

GENERAL DESCRIPTION

The ACP2855 is a high-efficiency monolithic synchronous buck regulator using a constant frequency, current mode architecture. The device is available in an adjustable version. Supply current with no load is 70 μ A and drops to <1 μ A in shutdown. The 2.5V to 5.5V input voltage range makes the ACP2855 ideally suited for single Li-Ion battery powered applications. 100% duty cycle provides low dropout operation, extending battery life in portable systems. PWM/PFM mode operation provides very low output ripple voltage for noise sensitive applications. Switching frequency is internally set at 2MHz, allowing the use of small surface mount inductors and capacitors. Low output voltages are easily supported with the 0.6V feedback reference voltage.

The device is available in a SOT25 package.

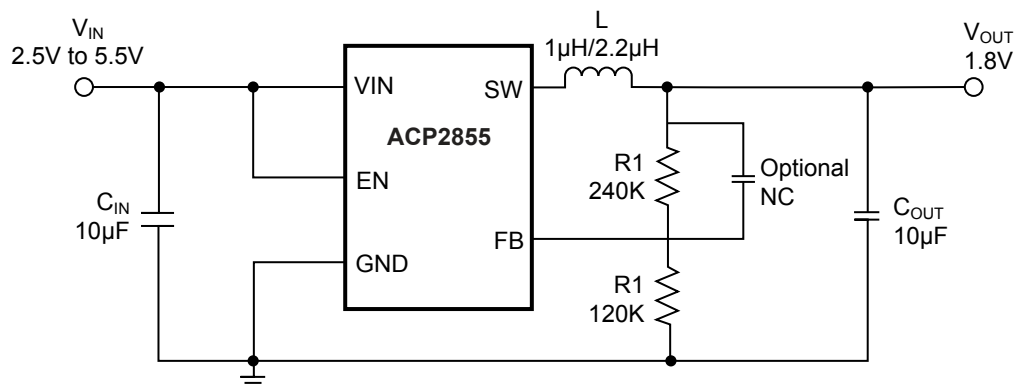
FEATURES

- Input Voltage Range: 2.5V to 5.5V
- 2MHz Constant Frequency Operation
- High Efficiency: Up to 96%
- No Schottky Diode Required
- Low Dropout Operation: 100% Duty Cycle
- PFM Mode for High Efficiency in Light Load
- Low Quiescent Current: 70 μ A
- Over Temperature Protected
- Short Circuit Protection
- Over Voltage Protection
- Inrush Current Limit and Soft Start

APPLICATION

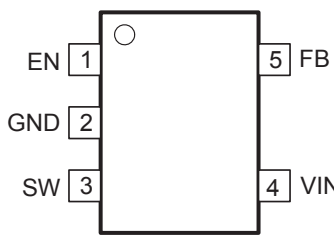
- PC Card
- Portable Instruments
- Wireless and DSL Modems
- Cellular and Smart Phones
- Digital Still and Video Cameras

APPLICATION CIRCUIT



Typical ACP2855 Application Circuit

▼ PIN CONFIGURATION

| Pin Configuration | Pin Description | | |
|-----------------------------------------------------------------------------------|-----------------|--------|-----------------------------|
| | Pin# | Symbol | Function |
|  | 1 | EN | Chip Enable Pin |
| | 2 | GND | Ground |
| | 3 | SW | Power Switch Output |
| | 4 | VIN | Power Supply Input |
| | 5 | FB | Output Voltage Feedback Pin |

▼ ORDERING INFORMATION

| Standard Part NO. | Package | Packing | Min. Quantity |
|-------------------|---------|-------------|---------------|
| ACP2855-BAA | SOT25 | Tape & Reel | 3000PCS |

▼ ABSOLUTE MAXIMUM RATINGS

| Parameter | Symbol | Rating | Unit |
|---------------------------------|---------------|----------------------|------|
| IN Voltage | V_{IN} | -0.3 to 7 | V |
| EN Voltage | V_{EN} | -0.3 to 6 | |
| SW Voltage | V_{SW} | -0.3 to $V_{IN}+0.3$ | |
| Peak SW Sink and Source Current | | 2.2 | A |
| Continuous Power Dissipation | P_D | 0.5 | W |
| Junction Temperature | T_J | -40 to 165 | °C |
| Storage Temperature | T_S | -65 to 150 | |
| Lead Temperature | T_L | 260 | |
| Junction to Ambient | θ_{JA} | 170 | °C/W |
| Junction to Case | θ_{JC} | 75 | |

