Description and Applications

The DIODES™ DLS3035FGBQ low-side switch provides a component and area-reducing solution for efficient power domain switching. In addition to integrated control functionality with ultra-low on−resistance, this device offers system safeguards and monitoring via fault protection and fault signaling. This cost effective solution is ideal for power management applications requiring low power consumption in a small footprint.

Applications

- USB charging port short to VBAT protection for automotive
- Low side drive loads

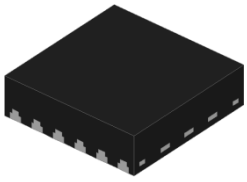
Features and Benefits

- Integrated 30V N-Channel MOSFET with Ultra Low R_{ON}
- Short-Circuit Protection with Hiccup Recovery
- Thermal Shutdown
- Fault Reporting
- Extremely Low Standby Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DLS3035FGBQ is suitable for automotive applications requiring specific change control; this part is AEC-Q100 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

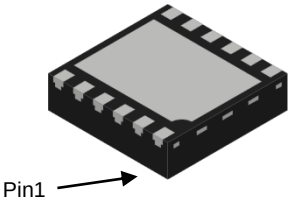
Mechanical Data

- Package: V-DFN3030-12
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.024 grams (Approximate)

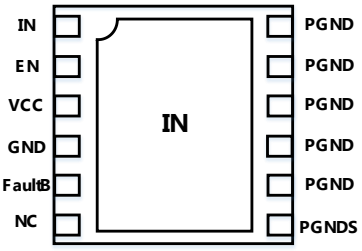
V-DFN3030-12 (Type B)



Top View



Bottom View



Top View

Ordering Information (Note 4)

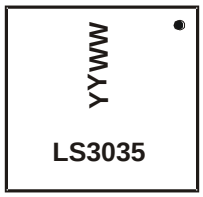
Part Number	Package	Tape Width	Tape Pitch	Packing	
				Qty.	Carrier
DLS3035FGBQ-7	V-DFN3030-12 (Type B)	8mm	4mm	3,000	Tape & Reel
DLS3035FGBQ-7A	V-DFN3030-12 (Type B)	12mm	8mm	1,500	Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

Site 1

V-DFN3030-12 (Type B)



LS3035 = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 22 = 2022)
WW = Week Code (01 to 53)

Site 2

V-DFN3030-12 (Type B)

LS3035 = Product Type Marking Code
YWX = Date Code Marking
Y = Year (ex: 2 = 2022)
W = Week (ex: a = Week 27; z Represents Week 52 and 53)
X = Internal Code (ex: U = Monday)

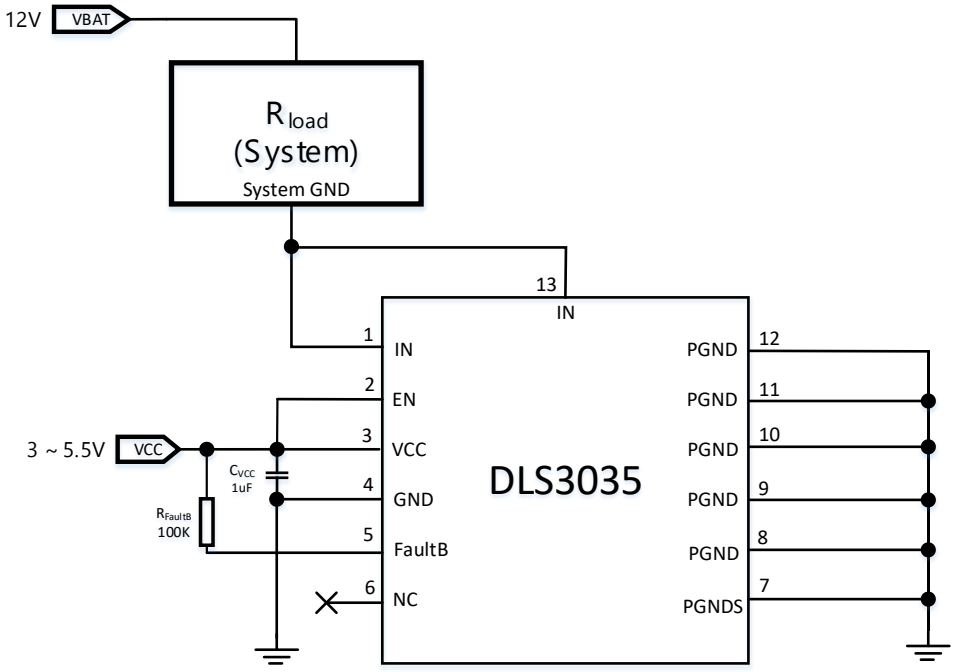
Date Code Key

Year	2020	…	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	0	…	2	3	4	5	6	7	8	9	0	1

