

**EVERLIGHT Electronics Co., Ltd.**

Attn: No.6-8, Zhonghua Road, Shulin Dist., New
Taipei City, 23860, Taiwan

- ☒ PRODUCT/PROCESS CHANGE NOTIFICATION
☐ PRODUCT TERMINATION NOTIFICATION

PCN tracking number: **PCN20251219-01 - CN25120002****DATE:** 03/12/2025**Contact:****Title:** PM**E-mail:****Phone:****Fax:**Product influenced: ☒ Major change ☐ Minor change

Product Identification: (e.g., affected supplier part number(s), affected product lines including specific package types, product family):

EL460A series products

Customer part number(s) (optional, if not required per agreed to customer criteria):

N/A

Method, if applicable, of identifying changed product:

The new chip features a larger Gate Pad which avoids the risk of short circuits between the gate and source (G) terminals when gold balls are misaligned during wire bonding.

The new chip has better ESD protection.

Reason for change(s):

- ☐ Products Package Outline Dimension
☐ Electrical/Optical Specification
☒ Material: Raw Material
☐ Equipment
☐ Data Sheet
☐ Packing:
☐ Other:

Detailed description:

To develop new chip capabilities and import them into the BOM sheet.

Anticipated (positive and negative) impact on form, fit, function, quality, or reliability:

Please see the comparison report before and after product changes for details.

Supplier Qualification plan schedule and/or results, where applicable:

N/A

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Forecasted key milestones	Date
Date, if required, when qualification samples are available	17.12.2025
Date, if required, when final qualification data are available	17.12.2025
Proposed First Ship Date for change	03.06.2025
Last buy date	03.06.2025
Execution date	03.06.2025
Customer acknowledgement of receipt within 30 days of delivery of the PCN:	
Customer: Name/Date: Title:	☐ Approval for shipments before effective date E-mail/Address: Phone/Fax:
Customer Comments:	
EVERLIGHT acknowledgement of receipt: RECORD BY: DATE:	

The document of individual PCN information will be retained for a minimum of 5 years.

EL460A New Chip Comparison Data

Reporter : OBU_PM

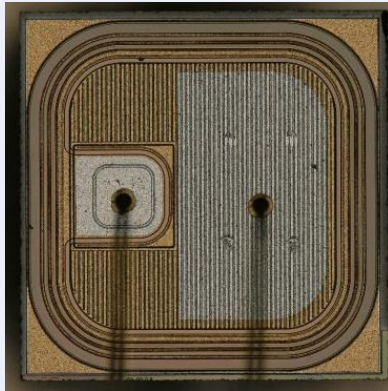
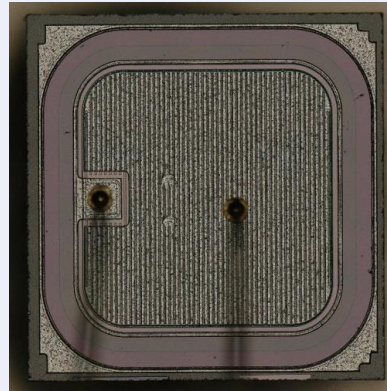
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Objectives & Outline

- **Objective: To develop new chip capabilities and import them into the BOM sheet**
- **Outline:**
 - **Chip Appearance**
 - **Basic Electrical Comparison**
 - **Characteristic Curve Comparison**
 - **VDE Optimization Data**
 - **Conclusion**

Comparison of basic chip specifications

Chip model	New chip	original
Chip size(mm)	1.05X1.05	0.98X0.98
Chip Thickness(mm)	0.23	0.23
Gate Pad(um)	239X218	105X105
Appearance		
Drain-Source Breakdown Voltage (BV_{DSS})	$>650V (@I_D=250\mu A)$	$>650V (@I_D=250\mu A)$
Drain-Source Leakage Current (I_{DSS})	$<1\mu A (@V_{DS}=650V, V_{GS}=0V)$	$<1\mu A (@V_{DS}=650V, V_{GS}=0V)$
On-state Resistance (R_{ON})	$<70\Omega$	$<70\Omega$

- The new chip features a larger gate pad, which avoids the risk of short circuits between the gate (G) and source (S) terminals when gold balls are misaligned during wire bonding.
- The electrical properties of the bare die are not significantly different.

