

May 16th, 2017

RE: LFPCN41260

To: Our Valued Customers.

From: Littelfuse Product Management Team

Subject: SIDACtor® Devices Sawing grid Optimization

Similar to LFPCN41228 which issued two years ago for die grid optimization only for B and C-rated SIDACtor® Devices on DO-214AA Package

Littelfuse would like to notify you of another PCN- LFPCN41260 for die grid design optimization only for the rest SIDACtor® Devices in various Packages. there are NO changes in active area of silicon, therefore the actual electrical performance stays identical to existing design,

Please refer to 3<sup>rd</sup> page for qualification report and refer to separate attachment for the affected Part number List

There are no changes to fit, form, function and shape of the finished product and electrical parameter.

Form, Fit, Function and shape Changes: None

Part Number Changes: None Effective Date: Aug, 16<sup>th</sup>, 2017

Migration period: Aug 16th 2017 to Dec 31st 2017

Replacement Products: N/A

Last Time Buy: N/A

If you have any other question or concerns, please contact Littelfuse® local sales representative, or Meng Wang, Product Manager for further assistance.

We highly value your business and look forward to assisting you whenever possible.

Best Regards,

Meng Wang

Product Manager
Littelfuse SIDACtor®

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800 E. Northwest Highway Des Plaines, IL 60016

# Product/Process Change Notice (PCN)

<b>PCN#:</b> LFPCN41260 Date: Aug 16 <sup>th</sup>	2017	Contact Information			
Product Identification:		Name: Meng Wang			
SIDACtor®		Title: Product Manager			
Implementation Date for Change:		Phone #: +86 510 85277701- 7955			
Aug 16 <sup>th</sup> 2017		Fax#: +86 510 85277700			
		E-mail: Mwang3@littelfuse.com			
Category of Change:	Descri	ption of Change:			
	Littelfus	se would like to notify you of die grid design optimization, the grid is for			
☐ Data Sheet	wafer s	awing , with expertise gained and process impovement , we would like			
☐ Technology	to optin	nize this grid for better sawing, since Aug 12th 2017, this chagne will be			
☐ Discontinuance/Obsolescence	implemented, from this date onwards , you will recievev the goods either with				
☐ Equipment					
☐ Manufacturing Site	previou	s grid or optimized grid till the old inventory is depleted.			
☐ Raw Material					
☐ Testing					
Other:					
Important Dates:					
□ Qualification Samples Available: May	y 16 <sup>th</sup> 20	D17 Last Time Buy: N/A			
	ay 16 <sup>th</sup> 2	017			
☐ Date of Final Product Shipment: N/A					
Method of Distinguishing Changed Product					
☐ Product Mark, N/A					
□ Date Code, 7Hxxx					
☐ Other,					
Demonstrated or Anticipated Impact on Form, Fit, Function or Reliability:					
N/A					
LF Qualification Plan/Results:					
available , see attached next page					
Customer Acknowledgement of Receipt: Littelfuse requests you acknowledge receipt of this PCN. In your acknowledgement, you can					
grant approval or request additional information. Littelfuse will assume the change is acceptable if no acknowledgement is received within 30 days					
of this notice. Lack of any additional response within 90 days of PCN issuance further constitutes acceptance of the change.					



Littelfuse, WX East 1# Zhen Fa 6 Road Shuo Fang Industrial Park Wuxi, Jiangsu 214142

## **Product Qualification Report**

To: Those who may concern

From: Zhihui Chen, Product Engineer, Littelfuse,

Date: May 9th, 2017

Subject: SIDACtor die grid optimization qualification

#### Purpose:

This report is to inform the successful qualification test results associated with all SIDACtor die shrink grid product

### 1. Qualification Types (Test Vehicle)

Product Series	Representative Test Sample Part Numbers	Package	Assembly Location	
	P0300S1ALRP	DO-214AC		
	P833P0080S1BLRP	DO-214A0	Wuxi	
	P6002SBLRP			
	P4202SCLRP			
	PLED13SW	DO-214AA		
SIDACtor	P1300SDLRP	DO-214AA		
OIDAOIOI	P3500SDLRP			
	P1101SDLRP			
	P3100Q12BLRP	Q3X3	- Outsource	
	P0080Q22CLRP	Q3.3X3.3		
	P0084UALRP	MS-013	Outsource	
	P1602ACLRP	A-PACK		

#### 2. Qualification Test Items and Result Summary:

Test Category	Description	Sample P/N	Samp le Qty	Littelfuse test Ref#	Contents/Conditions	Result summary
		P0300S1ALRP	50	88094		Meet datasheet spec
	Parametric Electrical Parameters	P833P0080S1BLRP	50	87487	VBO,Vdrm,IH,VT	
		P6002SBLRP	50	87810		
Parametric		P4202SCLRP	50	87811		
1 dramotrio		PLED13SW	50	90365		
		P1300SDLRP	50	90334		
		P3500SDLRP	50	90336		
		P1101SDLRP	50	90505		

