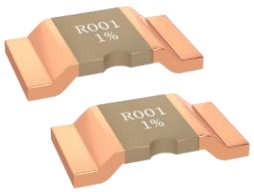
ST Series
Shunt Chip Resistors
Version. C

FEATURE



- AEC-Q200 Qualified.
- High stability and reliability
- Low resistance value down to 0.1 mΩ
- Low inductance value down to 3nH
- Superior TCR performance narrow to ±50 PPM/℃
- RoHS and Halogen-free compliance
- Applications:
  - VFD, Variable Frequency Drive
  - Servo drive
  - High current battery management system
  - Automotive electronics, such as control units, oil pump drive
  - DC/DC, DC/AC power modules
  - Automatic control system
  - Industrial instrument and equipment
  - etc.

MANUFACTURER PART NO.

ST3920F0R003TF550-ST3920 ±1% 3mΩ T/R-2500 5W ±50PPM/℃

Series	Size	Tol.	Nominal Resistance Value	PKG	SPQ	Power	TCR
2 codes	4 codes	1 code	2~5 codes	1 code	1 code	1 code	2 codes
ST	3920	F	0R003	T	F	5	50
Shunt Chip Resistors	2512 3920 5930	D=±0.5% F=±1% G=±2% J=±5%	0U1①=0.0001Ω, 0.1mΩ 0U75=0.00075Ω, 0.75mΩ 0R001②=0.001Ω, 1mΩ 1U5=0.0015Ω, 1.5mΩ 0R005=0.005Ω, 5mΩ	T=T/R③	1=1,000 2=2,000 3=3,000 F=2,500 G=1,500	3=3W 4=4W 5=5W 6=6W 7=7W 8=8W 9=9W T=10W 0=Std.	50=50PPM/℃ 00=Refer to table as below.

Note: ① U=milli, 10^{-3}, mΩ ② R=Radix, 10^{0},Ω ③ T/R=Taping in Reel package type.

CHARACTERISTIC

Item	Power, W @ 70℃	Resistance Value, mΩ	TCR, PPM/℃	Rthi, ℃/W
ST2512	6	0.2	±175	3
	6	0.3	±175	5
	6	0.5	±115	6
	6	1	±100	10
	6	1.2	±70	-
	6	1.5	±70	-
	6	2	±70	15
	4	2.5	±70	-
	4	3	±70	24
	4	4	±70	27
	3	5	±70	40
ST3920	12	0.2	±200	3
	10	0.3	±150	3.5
	9	0.4	±100	-
	9	0.5	±70	7
	8	0.7	±70	9
	7	1	±50	10
	8	1	±50	7
	6	1.5	±50	-
	6	2	±50	14.5
	5	2.5	±50	-
	5	3	±50	22
	5	4	±50	24
	5	5	±50	-

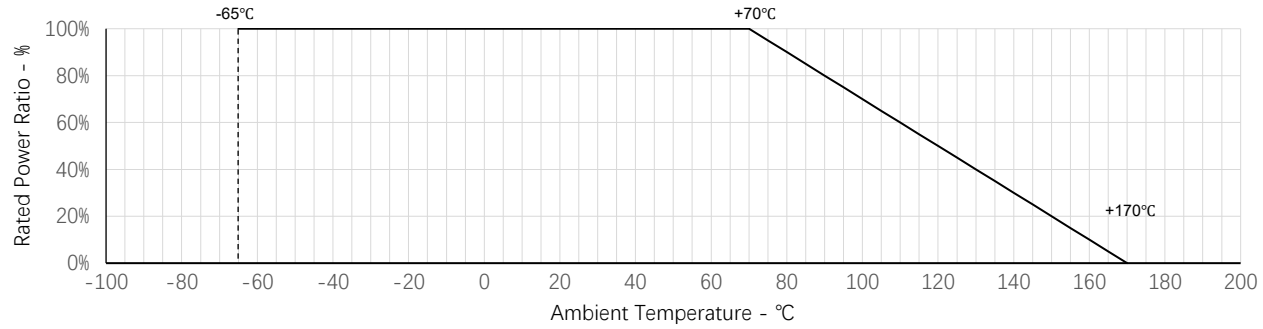
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Item	Power, W @ 70℃	Resistance Value, mΩ	TCR, PPM/℃	Rthi, ℃/W
ST5930	15	0.1	±200	2
	15	0.2	±100	3
	10	0.3	±100	-
	10	0.35	±100	-
	10	0.4	±100	-
	10	0.5	±75	3.5
	10	0.6	±75	-
	10	0.75	±75	6
	9	1	±50	7
	8	1.5	±50	10
	7	2	±50	13
	7	2.5	±50	-
	7	3	±50	17.5
	7	4	±50	-

