PCN

AO-PCN-2022-036-A

Introduction of 6” InGaAlP Thinfilm Chip for Multi Chip LED

Published by ams-OSRAM AG
Tobelbader Strasse 30, 8141 Premstaetten, Austria
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ams-osram.com

02.01.2023

Dear Customer,

please review this **PCN** and provide your feedback in the **Customer approval form** (at the end of this PCN document) to your ams OSRAM sales partner before **06.02.2023** *).

Your prompt reply will help ams OSRAM to assure a smooth and well executed transition. If ams OSRAM does not hear from your side by the due date, we will assume your (if you are a Distributor: and your customer's) full acceptance to this proposed change and its implementation.

ams OSRAM understands the time requirements your organization needs to approve this PCN.
However, if you can provide ams OSRAM an estimated date your organization will have finalized this PCN review, ams OSRAM can use this date to plan continued production to secure your order needs during the transition time.

Your attention and response to this matter is highly appreciated.

Please direct your inquiries to your local Sales office.

*) ams OSRAM aligns with the widely recognized JEDEC/ECIA/IPC Joint Standard No. 46, which stipulates:

- Customers should acknowledge receipt of the PCN within 30 days of delivery of the PCN.
- Lack of acknowledgement of the PCN within 30 days constitutes acceptance of the change.
- After acknowledgement, lack of additional response within the 90 day period constitutes acceptance of the change. If the customer requires additional time to perform sample testing, beyond the 90 day review period, an extension must be negotiated with the supplier.

Subject of change:	Introduction of 6” InGaAlP Thinfilm Chip for Multi Chip LED	
Affected products:	LTRB RASF	
Reason for change:	• Introduction of latest 6” chip technology to secure continuous supply • Update of datasheet to latest format and correction of input, where needed.	
Description of change:	Current status	New status
	For details refer to document 2_cip_AO-PCN-2022-036-A	
Product identification:	Date code: 1423 (WWYY)	
Time schedule for PCN material: (after implementation of change):	Final qualification report:	02.01.2023
	Samples available:	02.01.2023
	Intended Start of delivery:	02.04.2023 *) *) or earlier if released by customer and upon mutual agreement
Time schedule for Pre-PCN material: (prior to implementation of change):	Last time order date (LTO):	31.01.2024 **) **) Lead time and LTO quantity shall be mutually agreed between OSRAM OS and customer.
	Last time delivery date (LTD):	30.04.2024 ***) ***) planned last date for delivery of products of current status
Assessment:	No change of product reliability	
Documentation:	Customer information package 2_cip_AO-PCN-2022-036-A; 3_cip_AO-PCN-2022-036-A_Rel	

Note:
Pre-PCN material: Products of current status, means before implementation of the changes as described in the PCN.
PCN material: Products with implementation of the changes as described in the PCN.

Customer approval form
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Introduction of 6” InGaAlP Thinfilm Chip for Multi Chip LED

Please list product(s) affected in your application(s):

Please check the appropriate box below:

○ **Approval:** We agree with the proposed change and accept start of the shipment upon availability of PCN material	○ **Not relevant:** Change is not relevant for products in use.

○ **Change cannot be accepted:**

- ○ **We have objections:**
- ○ **We request following Information:**
- ○ **We request following Samples:**
- ○ **Expected approval date:**
- ○ **Volume requirements for Pre-PCN material:**

○ **Remarks:**

Sender:

Company:

Address / Location:

Signature: **Date:**

Please return this approval form to your Sales partner.

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Customer information package

R&D-PD-LED-TLM and OS Q CQM ICI
2023-01-02

Agenda

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Introduction of 6” InGaAlP Thinfilm Chip for Multi Chip LED

Reason for change

Item	Description
1.	Introduction of latest 6” chip technology to secure continuous supply
2.	Update of datasheet to latest format and correction of input, where needed.

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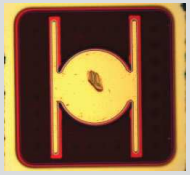
Description of change: new red chip

Item	Current status	New status
Picture (exemplary)		
Wafer size [mm]	100 (4”)	150 (6”)
Chip carrier substrate	Ge	Si
Chip size [µm]	250 x 250	175 x 175
Height [µm]	150	120

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Changes in the datasheets:

Page	Change Item	Reason for change	Old	New
1	Applications	New layout	Gaming, Amusement, Gambling Textile Illumination	Entertainment
2	Typ. V_F at I_F = 20mA	Change of new chip	2.10V	2.15V

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Changes in the datasheets: Forward Voltage for Red

Old

Characteristics

I_F = 20 mA; T_S = 25 °C

Parameter	Symbol		Values ● true green	Values ● red	Values ● blue
Forward Voltage [2]	V_F	min.	2.20 V	1.80 V	2.70 V
I_F = 20 mA		typ.	2.65 V	2.10 V	2.90 V
		max.	3.10 V	2.40 V	3.30 V

New

Characteristics

I_F = 20 mA; T_S = 25 °C

Parameter	Symbol		Values ● true green	Values ● red	Values ● blue
Forward Voltage [2]	V_F	min.	2.20 V	1.80 V	2.70 V
I_F = 20 mA		typ.	2.65 V	2.15 V	2.90 V
		max.	3.10 V	2.40 V	3.30 V

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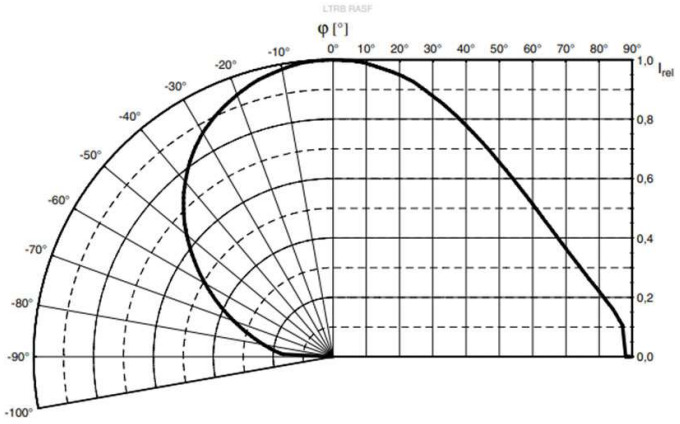
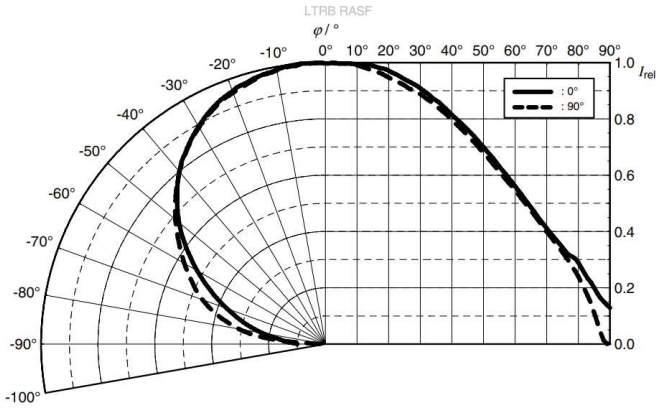
Changes in the datasheets:

Old	New
Radiation Characteristics 6), 7) $I_{rel} = f(\phi)$; $T_S = 25$ °C 	**Radiation Characteristics** 6), 7) $I_{rel} = f(\phi)$; $T_S = 25$ °C 

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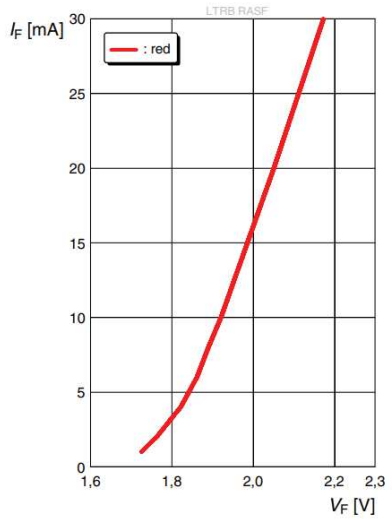
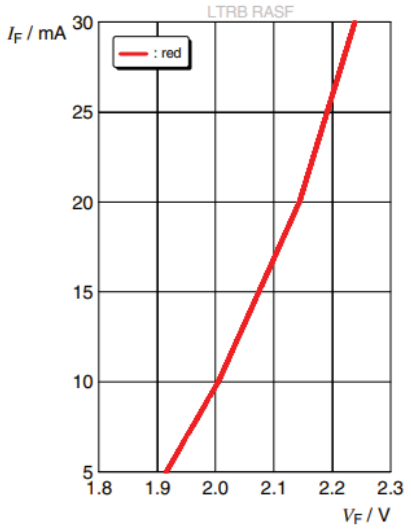
Changes in the datasheets: Forward Current - Red

Old	New
Forward current [6] $I_F = f(V_F)$; T_S = 25 °C 	**Forward current** [6] $I_F = f(V_F)$; T_S = 25 °C 

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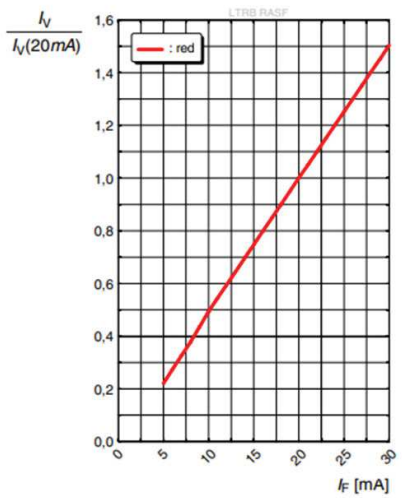
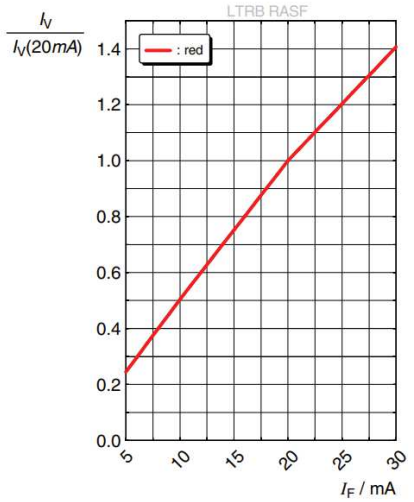
Changes in the datasheets: Relative Luminous Intensity - Red

Old	New
Relative Luminous Intensity 6), 8) $I_V/I_V(20\ mA) = f(I_F);\ T_S = 25\ °C$  	**Relative Luminous Intensity** 6), 8) $I_V/I_V(20\ mA) = f(I_F);\ T_S = 25\ °C$ 

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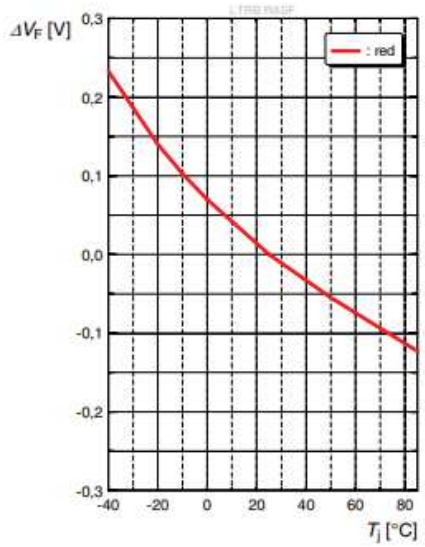
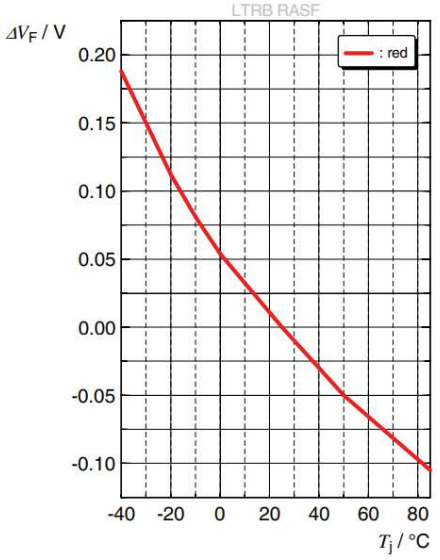
Changes in the datasheets: Forward Voltage - Red

Old	New
Forward Voltage 6) $\Delta V_F = V_F - V_F(25\ °C) = f(T_j);\ I_F = 20\ mA$  	**Forward Voltage** 6) $\Delta V_F = V_F - V_F(25\ °C) = f(T_j);\ I_F = 20\ mA$ 

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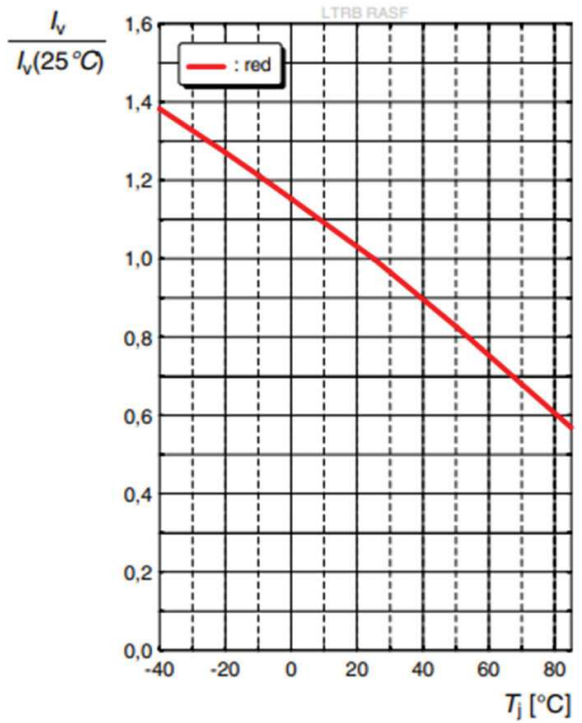
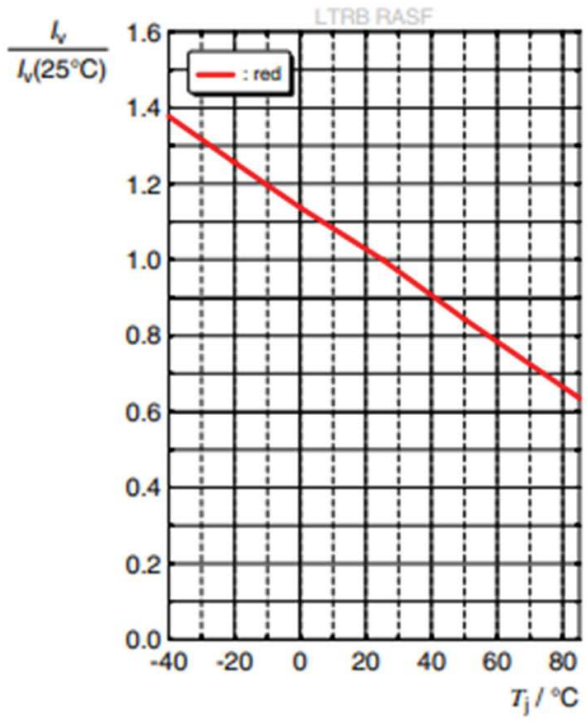
Changes in the datasheets: Relative Luminous Intensity (Tj)

Old	New





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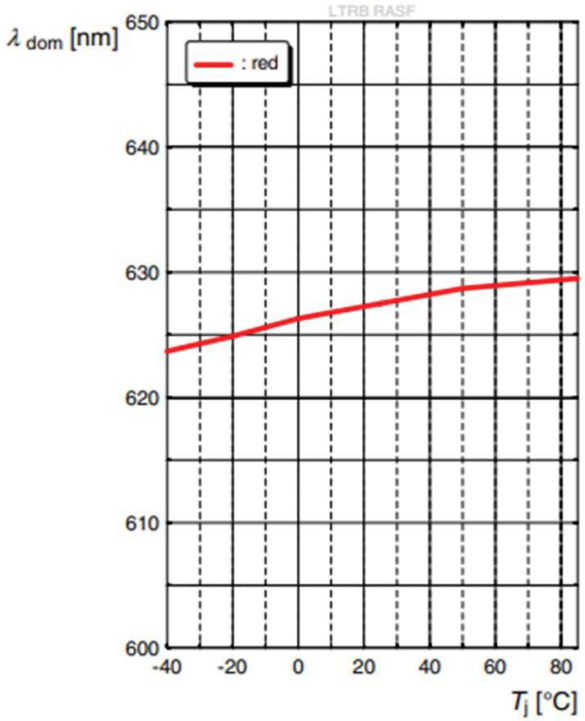
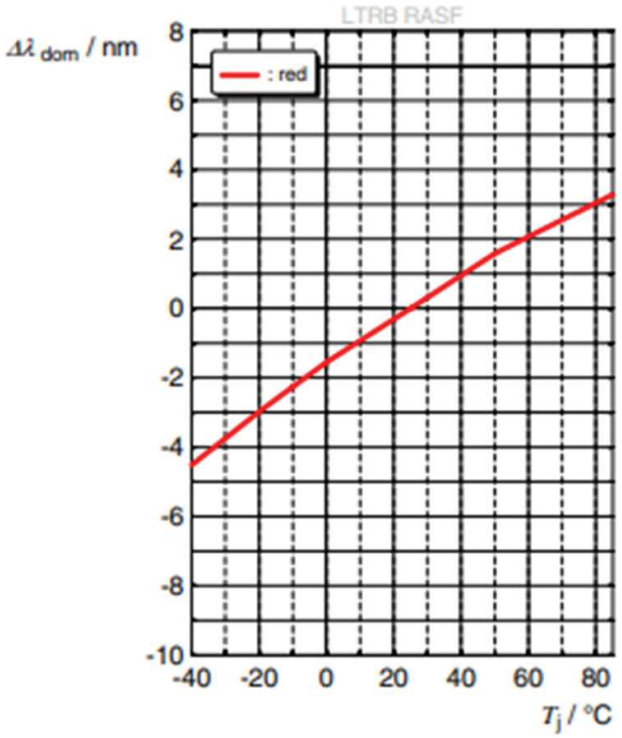
Changes in the datasheets: Dominant Wavelength

Old	New





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Changes in the datasheets: Updated Datasheet Version

Product type	Data sheet version before PCN	Data sheet version after PCN
LTRB RASF	1.6	1.7

Note: After PCN approval and shipment of new material, the new data sheet versions will be valid.
Latest version of data sheet is accessible on the ams OSRAM homepage.

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List of affected products

Brand	
Multi Chip LED	LTRB RASF

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PCN Samples

Brand	
Multi Chip LED	LTRB RASF

Color code: available

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Time schedule

for PCN material (after implementation of change):		
Final qualification report	02.01.2023	
Samples available	02.01.2023	
Intended Start of delivery	02.04.2023*)	*) or earlier if released by customer and upon mutual agreement

for Pre-PCN material (prior to implementation of change):		
Last time order date (LTO)	31.01.2024 **)	**) Lead time and LTO quantity shall be mutually agreed between OSRAM OS and customer.
Last time delivery date (LTD)	30.04.2024***)	***) planned last date for delivery of products of current status

Note:
Pre-PCN material: Products of current status, means before implementation of the changes as described in the PCN.
PCN material: Products with implementation of the changes as described in the PCN.

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Qualification Report 220215C1

Subject	Qualification of LTRB RASF according to AO-PCN-2022-036-A
Date	02.01.2023
Tested device	LTRB RASF
Brand (including sub brands)	Multi Chip LED
Applies to	LTRB RASF

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Pre-conditioning according to Jedec Level II

Test Performed	Condition	Duration	Sample Size	Failures El.	Failures Opt.	Failures Vis
Wet High Temperature Operating Life WHTOL *JESD22-A101*	T_A = 40°C; r.H.= 93% I_F = 5mA	500h	4x30	0	0	0
Temperature Cycling TC *JESD22-A104*	T_A = -40°C/+85°C 15min each extreme	300c	4x30	0	0	0
High Temperature Operating Life HTOL1 *JESD22-A108*	T_A = 25°C I_F = 30mA	500h	4x30	0	0	0
High Temperature Operating Life HTOL2 *JESD22-A108*	T_A = 85°C I_F = 13mA	500h	4x30	0	0	0
Pulsed Operating Life PLT *JESD22-A108*	T_A = 25°C I_F =100mA; tp = 0.01ms; DC = 3 %	1000h	4x30	0	0	0
Solderability (solder bath SMD) SD *IEC 60068-2-58*	T_A = 245°C T_A = 260°C method 1 (solder bath)	3s 10s	4x11	-	-	0
Sulphur dioxide test SO_2 *IEC 60068-2-42*	T_A = 25°C, r.H.= 75% SO_2 = 25+/-5ppm	168h	4x30	0	0	0
Resistance to Solder Heat RSH *JESD22-A113*	Reflow soldering 260°C	3x	4x30	0	0	0
Electrostatic Discharge HBM ANSI/ESDA/JEDEC JS-001	Human Body Model	8000V	3x10	0	0	0

Note: Lot A/B/C - Evaluation lot; Lot D - Control lot

Failure criteria:

Electrical failures: Uf (If = 20mA)
- blue chip > 3,3 V; ± 10% from initial value
- red chip > 2,4 V; ± 10% from initial value
- true green chip > 3,10 V; ± 10% from initial value

Optical failures: Iv (If = 20mA) — absolute limit: ± 50% max.

Visual failures: acc JEDEC JESD22-B101

Conclusion: The tested devices representing the product family as stated in the applies to section fulfill the reliability requirements.

Disclaimer

PLEASE CAREFULLY READ THE BELOW TERMS AND CONDITIONS BEFORE USING THE INFORMATION.
IF YOU DO NOT AGREE WITH ANY OF THESE TERMS AND CONDITIONS, DO NOT USE THE INFORMATION.

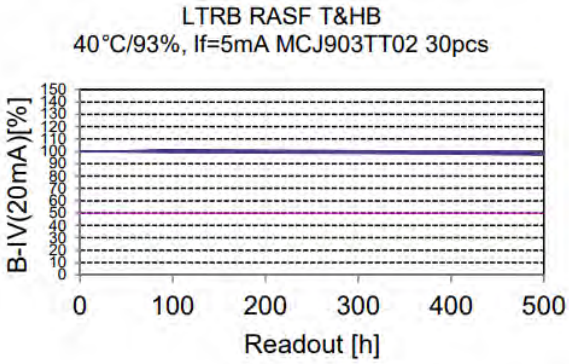
The Information contained in this Document does not constitute an independent warranty. The committed behavior is described in the Product data sheet and/or further, mutually agreed specifications.
Distribution of part or all of the contents of this Document to any 3rd party in any form without the prior permission of ams-OSRAM International GmbH is prohibited except in accordance with applicable mandatory law.

