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Chicago, Illinois USA 60631

Aug 14th, 2020

PCN # ESW490-35 – Samsung SDI EMC EOL and Alternative EMC Replacement for IXYS Germany Discrete Packages

To our valued customers,

Littelfuse would like to notify you that we will replace Epoxy Molding Compound (EMC) material for various IXYS Germany Discrete packages which currently are using Samsung SDI EMC due to their EOL as communicated in previous advanced notice.

Package types includes: ISOPLUS i4-PAK, ISO247, ISOPLUS247, ISOPLUS220, ISOPLUS264, TO-220FP, TO-252, TO-252HV, TO-264.

All affected IXYS Germany discrete products have been fully qualified in accordance with established performance and reliability criteria using alternative EMC. The attached pages summarized the qualification results. Full qualification data and/or samples will be available upon request.

Pls refer to attached product list in the last pages for detail affected product coverage.

Form, fit, function changes: No Fit/Form/Function change with alternative EMC.
UL file update for all ISO type packages are ongoing which expect to be completed in 3-4 months.

Part number changes: None
Effective date: Sep 1st, 2020
Replacement products: N/A
Last time buy: N/A

This notification is for your information and acknowledgement. If you have any other questions or concerns, please contact your local sales team or Zhiwei Wang, Product Marketing Manager of Power Bipolar Discrete.

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

Thank you very much!

Best Regards,

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Product/Process Change Notice (PCN)

PCN#: ESW490-35 Date: Aug 14th, 2020

Product Identification:

IXYS Germany Discrete Products

Implementation Date for Change:

Sep-1st, 2020

Contact Information

Name: Zhiwei Wang

Title: Product Marketing Manager

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Fax#: N/A

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Category of Change:

- ☐ Assembly Process
- ☐ Data Sheet
- ☐ Technology
- ☐ Discontinuance/Obsolescence
- ☐ Equipment
- ☐ Manufacturing Site
- ☒ Raw Material
- ☐ Testing
- ☐ Fabrication Process
- ☐ Other: _____

Description of Change:

Littelfuse would like to notify you that we will replace Epoxy Molding Compound (EMC) material for various IXYS Germany Discrete packages which are using Samsung SDI EMC due to their EOL as communicated in previous advanced notice.

Package types includes: ISOPLUS i4-PAK, ISO247, ISOPLUS247, ISOPLUS220, ISOPLUS264, TO-220FP, TO-252, TO-252HV, TO-264.

All affected IXYS Germany discrete products have been fully qualified in accordance with established performance and reliability criteria using alternativ EMC. The attached pages summarized the qualification results. Full qualificatio data and/or samples will be available upon request.

Pls refer to attached product list in the last pages for detail affected product coverage.

Important Dates:

- ☒ Qualification Samples Available: Aug 14th ,2020
- ☐ Last Time Buy:
- ☒ Final Qualification Data Available: Aug 14th ,2020
- ☐ Date of Final Product Shipment:

Method of Distinguishing Changed Product

- ☐ Product Mark,
- ☒ Date Code, Varies depends on Samsung SDI EMC inventory
- ☐ Other,

Demonstrated or Anticipated Impact on Form, Fit, Function or Reliability:

No Fit/Form/Function change with alternative EMC.

UL file update for all ISO type packages are ongoing which expect to be completed in 3-4 months.

LF Qualification Plan/Results:

Pass.

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.

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PCN Report

Prepared By : Zhiwei Wang, Product Marketing Manager
Date : Aug 14th, 2020
Products : IXYS Germany Discrete Products
Revision : A

1.0 Objective:

This qual report covers Samsung SDI EMC replacement for various package types of IXYS Germany Discrete Products.

2.0 Applicable Products:

IXYS Germany Discrete Products in ISOPLUS i4-PAK, ISO247, ISOPLUS247, ISOPLUS220, ISOPLUS264, TO-220FP, TO-252, TO-252HV, TO-264 package types.

Detail part number list pls refer to “7.0 Affected part number list” for details.

3.0 Physical Differences/Changes:

No change.

4.0 Comparison of Package outline dimensions specifications

No change

5.0 Qualification Test Result

All samples passed parametric and reliability test standard by Littelfuse/IXYS.

