Product specifications

VPI-1400-R*** VPI-14090-R 27 4 +V-90% 0.92 0.55 0.344 32.9 1.45 0.086 0.07 0.086 0.07 VPI-1090-R 12 2 +V-90% 0.63 0.85 0.145 0.85 0.145 0.87 VPI-1090-R 12 2 +V-90% 0.63 0.85 0.145 0.85 0.145 0.87 VPI-10102-R 1.09 +V-90% 0.053 0.055 0.054 0.085 0.145 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.185 0.145 0.18	Part (1)	L(BASE)	ISAT(BASE)	IRMS(BASE)	R(BASE)	Volt-µsec(base)	EPEAK(BASE)	Leakage Inductance	Thermal Resistance
PMPH-1400-R*** PMPH** PMP** PM	Number	, ,	(A) ´	(A) ´	Ohms	μVs	μĴ	(BASE) µH	°C/Watt
VPH-1400-R*** 89.6 + 30% 0.04 0.55 0.344 32.9 0.11 0.212 60.7 VPH-190-R 89.6 + 30% 0.06 0.85 0.145 21.8 0.11 0.096 60.7 VPH-1919-R 12.2 + ½0% 0.29 0.55 0.344 32.9 0.77 0.212 60.7 VPH-1919-R 12.2 + ½0% 0.53 0.55 0.344 32.9 0.77 0.096 60.7 VPH-19102-R 14.7 + ½0% 0.53 0.55 0.344 32.9 1.45 0.212 60.7 VPH-19102-R 14.7 + ½0% 0.53 0.55 0.344 32.9 1.45 0.212 60.7 VPH-19102-R 6.5 + ½0% 0.53 0.55 0.344 32.9 1.45 0.212 60.7 VPH-19102-R 10.9 + ½0% 0.72 0.55 0.344 32.9 1.45 0.212 60.7 VPH-19076-R 10.9 + ½0% 0.72 0.55 0.344 32.9 1.92 0.212 60.7 VPH-19076-R 10.9 + ½0% 0.72 0.55 0.344 32.9 1.92 0.212 60.7 VPH-1908-R 8.5 + ½0% 0.92 0.55 0.344 32.9 1.92 0.212 60.7 VPH-1908-R 8.5 + ½0% 0.92 0.55 0.344 32.9 1.92 0.212 60.7 VPH-1908-R 8.5 + ½0% 0.92 0.55 0.344 32.9 2.48 0.096 60.7 VPH-1908-R 8.5 + ½0% 0.92 0.55 0.344 32.9 2.48 0.096 60.7 VPH-1908-R 10.9 + ½0% 0.07 0.95 0.34 32.9 2.48 0.096 60.7 VPH-1908-R 10.9 + ½0% 0.07 0.95 0.33 0.85 0.145 21.8 2.48 0.096 60.7 VPH-2060-R** 16.6 + ½0% 0.07 0.95 0.159 48.3 0.29 0.155 44.0 VP2-1908-R** 78.4 + ½0% 0.10 1.26 0.090 33.7 0.29 0.083 44.0 VP2-2016-R 10.6 + ½0% 0.76 1.26 0.090 33.7 0.29 0.083 44.0 VP2-2016-R 10.6 + ½0% 0.76 1.26 0.090 33.7 2.11 0.083 44.0 VP2-2016-R 10.6 + ½0% 0.76 1.26 0.090 33.7 2.11 0.083 44.0 VP2-2016-R 5.7 + ½0% 1.31 0.99 0.95 0.159 48.3 0.34 0.093 44.0 VP2-2016-R 5.7 + ½0% 1.31 0.99 0.95 0.159 48.3 0.34 0.093 44.0 VP2-2016-R 8.3 + ½0% 1.39 0.96 0.159 48.3 0.37 0.34 0.093 44.0 VP2-2016-R 6.6 + ½0% 1.34 0.093 0.35.7 0.34 0.093 33.7 0.34 0.093 44.0 VP2-2016-R 8.3 + ½0% 1.39 0.95 0.159 48.3 0.37 0.34 0.093 44.0 VP2-2016-R 8.3 + ½0% 1.39 0.95 0.159 48.3 0.37 0.34 0.093 44.0 VP2-2016-R 8.3 + ½0% 1.39 0.95 0.159 48.3 0.37 0.34 0.093 44.0 0.99 0.95 0.159 48.3 0.093 44.0 0.99 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159 48.3 0.90 0.95 0.159			(TYP)(3)(4)		(MAX) ⁽⁶⁾				(TYP) ⁽⁹⁾
VPH-1090-R*** VPH-1090-R** 27.4 +\times 27.4 +\times 27.6 +\times 29.0	VPH1-1400-R(10)								
VPH-1919-R 12.2 + V-20% 0.29 0.55 0.344 32.9 0.77 0.212 60.7 VPH-10102-R 14.7 + V-20% 0.63 0.55 0.344 32.9 1.45 0.77 0.086 60.7 VPH-10102-R 14.7 + V-20% 0.55 0.55 0.344 32.9 1.45 0.212 60.7 VPH-10107-R 10.9 + V-20% 0.72 0.55 0.344 32.9 1.45 0.086 60.7 VPH-10107-R 10.9 + V-20% 0.72 0.55 0.344 32.9 1.92 0.212 60.7 VPH-10103-R 10.9 + V-20% 0.72 0.55 0.344 32.9 1.92 0.212 60.7 VPH-1005-R 10.9 + V-20% 0.086 0.7 VPH-1005-R 10.9 + V-20% 0.086 0.7 VPH-1005-R 10.9 + V-20% 0.096 0.07 0.95 0.344 32.9 1.92 0.212 60.7 VPH-1005-R 1.9 + V-20% 0.096 0.07 0.95 0.344 32.9 1.92 0.248 0.0212 60.7 VPH-1005-R 1.9 + V-20% 0.097 0.085 0.145 0.145 0.18 0.29 0.185 0.446 0.299 0.185 0.446 0.299 0.185 0.446 0.299 0.185 0.440 0.299 0.083 0.440 0.299 0.083 0.165 0.440 0.290 0.083 0.165 0.440 0.290 0.083 0.165 0.440 0.290 0.833.7 0.299 0.083 0.440 0.992 0.995 0.159 0.189	VP1-1400-R ⁽¹⁰⁾		0.06			21.8	0.11		60.7
VPI-0190-R 12.2 \(\sigma \) 0.43 0.85 0.145 21.8 0.77 0.096 60.7 VPI-0102-R 14.7 \(\sigma \) 0.85 0.95 0.344 32.9 1.45 0.212 60.7 VPI-0102-R 6.5 \(\sigma \) 0.85 0.80 0.85 0.145 21.8 1.45 0.096 60.7 VPI-0076-R 10.9 \(\sigma \) 1.006 0.85 0.145 21.8 1.45 0.096 60.7 VPI-0076-R 10.9 \(\sigma \) 1.006 0.85 0.145 21.8 1.92 0.096 60.7 VPI-0076-R 4.9 \(\sigma \) 1.006 0.85 0.145 21.8 1.92 0.096 60.7 VPI-10099-R 8.5 \(\sigma \) 3.5 \(\sigma \) 2.05 0.55 0.344 32.9 2.48 0.212 60.7 VPI-0096-R 3.5 \(\sigma \) 3.5 \(\sigma \) 2.05 0.55 0.344 32.9 2.48 0.212 60.7 VPI-0098-R 3.5 \(\sigma \) 3.5 \(\sigma \) 2.05 0.55 0.544 32.9 2.48 0.212 60.7 VPI-0098-R 3.5 \(\sigma \) 3.5 \(\sigma \) 2.05 0.55 0.544 32.9 2.48 0.212 60.7 VPI-0098-R 3.5 \(\sigma \) 3.5 \(\	VPH1-0190-R				0.344	32.9	0.77	0.212	
VPH-0102-R 14.7 4/20% 0.53 0.55 0.344 32.9 1.45 0.212 60.7 VPH-10076-R 10.9 4/20% 0.72 0.55 0.344 32.9 1.92 0.212 60.7 VPH-10076-R 10.9 4/20% 0.72 0.55 0.344 32.9 1.92 0.212 60.7 VPH-10076-R 10.9 4/20% 1.06 0.85 0.145 21.8 1.92 0.006 60.7 VPH-10099-R 8.5 4/20% 1.06 0.85 0.145 21.8 1.92 0.006 60.7 VPH-10099-R 8.5 4/20% 1.37 0.85 0.145 21.8 2.48 0.096 60.7 VPH-10099-R 160 4/30% 0.07 0.95 0.159 48.3 0.29 0.65 0.44 0.086 60.7 VPH-2006-R*** 160 4/30% 0.10 1.26 0.090 33.7 0.29 0.083 44.0 VP2-1600-R*** 78.4 4/30% 0.10 1.26 0.090 33.7 0.29 0.083 44.0 VP2-2016-R 21.6 4/20% 0.53 0.95 0.159 48.3 2.11 0.165 44.0 VP2-2016-R 11.6 4/20% 0.99 0.95 0.159 48.3 2.11 0.083 44.0 VP2-2016-R 11.6 4/20% 0.99 0.95 0.159 48.3 3.94 0.165 44.0 VP2-2016-R 11.6 4/20% 0.99 0.95 0.159 48.3 3.94 0.165 44.0 VP2-2016-R 5.7 4/20% 1.41 1.26 0.090 33.7 2.11 0.083 44.0 VP2-2016-R 5.7 4/20% 1.39 0.95 0.159 48.3 3.94 0.083 44.0 VP2-2016-R 5.7 4/20% 1.95 0.159 48.3 3.94 0.083 44.0 VP2-2016-R 5.7 4/20% 1.95 1.26 0.090 33.7 3.94 0.083 44.0 VP2-2016-R 5.7 4/20% 1.95 1.26 0.090 33.7 0.090 33.7 3.94 0.083 44.0 VP2-2016-R 5.7 4/20% 1.95 1.26 0.090 33.7 5.47 0.165 44.0 VP2-2068-R 3.2 4/20% 1.95 1.26 0.090 33.7 5.47 0.165 44.0 VP2-2068-R 3.2 4/20% 1.95 1.26 0.090 33.7 0.15 43.3 44.0 VPR2-2068-R 3.2 4/20% 1.95 1.26 0.090 33.7 0.15 43.3 44.0 VPR2-2068-R 3.2 4/20% 0.00 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VPR2-2068-R 3.2 4/20% 0.00 1.74 0.95 0.159 43.3 7.01 0.165 44.0 VPR2-2068-R 3.2 4/20% 0.07 0.07 0.07 0.07 0.07 0.07 0.07 0.	VP1-0190-R								
VPI-10102-R	VPH1-0102-R	14.7 +/-20%	0.53	0.55	0.344	32.9	1.45		60.7
VPH-0076-R 10.9 4/20% 10.6 0.85 0.344 32.9 1.92 0.212 60.7 VPH-10059-R 4.9 4/20% 10.6 0.85 0.145 21.8 1.92 0.096 60.7 VPH-10059-R 3.8 4/20% 0.92 0.55 0.344 32.9 2.48 0.212 60.7 VPH-2160-R ¹⁰⁰ 160 4/30% 0.07 0.95 0.159 48.3 0.29 0.083 44.0 VP2-2600-R ¹⁰⁰ 78.4 4/30% 0.10 1.26 0.090 33.7 0.29 0.083 44.0 VP2-2016-R 10.6 4/20% 0.53 0.95 0.159 48.3 2.11 0.083 44.0 VP2-2016-R 10.6 4/20% 0.56 0.7 VPH2-016-R 10.6 4/20% 0.76 0.76 0.76 0.76 0.76 0.76 0.76 0.76	VP1-0102-R		0.80		0.145	21.8	1.45	0.096	60.7
VPH-10698-R 8.5 +/-20% 1.37 0.85 0.145 21.8 2.48 0.096 60.7 VPH2-1600-R™ 160 +/-30% 0.07 0.95 0.159 48.3 0.29 0.165 44.0 VP2-1600-R™ 160 +/-30% 0.07 0.95 0.159 48.3 0.29 0.165 44.0 VP2-1600-R™ 160 +/-30% 0.01 1.26 0.090 33.7 0.29 0.083 44.0 VP2-216-R 10.6 +/-20% 0.53 0.59 0.159 48.3 0.21 1.0 0.165 44.0 VP2-216-R 10.6 +/-20% 0.76 1.26 0.090 33.7 2.11 0.083 44.0 VP2-216-R 11.6 +/-20% 0.76 1.26 0.090 33.7 2.11 0.083 44.0 VP2-216-R 11.6 +/-20% 0.76 1.26 0.090 33.7 2.11 0.083 44.0 VP2-216-R 11.6 +/-20% 1.39 0.95 0.159 48.3 3.94 0.165 44.0 VP2-216-R 11.6 +/-20% 0.76 1.26 0.090 33.7 3.94 0.083 44.0 VP2-216-R 1.7 +/-20% 1.39 0.95 0.159 48.3 3.94 0.083 44.0 VP2-2063-R 4.1 +/-20% 1.39 0.95 0.159 48.3 5.47 0.083 44.0 VP2-2068-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VP1-2068-R 3.2 +/-20% 2.50 1.26 0.090 33.7 7.01 0.165 44.0 VP1-2068-R 3.2 +/-20% 0.70 0.70 0.97 0.14 3.98 0.24 0.125 43.4 VP1-318-R 23.3 +/-20% 0.67 0.10 1.47 0.061 2.7.7 0.24 0.058 43.4 VP1-308-R 1.2 +/-20% 0.67 0.17 1.47 0.061 2.7.7 1.36 0.058 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.125 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.125 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.125 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.125 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.125 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.058 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.058 43.4 VP1-308-R 1.2 +/-20% 0.059 1.47 0.061 2.7.7 1.36 0.058 43.4 VP3-308-R 1.3 +/-20% 1.1 1.4 1.0 0.061 2.7.7 2.23 0.058 43.4 VP3-308-R 1.4 1.4 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.4 1.2 1.4 1.2 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	VPH1-0076-R	10.9 +/-20%	0.72	0.55	0.344	32.9	1.92	0.212	60.7
