## GENERAL DESCRIPTION

The ACP12522 is a current limit power switch designed for load-switching applications. The current limit threshold be set at an accurate 2.1A. The integrated current-limiting circuit protects the input supply against large currents which may cause the supply to fall out of regulation. They offer current and thermal limiting and short circuit protection as well as controlled rise time and under voltage lockout functionality. A 12ms deglitch capability on the open-drain Flag output prevents false over-current reporting and does not require any external components. The device are available in SOT25 and U-DFN2018-6 packages.

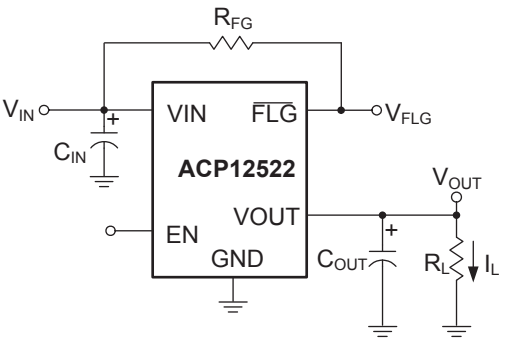
## FEATURES

- Input Voltage Range: 2.5V to 5.5V
- 2.1A Accurate Current Limiting Threshold
- Fast Transient Response
- Max 35μA Quiescent Current
- Low 90mΩ Typical $R_{DS(ON)}$
- Reverse Current Blocking
- Thermal Shutdown and Over-Current Protection
- Fault Report with 12ms Typical Blanking Time
- -40 to 85°C Operation Temperature Range

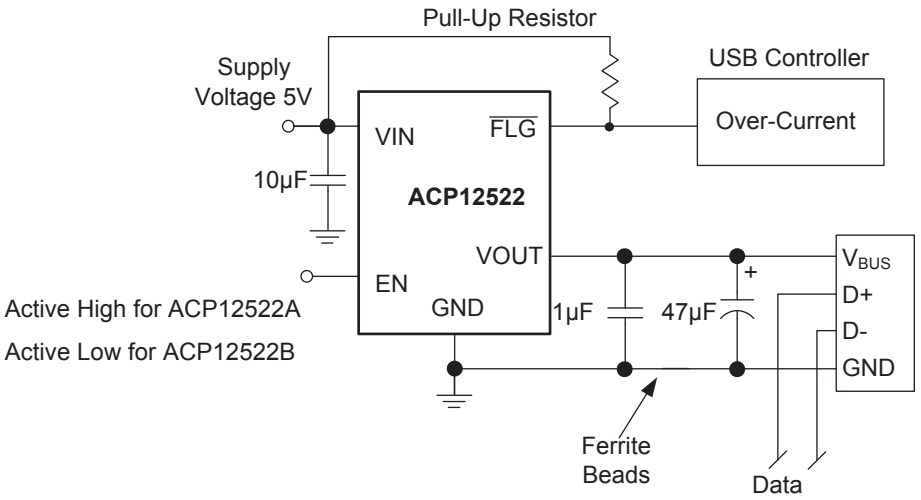
## APPLICATION

- USB Bus
- Self Powered Hubs
- USB Peripherals
- STB,LCD TV, Printer

## TEST CIRCUIT

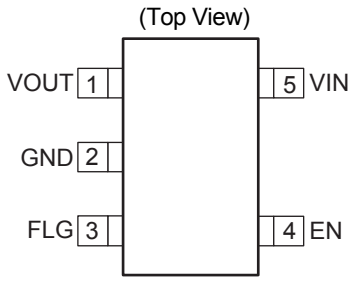


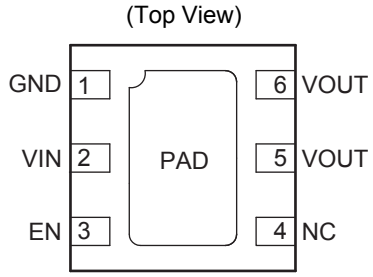

## APPLICATION CIRCUIT




**Typical ACP12522 Application Circuit**

## PIN CONFIGURATION

| Pin Configuration | Pin Description | | |
|---|---|---|---|
| **SOT25** | **Pin#** | **Symbol** | **Function** |
|  | 1 | VOUT | Voltage Output Pin |
| | 2 | GND | Ground |
| | 3 | FLG | Fault Report Pin |
| | 4 | EN | Enable Input, Active High |
| | 5 | VIN | Voltage Input Pin |

| Pin Configuration | Pin Description | | |
|---|---|---|---|
| **U-DFN2018-6** | **Pin#** | **Symbol** | **Function** |
|  | 1 | GND | Ground |
| | 2 | VIN | Voltage Input Pin |
| | 3 | EN | Enable Input |
| | 4 | FLG | Fault Report Pin |
| | 5 | VOUT | Voltage Output Pin |
| | 6 | VOUT | Voltage Output Pin |

