

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

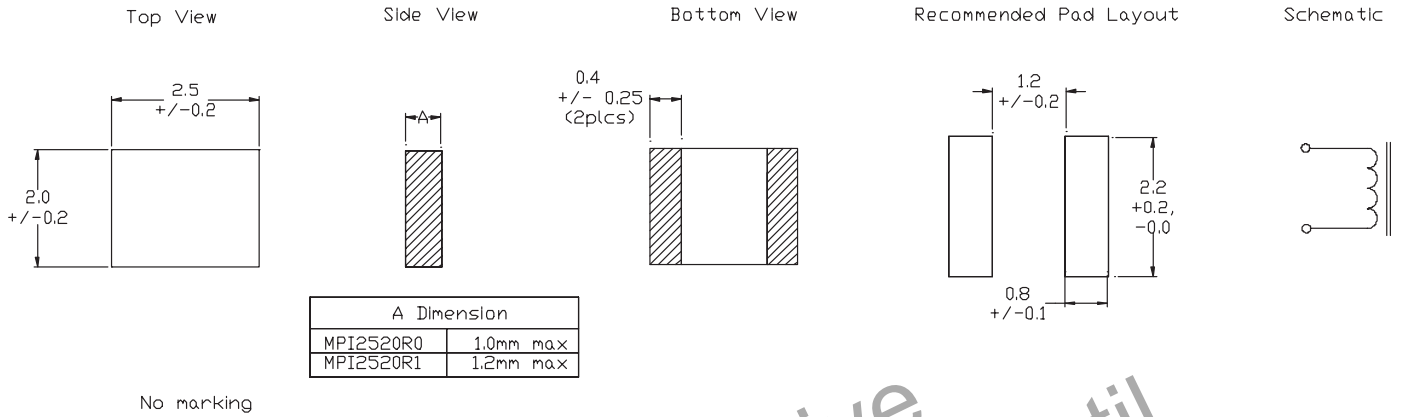
Discontinued, Effective September 15, 2016 or until inventory is depleted. Recommended replacement MPI25-V1

Product specifications

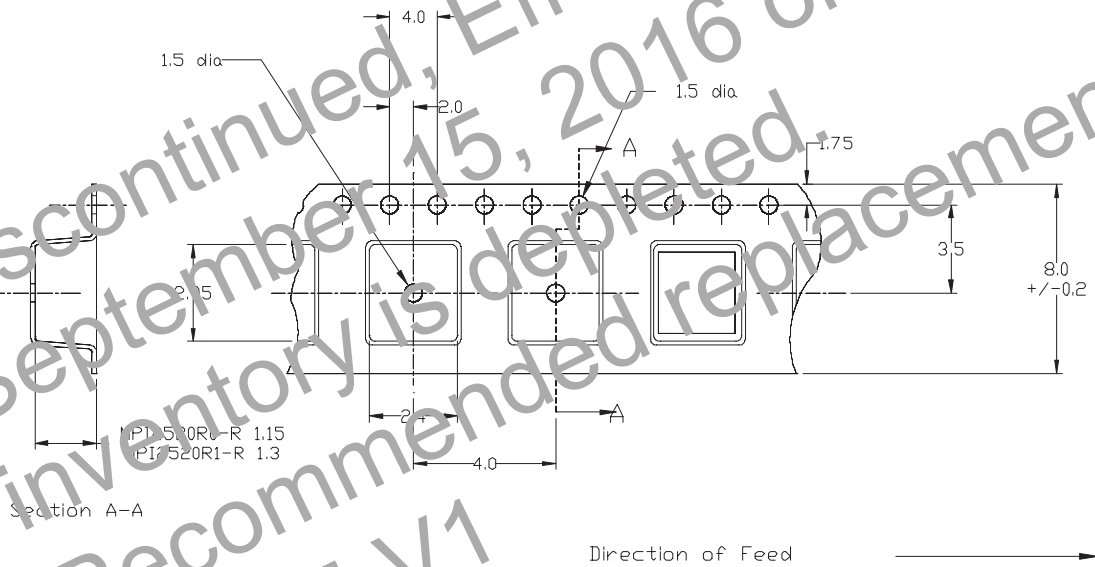
Part Number ⁵	OCL1 (μH) $\pm 20\%$	I_{rms}^2 (Amps)	I_{sat}^3 (Amps)	DCR (m Ω) @ 25°C typical	DCR (m Ω) @ 25°C max	K-Factor ⁴
R0 — 1.0mm Height						
MPI2520R0-R47-R	0.47	4.1	4.4	28	34	2887
MPI2520R0-1R0-R	0.9	3.2	3.2	50	60	1925
MPI2520R0-1R5-R	1.5	2.4	2.6	80	96	1444
MPI2520R0-2R2-R	2.2	2.2	2.4	103	124	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_{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_{sat} : Peak current for approximately 10% rolloff at +25°C
- K-factor: Used to determine B_{pp} for core loss (see graph).
 $B_{\text{pp}} = K \sqrt{L \Delta I}$; B_{pp} : (Gauss), K: (K-factor from table),
L: (Inductance in μH), ΔI (Peak to peak ripple current in Amps).
- Part Number Definition: MPI2520R x -yyy-R
- MPI2520R x = Product code and size
- yyy = Inductance value in μH , R = decimal point,
if no R is present then third character = number of zeros.
- "-R" suffix = RoHS compliant

