

FUJIPOLY[®]

SARCON[®] TR/GTR Series.

Sarcon TR : General Purpose for Extrusions and Moldings.

Sarcon GTR : General Purpose Glass cloth Reinforcement.

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FUJIPOLY DATA SHEET NUMBER FPDS 96-08 / Version 4

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FUJIPOLY[®] DATA SHEET FPDS 96-08 (Version 4)

1] Product Name :

- 1] -1) Sarcon[®] TR (UL File Number E58126)
- 2) Sarcon[®] GTR (UL File Number E58126)
- 3) Sarcon[®] GTR-AD (Silicone Pressure Sensitive Adhesive option)

2] Features for Sarcon TR / Sarcon GTR / Sarcon GTR-AD

1) High Heat Conductivity.

SARCON[®] TR is Fujipoly's originally developed High Heat Conductive Silicone Rubber. Fine, high heat conductive ceramic particles are mixed with insulative silicone rubber to produce this excellent insulative, high heat conductive silicone material.

SARCON[®] GTR is a composite of Heat Conductive Silicone Rubber and Fiberglass. SARCON[®] GTR has excellent mechanical and physical characteristics.

2) Usable Over a Wide Temperature Range. (−60°C ~ 182°C / −76°F ~ +360°F)

Due to its superior resistance to heat and cold, SARCON[®] is ideal for use across a wide temperature range. Sarcon maintains its outstanding electrical and electrical insulating properties which are characteristic of silicone. There is no significant variation in its physical properties.

SARCON[®] is distinguished by a wide range of other outstanding properties, such as excellent resistance to environmental conditions, arc, corona discharge, ozone and chemicals.

3) Simplified Processing and Reduced Operating Costs.

Unlike mica, SARCON[®] requires no grease. This significantly simplifies operation, and dispenses with the various costs required for applying the grease. Sarcon[®] is not messy, easy to apply and free from the problems of contamination due to grease application.

4) Cushion Effect.

Due to SARCON's elastic properties, it has an excellent cushion effect. Attached to devices like transistors. SARCON[®] provides superb protection against damage due to deformation as well as shock and vibration.

5) Complies with UL Standards. (UL 94. UL 746)

- A. Complies with UL 746 (Electrical Insulant Standard) 150°C
- B. Complies with UL 94 (Flame Retardancy Standard) V-0

6) Adhesive option.

Sarcon[®] GTR is available with a PSA (Pressure Sensitive Adhesive) mounting option. Temperature range performance is −46°C to +150°C. Simply remove the protective liner and press into position to attach.

3] Typical Product Properties of SARCON® TR / SARCON GTR

3] -1) SARCON® TR

Table - 1

Item	Unit	SARCON 30T	SARCON 45T	SARCON 85T
Color	—	Grey - Green		
Thickness	mm	0.3+0.1/-0	0.45±0.05	0.85±0.05
Hardness	ASTM D2240(A)	75		
Tensile Strength	KN/m	1.7	2.3	4.3
Elongation	%	100		
Tear Strength	KN/m	0.3B	0.4B	0.8B
Volume Resistivity	MΩ·m	x 10 ⁷	x 10 ⁷	x 10 ⁷
Breakdown Voltage	KV/AC	10	11	15
Withstand Voltage	KV/minute	7	8	10
Dielectric Constant	50Hz	4.4	4.5	4.9
	103Hz	4.4	4.5	4.9
	106Hz	4.4	4.5	4.9
Dielectric Dissipation Factor	50Hz	0.004	0.004	0.003
	103Hz	0.002	0.002	0.002
	106Hz	0.003	0.003	0.003
Thermal Impedance	FTM P-3010	0.62	0.73	1.35
Flame Retardant	UL-94	V - 0	V - 0	V - 0

Note.) 1. Test method is based on JIS K-6246.

