

Overview

NeoCapacitor® provides excellent performance for various applications due to high conductivity of the conductive polymer.

TOKIN's devices are classified into the following three quality grades, in accordance with their application: Standard, Special, and Specific. The quality grade of all devices in this document is "standard" and cannot be used for "special" or "specific" quality grade applications. Customers who intend to use the products in this document for applications other than "standard" quality grade must contact KEMET sales representative in advance.

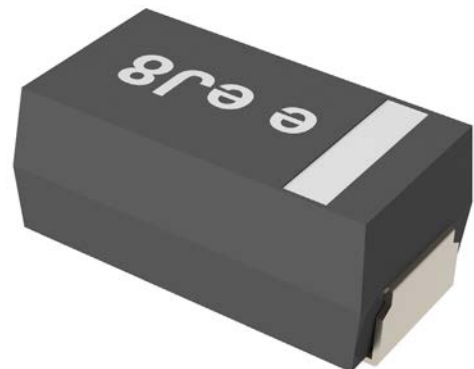
Standard: This quality grade is intended for applications in which failure or malfunction of the device is highly unlikely to cause harm to persons or damage to property, or be the source of any negative effects or problems in the wider community.

Special: This quality grade is intended for special applications that have common requirements, such as specific industrial fields. Devices with a "special" quality grade are designed, manufactured, and tested using more a stringent quality assurance program than what is used for "standard" grade devices. There is a high possibility that failure or malfunction of the device when being used for applications in this category will cause harm to persons or damage to property, or bring negative effects or problems in the wider community.

Specific: Devices in this quality grade are designed, manufactured, and tested using a quality assurance program that is designated by the customer or that is created in accordance with the customer's specifications. There is an extremely high possibility that failure or malfunction of the device when being used for applications in this category will cause harm to persons or damage to property, or bring serious problems in the wider community. Customers who use KEMET's products for these "specific" applications must conclude an individual quality agreement and/or development agreement with KEMET. A quality assurance program designated by the customer must also be determined in advance.

Benefits

- Excellent noise absorption performance
- Higher ripple current
- Miniaturized, thinner, higher capacitance and lower ESR
- Lead free (JEITA PHASE3), RoHS2 directive (2011/65/EU + 2015/863/EU) and halogen-free.
- Antimony-free and Red phosphorous-free materials for mold resin.



Applications

Typical applications include voltage smoothing, noise absorption in high speed operation circuit, multi media instruments, PC (voltage smoothing and noise absorption of CPU, memory and various LSI), Smartphone, mobile phone (stabilization of battery voltage, stabilization for display), LCD TV (stabilization of LCD driver and timing controller) and others (tablet, PC, portable audio player, DSC, DVC, HDD, SSD, communication card, portable gaming devices, head-mounted displays, drones, IoT devices).

K-SIM

For a detailed analysis of specific part numbers, please visit ksim.kemet.com to access KEMET's K-SIM software. KEMET K-SIM is designed to simulate behavior of components with respect to frequency, ambient temperature, and DC bias levels.

Ordering Information

TE	PSL	B2	1A	107	M	(45)	8R
Tape & Reel	Series	Case Code	DC Rated Voltage in Volts	Capacitance (pF)	Capacitance Tolerance	ESR Spec	Packing Orientation
φ 180 mm reel	Standard product of NeoCapacitor	A (3216-18) B3 (3528-12) B15 (3528-15) B2 (3528-21)	0E = 2.5 V 0G = 4 V 0J = 6.3 V 1A = 10 V 1C = 16 V 1D = 20 V 1E = 25 V	First two digits represents the cap code. Third digit specifies number of zeros to follow	M = ±20%	For example: (45) shows 45 mΩ Blank = Refer to PN in Table 1 for specification	8 = Tape width (8 mm) R = Packaging orientation (Cathode on sprocket hole)

Performance Characteristics

Item	Performance Characteristics							
Operating Temperature	-55°C to +105°C							
Rated Voltage Range (V)	2.5 – 25							
Surge Voltage (V)	Rated Voltage	2.5 V	4 V	6.3 V	10 V	16 V	20 V	25 V
	Surge Voltage	3.3 V	5.2 V	8 V	13 V	20 V	23 V	29 V
Nominal Capacitance (120 Hz)	3.3 μF ~ 470 μF*							
Dissipation Factor (tan δ, 120 Hz)	Refer to Standard Ratings*							
Leakage Current (LC, V _R , 5 minutes)	Refer to Standard Ratings							
Equivalent Series Resistance (ESR, 100 kHz**)	Refer to Standard Ratings							
Permissible Ripple Current (100 kHz**)	Refer to Standard Ratings							

