

# MPI2520

## High Current, Low Profile, Miniature Power Inductors



### Applications:

- Mobile/smart phones
- Handheld/mobile equipment
- Digital cameras
- Media players
- GPS
- MP3 Players
- Tablets/e-readers

### Environmental data:

- Storage temperature range (Component): -40°C to +125°C
- Operating temperature range: -40°C to +125°C (ambient + self temperature rise)
- Solder reflow temperature: J-STD-020D compliant

### Packaging:

- Supplied in tape and reel packaging, 3000 parts per 7" diameter reel

### Product description:

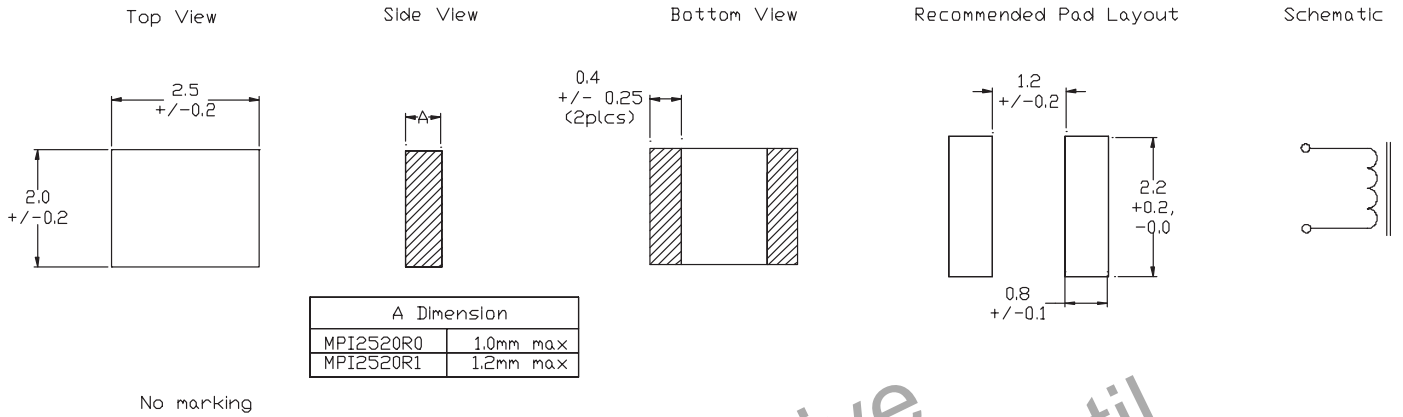
- Halogen free, lead free, RoHS compliant
- 125°C maximum total temperature operation
- 2.7 x 2.2 x 1.0 / 1.2mm maximum surface mount package
- Magnetically shielded, low EMI
- Inductance range from 0.47µH to 10.0µH
- Current range from 1.1 to 4.8 amps

