Power Inductor for Critical Applications

ST550PRT
ST563PRC

- Shielded power inductors
- Excellent current handling for a part this size; low DCR

This series provides greater current handling capability than any other power inductor its size. While requiring only one square centimeter of board space, this inductor can handle up to 36 Amps of current.

These shielded inductors were developed for multi-phase voltage regulators and are ideal for use in DC-DC converters, battery-powered devices and high current power supplies. Their flat wire construction ensures very low DC resistance and offers an excellent performance-to-height ratio. The materials used in these parts eliminate all thermal aging issues.

The ST550PRT is a high efficiency part that features very low core loss. The ST563PRC provides soft saturation and is unaffected by part temperature up to 125°C.

Refer to the comparison curves for L vs Current and ESR vs Frequency for performance differences.

Part number[1]	L[2] ±20% (µH)	DCR ±8% (mOhm)	SRF[3] typ (MHz)	Isat[4] (A)	Irms[5] (A)	Height max (mm)
Low core loss						
ST550PRT251MLZ	0.25	0.925	160	35	25	5.1
ST550PRT361MLZ	0.36	0.925	140	24	24	5.1
ST550PRT561MLZ	0.56	0.925	110	13	25	5.1
Soft saturation						
ST563PRC361MLZ	0.36	0.925	120	36	24	4.7
ST563PRC651MLZ	0.65	1.50	115	24	19	5.5
ST563PRC112MLZ	1.10	1.95	95	20	20	6.1
ST563PRC162MLZ	1.65	2.53	55	17	20	7.1
ST563PRC232MLZ	2.30	3.08	50	16	17	7.8

1. When ordering, please specify **termination** and **testing** codes:

ST563PRC232MLZ

Termination: **L** = Tin-silver over copper.
Special order:
T = Tin-silver-copper (95.5/4/0.5) or
S = Tin-lead (63/37).

Testing: **Z** = Unscreened
H = Group A screening per Coilcraft CP-SA-10001
All screening performed to the document's latest revision

2. Inductance measured at 500 kHz, 0.1 Vrms, 0 Adc using a Coilcraft SMD-A fixture in an Agilent/HP 4284A LCR meter or equivalent.
3. SRF measured on an Agilent/HP 8753ES.
4. DC current at 25°C that causes a 30% (typ) inductance drop for ST563PRC and 20% (typ) inductance drop for ST550PRT from its value without current.
5. Current that causes the specified temperature rise from 25°C ambient. This information is for reference only and does not represent absolute maximum ratings.
6. Electrical specifications at 25°C.

Refer to Doc 362 "Soldering Surface Mount Components" before soldering.

Core material ST550PRT: Ferrite; ST563PRC: Powdered iron

Terminations Tin-silver over copper. Other terminations available at additional cost.

Weight 550PRT: 2.1 g; 563PRC: 2.45 – 3.86 g

Ambient temperature –40°C to +85°C with Irms current

Maximum part temperature +125°C (ambient + temp rise)

Storage temperature Component: –55°C to +125°C.
Tape and reel packaging: –55°C to +80°C

Resistance to soldering heat Max three 40 second reflows at +260°C, parts cooled to room temperature between cycles

Moisture Sensitivity Level (MSL) 1 (unlimited floor life at <30°C / 85% relative humidity)

Packaging

ST550PRT251	175/7″ reel
ST550PRT361	175/7″ reel
ST550PRT561	175/7″ reel
ST563PRC361	200/7″ reel
ST563PRC651	175/7″ reel
ST563PRC112	175/7″ reel
ST563PRC162	100/7″ reel
ST563PRC232	100/7″ reel

Plastic tape: 24 mm wide, 16 mm pocket spacing

ST550PRT251	0.4 mm thick, 6.1 mm pocket depth
ST550PRT361	0.4 mm thick, 6.1 mm pocket depth
ST550PRT561	0.4 mm thick, 6.1 mm pocket depth
ST563PRC361	0.35 mm thick, 4.5 mm pocket depth
ST563PRC651	0.4 mm thick, 6.1 mm pocket depth
ST563PRC112	0.4 mm thick, 6.1 mm pocket depth
ST563PRC162	0.4 mm thick, 7.5 mm pocket depth
ST563PRC232	0.4 mm thick, 7.5 mm pocket depth

PCB washing Tested to MIL-STD-202 Method 215 plus an additional aqueous wash. See Doc787_PCB_Washing.pdf.

