

KNS Series Datasheet

Power Shunt Resistors | Radial and Axial Version
Low Inductance and Low Ohmic | Open Frame

ORDERING CODE - Example

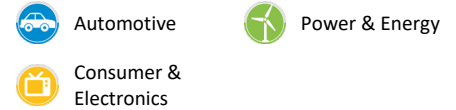
New SAP Part Nr.:

| | | | | | | | |
|------------|--------------|--|-----------|-----------------|---|-------------|---------------|
| KNS | 250 | J | B | - | RP- | R039 | AA |
| Serie | Power rating | Tol. | Pack-Code | TCR | Forming type | R Value | Special |
| | | F = ±1% G = ±2% H = ±3% J = ±5% | B = Bulk | - Base on spec. | AX- Axial Version RP- Radial Version (10[mm] RM) RL- Radial Version (15[mm] RM) RC- Radial Version (20[mm] RM) | | AA = Standard |

Historical VTM Part Nr.:

| | | | |
|--------------------|----------|-----------|--------------|
| KN352 - 009 | 5 | B | OR039 |
| Type | Tol. | Pack-Code | R Value |
| KN352 - 0 | 5 | B | OR068 |
| Type | Tol. | Pack-Code | R Value |

APPLICATIONS



FEATURES

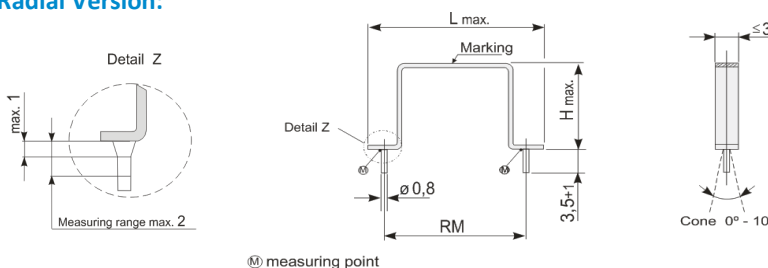
All welded construction
Very low inductance
Open frame design
Solderable terminals
RoHS & REACH Compliant
AEC - Q200 Qualified

ELECTRICAL SPECIFICATIONS

| Type | | KNS100 | KNS150 | KNS200 | KNS250 | KNS300 |
|---|---------------------------------------|-----------------------------------|-------------|-------------|---|---|
| Historical Part Number | RADIAL | KN350 - 009 | KN351 - 010 | KN351 - 009 | KN352 - 009 KN352 - 010 KN352 - 011 | KN353 - 009 KN353 - 010 KN353 - 011 |
| | AXIAL | KN350 - 0 | ----- | KN351 - 0 | KN352 - 0 | ----- |
| Nominal Power Rating P ₇₀ | | 1,0 | 1,5 | 2,0 | 2,5 | 3,0 |
| Resistance Range (Other values upon request) | [Ω] | Min. | OR003 | OR003 | OR003 | OR005 |
| | | Max. | OR051 | OR068 | OR068 | OR12 |
| E-Series (preferred) | | E24 >OR01 (Other upon request) | | | | |
| Tolerances | ±[%] | F = 1% ; G = 2% ; H = 3% ; J = 5% | | | | |
| Temperature Coefficient | ±[10 ⁻⁶ *K ⁻¹] | +200 ... +1200 (Depends on value) | | | | |
| Working Temperature Range | [°C] | -55 ... +300 | | | | |
| Thermal Resistance | [KW ⁻¹] | 230 | 115 | 153 | 92 | 77 |
| Max. Working Voltage | [V] _{RMS} | $\sqrt{P_{70} \times R}$ | | | | |
| Dielectric Withstanding Voltage IEC115-1 clause 4.7 (1[min]) | [V] _{RMS} | Non insulated | | | | |

DIMENSIONS [mm]

Radial Version:

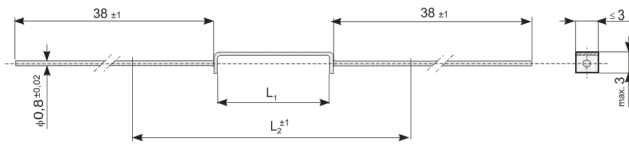


Construction: The resistive elements consist of a flat metal-band. Spot welded Cu-terminals ensure high stability of Contacts. Thus, this construction results in a non-inductive resistor of both high stability and overload capacity.

| Type | [Forming Type] | Historical P/N: | H max. | L max. | RM |
|--------|----------------|-----------------|--------|--------|----|
| KNS100 | [RP] | KN350-009 | 6,5 | 16 | 10 |
| KNS150 | [RL] | KN351-010 | 8,0 | 21 | 15 |
| KNS200 | [RP] | KN351-009 | 10,5 | 16 | 10 |
| KNS250 | [RP] | KN352-009 | 17,0 | 16 | 10 |
| | [RL] | KN352-010 | 14,5 | 21 | 15 |
| | [RC] | KN352-011 | 12,0 | 26 | 20 |
| KNS300 | [RP] | KN353-009 | 20,0 | 16 | 10 |
| | [RL] | KN353-010 | 18,0 | 21 | 15 |
| | [RC] | KN353-011 | 15,0 | 26 | 20 |

KNS Series Datasheet

Axial Version:



| Type | [Forming Type] | Historical P/N: | L ₁ | L ₂ |
|--------|----------------|-----------------|----------------|----------------|
| KNS100 | [AX] | KN350 - 0 | 12,0 ... 14,5 | 40 |
| KNS200 | | KN351 - 0 | 17,5 ... 21,5 | 45 |
| KNS250 | | KN352 - 0 | 29,0 ... 34,0 | 60 |

Measuring length L₂: Resistance value is measured over the centered length L₂ on terminals free of oxide and contaminations. Differing conditions require adequate corrections ($R_{\text{terminal}} = 0,4 \text{ [m}\Omega/\text{cm]}$).

PERFORMANCE DATA

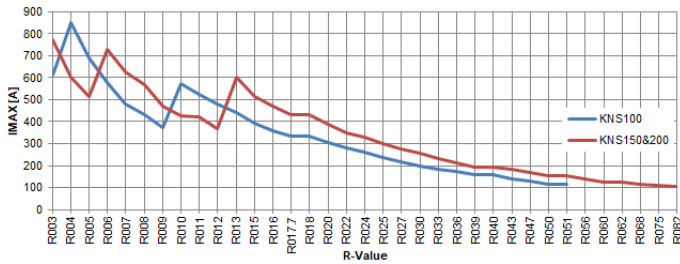
| Type | | KNS100 | KNS150 | KNS200 | KNS250 | KNS300 |
|--|-------------------------------------|-------------------------------------|-------------|-------------|---|---|
| Historical Part Number | RADIAL | KN350 – 009 | KN351 – 010 | KN351 – 009 | KN352 – 009 KN352 – 010 KN352 – 011 | KN353 – 009 KN353 – 010 KN353 – 011 |
| | AXIAL | KN350 – 0 | ----- | KN351 – 0 | KN352 – 0 | ----- |
| Derating Linear | [°C] | 70...300 (0W) | | | | |
| Climatic Category | | 55/200/56 | | | | |
| Failure Rate <i>(Total, θ_g, max, 60[%] cont. lev.)</i> | [10 ⁻⁹ h ⁻¹] | appr. 100 depends on value | | | | |
| Endurance <i>IEC60115-1 clause 4.25 (P₇₀ @ 70[°C], 1000[h])</i> | ±[%] | 3,0 | | | | |
| Resistance to Soldering Heat <i>IEC60115-1 clause 4.18 (260^{±5}[°C], 3,5^{±1}[s])</i> | ±[%] | 0,25 | | | | |
| Damp Heat, Steady State <i>IEC60115-1 clause 4.24 ; IEC60068-2-78 (40[°C], 93[% r.h.], 56[d])</i> | ±[%] | 0,5 | 1,5 | | 0,5 | 1,5 |
| Rapid change of temperature <i>IEC60115-1 clause 4.19 and IEC60068-2-14 (30 [min] -55 [°C] and 30 [min] +125 [°C])</i> | ±[%] | 2,0 | 1,0 | | 2,0 | 1,0 |
| Biased Humidity <i>MIL-STD-202 Method 103 (85[°C], 85[%RH] 1.000[h])</i> | ±[%] | 1,0 | 2,5 | | 1,0 | 2,5 |
| Vibrations <i>Mil-STD-202 Method 204 (10 to 2000 [Hz], 5 [G] for 20 [min], 12 cycles, each of 3 orientation)</i> | ±[%] | 4,5 | 9,0 | | 4,5 | 9,0 |
| Mechanical Shock <i>Mil-STD-202 Method 213 (Method C, peak value 100 [G], Half sine)</i> | ±[%] | 2,0 | 3,0 | | 2,0 | 3,0 |
| ESD <i>IEC60115-1 Clause 4.38, AEC-Q200-002 Direct contact, 2discharges, Cs = 150 [pF], Rd = 2000 [Ω], V = 2[KV] (time/sec)</i> | ±[%] | 2,0 | 1,5 | | 2,0 | 1,5 |
| Terminal Strength | ±[%] | 0,5 | | | | |
| Terminal Tensile Strength | [N] | ≥ 25 | | | | |
| Solderability <i>IEC60068-2-20 (245^{±5}[°C] 3^{±0,5}[s])</i> | | Solder bath method (> 95% coverage) | | | | |
| Marking <i>IEC60062</i> | | Value imprinted | | | | |