2. Breakdown Voltage : AC 60Hz

Withstand Voltage : AC 60Hz

3. Thermal Impedance : Fujipoly Test Method FTM P-3010 which gives ASTM D5470 Equivalent value.

4. Flame Retardant : UL-94

3] -2) SARCON® GTR

Table - 2

Item	Unit	SARCON 15GTR	SARCON 20GTR	SARCON 30GTR
Color	—	Grey - Green		
Thickness	mm	0.15+0.02/-0.04	0.20+0.02/-0.04	0.30+0.06/-0
Hardness	ASTM D2240(A)	87	87	92
Tensile Strength	KN/m	11		
Elongation	%	2 or less		
Volume Resistivity	MΩ·m	10 ⁷	10 ⁷	10 ⁷
Breakdown Voltage	KV/AC	4.0	6.5	8.0
Withstand Voltage	KV/minute	4.0	6.0	7.0
Dielectric Constant	50Hz	2.5	3.2	3.5
	10 ³ Hz	2.5	3.2	3.5
	10 ⁶ Hz	2.5	3.2	3.5
Dielectric Dissipation Factor	50Hz	0.008	0.007	0.007
	10 ³ Hz	0.004	0.003	0.003
	10 ⁶ Hz	0.004	0.004	0.003
Thermal Impedance	FTM P-3010	0.51°C/W	0.56 °C/W	0.66 °C/W
Thermal Impedance AD Type	FTM P-3010	0.78°C/W	0.83°C/W	0.93°C/W
Flame Retardant	UL-94	V - 0	V - 0	V - 0

Note.) 1. Test Method is based on JIS K-6249.

2. Breakdown Voltage : AC 60Hz

Withstand Voltage : AC 60Hz

3. Thermal Impedance : Fujipoly Test Method FTM P-3010 which gives ASTM D5470 Equivalent value.

4. Flame Retardant : UL-94

5. Tensile Strength / Elongation : Test methods according to ASTM D1458,
double silicone rubber / Glass cloth
test method.

4] Heat Aging Test

4] -1) Test Condition : 150°C (300°F) x 1,000hrs (42days)

SARCON® 30T

Table - 3

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	76	80	81	83
Tensile Strength	KN/m	1.7	1.7	1.8	1.8
Elongation	%	100	70	50	50
Volume Resistivity	MΩ·m	2.9 x 10 ⁷	3.0 x 10 ⁷	6.5 x 10 ⁷	5.6 x 10 ⁷
Breakdown Voltage	KV/AC	10.0	9.4	8.5	8.4
Dielectric Constant	50Hz	4.4	4.3	4.2	4.2
	10 ³ Hz	4.4	4.3	4.2	4.3
	10 ⁶ Hz	4.4	4.3	4.2	4.3
Dielectric Dissipation Factor	50Hz	0.004	0.003	0.003	0.004
	10 ³ Hz	0.002	0.003	0.002	0.002
	10 ⁶ Hz	0.003	0.003	0.003	0.003

SARCON® 45T

Table - 4

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	75	80	80	85
Tensile Strength	KN/m	2.2	2.4	2.4	2.6
Elongation	%	100	90	50	60
Volume Resistivity	MΩ·m	2.1 x 10 ⁷	3.5 x 10 ⁷	7.6 x 10 ⁷	6.5 x 10 ⁷
Breakdown Voltage	KV/AC	11.0	11.0	10.0	10.0
Dielectric Constant	50Hz	4.5	4.4	4.3	4.4
	10 ³ Hz	4.5	4.4	4.3	4.4
	10 ⁶ Hz	4.5	4.4	4.3	4.4
Dielectric Dissipation Factor	50Hz	0.004	0.003	0.003	0.002
	10 ³ Hz	0.002	0.002	0.002	0.002
	10 ⁶ Hz	0.003	0.002	0.002	0.002

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Table - 5

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	75	80	82	83
Tensile Strength	KN/m	4.3	4.7	4.6	4.6
Elongation	%	100	80	40	70
Volume Resistivity	MΩ·m	6.7 x 10 ⁶	1.3 x 10 ⁶	2.5 x 10 ⁶	3.7 x 10 ⁶
Breakdown Voltage	KV/AC	15.0	15.0	14.0	15.0
Dielectric Constant	50Hz	4.9	4.8	4.8	4.9
	10 ³ Hz	4.9	4.8	4.8	4.8
	10 ⁶ Hz	4.9	4.8	4.8	4.8
Dielectric Dissipation Factor	50Hz	0.003	0.003	0.003	0.003
	10 ³ Hz	0.002	0.002	0.002	0.002
	10 ⁶ Hz	0.003	0.002	0.002	0.002

4] -2) Test Condition : 200°C (390°F) x 1,000hrs(42days)

