

## PRODUCT / PROCESS CHANGE NOTIFICATION

### 1. PCN basic data

1.1 Company	 STMicroelectronics International N.V
1.2 PCN No.	ADG/23/14471
1.3 Title of PCN	Redesign of the NTL00 and NTL20 resistor dice and transfer from CT6 (Catania) to SG6 (Ang Mo Kio - Singapore) fab
1.4 Product Category	RF Power
1.5 Issue date	2023-12-13

### 2. PCN Team

2.1 Contact supplier	
2.1.1 Name	ROBERTSON HEATHER
2.1.2 Phone	+1 8475853058
2.1.3 Email	heather.robertson@st.com
2.2 Change responsibility	
2.2.1 Product Manager	Roberto CRISAFULLI
2.2.2 Marketing Manager	Gaetano PIGNATARO
2.2.3 Quality Manager	Vincenzo MILITANO

### 3. Change

3.1 Category	3.2 Type of change	3.3 Manufacturing Location
General Product & Design	Die redesign: Mask or mask set change with new die design - Design changes in active elements.	Ang Mo Kio (Singapore)

### 4. Description of change

	Old	New
4.1 Description	Diffusion process and wafer testing for NTL00 and NTL20 resistor dice historically performed in ST-CT6 Catania fab	Diffusion process and wafer testing for the redesign of the new resistors to be performed in ST-SG6 Ang Mo Kio (Singapore) fab
4.2 Anticipated Impact on form,fit, function, quality, reliability or processability?	form	

### 5. Reason / motivation for change

5.1 Motivation	To increase capacity and flexibility
5.2 Customer Benefit	CAPACITY INCREASE

### 6. Marking of parts / traceability of change

6.1 Description	Dedicated Finished Good (FG) code
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### 7. Timing / schedule

7.1 Date of qualification results	2023-12-05
7.2 Intended start of delivery	2024-03-05
7.3 Qualification sample available?	Upon Request

### 8. Qualification / Validation

8.1 Description	14471 New resistors design_AMK transfer_DCRF Qualification report.pptx - Read-Only.pdf		
8.2 Qualification report and qualification results	Available (see attachment)	Issue Date	2023-12-13

### 9. Attachments (additional documentations)

10. Affected parts		
10. 1 Current		10.2 New (if applicable)
10.1.1 Customer Part No	10.1.2 Supplier Part No	10.1.2 Supplier Part No
	SD2933W	
	SD2943W	
	SD4933	
	SD4933MR	

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**Product/process change notification:**  
**Redesign of the NTL00 and NTL20 resistor dice**  
**and transfer from CT6 (Catania) to SG6 (Ang Mo**  
**Kio - Singapore) fab**

ADG/23/14471

Product family	Technology	Package
RF DMOS	RF-RESISTOR	N/A

**Description of the change**

Diffusion process and wafer testing for NTL00 and NTL20 resistor dice previously performed in ST-CT6 Catania fab and now to be performed in ST-SG6 Ang Mo Kio (Singapore) fab

**Reason**

To increase capacity and flexibility

**Date of implementation**

3 months after notification date

**Impact of the change**

Form	X
Fit	
Function	
Reliability	

Product/process change notification:

Redesign of the NTL00 and NTL20 resistor dice and transfer from CT6 (Catania) to SG6 (Ang Mo Kio - Singapore) fab

ADG/23/14471

Processibility	
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### Qualification of the change

See qualification report

Product/process change notification:

ADG/23/14471

Redesign of the NTL00 and NTL20 resistor dice and transfer from CT6 (Catania) to SG6 (Ang Mo Kio - Singapore) fab

**APPENDIX 1: RISK ASSESSMENT**

#	Risks identified	Resulting potential risk	Class (low/medium/high)	Possible action
1				
2				
3				
4				
5				
...				

Product/process change notification:

ADG/23/14471

Redesign of the NTL00 and NTL20 resistor dice and transfer from CT6 (Catania) to SG6 (Ang Mo Kio - Singapore) fab

**APPENDIX 2: QUALIFICATION PLAN**

#	Test name	Conditions	Sample size	Criteria
1				
2				
3				
4				
5				
...				

Product/process change notification:

ADG/23/14471

Redesign of the NTL00 and NTL20 resistor dice and transfer from CT6 (Catania) to SG6 (Ang Mo Kio - Singapore) fab

