

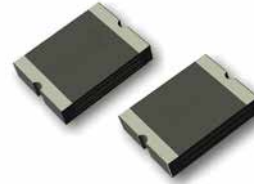
Positive Thermal Coefficient

SMD1206 Series

Positive Thermal Coefficient - SMD1206 Series

Description

The 1206 series provides miniature surface mount overcurrent protection with holding current from 0.05A to 3.0A. This series is suitable for wide range of applications in modern electronics where space is limited.



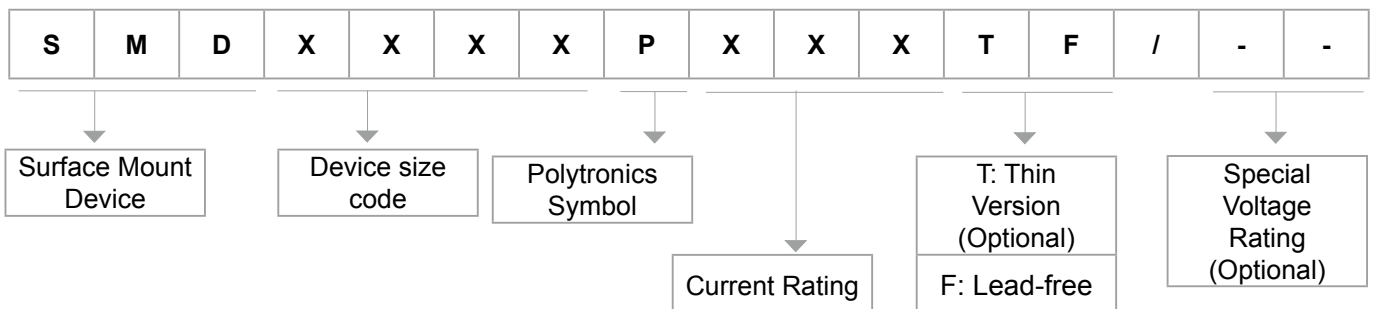
Features

- I(hold): 0.05~3.0A
- Very high voltage surge capabilities
- Available in lead-free version
- Fast response to fault current
- RoHS compliant, Lead- Free and Halogen-Free
- Low resistance
- Compact design saves board space
- Compatible with high temperature solders

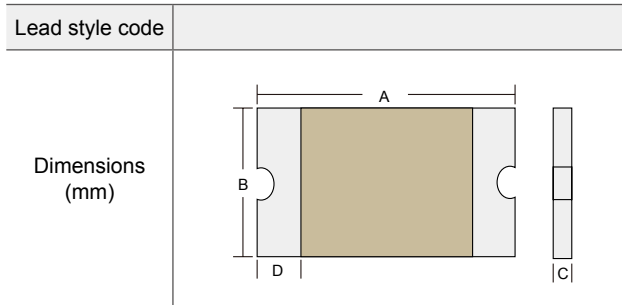
Applications

- USB peripherals
- Disk drives
- CD-ROMs
- General electronics
- Disk drives
- Set-top-box and HDMI
- Mobile Internet Device (MID)
- PDAs / digital cameras
- Game console port protection
- Plug and play protection for motherboards and peripherals
- Mobile phones - battery and port protection

