



Product Change Notification



Product Group: Diodes Division / March 9, 2020 / PCN-DD-004-2020 Rev 0

Improvement of FRED Die Passivation and Mold Compound Change

DESCRIPTION OF CHANGE: Vishay Semiconductors announces the introduction of an additional Silicon Nitride layer in passivation, on below FRED part numbers. Part Numbers in TO-247 package will also change the Mold Compound from SG-8200DTV to EME-E-500HAC. The new mold compound is halogen free as the current one.

CLASSIFICATION OF CHANGE: Wafer/Chip/Pellet Process/Structure Molding

REASON FOR CHANGE: Passivation: Continuous improvement
Mold Compound: discontinuation in the supply of the actual Mold Compound.

EXPECTED INFLUENCE ON QUALITY/RELIABILITY/PERFORMANCE: There will be no effect on quality, reliability or electrical performance.

PRODUCT CATEGORY: Diodes, Die & Wafers

PART NUMBERS/SERIES/FAMILIES AFFECTED:

Package	Family	Part Number	Mold Compound change
Die on film	FREDS	VS-4FD081H06A6FC	
Die on film	FREDS	VS-4FD081H06A6FCS1	
Die on film	FREDS	VS-4FD121H07A6FC	
Die on film	FREDS	VS-4FD121U07A6FC	
Die on film	FREDS	VS-4FD081U06A6FC	
Die on film	FREDS	VS-4FD063H06A6FCS1	
Die on film	FREDS	VS-4FD063H06A6FC	
Die on film	FREDS	VS-4FD121U06A6FCS1	
Die on film	FREDS	VS-4FD282H07A6FC	
Die on film	FREDS	VS-4FD198H06A6FC	
Die on film	FREDS	VS-4FD121U06A6FC	
Die on film	FREDS	VS-4FD198H07A6FC	
Die on film	FREDS	VS-4FD378U06A6FC	
Die on film	FREDS	VS-4FD236H06A6FC	
Die on film	FREDS	VS-4FD447U06A6FC	
Die on film	FREDS	VS-4FD236H07A6FC	
Die on film	FREDS	VS-4FD198U06A6FC	
Die on film	FREDS	VS-4FD198U07A6FC	
Die on film	FREDS	VS-4FD121H06A6FC	
Die on film	FREDS	VS-4FD236U06A6FC	

Package	Family	Part Number	Mold Compound change
Die on film	FREDS	VS-4FD335U07A6FC	
Die on film	FREDS	VS-4FD236U07A6FC	
Die on film	FREDS	VS-4FD156H06A6FC	
Die on film	FREDS	VS-4FD282U07A6FC	
Die on film	FREDS	VS-4FD156H07A6FC	
Die on film	FREDS	VS-4FD378H07S6FCT	
Die on film	FREDS	VS-4FD378H06A6FC	
Die on film	FREDS	VS-4FD156U06A6FC	
Die on film	FREDS	VS-4FD378H07V6FCS1	
Die on film	FREDS	VS-4FD156U07A6FC	
Die on film	FREDS	VS-4FD282H06A6FC	
Die on film	FREDS	VS-4FD378H07A6FC	
Die on film	FREDS	VS-4FD447H06A6FC	
Die on film	FREDS	VS-4FD378U07A6FC	
Die on film	FREDS	VS-4FD282U06A6FC	
Die on wafer	FREDS	VS-4FD081H06A6BC	
Die on wafer	FREDS	VS-4FD121H07A6BC	
Die on wafer	FREDS	VS-4FD335H06A6BC	
Die on wafer	FREDS	VS-4FD121U07A6BC	
Die on wafer	FREDS	VS-4FD335H07A6BC	
Die on wafer	FREDS	VS-4FD081U06A6BC	
Die on wafer	FREDS	VS-4FD063H06A6BC	
Die on wafer	FREDS	VS-4FD282H07A6BC	
Die on wafer	FREDS	VS-4FD198H06A6BC	
Die on wafer	FREDS	VS-4FD121U06A6BC	
Die on wafer	FREDS	VS-4FD198H07A6BC	
Die on wafer	FREDS	VS-4FD378U06A6BC	
Die on wafer	FREDS	VS-4FD236H06A6BC	
Die on wafer	FREDS	VS-4FD447U06A6BC	
Die on wafer	FREDS	VS-4FD236H07A6BC	
Die on wafer	FREDS	VS-4FD198U06A6BC	
Die on wafer	FREDS	VS-4FD198U07A6BC	
Die on wafer	FREDS	VS-4FD121H06A6BC	
Die on wafer	FREDS	VS-4FD335U06A6BC	
Die on wafer	FREDS	VS-4FD236U06A6BC	
Die on wafer	FREDS	VS-4FD335U07A6BC	
Die on wafer	FREDS	VS-4FD236U07A6BC	
Die on wafer	FREDS	VS-4FD156H06A6BC	

