

# HSJ High Speed/Class J

## Protect your wiring and power semiconductors with a single fuse

The High Speed J (HSJ) fuse combines the low  $I^2t$  of a semiconductor fuse and the branch circuit performance of a Class J UL listed fuse. This fuse was designed for the starting characteristics of solid state motor controllers. The HSJ can provide branch circuit protection per NEC requirements, as well as very low  $I^2t$  for protection of power semiconductors such as Diodes, SCR's, GTO's and SSR's.

### Features/Benefits:

- Optimized over-load capability for withstanding elevated levels of current during electronic motor controller starts
- Low  $I^2t$  (low thermal energy)
- Excellent cycling ability for frequent starts/stops without nuisance opening

### Highlights:

- Current-limiting
- AC & DC ratings
- Low  $I^2t$
- Compact size

### Applications:

- Branch circuits
- Control panels
- Electronic motor controllers
- Phase controllers
- Drives
- Soft-starters
- Solid state relays



### Ratings:

**Volts** : 600VAC  
: 500VDC

**Amps** : 1 to 600A (AC)  
: 15 to 600A (DC)

**IR** : 200kA I.R. AC  
: 100kA I.R. DC  
: L/R =10mS or less

(Self Certified for 600VAC, 300kA I.R., UL witnessed.)

### Approvals:

- UL listed to standard 248-8 File E2137
- CSA certified to standard C22.2 no. 248.8
- DC listed to UL 248



# HSJ High Speed/Class J

## Catalog Numbers (amps)

HSJ1	HSJ90
HSJ3	HSJ100
HSJ6	HSJ110
HSJ10	HSJ125
HSJ15	HSJ150
HSJ17-1/2	HSJ175
HSJ20	HSJ200
HSJ25	HSJ225
HSJ30	HSJ250
HSJ35	HSJ300
HSJ40	HSJ350
HSJ45	HSJ400
HSJ50	HSJ450
HSJ60	HSJ500
HSJ70	HSJ600
HSJ80	

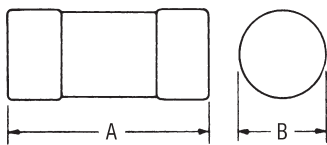
## Recommended Fuse Blocks With Box Connectors for Amp-Trap® Class J Fuses

Fuse Ampere Rating	Catalog Number 600V or Less	
	1-Pole	3-Pole
0-30	US3J1I	US3J3I
31-60	US6J1I	US6J3I
61-100	61036J	61038J
101-200	62001J	62003J
201-400	64031J	64033J
401-600	6631J	6633J

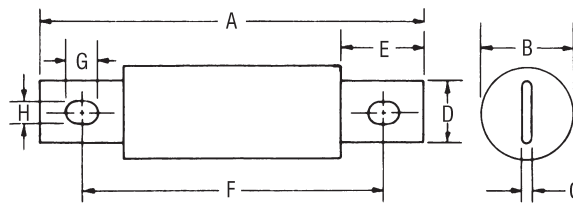
A variety of pole configurations and termination provisions are available. Refer to Section H for details.

## Dimensions

Ampere Rating	A		B		C		D		E		F		G		H	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1-30	2-1/4	57	13/16	21	-	-	-	-	-	-	-	-	-	-	-	-
31-60	2-3/8	60	1-1/16	27	-	-	-	-	-	-	-	-	-	-	-	-
61-100	4-4/8	117	1-1/8	29	1/8	3.2	3/4	19	1	25	3-5/8	92	3/8	10	9/32	7
101-200	5-3/4	146	1-5/8	41	3/16	4.8	1-1/8	29	1-3/8	35	4-3/8	111	3/8	10	9/32	7
201-400	7-1/8	181	2-1/8	54	1/4	6.3	1-5/8	41	1-7/8	48	5-1/4	133	17/32	13	13/32	10
401-600	8	203	2-1/2	64	3/8	9.5	2	51	2-1/8	54	6	152	11/16	18	17/32	13



