Initial Product/Process Change Notification

Document #:IPCN23766X

Issue Date:13 Jan 2021

Title of Change:	Reduction of Response Time after Boot Refresh to Improve System Transient Response Under a Wider Variety of Output Filters, Controller and System Configuration Options
Proposed First Ship date:	25 Jun 2021 or earlier if approved by customer
Contact Information:	Contact your local ON Semiconductor Sales Office or Ravi.Savanur@onsemi.com
PCN Samples Contact:	Contact your local ON Semiconductor Sales Office or <PCN.samples@onsemi.com>. Sample requests are to be submitted no later than 30 days from the date of first notification, Initial PCN or Final PCN, for this change. Samples delivery timing will be subject to request date, sample quantity and special customer packing/label requirements.
Type of Notification:	This is an Initial Product/Process Change Notification (IPCN) sent to customers. An IPCN is an advance notification about an upcoming change and contains general information regarding the change details and devices affected. It also contains the preliminary reliability qualification plan. The completed qualification and characterization data will be included in the Final Product/Process Change Notification (FPCN). This IPCN notification will be followed by a Final Product/Process Change Notification (FPCN) at least 90 days prior to implementation of the change. In case of questions, contact <PCN.Support@onsemi.com>
Marking of Parts/ Traceability of Change:	Revision on the Part marking will be changed as indicated below.
Change Category:	A feature is updated: design change
Change Sub-Category(s):	Product specific change

Sites Affected:	
ON Semiconductor Sites	**External Foundry/Subcon Sites**
None	None

Description and Purpose:

As stated in the datasheet: "*FDMF5062 and FDMF5071 monitor the Boot-SW voltage. If the voltage across the boot capacitor is lower than 3.3V, the FDMF5062 and FDMF5071 ignore the PWM input signal and starts the boot refresh cycle.*"

In order to improve the transient performance in a wider range of system designs, output filter selections, and controller configurations, the driver die for FDMF5062 and FDMF5071 will be modified to lower the boot refresh threshold to approximately 2.7V, and improve the time the power stage takes to respond to the PWM signal after a boot refresh. Only metal layers will be changed.

FDMF5062 Datasheet "Functional Description" FROM:

Boot Capacitor Refresh

FDMF5062 monitors the Boot−SW voltage. If the voltage across the boot capacitor is lower than 3.3 V, the FDMF5062 ignores the PWM input signal and starts the boot refresh cycle. The boot refresh cycle turns on the low side MOSFET for 200 ns every 7 ~ 14 μs until Boot−SW voltage is above 3.7 V. Usually a single refresh cycle is sufficient to re−charge the boot capacitor.

FDMF5062 Datasheet "Functional Description" TO:

Boot Capacitor Refresh

FDMF5062 monitors the Boot−SW voltage. If the voltage across the boot capacitor is lower than **2.7 V**, the FDMF5062 ignores the PWM input signal and starts the boot refresh cycle. The boot refresh cycle turns on the low side MOSFET for 200 ns every 7 ~ 14 μs until Boot−SW voltage is above **3.1 V**. Usually a single refresh cycle is sufficient to re−charge the boot capacitor.

Negative-OCP

  The FDMF5062 can detect large negative inductor current and protect the low side MOSFET. Once this negative current threshold is detected, SPS module takes control and truncates LS on−time pulse (LS FET is gated off regardless of PWM command). Driver will return to responding to PWM commands after 200 ns. So, if PWM is still being commanded LOW by the controller, then LS FET will turn back on.

Negative-OCP (NOCP)

  The FDMF5062 can detect large negative inductor current and protect the low side MOSFET. Once this negative current threshold is detected, **the driver will turn off the low side MOSFET for 200 ns. If the PWM signal remains low, the low side MOSFET will turn back on at the expiration of the 200 ns timer. If at any time the PWM goes high, even during the 200 ns, the high side MOSFET will turn on.**

FDMF5071 Datasheet "Functional Description" FROM:

Boot Capacitor Refresh

  FDMF5071 monitors the Boot−SW voltage. If the voltage across the boot capacitor is lower than 3.3 V, the FDMF5071 ignores the PWM input signal and starts the boot refresh cycle. The boot refresh cycle turns on the low side MOSFET for 200 ns every 7 ~ 14 μs until Boot−SW voltage is above 3.7 V. Usually a single refresh cycle is sufficient to re−charge the boot capacitor.

FDMF5071 Datasheet "Functional Description" TO:

Boot Capacitor Refresh

  FDMF5071 monitors the Boot−SW voltage. If the voltage across the boot capacitor is lower than **2.7 V**, the FDMF5071 ignores the PWM input signal and starts the boot refresh cycle. The boot refresh cycle turns on the low side MOSFET for 200 ns every 7 ~ 14 μs until Boot−SW voltage is above **3.1 V**. Usually a single refresh cycle is sufficient to re−charge the boot capacitor.

	From	To
Product marking change	5071 C1 XXXXXXX 5062 A0 XXXXXXX	5071 C4 XXXXXXX 5062 A1 XXXXXXX

Qualification Plan:

QV DEVICE NAME   FDMF3009
RMS W51121, F53306
PACKAGE PQFN 5x6 39ld

Test	Specification	Condition	Interval
HTOL	JESD22-A108	Ta= 125°C, 100 % max rated Vcc	1008 hrs
HTSL	JESD22-A103	Ta= 150°C	1008 hrs
TC	JESD22-A104	Ta= -65°C to +150°C	500 cyc
HAST	JESD22-A110	130°C, 85% RH, 18.8psig, bias	192 hrs
uHAST	JESD22-A118	130°C, 85% RH, 18.8psig, unbiased	96 hrs
PC	J-STD-020 JESD-A113	MSL 1 @ 260°C	TC, HAST, UHAST

QV DEVICE NAME   FDMF5071
RMS W75185
PACKAGE PQFN 5x6 39ld

Test	Specification	Condition	Interval
HTOL	JESD22-A108	Ta= 125°C, 100 % max rated Vcc	168 hrs

Estimated date for qualification completion 15 April 2021

List of Affected Parts:

Note: Only the standard (off the shelf) part numbers are listed in the parts list. Any custom parts affected by this PCN are shown in the customer specific PCN addendum in the PCN email notification, or on the PCN Customized Portal.

Part Number	Qualification Vehicle
FDMF5071	FDMF5071
FDMF5062	FDMF5071