



Traditional High Q (>10,000) Low ESR
Multi-Layer Ceramic Capacitors

3838C/P (0.380" x 0.380")

≠ **Product Features**

- High Q
- High RF Current/Voltage
- Ultra Stable Performance
- Capacitance Range:
0.5pF to 5100pF
- Working Voltage: 3600V
- Extended Voltage: 7200V

≠ **Product Applications**

Typical Functional Applications:

- Tuning • Bypass • Coupling
- D.C. Blocking • Impedance Matching

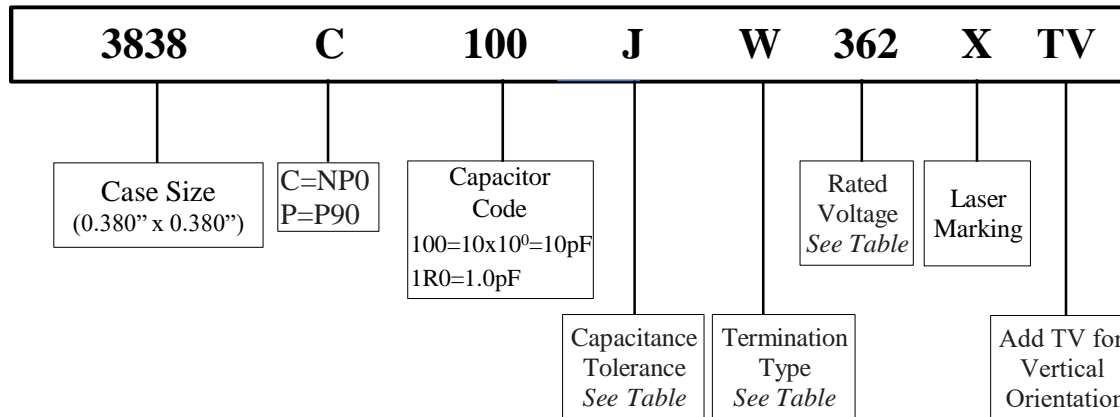
Typical Circuit Applications:

- HF/RF Power Amplifiers
- Antenna Tuning • Plasma Chambers
- Medical Equipment • Transmitters



Marking shown for illustration purposes only.
Actual marking may differ.

≠ **Part Numbering**



≠ **Capacitance Tolerance Codes**

Code	A	B	C	D	F	G	J	K
Tol.	±0.05pF	±0.1pF	±0.25pF	±0.5pF	±1%	±2%	±5%	±10%

≠ **Voltage Codes**

Voltage	Code
500V	501
1000V	102
2500V	252
3600V	362
7200V	722

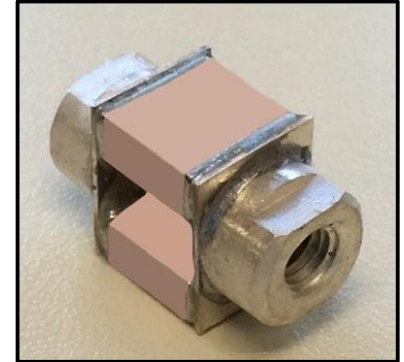


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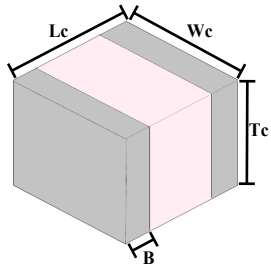
≠ 3838C/P Capacitance Values

Special capacitances, tolerances and WVDC are available. Please contact PPI.

