

2.5V-15V Input, 4.8A Current Limit Switch

GENERAL DESCRIPTION

PW1555 is a programmable current limit switch with input voltage range selection and output voltage clamping. Extremely low RDS(ON) of the integrated protection N-channel FET helps to reduce power loss during the normal operation. Programmable soft-start time controls the slew rate of the output voltage during the start-up time. Independent enable control allows the complicated system sequencing control. It integrates the over-temperature protection shutdown and autorecovery with hysteresis.

This IC along with small DFN3X3-10 footprint provides small PCB area application.

FEATURES

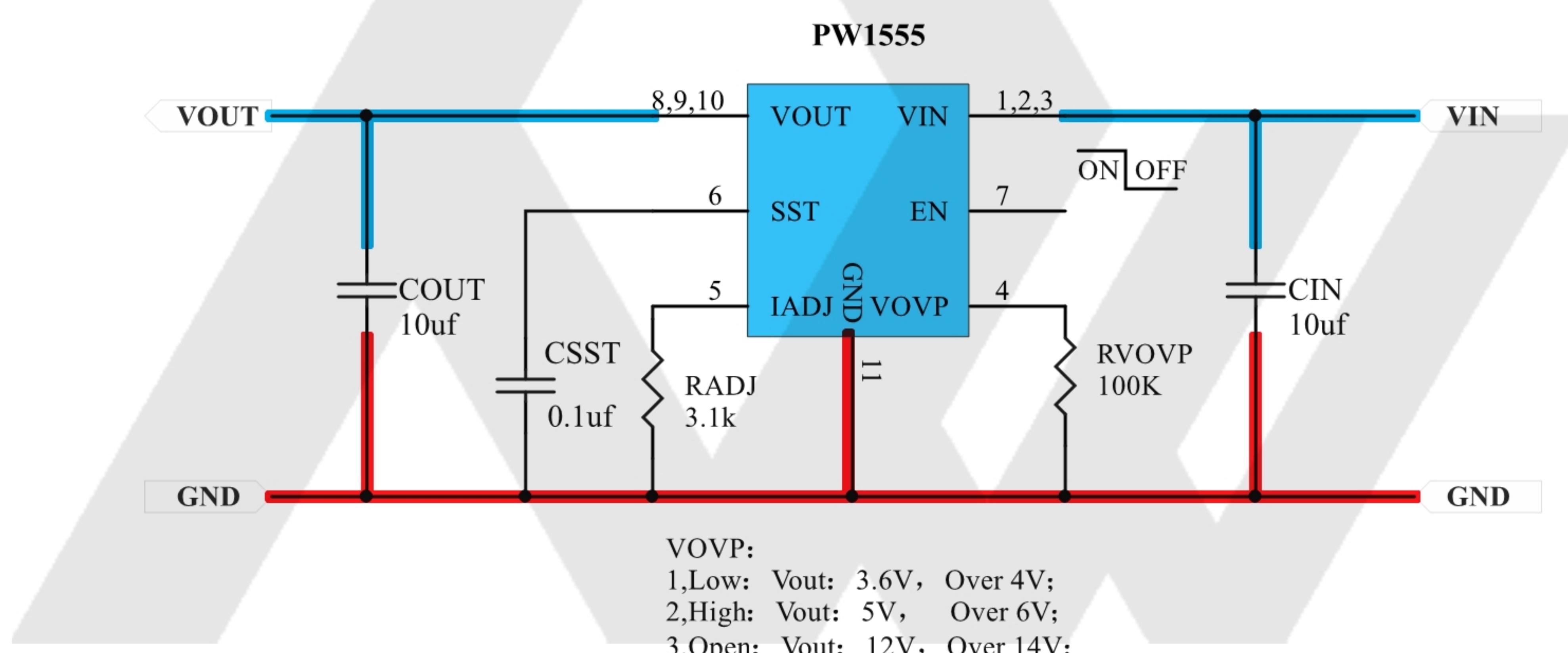
- Wide Input Voltage Range from 2.5V to 15V with surge up to 30V
- Extremely Low RDS(ON) for the Integrated Protection Switch: 40 mΩ
- Programmable Soft-Start Time
- Programmable Current Limit
- Short-circuit Protection
- Selectable Input Range and Clamping Output Voltage Threshold.
- Enable Interface Pin
- Thermal Shutdown Protection & Auto Recovery
- RoHS Compliant and Halogen Free
- Compact package: DFN3X3-10

APPLICATIONS

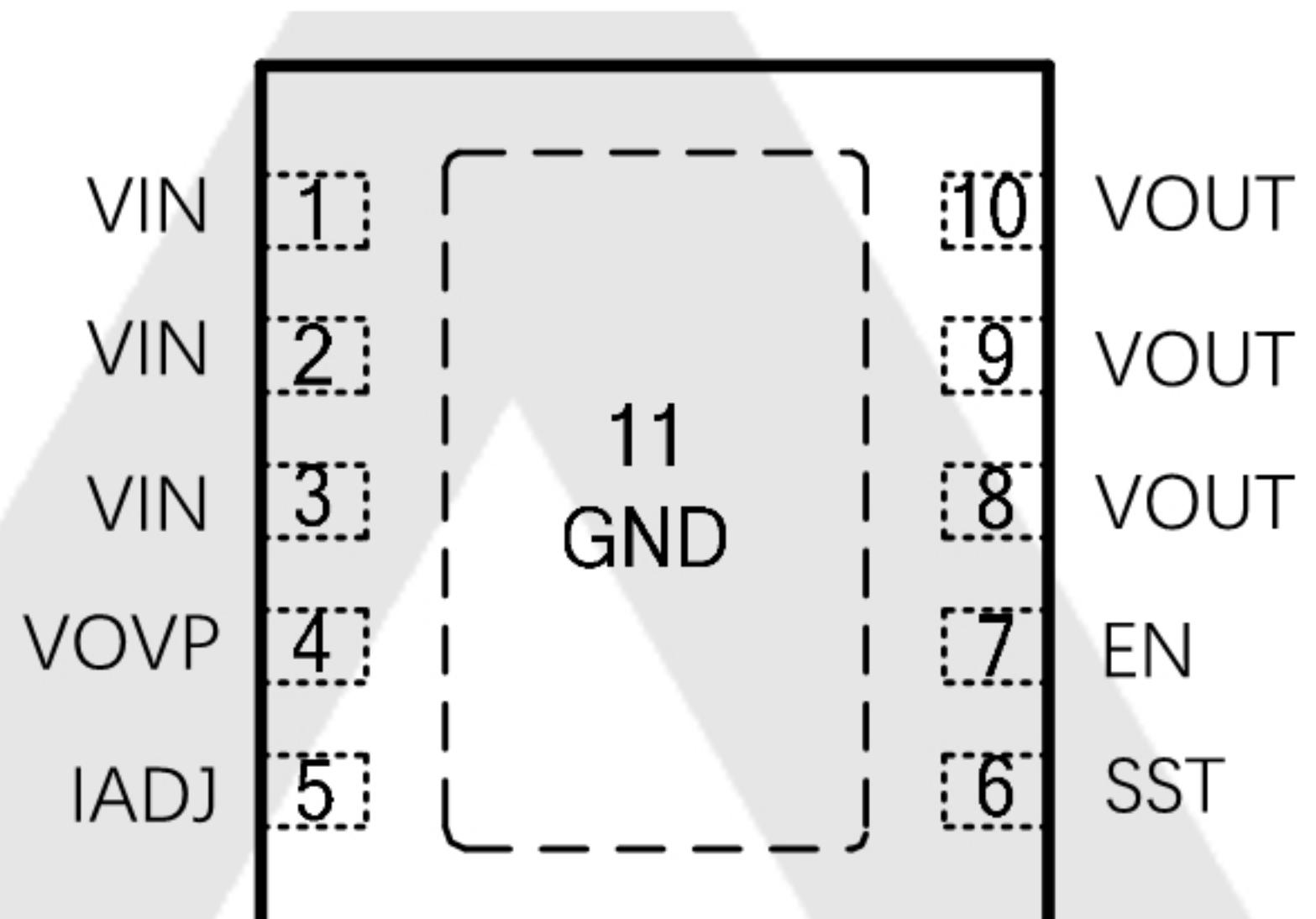
- Server
- Service PC
- Notebook PC
- pad Mini



