

**SCC**

# DOCUMENTATION CHANGE REQUEST

*TO BE COMPLETED BY ORIGINATOR*

Change request No. (4)

Not yet available

Page 1 of [2] (5)

Originator (1)  
Nicolas Martini  
Affiliation  
VISHAY S.A.Originator signature (2)  
Date :  
16/02/2010NSA or ESA representative signature (3)  
Date

DOCUMENT AFFECTED

Other documents affected  
N.A.Doc. No. (6) Status (7) Title (8)  
ESCC4001 Issue 5 RESISTORS, FIXED, CHIP, THIN FILM BASED ON TYPE PHR and PFR

Paragraph(s) and page(s) affected (9) 1.4; 2.6; APPENDIX A

**PROPOSED WORDING OF CHANGE**

- 1) Add new Temperature Coefficient Code.
- 2) Extension of Ohmic Value Range.
- 3) Editorial Changes.

Continuation sheet  
 Yes  No**JUSTIFICATION**

- 1) Customers needs.
- 3) Customers needs.
- 2) Clarification concerning the ESCC Component Number for PHR and PFRR.

Continuation sheet  
 Yes  No**Changes required for :**Procurement (project) Qualification MRB decision General Improvement of Spec. Other 

(13)

*RESERVED FOR USE BY SCC SECRETARIAT***Date of registration :****Order of Priority for Appr. / Impl. :**1 (high) 2 (medium) 3 (high) **Attachments :1****Qualification Status :**Qualified In process of qualification *RESERVED FOR USE BY APPROVING AUTHORITY***Approved** Yes  No**Date and signature****Reference to SCCG decision**Priority **Approved wording if different from box 11 or reason for rejection**

(14)

Continuation sheet  
 Yes  No



# DOCUMENTATION CHANGE REQUEST

CONTINUATION SHEET FOR BOX

[12]

Page of [1]

Change request No.  
(4)

Not yet available

Page 2 of [2]

## Proposed wording of change and justification

### 1) Add new Temperature Coefficient Code.

#### 1.1 In Paragraph 1.4.1.1 (c) Temperature coefficient expressed by the following codes:

Add Code 9 for TC  $\pm 5\text{ppm}/^\circ\text{C}$  on  $-55^\circ\text{C}/+155^\circ\text{C}$

Add NOTES:

1. Code 0  $\Rightarrow$  Temperature Coefficient  $\pm 5 \times 10^{-6}/^\circ\text{C}$  over  $T_{\text{amb}} = +22^\circ\text{C}$  to  $+70^\circ\text{C}$
2. Code 9  $\Rightarrow$  Temperature Coefficient  $\pm 5 \times 10^{-6}/^\circ\text{C}$  over  $T_{\text{amb}} = -55^\circ\text{C}$  to  $+155^\circ\text{C}$

#### 1.2 In Paragraph 1.4.2 Component Type Variants and Range of Components

\_ Modify the Note 4 to include new TC with restriction in a table :

TC  $5\text{ppm}/^\circ\text{C}$  ( $+22^\circ\text{C}/+70^\circ\text{C}$ ) for  $R \geq 50$  Ohms

TC  $5\text{ppm}/^\circ\text{C}$  ( $-55^\circ\text{C}/+155^\circ\text{C}$ ) for  $R \geq 50$  Ohms

TC  $10\text{ppm}/^\circ\text{C}$  ( $-55^\circ\text{C}/+155^\circ\text{C}$ ) for  $R \geq 20$  Ohms

TC  $25\text{ppm}/^\circ\text{C}$  ( $-55^\circ\text{C}/+155^\circ\text{C}$ ) for  $R \geq 10$  Ohms

#### 1.3 In Paragraph 2.6.2 High and Low Temperature Electrical Measurements

Replace in the table the value in Limits (Min & Max) for TC =  $\pm 5 \times 10^{-6}/^\circ\text{C}$  by :

Resistance Change between  $-55 (+3 -0)^\circ\text{C}$  and  $+22 \pm 3^\circ\text{C} \Rightarrow$  Limits =  $\pm 0.04$  (instead of  $\pm 0.08$ )

Resistance Change between  $+155 (+0 -3)^\circ\text{C}$  and  $+22 \pm 3^\circ\text{C} \Rightarrow$  Limits =  $\pm 0.068$  (instead of  $\pm 0.136$ )