Product Name

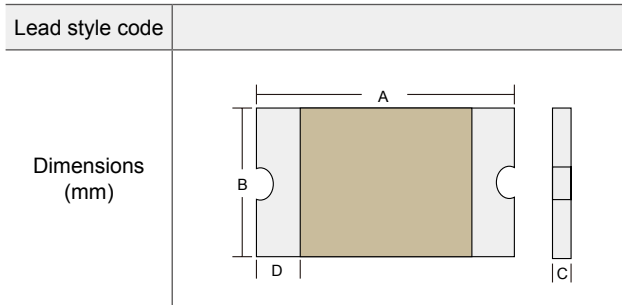


Positive Thermal Coefficient - SMD1206 Series



Type Number	I _{hold}	I _{trip}	Maximum Time To Trip		V _{max}	I _{max}	P _{d typ}	R _{min}	R _{1max}	Package	Package Dimensions (mm)						
			Current A	Time (Sec.)							A		B		C		D
	A	A	A	Sec.	V _{DC}	A	W	Ω	Ω	min	max	min	max	min	max	min	
SMD1206P005TF	0.05	0.15	0.25	1.5	60	100	0.4	3.6	50	1206	3.0	3.5	1.5	1.8	0.7	1.3	0.15
SMD1206P010TF	0.1	0.25	0.5	1.0	60	100	0.4	1.6	15	1206	3.0	3.5	1.5	1.8	0.7	1.3	0.15
SMD1206P012TF	0.12	0.29	0.2	0.2	60	100	0.6	1.5	6	1206	3.0	3.5	1.5	1.8	0.7	1.3	0.15
SMD1206P016TF	0.16	0.37	0.3	0.3	24	100	0.6	1.2	4.5	1206	3.0	3.5	1.5	1.8	0.7	1.3	0.15
SMD1206P020TF	0.2	0.46	8.0	0.08	24	100	0.6	0.35	2.7	1206	3.0	3.5	1.5	1.8	0.5	1.0	0.15
SMD1206P020TF/30	0.2	0.46	8.0	0.08	30	100	0.6	0.35	2.7	1206	3.0	3.5	1.5	1.8	0.5	1.0	0.15
SMD1206P020TF/48	0.2	0.46	8.0	0.08	48	100	0.6	0.35	2.7	1206	3.0	3.5	1.5	1.8	0.5	1.0	0.15
SMD1206P025TF	0.25	0.5	8.0	0.08	16	100	0.6	0.35	2.5	1206	3.0	3.5	1.5	1.8	0.5	1.0	0.15
SMD1206P025TF/30	0.25	0.5	8.0	0.08	30	100	0.6	0.35	2.5	1206	3.0	3.5	1.5	1.8	0.5	1.0	0.15
SMD1206P035TF	0.35	0.75	8.0	0.1	6.0	100	0.6	0.25	1.3	1206	3.0	3.5	1.5	1.8	0.5	1.0	0.15
SMD1206P035TF/16	0.35	0.75	8.0	0.1	16	100	0.6	0.25	1.3	1206	3.0	3.5	1.5	1.8	0.9	1.6	0.15
SMD1206P035TF/24	0.35	0.75	8.0	0.1	24	100	0.6	0.25	1.3	1206	3.0	3.5	1.5	1.8	0.9	1.6	0.15
SMD1206P035TF/48	0.35	0.75	8.0	0.1	48	100	0.6	0.25	1.3	1206	3.0	3.5	1.5	1.8	0.9	1.6	0.15
SMD1206P050TF	0.5	1.0	8.0	0.1	6.0	100	0.6	0.15	0.7	1206	3.0	3.5	1.5	1.8	0.5	1.0	0.15
SMD1206P050TF/13.2	0.5	1.0	8.0	0.1	13.2	100	0.6	0.15	0.7	1206	3.0	3.5	1.5	1.8	0.5	1.0	0.15
SMD1206P050TF/16	0.5	1.0	8.0	0.1	16	100	0.6	0.15	0.7	1206	3.0	3.5	1.5	1.8	0.8	1.4	0.15
SMD1206P050TF/24	0.5	1.0	8.0	0.1	24	100	0.6	0.15	0.7	1206	3.0	3.5	1.5	1.8	0.9	1.6	0.15
SMD1206P050TF/30	0.5	1.0	8.0	0.1	30	100	0.6	0.15	0.7	1206	3.0	3.5	1.5	1.8	0.9	1.6	0.15
SMD1206P075TF	0.75	1.5	8.0	0.2	6.0	100	0.6	0.09	0.5	1206	3.0	3.5	1.5	1.8	0.4	0.8	0.15
SMD1206P075TF/13.2	0.75	1.5	8.0	0.2	13.2	100	0.6	0.09	0.5	1206	3.0	3.5	1.5	1.8	0.8	1.4	0.15
SMD1206P075TF/16	0.75	1.5	8.0	0.2	16	100	0.6	0.09	0.5	1206	3.0	3.5	1.5	1.8	0.9	1.6	0.15
SMD1206P075TF/24	0.75	1.5	8.0	0.2	24	100	0.6	0.09	0.5	1206	3.0	3.5	1.5	1.8	0.9	1.6	0.15
SMD1206P100TF	1.0	1.8	8.0	0.3	6.0	100	0.6	0.055	0.27	1206	3.0	3.5	1.5	1.8	0.4	0.8	0.15
SMD1206P100TF/12	1.0	1.8	8.0	0.3	12	100	0.6	0.055	0.27	1206	3.0	3.5	1.5	1.8	0.5	1.1	0.15
SMD1206P100TF/16	1.0	1.8	8.0	0.3	16	100	0.6	0.055	0.27	1206	3.0	3.5	1.5	1.8	0.5	1.1	0.15

