# A \_ ab\_ C \_ -L P \_-D \_ b S 5

The NCP383 is a single input dual outputs power-distribution switch designed for applications where heavy capacitive loads and short-circuits are likely to be encountered, incorporating two very low  $R_{DS(on)}$ , N-channel MOSFETs in a single package. Each channel of the device limits the output current to a desired level by switching into a constant-current mode when the output load exceeds the current-limit threshold or a short circuit is present. The current-limit threshold is externally fixed by a pull down resistor placed between  $I_{lim}$  and GND. The power-switches rise and fall times are controlled to minimize current ringing during turn on/off.

An internal reverse–voltage detection comparator disables the power–switch if the output voltage is higher than the input voltage to protect devices on the input side of the switches.

The /FLAGx logic output asserts low during over-current, reverse-voltage or over temperature conditions. The switch is controlled by a logic enable input active low.

#### Features

- 2.7 V 5.5 V Operating Range
- Current limit: Adjustable up to 2.8 A
- ± 7.5% Current Limit Accuracy at 2.8 A
- Very fast Over–Current Detection Response: 2 µs (typ)
- 1 µA Maximum Standby Supply Current
- Under Voltage Lock-out (UVLO)
- Soft-Start Prevents Inrush Current
- Thermal Protection
- •

1

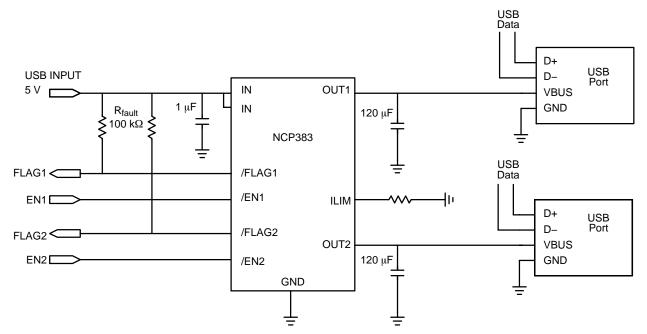


Figure 1. Typical Application Circuit: NCP383xMUAJxx

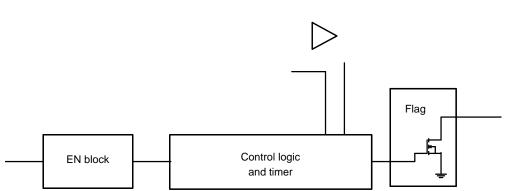
Adjustable Current limit on Channel 1 and Channel 2

#### PIN FUNCTION DESCRIPTION

Number

Pin Name

FMBERAB257940 59i201.7614192 9G.20)Tij4.772.60087.2827.07457452.214 351258pid811.2887908.868202383)T7.125(1.13515 TD(7



IN

OUT2

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
From IN to OUT1, From IN to OUT2 Supply Voltage (Note 1)	V <sub>IN</sub> , V <sub>OUT1</sub> ,V <sub>OUT2</sub>	-7.0 to +7.0	V
IN, OUT1,OUT2, /EN1, /EN2, /FLAG1, /FLAG2, ILIM Pins: In/Output (Note 1)	VIN , VOUT1, VOUT2, VEN1 , VEN2 , VFLAG1, VFLAG2, VILIM,	-0.3 to +7.0	V
/FLAG1, /FLAG2 Sink Current	I <sub>SINK</sub>	2	mA
ESD Withstand Voltage (IEC 61000–4–2) (output only, when bypassed with 1.0 $\mu F$ capacitor minimum)	ESD IEC	15 Air, 8 contact	kV
Human Body Model (HBM) ESD Rating are (Note 2)	ESD HBM	2000	V
Machine Model (MM) ESD Rating are (Note 2)	ESD MM	200	VNote

**ELECTRICAL CHARACTERISTICS** Min & Max Limits apply for  $T_A$  between  $-40^{\circ}C$  to  $+85^{\circ}C$  and  $T_J$  up to  $+125^{\circ}C$  for  $V_{IN}$  between 2.5 V to 5.5 V (Unless otherwise noted). Typical values are referenced to  $T_A = +25^{\circ}C$  and  $V_{IN} = 5$  V.