KNS Series Datasheet

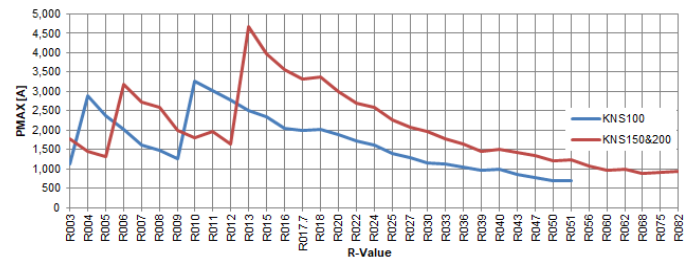
PULSE PERFORMANCE

The graphs below show the capability of electrical pulse for each KNS series, based on the construction for each type and Ohmic value, for a pulse time equal to 50[ms].

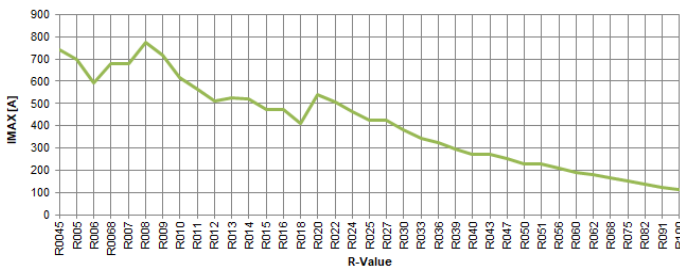
Maximum Pulse current graph KNS100 KNS150&200



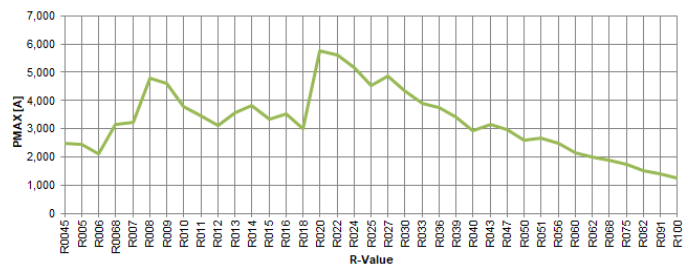
Maximum Pulse Power graph KNS100 KNS150&200