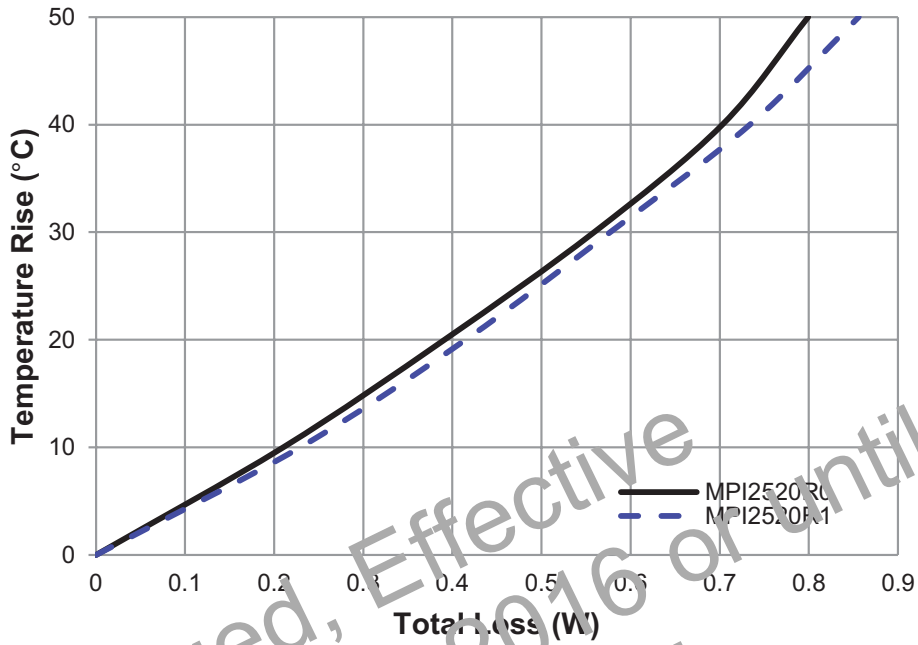
Dimensions - mm



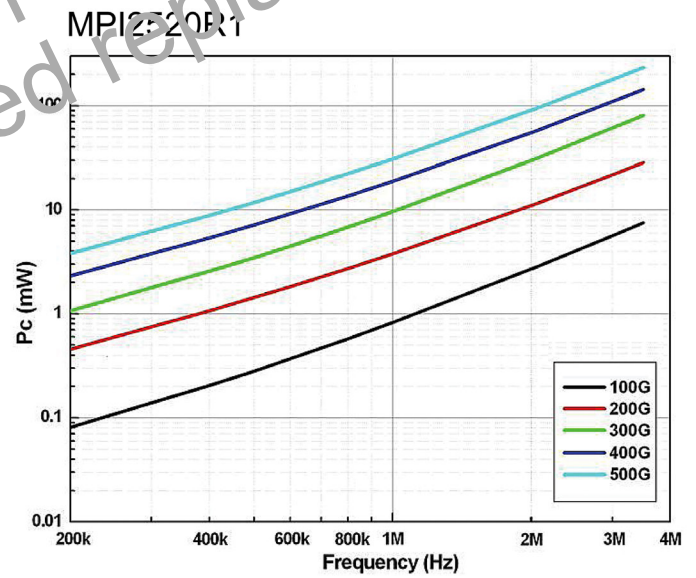
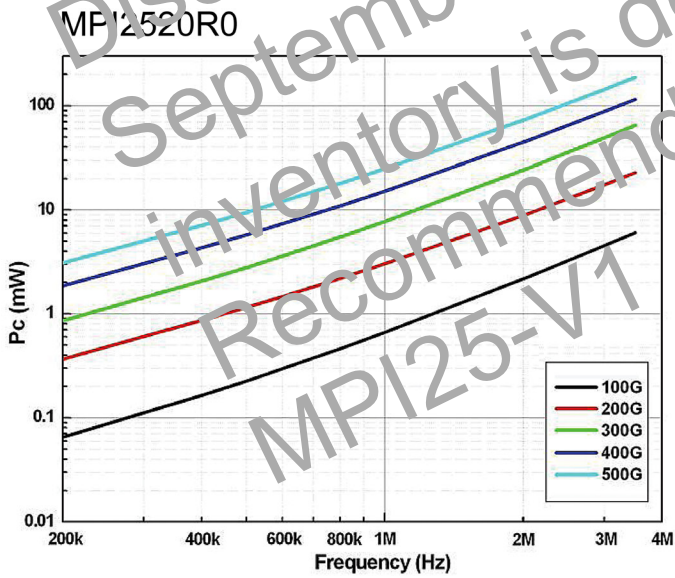
Packaging information - mm



