

SCSI Termpower Manager

FEATURES

- Integrated Circuit Breaker Function
- Integrated 0.2Ω Power FET
- SCSI, SCSI-2, SCSI-3 Compliant
- $1\mu\text{A}$ ICC When Disabled
- Programmable On Time
- Accurate 1.65A Trip Current and 2.0A Max Current
- Fixed 3% Duty Cycle
- Uni-Directional Switch
- Thermal Shutdown

DESCRIPTION

The UCC3916 SCSI termpower manager provides complete power management, hot swap capability, and circuit breaker functions with minimal external components. For most applications, the only external component required to operate the device, other than supply bypassing, is a timing capacitor which sets the fault time.

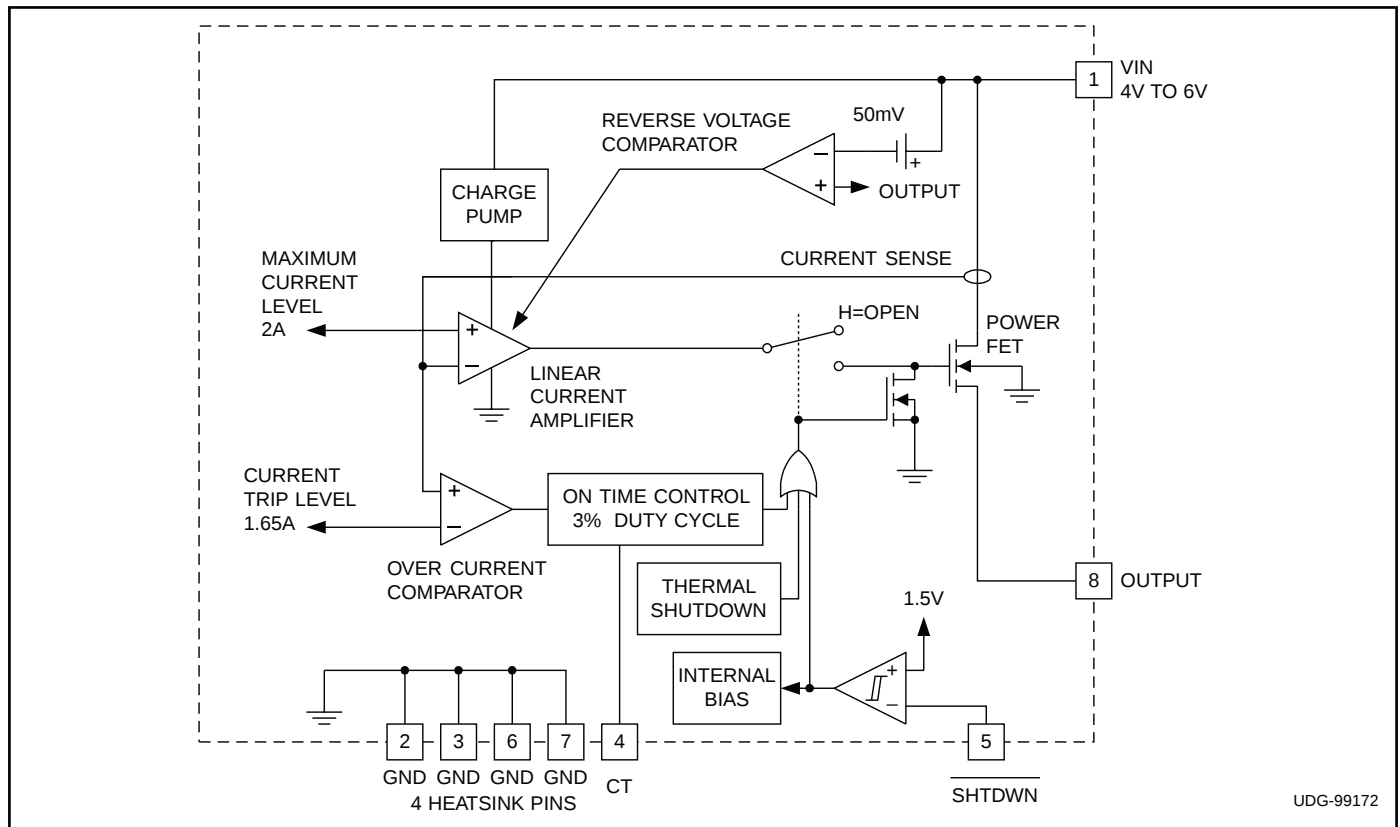
The current trip level is internally set at 1.65A, and the maximum current level is also internally programmed for 2A. While the output current is below the trip level of 1.65A, the internal power MOSFET is switched on at a nominal $220\text{m}\Omega$. When the output current exceeds the trip level but remains less than the maximum current level, the MOSFET remains switched on, but the fault timer starts charging CT. Once the fault time is reached, the circuit will shut off for a time which equates to a 3% duty cycle. Finally, when the output current reaches the maximum current level, the MOSFET transitions from a switch to a constant current source.

