AN5569

Standard Waveforms

Application Note

AN5569-1.0 November 2002

SINGLE PHASE

Circuit and output voltage waveform across a – b

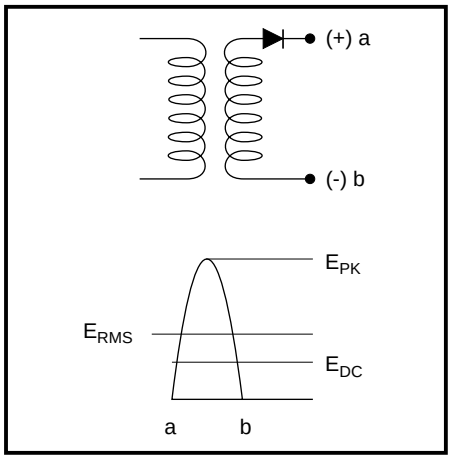

Fig. 1: Half wave

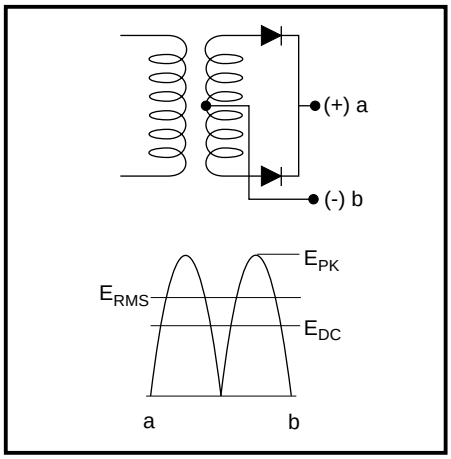

Fig. 2: Full wave centre tap

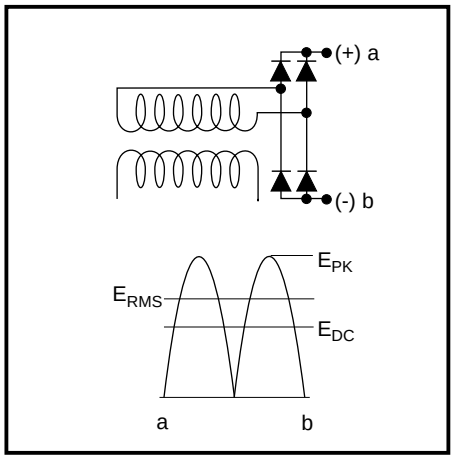

Fig. 3: Full wave bridge

			Current Ratios						Voltage Ratios		
	Fundamental Ripple Frequency	I_{AV} / I_{DC}	I_{RMS} / I_{DC} [A]		I_{PK} / I_{DC} [B]		I_{PK} / I_{DC} [C]		E_{RMS} / E_{DC} [D]	E_{RMS} / E_{DC} [E]	E_{PK} / E_{DC} [F]
			R	**L**	**R**	**L**	**R**	**L**			
Half Wave	1f	1.0	1.57	-	3.14	-	1.57	-	2.22	1.57	3.14
Half Wave Centre Tap	2f	0.5	0.785	0.707	1.57	1.0	0.785	0.707	1.11	2.22	1.57
Full Wave Bridge	3f	0.5	0.785	0.707	1.57	1.0	1.11	1.0	1.11	1.11	1.57

NOTES

R = Resistive load.

L = Inductive load.

A = Ratio of RMS current to DC output current. Arm fuses are rated for this RMS current.

B = Ratio of peak device current to DC output current.

C = Ratio of secondary RMS line current from supply to DC output current. Line fuses are rated for this RMS current.

D = Ratio of no load RMS line to line voltage to no load DC voltage.

E = Ratio of RMS phase voltage to DC voltage.

F = Ratio of peak phase voltage to DC voltage.

