# Fujipoly Data Sheet

# SARCON® QR series

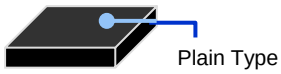
## Rubber Type

## FEATURES

**Thin Film with High Thermal Conductivity , Electric Isolation and Non-Flammable.**

- SARCON QR is available in press moldings, die-cut Gaskets, extrusion shapes and more with desired designs.
- UL 94 V-0 and UL 746 150℃ certified.

## CONSTRUCTIONS

| Series | Characteristics | Constructions |
|---|---|---|
| **SARCON® QR** | Fine heat conductive particles are mixed with insulative silicone rubber to produce this excellent insulative, high heat conductive silicone material : 1.1W/mK (by Hot Wire) |  Plain Type |

## THERMAL RESISTANCE

Unit : K-cm$^2$/W (K-in$^2$/W)

| Clamping Torque | 30Q (0.3mmT) | 45Q (0.45mmT) | 85Q (0.85mmT) |
|---|---|---|---|
| 0.29Nm / 0.22lbf-ft | 3.9 (0.61) | 5.4 (0.83) | 9.2 (1.42) |
| 0.49Nm / 0.36lbf-ft | 3.7 (0.57) | 5.0 (0.77) | 8.1 (1.25) |
| 0.69Nm / 0.51lbf-ft | 3.4 (0.52) | 4.6 (0.71) | 7.6 (1.18) |

1.Test Method by FTM P-3010

Fujipoly test method FTM P-3010 which gives ASTM D5470 equivalent value. Punched-out specimen in TO-3 package is located between a transistor and heat sink, and secured them by using a screwdriver. 20watt power is applied to the transistor. After three minutes, the thermal resistance is calculated based on the following formula.

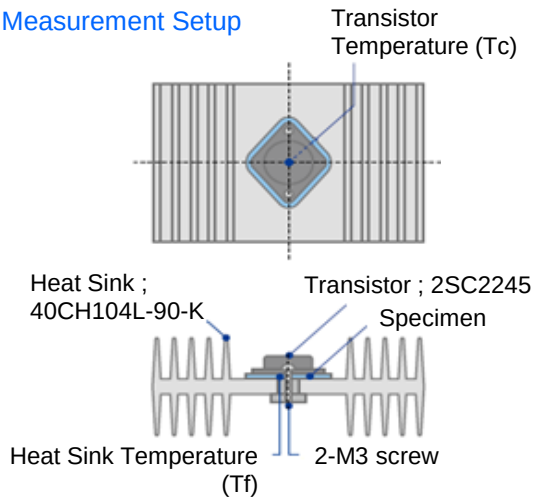
2.Principle

A thermal impedance is given by the equation below.

$Rt = (Tc - Tf) / P_0$

Rt : Thermal resistance(K/W)
Tc : Transistor temperature(K)
Tf : Heat sink temperature(K)
$P_0$ : Heat Flow(W)

●Measurement Setup



## TYPICAL PROPERTIES

| Properties | | unit | | QR | | | Test method |
|---|---|---|---|---|---|---|---|
| | | | | 30Q | 45Q | 85Q | |
| Physical Properties | Color | - | | Black | | | Visual |
| | Thickness | mm | | 0.3 +0.1/-0 | 0.45 ±0.05 | 0.85 ±0.05 | ISO 463:2006 |
| | Specific Gravity | - | | 2.2 | | | ASTM D792 |
| | Hardness Highest Value | IRHD | | 55 | 55 | 55 | ISO 7619 |
| | Tensile Strength | MPa | | 2.2 | 2.2 | 2.3 | ASTM D412 |
| | | psi | | 319 | 319 | 334 | |
| | Elongation | % | | 250 | 250 | 250 | ASTM D412 |
| | Tear Strength | N/mm | | 5 (Die-B) | 6 (Die-B) | 11 (Die-B) | ASTM D624 |
| Electrical Properties | Volume Resistivity | Ohm-m | | $1x10^{12}$ | $1x10^{12}$ | $1x10^{12}$ | ASTM D257 |
| | Breakdown Voltage | kV(AC) | | 11 | 12 | 16 | ASTM D149 |
| | Dielectric Strength | kV(AC) | | 7 | 8 | 11 | ASTM D149 |
| | Dielectric Constant | - | 50Hz | 4.2 | 4.3 | 4.9 | ASTM D150 |
| | | | 1kHz | 4.1 | 4.2 | 4.9 | |
| | | | 1MHz | 4.1 | 4.2 | 4.9 | |
| | Dissipation Factor | - | 50Hz | 0.006 | 0.006 | 0.007 | ASTM D150 |
| | | | 1kHz | 0.004 | 0.004 | 0.003 | |
| | | | 1MHz | 0.002 | 0.002 | 0.002 | |
| Thermal Properties | Thermal Conductivity | W/m-K | | 1.1 | | | ASTM D2326 (Hot Wire) |
| | Recommended Operating Temp. | ℃ | | -40 to +150 | | | - |
| | | °F | | -40 to +302 | | | |
| | Relative Thermal Index | ℃ | | 150 | | | UL 746 |
| | Flame Retardant | UL94 | | V-0 | | | UL 94 |

