

**Description**

The 1206 series provides miniature surface mount over-current protection with holding current from 0.05A to 3.5A. This series is suitable for wide range of applications in modern electronics where space is limited.



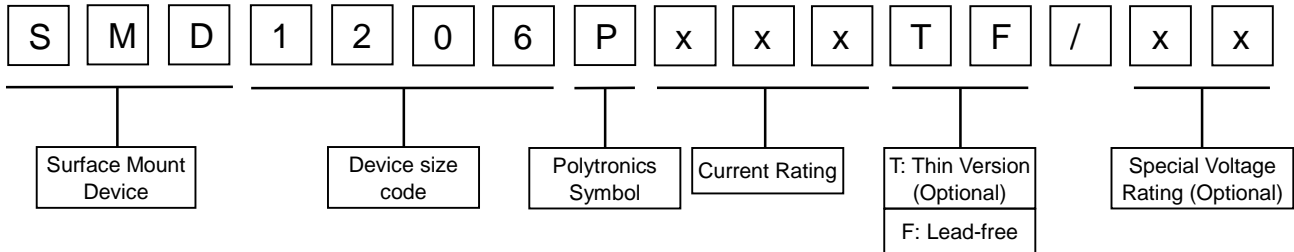
**Features**

- I I(hold): 0.05~3.5A
- I Very high voltage surge capabilities
- I Available in lead-free version
- I Fast response to fault current
- I RoHS compliant, Lead- Free and Halogen-Free
- I Low resistance
- I Compact design saves board space
- I Compatible with high temperature solders

**Applications**

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

**Part Number Code**



**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, 20times	±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



**Performance Specification**

Type Number	$I_{hold}$	$I_{trip}$	$V_{max}$	Max. Time to Trip		$I_{max}$	$P_d$ typ	$R_{i_{min}}$	$R_{1_{max}}$	Package
	A	A	$V_{DC}$	Current A	$T_{max}$ S	A	W	$\Omega$	$\Omega$	
SMD1206P005TF	0.05	0.15	60	0.25	1.50	10	0.4	3.60	50	1206
SMD1206P010TF	0.10	0.25	60	0.50	1.00	10	0.4	1.60	15	1206
SMD1206P012TF	0.12	0.29	60	0.50	1.00	10	0.4	1.60	15	1206
SMD1206P016TF	0.16	0.37	16	1.00	0.30	10	0.4	1.00	6	1206
SMD1206P016TF/24	0.16	0.37	24	1.00	0.30	10	0.4	1.00	6	1206
SMD1206P016TF/33	0.16	0.37	33	1.00	0.30	10	0.4	1.00	6	1206
SMD1206P020TF	0.20	0.46	24	8.00	0.08	10	0.6	0.35	2.7	1206
SMD1206P020TF/30	0.20	0.46	30	8.00	0.08	10	0.6	0.35	2.7	1206
SMD1206P025TF	0.25	0.50	16	8.00	0.08	10	0.6	0.35	2.5	1206
SMD1206P025TF/24	0.25	0.50	24	8.00	0.08	10	0.6	0.35	2.5	1206
SMD1206P025TF/30	0.25	0.50	30	8.00	0.08	10	0.6	0.35	2.5	1206
SMD1206P035TF	0.35	0.75	6	8.00	0.10	35	0.6	0.25	1.3	1206
SMD1206P035TF/16	0.35	0.75	16	8.00	0.10	35	0.6	0.25	1.3	1206
SMD1206P035TF/30	0.35	0.75	30	8.00	0.10	35	0.6	0.25	1.3	1206
SMD1206P050TF	0.50	1.00	6	8.00	0.10	35	0.6	0.15	0.7	1206
SMD1206P050TF/13.2	0.50	1.00	13.2	8.00	0.10	35	0.6	0.15	0.7	1206
SMD1206P050TF/16	0.50	1.00	16	8.00	0.10	35	0.6	0.15	0.7	1206
SMD1206P050TF/24	0.50	1.00	24	8.00	0.10	35	0.6	0.15	0.7	1206
SMD1206P050TF/30	0.50	1.00	30	8.00	0.10	35	0.6	0.15	0.7	1206
SMD1206P075TF	0.75	1.50	6	8.00	0.20	35	0.6	0.09	0.5	1206
SMD1206P075TF/13.2	0.75	1.50	13.2	8.00	0.20	35	0.6	0.09	0.5	1206
SMD1206P075TF/16	0.75	1.50	16	8.00	0.20	35	0.6	0.09	0.5	1206
SMD1206P075TF/24	0.75	1.50	24	8.00	0.20	35	0.6	0.09	0.5	1206
SMD1206P075TF/30	0.75	1.50	30	8.00	0.20	35	0.6	0.09	0.5	1206
SMD1206P100TF	1.00	1.80	6	8.00	0.30	35	0.6	0.05	0.27	1206
SMD1206P100TF/16	1.00	1.80	16	8.00	0.30	35	0.6	0.05	0.27	1206
SMD1206P100TF/24	1.00	1.80	24	8.00	0.30	35	0.6	0.05	0.27	1206
SMD1206P110TF	1.10	2.20	6	8.00	0.30	35	0.6	0.04	0.25	1206
SMD1206P110TF/16	1.10	2.20	16	8.00	0.30	35	0.6	0.04	0.25	1206
SMD1206P110TF/24	1.10	2.20	24	8.00	0.30	35	0.6	0.04	0.25	1206
SMD1206P150TF	1.50	3.00	6	8.00	0.30	35	0.8	0.025	0.13	1206
SMD1206P150TF/13.2	1.50	3.00	13.2	8.00	0.30	35	0.8	0.025	0.13	1206
SMD1206P150TF/16	1.50	3.00	16	8.00	0.30	35	0.8	0.025	0.13	1206
SMD1206P200TF	2.00	3.50	6	8.00	1.50	35	0.8	0.015	0.08	1206
SMD1206P200TF/12	2.00	3.50	12	8.00	1.50	35	0.8	0.015	0.08	1206
SMD1206P260TF	2.60	5.20	6	8.00	2.00	35	0.8	0.01	0.06	1206
SMD1206P300TF	3.00	6	6	8.00	4.00	35	1.0	0.01	0.05	1206
SMD1206P350TF	3.50	7	6	10.00	5.00	35	1.2	0.005	0.04	1206

