

# SMD COMMON MODE CHOKE

## RE100 SERIES

### INTRODUCTION

TE Schaffner's RE100 Series high-performance common mode choke is designed for 250V applications. Positioned on the grid side, it effectively suppresses electromagnetic interference (EMI) in systems with power ratings up to 1.5 kW. Engineered for effective integration into automated manufacturing processes, the RE100 Series is supplied in reels compatible with automated feeders, providing for efficiency and reliability in high-volume production environments.

### APPLICATIONS

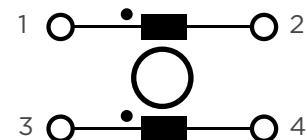
- General power electronics
- Switch mode power supplies
- EMC filters

### FEATURES AND BENEFITS

- Small, light
- Voltages up to 250V
- Low stray inductance
- Good size / performance ratio
- Suitable for automated production lines

### APPROVALS

- IEC 60938-2 / IEC 60938-1
- RoHS 2011/65/EU, 2015/863/EU
- REACH No. 1907/2006



Measurement conditions L: 10kHz, 0.2mA

Tolerances L: +50%  
-30%

### INDUCTANCE

Current [A]	Inductance [mH]
0.4	47
0.6	33
0.8	15
1	10
1.3	6.8
1.6	4.7
2	3.3
2.5	2.2
3.1	1
3.8	0.68
4.6	0.47
6	0.33

# TE SCHAFFNER SMD COMMON MODE CHOKE

RE100

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## SPECIFICATIONS

### ELECTRICAL CHARACTERISTICS

Overload Current Rating	1.5 x Rated current (for 1 minute once per hour)
Rated Current	0.4 A to 6 A @ 60 °C
Nominal Operating Voltage	230 +/- 10% VAC
Rated Operating Voltage	250 VAC/VDC
Rated Operating Frequency	DC/50/60Hz
Max. Operating Frequency	400 Hz
Production Line Test Voltage	0.75 kVAC for 2 s (Between pin 1 to 3)
Overvoltage Category (IEC 60664-1)	II
Surge Withstand (IEC 61000-4-5)	2 kV (P to P) ; 4 kV (P to housing) Level 4.
Operating Altitude	Apply derating according to IEC 60664-1 for altitudes exceeding 2000m
Clearance Distance	2.5 mm (P-P)
Creepage Distance	3.0 mm (P-P)

### MECHANICAL CHARACTERISTICS

Line (-20) Type	Surface Mounted Terminal
Load (-20) Type	Surface Mounted Terminal
IP Class (IEC 60529-1)	00
Net Weight	4 g