**Product specifications**

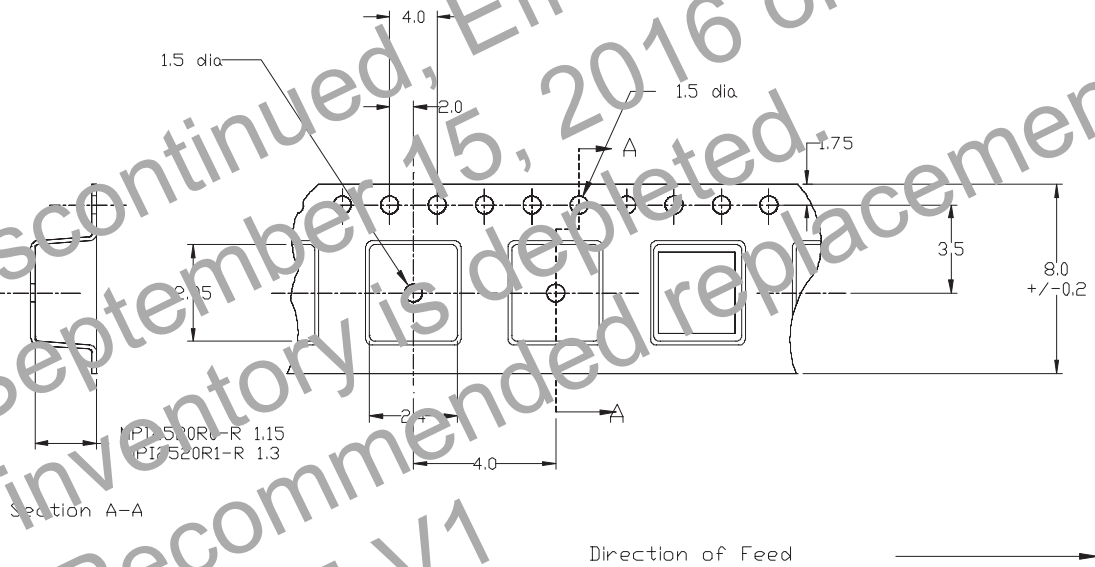
Part Number <sup>5</sup>	OCL1 ( $\mu\text{H}$ ) $\pm 20\%$	$I_{\text{rms}}^2$ (Amps)	$I_{\text{sat}}^3$ (Amps)	DCR (m $\Omega$ ) @ 25°C typical	DCR (m $\Omega$ ) @ 25°C max	K-Factor <sup>4</sup>
R0 — 1.0mm Height						
MPI2520R0-R47-R	0.47	4.1	4.4	28	34	2887
MPI2520R0-1R0-R	0.9	3.2	3.2	50	60	1925
MPI2520R0-1R5-R	1.5	2.4	2.6	80	96	1444
MPI2520R0-2R2-R	2.2	2.2	2.4	103	124	1283
MPI2520R0-3R3-R	3.3	1.6	1.6	190	228	1050
MPI2520R0-4R7-R	4.7	1.4	1.4	240	288	825
R1 - 1.2mm Height						
MPI2520R1-R47-R	0.47	4.5	4.8	20	24	2310
MPI2520R1-1R0-R	1.0	3.7	4.0	35	42	1925
MPI2520R1-1R5-R	1.5	2.9	3.2	55	66	1444
MPI2520R1-2R2-R	2.2	2.3	2.7	75	90	1255
MPI2520R1-3R3-R	3.3	1.8	2.4	105	126	962
MPI2520R1-4R7-R	4.7	1.6	1.9	150	180	825
MPI2520R1-5R6-R	5.6	1.5	1.5	200	240	679
MPI2520R1-6R8-R	6.8	1.3	1.3	300	360	679
MPI2520R1-100-R	10.0	1.1	1.2	390	468	525

- Open Circuit Inductance (OCL) Test Parameters: 1MHz, 0.1Vrms, 0.0Aac, 25°C
- $I_{\text{rms}}$ : DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB layout, trace thickness and width, air-flow, and proximity of other heat generating components will affect the temperature rise. It is recommended that the temperature of the part not exceed +25°C under worst case operating conditions verified in the end application.
- $I_{\text{sat}}$ : Peak current for approximately 10% rolloff at +25°C
- K-factor: Used to determine  $B_{\text{pp}}$  for core loss (see graph).  
 $B_{\text{pp}} = K \sqrt{L \Delta I}$ ;  $B_{\text{pp}}$ : (Gauss), K: (K-factor from table),  
L: (Inductance in  $\mu\text{H}$ ),  $\Delta I$  (Peak to peak ripple current in Amps).
- Part Number Definition: MPI2520R $x$ -yyy-R  
- MPI2520R $x$  = Product code and size  
- yyy = Inductance value in  $\mu\text{H}$ , R = decimal point,  
if no R is present then third character = number of zeros.  
- "-R" suffix = RoHS compliant