**APPENDIX 3: QUALIFICATION EXECUTION AND RESULT**

#	Test name	Conditions	Sample size	Criteria	When	Status	Result
1							
2							
3							
4							
5							
...							

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# **Redesign of the NTL00 and NTL20 resistor dice and transfer from CT6 (Catania) to SG6 (Ang Mo Kio - Singapore) fab**

**PCN # ADG/23/14471**  
Qualification report

December 6<sup>th</sup> , 2023

PCN # 14471

<b>Title</b>	Redesign of the NTL00 and NTL20 resistor dice and transfer from CT6 (Catania) to SG6 (Ang Mo Kio - Singapore) fab
<b>Type of change</b>	Die redesign: Mask or mask set change with new die design Line transfer for a full process or process brick (process step, control plan, recipes) from one site to another site: Wafer fabrication
<b>Current Description</b>	Diffusion process and wafer testing for NTL00 and NTL20 resistor dice historically performed in ST-CT6 Catania fab
<b>New Description</b>	Diffusion process and wafer testing for the redesign of the new resistors to be performed in ST-SG6 Ang Mo Kio (Singapore) fab
<b>Impact of change</b>	FORM
<b>Reason of change</b>	To increase capacity and flexibility
<b>Customers benefit</b>	MANUFACTURING FLEXIBILITY
<b>Manufacturing location</b>	Ang Mo Kio (Singapore)
<b>Traceability</b>	Dedicated Finished Good (FG) code
<b>Date of samples availability</b>	Upon request

NTL20 → NTL21

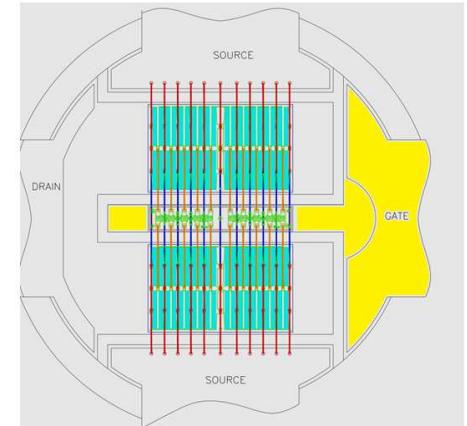
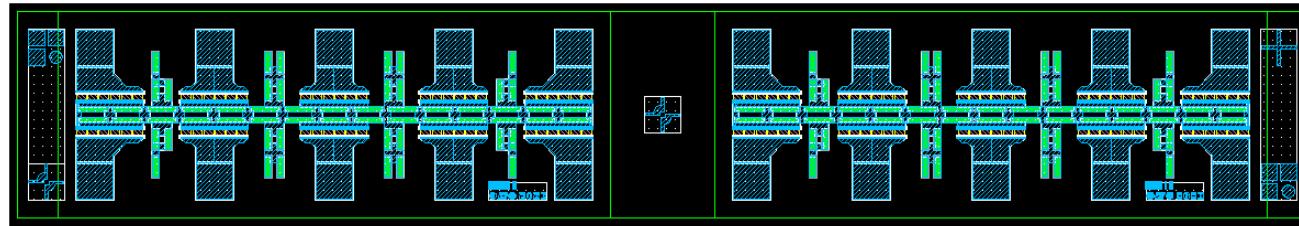
CP code	FG code	NEW FG code
SD4933	SD4933\$K	SD4933\$K1
SD4933-01	SD4933-01\$K	SD4933-01\$K1
SD4933MR	SD4933MR\$K	SD4933MR\$K1

NTL00 → NTL10

CP code	FG code	NEW FG code
SD2933-02W	SD2933-02W\$K1	SD2933-02W\$K3
SD2933-03W	SD2933-03W\$K1	SD2933-03W\$K3
SD2933-04W	SD2933-04W\$K1	SD2933-04W\$K3
SD2933-05W	SD2933-05W\$K1	SD2933-05W\$K3
SD2933-06W	SD2933-06W\$K1	SD2933-06W\$K2
SD2933W	SD2933W\$K1	SD2933W\$K3
SD2943-01W	SD2943-01W\$K1	SD2943-01W\$K3
SD2943W	SD2943W\$K1	SD2943W\$K3

