

# OFF-LINE SWITCH MODE TRANSFORMERS

Indicated Parts are UL1950 & CSA-950 Recognized under UL File# E162344

- \* Designed for Use with Power Integrations IC's.
- \* Design Engineering Support Available.
- \* Designed to Meet UL 1950/IEC950 Safety Standards.
- \* Multiple Configurations.

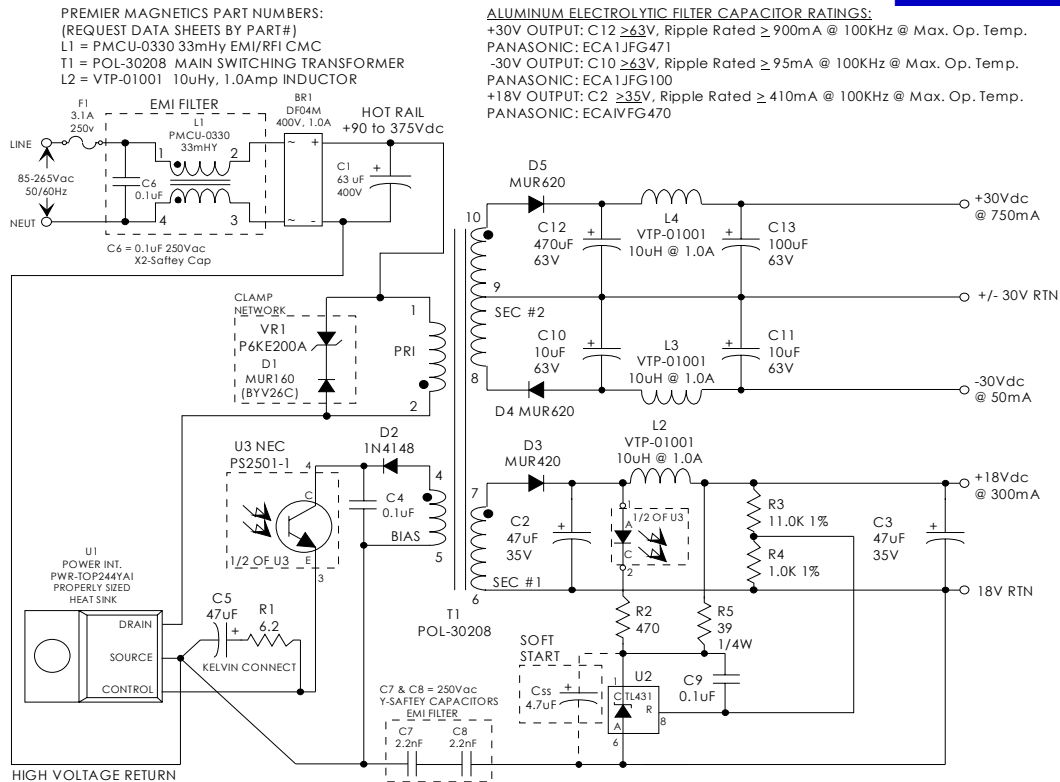
## GENERAL APPLICATION INFORMATION

Premier Magnetics' Off-Line Switch Mode Transformers have been designed for use with Power Integrations, Inc. TOPXXX series of off-line PWM switching regulators in the Flyback Buck-Boost circuit configuration. This conversion topology can provide isolated multiple outputs with efficiencies up to 90%. Premier's Switching Transformers have been optimized to provide maximum power throughput.

The TOPXXX series from Power Integrations, Inc. are self contained upto 132KHz controlled PWM switching regulators. This series contains all necessary functions for an off-line switched mode control DC power source. These switching regulators provide a very simple solution to off-line designs. The inductors and transformer used with the PWR-TOPXXX are critical to the performance of the circuit. They define the overall efficiency, output power and overall physical size.

Below is a universal input high precision 15V @ 2 Amps (30 watt) application circuit utilizing Power Integrations PWR-TOP226 switching regulator in the flyback buck-boost configuration. The component values listed are intended for reference purposes only. The soft start capacitor C<sub>ss</sub> is optional depending on the specific application. Simpler topology is possible depending on the line/load regulation required.

## SCHMATIC



Specifications subject to change without notice.

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## GENERAL ELECTRICAL SPECIFICATIONS AT 25°C - OPERATING TEMPERATURE RANGE 0°C TO +70°C

Units are Designed for a Universal AC Input of 85 to 265Vac, 47/440 Hz, Unless Otherwise Designated.

- 1 = Unit Designed for Voltage Doubler Input -or- PFC Corrected Front End.
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- 4 = Faraday Shield Between Primary + Bias & Secondaries. Connected to Bias - Pin.