		P3100Q12BLRP	50	91399		
		P0080Q22CLRP	50	91399		
		P0084UALRP	50	92727		
		P1602ACLRP	50	92729		
		P0300S1ALRP	10	88094		
		P833P0080S1BLRP	10	87487		
		P6002SBLRP	10	87810		
		P4202SCLRP	10	87811		
		P1300SDLRP	10	90334		
	Surge out 8*20us	P3500SDLRP	10	90336	'+/- hit,from rated Ipp,0.1Ipp step	
		P1101SDLRP	10	90505		
		P3100Q12BLRP	10	91399		
		P0080Q22CLRP	10	91399		
		P0084UALRP	10	92727		
		P1602ACLRP	10	92729		
		P0300S1ALRP	10	88094		
		P833P0080S1BLRP	10	87487		
		P6002SBLRP	10	87810		
		P4202SCLRP	10	87811		
		P1300SDLRP	10	90334		Meet datashee spec
Surge out	Surge out 10*700us	P3500SDLRP	10	90336	'+/- hit,from rated Ipp,0.1Ipp step	
	10 700us	P1101SDLRP	10	90505		
		P3100Q12BLRP	10	91399		
		P0080Q22CLRP	10	91399		
		P0084UALRP	10	92727		
		P1602ACLRP	10	92729		
		P0300S1ALRP	10	88094		
		P833P0080S1BLRP	10	87487		
		P6002SBLRP	10	87810		
		P4202SCLRP	10	94943		
		P1300SDLRP	10	90334		
	Curao out	P3500SDLRP	10	90336	'+/- hit,from rated	
	Surge out 10*1000us	P1101SDLRP	10	90505	lpp,0.1lpp step	
		P3100Q12BLRP	10	91399		
		P0080Q22CLRP	10	91399		
		P0084UALRP	10	92727		
		P1602ACLRP	10	92729		
		P0300S1ALRP	10	88094		
VS VS		P833P0080S1BLRP	10	87487		
		P6002SBLRP	10	87810		
		P4202SCLRP	10	87811		
		P1300SDLRP	10	90334	100V/us	Meet datashee
	VS	P3500SDLRP	10	90336		
		P1101SDLRP	10	90505		spec
		P3100Q12BLRP	10	91399		
		P0080Q22CLRP	10	91399		
		P0084UALRP	10	92727		
		P1602ACLRP	10	92729		
Deli-1-iii	DC/AC	P0300S1ALRP	77	88093	125°C,24h at +/-	0 failure
Reliability	Blocking (HTRB)	P833P0080S1BLRP	77	87484	80%Vdrm,AC	1008h

		P6002SBLRP	77	90243	blocking test with AC	
		P4202SCLRP	77	90243	peak 80% Vdrm 168/504/1008h	
		PLED13SW	77	90364		
		P1300SDLRP	77	90332	]	
		P3500SDLRP	77	90335		
		P1101SDLRP	77	90504		
		P3100Q12BLRP	77	91398		
		P0080Q22CLRP	77	91398		
		P0084UALRP	77	92726		
		P1602ACLRP	77	92728		
		P0300S1ALRP	40	88093		
		P833P0080S1BLRP	40	87484		
		P6002SBLRP	40	90243		
		P4202SCLRP	40	90243		0 failure at
		PLED13SW	40	90364	-55°C	
	Temperature	P1300SDLRP	40	90332		
	Cycling (TC)	P3500SDLRP	40	90335	~+150°C,H851000cycl es	1000Cycle
		P1101SDLRP	40	90504	63	
		P3100Q12BLRP	40	91398		
		P0080Q22CLRP	40	91398		
		P0084UALRP	40	92726		
		P1602ACLRP	40	92728		
		P0300S1ALRP	40	88093		
		P833P0080S1BLRP	40	87484	_	
		P6002SBLRP	40	90243		
		P4202SCLRP	40	90243		
		PLED13SW	40	90364	168/504/1008h at Tj=85C/85% RH with device reverse biased	0 failure at
	H3TRB	P1300SDLRP	40	90332		
		P3500SDLRP	40	90335	at 80% VDRM and	1008hrs
		P1101SDLRP	40	90504	not exceed 52V	
		P3100Q12BLRP	40	91398		
		P0080Q22CLRP	40	91398		
		P0084UALRP	40	92726		
		P1602ACLRP	40	92728		

#### 3. MTBF Calculation

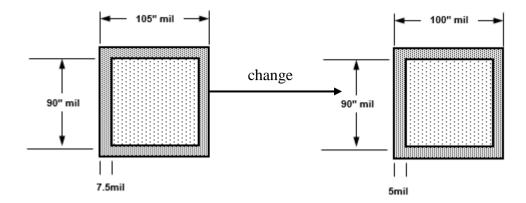
Estimate of Failure Rate, MTBF, FITS for a Given Operation Temperature (See note)

Temp ℃	% FR/khrs	MTBF (K)	FITS	
30	0.00004251	2352588	0.42	
60	0.00133448	74918	13.34	
80	0.00959617	10420	95.96	
100	0.05584068	1790	558.4	
125	0.39351454	254	3935.1	

Note: The **M**ean-**T**ime-**B**etween-**F**ailure (MTBF) in hours and the percent failure rate per 1000 hours (%FR/khr) are computed at a 60% confidence level using the chi square method and the Arrhenius derating model for various junction operating temperatures. For the calculations, a value of 1 eV was used for the activation energy.

#### 4. FAB Process & Material Differences/Changes:

There is grid size change from 7.5mil/side to 5mil/side in FAB process method



#### 5. Assembly Process & Material Differences/Changes:

There are no significant changes in the assembly and process method.

#### 6. Conclusion

According to the above qualification test results, Littelfuse concluded that SIDACtor product series passed the all Reliability Test at WTC Lab.