

Reliability Test Report

Product Information

Product Type	650V Cascode GaN (SMD 8x8)
Package Voltage	650V
Report Date	2025/12/20

Product List

No	Part-number	Package Type
1	GR-65J150AK	8080CM
2	GR-65J100AK	8080CM
3	GR-65J075AK	8080CM

Reliability Test Report Content

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2. Reliability test item
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1. Reliability Test Purpose

- ☒ Reliability monitoring test
- ☐ Others_____

2. Reliability Test Item

I. Biased Reliability Test:

- ☒ High temperature gate bias (HTGB)
- ☒ High temperature reverse bias (HTRB)
- ☐ Intermittent Operating Life (IOL)
- ☒ Electrostatic Discharge Test (ESD)

II. Non-Biased Reliability Test :

- ☒ Precondition + MSL3
- ☒ High temperature storage test (HTS)
- ☐ Low temperature storage test (LTS)
- ☒ Unbiased Highly Accelerated Stress Test (UHAST)
- ☒ Temperature cycling test (TCT)
- ☒ Thermal Shock Test (TST)
- ☒ Pressure cooking test (PCT)
- ☒ Wire Bond Integrity (WBI)

3.Test result

GR-65J150AK/GR-65J100AK/GR-65J075AK						
No	Test item	Standard	Package Type	Sample Q'ty	Fail Q'ty	Result
1	HTGB	JESD22-A108	8080CM	77	0	PASS
2	HTRB	JESD22-A108	8080CM	77	0	PASS
3	MSL3	J-STD-020	8080CM	77	0	PASS
4	HTS	JESD22-A103C	8080CM	77	0	PASS
5	UHASt	JESD22-A104	8080CM	77	0	PASS
6	TCT	JESD22-A102	8080CM	77	0	PASS
7	PCT	JESD22-A119	8080CM	77	0	PASS
8	WBI	JESD22-B120/B116A	8080CM	5	0	PASS

ESD (HBM)					
Part-number	Standard	Pass Level	G-S (V)	G-D (V)	D-S (V)
GR-65J150AK	JEDEC JS-001	Class-1C	+1250	+1200	+8000
GR-65J100AK	JEDEC JS-001	Class-1C	+1250	+1300	+8000
GR-65J075AK	JEDEC JS-001	Class-1C	+1550	+1350	+8000

4.Supporting Data

I. Device level:

Item	Name	Conditions	Sample Q'ty	Duration	Result
HTGB	High Temperature Gate Bias	Tj=150°C,Vgs=100%	<u>77</u> EA	☐ 168hrs ☐ 500hrs ☒ 1000hrs	☒ Pass ☐ Fail
HTRB	High Temperature Reverse Bias	Tj=150 °C, Vds=80%	<u>77</u> EA	☐ 168hrs ☐ 500hrs ☒ 1000hrs	☒ Pass ☐ Fail

II. Package level:

Item	Name	Conditions	Sample Q'ty	Duration	Result
UHASt	Unbiased Highly Accelerated Stress Test	Tj=130°C, RH=85%, T=96HR	<u>77</u> EA	■ 96hrs □ Fail	■ Pass □ Fail
HTS	High Temperature Storage	Ta=150°C, T=1000HR	<u>77</u> EA	□ 168hrs □ 500hrs ■ 1000hrs	■ Pass □ Fail
TCT	Temperature Cycling Test	Ta=-40°C → 125°C, Δ5~15°C/min, 1000cycles	<u>77</u> EA	□ 100cycles ■ 1000cycles	■ Pass □ Fail
PCT	Pressure Cooker Test	Ta=121°C, RH=100%, 2atm, 168HR	<u>77</u> EA	■ 168hrs	■ Pass □ Fail
WBI	Wire Bond Integrity	Ta=150°C, T=500HR	<u>5</u> EA	□ 168hrs ■ 500hrs	■ Pass □ Fail

5. Criteria

Item Data shift (%)	Ron1	Vth1	Igss	Idss	BVdss
Criteria	≤ 20%	≤ 20%	≤ 20%	Within 20 times of the standard value	≤ 20%

6. Conclusion

Biased Reliability Test				
Item Data shift (%)	Ron1 (%)	Vth1(%)	Igss(%)	Idss (%)
HTGB	< 10%	< 15%	< 20%	< 10%
HTRB	< 20%	< 20%	< 20%	< 20%

Non-Biased Reliability Test

Item Data shift (%)	Ron1 (%)	Vth1(%)	Igss(%)	Idss (%)
MSL3	< 5%	< 5%	< 5%	< 5%
HTS	< 10%	< 10%	< 5%	< 10%
UHAST	< 10%	< 10%	< 10%	< 18 times
TCT	< 10%	< 10%	< 10%	< 20%
PCT	< 10%	< 10%	< 10%	< 18 times
WBI	< 10%	< 10%	< 10%	< 10%