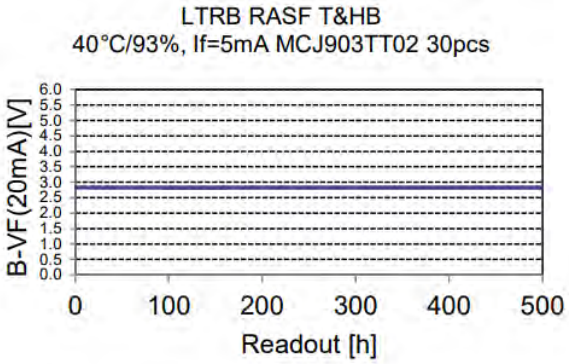
Further explanations:
Data: The Data used in this Document consider the reliability test results under the mentioned driving conditions only. For Product information on the maximum operating conditions and the OSRAM standard qualification profile please refer to the Product data sheet or contact your local sales partner.
Conditions: The conditions for the generation of the Data are as follows:
1. The Data and curves shown in this Document are based on experiments carried out under laboratory conditions on a random sample size of LED/IRED/Laser/Detector with readouts at discrete readout times (where applicable). Thus, the Data above represent a limited number of production lots only and may differ between different assembly lots over time (including chip or package changes). Thus, the behavior of the LED/IRED/Laser/Detector in the final application may differ from the Data. The behavior of the LED/IRED/Laser/Detector at conditions or readout times deviating from those stated above may not be deduced from the Data.
2. If applicable:
    a) Extended driving conditions:
    The tested driving conditions exceed the maximum limits stated in the Product data sheet. Therefore, a reduced lifetime or an accelerated degradation is expected. Failure limits noted in the Document refer to the testing condition according to the OSRAM standard Product qualification profile and not to the actual testing condition.
    b) Extended testing duration:
    The testing duration exceed the OSRAM standard qualification profile of the mentioned Product. Failure limits noted in the Document refer to the testing duration according to the OSRAM standard Product qualification profile and not to the actual testing duration.
    c) Exceeding standard qualification conditions – (Product data sheet limits not affected):
    The tested driving conditions exceed the OSRAM standard qualification profile of the mentioned Product. Therefore a reduced lifetime or an accelerated degradation is expected. Failure limits noted in the Document refer to the testing condition according to the OSRAM standard Product qualification profile and not to the actual testing condition.
3. For long term operation additional failure modes of the chip or package can occur which are not shown in this Document.
4. Possible differences in the thermal management of OSRAM and customer’s setup may lead to a different aging behavior.

