

Time Current Curves TD012027EN

Effective April 2014

Series G J-Frame

20-250A, 240-600V

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Note:

The following curves meet the requirements of UL, CSA, IEC, CCC and CE.

The following circuit breakers are derived from Eaton, Westinghouse, or Cutler-Hammer history.

Time Current Curves are engineering reference documents for application and coordination purposes only. For field testing molded case circuit breakers, refer to NEMA AB 4 guidelines.



Powering Business Worldwide

Catalog Number Selection

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

Table 1. Series G JG-Frame (63-250 Amperes)

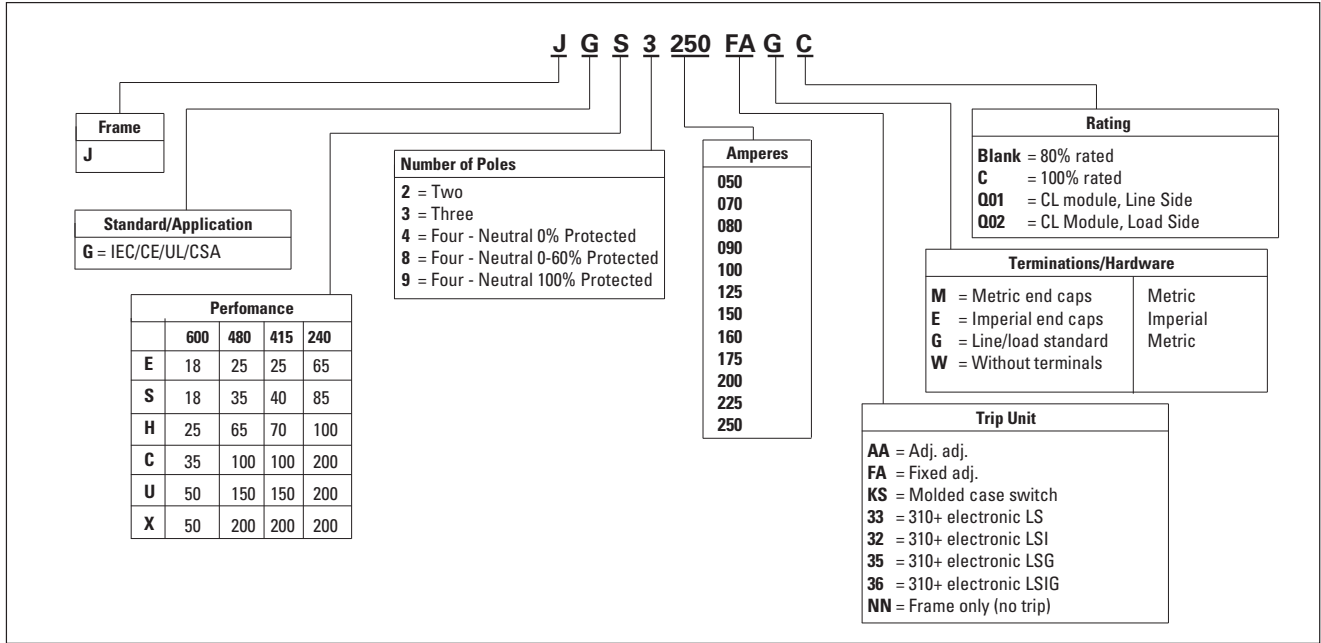


Table 2. Trip Unit

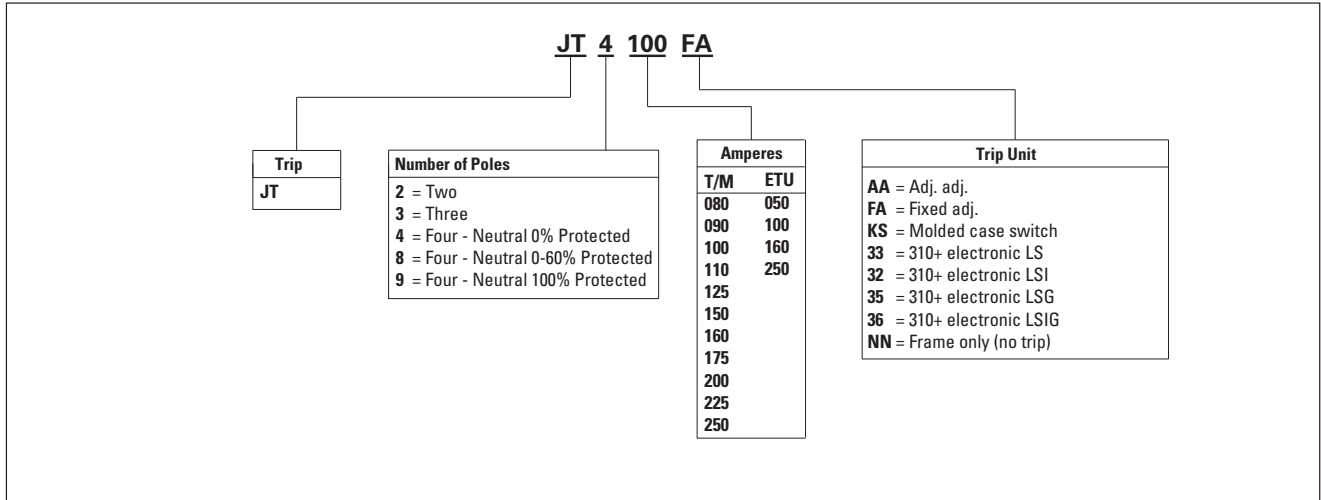
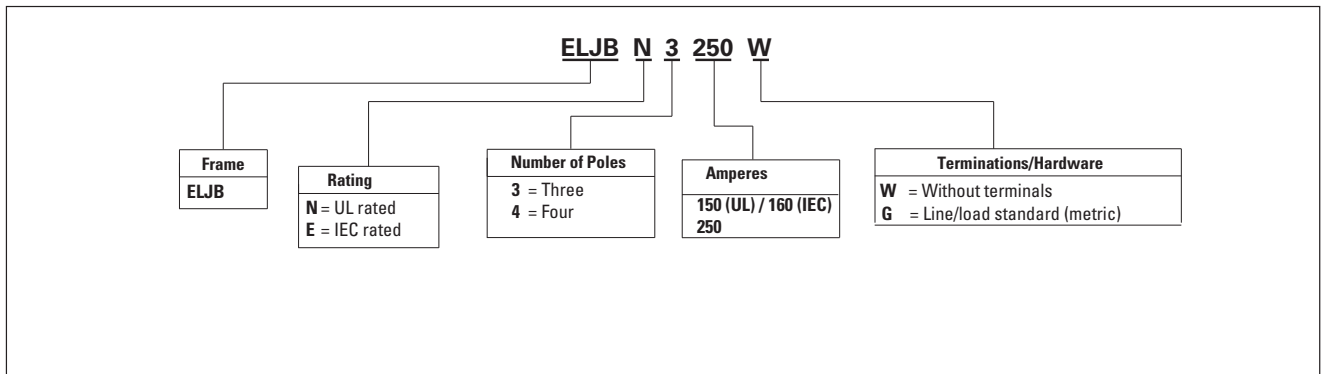