Week	1-26	27-52	53
Code	A-Z	a-z	z

Internal Code	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Code	T	U	V	W	X	Y	Z

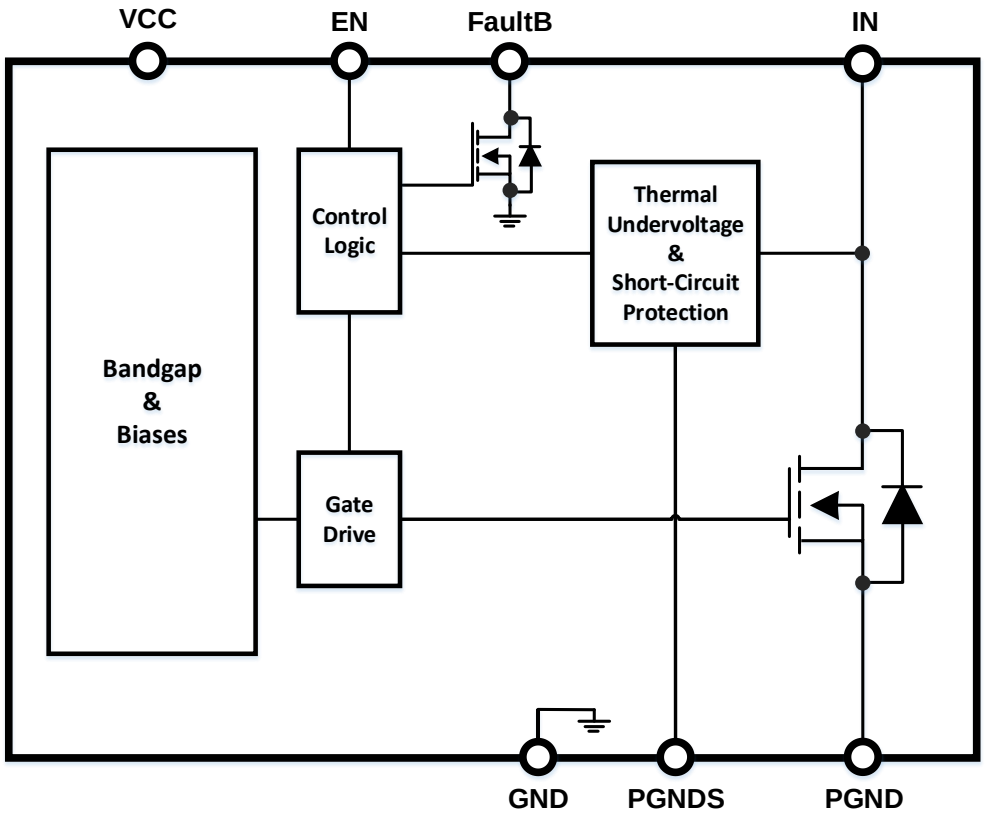
Typical Application Circuit



Pin Description

Pin Number	Pin Name	Pin Function
1, 13	IN	Drain of internal MOSFET, Pin 1 must be connected to Pin 13.
2	EN	Active−high digital input used to turn on the MOSFET, pin has an internal pull down resistor to GND (For LS application, tied to V_{CC} would be better).
3	VCC	Supply voltage to controller (3.0V to 5.5V).
4	GND	Ground.
5	FaultB	Fault status indicator. Active Low, open-drain output. Whenever an exception happens, the output of this pin is pulled to GND.
6	NC	Not connected Pin.
7	PGNDS	PGND sense connection which must be tied to GND.
8 to 12	PGND	Source of internal MOSFET, connected to GND.

Functional Block Diagram



Absolute Maximum Rating

Parameter	Rating
IN to GND	-0.3V to 32V
EN, VCC, FaultB to GND	-0.3V to 6V
I_{MAX}	20A
Storage Temperature (T_S)	-55°C to +150°C
ESD Capability, Human Body Model	2kV
ESD Capability, Charge Device Model	500V

