

Uninterruptible Power Supply

Table of Contents

AC Input Section, Diode Bridge.....	3
AC Input Section, Power Factor Correction.....	4
AC Input Section, XY Capacitors.....	5
Battery Charger, Discretes.....	6
Battery Charger, Full bridge.....	7
Battery Charger, Gate Drive.....	8
Control Section, Capacitors.....	9
Control Section, Discretes.....	10
Control Section, Measurement Multiplexing.....	11
DC/DC Step-up (boost or full bridge), Batt to 180 VDC to the inverter.....	12
House-Keeping Supply (off-line, flyback), Discretes.....	13
House-Keeping Supply (off-line, flyback), Power Semiconductors.....	14
Inverter Section (DC/AC) AC Output, Discretes.....	15
Inverter Section (DC/AC) AC Output, Power Semiconductors.....	16

Uninterruptible Power Supply

VISHAY components used for a UPS can include:

- Power MOSFETS
 - High-Power Modules
 - Diodes and Rectifiers
 - Capacitors
 - Resistors
 - Analog Switches
 - Visible LEDs
 - Optical Isolators
 - Inductors / EMI Filters
 - Shunt Resistors
 - ESD Protection Devices
 - LDOs
-

Application Overview

An Uninterruptible Power Supply, or UPS, is required when the AC power that runs sensitive equipment is not reliable or not well regulated or filtered. During power brownouts or blackouts the UPS can provide AC power to the equipment, such as computers or emergency lighting, for a period of time, usually until normal power source is restored. Most UPS circuits include some or all of the system blocks shown above.

Uninterruptible Power Supply : AC Input Section, Diode Bridge

Multi Phase

Product Name	Status	Description	Features	Package	Q-Level
VSKT570-18PbF		Thyristor/Thyristor, 570 A	High current capability High surge capability 3000 VRMS isolating voltag	Power Modules SUPER MAGN-A-PAK	

Single Phase

Product Name	Status	Description	Features	Package	Q-Level
36MB60A		Glass Passivated Bridge Rectifier	600V, 35 A	TH / Module D-34	
GBPC3506A		Glass Passivated Bridge Rectifier	600V, 35 A	TH / Module GBPC	

Uninterruptible Power Supply : AC Input Section, Power Factor Correction

Aluminum Electrolytic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
101/102 PHR-ST		Screw-Terminal Long useful life	25 V to 450 V 220 µF to 1000000 µF Life@85°C=10000-15000h	Screw Term 35x60 - 90x220	
157 PUM-SI		Snap-In Long useful life	200 V to 450 V 56 µF to 2200 µF Life at 85°C = 5000 h	Snap-In 22x25 to 35x60	

Bulk Capacitor

Product Name	Status	Description	Features	Package	Q-Level
MKP 1848 DC-Link	NEW	DC-link film capacitor	up to 400µF; up to 1200V no electrolyte, long life	TH / Radial	

PFC fast diode

Product Name	Status	Description	Features	Package	Q-Level
15ETX06		UltraFast Diode	600 V, 15 A, 18 nsec Trr	TH / Radial TO-220AC	
30EPH06		UltraFast Diode	600 V, 30 A, 35 nsec Trr	TH / Radial TO-247 (2 lead)	
HFA50PA60C		HexFRED Diode	600 V, 50 A, 75 nsec Trr	TH / Radial TO-247	
VS-8ETX06		UltraFast Diode	600 V, 8 A, 16 nsec Trr	TH / Radial TO-220AC	

PFC MOSFET

Product Name	Status	Description	Features	Package	Q-Level
IRF32N50K		Power MOSFET	500 V, 160 mohm	TH / Radial TO-247	
IRFPS43N50K		Power MOSFET	500 V, 90 mohm	TH / Radial Super TO-247	

Shunt resistor

Product Name	Status	Description	Features	Package	Q-Level
WSL		Power Metal Strip, for current sensing; low resistance values; tight tolerances; low TCR;	R0002 to R500, 1% TCR <= ± 75ppm P70 = 0.1W - 10W	SMD 0603-5931	

Uninterruptible Power Supply : AC Input Section, XY Capacitors

Film RFI caps

Product Name	Status	Description	Features	Package	Q-Level
BFC2 336 60103		Film Capacitor Y2 Polypropylene	300V, 10 nF, 20%	TH / Radial 5.0x11.0x17.5mm	

Uninterruptible Power Supply : Battery Charger, Discretes

Aluminum Electrolytic Capacitors

Product Name	Status	Description	Features	Package	Q-Level
101/102 PHR-ST		Screw-Terminal Long useful life	25 V to 450 V 220 µF to 1000000 µF Life@85°C=10000-15000h	Screw Term 35x60 - 90x220	
157 PUM-SI		Snap-In Long useful life	200 V to 450 V 56 µF to 2200 µF Life at 85°C = 5000 h	Snap-In 22x25 to 35x60	