Positive Thermal Coefficient - SMD1206 Series



Type Number	I _{hold}	I _{trip}	Maximum Time To Trip		V _{max}	I _{max}	P _{d typ}	R _{min}	R _{1max}	Package	Package Dimensions (mm)						
			Current A	Time (Sec.)							A		B		C		D
											min	max	min	max	min	max	min
SMD1206P100TF24	1	1.8	8	0.3	24	100	0.6	0.055	0.27	1206	3	3.5	1.5	1.8	0.6	1.2	0.15
SMD1206P110TF	1.1	2.2	8	0.3	6	100	0.8	0.04	0.18	1206	3	3.5	1.5	1.8	0.4	0.8	0.15
SMD1206P110TF/12	1.1	2.2	8	0.3	12	100	1.1	2.2	8	1206	3	3.5	1.5	1.8	0.5	1.1	0.15
MD1206P110TF/24	1.1	2.2	8	0.3	24	100	1.1	2.2	8	1206	3	3.5	1.5	1.8	0.8	1.4	0.15
MD1206P110TF/33	1.1	2.2	8	0.3	33	100	1.1	2.2	8	1206	3	3.5	1.5	1.8	0.8	1.4	0.15
SMD1206P150TF	1.5	3	8	1	6	100	0.8	0.04	0.13	1206	3	3.5	1.5	1.8	0.6	1.2	0.15
SMD1206P150TF/12	1.5	3	8	1	12	100	0.8	0.04	0.13	1206	3	3.5	1.5	1.8	0.6	1.2	0.15
SMD1206P150TF/16	1.5	3	8	1	16	100	0.8	0.04	0.13	1206	3	3.5	1.5	1.8	0.8	1.4	0.15
SMD1206P200TF	2	3.5	8	1.5	6	100	0.8	0.018	0.08	1206	3	3.5	1.5	1.8	0.8	1.4	0.15
SMD1206P200TF/16	2	3.5	8	1.5	6	100	0.8	0.018	0.08	1206	3	3.5	1.5	1.8	0.8	1.4	0.15
SMD1206P250TF	2.5	5.0	8	2.0	6	100	0.8	0.01	0.055	1206	3	3.5	1.5	1.8	0.9	1.6	0.15
SMD1206P260TF	2.6	5.2	8	2.0	6	100	0.8	0.015	0.070	1206	3	3.5	1.5	1.8	0.9	1.6	0.15
SMD1206P300TF	3	6	8	4	6	100	0.8	0.01	0.055	1206	3	3.5	1.5	1.8	0.9	1.6	0.15

I_{hold} = Hold current: maximum current device will pass without tripping in 25°C still air.

I_{trip} = Trip current: minimum current at which the device will trip in 25 °C still air.

V_{max} = Maximum voltage device can withstand without damage at rated current (I_{max})

I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max})

P_{d typ} = Typical power dissipated from device when in the tripped state at 25 °C still air.

R_{min} = Minimum resistance of device in initial (un-soldered) state.