Table 3. Earth Leakage Modules



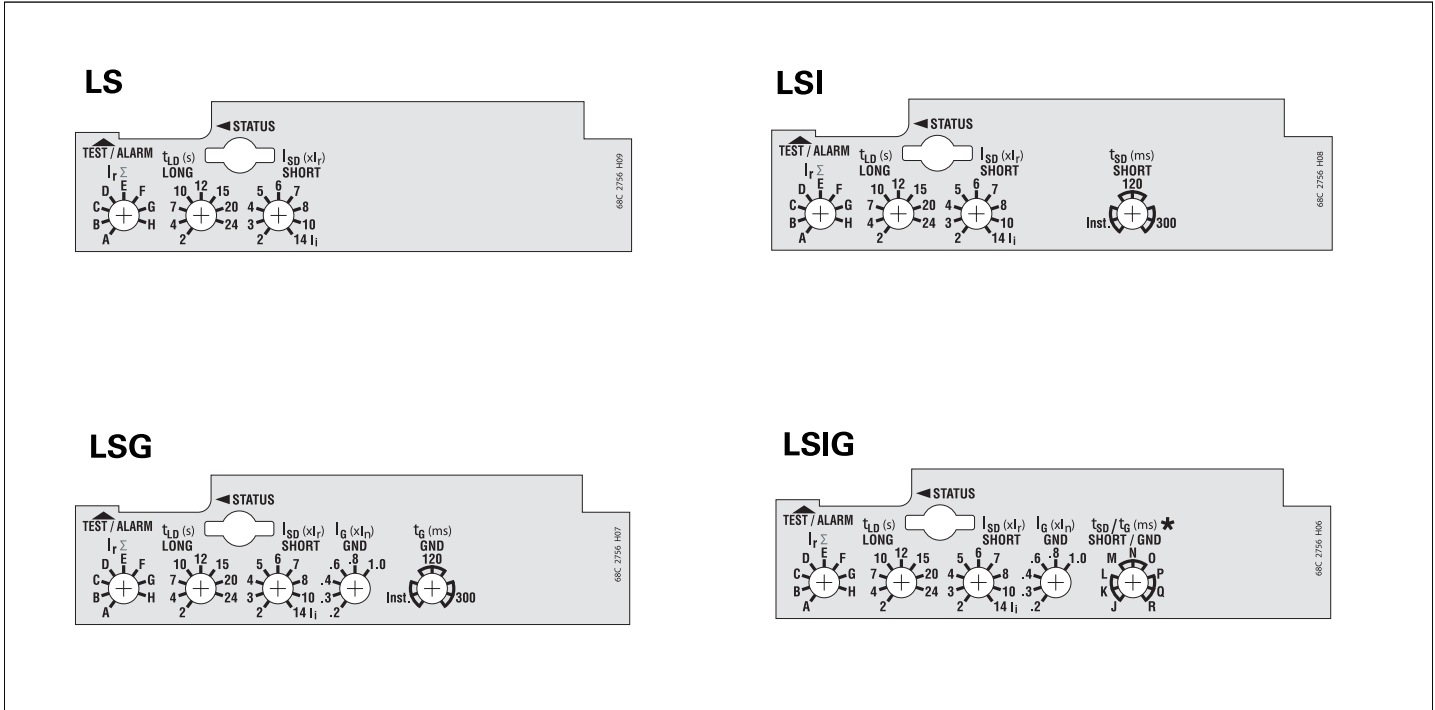


Figure 1. Digitrip 310+ Faceplates

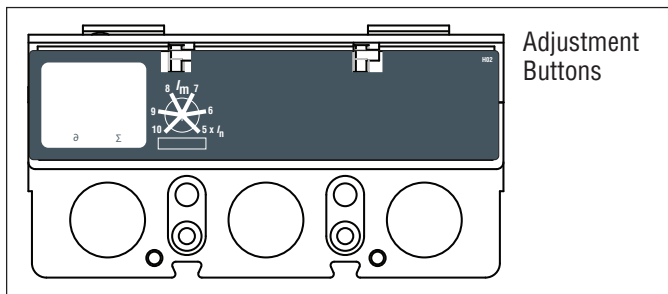


Figure 2. JG Thermal/Magnetic Faceplate

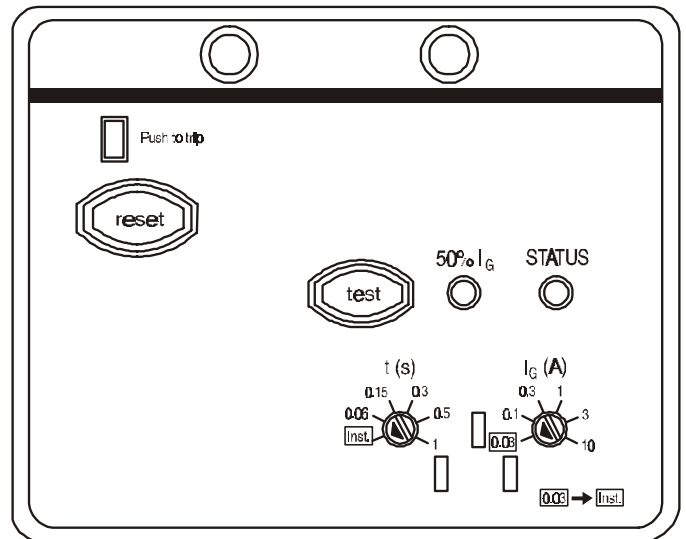


Figure 3. JG Earth Leakage Module Faceplate

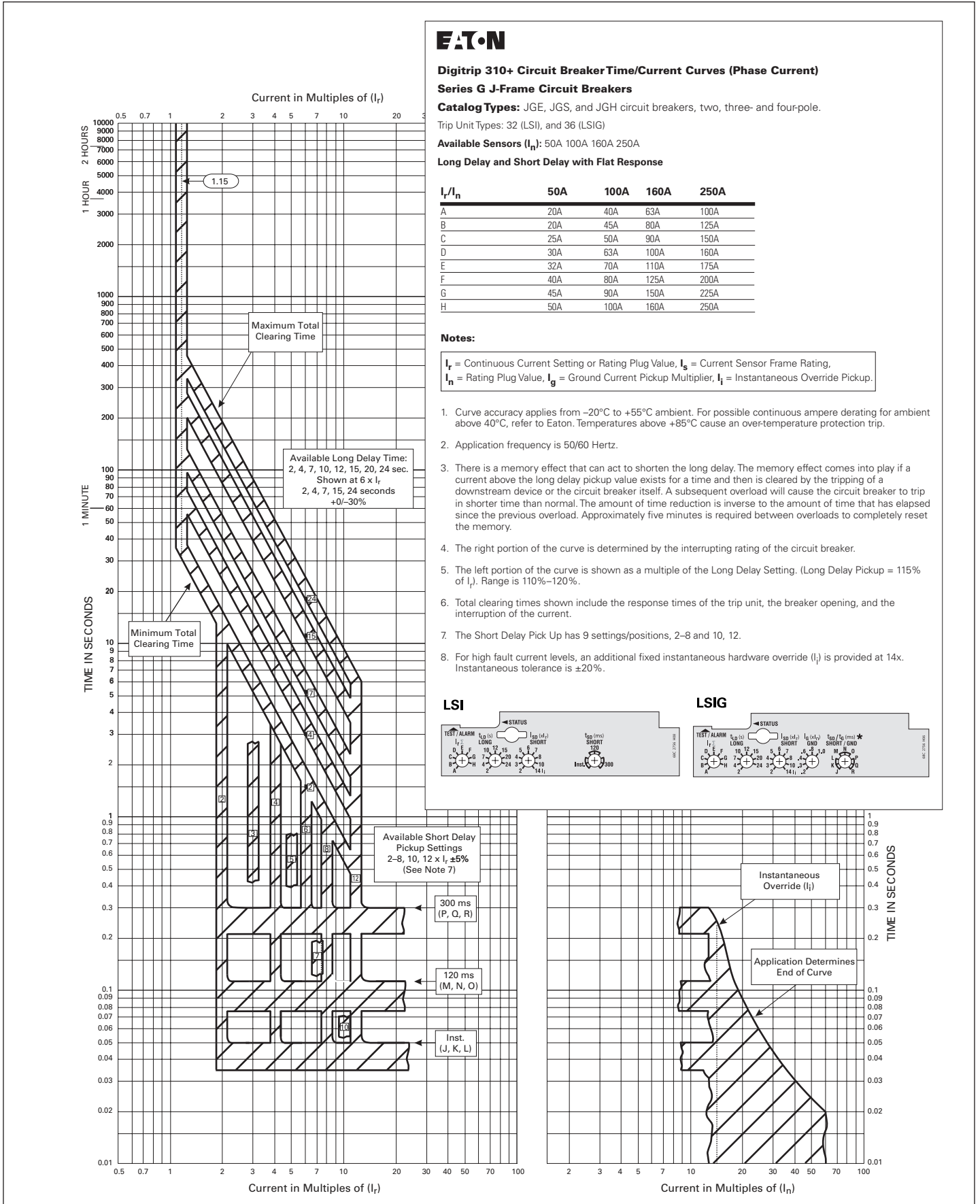


Figure 4. Digitrip 310+ Long Delay Response and Short Delay with Flat Response Curve (LSI, LSIG)—Curve Number TC01201001E, March 2012



Digitrip 310+ Circuit Breaker Time/Current Curves (Phase Current)

Series G J-Frame Circuit Breakers

Catalog Types: JGE, JGS, and JGH circuit breakers, two- three- and four-pole.

Trip Unit Types: 33 (LS) and 35 (LSG)

Available Sensors (I_n): 50A 100A 160A 250A

Long Delay and Short Delay with I^2T Response

| I_r/I_n | 50A | 100A | 160A | 250A |
|-----------|-----|------|------|------|
| A | 20A | 40A | 63A | 100A |
| B | 20A | 45A | 80A | 125A |
| C | 25A | 50A | 90A | 150A |
| D | 30A | 63A | 100A | 160A |
| E | 32A | 70A | 110A | 175A |
| F | 40A | 80A | 125A | 200A |
| G | 45A | 90A | 150A | 225A |
| H | 50A | 100A | 160A | 250A |

Notes:

I_r = Continuous Current Setting or Rating Plug Value, I_s = Current Sensor Frame Rating,
 I_n = Rating Plug Value, I_g = Ground Current Pickup Multiplier, I_i = Instantaneous Override Pickup.

1. Curve accuracy applies from -20°C to $+55^{\circ}\text{C}$ ambient. For possible continuous ampere derating for ambient above 40°C , refer to Eaton. Temperatures above $+85^{\circ}\text{C}$ cause an over-temperature protection trip.
2. Application frequency is 50/60 Hertz.
3. There is a memory effect that can act to shorten the long delay. The memory effect comes into play if a current above the long delay pickup value exists for a time and then is cleared by the tripping of a downstream device or the circuit breaker itself. A subsequent overload will cause the circuit breaker to trip in shorter time than normal. The amount of time reduction is inverse to the amount of time that has elapsed since the previous overload. Approximately five minutes is required between overloads to completely reset the memory.
4. The right portion of the curve is determined by the interrupting rating of the circuit breaker.
5. The left portion of the curve is shown as a multiple of the Long Delay Setting. (Long Delay Pickup = 115% of I_r). Range is 110%–120%.
6. Total clearing times shown include the response times of the trip unit, the breaker opening, and the interruption of the current.
7. The Short Delay Pick Up has 9 settings/positions, 2–8 and 10, 12.
8. Short Delay I^2T band has a tolerance of $\pm 15\%$.
9. Breakpoint back to FLAT response occurs at $8 \times I_r$ for upper line of the I^2T curve.
10. For high fault current levels, an additional fixed instantaneous hardware override (I_i) is provided (corresponding to SDPU position 9) at $14 \times (I_n)$. Instantaneous tolerance is $\pm 20\%$.

