Now TPS65177 is used as LCD bias in customer’s project.

In the test, when they increase the input voltage from 12V to 14V, 100mV step. They find that the input current will not decease monotonously, while the RT part will keep deceasing monotonously. Please see below test data.

I know the assumption of above conclusion is that the conversion efficiency should be the same for all power rails at different input voltage. So I think maybe this phenomenon is caused by that reason—efficiency of different power rails will change with the changing of Vin. And power rails may work in different mode, such as DCM or CCM.

I have also asked customer to test the SW and Vout waveform at different Vin to make sure the power rails could work well.

I think this may be not a issue, but the customer need an explanation about this.

Could you please give some suggestion?

Thank you.

|  |  |  |
| --- | --- | --- |
|  | Data for old version | Data for new version |
| Vin | 11.829 | 11.897 |
| Dvdd | 3.3097 | 3.3157 |
| Vcore | 1.3112 | 1.3057 |
| Vavdd | 17.579 | 16.193 |
| Vhavdd | 8.806 | 7.687 |
| Vgh | 30.185 | 29.890 |
| Vgl | 7.935 | 5.491 |

The comparison sheet for new version (AVDD 16.2V) and old version (AVDD 17.5)

|  |  |  |
| --- | --- | --- |
| Input voltage mV | Current/mA（New） | Current/mA（Old） |
| 12000 | 670 | 655.5 |
| 12100 | 667 | 651.7 |
| 12200 | 664.6 | 648.5 |
| 12300 | 663 | 645.8 |
| 12400 | 662.6 | 643.2 |
| 12500 | 659.2 | 640.9 |
| 12600 | 658.5 | 638.4 |
| 12700 | 657.3 | 636.1 |
| 12800 | 656.3 | 634.1 |
| 12900 | 657.4 | 632.4 |
| 13000 | 657.3 | 631.1 |
| 13100 | 659.7 | 629.5 |
| 13200 | 661.3 | 628.5 |
| 13300 | 665 | 627.2 |
| 13400 | 677.3 | 625.8 |
| 13500 | 668.5 | 625.0 |
| 13600 | 669.8 | 624.5 |
| 13700 | 667.3 | 623.8 |
| 13700 | 667.3 | 623.6 |
| 13900 | 662.8 | 624 |
| 14000 |  | 624.35 |