THREE PHASE

Circuit and output voltage waveform across a – b

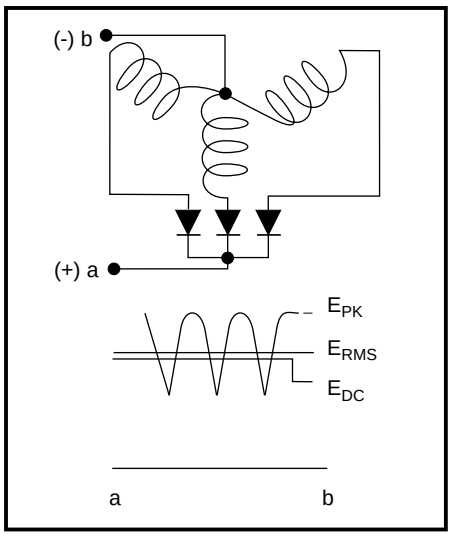

Fig. 4: Half wave

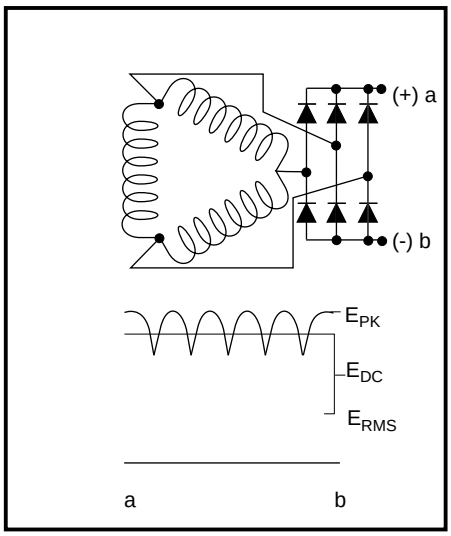

Fig. 5: Bridge

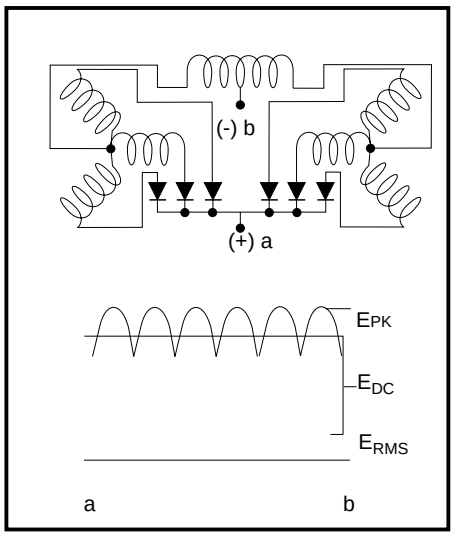

Fig. 6: Double star

			Current Ratios						Voltage Ratios		
	Fundamental Ripple Frequency	I_{AV} / I_{DC}	I_{RMS} / I_{DC}^{A}		I_{PK} / I_{DC}^{B}		I_{PK} / I_{DC}^{C}		E_{RMS} / E_{DC}^{D}	E_{RMS} / E_{DC}^{E}	E_{PK} / E_{DC}^{F}
			R	L	R	L	R	L			
Half Wave	3f	0.33	0.588	0.577	1.21	1.0	0.588	0.577	1.48	0.855	2.1
Bridge	6f	0.33	0.588	0.577	1.05	1.0	0.816	0.816	0.74	0.427	1.05
Double Star	6f	0.167	0.293	0.289	1.05	0.5	0.293	0.289	1.48	0.855	2.42

NOTES

R = Resistive load.
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A = Ratio of RMS current to DC output current. Arm fuses are rated for this RMS current.
B = Ratio of peak device current to DC output current.
C = Ratio of secondary RMS line current from supply to DC output current. Line fuses are rated for this RMS current.
D = Ratio of no load RMS line to line voltage to no load DC voltage.
E = Ratio of RMS phase voltage to DC voltage.
F = Ratio of peak phase voltage to DC voltage.