Coilcraft CPS
CRITICAL PRODUCTS & SERVICES

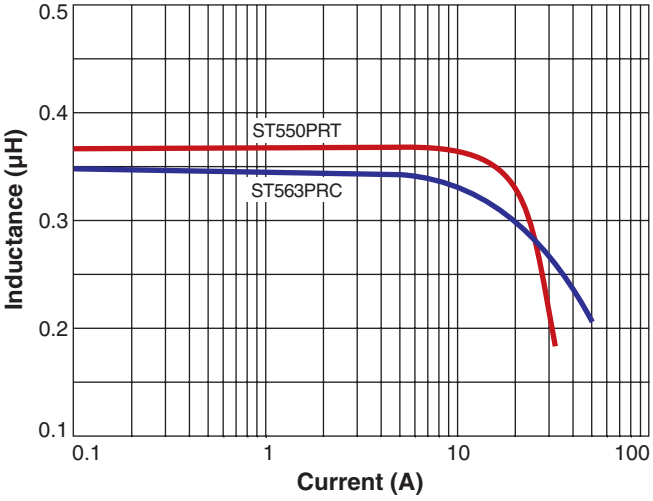
1102 Silver Lake Road
Cary, IL 60013
Phone 800-981-0363

Fax 847-639-1508
Email cps@coilcraft.com
www.coilcraft-cps.com

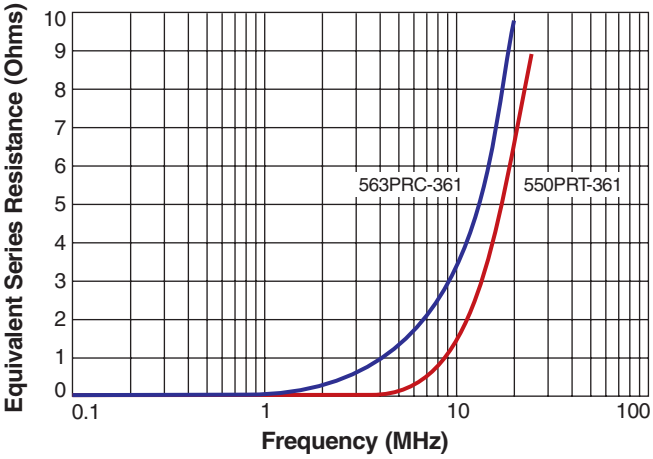
Document ST420-1 Revised 05/29/17

VRM/VRD Power Inductor – ST550PRT and ST563PRC

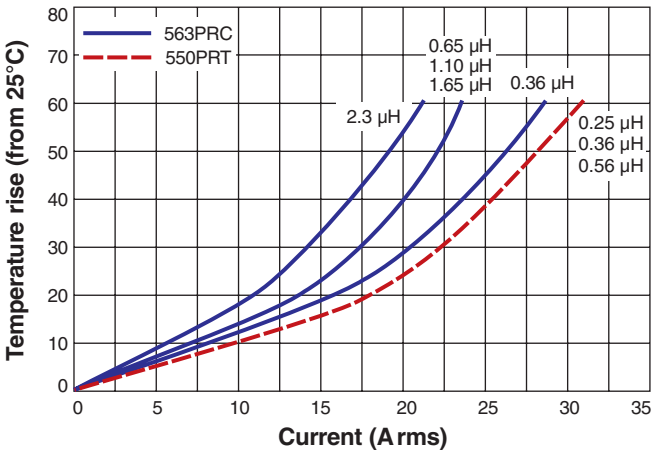
L vs Current Comparison – 0.36 µH

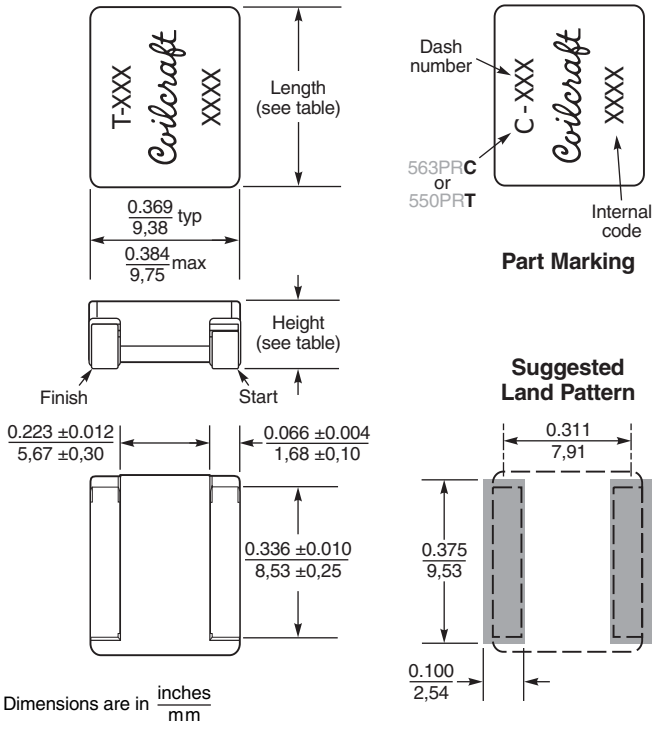


ESR vs Frequency Comparison – 0.36 µH



Current Derating





Dimensions are in inches / mm

Part number	Height (in. / mm) typ	Height (in. / mm) max	Length (in. / mm) typ	Length (in. / mm) max
550PRT-251	0.181 / 4,61	0.200 / 5,10	0.439 / 11,14	0.453 / 11,50
550PRT-361	0.181 / 4,61	0.200 / 5,10	0.439 / 11,14	0.453 / 11,50
550PRT-561	0.181 / 4,61	0.200 / 5,10	0.439 / 11,14	0.453 / 11,50
