EHBSA

Conductive polymer hybrid aluminum electrolytic surface mount capacitor

Photo is representative

Product features

- AEC-Q200
- High ripple current
- Low ESR and low leakage current
- Endurance with ripple current: 4,000 hours at +125 °C
- Wide variety of voltage options
- Surface mount package with multiple size options
- Moisture sensitivity level (MSL): 1

Applications

- LED headlights
- On-board charger (OBC)
- Battery management systems (BMS)
- ADAS
- 48 V systems
- Engine control unit (ECU)
- Electronic power system (EPS)

Environmental compliance and general specifications

- Storage temperature range (component): -55 °C to +125 °C
- Operating temperature range: -55 °C to +125 °C

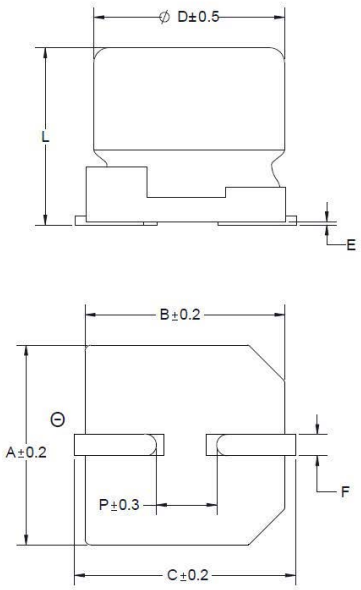
RoHS Pb HALOGEN HF FREE

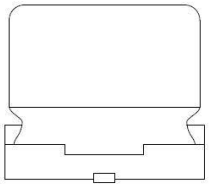
Powering Business Worldwide

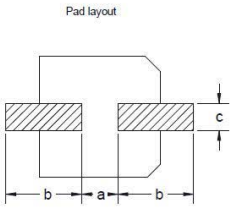
Part number system

EHB	S	A	035	M	331	0606	T
Family	**Type**	**Grade**	**Voltage (V)**	**Tolerance**	**Capacitance (µF)**	**Size code**	**Package code**
EHB	S = SMD	A = automotive	016 = 16 025 = 25 035 = 35 050 = 50 063 = 63 080 = 80	M = ±20%	First two digits= capacitance vlaue, third digit = numbero fo zeros example: 331 = 330 µF	Refer to size code table	T= Tape and reel, 15" diameter reel

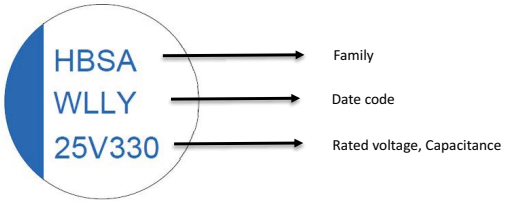
Dimensions-mm







Part marking



Size code table

Size code	Dimension - mm									Pad layout - mm		
	Diameter	L	L tolerance	A	B	C	F	E	P	a ref	b ref	c ref
0606	6.3	5.8	±0.2	6.6	6.6	7.3	0.5 to 0.8	0.3 maximum	2.1	2.1	3.5	1.6
0608	6.3	7.5	±0.5	6.6	6.6	7.3	0.5 to 0.8	0.3 maximum	2.1	2.1	3.5	1.6
0810	8.0	9.7	±0.3	8.3	8.3	9.0	0.8 to 1.1	0.3 maximum	2.9	2.8	4.2	1.9
1010	10	10.2	±0.3	10.3	10.3	11	0.8 to 1.1	0.3 maximum	4.6	4.3	4.4	1.9
1012	10	12.3	±0.2	10.3	10.3	11	0.8 to 1.1	0.3 maximum	4.6	4.3	4.4	1.9
1016	10	16.5	±0.3	10.3	10.3	11	0.8 to 1.1	0.3 maximum	4.6	4.3	4.4	1.9