R_{1max} = Maximum resistance of device at 25 °C measured one hour after tripping or reflow soldering of 260 °C for 20 sec.

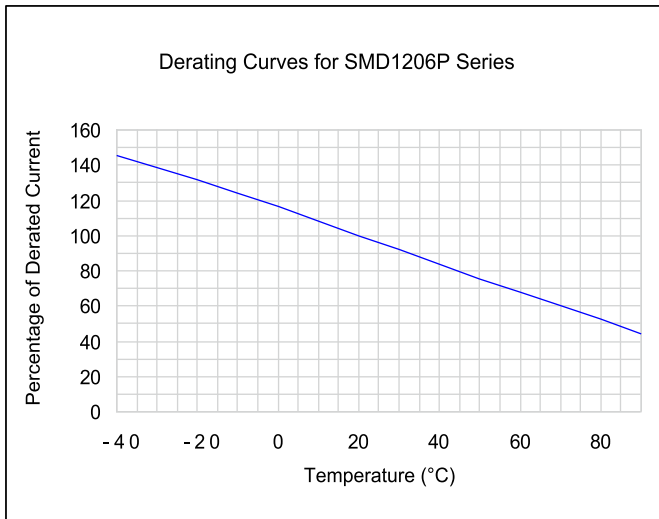
Positive Thermal Coefficient - SMD1206 Series

Thermal Derating Chart Recommended Hold Current (A) at Ambient Temperature (°C)

