

PRODUCT CHANGE NOTICE PCN Form (D4-E000-73)

PCN#21-003

NOTIFICATION DATE: March 5, 2021

MODELS AFFECTED:

LTCC Series products **BFCN, DLFCN, HFCN, HFCV, KLPF, LFCN, LFCV, NBP, SCG, SCN, SYBP, VBF, VGD, VHF, VLF, VLFX, ZSN, ZX60** (*see attached list*)

EXTENT OF CHANGE:

Transition to alternate qualified ceramic substrate materials

EFFECT OF CHANGE:

- No change to **Fit** (Dimensions) or **Form** (Appearance)
- No change to **Function** (Performance) is anticipated based on initial evaluations

REASON FOR CHANGE:

- Discontinuation of supplier Pb containing ceramic substrate material that is critical to RF performance.
- Alternate Pb-free material currently under evaluation and qualification to comply with EU RoHS expiration of exemption 7(c)I

NOTE: Our objective is that 'NEW' parts will be equivalent in performance to discontinued parts.

EFFECTIVE DATE OF CHANGE:

Immediate on exhaustion of existing stock

QUESTIONS?

Please refer to **FAQ** (Frequently Asked Questions) and/or [CONTACT US](#).

FREQUENTLY ASKED QUESTIONS:

1) Please explain reason for the PCN

PCN is issued to notify customers of a change to the materials used in the LTCC substrate.

2) Why are materials being changed?

The ceramics used until now have been discontinued by the manufacturer to comply with the EU RoHS regulation to eliminate Pb (lead) content

3) Why was Pb considered RoHS compliant until now?

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Since origination in 2006, the EU RoHS allowed for several exemptions, including 7(C)I for Pb in ceramic. This exemption was originally scheduled to expire in 2021. This expiration, however, was suspended in 2020 pending review of appeals by major component manufacturers to allow for time to implement Pb-free product.

Such applications typically ‘freeze’ the process for 18 to 24 months. See reference below including links to other exemptions under review. https://ec.europa.eu/environment/waste/rohs_eee/adaptation_en.htm

4) What were Mini-Circuits’ actions in preparation for the expiration?

Mini-Circuits learned that our ceramic supplier was developing a Pb-free ceramic in preparation of the RoHS expiration of the exemption. We initiated a project to evaluate our entire LTCC product line using the Pb-free materials in 2019. We did not, however, learn that the ceramic supplier was completely discontinuing the Pb content material until mid-2020, and did not have sufficient samples of new material to analyze. We were fortunate to have a project in place in any event.

5) Will the Pb-free ceramic be a direct equivalent to the existing ceramic?

Over the years, Mini-Circuits has introduced hundreds of LTCC products (ex: filters, splitters, etc). We are committed to evaluating each and every one of them to verify RF performance with the objective of having them be direct equivalents. In some cases, a redesign of layer structure and thickness may be needed to accomplish this. Evaluations done to date give us confidence in our ability to meeting this objective. We will, however, provide notification of change to Function (Performance) in situations where changes are needed.

6) How is the transition being handled? Can we continue to receive the ‘original’ parts?

Mini-Circuits’ policy has always been to maintain high stock levels based on our history and expectation of customer demands. We were able to secure a significant last time buy of the original ceramic material. This material will be allocated based on our projections of usage by individual part numbers.

7) Will customers be able to have a last time buy of the original part numbers during the transition?

Please, contact your Account Manager or PCN@minicircuits.com with the Part Number and LTB quantity required and we will review for feasibility to support

8) How will we know which version we will be receiving? Will part number be changed?

We will not be creating new part numbers as we anticipate the new parts to be equivalent. In addition, we understand that changes to part numbers creates documentation issues for customers. Our approach for identification will be to identify the lot numbers of parts received with new materials and identify this on the label. Alphanumeric device markings will identify new material.

9) What is the RoHS status of the original Pb containing ceramic LTCC parts?

Mini-Circuits will continue to consider original Pb containing ceramic parts to be RoHS complaint based on the suspension of the 7(C)I exemption 2021 expiration date.