PACKING

Type	Tape material	Resistance Value	SPQ, KPC/Reel
ST2512	Embossed plastic	0.2, 0.3 mΩ	1,000
		0.5 mΩ, 1.1~1.5 mΩ	2,000
		0.6 ~ 1 mΩ, 1.5~5 mΩ	3,000
ST3920	Embossed plastic	0.2 mΩ	2,000
		0.3 mΩ	1,500
		0.4 ~ 5 mΩ	2,500
ST5930	Embossed plastic	0.1, 0.2 mΩ	1,000
		0.3, 0.35 mΩ	1,500
		0.4 ~ 4 mΩ	2,000

POWER DERATING CURVE



RATED CURRENT

The resistor shall have a Rated Current which would be DC or AC corresponding to the Rated Power, and it can be calculated by formula as below.

The Rated Current of certain resistance value should be the calculated result or Max. Working Current of product series whichever less.

Formula:

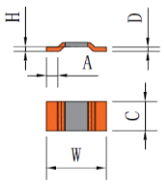
$$I = \sqrt{P/R}$$

I=Rated current (A)
P=Rated power (W)
R=Nominal resistance (Ω)

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DIMENSIONS

Unit: mm

Figure	Type	W	A	C	H
	ST2512	6.3±0.2	1.2±0.2	3.1±0.3	0.5±0.1
	ST3920	10±0.2	2.2±0.2	5.1±0.4	0.5±0.1
	ST5930	15±0.2	4.2±0.3	7.6±0.4	0.5±0.1

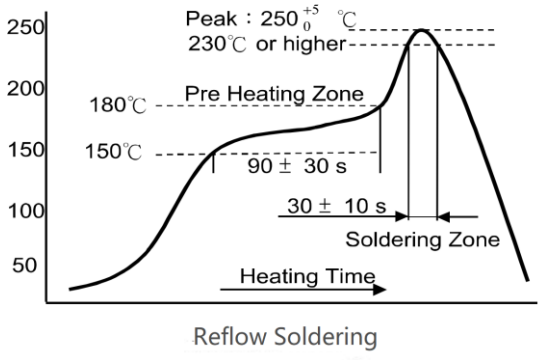
RELIABILITY

Test Item	Test method	Acceptable Criterion
Temperature Cycling	1,000 cycles (-55℃to +155℃), unpowered. Minimum dwell time 15min. at each temperature extreme. Maximum transition time 1 min. Measurement at least 24 hours after test conclusion.	△R/R=±0.5%
High temperature exposure	1,000 hrs. T=170℃, Unpowered	△R/R=±0.5%
Biased humidity	1,000 hrs. 85℃/85%RH. Note: Specified conditions as 10% of operating power	△R/R=±0.5%
High temperature operational Life	Condition D Steady State, TA=125℃ at rated power 90 min. Power ON and 30 min. Power OFF. Measurement at 24±4 hours after test conclusion.	△R/R=±0.5%
Solderability	245±5℃, 5±0.5s. weld bath.	95% Coverage minimum.
Vibration, High Frequency	5 g's for 20 min, 12 cycles each of 3 orientations. Note: Use 8"X5" PCB .031" thick 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.	△R/R=±0.5%
Resistance to soldering heat	250±5℃, 30±5s	△R/R=±0.5%
Short time overload	5×Rated power for 5 seconds.	△R/R=±0.5%
Mechanical Shock	1) Pulse waveform: Half-Sine pulse. 2) Accelerate peak: 100g's. 3) Pulse duration: 6ms. 4) Orientation & Shock time: ±X, ±Y, ±Z; 3 times, each orientation, total 18 times	△R/R=±0.5%
ESD	Direct Contact (DC): ±6kV. Air Discharge (AD): ±12kV, ±16kV, ±25kV;	△R/R=±0.5%
Board Flex	1) PCB board size(H×W×T): 100mm ×40mm×1.6mm. 2) Press tool: r = 340mm, Width = 20mm. 3) Deformation displacement: 2mm. 4) Duration: 60^{+5}_{0} seconds.	△R/R=±0.5%
Terminal Strength	1) Press tool: A pointed thruster with a radius of 0.5mm. 2) Shear force: 17.7N. 3) Duration: 60^{+1}_{0} seconds.	△R/R=±0.5%
Flame retardance	1) Current: 100%, 115%, 130%, 150% of rated current 2) Test duration: 1h. The following constitutes a failure: 1) A flame over 3.0 seconds duration. 2) An explosion. 3) A temperature above 350℃ sustained for over 10 seconds.	>10s for 350℃
Resistance to solvents	1) Solvent a: 1 part (by volume) of isopropyl alcohol reagent grade and 3 parts (by volume) of a mixture of 80% (by volume) of kerosene and 20% (by volume) ethylbenzene. 2) Solvent c: 9 parts (by volume) of D-limonene and 1 part of surfactant. 3) Solvent d: 42 parts (by volume) of water 1 part (by volume) of propylene glycol monomethyl ether 1 part (by volume) of monoethanolamine.	There was no missing, faded, smeared, blurred, or shifted (dislodged) with the marks. There was no crack, separation, crazing, swelling, softening, degradation on the samples.