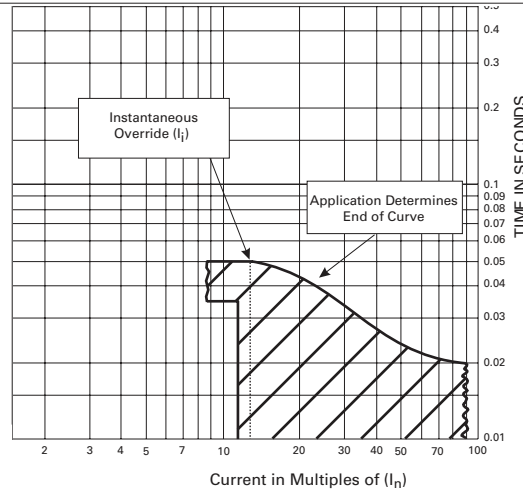
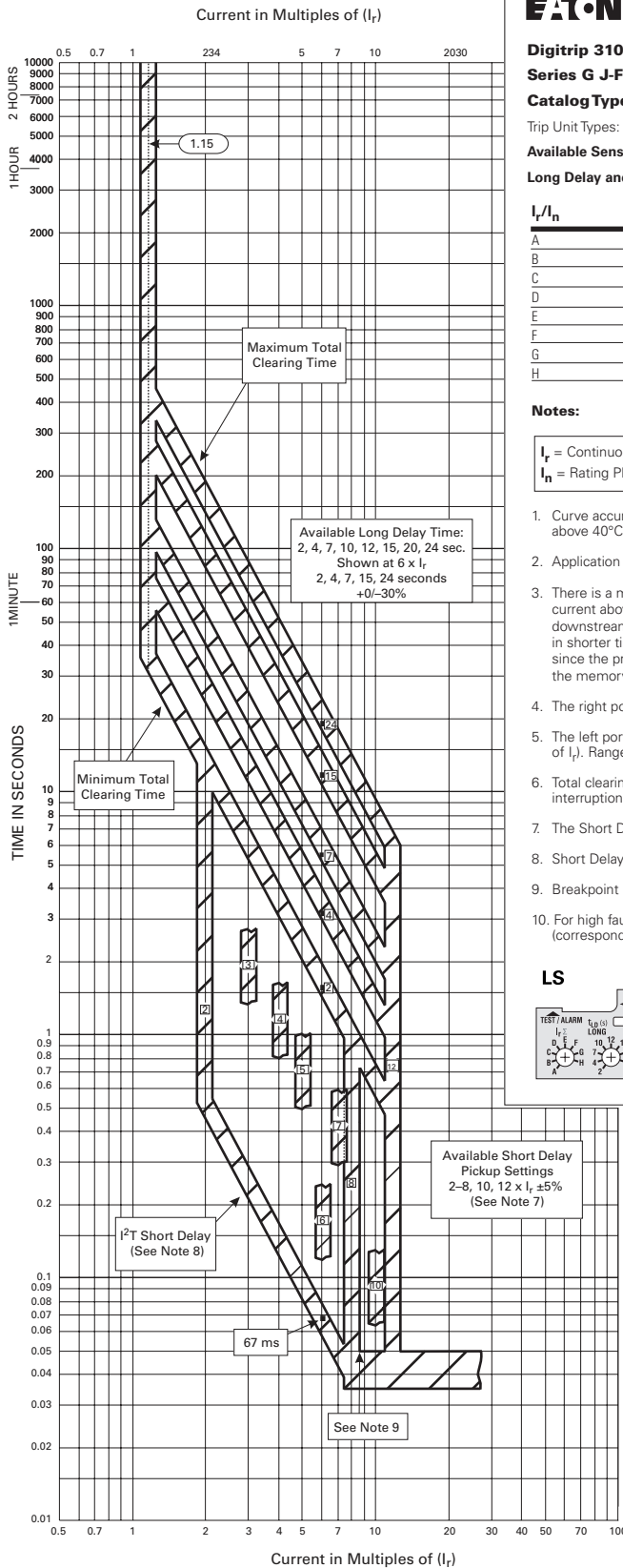
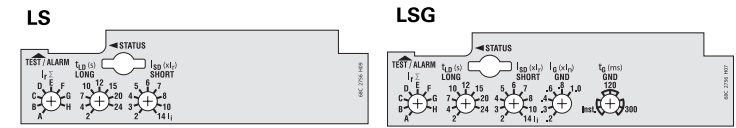


Figure 5. Digitrip 310+ Long Delay Response and Short Delay with I^2T Response Curve (LS, LSG) – Curve Number TC01201002E, March 2012

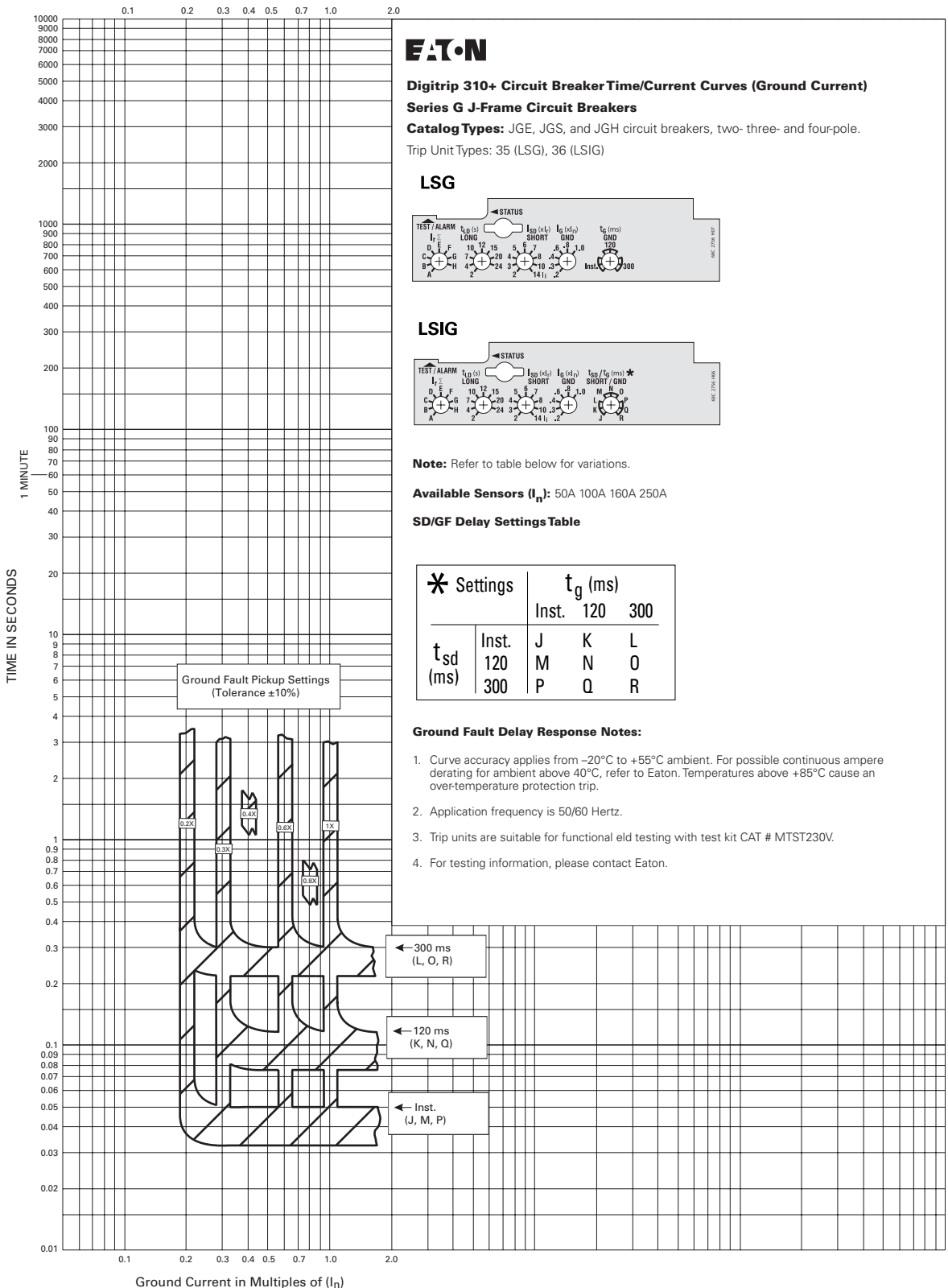


Figure 6. Ground Fault Delay Response Curve (LSG, LSI)—Curve Number TC01203004E, March 2012