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10) What is your Qualification process?

Mini-Circuits is performing detailed qualifications for key part categories based on function, frequency range and case style. Individual part numbers will be evaluated for performance against the original material.

11) Can customers obtain 'new' material parts while 'old' materials are still in stock?

'New' material parts will be based on our availability lead time. We will issue requests for 'new' material as a 'special' while 'old' material stock exists in order to distinguish them. We will not be combining old and new on individual reels.

12) Will pricing change?

We do not anticipate a price change at this time resulting from this material change

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Attachment to PCN#21-003

** List of Affected Models **				
BFCN-1560+	HFCN-440-10+	LFCN-120-8	LFCN-3400D+	LFCN-95
BFCN-1560+TRH	HFCN-440-2+	LFCN-140-1	LFCN-3400D-1+	LFCN-95+
BFCN-1560-1+	HFCN-440-3	LFCN-140-2+	LFCN-3400D-1-1+	LFCN-95-1
BFCN-1560-2+	HFCN-440-5+	LFCN-160+	LFCN-3400D-2	LFCN-95-2
BFCN-1580-1+	HFCN-440-6	LFCN-160+TRH	LFCN-3400D-3+	LFCN-95-3
BFCN-1690+	HFCV-145+	LFCN-160-1+	LFCN-3500-1+	LFCN-95-4
BFCN-2555+	HFCV-145-3+	LFCN-160-2+	LFCN-400D+	LFCN-95-5+
BFCN-2555-1+	K1-SCG+	LFCN-160-5+	LFCN-490D+	LFCN-95-6
BFCN-2555-2+	K1-VHF+	LFCN-160-9+	LFCN-490D-1+	LFCN-95-7
BFCN-2555-5	K1-VLF+	LFCN-180	LFCN-530D+	LFCN-95-8
BFCN-2700+	K3-LFCN+	LFCN-180+	LFCN-530D-1+	LFCN-95-9
BFCN-2700-1+	K4-VLF+	LFCN-180-1	LFCN-575D+	LFCN-95-9+
BFCN-2800-2+	KH-BFCN+	LFCN-180-2	LFCN-630D+	LFCV-45+
BFCN-2840+	KH-HFCN-1+	LFCN-180-3+	LFCN-630D-1+	LFCV-45-2+
BFCN-2850+	KH-LFCN+	LFCN-180-4	LFCN-630D-2+	LFCV-45-3+
BFCN-2900+	K-LFCN-1.7K+	LFCN-180-4+	LFCN-630D-3+	LFCV-45-4+
BFCN-2910+	KLPF-1+	LFCN-190+	LFCN-630D-4+	LFCV-52
BFCN-2975+	K-LTCC	LFCN-190-2+	LFCN-80	LFCV-52+
BFCN-3010+	LFCN-105	LFCN-190-3+	LFCN-80+	LFCV-52-2
BFCN-3010=	LFCN-105+	LFCN-190-4+	LFCN-80-1	LFCV-52-3+
BFCN-3010-1	LFCN-105-1+	LFCN-195-1	LFCN-80-11+	NBP-1560+
BFCN-3010-4+	LFCN-105-2+	LFCN-225D+	LFCN-80-12+	SCG-2-242+
BFCN-3085+	LFCN-105-3	LFCN-291-1+	LFCN-80-13+	SCG-2-242=
BFCN-3085+ RC	LFCN-105-4+	LFCN-291-1PM+	LFCN-80-14+	SCG-2-242-1+
BFCN-3085A+	LFCN-105-5	LFCN-291-1PM-1+	LFCN-80-17	SCG-2-242-2+
BFCN-3115+	LFCN-105-9	LFCN-320D+	LFCN-80-17+	SCG-2-242-3F
BFCN-3115+TRH	LFCN-105-9+	LFCN-320D-1+	LFCN-80-2	SCG-2-322+
BFCN-3115-3+	LFCN-120	LFCN-3400+	LFCN-80-20+	SCG-2-592+
BFCN-3115-4	LFCN-120+	LFCN-3400=	LFCN-80-21EDU	SCG-3-162+
BFCN-3150-1+	LFCN-120-1+	LFCN-3400-1+	LFCN-80-21F	SCG-3-162-1+
BFCN-3150-2+	LFCN-120-13	LFCN-3400-12+	LFCN-80-22F	SCG-3-162-2+
BFCN-4300-1+	LFCN-120-13+	LFCN-3400-2+	LFCN-80-3+	SCG-3-262+
BFCN-4440+	LFCN-120-2	LFCN-3400-3+	LFCN-80-4+	SCG-3-592+
BFCN-4440-1+	LFCN-120-3	LFCN-3400-4+	LFCN-80-5+	SCN-3-13
DLFCN-290+	LFCN-120-4+	LFCN-3400-5	LFCN-80-7+	SCN-3-13+
HFCN-425-1+	LFCN-120-5	LFCN-3400-7	LFCN-80-8	SCN-3-13-2
HFCN-440+	LFCN-120-6+	LFCN-3400-8	LFCN-80-9	SCN-3-13-4+
HFCN-440+TRH	LFCN-120-7+	LFCN-3400-9	LFCN-865-1+	SCN-3-13-7

