

Notes



Electronics for the Future

PCN No.3026007

Switch to Ag-wire products for
Si Power Transistors in Automotive SOP8 package
due to the discontinuation of halogen-containing products

Low Voltage Device Division
Si Power Device Business Unit
June 30, 2026

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- ① **To secure a stable long-term supply and strengthen product competitiveness**
⇒ Since it is not affected by fluctuations in the gold(Au) market, it enables both cost stabilization and a reliable, stable supply.
- ② **Improved Reliability**
⇒ Wire bond reliability is improved under high-temperature operating conditions.

Transition to Ag Bonding Wire and Au-less Backside Metallization.

Item		Before-change product Automotive HZG spec (Halogen-free resin and Sn plating)	After-change product Automotive HZG spec Ag-wire
Outline			
Marking			
Die		Same	
	backside metallization	TiNiAuAg	TiNiAg
Bonding wire material		Au	Ag
Lead frame base material		Cu-alloy	
MOLD compound		Brominated flame-retardant resin	Halogen-free resin
Solder plating on terminals		Sn-2Cu plating	Sn plating

Review of New and Changed Elements 4M Changes

4M Category		Before-change product Au-wire products	After-change product Ag-wire products	New Points / Changes
Man		Certified operator and inspector of same Rohm group factory, same level		None
Machine		SOP8 Assembly Line		None
Material	Lead frame material	Stripe Frame (Base material: Cu-alloy)		None
	Die attach material	Ag paste		None
	Bonding wire	Au-wire	Ag-wire	With
	Mold resin	Brominated flame-retardant resin	Halogen-free resin	With
	External plating	Sn-2Cu plating	Sn plating	With
	Die	Same wafer and chip		With
	backside metallization	TiNiAuAg	TiNiAg	
Method		Production with Strip Frames		None
Product Identification	Marking	Production Week Code (Identifiable by production week)		None
	Factory(End of Lot Number)	T: Thailand		None

Review of New and Changed Elements

Item	Before-change product	After-change product	Points of Concern	Verification Items	Results
Die backside metallization	TiNiAuAg	TiNiAg	Delamination of the backside metallization Variation in electrical characteristics	•Die bonding shear strength •Electrical Check •Reliability test	No Problems Found
Wire bonding material	Au-wire	Ag-wire	Wire Lift Wire Sweep Wire Sulfidation Electromigration	•FAB Appearance •Die bonding shear strength •Wire bonding shear strength •Wire bonding appearance •Wire sweep •Reliability test	No Problems Found
Mold resin	Brominated flame-retardant resin	Halogen-free resin	Resin fillability Adhesive strength Mechanical strength degradation	•Mold appearance •Wire Sweep •Detachment after moisture absorption reflow •Reliability test	No Problems Found
External plating	Sn-2Cu plating	Sn plating	Whisker growth	•Solder film thickness •Solder appearance •Solder wettability •Whisker evaluation	No Problems Found

We have verified the change points as above, and confirm that there is no problem.
There is no difference in product characteristics, performance and reliability.

1. 試験結果 TEST RESULT

試験項目 TEST ITEM	試験条件 TEST CONDITION	準拠規格 STANDARD	n[pcs]	Pn[pcs]
温度サイクル / Temperature cycle TCY	-55±5℃↔150±5℃ 1000サイクル / -55±5℃↔150±5℃ 1000cycles	JESD22-A104, AEC-Q101 Rev.E	77×3Lot	0
高温高温逆バイアス / High temp. high humidity reverse bias H ³ TRB	85±2℃, 85±5%RH, 規定のバイアス, 1000時間 / 85±2℃, 85±5%RH, specified bias, 1000hours	JESD22-A101, AEC-Q101 Rev.E	77×3Lot	0
飽和蒸気加圧 / Pressure cooker test PCT	121±2℃, 100%RH, 203kPa, 100時間 / 121±2℃, 100%RH, 203kPa, 100hours	JESD22-A102, AEC-Q101 Rev.E	77×3Lot	0
高温逆バイアス / High temperature reverse bias HTRB	T _j max, 規定のバイアス, 1000時間 / T _j max, specified bias, 1000hours	JESD22-A108, AEC-Q101 Rev.E	77×3Lot	0
高温ゲートバイアス / High temperature gate bias HTGB	T _j max, V _{GSS} (max.), 1000時間 / T _j max, V _{GSS} (max.), 1000hours	JESD22-A108, AEC-Q101 Rev.E	77×3Lot	0
断続動作 または パワー温度サイクル Intermittent Operation Life or Power and Temperature Cycle	Ta=25±5℃, ΔT _j ≥100℃, ON 120sec./ OFF 120sec. per cycle, 試験サイクル数/Duration 15000cycles Ta=-40(+0/-10)℃~+85(+10/-0)℃, ON 300sec./ OFF 300sec. per cycle, 試験サイクル数/Duration 6000cycles	MIL-STD-750 Method 1037 JESD22 A-105, AEC-Q101 Rev.E	77×3Lot	0

