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Control No. PCN-14441

November 11, 2014

PRODUCT/PROCESS CHANGE NOTIFICATION

TYPE OF CHANGE: Design Manufacturing Other

This notification is provided in accordance with Power Integrations policy of major change notification. If you have any questions or need further assistance, please contact your regional Power Integrations sales office.

DESCRIPTION OF CHANGE

1. A design change to improve the margin for surge withstand capability during a system level surge test and to increase the over-temperature protection limit to allow for the safety testing of the lamp fixture for short duration at elevated temperatures.
2. Discontinuation of the L-package for following part numbers:
 LYT4211L, LYT4212L, LYT4213L, LYT4214L, LYT4215L, LYT4216L, LYT4217L, LYT4218L and
 LYT4311L, LYT4312L, LYT4313L, LYT4314L, LYT4315L, LYT4316L, LYT4317L, LYT4318L

REASON FOR CHANGE

1. The change is part of a continual improvement activity and it has been verified through reliability evaluation under higher temperature than standard reliability test.
2. There is no demand for the L-package.

PRODUCTS AFFECTED

Please see the table below.

	Ordering Part Numbers
LYTSwitch™-4 HL	LYT4221E, LYT4222E, LYT4223E, LYT4224E, LYT4225E, LYT4226E, LYT4227E, LYT4228E LYT4321E, LYT4322E, LYT4323E, LYT4324E, LYT4325E, LYT4326E, LYT4327E, LYT4328E
LYTSwitch™-4 LL	LYT4211E, LYT4212E, LYT4213E, LYT4214E, LYT4215E, LYT4216E, LYT4217E, LYT4218E, LYT4311E, LYT4312E, LYT4313E, LYT4314E, LYT4315E, LYT4316E, LYT4317E, LYT4318E
LYTSwitch™-4 LL	LYT4211L, LYT4212L, LYT4213L, LYT4214L, LYT4215L, LYT4216L, LYT4217L, LYT4218L LYT4311L, LYT4312L, LYT4313L, LYT4314L, LYT4315L, LYT4316L, LYT4317L, LYT4318L

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The information in this report contains confidential and proprietary information of Power Integrations and its manufacturing partners. By receiving this report, the customer agrees to use this information for the sole purpose of addressing the issues reviewed in this report and to keep the contents confidential. If it becomes necessary for the customer to disclose this information to a third party, a non-disclosure agreement, which provides reasonable and customary protection for the disclosed information, must be executed.

QUALIFICATION STATUS

See Appendix 1 for the qualification report.

EFFECT ON CUSTOMER

No adverse impact is expected in customers' applications. The product will be guaranteed to meet the new datasheet limits.

EFFECTIVE DATE

February 11, 2015. This date is subject to change. Products assembled with the current design may continue to be shipped after implementation of the above change.

SAMPLE AVAILABILITY

Samples are available upon request. Please send requests for samples within two weeks after receipt of this notification to the local Power Integrations sales office. For customers that request samples, a reasonable accommodation will be made in order to allow time of customer's qualification in a case-specific manner.

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Appendix 1: LYTSwitch-4 High Line Product Parameter Limit Changes

