# High Current, High Frequency, Power Inductors **TLGQ1107**


## Description:

- Halogen free
- 125°C maximum total temperature operation
- 7.2 x 11.0 x 7.5mm surface mount package
- Ferrite core material
- High current carrying capacity, low core losses
- Controlled DCR tolerance for sensing circuits
- Inductance range from 70nH to 510nH
- Current range from 18 amps to 140 amps
- Frequency range up to 2MHz
- RoHS compliant

## Applications:

- Multi-phase regulators
- Voltage Regulator Module (VRM)
- Desktop and server VRMs and EVRDs
- Data networking and storage systems
- Notebook regulators
- Graphics cards and battery power systems
- Point-of-load modules
- DCR sensing

## Environmental Data:

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

## Packaging:

- Supplied in tape and reel packaging, 640 parts per reel, 13" diameter reel

**Product Specifications**

| Part Number[7] | OCL[1] ± 10% (nH) | FLL[2] Min. (nH) | $I_{rms}$[3] (Amps) | $I_{sat}1$[4] @ 25°C (Amps) | $I_{sat}2$[5] @ 125°C (Amps) | DCR (mΩ) @ 20°C | K-factor[6] |
|---|---|---|---|---|---|---|---|
| Version R | | | | | | | |
| TLGQ1107R-07 | 70 | 50 | 55 | 140 | 123 | 0.29 ± 8% | 361.1 |
| TLGQ1107R-12 | 120 | 86 | | 90 | 72 | | 361.1 |
| TLGQ1107R-15 | 150 | 108 | | 70 | 56 | | 361.1 |
| TLGQ1107R-23 | 230 | 166 | | 45 | 36 | | 361.1 |
| TLGQ1107R-30 | 300 | 217 | | 35 | 28 | | 361.1 |
| TLGQ1107R-40 | 400 | 288 | | 25 | 20 | | 361.1 |
| TLGQ1107R-51 | 510 | 364 | | 18 | 14.5 | | 361.1 |
| Version S | | | | | | | |
| TLGQ1107S-07 | 70 | 50 | 42 | 140 | 123 | 0.47 ± 6.4% | 363.3 |
| TLGQ1107S-12 | 120 | 86 | | 90 | 72 | | 363.3 |
| TLGQ1107S-15 | 150 | 108 | | 70 | 56 | | 363.3 |
| TLGQ1107S-23 | 230 | 166 | | 45 | 36 | | 363.3 |
| TLGQ1107S-30 | 300 | 217 | | 35 | 28 | | 363.3 |
| TLGQ1107S-40 | 400 | 288 | | 25 | 20 | | 363.3 |
| TLGQ1107S-51 | 510 | 364 | | 18 | 14.5 | | 363.3 |

1 Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10$V_{rms}$, 0.0Adc

2 Full Load Inductance (FLL) Test Parameters: 100kHz, 0.1$V_{rms}$, $I_{sat}1$

3 $I_{rms}$: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents. PCB pad layout, trace thickness and width, air-flow and proximity of other heat generating components will affect the temperature rise. It is recommended the part temperature not exceed 125°C under worst case operating conditions verified in the end application.

4 $I_{sat}1$: Peak current for approximately 20% rolloff at +25°C.

5 $I_{sat}2$: Peak current for approximately 20% rolloff at +125°C.

6 K-factor: Used to determine $B_{p-p}$ for core loss (see graph). $B_{p-p} = K * L * \Delta I * 10^{-3}$, $B_{p-p}$ : (Gauss), K: (K-factor from table), L: (inductance in nH), ΔI (peak-to-peak ripple current in amps).