Package	Family	Part Number	Mold Compound change
Die on wafer	FREDS	VS-4FD282U07A6BC	
Die on wafer	FREDS	VS-4FD156H07A6BC	
Die on wafer	FREDS	VS-4FD081H07A6BC	
Die on wafer	FREDS	VS-4FD378H06A6BC	
Die on wafer	FREDS	VS-4FD156U06A6BC	
Die on wafer	FREDS	VS-4FD156U07A6BC	
Die on wafer	FREDS	VS-4FD282H06A6BC	
Die on wafer	FREDS	VS-4FD081H07A6BCS1	
Die on wafer	FREDS	VS-4FD378H07A6BC	
Die on wafer	FREDS	VS-4FD447H06A6BC	
Die on wafer	FREDS	VS-4FD378U07A6BC	
Die on wafer	FREDS	VS-4FD282U06A6BC	
Fullpak-220	FREDS	VS-E4TU2006FP-N3	
TO-247 LL	FREDS	VS-E4PH6006LHN3	x
TO-247 LL	FREDS	VS-E4PH6006L-N3	x
TO-247 LL	FREDS	VS-C4PU3006LHN3	x
TO-247 LL	FREDS	VS-C4PU3006L-N3	x
TO-247 LL	FREDS	VS-E4PU6006LHN3	x
TO-247 LL	FREDS	VS-E4PU6006L-N3	x
TO-247 LL	FREDS	VS-C4PH3006LHN3	x
TO-247 LL	FREDS	VS-C4PH3006L-N3	x
TO-247 LL	FREDS	VS-C4PH6006LHN3	x
TO-247 LL	FREDS	VS-C4PH6006L-N3	x
TO-247 LL	FREDS	VS-E4PH3006LHN3	x
TO-247 LL	FREDS	VS-E4PH3006L-N3	x
TO-247 LL	FREDS	VS-C4PU6006LHN3	x
TO-247 LL	FREDS	VS-C4PU6006L-N3	x
TO-247 LL	FREDS	VS-E4PU3006LHN3	x
TO-247 LL	FREDS	VS-E4PU3006L-N3	x

VISHAY BRAND(s): Vishay Semiconductors

TIME SCHEDULE: Starting from May 11, 2020 Vishay may start to ship with the new die passivation and mold compound.

SAMPLE AVAILABILITY: On customer request

PRODUCT IDENTIFICATION: N/A

QUALIFICATION DATA: See annex 1 & 2

This PCN is considered approved, without further notification, unless we receive specific customer written concerns before May 11, 2020 or as specified by contract

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ANNEX 1 – New Termination Improvement Qualification Report

P/N PACKAGE PROCESS Metalization		C4PU3006L TO-247 Al	MTP-200A MTP Al	VS-E4PH5007L-N3 TO-247 Al	VS-E4TH1206-N3 TO-220 Ag
FAB PROCESS MOLDING		FRED SG-8200DTV	FRED N/A	FRED EME-E-500HAC	FRED EME-E-500HAC
		3567	3568	3575	3576
Test Item & Condition	Duration				
HTRB <u>Max Tj @ 100% Vr</u>	Condition				
	168 Hrs	0/77	0/9	0/77	0/77
	500 Hrs	0/77	0/9	0/77	0/77
	1000 Hrs	0/77	0/9	0/77	0/77
Temperature Cycling <u>@-55°C / +150°C / 30min.</u>	Condition				
	250 Cycles	0/77	0/9	0/77	0/77
	500 Cycles	0/77	0/9	0/77	0/77
	1000 Cycles	0/77	0/9	0/77	0/77
UHAST <u>@Ta= 130°C, 85%R.H.</u>	Condition				
	48 Hrs	0/77	0/9	0/77	0/77
	96 Hrs	0/77	0/9	0/77	0/77
IOL <u>Delta Tj=100°C T0n/Toff >= 2min</u>	Condition				
	500 Hrs	0/77	0/9	0/77	0/77
	1000 Hrs	0/77	0/9	0/77	0/77
H3TRB <u>85°C 85% HR @ 100V</u>	Condition				
	168 Hrs	0/77	0/9	0/77	0/77
	500 Hrs	0/77	0/9	0/77	0/77
	1000 Hrs	0/77	0/9	0/77	0/77