All soldering surfaces to be coplanar within 0.1 millimeters

Rating and part number

Rated voltage (Vdc)	Surge voltage (Vdc)	Capacitance[1] @ 120 Hz (µF)	Leakage current[1] (µA)	Dissipation factor[1] (tanδ)@ 120 Hz	ESR[1] @ 100 kHz (mΩ)	Ripple current @ 100 kHz, +125 °C (A)	Size code	Part number
16	20	820	131.2	0.16	18	2.8	1010	EHBSA016M8211010T
25	31.3	47	11.8	0.14	50	0.9	0606	EHBSA025M4700606T
		56	14	0.14	50	0.9	0606	EHBSA025M5600606T
		68	17	0.14	50	1.1	0606	EHBSA025M6800606T
		100	25	0.14	50	1.3	0606	EHBSA025M1010606T
		100	25	0.14	30	1.4	0608	EHBSA025M1010608T
		150	37.5	0.14	30	1.8	0608	EHBSA025M1510608T
		180	45	0.14	30	1.8	0608	EHBSA025M1810608T
		220	55	0.14	27	2.9	0810	EHBSA025M2210810T
		270	67.5	0.14	27	2.9	0810	EHBSA025M2710810T
		330	82.5	0.14	20	3.5	1010	EHBSA025M3311010T
		470	117.5	0.14	20	3.5	1010	EHBSA025M4711010T
		470	117.5	0.14	14	3.5	1012	EHBSA025M4711012T
35	43.8	27	9.5	0.12	60	0.9	0606	EHBSA035M2700606T
		47	16.5	0.12	60	0.9	0606	EHBSA035M4700606T
		47	16.5	0.12	35	1.4	0608	EHBSA035M4700608T
		68	23.8	0.12	35	1.4	0608	EHBSA035M6800608T
		100	35	0.12	35	1.7	0608	EHBSA035M1010608T
		100	35	0.12	27	1.9	0810	EHBSA035M1010810T
		120	42	0.12	35	1.7	0608	EHBSA035M1210608T
		150	52.5	0.12	27	2.9	0810	EHBSA035M1510810T
		180	63	0.12	27	2.9	0810	EHBSA035M1810810T
		220	77	0.12	20	2.8	1010	EHBSA035M2211010T
		270	94.5	0.12	20	3.5	1010	EHBSA035M2711010T
		330	115.5	0.12	20	3.5	1010	EHBSA035M3311010T
		330	115.5	0.12	14	3.5	1012	EHBSA035M3311012T
		390	136.5	0.12	20	3.5	1010	EHBSA035M3911010T
		470	164.5	0.12	14	3.5	1012	EHBSA035M4711012T
		470	164.5	0.12	11	4.0	1016	EHBSA035M4711016T
50	62.5	22	11	0.1	80	0.75	0606	EHBSA050M2200606T
		33	16.5	0.1	40	1.1	0608	EHBSA050M3300608T
		47	23.5	0.1	30	1.25	0810	EHBSA050M4700810T
		68	34	0.1	30	2.7	0810	EHBSA050M6800810T
		100	50	0.1	23	2.9	1010	EHBSA050M1011010T
		120	60	0.1	25	2.9	1010	EHBSA050M1211010T
		150	75	0.1	17	2.0	1012	EHBSA050M1511012T
		180	90	0.1	17	3.2	1012	EHBSA050M1811012T
		220	110	0.1	13	3.7	1016	EHBSA050M2211016T

1. +20 °C ±2 °C.