$V_{max}$  = Maximum operating voltage device can withstand without damage at rated current ( $I_{max}$ ).  
 $I_{max}$  = Maximum fault current device can withstand without damage at rated voltage ( $V_{max}$ ).  
 $I_{hold}$  = Hold Current. Maximum current device will not trip in 25°C still air.  
 $I_{trip}$  = Trip Current. Minimum current at which the device will always trip in 25°C still air.  
 $P_d$  = Power dissipation when device is in the tripped state in 25°C still air environment at rated voltage.  
 $R_{i_{min/max}}$  = Minimum/Maximum device resistance prior to tripping at 25°C.  
 $R_{1_{max}}$  = Maximum device resistance is measured one hour post reflow.

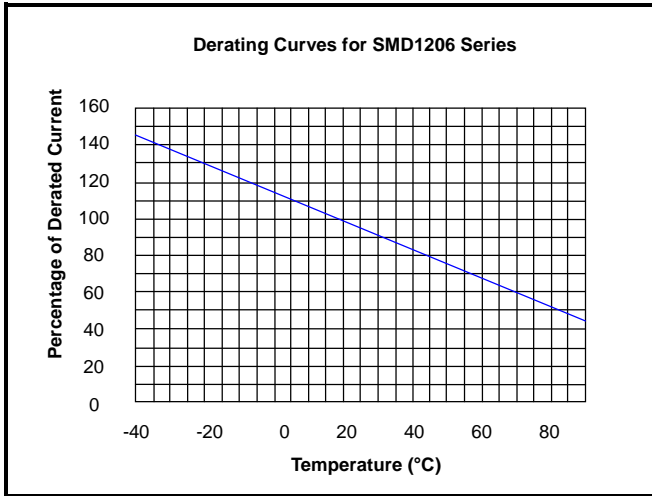


**Thermal Derating Chart-Ih(A)**

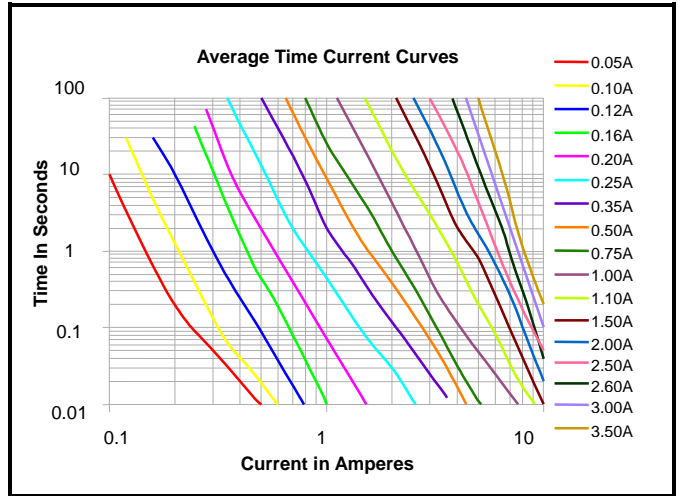
Part Number	Ambient Operation Temperature								
	-40 °C	-20 °C	0 °C	25 °C	40 °C	50 °C	60 °C	70 °C	85 °C
SMD1206P005TF	0.074	0.066	0.058	0.05	0.0425	0.0375	0.035	0.03	0.0275
SMD1206P010TF	0.148	0.132	0.116	0.10	0.085	0.075	0.07	0.06	0.055
SMD1206P012TF	0.18	0.16	0.14	0.12	0.10	0.09	0.08	0.07	0.07
SMD1206P016TF	0.24	0.21	0.18	0.16	0.14	0.13	0.12	0.11	0.10
SMD1206P016TF/24	0.24	0.21	0.18	0.16	0.14	0.13	0.12	0.11	0.10
SMD1206P016TF/33	0.24	0.21	0.18	0.16	0.14	0.13	0.12	0.11	0.10
SMD1206P020TF	0.30	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.11
SMD1206P020TF/30	0.30	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.11
SMD1206P025TF	0.37	0.33	0.29	0.25	0.22	0.20	0.17	0.15	0.12
SMD1206P025TF/24	0.37	0.33	0.29	0.25	0.22	0.20	0.17	0.15	0.12
SMD1206P025TF/30	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/30	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
SMD1206P075TF/30	1.14	1.01	0.88	0.75	0.65	0.59	0.54	0.49	0.41
SMD1206P100TF	1.45	1.31	1.15	1.00	0.84	0.77	0.69	0.61	0.48
SMD1206P100TF/16	1.45	1.31	1.15	1.00	0.84	0.77	0.69	0.61	0.48
SMD1206P100TF/24	1.45	1.31	1.15	1.00	0.84	0.77	0.69	0.61	0.48
SMD1206P110TF	1.60	1.45	1.30	1.10	0.95	0.80	0.72	0.66	0.55
SMD1206P110TF/16	1.60	1.45	1.30	1.10	0.95	0.80	0.72	0.66	0.55
SMD1206P110TF/24	1.60	1.45	1.30	1.10	0.95	0.80	0.72	0.66	0.55
SMD1206P150TF	2.18	1.94	1.72	1.50	1.28	1.17	1.06	0.96	0.77
SMD1206P150TF/13.2	2.18	1.94	1.72	1.50	1.28	1.17	1.06	0.96	0.77
SMD1206P150TF/16	2.18	1.94	1.72	1.50	1.28	1.17	1.06	0.96	0.77
SMD1206P200TF	2.88	2.63	2.34	2.00	1.74	1.58	1.42	1.17	0.93
SMD1206P200TF/12	2.88	2.63	2.34	2.00	1.74	1.58	1.42	1.17	0.93
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
SMD1206P350TF	4.65	4.23	3.92	3.50	2.92	2.68	2.35	1.91	1.42



