SUBMINIATURE SURFACE MOUNT

NANO²® SMF Very Fast-Acting Type

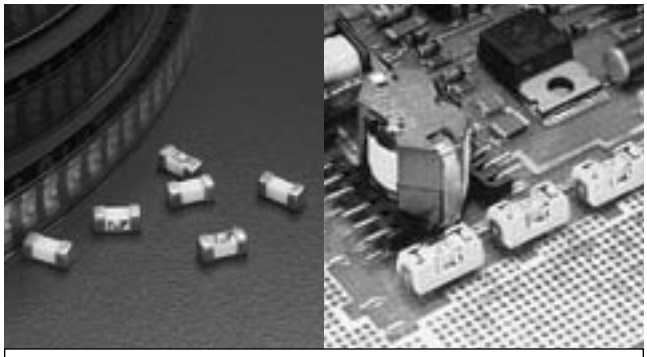
The Nano² SMF is a very small, square surface mount fuse design that exhibits electrical characteristics similar to the Littelfuse 271000 Nanofuse series.

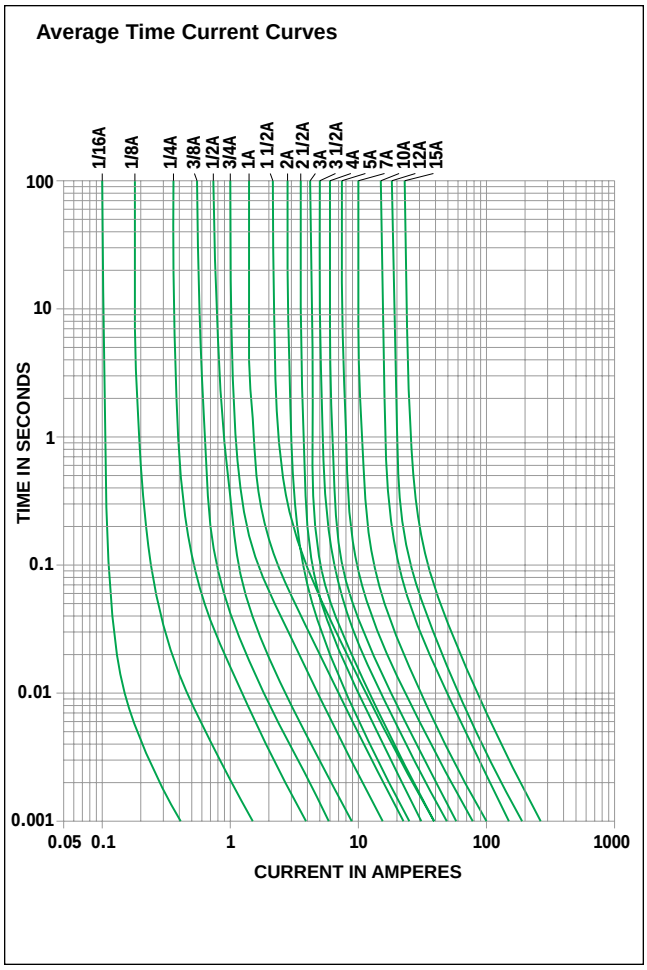
ELECTRICAL CHARACTERISTICS:

% of Ampere Rating	Ampere Rating	Opening Time
110%	1/16–15	4 hours, **Min**imum
200%	1/16–10	5 seconds, **Max**imum
	12–15	20 seconds, **Max**imum

AGENCY APPROVALS:[1] Recognized under the Components Program of Underwriters Laboratories and Certified by CSA. Approved by MITI from 1 through 5 amperes.
AGENCY FILE NUMBERS: UL E10480, CSA LR 29862.
INTERRUPTING RATINGS:
1/16 – 5 50 amperes at 125 VAC/VDC
7A – 10A 35 amperes at 125 VAC/VDC
12A – 15A 50 amperes at 65 VAC/VDC
ENVIRONMENTAL SPECIFICATIONS:
Operating Temperature: –55°C to 125°C.
Shock: MIL-STD-202, Method 213, Test Condition I (100 G's peak for 6 milliseconds).
Vibration: MIL-STD-202, Method 201 (10–55 Hz, .06 in. total excursion).
Salt Spray: MIL-STD-202 Method 101, Test Condition B (48 hrs.).
Insulation Resistance (After Opening): MIL-STD-202, Method 302, Test Condition A, (10,000 ohms minimum).
Resistance to Soldering Heat: MIL-STD-202, Method 210, Test Condition F (20 sec. at 260°C).
Thermal Shock: MIL-STD-202, Method 107, Test Condition B (–65 to 125°C).
Moisture Resistance: MIL-STD-202, Method 106, High Humidity (90-98 RH), Heat (65°C).
PHYSICAL SPECIFICATIONS:
Materials: Body: Ceramic
Terminations: Tin-Lead Alloy Plated Brass Caps. 1/8 Amp and below are silver plated.
Soldering Parameters:
Wave Solder — 260°C, 10 seconds maximum
Reflow Solder — 260°C, 30 seconds maximum
Solderability: MIL-STD-202, Method 208.
PACKAGING SPECIFICATIONS: 12mm Tape and Reel per EIA-RS481 (IEC 286, part 3); 1,000 per reel.
PATENTED
ORDERING INFORMATION:

Catalog Number	Ampere Rating	Voltage Rating	Nominal Resistance Cold Ohms	Nominal Melting I^2t A^2 Sec.
R451.062	1/16	125	5.50	0.00019
R451.125	1/8	125	2.95	0.00286
R451.250	1/4	125	1.05	0.01126
R451.375	3/8	125	0.610	0.0425
R451.500	1/2	125	0.420	0.0795
R451.750	3/4	125	0.245	0.185
R451 001	1	125	0.148	0.459
R451 01.5	1½	125	0.0630	0.853
R451 002	2	125	0.0367	0.53
R451 02.5	2½	125	0.0286	1.029
R451 003	3	125	0.0227	1.65
R451 03.5	3½	125	0.0200	2.469
R451 004	4	125	0.0160	3.152
R451 005	5	125	0.0125	5.566
R451 007	7	125	0.0090	10.32
R451 010	10	125	0.0056	26.46
R451 012	12	65	0.0043	47.97
R451 015	15	65	0.0037	97.82



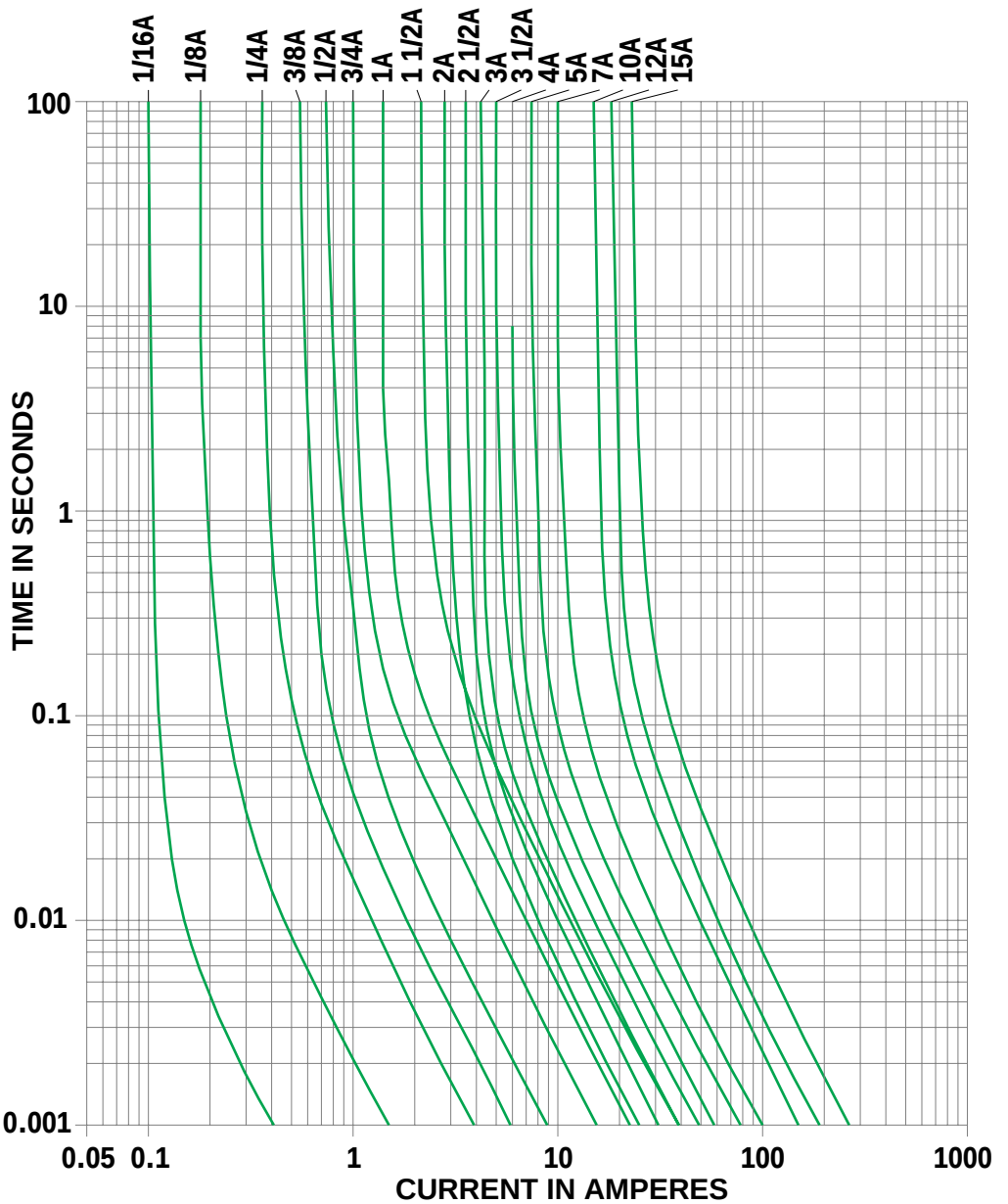


Refer to pg. 82 for SMF Omni-Blok Holder, Series **154** 000.

Littelfuse®

Nano² Fast-Acting Fuse

451 Series



SUBMINIATURE SURFACE MOUNT

NANO²® SMF Slo-Blo® Type Fuse

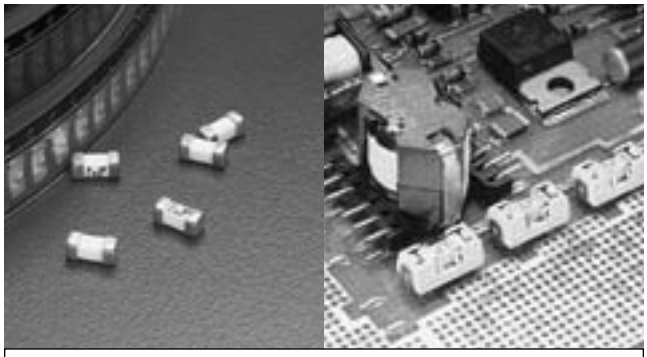
The very small NANO² Fuse is now available with time delay performance characteristics. This Slo-Blo NANO² Fuse is the smallest surface mount time delay fuse available. The unique time delay feature of this fuse design helps solve the problem of nuisance "opening" by accommodating inrush currents that normally cause a fast-acting fuse to open.

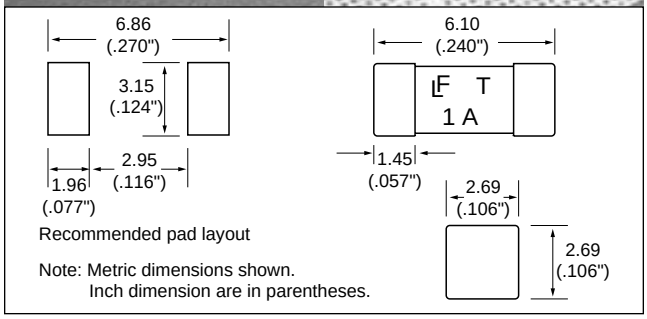
ELECTRICAL CHARACTERISTICS:

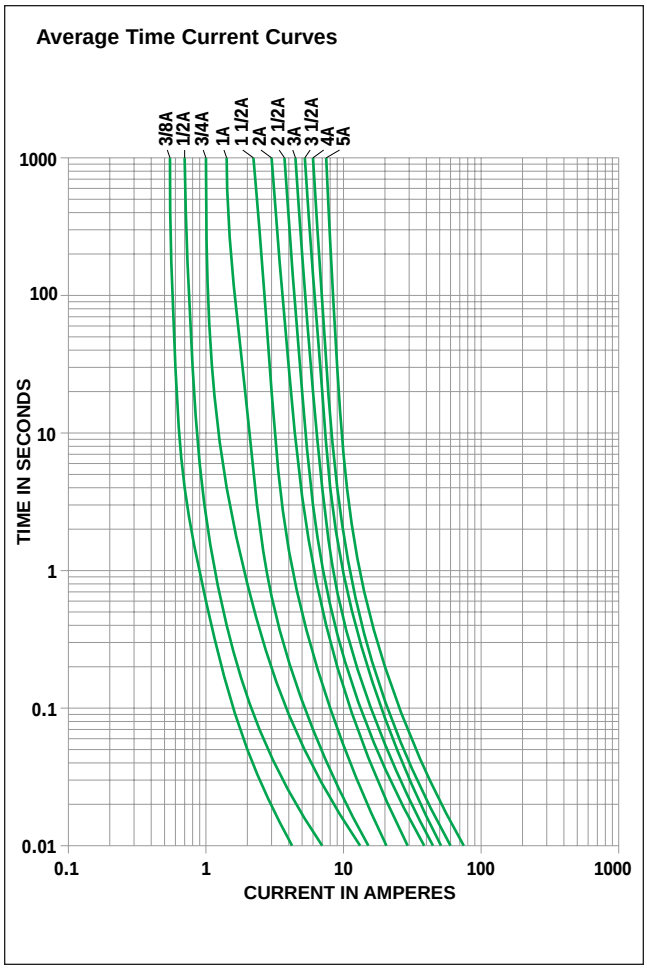
% of Ampere Rating	Opening Time
100%	4 hours, **Min**imum
200%	1 second, **Min.;** 60 seconds, **Max.**
300%	0.2 seconds, **Min.;** 3 seconds, **Max.**
800%	0.02 seconds, **Min.;** 0.1 seconds, **Max**.

AGENCY APPROVALS: Recognized under the Components Program of Underwriters Laboratories and Certified by CSA.
AGENCY FILE NUMBERS: UL E10480, CSA LR 29862.
INTERRUPTING RATINGS:
50 amperes at 125 VAC
50 amperes at 125 VDC.
ENVIRONMENTAL SPECIFICATIONS:
Operating Temperature: –55°C to 125°C.
Shock: MIL-STD-202, Method 213, Test Condition I (100 G's peak for 6 milliseconds).
Vibration: MIL-STD-202, Method 201 (10–55 Hz, .06 in. total excursion).
Salt Spray: MIL-STD-202 Method 101, Test Condition B (48 hrs.).
Insulation Resistance (After Opening): MIL-STD-202, Method 302, Test Condition A, (10,000 ohms minimum).
Resistance to Soldering Heat: MIL-STD-202, Method 210, (3 sec. at 260°C).
Thermal Shock: MIL-STD-202, Method 107, Test Condition B (–65 to 125°C).
Moisture Resistance: MIL-STD-202, Method 106, High Humidity (90-98 RH), Heat (65°C).
PHYSICAL SPECIFICATIONS:
Materials: Body: Ceramic
Terminations: Tin-Lead Alloy Plated Brass Caps.
Soldering Parameters:
Wave Solder — 260°C, 3 seconds maximum
Reflow Solder — 230°C, 30 seconds maximum
Solderability: MIL-STD-202, Method 208.
PACKAGING SPECIFICATIONS: 12mm Tape and Reel per EIA-RS481 (IEC 286, part 3); 1,000 per reel.
Marking: The **452** 000 series Slo-Blo fuse marking includes the letter "T" to designate time delay characteristics.
PATENTED
ORDERING INFORMATION:

Catalog Number	Ampere Rating	Voltage Rating	Nominal Resistance Cold Ohms	Nominal Melting I^2t A^2 Sec.
R452.375	3/8	125	1.60	0.101
R452.500	1/2	125	0.940	0.240
R452.750	3/4	125	0.460	0.904
R452 001	1	125	0.210	1.98
R452 01.5	1½	125	0.116	3.65
R452 002	2	125	0.0760	8.20
R452 02.5	2½	125	0.0540	15.0
R452 003	3	125	0.0414	20.16
R452 03.5	3½	125	0.0253	26.53
R452 004	4	125	0.0208	34.40
R452 005	5	125	0.0146	53.72





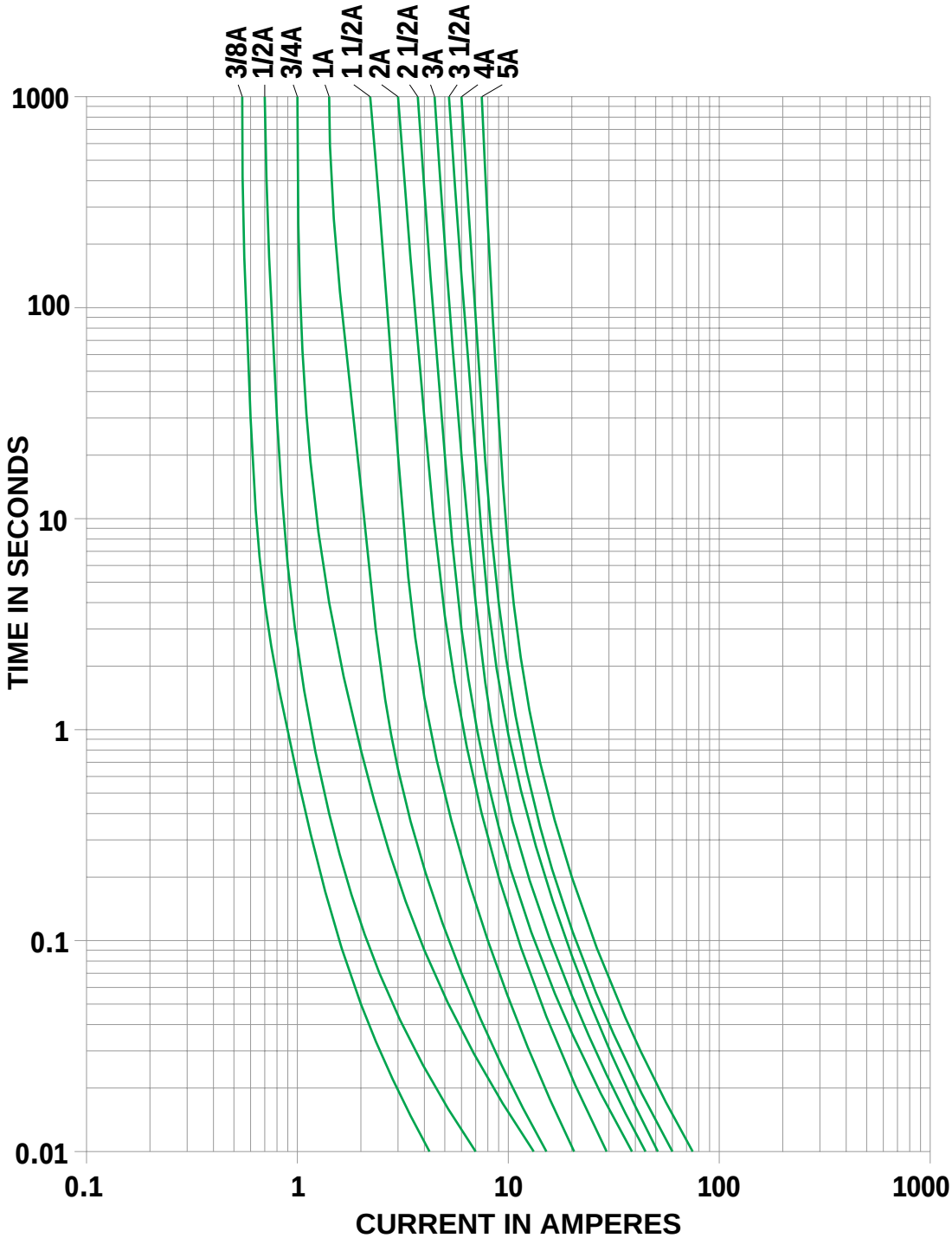


Refer to pg.82 for SMF Omni-Blok Holder, Series **154** 000T.

Littelfuse®

Nano² ® SMF Slo-Blo® Type

452 Series



FOR NANO²™ SURFACE MOUNT FUSES

SMF Omni-Blok® Fuse Block Molded Base Type

The SMF Omni-Blok® Fuseholder permits quick and easy replacement of Nano²™ SMF surface mount fuses. The fuse block and pre-installed fuse combination can be placed on the PC board in one efficient manufacturing operation. Fuse replacement is accomplished without exposing the PC board to the detrimental effects of solder heat. Refer to notes 1 and 2 below, for fuse/fuseholder combinations available.

APPROVALS: Recognized under the Components Program of Underwriters Laboratories and Certified by CSA.

SPECIFICATIONS:
Electricals: 7 Amperes, 125 Volts.
Molded Parts: Thermoplastic (94V0).
Terminals: Tin/Lead Alloy Plated Beryllium Copper.
Ambient Temperature: –55°C to +125°C.
Shock: MIL-STD-202, Method 213, Test Condition I (100 G's peak for 6 milliseconds).
Vibration: MIL-STD-202, Method 201 (10–55 Hz).
Thermal Shock: MIL-STD-202, Method 107, Condition A. (200 cycles: 30 minutes at –55°C, 30 minutes at 125°C).
Soldering Parameters (Fuse Installed):
Reflow — 154 000: 500°F (260°C), 30 sec.
154 000T: 445°F (230°C), 30 sec.
Solderability: MIL-STD-202, Method 208.
Packaging: 16mm Tape and Reel for use with automatic pick and place equipment per EIA Standard 481. 1500 per reel.

PATENTED

ORDERING INFORMATION:

With Very Fast-Acting Fuse Installed

Catalog Number	Ampere Rating	Fuse Furnished[1]
154.062	1/16	**453**.062
154.125	1/8	**453**.125
154 .250	1/4	**453**.250
154.375	3/8	**453**.375
154.500	1/2	**453**.500
154.750	3/4	**453**.750
154 001	1	**453** 001
154 01.5	1.5	**453** 01.5
154 002	2	**453** 002
154 02.5	2.5	**453** 02.5
154 003	3	**453** 003
154 03.5	3.5	**453** 03.5
154 004	4	**453** 004
154 005	5	**453** 005
154 007	7	**453** 007

With Slo-Blo® Fuse Installed

Catalog Number	Ampere Rating	Fuse Furnished[2]
154.375T	3/8	**454**.375
154.500T	1/2	**454**.500
154.750T	3/4	**454**.750
154 001T	1	**454** 001
154 01.5T	1½	**454** 01.5
154 002T	2	**454** 002
154 02.5T	2½	**454** 02.5
154 003T	3	**454** 003
154 03.5T	3½	**454** 03.5
154 004T	4	**454** 004
154 005T	5	**454** 005

[1] 453 Series Fuse has silver plated end caps, installed to accommodate solder reflow process. Use 451 Series with tin/lead alloy plated end caps for replacement purposes, page 24.

[2] 454 Series Fuse has silver plated end caps, installed to accommodate solder reflow process. Use 452 Series with tin/lead alloy plated end caps for replacement purposes, page 25.