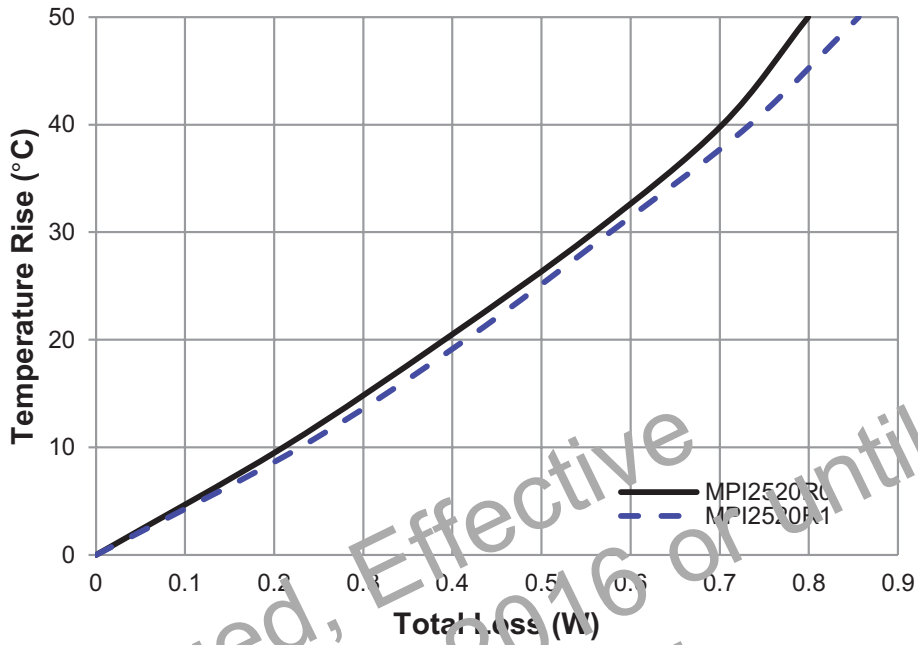
**Dimensions - mm**



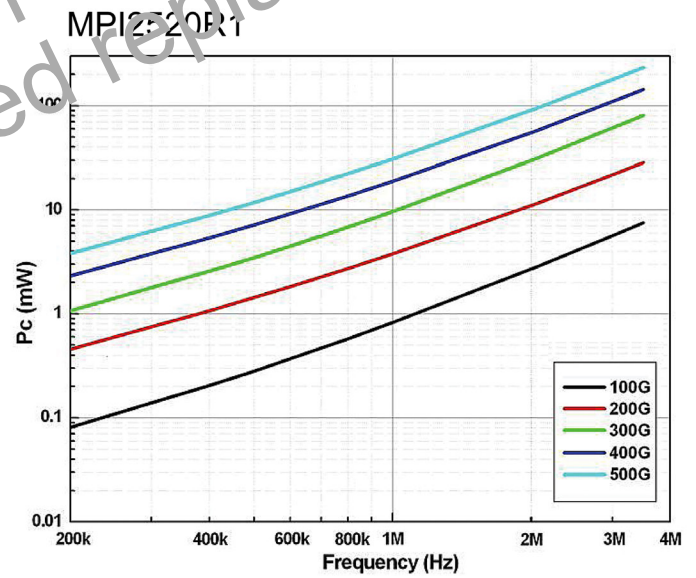
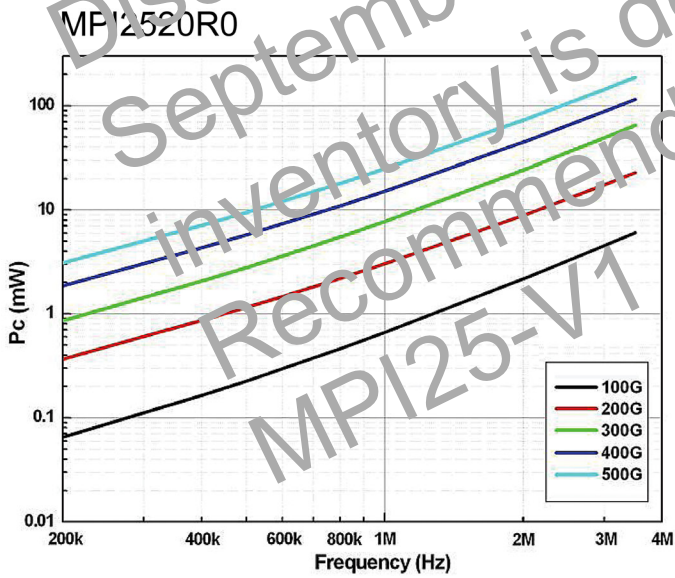
**Packaging information - mm**



