

# Low-Profile, Shielded Drum Core, Tapped Inductor

## SDT30 Series



SMD Device

### Description

- Halogen Free
- Approved for use with Maxim® MAX14521 chip set
- 125°C maximum total temperature operation
- 3.1 x 3.1 x 1.0mm shielded drum core
- Ferrite core material
- Low losses
- High efficiency
- Reduces peak output currents
- Magnetically shielded, low EMI
- RoHS compliant

### Applications

- Keypads
- Instrument clusters
- EL backlighting
- Buck or boost inductor

### Environmental Data

- Storage temperature range: -40°C to +125°C
- Operating temperature range: -40°C to +125°C (with derated current)
- Solder reflow temperature: J-STD-020D compliant

### Packaging

- Supplied in tape-and-reel packaging, 5000 parts per reel, 13" diameter reel
- Also supplied in tape-and-reel packaging, 7" diameter reel. See product specifications table note 5 below.



### Product Specifications

Part Number <sup>5</sup>	Pin Numbers	OCL <sup>1</sup> (μH)	Part Marking Designator	Turns Ratio Primary:Secondary	I <sub>rms</sub> <sup>2</sup> (Amps)	I <sub>sat</sub> <sup>3</sup> (Amps) @25°C	DCR (mΩ) @20°C	K-factor <sup>4</sup>
					0.60	0.85	0.41 ± 15%	
SDT30-127-R	(1 - 2) Primary	2.9 ± 30%	A	1:7	0.13	0.12	9.0 ± 15%	N/A
	(2 - 3) Secondary	148 ± 20%						

1 Open Circuit Inductance (OCL) Test Parameters: 100kHz, 0.10V<sub>rms</sub>, 0.0Adc

2 I<sub>rms</sub>: DC current for an approximate temperature rise of 40°C without core loss when either the primary or secondary winding is running separately. 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.

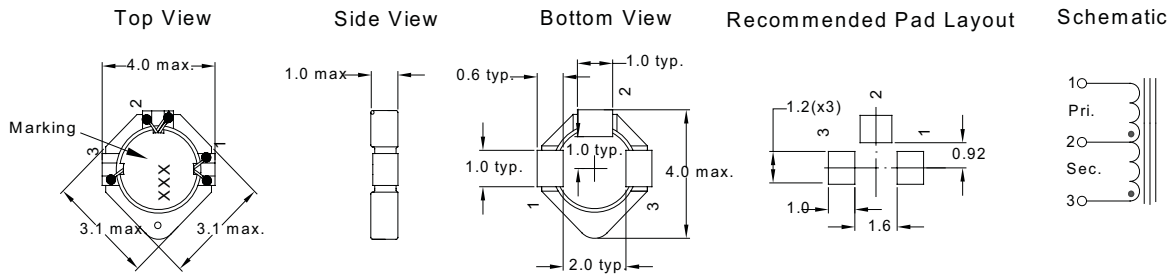
3 I<sub>sat</sub>: Peak current for approximately 30% rolloff at +25°C of primary or secondary with another winding open.

4 K-factor: Used to determine B<sub>p-p</sub> for core loss (see graph). B<sub>p-p</sub> = K · L · ΔI. B<sub>p-p</sub>: (Gauss), K: (K-factor from table), L: (primary inductance in μH), ΔI (peak-to-peak ripple current in amps).

5 Part Number Definition: SDT30-x2x-yy-R

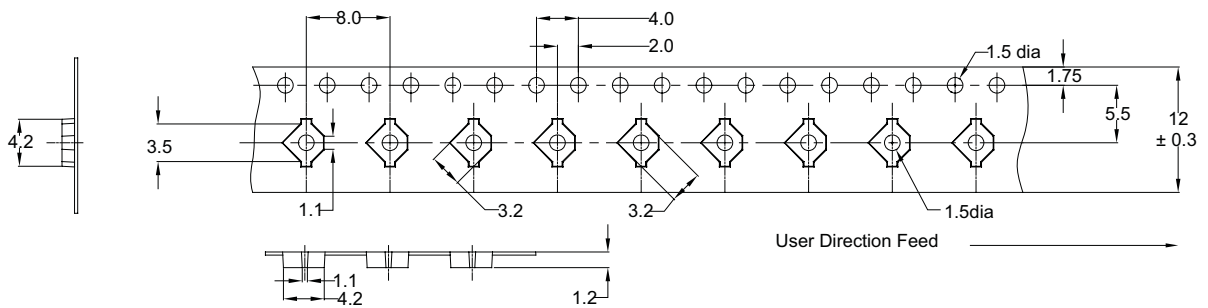
- SDT30 = Product code and size
- -x2x = Turns ratio (first "x" = primary winding, "2" = "." and second "x" = secondary winding) e.g., -127 = 1:7 primary to secondary turns ratio.
- -yy = add "T7" for 7 inch tape-and-reel package. Leave blank for 5000 parts on 13 inch tape-and-reel package.
- "-R" suffix = RoHS compliant

