Actual Situation of Lead Free Soldering for GPC

November 10th, 2008

All following GPC capacitors, with manufacturing code WD (December 2008) and later, are capable to fulfil the recommended reflow soldering profile for lead free process presented at end of this document.

63 VDC/40 VAC

CHIP LENGTH 7.3 MM CODE 2824

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.00047	K31	6.0	2.5	400	GPC7.3 471K63K31 TR12
0.00068	K31	6.0	2.5	400	GPC7.3 681K63K31 TR12
0.0010	K31	6.0	2.5	400	GPC7.3 102K63K31 TR12
0.0015	K31	6.0	2.5	400	GPC7.3 152K63K31 TR12
0.0022	K31	6.0	2.5	400	GPC7.3 222K63K31 TR12
0.0033	K31	6.0	2.5	400	GPC7.3 332K63K31 TR12
0.0047	K31	6.0	2.5	400	GPC7.3 472K63K31 TR12
0.0068	K31	6.0	2.5	400	GPC7.3 682K63K31 TR12
0.010	K31	6.0	2.5	400	GPC7.3 103K63K31 TR12
0.015	K31	6.0	2.5	400	GPC7.3 153K63K31 TR12
0.022	K31	6.0	2.5	400	GPC7.3 223K63K31 TR12
0.033	K33	6.0	3.0	400	GPC7.3 333K63K33 TR12
0.047	K33	6.0	3.0	400	GPC7.3 473K63K33 TR12
0.068	K35	6.0	3.5	400	GPC7.3 683K63K35 TR12
0.10	K37	6.0	4.5	400	GPC7.3 104K63K37 TR12

CHIP LENGTH 10.2 MM CODE 4036

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.0068	A31	9.1	5.5	300	GPC10.2 682K63A31 TR16
0.010	A31	9.1	5.5	300	GPC10.2 103K63A31 TR16
0.015	A31	9.1	5.5	300	GPC10.2 153K63A31 TR16
0.022	A31	9.1	5.5	300	GPC10.2 223K63A31 TR16
0.027	A31	9.1	5.5	300	GPC10.2 273K63A31 TR16
0.033	A31	9.1	5.5	300	GPC10.2 333K63A31 TR16
0.047	A31	9.1	5.5	300	GPC10.2 473K63A31 TR16
0.068	A31	9.1	5.5	300	GPC10.2 683K63A31 TR16
0.10	A31	9.1	5.5	300	GPC10.2 104K63A31 TR16
0.15	A31	9.1	5.5	300	GPC10.2 154K63A31 TR16
0.22	A31	9.1	5.5	300	GPC10.2 224K63A31 TR16
0.33	A31	9.1	5.5	300	GPC10.2 334K63A31 TR16

CHIP LENGTH 12.7 MM CODE 5045

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.47	B31	11.5	6.5	200	GPC12.7 474K63B31 TR24

CHIP LENGTH 16.5 MM CODE 6560

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.68	C31	15.0	7.0	100	GPC16.5 684K63C31 TR24
1.0	C31	15.0	7.0	100	GPC16.5 105K63C31 TR24

100 VDC/63 VAC

CHIP LENGTH 7.3 MM CODE 2824

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.00047	K31	6.0	2.5	800	GPC7.3 471K100K31 TR12
0.00068	K31	6.0	2.5	800	GPC7.3 681K100K31 TR12
0.0010	K31	6.0	2.5	800	GPC7.3 102K100K31 TR12
0.0015	K31	6.0	2.5	800	GPC7.3 152K100K31 TR12
0.0022	K31	6.0	2.5	800	GPC7.3 222K100K31 TR12
0.0033	K31	6.0	2.5	800	GPC7.3 332K100K31 TR12
0.0047	K31	6.0	2.5	800	GPC7.3 472K100K31 TR12
0.0068	K31	6.0	2.5	800	GPC7.3 682K100K31 TR12
0.010	K31	6.0	2.5	800	GPC7.3 103K100K31 TR12
0.015	K33	6.0	3.0	800	GPC7.3 153K100K33 TR12
0.022	K33	6.0	3.0	800	GPC7.3 223K100K33 TR12
0.033	K35	6.0	3.5	800	GPC7.3 333K100K35 TR12
0.047	K37	6.0	4.5	800	GPC7.3 473K100K37 TR12

