

DIO7320

5V,5A Load Switch with Slew Rate Control and Reverse Current Blocking

Features

- Low Ron, Typical 28mΩ at 5V Vin with 50mΩ max
- 5A Continuous Current Capability
- Reverse Current Blocking (RCB), during both OFF and ON state
- 3ms (typical) Soft on Slew Rate
- Robust ESD capability, 4kV HBM & 2kV CDM (4KV for all pins)

Descriptions

The DIO7320 load switch consists of a slew rate controlled low Ron (28mΩ) MOSFET and other features. The slew rate controlled turn-on characteristic prevents inrush current and the excessive voltage drop on power rails. The DIO7320 also has a true reverse current blocking function stopping unwanted from Vout to Vin during both ON and OFF states.

The DIO7320 is available in EP-SOIC8 package.

Application

- Smart phones
- PAD
- Storage
- Other portable device

Typical Application Diagram

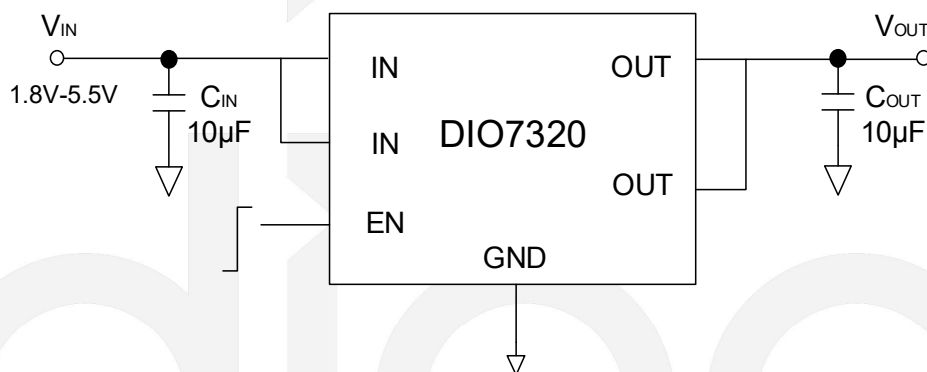


Figure 1 Typical Application Diagram

Ordering Information

Order Part Number	Top Marking	Green	T _A	Package	
DIO7320XS8	DIO7320	Yes	-40 to +85°C	EP-SOIC-8	Tape & Reel, 2500

Pin Assignment

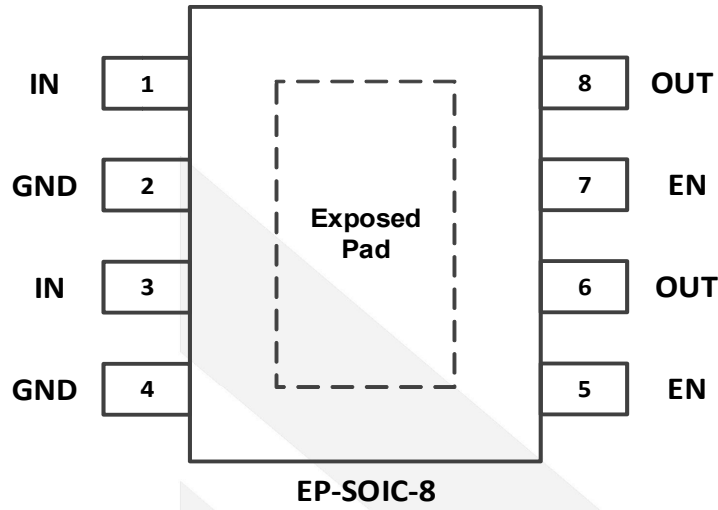


Figure 1 Pin Assignment

Pin Description

Pin #	Name	Description
1,3	IN	Switch Input voltage; connect a 1 μ F or greater ceramic capacitor from IN to GND as close as possible to the IC
2,4	GND	GND
5,7	EN	Enable input, logic high active
6,8	OUT	Switch Output; connect a 1 μ F capacitor from GND to GND as close as possible to the IC
	Exposed Pad	Exposed pad can be connected to GND plane for dissipation

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Rating" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Parameter		Rating	Unit
V_{IN}		-0.3 to 6	V
$V_{OUT, EN}$		-0.3 to 6	V
Storage Temperature		-65 to 150	°C
Maximum Junction Range		-40 to 145	°C
Latch up protection		200	mA
Package Thermal Resistance	Θ_{JA}	50	°C/W
	Θ_{JC}	10	
ESD Susceptibility	Human Body Model, JESD22-A114	4	kV
	Charged Device Model, JESD22-C101	2	

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation to ensure optimal performance to the datasheet specifications. DIOO does not recommend exceeding them or designing to Absolute Maximum Ratings.