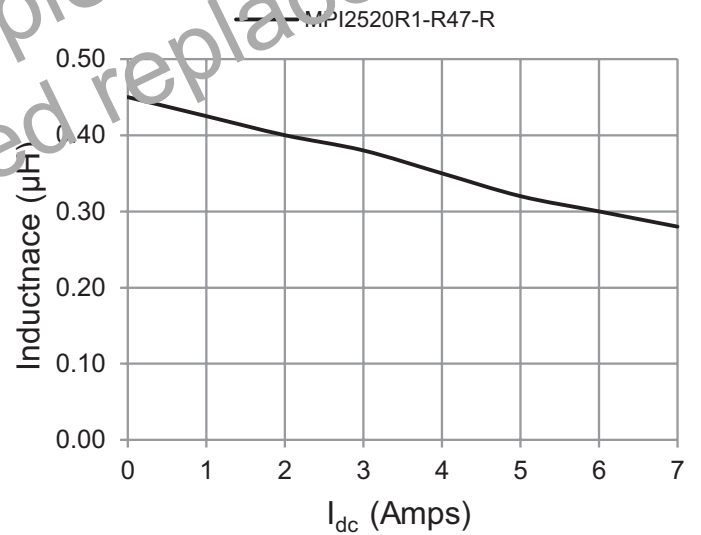
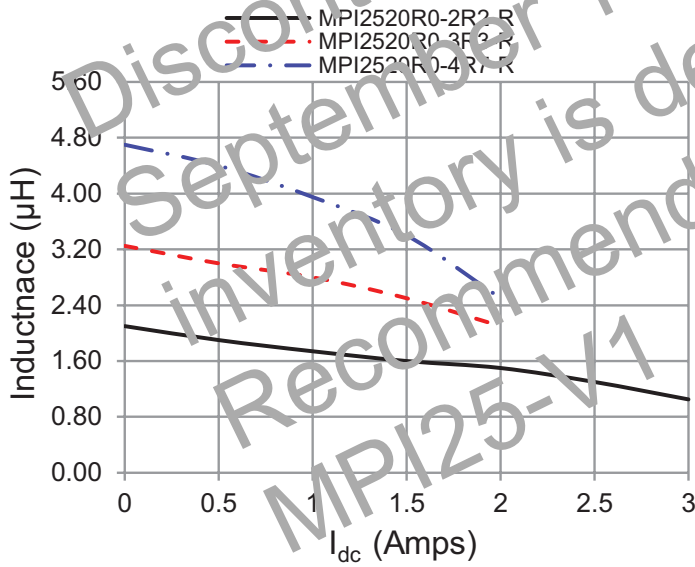
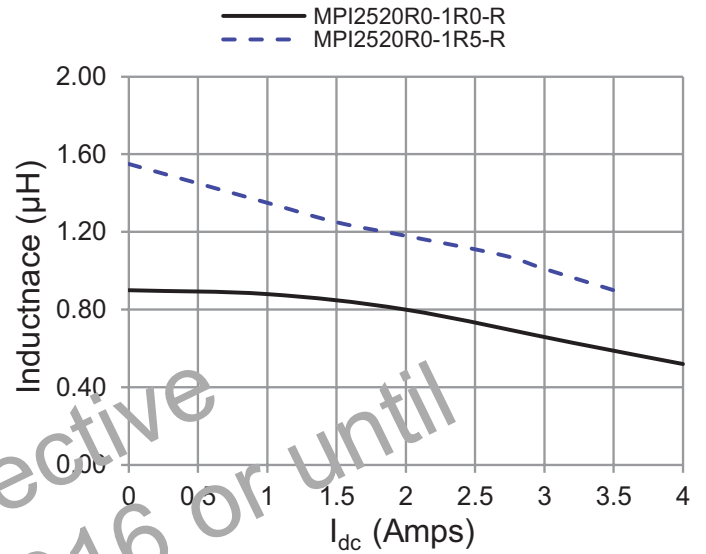
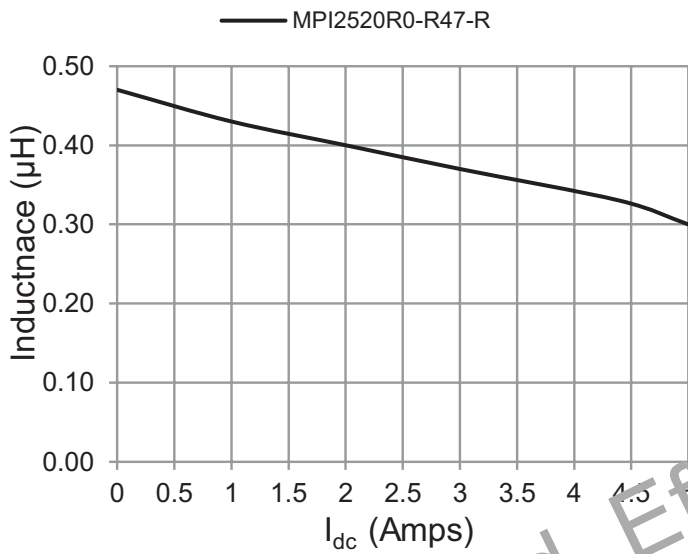
Temperature rise vs. total loss