100 VDC/63 VAC

CHIP LENGTH 10.2 MM CODE 4036

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.0068	A31	9.1	5.5	600	GPC10.2 682K100A31 TR16
0.010	A31	9.1	5.5	600	GPC10.2 103K100A31 TR16
0.015	A31	9.1	5.5	600	GPC10.2 153K100A31 TR16
0.022	A31	9.1	5.5	600	GPC10.2 223K100A31 TR16
0.027	A31	9.1	5.5	600	GPC10.2 273K100A31 TR16
0.033	A31	9.1	5.5	600	GPC10.2 333K100A31 TR16
0.047	A31	9.1	5.5	600	GPC10.2 473K100A31 TR16
0.068	A31	9.1	5.5	600	GPC10.2 683K100A31 TR16
0.10	A31	9.1	5.5	600	GPC10.2 104K100A31 TR16
0.15	A31	9.1	5.5	600	GPC10.2 154K100A31 TR16

CHIP LENGTH 12.7 MM CODE 5045

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.22	B31	11.5	6.5	400	GPC12.7 224K100B31 TR24
0.33	B31	11.5	6.5	400	GPC12.7 334K100B31 TR24

CHIP LENGTH 16.5 MM CODE 6560

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.47	C31	15.0	7.0	150	GPC16.5 474K100C31 TR24
0.68	C31	15.0	7.0	150	GPC16.5 684K100C31 TR24
1.0	C31	15.0	7.0	150	GPC16.5 105K100C31 TR24

160 VDC/100 VAC

CHIP LENGTH 7.3 MM CODE 2824

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.00047	K31	6.0	2.5	1000	GPC7.3 471K160K31 TR12
0.00068	K31	6.0	2.5	1000	GPC7.3 681K160K31 TR12
0.0010	K31	6.0	2.5	1000	GPC7.3 102K160K31 TR12
0.0015	K31	6.0	2.5	1000	GPC7.3 152K160K31 TR12
0.0022	K31	6.0	2.5	1000	GPC7.3 222K160K31 TR12
0.0033	K31	6.0	2.5	1000	GPC7.3 332K160K31 TR12
0.0047	K31	6.0	2.5	1000	GPC7.3 472K160K31 TR12
0.0068	K31	6.0	2.5	1000	GPC7.3 682K160K31 TR12
0.010	K33	6.0	3.0	1000	GPC7.3 103K160K33 TR12
0.015	K33	6.0	3.0	1000	GPC7.3 153K160K33 TR12
0.022	K35	6.0	3.5	1000	GPC7.3 223K160K35 TR12
0.033	K37	6.0	4.5	1000	GPC7.3 333K160K37 TR12

CHIP LENGTH 10.2 MM CODE 4036

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.0068	A31	9.1	5.5	800	GPC10.2 682K160A31 TR16
0.010	A31	9.1	5.5	800	GPC10.2 103K160A31 TR16
0.015	A31	9.1	5.5	800	GPC10.2 153K160A31 TR16
0.022	A31	9.1	5.5	800	GPC10.2 223K160A31 TR16
0.027	A31	9.1	5.5	800	GPC10.2 273K160A31 TR16
0.033	A31	9.1	5.5	800	GPC10.2 333K160A31 TR16
0.047	A31	9.1	5.5	800	GPC10.2 473K160A31 TR16
0.068	A31	9.1	5.5	800	GPC10.2 683K160A31 TR16
0.10	A31	9.1	5.5	800	GPC10.2 104K160A31 TR16

CHIP LENGTH 12.7 MM CODE 5045

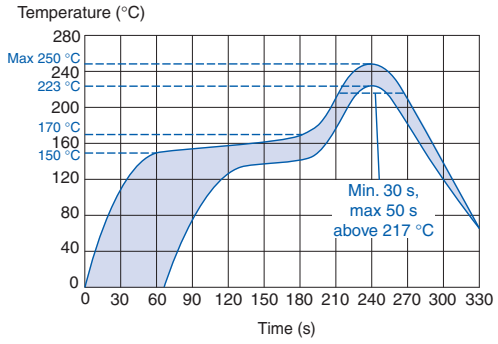
Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
0.15	B31	11.5	6.5	600	GPC12.7 154K160B31 TR24
0.22	B31	11.5	6.5	600	GPC12.7 224K160B31 TR24