VPH-10698-R 8.5 +/-20% 1.37 0.85 0.145 21.8 2.48 0.096 60.7 VPH2-1600-R™ 160 +/-30% 0.07 0.95 0.159 48.3 0.29 0.165 44.0 VP2-1600-R™ 160 +/-30% 0.07 0.95 0.159 48.3 0.29 0.165 44.0 VP2-1600-R™ 160 +/-30% 0.01 1.26 0.090 33.7 0.29 0.083 44.0 VP2-216-R 10.6 +/-20% 0.53 0.59 0.159 48.3 0.21 1.0 0.165 44.0 VP2-216-R 10.6 +/-20% 0.76 1.26 0.090 33.7 2.11 0.083 44.0 VP2-216-R 11.6 +/-20% 0.76 1.26 0.090 33.7 2.11 0.083 44.0 VP2-216-R 11.6 +/-20% 0.76 1.26 0.090 33.7 2.11 0.083 44.0 VP2-216-R 11.6 +/-20% 1.39 0.95 0.159 48.3 3.94 0.165 44.0 VP2-216-R 11.6 +/-20% 0.76 1.26 0.090 33.7 3.94 0.083 44.0 VP2-216-R 1.7 +/-20% 1.39 0.95 0.159 48.3 3.94 0.083 44.0 VP2-2063-R 4.1 +/-20% 1.39 0.95 0.159 48.3 5.47 0.083 44.0 VP2-2068-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VP1-2068-R 3.2 +/-20% 2.50 1.26 0.090 33.7 7.01 0.165 44.0 VP1-2068-R 3.2 +/-20% 0.70 0.70 0.97 0.14 3.98 0.24 0.125 43.4 VP1-318-R 23.3 +/-20% 0.67 0.10 1.47 0.061 2.7.7 0.24 0.058 43.4 VP1-308-R 1.2 +/-20% 0.67 0.17 1.47 0.061 2.7.7 1.36 0.058 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.125 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.125 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.125 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.125 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.125 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.058 43.4 VP1-308-R 1.2 +/-20% 0.67 0.97 0.14 3.9.8 1.36 0.058 43.4 VP1-308-R 1.2 +/-20% 0.059 1.47 0.061 2.7.7 1.36 0.058 43.4 VP3-308-R 1.3 +/-20% 1.1 1.4 1.0 0.061 2.7.7 2.23 0.058 43.4 VP3-308-R 1.4 1.4 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.2 1.4 1.4 1.2 1.4 1.2 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4 1.4	VP1-0076-R	4.9 +/-20%	1.06		0.145	21.8	1.92	0.096	60.7
VPI-0959-R 38 +/20% 1.37 0.85 0.145 21.8 2.48 0.096 60.7	VPH1-0059-R		0.92				2.48		60.7
VP2-1000-R*® 78.4 +/-30% 0.10 1.26 0.090 33.7 0.29 0.083 44.0 VP2-0216-R 10.6 +/-20% 0.53 0.95 0.159 48.3 2.11 0.165 44.0 VP2-0216-R 11.6 +/-20% 0.99 0.95 0.159 48.3 3.3.4 0.165 44.0 VP1-0216-R 11.6 +/-20% 0.99 0.95 0.159 48.3 3.94 0.165 44.0 VP1-0216-R 11.6 +/-20% 0.99 0.95 0.159 48.3 3.94 0.165 44.0 VP1-02083-R 8.3 +/-20% 1.39 0.95 0.159 48.3 5.47 0.165 44.0 VP1-02083-R 8.3 +/-20% 1.95 1.26 0.090 33.7 5.47 0.083 44.0 VP1-02083-R 4.1 +/-20% 1.95 1.26 0.090 33.7 5.47 0.083 44.0 VP1-02066-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VP1-02066-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VP1-0308-R** 132 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VP3-0780-R** 132 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VP3-0780-R** 23.3 +/-20% 0.59 1.47 0.061 27.7 0.24 0.058 43.4 VP3-0780-R** 23.3 +/-20% 0.59 1.47 0.061 27.7 0.24 0.058 43.4 VP3-0780-R** 8 23.3 +/-20% 0.59 1.47 0.061 27.7 1.36 0.068 43.4 VP3-0780-R 12 +/-20% 0.59 1.47 0.061 27.7 2.23 0.058 43.4 VP3-0780-R 12 +/-20% 0.59 1.47 0.061 27.7 2.23 0.058 43.4 VP3-078-R 6.8 +/-20% 0.59 1.47 0.061 27.7 2.23 0.058 43.4 VP3-078-R 7.94 +/-20% 0.67 0.97 0.14 39.8 3.38 0.125 43.4 VP3-078-R 7.94 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-078-R 7.94 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-005-R 9.3 +/-20% 1.46 1.47 0.061 27.7 2.23 0.058 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.38 0.125 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.38 0.125 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.125 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 3.39 0.155 3.3 0.056 43.4 VP3-005-R 9.5 +/-20% 1.50 1.70 0.057 44.7 0.57 0.075 39.4 VP4-0406-R 1.1 +/-20% 1.1 +/-20% 1.1 +/-20% 1.1 +/-	VP1-0059-R	3.8 +/-20%	1.37	0.85	0.145	21.8	2.48	0.096	60.7
VP2-1000-R*® 78.4 +/-30% 0.10 1.26 0.090 33.7 0.29 0.083 44.0 VP2-0216-R 10.6 +/-20% 0.53 0.95 0.159 48.3 2.11 0.165 44.0 VP2-0216-R 11.6 +/-20% 0.99 0.95 0.159 48.3 3.3.4 0.165 44.0 VP1-0216-R 11.6 +/-20% 0.99 0.95 0.159 48.3 3.94 0.165 44.0 VP1-0216-R 11.6 +/-20% 0.99 0.95 0.159 48.3 3.94 0.165 44.0 VP1-02083-R 8.3 +/-20% 1.39 0.95 0.159 48.3 5.47 0.165 44.0 VP1-02083-R 8.3 +/-20% 1.95 1.26 0.090 33.7 5.47 0.083 44.0 VP1-02083-R 4.1 +/-20% 1.95 1.26 0.090 33.7 5.47 0.083 44.0 VP1-02066-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VP1-02066-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VP1-0308-R** 132 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VP3-0780-R** 132 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VP3-0780-R** 23.3 +/-20% 0.59 1.47 0.061 27.7 0.24 0.058 43.4 VP3-0780-R** 23.3 +/-20% 0.59 1.47 0.061 27.7 0.24 0.058 43.4 VP3-0780-R** 8 23.3 +/-20% 0.59 1.47 0.061 27.7 1.36 0.068 43.4 VP3-0780-R 12 +/-20% 0.59 1.47 0.061 27.7 2.23 0.058 43.4 VP3-0780-R 12 +/-20% 0.59 1.47 0.061 27.7 2.23 0.058 43.4 VP3-078-R 6.8 +/-20% 0.59 1.47 0.061 27.7 2.23 0.058 43.4 VP3-078-R 7.94 +/-20% 0.67 0.97 0.14 39.8 3.38 0.125 43.4 VP3-078-R 7.94 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-078-R 7.94 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-005-R 9.3 +/-20% 1.46 1.47 0.061 27.7 2.23 0.058 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.38 0.125 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.38 0.125 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.125 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 0.155 43.4 VP3-005-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.39 3.39 0.155 3.3 0.056 43.4 VP3-005-R 9.5 +/-20% 1.50 1.70 0.057 44.7 0.57 0.075 39.4 VP4-0406-R 1.1 +/-20% 1.1 +/-20% 1.1 +/-20% 1.1 +/-	VPH2-1600-R(10)	160 +/-30%	0.07	0.95	0.159	48.3	0.29	0.165	44.0
VPH2-0216-R 21.6 +/-20% 0.53 0.95 0.159 48.3 2.11 0.165 44.0 VPP2-0216-R 10.6 +/-20% 0.76 1.26 0.090 33.7 2.11 0.083 44.0 VPP2-0116-R 11.6 +/-20% 0.99 0.95 0.159 48.3 3.94 0.165 44.0 VPP2-0116-R 11.6 +/-20% 1.91 1.91 1.26 0.090 33.7 3.94 0.083 44.0 VPP2-0116-R 13.9 4.20% 1.39 0.95 0.159 48.3 3.94 0.083 44.0 VPP2-0083-R 8.3 +/-20% 1.95 1.26 0.090 33.7 5.47 0.083 44.0 VPP2-0083-R 6.6 +/-20% 1.95 1.26 0.090 33.7 5.47 0.083 44.0 VPP2-0068-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VPP2-0066-R 3.2 +/-20% 2.50 1.26 0.090 33.7 7.01 0.083 44.0 VPP2-0066-R 3.2 +/-20% 2.50 1.26 0.090 33.7 7.01 0.083 44.0 VPP3-0780-R** 132 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VPP3-0780-R** 132 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VPP3-0780-R** 63.2 +/-20% 0.59 1.47 0.061 27.7 0.24 0.058 43.4 VPP3-0138-R 23.3 +/-20% 0.41 0.97 0.14 39.8 1.36 0.125 43.4 VPP3-0138-R 11.2 +/-20% 0.59 1.47 0.061 27.7 1.36 0.058 43.4 VPP3-0180-R* 14.2 +/-20% 0.59 1.47 0.061 27.7 1.36 0.058 43.4 VPP3-0084-R 6.8 +/-20% 0.97 1.47 0.061 27.7 2.23 0.058 43.4 VPP3-0085-R 9.3 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-0085-R 9.3 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-0055-R 9.3 +/-20% 1.06 0.97 0.14 39.8 3.38 0.125 43.4 VP3-0055-R 9.3 +/-20% 1.06 0.97 0.14 39.8 3.38 0.125 43.4 VP3-0055-R 9.3 +/-20% 1.09 0.97 0.14 39.8 4.00 0.125 43.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 43.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 43.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 33.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 33.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 33.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 33.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.38 0.155 33.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.38 0.155 33.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.38 0.155 33.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 3.38 0.055 33.3 0.058 33.4 VP3-0055-R 9.3 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 33.3 0.058 33.4 VP3-0055-R 9.5 +/-20% 1.19 0.057 44.7 0.051 0.057 0.057 0	VP2-1600-R(10)		0.10					0.083	44.0