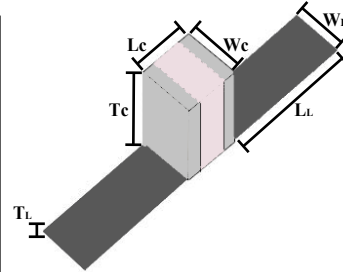


Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC		Cap. pF	Cap Code	Tol.	Rated WVDC
			Std.	Ext.				Std.	Ext.				Std.	Ext.				
0.5	OR5	B,C, D	3600V	7200V	4.7	4R7	B,C, D	3600V	7200V	51	510	F,G, J,K	3600V	7200V	560	561	F,G, J,K	2500V
0.6	OR6				5.1	5R1				56	560				620	621		
0.7	OR7				5.6	5R6				62	620				680	681		
0.8	OR8				6.2	6R2				68	680				750	751		
0.9	OR9				6.8	6R8				75	750				820	821		
1.0	1R0				7.5	7R5				82	820				910	911		
1.1	1R1				8.2	8R2	91	910	1000	102								
1.2	1R2				9.1	9R1	100	101	1100	112								
1.3	1R3				10	100	110	111	1200	122								
1.4	1R4				11	110	120	121	1500	152								
1.5	1R5				12	120	130	131	1800	182								
1.6	1R6				13	130	150	151	2200	222								
1.7	1R7				15	150	160	161	2400	242								
1.8	1R8				16	160	180	181	2700	272								
1.9	1R9				18	180	200	201	3000	302								
2.0	2R0				20	200	220	221	3300	332								
2.1	2R1				22	220	240	241	3600	362								
2.2	2R2				24	240	270	271	3900	392								
2.4	2R4	27	270	300	301	4300	432											
2.7	2R7	30	300	330	331	4700	472											
3.0	3R0	33	330	360	361	5100	512											
3.3	3R3	36	360	390	391													
3.6	3R6	39	390	430	431													
3.9	3R9	43	430	470	471	F,G, J,K	2500V	N/A										
4.3	4R3	47	470	510	511													

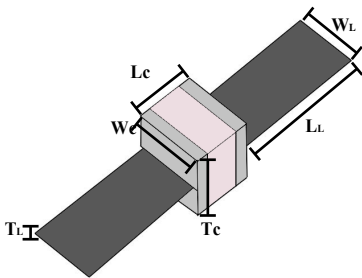
≠ Termination Types and Codes



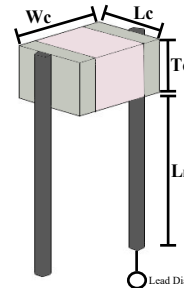
Chip Termination:
Codes: W, L, P



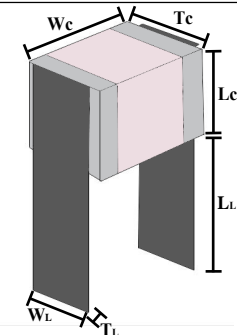
Microstrip Termination:
Codes: MS, MN



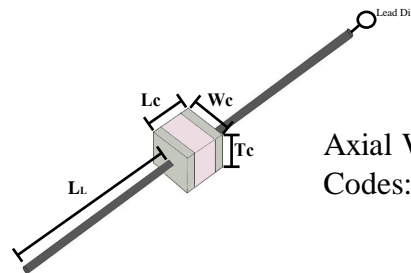
Axial Ribbon Termination:
Code: AR, AN



Radial Wire Termination:
Codes: RW, RN



Radial Ribbon Termination:
Code: RR, FN



Axial Wire Termination:
Codes: AW, BN

Termination Code	Magnetic Termination
W	100% Tin Solder over Nickel Barrier
L	90%Tin/10%Lead Solder over Nickel Barrier
MS	Silver-Plated Copper
AR	
RR	
RW	
AW	

Termination Code	Non-Magnetic
P	100% Tin Solder over Copper Barrier
MN	Silver-Plated Copper
AN	
FN	
RN	
BN	

Note: "Non-Magnetic" means no magnetic materials.



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≠ **Dimensions** - For Termination Types images, see previous page Unit: inch (millimeter)