### ENVIRONMENTAL & RELIABILITY

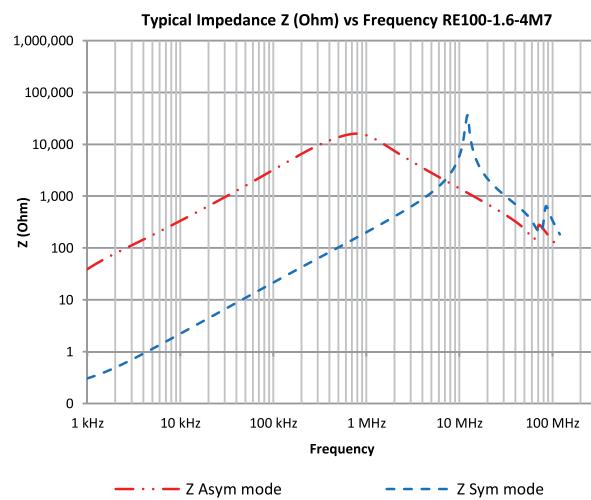
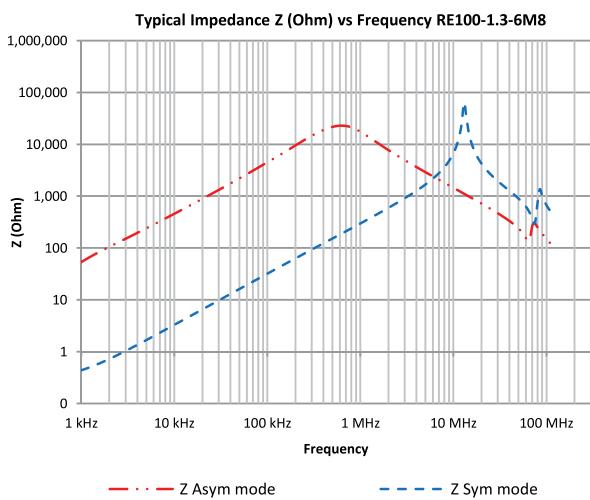
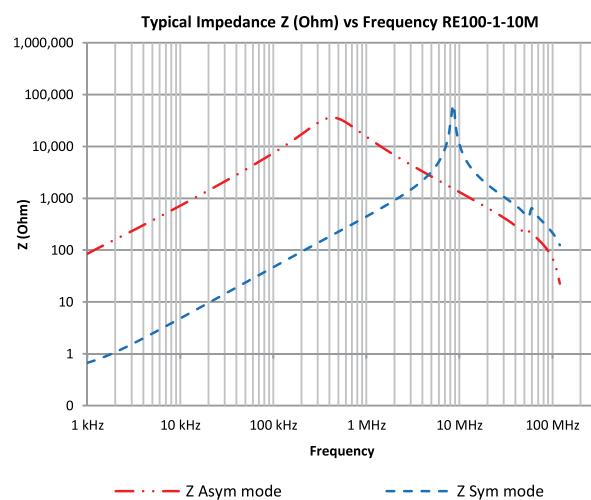
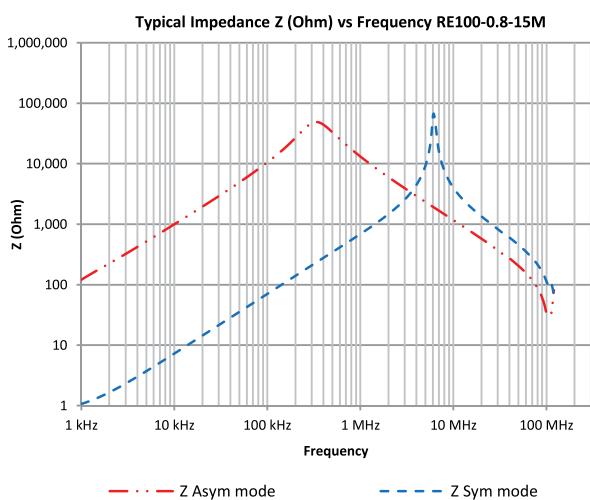
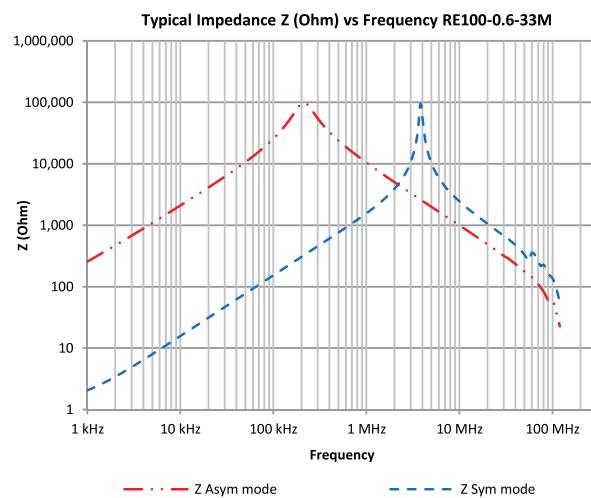
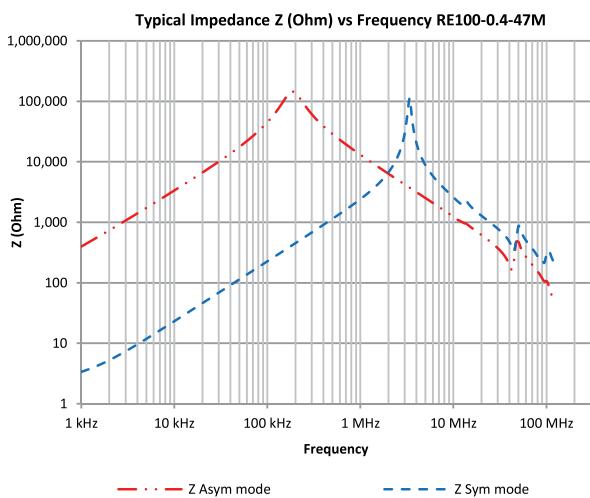
Operating Ambient Temp. Range	-40 °C to 125 °C
Cooling	AN
Pollution Degree (IEC 60664-1)	2
Climatic Class (IEC 60068-1)	40/125/56
MTBF (MIL-HDBK-217)	2,000,000 h (at rated voltage, rated current and ambient temperature)
Vibration (IEC60068-2-6)	0.75mm or 98m/22 (10g) ,24cycles 10Hz-55Hz
Shock (IEC60068-2-27)	half sine, 3 shocks each direction: 294m/s <sup>2</sup> (30g), 6ms
Moisture Sensitivity level (IPC/JEDEC J-STD-020E)	Level 1