WHTOL 40°C/93%r.H; 5mA

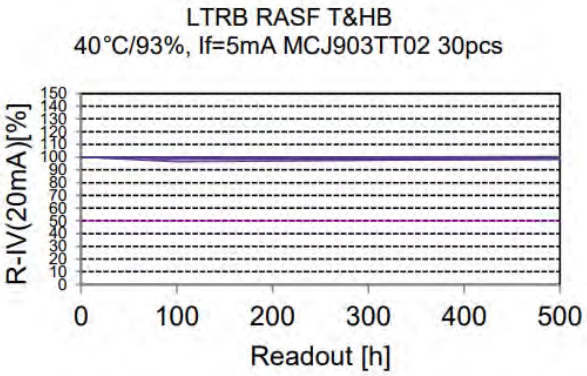
Lot A - Eval

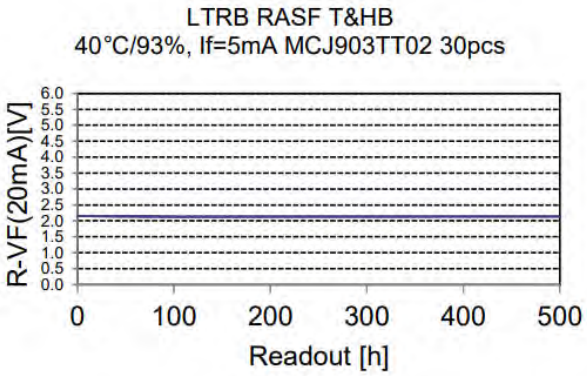
Blue chip



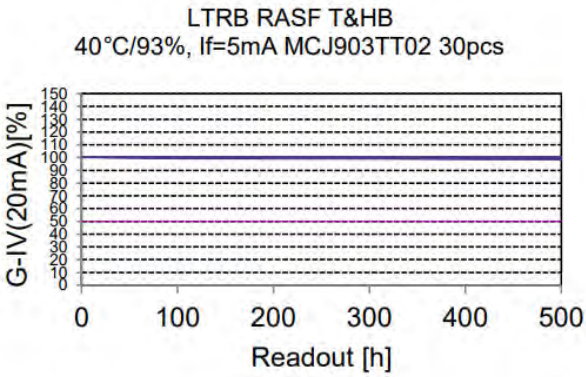


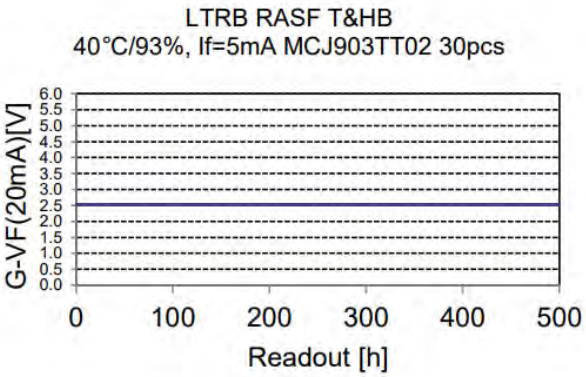
Red chip





True green chip

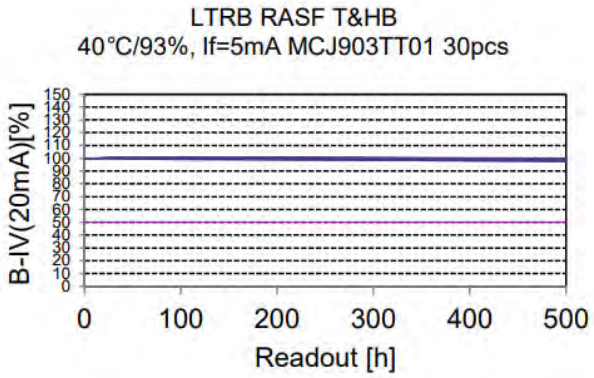


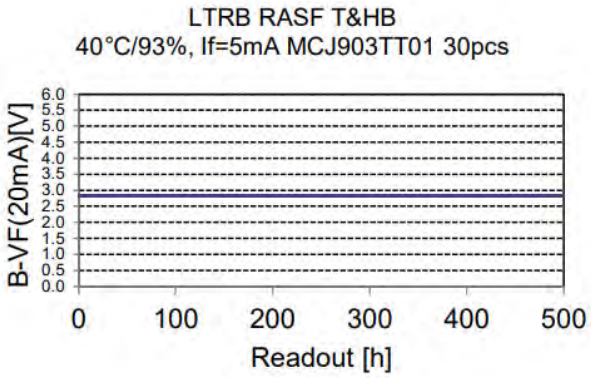


WHTOL 40°C/93%r.H; 5mA

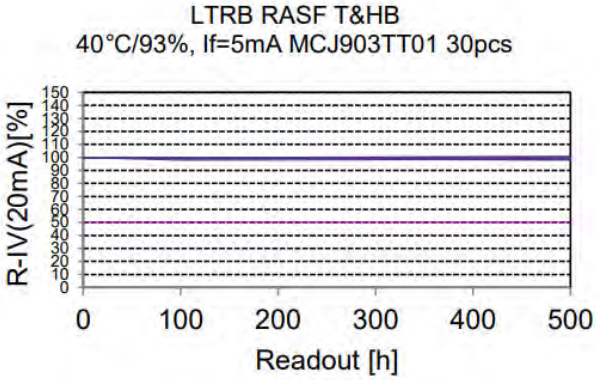
Lot B - Eval

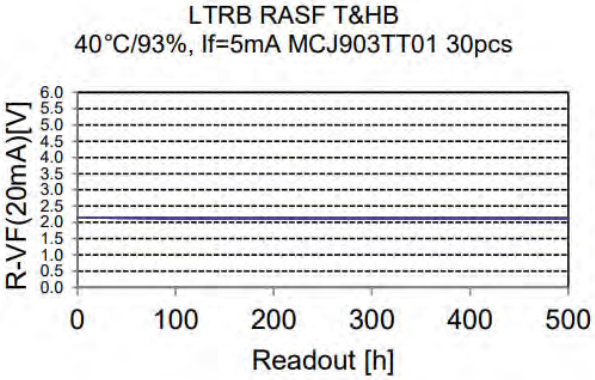
Blue chip



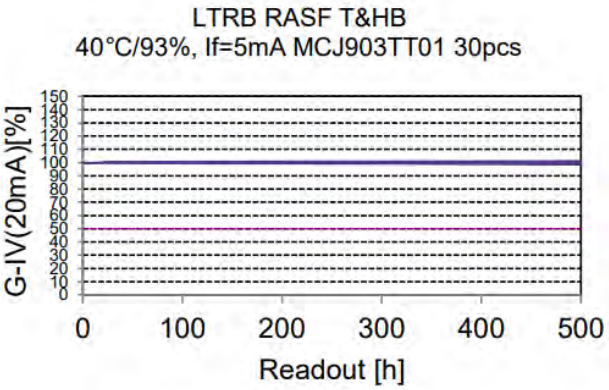


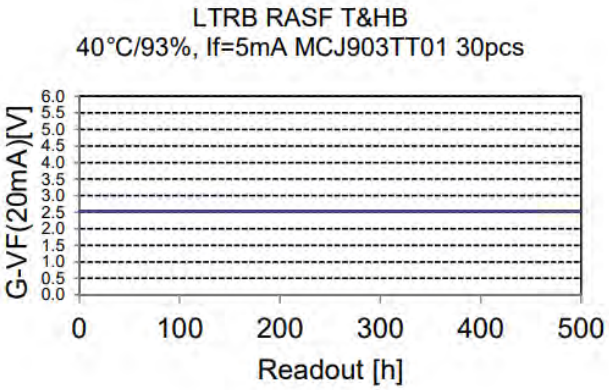
Red chip





True green chip

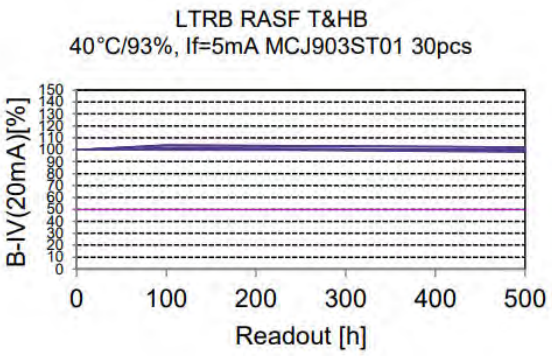


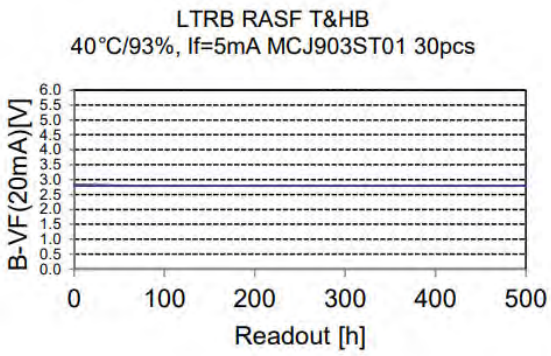


WHTOL 40°C/93%r.H; 5mA

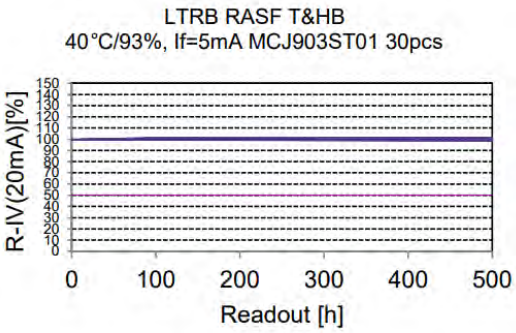
Lot C - Eval

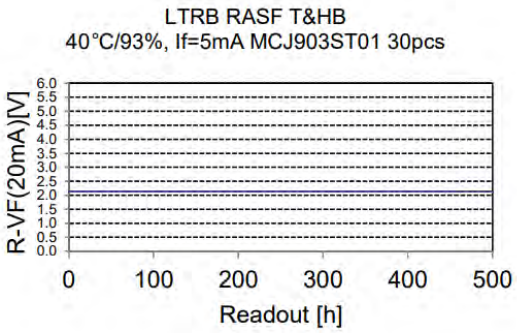
Blue chip



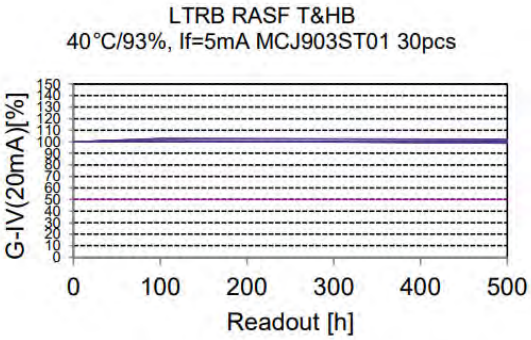


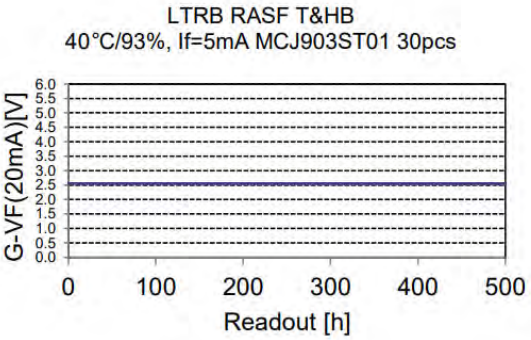
Red chip





True green chip

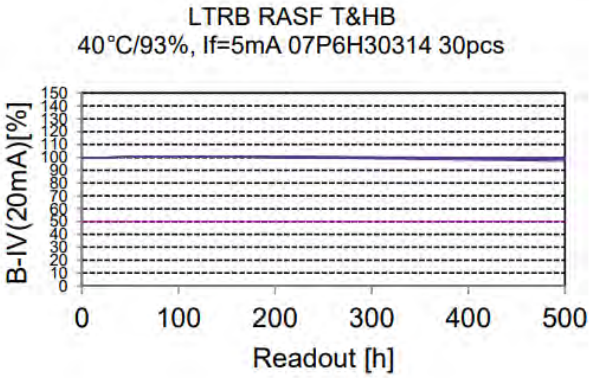


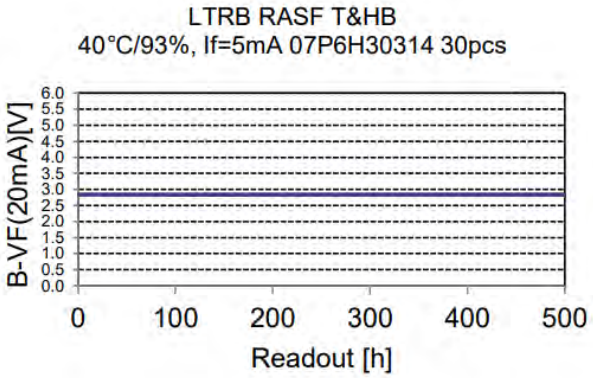


WHTOL 40°C/93%r.H; 5mA

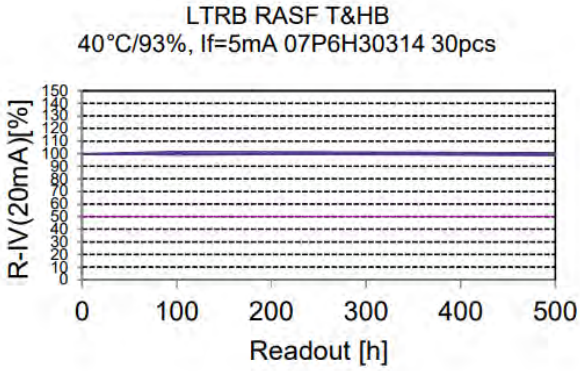
Lot D - Control

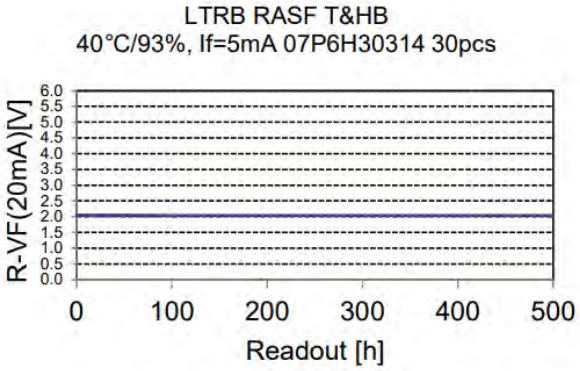
Blue chip



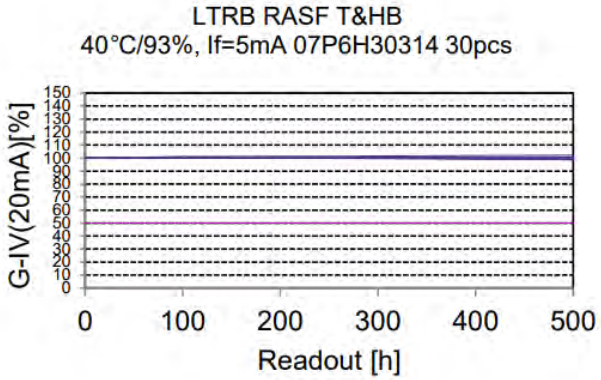


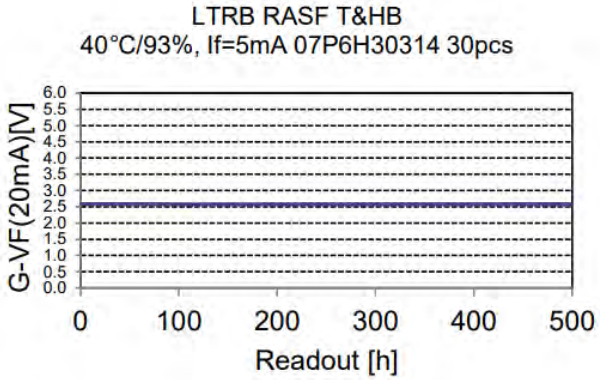
Red chip





True green chip

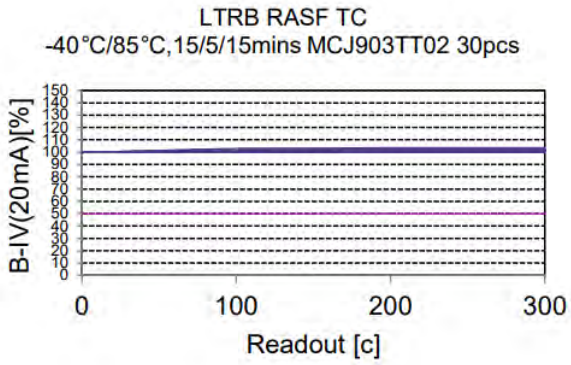


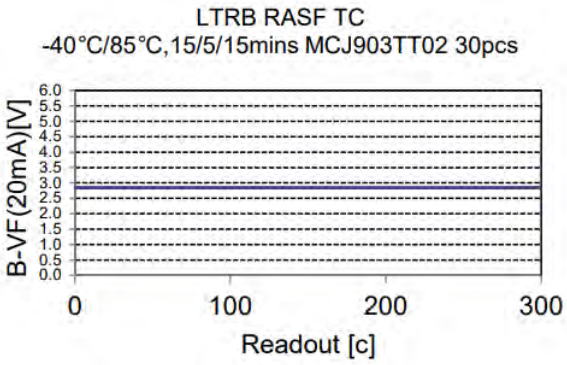


TC -40°C/85°C

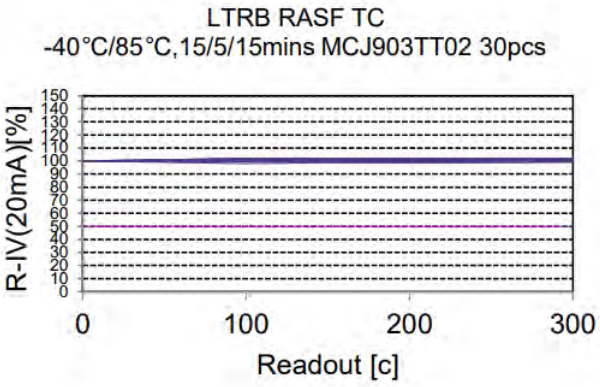
Lot A - Eval

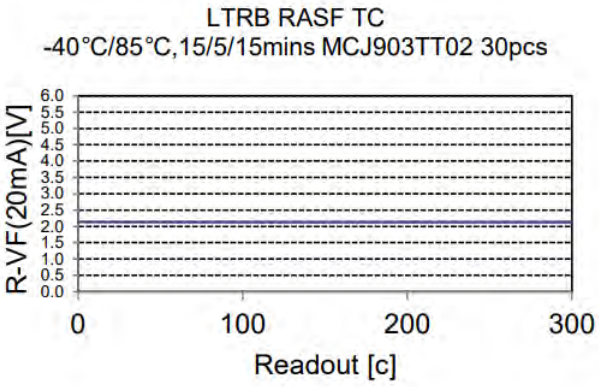
Blue chip



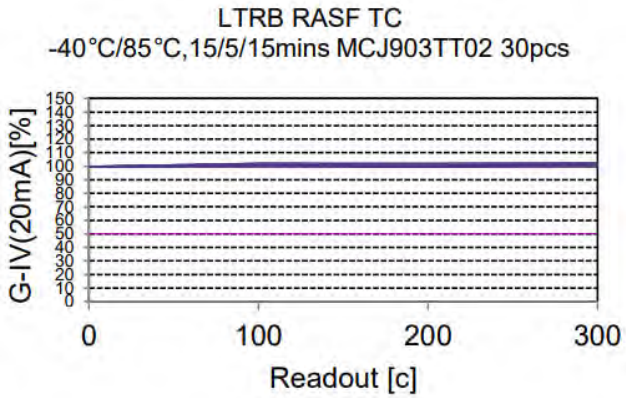


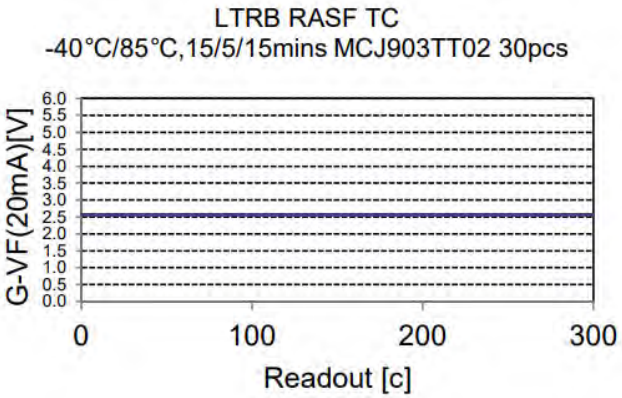
Red chip





True green chip

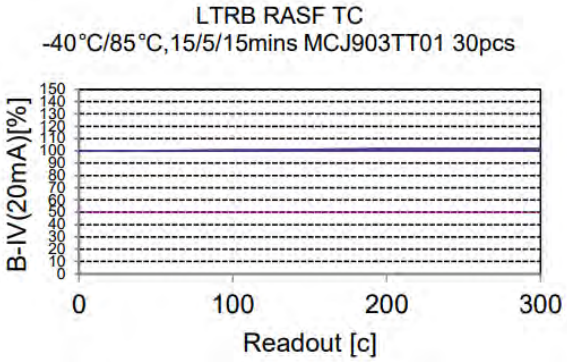


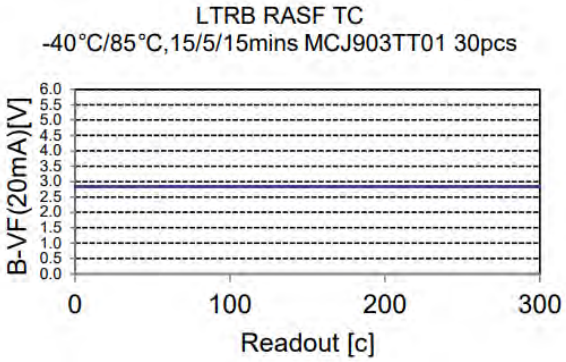


TC -40°C/85°C

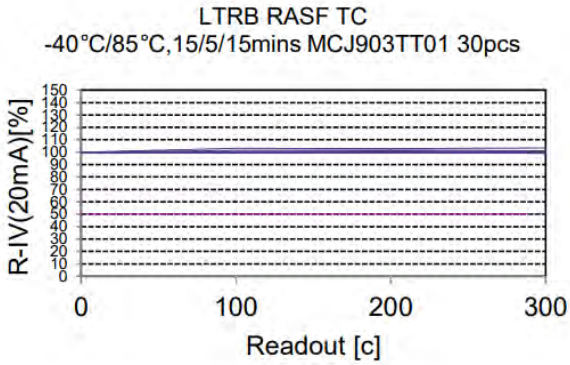
Lot B - Eval

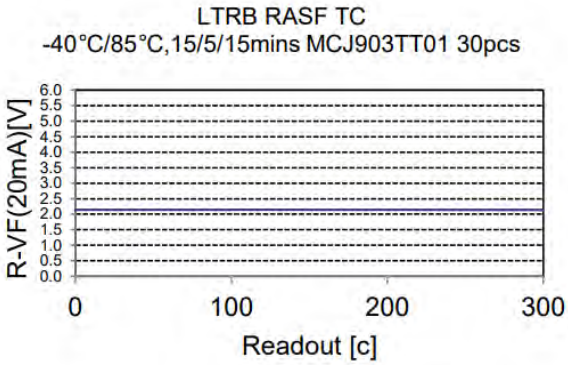
Blue chip



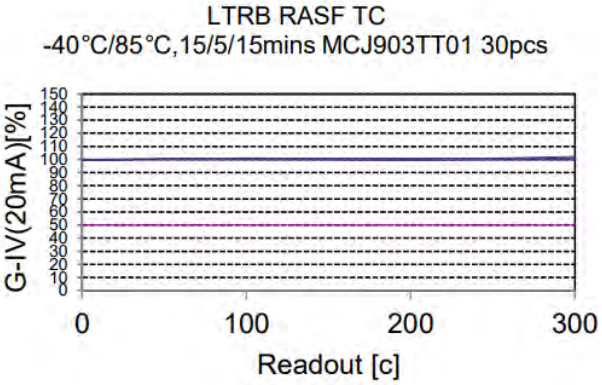


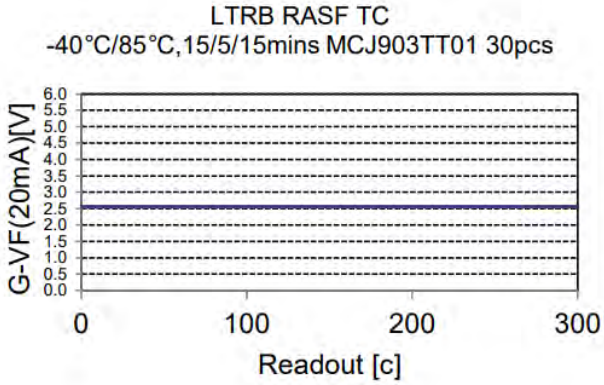
Red chip





True green chip