Symbol	Parameter	Conditions	Conditions	Min	Тур	Max	Unit
POWER SW	POWER SWITCH						
Р	Static drain-source on-state	$T_J = 25^{\circ}C$			45	70	mΩ
R <sub>DS(on)</sub>	resistance, per channel	–40°C < T <sub>J</sub> < 125°C				95	
Τ <sub>R</sub>	Output rise time	V <sub>IN</sub> = 5 V	$C_{LOAD} = 1 \mu F,$ R <sub>LOAD</sub> = 100 Ω	1.5	2.5	4	<b>m</b> 0
T <sub>F</sub>	Output fall time	V <sub>IN</sub> = 5 V	(Note 9)	0.1		0.5	ms
Logic Pins							
V <sub>IHEN</sub>	High-level input voltage			1.2			V
V <sub>ILEN</sub>	Low-level input voltage					0.4	V

 $V_{ENx} = 0 V, V_{ENx} = 5 V$ 

 $C_{LOAD} = 1\mu F$ ,  $R_{LOAD} = 100 \ \Omega$  (Note 9)

-0.5

1

1

\_

0.5

9

3

μΑ

ms

ms

VILEN	Low-level inp
I <sub>ENx</sub>	Input current

Turn on time

T<sub>OFF</sub> Turn off time

Current-limit threshold (Max-

I<sub>OCP</sub>

T<sub>ON</sub>

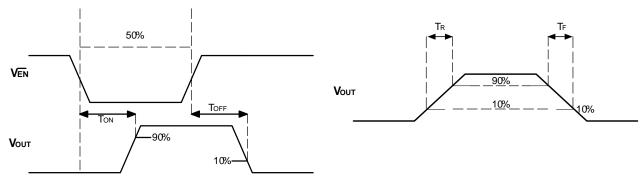


Figure 3. Ton, Toff, Trise, and Tfall

#### **FUNCTIONAL DESCRIPTION**

#### Overview

The NCP383 is a dual high side N channel MOSFET power distribution switches designed to protect the input supply voltage in case of heavy capacitive loads, short circuit or over current. In addition, the high side MOSFETs are turned off during under voltage, thermal shutdown or reverse voltage condition. Thanks to

- Off-phase: Power MOSFET is off during T<sub>OCP</sub> to allow the die temperature to drop.
- On-phase: regulation current mode during  $T_{REG}$ . The current is regulated to the  $I_{OCP}$

#### **APPLICATION INFORMATION**

#### **Power Dissipation**

The device's junction temperature depends on different contributor factor such as board layout, ambient temperature, device environment, etc... Yet, the main contributor in term of junction temperature is the power dissipation of the power MOSFET. Assuming this, the power dissipation and the junction temperature in normal mode can be calculated with the following equations:

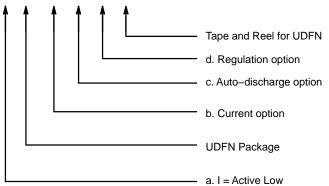
$$\mathsf{P}_{\mathsf{D}} = \mathsf{R}_{\mathsf{DS(on)}} \times \left( \left( \mathsf{I}_{\mathsf{OUT1}} \right)^2 \right)$$

#### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
NCP383LMUAJAATXG	UDFN10 (Pb-Free)	3000 / Tape & Reel

+For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

# NCP383xMUAJxxTXG



Code	Contents
а	L: active low
b	AJ: adjustable current limit
С	A: No autodischarge output path
d	A: standard regulation (CC + TSD warning + timer)

#### UDFN10 3x3, 0.5P (Leads 2 & 3 Tied) CASE 517CC ISSUE O

DATE 10 OCT 2011



\_\_\_\_\_

# 

onsemi, , and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi's product/patent coverage may be accessed at <a href="http://www.onsemi.com/site/pdf/Patent-Marking.pdf">www.onsemi.com/site/pdf/Patent-Marking.pdf</a>. Onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or incruit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using onsemi