Recommended Operating Ranges

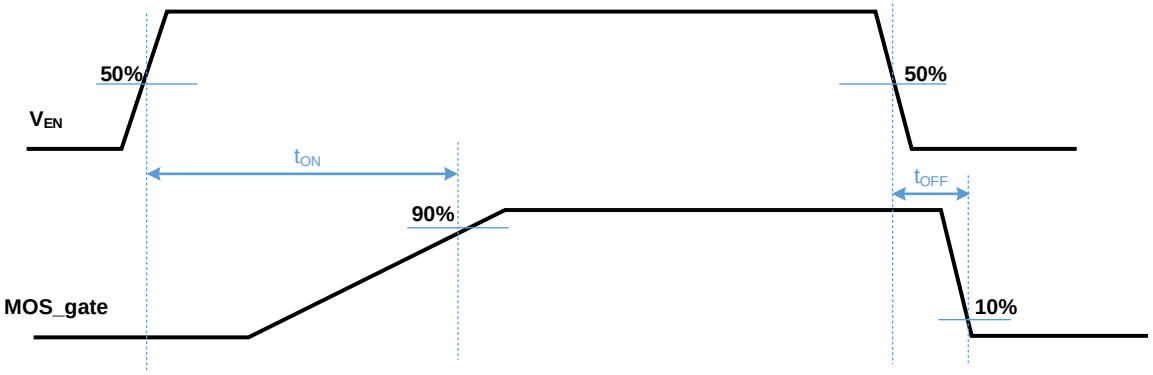
Parameter	Rating
Supply Voltage (V_{VCC})	3V to 5.5V
Input Voltage (V_{IN})	0V to 24V
Ambient Temperature (T_A)	-40°C to +125°C
Junction Temperature (T_J)	-40°C to +150°C
Package Thermal Resistance (θ_{JC})	4.5°C/W
Package Thermal Resistance (θ_{JA})	40°C/W

Electrical Characteristics (T_A = +25°C, V_{VCC} = 5.0V, V_{IN} = 0.1V, unless otherwise specified.)

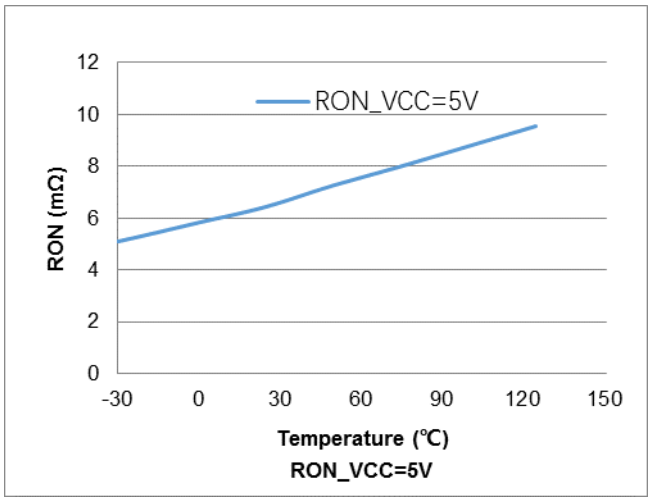
Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{IN}	Input Voltage	—	-0.3	—	30	V
V_{VCC}	Supply Voltage	—	3.0	—	5.5	V
I_{DYN}	V_{CC} Dynamic Supply Current	V_{EN} = V_{VCC} = 3V	—	65	150	μA
		V_{EN} = V_{VCC} = 5.5V	—	85	200	μA
I_{STBY}	V_{CC} Shutdown Supply Current	V_{VCC} = 3V, V_{EN} = 0V	—	0.1	1	μA
		V_{VCC} = 5.5V, V_{EN} = 0V	—	0.1	2	μA
V_{ENH}	EN High Level Voltage	V_{VCC} = 3V to 5.5V	2.0	—	—	V
V_{ENL}	EN Low Level Voltage	V_{VCC} = 3V to 5.5V	—	—	0.8	V
V_{FaultB}	FaultB Output Low Voltage	V_{VCC} = 5V, I_{SINK} = 5mA	—	—	0.2	V
I_{FaultB}	FaultB Output Leakage Current	V_{VCC} = 5V	—	—	100	nA
Switching Device						
R_{ON}	Switch On-State Resistance	V_{VCC} = 5V, I_{IN} = 1A	—	8	10	mΩ
I_{LEAK}	Input Shutdown Supply Current	V_{EN} = 0V, V_{IN} = 24V	—	100	—	μA
R_{PDEN}	EN Pull Down Resistance	—	—	1000	—	kΩ
Fault Protection						
T_{OTP}	Thermal Shutdown Threshold	V_{VCC} = 3V to 5.5V	—	150	—	°C
T_{OTPHYS}	Thermal Shutdown Hysteresis	V_{VCC} = 3V to 5.5V	—	30	—	°C
UVLO	V_{CC} Lockout Threshold	—	—	2.55	—	V
$UVLO_{HYS}$	V_{CC} Lockout Hysteresis	—	—	200	—	mV
V_{SCP}	Short−Circuit Protection Threshold	V_{VCC} = 3V to 5.5V, V_{IN} Ramp Up	180	265	350	mV