Magnetic Termination								
Code		Capacitor Dimensions				Lead Dimensions		
		Length	Width	Thickness	Overlap	Length	Width	Thickness
		Lc	Wc	Tc	B	LL	WL	TL
W/L	Chip	0.380 (9.65	$\begin{matrix} +0.015 \\ -0.010 \\ +0.38 \\ -0.25 \end{matrix}$)	0.380 ± 0.010 (9.65 ± 0.25)	0.170 max (4.32 max)	0.024 ~ 0.059 (0.60 ~ 1.50)	-	-
MS	Microstrip					0.728 min (18.50 min)	0.350 ± 0.020 (8.89 ± 0.50)	0.008 ± 0.001 (0.20 ± 0.025)
AR	Axial Ribbon					0.728 min (18.50 min)	0.315 ± 0.010 (8.00 ± 0.25)	0.008 ± 0.001 (0.20 ± 0.025)
RR	Radial Ribbon	0.380 (9.65	$\begin{matrix} +0.015 \\ -0.010 \\ +0.38 \\ -0.25 \end{matrix}$)	0.380 ± 0.010 (9.65 ± 0.25)	0.177 max (4.50 max)	-	0.354 min (9.00 min)	0.118 ± 0.005 (3.00 ± 0.13)
RW	Radio Wire					0.709 min (18.00 min)		Dia. = 0.031 ± 0.004
AW	Axial Wire					0.906 min (23.00 min)		Dia. = (0.80 ± 0.10)

Non-Magnetic Termination								
Code		Capacitor Dimensions				Lead Dimensions		
		Length	Width	Thickness	Overlap	Length	Width	Thickness
		Lc	Wc	Tc	B	LL	WL	TL
P	Chip	0.380 (9.65	$\begin{matrix} +0.015 \\ -0.010 \\ +0.38 \\ -0.25 \end{matrix}$)	0.380 ± 0.010 (9.65 ± 0.25)	0.170 max (4.32 max)	0.024 ~ 0.059 (0.60 ~ 1.50)	-	-
MN	Microstrip					0.728 min (18.50 min)	0.350 ± 0.020 (8.89 ± 0.50)	0.008 ± 0.001 (0.20 ± 0.025)
AN	Axial Ribbon					0.728 min (18.50 min)	0.315 ± 0.010 (8.00 ± 0.25)	0.008 ± 0.001 (0.20 ± 0.025)
FN	Radial Ribbon	0.380 (9.65	$\begin{matrix} +0.015 \\ -0.010 \\ +0.38 \\ -0.25 \end{matrix}$)	0.380 ± 0.010 (9.65 ± 0.25)	0.177 max (4.50 max)	-	0.354 min (9.00 min)	0.118 ± 0.005 (3.00 ± 0.13)
RN	Radio Wire					0.709 min (18.00 min)		Dia. = 0.031 ± 0.004
BN	Axial Wire					0.906 min (23.00 min)		Dia. = (0.80 ± 0.10)

⊗ Note: Non-Magnetic means no magnetic materials. All leads are attached with high temperature solder and parts are RoHS Compliant.



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⚡ Electrical Specifications

Quality Factor (Q)	No less than 1000pF, Q value more than 10,000, Test Frequency 1MHz More than 1000pF, Q value more than 10,000, Test Frequency 1kHz
Insulation Resistance (IR)	Test Voltage: 500V 10 ⁵ Megaohms min. @ +25°C 10 ⁴ Megaohms min. @ +125°C
Rated Voltage	See Rated Voltage in Capacitance Table
Dielectric Withstanding Voltage (DWV)	250% of Rated Voltage of 5 seconds, Rated Voltage ≤ 500VDC 150% of Voltage for 5 seconds, 500VDC < Rated Voltage ≤ 1250VDC 120% of Voltage for 5 seconds, Rated Voltage > 1250VDC
Operating Temperature Range	-55°C to 200°C
Temperature Coefficient (TC)	C: -55°C to 125°C 0±30ppm/°C; >125°C to 200°C 0±60ppm/°C P: -55°C to 200°C +90±20ppm/°C
Capacitance Drift	±0.02% or ±0.02pF, whichever is greater
Piezoelectric Effects	None
Termination Type	See Termination Type Table

