



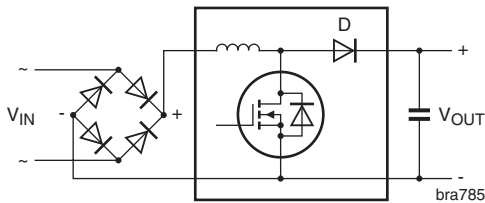
Bipolar power diodes for Switch Mode Power Supplies

Understanding PFC - SMPS applications

What is Power Factor Correction (PFC)

- ▶ It can be defined as the reduction of the harmonic content, and/or the aligning of the phase angle of incoming current
- ▶ PFC is required to reduce disturbance on the AC distribution net and maximize the real power drawn by the power supply from the AC line.

Boost PFC circuit

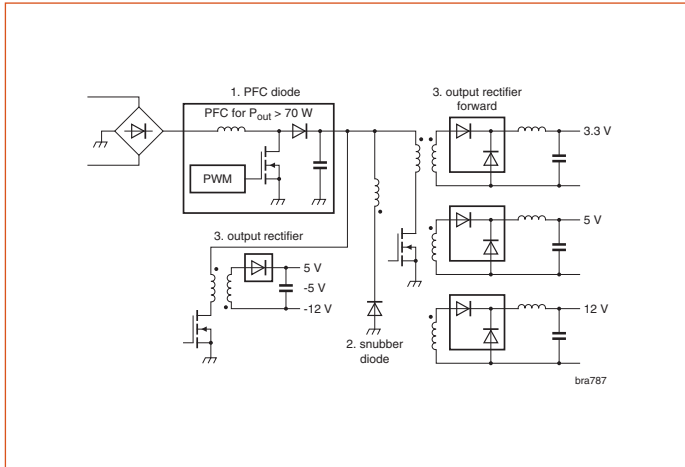


PFC benefits

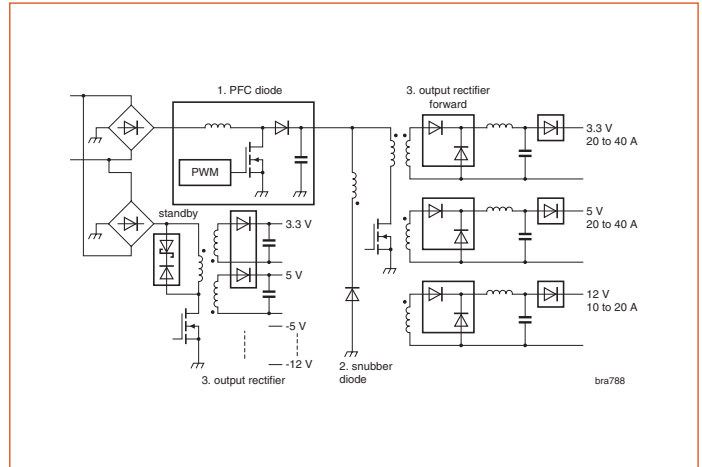
- ▶ Fully compliant with regional regulations imposing restrictions on power factor and total harmonic distortion (THD) in high-power applications (>75W), including:
 - CCC or '3'C in China
 - IEC1000-3-2/EN61000-3-2 in Europe
 - '80plus policy' in America
 - JIS C61000-3-2 in Japan
- ▶ Meets energy saving and 'green energy' trends to reduce electricity costs
- ▶ Optimizes and improves circuit performance
 - reduces mains harmonic content
 - decreases peak current at mains frequency
 - minimizes the electrolytic bulk capacitor used at PFC stage output
 - shrinks mains transformer size and weight
 - improves output regulation of downstream DC/DC converters