Balancing Resistors

Product Name	Status	Description	Features	Package	Q-Level
RW 20 x 117 series		Wirewound High-Power Vitreous Resistor	3K3 - 3K9 80 W		

Film Capacitors

Product Name	Status	Description	Features	Package	Q-Level
2222 368 series		Snubber Capacitor	1200 V 1µF 20%	TH / Radial 22.0x38.0x44.0mm	

Pre-Charge Resistor

Product Name	Status	Description	Features	Package	Q-Level
RSO 30x250 series		Wirewound High-Power Resistor	5R1 - 10R 350 W		

Shunt Resistor

Product Name	Status	Description	Features	Package	Q-Level
WSL		Power Metal Strip, for current sensing; low resistance values; tight tolerances; low TCR;	R0002 to R500, 1% TCR <= ± 75ppm P70 = 0.1W - 10W	SMD 0603-5931	

Uninterruptible Power Supply : Battery Charger, Full bridge

Power Switches

Product Name	Status	Description	Features	Package	Q-Level
IRFP32N50K		Power MOSFET	500 V, 160 mohm	TH / Radial TO-247	
IRFPS40N60K		Power MOSFET	600 V, 130 mohm	TH / Radial Super TO-247	

Uninterruptible Power Supply : Battery Charger, Gate Drive

Gate Drivers

Product Name	Status	Description	Features	Package	Q-Level
LPE-3325		Gate Drive Transformer	SMD Transformers	SMD 6.5 x 8.2 mm	

Power Transformer

Product Name	Status	Description	Features	Package	Q-Level
Custom		Dale Custom Magnetics		TH	

Uninterruptible Power Supply : Control Section, Capacitors

Tantalum Capacitors

Product Name	Status	Description	Features	Package	Q-Level
592D		Solid Tantalum Chip Capacitors; Low Profile, Conformal Terminals, Maximum C/V, Extended Range Offerings	4 - 35 Volt , 1 μ F - 3300 μ F 2.5mm down to 1.3mm Heigh	SMD A - X Case	
595D		Solid Tantalum Chip Capacitors, TANTAMOUNT®, Conformal-Coated, Maximum CV, Low ESR	4 - 50Volt; 0.1 μ F - 1500 μ F	SMD T - R Case	

Uninterruptible Power Supply : Control Section, Discretes

ESD Protection Diodes

Product Name	Status	Description	Features	Package	Q-Level
GSOT03 to GSOT36		Low-Capacitance Single Line ESD Protection Diode	VZT = 3.3-36V, C=80-800pF	SMD SOT-23	

Opto Isolator

Product Name	Status	Description	Features	Package	Q-Level
4N25		Optocoupler, Phototransistor Output	Isolation Test Voltage 5300 VRMS	SMD SMD-6, DIP-6	
CNY17-3		Optocoupler, Phototransistor Output	Isolation Test Voltage 5300 VRMS	SMD SMD-6, DIP-6	

Switching Diode

Product Name	Status	Description	Features	Package	Q-Level
1N4148WS		Small-Signal Switching Diodes	VRRM = 50-75 Volts , IFRM = 350 mA	SMD SOD-323	
BAS16WS-V		Space-Saving SMD Packages in SOD323	VRRM = 75 Volts	SMD SOD323	
BAV19WS		Fast Switching	VRRM = 120-250 Volts , IFRM = 625 mA	SMD SOD323	

Uninterruptible Power Supply : Control Section, Measurement Multiplexing

Analog Switch

Product Name	Status	Description	Features	Package	Q-Level
DG2002		Single-Pole/Double-Throw Analog Switches	Supply Voltage max = 6V, Ron = 15 Ohms	SMD SC70-6	
DG2011		Single-Pole/Double-Throw Analog Switches	Supply Voltage max = 6V, Ron = 2.7 Ohms	SMD SC89-6	
DG2711		Single-Pole/Double-Throw Analog Switches	Supply Voltage max =3.6V, Ron = 0.6 Ohms	SMD SC70-6	
DG2717		Single-Pole/Double-Throw Analog Switches	Supply Voltage max = 5V, Ron = 0.7 Ohms	SMD SC89-6	
DG2731	NEW	Dual Single-Pole/Double-Throw Analog Switches	Supply Voltage max =4.3V, Ron = 0.3 Ohms	SMD DFN-10 MSOP-10	
DG4599		Single-Pole/Double-Throw Analog Switches	Supply Voltage max = 6V, Ron = 95 Ohms	SMD SC70-6	

Uninterruptible Power Supply : DC/DC Step-up (boost or full bridge), Batt to 180 VDC to the inverter