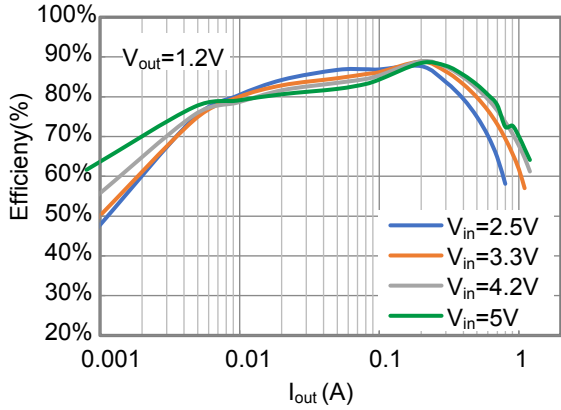
▼ ELECTRICAL CHARACTERISTICS

 (All typical values are at $T_J = 25^\circ\text{C}$, unless otherwise noted.)

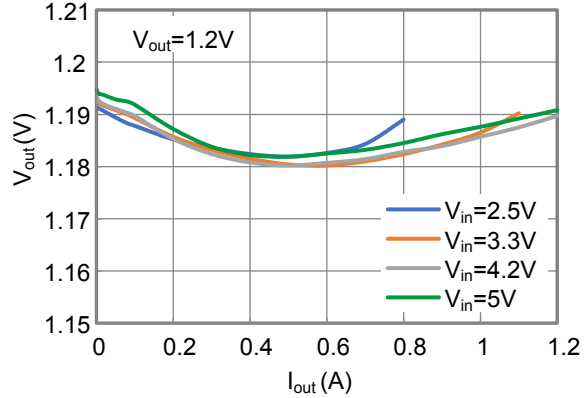
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|-------------------------------------|-----------------|----------------------------------------------|-----|-----|-----|------------------|
| Input Voltage Range | V_{IN} | | 2.5 | | 5.5 | V |
| Input Overvoltage Threshold | V_{OVP} | | | 6.1 | | |
| Feedback Voltage | V_{FB} | No Load | 588 | 600 | 612 | mV |
| Under Voltage Lockout Threshold | V_{UVLO} | | 2.1 | 2.3 | 2.5 | V |
| UVLO Hysteresis | V_{UVLO_hys} | | 0.1 | 0.2 | 0.3 | |
| Switching Frequency | f_{SW} | $V_{FB}=0.5V$ | 1.6 | 2 | 2.4 | MHz |
| Max Duty Cycle | D_{MAX} | | | 100 | | % |
| No Load Supply Current at V_{IN} | I_Q | | | 70 | 120 | μA |
| Shutdown Supply Current at V_{IN} | I_{SHUT} | $V_{EN}=0V$ | | 0.1 | 1 | |
| Efficiency | | $I_{LOAD}=0.6A$ | 85 | 90 | | % |
| Line Regulation | | $I_{LOAD}=300mA$ | | 0.1 | 0.2 | %/V |
| Load Regulation | | $I_{LOAD}=0-1A$ | | 0.1 | 0.2 | %/A |
| NMOS Switch On Resistance | $R_{DS(ON)}$ | $I_{SW} = 100mA$ | | 250 | 250 | m Ω |
| PMOS Switch On Resistance | | $I_{SW} = 100mA$ | | 350 | 350 | |
| Peak Current Limit | I_{LIM} | | 1.4 | 1.8 | 2.2 | A |
| SW Leakage Current | I_{LEAK} | $V_{IN}= 6V, V_{SW}= 0 \text{ or } 6V, EN=0$ | | | 10 | μA |
| OTP | | | 135 | 150 | 160 | $^\circ\text{C}$ |
| OTP Hysteresis | | | 20 | 30 | 40 | |
| EN Input Low Voltage | V_{IL} | | | | 0.3 | V |
| EN Input High Voltage | V_{IH} | | 1 | | | |

PARAMETER MEASUREMENT INFORMATION

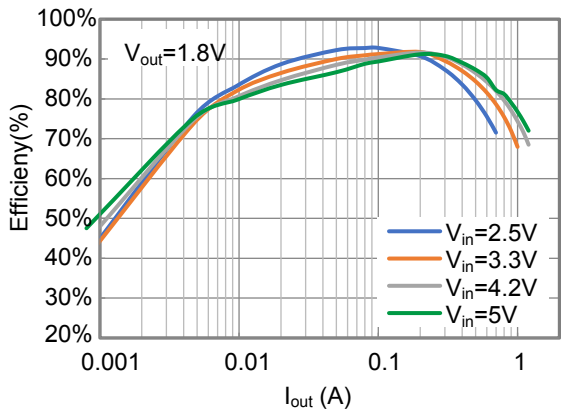
$C_{IN}=C_{OUT}=10\mu F$, $L=2.2\mu H$, $T_A=25^\circ C$, Unless otherwise specified