**CLICK ON THE RESPECTIVE PART NUMBER TO DISPLAY A DETAIL DATA SHEET**

PART NUMBER	Recommended Power Intgr. Controller	APPLICATION DATA			Recommended		Package Schematic
		Output Voltages Vout Vdc	Output Currents Io_cont Amps	Con Watt	Output Filter Inductor (L2)	Input Filter CMC (L1)	
TSD-1684	TOP 232	2.5/3.3/12	0.5/0.6/0.16	5.2	VTP-01001	PMCU-0330	EE16
TSD-1715	TOP 242	3.3	0.6	2.0	VTP-01001	PMCU-0220	EE16
TSD-1848	TOP 242	3.3/5	1.5/0.7	8.5	VTP-01001	PMCU-0330	EE16
TSD-1813	TOP 233	3.3/5/5	1.5/1.5/0.3	14.0	VTP-01001	PMCU-0330	EEL19
TSD-1687	TOP 243	5.0	2.5	12.5	VTP-01002	PMCU-0330	E22/19
POL-05006 <sup>3</sup>	TOP 210	5.0	0.60	3.0	VTP-01001	PMCU-0220	E16-Horz
TSD-816	TOP 210	5.0	0.60	3.0	VTP-01001	PMCU-0220	E16-Horz
TSD-1185	TOP 221	5.0	0.70	3.5	VTP-00301	PMCU-0220	E16-Vert
POL-05010 <sup>3</sup>	TOP 200	5.0	1.00	5.0	VTP-01001	PMCU-0220	E16-Horz
POL-05012	TOP 200	5.0	1.20	6.0	VTP-01001	PMCU-0330	E16-Horz
TSD-1812	TOP 242	5.0	1.60	8.0	VTP01001	PMCU-0220	EE16
POL-05020	TOP 223	5.0	2.00	10.0	VTP-01002	PMCU-0330	E16-Vert
POL-05030	TOP 202	5.0	3.00	15.0	VTP-01002	PMCU-0330	E22/19/6
TSD-1486	TOP 200	5.0	1.00	5.0	VTP-01001	PMCU-0220	EE16/EI16
TSD-1952	TOP 202	5 x 2	1.2/1.2	12.0	VTP-01001	PMCU-0220	EPC19
TSD-778	TOP 201	5.0 x 2	1.20/0.80	6.4	VTP-01001	PMCU-0330	E22,10pin
TSD-1853	TOP 246	5.0 x 4	.150-7.0	140.0	VTP-01005	PMCE-0330	ER35
TSD-1692	TOP 242	5.0/7.5/7.5	0.4/0.25/0.25	5.8	VTP-01001	PMCU-0220	EE16
TSD-1829	TOP 234	5/7/17.6/17.6/50	1.2/.9/.3/.3/.16	31.0	VTP-01002	PMCU-0330	EE30
TSD-937	TOP 204	5/+8/-8	3.0/+1.0	30.0	VTP-01002	PMCE-0330	E28/11
TSD-1201	TOP 225	5/+9/-9	6/+1.3/-0.13	43.0	VTP-01005	PMCU-0330	E133/29
TSD-1160	TOP 225	5/+12/-12	6/+1.0/-0.10	43.0	VTP-01005	PMCU-0330	E133/29
TSD-1695	TOP 248	5/5/12/12	3/2/2/2	49.0	VTP-01001	PMCE-0330	EE33
TSD-1390	TOP 226	5/12	5.0/3.0	61.0	VTP-01005	PMCE-0330	E133/29
TSD-877	TOP 204	5x2 & 15	2.5/0.10	16.0	VTP-01002	PMCU-0330	E28/11
TSD-1017	TOP 209	5/15	0.02/0.10	1.7	N/A	PMCU-0220	E16-Vert
TSD-1135	TOP 209	5/15	0.05/0.12	2.1	N/A	PMCU-0220	E22/19/6
TSD-1305 <sup>4</sup>	TOP 209	5/15	0.05/0.12	2.1	N/A	PMCU-0220	E22/19/6
TSD-1110	TOP 224	5/+15/-15	2.2/+0.3	20.0	VTP-01002	PMCU-0330	EEL19
TSD-1941	TOP 247	5/7.75/21/21/51	1.4/1/.35/.35/.19	39.2	VTP-01002	PMCU-0330	EI30
TSD-1866	TOP 247	5/15/30	.75/.10/2.5	80.5	VTP-01002	PMCE-0330	EE33
TSD-1869	TOP 248	5/33	3.0/3.0	115.0	VTP-01002	PMCU-0330	EFD25
TSD-893	TOP 201	5/30/+12/-12	1.0/.05/.25/.25	14.0	VTP-01001	PMCU-0330	E30
TSD-876	TOP 210	5/12	0.10/0.20	3.0	Bead	PMCU-0220	E19-Horz
TSD-815 <sup>1</sup>	TOP 201	5/15	1.0/1.0	20.0	VTP-01001	PMCU-0330	E22/19/6
TSD-1961	TOP 248	5/15/24	1/1/4	116.0	VTP-01002	PMCE-0330	EERL35
TSD-1820	TOP 234	5/18	2/0.5	19.0	VTP-01001	PMCU-0330	E20/10/6