VP2-2016-R 10.6 +/-20% 0.76 1.26 0.090 33.7 2.11 0.083 44.0 VPP2-0116-R 1.6 +/-20% 0.99 0.95 0.159 48.3 3.94 0.165 44.0 VP2-0116-R 5.7 +/-20% 1.41 1.26 0.090 33.7 3.94 0.083 44.0 VP1-0083-R 8.3 +/-20% 1.39 0.95 0.159 48.3 5.47 0.065 44.0 VP2-0083-R 4.1 +/-20% 1.95 1.26 0.090 33.7 7.01 0.165 44.0 VP2-0066-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VP3-0780-R°** 132 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VP3-0780-R°** 132 +/-30% 0.10 1.47 0.061 27.7 0.24 0.058 43.4 VP3-0780-R°** 1.2 +/-20% 0.59 1.47 0.061 27.7 0.24 <	VPH2-0216-R								
VPH2-0116-R 11.6 +/-20% 1.41 1.26 0.090 33.7 3.94 0.083 44.0 VPP2-018-R 8.3 +/-20% 1.39 0.95 0.159 48.3 5.47 0.165 44.0 VPP2-0083-R 8.3 +/-20% 1.95 1.96 1.95 1.26 0.090 33.7 5.47 0.083 44.0 VPP2-0083-R 1.1 +/-20% 1.95 1.26 0.090 33.7 5.47 0.083 44.0 VPP2-0066-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VPP2-0066-R 3.2 +/-20% 2.50 1.26 0.090 33.7 7.01 0.083 44.0 VPP3-0086-R 3.2 +/-20% 0.07 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VPH3-0138-R 1.2 +/-20% 0.01 1.47 0.061 2.77 0.24 0.058 43.4 VPH3-0138-R 11.2 +/-20% 0.59 1.47 0.061 2.77 1.36 0.058 43.4 VPH3-0084-R 11.2 +/-20% 0.67 0.97 0.14 39.8 1.36 0.125 43.4 VPR3-0084-R 18.8 +/-20% 0.97 1.47 0.061 2.77 2.23 0.058 43.4 VPR3-0084-R 18.9 +/-20% 0.97 1.47 0.061 2.77 2.23 0.058 43.4 VPR3-0085-R 9.3 +/-20% 1.02 0.97 0.14 39.8 0.223 0.125 43.4 VPR3-0085-R 9.3 +/-20% 0.97 0.14 39.8 0.23 0.125 43.4 VPR3-0084-R 0.8 +/-20% 0.97 0.14 39.8 0.23 0.125 43.4 VPR3-0085-R 9.3 +/-20% 0.97 0.14 39.8 0.058 43.4 VPR3-0085-R 9.3 +/-20% 0.97 0.14 39.8 0.058 43.4 VPR3-0085-R 9.3 +/-20% 0.97 0.14 39.8 0.058 43.4 VPR3-0085-R 1.5 +/-20% 0.97 0.14 39.8 0.058 3.38 0.058 43.4 VPR3-0085-R 1.5 +/-20% 0.97 0.14 39.8 0.058 3.8 0.058 3.8 0.058 3.8 0.058 3.8 0.058 3.8 0.058 3.9 0	VP2-0216-R	10.6 +/-20%	0.76	1.26	0.090	33.7	2.11	0.083	44.0
VP2-0116-R 5.7 +/-20% 1.41 1.26 0.090 33.7 3.94 0.083 44.0 VP2-0083-R 8.3 +/-20% 1.39 0.95 0.159 48.3 5.47 0.165 44.0 VP2-0068-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VP2-0068-R 3.2 +/-20% 1.74 0.95 0.159 48.3 7.01 0.165 44.0 VP2-0068-R 3.2 +/-20% 2.50 1.26 0.090 33.7 7.01 0.083 44.0 VP3-0780-R*** 132 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VP3-0780-R*** 3.2 +/-20% 0.50 0.11 0.97 0.14 39.8 0.24 0.125 43.4 VP3-0738-R 13.2 +/-20% 0.59 1.47 0.061 27.7 1.36 0.058 43.4 VP3-004-R 14.2 +/-20% 0.67 0.97 0.14 39.8 2.2	VPH2-0116-R								
VPH2-0083-R	VP2-0116-R								
VP2-0083-R 4.1 +/-20% 1.95 1.26 0.090 33.7 5.47 0.083 44.0 VP2-0066-R 6.6 +/-20% 1.74 0.95 0.159 48.3 7.01 0.063 44.0 VP2-0066-R 3.2 +/-20% 2.50 1.26 0.090 33.7 7.01 0.083 44.0 VP3-0780-R**** 132 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VP3-0780-R**** 63.2 +/-30% 0.10 1.47 0.061 27.7 0.24 0.058 43.4 VP3-07138-R 23.3 +/-20% 0.41 0.97 0.14 39.8 1.36 0.125 43.4 VP3-084-R 14.2 +/-20% 0.59 1.47 0.061 27.7 1.36 0.058 43.4 VP3-0084-R 14.2 +/-20% 0.67 0.97 0.14 39.8 2.23 0.125 43.4 VP3-0084-R 14.2 +/-20% 0.97 1.47 0.061 27.7 2.23 <	VPH2-0083-R	8.3 +/-20%	1.39	0.95	0.159	48.3	5.47	0.165	44.0
VPH2-0066-R 3.2 +/-20% 2.50 1.26 0.090 33.7 7.01 0.165 44.0 VP2-0066-R 3.2 +/-20% 2.50 1.26 0.090 33.7 7.01 0.083 44.0 VP3-0780-R*** 132 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VP3-0780-R** 192 +/-20% 0.010 1.47 0.061 27.7 0.24 0.058 43.4 VP3-0780-R** 193.8 23.3 +/-20% 0.41 0.97 0.14 39.8 1.36 0.125 43.4 VP3-0138-R 11.2 +/-20% 0.59 1.47 0.061 27.7 1.36 0.058 43.4 VP3-0084-R 14.2 +/-20% 0.67 0.97 0.14 39.8 2.23 0.125 43.4 VP3-0084-R 14.2 +/-20% 0.67 0.97 0.14 39.8 2.23 0.125 43.4 VP3-0084-R 14.2 +/-20% 0.97 1.47 0.061 27.7 2.23 0.058 43.4 VP3-0055-R 9.3 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-0055-R 4.5 +/-20% 1.02 0.97 0.14 39.8 3.38 0.058 43.4 VP3-0055-R 4.5 +/-20% 1.19 0.97 0.14 39.8 3.38 0.058 43.4 VP3-0047-R 3.8 +/-20% 1.19 0.97 0.14 39.8 3.8 0.058 43.4 VP3-0047-R 3.8 +/-20% 1.19 0.97 0.14 39.8 3.8 0.058 43.4 VP4-0065-R 4.5 +/-20% 1.19 0.97 0.14 39.8 3.8 0.058 43.4 VP4-0860-R** 159.65 +/-30% 0.11 1.41 0.0828 64.6 0.57 0.156 39.4 VP4-0404-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 0.57 0.156 39.4 VP4-0140-R 23.7 +/-20% 0.95 1.70 0.057 44.7 0.57 0.075 39.4 VP4-0140-R 23.7 +/-20% 1.51 1.70 0.057 44.7 0.561 3.94 VP4-0160-R 11.3 +/-20% 0.95 1.70 0.057 44.7 0.57 0.075 39.4 VP4-0060-R 11.1 +/-20% 1.52 1.41 0.0828 64.6 6.55 0.156 39.4 VP4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 6.55 0.156 39.4 VP4-0060-R 10.1 +/-20% 1.51 1.70 0.057 44.7 0.557 0.075 39.4 VPH4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 6.55 0.156 39.4 VP4-0060-R 10.1 +/-20% 1.51 1.70 0.057 44.7 0.557 0.075 39.4 VPH4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VPH4-0060-R 10.1 +/-20% 1.94 1.11 0.0828 64.6 8.16 0.156 39.4 VPH4-0060-R 10.1 +/-20% 1.94 1.11 0.0828 64.6 8.16 0.156 39.4 VPH4-0060-R 10.1 +/-20% 1.94 1.94 1.94 1.94 1.94 1.94 1.94 1.94							5.47		
VP2-0066-R 3.2 +/-20% 2.50 1.26 0.090 33.7 7.01 0.083 44.0 VPH3-0780-R ⁺⁽ⁿ⁾ 63.2 +/-30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VP3-0780-R ⁺⁽ⁿ⁾ 63.2 +/-30% 0.10 1.47 0.061 27.7 0.24 0.058 43.4 VP3-0138-R 23.3 +/-20% 0.41 0.97 0.14 39.8 1.36 0.125 43.4 VP3-0138-R 11.2 +/-20% 0.59 1.47 0.061 27.7 1.36 0.058 43.4 VP3-0084-R 14.2 +/-20% 0.67 0.97 0.14 39.8 2.23 0.125 43.4 VP3-0084-R 1.8 +/-20% 0.97 1.47 0.061 27.7 2.23 0.058 43.4 VP3-0055-R 9.3 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-0047-R 3.8 +/-20% 1.19 0.97 0.14 39.8 4.00	VPH2-0066-R								
VPH3-0780-R ¹⁰⁰ 132 +/30% 0.07 0.97 0.14 39.8 0.24 0.125 43.4 VPB-30780-R ¹⁰⁰ 63.2 +/-30% 0.10 1.47 0.061 27.7 0.24 0.058 43.4 VPH3-0138-R 23.3 +/-20% 0.41 0.97 0.14 39.8 1.36 0.125 43.4 VP3-0138-R 11.2 +/-20% 0.59 1.47 0.061 27.7 1.36 0.058 43.4 VP3-0084-R 6.8 +/-20% 0.67 0.97 0.14 39.8 2.23 0.125 43.4 VP3-0084-R 6.8 +/-20% 0.97 1.47 0.061 27.7 2.23 0.058 43.4 VP3-0055-R 9.3 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-0055-R 4.5 +/-20% 1.46 1.47 0.061 27.7 2.38 0.058 43.4 VP3-0055-R 3.8 +/-20% 1.13 1.47 0.061 27.7 3.38	VP2-0066-R	3.2 +/-20%	2.50						
VP3-0780-R [™] 63.2 +/-30% 0.10 1.47 0.061 27.7 0.24 0.058 43.4 VPH3-0138-R 23.3 +/-20% 0.41 0.97 0.14 39.8 1.36 0.125 43.4 VPP3-0138-R 11.2 +/-20% 0.59 1.47 0.061 27.7 1.36 0.058 43.4 VPP3-0084-R 14.2 +/-20% 0.67 0.97 0.14 39.8 2.23 0.125 43.4 VPH3-0084-R 6.8 +/-20% 0.97 1.47 0.061 27.7 2.23 0.058 43.4 VPH3-0055-R 9.3 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VPH3-0055-R 4.5 +/-20% 1.46 1.47 0.061 27.7 3.38 0.058 43.4 VPH3-0047-R 7.94 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 43.4 VPH3-0047-R 3.8 +/-20% 1.51 1.70 0.061 27.7 4.00			0.07						43.4