Symbol	Parameters	Conditions	Min.	Max.	Unit	
V_{IN}	Operational Power Supply		1.8	5.5	V	
V_{EN}	Enable Voltage		0	5.5	V	
T_A	Ambient Temperature Range		-40	25	+85	°C
T_J	Junction Temperature Range		-40	25	+125	°C
I_{OUT}	Maximum DC Current	$T_A=25^\circ\text{C}$		5	A	
I_{PEAK}	Maximum Peak Current	1ms pulse width at 217Hz, $T_A=25^\circ\text{C}$		7	A	

Electrical Characteristics

Unless otherwise noted, $V_{IN} = 1.8$ to $5.5V$, $T_A = -40$ to $85^\circ C$; typical values are at $V_{IN} = 4.5V$ and $T_A = 25^\circ C$.

Symbol	Parameters	Conditions	Min	Typ	Max	Unit	
POWER SWITCH							
$R_{DS(ON)}$	Static drain-source on-state resistance	$V_{IN}=1.8\sim 5.5V$	$T_A = 25^\circ C$		28	m Ω	
		$I_{OUT}=200mA$	$-40^\circ C < T_A < 85^\circ C$		50		
t_R	Switch turn-on edge rising time	$V_{IN}=4.5V$	$C_{LOAD}=100\mu F,$ $R_{LOAD}=150\Omega$	2	3	5	ms
t_F	Switch turn-off edge falling time	$V_{IN}=4.5V$	$C_{LOAD}=100\mu F,$ $R_{LOAD}=150\Omega$		3		ms
t_{DON}	Switch turn-on delay	$V_{IN}=4.5V$	50% of EN pin to $V_{OUT}=10\%$ of fully on		1.8		ms
t_{DOFF}	switch turn-off delay	$V_{IN}=4.5V$	50% of EN pin to $V_{OUT}=90\%$ of fully on		10		μs
ENABLE INPUT EN							
V_{IH}	High-level input voltage	$V_{IN}=4.5V$		1.4			V
V_{IL}	Low-level input voltage	$V_{IN}=4.5V$			0.85		V
R_{pd}	Pull-down resistance at EN pin	$T_A = -40^\circ C$ to $+85^\circ C$		1			M Ω
REVERSE-LEAKAGE PROTECTION (Spec addition is required for RCB during ON state, please refer to RCB Behavior)							
I_{REV}	Reverse-current protection	$V_{IN}=0V, V_{OUT}=4.2V, -40^\circ C < T_A < 85^\circ C,$ $EN="0"$		1	2		μA
QUIESCENT CURRENT							
I_q	Current consumption	$V_{in}=5V, V_{out}$ floating, $EN = 5V$		200	400		μA
I_{SDN}	shutdown current	$V_{in}=5V, En="0", V_{out}=GND$ $-40^\circ C < T_A < 85^\circ C$		1	3		μA

Notes: This parameter is guaranteed by design and characterization.