The UCC3916 is designed for uni-directional current flow, emulating a diode in series with the power MOSFET.

The UCC3916 can be put in a sleep mode, drawing only $1\mu\text{A}$ of supply current.

Other features include thermal shutdown and low thermal resistance Small Outline Power package.

BLOCK DIAGRAM



UDG-99172

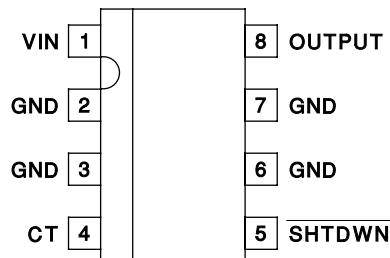
ABSOLUTE MAXIMUM RATINGS

VIN +6V
 Output Current
 DC Self Limiting
 Pulse (Less than 100ns) 20A
 Storage Temperature -65°C to +150°C
 Junction Temperature -55°C to +150°C
 Lead Temperature (Soldering, 10 sec.) +300°C

Currents are positive into, negative out of the specified terminal. Consult Packaging Section of Databook for thermal limitations and considerations of packages.

CONNECTION DIAGRAM

SOIC-8 (Top View)
DP Package



ELECTRICAL CHARACTERISTICS: Unless otherwise stated, these parameters apply for $T_J = 0^\circ\text{C}$ to $+70^\circ\text{C}$; $V_{IN} = 5\text{V}$, $SHTDWN = 2.4\text{V}$, $T_A = T_J$.

PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Supply Current Section					
ICC			1.00	2.00	mA
ICC - Sleep Mode	$SHTDWN = 0.2\text{V}$		0.50	5	μA
Output Section					
Voltage Drop	$I_{OUT} = 1\text{A}$		0.22	0.33	V
	$I_{OUT} = 1.5\text{A}$		0.33	0.50	V
	$I_{OUT} = 1.65\text{A}$		0.40	0.60	V
Trip Current		-1.8	-1.65	-1.5	A
Max Current		-2.4	-2	-1.65	A
Reverse Leakage	$V_{IN} = 4.5\text{V}$, $V_{OUT} = 5\text{V}$		6	20	μA
	$V_{IN} = 0\text{V}$, $V_{OUT} = 5\text{V}$		0.50	9	μA
Soft Start Time	Initial Startup		50		μs
Short Circuit Response			100		ns
Fault Section					
CT Charge Current	$V_{CT} = 1.0\text{V}$	-45	-36.0	-27	μA
CT Discharge Current	$V_{CT} = 1.0\text{V}$	0.90	1.0	1.50	μA
Output Duty Cycle	$V_{OUT} = 0\text{V}$	2.00	3.00	6.00	%
CT Charge Threshold		0.4	0.5	0.6	V
CT Discharge Threshold		1.2	1.4	1.8	V
Thermal Shutdown			170		$^\circ\text{C}$
Thermal Hysteresis			10		$^\circ\text{C}$
Shutdown Section					
Shutdown Threshold			1.5	3.0	V
Shutdown Hysteresis			150	300	mV
Shutdown Bias Current	$SHTDWN = 1.0\text{V}$		100	500	nA

Note 1: All voltages are with respect to ground.

PIN DESCRIPTIONS

CT: A capacitor is applied between this pin and ground to set the maximum fault time. The maximum fault time must be more than the time to charge external capacitance. The maximum fault time is defined as:

$$T_{FAULT} = 28 \cdot 10^3 \cdot CT.$$

Once the fault time is reached the output will shutdown for a time given by:

$$T_{SD} = 1 \cdot 10^6 \cdot CT$$

this results in a 3% duty cycle. 0.1μF is recommended for SCSI applications to achieve the normal maximum capacitance on the Tempwr line.

