



# SILEGO

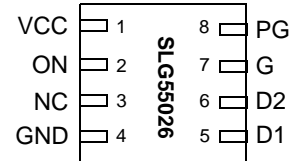
# SLG55026-200300V

## GreenFET™ Dual Power MOSFET Driver

### Features

- 12V Power supply
- Drain Voltage Range 1.0V to 20V
- Internal Gate Voltage Charge Pump
- Controlled Turn on Delay
- Controlled Turn on Slew Rate
- 2mm x 2mm TDFN-8 Package

### Pin Configuration



**8-pin TDFN**  
(Top View)

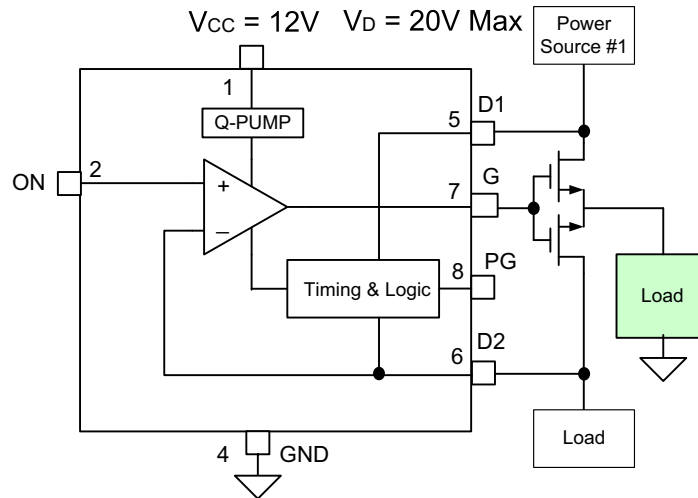
### Applications

- Power Rail Switches
- Hot Plugging Applications
- Soft Switching
- Personal computers and Servers
- Data Communications Equipment

### Environmental

- Pb-Free / RoHS compliant
- Halogen Free

### Block Diagram



**SLG55026**  
For N-MOSFETS with  $8V < V_{GD2} < 16V$



## Pin Description

Pin #	Pin Name	Type	Pin Description
1	VCC	Power	Supply Voltage
2	ON	Input	CMOS Logic Level. High True
3	NC	--	No Connect.
4	GND	GND	Ground.
5	D1	Input	FET1 Drain Connection
6	D2	Input	FET2 Drain Connection
7	G	Output	FET Gate Drive
8	PG	Output	Output Open Drain - Power Good, indicates external FET fully on. Pull-up resistor greater than 300k $\Omega$ recommended.

## Overview

The SLG55026-200300V N-Channel FET Gate Driver is used for controlling a delayed turn on and ramping slew rate of the source voltage on N-Channel FET switches from a CMOS logic level input. The gate driver exhibits a turn-on slew rate of 2 V/ms which, depending on load supplying source voltages in the range of 1.0V to 20V results in ramp times from 500 $\mu$ s to over 10ms (see Application Section). Start up ramp delay is 250 $\mu$ s. A power good condition is output to indicate that the ramp-up slew of the source voltage is finished. The SLG55026 gate driver is packaged in an 8 pin TDFN package.

When used with external N-Channel FETs, the SLG55026 supports low transient, energy efficient switching of high current loads at source voltages ranging from 1.0V to 20V.

## Ordering Information

Part Number	Type
SLG55026-200300V	TDFN-8
SLG55026-200300VTR	TDFN-8 - Tape and Reel (3k units)

## Configuration Options

Code	Slew Rate (V/ms)	Delay (ms)	Discharge ( $\Omega$ )
200300	2.0	0.25	Open



### Absolute Maximum Conditions

Parameter	Min.	Max.	Unit
$V_{D1}$ or $V_{D2}$ to GND	-0.3	40.0	V
Voltage at Logic Input pins	-0.3	6.5	V
Current at input pin	-1.0	1.0	mA
Storage temperature range	-65	150	°C
Operating temperature range	-55	125	°C
Junction temperature	--	150	°C
ESD Human Body Model	--	2000	V
ESD Machine Model	--	200	V