1-60A



61-600A

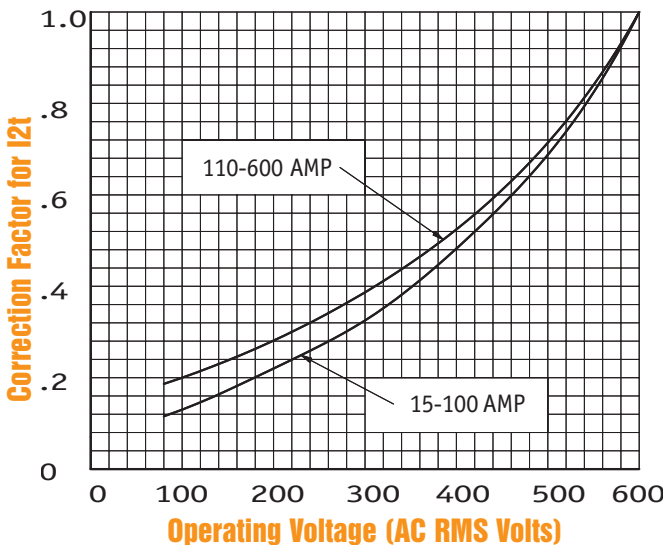
# HIGH SPEED/CLASS J

I<sup>2</sup>t Data - 600 Volts AC, 100kA

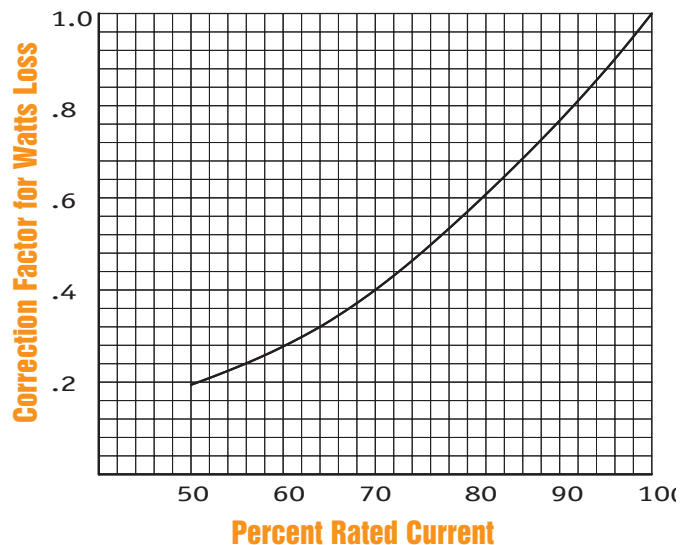
Ampere Rating (A)	Pre-Arc (A <sup>2</sup> s x 10 <sup>3</sup> )	Max Clearing I <sup>2</sup> t @ 600V AC 100kA		Max Clearing I <sup>2</sup> t @ 480V AC 100kA		Watts Loss at Rated Current
		1 Fuse (A <sup>2</sup> s x 10 <sup>3</sup> )	2 in Series (A <sup>2</sup> s x 10 <sup>3</sup> )	1 Fuse (A <sup>2</sup> s x 10 <sup>3</sup> )	2 in Series (A <sup>2</sup> s x 10 <sup>3</sup> )	
15	0.02	0.36	0.15	0.23	0.12	2.6
17.5	0.03	0.45	0.19	0.29	0.15	3.5
20	0.04	0.58	0.24	0.37	0.19	3.7
25	0.08	1.2	0.50	0.77	0.40	4
30	0.16	2	0.84	1.3	0.66	4.1
35	0.16	1.5	0.63	0.96	0.50	5.3
40	0.27	2.3	1.0	1.5	0.76	5.5
45	0.32	3.3	1.4	2.1	1.1	6
50	0.44	5.5	2.3	3.5	1.8	6.8
60	0.72	8.0	3.4	5.1	2.6	8.4
70	1.2	12	5.0	7.7	4.0	10
80	1.6	15	6.3	9.6	5.0	11
90	2.3	21	8.8	13	6.9	13
100	2.7	23	9.7	15	7.6	14
110	2.3	21	10	13.9	8	18
125	3.4	29	14	19	11	19
150	5.1	41	20	27	16	22
175	8.0	60	29	40	23	24
200	14	92	44	61	35	26
225	14	110	53	73	42	30
250	16	130	62	86	49	36
300	26	200	96	132	76	38
350	37	290	139	191	110	40
400	63	450	216	297	171	42
450	67	500	240	330	190	58
500	98	600	288	396	228	59
600	141	900	432	594	342	68

B

Clearing I<sup>2</sup>t vs Operating Voltage



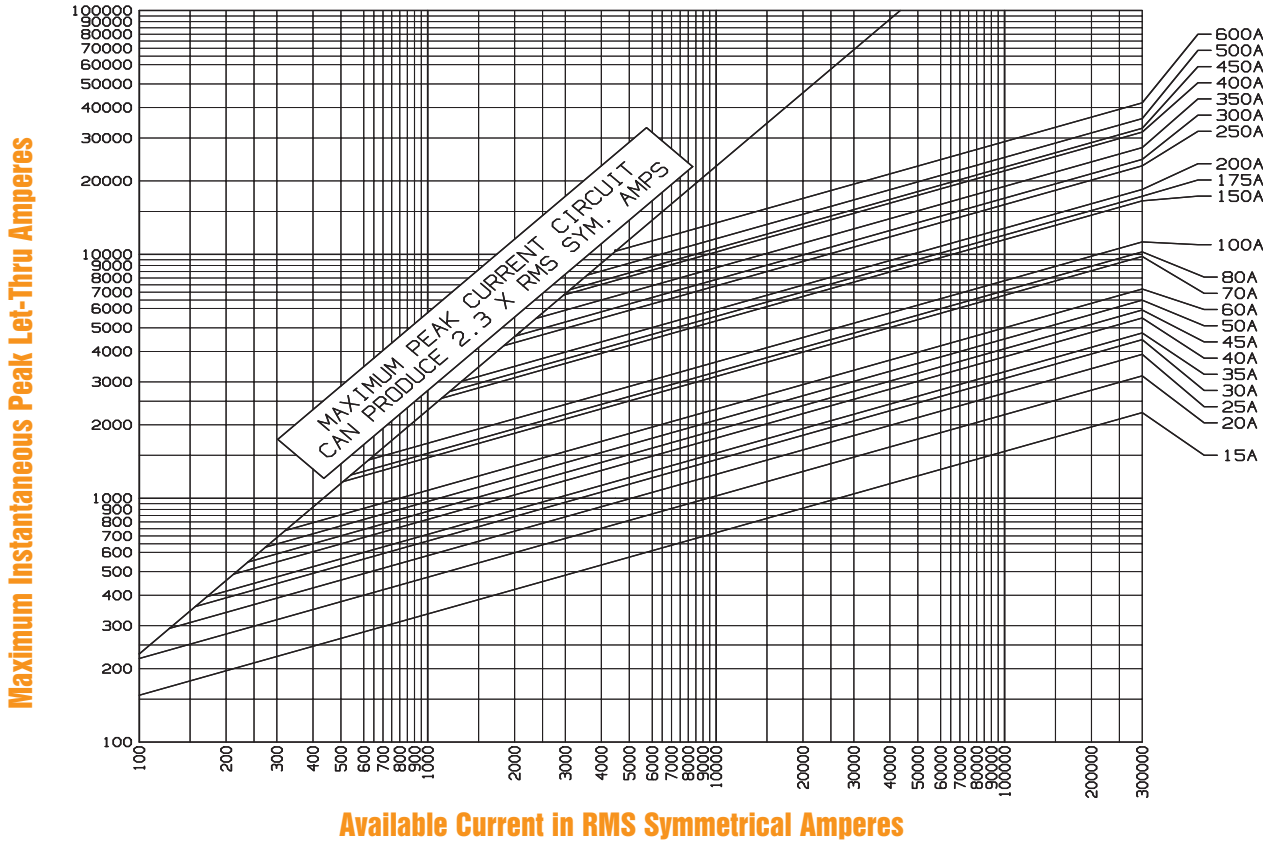
Watts Loss vs. % Rated Current



# HIGH SPEED/CLASS J

HSJ

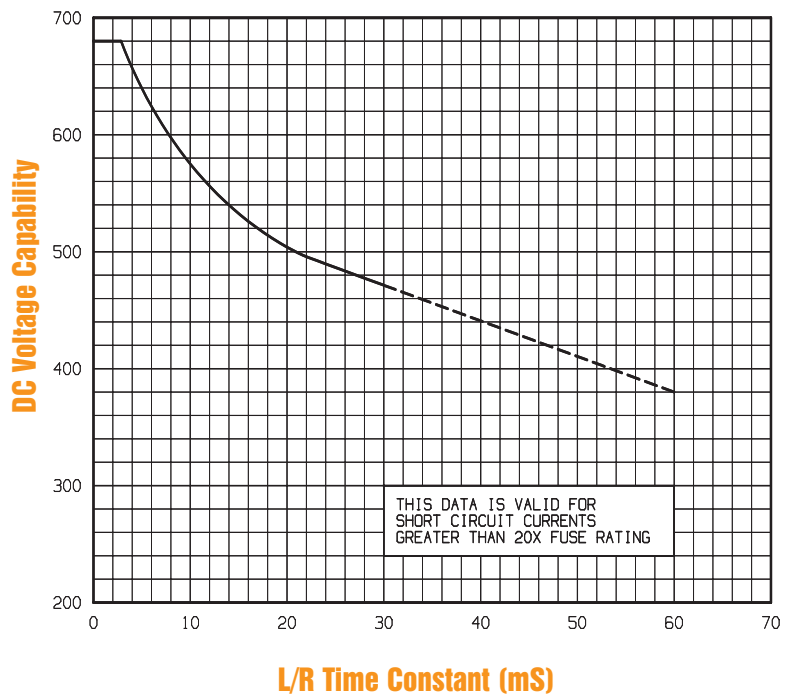
Peak Let-Thru Data - HSJ15 to 600, 600Volts AC



Clearing I<sup>2</sup>t at 500 VDC 100kA, L/R = 10mS

AMPERE RATING	CLEARING I <sup>2</sup> t @ 500 VDC L/R = 10 ms (A <sup>2</sup> s X 10 <sup>3</sup> )
15	0.12
17.5	0.18
20	0.24
25	0.46
30	0.91
35	0.60
40	0.92
45	1.3
50	2.2
60	3.2
70	4.8
80	6.2
90	8.9
100	10
110	8.8
125	13
150	19
175	28
200	46
225	52
250	59
300	96
350	136
400	230
450	270
500	390
600	560

DC Voltage vs. Time Constant

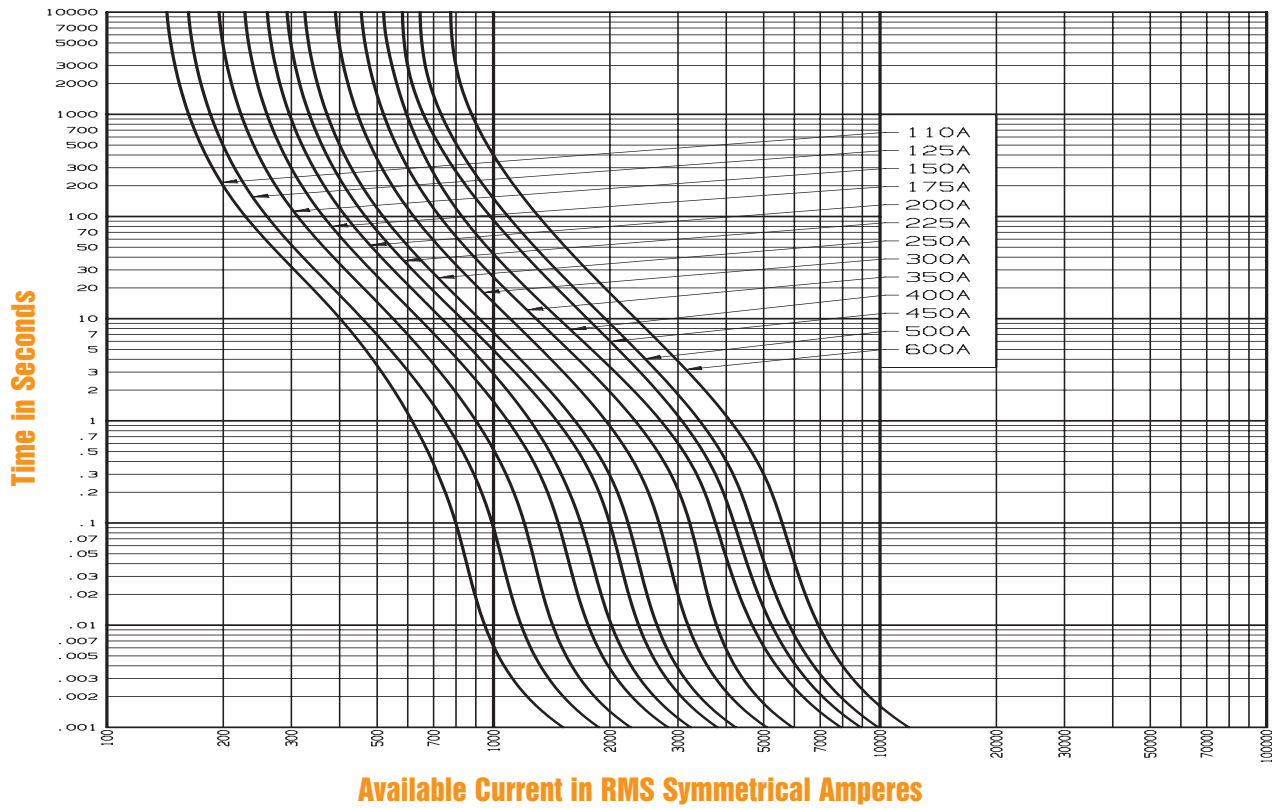