Functional Block Diagram

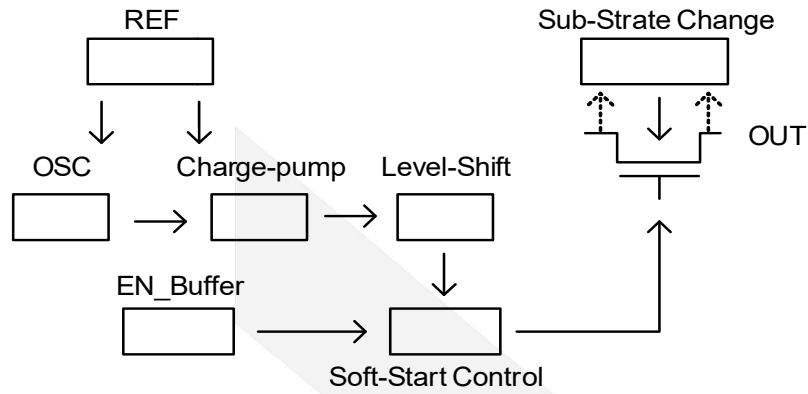


Figure 2 Functional Block Diagram

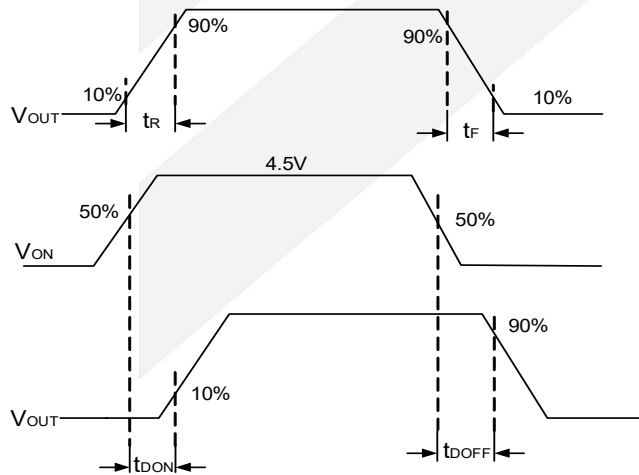


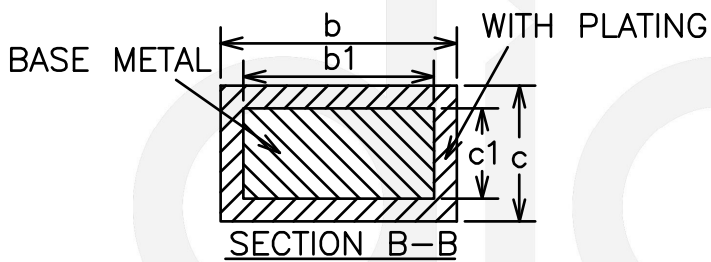
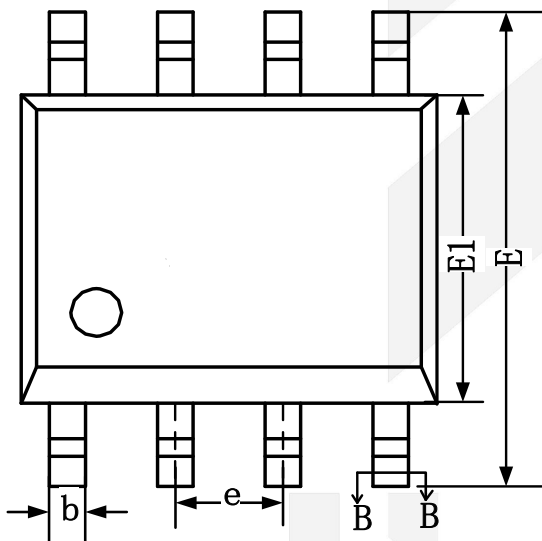
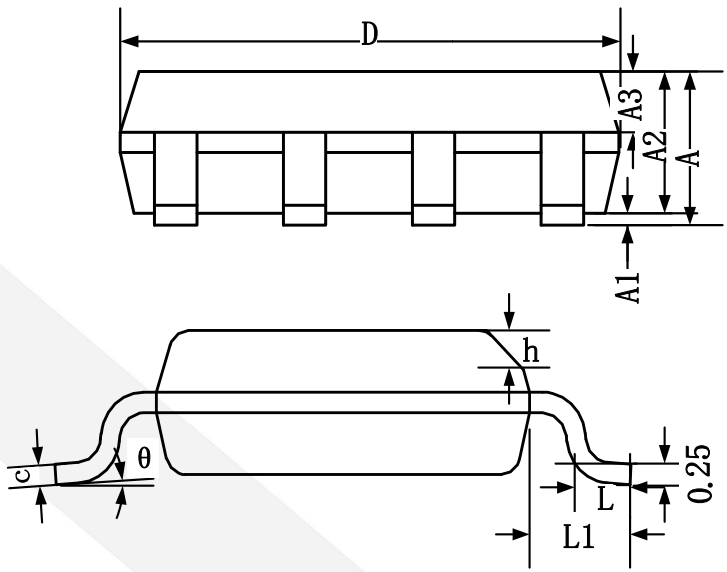
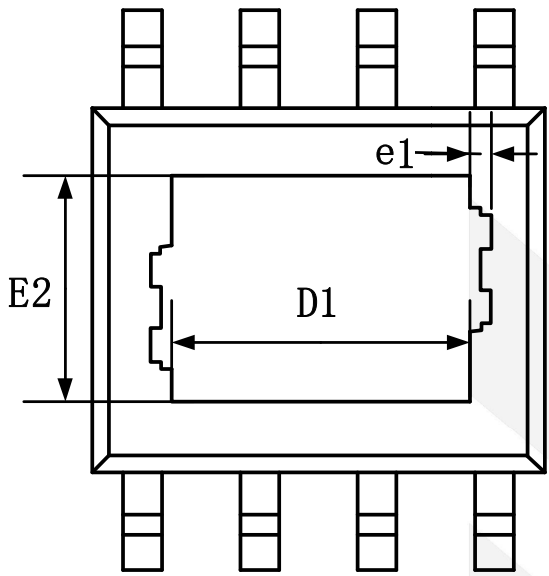
Figure 3 Application Sequence Diagram

$$t_{ON} = t_{DON} + t_R, t_{OFF} = t_{DOFF} + t_F$$

t_{ON} : switch turn-on time; t_{DON} : switch turn-on delay; t_R : switch turn-on edge rising time;

t_{OFF} switch turn-off time; t_{DOFF} : switch turn-off delay; t_F : switch turn-off edge falling time.

Physical Dimensions: EP-SOIC-8



COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	-	-	1.65
A1	0.05	-	0.15
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
b	0.39	-	0.48
b1	0.38	0.41	0.43
c	0.21	-	0.25
c1	0.19	0.20	0.21
D	4.70	4.90	5.10
D1	-	3.10	-
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
E2	-	2.21	-
e	1.27BSC		
e1	-	0.10	-
h	0.25	-	0.50
L	0.50	0.60	0.80
L1	1.05BSC		
θ	0°	-	8°

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