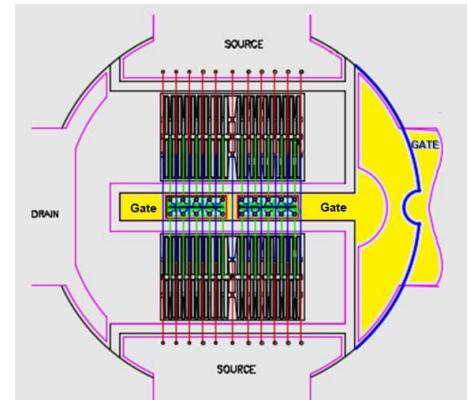
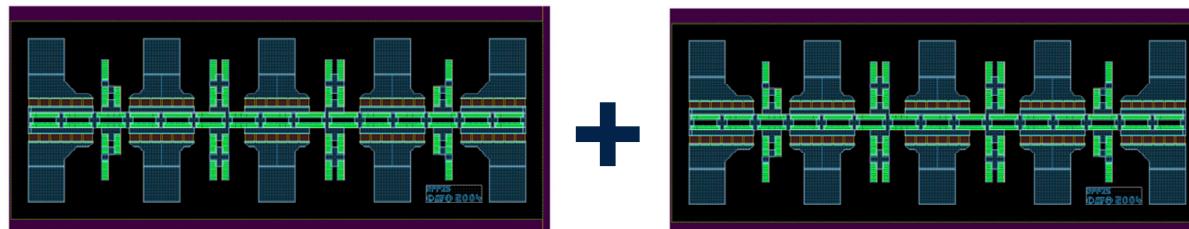
ST Restricted

## New Resistor \_Top Layout : NTL10



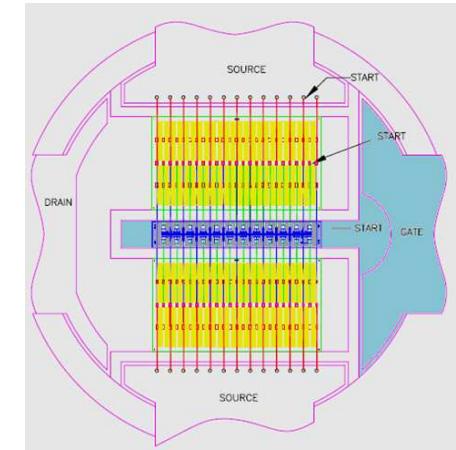
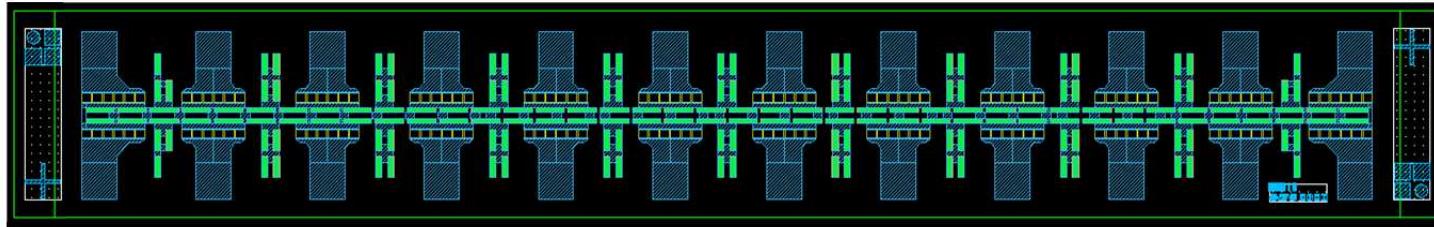
SD2933/SD2943 products family