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		Output Voltages Vout Vdc	Output Currents Io_cont Amps	Con Watt	Output Filter Inductor (L2)	Input Filter CMC (L1)	
TSD-1694	TOP 234	5/20/20	1.3/.260/.260	17.0	VTP-01001	PMCU-0330	EEL19
TSD-1753	TOP 243	5/24	0.50/0.150	6.1	VTP-01001	PMCU-0220	EE19
TSD-858	TOP 210	5/24	0.30/0.08	3.4	VTP-01001	PMCU-0220	E16-Horz
TSD-1696	TOP 248	5/24/48	0.8/0.15/0.02	8.6	VTP-01001	PMCU-0330	EI28
TSD-779	TOP 202	5/33	1.0/0.50	21.5	VTP-01001	PMCU-0100	E22/19/6
TSD-988	TOP 214	5/28	1.0/0.50	21.0	VTP-01001	PMCU-0100	EEL22
TSD-983	TOP 202	5/33	1.0/0.50	21.5	VTP-01001	PMCU-0100	E22/19/6
TSD-1422	TOP 223Y	5/-65	1.0/0.1	11.5	VTP-01001	PMCU-0330	EFD30
TSD-979	TOP 210	5.5/10	0.80/0.05	5.0	VTP-01001	PMCU-0220	E16-Horz
TSD-1046 <sup>3</sup>	TOP 221	6/25	0.30/0.09	3.9	VTP-00301	PMCU-0220	E22/19/6
TSD-1370	TOP 222	6/24	0.55/0.10	5.0	VTP-01001	PMCU-0220	E2425
TSD-1144 <sup>1</sup>	TOP 223	6/ -38/ -60	1.2/0.30/.050	20.0	VTP-01001	PMCE-0330	E2425
TSD-940	TOP 210	6.5	0.80	5.2	VTP-01001	PMCU-0220	E16-Horz
TSD-860	TOP 224	6.9/2x15	0.30/0.60	20.0	VTP-01001	PMCU-0330	E28/11
TSD-1347	TOP 224	6.9/24/-15	0.3/0.6/0.2	20.0	VTP-01001	PMCU-0330	E28/11
POL-07050	TOP 226	7.0	5.00	35.0	VTP-01005	PMCE-0330	E28/11
POL-07003	TOP 209P	7.5	0.26	2.0	VTP-01002	PMCU-0330	E16-Vert
TSD-1093 <sup>4</sup>	TOP 209P	7.5	0.26	2.0	VTP-01002	PMCU-0330	E16-Vert
POL-07020	TOP 202	7.5	2.00	15.0	VTP-01002	PMCU-0330	E22/19/6
TSD-1024	TOP 223P	7.5/15	1.0/0.25	11.3	VTP-01002	PMCU-0330	E22/19/6
TSD-1751	TOP 249	7.5/15	1.0/8	128.0	VTP-02007	PMCE-0330	EER35
TSD-1759	TOP 243	7.5/24/24	.27/.20/.04	7.8	VTP-01001	PMCU-0220	EE16
TSD-1195	TOP 224	8/16/16	2.0/0.25/0.25	30.0	VTP-01001	PMCE-0330	E30
TSD-1740	TOP 248	8/13/18/18	1.5/3x1.25	73.3	VTP-01001	PMCE-0330	EER35
TSD-794 <sup>1</sup>	TOP 202	8.5	4.00	34.0	VTP-01005	PMCU-2220	E28/11
TSD-1691	TOP 243	8.6	1.8	15.5	VTP-01002	PMCU-0330	E22/19
TSD-1489	TOP 221Y	9.0	0.40	3.6	VTP-0100	PMCU-0220	EE16/EI16
TSD-880	TOP 204	9/24	3.0/0.60	50.0	VTP-01002	PMCE-0330	E30
POL-97505	TOP 221	9.75	0.50	4.9	VTP-01001	PMCU-0330	E16-Vert
TSD-813 <sup>2</sup>	TOP 200	9.75	0.50	4.9	Bead	PMCU-0220	E19-Horz
POL-97506	TOP 221	9.75	0.60	5.8	Bead	PMCU-0220	E19-Horz
TSD-825 <sup>3</sup>	TOP 221P	12.0	0.30	3.6	VTP-01001	PMCU-0220	E16-Horz
TSD-935 <sup>3</sup>	TOP 200	12.0	0.50	5.0	VTP-01001	PMCU-0220	E19-Horz
TSD-990 <sup>3</sup>	TOP 222P	12.0	0.67	8.0	VTP-01001	PMCU-0220	E19-Horz
POL-12012	TOP 202	12.0	1.20	15.0	VTP-01001	PMCU-0330	E22/19/6
POL-12017	TOP 224P	12.0	1.70	20.4	VTP-01002	PMCU-0220	E25-Vert
POL-15020	TOP 226	12.0	2.50	30.0	VTP-01002	PMCU-0330	E28/11

