

### Description

The Si3400 integrates an IEEE 802.3af compliant interface and complete power management solution for a Power over Ethernet (PoE) powered device (PD) application. The Si3400 converts the high voltage supplied over a 10/100/1000BASE-T Ethernet cable into a regulated low voltage output supply. The Si3400's optimized architecture minimizes the solution footprint, reduces the external BOM cost and enables the use of low cost external components while maintaining high performance. The Si3400 integrates two full diode bridges and a transient surge suppressor, enabling a direct connection of the IC to the Ethernet RJ-45 connector. The switching power FET and all the associated functions are also integrated. The integrated, pulse width modulated (PWM) switching regulator supports isolated (flyback) and non-isolated (buck) converter topologies.

Featuring dual current limits, the Si3400 supports IEEE 802.3af-2003 compliant solutions as well as pre-standard products all in a single IC. Standard external resistors connected to the Si3400 provide the proper 802.3af signatures for the detection function and programming of the classification mode. Programmable soft start and comprehensive protection circuits ensure well-controlled initial operation of both the hot swap switch and voltage regulator.

For applications that require more power than the 11 W (max) capability of the Si3400, the Si3401 provides the same feature set as the Si3400 but adds an increased hot swap switch current limit of 470 mA (min), versus the Si3400's 350 mA (min). The Si3401's higher current limit enables it to support applications in the range of 14 to 16 W.

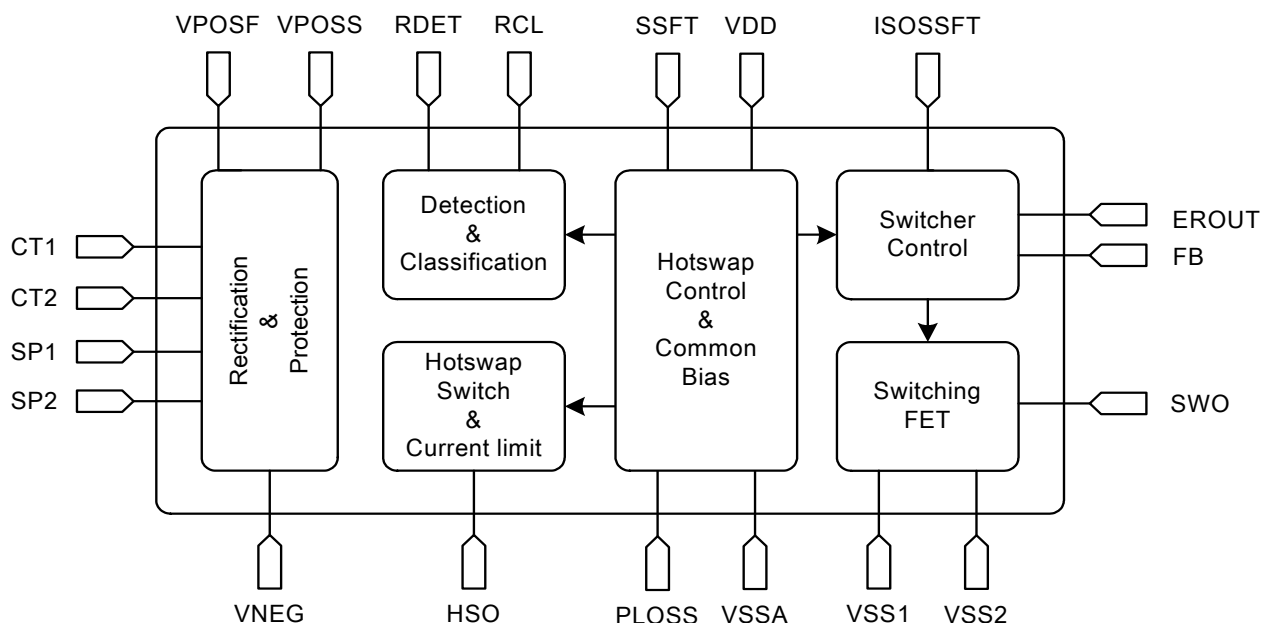
The Si3400 and Si3401 are supplied in low-profile 20-pin, 5x5 mm QFN packages.