563PRC-361	0.171 / 4,35	0.185 / 4,70	0.448 / 11,37	0.453 / 11,50
563PRC-651	0.207 / 5,25	0.217 / 5,50	0.448 / 11,37	0.453 / 11,50
563PRC-112	0.232 / 5,90	0.240 / 6,10	0.448 / 11,37	0.453 / 11,50
563PRC-162	0.262 / 6,65	0.280 / 7,10	0.448 / 11,37	0.453 / 11,50
563PRC-232	0.287 / 7,29	0.307 / 7,80	0.448 / 11,37	0.453 / 11,50

Note: Height dimension is before optional solder application.
For maximum height including solder, add 0.006 in / 0,15 mm.

SPICE models
ON OUR WEB SITE

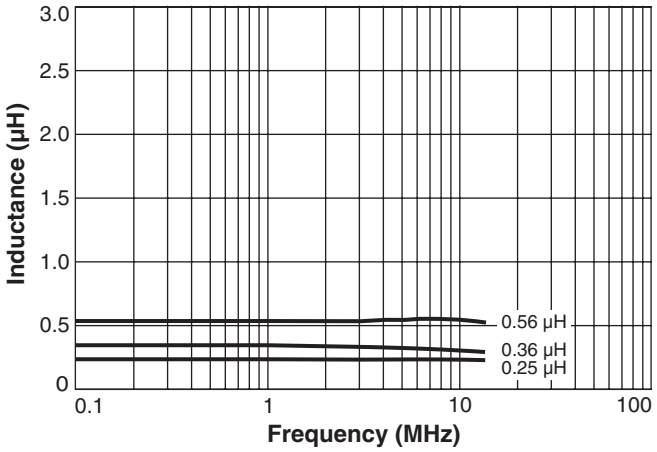
Document ST420-2 Revised 05/29/17

Coilcraft CPS
CRITICAL PRODUCTS & SERVICES
1102 Silver Lake Road
Cary, IL 60013
Phone 800-981-0363
Fax 847-639-1508
Email cps@coilcraft.com
www.coilcraft-cps.com

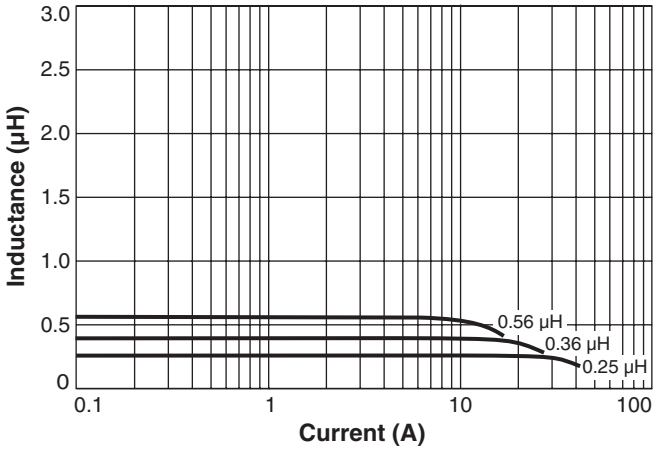
VRM/VRD Power Inductor – ST550PRT and ST563PRC