SARCON® 30T

Table - 6

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	76	82	85	90
Tensile Strength	KN/m	1.7	1.7	1.8	2.1
Elongation	%	100	60	50	30
Volume Resistivity	MΩ·m	2.9 x 10 ⁷	3.9 x 10 ⁷	7.6 x 10 ⁷	7.2 x 10 ⁷
Breakdown Voltage	KV/AC	10.0	9.7	9.8	8.0
Dielectric Constant	50Hz	4.4	4.3	4.2	4.2
	10 ³ Hz	4.4	4.3	4.2	4.2
	10 ⁶ Hz	4.4	4.3	4.2	4.2
Dielectric Dissipation Factor	50Hz	0.004	0.006	0.005	0.004
	10 ³ Hz	0.002	0.003	0.003	0.002
	10 ⁶ Hz	0.003	0.003	0.003	0.003

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Table - 7

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	75	80	86	87
Tensile Strength	KN/m	2.2	2.3	2.3	3.2
Elongation	%	100	70	50	40
Volume Resistivity	MΩ·m	2.1 x 10 ⁷	3.8 x 10 ⁷	4.0 x 10 ⁷	6.9 x 10 ⁷
Breakdown Voltage	KV/AC	11.0	11.0	10.0	10.0
Dielectric Constant	50Hz	4.5	4.4	4.3	4.5
	10 ³ Hz	4.5	4.4	4.3	4.5
	10 ⁶ Hz	4.5	4.4	4.4	4.5
Dielectric Dissipation Factor	50Hz	0.003	0.003	0.003	0.003
	10 ³ Hz	0.002	0.002	0.002	0.002
	10 ⁶ Hz	0.003	0.002	0.002	0.002

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Table - 8

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	75	80	85	86
Tensile Strength	KN/m	4.2	4.3	4.5	5.1
Elongation	%	100	55	50	40
Volume Resistivity	MΩ·m	6.7 x 10 ⁶	2.3 x 10 ⁷	7.0 x 10 ⁷	6.7 x 10 ⁷
Breakdown Voltage	KV/AC	15.0	14.0	14.0	15.0
Dielectric Constant	50Hz	4.9	4.8	4.8	4.9
	10 ³ Hz	4.9	4.8	4.8	4.9
	10 ⁶ Hz	4.9	4.8	4.8	4.9
Dielectric Dissipation Factor	50Hz	0.003	0.003	0.003	0.003
	10 ³ Hz	0.002	0.002	0.002	0.002
	10 ⁶ Hz	0.003	0.002	0.002	0.002

4] -3) Test Condition : 150°C (300°F) x 1,000hrs (42days)

SARCON® 15GTR

Table - 9

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	87	87	87	87
Tensile Strength (ASTM D1458)	KN/m	11.0	9.1	9.1	9.1
Elongation (ASTM D1458)	%	2 or less	2 or less	2 or less	2 or less
Volume Resistivity	MΩ·m	5.7 x 10 ⁷	7.0 x 10 ⁷	1.1 x 10 ⁷	9.1 x 10 ⁷
Breakdown Voltage	KV/AC	4.0	4.0	3.6	3.5
Dielectric Constant	50Hz	2.5	2.2	2.3	2.3
	10 ³ Hz	2.5	2.2	2.3	2.2
	10 ⁶ Hz	2.5	2.2	2.3	2.3
Dielectric Dissipation Factor	50Hz	0.008	0.006	0.002	0.002
	10 ³ Hz	0.004	0.003	0.002	0.002
	10 ⁶ Hz	0.004	0.003	0.003	0.003

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Table - 10

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	87	87	88	89
Tensile Strength (ASTM D1458)	KN/m	10.8	9.9	9.8	7.7
Elongation (ASTM D1458)	%	2 or less	2 or less	2 or less	2 or less
Volume Resistivity	MΩ·m	1.1 x 10 ⁷	3.9 x 10 ⁷	6.8 x 10 ⁷	5.8 x 10 ⁷
Breakdown Voltage	KV/AC	6.5	6.5	6.0	6.0
Dielectric Constant	50Hz	3.2	2.8	2.6	2.7
	10 ³ Hz	3.2	2.8	2.6	2.7
	10 ⁶ Hz	3.2	2.8	2.6	2.7
Dielectric Dissipation Factor	50Hz	0.007	0.004	0.003	0.003
	10 ³ Hz	0.003	0.002	0.002	0.002
	10 ⁶ Hz	0.004	0.003	0.003	0.003