Basic Electrical Comparison

- Evaluation model: 600V SSR Coupler
- Basic electrical properties comparison between the new chip and the original chip

project	I_{DRM1}	$R_{(ON)}$	I_{FON}	I_{FOFF}	T_{ON}	T_{OFF}
unit	μA	ohm	mA	mA	mS	mS
Test conditions	$V_L=600V$ $I_F=0mA$	$I_F=10mA$ $I_L=50mA$	$I_L=50mA$	$I_L=0.01mA$	$I_F=10mA, R_L=200\Omega$ $I_L=50mA$	
Specification	≤ 1	≤ 70	≤ 5	> 0.1	≤ 3	≤ 0.5
Original chipset 1	0.028	38.88	2.19	2.14	0.325	0.241
Original chipset 2	0.032	39.23	2.06	2.02	0.348	0.242
New chip 1	0.028	37.87	1.83	1.79	0.272	0.223
New chip 2	0.026	38.12	1.92	1.88	0.287	0.229

➤ There is no significant difference in basic electrical properties.

Characteristic Curve Comparison(1)

Black line: Existing chipset; Red line: New chipset

Figure 6. Normalized LED Operate on Current vs Ambient Temperature

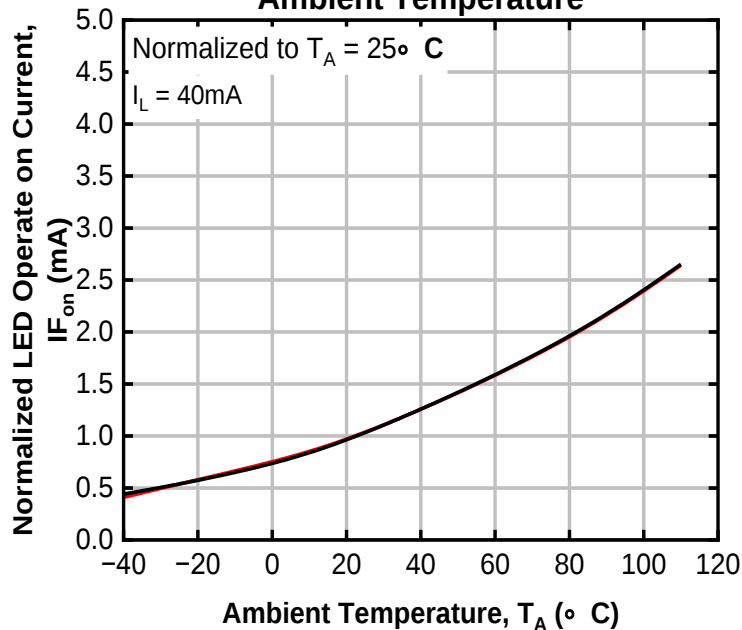
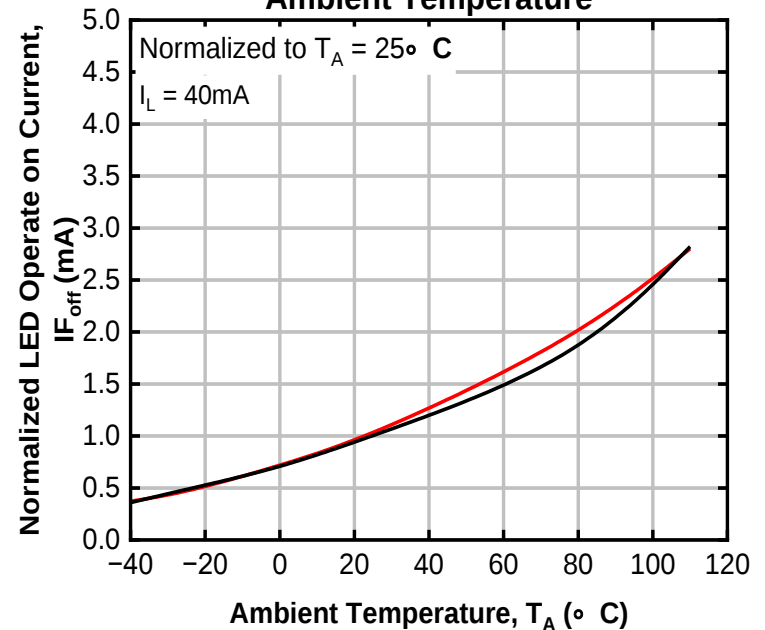


Figure 7. Normalized LED Turn Off Current vs Ambient Temperature



➤ No significant difference.