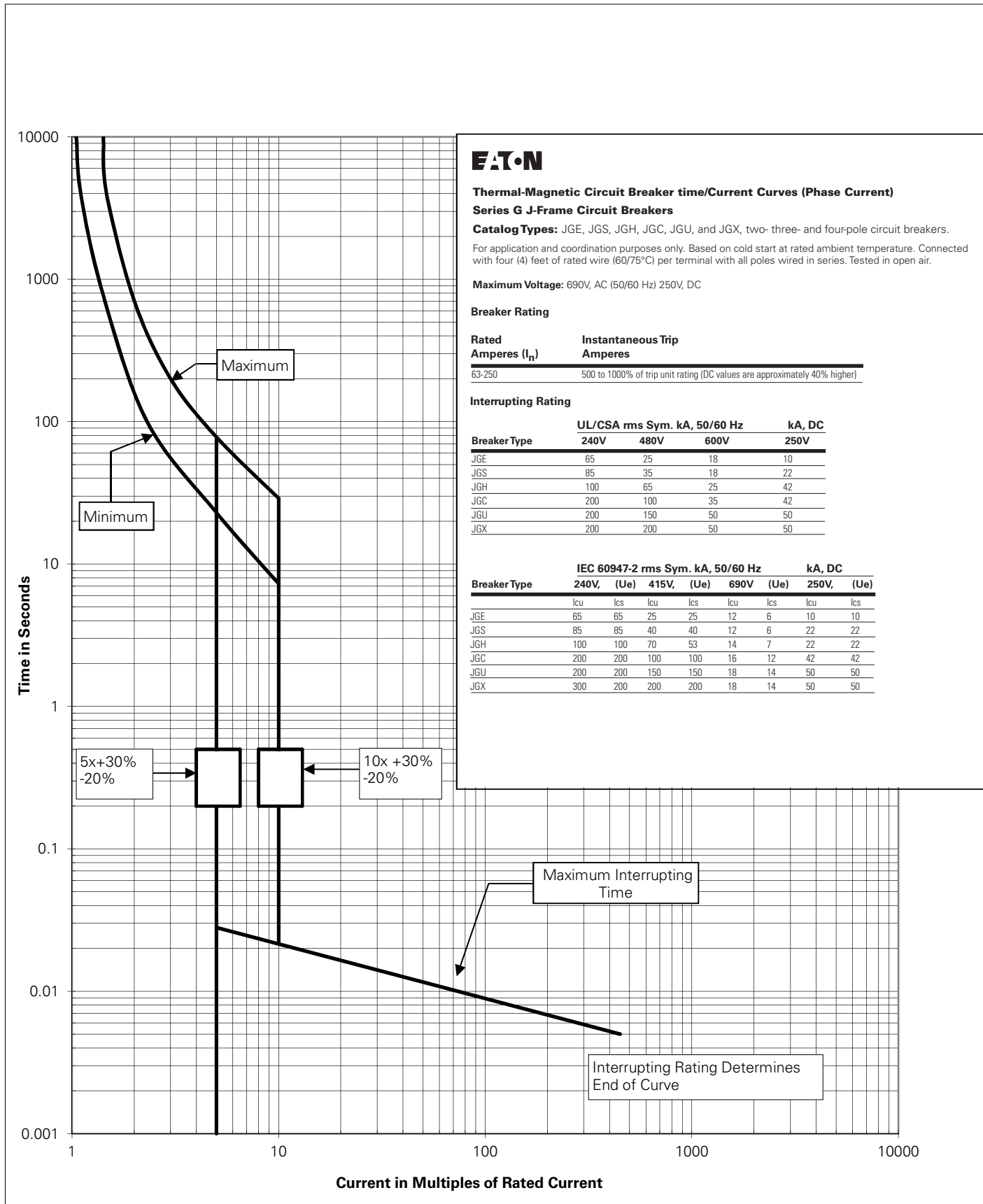


Figure 7. Thermal/Magnetic JGE, JGS, JGH, JGC, JGU, and JGX 2, 3, and 4 pole circuit breakers

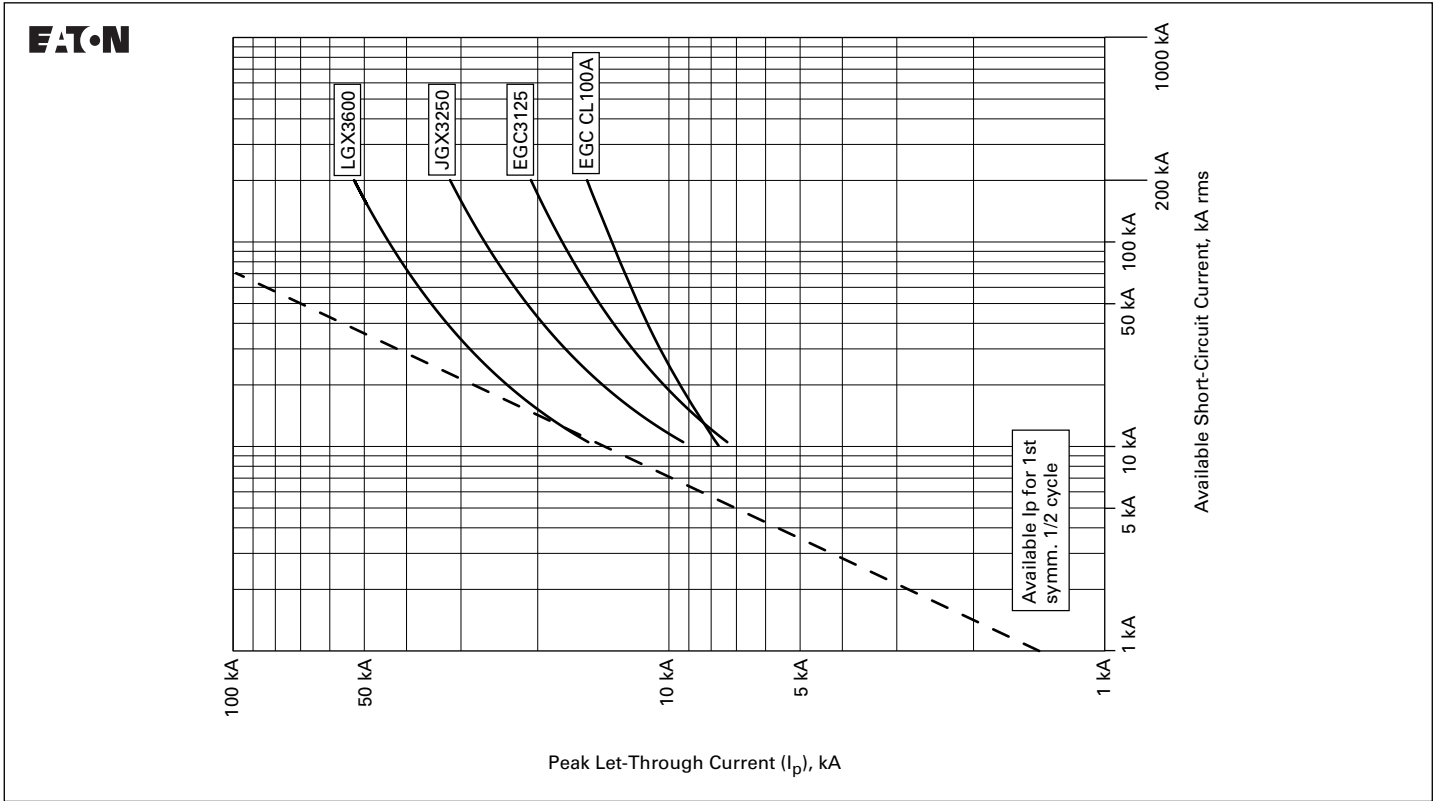


Figure 8. Peak Let-Through Current Series G Types LGX, JGX, EGC, and EGC CL (with Current Limiter), Molded-Case Circuit Breakers—240V—Curve Number TC01200001E-A, April 2012