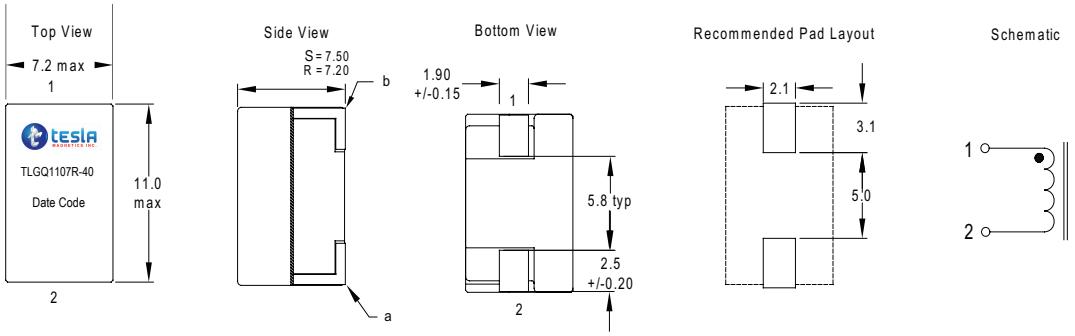
TESLA MAGNETICS INC.
3240 SCOTT BLVD
SANTA CLARA, CA 95054



TEL: (408) 207-0407
FAX: (408) 980-1555
www.teslamagnetics.com

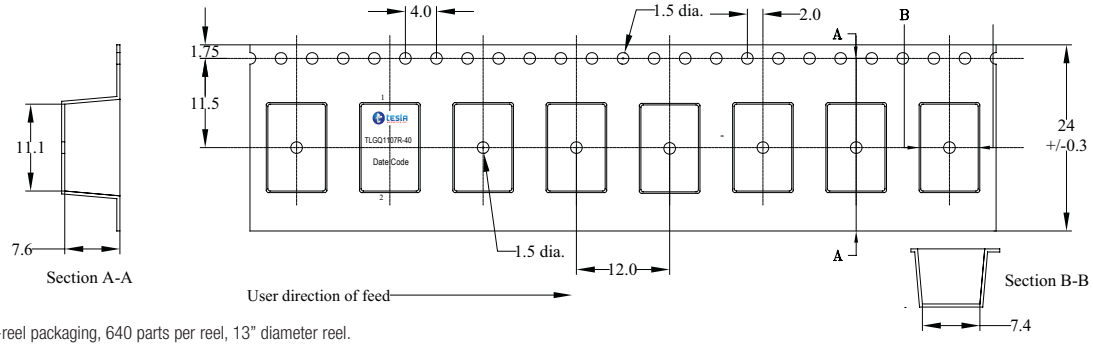
# High Current, High Frequency, Power Inductors **TLGQ1107**

## Dimensions - mm



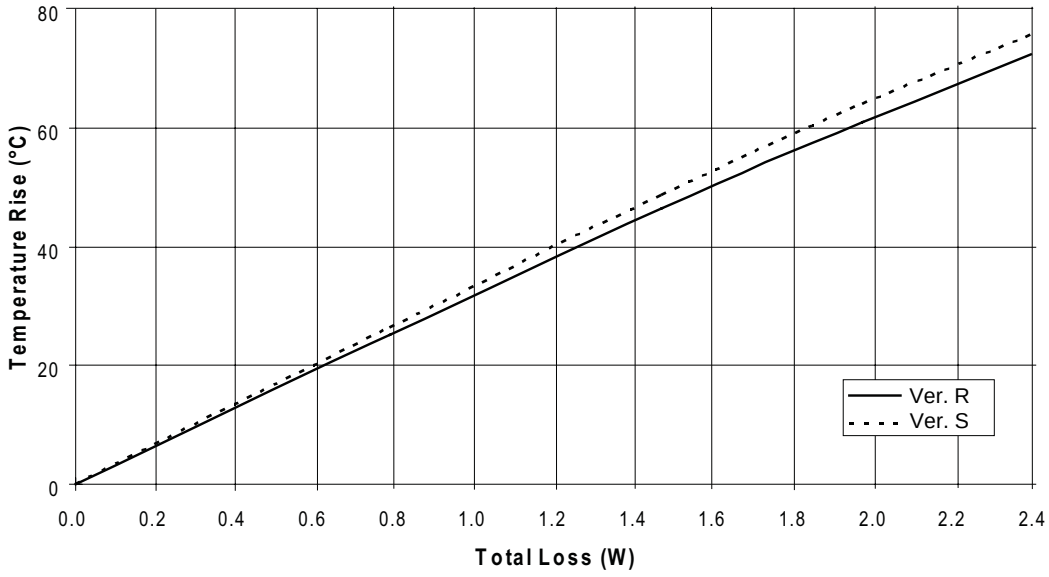

The nominal DCR is measured from point "a" to point"b."