VPH3-0138-R 23.3 +/-20% 0.41 0.97 0.14 39.8 1.36 0.125 43.4 VP3-0138-R 11.2 +/-20% 0.59 1.47 0.061 27.7 1.36 0.058 43.4 VP3-0984-R 14.2 +/-20% 0.67 0.97 0.14 39.8 2.23 0.125 43.4 VP3-0984-R 6.8 +/-20% 0.97 1.47 0.061 27.7 2.23 0.058 43.4 VP3-095-R 9.3 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-095-R 4.5 +/-20% 1.46 1.47 0.061 27.7 3.38 0.058 43.4 VP3-095-R 4.5 +/-20% 1.19 0.97 0.14 39.8 3.38 0.125 43.4 VP3-095-R 4.5 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 43.4 VP3-094-R 7.94 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 43.4 VP3-094-R 3.8 +/-20% 1.73 1.47 0.061 27.7 4.00 0.058 43.4 VP4-0860-R ⁽¹⁰⁾ 159.65 +/-30% 0.11 1.41 0.0828 64.6 0.57 0.156 39.4 VP4-0860-R ⁽¹⁰⁾ 159.65 +/-30% 0.15 1.70 0.057 44.7 0.57 0.075 39.4 VP4-0140-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 3.54 0.156 39.4 VP4-0140-R 11.3 +/-20% 0.95 1.70 0.057 44.7 3.54 0.075 39.4 VP4-0140-R 11.3 +/-20% 1.21 1.41 0.0828 64.6 6.55 0.156 39.4 VP4-0075-R 6.1 +/-20% 1.52 1.41 0.0828 64.6 6.55 0.075 39.4 VP4-0060-R 1.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-0060-R 1.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-0060-R 1.1 +/-20% 1.94 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-0060-R 3.8 +/-20% 2.81 1.70 0.057 44.7 8.16 0.075 39.4 VP4-0075-R 2.3 +/-20% 1.94 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-0060-R 1.94 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-0060-R 1.94 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-0060-R 1.94 1.41 0.0828 64.6 8.16 0.075 39.4 VP4-0060-R 1.94 1.41 0.0828 64.6 8.16 0.055 30.3 VP5-0155-R 2.3 +/-20% 1.96 1.70 0.0711 98.4 8.83 0.235 30.3 VP5-0155-R 9.	VP3-0780-R(10)		0.10		0.061		0.24		43.4
VPH3-0084-R 14.2 +/-20% 0.67 0.97 0.14 39.8 2.23 0.125 43.4 VP3-0084-R 6.8 +/-20% 0.97 1.47 0.061 27.7 2.23 0.058 43.4 VPH3-0055-R 9.3 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-0055-R 4.5 +/-20% 1.46 1.47 0.061 27.7 3.38 0.058 43.4 VPH3-0047-R 7.94 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 43.4 VP3-0047-R 3.8 +/-20% 1.73 1.47 0.061 27.7 4.00 0.058 43.4 VPH4-0860-R ¹⁰⁰ 159.65 +/-30% 0.11 1.41 0.0828 64.6 0.57 0.156 39.4 VP4-0860-R ¹⁰⁰ 87.0 +/-30% 0.15 1.70 0.057 44.7 0.57 0.075 39.4 VP4-0140-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 0.55	VPH3-0138-R	23.3 +/-20%	0.41	0.97	0.14	39.8	1.36	0.125	43.4
VP3-0084-R 6.8 +/-20% 0.97 1.47 0.061 27.7 2.23 0.058 43.4 VPH3-0055-R 9.3 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VPB-0055-R 4.5 +/-20% 1.46 1.47 0.061 27.7 3.38 0.058 43.4 VPH3-0047-R 7.94 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 43.4 VP3-0047-R 3.8 +/-20% 1.73 1.47 0.061 27.7 4.00 0.058 43.4 VP4-0860-R ⁽¹⁰⁾ 159.65 +/-30% 0.11 1.41 0.0828 64.6 0.57 0.156 39.4 VP4-0860-R ⁽¹⁰⁾ 87.0 +/-30% 0.15 1.70 0.057 44.7 0.57 0.075 39.4 VP4-0404-R 13.3 +/-20% 0.65 1.41 0.0828 64.6 3.54 0.156 39.4 VPH-0075-R 12.7 +/-20% 1.52 1.70 0.057 44.7 6.55 <th>VP3-0138-R</th> <th>11.2 +/-20%</th> <th>0.59</th> <th>1.47</th> <th>0.061</th> <th>27.7</th> <th>1.36</th> <th>0.058</th> <th>43.4</th>	VP3-0138-R	11.2 +/-20%	0.59	1.47	0.061	27.7	1.36	0.058	43.4
VPH3-0055-R 9.3 +/-20% 1.02 0.97 0.14 39.8 3.38 0.125 43.4 VP3-0055-R 4.5 +/-20% 1.46 1.47 0.061 27.7 3.38 0.058 43.4 VPH3-0047-R 7.94 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 43.4 VP3-0047-R 7.94 +/-20% 1.73 1.47 0.061 27.7 4.00 0.125 43.4 VPH4-0860-R ⁽¹⁰⁾ 159.65 +/-30% 0.11 1.41 0.0828 64.6 0.57 0.156 39.4 VPH4-0860-R ⁽¹⁰⁾ 87.0 +/-30% 0.15 1.70 0.057 44.7 0.57 0.075 39.4 VPH4-0140-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 3.54 0.156 39.4 VPH4-0140-R 11.3 +/-20% 0.95 1.70 0.057 44.7 3.54 0.075 39.4 VPH4-0075-R 61.7 +/-20% 1.21 1.41 0.0828 64.6	VPH3-0084-R	14.2 +/-20%	0.67	0.97	0.14	39.8	2.23	0.125	43.4
VP3-0055-R 4.5 +/-20% 1.46 1.47 0.061 27.7 3.38 0.058 43.4 VPH3-0047-R 7.94 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 43.4 VP3-0047-R 3.8 +/-20% 1.73 1.47 0.061 27.7 4.00 0.058 43.4 VPH4-0860-R ⁽¹⁰⁾ 159.65 +/-30% 0.11 1.41 0.0828 64.6 0.57 0.156 39.4 VP4-0860-R ⁽¹⁰⁾ 87.0 +/-30% 0.15 1.70 0.057 44.7 0.57 0.075 39.4 VP4-0140-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 3.54 0.156 39.4 VP4-0140-R 11.3 +/-20% 0.95 1.70 0.057 44.7 3.54 0.075 39.4 VP4-0075-R 12.7 +/-20% 1.21 1.41 0.0828 64.6 6.55 0.156 39.4 VP4-0075-R 6.1 +/-20% 1.52 1.41 0.0828 64.6 8.16	VP3-0084-R	6.8 +/-20%	0.97	1.47	0.061	27.7	2.23	0.058	43.4
VPH3-0047-R 7.94 +/-20% 1.19 0.97 0.14 39.8 4.00 0.125 43.4 VP3-0047-R 3.8 +/-20% 1.73 1.47 0.061 27.7 4.00 0.058 43.4 VPH-0860-R ^(*0) 159.65 +/-30% 0.11 1.41 0.0828 64.6 0.57 0.156 39.4 VP4-0860-R ^(*0) 87.0 +/-30% 0.15 1.70 0.057 44.7 0.57 0.075 39.4 VPH4-0140-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 3.54 0.156 39.4 VP4-0140-R 11.3 +/-20% 0.95 1.70 0.057 44.7 3.54 0.075 39.4 VP4-0140-R 11.3 +/-20% 0.95 1.70 0.057 44.7 3.54 0.075 39.4 VP4-0075-R 12.7 +/-20% 1.21 1.41 0.0828 64.6 6.55 0.156 39.4 VPH4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 8.	VPH3-0055-R	9.3 +/-20%	1.02	0.97	0.14	39.8	3.38	0.125	43.4
VP3-0047-R 3.8 +/-20% 1.73 1.47 0.061 27.7 4.00 0.058 43.4 VPH4-0860-R ⁽¹⁰⁾ 159.65 +/-30% 0.11 1.41 0.0828 64.6 0.57 0.156 39.4 VP4-0860-R ⁽¹⁰⁾ 87.0 +/-30% 0.15 1.70 0.057 44.7 0.57 0.075 39.4 VPH-0140-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 3.54 0.156 39.4 VP4-0140-R 11.3 +/-20% 0.95 1.70 0.057 44.7 3.54 0.075 39.4 VPH-40075-R 12.7 +/-20% 1.21 1.41 0.0828 64.6 6.55 0.156 39.4 VPH-40075-R 1.7-20% 1.52 1.70 0.057 44.7 6.55 0.075 39.4 VPH-4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VPH-4-0060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.	VP3-0055-R								
VPH4-0860-R ^(*0) 159.65 +/-30% 0.11 1.41 0.0828 64.6 0.57 0.156 39.4 VP4-0860-R ^(*0) 87.0 +/-30% 0.15 1.70 0.057 44.7 0.57 0.075 39.4 VPH4-0140-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 3.54 0.156 39.4 VPH-0140-R 11.3 +/-20% 0.95 1.70 0.057 44.7 3.54 0.075 39.4 VPH-40075-R 12.7 +/-20% 1.21 1.41 0.0828 64.6 6.55 0.156 39.4 VPH-0060-R 10.1 +/-20% 1.75 1.70 0.057 44.7 6.55 0.075 39.4 VPH-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VPH-0060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.16 0.075 39.4 VPH-0060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.							4.00		
VP4-0860-R ⁽¹⁰⁾ 87.0 +/-30% 0.15 1.70 0.057 44.7 0.57 0.075 39.4 VPH4-0140-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 3.54 0.156 39.4 VP4-0140-R 11.3 +/-20% 0.95 1.70 0.057 44.7 3.54 0.075 39.4 VP4-0075-R 12.7 +/-20% 1.21 1.41 0.0828 64.6 6.55 0.156 39.4 VP4-0075-R 6.1 +/-20% 1.75 1.70 0.057 44.7 6.55 0.075 39.4 VP4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.16 0.075 39.4 VP4-060-R 4.9 +/-20% 1.94 1.41 0.0828 64.6 10.52 0.156 39.4 VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52	VP3-0047-R	3.8 +/-20%	1.73	1.47	0.061	27.7	4.00	0.058	43.4
VP4-0860-R ⁽¹⁰⁾ 87.0 +/-30% 0.15 1.70 0.057 44.7 0.57 0.075 39.4 VPH4-0140-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 3.54 0.156 39.4 VP4-0140-R 11.3 +/-20% 0.95 1.70 0.057 44.7 3.54 0.075 39.4 VP4-0075-R 12.7 +/-20% 1.21 1.41 0.0828 64.6 6.55 0.156 39.4 VP4-0075-R 6.1 +/-20% 1.75 1.70 0.057 44.7 6.55 0.075 39.4 VP4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.16 0.075 39.4 VP4-060-R 4.9 +/-20% 1.94 1.41 0.0828 64.6 10.52 0.156 39.4 VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52	VPH4-0860-R(10)	159.65 +/-30%	0.11	1.41	0.0828	64.6	0.57	0.156	39.4
