - 330m	
					—	22m - 32.4m	22m - 30m	
					—	—	10m - 20m	

## Wide Terminal High Pulse/Surge

### WG73

Part Designation	Power Rating	Rated Ambient Temperature	Rated Terminal Part Temperature	T.C.R. (X 10 <sup>-6</sup> /K)	Resistance Range (Ω)		Maximum Working Voltage	Maximum Overload Voltage	Operating Temperature Range
					K±10% E-12	M±20% E-12			
WG732B	1.0W	70°C	±125°C	±100	560m ~ 1k	560m ~ 1k	200V	400V	-55°C to +155°C
WG732H	1.5W	70°C	±125°C	±100	560m ~ 1k	560m ~ 1k	200V	400V	-55°C to +155°C
WG733A	2.0W	70°C	±125°C	±100	560m ~ 1k	560m ~ 1k	200V	400V	-55°C to +155°C

## Thick Film Current Sense

### Low T.C.R

### WU73

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

<sup>1</sup> If you want to use at rated power use derating curves based on the terminal part temperature



# Applications & Ratings

## General Purpose

### RK73B-AT & RK73H-AT

Part Designation	Size	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	Resistance Range				TCR (X 10 <sup>-6</sup> /K)
					RK73H		RK73B		
					D±0.5% E-24, E-96	F±1% E-24, E-96	G±2% E-24	J±5% E-24	
RK73H1E AT RK73B1E AT	0402	0.1W	70°C	125°C	10 - 1MΩ	10 - 1MΩ	1 - 10MΩ	1 - 10MΩ	±100 (H1E), ±200 (B1E)
					—	1Ω - 9.76Ω 1.02MΩ - 10MΩ	—	—	±200 (H1E)
RK73H1J AT RK73B1J AT	0603	0.1W			1.02kΩ - 1MΩ	1.02kΩ - 1MΩ	1.1kΩ - 1MΩ	1.1kΩ - 10MΩ	±100 (H1J), ±200 (B1J)
					—	1.02kΩ - 10MΩ	—	11MΩ - 22MΩ	±200 (H1J) ±400(B1J)
RK73H1J AT RK73B1J AT	0603	0.125W			10kΩ - 1kΩ	10kΩ - 1kΩ	—	—	±100 (H1J)
					—	1Ω - 9.76Ω	1Ω - 1kΩ	1Ω - 1kΩ	±200 (H1J, B1J)
RK73H2A AT RK73B2A AT	0805	0.25W			10Ω - 1MΩ	10Ω - 1MΩ	—	—	±100 (H2A)
					—	1Ω - 9.76Ω	1Ω - 1MΩ	1Ω - 1MΩ	±200 (H2A, B2A)
RK73H2A AT RK73B2A AT	0805	0.25W			—	1.02MΩ - 10MΩ	1.1MΩ - 10MΩ	1.1MΩ - 10MΩ	±400 (H2A, B2A)
					10Ω - 1MΩ	10Ω - 1MΩ	—	—	±100 (H2A)
RK73H2B AT RK73B2B AT	1206	0.25W			—	1Ω - 9.76Ω 1.02MΩ - 5.6MΩ, 6MΩ	1Ω - 5.6MΩ	1Ω - 5.6MΩ	±200 (H2A, B2A)
					—	5.62MΩ - 10MΩ	6.2MΩ - 10MΩ	6.2MΩ - 22MΩ	±400 (H2A, B2A)

### RK73Z-AT

Part Designation	Size	Rated Ambient Temp.	Rated Terminal Part Temp.	Resistance Range	Maximum Continuous Current @70°C	Maximum Overload Current @70°C (for <1 sec.)
RK73Z1E AT	0402	70°C	125°C	50mΩ max.	1A	2A
RK73Z1J AT	0603			50mΩ max.	1A	2A
RK73Z2A AT	0805			50mΩ max.	2A	5A
RK73ZB AT	1206			50mΩ max.	2A	10A