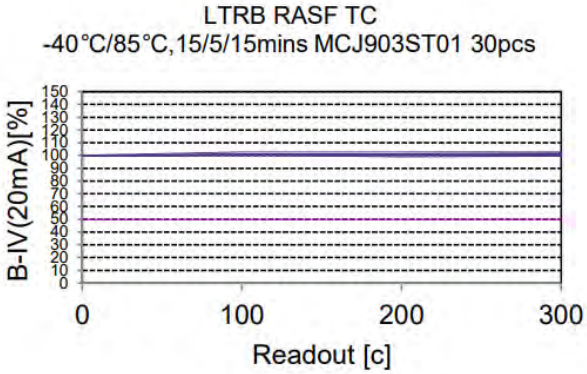


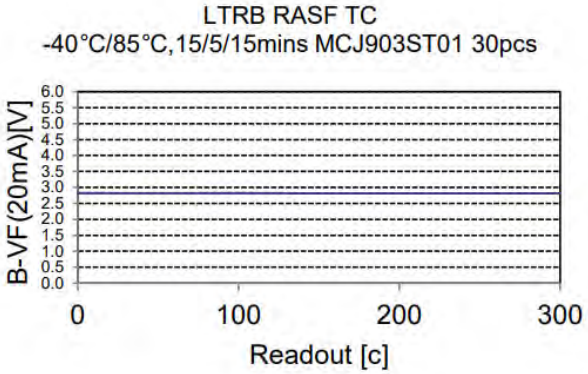


TC -40°C/85°C

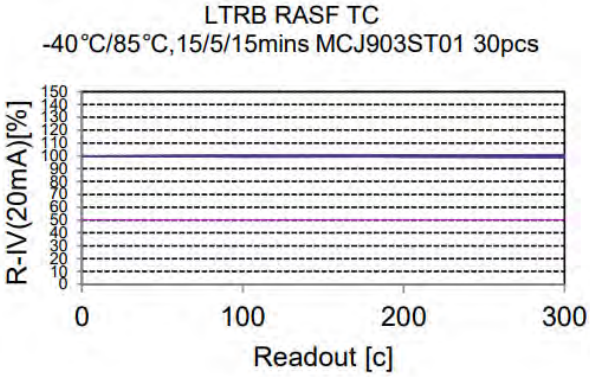
Lot C - Eval

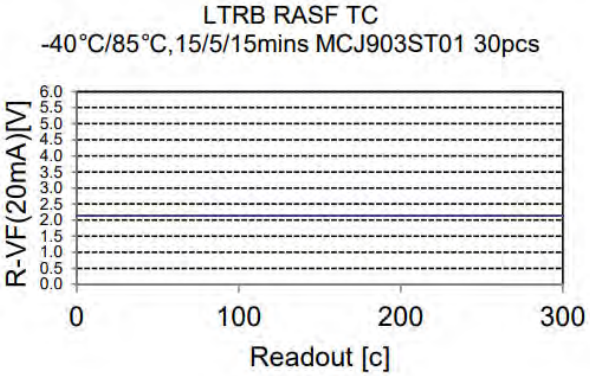
Blue chip



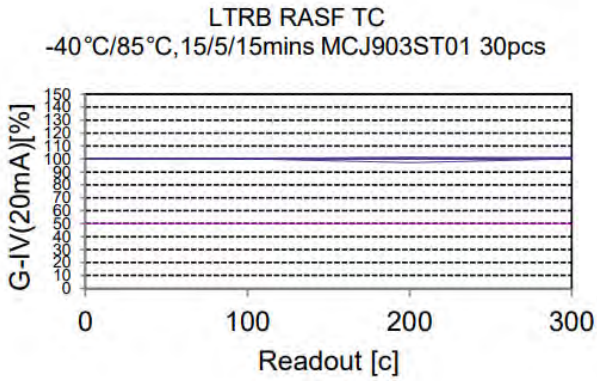


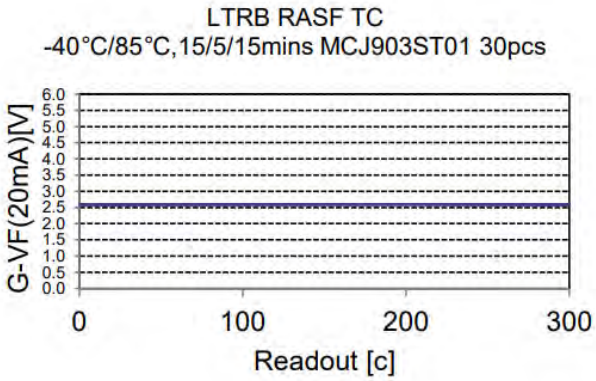
Red chip





True green chip

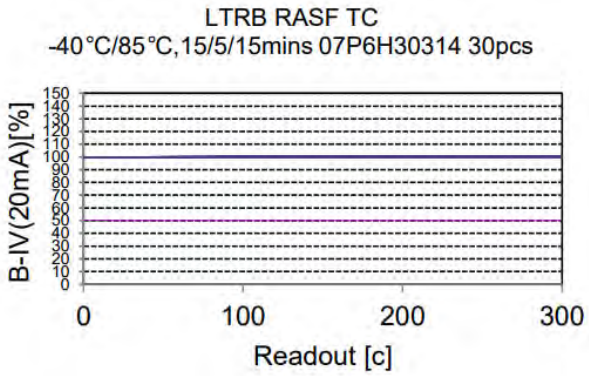


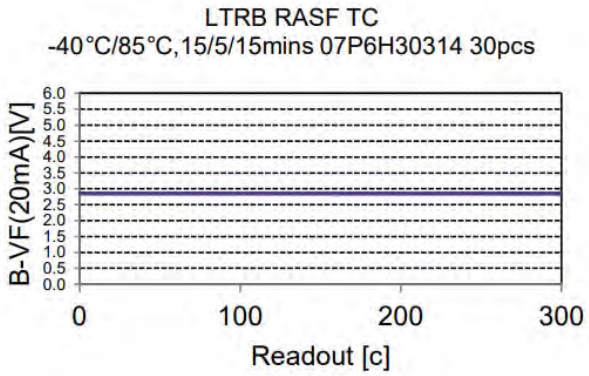


TC -40°C/85°C

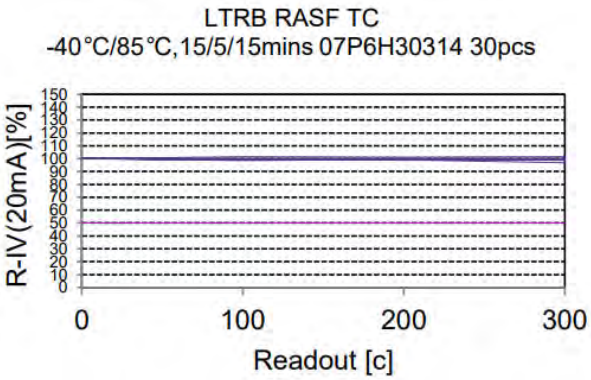
Lot D - Control

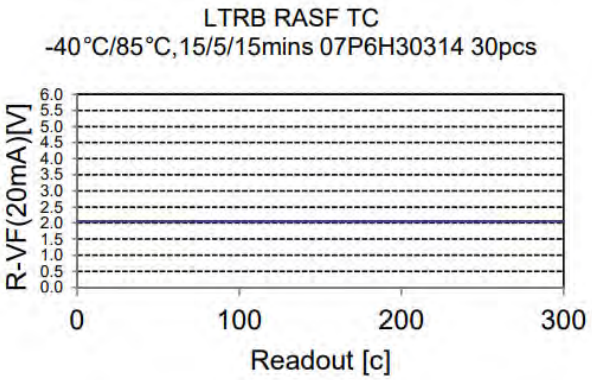
Blue chip



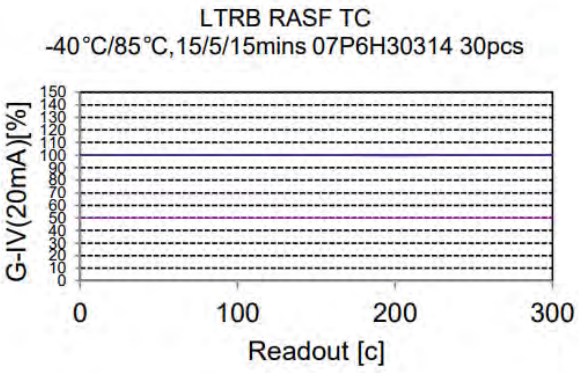


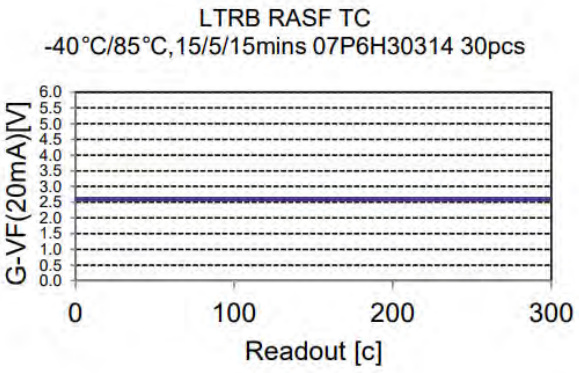
Red chip





True green chip

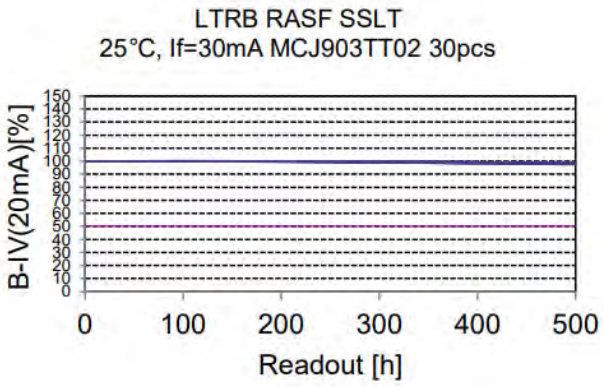


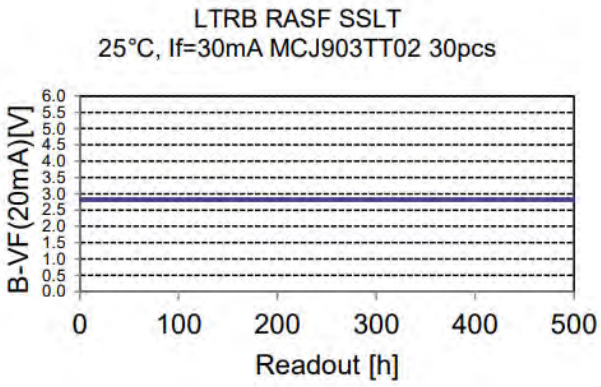


HTOL1 25°C/30mA

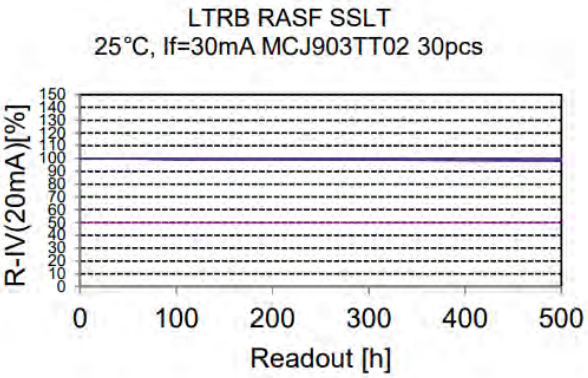
Lot A - Eval

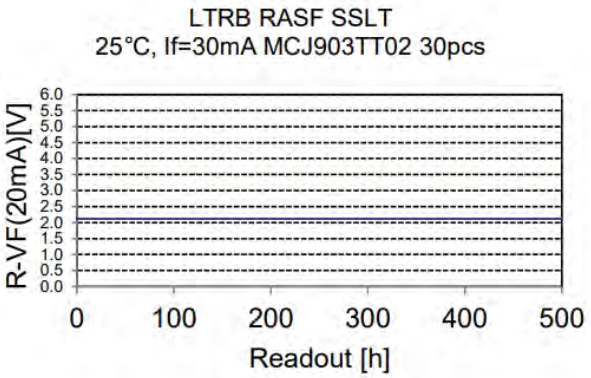
Blue chip



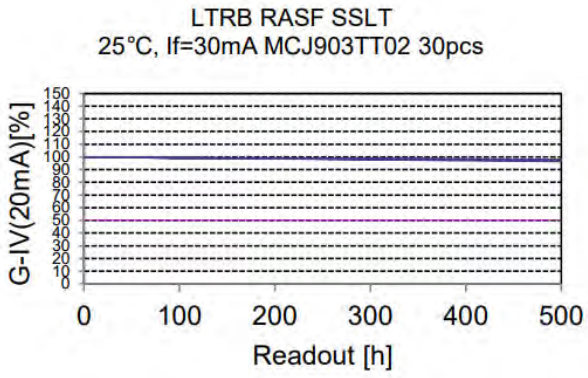


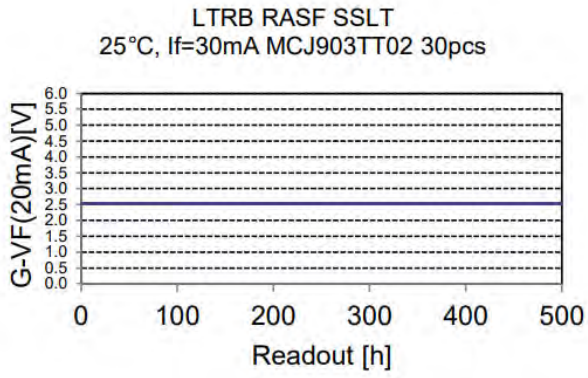
Red chip





True green chip

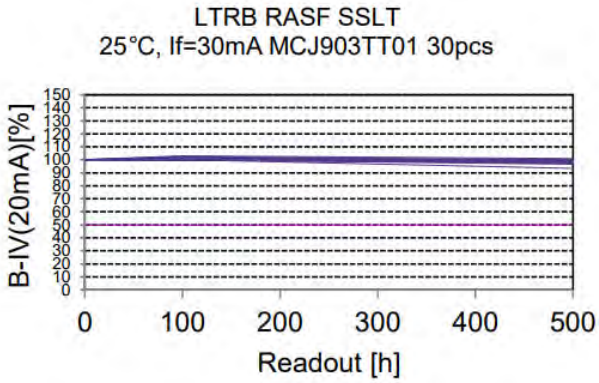


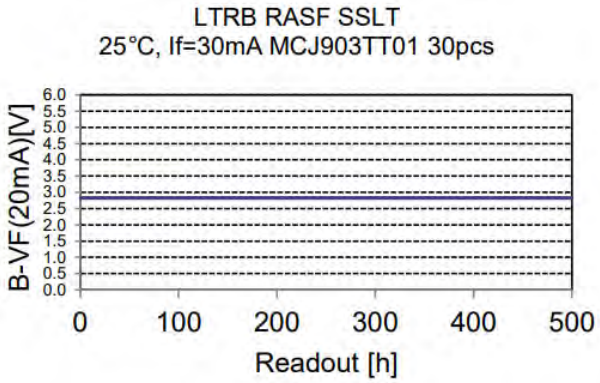


HTOL1 25°C/30mA

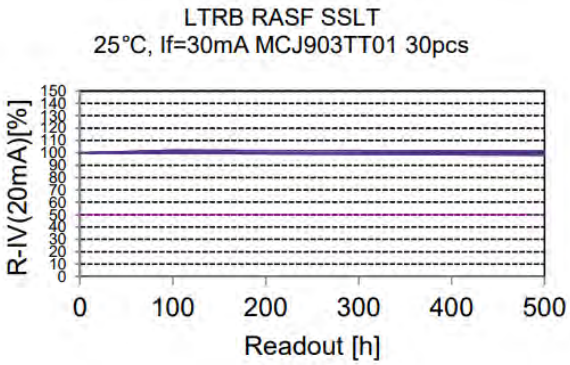
Lot B - Eval

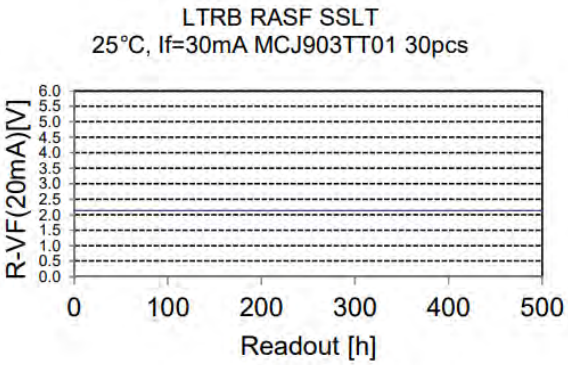
Blue chip



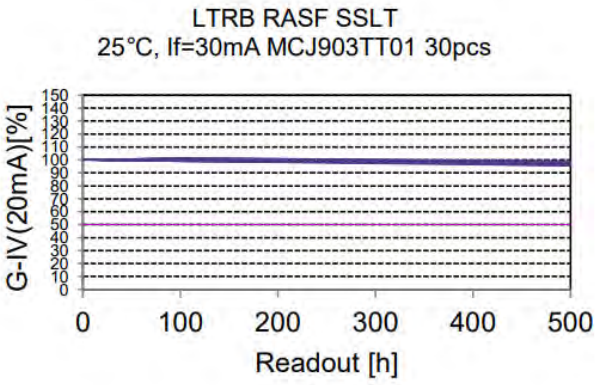


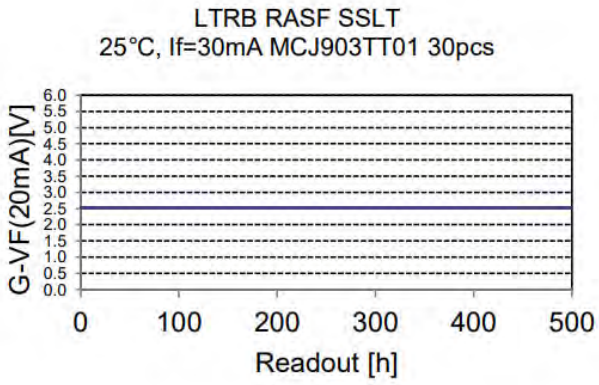
Red chip





True green chip

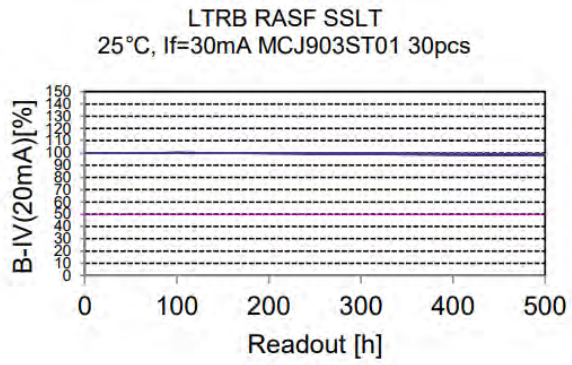


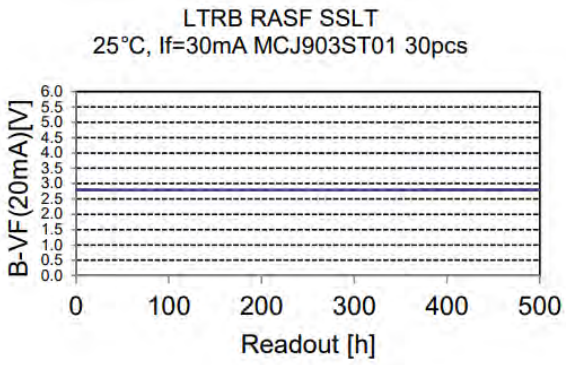


HTOL1 25°C/30mA

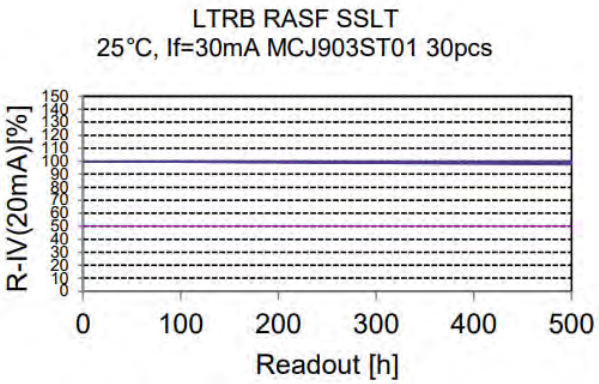
Lot C - Eval

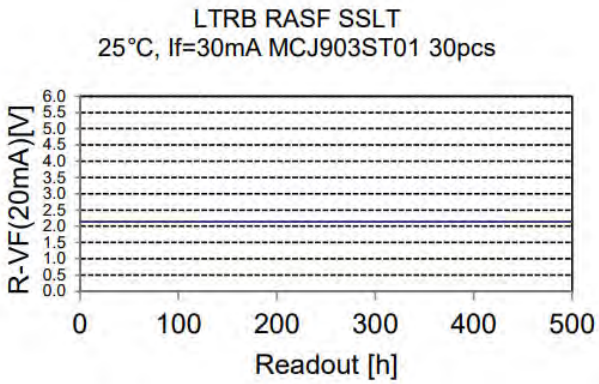
Blue chip



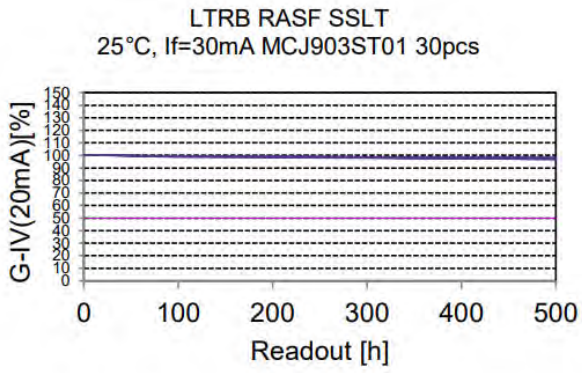


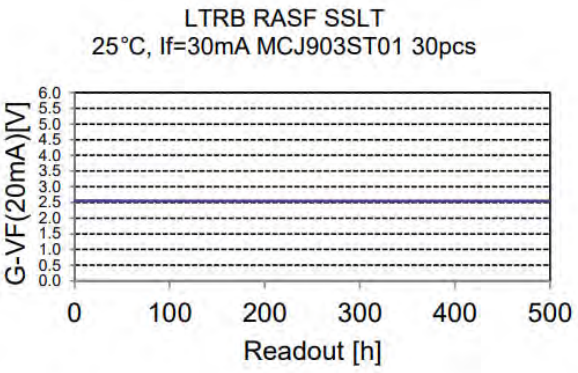
Red chip





True green chip

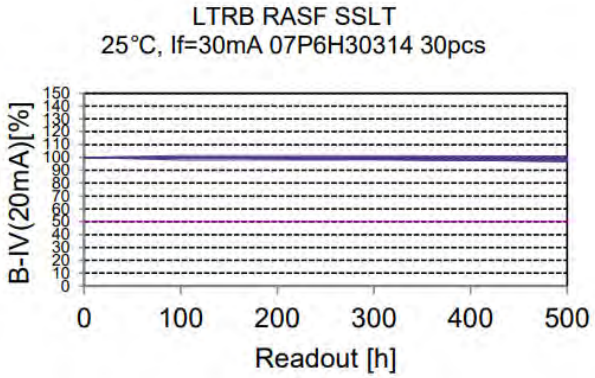


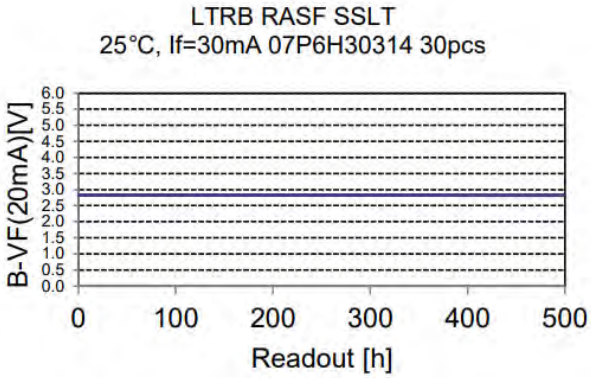


HTOL1 25°C/30mA

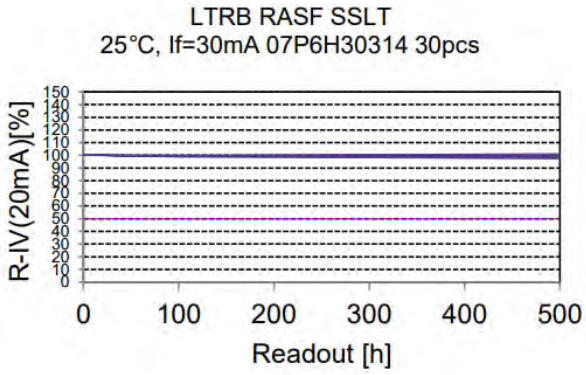
Lot D - Control

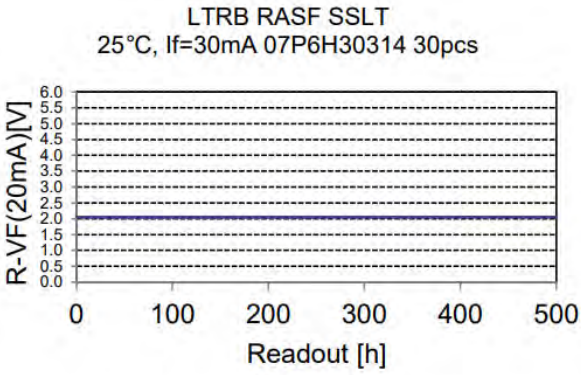
Blue chip



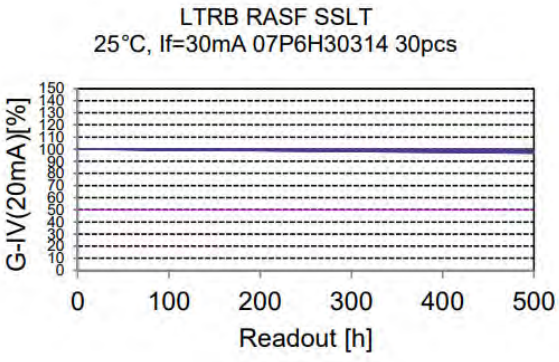


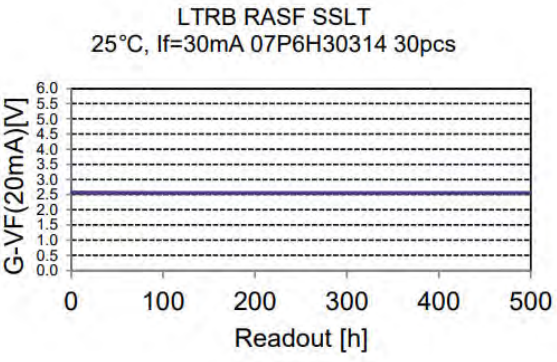