### Dimensions - mm



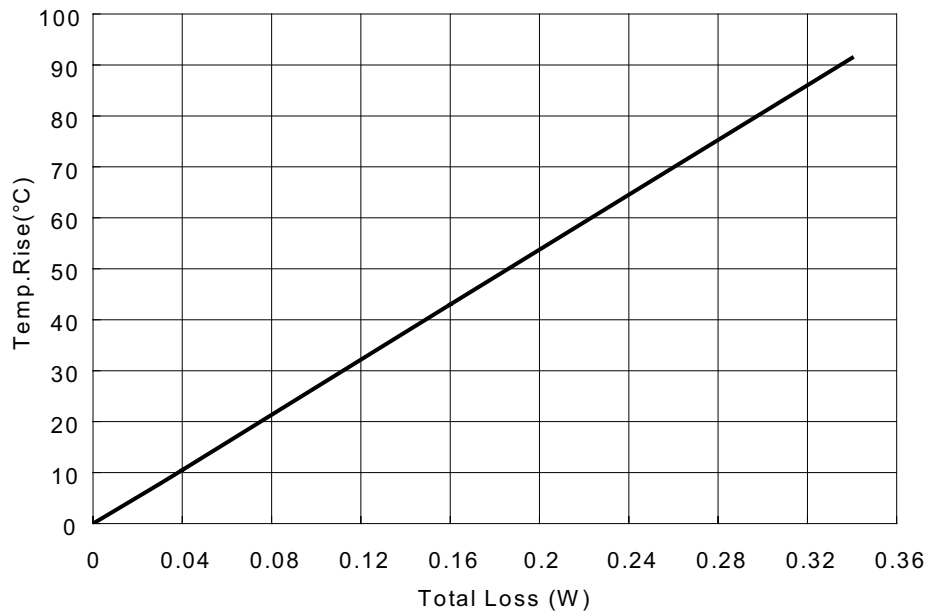
Part Marking: Three digit marking; 1<sup>st</sup> digit indicated inductance value per Part Marking Designator chart, 2<sup>nd</sup> digit indicated bi-weekly production date code, 3<sup>rd</sup> digit is last digit of the year produced.

### Packaging Information - mm



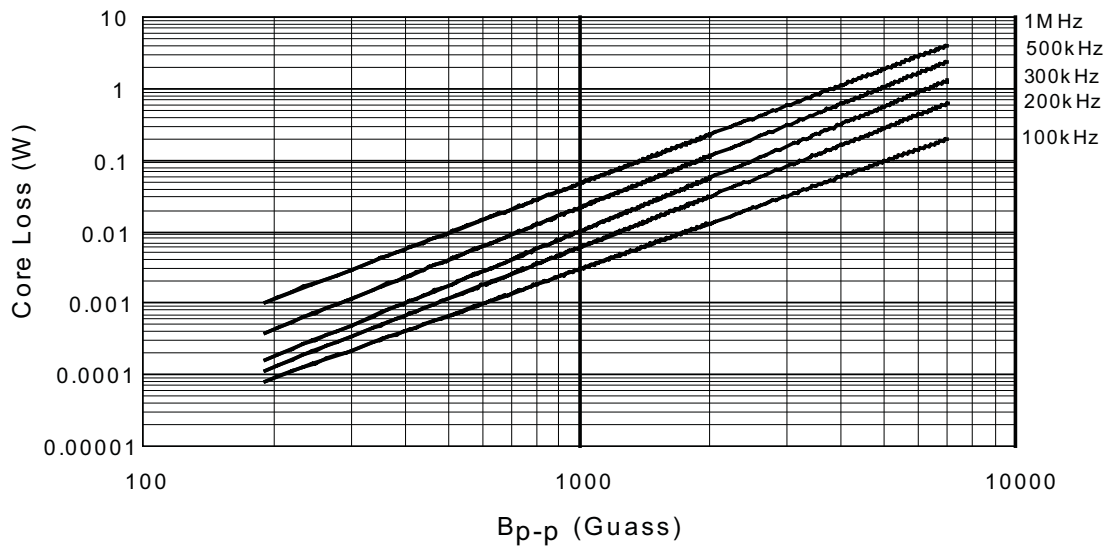
Supplied in tape-and-reel packaging, 5000 parts per reel, 13" diameter reel. Also supplied in tape-and-reel packaging on 7" diameter reel (not shown above). See product specifications table note 5 on page 1 for ordering details.