ANNEX 2 – Mold Compound Qualification Report

P/N PACKAGE PROCESS Metalization Mold Compound FAB PROCESS	VS-6TQ035HN3 TO220 Al EME-E500HAC. Schottky	VS-HFA25TB60HN3 TO220 Al EME-E500HAC. Hexfred	VS-30ETU12THN3 TO220 Al EME-E500HAC. FRD	VS-25TTS12HM3 TO220 Al EME-E500HAC. SCR	VS-20ETS16THM3 TO220 Al EME-E500HAC. Rectifier	VS-HFA08PB60-N3 TO247 Al EME-E500HAC. Hexfred	VS-40L15CW-N3 TO247 Al EME-E500HAC. Schottky
Test Item & Condition	Duration						
HTRB	Condition						
Max Tj @ 100% Vr	168 Hrs	0/77	0/77	0/77	0/77	0/77	0/77
	500 Hrs	0/77	0/77	0/77	0/77	0/77	0/77
	1000 Hrs	0/77	0/77	0/77	0/77	0/77	0/77
	2000 Hrs					0/77	
Temperature Cycling @-55°C / +150°C / 30min.	Condition						
	250 Cycles	0/77	0/77	0/77	0/77	0/77	0/77
	500 Cycles	0/77	0/77	0/77	0/77	0/77	0/77
	1000 Cycles	0/77	0/77	0/77	0/77	0/77	0/77
UHAST @Ta= 130°C , 85%R.H.	Condition						
	48 Hrs	0/77	0/77	0/77	0/77	0/77	0/77
	96 Hrs	0/77	0/77	0/77	0/77	0/77	0/77
IOL Delta Tj=100°C T0n/Toff >= 2min	Condition						
	500 Hrs	0/77	0/77	0/77	0/77	0/77	0/77
	1000 Hrs	0/77	0/77	0/77	0/77	0/77	0/77
H3TRB 85°C 85% HR @ 100V	Condition						
	168 Hrs		0/77		0/77		0/77
	500 Hrs		0/77		0/77		0/77
	1000 Hrs		0/77		0/77		0/77
HAST 130°C 85%HR @42V	Condition						
	96 Hrs	0/77		0/77		0/77	0/77
Solder Dip (TH) 280°C/10sec	Condition						
	96 Hrs	0/30	0/30	0/30	0/30	0/30	0/30
Solderability	Condition						
	96 Hrs	0/15	0/15	0/15	0/15	0/15	0/15

P/N PACKAGE PROCESS Metalization Mold Compound FAB PROCESS	VS-63CPQ100HN3 TO247 Al EME-E500HAC. Schottky	VS-EPU6006-N3 TO247 Al EME-E500HAC. FRED	VS-50TPS12LHM3 TO247 Al EME-E500HAC. SCR	VS-HFA30PB120HN3 TO247 Al EME-E500HAC. Hexfred	VS-75EPU12LHN3 TO247 Al EME-E500HAC. FRED	VS-65EPS16LHM3 TO247 Al EME-E500HAC. Rectifier
Test Item & Condition	Duration					
HTRB	Condition					
Max Tj @ 100% Vr	168 Hrs	0/77	0/77	0/77	0/77	0/77
	500 Hrs	0/77	0/77	0/77	0/77	0/77
	1000 Hrs	0/77	0/77	0/77	0/77	0/77
	2000 Hrs					0/77
Temperature Cycling @-55°C / +150°C / 30min.	Condition					
	250 Cycles	0/77	0/77	0/77	0/77	0/77
	500 Cycles	0/77	0/77	0/77	0/77	0/77
	1000 Cycles	0/77	0/77	0/77	0/77	0/77
UHAST @Ta= 130°C , 85%R.H.	Condition					
	48 Hrs	0/77	0/77	0/77	0/77	0/77
	96 Hrs	0/77	0/77	0/77	0/77	0/77
IOL Delta Tj=100°C T0n/Toff >= 2min	Condition					
	500 Hrs	0/77	0/77	0/77	0/77	0/77
	1000 Hrs	0/77	0/77	0/77	0/77	0/77
H3TRB 85°C 85% HR @ 100V	Condition					
	168 Hrs	0/77		0/77	0/77	
	500 Hrs	0/77		0/77	0/77	
	1000 Hrs	0/77		0/77	0/77	
HAST 130°C 85%HR @42V	Condition					
	96 Hrs		0/77		0/77	0/77
Solder Dip (TH) 280°C/10sec	Condition					
	96 Hrs	0/30	0/30	0/30	0/30	0/30
Solderability	Condition					
	96 Hrs	0/15	0/15	0/15	0/15	0/15