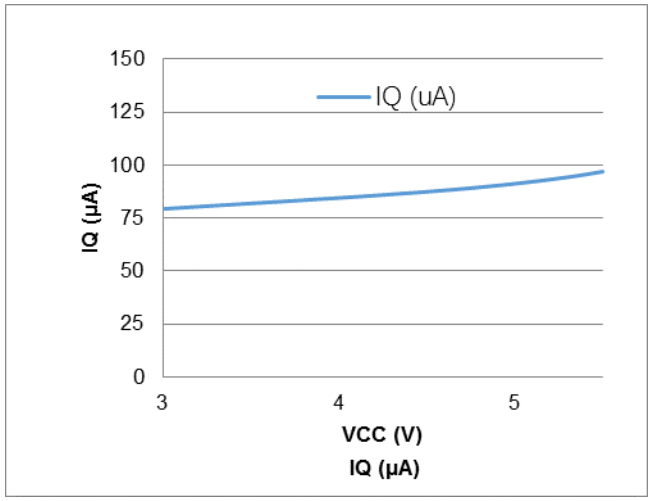
Switching Characeristics (T_A = +25°C, unless otherwise specified.)

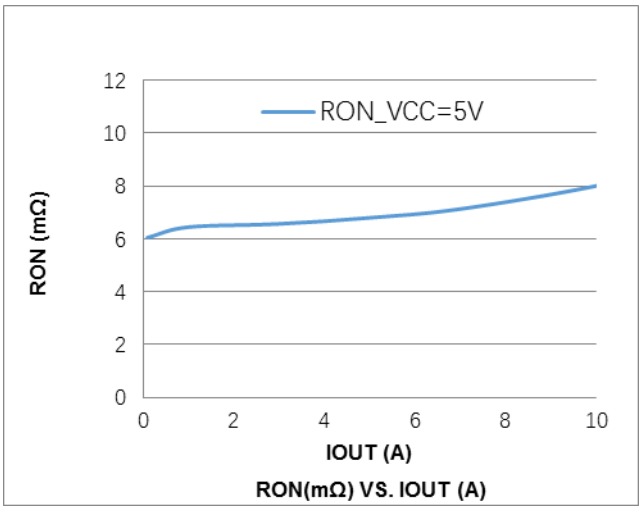
Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{IN} = 0.1V						
t_{ON}	MOS Output Turn-On Delay Time	V_{VCC} = 5V	—	100	—	μs
t_{OFF}	MOS Output Turn-Off Delay Time	V_{VCC} = 5V	—	0.5	—	

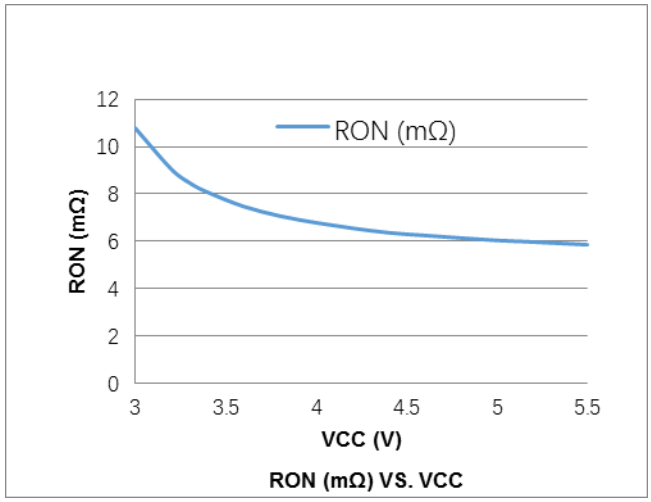


Performance Characterisitics (T_A = +25°C, unless otherwise specified.)









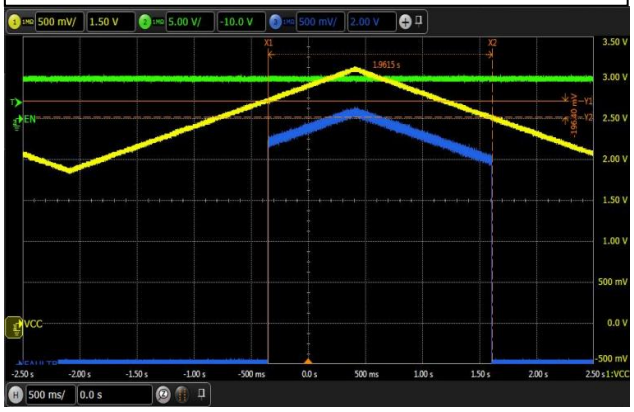
Performance Characterisitics (T_A = +25°C, unless otherwise specified.)

