NEW RELEASE

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GaN(650V): GaN Transistors Manufacturing Cost Analysis

Report Overview

GaN-based power devices are attracting significant attention in applications such as AC adapters, power supplies, BLDC motor drivers, and AI power supplies because they can operate at much higher frequencies than SiC MOSFETs. Furthermore, new GaN Bidirectional Switches (BDS) enable new circuit topologies, and are considered for applications in xEVs (OBCs, matrix converters, etc.).

For over 10 years, LTEC has accumulated data on high-voltage GaN transistor technologies. Now, leveraging these data, LTEC is releasing a report on the current technological trends and manufacturing costs of mainstream GaN-on-Si transistors exceeding 650V.

Investigated GaN Products

The manufacturing cost analysis is based on the structural and process analysis of the following GaN products,

1. INFINEON 650V GaN G5 (INFINEON Villach, Austria: 200mm→300mm)
2. NAVITAS/Cambridge GaN Devices GaN IC (TSMC Foundry)
3. INNOSCIENCE 650V GaN (China naufacturer)

Analysis details and report price

Refer to the next page for details of the report's contents

- Comparison of the Average Selling Price (ASP) trend and the cost/price and die area/Ron of power transistors. Is there a cost advantage at the system level?
- Trends in the specific On-Resistance (RonA) Performance Index: GaN vs. SiC
- On the area scaling limit of lateral (horizontal) GaN transistors
- Cost/price trend survey of GaN-on-Si (Sapphire) wafers
- Cost analysis of processed wafers based on manufacturing process flow extraction
- What is the impact (percentage) of GaN wafer costs?
- GaN device cost and price per die area?
- Cost estimate of Foundry manufactured GaN device wafer.

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2-3: Comparison of 650V Power Transistors

	Si- SJMOS	GaN-on-Si	SiC MOSFET
Vdss [V]	650	650	650
Technology Generation	CM8 (Infineon)	G5 (Infineon)	Gen 2 (Infineon)
RonAA [mΩ・mm2]	~500	~250	~135
Max Current density, Id/AA [A/mm2]	4.5	7.1	17
Ron・Qg [mΩ・nC]	2449	252	1120
Ron・Qgd [mΩ・nC]	868	140	212
ASP/Chip Area [$/mm2]			
Price for Ron=100mΩ			

※ Estimated

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Excerpt from the GaN transistor manufacturing cost analysis report.

1.1 Executive summary

The latest generation (2022-2025) of commercial (GaN-on-Si Substrate) 650V GaN FETs were evaluated and compared using correlation between structural/material physics analysis and electrical characteristics, and survey of GaN wafer price/cost. Three leading GaN manufacturers/vendors are considered:

- INFINEON GaN G5 process
- NAVITAS GaN (Manufactured by TSMC)
- INNOSCIENCE GaN (Manufactured in China).

1) A clear ASP (Average Selling Price) decreasing trend is observed. From 2022 to 2025, the per die area ASP has dropped from $/mm2 (2022) to
e of ~500,000$/m2 !
ufacturing yield), (ii) awareness of GaN and
ns (AI power supplies, EVs OBC, tec.)

2) T ITAS) reduce the FOM of RonxA to about

3) S , the better, GaN transistors have a clear

4) T substrates currently used are (a) GaN-on-Si

5) T

6) C urveyed to be $' (China)-$

7) T sed mass production and sales, (ii) cheaper

4.5 Cost Analysis Summary of 600-650V GaN-on-Si FET/IC Manufacturing Process

Table 2: Processed Wafer Cost (PWC) estimate 2026

#			INFINEON IGLR65R140D2	INFINEON IGLT65R055B2	NAVITAS (TSMC GaN) NV6428	NAVITAS (TSMC GaN) NV6428	INNOSCIENCE INN650TA030AH
1	Process Technology		G5	G5			
2	Total Metal Layers						
3	Manufacturing Fab						
4	Device						
5	Chip Size	mm2					
6	RON	mΩ					
7	Gross Die per wafer						
8	・Wafer Diameter Size	mm					
9	・Raw Wafer Cost	$/waf					
10	・Epi Cost (AlGaN, P-GaN)	$/waf					
11	・Wafer + Epi Cost	$/waf					
12	・Processing Cost	$/waf					
13	・Processed Wafer Cost, PWC	$/waf					
14	◆ Manufacturer's profit	%					
15	・Processed Wafer Price, PWP	$/waf					
16	・Defect Density, Do	def/cm2					
17	・Manufacturing Yield, Y	%					
18	Yielded Dies per Wafer, N						
19	・Yielded Wafer Cost, YWC	$/waf					
20	・Die cost (without final test)	$/die					
21	・Die cost per area	$/mm2					
22							
23	◆ Distributor ASP$/Die Area	$/mm2					

