ISSUED : Mar.28 1999 Version 1

FUJIPOLY®

SARCON® GR-d Series.

High Heat Conductive Flame Retardant Silicone Gap Filler Pad.

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FUJIPOLY DATA SHEET NUMBER : FPDS 99-22 (Version 1)

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FUJIPOLY® DATA SHEET FPDS 99-22 (Version 1)

1] Product Name :

Sarcon® GR-d material (Gap Filler pads.)

2] Features. :

Sarcon GR-d is a highly conformable, thermally conductive material in areas where space between surfaces is uneven and surface textures vary. Sarcon GR-d material conforms to irregular surfaces and fills air gaps.

Applications include.

1) Between a chassis wall and other surface.
2) Between a "CPU" and heat sinks.
3) Between a semiconductors and heat sinks.
4) Areas where heat needs to be transferred to some type of heat spreader.

3] Variety of Sarcon GR-d products.

Table - 1

Series	Construction	Application Guidelines
Sarcon GR-d	Silicone compound	Between a chassis wall and other surface. Between CPU and heat sink. Between a semiconductor and heat sink.
Sarcon GR-Hd	Silicone compound with hardened top surface	Same as above, except hardened top surface facilitates handling and installation during complex assemblies.
Sarcon GR-Fd	Silicone compound with mesh embedded overall	Same as Sarcon GR-d, except nylon mesh reinforcement prevent stretching, i.e. elongation of die-cut holes.
Sarcon GR-HFd	Silicone compound with hardened top surface and mesh embedded overall	Same as Sarcon GR-d, except hardened top surface facilitates handling and installation during complex assemblies; nylon mesh reinforcement prevents stretching, i.e. elongation of die-cut holes.

*Available in thicknesses for 0.50mm (0.020") to 5.00mm (0.197").
*Can be designed for custom applications.
*Flame retardant silicone polymer filled with an special organic substance.

4] Types and Configuration.

Table - 2

Series	Product Description	Width x Length	Thickness
Sarcon® GR-d	Sarcon **50G-d** Sarcon **100G-d** Sarcon **150G-d** Sarcon **200G-d** Sarcon **250G-d** Sarcon **300G-d** Sarcon **350G-d** Sarcon **400G-d** Sarcon **450G-d** Sarcon **500G-d**	Usable size 280mm x 180mm (11" x 7.1") Actual size 300mm x 200mm (11.8" x 7.8")	0.5mm ± 0.1mm 1.0mm ± 0.2mm 1.5mm ± 0.2mm 2.0mm ± 0.3mm 2.5mm ± 0.3mm 3.0mm ± 0.3mm 3.5mm ± 0.3mm 4.0mm ± 0.4mm 4.5mm ± 0.4mm 5.0mm ± 0.5mm
Sarcon GR-Hd	Sarcon **50G-Hd** Sarcon **100G-Hd** Sarcon **150G-Hd** Sarcon **200G-Hd** Sarcon **250G-Hd** Sarcon **300G-Hd** Sarcon **350G-Hd** Sarcon **400G-Hd** Sarcon **450G-Hd** Sarcon **500G-Hd**	Usable size 280mm x 180mm (11" x 7.1") Actual size 300mm x 200mm (11.8" x 7.8")	0.5mm ± 0.1mm 1.0mm ± 0.2mm 1.5mm ± 0.2mm 2.0mm ± 0.3mm 2.5mm ± 0.3mm 3.0mm ± 0.3mm 3.5mm ± 0.3mm 4.0mm ± 0.4mm 4.5mm ± 0.4mm 5.0mm ± 0.5mm
Sarcon GR-Fd	Sarcon **50G-Fd** Sarcon **100G-Fd** Sarcon **150G-Fd** Sarcon **200G-Fd** Sarcon **250G-Fd** Sarcon **300G-Fd** Sarcon **350G-Fd** Sarcon **400G-Fd** Sarcon **450G-Fd** Sarcon **500G-Fd**	Usable size 280mm x 180mm (11" x 7.1") Actual size 300mm x 200mm (11.8" x 7.8")	0.5mm ± 0.1mm 1.0mm ± 0.2mm 1.5mm ± 0.2mm 2.0mm ± 0.3mm 2.5mm ± 0.3mm 3.0mm ± 0.3mm 3.5mm ± 0.3mm 4.0mm ± 0.4mm 4.5mm ± 0.4mm 5.0mm ± 0.5mm
Sarcon GR-HFd	Sarcon **50G-HFd** Sarcon **100G-HFd** Sarcon **150G-HFd** Sarcon **200G-HFd** Sarcon **250G-HFd** Sarcon **300G-HFd** Sarcon **350G-HFd** Sarcon **400G-HFd** Sarcon **450G-HFd** Sarcon **500G-HFd**	Usable size 280mm x 180mm (11" x 7.1") Actual size 300mm x 200mm (11.8" x 7.8")	0.5mm ± 0.1mm 1.0mm ± 0.2mm 1.5mm ± 0.2mm 2.0mm ± 0.3mm 2.5mm ± 0.3mm 3.0mm ± 0.3mm 3.5mm ± 0.3mm 4.0mm ± 0.4mm 4.5mm ± 0.4mm 5.0mm ± 0.5mm

