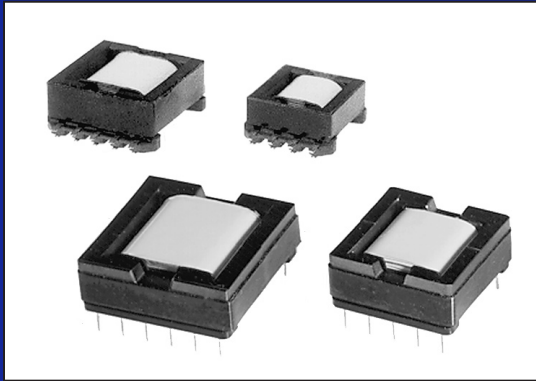


# SWITCH MODE TRANSFORMERS

## WCM 402 Series



### PRODUCT DESCRIPTION

West Coast Magnetics' 402 series high frequency transformers are intended for use in switch mode power supplies including push/pull, flyback, and forward converter circuits. Output power as high as 257 watts can be achieved in push/pull circuits. All sizes are based on low profile E-core geometry and two sizes are offered in surface mount packaging. West Coast Magnetics stocks core material which will accommodate a range of operating frequencies from 10 kHz to 3 MHz.

### FEATURES - BENEFITS



- Low profile, surface mount core geometry
- Low loss material
- Operating frequency to 3 MHz
- Standard gapped cores available from stock
- Design assistance from West Coast Magnetics

### DESIGN CONSTANTS

Size Code	$A_l$ frequency > 500 kHz <sup>a</sup>	$A_l$ frequency $\leq$ 500 kHz <sup>a</sup>	$A_l$ single gap	$A_l$ double gap	$A_e$ core area (mm <sup>2</sup> )	$l_e$ magnetic path length (mm)	$V_e$ core volume (mm <sup>3</sup> )	$W_a$ bobbin winding area (mm <sup>2</sup> )	$W_a C_e$ core area x winding area (mm <sup>4</sup> )	Bobbin window width (mm)	Bobbin window height (mm)	Mean length per turn (mm)
EFD 15	400	850	70	135	15.0	34.0	510	17.1	257	8.9	1.93	27
EFD 20	650	1200	70	135	31.0	47.0	1460	28.1	871	13.4	2.10	38
EFD 25	1000	2000	80	155	58.0	57.0	3300	42.5	2465	16.7	2.55	48
EFD 30	1050	2150	80	155	69.0	68.0	4700	54.1	3733	20.4	2.65	52

### OUTPUT POWER VS. FREQUENCY OF OPERATION (WATTS)

Size Code	50 kHz	100 kHz	250 kHz	500 kHz	1000 kHz	2000 kHz	3000 kHz
EFD 15	6.8	9.3	14	16	25	20	17
EFD 20	20	27	42	47	72	59	49
EFD 25	49	67	104	117	180	147	121
EFD 30	70	96	149	169	257	210	173

#### Power Curve Assumptions:

1. Push/Pull circuit topology
2. Bobbin Window area utilization = 40%
3. Flux density (B) chosen so that core losses at all Frequencies are 100 mW/cm<sup>3</sup>.

<sup>a</sup>  $A_l$  measured for ungapped cores.  $nH/T^2 \pm 25\%$

#### Notes:

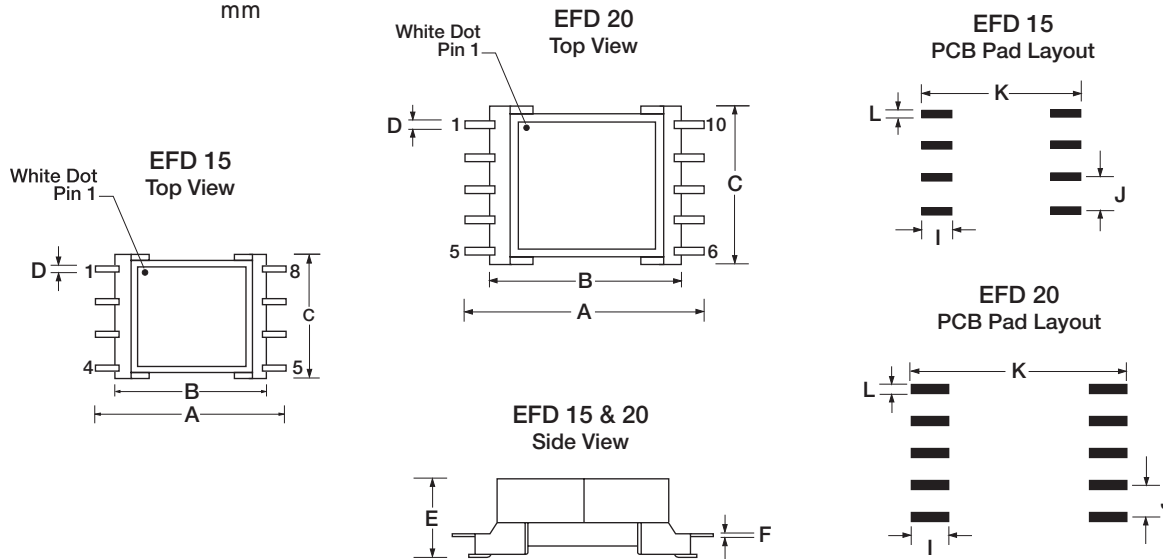
1. Reduce power rating in Table above by 50% for forward and flyback converter topologies.
2. Final sizing of the transformer will depend on a number of interrelated variables. The data in the above table should be considered a starting point only.
3. If safety agency is required, the final size may be significantly larger than the data in the table would indicate.