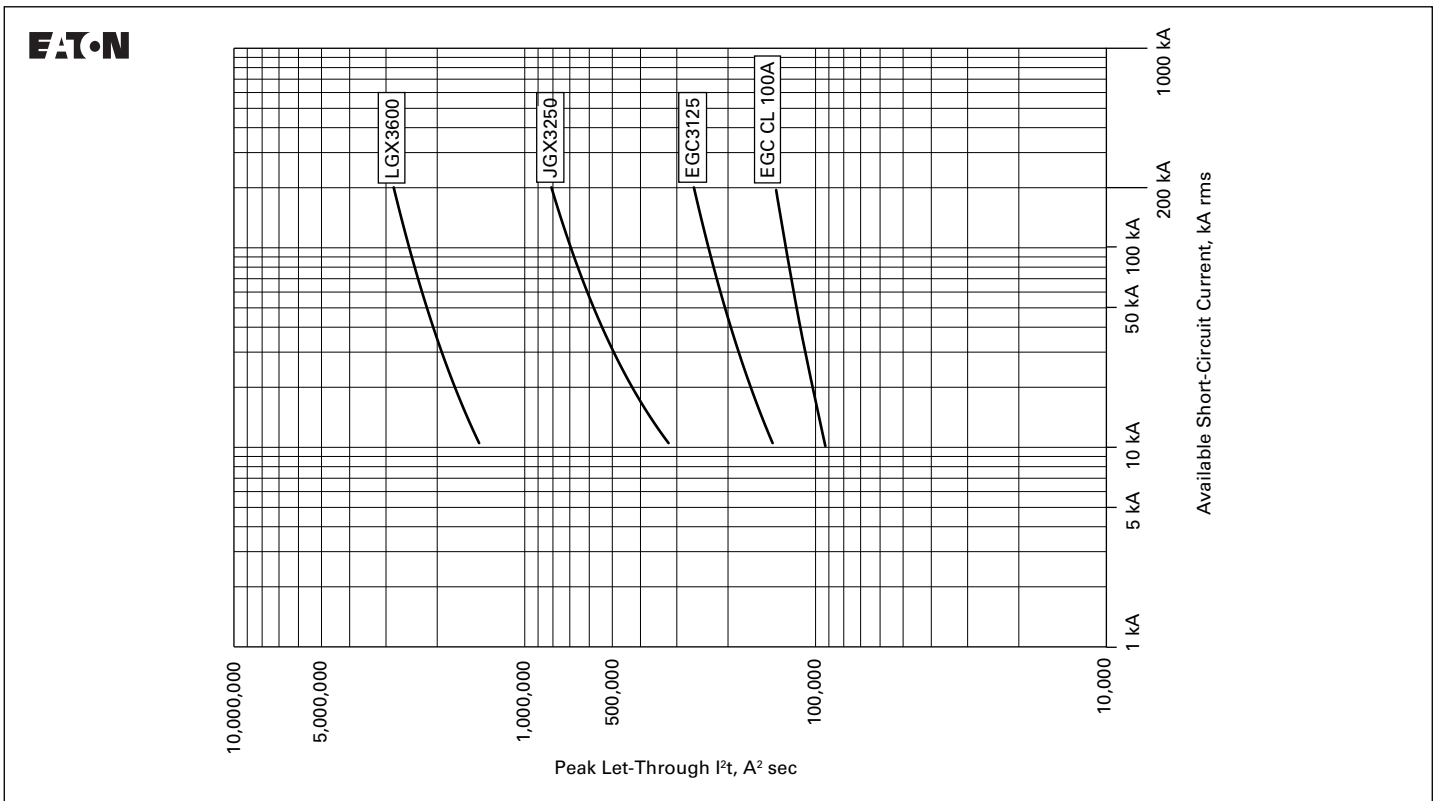


Figure 9. Peak Let-Through I^2t Series G Types LGX, JGX, EGC, and EGC CL (with Current Limiter), Molded-Case Circuit Breakers—240V—Curve Number TC01200001E-A, April 2012

Notes: All values are typical.

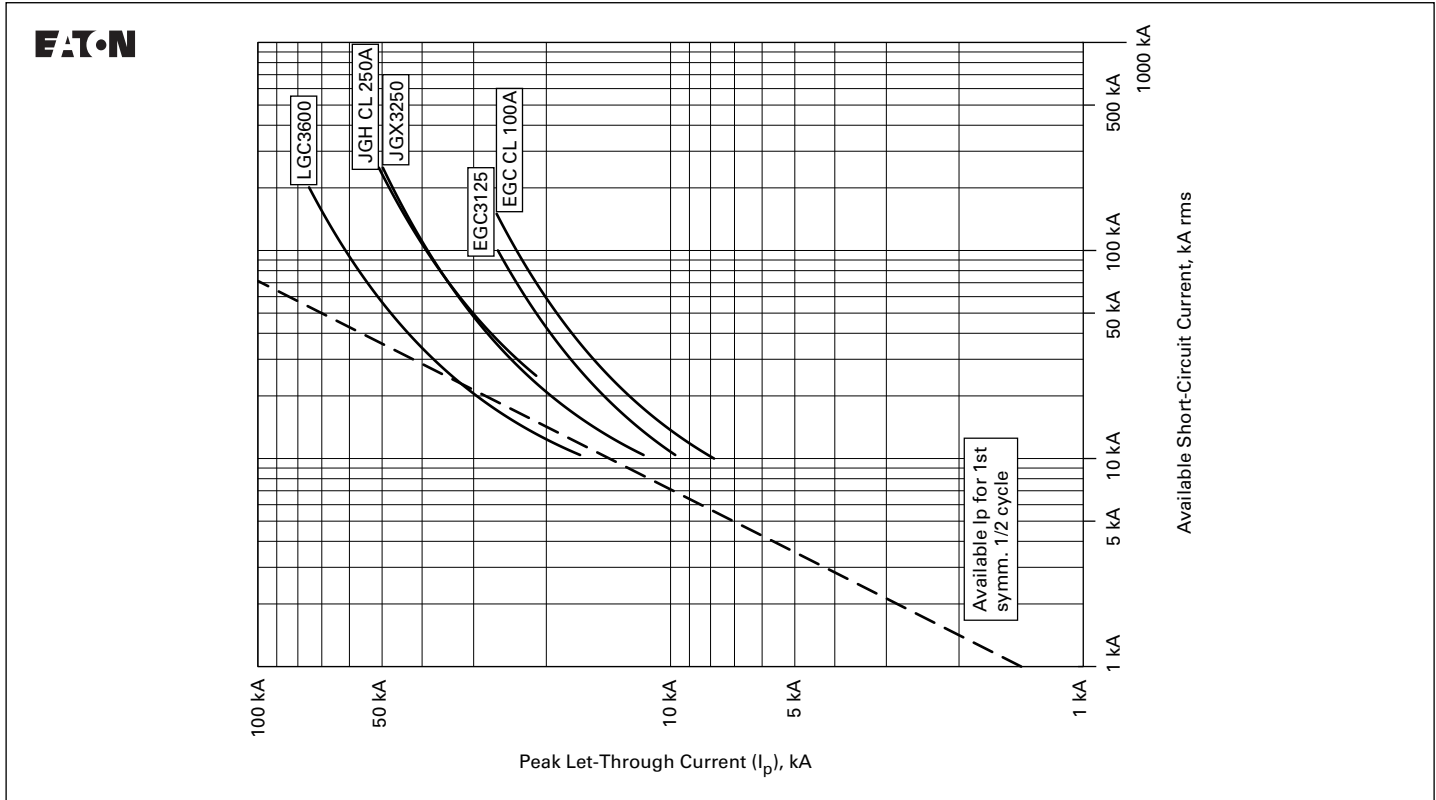


Figure 10. Peak Let-Through Current Series G Types LG, JG CL, JG, EG, and EG CL (with Current Limiter), Molded-Case Circuit Breakers—480V—Curve Number TC01200001E-B, April 2012

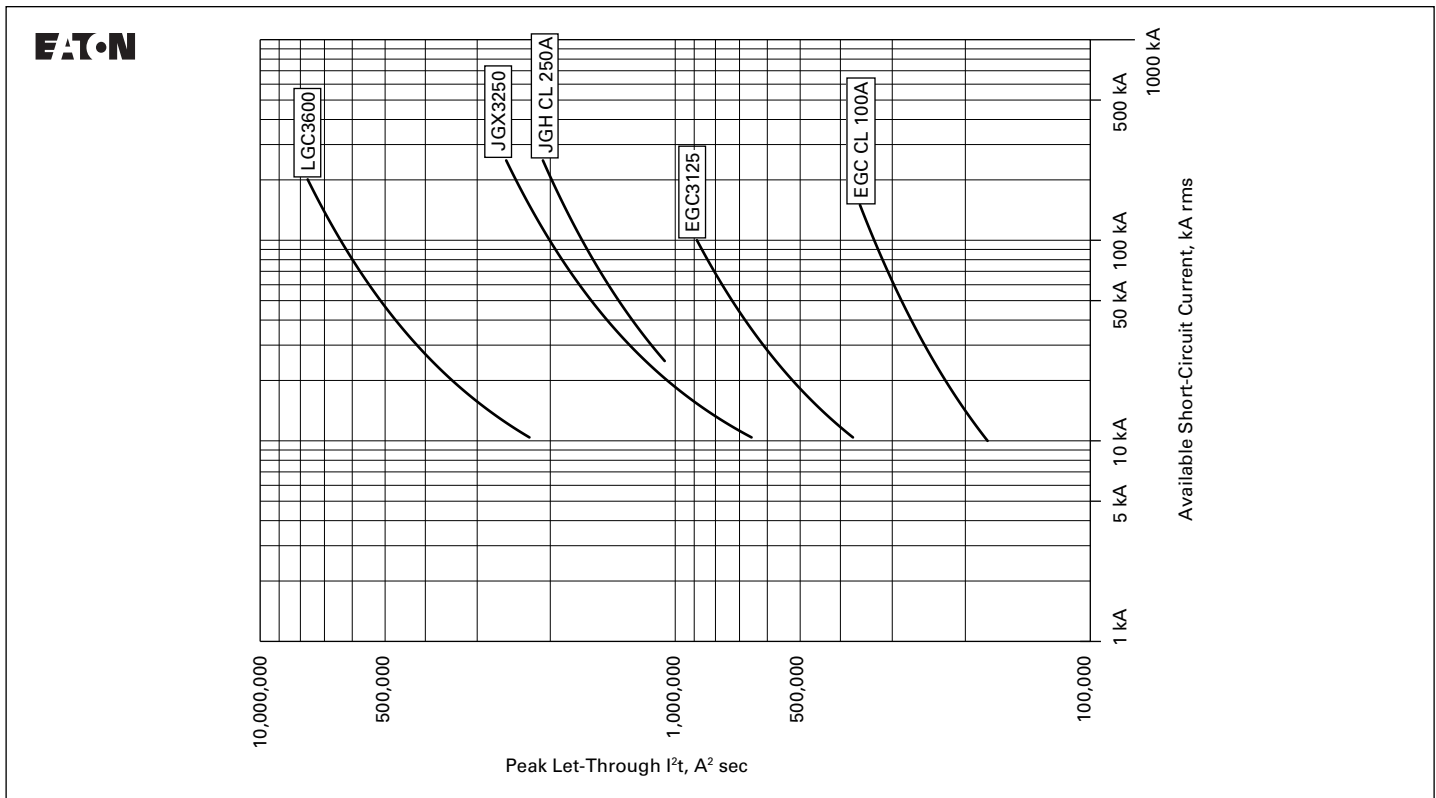


Figure 11. Peak Let-Through I^2t Series G Types LG, JG, JG CL, EG, and EG CL (with Current Limiter), Molded-Case Circuit Breakers—480V—Curve Number TC01200001E-B, April 2012

Notes: All values are typical.