SIX PHASE

Circuit and output voltage waveform across a – b

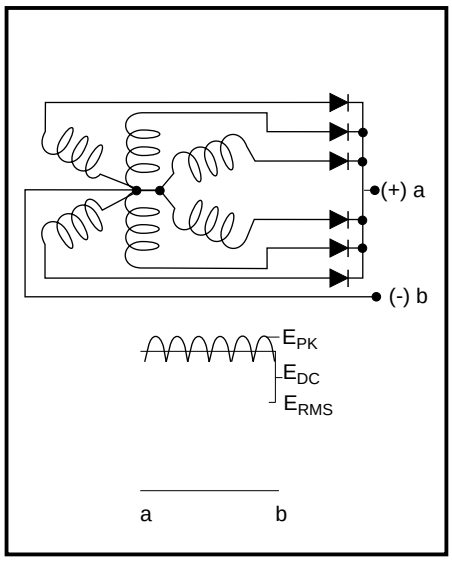

Fig. 7: 5 star limb core

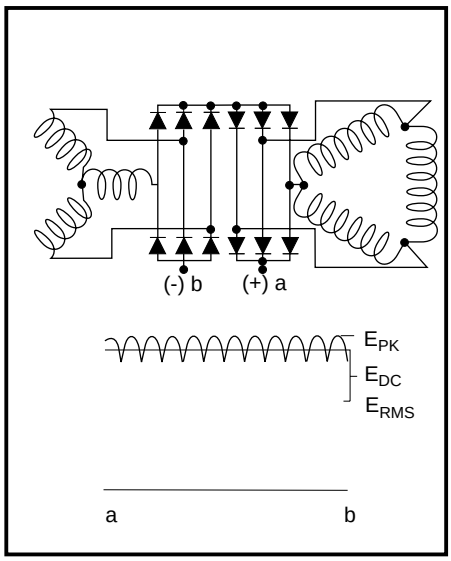

Fig. 8: Series bridges

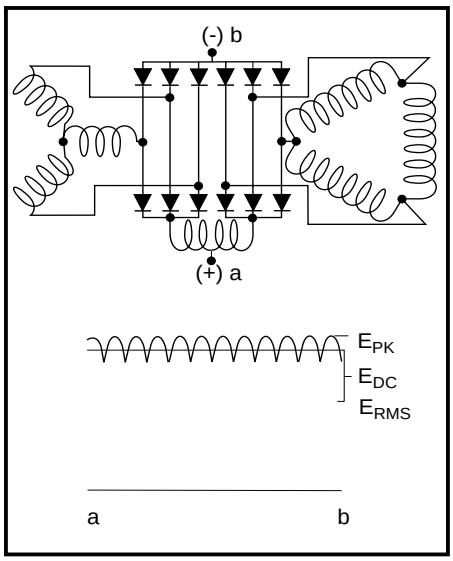

Fig. 9: Star delta with IPT

			Current Ratios						Voltage Ratios		
	Fundamental Ripple Frequency	I_{AV} / I_{DC}	I_{RMS} / I_{DC}^{A}		I_{PK} / I_{DC}^{B}		I_{PK} / I_{DC}^{C}		E_{RMS} / E_{DC}^{D}	E_{RMS} / E_{DC}^{E}	E_{PK} / E_{DC}^{F}
			R	L	R	L	R	L			
5 Star Limb Core	6f	0.167	0.408	0.408	1.05	0.5	0.408	0.408	1.48	-	2.1
Series Bridges	12f	0.33	0.588	0.577	1.05	1.0	0.816	0.816	0.74	-	1.05
Star Delta with IPT	12f	0.167	0.293	0.289	0.525	0.5	0.408	0.408	1.48	-	2.42

NOTES

R = Resistive load.
L = Inductive load.
A = Ratio of RMS current to DC output current. Arm fuses are rated for this RMS current.
B = Ratio of peak device current to DC output current.
C = Ratio of secondary RMS line current from supply to DC output current. Line fuses are rated for this RMS current.
D = Ratio of no load RMS line to line voltage to no load DC voltage.
E = Ratio of RMS phase voltage to DC voltage.
F = Ratio of peak phase voltage to DC voltage.

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The Power Assembly group was set up to provide a support service for those customers requiring more than the basic semiconductor, and has developed a flexible range of heatsink and clamping systems in line with advances in device voltages and current capability of our semiconductors.

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DYNEX SEMICONDUCTOR

http://www.dynexsemi.com

e-mail: power_solutions@dynexsemi.com

HEADQUARTERS OPERATIONS
DYNEX SEMICONDUCTOR LTD
Doddington Road, Lincoln.
Lincolnshire. LN6 3LF. United Kingdom.
Tel: +44-(0)1522-500500
Fax: +44-(0)1522-500550

CUSTOMER SERVICE
Tel: +44 (0)1522 502753 / 502901. Fax: +44 (0)1522 500020

SALES OFFICES
Benelux, Italy & Switzerland: Tel: +33 (0)1 64 66 42 17. Fax: +33 (0)1 64 66 42 19.
France: Tel: +33 (0)2 47 55 75 52. Fax: +33 (0)2 47 55 75 59.
Germany, Northern Europe, Spain & Rest Of World: Tel: +44 (0)1522 502753 / 502901.
Fax: +44 (0)1522 500020
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No Annotation: The product parameters are fixed and the product is available to datasheet specification.