Parameter	Symbol	Part Number	Existing Data Sheet				Units	Part Number	New Data Sheet				Units	Effect on Existing Designs	Reason for Change
			Min	Typ	Max				Min	Typ	Max				
BYPASS Pin Charge Current	I_{CH1}	LYT4x21	-4.1	-3.4	-2.7			LYT4x21	-6.04	-3.45	-2.59		mA	Improvement: Increases charge current to the BP capacitor improving startup.	Better represents capability of the part family.
		LYT4x22	-7.3	-6.1	-4.9			LYT4x22	-10.89	-6.22	-4.67				
		LYT4x23-4x27	-12	-9.5	-7.0			LYT4x23	-16.21	-9.26	-6.95				
		LYT4x28		-11.8				LYT4x24	-21.88	-12.5	-9.38				
								LYT4x25	-26.25	-15.0	-11.25				
							LYT4x26	-15.75	-9.00	-6.75					
							LYT4x27	-17.50	-10.0	-7.50					
							LYT4x28	-20.65	-11.8	-8.85					
BYPASS Pin Charge Current	I_{CH2}	LYT4x21	-0.90	-0.56	-0.28			LYT4x21	-1.23	-0.7	-0.49		mA		
		LYT4x22	-3.1	-2.4	-1.7			LYT4x22	-4.38	-2.5	-1.75				
		LYT4x23-4x26	-5.7	-4.35	-3.1			LYT4x23	-8.05	-4.6	-3.22				
		LYT4x27	-6.8	-4.35	-3.1			LYT4x24	-11.64	-6.65	-4.66				
		LYT4x28		-6.4				LYT4x25	-15.10	-8.63	-6.04				
							LYT4x26	-7.61	-4.35	-3.05					
							LYT4x27	-9.22	-5.27	-3.69					
							LYT4x28	-10.15	-5.8	-4.06					
BYPASS Pin Shunt Voltage	$V_{BP(SHUNT)}$	LYT4x21-LYT4x28			6.6	V				6.7	V	Marginal: Increases clamp voltage applied when externally powering the BP pin capacitor. Increase is extremely small (0.1 V), so will not affect existing designs.	Better reflects population distribution of shunt voltage clamp in actual devices.		
Line Overvoltage Threshold	I_{OV}	Row: Hysteresis		5.5		μA	Row: Hysteresis		5		μA	None	Better describes typical performance from a larger part population.		
VOLTAGE MONITOR Pin Voltage	V_V	LYT4x21-LYT4x26	3.00	3.25	3.50	V	LYT4x21-LYT4x28	2.75	3.00	3.25	V	Marginal: Reduces in line OVP trigger point by 0.25 V compared to 400 V - change is insignificant.	Better describes typical performance from a larger part population.		
		LYT4x27-LYT4x28	2.75	3.00	3.25	V									
VOLTAGE MONITOR Pin Short-Circuit Current	I_{VISC}	LYT4x21-LYT4x26	205	230	255	μA	LYT4x21-LYT4x28	150	175	200	μA	None; Reduces short circuit current.	Better describes typical performance from a larger part population.		
		LYT4x27-LYT4x28	150	175	200	μA									
FEEDBACK Pin Current Skip Cycle Threshold	$I_{FB(SKIP)}$		0 °C < T _J < 100 °C						T _J = 65 °C			None	Corrects error on data sheet.		
FEEDBACK Pin Short-Circuit Current	$I_{FB(SC)}$			400		μA			380		μA	None	Better describes typical performance from a larger part population.		
Duty Cycle Reduction	DC40			34		%			37		%	None	Better describes typical performance from a larger part population		
		DC60		50		%			60		%				
Reduced Power Current Limit (C _{SP} = 47 μF)	$I_{LIMIT(R)}$	LYT4x21	di/dt = 120 mA/ μs					LYT4x21	di/dt = 110 mA/ μs				None	di/dt values adjusted to reflect actual production test conditions.	
		LYT4x22	di/dt = 170 mA/ μs					LYT4x22	di/dt = 158 mA/ μs						
		LYT4x23	di/dt = 170 mA/ μs					LYT4x23	di/dt = 155 mA/ μs						
		LYT4x27	di/dt = 430 mA/ μs					LYT4x27	di/dt = 415 mA/ μs						
		LYT4x28	di/dt = 790 mA/ μs					LYT4x28	di/dt = 770 mA/ μs						
Thermal Shutdown Temperature	LYT4x21-4x26	135	142	150		°C	LYT4x21-4x28	147	155	164		°C	Improvement: Testing has shown that LYTSwitch-4 parts can operate safely at higher ambient temperatures - new DTP spec. reflects this increased performance. Note that this change was in place when LYT4X27 and LYT4x28 were introduced.	Allows designs to pass testing more easily without the need for heat sinking or potting materials.	
	LYT4x27-4x28	147	155	163					56						
Thermal Shutdown Hysteresis			75												
(C _{SP} = 47 μF)	LYT4x27						LYT4x27 ID = 350 mA					None	Corrects omission on data sheet.		
	LYT4x28						LYT4x28 ID = 600 mA								