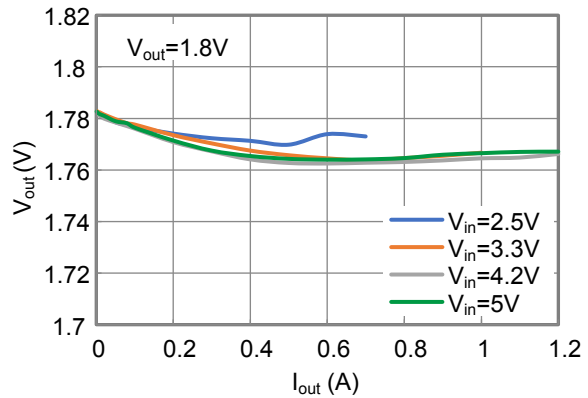
Efficiency $V_{out}=1.2V$



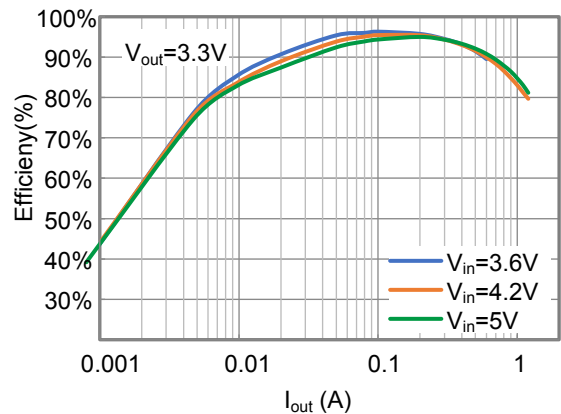
Load Regulation $V_{out}=1.2V$



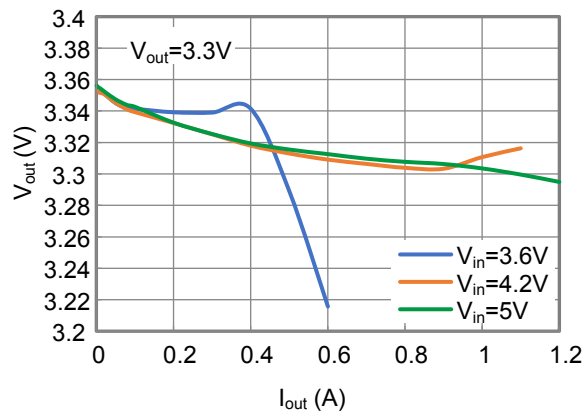
Efficiency $V_{out}=1.8V$



Load Regulation $V_{out}=1.8V$

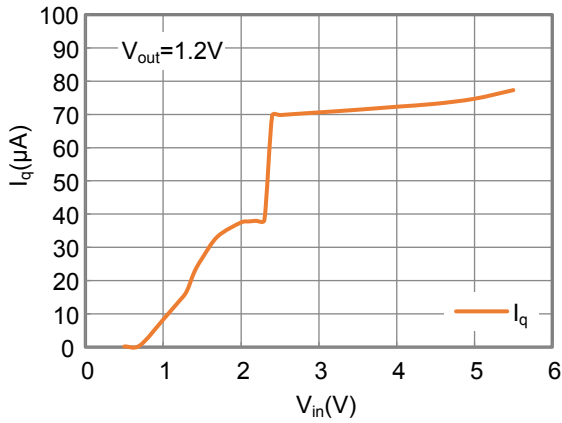


Efficiency $V_{out}=3.3V$

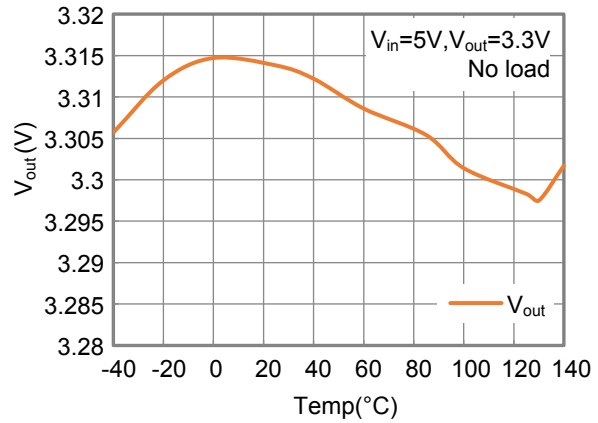


Load Regulation $V_{out}=3.3V$

PERFORMANCE CHARACTERISTIC(Continued)