Red chip





True green chip

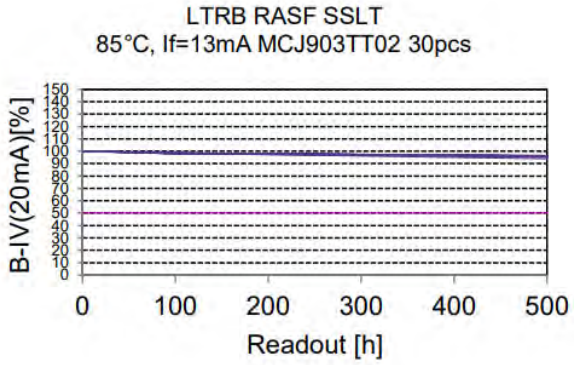


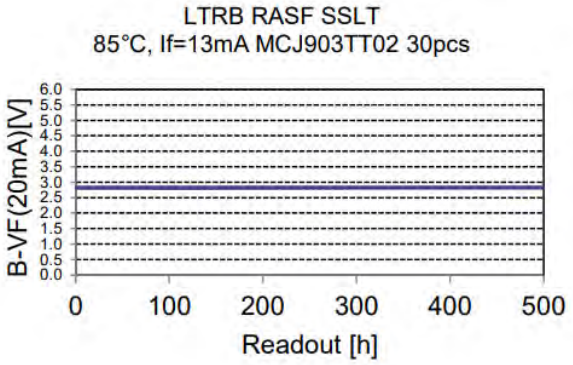


HTOL2 85°C/13mA

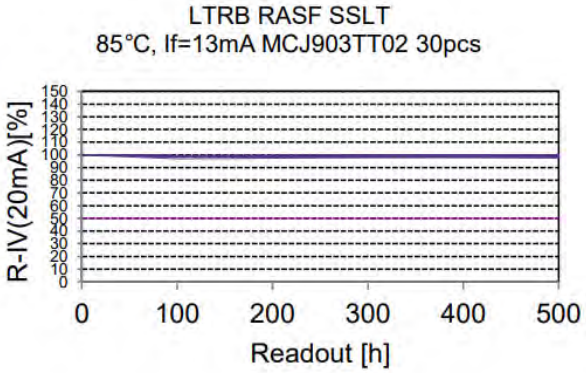
Lot A - Eval

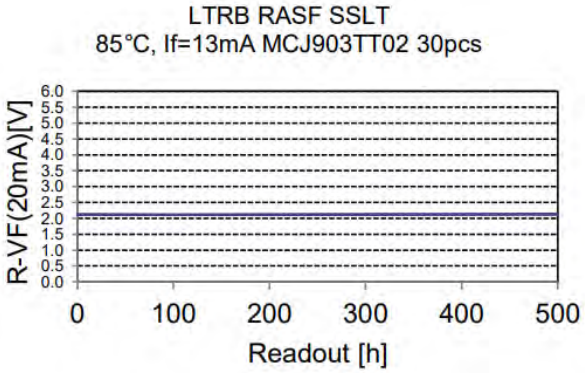
Blue chip



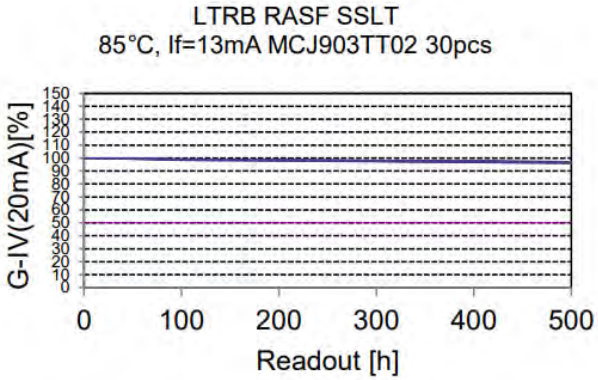


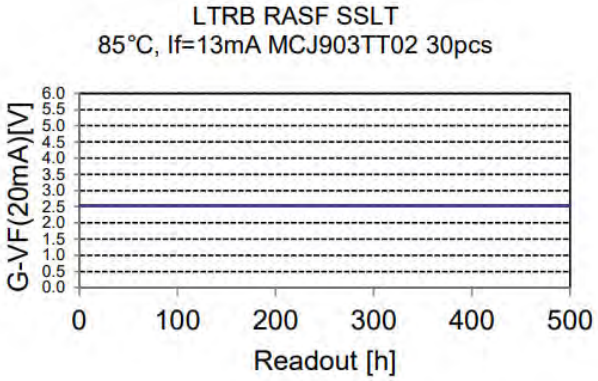
Red chip





True green chip

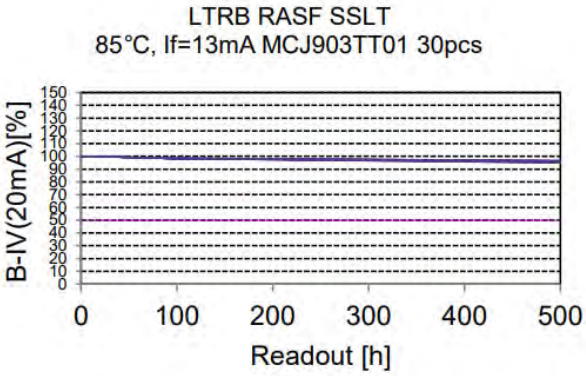


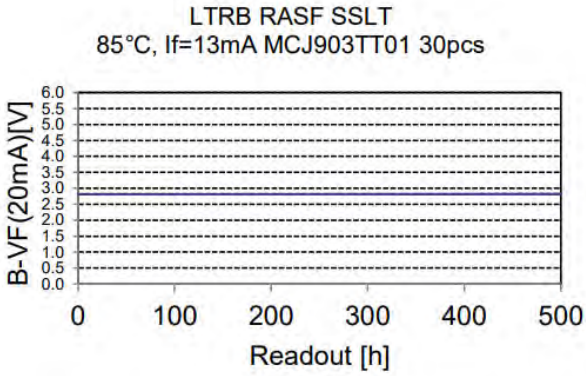


HTOL2 85°C/13mA

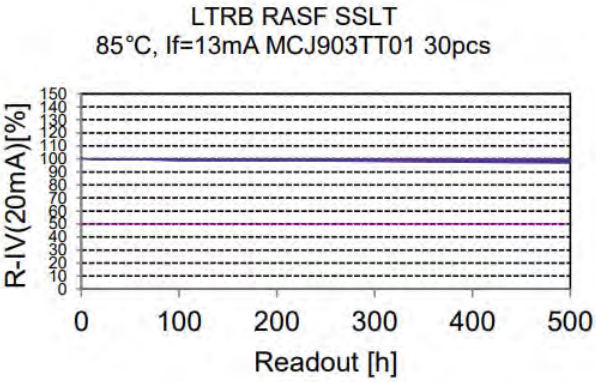
Lot B - Eval

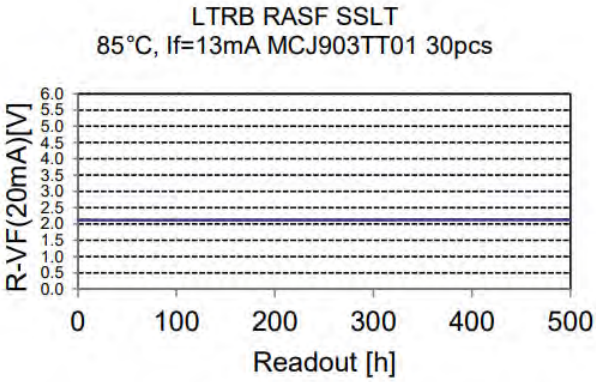
Blue chip



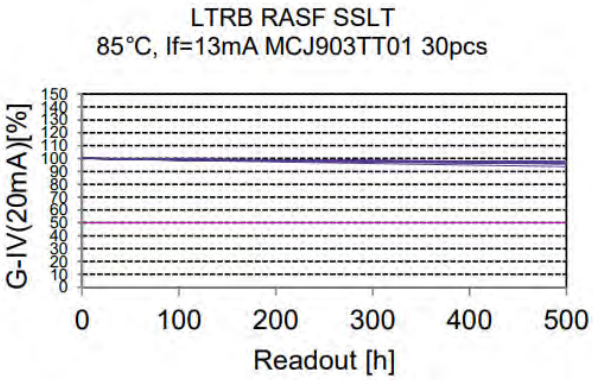


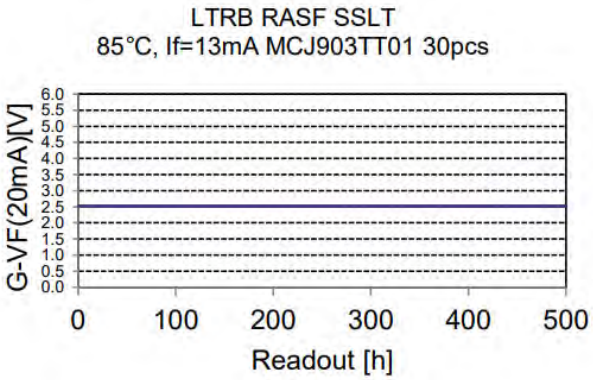
Red chip





True green chip

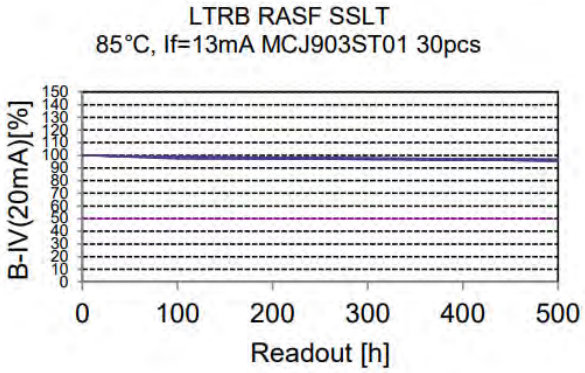


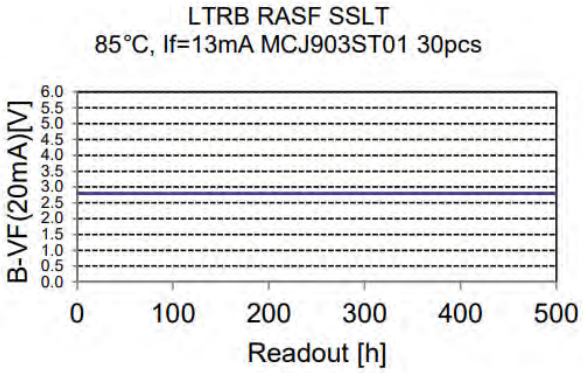


HTOL2 85°C/13mA

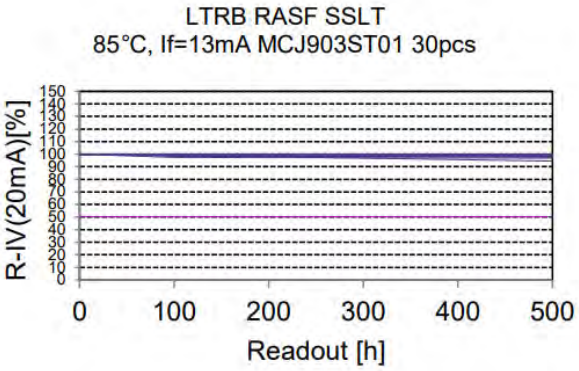
Lot C - Eval

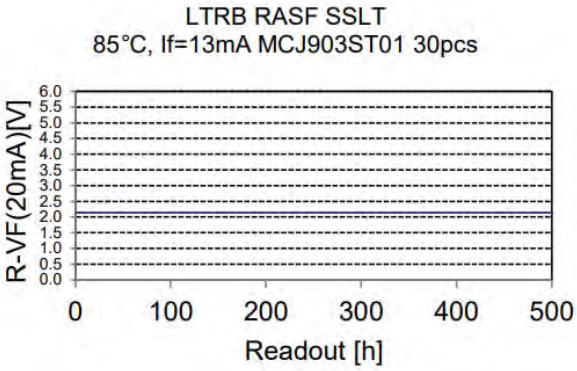
Blue chip



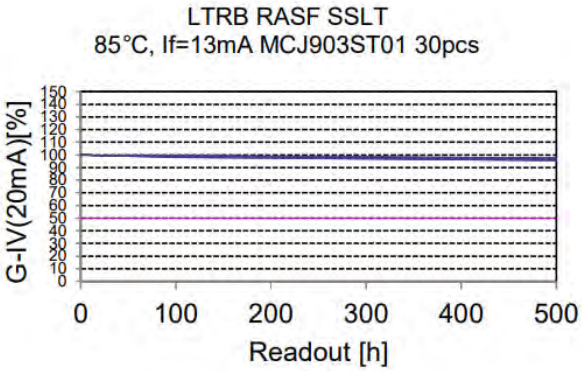


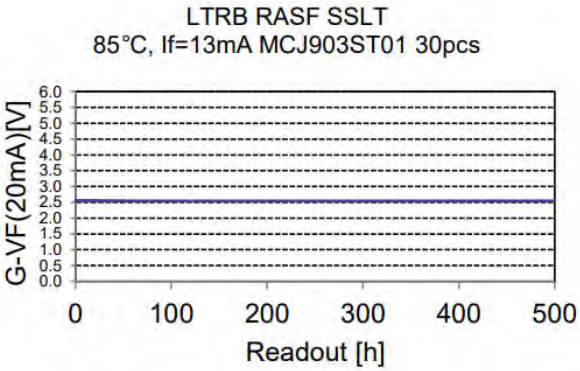
Red chip





True green chip

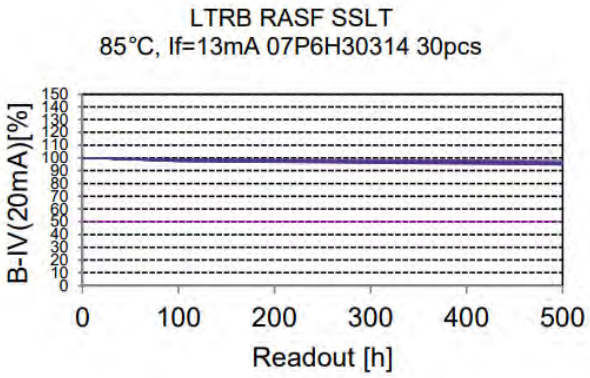


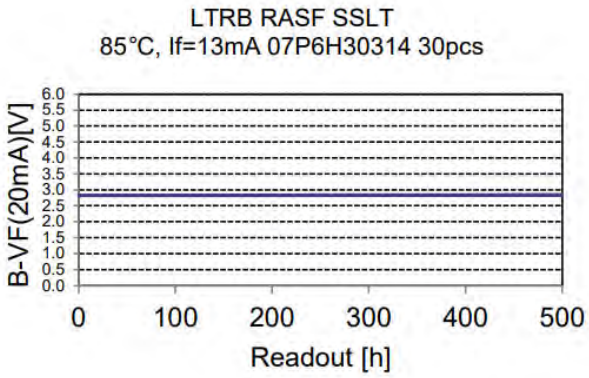


HTOL2 85°C/13mA

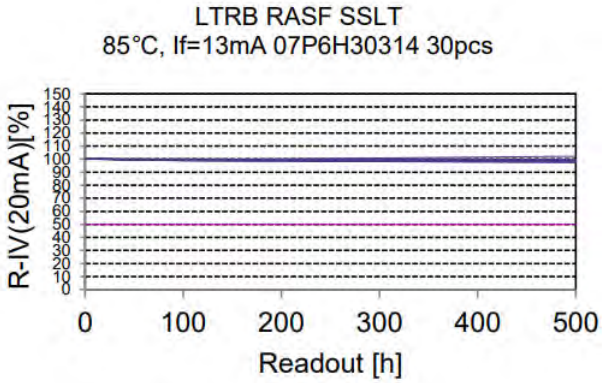
Lot D - Control

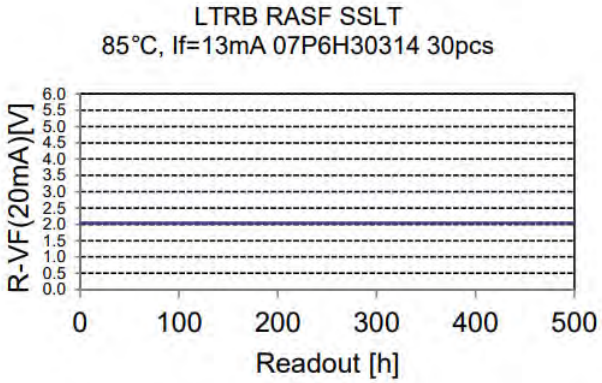
Blue chip



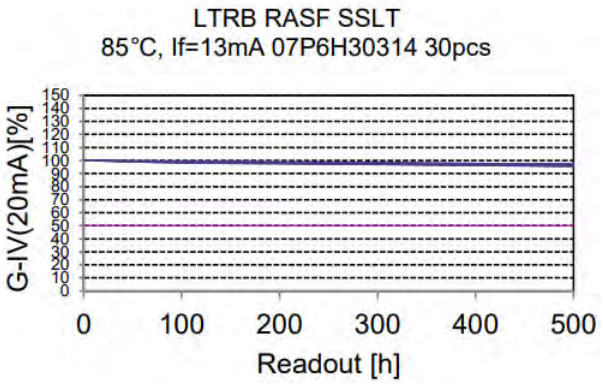


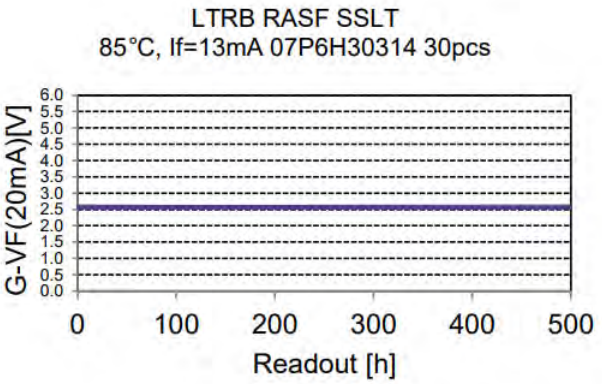
Red chip





True green chip

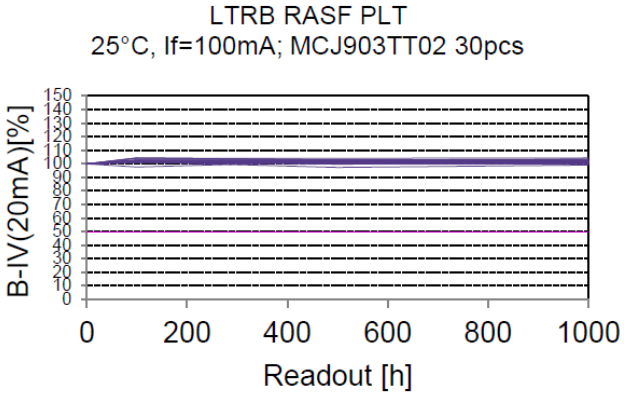


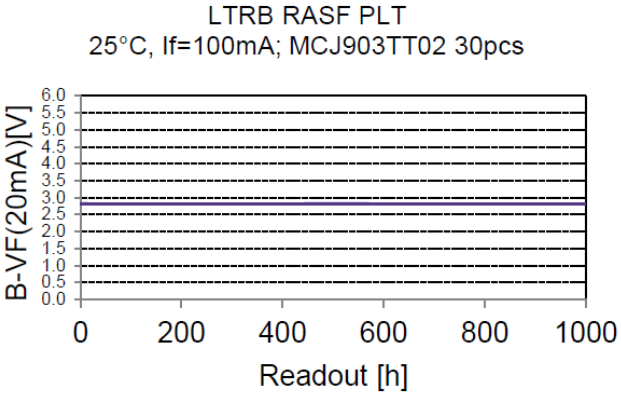


PLT 25°C/100mA/0.01ms/D=0.03

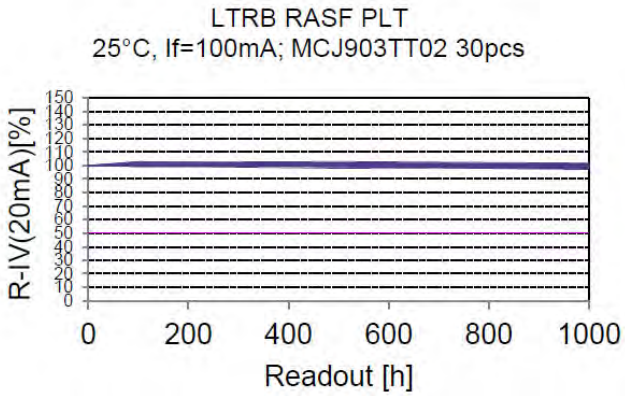
Lot A - Eval

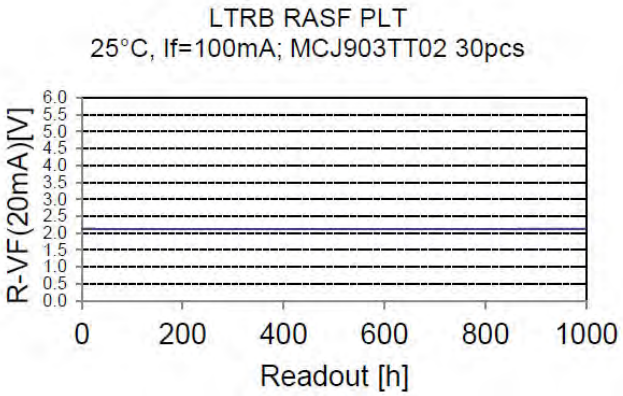
Blue chip



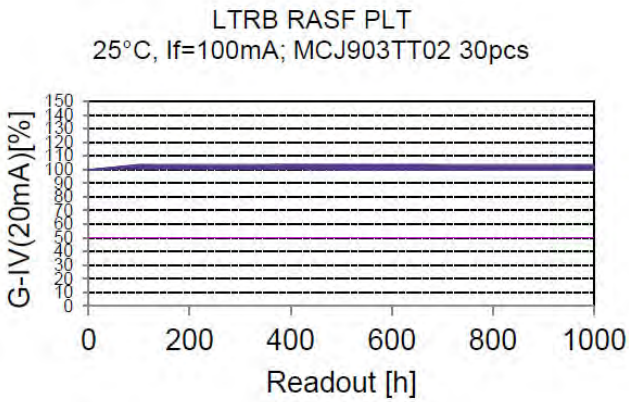


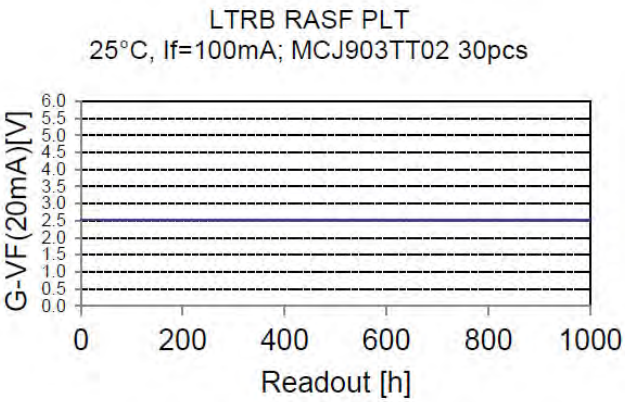
Red chip





True green chip

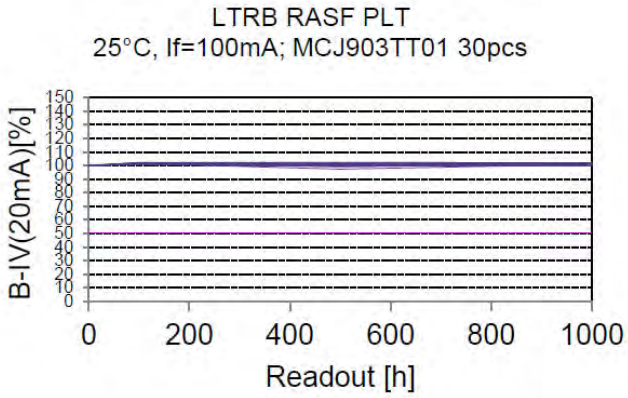


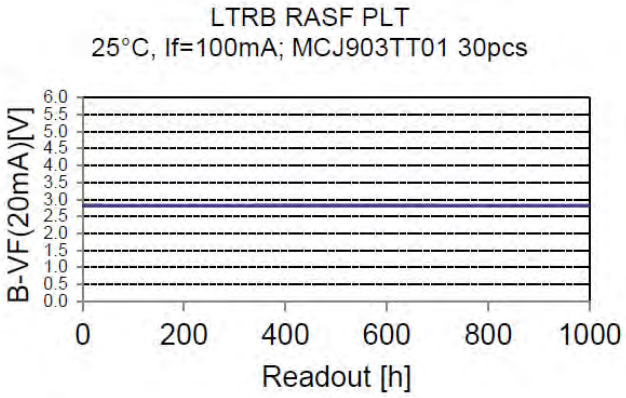


PLT 25°C/100mA/0.01ms/D=0.03

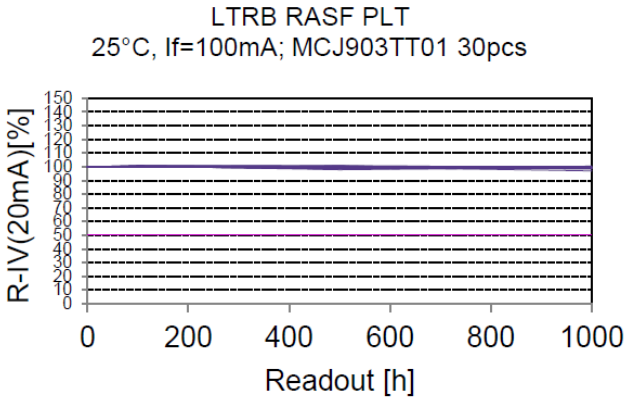
Lot B - Eval

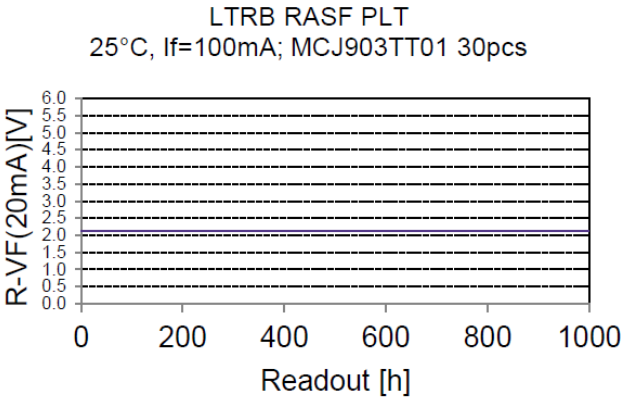