# DURABILITY

## Heat Aging Test : 150℃ (300°F)

| Properties | unit | 30Q | | | 45Q | | | 85Q | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Before | 500hrs | 1,000hrs | Before | 500hrs | 1,000hrs | Before | 500hrs | 1,000hrs |
| Hardness | IRHD | 66 | 69 | 73 | 58 | 66 | 69 | 55 | 63 | 66 |
| Tensile Strength | Mpa | 3.4 | 4.2 | 4.5 | 2.6 | 3.9 | 4.4 | 2.9 | 4.0 | 4.6 |
| Elongation | % | 168 | 118 | 103 | 207 | 140 | 117 | 196 | 130 | 113 |
| Volume Resistivity | Ohm-m | $5.6x10^{12}$ | $2.0x10^{13}$ | $3.2x10^{13}$ | $4.1x10^{12}$ | $2.4x10^{13}$ | $4.3x10^{13}$ | $4.6x10^{12}$ | $3.2x10^{13}$ | $4.1x10^{13}$ |
| Breakdown Voltage | kV | 11 | 11 | 10 | 12 | 12 | 12 | 16 | 16 | 16 |
| Dielectric Constant | 50Hz | 4.2 | 4.1 | 4.0 | 4.3 | 4.2 | 4.2 | 4.9 | 4.9 | 4.9 |
| | 1kHz | 4.1 | 4.1 | 4.0 | 4.2 | 4.2 | 4.2 | 4.9 | 4.9 | 4.8 |
| | 1MHz | 4.1 | 4.1 | 4.0 | 4.2 | 4.2 | 4.2 | 4.9 | 4.8 | 4.8 |
| Dissipation Factor | 50Hz | 0.006 | 0.004 | 0.004 | 0.006 | 0.003 | 0.003 | 0.007 | 0.003 | 0.003 |
| | 1kHz | 0.004 | 0.003 | 0.003 | 0.004 | 0.002 | 0.002 | 0.003 | 0.003 | 0.002 |
| | 1MHz | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 |

## Heat Aging Test : 200℃ (390°F)

| Properties | unit | 30Q | | | 45Q | | | 85Q | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Before | 500hrs | 1,000hrs | Before | 500hrs | 1,000hrs | Before | 500hrs | 1,000hrs |
| Hardness | IRHD | 66 | 76 | 80 | 58 | 80 | 82 | 55 | 76 | 78 |
| Tensile Strength | Mpa | 3.4 | 4.5 | 5.0 | 2.6 | 5.0 | 5.4 | 2.9 | 5.6 | 5.3 |
| Elongation | % | 168 | 90 | 70 | 207 | 77 | 77 | 196 | 117 | 77 |
| Volume Resistivity | Ohm-m | $5.6x10^{12}$ | $3.6x10^{13}$ | $7.5x10^{13}$ | $4.1x10^{12}$ | $4.4x10^{13}$ | $6.5x10^{13}$ | $4.6x10^{12}$ | $5.8x10^{13}$ | $8.0x10^{13}$ |
| Breakdown Voltage | kV | 11 | 10 | 11 | 12 | 13 | 13 | 16 | 17 | 18 |
| Dielectric Constant | 50Hz | 4.2 | 4.0 | 3.9 | 4.3 | 4.3 | 4.2 | 4.9 | 4.9 | 4.9 |
| | 1kHz | 4.1 | 4.0 | 3.9 | 4.2 | 4.3 | 4.2 | 4.9 | 4.9 | 4.9 |
| | 1MHz | 4.1 | 3.9 | 3.9 | 4.2 | 4.2 | 4.2 | 4.9 | 4.9 | 4.9 |
| Dissipation Factor | 50Hz | 0.006 | 0.003 | 0.004 | 0.006 | 0.003 | 0.003 | 0.007 | 0.003 | 0.002 |
| | 1kHz | 0.004 | 0.003 | 0.003 | 0.004 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 |
| | 1MHz | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.003 | 0.003 |