### Temperature Rise vs. Total Loss



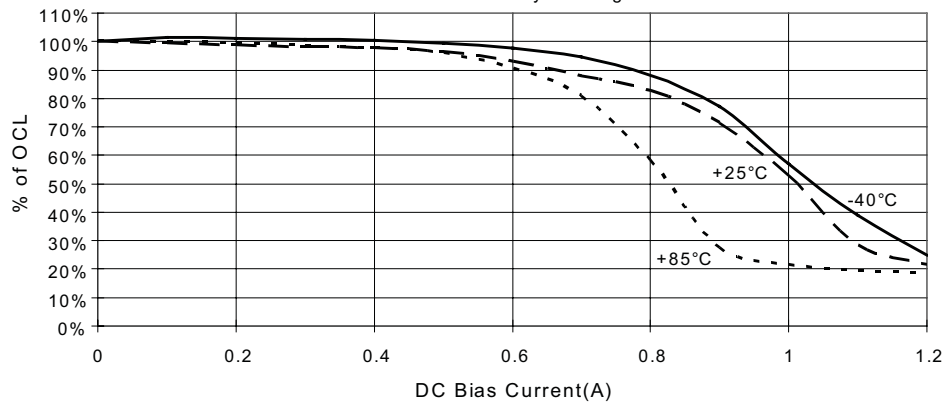
Core Loss

Core Loss vs.  $B_{p-p}$

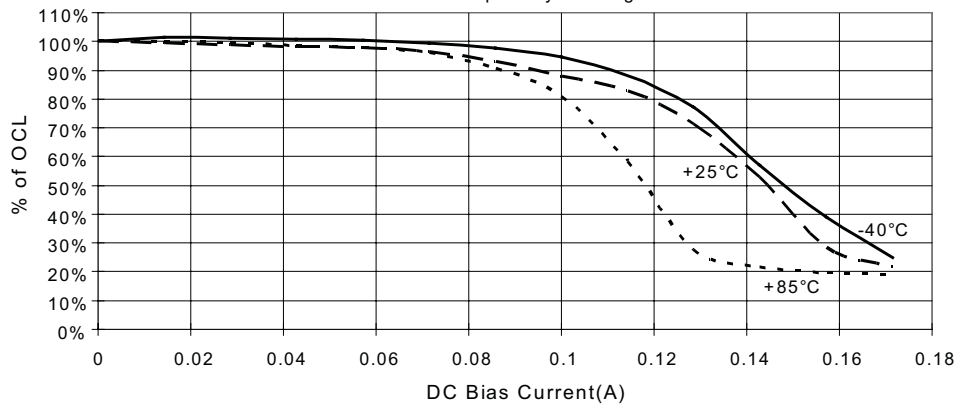


Inductance Characteristics

% of OCL vs. DC Bias current  
PRIMARY - secondary winding OPEN



% of OCL vs. DC Bias current  
SECONDARY - primary winding OPEN



## Solder Reflow Profile

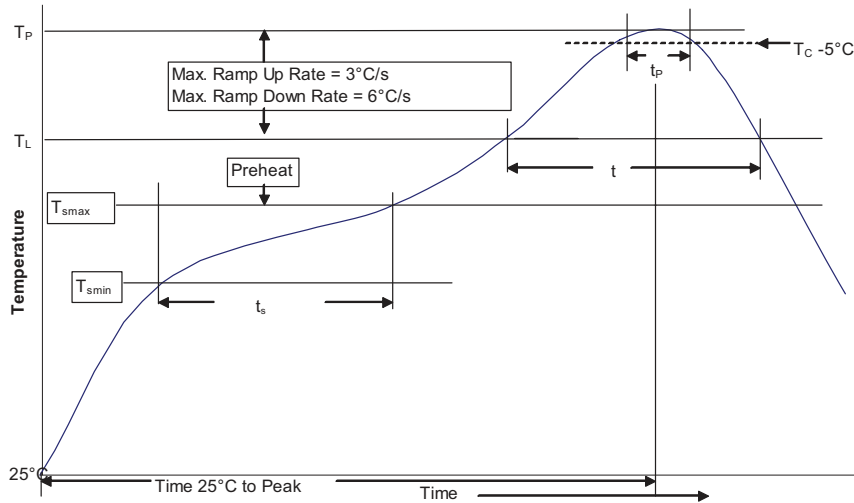


Table 1 - Standard SnPb Solder ( $T_C$ )

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ $\geq 350$
<2.5mm	235°C	220°C
$\geq 2.5\text{mm}$	220°C	220°C

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

Package Thickness	Volume $\text{mm}^3$ <350	Volume $\text{mm}^3$ 350 - 2000	Volume $\text{mm}^3$ >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 ( $T_L$ )	183°C	217°C
Time at liquidous ( $t_L$ )	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 $T_{smax}$ )	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.

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