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POL-15033	TOP 226	12.0	3.00	36.0	VTP-01002	PMCE-0330	E30
TSD-762 <sup>2</sup>	TOP 103	12.0	3.40	41.0	VTP-01002	PMCE-0330	E28/11
TSD-1834	TOP 247	12	3.75	45.0	VTP-01005	PMCE-0330	E119
TSD-777 <sup>2</sup>	TOP 104	12.0	5.00	60.0	VTP-01005	PMCE-0330	E30
TSD-1405	TOP 224P	12.0	1.70	20.4	VTP-01002	PMCU-0220	E25.4
POL-12208	TOP 223	12x2	0.50/0.30	9.6	VTP-01001	PMCU-0330	E22/19/
POL-12216	TOP 224	12x2	0.80/0.80	21.5	VTP-01001	PMCU-0330	E125-Vert
TSD-1943	TOP 248	12x2	2.5/2.5	62.5	VTP-01002	PMCE-0330	E30
TSD-1551	TOP 222Y	12/5/3.3/-12	0.1/0.2/1.5/0.1	8.4	VTP-01001	PMCU-0330	EE22/19/6
TSD-1654	TOP 223Y	12/12	0.30/0.50	9.6	VTP-01001	PMCU-0330	EE19/EI19
TSD-1469	TOP 222Y	13/6/3.3/-13	0.1/0.2/1.5/0.1	8.8	VTP-01001	PMCU-0330	EE22/19/6
POL-15033 <sup>2</sup>	TOP 104	13.8	4.00	56.0	VTP-01002	PMCE-0330	E30
TSD-946 <sup>3</sup>	TOP 210	14.0	0.20	3.0	VTP-01001	PMCU-0330	E16-Horz
TSD-1010	TOP 210	14.0	0.43	4.5	VTP-01001	PMCU-0330	EFD20
TSD-1003 <sup>3</sup>	TOP 210	15.0	0.20	3.0	VTP-01001	PMCU-0330	E16-Horz
TSD-1330 <sup>3</sup>	TOP 210	15.0	0.20	3.0	VTP-01001	PMCU-0330	E16-Vert
TSD-1811	TOP 243	15.0	1.0	15.0	VTP-01001	PMCU-0220	EE16
TSD-737 <sup>3</sup>	TOP 223	15.0	1.00	15.0	VTP-01001	PMCU-0330	E22/19/6
POL-15020	TOP 226	15.0	2.00	30.0	VTP-01002	PMCU-0330	E28/11
POL-15033	TOP 226	15.0	3.33	50.0	VTP-01002	PMCE-0330	E30
TSD-812	TOP 204	15.0	3.33	50.0	VTP-01002	PMCE-0330	EER28L
POL-15073 <sup>1</sup>	TOP 204	15.0	7.33	110.0	VTP-02007	PMCE-3330	EER28L
POL-15204 <sup>3</sup>	TOP 200	15x2	0.20/0.20	6.0	VTP-01001	PMCU-0220	E19-Horz
TSD-1683	TOP 221	15.0/15.0	0.20/0.18	6.3	VTP-01001	PMCU-0220	EE22
TSD-860	TOP 202	+15/6.9	+0.60/0.30	20.0	VTP-01001	PMCU-0330	E28/11
TSD-1432	TOP 224Y	15/-15/6.9	0.8/0.8/0.3	26.1	VTP-01001	PMCU-0330	EER28L
TSD-1385	TOP 204	15/15/5	0.2/0.2/1.0	11.0	VTP-01002	PMCU-0330	E28/11
TSD-873 <sup>1</sup>	TOP 210	17.0	0.10	1.7	Bead	N/A	EP10-SMD
TSD-1035	TOP 221	17.0	0.20	3.5	Bead	N/A	EP10-SMD
TSD-1197	TOP 227	17/21/17	2.0/0.25/0.25	90.0	VTP-01002	PMCE-0330	E133/29
TSD-1055 <sup>3</sup>	TOP 210	15V to 18V	.300 to .350	5.5	VTP-01001	PMCU-0220	EEL16
TSD-1439	TOP 221Y	18.0	0.2	3.6	VTP-01001	PMCU-0220	EE16/EI16
TSD-968 <sup>3</sup>	TOP 202	18x2	0.40/0.40	14.4	VTP-01001	PMCU-0330	E22/19/6
POL-30208	TOP 244	18/+30/-30	0.30/0.75/0.5	30.0	VTP-01001	PMCU-0330	EE28/11
TSD-1668	TOP 232	18.0	0.40	7.2	VTP-01001	PMCU-0220	EEL16
TSD-1752	TOP 232	19.0	0.45	8.6	VTP-01001	PMCU-0220	EEL19
POL-22007	TOP 202	22.0	0.70	15.4	VTP-01001	PMCU-0330	E22/19/6
TSD-924 <sup>4</sup>	TOP 202	22.0	0.70	15.4	VTP-01001	PMCU-0330	E22/19/6