Notice.

1) Standard Product Form.
Sarcon GR-d series is placed between PET (polyester) Film and special polyethylene Film, Kisscut into the required shape.

5] Typical Properties.

Table - 3

Property	Unit	GR-d	GR-Hd	GR-Fd	GR-HFd	Test Method	Specimen
Color	–	Dark Grey	Dark Grey	Dark Grey	Dark Grey	Visual	–
Operating Temp. range	˚C	−60~+200	−60~+200	−60~+200	−60~+200	–	–
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220 ASTM D-792	–
Hardness	ASKER-C	(18)	(18)	(18)	(18)	SRISO101	B
Tensile Strength	(Mpa)	0.3	0.5	0.5	0.7	JIS-K-6251 (#2) ASTM D-412	A
Elongation	%	100	80	60	60	JIS-K-6251 (#2) ASTM D-412	A
Tear Resistance	(KN/m)	1	1	2	2	JIS-K-6252 (Angle) ASTM D-624	A
Volume Resistivity	(Mohms·m)	1 x 10^6	1 x 10^6	1 x 10^6	1 x 10^6	JIS-K-6249 ASTM D-257	C
Break Down Voltage	(Kv/mm)	18	17	12	10	JIS-K-6249 ASTM D-149	C
Withstand Voltage	(Kv/mm)	14	13	9	8	JIS-K-6249 ASTM D-149	C

Remarks/ Specimen A 2.0mm Thickness.
Specimen B 60mm Width x 120mm Length x 20mm Thickness.
Specimen C 120mm Width x 120mm Length x 1.0mm Thickness.

6]Thermal Properties.

1) Thermal Resistance.

(Unit:˚C·inch^2 /watt) **Table - 4**

Thickness	GR-d	GR-Hd	GR-Fd	GR-HFd
0.5mm	0.39	0.44	0.42	0.48
1.0mm	0.82	0.89	0.83	0.90
1.5mm	1.23	1.37	1.35	1.43
2.0mm	1.48	1.71	1.62	1.69
2.5mm	1.87	2.00	2.03	2.15
3.0mm	2.10	2.29	2.32	2.43
3.5mm	2.34	2.38	2.38	2.49
4.0mm	2.54	2.62	2.64	2.66
4.5mm	2.84	2.90	2.91	2.92
5.0mm	3.04	3.06	3.07	3.11

Test Method : Transistor : TO-3 at 20 Watts of 5 minutes.
Clamping : 2Kgf.
FPDS97-20 (Version 1) : Test Method of Thermal Resistance.

2) Thermal Conductivity.

Table - 5

	Unit	GR-d	GR-Hd	GR-Fd	GR-HFd
Thermal Conductivity	watt / m-k	1.50	1.50	1.50	1.50

Test Method : JIS R 2618

7] Heat Aging Test.

1) **Test Condition :** 70˚C (158˚F) x 1,000hrs (42 days)

Sarcon® GR-d

Table - 6

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	—
Hardness	ASKER·C	(18)	(20)	(21)	(22)	SRISO101	B
Tensile Strength	(Mpa)	0.3	0.3	0.2	0.3	JIS-K-6251 (#2)	A
Elongation	%	100	100	80	70	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	1	1	1	1	JIS-K-6252 (Angle)	A
Volume Resistivity	(Mohms·m)	3.1 x 10^6	2.4 x 10^6	2.9 x 10^6	1.1 x 10^7	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	18	18	20	20	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Sarcon GR-Hd