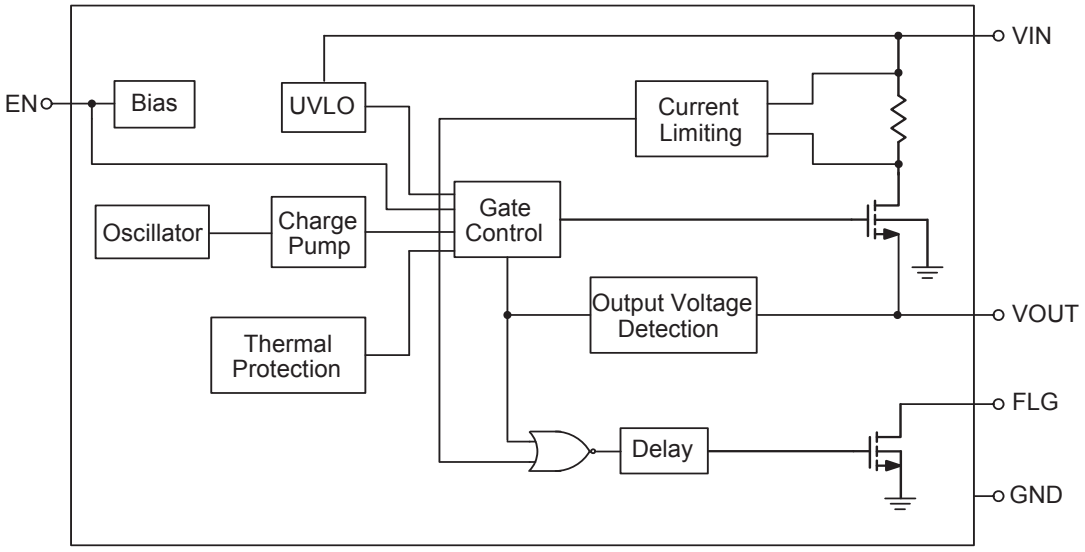
## ORDERING INFORMATION

| Standard Part NO. | Package | Remark | Min. Quantity |
|---|---|---|---|
| ACP12522A-BTRAL | SOT25 | Active-High | 3000PCS |
| ACP12522B-BTRAL | | Active-Low | 3000PCS |
| ACP12522A-ZTRAL | U-DFN2018-6 | Active-High | 3000PCS |
| ACP12522B-ZTRAL | | Active-Low | 3000PCS |

## ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Rating | Unit |
|---|---|---|---|
| Input, EN Voltage | $V_{IN}$, $V_{EN}$ | 6.5 | V |
| Output Voltage | $V_{OUT}$ | $V_{IN}$+0.3 | |
| Maximum Junction Temperature | $T_J$ | -40 to 150 | °C |
| Storage Temperature | $T_S$ | -65 to 150 | |
| Operating Ambient Temperature | $T_A$ | -40 to 85 | |
| Human Body Model | HBM | 2000 | V |
| Machine Mode | MM | 400 | |

