# Nichrome Resistor Networks on Silicon Substrates

**TT electronics**

S Series: SQSxxA[1], SQSxxB, SSNxxA, SSNxxB, SSWxxA, SSWxxB, SPDxxA, SPDxxB

**Isolated and bussed circuits**
**Thin film resistor network**
**RoHS compliant**
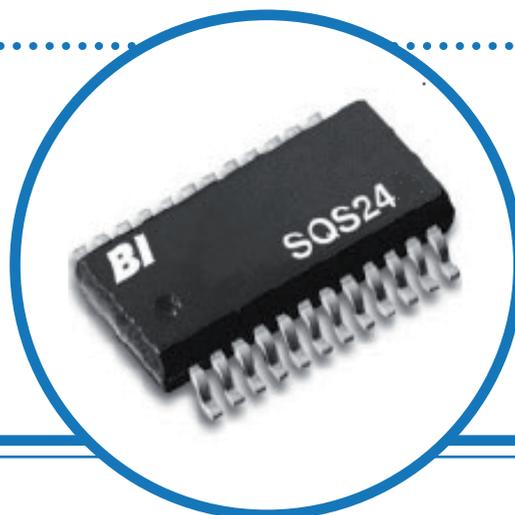
## Features

| | |
|---|---|
| Precision Nichrome Resistors on Silicon | Passivation coating provides protection in humid environments |
| Industry Standard Packaging | JEDEC 95 |
| Ratio Tolerances | < ± 0.05% |
| TCR Tracking Tolerances | < ± 5 ppm/°C |

## Schematics
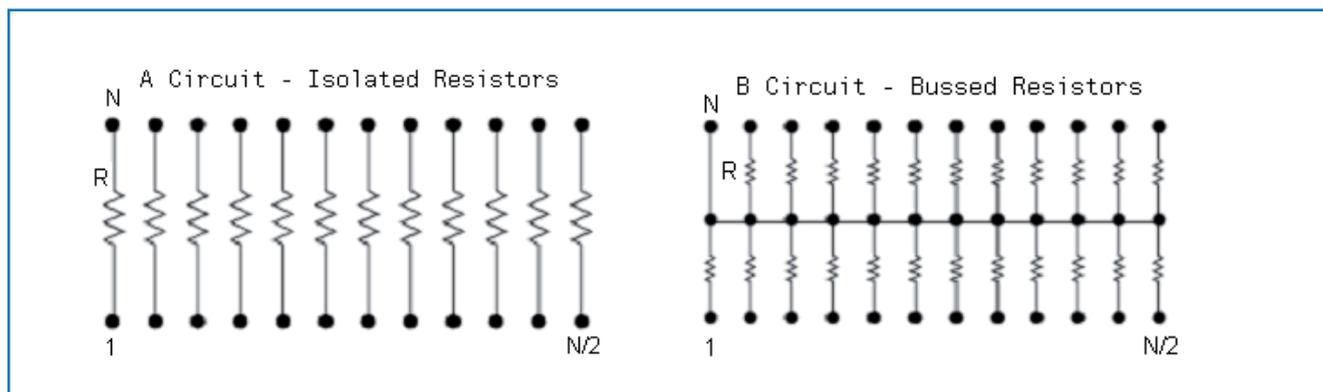


## Electrical[2]

| | |
|---|---|
| Standard Resistance Range[3] | 1K ohms to 100K ohms (Isolated)<br>1K ohms to 30K ohms (Bussed) |
| Resistor Tolerances | ± 0.25% |
| Ratio Tolerances | ± 0.05% |
| TCR | TCR table |
| Operating Temperature Range | -55°C to +125°C |
| Interlead Capacitance | < 2 pF |
| Insulation Resistance | ≥ 10,000 Megohms |
| Maximum Operating Voltage | 100 Vdc or v PR |
| Noise, Maximum (MIL-STD-202, Method 308) | -25 dB |
| Resistor Power Rating at 70°C | 0.1 Watts |

1 xx denotes package pin count. Reference package type section in this data sheet for description.
2 Specifications subject to change without notice.
3 E96 codes available.

**General Note**

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## Nichrome Resistor Networks on Silicon Substrates

# Power Derating Curve & Package Power, Watts @ 70°C, Max.[4]

| QSOP | | | SOIC (Narrow) | | | SOIC (Wide) | | | P-DIP | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | 20 | 24 | 8 | 14 | 16 | 16 | 20 | 24 | 8 | 14 | 16 |
| 0.6 | 0.7 | 0.8 | 0.4 | 0.7 | 0.8 | 1.0 | 1.2 | 1.2 | 0.4 | 0.6 | 0.8 |
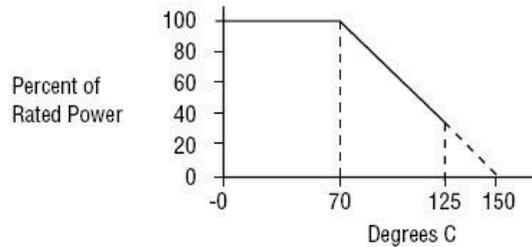