Table - 7

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	—
Hardness	ASKER-C	(18)	(20)	(21)	(22)	SRISO101	B
Tensile Strength	(Mpa)	0.5	0.6	0.5	0.6	JIS-K-6251 (#2)	A
Elongation	%	80	70	70	60	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	1	1	1	1	JIS-K-6252 (Angle)	A
Volume Resistivity	(Mohms·m)	2.7 x 10^6	9.8 x 10^6	9.8 x 10^6	1.3 x 10^7	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	17	20	22	22	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Sarcon GR-Fd

Table - 8

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.8	2.6	JIS-K-6220	—
Hardness	ASKER-C	(18)	(20)	(21)	(22)	SRISO101	B
Tensile Strength	(Mpa)	0.5	0.6	0.7	0.9	JIS-K-6251 (#2)	A
Elongation	%	60	50	50	50	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	2	2	2	2	JIS-K-6252 (Angle)	A
Volume Resistivity	(Mohms·m)	2.0 x 10^6	9.8 x 10^6	5.9 x 10^6	7.4 x 10^7	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	12	13	15	15	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Sarcon GR-HFd

Table - 9

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	—
Hardness	ASKER-C	(18)	(20)	(21)	(22)	SRISO101	B
Tensile Strength	(Mpa)	0.7	0.9	1.1	1.5	JIS-K-6251 (#2)	A
Elongation	%	60	50	50	50	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	2	2	2	1	JIS-K-6252 (Angle)	A
Volume Resistivity	(Mohms·m)	2.4 x 10^6	4.9 x 10^6	5.9 x 10^6	9.3 x 10^6	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	10	11	12	12	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Remarks / Specimen A : 2.0mT
Specimen B : 60mm Width x 120mm Length x 20mm Thickness.(GR-d for all products)
Specimen C : 120mm Width x 120mm Length x 1.0mm Thickness.

2) **Test Condition :** 150˚C (302˚F) x 1,000hrs (42 days)

Sarcon® GR-d

Table - 10

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	–
Hardness	ASKER-C	(18)	(23)	(28)	(29)	SRISO101	B
Tensile Strength	(Mpa)	0.3	0.3	0.3	0.3	JIS-K-6251 (#2)	A
Elongation	%	100	100	100	80	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	1	1	1	1	JIS-K-6252(Angle)	A
Volume Resistivity	(Mohms·m)	3.1 x 10^6	2.2 x 10^6	2.0 x 10^7	2.6 x 10^7	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	18	19	21	21	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Sarcon GR-Hd

Table - 11

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	–
Hardness	ASKER-C	(18)	(23)	(28)	(29)	SRISO101	B
Tensile Strength	(Mpa)	0.5	0.7	0.6	0.6	JIS-K-6251 (#2)	A
Elongation	%	80	50	50	50	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	1	1	1	1	JIS-K-6252 (Angle)	A
Volume Resistivity	(Mohms·m)	2.7 x 10^6	2.7 x 10^7	2.0 x 10^7	2.2 x 10^7	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	17	19	22	22	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Sarcon GR-Fd

Table - 12

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	–
Hardness	ASKER-C	(18)	(23)	(28)	(29)	SRISO101	B
Tensile Strength	(Mpa)	0.5	0.4	0.3	0.3	JIS-K-6251 (#2)	A
Elongation	%	60	50	50	50	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	3	2	1	1	JIS-K-6252 (Angle)	A
Volume Resistivity	(Mohms·m)	2.0 x 10^6	4.9 x 10^7	5.9 x 10^6	1.1 x 10^7	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	12	12	15	13	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Sarcon GR-HFd

Table - 13

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	–
Hardness	ASKER-C	(18)	(23)	(28)	(29)	SRISO101	B
Tensile Strength	(Mpa)	0.7	0.7	0.5	0.5	JIS-K-6251 (#2)	A
Elongation	%	60	50	50	50	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	2	2	2	1	JIS-K-6252 (Angle)	A
Volume Resistivity	(Mohms·m)	2.4 x 10^6	3.5 x 10^6	5.9 x 10^6	6.8 x 10^6	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	10	12	14	14	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Remarks / Specimen A : 2.0mT
Specimen B : 60mm Width x 120mm Length x 20mm Thickness.(GR-d for all products)
Specimen C : 120mm Width x 120mm Length x 1.0mm Thickness.

8] Humidity Test.