Rating and part number

Rated voltage (Vdc)	Surge voltage (Vdc)	Capacitance[1] @ 120 Hz (µF)	Leakage current[1] (µA)	Dissipation factor[1] (tanδ)@ 120 Hz	ESR[1] @ 100 kHz (mΩ)	Ripple current @ 100 kHz, +125 °C (A)	Size code	Part number
63	78.8	10	6.3	0.08	120	0.7	0606	EHBSA063M1000606T
		22	13.9	0.08	80	0.9	0608	EHBSA063M2200608T
		33	20.8	0.08	40	1.1	0810	EHBSA063M3300810T
		47	29.6	0.08	32	2.4	0810	EHBSA063M4700810T
		56	35.3	0.08	30	2.8	1010	EHBSA063M5601010T
		68	42.8	0.08	30	2.8	1010	EHBSA063M6801010T
		82	51.7	0.08	30	2.8	1010	EHBSA063M8201010T
		100	63	0.08	30	2.8	1010	EHBSA063M1011010T
		120	75.6	0.08	19	3.0	1012	EHBSA063M1211012T
		150	94.5	0.08	15	3.5	1016	EHBSA063M1511016T
80	100	22	17.6	0.08	45	1.05	0810	EHBSA080M2200810T
		47	37.6	0.08	33	1.36	1010	EHBSA080M4701010T
		56	44.8	0.08	33	1.36	1010	EHBSA080M5601010T

1. +20 °C ±2 °C.

Frequency coefficient of rated ripple current

Frequency	120 Hz	1 kHz	10 kHz	50 kHz	100 kHz to 300 kHz
Coefficient	0.05	0.30	0.70	0.85	1.0

Impedance at low temperature

Impedance ratio	Performance
Z (-55 °C) / Z (+20 °C)	≤ 2.0
Z (-40 °C) / Z (+20 °C)	≤ 1.5

Impedance at 100 kHz at -55 °C ± 3 °C or -40 °C ± 2 °C

Endurance

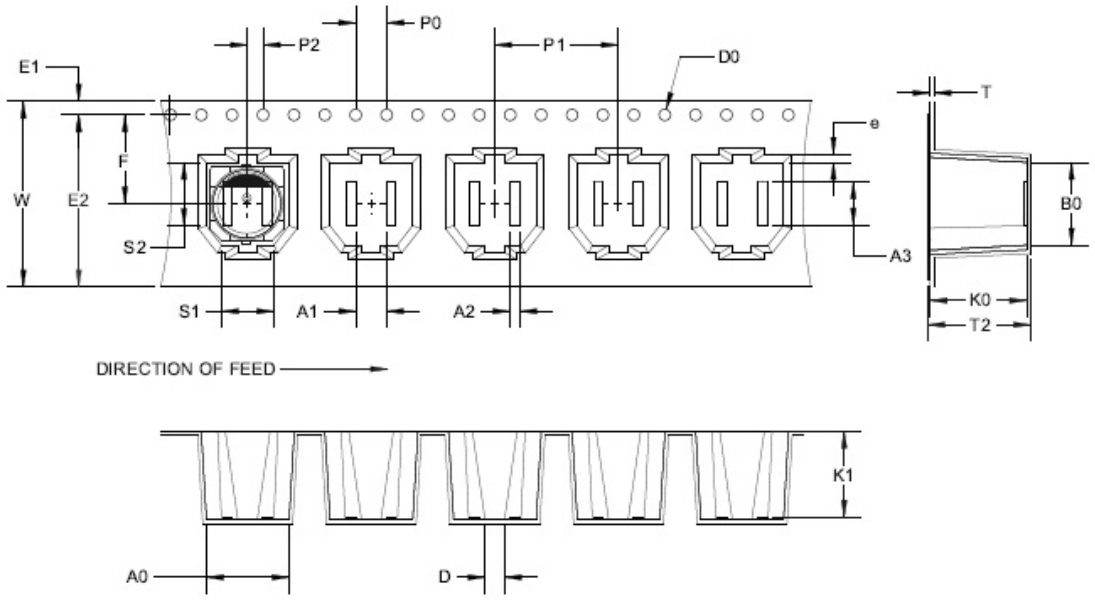
Characteristics	Performance
Appearance	No significant damage
Capacitance	≤ ±30% of the initial value
Dissipation factor tanδ	≤ 200% of the initial specified value
ESR	≤ 200% of the initial specified value
Leakage current	≤ the initial specified value