## Humidity Test : 60℃ (140°F) / 95%RH

| Properties | unit | 30Q | | | 45Q | | | 85Q | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Before | 250hrs | 500hrs | Before | 250hrs | 500hrs | Before | 250hrs | 500hrs |
| Hardness | IRHD | 66 | 62 | 63 | 58 | 59 | 60 | 55 | 56 | 54 |
| Tensile Strength | Mpa | 3.4 | 3.4 | 3.6 | 2.6 | 2.6 | 2.8 | 2.9 | 3.2 | 2.9 |
| Elongation | % | 168 | 157 | 147 | 207 | 202 | 183 | 196 | 198 | 173 |
| Volume Resistivity | Ohm-m | $5.6x10^{12}$ | $2.9x10^{12}$ | $2.8x10^{12}$ | $4.1x10^{12}$ | $2.5x10^{12}$ | $1.9x10^{12}$ | $4.6x10^{12}$ | $3.5x10^{12}$ | $3.5x10^{12}$ |
| Breakdown Voltage | kV | 11 | 11 | 11 | 12 | 12 | 12 | 16 | 17 | 17 |
| Dielectric Constant | 50Hz | 4.2 | 4.1 | 4.2 | 4.3 | 4.2 | 4.3 | 4.9 | 4.9 | 4.9 |
| | 1kHz | 4.1 | 4.0 | 4.1 | 4.2 | 4.2 | 4.3 | 4.9 | 4.9 | 4.9 |
| | 1MHz | 4.1 | 4.0 | 4.1 | 4.2 | 4.2 | 4.2 | 4.9 | 4.9 | 4.9 |
| Dissipation Factor | 50Hz | 0.006 | 0.012 | 0.013 | 0.006 | 0.010 | 0.014 | 0.007 | 0.009 | 0.010 |
| | 1kHz | 0.004 | 0.006 | 0.007 | 0.004 | 0.003 | 0.007 | 0.003 | 0.005 | 0.005 |
| | 1MHz | 0.002 | 0.003 | 0.003 | 0.002 | 0.002 | 0.003 | 0.002 | 0.002 | 0.002 |

## Chemical Resistance Test : (Chemical : HCFC AK-225 (Substitutive Freon) )

| Properties | unit | 30Q | | 45Q | | 85Q | |
|---|---|---|---|---|---|---|---|
| | | Before | 24hrs | Before | 24hrs | Before | 500hrs |
| Volume Resistivity | Ohm-m | $5.6x10^{12}$ | $6.7x10^{11}$ | $4.1x10^{12}$ | $3.7x10^{11}$ | $4.6x10^{12}$ | $4.0x10^{12}$ |
| Breakdown Voltage | kV | 11 | 11 | 12 | 12 | 16 | 17 |
| Thermal Resistance | K-$in^2$/W | 0.57 | 0.57 | 0.77 | 0.78 | 1.25 | 1.24 |

## HANDLING NOTES

- It is recommended to compress the material with the equal ratio on the whole surface. Partial excessive stress may also result in excessive silicone oil exudation.

## WARRANTY STATEMENT

- Properties of the products may be revised due to some changes for improving performance.
- Properties values in this document are not specification or guaranteed.
- This product is made of silicone, and silicone oil may exude from the product.
- This product is made of silicone, and low molecular siloxane may vaporize depending on operating conditions.
- The product is designed, developed, and manufactured for general industrial use only. Never use for medical, surgical, and/or relating purposes. Never use for the purpose of implantation and/or other purposes by which a part of or whole product remains in human body.
- Before using, a safety must be evaluated and verified by the purchaser.
- Contents described in the document do not guarantee the performances and qualities required for the purchaser's specific purposes. The purchaser is responsible for pre-testing the product under the purchaser's specific conditions and for verifying the expected performances.
- Statements concerning possible or suggested uses made herein may not be relied upon, or be constructed, as a guaranty of no patent infringement.
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