Core loss

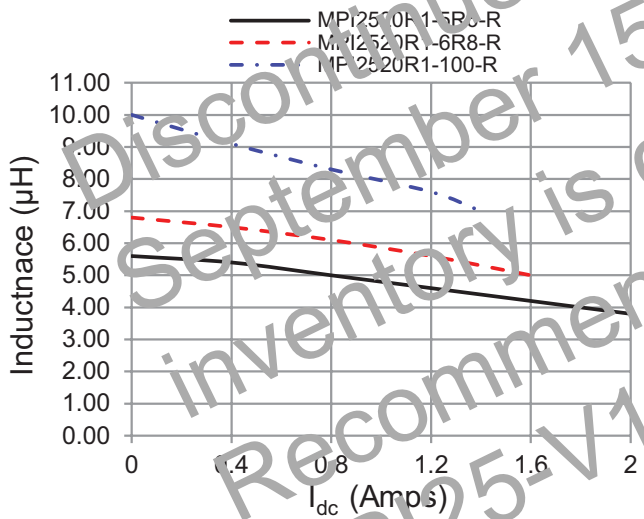
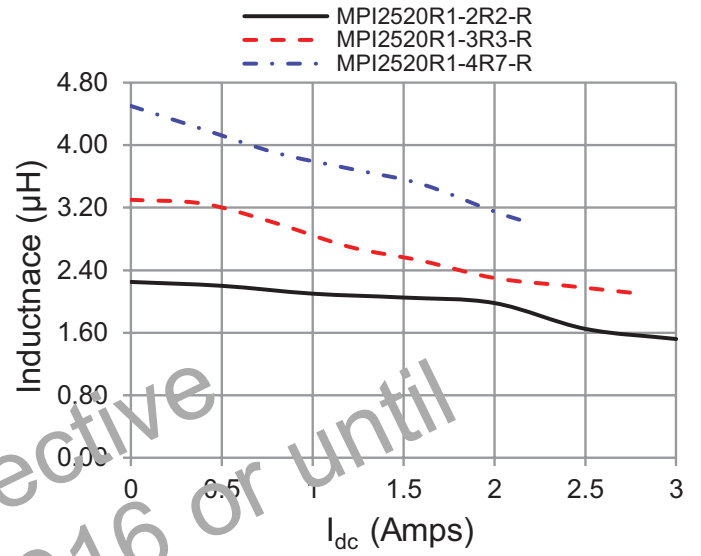
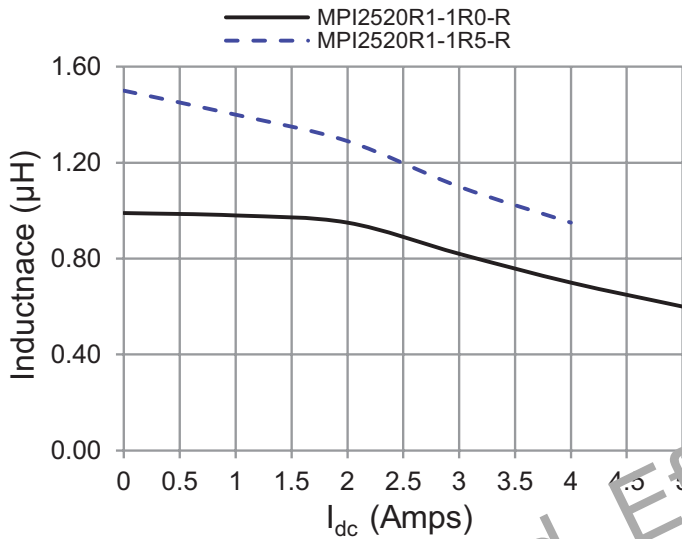