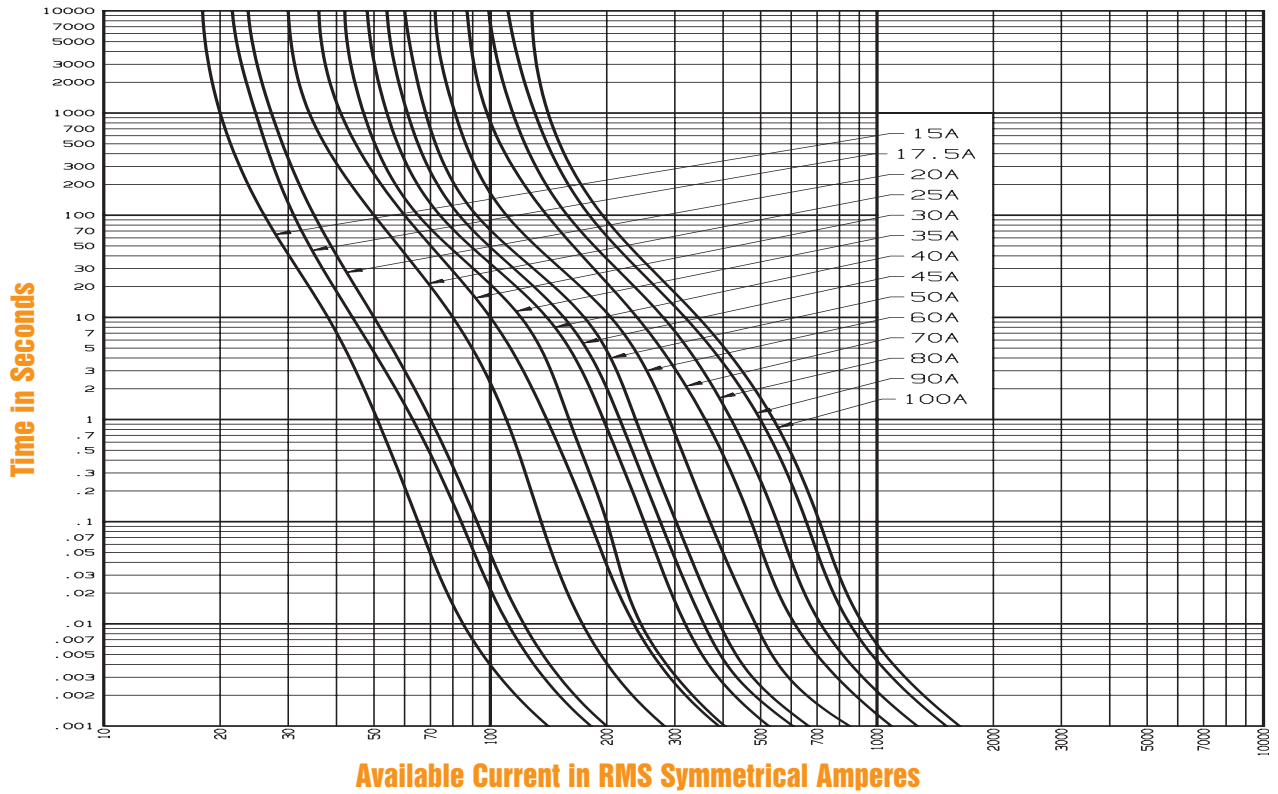