VPH4-0140-R 23.7 +/-20% 0.65 1.41 0.0828 64.6 3.54 0.156 39.4 VP4-0140-R 11.3 +/-20% 0.95 1.70 0.057 44.7 3.54 0.075 39.4 VPH4-0075-R 12.7 +/-20% 1.21 1.41 0.0828 64.6 6.55 0.156 39.4 VP4-0075-R 6.1 +/-20% 1.75 1.70 0.057 44.7 6.55 0.075 39.4 VPH4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-0060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.16 0.075 39.4 VP4-0060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.16 0.075 39.4 VP4-0047-R 7.94 +/-20% 1.94 1.41 0.0828 64.6 10.52 0.156 39.4 VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52	VP4-0860-R(10)	87.0 +/-30%	0.15	1.70	0.057		0.57		39.4
VPH4-0075-R 12.7 +/-20% 1.21 1.41 0.0828 64.6 6.55 0.156 39.4 VP4-0075-R 6.1 +/-20% 1.75 1.70 0.057 44.7 6.55 0.075 39.4 VPH4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-0060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.16 0.075 39.4 VPH4-0047-R 7.94 +/-20% 1.94 1.41 0.0828 64.6 10.52 0.156 39.4 VP4-0047-R 7.94 +/-20% 1.94 1.41 0.0828 64.6 10.52 0.156 39.4 VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52 0.075 39.4 VPH5-1200-R ^(**) 173 +/-30% 0.14 1.70 0.0711 98.4 1.11 0.235 30.3 VP5-1200-R ^(**) 76.8 +/-30% 0.20 2.08 0.047 65.6 1	VPH4-0140-R					64.6			39.4
VP4-0075-R 6.1 +/-20% 1.75 1.70 0.057 44.7 6.55 0.075 39.4 VPH4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-0060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.16 0.075 39.4 VPH4-0047-R 7.94 +/-20% 1.94 1.41 0.0828 64.6 10.52 0.156 39.4 VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52 0.075 39.4 VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52 0.075 39.4 VP4-0047-R 3.8 +/-20% 0.14 1.70 0.0711 98.4 1.11 0.235 30.3 VP5-1200-R ⁽¹⁰⁾ 173 +/-30% 0.20 2.08 0.047 65.6 1.11 0.105 30.3 VP5-0155-R 22.3 +/-20% 1.60 2.08 0.047 65.6 8.83	VP4-0140-R	11.3 +/-20%	0.95	1.70	0.057	44.7	3.54	0.075	39.4
VP4-0075-R 6.1 +/-20% 1.75 1.70 0.057 44.7 6.55 0.075 39.4 VPH4-0060-R 10.1 +/-20% 1.52 1.41 0.0828 64.6 8.16 0.156 39.4 VP4-0060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.16 0.075 39.4 VPH4-0047-R 7.94 +/-20% 1.94 1.41 0.0828 64.6 10.52 0.156 39.4 VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52 0.075 39.4 VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52 0.075 39.4 VP4-0047-R 3.8 +/-20% 0.14 1.70 0.057 44.7 10.52 0.075 39.4 VP4-0047-R 3.8 +/-20% 0.14 1.70 0.0711 98.4 1.11 0.235 30.3 VP5-1200-R ⁽¹⁰⁾ 76.8 +/-30% 0.20 2.08 0.047 65.6 1.11	VPH4-0075-R		1.21	1.41	0.0828	64.6	6.55	0.156	
VP4-0060-R 4.9 +/-20% 2.18 1.70 0.057 44.7 8.16 0.075 39.4 VPH4-0047-R 7.94 +/-20% 1.94 1.41 0.0828 64.6 10.52 0.156 39.4 VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52 0.075 39.4 VPH5-1200-R ⁽¹⁰⁾ 173 +/-30% 0.14 1.70 0.0711 98.4 1.11 0.235 30.3 VP5-1200-R ⁽¹⁰⁾ 76.8 +/-30% 0.20 2.08 0.047 65.6 1.11 0.105 30.3 VP5-0155-R 22.3 +/-20% 1.05 1.70 0.0711 98.4 8.83 0.235 30.3 VP5-0155-R 9.9 +/-20% 1.60 2.08 0.047 65.6 8.83 0.105 30.3 VP5-0083-R 12 +/-20% 1.96 1.70 0.0711 98.4 16.07 0.235 30.3 VP5-0087-R 9.65 +/-20% 2.43 1.70 0.0711 98.4 19.83	VP4-0075-R			1.70				0.075	
VPH4-0047-R 7.94 +/-20% 1.94 1.41 0.0828 64.6 10.52 0.156 39.4 VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52 0.075 39.4 VPH5-1200-R ⁽¹⁰⁾ 173 +/-30% 0.14 1.70 0.0711 98.4 1.11 0.235 30.3 VP5-1200-R ⁽¹⁰⁾ 76.8 +/-30% 0.20 2.08 0.047 65.6 1.11 0.105 30.3 VP5-0155-R 22.3 +/-20% 1.05 1.70 0.0711 98.4 8.83 0.235 30.3 VP5-0155-R 9.9 +/-20% 1.60 2.08 0.047 65.6 8.83 0.105 30.3 VP5-0083-R 12 +/-20% 1.96 1.70 0.0711 98.4 16.07 0.235 30.3 VP5-0083-R 5.3 +/-20% 2.95 2.08 0.047 65.6 16.07 0.105 30.3 VP5-0067-R 9.65 +/-20% 2.43 1.70 0.0711 98.4 19.8	VPH4-0060-R								
VP4-0047-R 3.8 +/-20% 2.81 1.70 0.057 44.7 10.52 0.075 39.4 VPH5-1200-R ⁽¹⁰⁾ 173 +/-30% 0.14 1.70 0.0711 98.4 1.11 0.235 30.3 VP5-1200-R ⁽¹⁰⁾ 76.8 +/-30% 0.20 2.08 0.047 65.6 1.11 0.105 30.3 VPH5-0155-R 22.3 +/-20% 1.05 1.70 0.0711 98.4 8.83 0.235 30.3 VP5-0155-R 9.9 +/-20% 1.60 2.08 0.047 65.6 8.83 0.105 30.3 VP5-0083-R 12 +/-20% 1.96 1.70 0.0711 98.4 16.07 0.235 30.3 VP5-0083-R 5.3 +/-20% 2.95 2.08 0.047 65.6 16.07 0.105 30.3 VP5-0067-R 9.65 +/-20% 2.43 1.70 0.0711 98.4 19.83 0.235 30.3 VP5-0067-R 4.3 +/-20% 3.63 2.08 0.047 65.6 19.83<	VP4-0060-R								
VPH5-1200-R ⁽¹⁰⁾ 173 +/-30% 0.14 1.70 0.0711 98.4 1.11 0.235 30.3 VP5-1200-R ⁽¹⁰⁾ 76.8 +/-30% 0.20 2.08 0.047 65.6 1.11 0.105 30.3 VPH5-0155-R 22.3 +/-20% 1.05 1.70 0.0711 98.4 8.83 0.235 30.3 VP5-0155-R 9.9 +/-20% 1.60 2.08 0.047 65.6 8.83 0.105 30.3 VPH5-0083-R 12 +/-20% 1.96 1.70 0.0711 98.4 16.07 0.235 30.3 VP5-0083-R 5.3 +/-20% 2.95 2.08 0.047 65.6 16.07 0.105 30.3 VPH5-0067-R 9.65 +/-20% 2.43 1.70 0.0711 98.4 19.83 0.235 30.3 VP5-0067-R 4.3 +/-20% 3.63 2.08 0.047 65.6 19.83 0.105 30.3 VPH5-0053-R 7.63 +/-20% 3.07 1.70 0.0711 98.4 2									
VP5-1200-R ⁽¹⁰⁾ 76.8 +/-30% 0.20 2.08 0.047 65.6 1.11 0.105 30.3 VPH5-0155-R 22.3 +/-20% 1.05 1.70 0.0711 98.4 8.83 0.235 30.3 VP5-0155-R 9.9 +/-20% 1.60 2.08 0.047 65.6 8.83 0.105 30.3 VPH5-0083-R 12 +/-20% 1.96 1.70 0.0711 98.4 16.07 0.235 30.3 VP5-0083-R 5.3 +/-20% 2.95 2.08 0.047 65.6 16.07 0.105 30.3 VPH5-0067-R 9.65 +/-20% 2.43 1.70 0.0711 98.4 19.83 0.235 30.3 VP5-0067-R 4.3 +/-20% 3.63 2.08 0.047 65.6 19.83 0.105 30.3 VPH5-0053-R 7.63 +/-20% 3.07 1.70 0.0711 98.4 25.10 0.235 30.3	VP4-0047-R		2.81	1.70	0.057	44.7	10.52	0.075	39.4
VPH5-0155-R 22.3 +/-20% 1.05 1.70 0.0711 98.4 8.83 0.235 30.3 VP5-0155-R 9.9 +/-20% 1.60 2.08 0.047 65.6 8.83 0.105 30.3 VPH5-0083-R 12 +/-20% 1.96 1.70 0.0711 98.4 16.07 0.235 30.3 VP5-0083-R 5.3 +/-20% 2.95 2.08 0.047 65.6 16.07 0.105 30.3 VPH5-0067-R 9.65 +/-20% 2.43 1.70 0.0711 98.4 19.83 0.235 30.3 VP5-0067-R 4.3 +/-20% 3.63 2.08 0.047 65.6 19.83 0.105 30.3 VPH5-0053-R 7.63 +/-20% 3.07 1.70 0.0711 98.4 25.10 0.235 30.3	VPH5-1200-R(10)								
VP5-0155-R 9.9 +/-20% 1.60 2.08 0.047 65.6 8.83 0.105 30.3 VPH5-0083-R 12 +/-20% 1.96 1.70 0.0711 98.4 16.07 0.235 30.3 VP5-0083-R 5.3 +/-20% 2.95 2.08 0.047 65.6 16.07 0.105 30.3 VPH5-0067-R 9.65 +/-20% 2.43 1.70 0.0711 98.4 19.83 0.235 30.3 VP5-0067-R 4.3 +/-20% 3.63 2.08 0.047 65.6 19.83 0.105 30.3 VPH5-0053-R 7.63 +/-20% 3.07 1.70 0.0711 98.4 25.10 0.235 30.3	VP5-1200-R ⁽¹⁰⁾								
VPH5-0083-R 12 +/-20% 1.96 1.70 0.0711 98.4 16.07 0.235 30.3 VP5-0083-R 5.3 +/-20% 2.95 2.08 0.047 65.6 16.07 0.105 30.3 VPH5-0067-R 9.65 +/-20% 2.43 1.70 0.0711 98.4 19.83 0.235 30.3 VP5-0067-R 4.3 +/-20% 3.63 2.08 0.047 65.6 19.83 0.105 30.3 VPH5-0053-R 7.63 +/-20% 3.07 1.70 0.0711 98.4 25.10 0.235 30.3	VPH5-0155-R		1.05	1.70	0.0711	98.4		0.235	
VP5-0083-R 5.3 +/-20% 2.95 2.08 0.047 65.6 16.07 0.105 30.3 VPH5-0067-R 9.65 +/-20% 2.43 1.70 0.0711 98.4 19.83 0.235 30.3 VP5-0067-R 4.3 +/-20% 3.63 2.08 0.047 65.6 19.83 0.105 30.3 VPH5-0053-R 7.63 +/-20% 3.07 1.70 0.0711 98.4 25.10 0.235 30.3									
VPH5-0067-R 9.65 +/-20% 2.43 1.70 0.0711 98.4 19.83 0.235 30.3 VP5-0067-R 4.3 +/-20% 3.63 2.08 0.047 65.6 19.83 0.105 30.3 VPH5-0053-R 7.63 +/-20% 3.07 1.70 0.0711 98.4 25.10 0.235 30.3	VPH5-0083-R								
VP5-0067-R 4.3 +/-20% 3.63 2.08 0.047 65.6 19.83 0.105 30.3 VPH5-0053-R 7.63 +/-20% 3.07 1.70 0.0711 98.4 25.10 0.235 30.3	VP5-0083-R		2.95	2.08		65.6			
VPH5-0053-R 7.63 +/-20% 3.07 1.70 0.0711 98.4 25.10 0.235 30.3									
	VP5-0067-R								
VP5-0053-R 3.4 +/-20% 4.59 2.08 0.047 65.6 25.10 0.105 30.3	VPH5-0053-R								
	VP5-0053-R	3.4 +/-20%	4.59	2.08	0.047	65.6	25.10	0.105	30.3

