5.2 Vishay Sfernice France

Contact Information

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Initial Qualification

Qualification Certificate No.	Validity Dates	Type Designation
287	Feb. 2009 – Feb. 2011	Thin Film Technology for Chip, Wraparound, Single and Network Resistors, Fixed, Based on Types P for Single Chip, PRA and CNW for Resistor Networks

Maintenance of Qualification

Qualification Certificate No.	Validity Dates	Comment
287A	Feb, 2009- Feb. 2011	CNES application No. 287A and DCR 528.

Applicable Documents

ESCC Generic Specification No. 4001

ESCC Detail Specifications No. 4001/023, 4001/025

Vishay Process Identification Document PID PID-TFD P PRA CNW

List of Qualified Components

Variant No. By Form Factor	Component Type	ESCC Detail Specification
09	P 0603 FR Failure Rate Level R	4001/023
01 and 05	P 0603 HR	4001/023(*)
10	P 0805 FR Failure Rate Level R	4001/023
02 and 06	P 0805 HR	4001/023(*)
11	P 1206 FR Failure Rate Level R	4001/023
03 and 07	P 1206 HR	4001/023(*)
12	P 2010 FR Failure Rate Level R	4001/023
04 and 08	P 2010 HR	4001/023(*)
01 to 07 and 22 to 28	PRA 100 HR	4001/025
08 to 14 and 29 to 35	PRA 135 HR	4001/025
15 to 21 and 36 to 42	PRA 182 HR	4001/025

* Note that gold finish variants are not intended for de-golding and tinning

Technology Flow Abstract

1. Technology Flow

The thin film technology for chip, fixed, wraparound, single and network resistors are designed on types based on P for single chip, PRA for 2 to 8 resistors of similar value and CNW for 2 to 8 resistors with at least two different values with the same form factor as PRA.

Technology Flow	Scope	Site
Design Centre	Single resistor chips in 0605, 0805, 1206 and 2010 formats 2 to 8 resistors of similar value in formats 0603, 0805 and 1206 2 to 8 resistors with at least 2 different values with the same form factor, 0603, 0805 or 1206	Vishay S.A. Division Résistances de Très Haute Précision 199, Boulevard de la Madeleine B.P. 1159 06003 Nice Cedex 1 France
Fabrication	Film deposition Photolithography Thermal treatment Passivation Thermal stabilization and control	As above
Assembly	Laser trim Protective layer Termination and Test	As above
Test	Chart 2, 3 and 4 Periodic Testing	As above

(a) Basic Information

The technology consists of:

- substrate: High purity alumina (99.5%)
- Resistive Layer: Nickel chromium
- Protection: Silicon Nitride
- Termination: Nickel barrier
- Processes: Thin film deposition
- Finish: SnPbAg or Au

Critical resistance by style:

- P 0603 FR: 25 kΩ
- P 0603 HR: 12.25 kΩ
- P 0805 FR: 80 kΩ
- P 0805 HR: 45 kΩ
- P 1206 FR: 90 kΩ
- P 1206: 40 kΩ
- P 2010 FR: 80 kΩ
- P 2010 HR: 45 kΩ
- PRA 100: 12.25 kΩ
- PRA 135: 56.25 kΩ
- PRA 182: 100 kΩ

(b) Component Types

This table presents the available formats as defined in the variants table in the Detail Specifications.

Variants with established reliability in accordance with Basic Specification No. 26000 are designated with an “FR” suffix here for convenience. Variants 09, 10, 11 and 12 have established reliability level “R” at 60% confidence level.

2. Design

The Design Manuals cover the design rules and limits:
- HP-BE/001 (Maîtrise de la conception)
- HP-BE/004 (Données technologiques, Régles d’implementation, Performances)

Critical design characteristics:

- Minimum metal width: 10µm
- Power dissipation lower then 250mW/mm^2
- Current density lower than 7000 A/mm^2
- Electrical field lower than 5V/µm

3. Fabrication / Assembly

The manufacturing flows and procedures are described in section 4 of Vishay PID.

4. Test

   Complete test sequence as detailed in ESCC Generic 4001 and the relevant Detail Specifications is conducted by Vishay Sfernice.

   The deletion of the Third Harmonic Control requirement from ESCC Detail Specification No. 4001/023 for thin film wraparound technology is documented in reference report MAT/3HC/07.02 revision 3 dated 2007-06-20.

   For variants with established reliability the efficiency of the Overload Test is increased with the implementation of a resistance change rejection criteria of 500 ppm and approved by TRB decisions on 2007-04-04

5. Radiation Characteristics

   The resistors covered in this technology domain is considered insensitive to radiation effects

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