Part Number	Package	Test Item	Sample	Result
LKK47-06C5	ISOPLUS264	HTRB -1000hrs, 125C ,480V DC	0/20	Pass
		H3TRB – 1000hrs, 100DC, 85C, 85%RH	0/20	Pass
		Temp Cycle - 100cycles, -55C~150C	0/20	Pass
IXA4IF1200UC	TO-252	HTRB - 1000hrs, 125C ,960V DC	0/20	Pass
		H3TRB – 1000hrs, 100DC, 85C, 85%RH	0/20	Pass
		Temp Cycle - 100cycles, -40C~150C	0/20	Pass
DPG60C300HJ	ISOPLUS247	HTRB -1000hrs, 150C ,240V DC	0/20	Pass
		Temp Cycle - 100cycles, -55C~150C	0/20	Pass

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FBO16-12N	ISOPLUS i4-PAK	HTRB -1000hrs, 150C ,840V DC	0/20	Pass
		Temp Cycle - 100cycles, -55C~150C	0/20	Pass
DSA15IM200UC	TO-252	HTRB -1000hrs, 150C ,200V DC	0/20	Pass
		Temp Cycle - 100cycles, -55C~150C	0/20	Pass
DPG10IM300UC	TO-252	HTRB -1000hrs, 150C ,240V DC	0/20	Pass
		Temp Cycle - 100cycles, -55C~150C	0/20	Pass
DSEE15-12CC	ISOPLUS220	HTRB -1000hrs, 150C ,480V DC	0/20	Pass
		Temp Cycle - 100cycles, -55C~150C	0/20	Pass
DNA120E2200KO	ISOPLUS264	HTRB -1000hrs, 150C ,1540V AC	0/20	Pass
		Temp Cycle - 100cycles, -55C~150C	0/20	Pass
DNA30E2200FE	ISOPLUS i4-PAK	HTRB -1000hrs, 150C ,1540V AC	0/20	Pass
		Temp Cycle - 100cycles, -55C~150C	0/20	Pass
DSI45-16AR	ISOPLUS247	HTRB -1000hrs, 150C ,1120V AC	0/20	Pass
		Temp Cycle - 100cycles, -55C~150C	0/20	Pass
DPG10P400PJ	ISOPLUS220	HTRB -1000hrs, 150C ,320V DC	0/20	Pass
		Temp Cycle - 100cycles, -55C~150C	0/20	Pass
CLA40MT1200NHR	ISO247	HTRB -1000hrs, 125C ,840V AC	0/20	Pass
		Temp Cycle - 100cycles, -40C~150C	0/20	Pass
DPG20C200PN	TO220FP	HTRB -1000hrs, 150C ,160V DC	0/20	Pass
		Temp Cycle - 100cycles, -40C~150C	0/20	Pass
CMA30E1600PN	TO220FP	HTRB -1000hrs, 125C ,1120V AC	0/20	Pass
		Temp Cycle - 100cycles, -40C~150C	0/20	Pass
CLA100E1200KB	TO-264	HTRB -1000hrs, 125C ,840V DC	0/20	Pass
		Temp Cycle - 100cycles, -40C~150C	0/20	Pass

6.0 Recommendations & Conclusions:

Base on the above qualification test results, Littelfuse/IXYS judged that alternative EMC can pass the release criterion and ready to start mass production for affected products.

7.0 Affected part number list

Part Name	Package Type	Technology Type
LKK4706C5	ISOPLUS264	MOSFET
IXA40I4000KN	ISOPLUS264	IGBT
IXG5I4500KN	ISOPLUS264	IGBT
IXG65I3300KN	ISOPLUS264	IGBT
IXLF19N220A_250A_300A	ISOPLUS i4-PAK	IGBT
FII50-12EL	ISOPLUS i4-PAK	IGBT+Diode
FBE22-06NI	ISOPLUS i4-PAK	Diode