2. 測定項目及び故障判定基準 MEASUREMENT ITEM & CRITERIA

測定項目 ITEM	測定条件 CONDITION	故障判定基準 CRITERIA
ゲート漏れ電流 / Gate-Source Leakage : I _{GSS}	仕様書条件による / Per specification	仕様書に記載の電気的特性に従う / According to the electrical characteristics specified by the specification.
ドレインシャ断電流 / Zero Gate Voltage Drain Current : I _{DSS}		
順電圧アドミタンス / Forward Transfer Admittance : Y _{fs}		
外観 / Physical	目視 / Visual check	著しい変化のないこと / No outstanding change in physical.

3. 判定結果 JUDGEMENT

各試験項目とも故障の発生は認められておりません。 / No failure is observed from each test item.



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			Replacement			No.3026007
Package	Internal PN	Public (External) PN	Package	Internal PN	Public (External) PN	
SOP8	RRS040P03FRATB	RRS040P03FRATB	SOP8	RRS050P03UG1TB	RRS050P03HZGTB	
SOP8	RRS075P03FRATB	RRS075P03FRATB	SOP8	RRS090P03UG1TB	RRS090P03HZGTB	
SOP8	RRS090P03FRATB	RRS090P03FRATB	SOP8	RRS090P03UG1TB	RRS090P03HZGTB	
SOP8	RRS090P03HZETB	RRS090P03HZETB	SOP8	RRS090P03UG1TB	RRS090P03HZGTB	
SOP8	RRS090P03MZATB	RRS090P03HZETB	SOP8	RRS090P03UG1TB	RRS090P03HZGTB	
SOP8	RRS100P03FRATB	RRS100P03FRATB	SOP8	RRS100P03UG1TB	RRS100P03HZGTB	
SOP8	RRS100P03MC2TB	RRS100P03FRATB	SOP8	RRS100P03UG1TB	RRS100P03HZGTB	
SOP8	RRS100P03MD2TB	RRS100P03FRATB	SOP8	RRS100P03UG1TB	RRS100P03HZGTB	
SOP8	RRS140P03FRATB	RRS140P03FRATB	SOP8	RRS140P03UG1TB	RRS140P03HZGTB	
SOP8	RSS050P03FRATB	RSS050P03FRATB	SOP8	RRS050P03UG1TB	RRS050P03HZGTB	
SOP8	RSS060P05FRATB	RSS060P05FRATB	SOP8	RSS060P05UG1TB	RSS060P05HZGTB	
SOP8	RSS065N06FRATB	RSS065N06FRATB	SOP8	RSS065N06UG1TB	RSS065N06HZGTB	
SOP8	RSS065N06M85TB	RSS065N06M85TB	SOP8	RSS065N06UG1TB	RSS065N06HZGTB	
SOP8	RSS070N05FRATB	RSS070N05FRATB	SOP8	RSS070N05UG1TB	RSS070N05HZGTB	
SOP8	RSS070P05FRATB	RSS070P05FRATB	SOP8	RSS070P05UG1TB	RSS070P05HZGTB	
SOP8	RSS070P05MT2TB	RSS070P05FRATB	SOP8	RSS070P05UG1TB	RSS070P05HZGTB	
SOP8	RSS090N03FRATB	RSS090N03FRATB	SOP8	RSS100N03UG1TB	RSS100N03HZGTB	
SOP8	RSS090P03.TB	RSS090P03.TB	SOP8	RSS100N03UG1TB	RSS100N03HZGTB	
SOP8	RSS090P03M.4TB	RSS090P03.TB	SOP8	RRS090P03UG1TB	RRS090P03HZGTB	