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HSJ

B

**Melting Time - Current Data, HSJ15 to 600, 600Volts AC**





# High-Speed Class J Fuses

Advanced protection for  
drives and soft-starters

# The Need for code compliance and semi-conduct

Branch Circuit Protection



## The Ferraz Shawmut solution: High Speed Class J fuses

Many manufacturers of drives and soft-starters have sought to reduce costs by eliminating internal semiconductor fusing. This now leaves equipment vulnerable to component failure, and falls short of code branch circuit requirements. Therefore, it becomes the end users' responsibility to protect the drives and soft-starters, while also providing branch circuit protection.

Ferraz Shawmut has developed an innovative solution to this problem, the UL listed Class J Fuse (HSJ) designed specifically to fit the operating parameters of drives and soft-starters, and protect the internal power electronic devices.

The HSJ combines the following features:

- Semiconductor protection (very low  $I^2t$ )
- Compliance to NEC (branch circuit protection)
- Mirrors operating characteristics of electronic motor controllers
- Capable of protecting overloads down to 135% of fuse rating

## Why let short cuts result in costly short circuits?

By using Ferraz Shawmut HSJ fuses not only are the NEC safety requirements and the equipment integrity maintained, but the price of replacing costly equipment is also eliminated.

## Features & Benefits

- UL listed to 248-8
- UL Class J dimension
- CSA certified to C22.2
- 600VAC/500VDC
- 15A to 600A
- 200 kA interrupting rating
- Very low  $I^2t$
- Protects most semiconductor devices
- Can be used with ULTRASAFE fuse holders for finger-safe protection (up to 60A)
- Easily coordinated with drives and soft starters