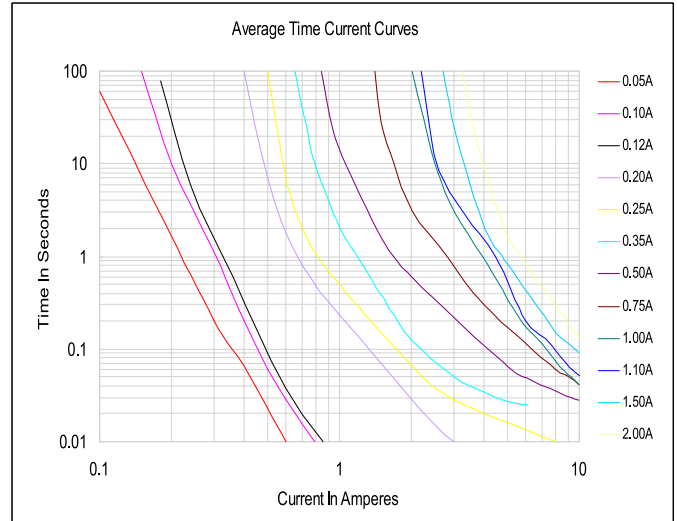
Part Number	-40°C	-20°C	0°C	25 °C	40°C	50 °C	60°C	70°C	85°C
SMD1206P005TF	0.074	0.066	0.058	0.05	0.0425	0.0375	0.035	0.03	0.0275
SMD1206P010TF	0.148	0.132	0.116	0.10	0.085	0.075	0.07	0.06	0.055
SMD1206P012TF	0.18	0.16	0.14	0.12	0.10	0.09	0.08	0.07	0.05
SMD1206P016TF	0.22	0.2	0.18	0.16	0.14	0.12	0.10	0.9	0.8
SMD1206P020TF	0.28	0.25	0.23	0.20	0.17	0.15	0.14	0.12	0.09
SMD1206P020TF/30	0.28	0.25	0.23	0.20	0.17	0.15	0.14	0.12	0.09
SMD1206P020TF/48	0.28	0.25	0.23	0.20	0.17	0.15	0.14	0.12	0.09
SMD1206P025TF	0.37	0.33	0.29	0.25	0.22	0.20	0.17	0.15	0.12
SMD1206P035TF	0.50	0.45	0.40	0.35	0.30	0.27	0.24	0.21	0.15
SMD1206P035TF/16	0.50	0.45	0.40	0.35	0.30	0.27	0.24	0.21	0.15
SMD1206P035TF/24	0.50	0.45	0.40	0.35	0.30	0.27	0.24	0.21	0.15
SMD1206P035TF/48	0.50	0.45	0.40	0.35	0.30	0.27	0.24	0.21	0.15
SMD1206P050TF	0.71	0.64	0.57	0.50	0.42	0.39	0.35	0.31	0.25
SMD1206P050TF/13.2	0.71	0.64	0.57	0.50	0.42	0.39	0.35	0.31	0.25
SMD1206P050TF/16	0.71	0.64	0.57	0.50	0.42	0.39	0.35	0.31	0.25
SMD1206P050TF/24	0.71	0.64	0.57	0.50	0.42	0.39	0.35	0.31	0.25
SMD1206P050TF/30	0.71	0.64	0.57	0.50	0.42	0.39	0.35	0.31	0.25
SMD1206P075TF	1.14	1.01	0.88	0.75	0.65	0.59	0.54	0.49	0.41
SMD1206P075TF/13.2	1.14	1.01	0.88	0.75	0.65	0.59	0.54	0.49	0.41
SMD1206P075TF/16	1.14	1.01	0.88	0.75	0.65	0.59	0.54	0.49	0.41
SMD1206P075TF/24	1.14	1.01	0.88	0.75	0.65	0.59	0.54	0.49	0.41
SMD1206P100TF	1.45	1.3	1.15	1.00	0.84	0.77	0.69	0.61	0.48
SMD1206P100TF/12	1.45	1.3	1.15	1.00	0.84	0.77	0.69	0.61	0.48
SMD1206P100TF/16	1.45	1.3	1.15	1.00	0.84	0.77	0.69	0.61	0.48
SMD1206P100TF/24	1.45	1.3	1.15	1.00	0.84	0.77	0.69	0.61	0.48
SMD1206P110TF	1.64	1.46	1.30	1.10	0.92	0.83	0.80	0.65	0.52
SMD1206P110TF/12	1.64	1.46	1.30	1.10	0.92	0.83	0.80	0.65	0.52
SMD1206P110TF/24	1.64	1.46	1.30	1.10	0.92	0.83	0.80	0.65	0.52
SMD1206P110TF/33	1.64	1.46	1.30	1.10	0.92	0.83	0.80	0.65	0.52
SMD1206P150TF	2.20	1.99	1.77	1.50	1.34	1.23	1.10	1.01	0.84
SMD1206P150TF/12	2.20	1.99	1.77	1.50	1.34	1.23	1.10	1.01	0.84
SMD1206P150TF/16	2.20	1.99	1.77	1.50	1.34	1.23	1.10	1.01	0.84
SMD1206P200TF	2.60	2.44	2.35	2.00	1.78	1.67	1.50	1.45	1.10
SMD1206P200TF/16	2.60	2.44	2.35	2.00	1.78	1.67	1.50	1.45	1.10
SMD1206P250TF	3.30	3.10	2.82	2.50	2.14	1.95	1.8	1.51	1.3
SMD1206P260TF	3.43	3.22	2.93	2.60	2.23	2.03	1.87	1.57	1.35
SMD1206P300TF	4.05	3.66	3.36	3.00	2.50	2.28	2.00	1.62	1.35