4.3 Analyzed GaN transistor's chips

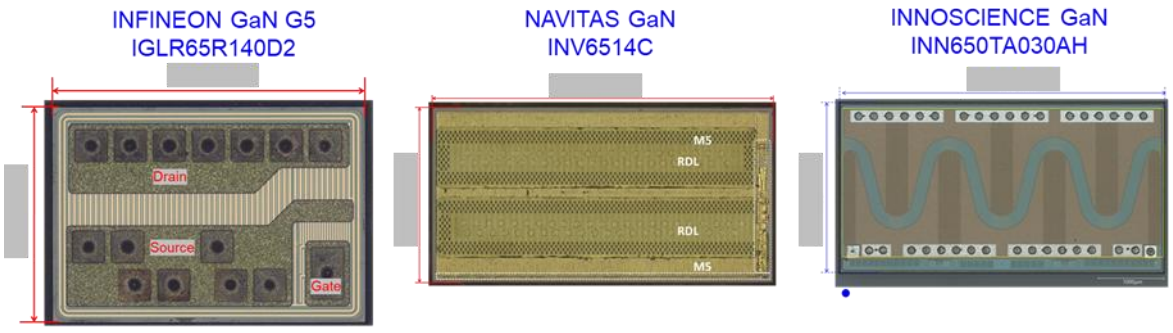

Fig.4-1: GaN transistors Chip

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Excerpt from the GaN transistor manufacturing cost analysis report.

2.2 Companies currently commercializing GaN power transistors

A.O.A. 2026/3

Company		GaN Structure	Remarks
Transphorm/	US	Normally ON→Cascode	・Vdss（600V～900V）
Renesas			★ EPC announces GaN licensing agreement with Renesas (February 11, 2026)
INFINEON			Fab 200mm→300mm)+
STMicro			
NAVITAS			
TI			
ROHM			rietary technology★ ped with ANCONA (Taiwan)（TSMC Fab）
			n in-house production of 650V GaN power
EPC			upplies ment with Renesas (2026, 2月11日)
NEXPERIA			
INNOSCIENCE			NOSCIENCE.
Power Integrations			verter for AC Adapters
SANKEN			high-voltage GaN superjunctions (lateral)
Vanguard Foundry			ement with TSMC (January 29, 2026).
X-Fab Foundry			
TSMC Foundry			) →To withdraw in 2027

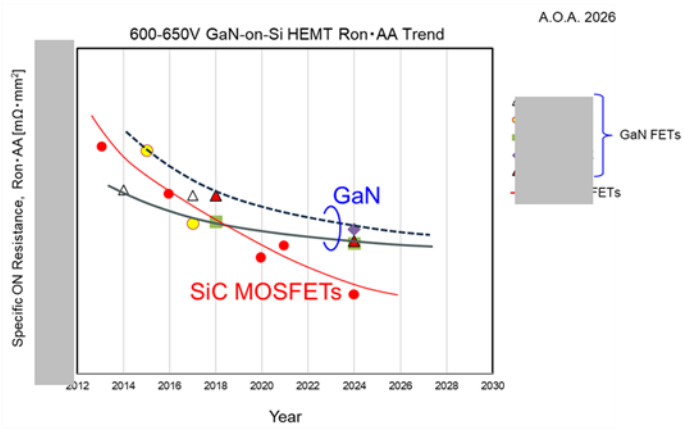

Fig.3-1: 600-650V GaN-on-Si FETs on-resistance (RONxA) figure of merit (FOM) trends

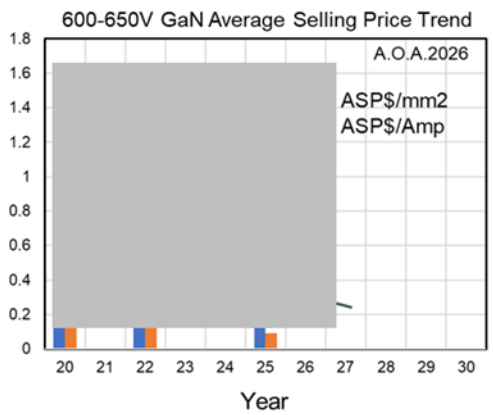

Fig. 2-2: Trends in per area (ASP$/mm2) and per Ampere (ASP$/Amp) average selling prices (ASP) of INFINEON GaN G5 transistors

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