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<a href="#">POL-24013</a>	TOP 204	22.0	1.50	33.0	VTP-01002	PMCU-0330	E28/11
<a href="#">POL-24020</a>	TOP 226	22.0	2.00	44.0	VTP-01002	PMCE-0330	E30
<a href="#">TSD-1936</a>	TOP 243	24.0	0.50	12..	VTP-01001	PMCU-0220	EE16
<a href="#">TSD-1693</a>	TOP 246	24.0	3.5	8.4	VTP-01005	PMCU-0330	EI30
<a href="#">TSD-790</a>	TOP 200	24.0	0.15	3.6	VTP-01001	PMCU-0220	E22/19/6
<a href="#">TSD-1801</a>	TOP 243	24.0	0.20	4.8	VTP-01001	PMCU-0220	EE16
<a href="#">TSD-1791</a>	TOP 234	24.0	1.25	30.0	VTP-01001	PMCU-0330	EF25
<a href="#">POL-24013</a>	TOP 226	24.0	1.30	31.2	VTP-01002	PMCU-0330	E28/11
<a href="#">TSD-1043<sup>4</sup></a>	TOP 204	24.0	1.30	31.2	VTP-01002	PMCU-0330	E28/11
<a href="#">TSD-975</a>	TOP214	24.0	1.30	31.2	VTP-01001	PMCU-0330	EPC25
<a href="#">POL-24020</a>	TOP 226	24.0	2.00	48.0	VTP-01002	PMCE-0330	E30
<a href="#">POL-24208</a>	TOP 226	24.0x2	0.80x2	38.4	VTP-01001	PMCU-0330	E25-Vert
<a href="#">POL-24219</a>	TOP 227	24.0x2	1.875x2	90.0	VTP-01001	PMCE-0330	EI33/29
<a href="#">TSD-1667</a>	TOP 242	24.0/5.0	0.150/0.400	5.6	VTP-01001	PMCU-0220	EI19
<a href="#">TSD-1395</a>	TOP 224Y	24.0/5.0	1.0/3.0	39.0	VTP-01002	PMCE-0330	EE30
<a href="#">TSD-1406</a>	TOP 223P	24.0/5.0	0.15/0.8	7.6	VTP-01001	PMCU-5330	EE22/19/6
<a href="#">TSD-1476</a>	TOP 202YAI		24.0/5.0	0.5/1.0	17.0	VTP-01001	PMCU-0100
<a href="#">E122/19/6</a>							
<a href="#">TSD-1647</a>	TOP 222	24.0/7.5	0.2/0.265	6.8	VTP-01001	PMCU-0100	EE16/EI16
<a href="#">TSD-1468</a>	TOP 222	-24.0/-60.0	0.3/0.13	15.0	VTP-01001	PMCU-0330	EE19/EI19
<a href="#">POL-28022</a>	TOP 204	28.0	2.20	61.6	VTP-01002	PMCE-0330	E30
<a href="#">TSD-1717</a>	TOP 249	28.0	7.5	210.0	VTP-02007	PMCE-0330	ETD39
<a href="#">POL-30030<sup>1</sup></a>	TOP 227Y	28.0	4.00	112.0	VTP-01005	PMCE-0160	EI33/29
<a href="#">TSD-1056<sup>1</sup></a>	TOP 227Y	29/9.5	3.50/0.25	104.0	VTP-01003	PMCE-0330	EI40
<a href="#">POL-30030</a>	TOP 227Y	30.0	3.00	90.0	VTP-01002	PMCE-0160	EI33/29
<a href="#">TSD-1737</a>	TOP 247	30.0	4.0	120.0	VTP-01005	PMCE-0330	E42
<a href="#">POL-40020</a>	TOP 227Y	40.0	2.00	80.0	VTP-01002	PMCE-0160	EI33/29
<a href="#">POL-45012</a>	TOP 204	45.0	1.20	54.0	VTP-01002	PMCE-0330	E28/11
<a href="#">TSD-1421</a>	TOP 222Y	48.0	0.25	12.0	VTP-01001	PMCE-0330	EF25
<a href="#">TSD-1739</a>	TOP 246	48.0	2.0	96.0	VTP-01002	PMCE-0330	EI33
<a href="#">TSD-1854</a>	TOP 250	48	4.16	200.0	VTP-01005	PMCE-0330	E42/21
<a href="#">TSD-1686</a>	TOP 246	72.0	0.8	58.0	VTP-01001	PMCE-0330	E28
<a href="#">TSD-1809</a>	TOP 245	72.0	0.5	36.0	VTP-01001	PMCU-0330	EI25
<a href="#">TSD-1552</a>	TOP 227	85/-85/48/24	0.175/0.175/1.3/1.3	123.4	VTP-01002	PMCE-0330	EI33/29/1
<a href="#">TSD-974<sup>5</sup></a>	TOP104	-118	-0.13	15.3	VTP-01002	N/A	EFD25
<a href="#">TSD-1851</a>	TOP 249	360	.180	65.0	VTP-01001	PMCE-0330	EI40