## FUNCTION BLOCK



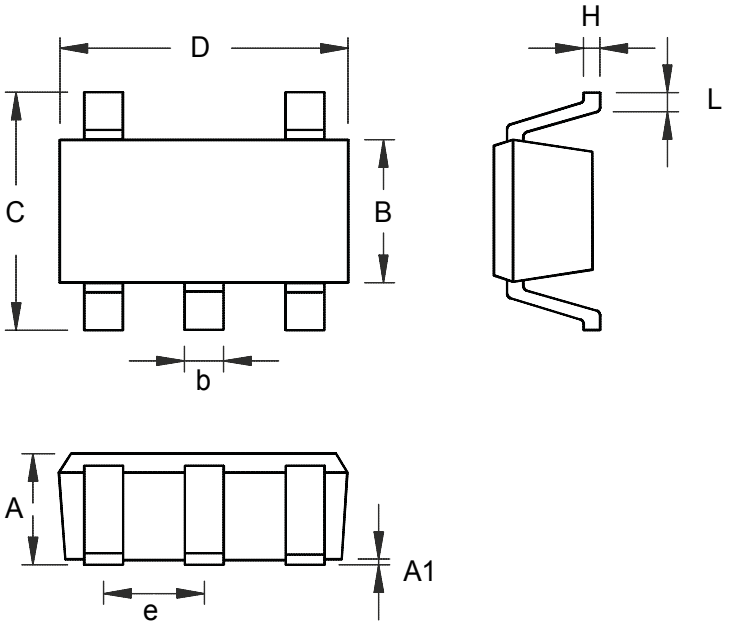

**Functional Block Diagram**

## ELECTRICAL CHARACTERISTICS($T_A$ = +25°C)

| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Input UVLO Threshold | $V_{UVLO}$ | $V_{IN}$ Rising | 1.7 | | 2.3 | V |
| Input Shutdown Current | $I_{SHDN}$ | Disabled, $I_{OUT}$ = 0 | | 0.1 | 1 | μA |
| Input Quiescent Current | $I_Q$ | Enabled, $I_{OUT}$ = 0 | | 20 | 35 | |
| Input Leakage Current | $I_{LEAK}$ | Disabled, OUT Grounded | | 0.1 | 1 | |
| Reverse Leakage Current | $I_{REV}$ | Disabled, $V_{IN}$ = 0V<br>$V_{OUT}$ = 5V,$I_{REV}$ at $V_{IN}$ | | 0.1 | 1 | |
| Switch On-Resistance | $R_{DS(ON)}$ | $V_{IN}$ = 5V,$I_{OUT}$=1.5A<br>-40°C≤$T_A$≤85°C | | 90 | 120 | mΩ |
| | | $V_{IN}$ = 3.3V,$I_{OUT}$=1.5A<br>-40°C≤$T_A$≤85°C | | 100 | 130 | |
| Short Circuit Current Limit | $I_{SH}$ | Enabled into short circuit,<br>$C_L$=120μF | | 2 | | A |
| Over Load Current Limit | $I_L$ | $V_{IN}$= 5V, $V_{OUT}$= 4.0V,<br>$C_L$=120μF, -40°C≤$T_A$≤85°C | 1.85 | 2.1 | 2.35 | |
| Current limiting Trigger Threshold | $I_{Trig}$ | Output Current Slew rate<br>(<100A/S) , $C_L$=120μF | | 2.6 | | |
| EN Input Logic Low Voltage | $V_{IL}$ | $V_{IN}$ = 2.7V to 5.5V | | | 0.4 | V |
| EN Input Logic High Voltage | $V_{IH}$ | | 1.6 | | | |
| EN Input leakage | $I_{SINK}$ | $V_{EN}$ = 5V | | | 1 | μA |
| Output Turn On Rise Time | $t_R$ | $C_L$ = 1μF<br>$R_{LOAD}$ = 10Ω | | 0.6 | 1.5 | ms |
| Output Turn On Delay Time | $t_{D(ON)}$ | | | 2.3 | | |
| Output Turn Off Delay Time | $t_{D(OFF)}$ | | | 0.025 | | |
| Output Turn On Fall Time | $t_F$ | | | 0.05 | 0.1 | |
| FLG Output FET On-Resistance | $R_{FLG}$ | $I_{FLG}$ =10mA | | 20 | 40 | Ω |
| FLG Blanking Time | $T_{Blank}$ | $C_{IN}$=10μF, $C_L$=22μF | 8 | 12 | 16 | ms |
| Thermal Shutdown Threshold | $T_{SHDN}$ | Enabled, $R_{load}$=1KΩ | | 150 | | °C |
| Thermal Shutdown Hysteresis | $T_{HYS}$ | | | 20 | | |
| Junction to Ambient | $θ_{JA}$ | SOT25 | | 170 | | °C/W |
| | | U-DFN2018-6 | | 70 | | |

## PACKAGE INFORMATION

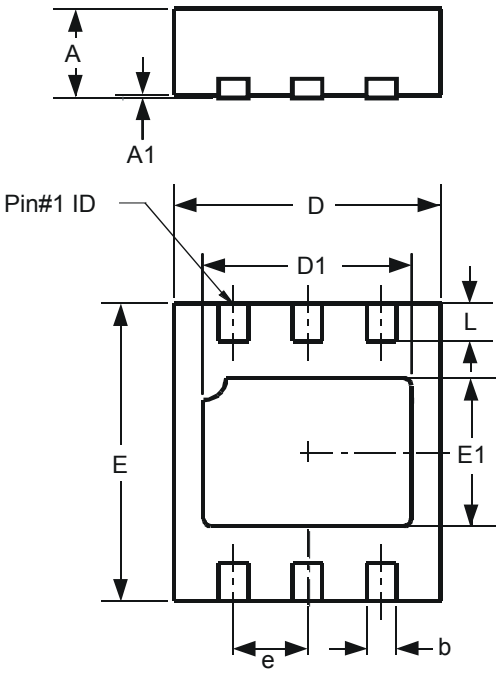
- **SOT25**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.889 | 1.295 | 0.035 | 0.051 |
| A1 | 0.000 | 0.152 | 0.000 | 0.006 |
| B | 1.397 | 1.803 | 0.055 | 0.071 |
| b | 0.356 | 0.559 | 0.014 | 0.022 |
| C | 2.591 | 2.997 | 0.102 | 0.118 |
| D | 2.692 | 3.099 | 0.106 | 0.122 |
| e | 0.838 | 1.041 | 0.033 | 0.041 |
| H | 0.080 | 0.254 | 0.003 | 0.010 |
| L | 0.300 | 0.610 | 0.012 | 0.024 |

## PACKAGE INFORMATION

- **U-DFN2018-6**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 0.545 | 0.605 | 0.021 | 0.023 |
| A1 | | 0.050 | | 0.002 |
| b | 0.150 | 0.250 | 0.005 | 0.009 |
| D | 1.750 | 1.875 | 0.068 | 0.070 |
| D1 | 1.300 | 1.500 | 0.051 | 0.059 |
| e | 0.450 | 0.600 | 0.017 | 0.023 |
| E | 1.950 | 2.075 | 0.076 | 0.081 |
| E1 | 0.900 | 1.100 | 0.035 | 0.043 |
| L | 0.200 | 0.300 | 0.007 | 0.011 |