Product specifications- notes

- (1) The first three or four digits in the part number signify the size of the package. The next four digits specify the A_L, or nanoHenries per turn squared. -R indicates RoHS compliant.
- (2) LBASE = Nominal Inductance of a single winding.
- (3) I_{BASE} is the lessor of $I_{\text{SAT}(\text{BASE})}$ and $I_{\text{RMS}(\text{BASE})}$.
- (4) Peak current that will result in 30% saturation of the core. This current value assumes that equal current flows in all six windings. For applications in which all windings are not simultaneously driven (i.e. flyback, SEPIC, Cuk, etc.), the saturation current per winding may be calculated as follows:

$$I_{SAT} = \frac{6 \times I_{SAT(BASE)}}{Number of Windings Driven}$$

- (5) RMS Current that results in a surface temperature of approximately 40 °C above ambient. The 40 °C rise occurs when the specified current flows through each of the six windings.
- (6) Maximum DC Resistance of each winding.
- (7) For multiple windings in series, the volt-µsecond_{rorat} (µVs) capability varies as the number of windings in series (S):

Volt-
$$\mu$$
sec_{total} = S x Volt- μ sec_(BASE)

For multiple windings in parallel, the volt- $\mu second_{\mbox{\tiny TOTAL}}$ (μVs) capability is as shown in the table above.