### PLASTIC MATERIAL

Flammability Plastics (UL 94 ,IEC 60695-11-10,-20)	VO
GWFI (IEC 60695-2-12)	960 °C
GWIT (IEC 60695-2-13)	825 °C
HWI (UL 746A)	PLC 4
Ball Pressure Test (IEC 60695-10-2)	125 °C

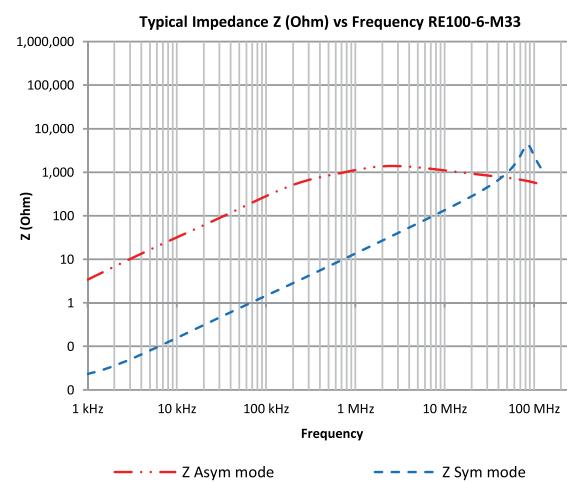
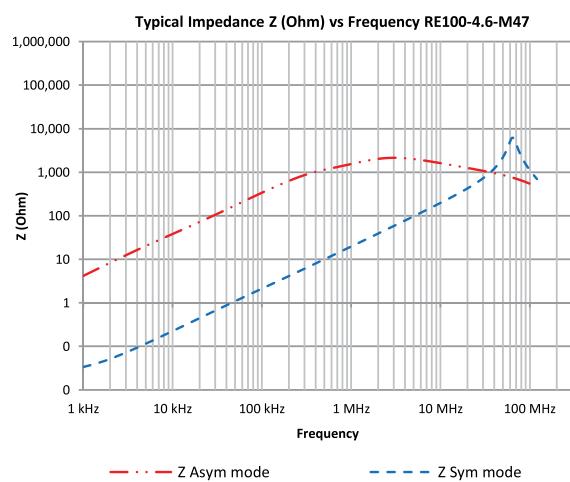
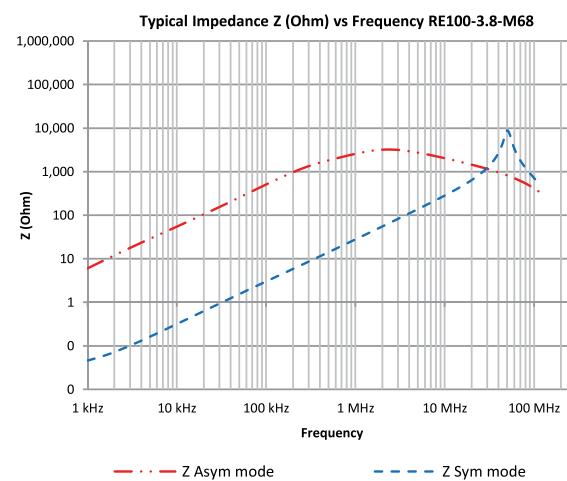
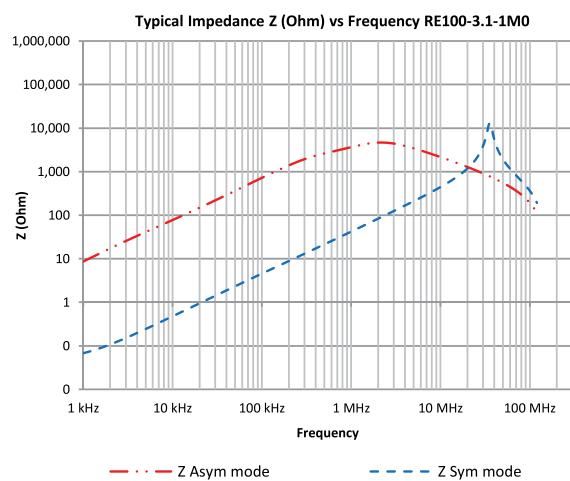
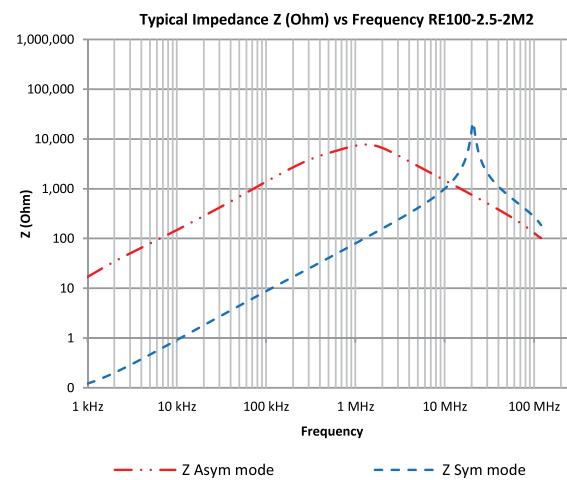
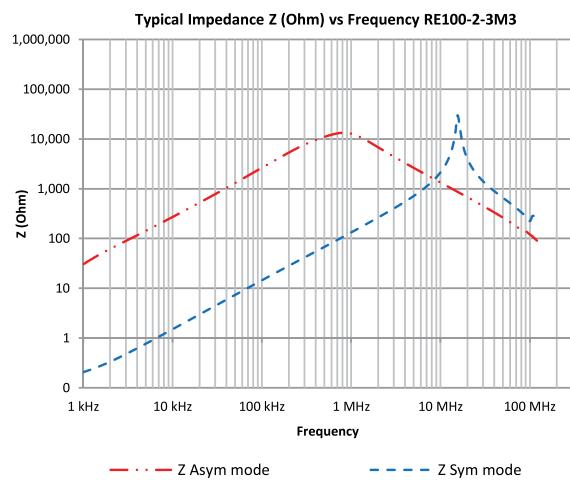
## TYPICAL IMPEDANCE

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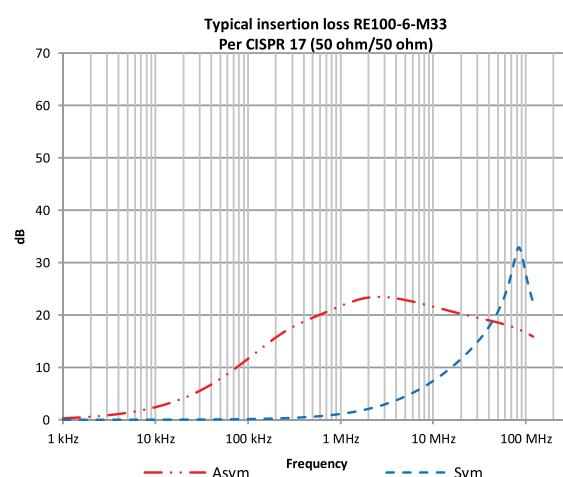
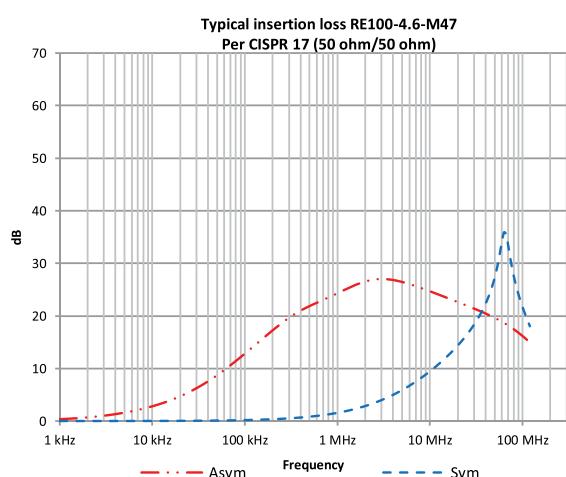
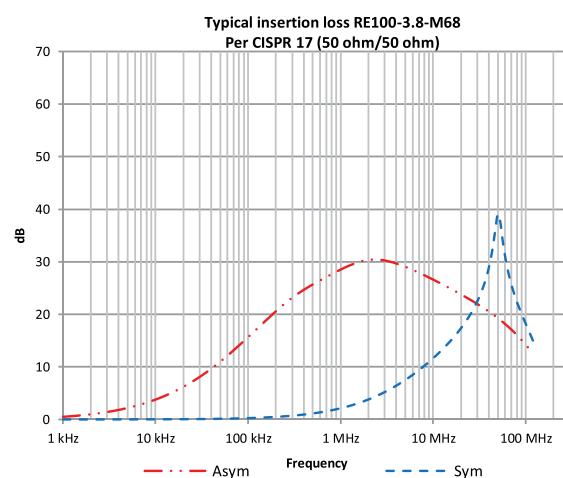
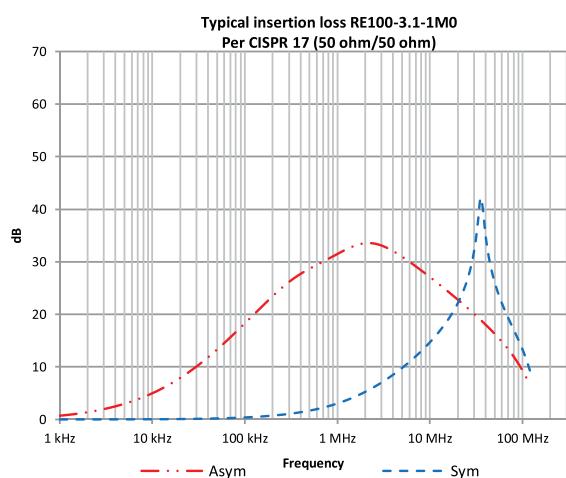