TYPICAL APPLICATION CIRCUIT



PIN ASSIGNMENT/DESCRIPTION



Pin Number	Pin Name	Function																										
1	VIN																											
2	VIN	Power input pin. Decouple high frequency noise by connecting at least 0.1uF MLCC to ground.																										
3	VIN																											
4	VOVP	<p>Output clamp voltage selection based on the input voltage. Pull VOVP pin to High by connecting a resistor to VIN, or pull VOVP pin to Low by connecting a resistor to ground, or float VOVP Pin to select different output clamping thresholds. Recommend to decoupling this pin with 0.1uF capacitor.</p> <table border="1"> <thead> <tr> <th rowspan="2">VOVP</th> <th rowspan="2">VIN</th> <th colspan="3">Clamping Threshold</th> </tr> <tr> <th>Min</th> <th>Typ</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>Low</td> <td>3.3V</td> <td>Over 4V</td> <td>3.6V</td> <td>3.8V</td> <td>4.0V</td> </tr> <tr> <td>High</td> <td>5V</td> <td>Over 6V</td> <td>5.4V</td> <td>5.7V</td> <td>6.0V</td> </tr> <tr> <td>Open</td> <td>12V</td> <td>Over 14V</td> <td>12.6V</td> <td>13.3V</td> <td>14V</td> </tr> </tbody> </table>	VOVP	VIN	Clamping Threshold			Min	Typ	Max	Low	3.3V	Over 4V	3.6V	3.8V	4.0V	High	5V	Over 6V	5.4V	5.7V	6.0V	Open	12V	Over 14V	12.6V	13.3V	14V
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Open	12V	Over 14V	12.6V	13.3V	14V																							
5	IADJ	<p>Current limit program pin. Program the current limit by connecting a resister to ground. Recommended Formula for RADJ & Current Limit Calculation:</p> $ILIM (A) = 11/RADJ (K\Omega)$																										
6	SST	<p>Soft-start time program pin. Connect a capacitor to ground to program the soft start time. Recommended Formula for CSST & Soft-start Time Calculation:</p> $T_{ss} = \begin{cases} T_{ss_DLT}, & \text{No external } C_{sst} \\ \frac{C_{sst}}{I_{int}}, & T_{ss} > T_{ss_DLT} \end{cases}$ <p>Where, TSS_DLT is the internally fixed default soft-start time, about 1.4ms, which means there's no any external CSST; IINT is the internal current source, about 3.6uA.</p>																										
7	EN	Enable interface pin. Pull it High to enable the IC.																										
8	VOUT																											
9	VOUT	Power output pin.																										
10	VOUT																											
11 (EP)	GND	Ground pin.																										

Absolute Maximum Ratings (note1)

Parameter	Value	Unit
Supply Input Voltage	30	V
EN pin, VOVP pin	30	V
Power Dissipation, PD @ TA = 25°C	2.6	W
Package Thermal Resistance (Note 2)	θJA θJC	°C/W °C/W
Junction Temperature Range	125	°C
Lead Temperature (Soldering, 10 sec.)	260	°C
Storage Temperature Range	-65 to 150	°C

RECOMMENDED OPERATING Conditions (note3)