### Electrical Characteristics (0°C to 70°C)

Symbol	Parameter	Condition/Note	Min.	Typ.	Max.	Unit
$V_{CC}$	Supply Voltage		11.5	12.0	12.5	V
$T_{VCC\_RAMP}$	$V_{CC}$ Ramp-up Rate	See Note 1	0.25	--	--	V/ms
$I_q$	Quiescent Current	$V_G$ not ramping FET = ON	--	50	80	μA
		$V_G$ not ramping FET = OFF	--	0.1	1	μA
$V_{D1}$	FET Drain Voltage		1.0	--	20	V
$V_{D2}$	Gate-Drain Voltage		8.0	11.5	16	V
$C_G$	FET Gate Capacitance		500	--	16000	pF
$T_{DELAY}$	Ramp Delay Range		--	0.25	0.325	ms
$T_{SLEW}$	FET Turn on Slew Rate	2.0V/ms config option	1.4	2.0	2.6	V/ms
$I_{DISCHARGE}$	Internal Discharge Resistor		--	Open	--	Ω
$V_{IH}$	HIGH-level input voltage	ON (200mV Hysteresis)	2.4	--	5.5	V
$V_{IL}$	LOW-level Input voltage	ON (200mV Hysteresis)	--	--	0.4	V
$V_{OH}$	HIGH-level output voltage	PG Open Drain	--	--	5.5	V
$I_{OL\_LOGIC}$	Logic LOW level output	PG Sink Current (0.4V)	--	0.02	--	mA

Note 1: If  $T_{VCC\_RAMP} > 5V/ms$  and ON is asserted, Gate charging will begin after 1ms.



## Device Operation

In a typical application, de-asserting ON (low) turns off the external power N-FET. When ON is asserted (high), the device will not begin driving the gate of the external power FET unless the voltage at the drain of the device is at or above 1V (e.g.  $V_{D1} \geq 1V$ ). Gate voltage is applied to the gate of the external power N-FET after  $T_{DELAY}$  then the gate drain ( $V_{GD2}$ ) voltage is ramped up to 11.5V above the output voltage  $V_{D2}$  at a slew rate determined by the internal slew rate control circuit in SLG55026. Monotonic rise of  $V_{D2}$  is maintained even as  $I_D$  increases dramatically after the load device turn on threshold voltage is reached. After the output voltage has ramped up to its maximum steady state value, the Open Drain PG (Power Good) signal is asserted. PG may be used as the ON control of a second SLG55026 thereby providing power on sequence control of a number of switched power rails, or used in a 'wired and' with other PG signals to indicate all switched power rails are in a power good condition.

If the ON signal has been asserted prior to the application of  $V_{CC}$ , the device will begin turning on the external power FET after  $V_{CC}$  ramps up

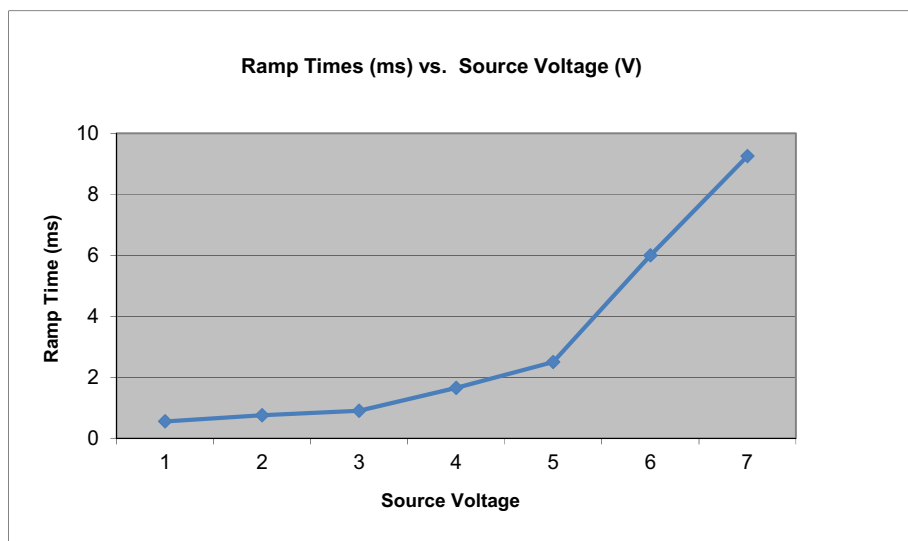
## Delay Time and Slew Rates

The two components of controlling the application of FET source voltage to the load are a fixed time delay before beginning turn on of the FET ( $T_{DELAY}$ ) and the Ramp Time of the output voltage. The Delay Time before gate voltage to the FET is applied is 250 $\mu$ s, independent of FET drain voltage, source voltage or SLG55026 supply voltage.