Blue chip



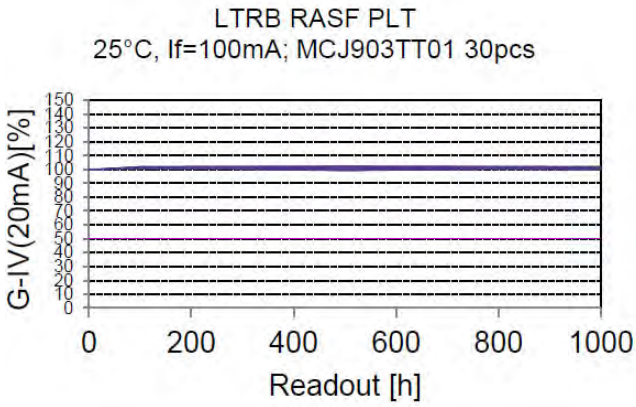


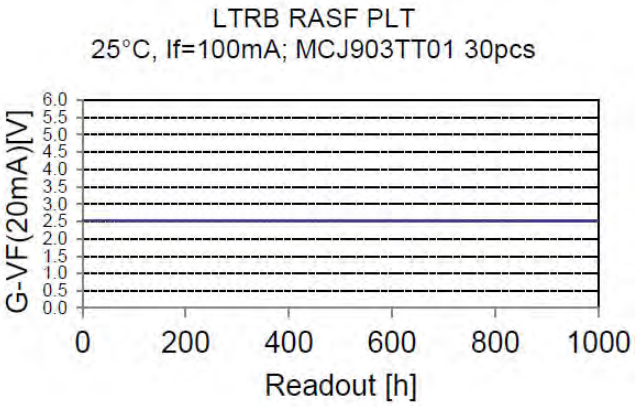
Red chip





True green chip

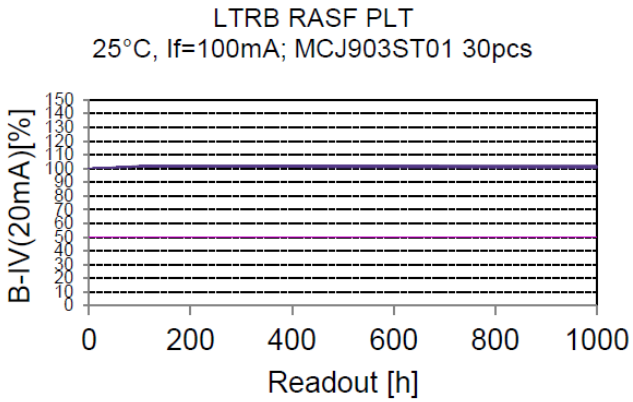


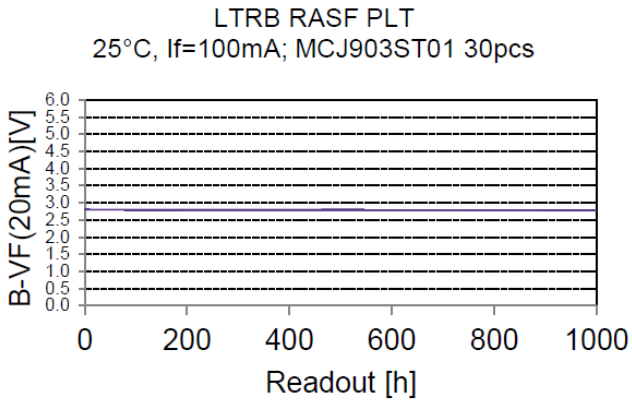


PLT 25°C/100mA/0.01ms/D=0.03

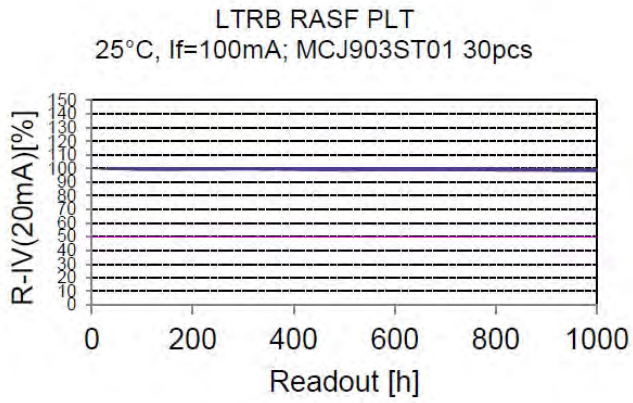
Lot C - Eval

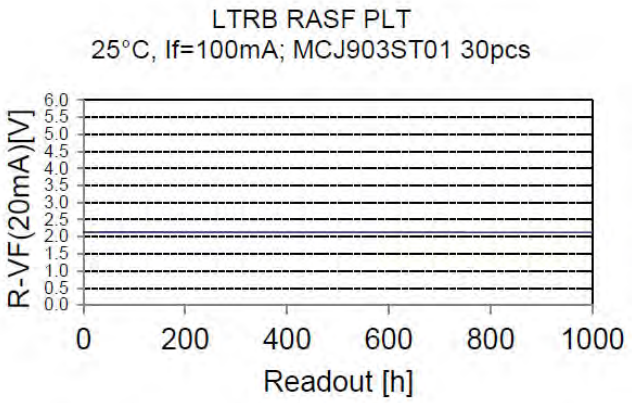
Blue chip



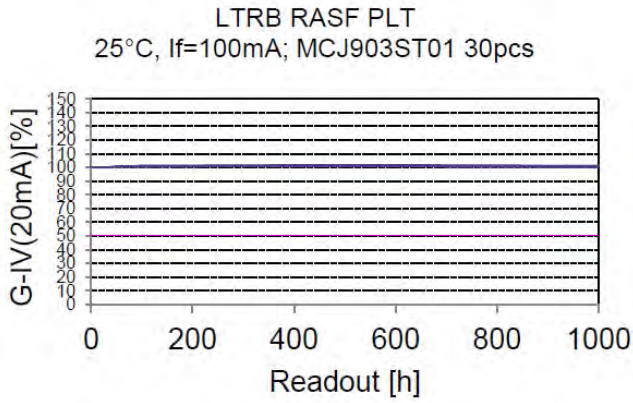


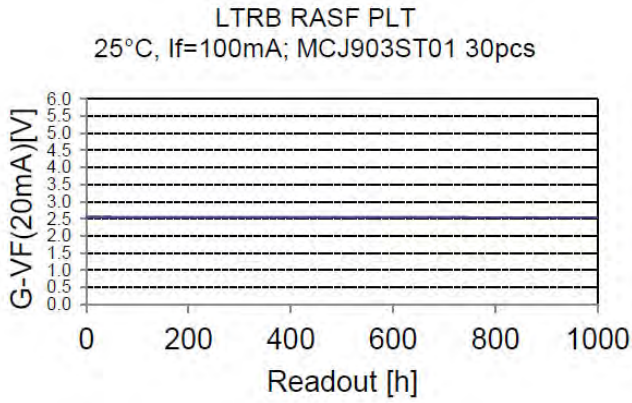
Red chip





True green chip

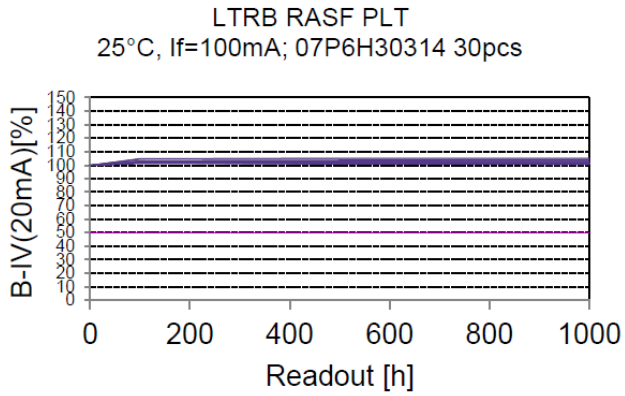


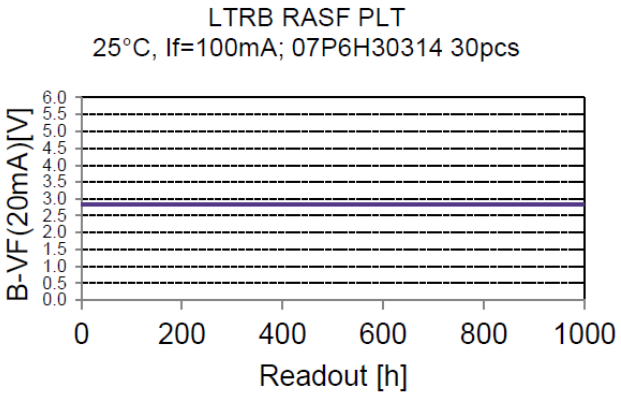


PLT 25°C/100mA/0.01ms/D=0.03

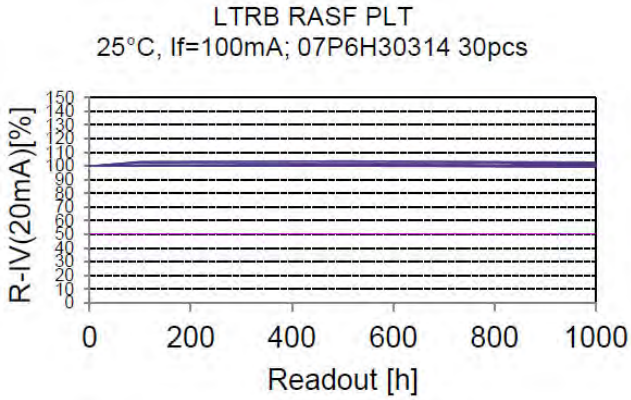
Lot D - Control

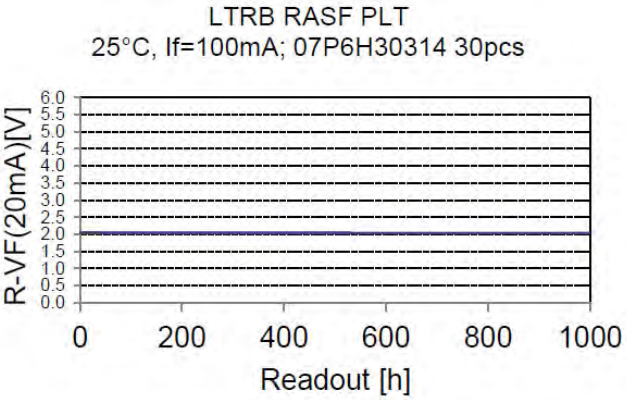
Blue chip



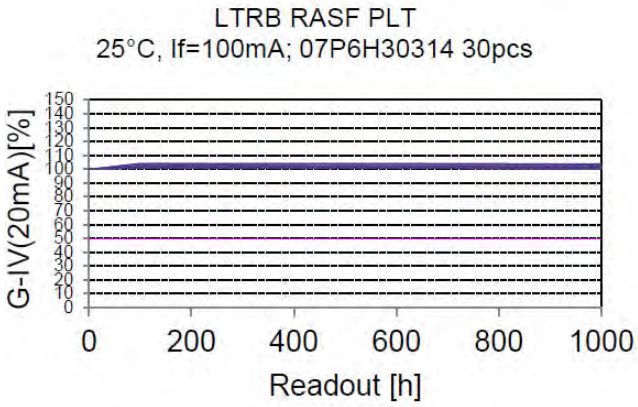


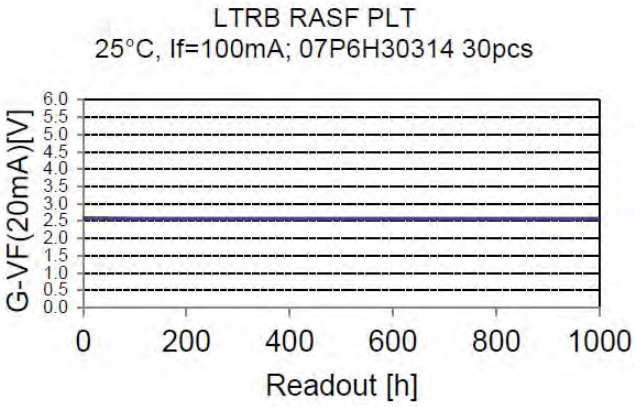
Red chip





True green chip

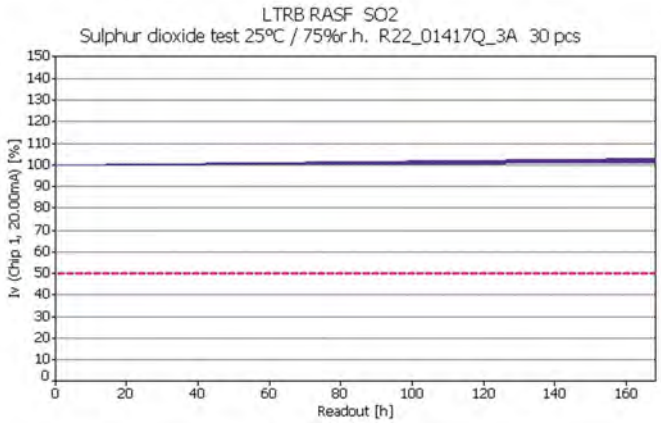


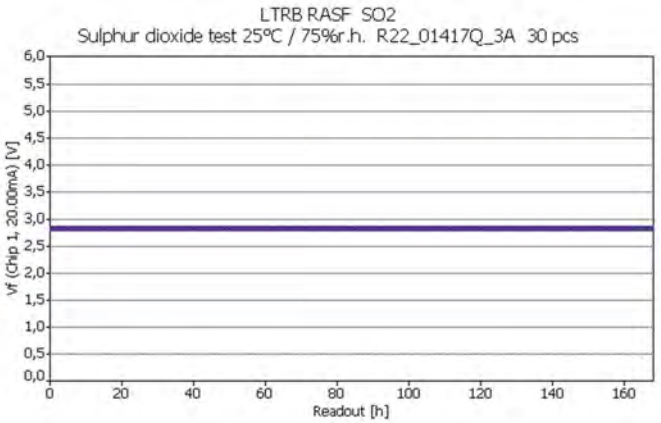


SO_2 25°C/75% r.H.

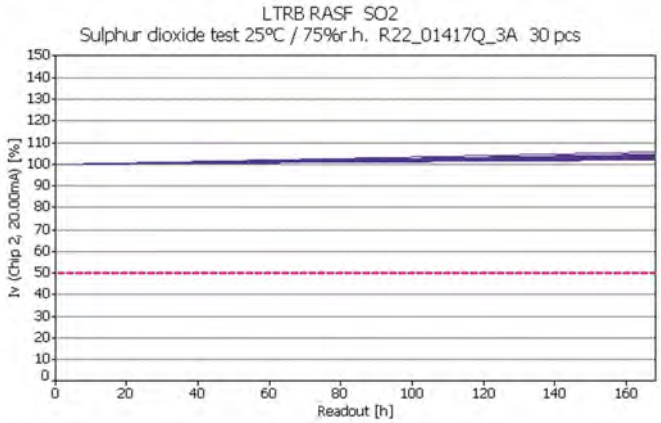
Lot A - Eval

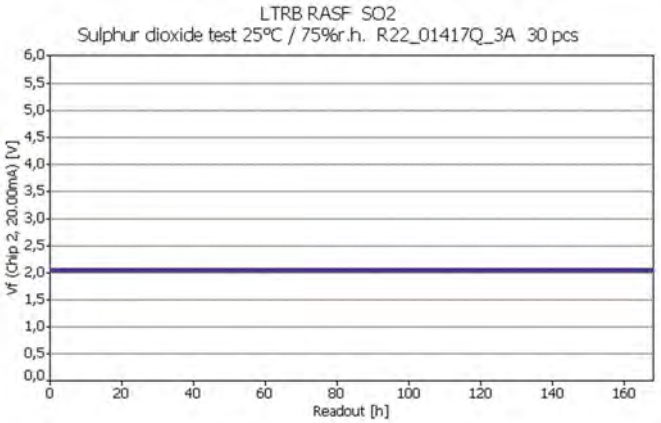
Blue chip



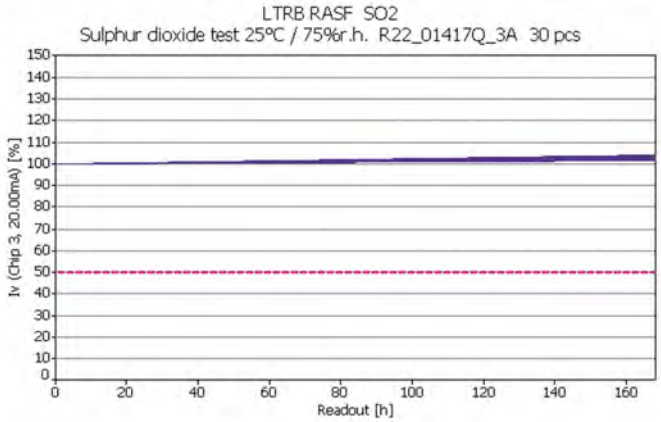


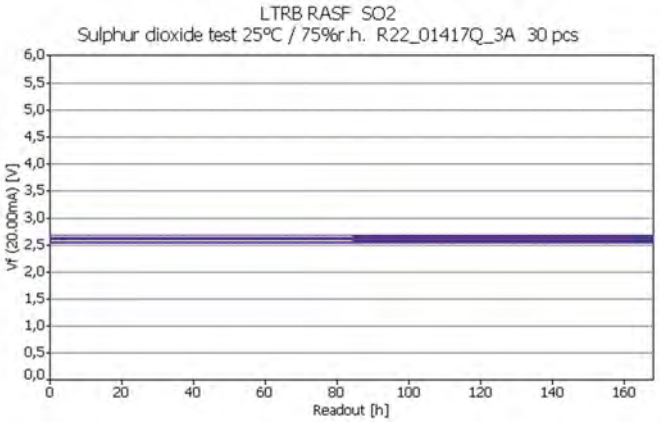
Red chip





True green chip

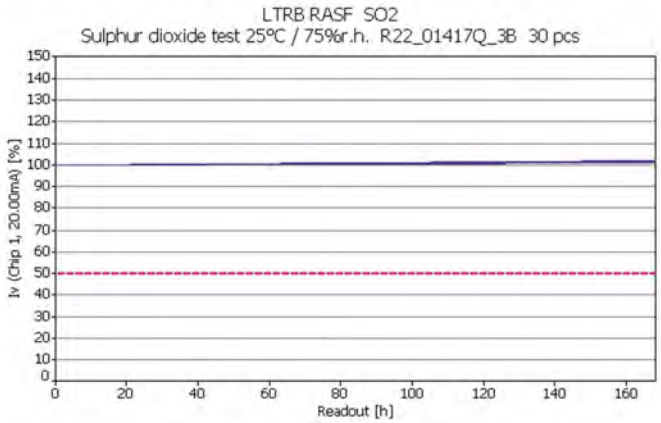


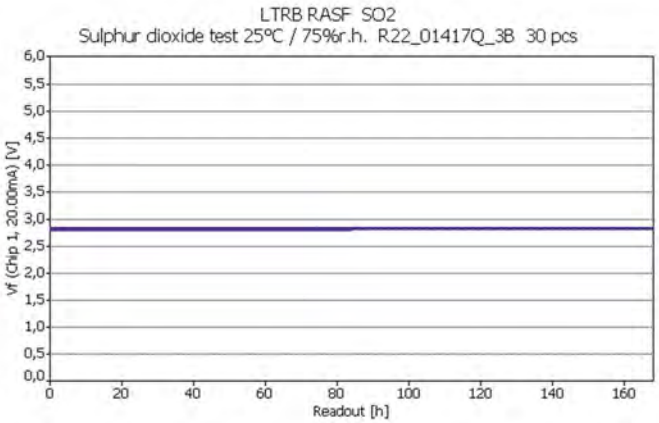


SO_2 25°C/75% r.H.

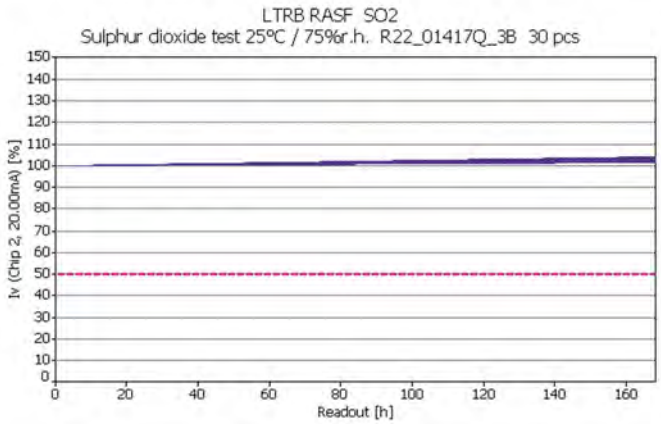
Lot B - Eval

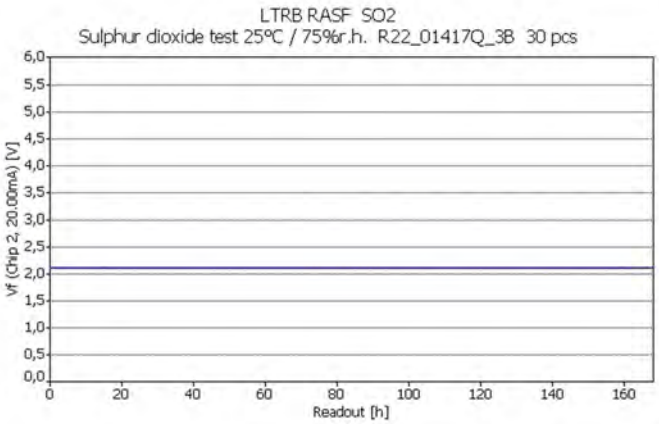
Blue chip



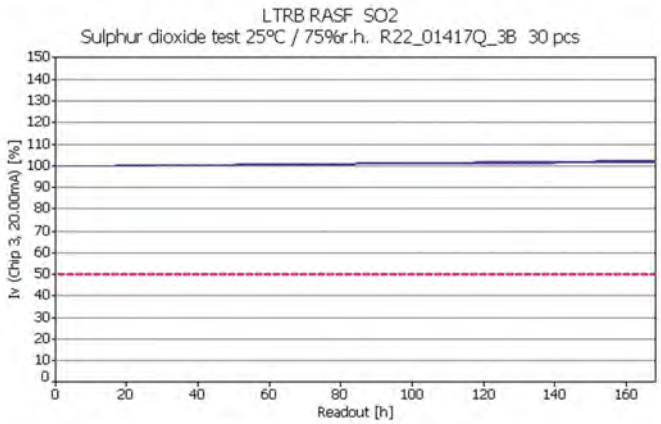


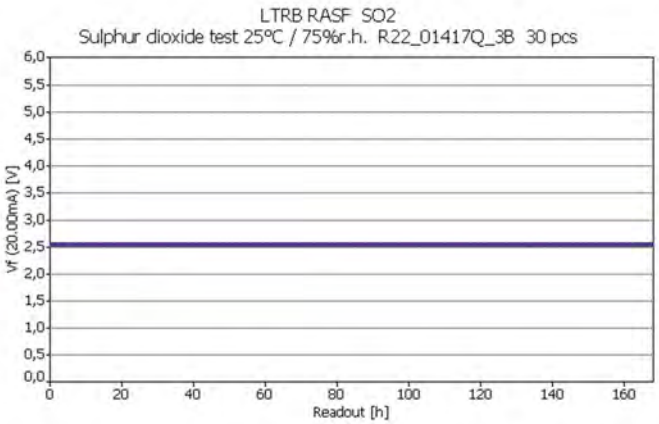
Red chip





True green chip

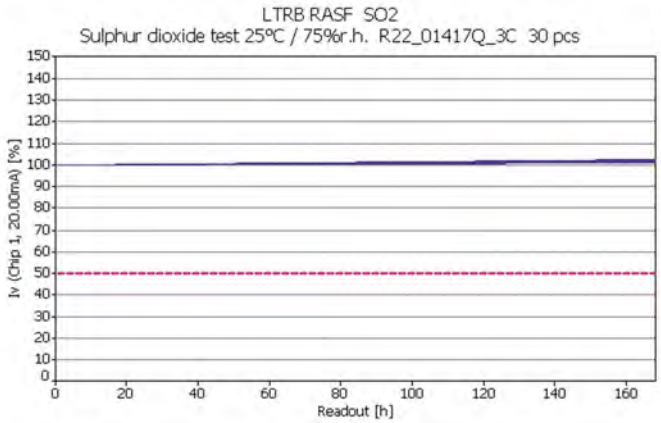


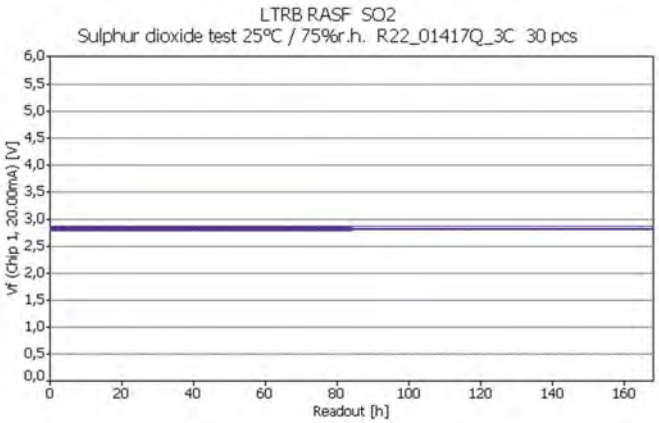


SO_2 25°C/75% r.H.

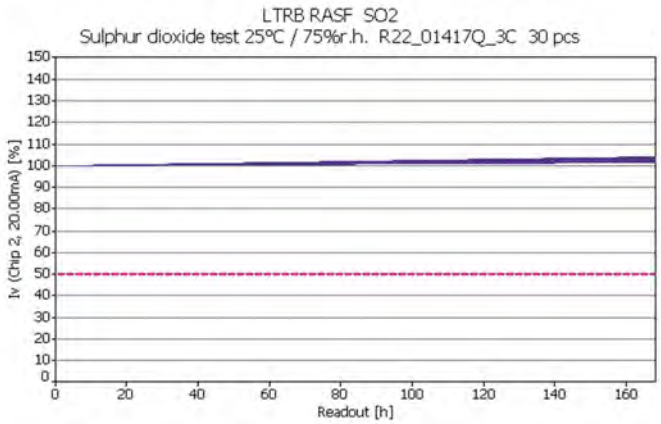
Lot C - Eval

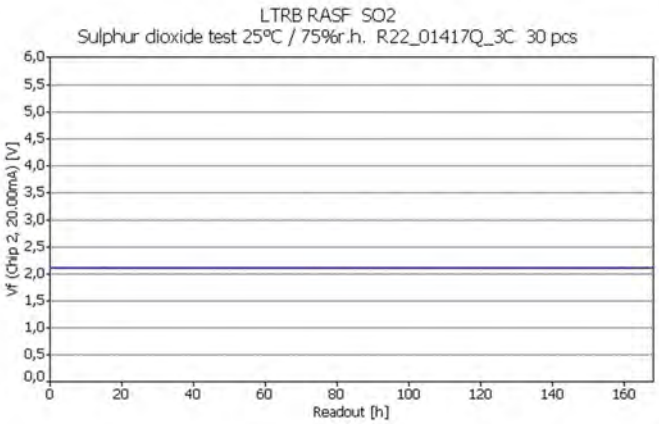
Blue chip



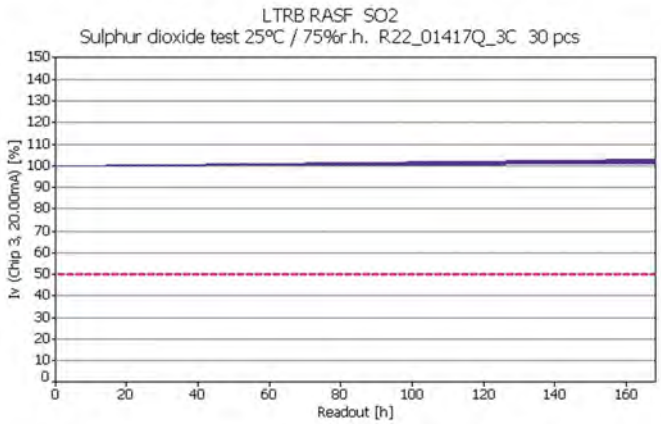


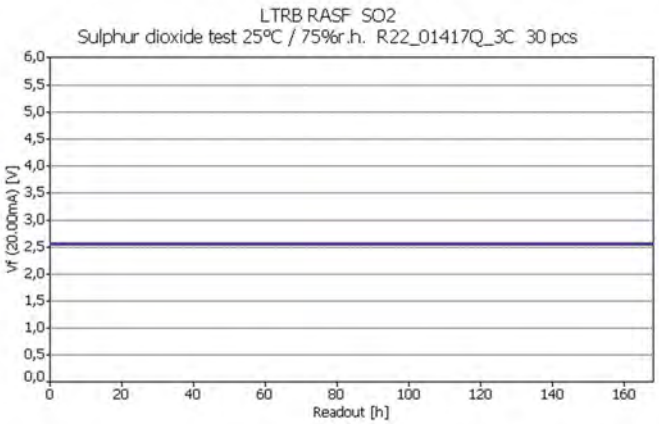
Red chip





True green chip

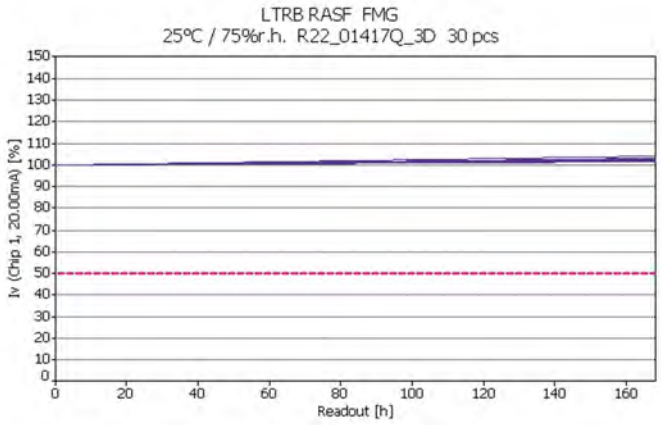


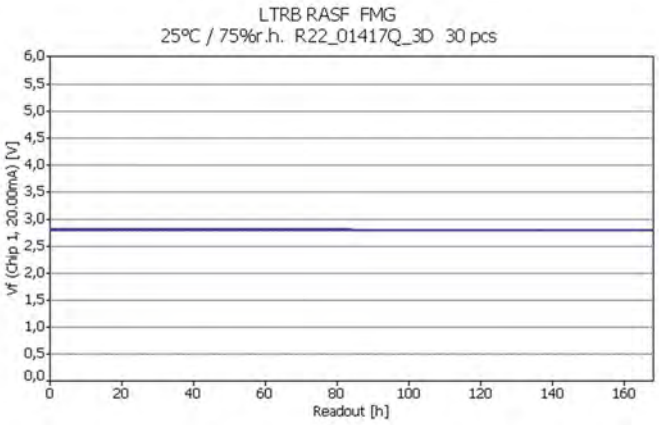


SO_2 25°C/75% r.H.