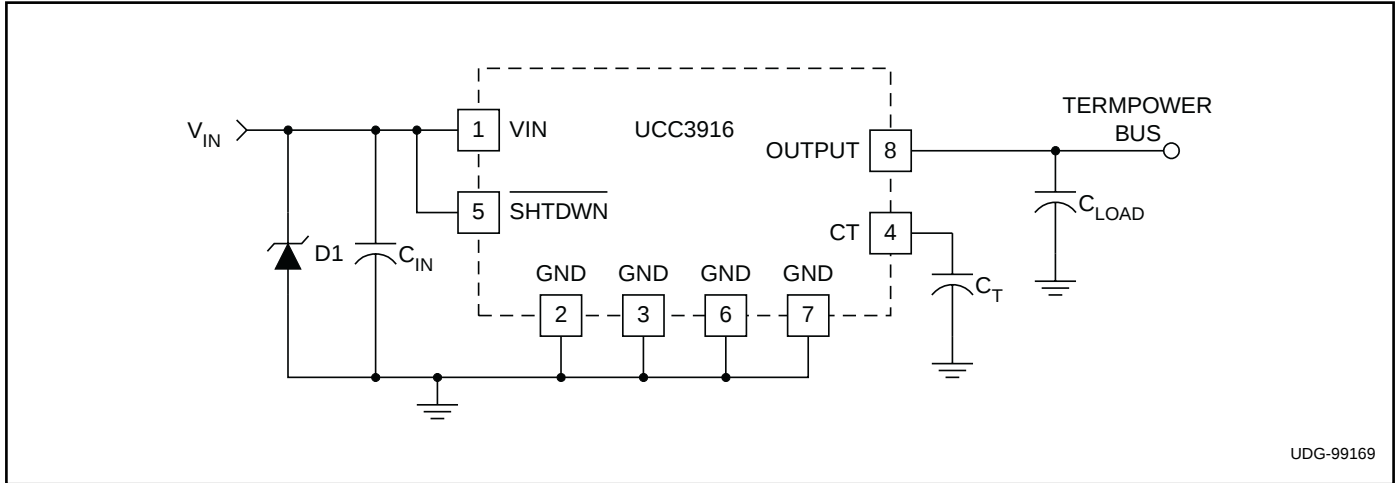
SHTDWN: The IC enters a low-power sleep mode when this pin is low and exits the sleep mode when this pin is high.

VIN: Input voltage to the circuit breaker, ranging from 4V to 6V.

VOUT: Output voltage of the circuit breaker. When switched, the output voltage is approximately:

$$V_{OUT} = V_{IN} - (220m\Omega) \cdot I_{OUT}.$$

TYPICAL APPLICATION



APPLICATION INFORMATION

Protecting The UCC3916 From Voltage Transients

The parasitic inductance associated with the power distribution can cause a voltage spike at VIN if the load current is suddenly interrupted by the UCC3916. *It is important to limit the peak of this spike to less than 6V to prevent damage to the UCC3916.* This voltage spike can be minimized by:

- Reducing the power distribution inductance (e.g., twist the positive (+) and negative (–) leads of the power supply feeding VIN pin, locate the power supply close to the UCC3916 or use a PCB ground plane).
- Decoupling VIN with a capacitor, CIN, located close to the VIN. This capacitor is typically less than 1μF to limit the inrush current.
- Clamping the voltage at VIN below 6V with a Zener diode, D1, located close to the VIN pin.

SAFETY RECOMMENDATIONS

Although the UCC3916 is designed to provide system protection for all fault conditions, all integrated circuits can ultimately fail short. For this reason, if the UCC3916 is intended for use in safety critical applications where UL[®] or some other safety rating is required, a redundant safety device such as a fuse should be placed in series with the device. The UCC3916 will prevent the fuse from blowing virtually all fault conditions, increasing system reliability and reducing maintenance cost, in addition to providing the hot swap benefits of the device.

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
UCC3916DP	Active	Production	SOIC (D) 8	75 TUBE	Yes	NIPDAU	Level-2-260C-1 YEAR	0 to 70	UCC3916
UCC3916DP.A	Active	Production	SOIC (D) 8	75 TUBE	Yes	NIPDAU	Level-2-260C-1 YEAR	0 to 70	UCC3916
UCC3916DPTR	Active	Production	SOIC (D) 8	2500 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	0 to 70	UCC3916
UCC3916DPTR.A	Active	Production	SOIC (D) 8	2500 LARGE T&R	Yes	NIPDAU	Level-2-260C-1 YEAR	0 to 70	UCC3916