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
160 VDC/100 VAC					
CHIP LENGTH 16.5 MM CODE 6560					
0.33	C31	15.0	7.0	250	GPC16.5 334K160C31 TR24
0.47	C31	15.0	7.0	250	GPC16.5 474K160C31 TR24
0.68	C31	15.0	7.0	250	GPC16.5 684K160C31 TR24
250 VDC/160 VAC					
CHIP LENGTH 7.3 MM CODE 2824					
0.00047	K31	6.0	2.5	1200	GPC7.3 471K250K31 TR12
0.00068	K31	6.0	2.5	1200	GPC7.3 681K250K31 TR12
0.0010	K31	6.0	2.5	1200	GPC7.3 102K250K31 TR12
0.0015	K31	6.0	2.5	1200	GPC7.3 152K250K31 TR12
0.0022	K31	6.0	2.5	1200	GPC7.3 222K250K31 TR12
0.0033	K31	6.0	2.5	1200	GPC7.3 332K250K31 TR12
0.0047	K31	6.0	2.5	1200	GPC7.3 472K250K31 TR12
0.0068	K33	6.0	3.0	1200	GPC7.3 682K250K33 TR12
0.010	K33	6.0	3.0	1200	GPC7.3 103K250K33 TR12
0.015	K35	6.0	3.5	1200	GPC7.3 153K250K35 TR12
0.022	K37	6.0	4.5	1200	GPC7.3 223K250K37 TR12
CHIP LENGTH 10.2 MM CODE 4036					
0.0068	A31	9.1	5.5	1000	GPC10.2 682K250A31 TR16
0.010	A31	9.1	5.5	1000	GPC10.2 103K250A31 TR16
0.015	A31	9.1	5.5	1000	GPC10.2 153K250A31 TR16
0.022	A31	9.1	5.5	1000	GPC10.2 223K250A31 TR16
0.027	A31	9.1	5.5	1000	GPC10.2 273K250A31 TR16
0.033	A31	9.1	5.5	1000	GPC10.2 333K250A31 TR16
0.047	A31	9.1	5.5	1000	GPC10.2 473K250A31 TR16
0.068	A31	9.1	5.5	1000	GPC10.2 683K250A31 TR16
CHIP LENGTH 12.7 MM CODE 5045					
0.10	B31	11.5	6.5	700	GPC12.7 104K250B31 TR24
0.15	B31	11.5	6.5	700	GPC12.7 154K250B31 TR24
CHIP LENGTH 16.5 MM CODE 6560					
0.22	C31	15.0	7.0	350	GPC16.5 224K250C31 TR24
0.33	C31	15.0	7.0	350	GPC16.5 334K250C31 TR24
0.47	C31	15.0	7.0	350	GPC16.5 474K250C31 TR24
400 VDC/200 VAC					
CHIP LENGTH 7.3 MM CODE 2824					
0.00047	K31	6.0	2.5	1600	GPC7.3 471K400K31 TR12
0.00068	K31	6.0	2.5	1600	GPC7.3 681K400K31 TR12
0.0010	K31	6.0	2.5	1600	GPC7.3 102K400K31 TR12
0.0015	K31	6.0	2.5	1600	GPC7.3 152K400K31 TR12
0.0022	K31	6.0	2.5	1600	GPC7.3 222K400K31 TR12
0.0033	K31	6.0	2.5	1600	GPC7.3 332K400K31 TR12
0.0047	K33	6.0	3.0	1600	GPC7.3 472K400K33 TR12
0.0068	K35	6.0	3.5	1600	GPC7.3 682K400K35 TR12
0.010	K37	6.0	4.5	1600	GPC7.3 103K400K37 TR12
CHIP LENGTH 10.2 MM CODE 4036					
0.0068	A31	9.1	5.5	1300	GPC10.2 682K400A31 TR16
0.010	A31	9.1	5.5	1300	GPC10.2 103K400A31 TR16
0.015	A31	9.1	5.5	1300	GPC10.2 153K400A31 TR16
0.022	A31	9.1	5.5	1300	GPC10.2 223K400A31 TR16
0.027	A31	9.1	5.5	1300	GPC10.2 273K400A31 TR16