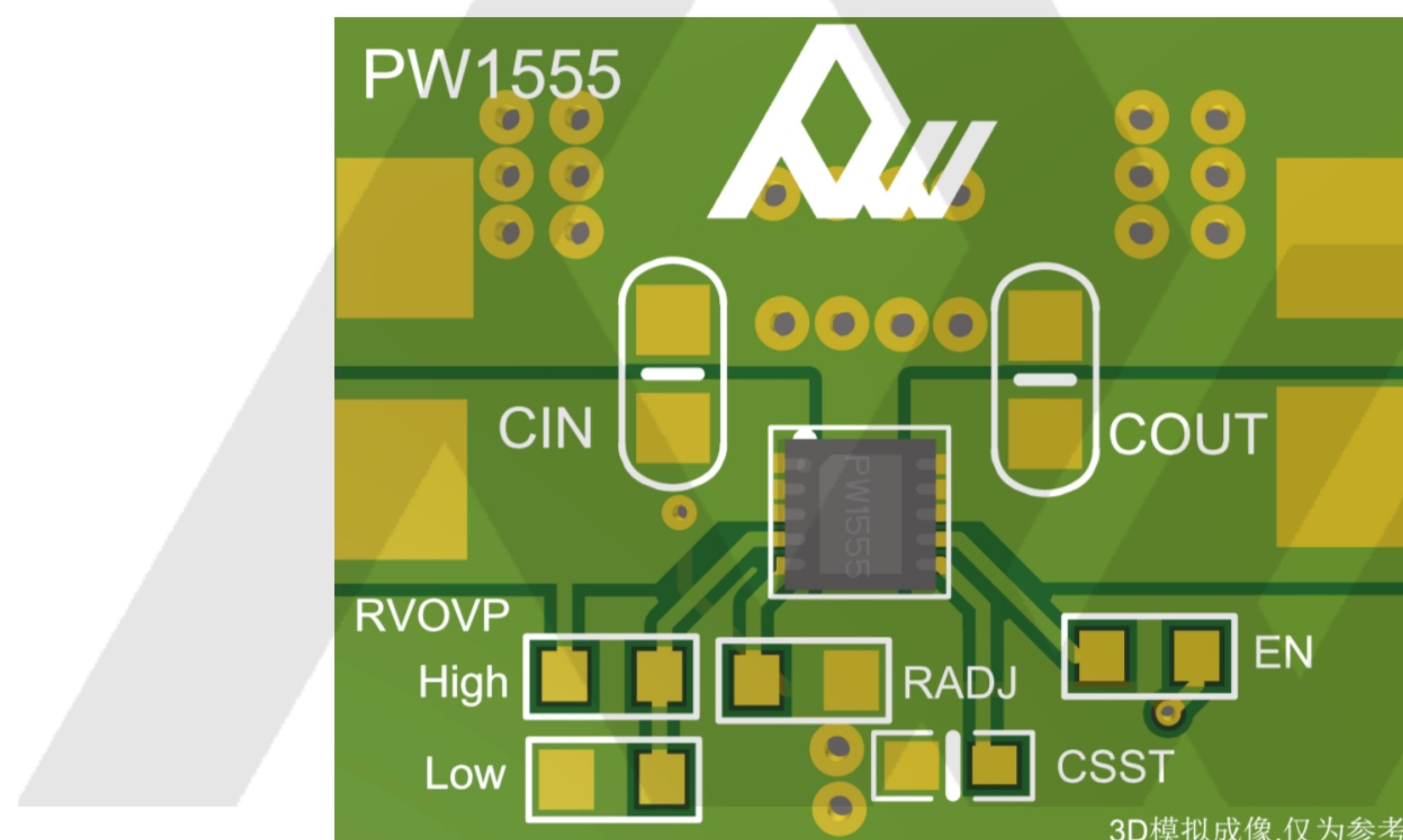
Parameter	Value	Unit
Supply Input Voltage	2.5 to 15	V
Junction Temperature Range	-40 to 125	°C
Ambient Temperature Range	-40 to 85	°C

Note 1: Stresses beyond “Absolute Maximum Ratings” may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions may affect device reliability.

Note 2: θJA is measured in the natural convection at TA = 25°C on a low effective single layer thermal conductivity test board of JEDEC 51-3 thermal measurement standard. Test condition: Device mounted on 2" x 2" FR-4 substrate PCB, 2oz copper, with minimum recommended pad on top layer and thermal vias to bottom layer ground plane.

Note 3: The device is not guaranteed to function outside its operating conditions