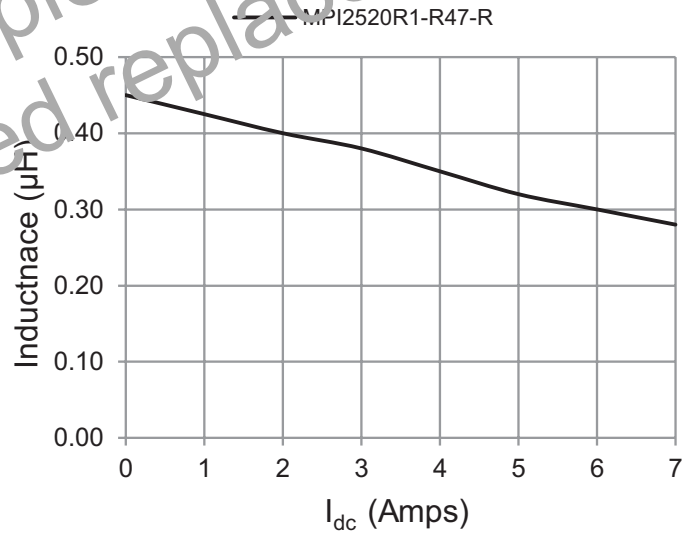
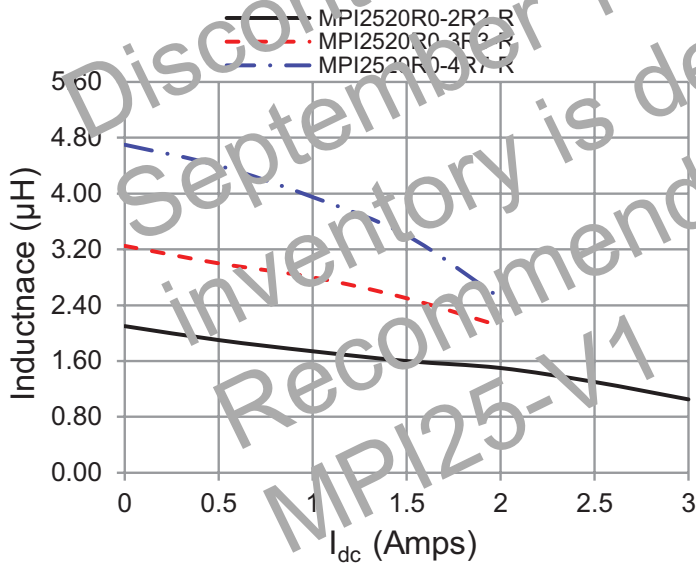
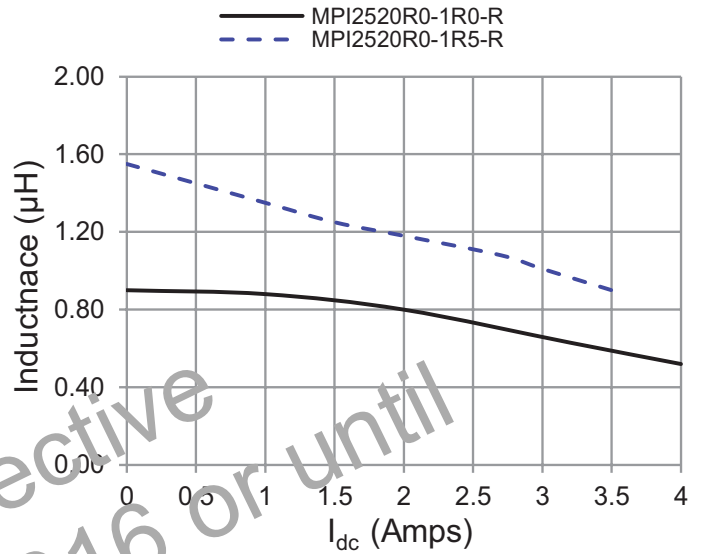
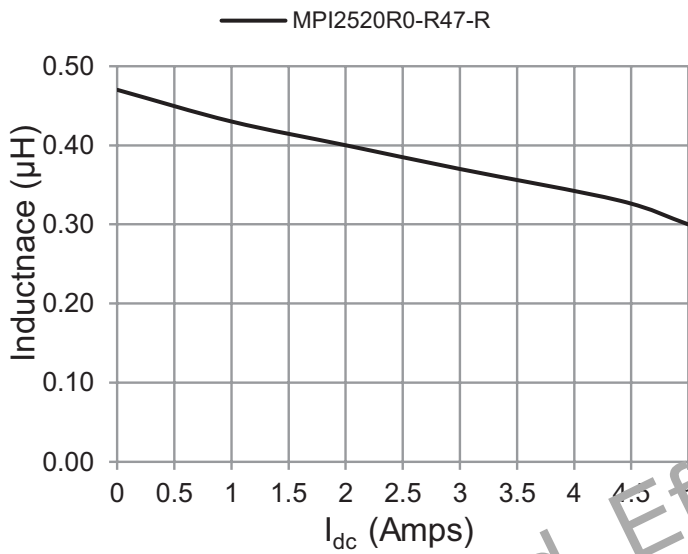
Temperature rise vs. total loss