+ 125 °C, 4000 hours, apply the rated ripple current without exceeding the rated voltage

Packaging information (mm)

Drawing not to scale

Supplied in tape and reel packaging, 1200 parts for 0606 per 15" (381 mm.) diameter reel



Size Code	0606
Dimension	**Value**
W±0.30	16.00
F±0.15	7.50
E1±0.15	1.75
E2 Min.	14.25
P0±0.05	4.00
P1±0.10	12.00
P2±0.05	2.00
D0+0.10/-0	1.50
D±0.10	1.60
A0±0.10	7.00
B0±0.10	7.00
K0±0.10	6.50
K1±0.05	6.25
T±0.05	0.40
T2 Max.	7.07
e±0.10	0.60
S1±0.10	4.30
S2±0.10	5.20
A1±0.10	2.50
A2±0.10	0.80
A3±0.10	3.50

Packaging information (mm)

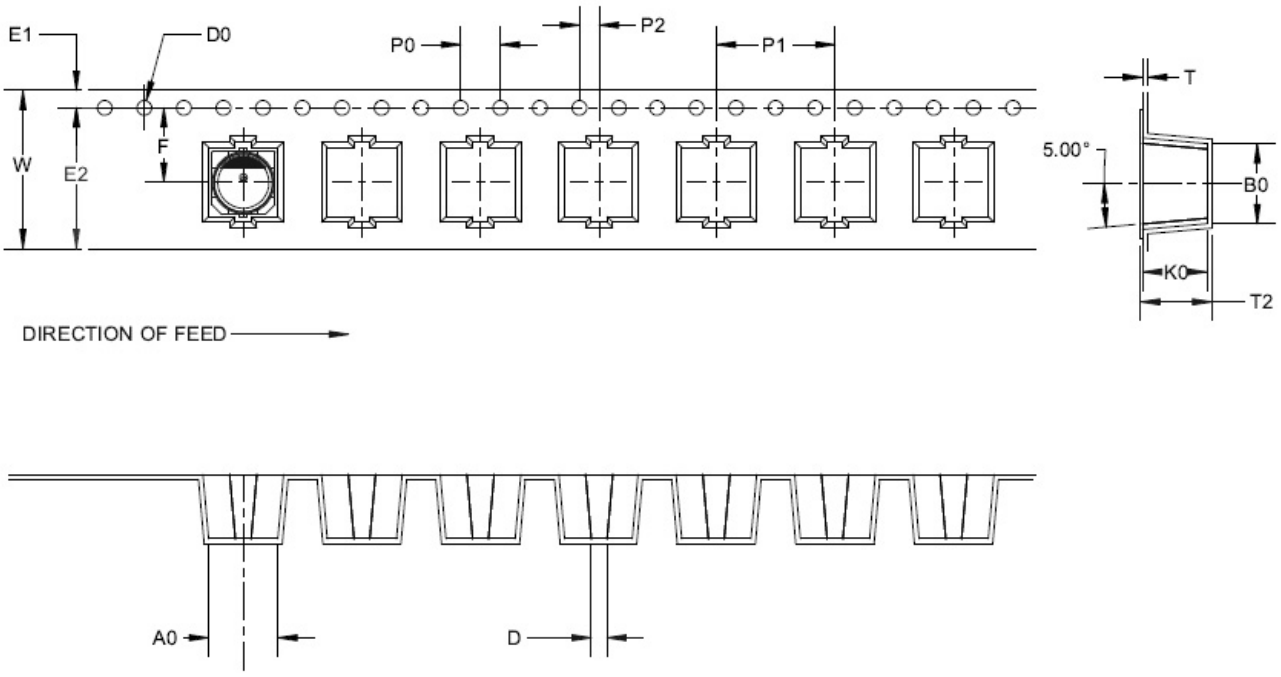
Drawing not to scale

Supplied in tape and reel packaging, 900 parts for 0608 per 15" (381 mm.) diameter reel

