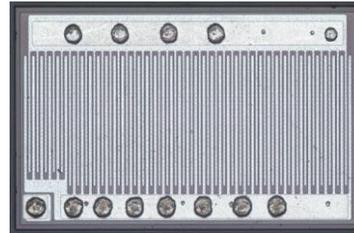


## GaN FET (900V): Power Integrations INN3690C Structure Analysis Report



Package



GaN FET die

### Overview

Until now, the applicable voltage range for compound power devices has been divided into the 650 V or higher range for SiC power devices and the 650 V or lower range for GaN power devices (horizontal type). However, recently, high-voltage (650V or higher) and high-power GaN power devices are also becoming available .

The InoSwitch3 family of switching power supply ICs released by Power Integrations, Inc., integrates primary, secondary, and feedback circuits.

The primary switch uses gallium nitride (GaN) technology called PowiGaN:INN3690C uses a GaN die with 900V breakdown voltage. This report provides the planar layout, cross-sectional structural analysis, and electrical characteristics analysis of the module and GaN die.

### Product features

- Product number : INN3690C (InooSwitch3-EP family)  $V_{ds}= 900V$   $R_{on}=0.29\Omega$
- Release date : May 2023
- Normally-on GaN FET
- Application

Auxiliary, standby, and bias power supplies for appliances, computers, and consumer product

### Report Contents (73 pages)

- GaN Epi layer on sapphire substrate
- Multiple layers of gate insulating film between Gate electrode and AlGaN layer
- Source-Drain pitch reduced by about 30% compared to the company's GaN (SC1993C released in 2016:  $V_{ds}= 650V$ )

### Report price

**Delivered one week after order placement.**

**Please contact us for report pricing.**

## TABLE OF CONTENTS

		Page
1	Device summary	
	Table1: Device summary	... 3
2	Analysis result summary	... 4
	Table2-1:GaN FET Structure	... 5
	Table2-2:GaN FE material, layer thickness	... 6
3	Package Analysis	... 8
4	Plane view analysis	
4-1	Plane view analysis (Optical microscope)	... 12
4-2	Plane view analysis (SEM)	... 28
5	Cross section analysis	
5-1	Cross-sectional machining location	... 32
5-2	Cross-sectional observation of element	... 33
5-3	Cross-sectional observation of die periphery	... 40
6	Cross-sectional TEM structural analysis	... 44
7	TEM-EDX analysis	... 52
8	Electrical Characteristics Analysis	... 67
9	Appendix	... 72