## Old Resistor \_Top Layout : NTL00



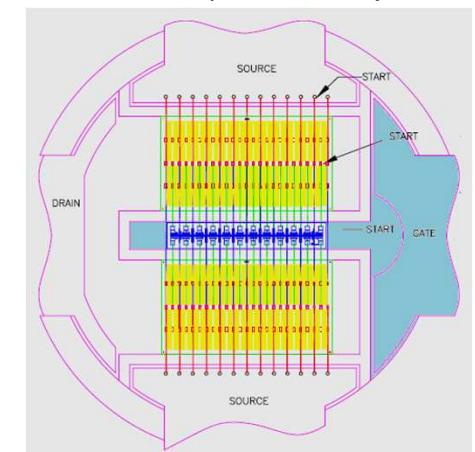
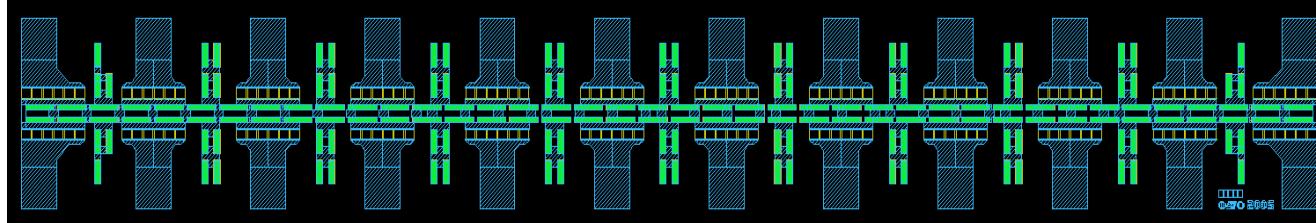
**Note** : the differences between new and old resistor consists in a single die , instead of 2 close together.  
Furthermore, the new version contains some marks for automation assembly system.

## New Resistor\_Top Layout : NTL21



SD4933 products family

## Old Resistor\_Top Layout : NTL20



**Note** : the only differences between new and old resistor consists in a die size increase, to allow the marks introduction for automation assembly system.



# DC characterization

Test vehicle : SD2933-04W

# DC characterization AMK vs Catania resistor

## FG code : SD2933-04W\$K1 – AMK die & Catania resistor

ASSY Lot #	DIE Lot #	WAFER	RESISTOR Lot #	DC IN/OUT	DC Yield %
CZ342DYQR1	V6248E37	8	860	119/119	100%

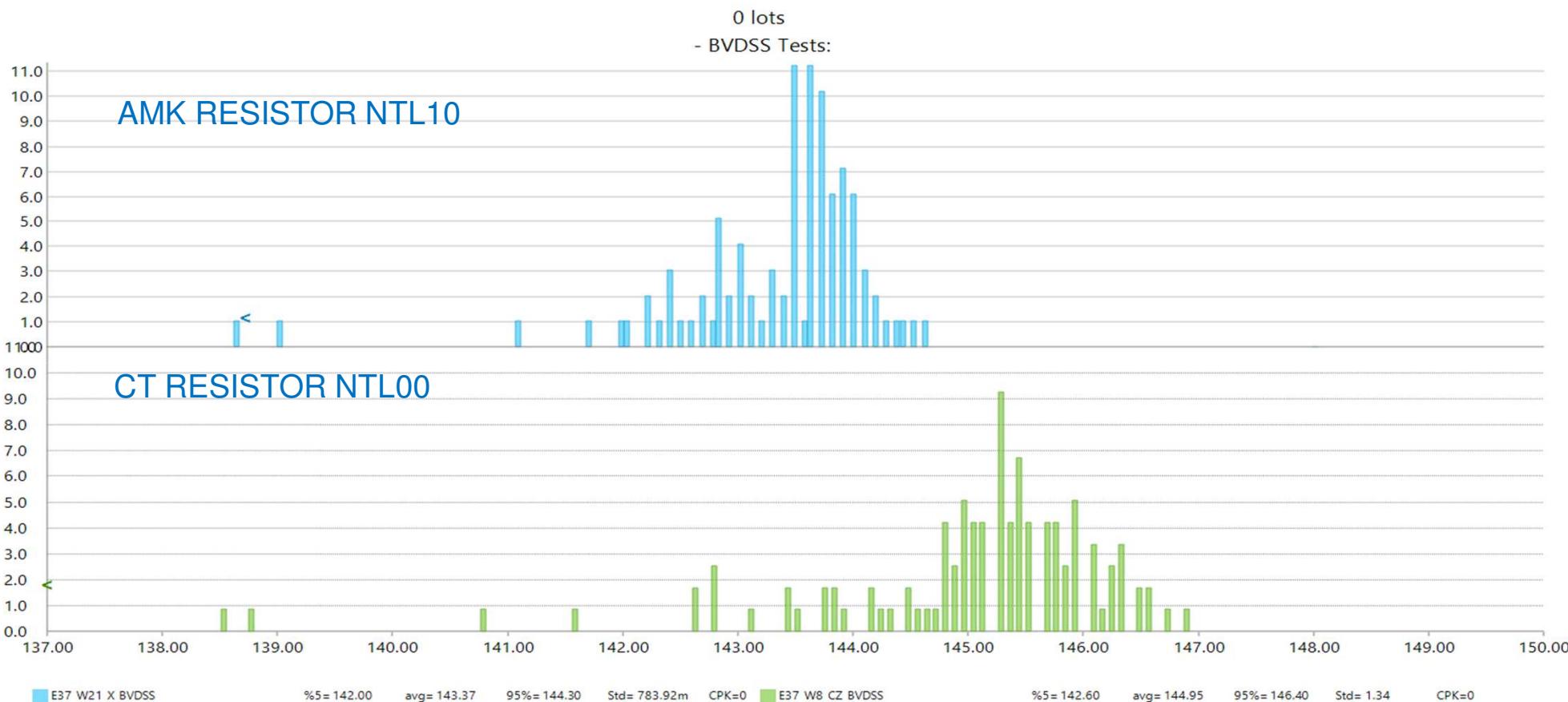
## FG code : SD2933-04W\$K3 - AMK die & resistor