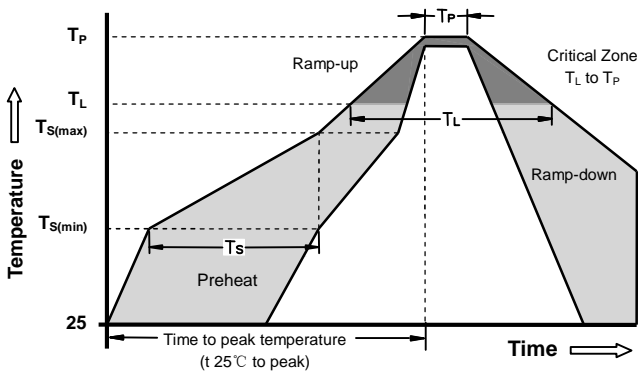
**Thermal Derating Curve**



**Average Time-Current Curve**

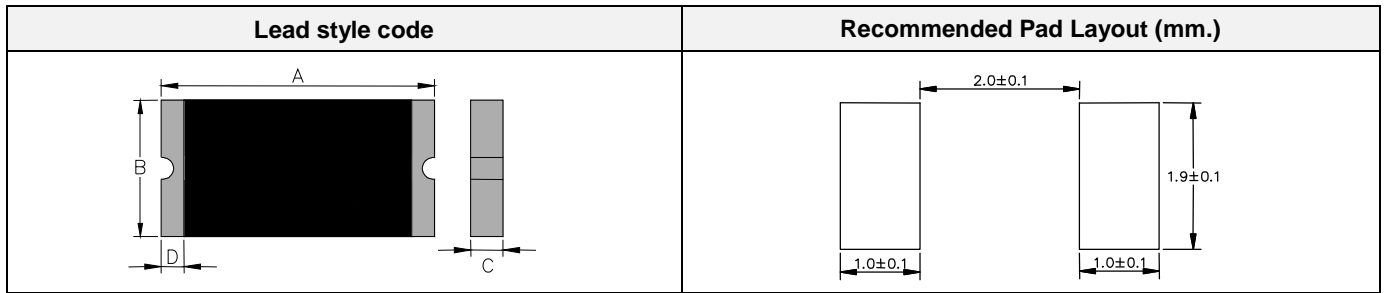


**Soldering Parameters**



Reflow Condition		Pb - Free assembly
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	150°C
	-Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 -180 Seconds
Average ramp up rate ( Liquids Temp $T_L$ ) to peak		3°C/second max
$T_{S(max)}$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflo w	- Temperature ( $T_L$ ) (Liquids)	217°C
	- Time (min to max) ( $t_s$ )	60 -150 Seconds
Peak Temperature ( $T_P$ )		260 +0/-5°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 ( $T_P$ )		8 minutes Max
Do not exceed		260°C





