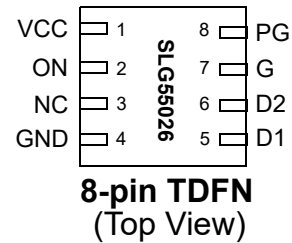


Features

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

Pin Configuration



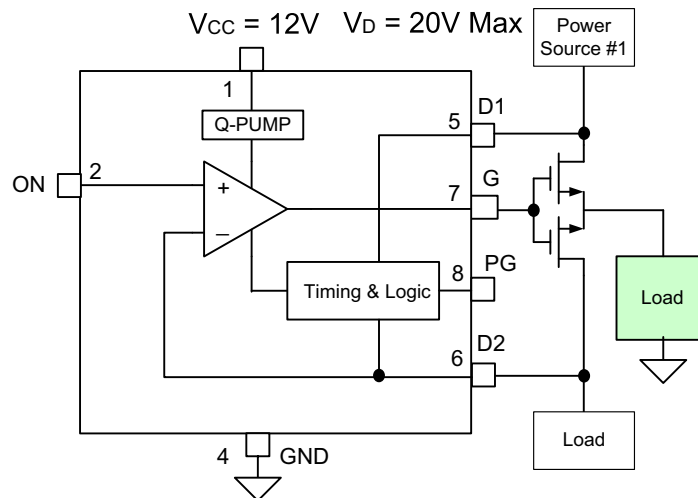
Applications

- 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 Ω 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 1.0 V to 20 V results in ramp times from 500 μ s to over 10 ms (see Application Section). Start up ramp delay is 250 μ 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 1.0 V to 20 V.

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 (Ω) |
|--------|------------------|------------|------------------------|
| 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 $T_{VCC_RAMP} > 5$ V/ms and ON is asserted, Gate charging will begin after 1 ms.

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 1 V (e.g. $V_{D1} \geq 1\text{ V}$). 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

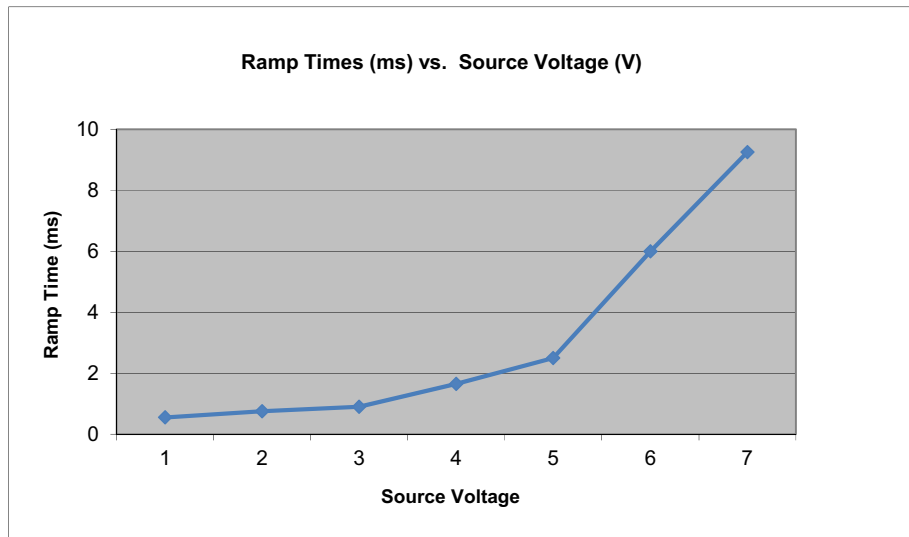
Delay Time and Slew Rates

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 μ 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 5 V rail which has a total of 500 μ F of decoupling, fully on in 10 μ s will generate a 250 A 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 2.5 A. 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 2 V/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) | | | | | | |
|------------------|---|-------|-------|-------|-------|------|--------|
| | 1.1 V | 1.5 V | 1.8 V | 3.3 V | 5.0 V | 12 V | 18.5 V |
| 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 μ s.