#### 1.4 In APPENDIX A High and Low Temperatures Electrical Measurements

Replace the sentence "All tests at high and low ..." by :

Tests at high and low temperatures are done before the Burn-in step only for the Temperature Coefficient  $\pm 5 \times 10^{-6}/^\circ\text{C}$  over  $T_{\text{amb}} = -55^\circ\text{C}$  to  $+155^\circ\text{C}$ . (Code 9)

All other tests at high and low temperatures are guaranteed but not tested based on temperature coefficient measurements performed on each wafer at  $+25^\circ\text{C}$  and  $+75^\circ\text{C}$  in accordance with VISHAY SFERNICE specification CM-SF-00210.

### 2) Extension of Ohmic Value Range.

#### 2.1 In Paragraph 1.4.2 Component Type Variants and Range of Components

Replace "50" in Resistance Range  $R_n$  Min by "10" for variants 01 to 08

#### 2.2 In Paragraph 1.4.2 Note 3

Modify the table to include Available tolerances for the new ohmic value range (10R to 49.9R) :

$10 \leq R_n < 50$  0.1%

### 3) Editorial Changes.

In the title, change PFR by PFRR

#### 3.1 In Paragraph 1.4.1 The ESCC Component Number

Modify the "Example : 4001023..." by :

a) For PHR variants (01 to 08)

Example: 4001023012490P1

with all details...

b) For PFRR variants (09 to 12)

Example : 400102309R2490W1

with all details...

Details For DCR 100104  
(new inputs in blue)

1) Add new Temperature Coefficient Code.

1.1 In Paragraph 1.4.1.1 (c)

Add Code 9 for TC  $\pm 5\text{ppm}/^\circ\text{C}$  between  $-55^\circ\text{C}$  and  $+155^\circ\text{C}$

Temperature Coefficient ( $\pm 10^{-6}/^\circ\text{C}$ )	Code
5 (Note 1)	0
10	1
25	2
5 (Note 2)	9

Add NOTES.

NOTES:

- Code 0 => Temperature Coefficient  $\pm 5 \times 10^{-6}/^\circ\text{C}$  over  $T_{\text{amb}} = +22^\circ\text{C}$  to  $+70^\circ\text{C}$
- Code 9 => Temperature Coefficient  $\pm 5 \times 10^{-6}/^\circ\text{C}$  over  $T_{\text{amb}} = -55^\circ\text{C}$  to  $+155^\circ\text{C}$

1.2 In Paragraph 1.4.2 Component Type Variants and Range of Components

Replace Note 4 by :

- The temperature ranges applicable to the temperature coefficients are as follows.
  - $\pm 5 \times 10^{-6}/^\circ\text{C}$  over  $T_{\text{amb}} = +22^\circ\text{C}$  to  $+70^\circ\text{C}$ , together with  $\pm 10 \times 10^{-6}/^\circ\text{C}$  over  $T_{\text{amb}} = -55^\circ\text{C}$  to  $+155^\circ\text{C}$ .
  - $\pm 10 \times 10^{-6}/^\circ\text{C}$  over  $T_{\text{amb}} = -55^\circ\text{C}$  to  $+155^\circ\text{C}$ .
  - $\pm 25 \times 10^{-6}/^\circ\text{C}$  over  $T_{\text{amb}} = -55^\circ\text{C}$  to  $+155^\circ\text{C}$ .

4. The temperature ranges applicable to the temperature coefficients are as follows.

TC ( $\pm 10^{-6}/^\circ\text{C}$ )	Temperature Range	Ohmic Values ( $\Omega$ )
5	$T_{\text{amb}} +22^\circ\text{C}$ to $+70^\circ\text{C}$	$R_n \geq 50$
5	$T_{\text{amb}} -55^\circ\text{C}$ to $+155^\circ\text{C}$	$R_n \geq 50$
10	$T_{\text{amb}} -55^\circ\text{C}$ to $+155^\circ\text{C}$	$R_n \geq 20$
25	$T_{\text{amb}} -55^\circ\text{C}$ to $+155^\circ\text{C}$	$R_n \geq 10$

1.3 In Paragraph 2.6.2 High and Low Temperature Electrical Measurements

Replace in the table the value in Limits (Min & Max) for TC =  $\pm 5 \times 10^{-6}/^\circ\text{C}$  by :

