DEVELOPMENT OF ASSEMBLY CHECK FOR TL431A

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ABSTRACT

This project aims to move parametric tests from Final Test (FT) to Probe where equipment is cheaper, and inherently better utilized. This project named 'Assembly Check'. Assembly quality will still be guaranteed via an electrical check during unit transfer to Tape & Reel, and common per-package setups. The impacts of this project are the efficiency and overall test cost. This project will drive maximum probe coverage and minimum final test coverage (open, short, leakage and critical parametric tests). The TL431A was chosen since this device has qualified all of criteria set up by AEO (Analog Engineering Operations) and TT-PEG (Test Technology Product Engineering Group) organization.

The TL431A is a three-terminal adjustable shunt regulator, with specified thermal stability over applicable automotive, commercial, and military temperature ranges. The output voltage can be set to any value between Vref (approximately 2.5 V) and 36 V, with two external resistors. These devices have a typical output impedance of 0.2 Ω. Active output circuitry provides a very sharp turn-on characteristic, making these devices excellent replacements for zener diodes in many applications, such as onboard regulation, adjustable power supplies, and switching power supplies [1].

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Final Test is expensive due to poor equipment utilization by many, low volume products, tested on expensive testers and handlers. Assembly Check will move almost all test of Final Test to Probe where the equipment is cheaper, clean, and inherently better utilized. Costs reduction is the key and Assembly Check will still be guaranteed via an electrical check during the device transfers to Tape and Reel.

TL431A was chosen as Pilot device because this device has high customer demand and fully trimming at Probe. With 100% of test coverage at Final Test and 60% at Probe there are some tests perform twice and this will lead to high test costs. To eliminate from performing the tests twice and overlap, Probe and Final Test coverage compared apple to apple and decided to move 5 tests from Final Test to Probe.

The tests that will integrate are Minimum Cathode Current (IK_Min), Cathode Current at 1.35V (IK_1.35V), Regulation to Maximum (Reg_Max), Voltage Cathode to Anode at 36V (VKA_36V) and Voltage Cathode to Anode at 10mA (VKA_10mA). In mean time, Fuse Trimming at Vref needs to be fixing since it affected the Final Test yield.