* For these measurements apply 1.5 VDC

** Partially ESR measurements should be taken at 300 k to 500 kHz

Qualification

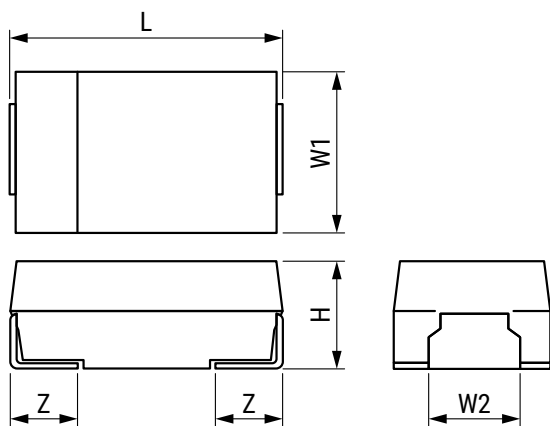
Test	Condition	Characteristics		
Surge Voltage	Temperature: 105°C, Surge Voltage apply, 1,000 Ω series resistance, 1,000 cycles	Δ C/C	+20% ~ -20% of the initial value	
		tan δ	Within IL	
		LC	Within IL	
Temperature Stability	Temperature exposure at +25°C, -55°C, +105°C		+25°C	-55°C
		Δ C/C	-	0% ~ -20% compare with +25°C
		tan δ	Within IL	Within IL
		LC	Within IL	Within 10 $\times$ IL
Endurance	Temperature: 105°C, Rated voltage apply, 2,000 hours*	Δ C/C	+20% ~ -20% of the initial value	
		tan δ	Within 1.5 $\times$ IL	
		LC	Within IL	
Humidity	Temperature: 60°C, Humidity: 90 ~ 95% R.H., 500 hours	Δ C/C	+30% ~ -20% of the initial value	
		tan δ	Within 1.5 $\times$ IL	
		LC	Within IL	

IL = Initial limit

* 85°C, Rated voltage apply, 1,000 hours for TEPSLB20E477M(14)8R.

Dimensions – Millimeters

Metric will govern



Case Size		Component Dimensions				
KEMET	EIA	L ± 0.2	W1 ± 0.2	W2 ± 0.1	H	Z ± 0.2
A	3216-18	3.2	1.6	1.2	1.6 ± 0.2	0.8
B3	3528-12	3.5	2.8	2.2	1.1 ± 0.1	0.8
B15	3528-15	3.5	2.8	2.2	1.4 ± 0.1	0.8
B2	3528-21	3.5	2.8	2.2	1.9 ± 0.1	0.8