SARCON® 30GTR

Table - 11

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	92	92	92	92
Tensile Strength (ASTM D1458)	KN/m	11.0	10.4	10.0	7.0
Elongation (ASTM D1458)	%	2 or less	2 or less	2 or less	2 or less
Volume Resistivity	MΩ·m	1.3 x 10 ⁷	3.5 x 10 ⁷	4.5 x 10 ⁷	8.4 x 10 ⁷
Breakdown Voltage	KV/AC	8.0	7.5	7.4	7.3
Dielectric Constant	50Hz	3.5	3.3	3.4	3.3
	10 ³ Hz	3.5	3.3	3.4	3.3
	10 ⁶ Hz	3.5	3.3	3.4	3.3
Dielectric Dissipation Factor	50Hz	0.007	0.003	0.002	0.002
	10 ³ Hz	0.003	0.002	0.001	0.001
	10 ⁶ Hz	0.003	0.003	0.003	0.003

4] -4) Test Condition : 200°C (390°F) x 1,000hrs (42days)

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Table - 12

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	87	87	88	88
Tensile Strength (ASTM D1458)	KN/m	11.0	8.5	7.4	6.6
Elongation (ASTM D1458)	%	2 or ress	2 or ress	2 or ress	2 or ress
Volume Resistivity	MΩ·m	5.7 x 10 ⁷	7.3 x 10 ⁷	1.2 x 10 ⁷	1.1 x 10 ⁷
Breakdown Voltage	KV/AC	4.0	3.7	3.2	3.0
Dielectric Constant	50Hz	2.5	2.3	2.1	2.1
	10 ³ Hz	2.5	2.3	2.1	2.1
	10 ⁶ Hz	2.5	2.3	2.1	2.1
Dielectric Dissipation Factor	50Hz	0.008	0.003	0.003	0.003
	10 ³ Hz	0.004	0.002	0.002	0.002
	10 ⁶ Hz	0.004	0.003	0.002	0.002

SARCON® 20GTR

Table - 13

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	87	88	89	89
Tensile Strength (ASTM D1458)	KN/m	10.8	10.7	7.0	6.4
Elongation (ASTM D1458)	%	2 or ress	2 or ress	2 or ress	2 or ress
Volume Resistivity	MΩ·m	1.1 x 10 ⁷	8.3 x 10 ⁷	9.8 x 10 ⁷	9.8 x 10 ⁷
Breakdown Voltage	KV/AC	6.5	6.0	6.0	4.1
Dielectric Constant	50Hz	3.2	2.8	2.7	2.7
	10 ³ Hz	3.2	2.8	2.7	2.7
	10 ⁶ Hz	3.2	2.8	2.7	2.7
Dielectric Dissipation Factor	50Hz	0.007	0.003	0.002	0.003
	10 ³ Hz	0.003	0.002	0.002	0.002
	10 ⁶ Hz	0.004	0.003	0.003	0.003

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Table - 14

Properties	Unit	Before test	After 100hrs	After 500hrs	After 1,000hrs
Hardness	ASTM D2240(A)	92	92	92	92
Tensile Strength (ASTM D1458)	KN/m	11.0	10.5	9.6	8.5
Elongation (ASTM D1458)	%	2 or ress	2 or ress	2 or ress	2 or ress
Volume Resistivity	MΩ·m	1.3 x 10 ⁷	6.3 x 10 ⁷	1.4 x 10 ⁷	8.1 x 10 ⁷
Breakdown Voltage	KV/AC	8.0	7.5	7.4	5.5
Dielectric Constant	50Hz	3.6	3.4	3.2	3.2
	10 ³ Hz	3.5	3.4	3.2	3.1
	10 ⁶ Hz	3.6	3.4	3.2	3.1
Dielectric Dissipation Factor	50Hz	0.007	0.002	0.002	0.002
	10 ³ Hz	0.003	0.001	0.001	0.002
	10 ⁶ Hz	0.003	0.003	0.003	0.003

5] Water resistance.