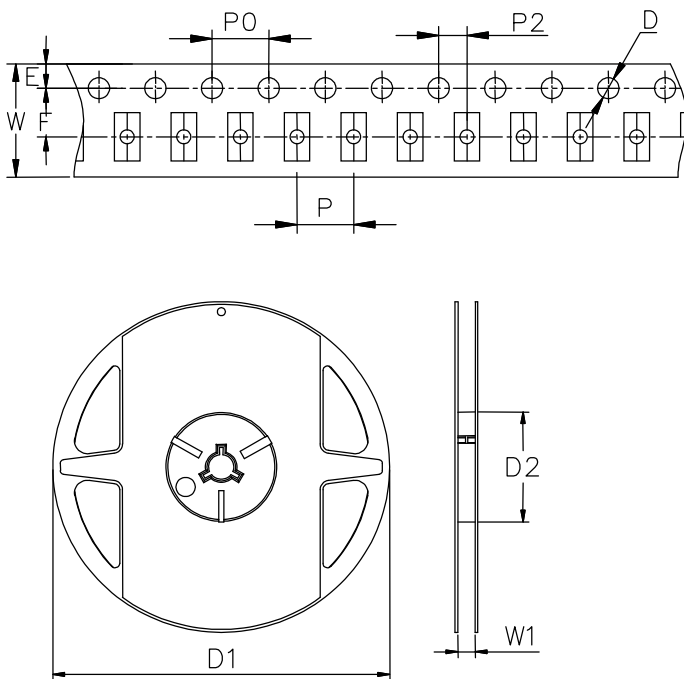
**Dimensions**

Type Number	Package Dimensions (mm)							Package Dimensions (in)						
	A		B		C		D	A		B		C		D
	min	max	min	max	min	max	min	min	max	min	max	min	max	min
SMD1206P005TF	3	3.6	1.5	1.9	0.6	1.2	0.15	0.118	0.142	0.059	0.075	0.024	0.047	0.004
SMD1206P010TF	3	3.6	1.5	1.9	0.6	1.2	0.15	0.118	0.142	0.059	0.075	0.024	0.047	0.004
SMD1206P012TF	3	3.6	1.5	1.9	0.6	1.2	0.15	0.118	0.142	0.059	0.075	0.024	0.047	0.004
SMD1206P016TF	3	3.6	1.5	1.9	0.4	1.0	0.15	0.118	0.142	0.059	0.075	0.016	0.039	0.004
SMD1206P016TF/24	3	3.6	1.5	1.9	0.4	1.0	0.15	0.118	0.142	0.059	0.075	0.016	0.039	0.004
SMD1206P016TF/33	3	3.6	1.5	1.9	0.4	1.0	0.15	0.118	0.142	0.059	0.075	0.016	0.039	0.004
SMD1206P020TF	3	3.6	1.5	1.9	0.4	1.0	0.15	0.118	0.142	0.059	0.075	0.016	0.039	0.004
SMD1206P020TF/30	3	3.6	1.5	1.9	0.4	1.0	0.15	0.118	0.142	0.059	0.075	0.016	0.039	0.004
SMD1206P025TF	3	3.6	1.5	1.9	0.4	1.0	0.15	0.118	0.142	0.059	0.075	0.016	0.039	0.004
SMD1206P025TF/24	3	3.6	1.5	1.9	0.4	1.0	0.15	0.118	0.142	0.059	0.075	0.016	0.039	0.004
SMD1206P025TF/30	3	3.6	1.5	1.9	0.4	1.0	0.15	0.118	0.142	0.059	0.075	0.016	0.039	0.004
SMD1206P035TF	3	3.6	1.5	1.9	0.35	0.8	0.15	0.118	0.142	0.059	0.075	0.014	0.031	0.004
SMD1206P035TF/16	3	3.6	1.5	1.9	0.35	0.8	0.15	0.118	0.142	0.059	0.075	0.014	0.031	0.004