TRIAL N°	ASSY Lot #	DIE. Lot #	WAFER	RESISTOR Lot #	WAFER	DC IN/OUT	DC Yield %
T122339GC1559	CZ342DYQ0A	V6248E37	21	6318EYEV07	23	97/97	100%

# BVDSS @ 0.2A

Spec : 130V min

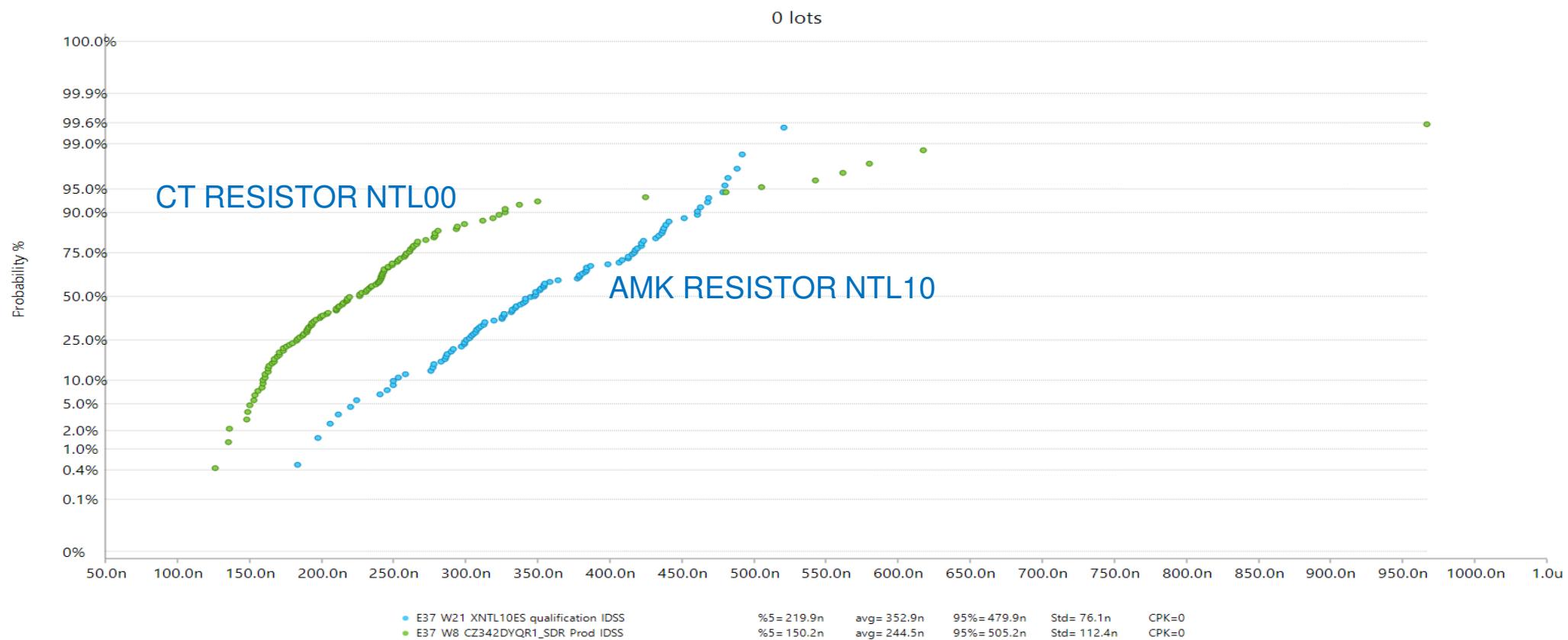
nder v 5.0.1:2020-0221 User: fulvio vecchio