Bipolar-power diodes in various SMPS application

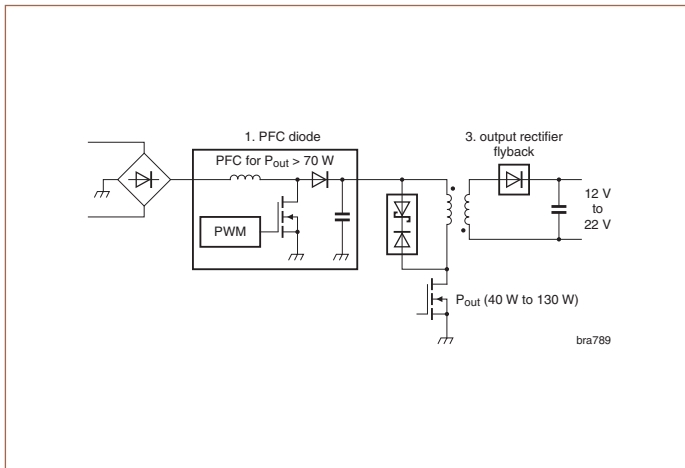
Computer: desktop



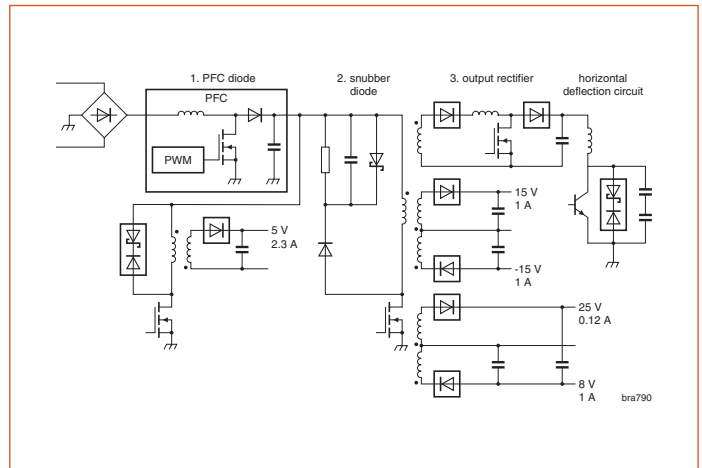
Computer: file server



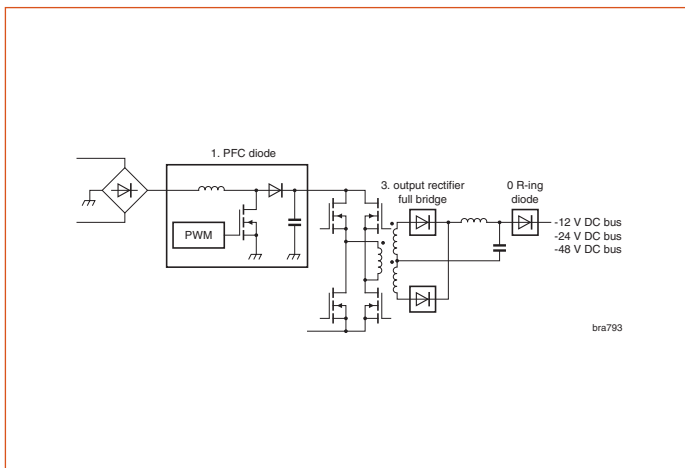
Computer and consumer adaptor

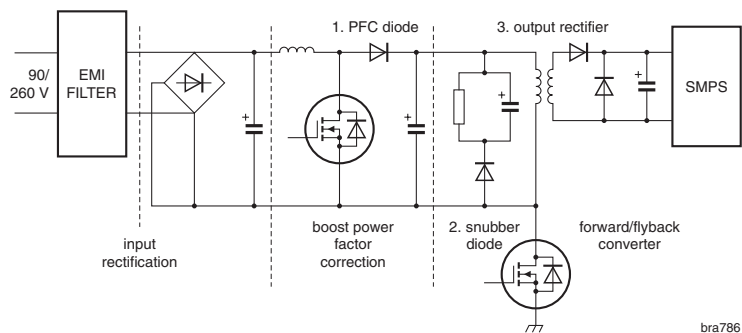


Consumer: TV display



Telecom: AC/DC Converter





Hyperfast & ultrafast recovery diodes for PFC

V_{RRM} (V)	$I_{F(AV)}$ (A)	V_F (typ) @ 150C (V)	@ I_F (A)	t_{rr} (typ) @ 25C (ns)	SOD59 (TO220AC)	SOD113 (2-pin SOT186A)	SOT78 (TO220AB)	SOT186A (isolated TO220AB)	SOT404 (D ² PAK)
Ultrafast diodes for Discontinuous or Critical Current Mode									
500	9	0.9	8	50	BYV29-500	BYV29X-500			BYV29B-500
500	2 x 5	0.95	5	50			BYT28-500		
500	14	0.9	15	50	BYT79-500				
500	2 x 10	0.87	10	50			BYV34-500		
500	2 x 15	0.95	15	50			BYV44-500		
600	8	1.07	8	60	BYR29-600	BYR29X-600			
600	9	0.9	8	50	BYV29-600	BYV29X-600			BYV29B-600
600	14	0.9	15	50	BYT79-600	BYT79X-600			
600	2 x 10	0.87	10	50			BYV34-600	BYV34X-600	
Hyperfast diodes for Continuous Current Mode									
600	5	1.4	5	19	BYC5-600	BYC5X-600			BYC5B-600
600	8	1.4	8	19	BYC8-600	BYC8X-600			BYC8B-600
600	10	1.4	10	19	BYC10-600	BYC10X-600			BYC10B-600
600	2 x 5	1.4	5	19			BYC10-600CT		

Types in bold red represent new products

Ultrafast recovery diodes (for snubber diodes and output rectifiers)

V_{RRM} (V)	$I_{F(AV)}$ (A)	V_F (typ) @ 150C (V)	@ I_F (A)	t_{rr} (typ) @ 25C (ns)	SOD59 (TO220AC)	SOD113 (2-pin SOT186A)	SOT78 (TO220AB)	SOT186A (isolated TO220AB)	SOT223	SOT404 (D ² PAK)	SOT428 (DPAK)	SOT429 (TO247)
100	8	0.8	8	20	BYW29E-100							
100	2 x 10	0.72	8	20			BYV32E-100					