⚡ Environmental Specifications

	Specification	Test Parameters
Thermal Shock	DWV: The initial value IR: Shall not be less than 30% of the initial value. Capacitance Change:	MIL-STD-202, Method 107, Condition A. At the maximum rated temperature (-55°C and 200°C) stay 30 minutes, the time of removing shall not be more than 3 minutes. Perform five cycles.
Moisture Resistance	No more than 0.5% or 0.5pF, whichever is greater.	MIL-STD-202, Method 106
Humidity (Steady State)	DWV: The initial value IR: The initial value Capacitance Change: No more than 0.3% or 0.3pF, whichever is greater.	MIL-STD-202, Method 103, Condition A With 1.5Volts DC applied while subjected to an environment of 85°C with 85% relative humidity for 240 hours minimum.
Life	IR: Shall not be less than 30% of the initial value. Capacitance Change: No more than 2.0% or 0.5pF, whichever is greater.	MIL-STD-202, Method 108. For 2000 hours, at 200°C. 200% of Voltage for Capacitors, Rated Voltage ≤ 500VDC; 120% of Voltage for Capacitors, 500VDC < Rated Voltage ≤ 1250VDC; 100% for Voltage for Capacitors, Rated Voltage > 1250VDC
Terminal Strength	Force: 20lbs typical, 10lbs. min. Duration Time: 5 to 10 seconds	MIL-STD-202, Method 211A, Test Condition A. Applied a force and maintained for a period of 5 to 10 seconds. The force shall be in the direction of the axes of the terminations.

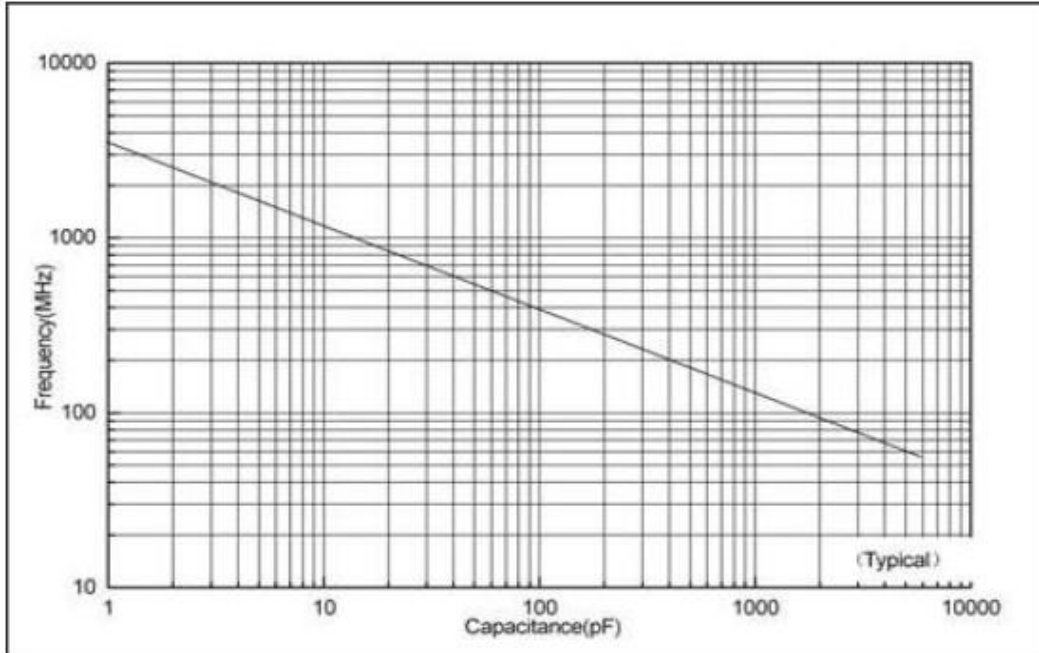
Capacitors are designed and manufactured to meet the requirements of MIL-PRF-55681 and MIL-PRF-123.