During FET turn on, it is important to control transients (caused by  $dv/dt$ ) by being able to control the Slew Rate of the FET's output voltage. A power FET, for example, switching a 5V rail which has a total of 500 $\mu$ F of decoupling, fully on in 10 $\mu$ s will generate a 250A current surge which is very undesirable. If the FET turn on time can be stretched to 1ms, the current surge to charge the decoupling capacitors is reduced to 2.5A. The SLG55026 controls slew rate of a FET's output voltage as it is turned on. Obviously, the time to fully slew the output voltage to fully on is a function of the drain supply voltage. The table and graph below shows output voltage ramp times for a 2V/ms slew rate supported by the SLG55026 for a range of specific source voltages.

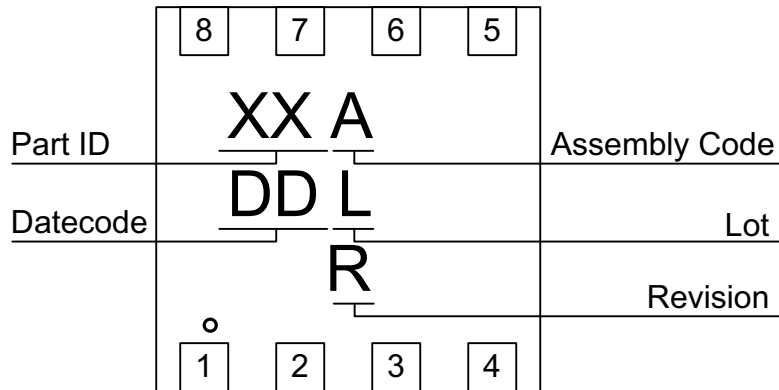
Slew Rate (V/ms)	Ramp Times (ms) vs. Source Voltages (V)						
	1.1V	1.5V	1.8V	3.3V	5.0V	12V	18.5V
2.00	0.56	0.76	0.90	1.66	2.50	6.00	9.26

\* The minimum time that ON can be de-asserted between switching cycles is 100 $\mu$ s.





### Package Top Marking System Definition

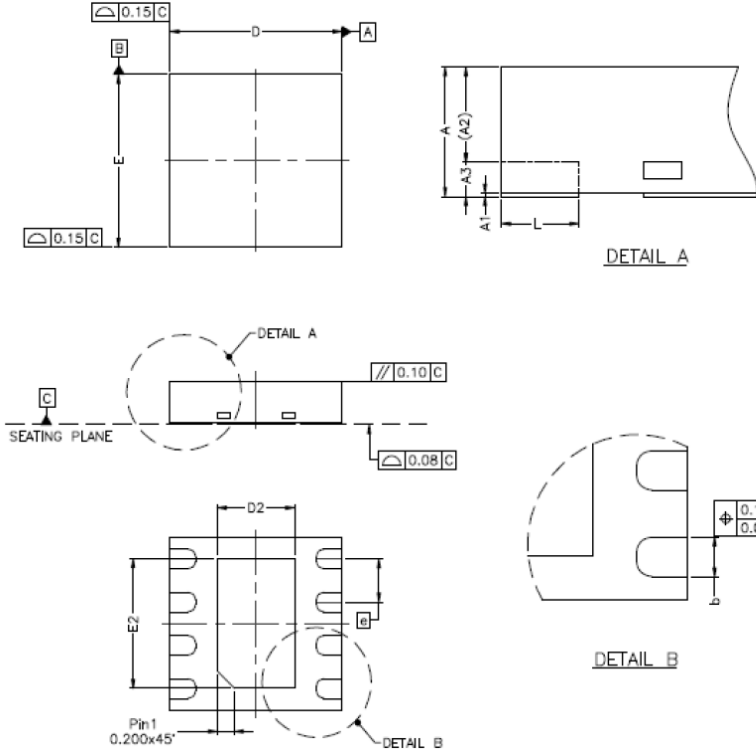


- XX – Part ID Field: identifies the specific device configuration
- A – Assembly Code Field: Assembly Location of the device.
- DD – Date Code Field: Coded date of manufacture
- L – Lot Code: Designates Lot #
- R – Revision Code: Device Revision