## High Precision

### RK73G-AT

Part Designation	Size	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	Resistance Range			TCR (X 10 <sup>-6</sup> /K)
					C±0.25% E-24, E-96	D±0.5% E-24, E-96	F±1% E-24, E-96	
RK73G1E AT	0402	0.1W	70°C	125°C	100Ω - 1MΩ	10Ω - 1MΩ	10Ω - 1MΩ	±50
RK73G1J AT	0603	0.1W			100Ω - 1MΩ	10Ω - 1MΩ	10Ω - 1MΩ	±50
RK73G2A AT	0805	0.125W			100Ω - 1MΩ	10Ω - 1MΩ	10Ω - 1MΩ	±50
RK73G2B AT	1206	0.25W			100Ω - 1MΩ	10Ω - 1MΩ	10Ω - 1MΩ	±50

## High Voltage

### HV73V-AT

Part Designation	Size	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	Resistance Range				TCR (X 10 <sup>-6</sup> /K)
					D±0.25% E-24, E-96	F±1% E-24, E-96	G±2% E-24	J±5% E-24	
HV73V1J AT	0603	0.1W	70°C	125°C	—	10kΩ - 10MΩ	10kΩ - 10MΩ	10kΩ - 10MΩ	±100
HV73V2A AT	0805	0.25W			100kΩ - 1MΩ	100kΩ - 10MΩ	100kΩ - 10MΩ	100kΩ - 10MΩ	±100
					—	—	—	11MΩ - 51MΩ	±200
HV73V2B AT	1206	0.33W			100kΩ - 1MΩ	100kΩ - 10MΩ	100kΩ - 10MΩ	100kΩ - 10MΩ	±100
			—	—	—	11MΩ - 51MΩ	±200		

\* Cold T.C.R. (-55°C ~ +25°C) of 1.02MΩ ~ 10MΩ is +200x10<sup>-6</sup>/K

# Applications & Ratings

## High Pulse/Surge

### SG73-AT

Part Designation	Size	Rated Ambient Temp.	Rated Terminal Part Temp.	Power Rating	Resistance Range	TCR (X 10 <sup>-6</sup> /K)
SG731J AT	0603	70°C	125°C	0.1W	1Ω - 8.2Ω	±400
					10Ω - 1MΩ	±200
SG732A AT	0805			0.125W	1Ω - 8.2Ω	±400
					10Ω - 1MΩ	±200
SG732B AT	1206			0.33W	1Ω - 8.2Ω	±400
					10Ω - 1MΩ	±200

## High Precision Pulse Power

### SG73G-AT

Part Designation	Size	Rated Ambient Temp.	Rated Terminal Part Temp.	Power Rating	Resistance Range E-24, E-96	TCR (X 10 <sup>-6</sup> /K)
SG73G1J AT	0603	70°C	125°C	0.2W	10Ω - 1MΩ	±50
				0.33W		
SG73G2A AT	0805	70°C	125°C	0.25W	10Ω - 1MΩ	±50
		70°C	100°C	0.5W		
SG73G2B AT	1206	70°C	125°C	0.33W	10Ω - 1MΩ	±50
		70°C	120°C	0.5W		