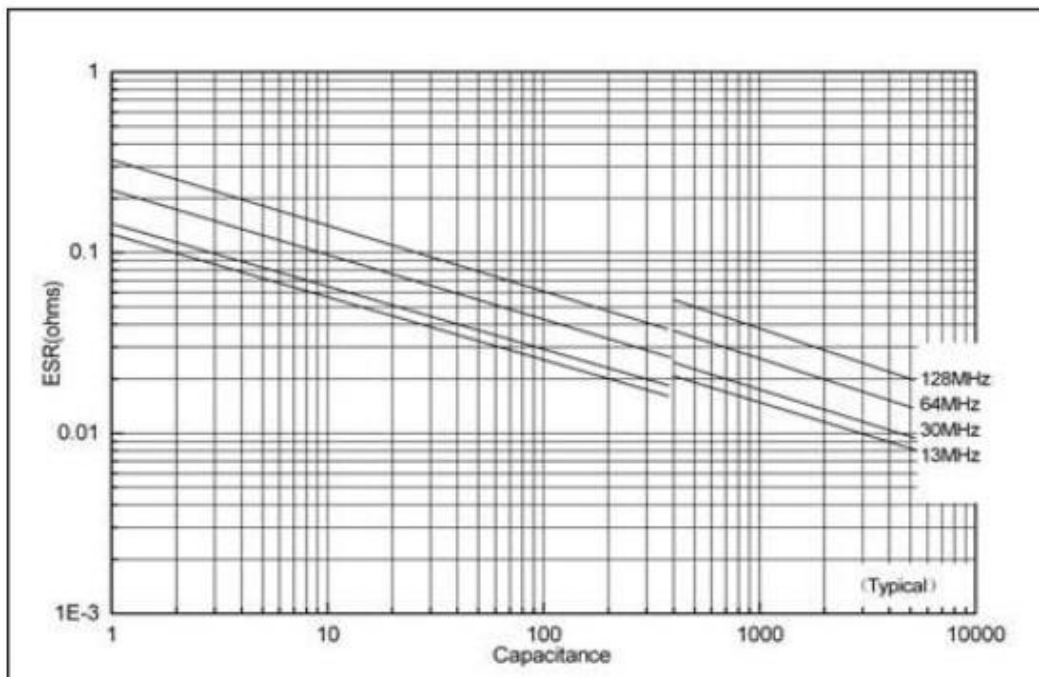
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≠ Series Resonance vs. Capacitance