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

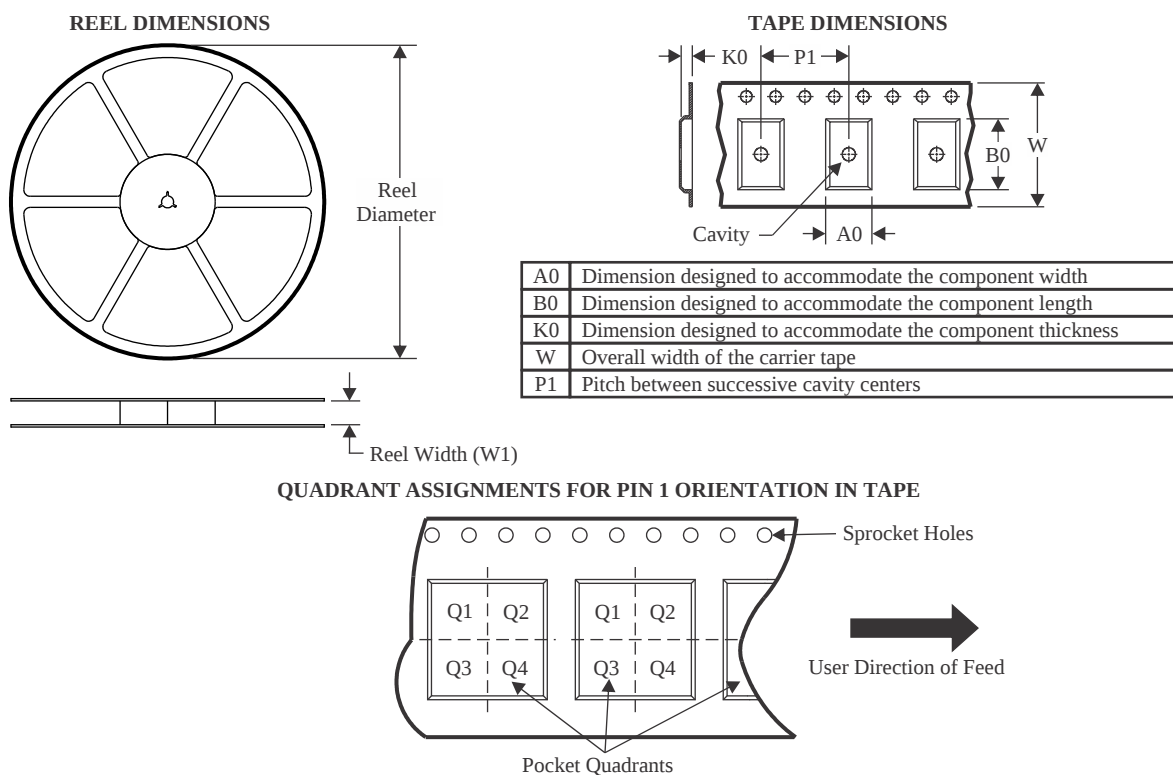
⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "-" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

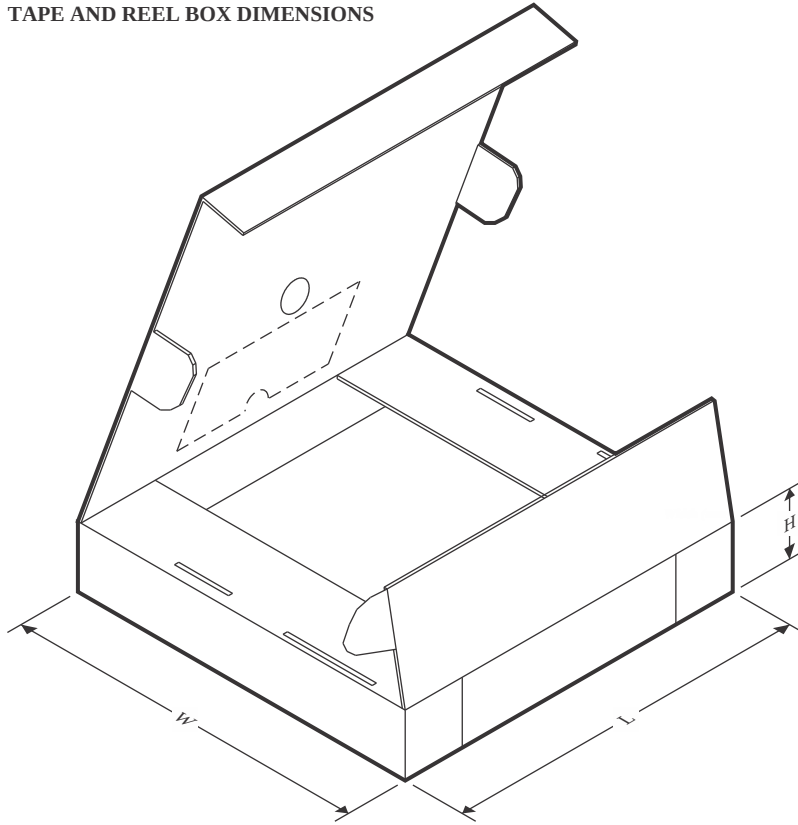
TAPE AND REEL INFORMATION



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
UCC3916DPTR	SOIC	D	8	2500	330.0	12.4	6.4	5.2	2.1	8.0	12.0	Q1

TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
UCC3916DPTR	SOIC	D	8	2500	353.0	353.0	32.0

TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
UCC3916DP	D	SOIC	8	75	506.6	8	3940	4.32
UCC3916DP.A	D	SOIC	8	75	506.6	8	3940	4.32

IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you fully indemnify TI and its representatives against any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#), [TI's General Quality Guidelines](#), or other applicable terms available either on [ti.com](#) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products. Unless TI explicitly designates a product as custom or customer-specified, TI products are standard, catalog, general purpose devices.

TI objects to and rejects any additional or different terms you may propose.

Copyright © 2026, Texas Instruments Incorporated

Last updated 10/2025