## Low T.C.R. Pulse Power

### SG73P-AT

Part Designation	Size	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	Resistance Range			TCR (X 10 <sup>-6</sup> /K)	
					D±0.25% E-24, E-96	F±1% E-24, E-96	G±2%, J±5% E-24		
SG73P1J AT	0603	0.2W	70°C	135°C	510Ω - 576kΩ	510Ω - 576kΩ	510Ω - 576kΩ	±100	
					10Ω - 499Ω	1Ω - 499Ω	1Ω - 470Ω		
		590kΩ - 1MΩ		590kΩ - 1MΩ	620kΩ - 10MΩ				
		510Ω - 576kΩ		510Ω - 576kΩ	510Ω - 576kΩ				
		0.33W		125°C	10Ω - 499Ω	1Ω - 499Ω	1Ω - 470Ω		
					590kΩ - 1MΩ	590kΩ - 1MΩ	620kΩ - 10MΩ		
SG73P2A AT	0805	0.25W		125°C	100Ω - 100kΩ	100Ω - 100kΩ	100Ω - 100kΩ	±100	
					10Ω - 97.6Ω	1Ω - 97.6Ω	1Ω - 91Ω		
		102kΩ - 1MΩ	102kΩ - 1MΩ	110kΩ - 1MΩ	±200				
		100Ω - 100kΩ	100Ω - 100kΩ	100Ω - 100kΩ	±100				
		0.5W	100°C	10Ω - 97.6Ω	1Ω - 97.6Ω	1Ω - 91Ω	±200		
				102kΩ - 1MΩ	102kΩ - 1MΩ	110kΩ - 10MΩ			
SG73P2B AT	1206	0.33W	125°C	300Ω - 1MΩ	300Ω - 1MΩ	300Ω - 1MΩ	±100		
				10Ω - 294Ω	1Ω - 294Ω	1Ω - 270Ω			
				0.75W	105°C	300Ω - 1MΩ	300Ω - 1MΩ	300Ω - 1MΩ	±100
						10Ω - 294Ω	1Ω - 294Ω	1Ω - 270Ω	
				1.2MΩ - 10MΩ	±200				

# Applications & Ratings

## High Voltage Surge

### SG73S-AT

Part Designation	Size	Power Rating	Rated Ambient Temp.	Rated Terminal Part Temp.	Resistance Range			TCR (X 10 <sup>-6</sup> /K)
					D±0.25% E-24, E-96	F±1% E-24, E-96	G±2%, J±5% E-24	
SG73S1J AT	0603	0.2W	70°C	135°C	510Ω - 576kΩ 10Ω - 499Ω 590kΩ - 1MΩ	510Ω - 576kΩ 1Ω - 499Ω 590kΩ - 1MΩ	510Ω - 576kΩ 1Ω - 470Ω 620kΩ - 10MΩ	±100
		0.33W		125°C	510Ω - 576kΩ 10Ω - 499Ω 590kΩ - 1MΩ	510Ω - 576kΩ 1Ω - 499Ω 590kΩ - 1MΩ	510Ω - 576kΩ 1Ω - 470Ω 620kΩ - 10MΩ	±100
SG73S2A AT	0805	0.25W		125°C	10Ω - 1MΩ	1Ω - 1MΩ	1Ω - 10MΩ	±200
		0.5W		100°C				
SG73S2B AT	1206	0.33W	125°C	10Ω - 1MΩ	1Ω - 1MΩ	1Ω - 10MΩ	±200	
		0.75W	105°C					

## High Temperature

### HSG73P-AT

Part Designation	Size	Power Rating	Rated Ambient Temp.		Rated Term. Part Temp.		Resistance Range		T.C.R. (x10 <sup>-6</sup> /K) Max.
			Term. Surf. Material: T (Sn plating)	Term. Surf. Material: G (Au plating)	Term. Surf. Material: T (Sn plating)	Term. Surf. Material: G (Au plating)	F: ±1% E24	J: ±5% E24	
HSG73P1E AT	0402	0.125W	70°C	70°C	125°C	—	10Ω-1MΩ	1Ω-10MΩ	±200
		0.2W <sup>1</sup>		—	105°C	—			
HSG73P1J AT	0603	0.2W		70°C	135°C	—	10Ω-1MΩ	1Ω-10MΩ	
		0.33W <sup>1</sup>		—	125°C	—			
HSG73P2A AT	0805	0.25W		70°C	125°C	—	10Ω-1MΩ	1Ω-10MΩ	
		0.5W <sup>1</sup>		—	100°C	—			
HSG73P2B AT	1206	0.33W		70°C	125°C	—	10Ω-1MΩ	1Ω-10MΩ	
		0.75W <sup>1</sup>		—	105°C	—			