150	2 x 0.75	0.5	0.5	10					BYV40E-150			
150	8	0.8	8	20	BYW29E-150							
150	2 x 10	0.72	8	20			BYV32E-150					
150	2 x 15	0.78	15	20			BYV42E-150					
200	8	0.8	8	20	BYW29E-200	BYW29EX-200					BYW29ED-200	
200	2 x 5	0.8	5	15			BYQ28E-200	BYQ28EX-200			BYQ28ED-200	
200	14	0.83	14	20	BYV79E-200							
200	2 x 8	0.84	8	20			BYQ30E-200					
200	2 x 10	0.72	8	20			BYV32E-200			BYV32EB-200		
200	2 x 15	0.78	15	20			BYV42E-200			BYV42EB-200		
200	2 x 15	0.83	15	20								BYV72EW-200
300	2 x 5	0.95	5	50			BYT28-300					
400	9	0.9	8	50	BYV29-400							
400	2 x 10	0.87	10	50			BYV34-400					
400	2 x 15	0.95	15	50								BYV74W-400
500	9	0.9	8	50	BYV29-500	BYV29X-500				BYV29B-500		
500	2 x 5	0.95	5	50			BYT28-500					
500	14	0.9	15	50	BYT79-500							
500	2 x 10	0.87	10	50			BYV34-500					
500	2 x 15	0.95	15	50			BYV44-500					
600	8	1.07	8	60	BYR29-600	BYR29X-600						
600	9	0.9	8	50	BYV29-600	BYV29X-600				BYV29B-600		
600	14	0.9	15	50	BYT79-600	BYT79X-600						
600	2 x 10	0.87	10	50			BYV34-600	BYV34X-600				
800	8	1.07	8	60	BYR29-800							

Types in bold red represent new products

Fast soft-recovery diodes (for snubber diodes)

V_{RRM} (V)	$I_{F(peak)}$ (A)	V_F (typ) @ 25C (V)	@ I_F (A)	t_{rr} (typ) @ 25C (ns)	SOD59 (TO220AC)	SOD113 (2-pin SOT186A)
200	8	1.5	20	100		BY229X-200
600	8	1.5	20	100	BY229-600	BY229X-600
800	8	1.5	20	100		BY229X-800
1000	8	1.5	20	100	BY329-1000	
1200	8	1.5	20	100	BY329-1200	BY329X-1200

Bipolar diodes in various PFC power applications

Computer	Consumer	Telecom	Lighting
Desktop File server Notebook adapter	Adapter Plasma TV LCD TV CRT TV	AC/DC converter UPS	Ballast



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