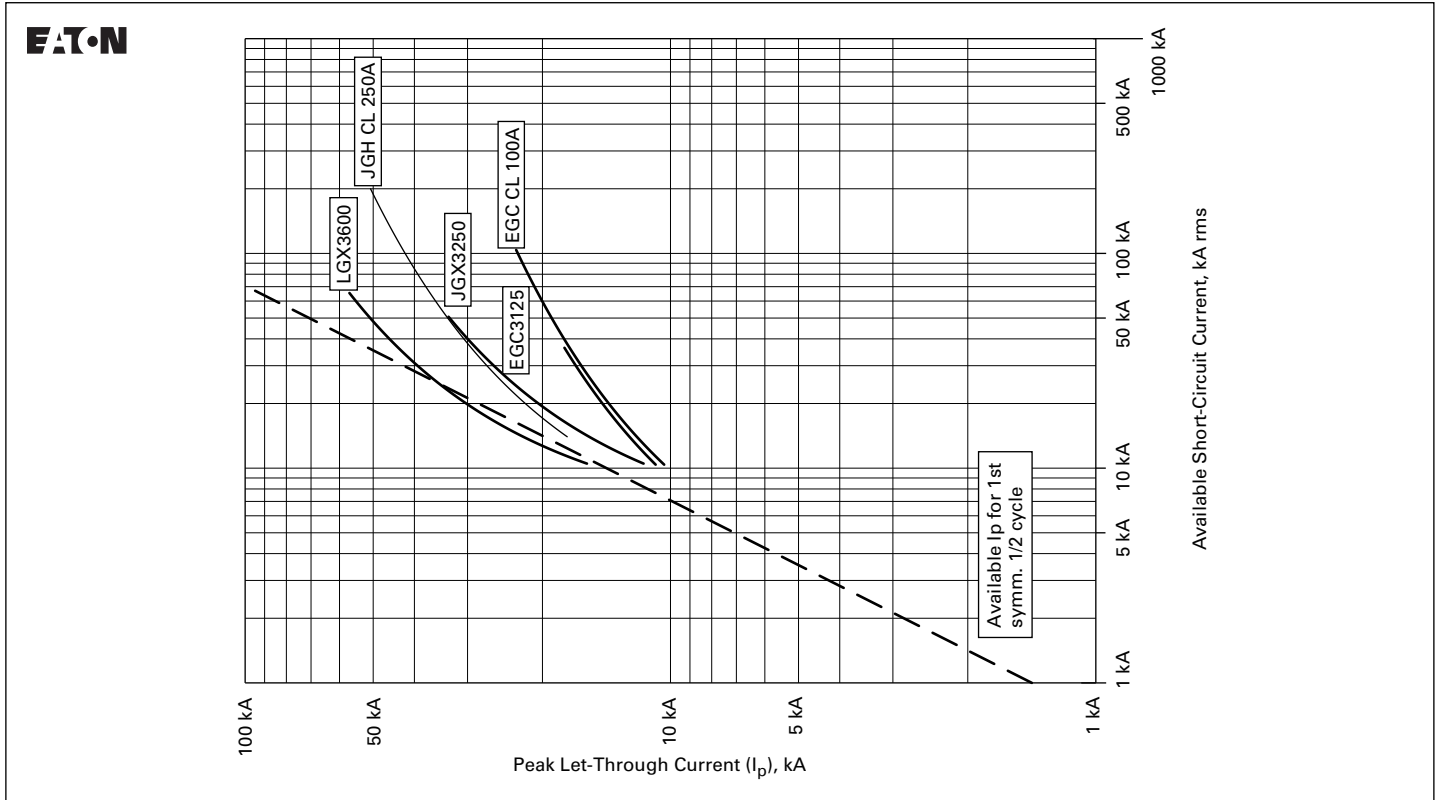


Figure 12. Peak Let-Through Current Series G Types LG, JG CL, JG, EG, and EG CL (with Current Limiter), Molded-Case Circuit Breakers—600V—Curve Number TC01200001E-C, April 2012

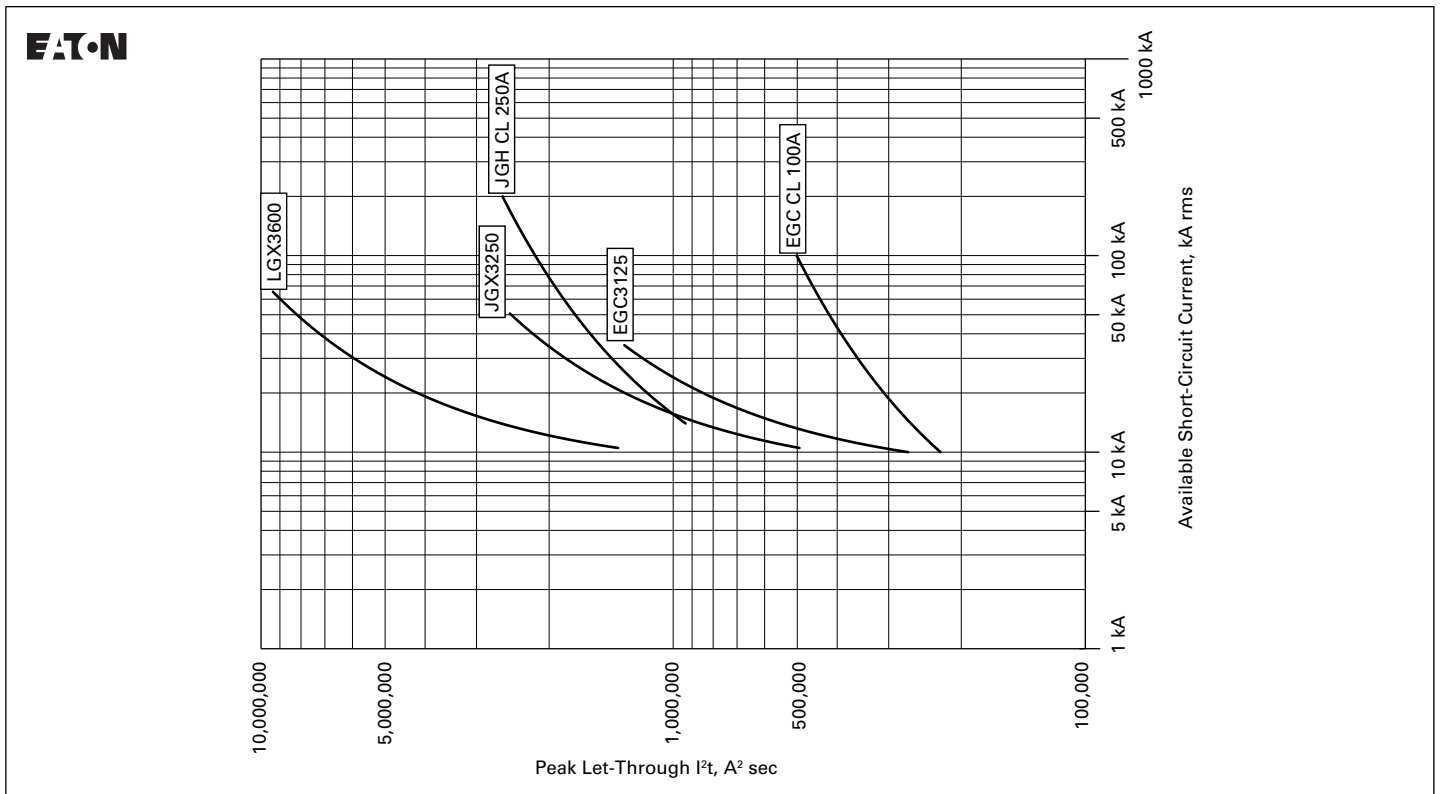


Figure 13. Peak Let-Through I^2t Series G Types LG, JG, JG CL, EG, and EG CL (with Current Limiter), Molded-Case Circuit Breakers—600V—Curve Number TC01200001E-C, April 2012

Notes: All values are typical.