SMD1206P035TF/30	3	3.6	1.5	1.9	0.40	0.9	0.15	0.118	0.142	0.059	0.075	0.016	0.035	0.004
SMD1206P050TF	3	3.6	1.5	1.9	0.35	0.8	0.15	0.118	0.142	0.059	0.075	0.014	0.031	0.004
SMD1206P050TF/13.2	3	3.6	1.5	1.9	0.35	0.8	0.15	0.118	0.142	0.059	0.075	0.014	0.031	0.004
SMD1206P050TF/16	3	3.6	1.5	1.9	0.35	0.8	0.15	0.118	0.142	0.059	0.075	0.014	0.031	0.004
SMD1206P050TF/24	3	3.6	1.5	1.9	0.50	1.0	0.15	0.118	0.142	0.059	0.075	0.020	0.039	0.004
SMD1206P050TF/30	3	3.6	1.5	1.9	0.50	1.0	0.15	0.118	0.142	0.059	0.075	0.020	0.039	0.004
SMD1206P075TF	3	3.6	1.5	1.9	0.35	0.8	0.15	0.118	0.142	0.059	0.075	0.014	0.031	0.004
SMD1206P075TF/13.2	3	3.6	1.5	1.9	0.50	1.0	0.15	0.118	0.142	0.059	0.075	0.020	0.039	0.004
SMD1206P075TF/16	3	3.6	1.5	1.9	0.50	1.0	0.15	0.118	0.142	0.059	0.075	0.020	0.039	0.004
SMD1206P075TF/24	3	3.6	1.5	1.9	0.50	1.0	0.15	0.118	0.142	0.059	0.075	0.020	0.039	0.004
SMD1206P075TF/30	3	3.6	1.5	1.9	0.50	1.0	0.15	0.118	0.142	0.059	0.075	0.020	0.039	0.004
SMD1206P100TF	3	3.6	1.5	1.9	0.35	0.8	0.15	0.118	0.142	0.059	0.075	0.014	0.031	0.004
SMD1206P100TF/16	3	3.6	1.5	1.9	0.5	1.0	0.15	0.118	0.142	0.059	0.075	0.020	0.039	0.004
SMD1206P100TF/24	3	3.6	1.5	1.9	0.5	1.0	0.15	0.118	0.142	0.059	0.075	0.020	0.039	0.004
SMD1206P110TF	3	3.6	1.5	1.9	0.35	0.8	0.15	0.118	0.142	0.059	0.075	0.014	0.031	0.004