5] -1) Test Condition : 60°C (140°F) x 500hrs(20days)

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Table - 15

Properties	Unit	Before test	After 250hrs	After 500hrs
Hardness	ASTM D2240(A)	76	75	73
Volume Resistivity	MΩ·m	2.9 x 10 ⁷	9.5 x 10 ⁵	6.1 x 10 ⁵
Breakdown Voltage	KV/AC	10.0	8.0	6.0
Dielectric Constant	50Hz	4.4	4.8	4.8
	10 ³ Hz	4.4	4.6	4.6
	10 ⁶ Hz	4.4	4.5	4.5
Dielectric Dissipation Factor	50Hz	0.004	0.029	0.030
	10 ³ Hz	0.002	0.013	0.014
	10 ⁶ Hz	0.003	0.006	0.006

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Table - 16

Properties	Unit	Before test	After 250hrs	After 500hrs
Hardness	ASTM D2240(A)	75	74	73
Volume Resistivity	MΩ·m	2.1 x 10 ⁷	9.5 x 10 ⁵	7.4 x 10 ⁵
Breakdown Voltage	KV/AC	11.0	9.0	7.0
Dielectric Constant	50Hz	4.5	5.1	5.2
	10 ³ Hz	4.5	4.8	5.0
	10 ⁶ Hz	4.5	4.8	4.9
Dielectric Dissipation Factor	50Hz	0.004	0.034	0.039
	10 ³ Hz	0.002	0.015	0.016
	10 ⁶ Hz	0.003	0.002	0.005

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Table - 17

Properties	Unit	Before test	After 250hrs	After 500hrs
Hardness	ASTM D2240(A)	75	74	74
Volume Resistivity	MΩ·m	6.7 x 10 ⁶	1.6 x 10 ⁵	1.1 x 10 ⁵
Breakdown Voltage	KV/AC	16.0	11.0	10.0
Dielectric Constant	50Hz	4.9	5.5	5.2
	10 ³ Hz	4.9	5.3	5.1
	10 ⁶ Hz	4.9	5.2	5.0
Dielectric Dissipation Factor	50Hz	0.003	0.030	0.022
	10 ³ Hz	0.002	0.014	0.009
	10 ⁶ Hz	0.003	0.004	0.003

5] -2)Test Condition : 60°C (140°F) x 500hrs (20days)

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Table - 18

Properties	Unit	Before test	After 250hrs	After 500hrs
Hardness	ASTM D2240(A)	87	87	87
Volume Resistivity	MΩ·m	5.7 x 10 ⁷	1.3 x 10 ⁵	9.1 x 10 ⁵
Breakdown Voltage	KV/AC	4.0	3.5	3.0
Dielectric Constant	50Hz	2.5	2.9	2.7
	10 ³ Hz	2.5	2.7	2.7
	10 ⁶ Hz	2.5	2.7	2.7
Dielectric Dissipation Factor	50Hz	0.008	0.059	0.024
	10 ³ Hz	0.004	0.008	0.008
	10 ⁶ Hz	0.004	0.005	0.005

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Table - 19

Properties	Unit	Before test	After 250hrs	After 500hrs
Hardness	ASTM D2240(A)	87	87	87
Volume Resistivity	MΩ·m	1.1 x 10 ⁷	4.9 x 10 ⁴	2.3 x 10 ⁴
Breakdown Voltage	KV/AC	6.0	5.0	4.0
Dielectric Constant	50Hz	3.2	3.5	3.6
	10 ³ Hz	3.2	3.3	3.4
	10 ⁶ Hz	3.2	3.3	3.4
Dielectric Dissipation Factor	50Hz	0.007	0.055	0.052
	10 ³ Hz	0.003	0.018	0.017
	10 ⁶ Hz	0.004	0.005	0.005

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Table - 20

Properties	Unit	Before test	After 250hrs	After 500hrs
Hardness	ASTM D2240(A)	92	92	92
Volume Resistivity	MΩ·m	1.3 x 10 ⁷	4.0 x 10 ⁵	1.3 x 10 ⁵
Breakdown Voltage	KV/AC	8.0	7.0	6.0
Dielectric Constant	50Hz	3.6	3.9	3.9
	10 ³ Hz	3.5	3.7	3.7
	10 ⁶ Hz	3.6	3.6	3.6
Dielectric Dissipation Factor	50Hz	0.007	0.042	0.041
	10 ³ Hz	0.003	0.018	0.020
	10 ⁶ Hz	0.003	0.005	0.005

6] Clamping Torque VS Thermal Impedance (°C/W).