ST550PRT

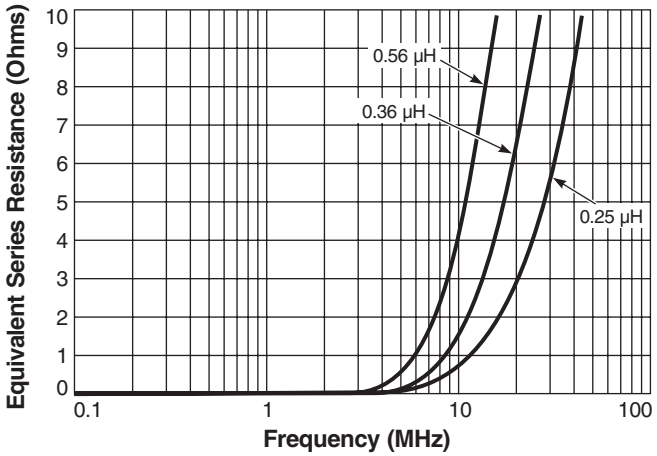
L vs Frequency



L vs Current

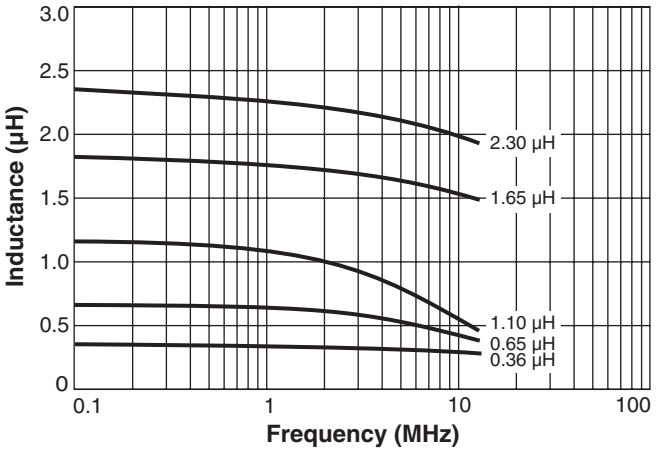


ESR vs Frequency

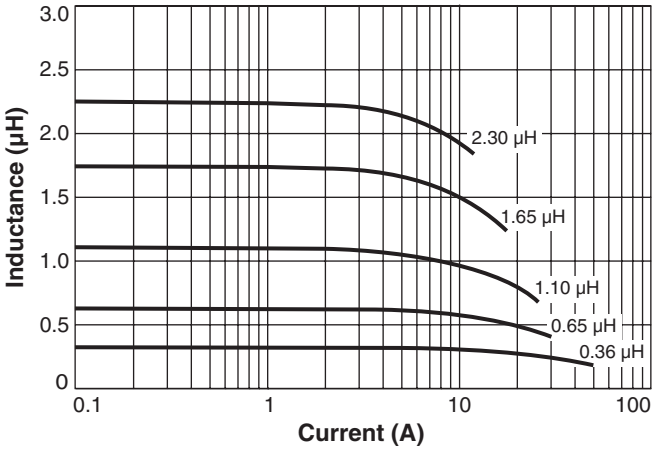


ST563PRC

L vs Frequency

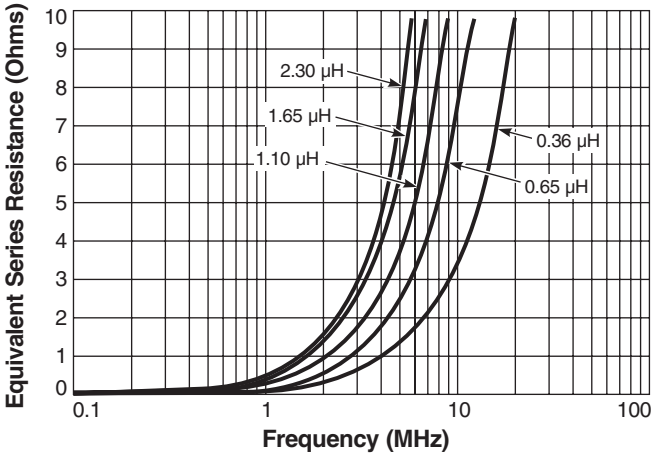


L vs Current



Inductance vs current is unaffected by part temperature up to 125°C.

ESR vs Frequency



Document ST420-3 Revised 05/29/17

Coilcraft CPS
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1102 Silver Lake Road
Cary, IL 60013
Phone 800-981-0363
Fax 847-639-1508
Email cps@coilcraft.com
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