Characteristic Curve Comparison(2)

Black line: Existing chipset; Red line: New chipset

Figure 2. On Resistance vs Ambient Temperature

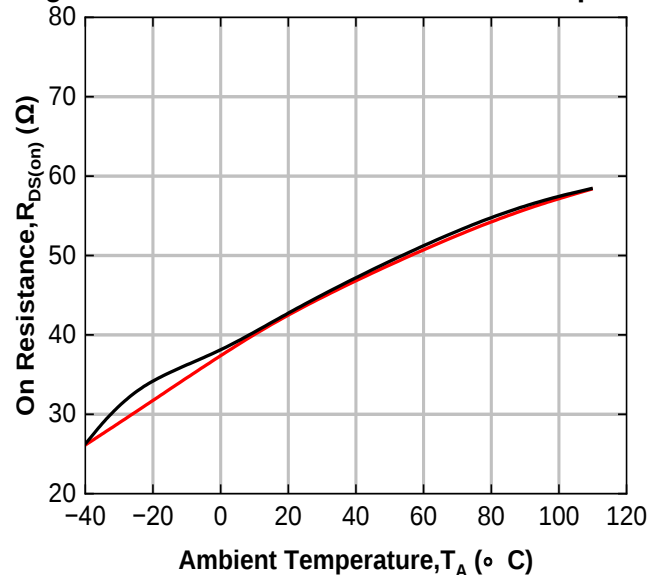
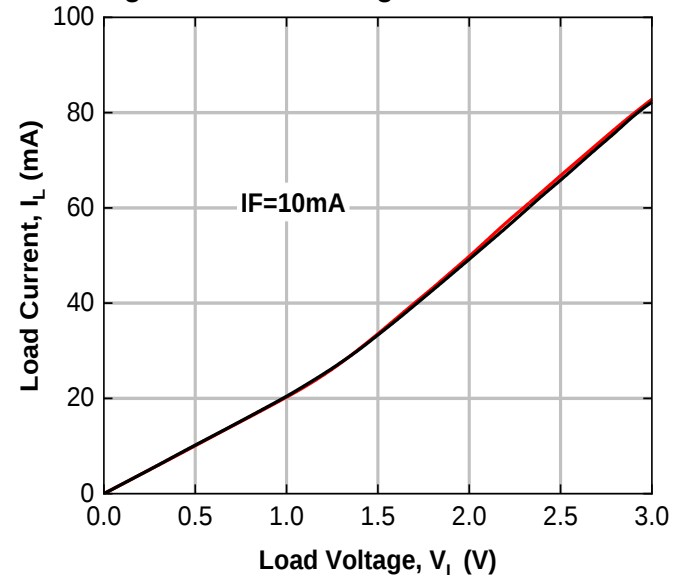