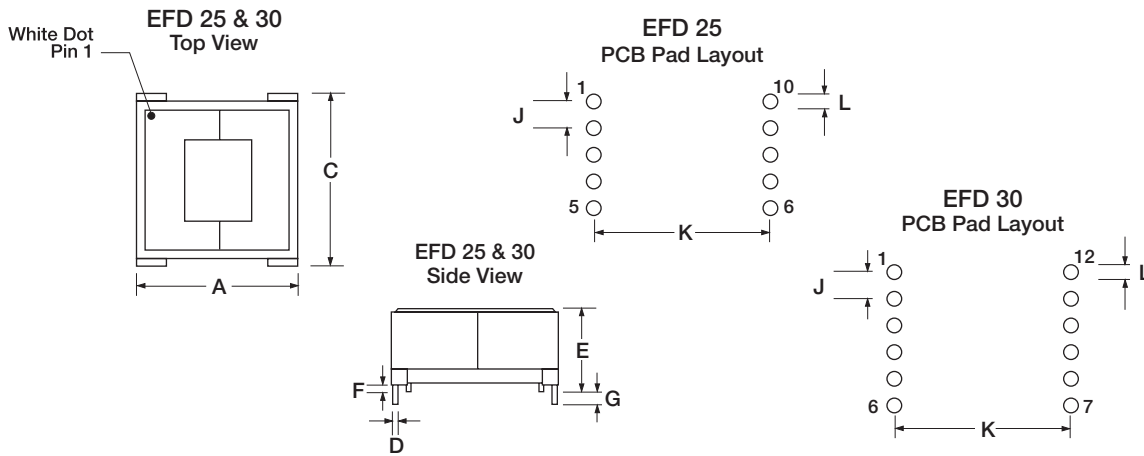
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Dimensions:  $\frac{\text{Inches}}{\text{mm}}$



Size Code	A	B	C	D	E	F	I	J	K	L
EFD 15	$\frac{.894}{22.7}$	$\frac{.736}{18.7}$	$\frac{.657}{16.7}$	$\frac{.039}{1.0}$	$\frac{.315}{8.0}$	$\frac{.012}{0.3}$	$\frac{.110}{2.8}$	$\frac{.150}{3.75}$	$\frac{.811}{20.6}$	$\frac{.079}{2.0}$
EFD 20	$\frac{1.091}{27.7}$	$\frac{.933}{23.7}$	$\frac{.854}{21.7}$	$\frac{.039}{1.0}$	$\frac{.406}{10.3}$	$\frac{.012}{0.3}$	$\frac{.110}{2.8}$	$\frac{.150}{3.75}$	$\frac{1.01}{25.6}$	$\frac{.079}{2.0}$



Size Code	A	C	D	E	F	G	J	K	L
EFD 25	$\frac{1.024}{26.0}$	$\frac{1.024}{26.0}$	$\frac{.031}{0.8}$	$\frac{.511}{13.0}$	$\frac{.071}{1.8}$	$\frac{.138}{3.5}$	$\frac{.197}{5.0}$	$\frac{.886}{22.5}$	$\frac{.052}{1.3}$
EFD 30	$\frac{1.220}{31.0}$	$\frac{1.220}{31.0}$	$\frac{.031}{0.8}$	$\frac{.511}{13.0}$	$\frac{.071}{1.8}$	$\frac{.138}{3.5}$	$\frac{.197}{5.0}$	$\frac{1.083}{27.5}$	$\frac{.052}{1.3}$

Note: All materials of construction minimum Class B 130 degrees C rated.