PCB Layout Guideline

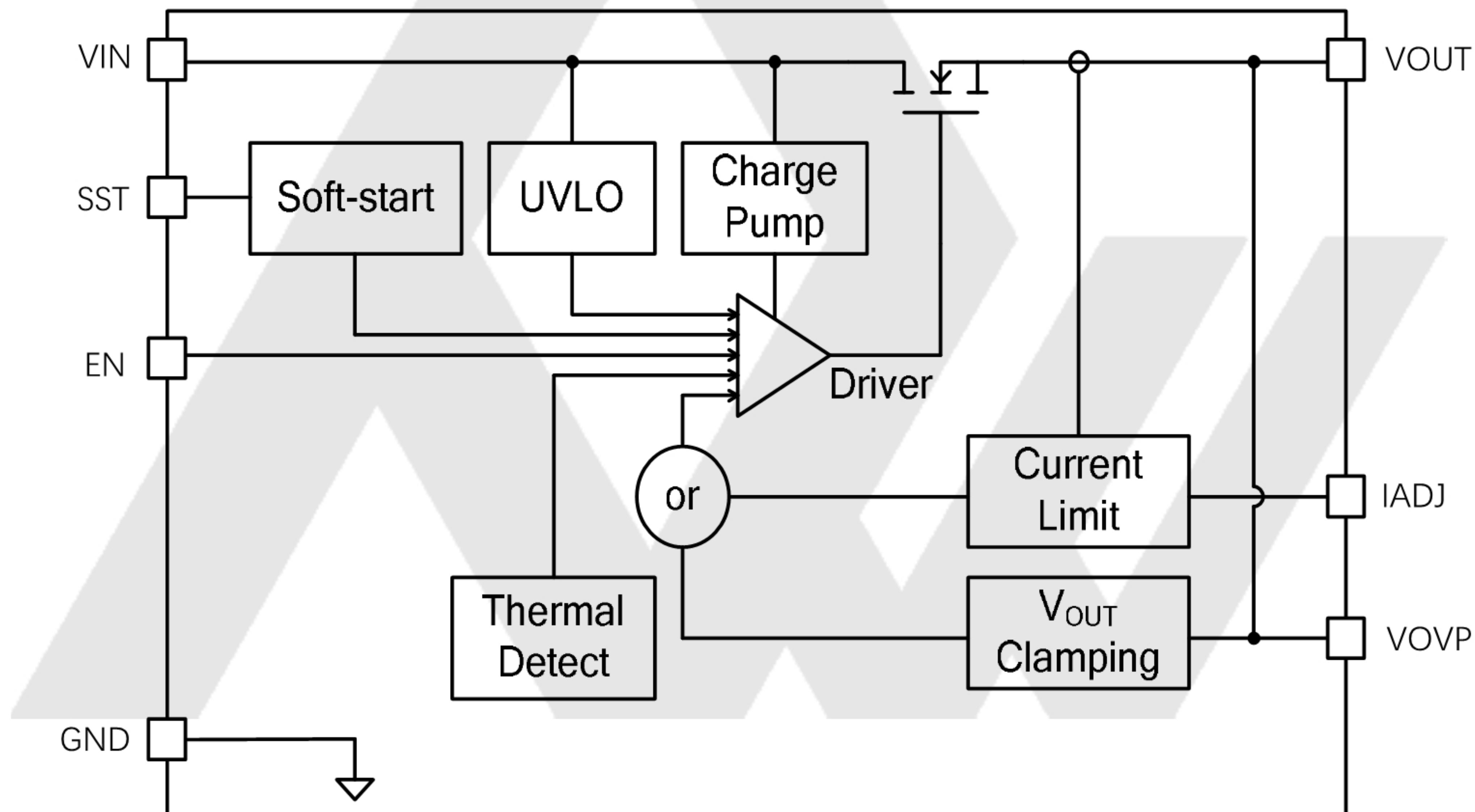


ELECTRICAL CHARACTERISTICS

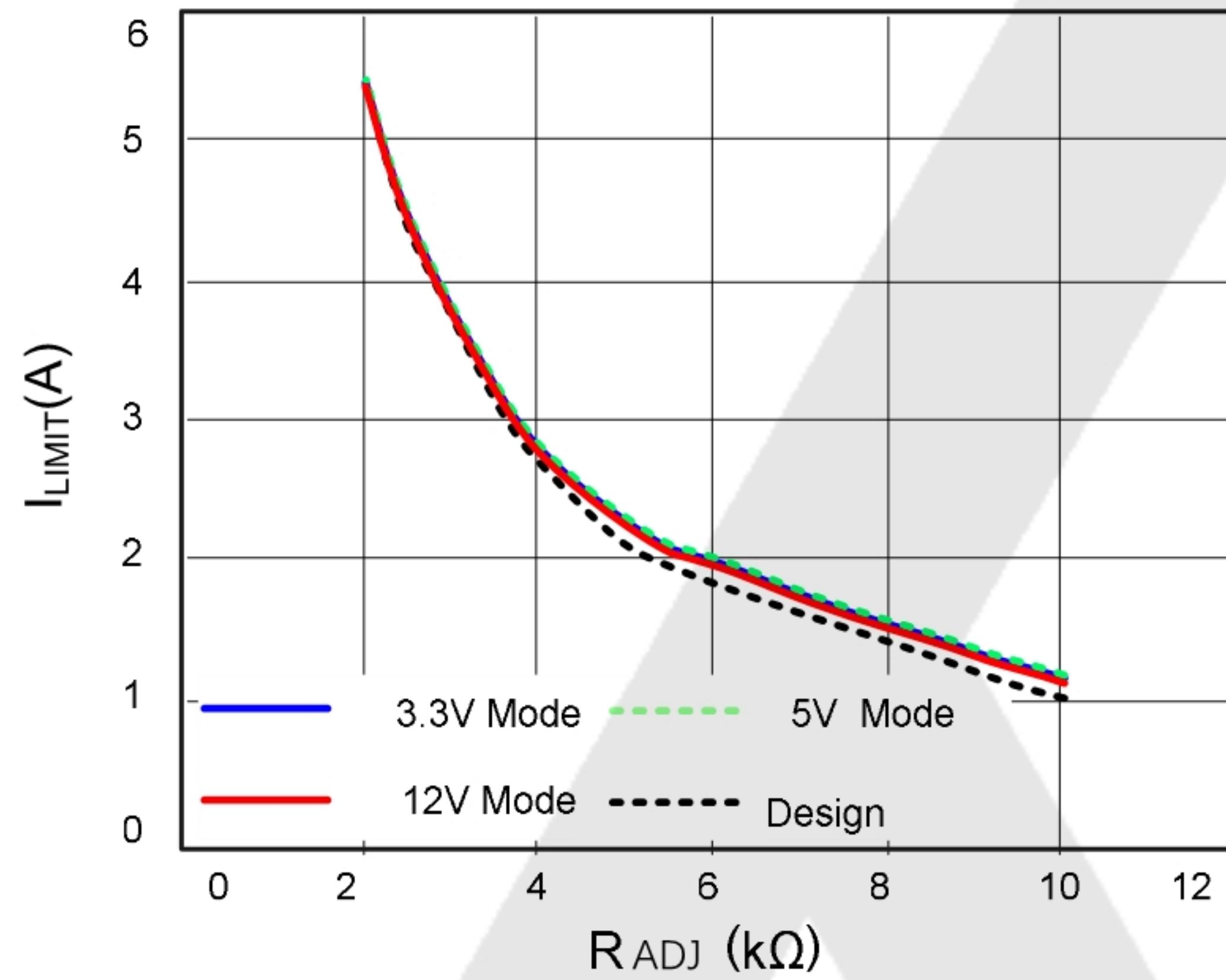
($V_{IN} = 5V$, $R_{ADJ}=10k\Omega$, $C_{SST}=105nF$, $C_{IN} = 10\mu F$, $C_{OUT} = 10\mu F$, $TA = 25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Voltage Range	V_{IN}		2.5		30	V
Input UVLO Threshold	V_{UVLO}	$VOVP=LOW$	2.2		2.4	V
		$VOVP=HIGH$	3.4		3.8	V
		$VOVP=OPEN$	8.1		9.0	V
UVLO hysteresis	V_{HYS}	$VOVP=LOW$	0.05	0.085	0.13	V
		$VOVP=HIGH$	0.06	0.095	0.15	V
		$VOVP=OPEN$	0.1	0.19	0.29	V
Bias Current	I_{BIAS}			200		μA
Shutdown Current	I_{SHDN}	$EN=0$		10		μA
Protection FET RON	$R_{DS(ON)}$			40	70	$m\Omega$
Current Limit Accuracy				30% I_{LIM}		
Current Limit Program Range	I_{LIM}		1		5	A
Clamping Output Voltage	V_{CLP}	$VOVP=LOW$	3.6	3.8	4.0	V
		$VOVP=HIGH$	5.4	5.7	6.0	V
		$VOVP=OPEN$	12.6	13.3	14.0	V
Soft-start Time	$TSST$	$CSST=105nF$		29.4		ms
Soft-start Time Accuracy				$\pm 30\% TSST$		
EN Turn-on Threshold	V_{EN_ON}		2			V
EN Turn-off Threshold	V_{EN_OFF}				0.4	V
Thermal Shutdown Temperature	T_{SD}			140		$^{\circ}C$
Thermal Shutdown Hysteresis	$THYS$			20		$^{\circ}C$