# IDSS @ 50V

Spec : 30 $\mu$ A max

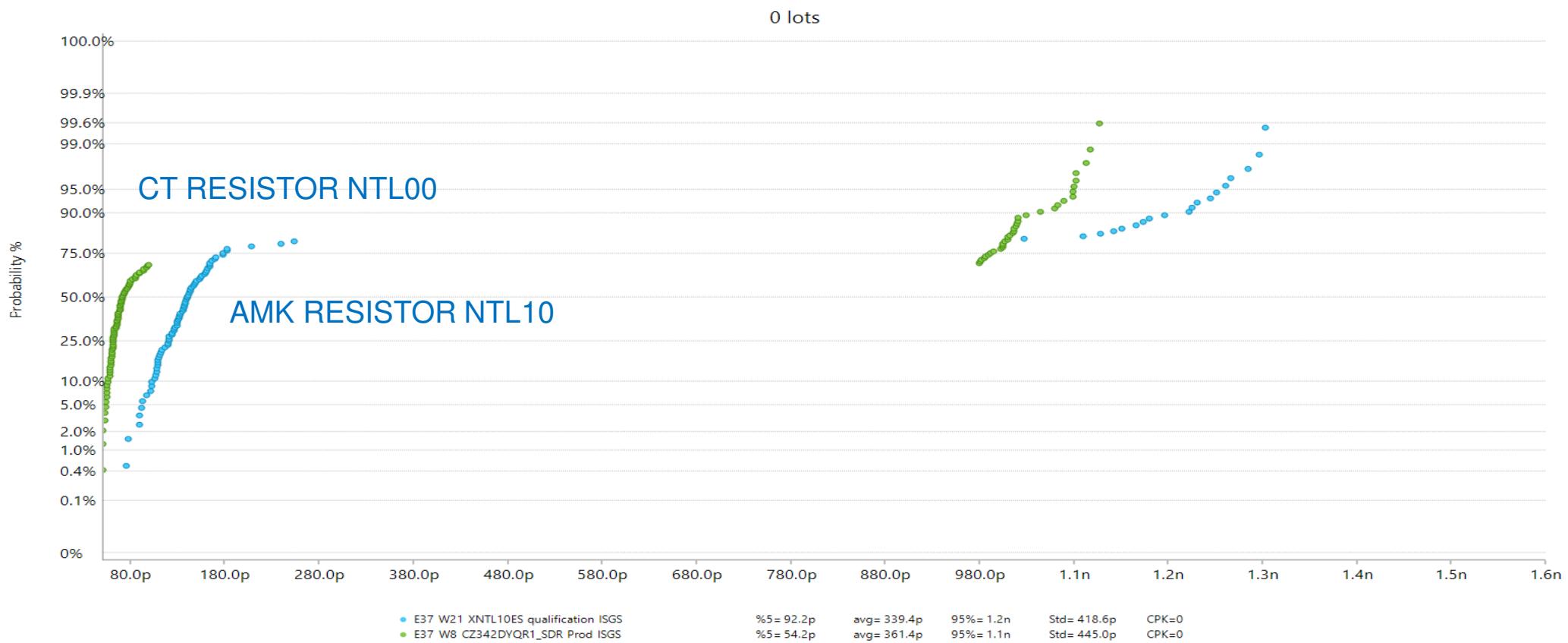
: fulvio vecchio



# IGSS @ 20V

Spec : 300nA max