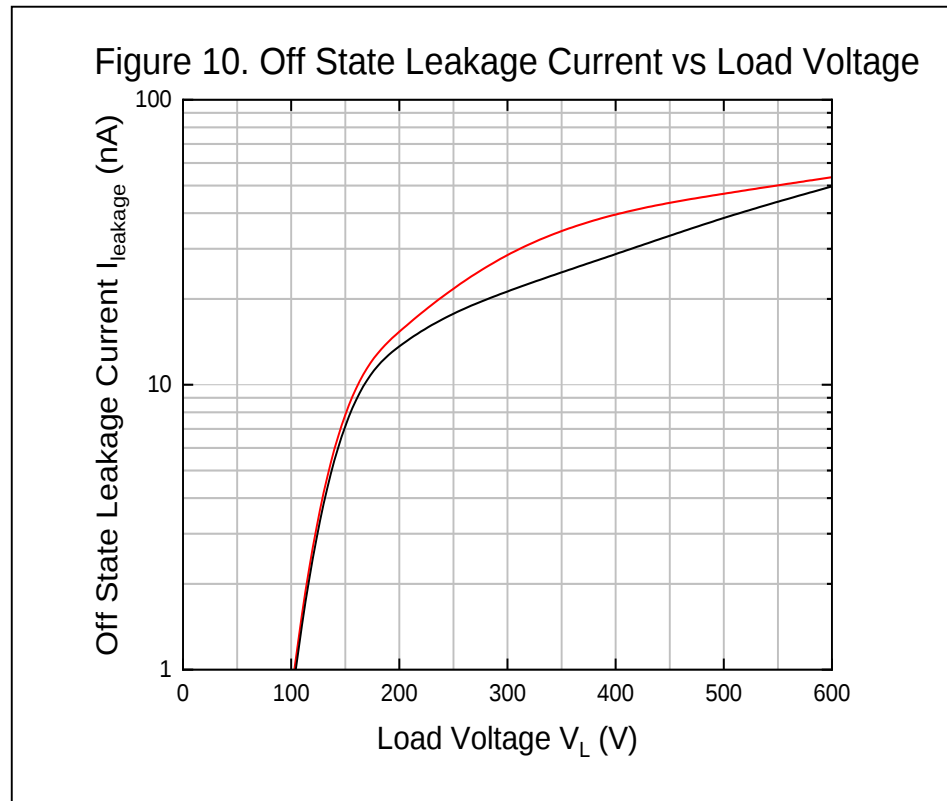
Figure 9. Load Voltage vs Load Current



➤ No significant difference.

Characteristic Curve Comparison(3)

Black line: Existing chipset; Red line: New chipset



➤ **No significant difference.**

Outsourced third-party VDE testing

- ESD_HBM

Sample	Pin combination	ESD(V)_HBM
Original chip	G-S	100
	D-G	100
	D-S	5000
New chip	G-S	1500
	D-G	1500
	D-S	5000

Test Components: New Chip vs. Original Chip

Results: The new chip's G-S & D-G performance is significantly higher than the original chip.

Conclusion

- **The new chip features a larger Gate Pad, which avoids the risk of short circuits between the gate and source (G) terminals when gold balls are misaligned during wire bonding.**
- **The new chip's basic electrical properties and characterization profiles meet specifications.**
- **The new chip has better ESD protection.**
- **It has passed reliability verification (quasi-25-09-PCAM-1938-TP, quasi-24-06-PC8-1700-TP).**

RELIABILITY TESTING REPORT

Customer(申請人)	鄭忠佑
Depart.(部門)	IBU RD_隔離元件開發部_固態繼電器與高速隔離器開發課
Test No.(編號)	准-24-06-PC8-1700-TP
Test Date(試驗日期)	2024/09/18~2024/11/01
Package Type(產品類別)	EL460A

Tester:

許楓傑

Checker:

鄭智榕

Signed By:

CC Chiang

EVERLIGHT ELECTRONICS CO.,LTD.

Reliability Testing Condition

PRIOR TEST:

NO	Code	Test Item	Condition	Device	Device	Physical	VFn(V)	IR(uA)	Ileak1(uA)	Ileak2(uA)	IFon1(mA)	IFon2(mA)	IFof1(mA)	IFof2(mA)	RonA1(Ohm)	RonA2(Ohm)	Failure Number
				Times	Pcs	NG(Pcs)	Δ %	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
Pre-conditioning test: 125℃ 烘烤24小時 85℃ 85%RH 168hrs reflow 3times																	
1	TC	溫度循環 Temperature Cycle	-55℃~125℃ / Dwell time 15min / 300 Cycles	BEFORE 300CYCLES	22		0.118%	0.000	0.002	0.015	2.018	2.018	1.997	1.998	37.650	37.645	0
2	HTB	高溫 High Temperature Life	110℃ / 1000 H / @IF=5mA,IL=20mA	BEFORE	22		0.163%	0.000	0.003	0.017	1.991	1.992	1.972	1.973	37.386	37.361	0
				168HRS			0.099%	0.000	0.002	0.015	1.897	1.897	1.878	1.879	37.714	37.678	
				500HRS			0.438%	0.000	0.017	0.033	1.820	1.821	1.806	1.807	37.095	37.027	
				1000HRS			0.190%	0.000	0.005	0.019	1.873	1.873	1.855	1.856	37.368	37.338	
3	HTR	高溫逆向 Temperature with Reverse Bais	85℃ / 1000 H / @VL=480V	BEFORE	22		0.445%	0.000	0.002	0.015	1.837	1.838	1.821	1.823	37.184	37.155	0
				168HRS			0.078%	0.000	0.002	0.015	1.922	1.922	1.901	1.903	37.761	37.712	
				500HRS			0.417%	0.000	0.017	0.033	1.839	1.840	1.825	1.826	37.088	37.004	
				1000HRS			0.285%	0.000	0.006	0.019	1.862	1.862	1.843	1.844	37.192	37.162	
4	HTHR	高溫高濕逆向 Humidity with Reverse Bais	85℃/85%RH / 1000 H / @VL=100V	BEFORE	22		0.438%	0.000	0.002	0.015	1.840	1.841	1.824	1.841	37.103	37.062	0
				168HRS			0.082%	0.000	0.002	0.015	1.978	1.979	1.959	1.960	37.738	37.706	
				500HRS			0.237%	0.000	0.016	0.032	1.929	1.930	1.912	1.913	37.712	37.637	
				1000HRS			0.297%	0.000	0.005	0.018	1.904	1.905	1.887	1.888	37.663	37.659	
Non Pre-conditioning(未吸濕，未上PCB板)																	
5	壓力鍋	壓力鍋	壓力鍋 / 96 H	96HRS	22		0.381%	0.000	0.005	0.021	1.847	1.848	1.831	1.833	37.434	37.408	0
6	HT	高溫 High Temperature Storage	110℃ / 1000 H	168HRS	22		0.221%	0.000	0.014	0.030	1.901	1.901	1.886	1.886	37.111	37.069	0
				500HRS			0.140%	0.000	0.004	0.017	1.942	1.942	1.924	1.926	37.199	37.213	
				1000HRS			0.403%	0.006	0.002	0.015	1.938	1.939	1.922	1.924	36.903	36.903	
7	LT	低溫 Low Temperature Storage	-40℃ / 1000 H	168HRS	22		0.243%	0.000	0.013	0.029	1.901	1.901	1.886	1.886	37.452	37.410	0
				500HRS			0.169%	0.000	0.003	0.017	1.918	1.918	1.900	1.901	37.507	37.510	
				1000HRS			0.553%	0.000	0.002	0.015	1.851	1.852	1.837	1.839	37.078	37.085	
8	SH	焊錫耐熱 Resistance to Solder Heat	Level 1 / Dip / 260℃ / 10 sec / 3 Times	3TIMES	22		0.040%	0.000	0.002	0.015	1.961	1.961	1.942	1.943	37.773	37.779	0
9	SH2	沾錫性 Solderability	Dip / 245℃ / 3 sec / 1Times	1TIMES	22												0

Test Item	Unit	Condition	MIN	MAX	Judgment
V _F	V	I _F = 10mA	0.8	1.5	△V _F < ± 20%
I _R	uA	V _R = 5V	0	1	I _R < 1μA
R _{on}	Ω	I _F = 5mA, I _L = 50mA	30	70	R _{on} < 60Ω
I _{Fon}	mA	I _L = 50mA, V _L = ±20V	0.4mA	5mA	I _{Fon} < 5mA
I _{Foff}	mA	I _L < 5uA, V _L = ±20V	0.4mA	5mA	I _{Foff} > 0.4mA
I _{leak}	uA	V _L = 600V	0	1uA	I _L < 1μA
Appearance check		10~50 X Microscope Inspection			Solder coating more than 95%