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SOLDERING

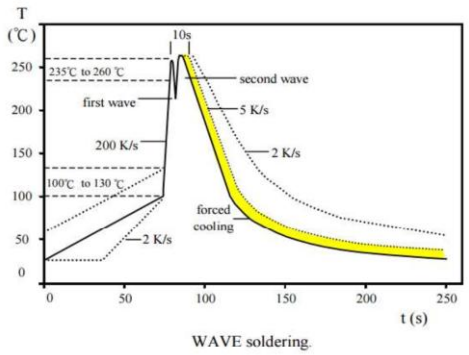
Lead Free IR Reflow Soldering Profile



Reflow Soldering

- Reference: J-STD-020D

Lead Free Double-Wave Soldering Profile

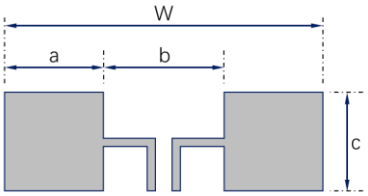


WAVE soldering

- 350±10℃ within 3 Sec. if soldering iron.

SOLDERING PAD

Unit: mm

Figure	Size	W	a	b	c
	ST2512	7	1.8	3.4	3.4
	ST3920	11	2.7	5.6	6.2
	ST5930	16	5.2	5.6	8.75

WORKING ENVIRONMENT

If user intends to use products in special environments or states (including but not limited to the following), it is necessary to approve special characteristics and reliability for the following or other application environments.

A. High temperature.
B. Near the sea, or corrosive gas, such as Cl_2, H_2S, NH_3, SO_2 and NO_2, etc.
C. Unverified liquids, such as water, oil, chemical or organic solvent.
D. Unverified resin or paint to cover products.
E. Products should be washed with water soluble cleaner even if non cleaning flux.

STORAGE / CARRY CONDITION

A. Temperature: 20±15℃
B. Humidity: 60±15%RH
C. Storage life: 2 years, FIFO
D. Please hold box correct orientation when storing and carrying. It is strictly prohibited to fall or squeeze the box, otherwise the product electrode or body may be damaged.

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   - Product information shall be subject to the published version on GiantOhm official website (www.giantohm.com). Please note to check for updates.
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   - Damages: Any direct/indirect losses (including loss of profit, special damages, punitive damages, etc.) caused by improper use or application of the products, regardless of the legal theory (contract, tort, or otherwise).
   - Implied Warranties: Exclusion of implied fitness warranties for a particular purpose, non-infringement, and merchantability (except as mandated by law).
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   - Continued use of the products by the user after the Terms update shall constitute deemed acceptance of the new Terms.
6. Effectiveness:
   - This disclaimer does not exclude liability for personal injury caused by intentional misconduct or gross negligence, or other liabilities prohibited from exclusion by law.

VERSION HISTORY

Version	Date	Change Item(s)	Description
A	2022/07/06	-	First version
B	2024/10/10	Full	Update Characteristic, Disclaimer, etc.
C	2024/12/08	Reliability	Update test method, such as temperature, duration.

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