Table 1 – Ratings & Part Number Reference

Rated Voltage	Rated Capacitance	Case Code/ Case Size	KEMET Part Number	Leakage Current	tan δ	ESR	Permissible Ripple Current	Rated and Maximum Operating Temperature
V	μF	KEMET/EIA		μA at +25°C Maximum	% at 25°C 120 Hz Maximum	mΩ at 25°C 100 kHz Maximum	(mA _{rms} , +25°C, 100 kHz) Maximum	°C
2.5	47	A/3216-18	TEPSLA0E476M8R	11.7	6	180	645	105
2.5	100	A/3216-18	TEPSLA0E107M8R	25	8	100	866	105
2.5	100	A/3216-18	TEPSLA0E107M(45)8R	25	8	45	1291	105
2.5	100	A/3216-18	TEPSLA0E107M(35)8R	25	8	35	1464	105
2.5	100	B3/3528-12	TEPSLB30E107M8R	25	8	70	1035	105
2.5	220	A/3216-18	TEPSLA0E227M(70)8R	55	8	70	1035	105
2.5	220	A/3216-18	TEPSLA0E227M(45)8R	55	8	45 *	1291 *	105
2.5	220	A/3216-18	TEPSLA0E227M(35)8R	55	8	35 *	1464 *	105
2.5	220	A/3216-18	TEPSLA0E227M(25)8R	55	8	25 *	1732 *	105
2.5	220	B2/3528-21	TEPSLB20E227M8R	55	8	45	1374	105
2.5	220	B2/3528-21	TEPSLB20E227M(35)8R	55	8	35	1558	105
2.5	220	B2/3528-21	TEPSLB20E227M(25)8R	55	8	25	1844	105
2.5	220	B2/3528-21	TEPSLB20E227M(21)8R	55	8	21	2012	105
2.5	220	B2/3528-21	TEPSLB20E227M(15)8R	55	8	15 *	2380 *	105
2.5	220	B3/3528-12	TEPSLB30E227M8R	55	8	70	1035	105
2.5	220	B3/3528-12	TEPSLB30E227M(35)8R	55	8	35	1464	105
2.5	330	B2/3528-21	TEPSLB20E337M(45)8R	82.5	8	45	1374	105
2.5	330	B2/3528-21	TEPSLB20E337M(35)8R	82.5	8	35	1558	105
2.5	330	B2/3528-21	TEPSLB20E337M(21)8R	82.5	8	21	2012	105
2.5	330	B2/3528-21	TEPSLB20E337M(15)8R	82.5	8	15 *	2380 *	105
2.5	470	B2/3528-21	TEPSLB20E477M(14)8R	188	8	14 *	2464 *	85
4	47	A/3216-18	TEPSLA0G476M8R	18.8	6	180	645	105
4	47	A/3216-18	TEPSLA0G476M(70)8R	18.8	6	70	1035	105
4	68	A/3216-18	TEPSLA0G686M8R	27.2	6	180	645	105
4	100	A/3216-18	TEPSLA0G107M8R	40	8	100	866	105
4	100	A/3216-18	TEPSLA0G107M(45)8R	40	8	45	1291	105
4	100	A/3216-18	TEPSLA0G107M(35)8R	40	8	35	1464	105
4	100	A/3216-18	TEPSLA0G107M(25)8R	40	8	25	1732	105
4	100	B2/3528-21	TEPSLB20G107M8R	40	8	70	1102	105
4	100	B2/3528-21	TEPSLB20G107M(45)8R	40	8	45	1374	105
4	100	B2/3528-21	TEPSLB20G107M(35)8R	40	8	35	1558	105
4	100	B3/3528-12	TEPSLB30G107M8R	40	8	70	1035	105
4	150	B2/3528-21	TEPSLB20G157M8R	60	8	45	1374	105
4	150	B2/3528-21	TEPSLB20G157M(35)8R	60	8	35	1558	105
4	150	B2/3528-21	TEPSLB20G157M(30)8R	60	8	30	1683	105
4	150	B2/3528-21	TEPSLB20G157M(25)8R	60	8	25	1844	105
4	220	B2/3528-21	TEPSLB20G227M8R	88	8	45	1374	105
V	μF	KEMET/EIA		μA at +25°C Maximum	% at 25°C 120 Hz Maximum	mΩ at 25°C 100 kHz Maximum	(mA _{rms} , +25°C, 100 kHz) Maximum	°C
Rated Voltage	Rated Capacitance	Case Code/ Case Size	KEMET Part Number	Leakage Current	tan δ	ESR	Permissible Ripple Current	Rated and Maximum Operating Temperature

* ESR and Ripple measurement condition is 300 to 500kHz

∅ Ripple current condition is at 105°C, 100kHz

Table 1 – Ratings & Part Number Reference cont.

