Low TCR Precision Polysilicon Resistors

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Features

- TCR less than 100 ppm/°C, (-40 to +85°C).
- Target sheet resistance between 300 and 500Ω/sq. (depending on process used).
- Contact resistance typically less than 100Ω (for minimum size contact)
- Thight sheet resistance specification at +/-10%.
- Excellent sheet resistance uniformity on wafer (typically σ=0.7%).
- Resistance matching 0.1% +/- 1σ, measured on 10µm x 400µm resistors.
- No extra mask level required, can replace standard second polysilicon.
- Compatible with all CMOS processes.

Applications

- Linear CCD's
- Area CCD's
- Custom Special Design

Description

Mitel's ultra low TCR polysilicon delivers outstanding performance thanks to careful process optimization and to stringent process control to achieve excellent temperature stability and tight sheet resistance control. The improved resistivity control and the extremely low TCR makes this material very well suited for high accuracy analog appications or for replacing external precision resistors.

Any design requiring double polysilicon can make use of the low TCR polysilicon without the extra masking step (low cost!). This film can be used with any CMOS process that Mitel is currently offering. In addition to the cost advantage, the performance of this polysilicon film compare easily with other low TCR films.

With typical TCR at about 30-50ppm/C (specified below 100ppm/C) and sheet resistance tolerances at +/-10%, this ultra low TCR polysilicon film offers a very attractive alternative over standard thin film (SiCr, NiCr) resistors.

Example Process Parameters

(for 3um 10V single metal process)

Process Parameters	min.	typ.	max.	Units
Resistance	360	400	440	Ω/sq.
Temperature Coefficient (TCR)	n/a	32	100	ppm/°C -40 to +85°C
Contact Chain Resistance	350	520	750	Ω/link*

*1 link = 2 minimum contacts + 1 square of low TCR poly.

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Notes: