

Features

- ▶ compact design saves board space
- ▶ RoHS compliant and lead-free
- ▶ Halogen-free
- ▶ Fast reponse to fault current
- ▶ Symmetrical design

Applications

- ▶ USB port protection - USB 2.0, 3.0&OTG
- ▶ HDMI 1.4 Source protection
- ▶ PDAs / digital cameras
- ▶ Game console port protection
- ▶ PC motherboards-plug and play protection

HF RoHS REACH Pb Free

1.Electrical Characteristics

Model	I-hold (A)	I-trip (A)	Vmax (Vdc)	Imax (A)	Pd typ (W)	Max. Time to trip		R0 min (Ohm)	R1max (Ohm)	Agency Approval C _{UL} 
						Current (A)	Time (Sec.)			
DT-0603-002J	0.02	0.06	60.00	40.00	0.50	0.20	1.00	12.00	70.00	×
DT-0603-004	0.04	0.12	24.00	20.00	0.50	0.20	1.00	4.00	40.00	×
DT-0603-005	0.05	0.15	24.00	40.00	0.50	0.20	1.00	3.50	40.00	×
DT-0603-005/30	0.05	0.15	30.00	40.00	0.50	0.20	1.00	3.50	40.00	×
DT-0603-005/48	0.05	0.15	48.00	40.00	0.50	0.20	1.00	3.50	40.00	×
DT-0603-010	0.10	0.30	15.00	40.00	0.50	0.50	1.00	0.90	6.00	×
DT-0603-010/24	0.10	0.30	24.00	40.00	0.50	0.50	1.00	0.90	6.00	×
DT-0603-020	0.20	0.50	9.00	40.00	0.50	1.00	0.60	0.55	3.50	×
DT-0603-020/16	0.20	0.50	16.00	40.00	0.50	1.00	0.60	0.55	3.50	×
DT-0603-025	0.20	0.50	9.00	40.00	0.50	1.00	0.60	0.50	3.00	×
DT-0603-025/16	0.20	0.50	16.00	40.00	0.50	1.00	0.60	0.50	3.00	×
DT-0603-025J	0.20	0.50	9.00	40.00	0.50	1.00	0.60	0.50	3.00	×
DT-0603-025/16J	0.20	0.50	16.00	40.00	0.50	1.00	0.60	0.50	3.00	×
DT-0603-035	0.35	0.70	6.00	40.00	0.50	8.00	0.10	0.20	1.40	×
DT-0603-050	0.50	1.00	6.00	40.00	0.50	8.00	0.10	0.10	0.80	×
DT-0603-075J	0.75	1.50	6.00	40.00	0.50	8.00	0.10	0.060	0.450	×

I-hold: Holding Current: maximum current at which the device will not trip in 25°C still air.

I-trip: Tripping Current: minimum current at which the device will trip in 25°C still air.

Vmax: Maximum voltage device can withstand without damage at rated current(Imax).

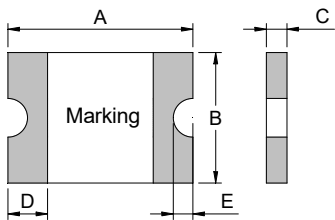
I max: Maximum fault current device can withstand without damage at rated voltage(Vmax).

Pd typ: Typical power dissipated from device when in the tripped state at 25°C still air.

R0 min: Minimum resistance of device in initial (un-soldered) state.

R1 max: Maximum resistance of device at 25°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

2.Product Dimensions(mm)&Marking



Model	A		B		C		D		E	Marking
	Min	Max	Min	Max	Min	Max	Min	Max	Min	
DT-0603-002J	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	Y
DT-0603-004	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	-
DT-0603-005	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	C
DT-0603-005/30	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	C
DT-0603-005/48	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	C
DT-0603-010	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	1
DT-0603-010/24	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	1
DT-0603-020	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	2
DT-0603-020/16	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	2
DT-0603-025	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	2
DT-0603-025/16	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	2
DT-0603-025J	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	2
DT-0603-025/16J	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	2
DT-0603-035	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	3
DT-0603-050	1.45	1.85	0.65	1.05	0.60	1.00	0.15	0.50	0.05	5
DT-0603-075J	1.45	1.85	0.65	1.05	0.60	1.00	0.15	0.50	0.05	7

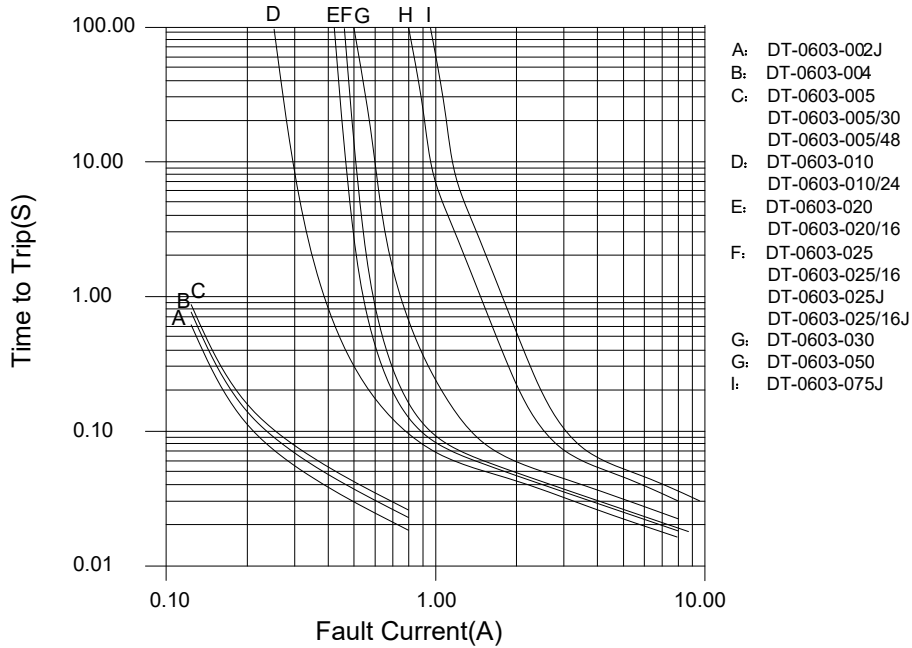
3.Thermal Derating Chart

Recommended hold current(A) at ambient Temperature(°C)

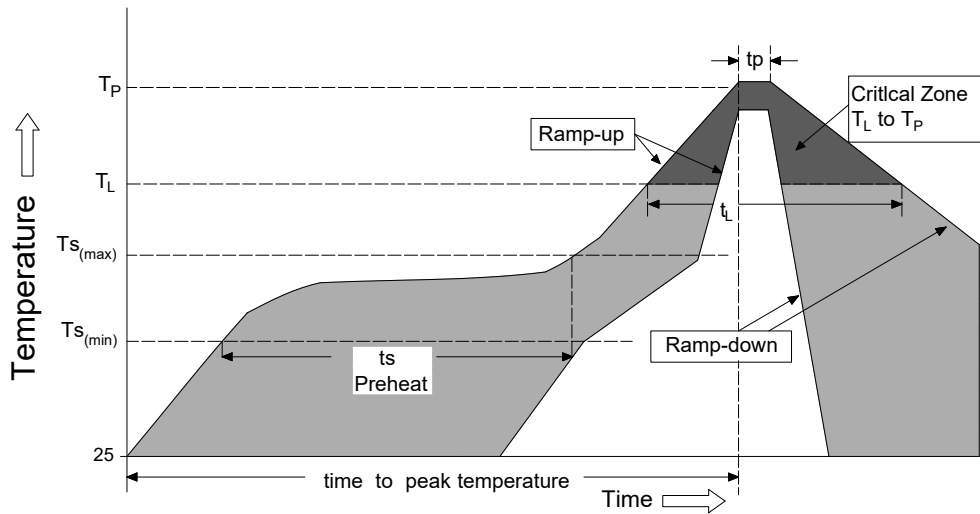
Model	Ambient Operating Temperature								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
DT-0603-002J	0.031	0.027	0.024	0.020	0.016	0.014	0.012	0.011	0.007
DT-0603-004	0.050	0.048	0.044	0.040	0.033	0.030	0.025	0.020	0.012
DT-0603-005	0.065	0.060	0.055	0.050	0.040	0.035	0.030	0.025	0.015
DT-0603-005/30	0.065	0.060	0.055	0.050	0.040	0.035	0.030	0.025	0.015
DT-0603-005/48	0.065	0.060	0.055	0.050	0.040	0.035	0.030	0.025	0.015
DT-0603-010	0.13	0.12	0.11	0.10	0.08	0.07	0.06	0.05	0.03
DT-0603-010/24	0.13	0.12	0.11	0.10	0.08	0.07	0.06	0.05	0.03
DT-0603-020	0.27	0.25	0.23	0.20	0.17	0.14	0.12	0.10	0.07
DT-0603-020/16	0.27	0.25	0.23	0.20	0.17	0.14	0.12	0.10	0.07
DT-0603-025	0.32	0.29	0.27	0.25	0.21	0.18	0.16	0.14	0.10
DT-0603-025/16	0.32	0.29	0.27	0.25	0.21	0.18	0.16	0.14	0.10
DT-0603-025J	0.32	0.29	0.27	0.25	0.21	0.18	0.16	0.14	0.10
DT-0603-025/16J	0.32	0.29	0.27	0.25	0.21	0.18	0.16	0.14	0.10
DT-0603-035	0.47	0.41	0.38	0.35	0.29	0.26	0.24	0.20	0.14
DT-0603-050	0.67	0.59	0.54	0.50	0.41	0.37	0.34	0.29	0.20
DT-0603-075J	0.98	0.85	0.81	0.75	0.60	0.54	0.44	0.40	0.31

4. Typical time to trip at 25°C

0603 Series TTT Vs Fault current chart



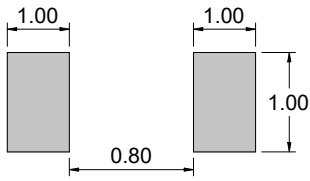
5. Soldering parameters



Profile Feature		Pb-Free Assembly
Average Ramp-Up Rate ($T_{s(max)}$ to T_P)		3°C/second max
Pre Heat:	Temperature Min ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (Min to Max) (t_s)	60 – 180 secs
Time Maintained Above:	Temperature (T_L)	217°C
	Temperature (t_L)	60 – 150 seconds
Peak / Classification 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.

- ◆ All temperature refer to toposide of the package, measured on the package body surface
- ◆ If reflow temperature exceeds the recommended profile, devices may not meet the performance requirements
- ◆ Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead
- ◆ Recommended maximum paste thickness is 0.25mm (0.010inch)
- ◆ Devices can be cleaned using standard industry methods and solvents

6. Recommended Pad Layout(mm) & Physical Specifications



Terminal Material	Tin-Plated Nickel-Copper (Solder Material: Matte Tin (Sn))
Lead Solderability	Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3.

7. Environmental Specifications

Operating Temperature	-40 °C to +85 °C
Maximum Device Surface Temperature in Tripped State	125°C
Passive Aging	+85 °C, 1000 hours ; ±5 % typical resistance change
Humidity Aging	+85 °C, 85 % R.H. 1000 hours; ±5 % typical resistance change
Thermal Shock	MIL-STD-202, Method 107; +85 °C to -40 °C, 20 times;-30 % typical resistance change
Solvent Resistance	MIL-STD-202, Method 215 ; No change
Vibration	MIL-STD-883, Method 2007, Condition A; No change
Moisture Sensivity Level	Level 1, J-STD-020
Storage Conditions	+40 °C Max. 70% RH Max. Packed in original packaging.

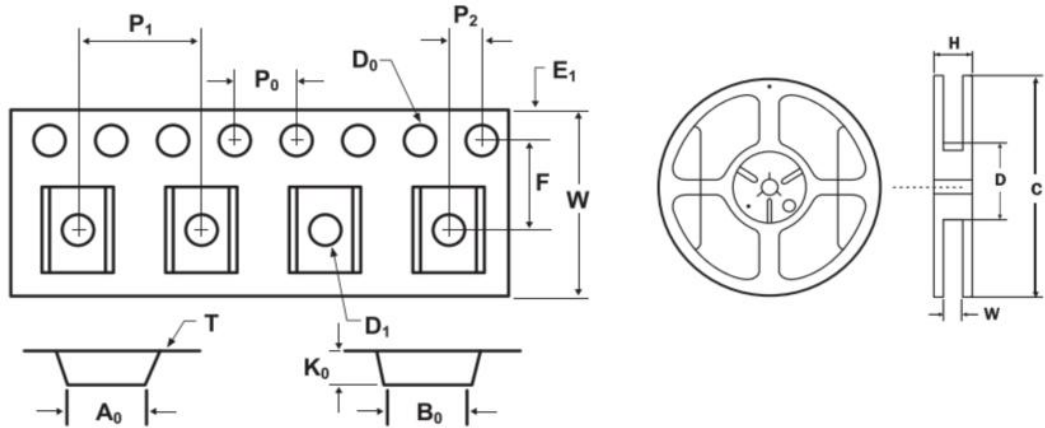
8. Test Procedures And Requirements

No.	Test	Test Conditions	Accept/Reject Criteria
1	R0 min	Resistance measurement at 25°C	$R0min \leq R \leq R1max$
2	R1 max	Resistance measurement one hour after post trip	$R0min \leq R \leq R1max$
3	I-hold	Hold rated current 1800 second without trip, @ 25°C	No trip
4	I-trip	Device must trip within 900 second under rated current, @25°C	Trip
5	Max. time to trip	At specified current, 25 °C	$T \leq \text{max. time to trip (seconds)}$
6	Trip Cycle Life	V_{max} , I_{max} , 100 cycles	No arcing or burning
7	Trip Endurance	V_{max} , I_{max} 24 hours	No arcing or burning
8	Solderability	ANSI/J-STD-002	95 % min. coverage

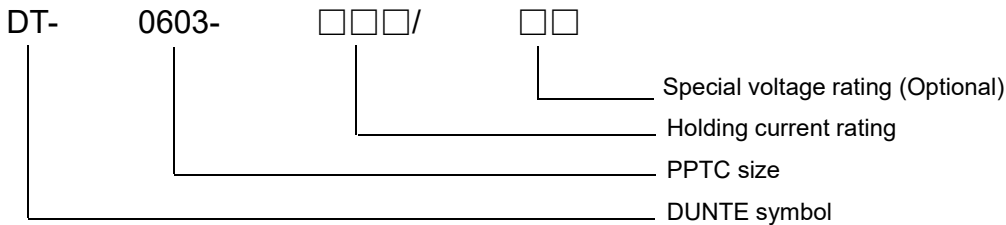
9. Tape and Reel Specifications&Packaging quantity per Reel

TAPE SPECIFICATIONS: EIA-481-1 (mm)					REEL DIMENSIONS: EIA-481-1 (mm)	
Item	DT-0603-002J	DT-0603-004	DT-0603-005	DT-0603-050 DT-0603-075J	C	Ø178±1.0
	DT-0603-005/30	DT-0603-005/48	DT-0603-010		D	Ø60.2±0.5
	DT-0603-010/24	DT-0603-020	DT-0603-020/16		W	9.0±1.5
	DT-0603-025	DT-0603-025/16	DT-0603-025J		H	11.0±0.5
	DT-0603-025J/16	DT-0603-035				
W	8.00±0.30			8.00±0.30		
F	3.50±0.10			3.50±0.10		
E1	1.75±0.10			1.75±0.10		
D0	1.55±0.05			1.55±0.05		
D1	0.50±0.10			0.50±0.10		
P0	4.00±0.10			4.00±0.10		
P1	4.00±0.10			4.00±0.10		
P2	2.00±0.05			2.00±0.05		
A0	1.10±0.10			1.10±0.10		
B0	1.85±0.10			1.90±0.10		

T	0.20±0.10	0.20±0.10
K0	0.72±0.10	0.85±0.10
Leader	390mm	390mm
Trailer	160mm	160mm
Q'ty	5,000pcs/Reel	4,000pcs/Reel



10. Part Ordering Number System



Warning:

- Users shall independently assess the suitability of these devices for each of their applications
- Operation of these devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire
- These devices are intended to protect against the effects of temporary over-current or over-temperature conditions and are not intended to perform as protective devices where such conditions are expected to be repetitive or prolonged in duration
- Exposure to silicon-based oils, solvents, electrolytes, acids, and similar materials can adversely affect the performance of these PPTC devices
- These devices undergo thermal expansion under fault conditions, and thus shall be provided with adequate space and be protected against mechanical stresses
- Circuits with inductance may generate a voltage ($L di/dt$) above the rated voltage of the PPTC device.