Test Condition : 60˚C (140˚F) x 1,000hrs (42 days) x 90%RH

Sarcon® GR-d

Table - 14

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	–
Hardness	ASKER-C	(18)	(19)	(20)	(20)	SRISO101	B
Tensile Strength	(Mpa)	0.3	0.3	0.3	0.3	JIS-K-6251 (#2)	A
Elongation	%	100	100	100	100	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	1	1	1	1	JIS-K-6252 (Angle)	A
Volume Resistivity	(Mohms·m)	3.1 x 10^6	1.8 x 10^6	5.9 x 10^5	7.4 x 10^5	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	18	18	20	20	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Sarcon GR-Hd

Table - 15

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	–
Hardness	ASKER-C	(18)	(19)	(20)	(20)	SRISO101	B
Tensile Strength	(Mpa)	0.5	0.6	0.7	0.6	JIS-K-6251 (#2)	A
Elongation	%	80	70	70	50	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	1	1	1	1	JIS-K-6252 (Angle)	A
Volume Resistivity	(Mohms·m)	2.7 x 10^6	3.9 x 10^6	1.5 x 10^6	1.1 x 10^6	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	17	19	20	20	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Sarcon GR-Fd

Table - 16

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	–
Hardness	ASKER-C	(18)	(19)	(20)	(20)	SRISO101	B
Tensile Strength	(Mpa)	0.5	0.8	0.6	0.6	JIS-K-6251 (#2)	A
Elongation	%	60	50	50	50	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	2	2	2	2	JIS-K-6252 (Angle)	A
Volume Resistivity	(Mohms·m)	2.0 x 10^6	0.8 x 10^6	0.8 x 10^6	1.1 x 10^5	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	12	13	20	20	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Sarcon GR-HFd

Table - 17

Property	Unit	Initial	100Hrs	500Hrs	1,000Hrs	Test Method	Specimen
Specific Gravity	gr/cm^3	2.6	2.6	2.6	2.6	JIS-K-6220	–
Hardness	ASKER-C	(18)	(19)	(20)	(20)	SRISO101	B
Tensile Strength	(Mpa)	0.7	0.9	0.9	0.9	JIS-K-6251 (#2)	A
Elongation	%	60	50	50	50	JIS-K-6251 (#2)	A
Tear Resistance	(KN/m)	2	2	2	3	JIS-K-6252 (Angle)	A
Volume Resistivity	(M0hms·m)	2.4 x 10^6	1.2 x 10^6	1.8 x 10^6	0.8 x 10^6	JIS-K-6249	C
Break Down Voltage	(Kv/mm)	10	12	14	13	JIS-K-6249	C
Thermal Conductivity	w/m·k	(1.5)	(1.5)	(1.5)	(1.5)	JIS-K-2618	B

Remarks / Specimen A : 2.0mT
Specimen B : 60mm Width x 120mm Length x 20mm Thickness. (GR-d for all products)
Specimen C : 120mm Width x 120mm Length x 1.0mm Thickness.

9] **Mechanical Property** / Compression VS Compression Load

Sarcon® GR-d

(Unit : Kgf/inch^2) **Table - 18**

	50G	100G	150G	200G	250G	300G	350G	400G	450G	500G
10%	13.0	12.5	11.5	10.2	7.70	6.10	5.60	4.90	4.60	4.20
20%	27.5	26.5	19.1	18.5	14.1	12.5	11.3	10.5	10.1	9.30
30%	50.9	40.9	31.6	30.5	25.1	20.2	20.1	18.8	18.5	15.3
40%	68.2	57.0	47.3	45.7	35.8	30.5	30.0	27.7	25.4	23.5
50%	86.1	76.8	67.7	64.6	58.8	45.2	43.1	40.8	35.4	35.1
sustain 50%	40.2	39.2	33.1	30.9	27.2	24.7	23.5	20.3	17.6	15.8

Sarcon GR-Hd

(Unit : Kgf/inch^2) **Table - 19**

	50G	100G	150G	200G	250G	300G	350G	400G	450G	500G
10%	20.9	19.8	15.2	12.3	10.9	8.00	6.90	5.70	5.30	5.00
20%	46.1	39.9	26.2	26.2	20.4	17.7	13.2	11.5	11.0	10.7
30%	77.7	63.1	49.0	44.3	32.3	30.4	28.2	22.7	22.0	21.8
40%	106.2	90.3	78.0	67.9	54.0	49.6	44.6	42.8	42.0	39.4
50%	135.6	121.7	115.0	98.1	83.0	68.1	65.2	60.1	58.7	52.1
sustain 50%	106.9	91.6	59.8	33.4	28.1	25.2	24.7	23.1	20.8	20.1