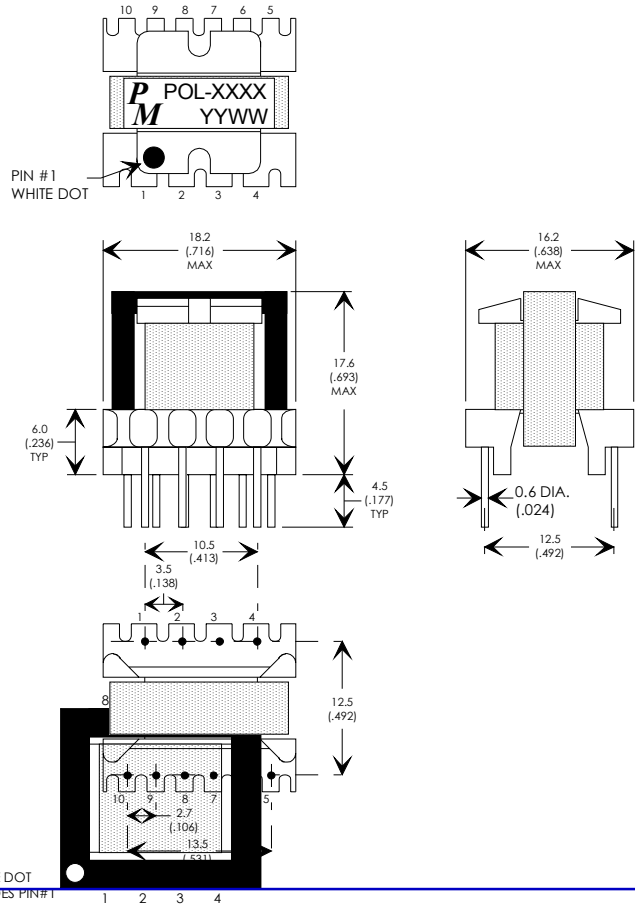
# OFF-LINE SWITCH MODE TRANSFORMERS

## MECHANICALS

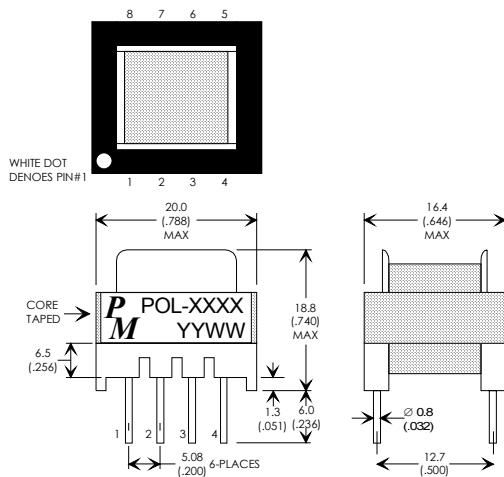
### E16-Horz

**P** POL-XXXX  
**M** YYWW

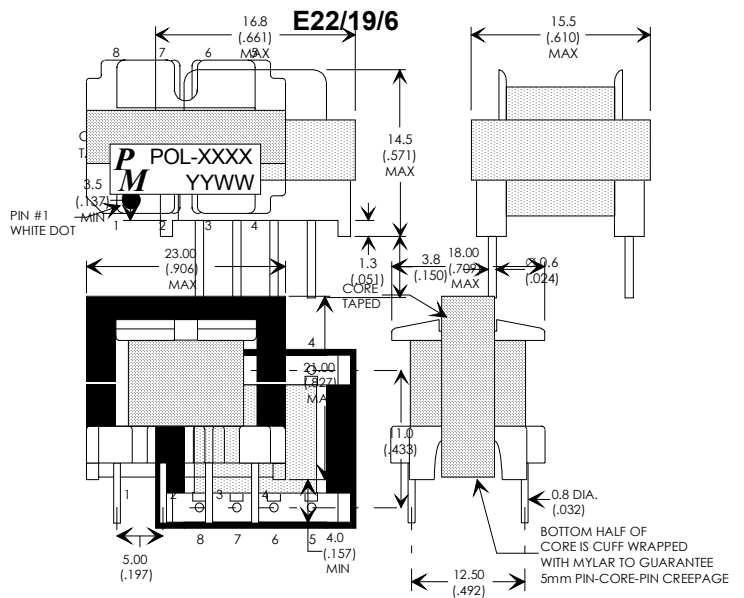
### E16-Vert



### E19-Horz



### E22/19/6

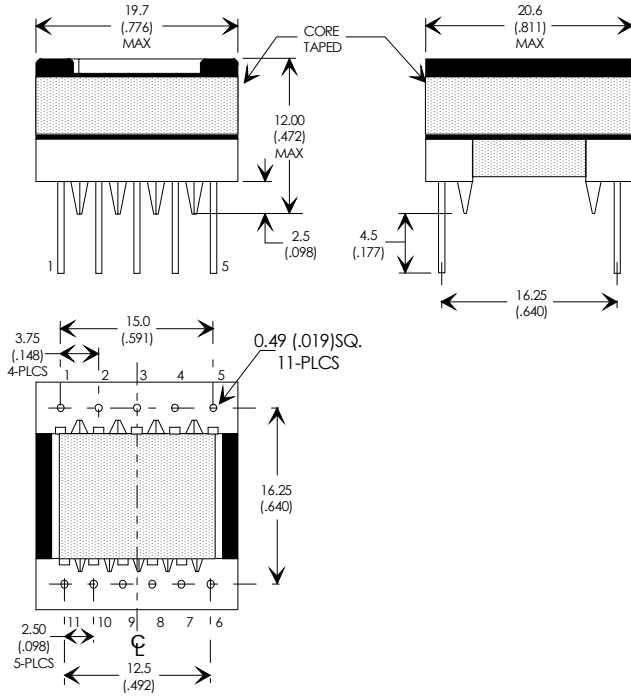


Specifications subject to change without notice.

