



New Product Announcement

AP43331N
AP3302
APR34509

Diodes' Quick Charge 3.0 High Efficiency Solution - AP43331N + AP3302 + APR34509

The combination of the AP3302, AP43331N and APR34509 provides a highly integrated efficient solution to Quick Charge 3.0 chargers.

The AP43331N(SO-8) is a secondary side Qualcomm Quick Charge 3.0 (QC 3.0) Charging Port (HVDCP) Class A controller. Using the USB data pins it determines the output voltage of the AC-DC USB charger. The USB-bus voltage is adjusted in discrete steps (QC 3.0's step is 0.2V). The output current is limited not to exceed maximum allowable power level.

The AP3302 is a Quasi-Resonant controller optimized for high performance and cost effective Quick Charge applications. It operates in valley lock QR mode to improve system efficiency and EMI performance and will enter the burst mode at no load or light load to minimize standby power.

The APR34509 is a secondary side synchronous rectifier (SR), supporting CCM, DCM and Quasi-Resonant modes. It is suitable for 5V to 12V output voltages for 15-24W applications. By sensing the MOSFET's drain-to-source voltage, the APR34509 enhances the MOSFET to minimize conduction losses when compared to Schottky/SBR rectifiers..



The Diodes' Advantage

AP43331N+AP3302+APR34509 delivers high performance, cost effective Quick Charge 3.0 solutions for portable and consumer applications.

- **AP3302 provides QR mode and Output Under-Voltage protection (SUVP)**

QR Improves efficiency across all load levels.

SUVP provides protection when charger's output cable is shorted

- **AP43331N provides CC/CV and auto-discharge function**

Controls max output power to 18W from 9V to 12V.

Safe-discharge to quickly and reliably discharge output capacitors when the output voltage is switched down.

- **APR34509 provides Synchronous rectification in SO-8EP**

Improves efficiency with minimum BOM cost and solution size

Applications

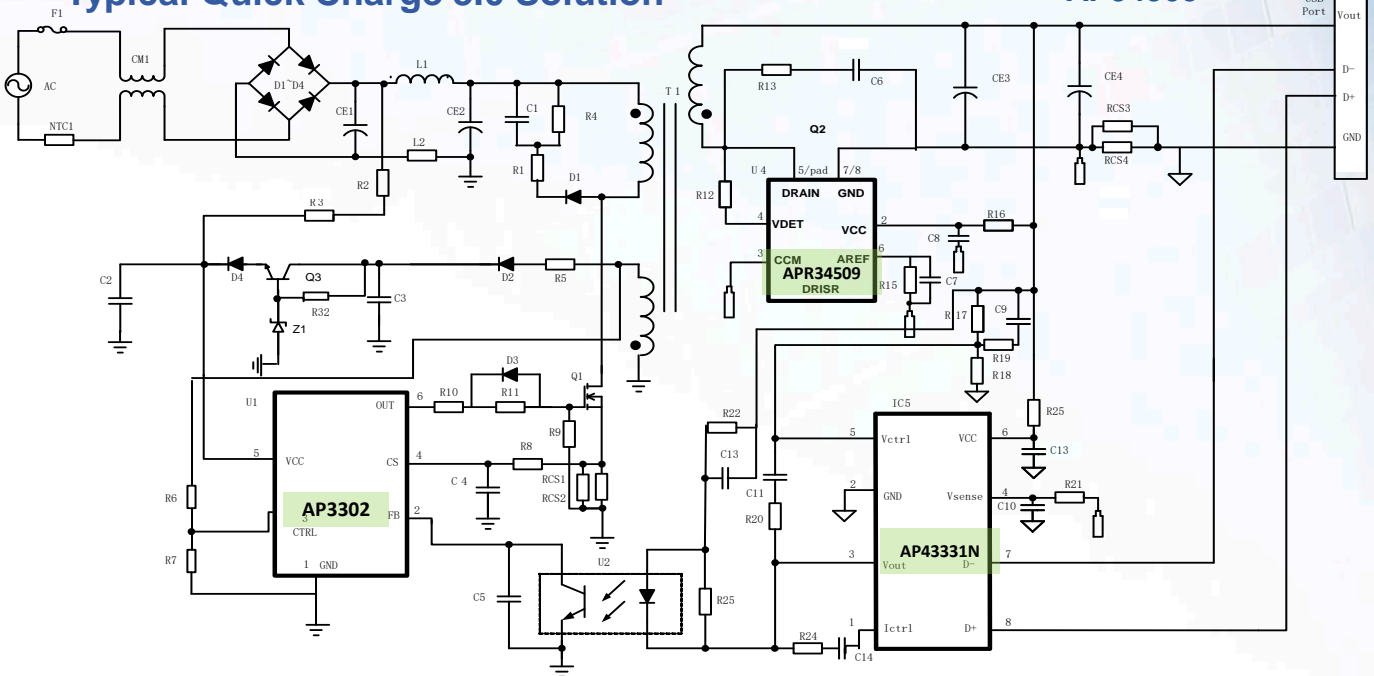
- Quick Charger 3.0 for intelligent Smartphone



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Typical Quick Charge 3.0 Solution



Diodes' Secondary Side Quick charge 3.0 Decoder

Part Number	MAX VCC (V)	Operating Current (µA)	Protocol Compatible	Voltage sense reference (5V/9V/12V)	Current sense reference (5V/9V/12V)	UVLO voltage	Package
AP43331N	20	770	QC3.0	0.5V/0.9V/1.2V	75mV/50mV/37.5mV	2.8V	SO-8

Diodes' cost effective QR Controllers for Quick Charge 3.0 Application

Part Number	HV Start-Up Circuit	Startup Current (µA)	UVLO Threshold on/off (V)	Gate Output Current (mA)	Maximum Frequency (kHz)	SOVP/SUVP PIN		VOVP	OLP & SOCP	BNO	Package
						SOVP	SUVP				
AP3302	No	1	15.8/7.6	350	120	Auto-recover	Auto-recover	Auto-recover	Auto-recover	Auto-recover	SOT26

Diodes' Synchronous Rectification Solutions

Part Number	VCC MAX (V)	Operating Current (µA)	Turn-Off Threshold (mV)	VDET PIN Rating (V)	Mosfet Rds(on) (mΩ)	Package
APR34509	16	100	-11.5	60	8	SO-8EP

Device	Packaging	Quantity	Datasheet
AP3302KTR-G1	SOT26	3,000	http://diodes.com/datasheets/AP3302.pdf
APR34509MPTR-G1	SO-8EP	4,000	http://diodes.com/datasheets/APR34509.pdf
AP43331NMTR-G1	SO-8	4,000	http://diodes.com/datasheets/AP43331N.pdf