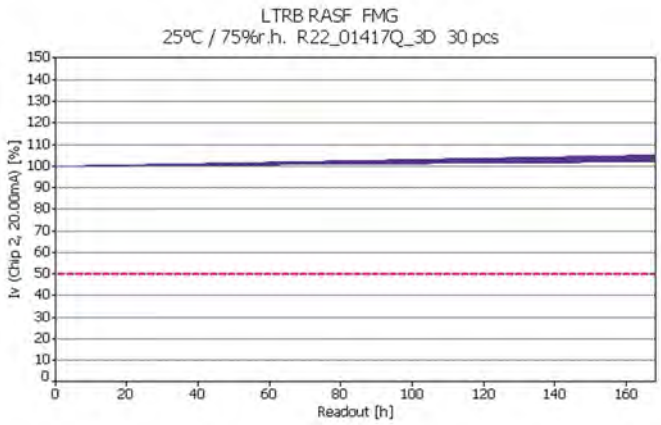
Lot D - Control

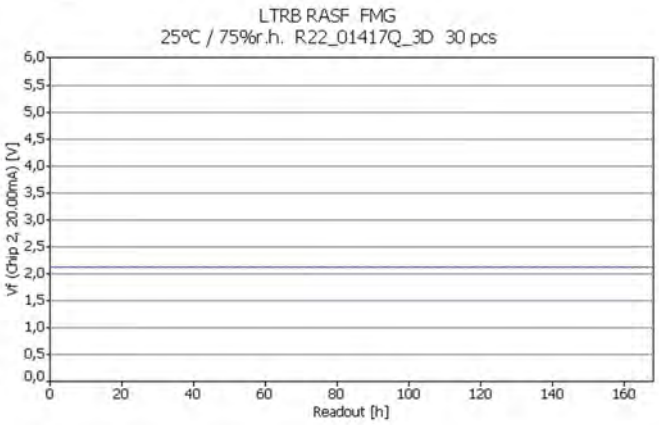
Blue chip



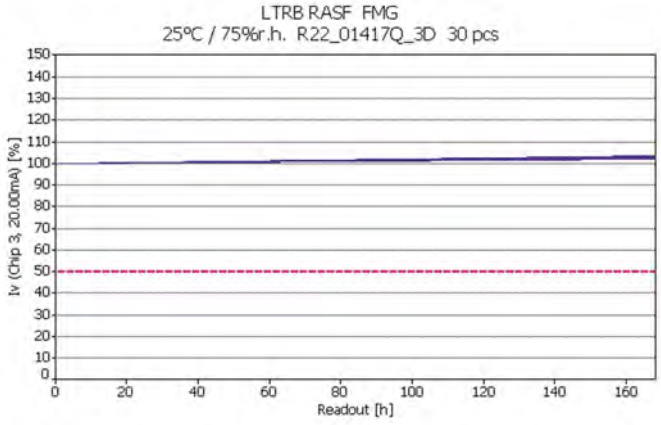


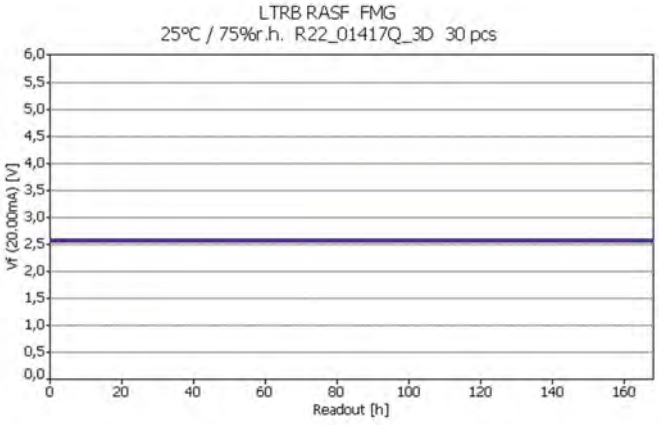
Red chip





True green chip

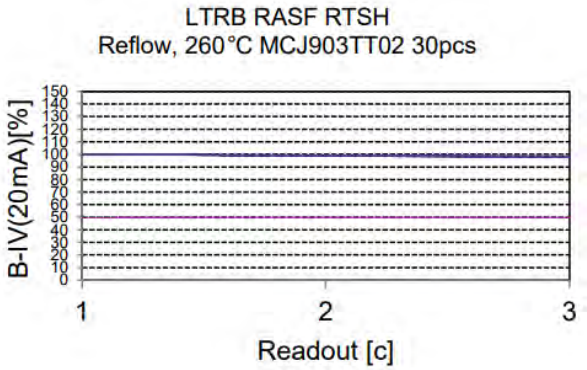


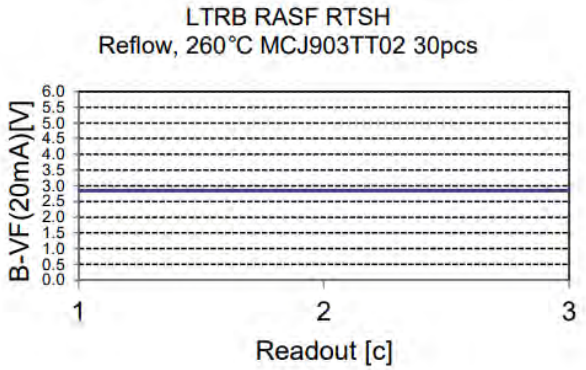


RSH Resistance to Solder Heat

Lot A - Eval

Blue chip





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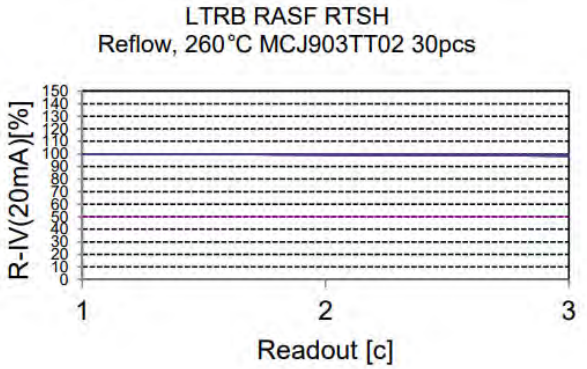
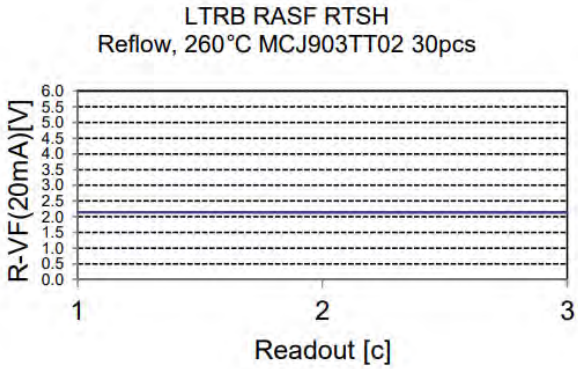
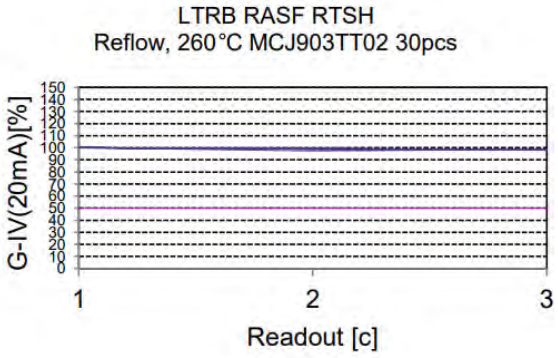
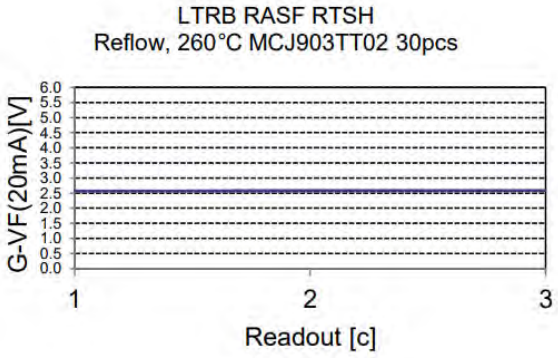




True green chip

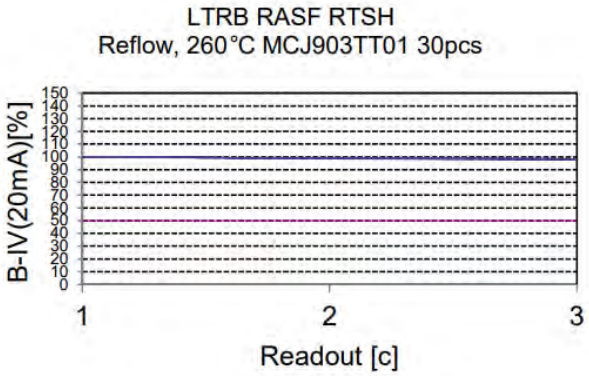


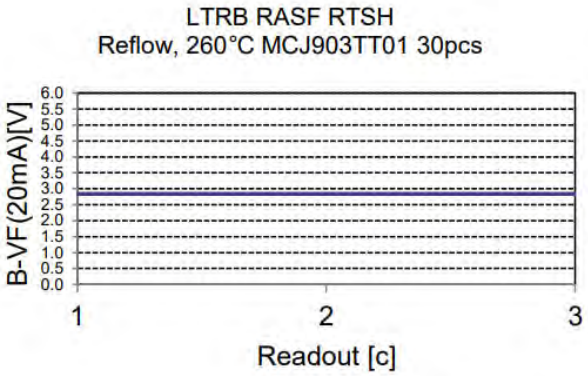


RSH Resistance to Solder Heat

Lot B - Eval

Blue chip





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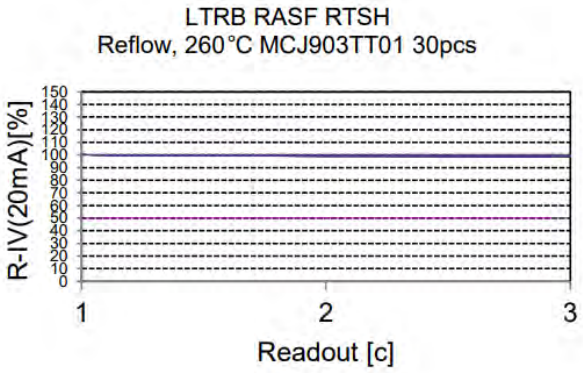
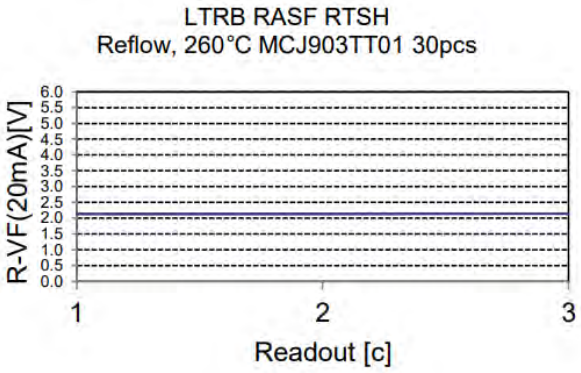
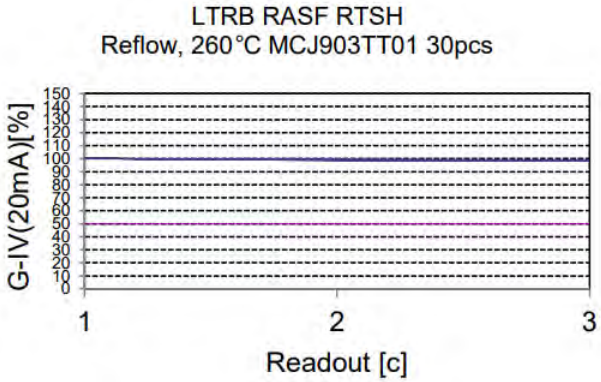
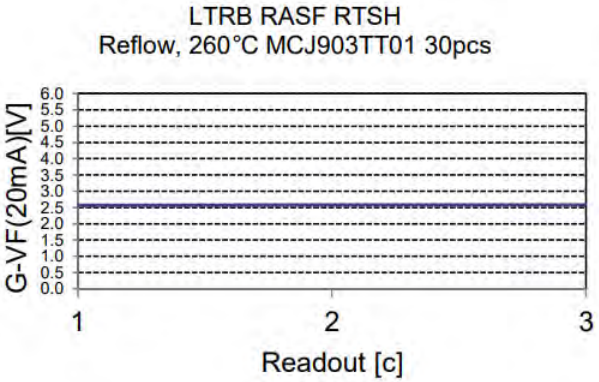