Boost Converter FET

Product Name	Status	Description	Features	Package	Q-Level
IRFB18N50K		Power MOSFET	500 V, 290 mohm	TH / Radial TO-220	
SUM65N20-30		Power MOSFET	200 V, 30 mohm	SMD D2-Pak	

Uninterruptible Power Supply : House-Keeping Supply (off-line, flyback), Discretes

Film RFI Capacitors

Product Name	Status	Description	Features	Package	Q-Level
BFC2 336 60103		Film Capacitor Y2 Polypropylene	300 V, 10 nF, 20%	TH / Radial 5.0x11.0x17.5mm	

Power Transformer

Product Name	Status	Description	Features	Package	Q-Level
Custom		Dale Custom Magnetics		TH	

Shunt resistor

Product Name	Status	Description	Features	Package	Q-Level
WSL		Power Metal Strip, for current sensing; low resistance values; tight tolerances; low TCR;	R0002 to R500, 1% TCR <= ± 75ppm P70 = 0.1W - 10W	SMD 0603-5931	

Tantalum Capacitors

Product Name	Status	Description	Features	Package	Q-Level
592D		Solid Tantalum Chip Capacitors; Low-Profile, Conformal Terminals, Maximum C/V, Extended Range Offerings	4 - 35 Volt , 1 µF - 3300 µF 2.5mm down to 1.3mm Heigh	SMD A - X Case	
595D		Solid Tantalum Chip Capacitors, TANTAMOUNT®, Conformal-Coated, Maximum CV, Low ESR	4 - 50Volt; 0.1 µF - 1500 µF	SMD T - R Case	

TVS and ESD protection

Product Name	Status	Description	Features	Package	Q-Level
GSOT03 to GSOT36		Low-Capacitance Single Line ESD Protection Diode	VZT=3.3-36V, C=80-800pF	SMD SOT-23	
P4KE series		Transient Voltage Suppressor Diodes	Clamps at 10.5 to 772V	TH / Axial DO-204AL (DO-41)	

Uninterruptible Power Supply : House-Keeping Supply (off-line, flyback), Power Semiconductors

Flyback Diode

Product Name	Status	Description	Features	Package	Q-Level
V20100S	NEW	Schottky	100 V, 20A, single	TH / Radial TO-220AC	
VS-16CTQ100		Schottky	100 V, 16A, dual	TH / Radial TO-220AC	

Flyback Switch

Product Name	Status	Description	Features	Package	Q-Level
IRFIBE30G		Power MOSFET	800 V, 3 ohm	TH / Radial FullPak TO-220	
IRFPE40		Power MOSFET	800 V, 2 ohm	TH / Radial TO-247	
IRFPE50		Power MOSFET	800 V, 1.2 ohm	TH / Radial TO-247	
VSKT570-18PbF		Thyristor/Thyristor, 570 A	High current capability High surge capability 3000 VRMS isolating voltg	Power Modules SUPER MAGN-A-PAK	

Uninterruptible Power Supply : Inverter Section (DC/AC) AC Output, Discretes

Power transformer

Product Name	Status	Description	Features	Package	Q-Level
Custom Magnetics		Custom Capabilities Power Transformers All Switch Mode Power Topologies		TH	

Shunt Resistor

Product Name	Status	Description	Features	Package	Q-Level
WSL		Power Metal Strip, for current sensing; low resistance values; tight tolerances; low TCR;	R0002 to R500, 1% TCR <= ± 75ppm P70 = 0.1W - 10W	SMD 0603-5931	

Tantalum Capacitors

Product Name	Status	Description	Features	Package	Q-Level
592D		Solid Tantalum Chip Capacitors; Low-Profile, Conformal Terminals, Maximum C/V, Extended Range Offerings	4 - 35 Volt , 1 µF - 3300 µF 2.5mm down to 1.3mm Heigh	SMD A - X Case	
595D		Solid Tantalum Chip Capacitors, TANTAMOUNT®, Conformal-Coated, Maximum CV, Low ESR	4 - 50Volt; 0.1 µF - 1500 µF	SMD T - R Case	

Uninterruptible Power Supply : Inverter Section (DC/AC) AC Output, Power Semiconductors

Power Switches

Product Name	Status	Description	Features	Package	Q-Level
IRFP22N60K		Power MOSFET	600 V, 280 mohm	TH / Radial TO-247	
IRFPE50		Power MOSFET	800 V, 1.2 ohm	TH / Radial TO-247	

Rectifier

Product Name	Status	Description	Features	Package	Q-Level
V20100S	NEW	Schottky	100 V, 20 A, single	TH / Radial TO-220AC	
VS-16CTQ100		Schottky	100 V, 16 A, dual	TH / Radial TO-220AC	