**Package Drawing and Dimensions**

**8 Lead TDFN Package  
JEDEC MO-229, Variation WCCD**



SYMBOL	DIMENSION (MM)			DIMENSION (MIL)		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80	28	30	31
A1	0.00	0.02	0.05	0	1	2
A2	0	0.55	0.80	0	22	31
A3	—	0.20	—	—	8	—
b	0.18	0.25	0.30	7	10	12
D	1.90	2.00	2.10	74	79	83
D1	—			—		
D2	0.75	0.90	1.05	30	35	41
E	1.90	2.00	2.10	75	79	83
E1	—			—		
E2	1.50	1.65	1.70	53	59	65
e	0.50 BSC			20 BSC		
L	0.25	0.30	0.35	10	12	14

- NOTE :
1. REFER TO JEDEC STD: MO-229.
  2. DIMENSION "b" APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.15MM AND 0.30MM FROM THE TERMINAL TIP. IF THE TERMINAL HAS OPTIONAL RADIUS ON THE OTHER END OF THE TERMINAL, THE DIMENSION B SHOULD NOT BE MEASURED IN THAT RADIUS AREA.

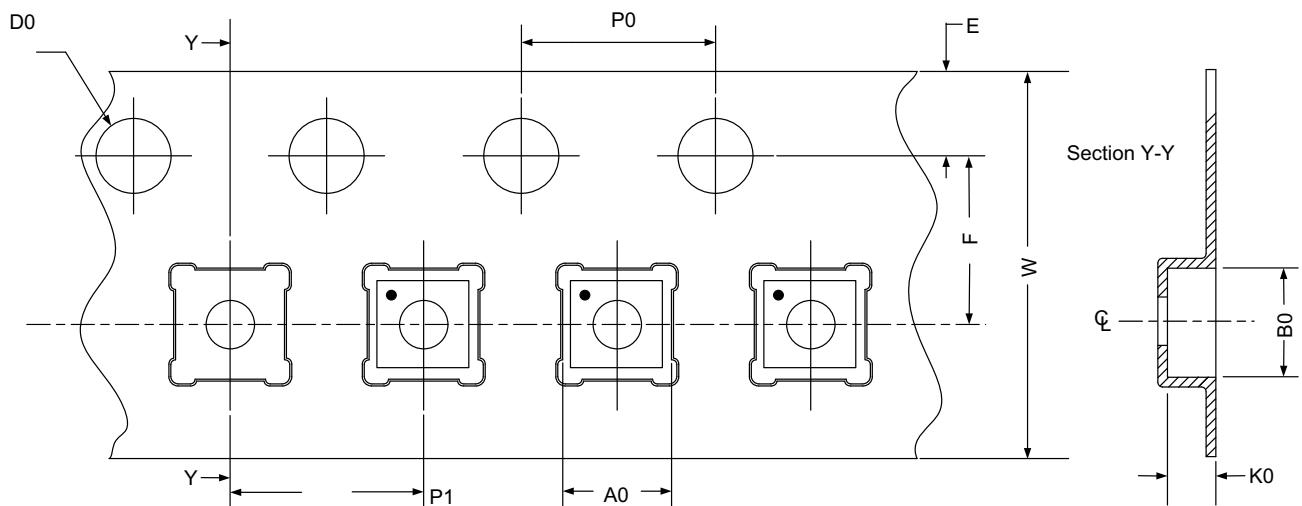


## Tape and Reel Specifications

Package Type	# of Pins	Nominal Package Size [mm]	Max Units		Reel & Hub Size [mm]	Leader (min)		Trailer (min)		Tape Width [mm]	Part Pitch [mm]
			per Reel	per Box		Pockets	Length [mm]	Pockets	Length [mm]		
TDFN 8L Green	8	2 x 2 x 0.75	3,000	3,000	178 / 60	100	400	100	400	8	4

## Carrier Tape Drawing and Dimensions

Package Type	Pocket BTM Length	Pocket BTM Width	Pocket Depth	Index Hole Pitch	Pocket Pitch	Index Hole Diameter	Index Hole to Tape Edge	Index Hole to Pocket Center	Tape Width
	A0	B0	K0	P0	P1	D0	E	F	W
TDFN 8L Green	2.3	2.3	1.05	4	4	1.55	1.75	3.5	8



Refer to EIA-481 specification

## Recommended Reflow Soldering Profile

Please see IPC/JEDEC J-STD-020: latest revision for reflow profile based on package volume of 3.00 mm<sup>3</sup> (nominal). More information can be found at [www.jedec.org](http://www.jedec.org).