Inductance characteristics



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Solder reflow profile

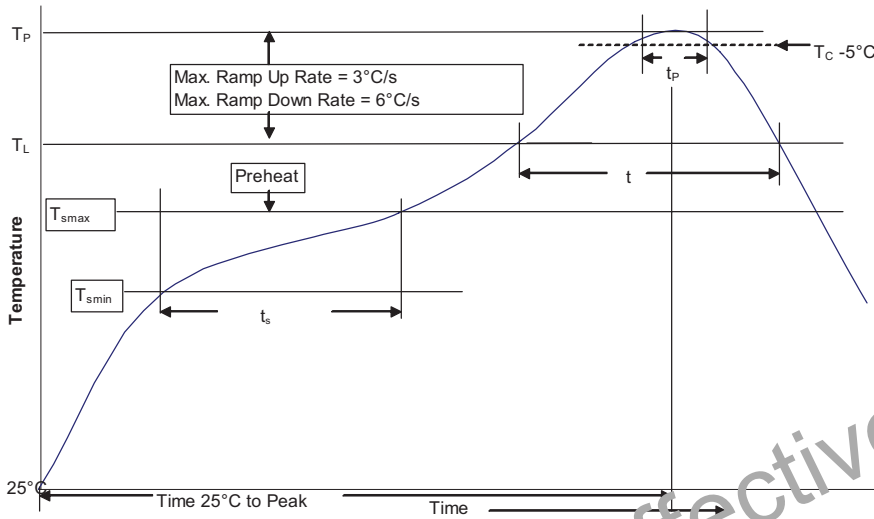


Table 1 - Standard SnPb Solder (T_c)

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

Table 2 - Lead (Pb) Free Solder (T_c)

Package Thickness	Volume <350 mm ³	Volume 350 - 2000 mm ³	Volume >2000 mm ³
<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"> Temperature min. (T_{smmin}) Temperature max. (T_{smmax}) Time (T_{smmin} to T_{smmax}) (t_s) 	<ul style="list-style-type: none"> 100°C 50°C 60-120 Seconds
Average ramp up rate T _{smmax} to T _p	3°C/ Second Max.	3°C/ Second Max.
Liquidus temperature (T _L)	183°C	217°C
Time at Liquidus (t _L)	60-150 Seconds	60-150 Seconds
Peak package body temperature (T _p)*	Table 1	Table 2
Time (t _p)** within 5°C of the specified classification temperature (T _c)	20 Seconds**	30 Seconds**
Average ramp-down rate (T _p to T _{smmax})	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_p) is defined as a supplier minimum and a user maximum.

** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.

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