


PRODUCT / PROCESS CHANGE NOTIFICATION

1. PCN basic data

| | | |
|----------------------|---|--------------------------------------|
| 1.1 Company |  | STMicroelectronics International N.V |
| 1.2 PCN No. | IPG/14/9008 | |
| 1.3 Title of PCN | Linear Voltage Regulator and Reference BU: New Enhanced TO220 Single Gauge Frame | |
| 1.4 Product Category | Linear Voltage Regulator | |
| 1.5 Issue date | 2014-12-11 | |

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 | Lorenzo NASO |
| 2.1.2 Marketing Manager | Antonio RIVIERA |
| 2.1.3 Quality Manager | Paolo MORETTI |

3. Change

| | | |
|--------------|---|----------------------------|
| 3.1 Category | 3.2 Type of change | 3.3 Manufacturing Location |
| Materials | New direct material part number (same supplier, different supplier or new supplier), lead frame, resin, wire, ...) | Shenzhen |

4. Description of change

| | | |
|---|---------------------------------|--|
| | Old | New |
| 4.1 Description | TO220 Single Gauge Frame vers.2 | Following Divisional Commitments towards a continuous improvement philosophy an enhanced frame has been introduced for the TO220 Single Gauge Frame package vers. 3. Some mechanical parameters related to the frame have been changed compared to the version currently in production. The changes are related to the back Holes of the frame, Grooves and Downset characteristics (see attached slide for better understanding). |
| 4.2 Anticipated Impact on form,fit, function, quality, reliability or processability? | no impact | |

5. Reason / motivation for change

| | |
|----------------------|--|
| 5.1 Motivation | To optimize the overall package robustness and in particular to improve the crimping resin / frame |
| 5.2 Customer Benefit | QUALITY IMPROVEMENT |

6. Marking of parts / traceability of change

| | |
|-----------------|--|
| 6.1 Description | Adding "3" at the end of first row marking.. See attached examples This special marking will be valid for 6months only during the transition time. Once the production will be 100% switched to the new frame version (ver3) the marking will come back to the STD one. |
|-----------------|--|

7. Timing / schedule

| | |
|-------------------------------------|--------------|
| 7.1 Date of qualification results | 2014-11-20 |
| 7.2 Intended start of delivery | 2015-03-12 |
| 7.3 Qualification sample available? | Upon Request |

| 8. Qualification / Validation | | | |
|--|--------------------------------|------------|------------|
| 8.1 Description | REL 6088-306-W-14_TO220 SG.pdf | | |
| 8.2 Qualification report and qualification results | Available (see attachment) | Issue Date | 2014-12-11 |

| 9. Attachments (additional documentations) | | | |
|--|--|--|--|
| 9008PpPrdtLst.pdf REL 6088-306-W-14_TO220 SG.pdf TO220 Single Gauge ver3.pdf | | | |

| 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 |
| L7805ABV | L7805ABV | |
| L7805ACV | L7805ACV | |
| L7805CV | L7805CV | |
| L7808ABV | L7808ABV | |
| L7808ACV | L7808ACV | |
| L7808CV | L7808CV | |
| L7809ABV | L7809ABV | |
| L7809CV | L7809CV | |
| L7812ABV | L7812ABV | |
| L7812ACV | L7812ACV | |
| L7812CV | L7812CV | |
| L7815ABV | L7815ABV | |
| L7815ACV | L7815ACV | |
| L7815CV | L7815CV | |
| L7818CV | L7818CV | |
| L7824ABV | L7824ABV | |
| L7824ACV | L7824ACV | |
| L7824CV | L7824CV | |
| L78M05CV | L78M05CV | |
| L78M09CV | L78M09CV | |
| L78M12CV | L78M12CV | |
| L78M15ABV | L78M15ABV | |
| L78M15CV | L78M15CV | |
| L78M24CV | L78M24CV | |
| L78S05CV | L78S05CV | |
| L78S10CV | L78S10CV | |
| L78S12CV | L78S12CV | |
| L78S15CV | L78S15CV | |
| L78S24CV | L78S24CV | |
| L78S75CV | L78S75CV | |
| L7905ACV | L7905ACV | |
| L7905CV | L7905CV | |
| L7912ACV | L7912ACV | |
| L7912CV | L7912CV | |
| L7915ACV | L7915ACV | |
| L7915CV | L7915CV | |
| LD1117AV33 | LD1117AV33 | |
| LD1117V | LD1117V | |
| LD1117V18 | LD1117V18 | |

| | | |
|------------|------------|--|
| LD1117V33 | LD1117V33 | |
| LD1117V33C | LD1117V33C | |
| LD1117V50 | LD1117V50 | |
| | LD1117V50C | |
| LF33ABV | LF33ABV | |
| LF33CV | LF33CV | |
| LF50ABV | LF50ABV | |
| LF50CV | LF50CV | |
| LF60ABV | LF60ABV | |
| LF60CV | LF60CV | |
| LF90CV | LF90CV | |

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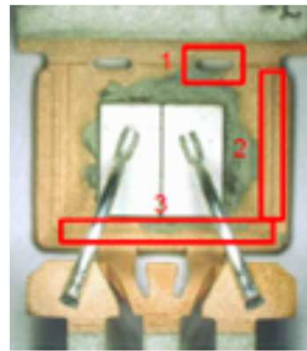
PACKAGE ROBUSTNESS

With the aim to improve the Package Robustness, **in particular the crimping resin/frame**, we changed some mechanical parameter related to the frame. In particular we worked on the Holes, Grooves and Downset characteristics implementing:

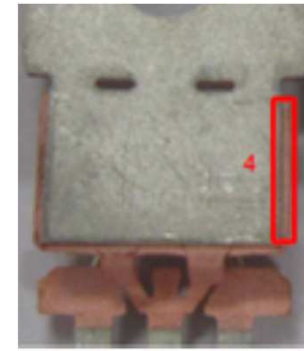
- ❖ **Larger Ovoid Holes (1)**
- ❖ **Deeper Grooves (2)**
- ❖ **Deeper Downset (3)**



(1)

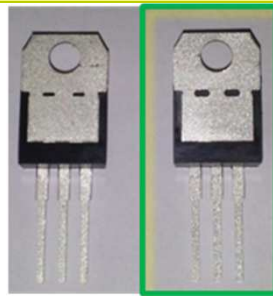


(2)

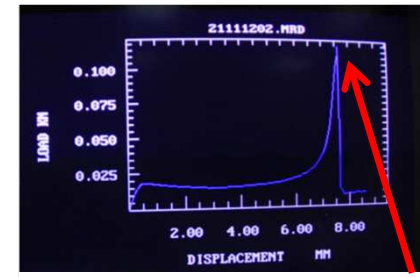


(3)

In order to verify the effectiveness of the above changes we performed, in collaboration with the CCR (Research Center at the Catania University), the **Body Crack Test**. According to the test results we found out a significant improvement vs the first version **(60N vs. 28N)**



First and Last Version



Max Load=60N

| PART NUMBER | STD MARKING | TEMPORARY MARKING |
|-------------|-------------|-------------------|
|-------------|-------------|-------------------|

| | | |
|-----------|-----------|------------|
| L7805CV | L7805CV | L7805CV3 |
| L7805ABV | L7805ABV | L7805ABV3 |
| L7905CV | L7905CV | L7905CV3 |
| LF50ABV | LF50ABV | LF50ABV3 |
| L78M05ABV | L78M05ABV | L78M05ABV3 |