Core loss

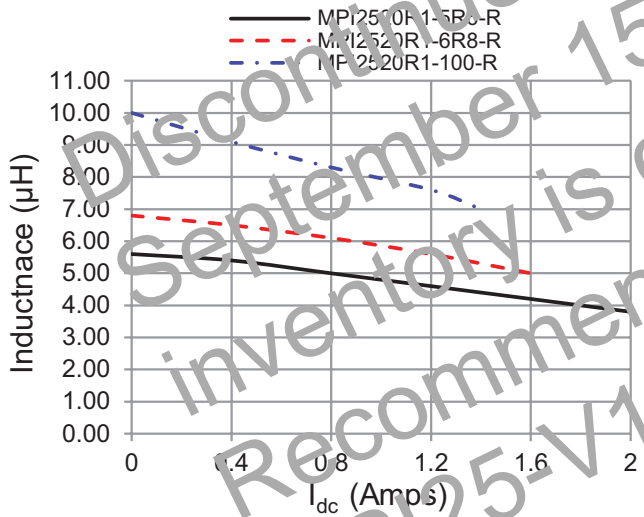
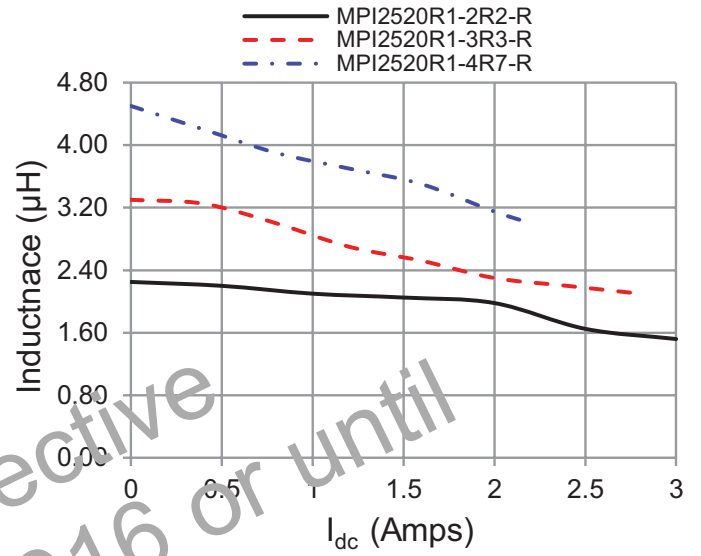
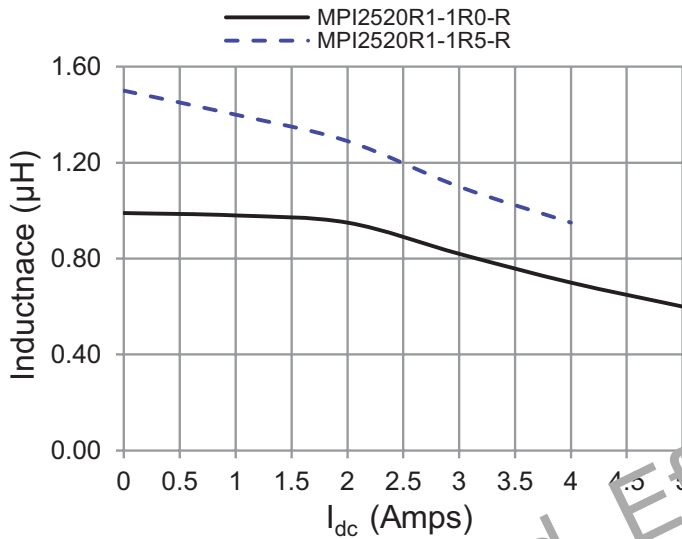