Rated Voltage	Rated Capacitance	Case Code/ Case Size	KEMET Part Number	Leakage Current	tan δ	ESR	Permissible Ripple Current	Rated and Maximum Operating Temperature
V	μF	KEMET/EIA		μA at +25°C Maximum	% at 25°C 120 Hz Maximum	mΩ at 25°C 100 kHz Maximum	(mA _{rms} , +25°C, 100 kHz) Maximum	°C
4	220	B2/3528-21	TEPSLB20G227M(35)8R	88	8	35	1558	105
4	220	B2/3528-21	TEPSLB20G227M(15)8R	88	8	15	2380	105
6.3	6.8	A/3216-18	TEPSLA0J685M8R	4.2	6	300	500	105
6.3	10	A/3216-18	TEPSLA0J106M8R	6.3	6	200	612	105
6.3	15	A/3216-18	TEPSLA0J156M8R	9.4	6	200	612	105
6.3	22	A/3216-18	TEPSLA0J226M8R	13.8	6	180	645	105
6.3	22	B2/3528-21	TEPSLB20J226M8R	13.8	8	150	753	105
6.3	22	B3/3528-12	TEPSLB30J226M8R	13.8	8	70	1035	105
6.3	33	A/3216-18	TEPSLA0J336M8R	20.7	6	180	645	105
6.3	33	B2/3528-21	TEPSLB20J336M8R	20.7	8	150	753	105
6.3	33	B3/3528-12	TEPSLB30J336M8R	20.7	8	70	1035	105
6.3	47	A/3216-18	TEPSLA0J476M8R	29.6	6	150	645	105
6.3	47	A/3216-18	TEPSLA0J476M(70)8R	29.6	6	70	1035	105
6.3	47	B2/3528-21	TEPSLB20J476M8R	29.6	8	150	753	105
6.3	47	B2/3528-21	TEPSLB20J476M(70)8R	29.6	8	70	1102	105
6.3	47	B3/3528-12	TEPSLB30J476M8R	29.6	8	70	1035	105
6.3	47	B3/3528-12	TEPSLB30J476M(55)8R	29.6	8	55	1168	105
6.3	68	A/3216-18	TEPSLA0J686M(70)8R	43	8	70	1035	105
6.3	68	B2/3528-21	TEPSLB20J686M8R	42.8	8	70	1102	105
6.3	68	B2/3528-21	TEPSLB20J686M(55)8R	42.8	8	55	1243	105
6.3	68	B3/3528-12	TEPSLB30J686M8R	42.8	8	70	1035	105
6.3	100	A/3216-18	TEPSLA0J107M8R	63	8	70	1035	105
6.3	100	A/3216-18	TEPSLA0J107M(45)8R	63	8	45	1291	105
6.3	100	A/3216-18	TEPSLA0J107M(35)8R	63	8	35	1464	105
6.3	100	A/3216-18	TEPSLA0J107M(25)8R	63	8	25	1735	105
6.3	100	B2/3528-21	TEPSLB20J107M8R	63	8	70	1102	105
6.3	100	B2/3528-21	TEPSLB20J107M(45)8R	63	8	45	1374	105
6.3	100	B2/3528-21	TEPSLB20J107M(35)8R	63	8	35	1558	105
6.3	100	B2/3528-21	TEPSLB20J107M(25)8R	63	8	25	1844	105
6.3	100	B3/3528-12	TEPSLB30J107M8R	63	8	70	1035	105
6.3	100	B3/3528-12	TEPSLB30J107M(45)8R	63	8	45	1291	105
6.3	150	B15/3528-15	TEPSLB150J157M(70)8R	94.5	10	70	1069	105
6.3	150	B15/3528-15	TEPSLB150J157M(35)8R	94.5	10	35	1512	105
6.3	150	B2/3528-21	TEPSLB20J157M(45)8R	94.5	8	45	1374	105
6.3	150	B2/3528-21	TEPSLB20J157M(35)8R	94.5	8	35	1558	105
6.3	150	B2/3528-21	TEPSLB20J157M(25)8R	94.5	8	25	1844	105
6.3	150	B3/3528-12	TEPSLB30J157M(35)8R	94.5	8	35	1464	105
6.3	220	B15/3528-15	TEPSLB150J227M(35)8R	138.6	10	35	1512	105
V	μF	KEMET/EIA		μA at +25°C Maximum	% at 25°C 120 Hz Maximum	mΩ at 25°C 100 kHz Maximum	(mA _{rms} , +25°C, 100 kHz) Maximum	°C
Rated Voltage	Rated Capacitance	Case Code/ Case Size	KEMET Part Number	Leakage Current	tan δ	ESR	Permissible Ripple Current	Rated and Maximum Operating Temperature