### Features

- IEEE 802.3af compliant PD I/F and hot swap switch with efficient switching regulator
  - Minimal external components required
  - Integrated diode bridges and transient surge suppressor
  - Integrated switching regulator controller and driver FET
  - Integrated dual current-limited hotswap switch
- Supports non-isolated and isolated switching topologies
- Comprehensive Protection Circuitry
  - Transient overvoltage protection
  - Undervoltage lockout
  - Early power-loss indicator
  - Thermal shutdown protection
  - Foldback current limiting
- Programmable classification circuit
- IEEE 802.3af standard compliant solution with pre-standard support
- Low-profile 5 x 5 mm 20-pin QFN package
- Pb-free/RoHS-compliant

### Applications

- Voice over IP Telephones and Adapters
- Wireless Access Points
- Security Cameras
- Point-of-Sale Terminals
- Internet Appliances
- Network Devices

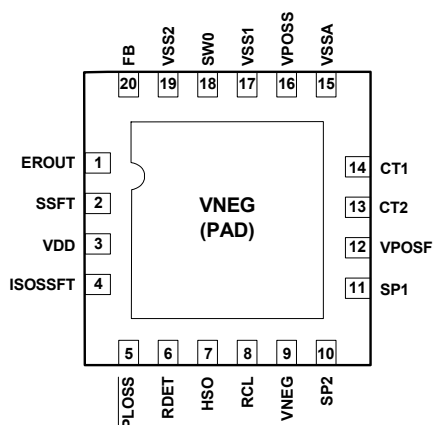


### Selected Electrical Specifications

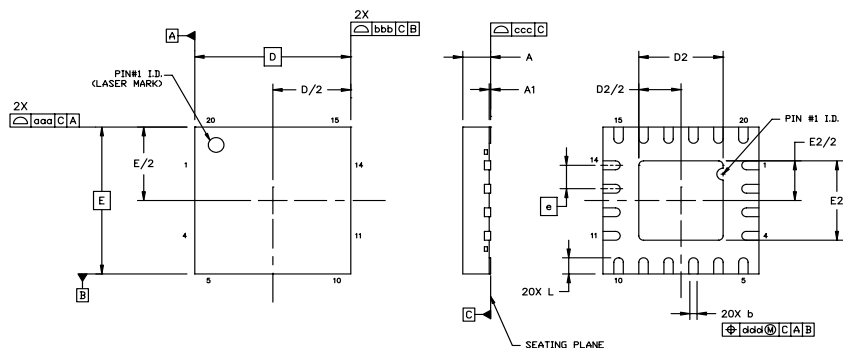
Parameter	Description	Min	Typ	Max	Unit
CT1 – CT2 or SP1 – SP2	Maximum input voltage range (transient)	-82	—	82	V
CT1 – CT2  or  SP1 – SP2	VPORT operating range	2.8	—	57	V
I <sub>PORT</sub> Operating Current <sup>1</sup>	36 V ≤ V <sub>PORT</sub> ≤ 57 V	—	—	3.1	mA
Current Limit <sup>2</sup>	Inrush	—	130	—	mA
	Operating (Si3400)	350	525	—	mA
	Operating (Si3401)	470	550	—	mA
Hotswap FET On-Resistance + R <sub>SENSE</sub>	36 V ≤ V <sub>PORT</sub> ≤ 57 V	0.5	—	1.4	Ω
Switcher Frequency		—	350	—	kHz
Switching FET On-Resistance		0.34	—	0.86	Ω
Thermal Shutdown	Junction temperature	—	160	—	°C
Power Dissipation	V <sub>PORT</sub> = 50 V, V <sub>OUT</sub> = 5 V, 2 A <sup>3</sup>	—	1.2	—	W
	V <sub>PORT</sub> = 50 V, V <sub>OUT</sub> = 5 V, 2 A <sup>4</sup>	—	0.7	—	W
Ambient Operating Temperature	TA	-40	25	85	°C

- I<sub>PORT</sub> includes full operating current of switching regulator controller.
- The PD interface includes dual level input current limit. At turn-on, before the HSO load capacitor is charged, the current limit is set at the inrush level. After the capacitor has been charged within ~1.25 V of VNEG, the operating current limit is engaged. This higher current limit remains active until the UVLO lower limit has been tripped, or the hotswap switch is current limited enough to cause a foldback of the HSO voltage.
- Assumes use of on-chip diode bridges.
- Assumes use of external diode bridges (on-chip bridges bypassed).

### Pin Assignments



### Package Information



Dimension	MIN	NOM	MAX
A	0.80	0.85	0.90
A1	0.00	0.02	0.05
b	0.25	0.30	0.35
D	5.00 BSC		
D2	2.60	2.70	2.80
e	0.80 BSC		
E	5.00 BSC		

Dimension	MIN	NOM	MAX
E2	2.60	2.70	2.80
L	0.50	0.55	0.60
aaa	—	—	0.10
bbb	—	—	0.10
ccc	—	—	0.08
ddd	—	—	0.10
eee	—	—	0.10