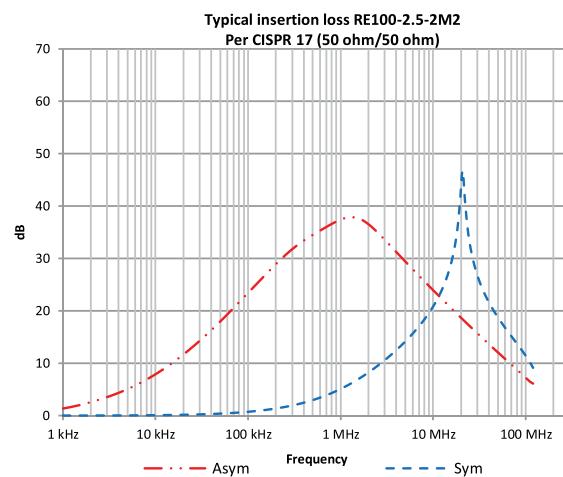
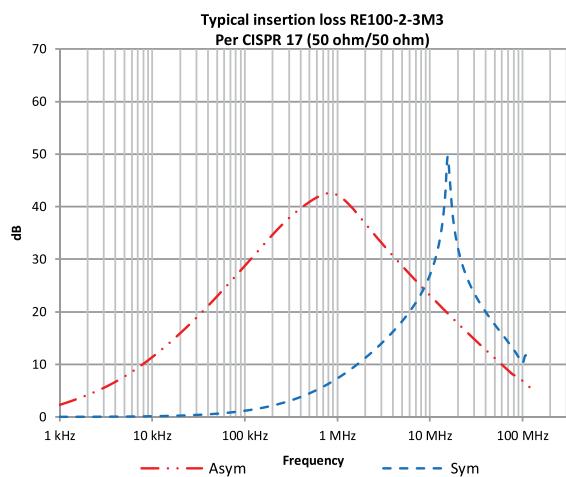
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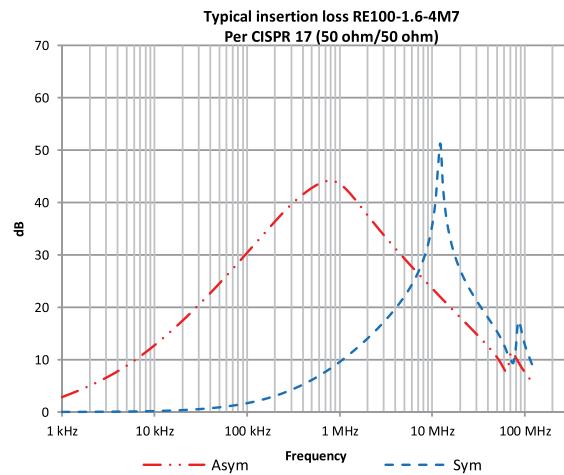
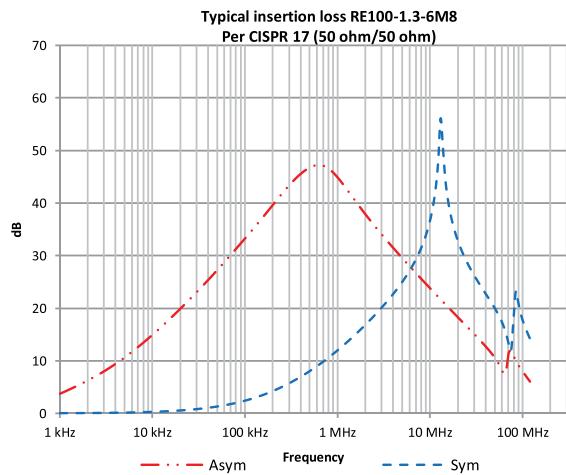