SOP8	RSS095N05FRATB	RSS095N05FRATB	SOP8	RSS095N05UG1TB	RSS095N05HZGTB	
SOP8	RSS100N03FRATB	RSS100N03FRATB	SOP8	RSS100N03UG1TB	RSS100N03HZGTB	
SOP8	RSS130N03FRATB	RSS130N03FRATB	SOP8	RSS130N03UG1TB	RSS130N03HZGTB	
SOP8	RXS125N03FRATB	RXS125N03FRATB	SOP8	RSS130N03UG1TB	RSS130N03HZGTB	
SOP8	SP8J2FRATB	SP8J2FRATB	SOP8	SP8J2UG1TB	SP8J2HZGTB	
SOP8	SP8J5FRATB	SP8J5FRATB	SOP8	SP8J2UG1TB	SP8J2HZGTB	
SOP8	SP8J66FRATB	SP8J66FRATB	SOP8	No replacement	-	
SOP8	SP8K1FRATB	SP8K1FRATB	SOP8	SP8K2UG1TB	SP8K2HZGTB	
SOP8	SP8K2FRATB	SP8K2FRATB	SOP8	SP8K2UG1TB	SP8K2HZGTB	
SOP8	SP8K22FRATB	SP8K22FRATB	SOP8	SP8K22UG1TB	SP8K22HZGTB	
SOP8	SP8K24FRATB	SP8K24FRATB	SOP8	SP8K24UG1TB	SP8K24HZGTB	
SOP8	SP8K31FRATB	SP8K31FRATB	SOP8	SP8K31UG1TB	SP8K31HZGTB	
SOP8	SP8K31MT2TB	SP8K31FRATB	SOP8	SP8K31UG1TB	SP8K31HZGTB	
SOP8	SP8K32FRATB	SP8K32FRATB	SOP8	SP8K32UG1TB	SP8K32HZGTB	
SOP8	SP8K33FRATB	SP8K33FRATB	SOP8	SP8K33UG1TB	SP8K33HZGTB	
SOP8	SP8K3FRATB	SP8K3FRATB	SOP8	SP8K3UG1TB	SP8K3HZGTB	
SOP8	SP8K41FRATB	SP8K41FRATB	SOP8	SP8K41UG1TB	SP8K41HZGTB	
SOP8	SP8K52FRATB	SP8K52FRATB	SOP8	SP8K52UG1TB	SP8K52HZGTB	
SOP8	SP8M10FRATB	SP8M10FRATB	SOP8	SP8M4UG1TB	SP8M4HZGTB	
SOP8	SP8M21FRATB	SP8M21FRATB	SOP8	SP8M21UG1TB	SP8M21HZGTB	
SOP8	SP8M24FRATB	SP8M24FRATB	SOP8	SP8M24UG1TB	SP8M24HZGTB	
SOP8	SP8M31FRATB	SP8M31FRATB	SOP8	SP8M31UG1TB	SP8M31HZGTB	
SOP8	SP8M3FRATB	SP8M3FRATB	SOP8	SP8M3UG1TB	SP8M3HZGTB	
SOP8	SP8M3HZETB	SP8M3HZETB	SOP8	SP8M3UG1TB	SP8M3HZGTB	
SOP8	SP8M3MB5TB	SP8M3HZETB	SOP8	SP8M3UG1TB	SP8M3HZGTB	
SOP8	SP8M3MHR TB	SP8M3TB	SOP8	SP8M3UG1TB	SP8M3HZGTB	
SOP8	SP8M41FRATB	SP8M41FRATB	SOP8	SP8M41UG1TB	SP8M41HZGTB	
SOP8	SP8M43FRATB	SP8M43FRATB	SOP8	SP8M3UG1TB	SP8M3HZGTB	
SOP8	SP8M4FRATB	SP8M4FRATB	SOP8	SP8M4UG1TB	SP8M4HZGTB	
SOP8	SP8M51FRATB	SP8M51FRATB	SOP8	SP8M51UG1TB	SP8M51HZGTB	
SOP8	SP8M5FRATB	SP8M5FRATB	SOP8	SP8M5UG1TB	SP8M5HZGTB	
SOP8	SP8M5MT2TB	SP8M5FRATB	SOP8	SP8M5UG1TB	SP8M5HZGTB	
SOP8	SP8M6FRATB	SP8M6FRATB	SOP8	SP8M6UG1TB	SP8M6HZGTB	
SOP8	SP8M8FRATB	SP8M8FRATB	SOP8	SP8M3UG1TB	SP8M3HZGTB	