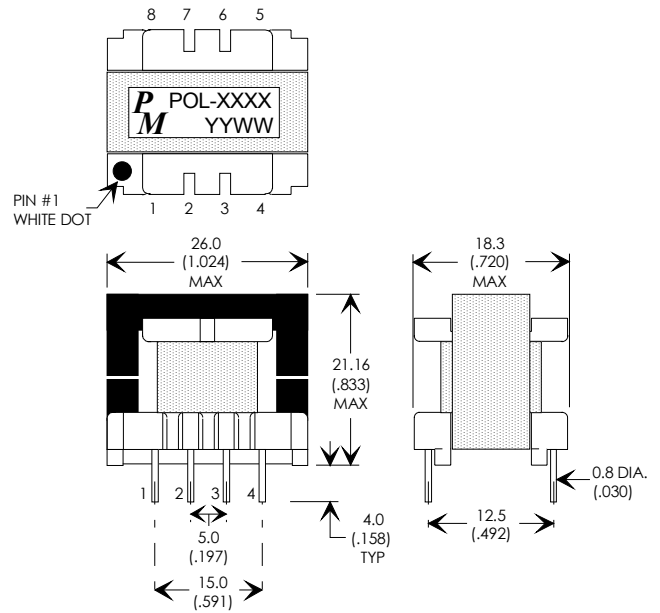
pol 10/99

**MECHANICALS**

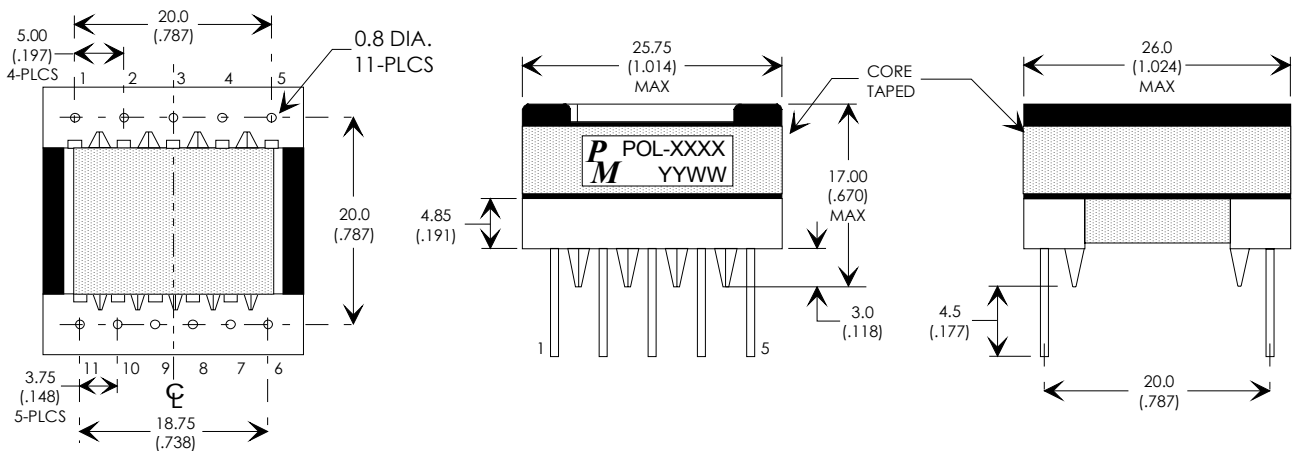
**EPC 19**



**E-25**

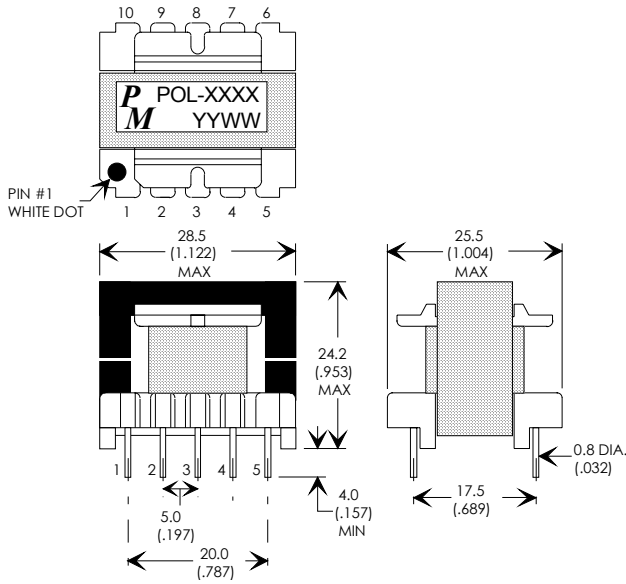


**EPC25**

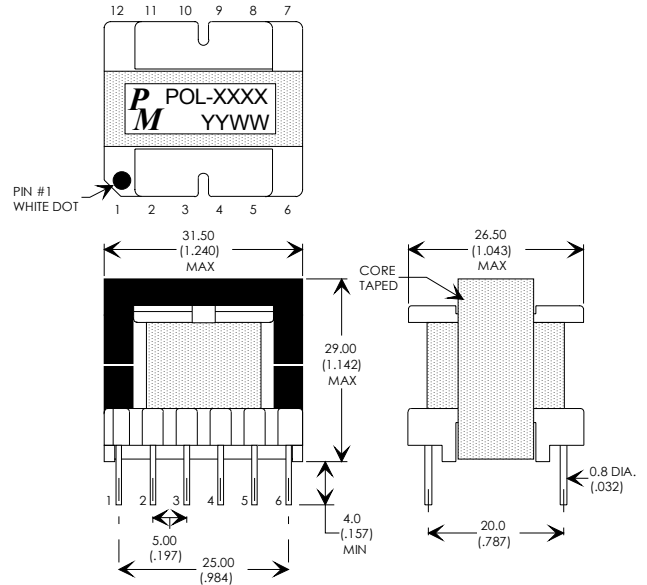


**MECHANICALS**

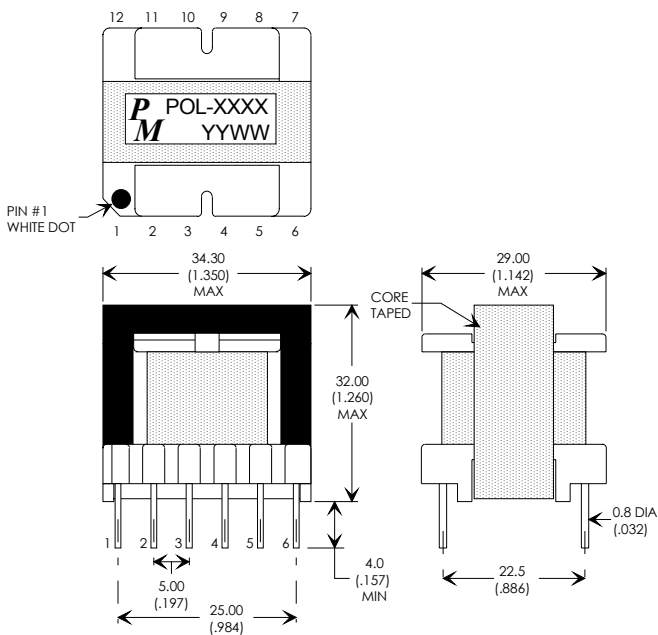
**E28/11**



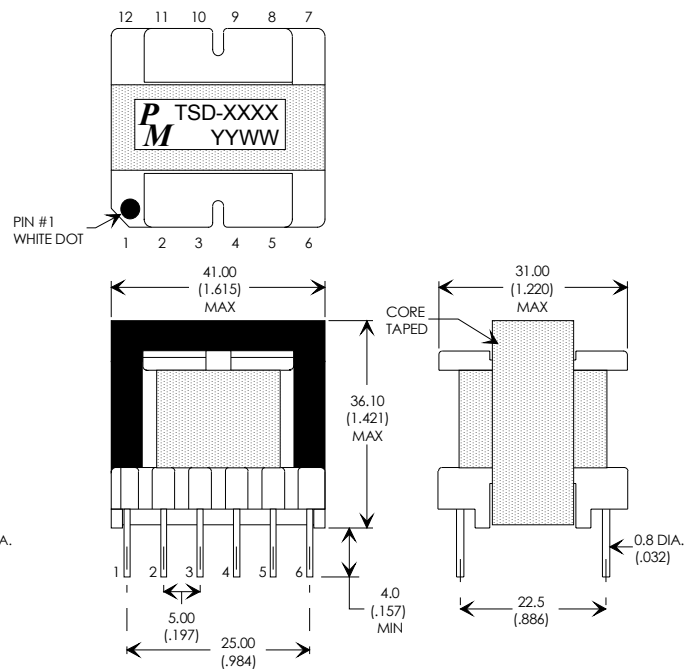
**E30**



**E133/29**



**E140**







# OFF-LINE SWITCH MODE TRANSFORMERS

**Indicated parts are UL1950 & CSA-950 Recognized under UL File# E162344**

## UL 1950 & CSA 950-95, C-UL US Recognized Parts

UL & CSA Recognized Components in UL File E162344 (S), Product Designation XNWX2

REF #	PART NUMBER	Package Schematic	REF #	PART NUMBER	Package Schematic	REF #	PART NUMBER	Package Schematic
1	TSD-737	E22/19/6	38	TSD-1110	EEL19			
2	TSD-762	E28/11	39	POL-05006	E-16 HORIZ			
3	TSD-777	E30	40	POL-05010	E-16 HORIZ			
4	TSD-778	E22/19/6	41	POL-05012	E-16 HORIZ			
5	TSD-779	E22/19/6	42	POL-05020	E-16 VERT			
6	TSD-790	E22/19/6	43	POL-05030	E22/19/6			
7	TSD-794	E28/11	44	POL-07003	E-16 VERT			
8	TSD-812	EER28L	45	POL-07020	E22/19/6			
9	TSD-813	E19HORIZ	46	POL-07050	E28/11			