Sarcon GR-Fd

(Unit : Kgf/inch^2) **Table - 20**

	50G	100G	150G	200G	250G	300G	350G	400G	450G	500G
10%	17.0	15.5	15.4	11.2	8.20	7.30	6.50	5.40	5.10	4.80
20%	47.0	31.2	26.7	26.0	17.0	16.2	12.7	10.9	10.5	9.70
30%	80.1	46.9	45.9	39.4	28.7	24.9	21.6	20.9	19.6	17.9
40%	100.8	63.8	63.2	57.1	42.8	37.2	35.8	32.4	31.8	30.3
50%	112.9	101.9	82.6	67.5	62.2	50.1	49.8	48.7	44.8	42.7
sustain 50%	96.4	71.6	49.9	31.2	25.8	20.0	18.9	18.2	18.1	17.9

Sarcon GR-HFd

(Unit : Kgf/inch^2) **Table - 21**

	50G	100G	150G	200G	250G	300G	350G	400G	450G	500G
10%	22.5	20.7	20.1	15.7	14.8	12.1	9.8	9.0	7.8	7.1
20%	54.1	48.9	40.1	37.2	24.3	17.8	15.2	14.9	14.3	14.2
30%	89.3	80.5	68.5	48.9	37.9	29.7	28.8	28.0	27.9	27.7
40%	113.7	110.8	80.2	71.2	59.8	47.2	47.0	46.1	44.2	42.1
50%	137.6	130.9	117.8	108.9	87.4	70.8	68.0	62.7	60.2	53.9
sustain 50%	119.8	102.9	78.2	50.8	41.7	38.9	32.2	32.1	28.7	25.2

Remarks / Test Method : Fujipoly Test Method
Compression Velocity 5.0mm / minute with 200Kgf load
Compression Area 6.25cm^2 (25mm x 25mm)
Sustain 50% at One minute after

10] Extractable Volatiles.

Table - 22

D n	**Sarcon GR-d**
D_4 ~ D_{10}	Less than 0.0010wt %
D_{11} ~ D_{20}	Less than 0.0099wt %
total less D_{20}	Less than 0.0099wt %

FPDS97-21 (Version 1) : Test Method : Gas Chromatographic Analysis by Abstracting Acetone.

11] Flame Retardancy.

Table - 23

Series	Product Description	UL94	Series	Product Description	UL94
Sarcon® GR-d	Sarcon **50G-d**	94V – 0	**Sarcon GR-Hd**	Sarcon **50G-Hd**	94V – 0
	Sarcon **100G-d**	94V – 0		Sarcon **100G-Hd**	94V – 0
	Sarcon **150G-d**	94V – 0		Sarcon **150G-Hd**	94V – 0
	Sarcon **200G-d**	94V – 0		Sarcon **200G-Hd**	94V – 0
	Sarcon **250G-d**	94V – 0		Sarcon **250G-Hd**	94V – 0
	Sarcon **300G-d**	94V – 0		Sarcon **300G-Hd**	94V – 0
	Sarcon **350G-d**	94V – 0		Sarcon **350G-Hd**	94V – 0
	Sarcon **400G-d**	94V – 0		Sarcon **400G-Hd**	94V – 0
	Sarcon **500G-d**	94V – 0		Sarcon **500G-Hd**	94V – 0
Sarcon GR-Fd	Sarcon **50G-Fd**	94V – 1	**Sarcon GR-HFd**	Sarcon **50G-HFd**	94V – 1
	Sarcon **100G-Fd**	94V – 1		Sarcon **100G-HFd**	94V – 1
	Sarcon **150G-Fd**	94V – 1		Sarcon **150G-HFd**	94V – 1
	Sarcon **200G-Fd**	94V – 1		Sarcon **200G-HFd**	94V – 1
	Sarcon **250G-Fd**	94V – 1		Sarcon **250G-HFd**	94V – 1
	Sarcon **300G-Fd**	94V – 0		Sarcon **300G-HFd**	94V – 0
	Sarcon **350G-Fd**	94V – 0		Sarcon **350G-HFd**	94V – 0
	Sarcon **400G-Fd**	94V – 0		Sarcon **400G-HFd**	94V – 0
	Sarcon **500G-Fd**	94V – 0		Sarcon **500G-HFd**	94V – 0

12] Test Method for Sarcon® GR-d products.