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
400 VDC/200 VAC					
CHIP LENGTH 12.7 MM CODE 5045					
0.033	B31	11.5	6.5	900	GPC12.7 333K400B31 TR24
0.047	B31	11.5	6.5	900	GPC12.7 473K400B31 TR24
0.068	B31	11.5	6.5	900	GPC12.7 683K400B31 TR24
CHIP LENGTH 16.5 MM CODE 6560					
0.10	C31	15.0	7.0	450	GPC16.5 104K400C31 TR24
0.15	C31	15.0	7.0	450	GPC16.5 154K400C31 TR24
0.22	C31	15.0	7.0	450	GPC16.5 224K400C31 TR24
630 VDC/300 VAC					
CHIP LENGTH 7.3 MM CODE 2824					
0.00047	K31	6.0	2.5	2000	GPC7.3 471K630K31 TR12
0.00068	K31	6.0	2.5	2000	GPC7.3 681K630K31 TR12
0.0010	K31	6.0	2.5	2000	GPC7.3 102K630K31 TR12
0.0015	K31	6.0	2.5	2000	GPC7.3 152K630K31 TR12
0.0022	K33	6.0	3.0	2000	GPC7.3 222K630K33 TR12
0.0033	K33	6.0	3.0	2000	GPC7.3 332K630K33 TR12
0.0047	K35	6.0	3.5	2000	GPC7.3 472K630K35 TR12
0.0068	K37	6.0	4.5	2000	GPC7.3 682K630K37 TR12
CHIP LENGTH 10.2 MM CODE 4036					
0.0068	A31	9.1	5.5	1600	GPC10.2 682K630A31 TR16
0.010	A31	9.1	5.5	1600	GPC10.2 103K630A31 TR16
0.015	A31	9.1	5.5	1600	GPC10.2 153K630A31 TR16
0.022	A31	9.1	5.5	1600	GPC10.2 223K630A31 TR16
CHIP LENGTH 12.7 MM CODE 5045					
0.033	B31	11.5	6.5	1100	GPC12.7 333K630B31 TR24
0.047	B31	11.5	6.5	1100	GPC12.7 473K630B31 TR24
CHIP LENGTH 16.5 MM CODE 6560					
0.068	C31	15.0	7.0	550	GPC16.5 683K630C31 TR24
0.10	C31	15.0	7.0	550	GPC16.5 104K630C31 TR24
1000 VDC/350 VAC					
CHIP LENGTH 7.3 MM CODE 2824					
0.00047	K31	6.0	2.5	2200	GPC7.3 471K1000K31 TR12
0.00068	K31	6.0	2.5	2200	GPC7.3 681K1000K31 TR12
0.0010	K31	6.0	2.5	2200	GPC7.3 102K1000K31 TR12
0.0015	K33	6.0	3.0	2200	GPC7.3 152K1000K33 TR12
0.0022	K33	6.0	3.0	2200	GPC7.3 222K1000K33 TR12
0.0033	K35	6.0	3.5	2200	GPC7.3 332K1000K35 TR12
0.0047	K37	6.0	4.5	2200	GPC7.3 472K1000K37 TR12
CHIP LENGTH 10.2 MM CODE 4036					
0.0068	A31	9.1	5.5	1700	GPC10.2 682K1000A31 TR16
0.010	A31	9.1	5.5	1700	GPC10.2 103K1000A31 TR16
0.015	A31	9.1	5.5	1700	GPC10.2 153K1000A31 TR16
CHIP LENGTH 12.7 MM CODE 5045					
0.022	B31	11.5	6.5	1200	GPC12.7 223K1000B31 TR24
0.033	B31	11.5	6.5	1200	GPC12.7 333K1000B31 TR24

Capacitance µF	Size code	Dimensions in mm ±0.2 B	H	Max dU/dt V/µs	Article code
1000 VDC/350 VAC					
CHIP LENGTH 16.5 MM CODE 6560					
0.047	C31	15.0	7.0	600	GPC16.5 473K1000C31 TR24
0.068	C31	15.0	7.0	600	GPC16.5 683K1000C31 TR24

Reflow soldering on the top body surface of the component
Preheating temperature should be less than 170 °C. The time above 217 °C should be less than 50 s. The peak temperature must not exceed 250 °C.
This profile is recommended for convection reflow ovens and IR reflow ovens. If vapour phase reflow oven is used, please consult Evox Rifa.



This recommended reflow soldering profile for lead free soldering is valid for those GPC products listed above, which have manufacturing code WD (December 2008) and later.
For marking of our SMD capacitors, please see page 18 in the Evox Rifa SMD and DIL Film Capacitors catalogue or www.evoxrifa.com/smd_catalog/wound_tech_caps/gen_info_wound_smd.pdf

Exceeding the manufacturer's process recommendations may harm the component and keep the manufacturer not liable for any defect caused by exceeding the recommendations.

According to international standards, the maximum temperature capability shall be measured on the top surface of a component. Any of the international standards do not define how the thermocouple should be fastened on the component. Our recommendation for attaching the thermocouple on the top surface of the component is glueing with high temperature resistant glue.

All updates for SMD capacitors reflow capability will be informed through www.evoxrifa.com.
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