10	TSD-816	E-16 HORIZ	47	POL-12012	E22/19/6			
11	TSD-825	E-16 HORIZ	48	POL-12017	E125 VERT			
12	TSD-858	E16HORIZ	49	POL-12208	E22/19/6			
13	TSD-860	E28/11	50	POL-12216	E125 VERT			
14	TSD-876	E19HORIZ	51	POL-15020	E28/11			
15	TSD-877	E28/11	52	POL-15033	E30			
16	TSD-880	E30	53	POL-15073	EER28L			
17	TSD-893	E30	54	POL-15204	E19HORIZ			
18	TSD-924	E22/19/6	55	POL-22007	E22/19/6			
19	TSD-935	E19HORIZ	56	POL-24013	E28/11			
20	TSD-937	E28/11	57	POL-24020	E28/11			
21	TSD-940	E-16 HORIZ	58	POL-28022	E30			
22	TSD-946	E-16 HORIZ	59	POL-30030	E133/29			
23	TSD-968	E22/19/6	60	POL-40020	E133/29			
24	TSD-974	EFD25	61	POL-45012	E28/11			
25	TSD-975	EPC25	62	POL-97506	E19HORIZ			
26	TSD-979	E-16 HORIZ						
27	TSD-983	E22/19/6						
28	TSD-988	EEL22						
29	TSD-990	E19HORIZ						
30	TSD-1003	E-16 HORIZ						
31	TSD-1017	E-16 VERT						
32	TSD-1024	E22/19/6						
33	TSD-1043	E28/11						
34	TSD-1046	E22/19/6						
35	TSD-1055	EEL16						
36	TSD-1056	E140						
37	TSD-1093	E-16 VERT						

Specifications subject to change without notice.

pol 03/04



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