**Package Top Marking System Definition
For devices manufactured after 2021**

| | |
|------------|-------------------------------------|
| PPP | Part Code |
| NNN | Serial Number |
| ○ R | Pin 1 Identifier + Revision Code |

PPP - Part Code Field: Identifies the specific device Configuration
 NNN - Serial Number Field: Serial number
 R - Revision Code Field: Device Revision

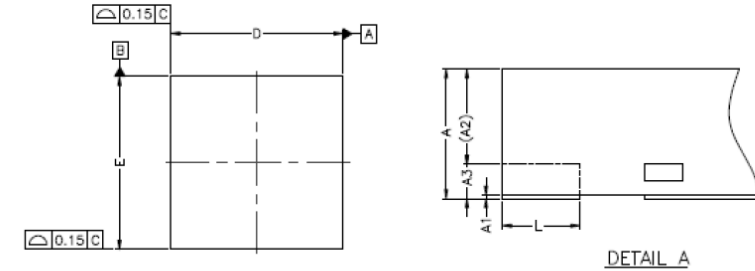
For devices manufactured before 2021

| | |
|------------|-------------------------------------|
| XXA | Part ID + Assembly Code |
| DDL | Date Code + Lot |
| ○ R | Pin 1 Identifier + Revision Code |

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

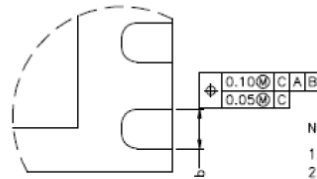
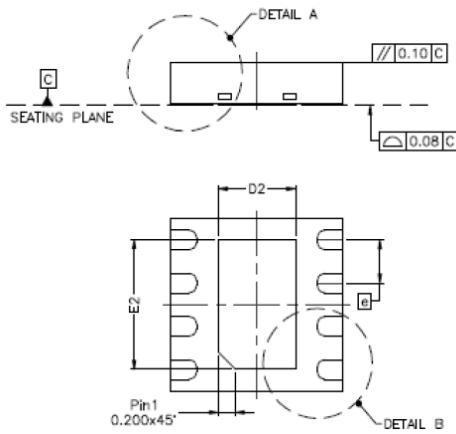
Package Drawing and Dimensions

8 Lead TDFN Package JEDEC MO-229, Variation WCCD



DETAIL A

| 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 |



DETAIL B

NOTE :

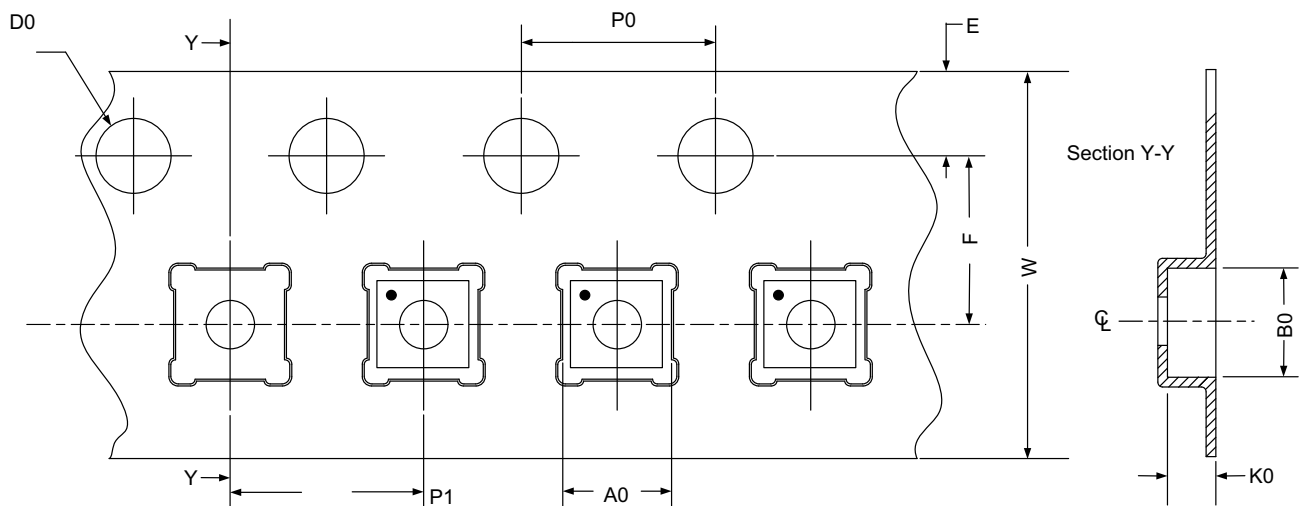
1. REFER TO JEDEC STD: MO-229.
2. DIMENSION "b" APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.15MM AND 0.30MM FROM THE TERMINAL TIP. IF THE TERMINAL HAS OPTIONAL RADIUS ON THE OTHER END OF THE TERMINAL, THE DIMENSION B SHOULD NOT BE MEASURED IN THAT RADIUS AREA.

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 mm³ (nominal). More information can be found at www.jedec.org.

Revision History

| Date | Version | Change |
|----------|---------|--|
| 6/8/2023 | 1.03 | Updated Part Marking Definition |
| 2/9/2022 | 1.02 | Updated Company name and logo Fixed typos |

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