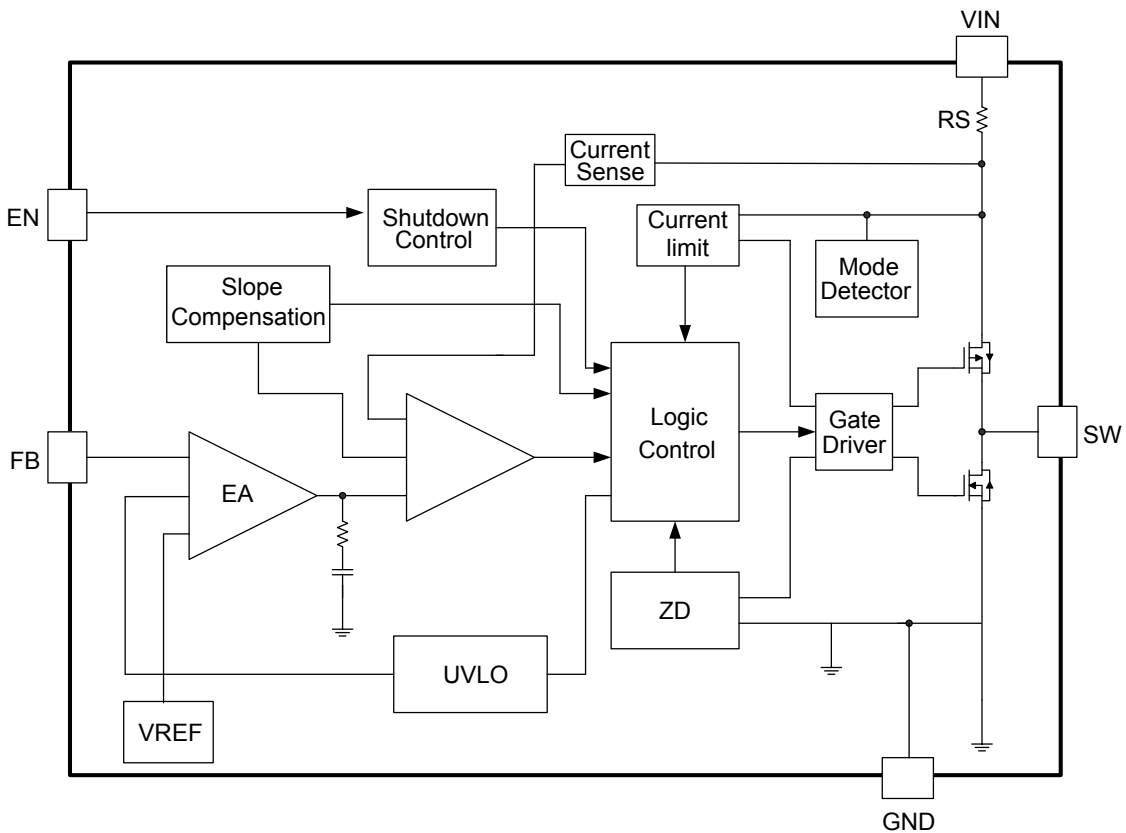


I_q VS. V_{in}



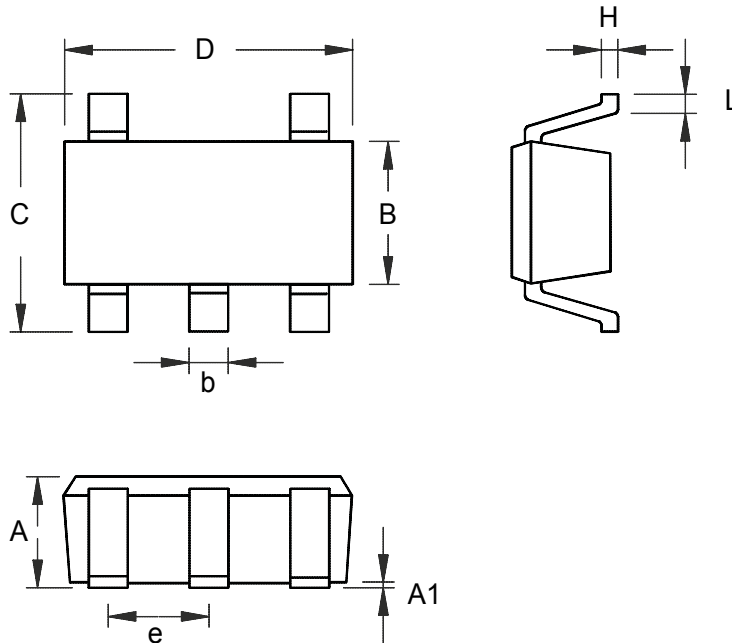
V_{out} VS. Temp

FUNCTION BLOCK



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 |