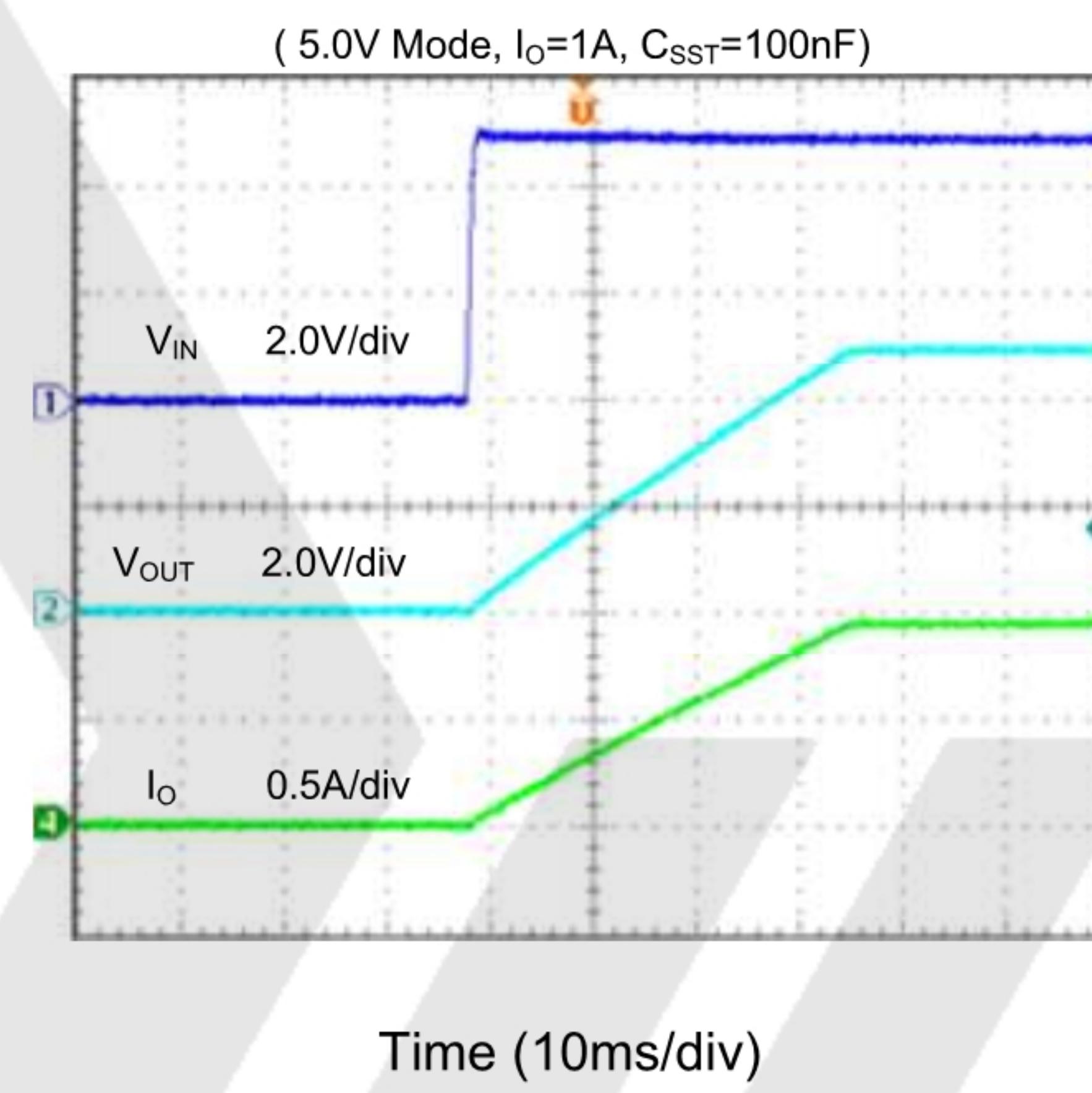
Block Diagram



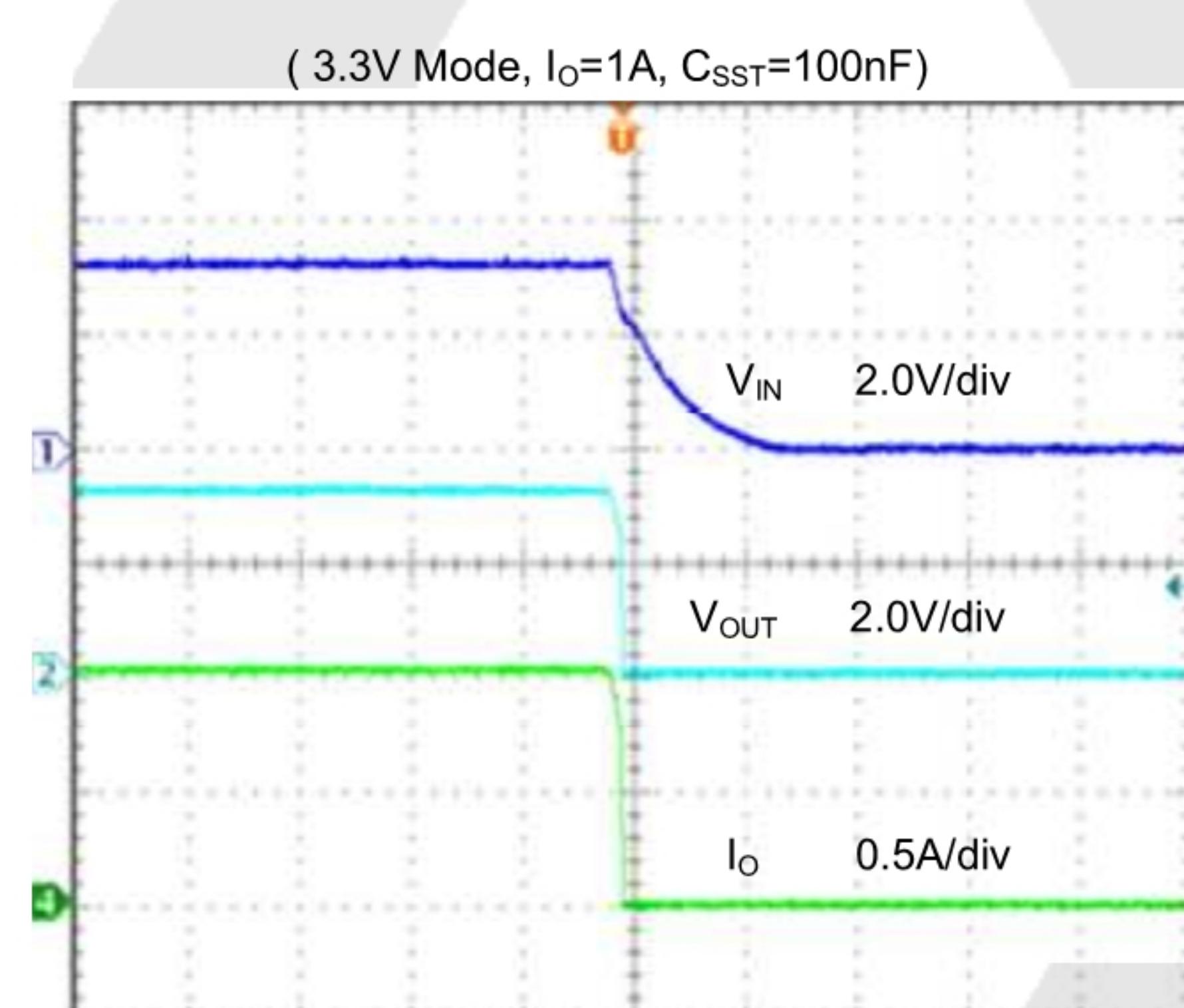
Typical Performance Characteristics



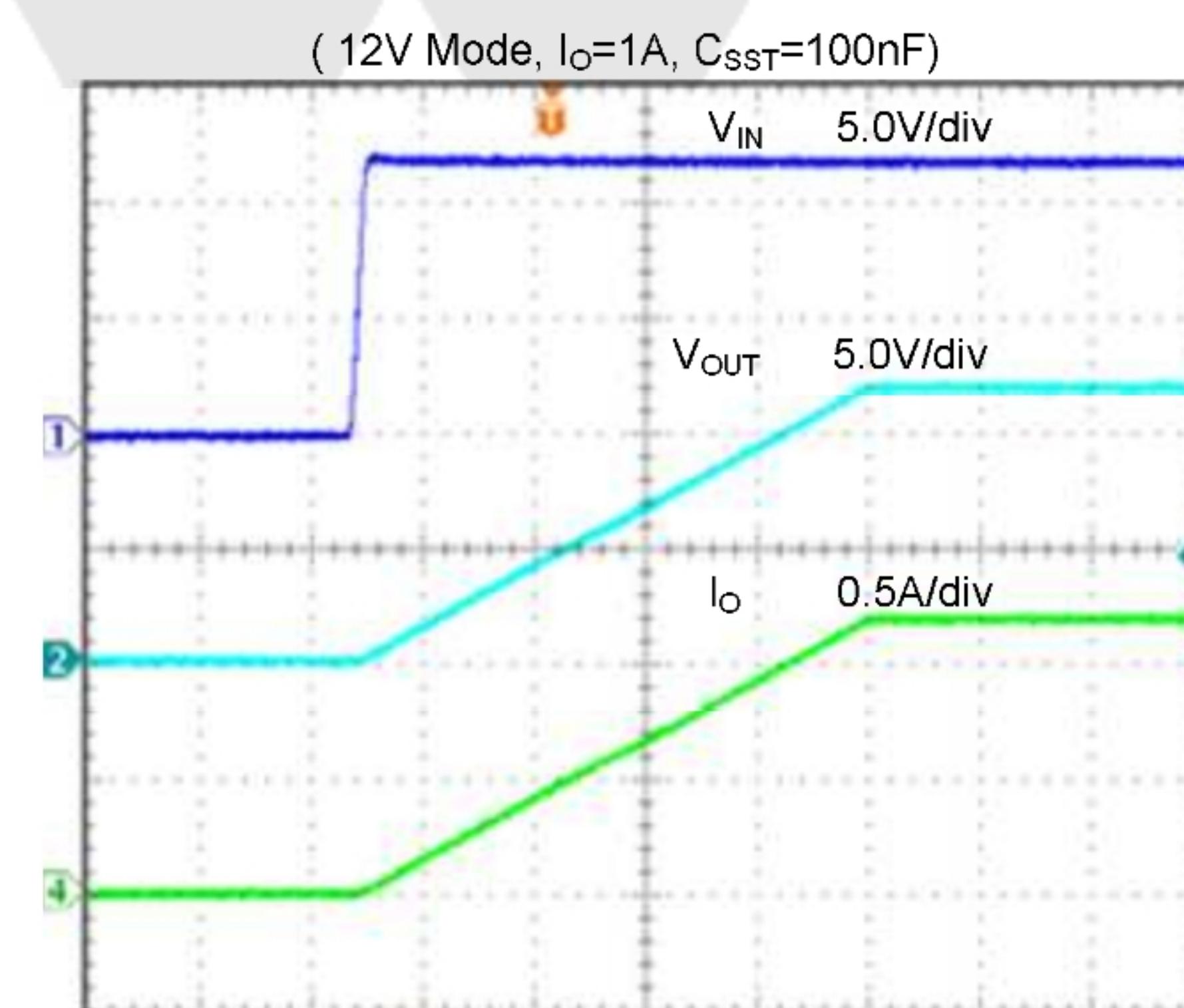