* ESR and Ripple measurement condition is 300 to 500kHz

∅ Ripple current condition is at 105°C, 100kHz

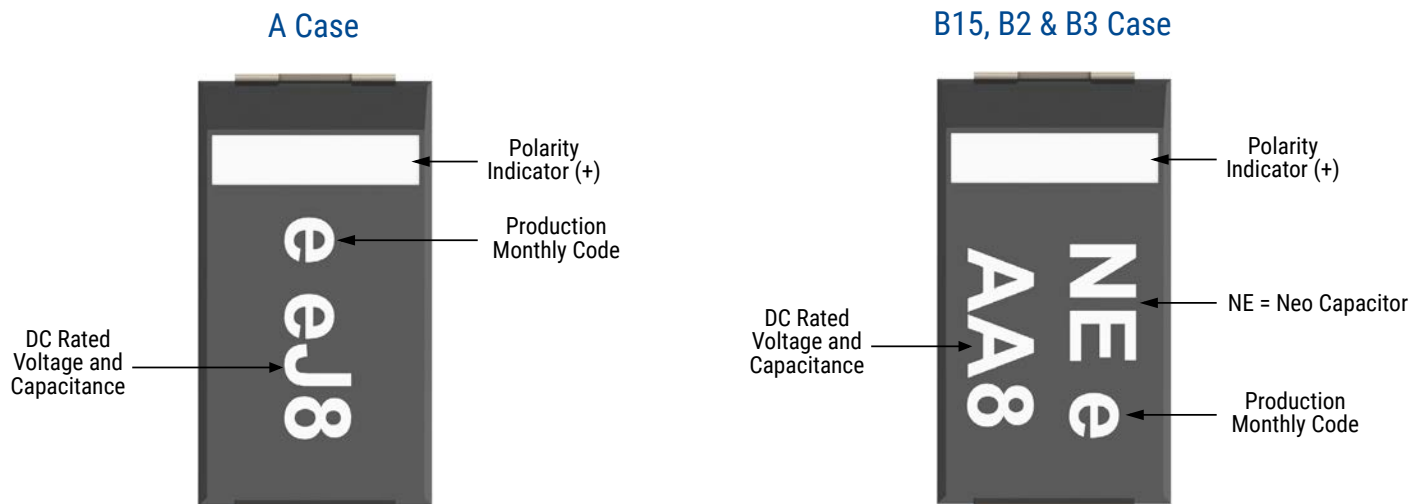
Table 1 – Ratings & Part Number Reference cont.

Rated Voltage	Rated Capacitance	Case Code/ Case Size	KEMET Part Number	Leakage Current	tan δ	ESR	Permissible Ripple Current	Rated and Maximum Operating Temperature
V	μF	KEMET/EIA		μA at +25°C Maximum	% at 25°C 120 Hz Maximum	mΩ at 25°C 100 kHz Maximum	(mA _{rms} , +25°C, 100 kHz) Maximum	°C
6.3	220	B2/3528-21	TEPSLB20J227M(45)8R	138.6	8	45	1374	105
6.3	220	B2/3528-21	TEPSLB20J227M(35)8R	138.6	8	35	1558	105
6.3	220	B2/3528-21	TEPSLB20J227M(25)8R	138.6	8	25	1844	105
6.3	220	B2/3528-21	TEPSLB20J227M(18)8R	138.6	8	18	2173	105
6.3	220	B2/3528-21	TEPSLB20J227M(15)8R	138.6	8	15	2380	105
6.3	330	B2/3528-21	TEPSLB20J337M(45)8R	415.8	8	45	1374	105
10	4.7	A/3216-18	TEPSLA1A475M8R	4.7	6	300	500	105
10	6.8	A/3216-18	TEPSLA1A685M8R	6.8	6	300	500	105
10	10	A/3216-18	TEPSLA1A106M8R	10	6	200	612	105
10	10	B2/3528-21	TEPSLB21A106M8R	10	8	200	652	105
10	15	A/3216-18	TEPSLA1A156M8R	15	6	180	645	105
10	15	B2/3528-21	TEPSLB21A156M8R	15	8	150	753	105
10	22	A/3216-18	TEPSLA1A226M8R	22	6	180	645	105
10	22	B2/3528-21	TEPSLB21A226M8R	22	8	150	753	105
10	22	B3/3528-12	TEPSLB31A226M8R	22	8	70	1035	105
10	33	A/3216-18	TEPSLA1A336M8R	33	8	200	612	105
10	33	B2/3528-21	TEPSLB21A336M8R	33	8	150	753	105
10	33	B3/3528-12	TEPSLB31A336M8R	33	8	70	1035	105
10	47	A/3216-18	TEPSLA1A476M(180)8R	47	8	180	645	105
10	47	A/3216-18	TEPSLA1A476M(45)8R	47	8	45	1291	105
10	47	B2/3528-21	TEPSLB21A476M8R	47	8	70	1102	105
10	47	B2/3528-21	TEPSLB21A476M(35)8R	47	8	35	1558	105
10	47	B3/3528-12	TEPSLB31A476M8R	47	8	70	1035	105
10	47	B3/3528-12	TEPSLB31A476M(45)8R	47	8	45	1291	105
10	100	B2/3528-21	TEPSLB21A107M(45)8R	100	10	45	1374	105
16	3.3	A/3216-18	TEPSLA1C335M8R	5.2	6	800	306 ∅	105
16	4.7	B2/3528-21	TEPSLB21C475M8R	7.5	8	200	652 ∅	105
16	6.8	B2/3528-21	TEPSLB21C685M8R	10.8	8	200	652 ∅	105
16	10	A/3216-18	TEPSLA1C106M8R	16	8	200	612	105
16	10	B2/3528-21	TEPSLB21C106M8R	16	8	100	922 ∅	105
16	15	B2/3528-21	TEPSLB21C156M(90)8R	16	10	90	972 ∅	105
16	33	B2/3528-21	TEPSLB21C336M8R	52.8	8	70	1102 ∅	105
16	33	B3/3528-12	TEPSLB31C336M8R	105.6	8	70	1035 ∅	105
16	33	B3/3528-12	TEPSLB31C336M(55)8R	105.6	8	55	1168 ∅	105
16	33	B3/3528-12	TEPSLB31C336M(45)8R	105.6	8	45	1291 ∅	105
20	33	B2/3528-21	TEPSLB21D336M8R	132	10	90	972 ∅	105
25	6.8	B2/3528-21	TEPSLB21E685M8R	17	8	100	922 ∅	105
25	6.8	B3/3528-12	TEPSLB31E685M8R	34	8	100	866 ∅	105
25	10	B15/3528-15	TEPSLB151E106M8R	50	10	100	894 ∅	105
25	15	B2/3528-21	TEPSLB21E156M8R	75	10	100	922 ∅	105
25	22	B2/3528-21	TEPSLB21E226M8R	55	10	90	972 ∅	105
V	μF	KEMET/EIA		μA at +25°C Maximum	% at 25°C 120 Hz Maximum	mΩ at 25°C 100 kHz Maximum	(mA _{rms} , +25°C, 100 kHz) Maximum	°C
Rated Voltage	Rated Capacitance	Case Code/ Case Size	KEMET Part Number	Leakage Current	tan δ	ESR	Permissible Ripple Current	Rated and Maximum Operating Temperature