≠ ESR vs. Frequency

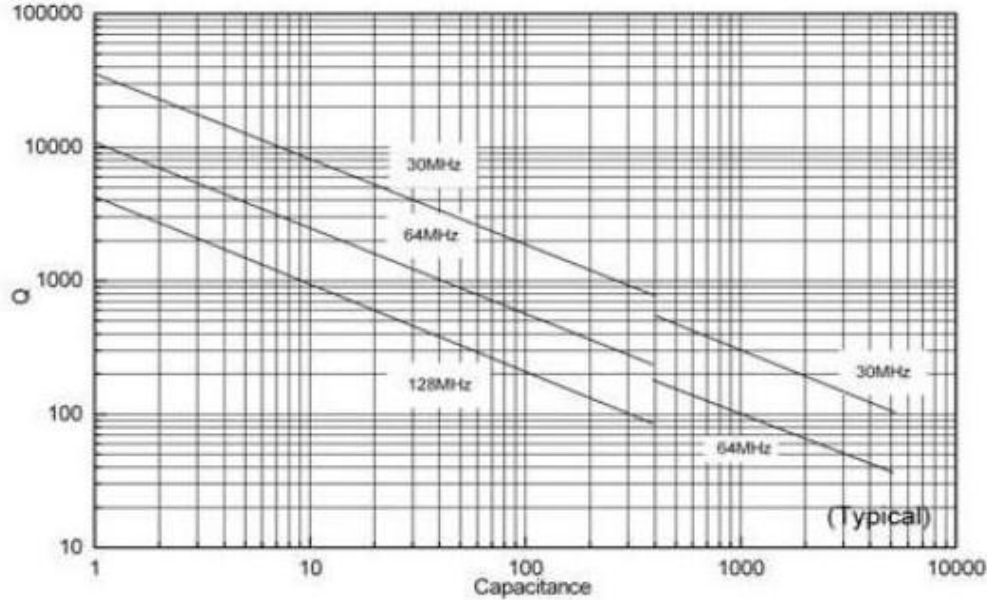




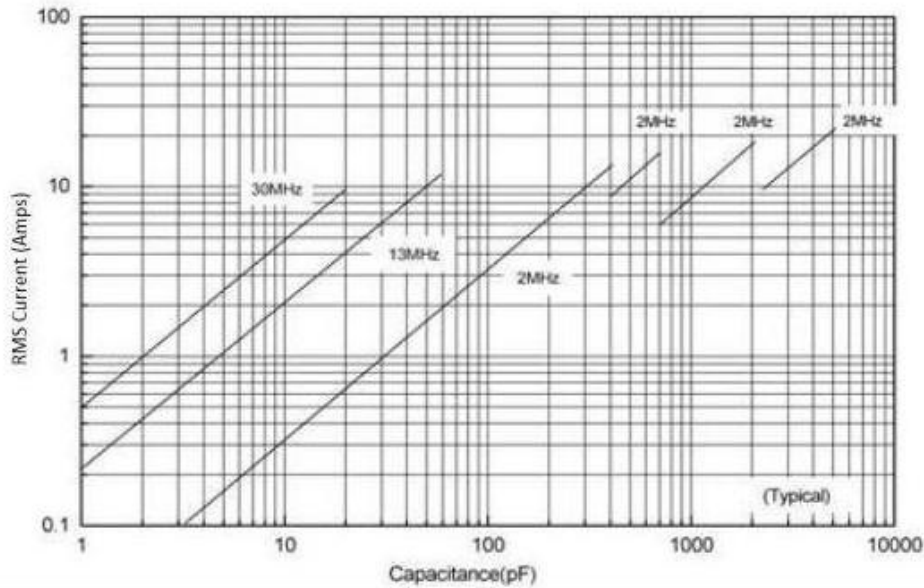
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≠ Q vs. Capacitance



≠ Current Rating vs. Capacitance



Current limits can depend on two different criteria. The first Voltage Limited Current ($I_{voltage\ lim}$, represented by the solid line), the second is Power Dissipation Limited Current ($I_{pow\ diss}$).

$$I_{voltage\ lim} = \frac{\sqrt{2}}{2} I_{peak} = \frac{\sqrt{2}}{2} \times \frac{V_{rated}}{X_C} = \sqrt{2} \pi F C V_{rated}$$

$I_{pow\ diss} = \sqrt{\frac{P_{dissipation}}{ESR}}$ (If the thermal resistance of the mounting surface is 12°C/W, then you will reach the power dissipated limit of 5W)



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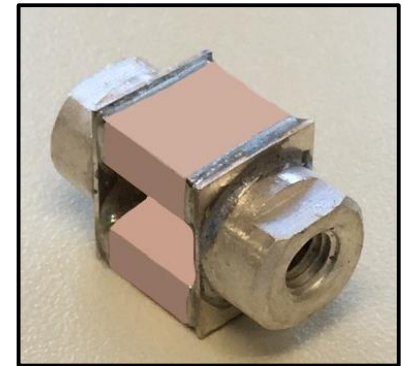
≠ Recommended Land Pattern Dimensions

Regarding Landing Patterns, please refer to IPC-7351B (table 3-5, 3-6).

≠ Custom Assemblies

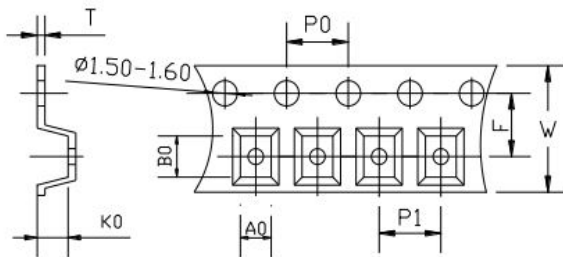
Passive Plus offers Capacitor Assemblies for high power requirements. Typical assemblies are configured in series and/or parallel combinations, producing higher voltage/current handling capabilities, extended capacitance range and tighter tolerances.

To get started, simply send us either a mechanical drawing or circuit conditions and we can recommend a solution. All components are 100% up-screened for Partial Discharge and Sonoscanned. All assemblies include a 100hr Military burn in.



≠ Tape & Reel Specifications (mm)

Orientation	Measurement Unit	W	P0	P1	T	F	Minimum Qty per Reel	Std Qty per Reel	Tape Material
H	in. mm	0.630 16.00	0.157 4.00	0.630 16.00	0.012 0.30	0.295 7.50	50	200	Plastic



A₀B₀K₀

- Determined by component size. Typical clearance between the cavity and the component is: .50 (.002) min to .65 (.026) max for 12mm tape.
- The component cannot rotate more than 20° within the determined cavity.

Please note that the contents of this document are subject to change at any time at PPI's sole discretion. The most up-to-date version of this document is available at www.passiveplus.com.