Positive Thermal Coefficient - SMD1206 Series

Thermal Derating Curve



Average Time-Current Curve



Environmental Specifications

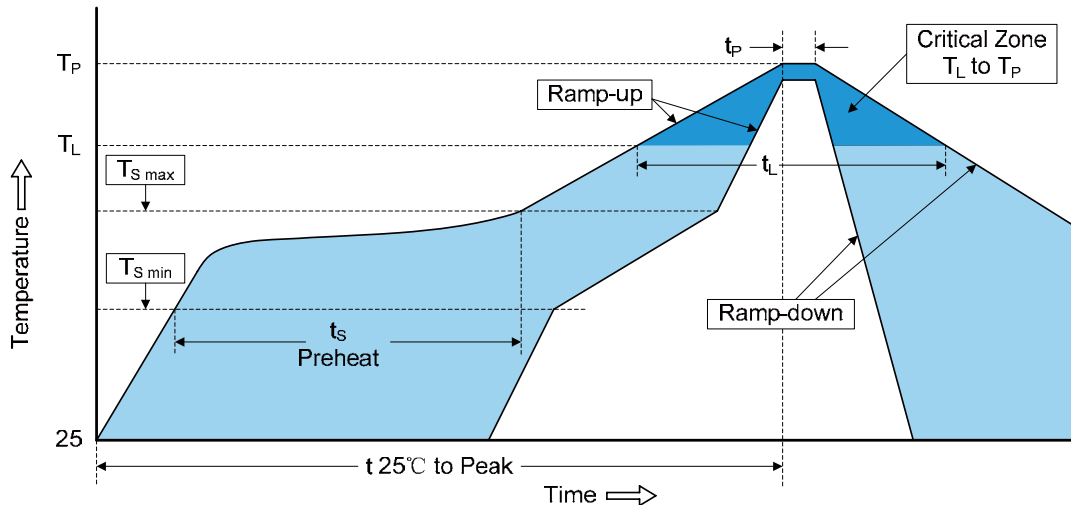
Test	Conditions	Resistance change
Passive aging	+85°C, 1000 hrs.	±5% typical
Humidity aging	+85°C, 85% R.H. , 168 hours	±5% typical
Thermal shock	+85°C to -40°C, 20 times	±33% typical
Resistance to solvent	MIL-STD-202,Method 215	No change
Vibration	MIL-STD-202,Method 201	No change

Ambient operating conditions : - 40 °C to +85 °C

Maximum surface temperature of the device in the tripped state is 125 °C

Positive Thermal Coefficient - SMD1206 Series

Soldering Parameters



Profile Feature	Pb-Free Assembly
Average ramp-up rate ($T_{S\ max}$ to T_P)	3°C/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) ($T_{S\ min}$ to $T_{S\ max}$)	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (t_p)	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.
Storage Condition	0°C ~ 35°C, ≤70%RH

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N₂ environment for lead-free
- Recommended maximum paste thickness is 0.25mm (0.010 inch)
- Device can be cleaned using standard industry methods and solvents.

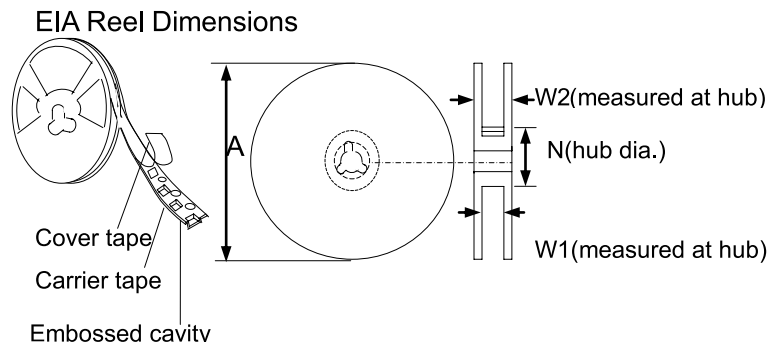
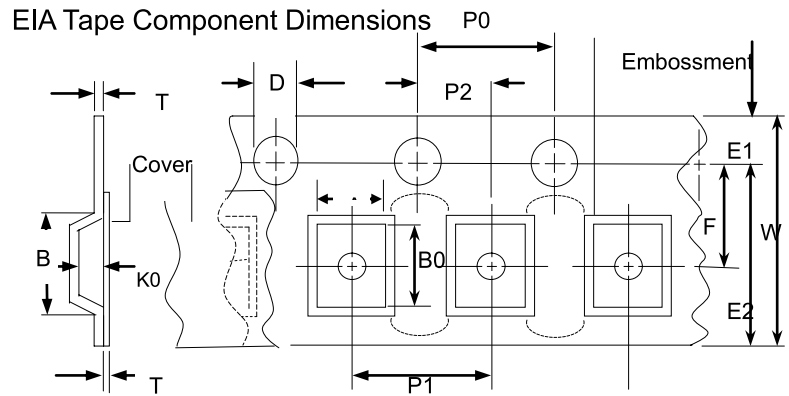
Note 1: All temperature refer to topside of the package, measured on the package body surface.

Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Positive Thermal Coefficient - SMD1206 Series

Tape and Reel Specifications

Governing Specifications	EIA 481-1
W	8.15 ± 0.3
P0	4.0 ± 0.10
P1	4.0 ± 0.10
P2	2.0 ± 0.05
A0	1.95 ± 0.10
B0	3.40 ± 0.10
B1max.	4.35
D0	$1.50 + 0.1, -0$
F	3.5 ± 0.05
E1	1.75 ± 0.10
E2min.	6.25
T	0.6
T1max.	0.1
K0	1.04 ± 0.1
Leader min.	390
Trailer min.	160
Reel Dimensions	
A max.	178
N min.	60
W1	9 ± 0.5
W2	12.6 ± 0.5



Positive Thermal Coefficient - SMD1206 Series

Packaging

Part Number	Halogen Free	Packaging Option	Quantity	Quantity & Packaging Codes
SMD1206P005TF	Yes	Tape and Reel	3500	YR
SMD1206P010TF	Yes	Tape and Reel	3500	YR
SMD1206P012TF	Yes	Tape and Reel	3500	YR
SMD1206P016TF	Yes	Tape and Reel	4500	YR
SMD1206P020TF	Yes	Tape and Reel	4500	YR
SMD1206P020TF/30	Yes	Tape and Reel	4500	YR
SMD1206P020TF/48	Yes	Tape and Reel	3500	YR
SMD1206P025TF	Yes	Tape and Reel	3500	YR
SMD1206P035TF	Yes	Tape and Reel	5000	YR
SMD1206P035TF/16	Yes	Tape and Reel	4500	YR
SMD1206P035TF/24	Yes	Tape and Reel	3500	YR
SMD1206P035TF/48	Yes	Tape and Reel	3500	YR
SMD1206P050TF	Yes	Tape and Reel	4500	YR
SMD1206P050TF/13.2	Yes	Tape and Reel	4500	YR
SMD1206P050TF/16	Yes	Tape and Reel	3500	YR
SMD1206P050TF/24	Yes	Tape and Reel	3500	YR
SMD1206P050TF/30	Yes	Tape and Reel	3500	YR
SMD1206P075TF	Yes	Tape and Reel	4500	YR
SMD1206P075TF/13.2	Yes	Tape and Reel	4500	YR
SMD1206P075TF/16	Yes	Tape and Reel	3500	YR
SMD1206P075TF/24	Yes	Tape and Reel	3500	YR
SMD1206P100TF	Yes	Tape and Reel	4500	YR
SMD1206P100TF/12	Yes	Tape and Reel	3500	YR
SMD1206P100TF/16	Yes	Tape and Reel	3500	YR
SMD1206P100TF/24	Yes	Tape and Reel	3500	YR
SMD1206P110TF	Yes	Tape and Reel	4500	YR
SMD1206P110TF/12	Yes	Tape and Reel	3500	YR
SMD1206P110TF/24	Yes	Tape and Reel	3500	YR
SMD1206P110TF/30	Yes	Tape and Reel	3500	YR
SMD1206P150TF	Yes	Tape and Reel	3500	YR
SMD1206P150TFT/12	Yes	Tape and Reel	3500	YR
SMD1206P150TFT/16	Yes	Tape and Reel	3500	YR
SMD1206P200TF	Yes	Tape and Reel	3500	YR
SMD1206P200TF/16	Yes	Tape and Reel	3500	YR
SMD1206P250TF	Yes	Tape and Reel	3500	YR
SMD1206P260TF	Yes	Tape and Reel	3500	YR
SMD1206P300TF	Yes	Tape and Reel	3500	YR