* ESR and Ripple measurement condition is 300 to 500kHz

∅ Ripple current condition is at 105°C, 100kHz

Capacitor Marking



DC Rated Voltage and Capacitance Code

Capacitance (μ F)		Voltage						
		2.5 e	4 g	6.3 j	10 A	16 C	20 D	25 E
3.3	N6					CN6		
4.7	S6				AS6	CS6		
6.8	W6			jW6	AW6	CW6		EW6
10	A7			jA7	AA7	CA7		EA7
15	E7			jE7	AE7	CE7		EE7
22	J7			jJ7	AJ7			EJ7
33	N7			jN7	AN7	CN7	DN7	
47	S7	eS7	gS7	jS7	AS7			
68	W7		gW7	jW7				
100	A8	eA8	gA8	jA8	AA8			
150	E8		gE8	jE8				
220	J8	eJ8	gJ8	jJ8				
330	N8	eN8		jN8				
470	S8	eS8						

Production Monthly Code

Year	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	A	B	C	D	E	F	G	H	J	K	L	M
2022	N	P	Q	R	S	T	U	V	W	X	Y	Z
2023	a	b	c	d	e	f	g	h	j	k	l	m
2024	n	p	q	r	s	t	u	v	w	x	y	z

Production monthly code will resume beginning in 2025.

KEMET Electronics Corporation Sales Offices

For a complete list of our global sales offices, please visit www.kemet.com/sales.

Disclaimer

YAGEO Corporation and its affiliates do not recommend the use of commercial or automotive grade products for high reliability applications or manned space flight.

All product specifications, statements, information and data (collectively, the "Information") in this datasheet are subject to change. The customer is responsible for checking and verifying the extent to which the Information contained in this publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without guarantee, warranty, or responsibility of any kind, expressed or implied.

Statements of suitability for certain applications are based on KEMET Electronics Corporation's ("KEMET") knowledge of typical operating conditions for such applications, but are not intended to constitute – and KEMET specifically disclaims – any warranty concerning suitability for a specific customer application or use. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by KEMET with reference to the use of KEMET's products is given gratis, and KEMET assumes no obligation or liability for the advice given or results obtained.

Although KEMET designs and manufactures its products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

KEMET is a registered trademark of KEMET Electronics Corporation.