FMD47-06KC5	ISOPLUS i4-PAK	MOSFET
FBS10-12SC TDI	ISOPLUS i4-PAK	Diode
CMA30P1600FC	ISOPLUS i4-PAK	Thyristor
CMA50P1600FC	ISOPLUS i4-PAK	Thyristor
FMD15-06KC5	ISOPLUS i4-PAK	MOSFET
FDM15-06KC5	ISOPLUS i4-PAK	MOSFET
FDM47-06KC5	ISOPLUS i4-PAK	MOSFET
FBS16-06SC	ISOPLUS i4-PAK	Diode
FBO40-12N	ISOPLUS i4-PAK	Diode
FUO22-08_12_16N	ISOPLUS i4-PAK	Diode
FII40-06D	ISOPLUS i4-PAK	IGBT+Diode
FMD21-05QC	ISOPLUS i4-PAK	MOSFET+Diode
FBO16-08_12N	ISOPLUS i4-PAK	Diode
FUE30-12N1	ISOPLUS i4-PAK	Diode
CS45-16IO1R	ISOPLUS247	Thyristor
DSS17-06CR	ISOPLUS247	Diode
IRA37IH1200HJ	ISOPLUS247	IGBT+Diode
DSA90C200HR	ISO247	Diode
DMA50P1200HR	ISO247	Diode
CLA60MT1200HR	ISO247	Thyristor
CLA40E1200HR	ISO247	Thyristor
CMA40E1600HR	ISO247	Thyristor
DMA30P1600HR	ISO247	Diode
MKH24I650HR	ISO247	MOSFET
CLA80MT1200NHR	ISO247	Thyristor
CMA60MT1600NHR	ISO247	Thyristor
DPF30P600HR	ISO247	Thyristor
ITF48IF1200HR	ISO247	IGBT+Diode
DMA10P1200HR	ISO247	Diode
CLA40MT1200NHR	ISO247	Thyristor
DMA10P1600HR	ISO247	Diode
DCG20C1200HR	ISO247	Diode
DCG10P1200HR	ISO247	Diode
DCG35C1200HR	ISO247	Diode
DCG17P1200HR	ISO247	Diode
CMA80MT1600NHR	ISO247	Thyristor
DSSK70-008AR	ISOPLUS247	Diode
IXKC20N60C	ISOPLUS220	MOSFET
CS29-08_12 IO1C	ISOPLUS220	Thyristor
DSEE15-12CC	ISOPLUS220	Diode

DSEE29-12CC	ISOPLUS220	Diode
IXKC40N60C	ISOPLUS220	MOSFET
DSEC 29-06AC	ISOPLUS220	Diode
IXUC200N055	ISOPLUS220	MOSFET
IXKC25N80C	ISOPLUS220	MOSFET
DSEE8-08CC	ISOPLUS220	Diode
DSS20-01AC	ISOPLUS220	Diode
IXKC13N80C	ISOPLUS220	MOSFET
IXKC23N60C5	ISOPLUS220	MOSFET
IXKC19N60C5	ISOPLUS220	MOSFET
IXKC15N60C5	ISOPLUS220	MOSFET
DSEC 16-06AC	ISOPLUS220	Diode
DSEC 59-06BC	ISOPLUS220	Diode
DPG10P400PJ	ISOPLUS220	Diode
CSM1214PI	ISOPLUS220	Diode
FMD40-06KC	ISOPLUS i4-PAK	MOSFET
FBS10-06SC	ISOPLUS i4-PAK	Diode
FUO50-16N	ISOPLUS i4-PAK	Diode
IXKR40N60C	ISOPLUS247	MOSFET
DSSS30-01AR	ISOPLUS247	Diode
DSSS35-008AR	ISOPLUS247	Diode
DSSK60-015AR	ISOPLUS247	Diode
DSSK60-02AR	ISOPLUS247	Diode
IXER35N120D1	ISOPLUS247	IGBT+Diode
DSEP30-06BR	ISOPLUS247	Diode
IXKR25N80C	ISOPLUS247	MOSFET
DSEP75-06AR	ISOPLUS247	Diode
DSEP30-12AR	ISOPLUS247	Diode
IXER20N120D1	ISOPLUS247	IGBT+Diode
DSEP60-12AR	ISOPLUS247	Diode
DPG60C300HJ	ISOPLUS247	Diode
DSEP15-12CR	ISOPLUS247	Diode
DSP25-16AR	ISOPLUS247	Diode
DPH30IS600HI	ISOPLUS247	Diode
IXKR47N60C5	ISOPLUS247	MOSFET
DSI45-16AR	ISOPLUS247	Diode
IXA55I1200HJ	ISOPLUS247	IGBT
IXA37IF1200HJ	ISOPLUS247	IGBT+Diode
IXA17IF1200HJ	ISOPLUS247	IGBT+Diode
IXA27IF1200HJ	ISOPLUS247	IGBT+Diode