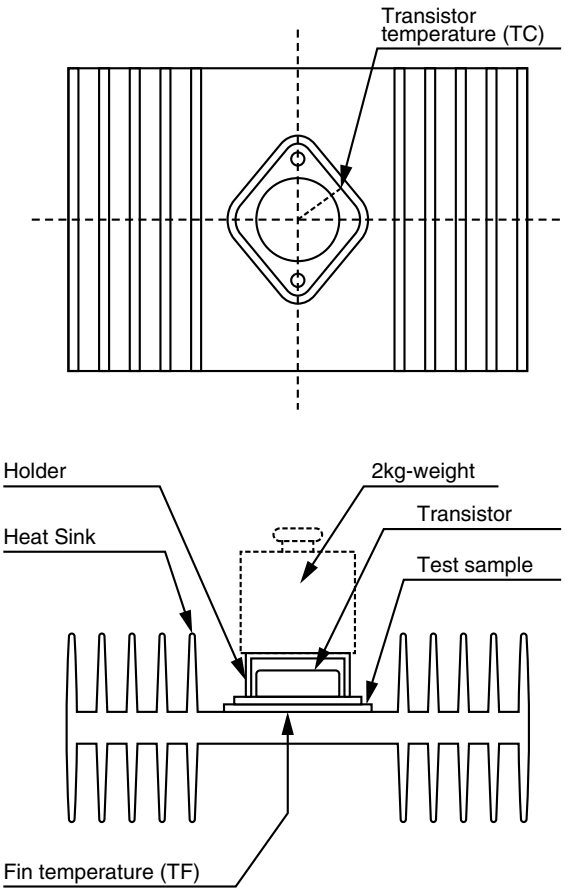
1) Test method of thermal resistance.

(FUJIPOLY® DATE SHEET NUMBER : FPDS 97-20 (Version 1))

[Test method]

1) Punched-out specmen in TO-3 package is located between a transistor and heat sink. (Fig.1)
2) The transistor is covered with resin holder and added 2kg -weight as a load.
3) DC 10V, 2A (20W) current is applied to the transistor.
4) The thermal resistance is determined by formula from the transistor and heat sink temperatures measured three minutes later.

(Fig.1)



Test Apparatus

Transistor : 2SC2245

Heat Sink : 40CH104L-90-K
(manufactured by Ryosan Co., Ltd)

Heat Sensor : 2SC1-OHK300 x 532W x JOO2Y
(manufactured by Chino Co., Ltd)

Condition : 25˚C 60%RH

Formula for calculating the Thermal impedance.
∂ = (Tc-Tf) / PC

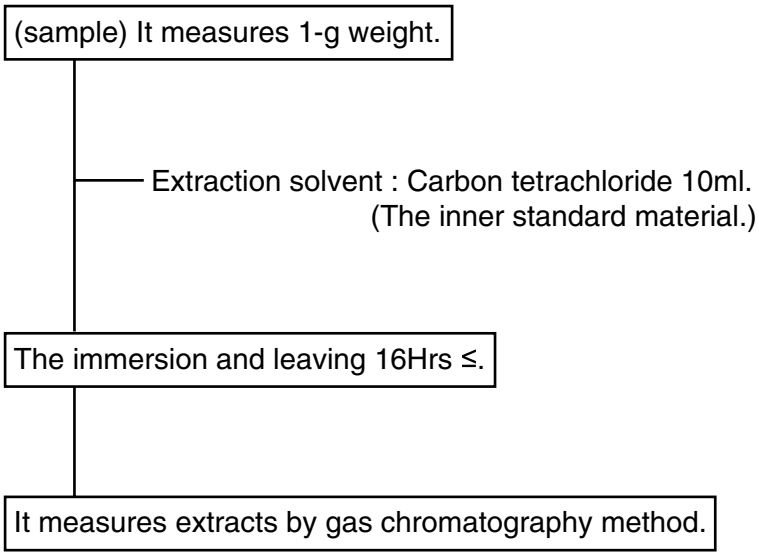
∂ : Thermal impedance (˚C/W)
Tc : Transistor temperature ˚C
Tf : Hert sink temperature ˚C
PC : Power applied to transistor

2) The gas chromatography method by the carbon.

(FUJIPOLY® DATE SHEET NUMBER : FPDS 97-21 (Version 1))

[Test method]

[The preprocessing]



[The measurement condition]

model : SHIMAZU SEISAKUSHO Co,. Ltd. GC-12A
detector : FID (The hydrogen flame ionization detector.)
column : OV-17 (3m)
column temperature : 60˚C · 2min temperature-programmed 16˚C / min maintenance 300˚C
ventage temperature : 280˚C
carrier gas flow rate : 40ml / min
inculcating quantity : 2μl