# Environmental (Mil-R-83401)

| | |
|---|---|
| Thermal Shock plus Power Conditioning | ΔR 0.25% |
| Short Time Overload | ΔR 0.1% |
| Terminal Strength | ΔR 0.1% |
| Moisture Resistance | ΔR 0.2% |
| Mechanical Shock | ΔR 0.25% |
| Vibration | ΔR 0.25% |
| Low Temperature Operation | ΔR 0.05% |
| High Temperature Exposure | ΔR 0.1% |
| Resistance to Solder Heat | ΔR 0.1% |
| Marking Permanency | Per MIL-STD-202, Method 215 |
| Flammability | UL-94V-0 Rated |
| Storage Temperature Range | -55°C to +125°C |

# Mechanical

| | |
|---|---|
| Lead Plating | 100 matte Tin (RoHS) |
| Lead Material | Copper Alloy |
| Lead Configuration | Gull Wing |
| Lead Coplanarity | 0.004" (0.102 mm) |
| Substrate Material | Silicon |
| Resistor Material | Passivated Nichrome |
| Body Material | Molded Epoxy |

4 Maximum power per resistor @ 70°C is 100 mW, not to exceed package power.

# Nichrome Resistor Networks
## on Silicon Substrates

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## Ordering Information [5]

```
S   QS   16   A   XXXX   F   S   LF   13
```

Model Series:
S = Passivated Nichrome
on Silicon

Package Type:

Lead Count:

Circuit Type:
A=Isolated
B=Bussed

Resistance Code

Bulk packaging option:
7=7" Tape & Reel
13 = 13" Tap e & Reel
(No Code used for Tubes)

Lead Finish:
LF=Lead Free (RoHS)

TCR Code

Tolerance Code
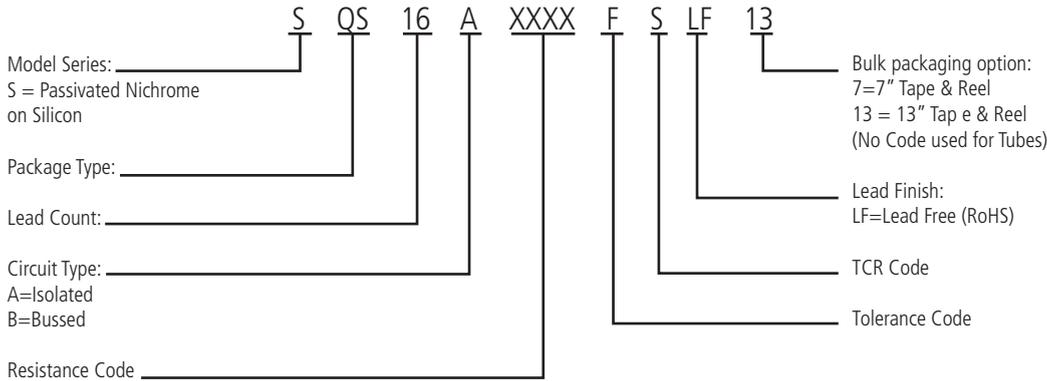
## Package Type

|  | Package Codes | Lead count | Mechanical Outline |
|---|---|---|---|
| QSOP | QS | 16, 20, 24 | MO-137 |
| SOIC Narrow Body | SN | 8, 14, 16 | MS-012 |
| SOIC Wide Body | SW | 16, 20, 24 | MS-013 |
| P-DIP | PD | 8, 14, 16 | MS-001 |

## Resistance [5]

First 3 digits are significant. Fourth digit denotes number of trailing zeros. For values less than 100, use "R" to denote a decimal point. Example, 51 and 10000 ohms are coded as 51R0 and 1002 respectively. Standard values follow E96.

## Resistance Tolerance

| Accuracy Code at 25°C | CA | CB | D | FA | F | G | J |
|---|---|---|---|---|---|---|---|
| Absolute Resistance Tolerances (%) | ± 0.25 | ± 0.25 | ± 0.5 | ± 1.0 | ± 1.0 | ± 2.0 | ± 5.0 |
| Ratio Tolerances (R1 Ref) (%) | ± 0.05 | ± 0.1 | ± 0.1 | ± 0.05 | ± 1.0 | N/A | N/A |

## Temperature Coefficient of Resistance (TCR)

| TCR Code (-55°C to 125°C) | Q | P | S | L |
|---|---|---|---|---|
| Absolute (ppm/°C) | ± 25 | ± 50 | ± 100 | ± 200 |
| Tracking (R1 Ref) (ppm/°C) | ± 5 | ± 5 | N/A | N/A |

5 Contact customer service for custom designs and features

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# Bulk Packaging Options

| Model + Pin Count | Quantity | | |
| --- | --- | --- | --- |
| | 7" Reel | 13" Reel | Tubes |
| SQS16 | 1000 | 2500 | 100 |
| SQS20 | 1000 | 2500 | 50 |
| SQS24 | 1000 | 2500 | 50 |
| SSN08 | 1000 | 2500 | 100 |
| SSN14 | 500 | 2500 | 50 |
| SSN16 | 500 | 2500 | 50 |
| SSW16 | 500 | 1500 | 50 |
| SSW20 | 500 | 1500 | 38 |
| SPD08 | N/A | N/A | 50 |
| SPD14 | N/A | N/A | 25 |
| SPD16 | N/A | N/A | 25 |

# Typical Marking



## General Note

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