Programmable Current Limit



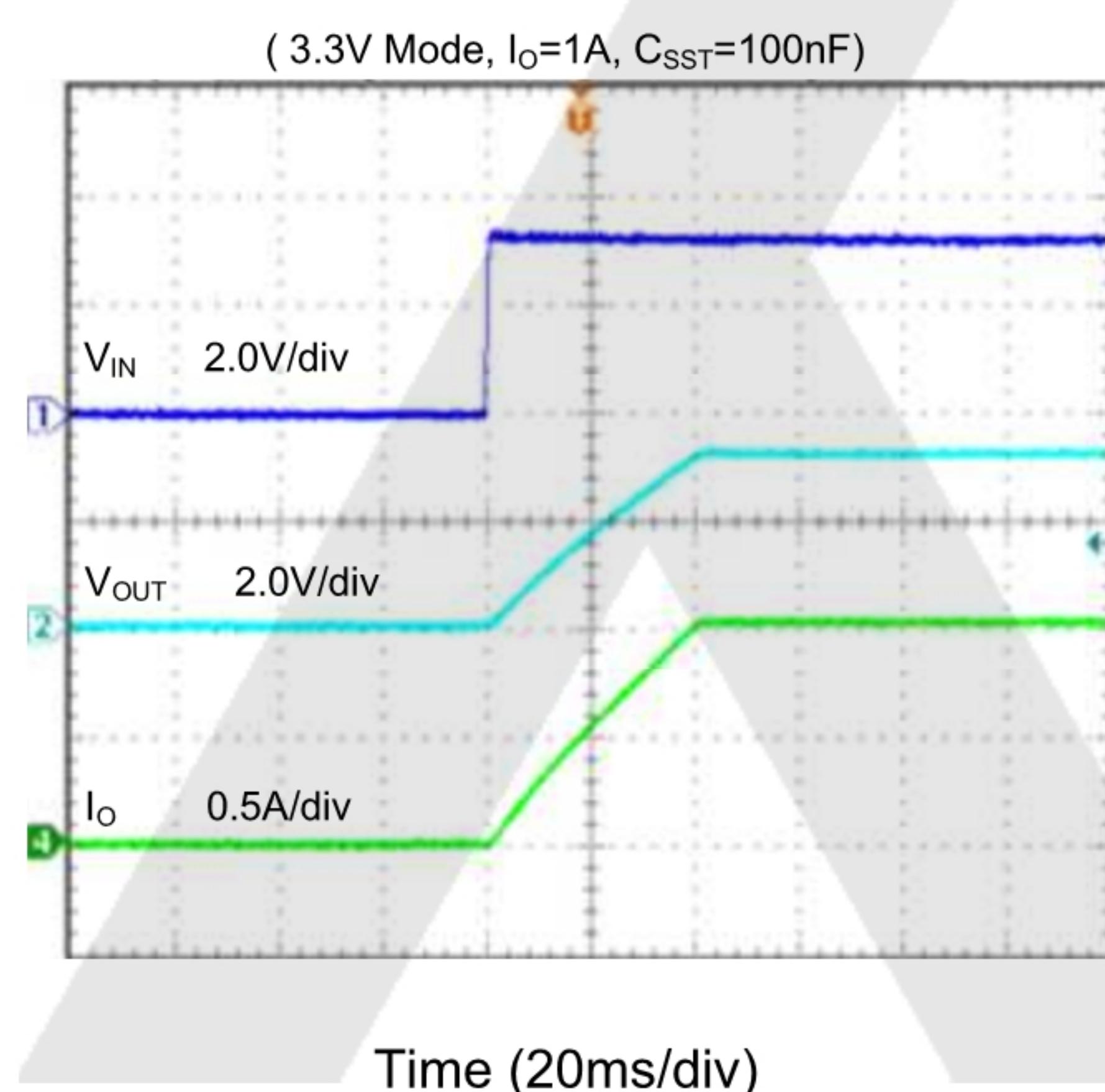
Programmable Soft-start Time



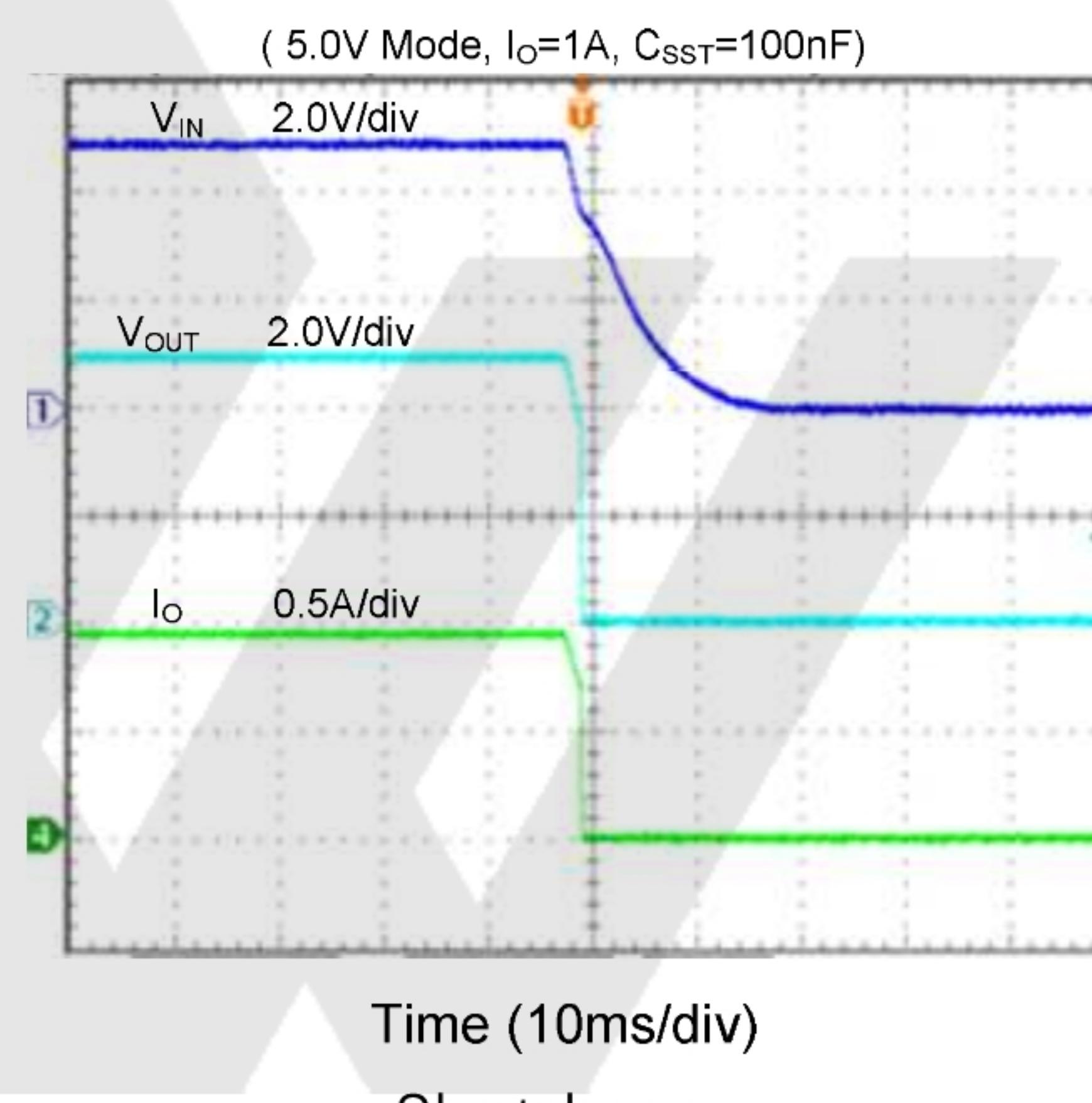
Shutdown