True green chip

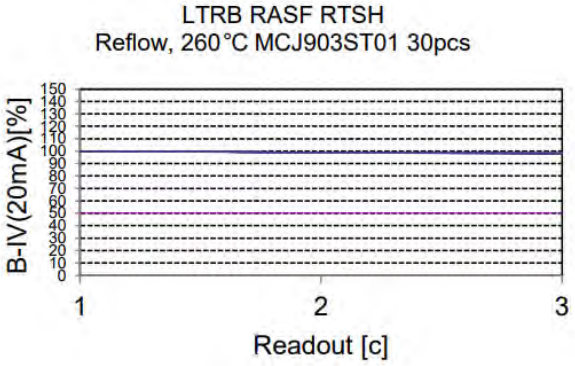


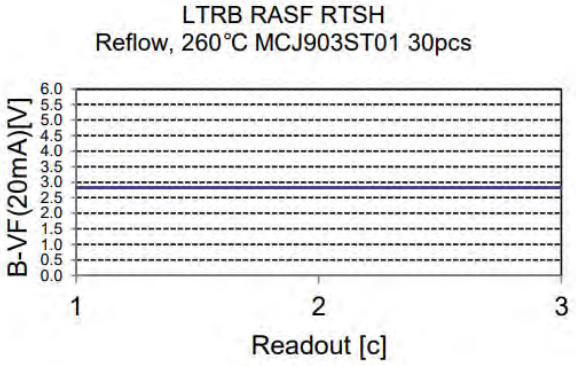


RSH Resistance to Solder Heat

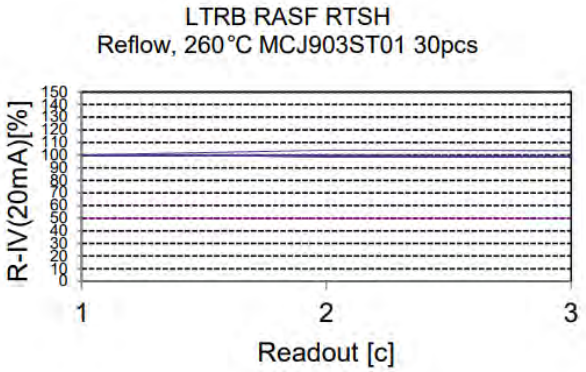
Lot C - Eval

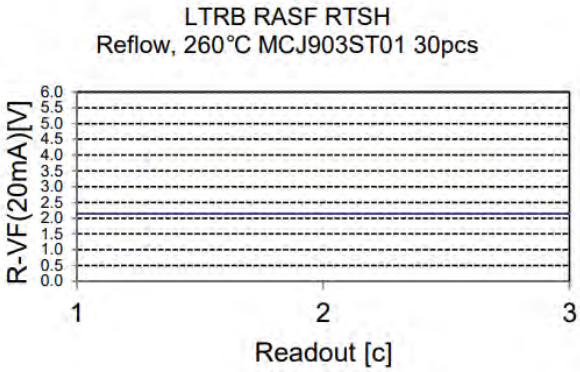
Blue chip



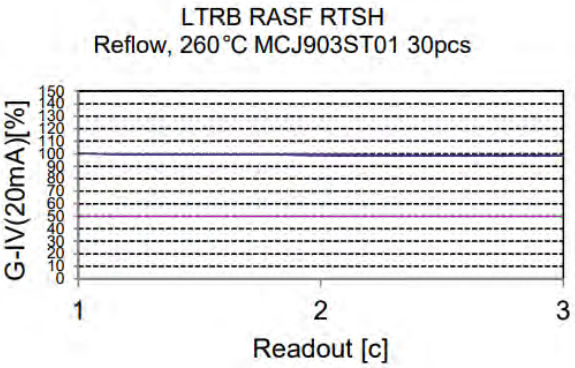


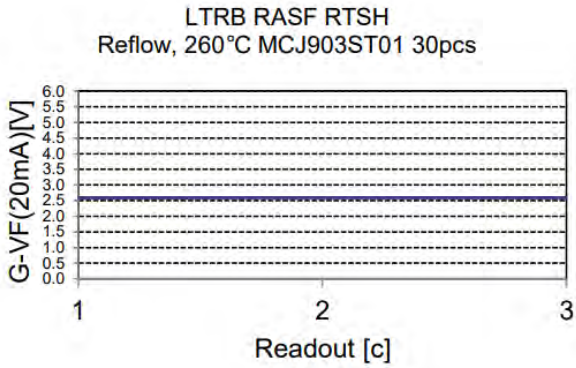
Red chip





True green chip

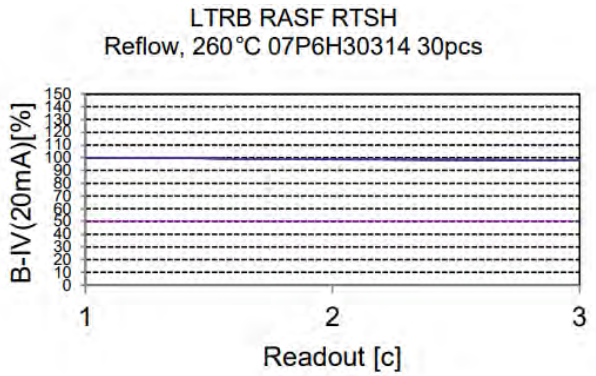


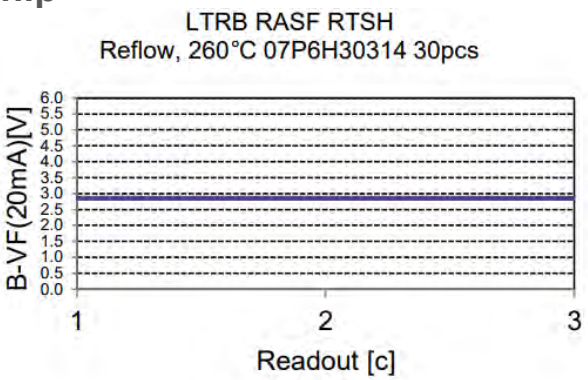


RSH Resistance to Solder Heat

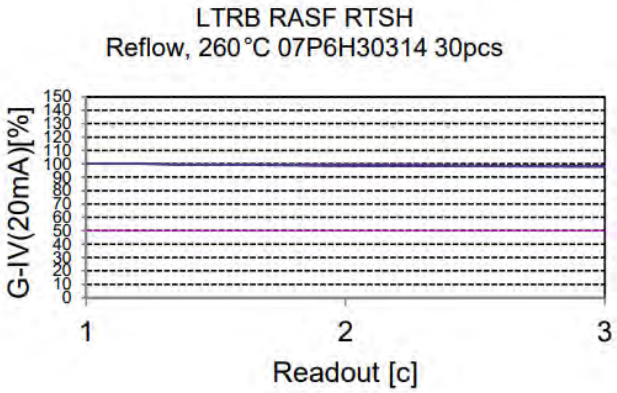
Lot D - Control

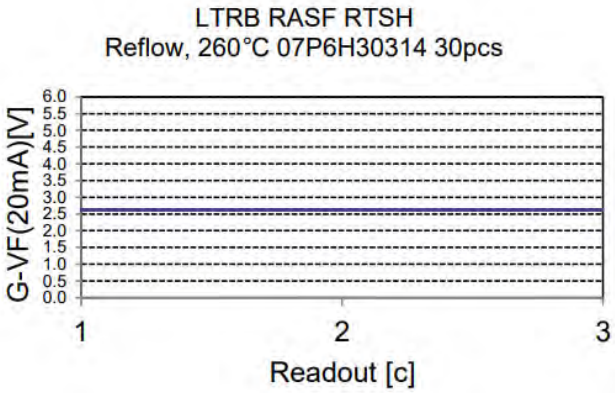
Blue chip



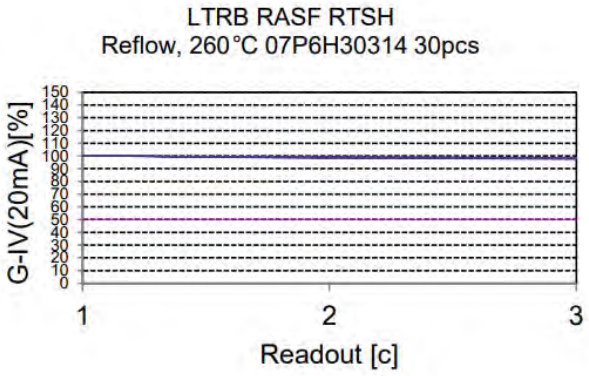


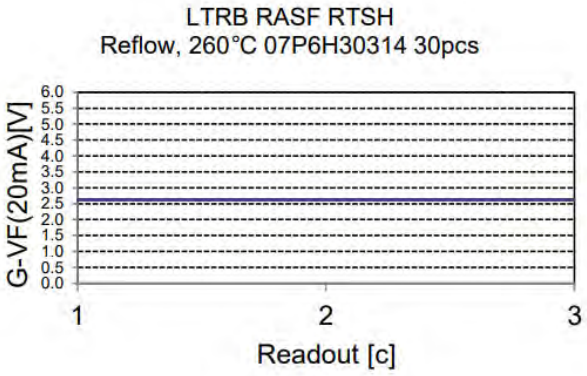
Red chip





True green chip

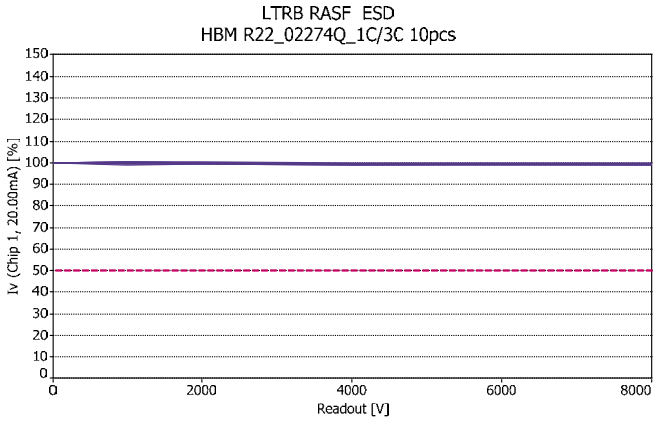


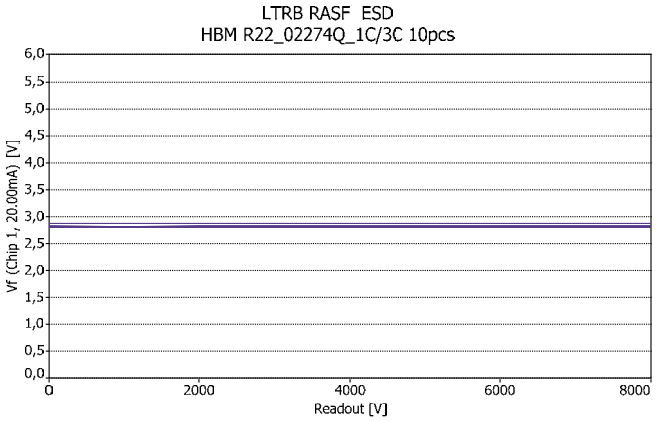


ESD HBM Human Body Model

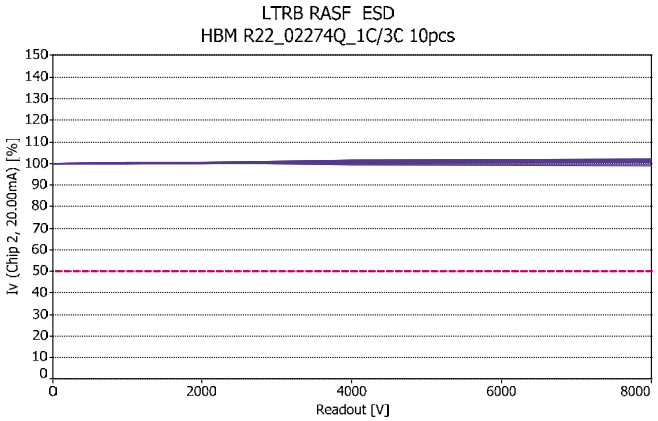
Lot A - Eval

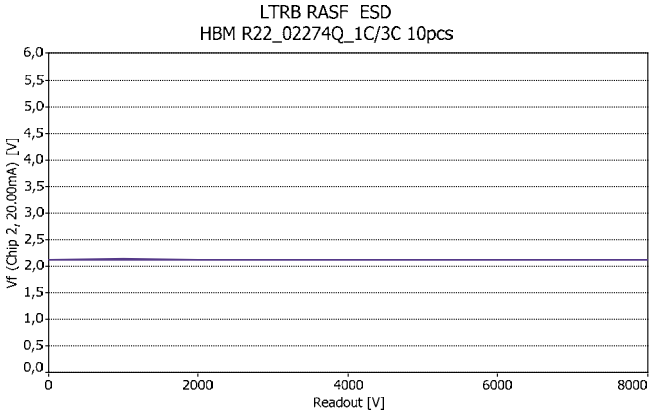
Blue chip



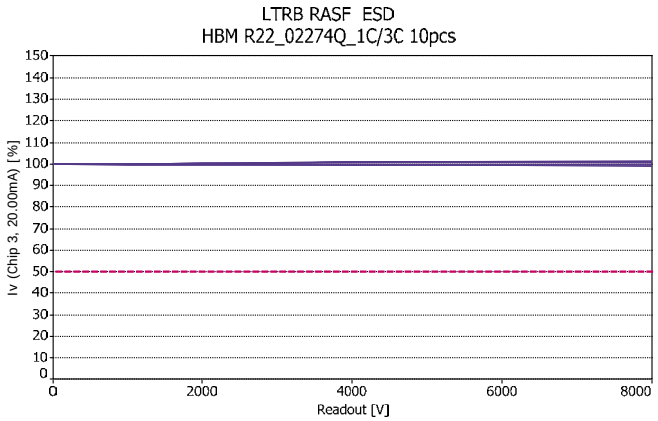


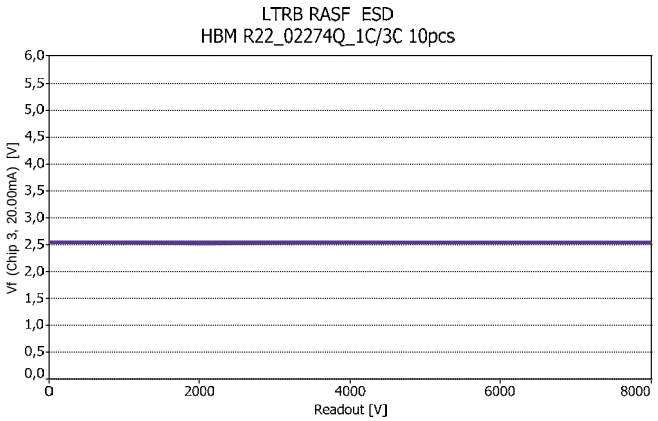
Red chip





True green chip

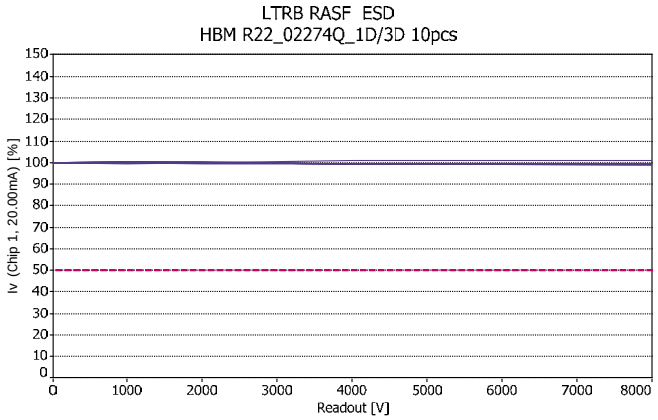


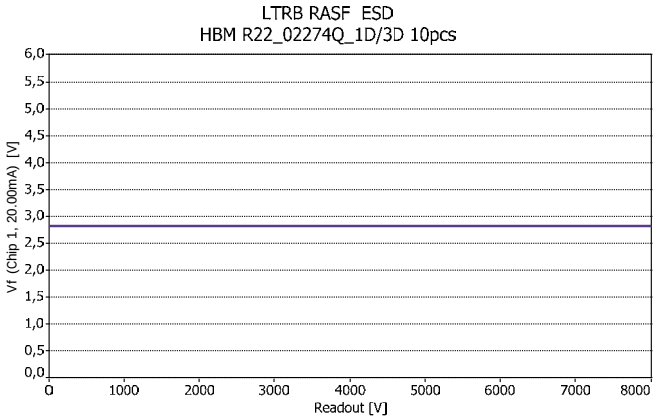


ESD HBM Human Body Model

Lot B - Eval

Blue chip





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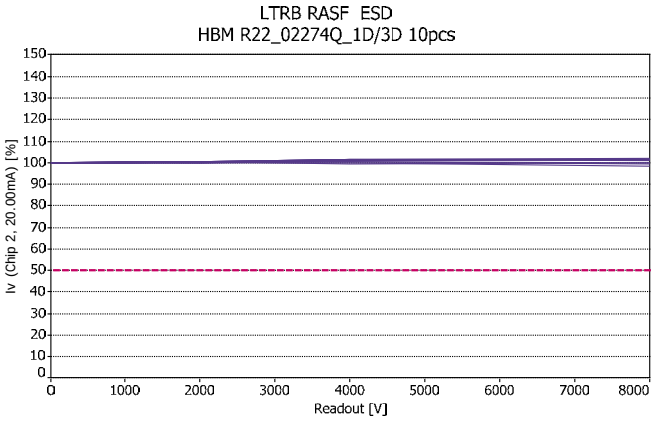
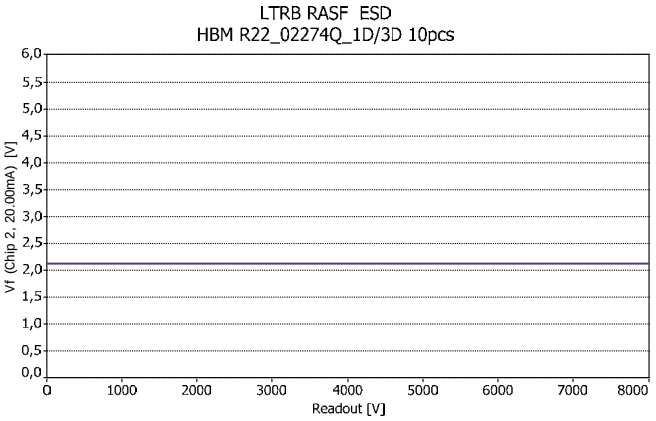
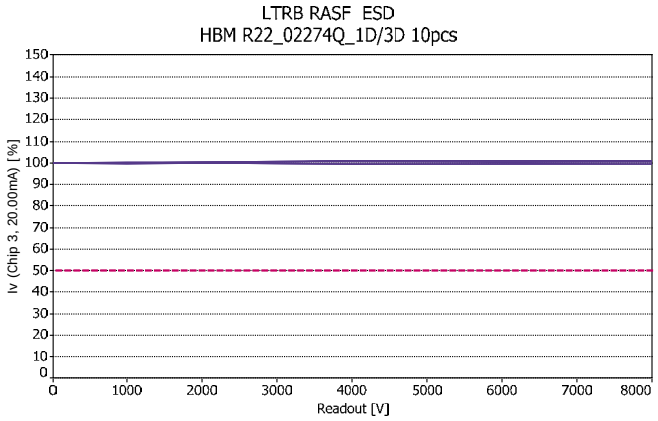
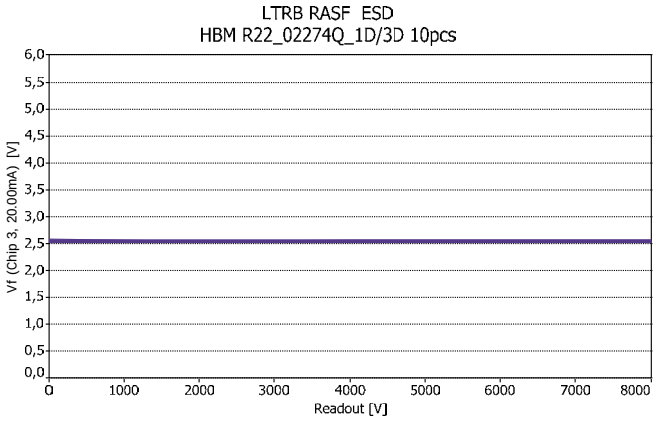




True green chip

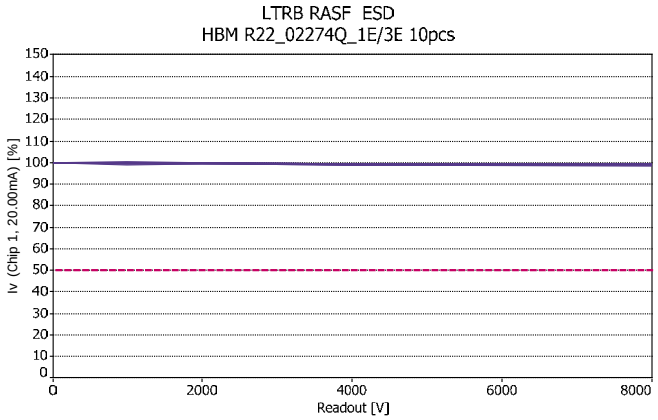


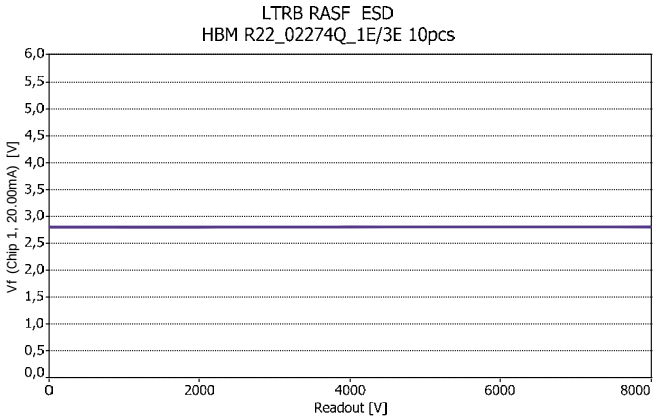


ESD HBM Human Body Model

Lot C - Eval

Blue chip





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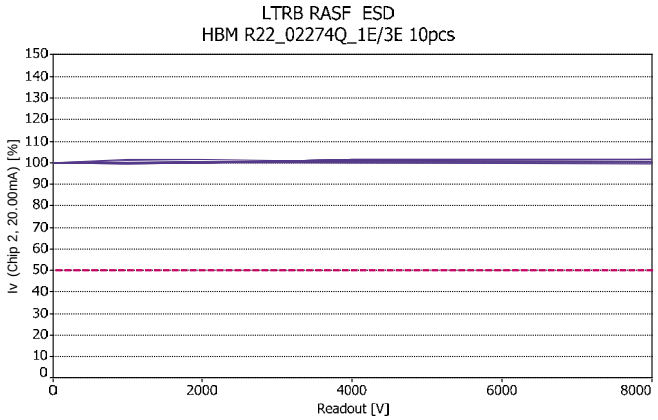
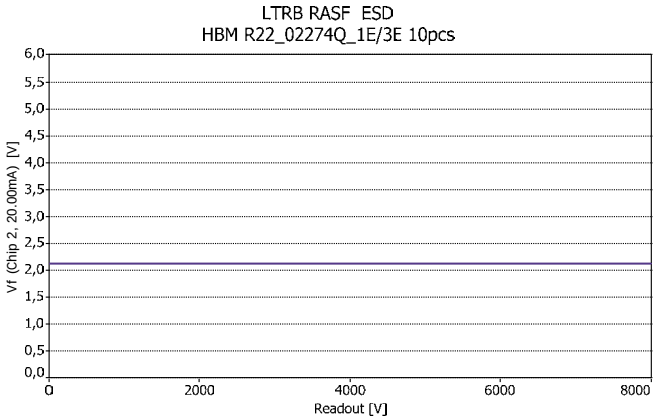
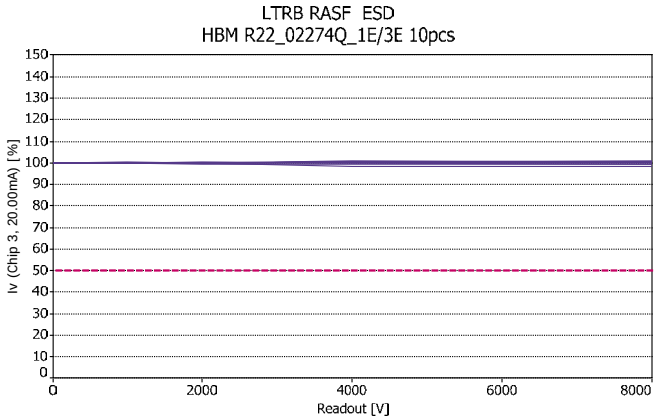
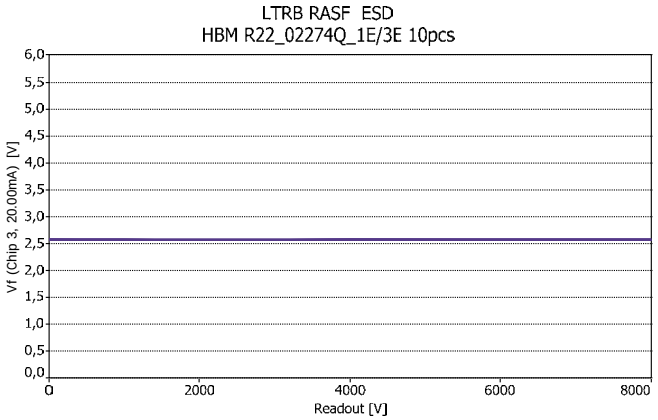




True green chip

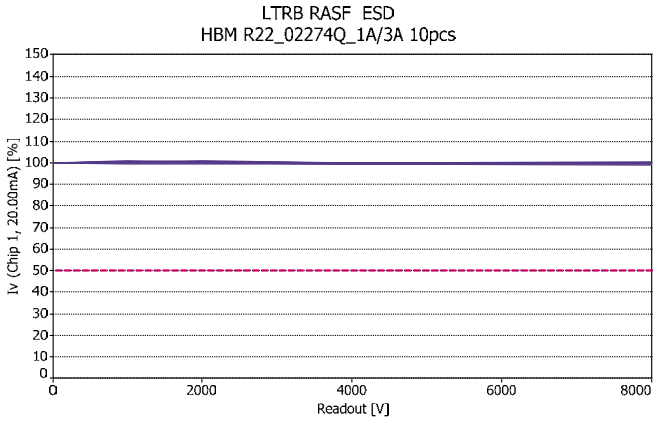


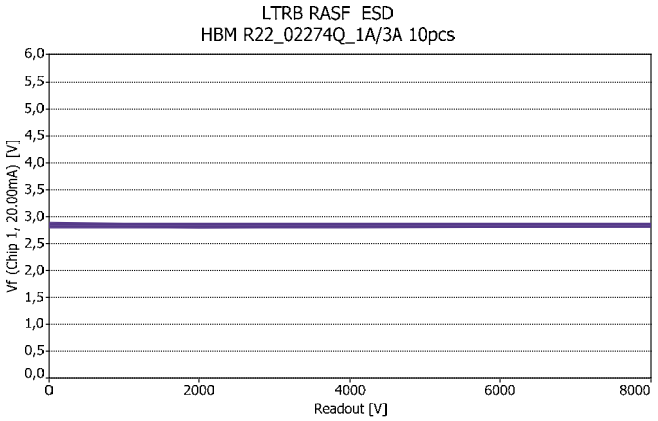


ESD HBM Human Body Model

Lot D - Control

Blue chip





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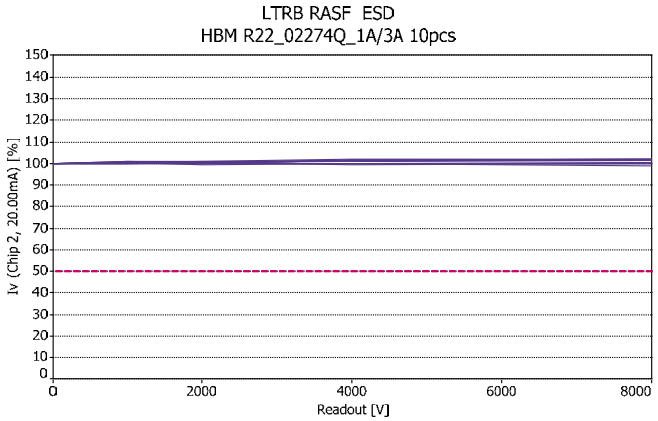
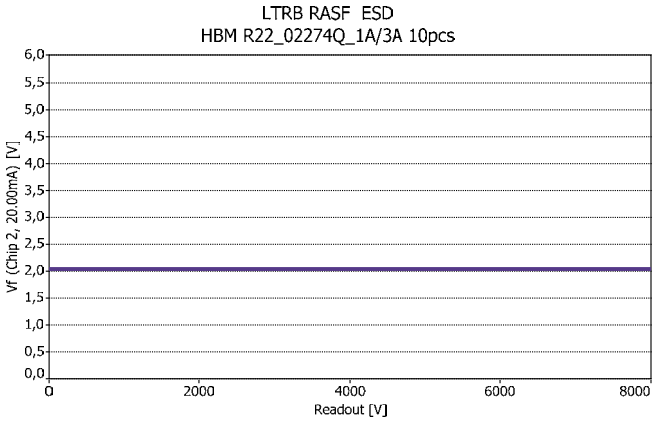
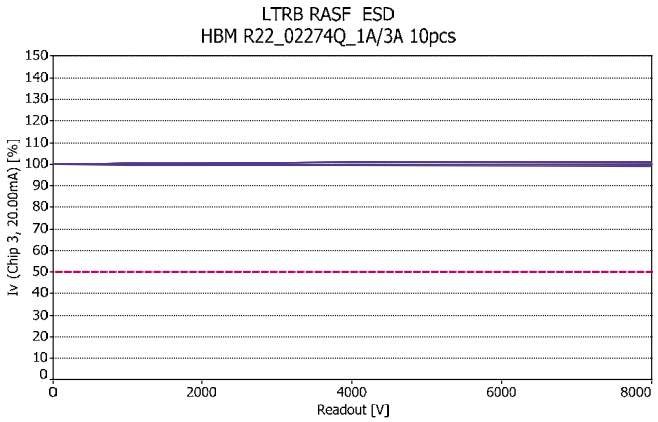
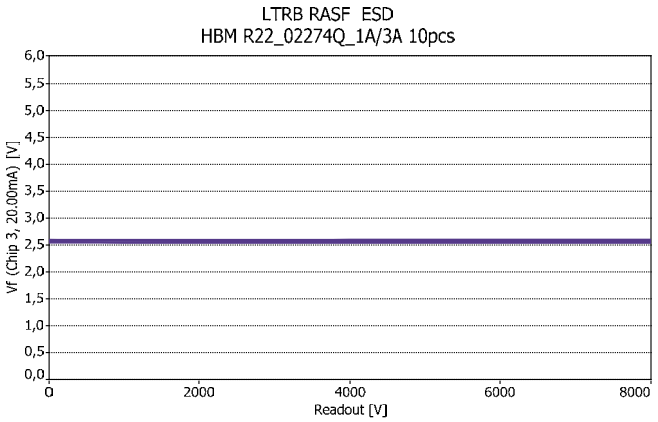




True green chip





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