DSP45-16AR	ISOPLUS247	Diode
DHG55I3300 FE	ISOPLUS i4-PAK	Diode
DNA30E2200FE	ISOPLUS i4-PAK	Diode
CS1710	ISOPLUS i4-PAK	Thyristor
CNA30E2200FB	ISOPLUS i4-PAK	Thyristor
MKE11R600DCGFC	ISOPLUS i4-PAK	IC/SSR
CLA40P1200FC	ISOPLUS i4-PAK	Thyristor
MXB12R650DCGFC	ISOPLUS i4-PAK	IC/SSR
CSM1214PI	ISOPLUS220	Diode
DPG10P400 PJ	ISOPLUS220	Diode
DPG30P300 PJ	ISOPLUS220	Diode
DPG30P400 PJ	ISOPLUS220	Diode
IXA37IF1200HJ	ISOPLUS247	IGBT
IXA17IF1200HJ	ISOPLUS247	IGBT
IXA27IF1200HJ	ISOPLUS247	IGBT
CS60-16IO1R	ISOPLUS247	Thyristor
DPH30IS600 HI	ISOPLUS247	Diode
DSS17-06CR	ISOPLUS247	Diode
DSEP30-12 CR	ISOPLUS247	Diode
DSEP30-12AR	ISOPLUS247	Diode
DSEP30-06BR	ISOPLUS247	Diode
DSI 45-16 AR	ISOPLUS247	Diode
DSEI30-10AR	ISOPLUS247	Diode
DPF 60C200 HJ	ISOPLUS247	Diode
DSEK60-02AR	ISOPLUS247	Diode
DSIK45-16AR	ISOPLUS247	Diode
DSSK80-006BR	ISOPLUS247	Diode
IXDR30N120D1	ISOPLUS247	IGBT
CS45-16IO1R	ISOPLUS247	Thyristor
DHG40I4500KO	ISOPLUS264	Diode
DNA120E2200KO	ISOPLUS264	Diode
CSM160KP	ISOPLUS264	IC/SSR
CSM162KP	ISOPLUS264	IC/SSR
CLA100E1200KB	TO-264	Thyristor
CLA5E1200UC	TO-252	Thyristor
CLA5E1200UC	TO-252	Thyristor
CMA30E1600PN	TO-220FP	Thyristor
CS22-08IO1M	TO-220FP	Thyristor
CS22-12IO1M	TO-220FP	Thyristor
DFE10I600PM	TO-220FP	Diode

DHG10I1200PM	TO-220FP	Diode
DHG10I600PM	TO-220FP	Diode
DHG5I600PM	TO-220FP	Diode
DLA10IM800UC	TO-252	Diode
DLA5P800UC	TO-252	Diode
DMA10P1200UZ-TRL	TO-252HV	Diode
DPG10I200PM	TO-220FP	Diode
DPG10I400PM	TO-220FP	Diode
DPG10IM300UC	TO-252	Diode
DPG15I400PM	TO-220FP	Diode
DPG20C200PN	TO-220FP	Diode
DPG20C300PN	TO-220FP	Diode
DPG20C400PN	TO-220FP	Diode
DSA10C150UC	TO-252	Diode
DSA10I100PM	TO-220FP	Diode
DSA10IM100UC	TO-252	Diode
DSA15IM200UC	TO-252	Diode
DSA20C100PN	TO-220FP	Diode
DSA20C150PN	TO-220FP	Diode
DSA20C60PN	TO-220FP	Diode
DSA30C100PN	TO-220FP	Diode
DSB10I45PM	TO-220FP	Diode
DSB15IM30UC	TO-252	Diode
DSB20C60PN	TO-220FP	Diode
DSEP6-06AS	TO-252	Diode
DSS6-0025BS	TO-252	Diode
DSS6-0045AS	TO-252	Diode
DSS6-015AS	TO-252	Diode
IXA4I1200UC	TO-252	IGBT
IXA4IF1200UC	TO-252	IGBT