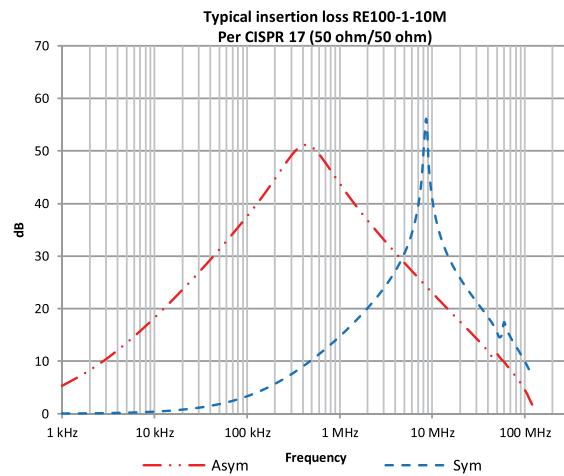
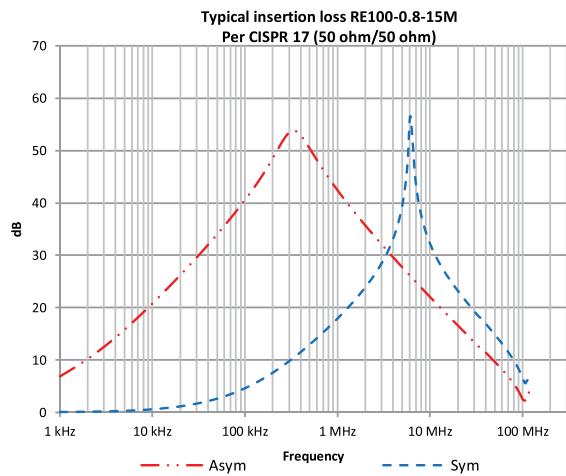
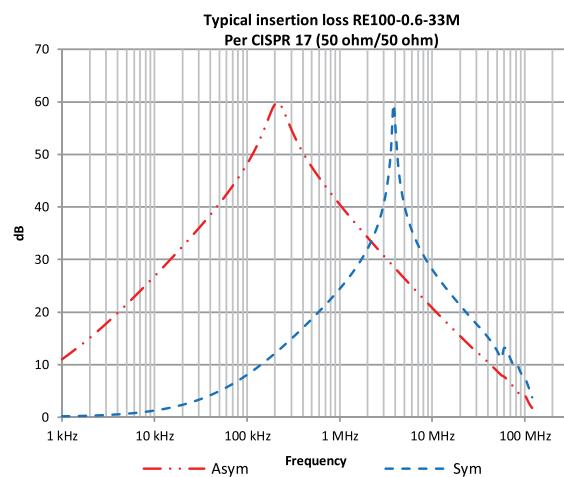
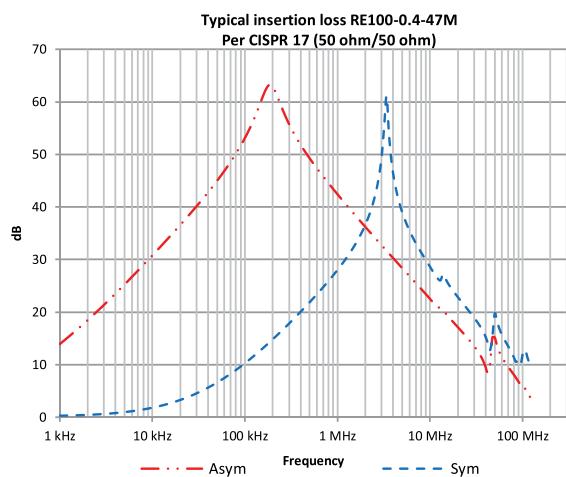
## TYPICAL INSERTION LOSS