IN = 0V, V_{CC} = 5 = EN = 0V to 5V, R_{disc} = 1kΩ

IN = 5V, V_{CC} = 5= EN = 0V to 5V, R_{disc} = 1kΩ

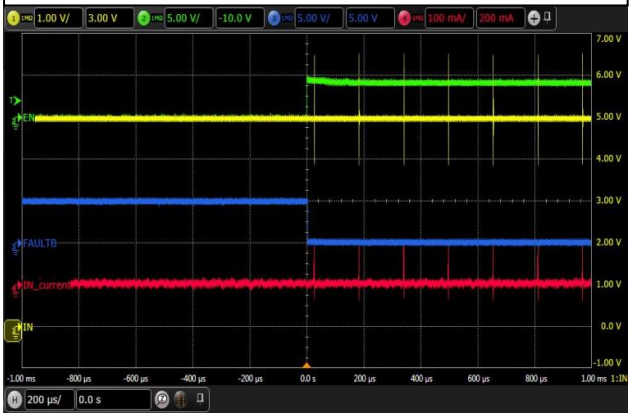
V_{CC} = EN = 5V, IN_Current = 0A to 10A (IN Initial = 0V)

UVLO Locked Out Threshold and Hysteresis.



V_{CC} = EN = 5V, IN = 0V Hard Short to 12V

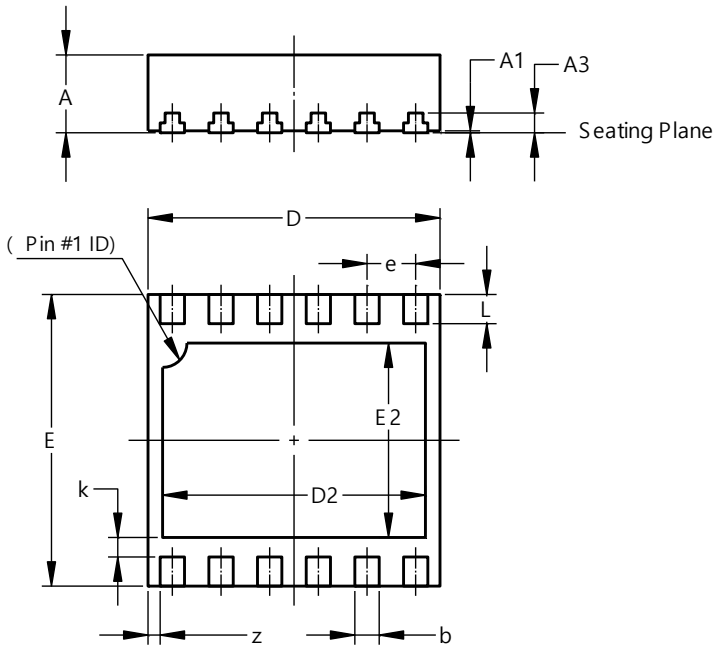
IN = Hard Short to 5V, V_{CC} = EN = 0V to 5V



Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

V-DFN3030-12 (Type B)

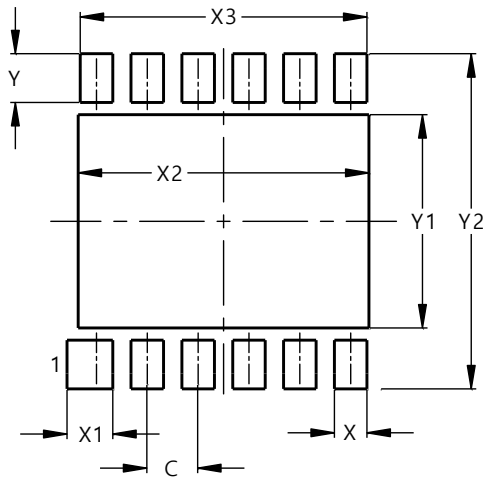


V-DFN3030-12 Type B			
Dim	**Min**	**Max**	**Typ**
A	0.77	0.85	0.80
A1	0.00	0.05	0.02
A3	--	--	0.203
b	0.20	0.30	0.25
D	2.95	3.05	3.00
D2	2.60	2.80	2.70
E	2.95	3.05	3.00
E2	1.90	2.10	2.00
e	0.50BSC		
k	--	--	0.20
L	0.25	0.35	0.30
z	--	--	0.125
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

V-DFN3030-12 (Type B)



Dimensions	Value (in mm)
C	0.50
X	0.32
X1	0.45
X2	2.86
X3	2.82
Y	0.48
Y1	2.10
Y2	3.30

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