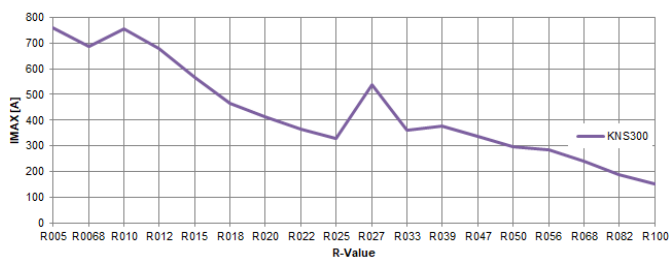
Maximum Pulse current graph KNS250



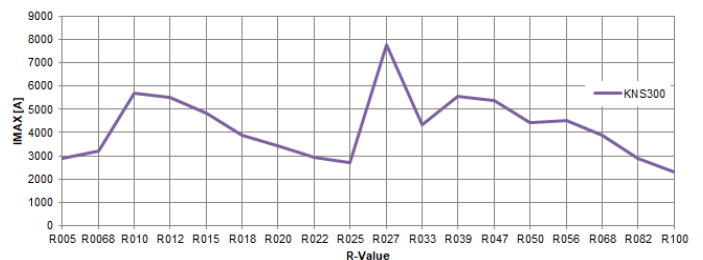
Maximum Pulse power graph KNS250



Maximum Pulse current graph KN300



Maximum Pulse power graph KN300



KNS Series Datasheet

PACKAGING

The standard packaging for KNS in radial and axial type is Bulk, dimensions below.

Radial Version:



| Type | Historical P/N: | Pack Code | Pieces | * Forming Type | Special |
|---------------|-----------------|-----------|--------|----------------|---------------|
| KNS100 | KN350 – 009 | B = Bulk | 100 | RP- | AA = Standard |
| KNS200 | KN351 – 009 | | 1000 | RP- | |
| KNS150 | KN351 – 010 | | 1000 | RL- | |
| KNS250 | KN352 – 009 | | 500 | RP- | |
| | KN352 – 010 | | 500 | RL- | |
| | KN352 – 011 | | 500 | RC- | |
| KNS300 | KN353 – 009 | | 500 | RP- | |
| | KN353 – 010 | | 500 | RL- | |
| | KN353 – 011 | | 500 | RC- | |

* RP- Radial (1 Pin 10[mm] RM) ; RL- Radial (1 Pin 15[mm] RM) ; RC- Radial (1 Pin 20[mm] RM)

Axial Version:



| Type | Historical P/N: | Pack Code | Pieces | Forming Type | Special |
|---------------|-----------------|-----------|--------|--------------|---------------|
| KNS100 | KN350 – 0 | B = Bulk | 500 | AX- = Axial | AA = Standard |
| KNS200 | KN351 – 0 | | 500 | | |
| KNS300 | KN352 – 0 | | 500 | | |

Ordering Code for Radial:

| KNS | 250 | J | B | - | RP- | R039 | AA |
|-------|--------------|--|-----------|-----------------|--|---------|---------------|
| Serie | Power rating | Tol. | Pack-Code | TCR | Forming type | R Value | Special |
| | | F = ±1% G = ±2% H = ±3% J = ±5% | B = Bulk | - Base on spec. | RP- Radial Version (10[mm] RM) or RL- Radial Version (15[mm] RM) or RC- Radial Version (20[mm] RM) | | AA = Standard |

Ordering Code for Axial:

| KNS | 250 | J | B | - | AX- | R039 | AA |
|-------|--------------|--|-----------|-----------------|-------------------|---------|---------------|
| Serie | Power rating | Tol. | Pack-Code | TCR | Forming type | R Value | Special |
| | | F = ±1% G = ±2% H = ±3% J = ±5% | B = Bulk | - Base on spec. | AX- Axial Version | | AA = Standard |