Table - 21

Clamping Torque		3kg-cm	5kg-cm	7kg-cm
Product Name	Thickness (mm)			
30T	0.33	0.65	0.62	0.59
45T	0.44	0.76	0.73	0.71
85T	0.84	1.37	1.35	1.32
15GTR	0.16	0.58	0.51	0.50
20GTR	0.21	0.60	0.56	0.54
30GTR	0.33	0.68	0.66	0.64
15GTR - AD	0.20		0.78	
20GTR - AD	0.25		0.83	
30GTR - AD	0.35		0.93	

Note.) Test inethod : Fujipoly test method FTM P-3010 which gives ASTM D5470 Equivalent value.

7] Chemical Resistance. (Chemical Name : HCFC AK-225 (Substitutive Freon))

Table - 22

Product Name	Insulative Resistivity (MΩ·m)		Breakdown Voltage (KV)		Thermal Impedance (°C/W)	
	before soak	after 24hrs	before soak	after 24hrs	before soak	after 24hrs
30T	2.9 x 10 ⁷	1.3 x 10 ⁶	10	9	0.62	0.62
45T	2.1 x 10 ⁷	4.1 x 10 ⁶	11	10	0.73	0.70
85T	6.7 x 10 ⁶	4.7 x 10 ⁶	15	13	1.35	1.36
15GTR	5.7 x 10 ⁶	8.6 x 10 ⁶	4	4	0.51	0.50
20GTR	1.1 x 10 ⁷	2.9 x 10 ⁷	6.5	6	0.56	0.57
30GTR	1.3 x 10 ⁷	2.5 x 10 ⁷	8.0	9	0.66	0.69

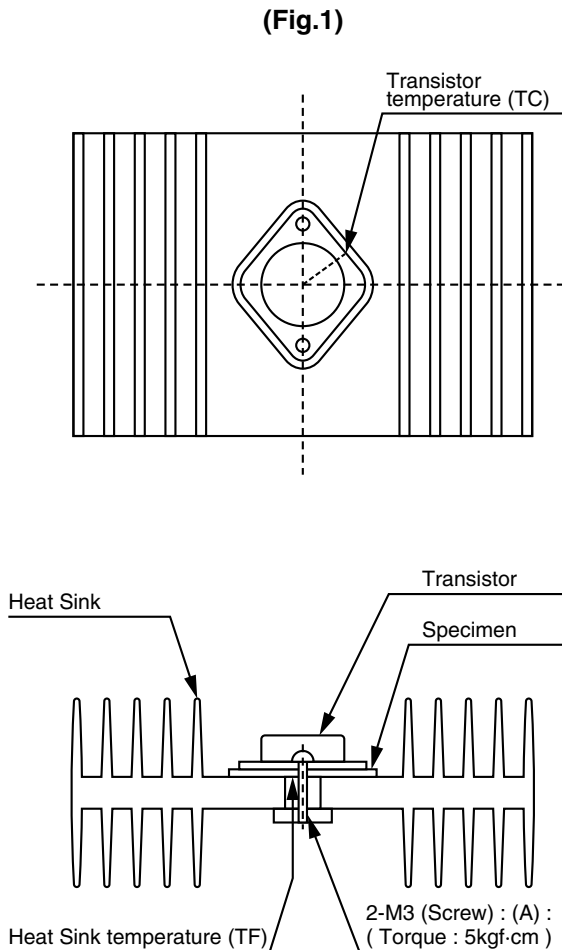
8] Standard Products.

- Sacon® Roll and Sheets.
- Sacon® Die-cut Gaskets.
- Sacon® Sleeves.
- Sacon® Cases.

9] Test Method for Thermal Resistance (Impedance) .

Test method : Fujipoly test method FTM P-3010 which gives ASTM D5470 equivalent value.

- 1) Punched-out specimen in TO-3 package is located between a transistor and heat sink (Fig.1). and secured with screws the position (A), using a screwdriver.
- 2) DC 10V, 2A (20W) current is applied to the transistor.
- 3) After three minutes, the thermal resistance is calculated based on the following formula (B).



Test Apparatus

Transistor : 2SC2245

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

Heat Sensor : 2SC1-OHK300 x 532W x J002Y
(manufactured by Chino Co., Ltd)

Condition : 25°C 60%RH

Formula for Thermal Impedance calculation.

$$(B) : R_t = (T_c - T_f) / P_C$$

R_t : Thermal resistance (°C·inch² / W)

T_c : Transistor temperature °C

T_f : Heat sink temperature °C

P_C : Power applied to transistor

10] Other Technical Information and Design Guide.

Fuji Poly website <http://www.fujipoly.com>

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: June 1st 1999 version 2
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