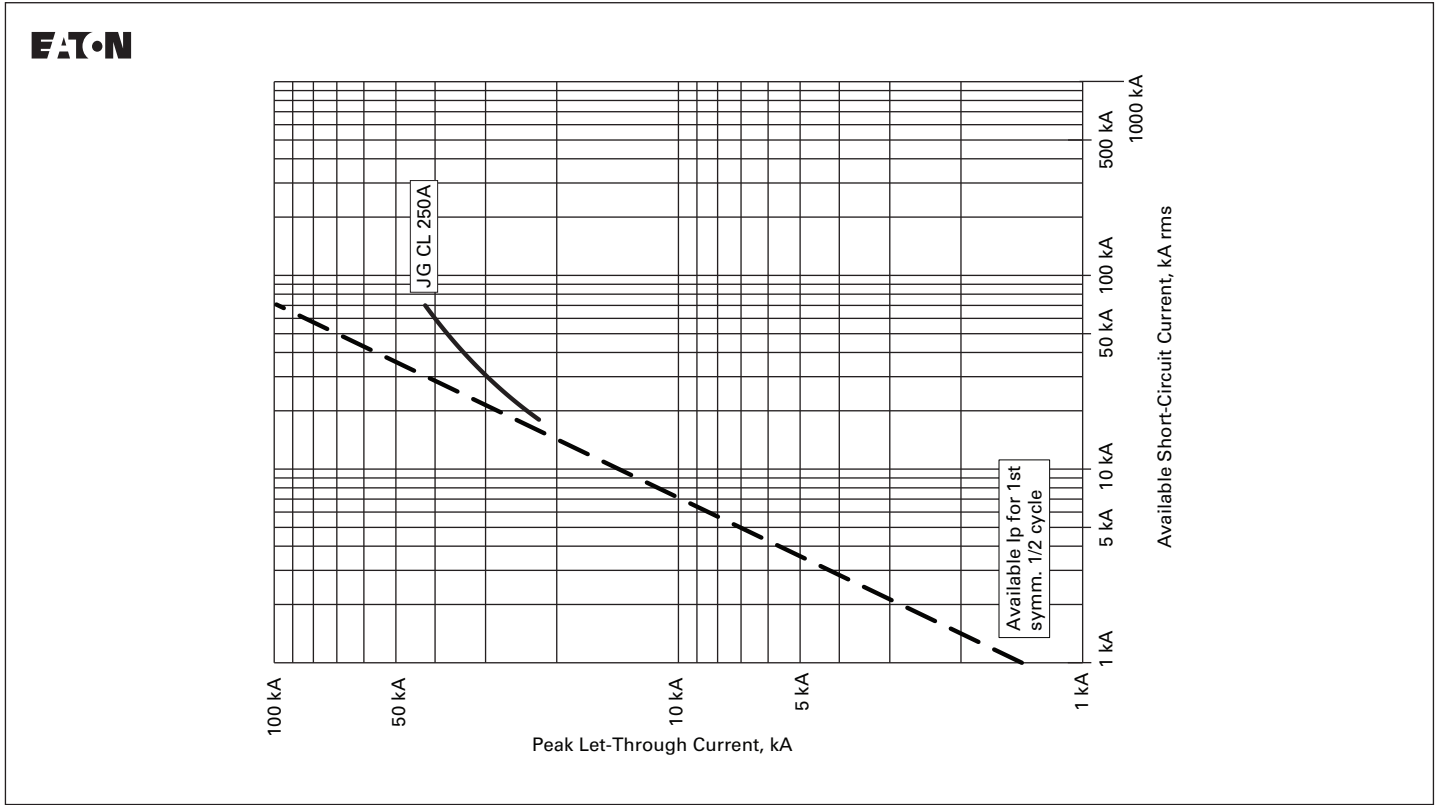


Figure 14. Series G Types JG CL Molded-Case Circuit Breakers—690V

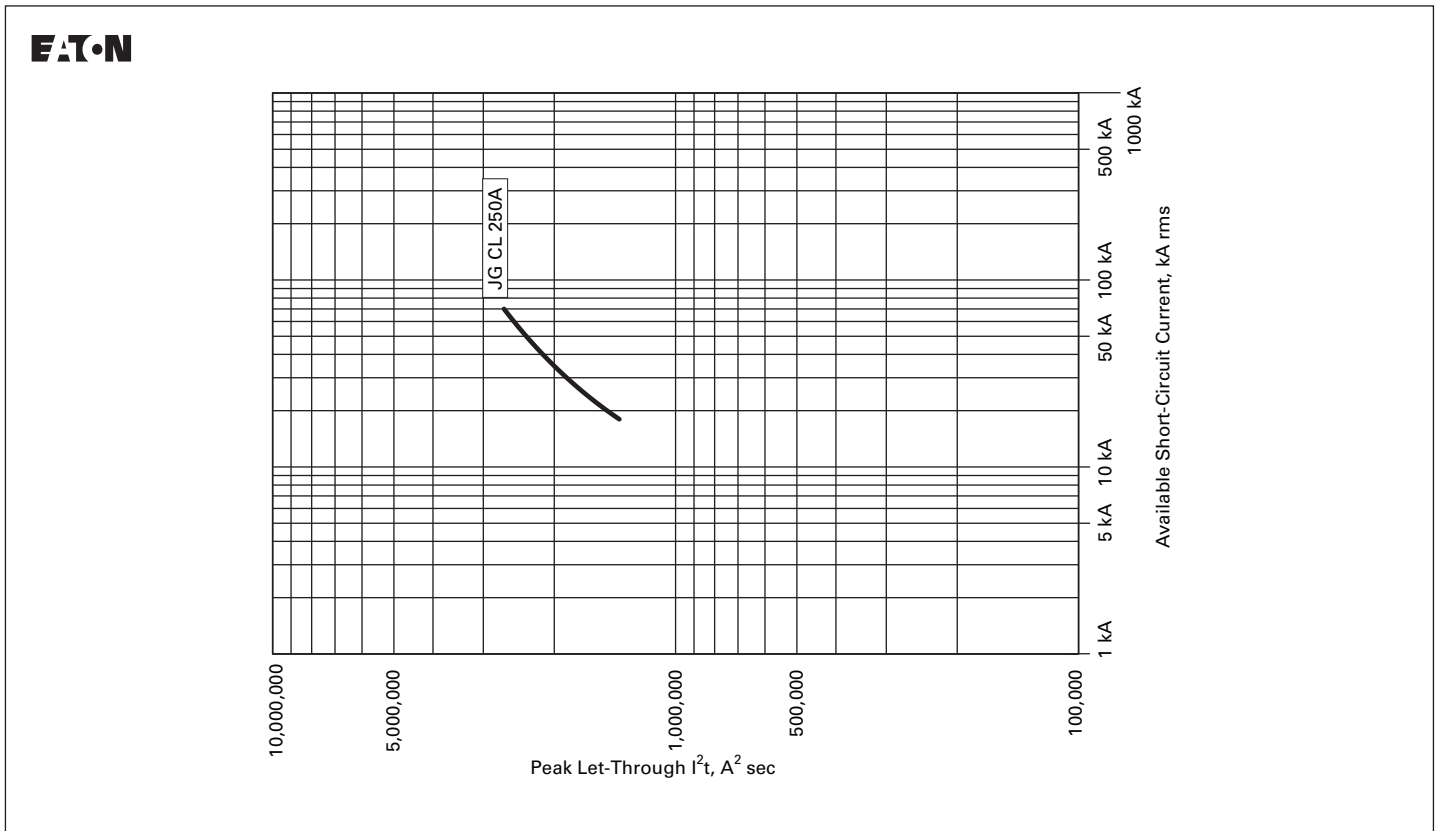


Figure 15. Series G Types JG CL Molded-Case Circuit Breakers—690V

Notes: All values are typical.

Figure 26. 240V Peak Let-Through (I_p) and Clearing (I²t) Values for Series G High-Performance Breakers

| Frame/Max. Amperes (UL) | Maximum Available Fault Current | | | | | | | | | | | |
|-------------------------|---------------------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|
| | 35 kA | | 42 kA | | 65 kA | | 100 kA | | 150 kA | | 200 kA | |
| | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) |
| JGC/250A | 18 | 510,000 | 20 | 560,000 | 24 | 610,000 | 27 | 700,000 | N/A | N/A | N/A | N/A |
| JGU/250A | 18 | 510,000 | 20 | 560,000 | 24 | 610,000 | 27 | 700,000 | 29 | 750,000 | N/A | N/A |
| JGX/250A | 18 | 510,000 | 20 | 560,000 | 24 | 610,000 | 27 | 700,000 | 29 | 750,000 | 32 | 800,000 |

Figure 27. 480V Peak Let-Through (I_p) and Clearing (I²t) Values for Series G High-Performance Breakers

| Frame/Max. Amperes (UL) | Maximum Available Fault Current | | | | | | | | | | | |
|-------------------------|---------------------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|
| | 35 kA | | 50 kA | | 65 kA | | 100 kA | | 150 kA | | 200 kA | |
| | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) |
| JGC/250A | 24 | 1,300,000 | 28 | 1,500,000 | 32 | 1,700,000 | 36 | 1,800,000 | N/A | N/A | N/A | N/A |
| JGU/250A | 24 | 1,300,000 | 28 | 1,500,000 | 32 | 1,700,000 | 36 | 1,800,000 | 40 | 2,100,000 | N/A | N/A |
| JGX/250A | 24 | 1,300,000 | 28 | 1,500,000 | 32 | 1,700,000 | 36 | 1,800,000 | 40 | 2,100,000 | 44 | 2,300,000 |
| JGH CL/250A | 26 | 1,300,000 | 31 | 1,400,000 | 34 | 1,500,000 | 40 | 1,700,000 | 45 | 1,900,000 | 48 | 2,000,000 |

Figure 28. 600V Peak Let-Through (I_p) and Clearing (I²t) Values for Series G High-Performance Breakers

| Frame/Max. Amperes (UL) | Maximum Available Fault Current | | | | | |
|-------------------------|---------------------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|
| | 35 kA | | 50 kA | | 65 kA | |
| | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) |
| JGC/250A | 25 | 1,900,000 | N/A | N/A | N/A | N/A |
| JGU/250A | 25 | 1,900,000 | 30 | 2,300,000 | N/A | N/A |
| JGX/250A | 25 | 1,900,000 | 30 | 2,300,000 | N/A | N/A |
| JGH CL/250A | 29 | 1,600,000 | 34 | 1,800,000 | 37 | 1,900,000 |

Figure 29. 690V Peak Let-Through (I_p) and Clearing (I²t) Values for Series G High-Performance Breakers

| Frame/Max. Amperes (IEC) | Maximum Available Fault Current | | | | | |
|--------------------------|---------------------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|
| | 18 kA | | 50 kA | | 70 kA | |
| | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) | I _p (kA) | I ² T (A ² sec) |
| JGH CL/250A | 23 | 1,600,000 | 38 | 2,500,000 | 43 | 3,200,000 |

Notes: All values are typical.