LOGO (OPTIONAL)

(8) Maximum Energy capability of each winding. This is based on 30% saturation of the core:

Energy_{SERIES} =
$$S^2 \times \frac{1}{2} \times 0.7 L_{BASE} \times I_{SAT(BASE)}^2$$

Energy_{PARALLEL} =
$$P^2 \times \frac{1}{2} \times 0.7 L_{BASE} \times I_{SAT(BASE)}^2$$

For multiple windings, the energy capability varies as the square of the number of windings. For example, six windings (either parallel or series) can store 36 times more energy than one winding.

- (9) Thermal Resistance is the approximate surface temperature rise per Watt of heat loss under still-air conditions. Heat loss is a combination of core loss and wire loss. The number assumes the underlying PCB copper area equals 150% of the component area.
- (10) These devices are designed for feed-forward applications, where load current dominates magnitizing current.

VERSA-PAC temperature rise depends on total power losses and size. Any other **PCM** configurations other than those suggested could run hotter than acceptable.

Certain topologies or applications must be analyzed for needed requirements and matched with the best **VERSA-PAC** size and configuration. Proper consideration must be used with all parameters, especially those associated with current rating, energy storage, or maximum volt-seconds.

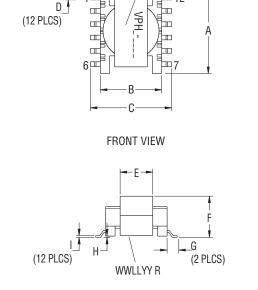
VERSA-PAC should not be used in off-line or safety related applications. The breakdown voltage from one winding to any other winding is 500 VAC maximum.

Dimensions- mm

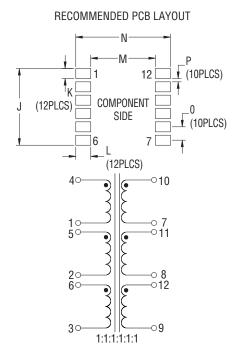
VP1 and VPH1

WHITE DOT -

PIN #1



TOP VIEW





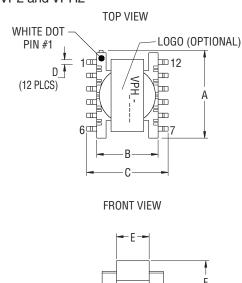
NOTES:

- 1) Tolerances A I are ± 0.25 mm unless specified otherwise.
- 2) Tolerances J P are +/- 0.1 mm unless specified otherwise.
- 3) Marking:
 - a) Dot for pin #1 identification
- b) VP(H)x-xxx (product code, size, 4 digit part number per family table.)
- c) Versa Pac Logo (optional)
- d) wwllyy = (date code) R = (revision level)
- 4) All soldering surfaces must be coplanar within 0.102 mm.
- 5) Packaged in tape and reel 600 parts per reel

	A mm	B mm	mm	mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	L mm	M mm	N mm	O mm	P mm
	max	ref	max	ref	ref	max	ref	ref	ref	ref			ref	max		
VP1 and VPH1	12.9	9.2	13.0	0.7	5.9	6.2	1.5	0.1	0.25	11.5	1.5	2.25	9.7	14.2	2.0	0.5

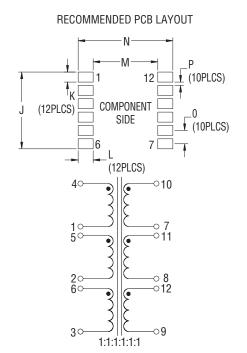
Dimensions- mm

VP2 and VPH2



WWLLYY R

(2 PLCS)





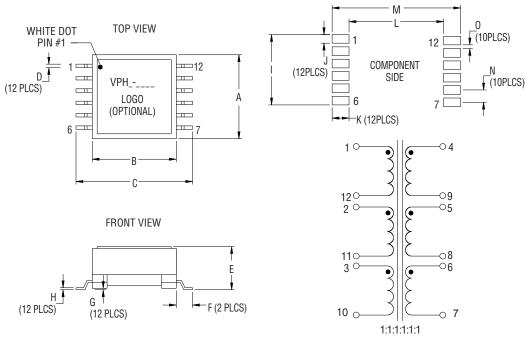
NOTES:

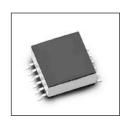
- 1) Tolerances A I are ± 0.25 mm unless specified otherwise.
- 2) Tolerances J P are +/- 0.1 mm unless specified otherwise.
- 3) Marking:
- a) Dot for pin #1 identification
- b) VP(H)x-xxx (product code, size, 4 digit part number per family table.)
- c) Versa Pac Logo (optional)
- d) wwllyy = (date code) R = (revision level)
- 4) All soldering surfaces must be coplanar within 0.102 mm.
- 5) Packaged in tape and reel 300 parts per reel

	I	A mm max	B mm ref	C mm max	D mm ref	E mm ref	F mm max	G mm ref	H mm ref	I mm ref	J mm ref	K mm	L mm	M mm ref	N mm max	O mm	P mm
VP2 and \	/PH2 1	16.3	12.0	16.8	0.7	6.7	7.8	2.0	0.1	0.30	14.25	1.75	2.5	13.0	18.0	2.5	0.75

VP3 and VPH3

(12 PLCS)





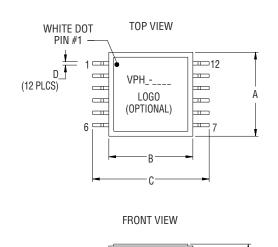
NOTES:

- 1) Tolerances A I are \pm 0.25 mm unless specified otherwise.
- 2) Tolerances J P are +/- 0.1 mm unless specified otherwise.
- 3) Marking:
- a) Dot for pin #1 identification
- b) VP(H)x-xxx (product code, size, 4 digit part number per family table.)
- c) Versa Pac Logo (optional)
- d) wwllyy = (date code) R = (revision level)
- 4) All soldering surfaces must be coplanar within 0.102 mm.
- 5) Packaged in tape and reel 200 parts per reel

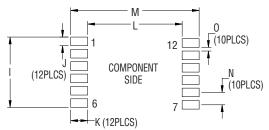
	A mm max	B mm ref	C mm max	D mm ref	E mm max	F mm ref	G mm ref	H mm ref	I mm ref	J mm	K mm	L mm ref	M mm max	N mm	O mm
VP3 and VPH3	17.1	16.0	22.3	0.7	8.4	3.0	0.1	0.4	14.49	1.79	3.43	16.88	23.74	2.54	0.75

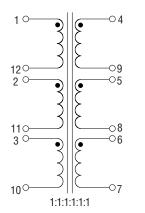
Dimensions- mm

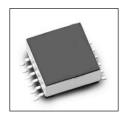
VP4 and VPH4



(12 PLCS)







NOTES:

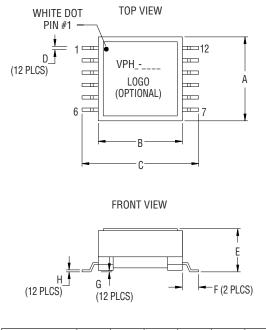
- 1) Tolerances A I are ± 0.25 mm unless specified otherwise.
- Tolerances J P are +/- 0.1 mm unless specified otherwise.
- 3) Marking:
- a) Dot for pin #1 identification
- b) VP(H)x-xxx (product code, size, 4 digit part number per family table.)
- c) Versa Pac Logo (optional)
- d) wwllyy = (date code) R = (revision level)
- 4) All soldering surfaces must be coplanar within 0.102 mm.
- 5) Bulk packaged
- For tape and reel add TR to part number: (i.e. VP4-0140TR-R) 140 parts per reel

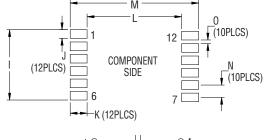
	A mm max	B mm ref	C mm max	D mm ref	E mm max	F mm ref	G mm ref	H mm ref	I mm ref	J mm	K mm	L mm ref	M mm max	N mm	O mm
VP4 and VPH4	18.0	18.0	24.6	0.7	10.0	3.3	0.1	0.4	14.25	1.75	3.43	19.14	26.0	2.5	0.75

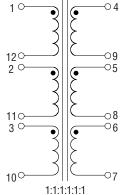
F (2 PLCS)

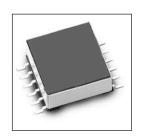
VP5 and VPH5

(12 PLCS)









NOTES:

- 1) Tolerances A I are \pm 0.25 mm unless specified otherwise.
- 2) Tolerances J P are +/- 0.1 mm unless specified otherwise.
- 3) Marking:
- a) Dot for pin #1 identification
- b) VP(H)x-xxx (product code, size, 4 digit part number per family table.)
- c) Versa Pac Logo (optional)
- d) wwllyy = (date code) R = (revision level)
- 4) All soldering surfaces must be coplanar within 0.102 mm.
- 5) Bulk packaged
- For tape and reel add TR to part number: (i.e. VP5-0155TR-R) 115 parts per reel

	Α	В	С	D	E	F	G	Н	I	J	K	L	M	N	0
	mm max	mm ref	mm max	mm ref	mm max	mm ref	mm ref	mm ref	mm ref	mm	mm	mm ref	mm max	mm	mm
VP5 and VPH5	21.0	21.0	28.5	0.7	10.8	2.95	0.1	0.4	17.25	2.25	3.15	22.7	29.0	3.0	0.75

5

How to use multiple windings

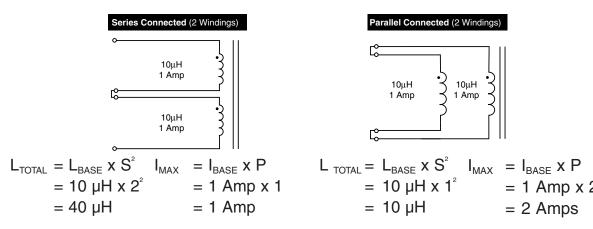
Discrete inductors combine like resistors, when connected in series or parallel. For example, inductors in series add and inductors in parallel reduce in a way similar to Ohm's Law.

$$L_{\text{Series}} = L1 + L2 + L3...Ln$$

$$L_{\text{Parallel}} = 1/[1/L1 + 1/L2 + 1/L3....1/Ln]$$

Windings on the same magnetic core behave differently. Two windings in series result in four times the inductance of a single winding. This is because the inductance varies proportionately to the square of the turns.

Paralleled VERSA-PAC windings result in no change to the net inductance because the total number of turns remains unchanged; only the effective wire size becomes larger. Two parallel windings result in approximately twice the current carrying capability of a single winding. The net inductance of a given PCM configuration is based on the number of windings in series squared multiplied by the inductance of a single winding (Lease). The current rating of a PCM configuration is derived by multiplying the maximum current rating of one winding (IBASE) by the number of windings in parallel. Examples of simple two-winding devices are shown below:



Where:

 L_{BASF} = Inductance of a single winding

P = Number of windings in parallel (use 1 with all windings in series)

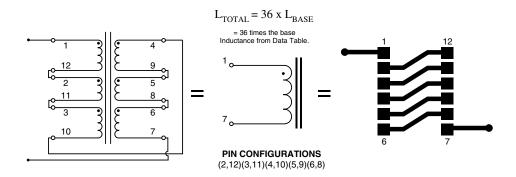
S = Number of windings in series

I_{BASE} = Maximum current rating of one winding

How to pin-configure VERSA-PAC®

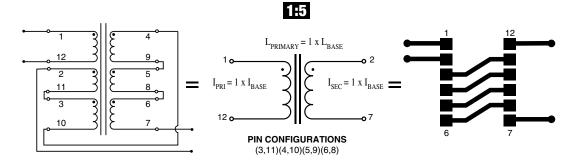
Each **VERSA-PAC** can be configured in a variety of ways by simply connecting pins together on the Printed Circuit Board (PCB). As shown below, the connections on the PCB are equal to the pin configuration statement shown at the bottom of the schematic symbol. Connecting a number of windings in parallel will increase the current carrying capability, while connecting in series will multiply the inductance. Each **VERSA-PAC** part can be configured in at least 6 combinations for inductor use or configured in at least 15 turns ratios for transformer applications. The **VERSA-PAC** allows for at least 500 magnetic configurations. The **PCM** configurations can either be created by the designer or simply chosen from the existing **PCM** diagrams. The following inductor example shows 6 windings in series, which result in an inductance of 36 times the base inductance and 1 times the base current.

INDUCTOR EXAMPLE FOR SIZES VP3, VP4 AND VP5



Each VERSA-PAC may be used in at least 15 transformer applications. More than 375 transformer combinations may be achieved using the available VERSA-PAC parts.

TRANSFORMER EXAMPLE FOR SIZES VP3. VP4 AND VP5



The PCM configurations may be selected from the examples above or created by the designer. The printed circuit board layout in each example illustrates the connections to obtain the desired inductance or turns ratio. The examples may be used by the PCB designer to configure **VERSA-PAC** as desired.

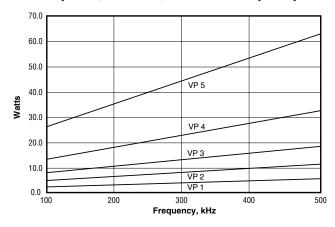
To assist the designer, **VERSA-PAC** phasing, coupling and thermal issues have been considered in each of the PCM configurations illustrated. Additionally, the inductance and current ratings, as a function of the respective base values are shown in each PCM example.

It is important to carefully select the proper **VERSA-PAC** part in order to minimize the component size without exceeding the RMS current capability or saturating the core. The Product specification table indicates maximum ratings.

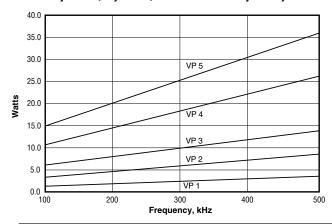
Effective August 2017

VERSA-PAC® Performance characteristics

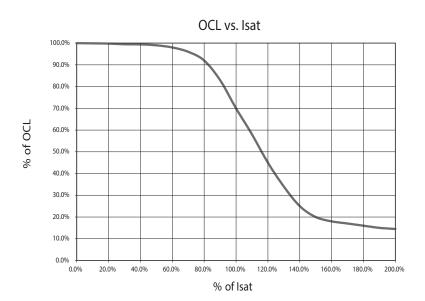
Bipolar (Push-Pull) Power vs Frequency



Unipolar (Flyback) Power vs Frequency



Inductance characteristics



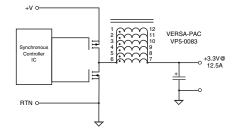
These curves represent typical power handling capability.

Indicated power levels may not be achievable with all configurations.

3.3V Buck Converter

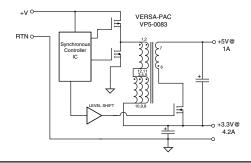
This circuit utilizes the gap of the VP5-0083 to handle the 12.5 Amp output current without saturating. In each of the five **VERSA-PAC** sizes, the gap is varied to achieve a selection of specific inductance and current values (see **VERSA-PAC** Data Table).

All six windings are connected in parallel to minimize AC/DC copper losses and to maximize heat dissipation. With **VERSA-PAC**, this circuit works well at or above 300 KHz. Also, the closed flux-path EFD geometry enables much lower radiation characteristics than open-path bobbin core style components.



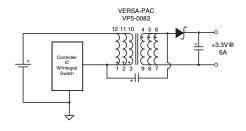
5V to 3.3V Buck Converter With 5V Output

This circuit minimizes both board space and cost by eliminating a second regulator. **VERSA-PAC**'s gap serves to prevent core saturation during the switch on-time and also stores energy for the +5V load which is delivered during the flyback interval. The +3.3V buck winding is configured by placing two windings in series while the +5V is generated by an additional flyback winding stacked on the 3.3V output. Extra windings are paralleled with primary windings to handle more current. The turns ratio of 2:1 adds 1.67V to the +3.3V during the flyback interval to achieve +5V.



LITHIUM-ION BATTERY TO 3.3V SEPIC CONVERTER

The voltage of a Lithium-Ion Battery varies above and below +3.3V depending on the degree of charge. The SEPIC configuration takes advantage of **VERSA-PAC**'s multiple tightly coupled windings. This results in lower ripple current which lowers noise and core losses substantially. The circuit does not require a snubber to control the voltage "spike" associated with switch turnoff, and is quite efficient due to lower RMS current in the windings.



Solder Reflow Profile

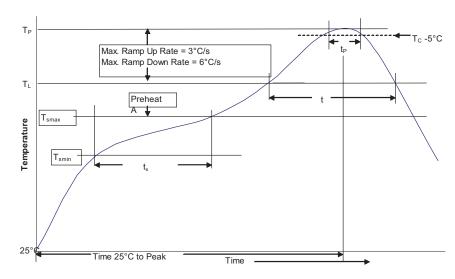


Table 1 - Standard SnPb Solder (T_c)

	Volume	Volume
Package	mm³	mm³
Thickness	<350	≥350
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

Table 2 - Lead (Pb) Free Solder (T_C)

Package	Volume mm³	Volume mm³	Volume mm³
Thickness	<350	350 -	>2000
<1.6mm	260°C	260°C	260°C
1.6 - 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

Reference JDEC J-STD-020

Profile Feature		Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak	• Temperature min. (T _{smin})	100°C	150°C
	Temperature max. (T _{smax})	150°C	200°C
	• Time (T _{smin} to T _{smax}) (t _s)	60-120 Seconds	60-120 Seconds
Average ramp up ra	te T _{smax} to T _p	3°C/ Second Max.	3°C/ Second Max.
Liquidous temperatu Time at liquidous (t _L	` '	183°C 60-150 Seconds	217°C 60-150 Seconds
Peak package body	temperature (T _P)*	Table 1	Table 2
Time (t _p)** within 5	°C of the specified classification temperature (T _C)	20 Seconds**	30 Seconds**
Average ramp-down	rate (T _p to T _{smax})	6°C/ Second Max.	6°C/ Second Max.
Time 25°C to Peak	Temperature	6 Minutes Max.	8 Minutes Max.

 $^{^{\}star}$ Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin

Eaton Electronics Division

1000 Eaton Boulevard Cleveland, OH 44122 United States www.eaton.com/electronics

© 2017 Eaton All Rights Reserved Printed in USA Publication No. 4301 August 2017

Eaton is a registered trademark.

All other trademarks are property of their respective owners.



^{**} Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.