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Appendix 2: LYTSwitch-4 Low Line Product Parameter Limit Changes

Parameter	Symbol	Part Number	Existing Data Sheet				New Data Sheet				Effect on Existing Designs	Reason for Change		
			L package part option				No L package part option							
			Min	Typ	Max	Units	Min	Typ	Max	Units				
BYPASS Pin Charge Current	I _{CH2}										No existing designs.	Not required in the market.		
		LYT4x11	-0.81					-0.85					Improvement: Increases charge current to the BP capacitor improving startup.	Better represents capability of the part family.
		LYT4x12	-3.1					-3.5						
		LYT4x13-4x17	-5.6					-5.5						
LYT4x18	-6.75					-7.5								
Thermal Shutdown Temperature		LYT4x11-LYT4x18	132	142	150	°C		147	155	164	°C	Improvement: Testing has shown that LYTSwitch-4 parts can operate safely at higher ambient temperatures - new OTP spec. reflects this increased performance.	Allows designs to pass testing more easily without the need for heat sinking or potting materials.	
Thermal Shutdown Hysteresis				75		°C			56		°C			
Breakdown Voltage	BV _{DSS}	LYT4x11-LYT4x18	670			V			725		V	Description Change: MOSFET has always been 725 VAC rated. Spec. allowed option to reduce voltage rating of MOSFET as a costreduction exercise. It has been determined that this is not required and the part will therefore be described with its actual breakdown.	Reflects actual device performance.	

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*Appendix 1
Reliability Engineering
Qualification Report*

*Date of Report: 31-Oct-2014
Prepared By: Nick Stanco
Manager, Reliability Engineering*

Project: LYTSwitch™-4 Design Revision Qualification
<p>Summary:</p> <p>LYTSwitch™-4 products were subjected to reliability testing for qualification of a die revision for improved surge test performance and increased over-temperature protection (OTP) as well as the resulting datasheet changes. Three LYTSwitch™-4 lots were subjected to 1000 hours of DOPL testing with passing results achieved in all cases. A parameter characterization study was completed with acceptable results.</p> <p>Based on acceptable reliability test results, the LYTSwitch™-4 die revisions are qualified and approved for production.</p>
Qualification Vehicles: LYT4312E2, LYT4321E3, LYT4328E3 and LYT4321E4.

Reliability Test Descriptions and Conditions

Test Name	Conditions	Specification
DOPL (Dynamic Operating Life Test)	T _j =145°C, V _d (peak)=580V	EIA/JESD22-A108-D

DOPL (Dynamic Operating Life)

Product	Lot No.	Test Duration	No. Failures/Sample Size
LYT4321E3	3D536A	1000 hours	0/47
LYT4328E3	3D491A	1000 hours	0/47
LYT4321E4	3H023A	1000 hours	0/47

The following test was done to verify functionality at abnormal operating temperature in order to enable system level safety test requirement.

Test Name	Conditions	Specification
DOPL (Dynamic Operating Life Test) At abnormal operating temperature	T _j =160°C, V _d (peak)=580V	EIA/JESD22-A108-D

Conclusion: Based on acceptable reliability test results, the LYTSwitch™-4 die revisions are qualified and approved for production.

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CUSTOMER ACKNOWLEDGEMENT

Power Integrations requests you acknowledge the receipt of the above-mentioned PCN. If no acknowledgment is received within 30 days of this notification, Power Integrations will assume the change is acceptable. Lack of any additional response within 90 days of this notification further constitutes acceptance of the change.

Power Integrations reserves the right to ship either version manufactured after the effective date until the inventory of the earlier version has been depleted.

If you have any questions or need further assistance, please contact your regional Power Integrations sales office. Otherwise, please check the box below, acknowledging the receipt of the PCN.

The indicated Product/Process Change Notification was received by the undersigned authority.

Name/Title: _____

Signature: _____ Date: _____

Email
Address/Phone#: _____

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CUSTOMER COMMENTS

Please email this signed form to pcn@powerint.com specifying the PCN# in the subject.

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