**Inductance characteristics**



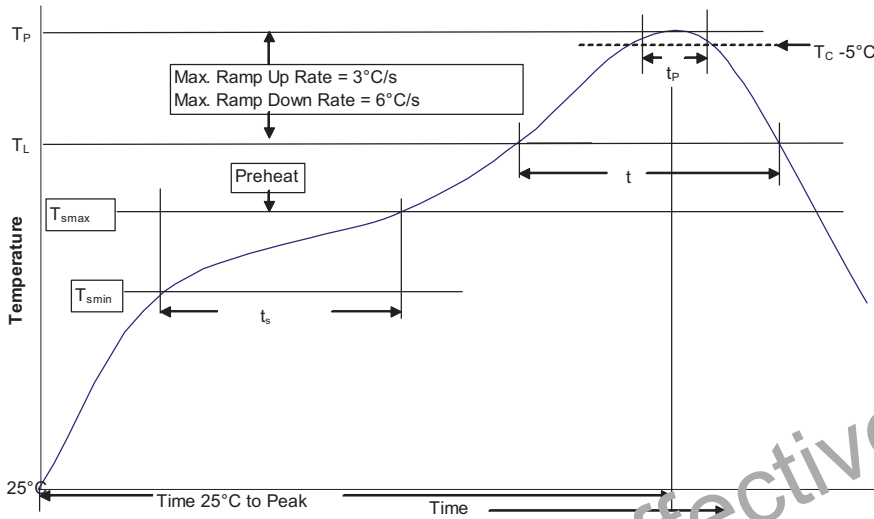
Discontinued, Effective September 15, 2016 or until inventory is depleted. Recommended replacement MPI25-V1

**Inductance characteristics**



Discontinued, Effective September 15, 2016 or until inventory is depleted. Recommended replacement MPI25-V1

**Solder reflow profile**



**Table 1 - Standard SnPb Solder (T<sub>c</sub>)**

Package Thickness	Volume <350 mm <sup>3</sup>	Volume ≥350 mm <sup>3</sup>
<2.5mm	235°C	220°C
≥2.5mm	220°C	220°C

**Table 2 - Lead (Pb) Free Solder (T<sub>c</sub>)**

Package Thickness	Volume <350 mm <sup>3</sup>	Volume 350 - 2000 mm <sup>3</sup>	Volume >2000 mm <sup>3</sup>
<1.6mm	260°C	260°C	260°C
1.6 - 2.5mm	260°C	250°C	245°C
>2.5mm	250°C	245°C	245°C

**Reference JDEC J-STD-020D**

Profile Feature	Standard SnPb Solder	Lead (Pb) Free Solder
Preheat and Soak	<ul style="list-style-type: none"> <li>Temperature min. (T<sub>smin</sub>)</li> <li>Temperature max. (T<sub>smax</sub>)</li> <li>Time (T<sub>smin</sub> to T<sub>smax</sub>) (t<sub>s</sub>)</li> </ul>	<ul style="list-style-type: none"> <li>100°C</li> <li>50°C</li> <li>60-120 Seconds</li> </ul>
Average ramp up rate T <sub>smax</sub> to T <sub>p</sub>	3°C/ Second Max.	3°C/ Second Max.
Liquidus temperature (T <sub>L</sub> )	183°C	217°C
Time at Liquidus (t <sub>L</sub> )	60-150 Seconds	60-150 Seconds
Peak package body temperature (T <sub>p</sub> )*	Table 1	Table 2
Time (t <sub>p</sub> )** within 5°C of the specified classification temperature (T <sub>c</sub> )	20 Seconds**	30 Seconds**
Average ramp-down rate (T <sub>p</sub> to T <sub>smax</sub> )	6°C/ Second Max.	6°C/ Second Max.
Time 25°C to Peak Temperature	6 Minutes Max.	8 Minutes Max.

\* Tolerance for peak profile temperature (T<sub>p</sub>) is defined as a supplier minimum and a user maximum.

\*\* Tolerance for time at peak profile temperature (t<sub>p</sub>) is defined as a supplier minimum and a user maximum.

Life Support Policy: Eaton does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Eaton reserves the right, without notice, to change design or construction of any products and to discontinue or limit distribution of any products. Eaton also reserves the right to change or update, without notice, any technical information contained in this bulletin.

**Eaton**  
Electronics Division  
1000 Eaton Boulevard  
Cleveland, OH 44122  
United States  
www.eaton.com/elx



© 2014 Eaton  
All Rights Reserved  
Publication No. 10199 — BU-SB131200  
January 2014

Eaton is a registered trademark.

All other trademarks are property of their respective owners.

www.eaton.com/elx