AS9100 ISO9001 ISO14001 Certified to QMS and EMS

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SCN-3-16	TB-BFCN-2700+	TB-LFCN-190+	TB-SCG-3-162+	VLF-160+
SCN-3-16+	TB-BFCN-2840+	TB-LFCN-225D+	TB-SCG-3-262+	VLF-180
SCN-3-16-1	TB-BFCN-2850+	TB-LFCN291-1PM+	TB-SCN-3-13	VLF-180+
SCN-3-16-2	TB-BFCN-2900+	TB-LFCN-320D+	TB-SCN-3-13+	VLF-190+
SCN-3-20-1+	TB-BFCN-2910+	TB-LFCN-3400+	TB-SCN-3-16+	VLF-3400+
SCN-3-20-2+	TB-BFCN-2975+	TB-LFCN-3400D+	TB-SCN-3-28	VLF-45+
SCN-3-28	TB-BFCN-3010+	TB-LFCN3400D-1+	TB-SCN-3-28+	VLF-52+
SCN-3-28+	TB-BFCN-3085+	TB-LFCN-400D+	TB-SYBP-675+	VLF-80+
SCN-3-28-1+	TB-BFCN-3085A+	TB-LFCN-490D+	VBF-1560+	VLF-95+
SCN-3-28-3	TB-BFCN-3115+	TB-LFCN-530D+	VBF-1732-1+	VLF-95-1+
SCN-3-28-6	TB-BFCN-4440+	TB-LFCN-575D+	VBF-2555+	VLFX-105+
SCN-3-28-7	TB-DLFCN-290+	TB-LFCN-630D+	VBF-2900+	VLFX-105-1
SCN-3-28-8	TB-HFCN-440+	TB-LFCN-80	VBF-4440+	VLFX-80+
SCN-3-28-9	TB-HFCV-145+	TB-LFCN-80+	VBF-4650-1+	VLFX-80-2
SCN-3-28-NGCAC	TB-LFCN-105	TB-LFCN-95	VGD-1700-1+	ZSN-100A-1C+
SCN-3-28-NGCQA	TB-LFCN-105+	TB-LFCN-95+	VHF-145+	ZSN-191A-1C+
SYBP-675+	TB-LFCN-120	TB-LFCV-45+	VHF-440+	ZSN-3400A-1C+
TB-1018+	TB-LFCN-120+	TB-LFCV-52+	VHF-440-1+	ZX60-451LN-2+
TB-BFCN-1560+	TB-LFCN-160+	TB-SCG-2-242+	VLF-105+	
TB-BFCN-1690+	TB-LFCN-180	TB-SCG-2-322+	VLF-120	
TB-BFCN-2555+	TB-LFCN-180+	TB-SCG-2-592+	VLF-120+	