Type Number	Package Dimensions (mm)							Package Dimensions (in)						
	A		B		C		D	A		B		C		D
	min	max	min	max	min	max	min	min	max	min	max	min	max	min
SMD1206P110TF/16	3	3.6	1.5	1.9	0.35	0.8	0.15	0.118	0.142	0.059	0.075	0.014	0.031	0.004
SMD1206P110TF/24	3	3.6	1.5	1.9	0.35	0.8	0.15	0.118	0.142	0.059	0.075	0.014	0.031	0.004
SMD1206P150TF	3	3.6	1.5	1.9	0.5	1.0	0.15	0.118	0.142	0.059	0.075	0.020	0.039	0.004
SMD1206P150TF/13.2	3	3.6	1.5	1.9	1.0	1.6	0.15	0.118	0.142	0.059	0.075	0.039	0.063	0.004
SMD1206P150TF/16	3	3.6	1.5	1.9	1.0	1.6	0.15	0.118	0.142	0.059	0.075	0.039	0.063	0.004
SMD1206P200TF	3	3.6	1.5	1.9	0.7	1.3	0.15	0.118	0.142	0.059	0.075	0.028	0.051	0.004
SMD1206P200TF/12	3	3.6	1.5	1.9	1.0	1.6	0.15	0.118	0.142	0.059	0.075	0.039	0.063	0.004
SMD1206P260TF	3	3.6	1.5	1.9	1.0	1.6	0.15	0.118	0.142	0.059	0.075	0.039	0.063	0.004
SMD1206P300TF	3	3.6	1.5	1.9	1.0	1.6	0.15	0.118	0.142	0.059	0.075	0.039	0.063	0.004
SMD1206P350TF	3	3.5	1.5	1.8	1.0	1.6	0.15	0.118	0.138	0.059	0.071	0.039	0.063	0.004

**Taping and Reel Specifications**



Symbol	Millimeters	Inches
W	8.15±0.3	0.321±0.012
P	4.0±0.1	0.157±0.004
F	3.5±0.05	0.138±0.002
E	1.75±0.1	0.069±0.004
D	1.55±0.05	0.061±0.002
P0	4.0±0.1	0.157±0.004
P2	2.0±0.05	0.079±0.002
D1(max.)	178	7.007
D2(min.)	60	2.362
W1	9±0.5	0.354±0.02

Part Number	Halogen Free	Packaging Option	Quantity	Quantity & Packaging Codes
SMD1206P016 ,020,020TF/30, 025,035,035TF/16, 050,075,100,110TF	Yes	Tape and Reel	4500	YR
Other	Yes	Tape and Reel	3500	YR



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