## Packaging Information - mm



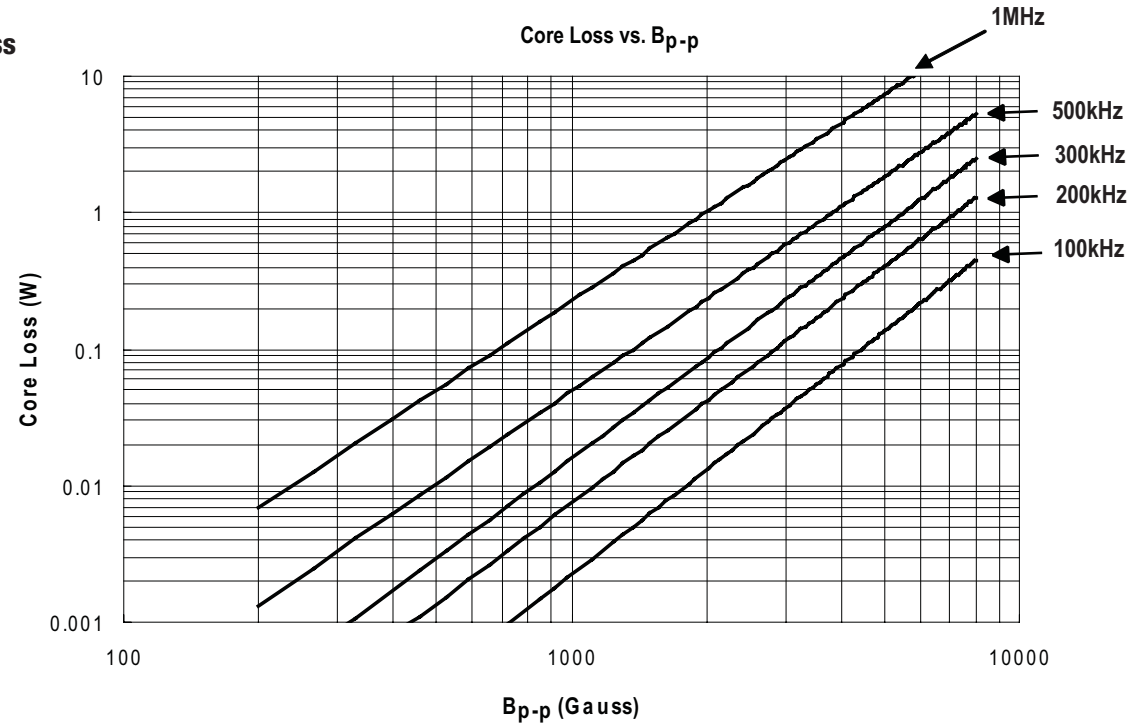

Supplied in tape-and-reel packaging, 640 parts per reel, 13" diameter reel.

