Technical Data 11216

Effective January 2021 Supersedes November 2020

SMCPxxxSC Thyristor



Product features

- Low profile SMB package
- Lower capacitance
- · Low on-state voltage
- Excellent capability of absorbing transient surge
- · Quick response to surge voltage (ns level)
- Eliminates overvoltage caused by fast rising transients
- Meets moisture sensitivity level (MSL) level 1
- UL 497B recognized. File No. : E198449 Guide QVGQ2
- SMCPxxxSC tested and confirmed compatible with Bussmann series <u>TCP brick</u> <u>fuse</u> (see page 4)

Applications

- Consumer electronics
- Telecommunications
- · Computing and servers
- Networking equipment

Environmental compliance and general specifications

BUSSMANN SERIES



Ordering part number

	<u>SMCP 380</u>	<u>0 S C</u>
Family as ma		
Family name ———		
V _R voltage	I	
Bi-/Uni-Directional — (0 = Bi, 1 = Uni)		
Package type ———		
Surge rating		

PIN configuration





Absolute maximum ratings (+25 °C, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Operating junction temperature range	TJ	-40 to +125	°C
Repetitive peak pulse current	I _{pp}	100	А
Storage temperature range	T _{stg}	-60 to +150	°C

Surge ratings

	I _{PP} (A) minimum			
Family	2×10 µs	8×20 μs	10×360 µs	10×1000 μs
SMCP	500	400	175	100

Electrical characteristics (+25 °C)

I _{drm} @V _{drm}		V _s @ I _s		V _T @ I _T		I _H	Co	
(µA) max	(V)	(V) max	(mA) max	(V) max	A max	(mA) min	(pF) max	Marking
1	6	15	800	4	2.2	30	60	CP-8C
1	25	40	800	4	2.2	30	60	CP03C
1	58	77	800	4	2.2	120	60	CP06C
1	65	87	800	4	2.2	120	50	CP07C
1	120	160	800	4	2.2	120	50	CP13C
1	140	180	800	4	2.2	120	45	CP15C
1	170	220	800	4	2.2	120	45	CP18C
1	190	260	800	4	2.2	120	40	CP23C
1	220	300	800	4	2.2	120	40	CP26C
1	275	350	800	4	2.2	120	35	CP31C
1	320	400	800	4	2.2	120	35	CP35C
1	340	450	800	4	2.2	120	35	CP38C
1	400	520	800	4	2.2	120	35	CP42C
	(μA) max 1	(μA) max (V) 1 6 1 25 1 58 1 65 1 120 1 140 1 140 1 170 1 220 1 220 1 220 1 220 1 220 1 220 1 320 1 340	(μA) max(V)(V) max16151254015877165871120160114018011702201902601220300127535013204001340450	(μA) max(V)(V) max(mA) max161580012540800158778001658780016587800112016080011401808001170220800120300800122030080013204008001340450800	(μA) max(V)(V) max(mA) max(V) max16158004125408004158778004158778004165878004112016080041140180800411702208004122030080041225350800413204008004	(μA) max(V)(V) max(mA) max(V) maxA max161580042.21254080042.21587780042.21658780042.21658780042.2112016080042.2114018080042.2117022080042.212030080042.2122030080042.2132040080042.2134045080042.2	(μA) max(V) max(MA) max(V) maxA max(mA) min161580042.2301254080042.2301587780042.21201658780042.2120112016080042.2120114018080042.2120117022080042.2120119026080042.2120122030080042.2120132040080042.2120134045080042.2120	(μA) max(V)(V) max(mA) max(V) maxA max(mA) min(pF) max161580042.230601254080042.230601587780042.2120601658780042.212050112016080042.212050112016080042.212045114018080042.212045117022080042.21204012030080042.212035132040080042.212035134045080042.212035

SMCPxxxSC Thyristor

Mechanical parameters, pad layout- mm/inches





	Millimeters		Inches	
Dimension	Minimum	Maximum	Minimum	Maximum
A	3.30	3.94	0.130	0.155
В	4.30	4.80	0.169	0.189
С	1.90	2.20	0.075	0.087
D	0.95	1.52	0.037	0.060
E	5.20	5.60	0.205	0.220
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
Н	2.10	2.40	0.083	0.094
J	2.20		0.087	
К		2.60		0.102
L	2.30		0.091	

Part marking



Part marking: xxxx = Date code yyyyy- Refer to marking designator listed in Electrical Characteristics table

Packaging information (mm)

Drawing not to scale.

Supplied in tape and reel packaging, 3,000 parts per 13" diameter reel (EIA-481 compliant)



Dimension	Millimeters	Inches
A0	3.76 ± 0.3	0.148 ± 0.012
B0	5.69 ± 0.3	0.224 ± 0.012
С	330.0	13.0
DO	1.55 ± 0.1	0.061 ± 0.004
E	1.75 ± 0.2	0.069 ± 0.008
E1	13.3 ± 0.3	0.524 ± 0.012
F	5.5 ± 0.2	0.217 ± 0.008
PO	4.00 ± 0.2	0.157 ± 0.008
P1	8.00 ± 0.2	0.315 ± 0.008
P2	2.00 ± 0.2	0.079 ± 0.008
W	12.0 ± 0.2	0.472 ± 0.008
W1	15.7 ± 2.0	0.618 ± 0.079

Ratings and V-I characteristic curves (+25 °C unless otherwise noted)

V- I curve characteristics (Uni-directional)



Normalized DC holding current vs. case temperature



Special Investigation

The SMCPxxxSC family has been tested and confirmed compatible with the Bussmann series TCP brick fuse. The SMCP3100SC with the TCP1.25-R is compliant with Telcordia GR-1089 (lightning and AC power fault), FCC Part 68 and UL 60950 (AC power fault). To provide easier specification experience, Eaton can provide a special test report confirming the coordination between the SMCP3100SC and the TCP1.25-R devices



Pulse waveform

Normalized vs. change vs. junction temperature





Test Circuit 1

Test Circuit 2

SMCPxxxSC Thyristor

Solder reflow profile



Table 1 - Standard SnPb solder (T_c)

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

Table 2 - Lead (Pb) free solder (T_c)

Package thickness	Volume mm ³ <350	Volume mm ³ 350 - 2000	Volume mm ³ >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

Powering Business Worldwide

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	60-180 seconds
Ramp up rate TL to Tp	3 °C/ second max.	3 °C/ second max.
Liquidous temperature (TL) Time (tL) maintained above ${\rm T_L}$	183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body temperature (Tp)*	Table 1	Table 2
Time $(t_p)^*$ within 5 °C of the specified classification temperature (T_c)	20 seconds*	30 seconds*
Ramp-down rate (T _p to TL)	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

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

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