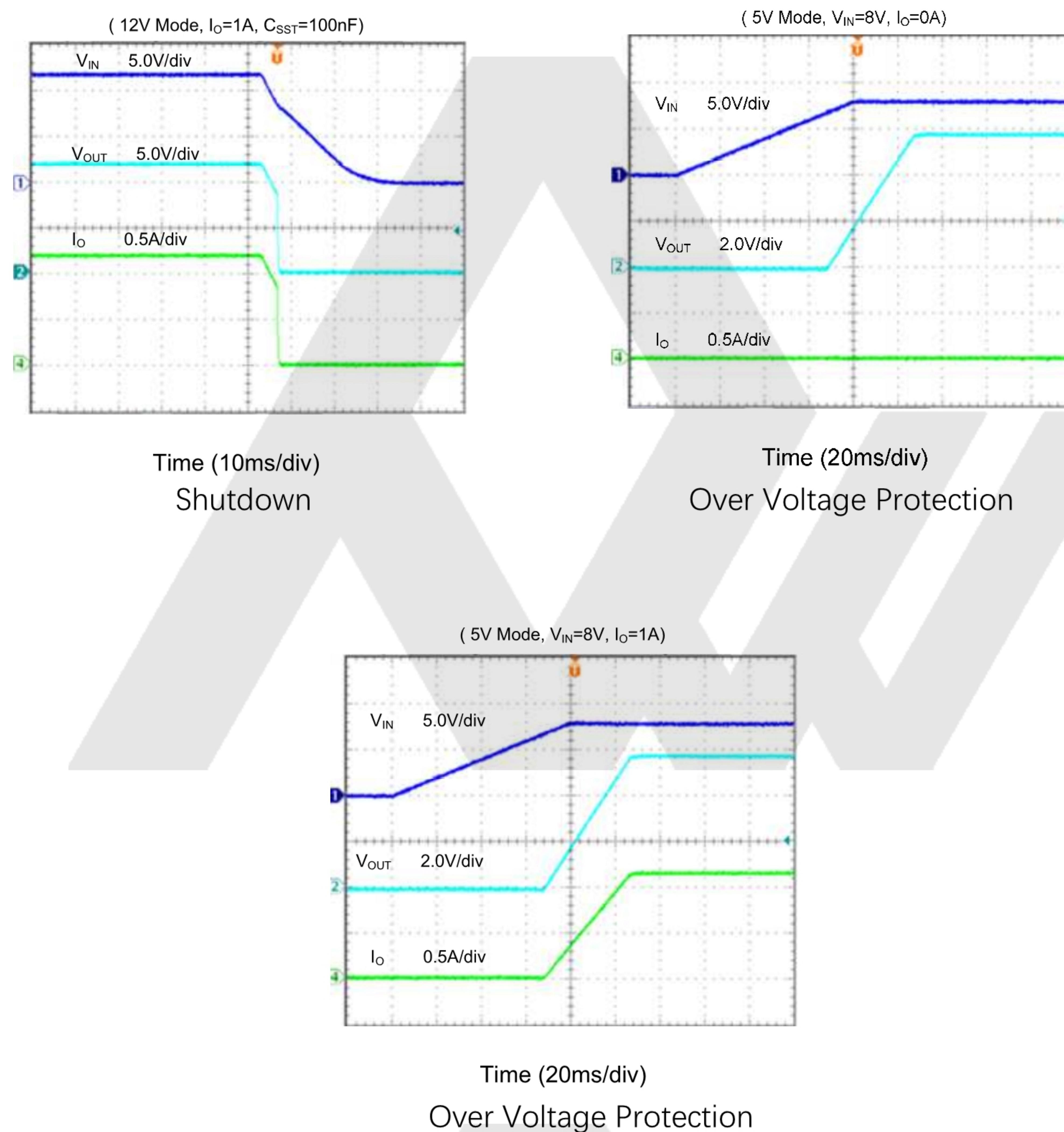
Programmable Soft-start Time



Programmable Soft-start Time

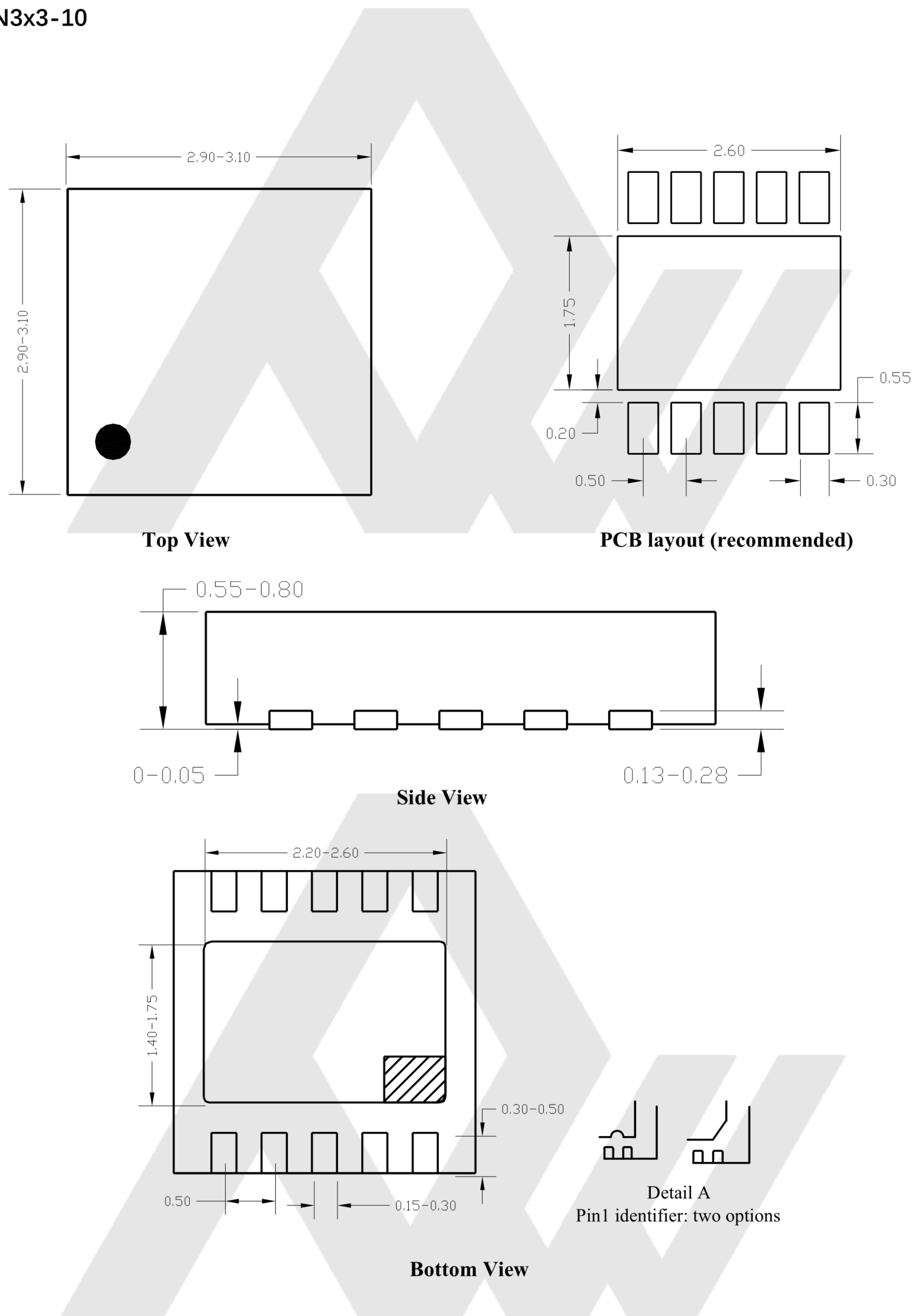


Shutdown



PACKAGE DESCRIPTION

DFN3x3-10



Notes: All dimensions are in millimeters and exclude mold flash & metal burr.

IMPORTANT NOTICE

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