Supplied in tape and reel packaging, 500 parts for 0810 per 15" (381 mm.) diameter reel

Supplied in tape and reel packaging, 500 parts for 1010 per 15" (381 mm.) diameter reel

Supplied in tape and reel packaging, 450 parts for 1012 per 15" (381 mm.) diameter reel

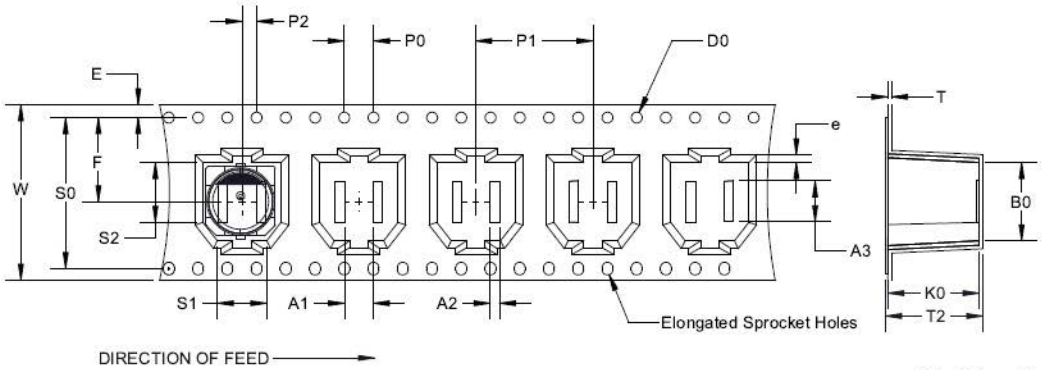


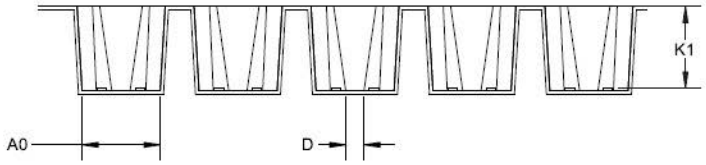
Size Code	0608	0810	1010	1012
Dimension	**Value**	**Value**	**Value**	**Value**
W±0.30	16.00	24.00	24.00	24.00
F±0.10	7.50	11.50	11.50	11.50
E1±0.10	1.75	1.75	1.75	1.75
E2 Min.	14.25	22.25	22.25	22.25
P0±0.10	4.00	4.00	4.00	4.00
P1±0.10	12.00	16.00	16.00	16.00
P2±0.10	2.00	2.00	2.00	2.00
D0+0.10/-0	1.50	1.50	1.50	1.50
D±0.10	1.60	1.60	1.60	1.60
A0±0.10	7.00	8.70	10.70	10.70
B0±0.10	7.00	8.70	10.70	10.70
K0	8.20±0.10	10.00+0.10/-0	11.00±0.10	13.00±0.10
T±0.05	0.50	0.50	0.50	0.50
T2 Max.	8.87	10.67	11.67	13.67

Packaging information (mm)

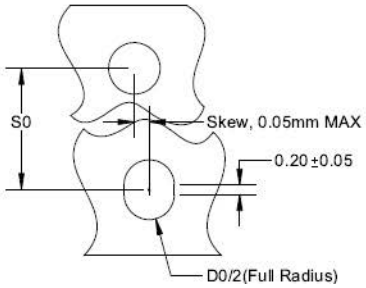
Drawing not to scale

Supplied in tape and reel packaging, 200 parts for 1016 per 15" (381 mm.) diameter reel