## Temperature Rise vs.Total Loss

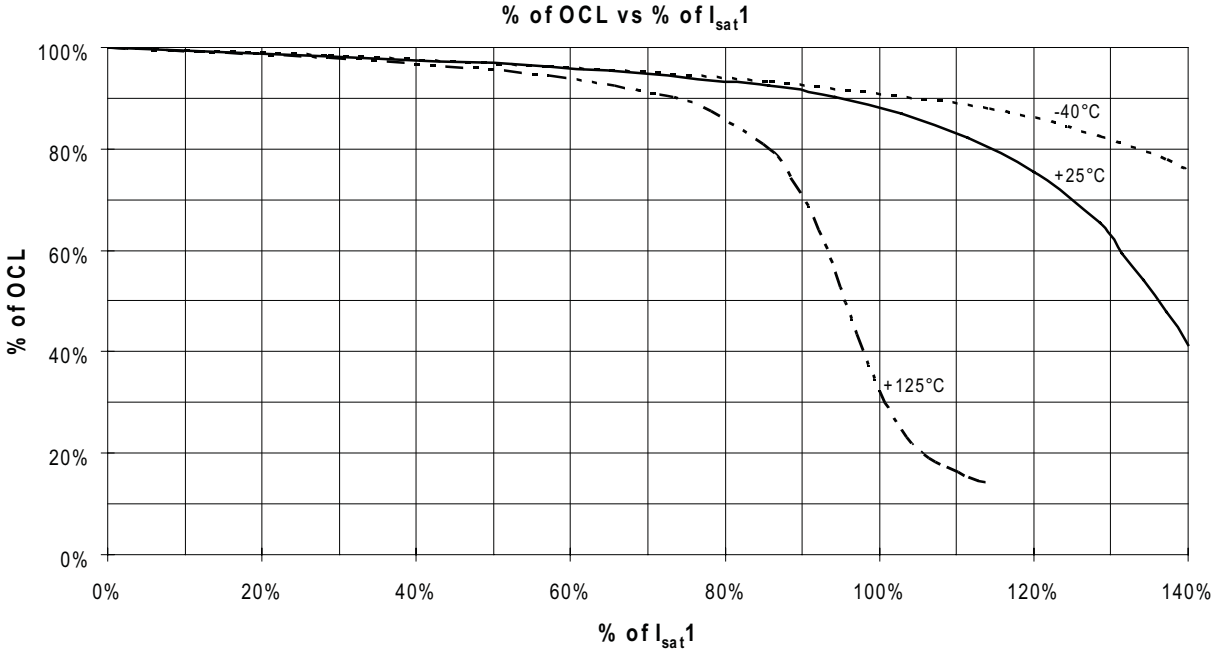


# High Current, High Frequency, Power Inductors TLGQ1107

## Core Loss




## Inductance Characteristics



# High Current, High Frequency, Power Inductors TLGQ1107

## Solder Reflow Profile

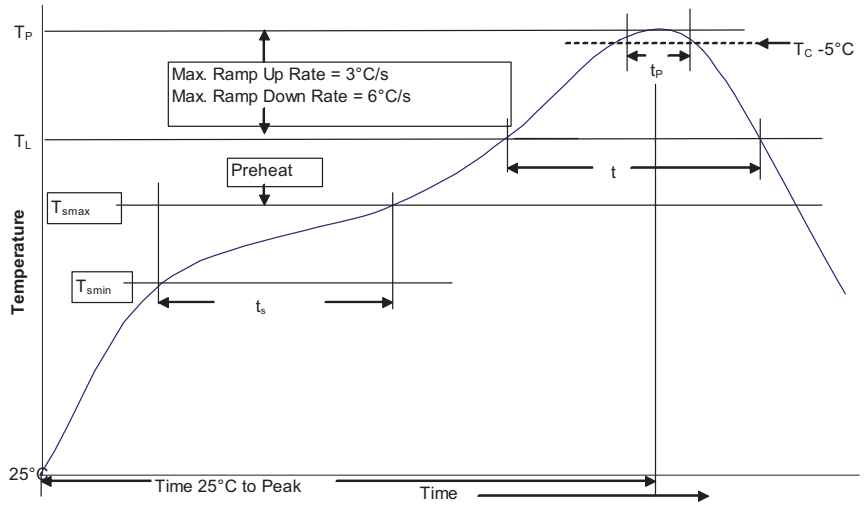



Table 1 - Standard SnPb Solder ($T_C$)

| Package Thickness | Volume mm³ <350 | Volume mm³ ≥350 |
|---|---|---|
| <2.5mm | 235°C | 220°C |
| ≥2.5mm | 220°C | 220°C |

Table 2 - Lead (Pb) Free Solder ($T_C$)

| Package Thickness | Volume mm³ <350 | Volume mm³ 350 - 2000 | Volume mm³ >2000 |
|---|---|---|---|
| <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 | • Temperature min. ($T_{smin}$) | 100°C | 150°C |
| | • Temperature max. ($T_{smax}$) | 150°C | 200°C |
| | • Time ($T_{smin}$ to $T_{smax}$) ($t_s$) | 60-120 Seconds | 60-120 Seconds |
| Average ramp up rate $T_{smax}$ to $T_p$ | | 3°C/ Second Max. | 3°C/ Second Max. |
| Liquidous temperature ($T_L$)<br>Time at liquidous ($t_L$) | | 183°C<br>60-150 Seconds | 217°C<br>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 $T_{smax}$) | | 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.