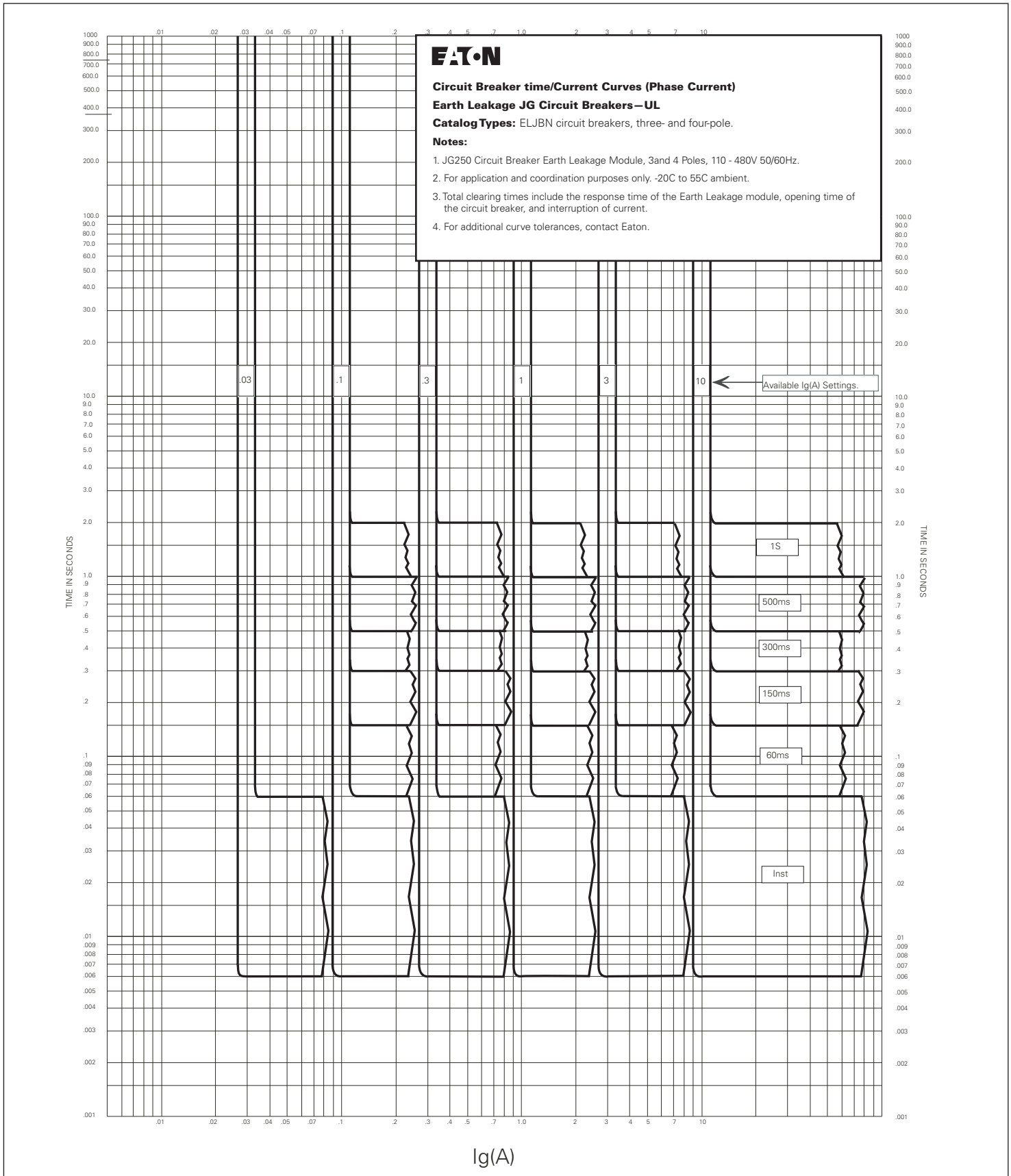


Figure 16. UL JG Circuit Breaker Earth Leakage Module, Three- and Four-Pole, 110-480V - Curve Number TC01204004E, March 2003

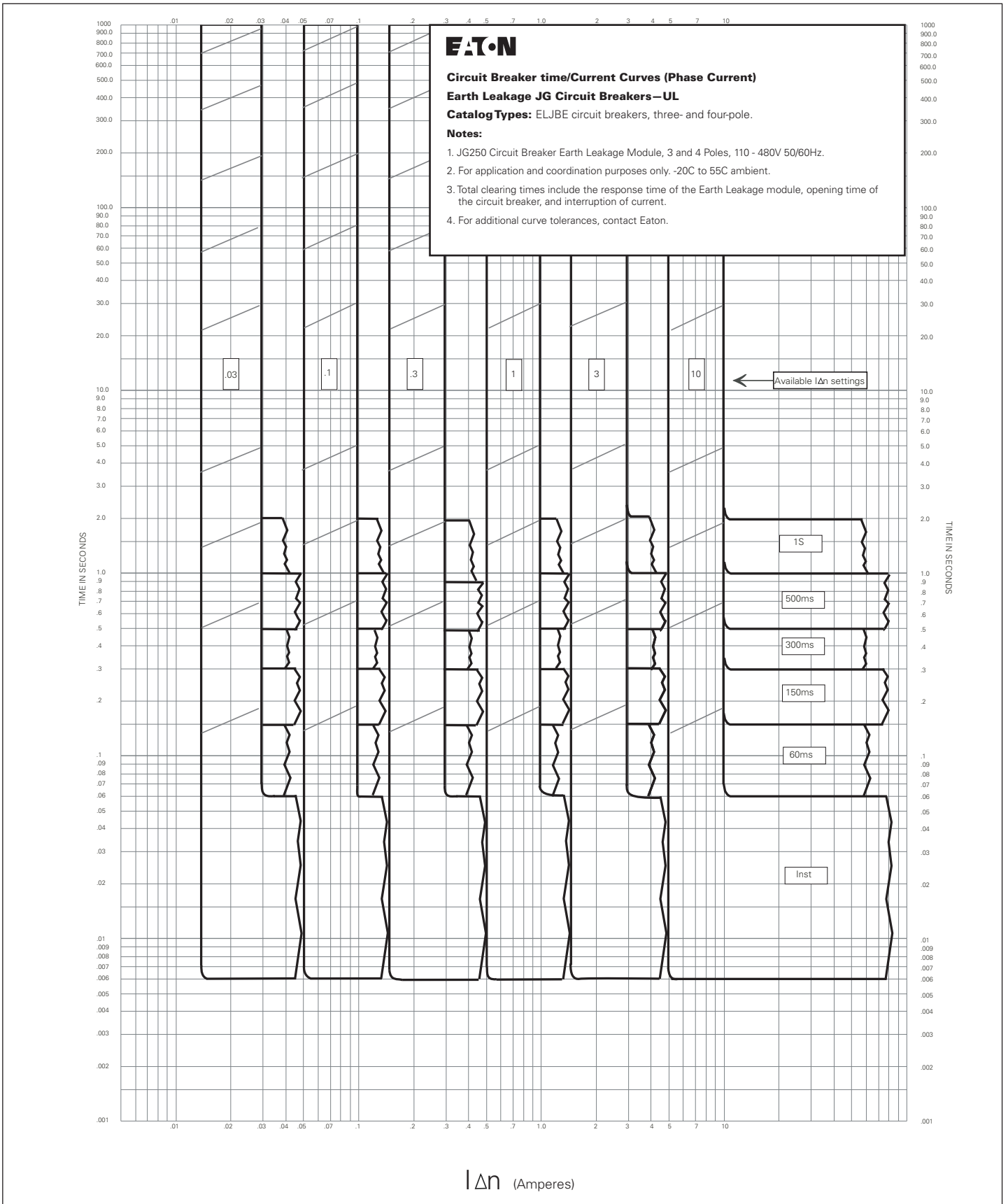


Figure 17. IEC JG Circuit Breaker Earth Leakage Module, Three- and Four-Pole, 110-480V - Curve Number TC01205001E, March 2003

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