Detail, Elongation and Skew of Sprocket Holes



Size Code	**1016**
Dimension	**Value**
W±0.30	32.00
F±0.10	14.25
E±0.10	1.75
P0±0.10	4.00
P1±0.10	24.00
P2±0.10	2.00
D0+0.10/-0	1.50
D±0.10	1.60
A0±0.10	10.50
B0±0.10	10.50
K0±0.10	16.95
K1±0.05	16.85
T±0.05	0.50
T2 Max.	17.62
e±0.10	0.60
S0±0.10	28.40
S1±0.10	7.30
S2±0.10	8.70
A1±0.10	4.00
A2±0.10	1.00
A3±0.10	5.40

Storage condition and shelf life

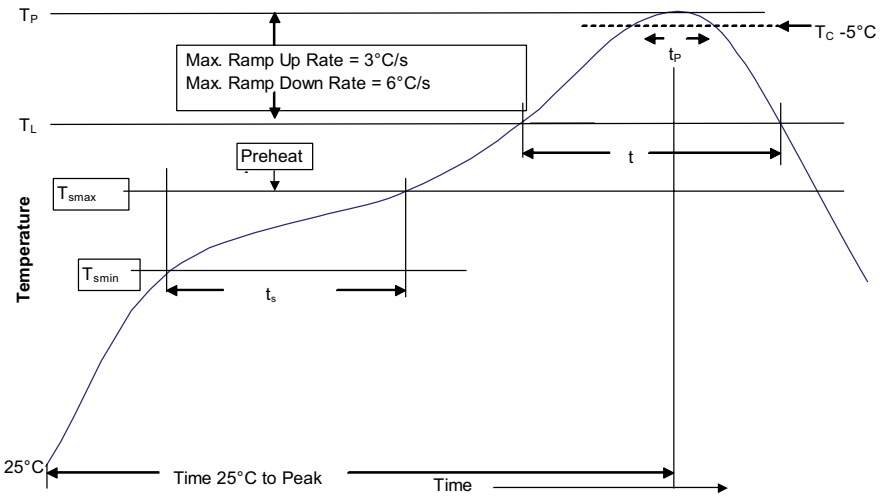
The minimum shelf life is two (2) years from date code manufactured provided product is maintained in its original packaging and stored in a controlled environment under the conditions of +15 to +35 °C / < 75% relative humidity.

A capacitor left for a long period is prone to have a greater flow of leak current. This happens because the oxide film deteriorates under a no-load condition. Voltage application to the capacitor reduces the leak current.

However, at the start of voltage application, a large flow of film recovery current increases the leak current, which may cause a circuit failure, etc.

Avoid the following storage environmental conditions:

- Environments resulting in water adhesion, high temperatures, high humidity, and condensation.
- Environments resulting in oil adhesion or environments filled with oil components in a gaseous state.
- Environments resulting in saltwater adhesion or environments filled with salt.
- Environments filled with acidic toxic gases (hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine, methyl bromide, etc.).
- Environments filled with ammonia or other alkaline toxic gases.
- Environments exposed to acids or alkaline solvents.
- Environments exposed to direct sunlight, ozone, UV light, or radiation.
- Conditions related to vibration and shock.



Profile feature		
Preheat and soak	• Temperature minimum (T_{smin})	150 °C
	• Temperature maximum (T_{smax})	200 °C
	• Time (T_{smin} to T_{smax}) (t_s)	60 to 120 seconds
Ramp up rate T_L to T_p		3 °C/ second maximum
Liquidous temperature (T_L) Time (t_L) maintained above T_L		217 °C 60 to 150 seconds
Peak package body temperature (T_P)		260 °C
Time (t_p)* within 5 °C of the specified classification temperature (T_C)		10 seconds
Ramp-down rate (T_p to T_L)		6 °C/ second maximum

* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

Manual solder

+350 °C, 20 Watt soldering iron, 4 to 5 seconds maximum with tip diameter of 1.0 mm maximum, generally manual, hand soldering is not recommended

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