Resistance Change between  $-55 (+3 -0)^\circ\text{C}$  and  $+22 \pm 3^\circ\text{C}$  => Limits =  $\pm 0.04$  (instead of  $\pm 0.08$ )

Resistance Change between  $+155 (+0 -3)^\circ\text{C}$  and  $+22 \pm 3^\circ\text{C}$  => Limits =  $\pm 0.068$  (instead of  $\pm 0.136$ )

Characteristics	Symbols	ESCC 4001 Test Method and Conditions	Limits		Unit
			Min	Max	
Resistance Change between $-55 (+3 -0)^\circ\text{C}$ and $+22 \pm 3^\circ\text{C}$	$\Delta R_A/R_A$	Para. 8.3.1.1 TC = $\pm 5 \times 10^{-6}/^\circ\text{C}$ TC = $\pm 10 \times 10^{-6}/^\circ\text{C}$ TC = $\pm 25 \times 10^{-6}/^\circ\text{C}$	-0.04 -0.08 -0.2	+0.04 +0.08 +0.2	%
Resistance Change between $+155 (+0 -3)^\circ\text{C}$ and $+22 \pm 3^\circ\text{C}$	$\Delta R_A/R_A$	Para. 8.3.1.1 TC = $\pm 5 \times 10^{-6}/^\circ\text{C}$ TC = $\pm 10 \times 10^{-6}/^\circ\text{C}$ TC = $\pm 25 \times 10^{-6}/^\circ\text{C}$	-0.068 -0.136 -0.34	+0.068 +0.136 +0.34	%
Resistance Change between $+70 (+0 -3)^\circ\text{C}$ and $+22 \pm 3^\circ\text{C}$	$\Delta R_A/R_A$	Para. 8.3.1.1 TC = $\pm 5 \times 10^{-6}/^\circ\text{C}$	-0.026	+0.026	%

1.4 In APPENDIX A High and Low Temperatures Electrical Measurements

Replace the sentence "All tests at high and low ..." by :

Tests at high and low temperatures are done before the Burn-in step only for the Temperature Coefficient  $\pm 5 \times 10^{-6}/^{\circ}\text{C}$  over  $T_{\text{amb}} = -55^{\circ}\text{C}$  to  $+155^{\circ}\text{C}$ . (Code 9)

All other tests at high and low temperatures are guaranteed but not tested based on temperature coefficient measurements performed on each wafer at  $+25^{\circ}\text{C}$  and  $+75^{\circ}\text{C}$  in accordance with VISHAY SFERNICE specification CM-SF-00210.

2) Extension of Ohmic Value Range.

2.1 In Paragraph 1.4.2 Component Type Variants and Range of Components

Replace "50" in Resistance Range  $R_n$  Min by "10" for variants 01 to 08

2.2 In Paragraph 1.4.2 Note 3

Modify the table to include available tolerances for the new ohmic value range ( $10\Omega$  to  $49.9\Omega$ ) :

Resistance $R_n$ ( $\Omega$ )	Variant Number	Available Tolerance ( $\pm$ %)	Available Resistance Values
$R_n < 50$	01 to 08	0.1	Any value in the resistance range to 3 significant figures
$50 \leq R_n < 100$	01 to 08	0.05 and 0.1	
$100 \leq R_n < 250$	01 to 08	0.02, 0.05, 0.1	
	09 to 12	0.05, 0.1	
$R_n \geq 250$	01 to 08	0.01, 0.02, 0.05, 0.1	
	09 to 12	0.05, 0.1	

3) Editorial Changes.

2.3 In Paragraph 1.4.1 The ESCC Component Number

Modify the "Example : 4001023..." by :

Example: 400102301R2490P1

- Detail Specification Reference: 4001023
- Component Type Variant Number: 01 (as required)
- Failure Rate Level Letter: R (as applicable; see Note 1)
- Characteristic code: Resistance Value ( $249\Omega$ ): 2490 (as required)
- Characteristic code: Resistance Tolerance ( $\pm 0.02\%$ ): P (as required)
- Characteristic code: Temperature Coefficient ( $\pm 10 \times 10^{-6}/^{\circ}\text{C}$ ): 1 (as required)

a) For PHR variants (01 to 08)

Example: 4001023012490P1

with all details...

b) For PFRR variants (09 to 12)

Example : 400102309R2490W1

with all details...