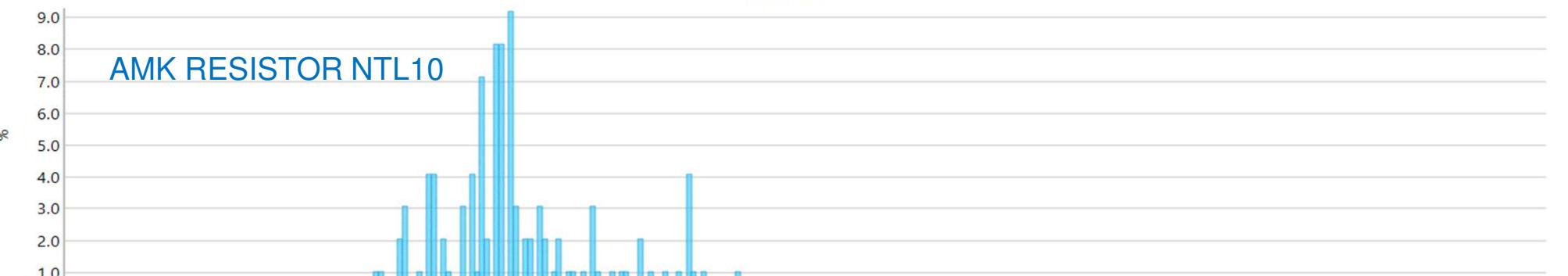
r: fulvio vecchio



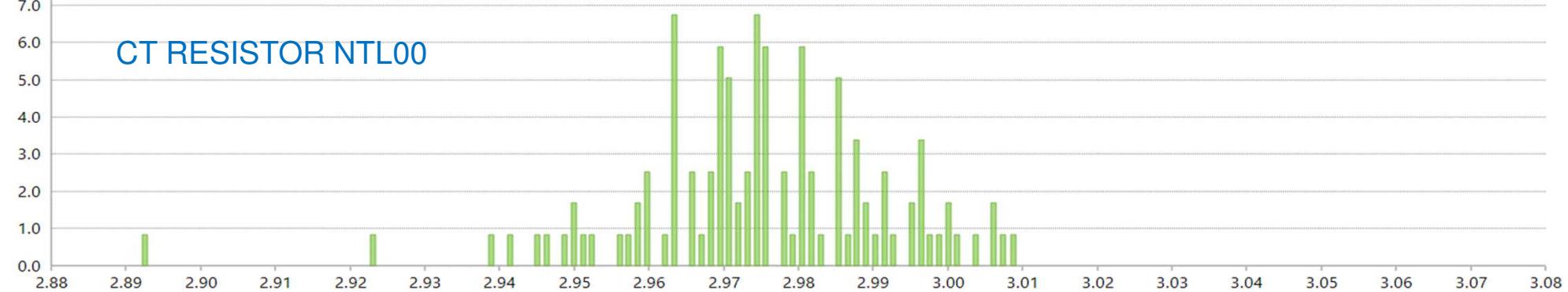
VP @ 0.25A  
Spec : 1.8V min – 3.5V max

0 lots  
- VP Tests:

AMK RESISTOR NTL10



CT RESISTOR NTL00



E37 W21 X VP

%5 = 2.93

avg = 2.94

95% = 2.96

Std = 10.83m

CPK=0 E37 W8 CZ VP

%5 = 2.94

avg = 2.97

95% = 3.00

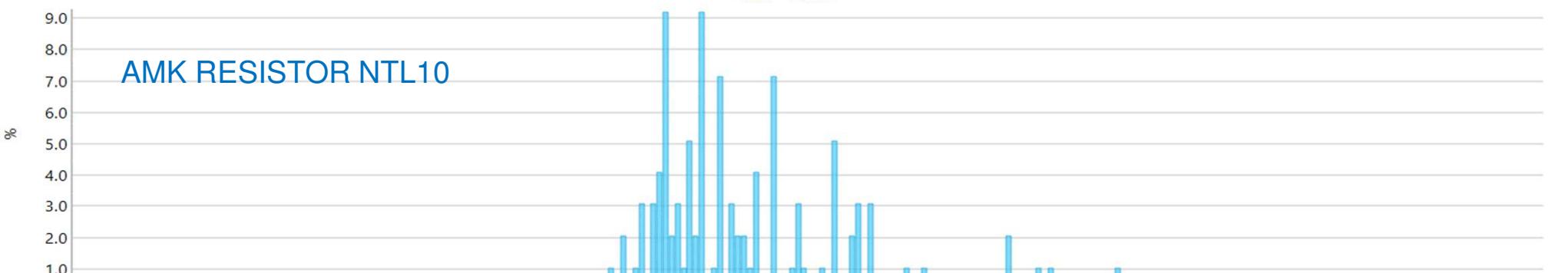
Std = 20.37m CPK=0

# GFS @ 10A

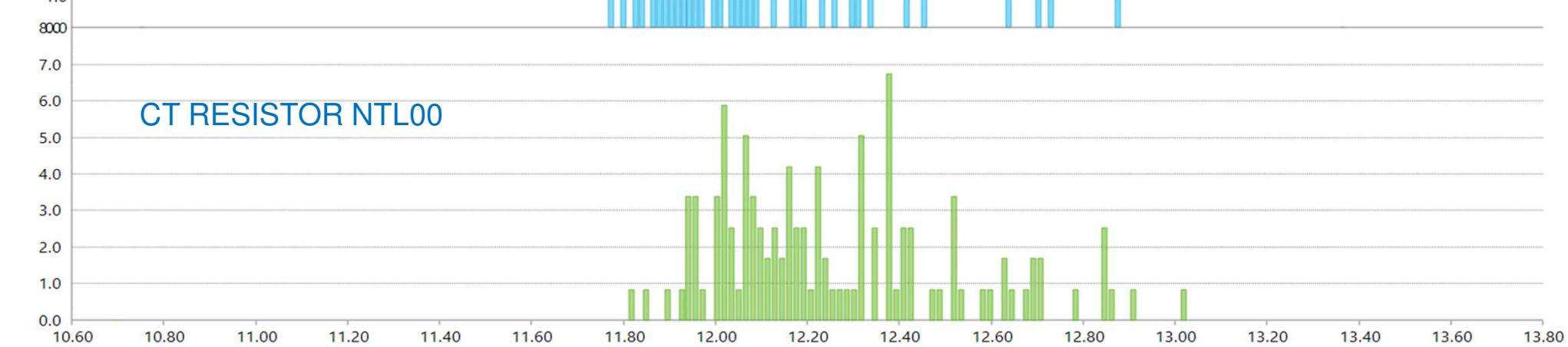
Spec : 10S min

0 lots  
- GMP Tests:

AMK RESISTOR NTL10



CT RESISTOR NTL00



# RF characterization

## **Test vehicle**

30MHz : SD2933-02W / -03W / -05W

60MHz : SD2933-04W

# RF characterization @ 30MHz AMK vs Catania resistor

**FG code : SD2933-02W\$K1 / -03W\$K1 / -05W\$K1 – AMK  
die & Catania resistor**

ASSY Lot #	DIE Lot #	WAFER	RESISTOR Lot #	RF IN/OUT	RF Yield %
CZ342DYQR1	V6248E37	8	860	119/119	100%

**FG code : SD2933-02W\$K3 / -03W\$K3 / -05W\$K3 – AMK die & resistor**

TRIAL N°	ASSY Lot #	DIE. Lot #	WAFER	RESISTOR Lot #	WAFER	RF IN/OUT	RF Yield %
T122339GC1559	CZ342DYQ0A	V6248E37	21	6318EYEV07	23	97/97	100%

# RF characterization @ 60MHz AMK vs Catania resistor

FG code : SD2933-04W\$K1 – AMK die & Catania resistor						
ASSY Lot #	DIE Lot #	WAFER	RESISTO R Lot #	RF IN/OUT	RF Yield %	RF GAIN code
CZ342DYQR1	V6248E37	8	860	119/119	100%	73R + 45S + 1T

FG code : SD2933-04W\$K3 – AMK die & resistor								
TRIAL N°	ASSY Lot #	DIE. Lot #	WAFER	RESISTOR Lot #	WAFER	RF IN/OUT	RF Yield %	RF GAIN code
T122339GC1559	CZ342DYQ0A	V6248E37	21	6318EYEV07	23	97/97	100%	96R + 1S

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**PCN Reference :** ADG/23/14471

**Subject :** Public Products List

Dear Customer,

Please find below the Standard Public Products List impacted by the change.

SD2943W	SD2933W	SD4933
SD4933MR		

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