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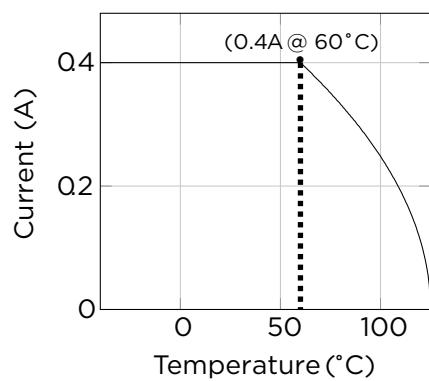


## CURRENT DERATING

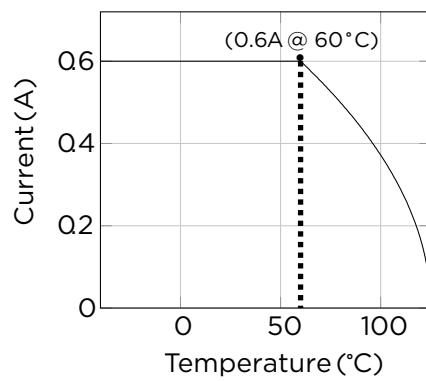
	RE100-0.4-47M (823901-SF)	RE100-0.6-33M (823902-SF)	RE100-0.8-15M (823903-SF)	RE100-1-10M (823904-SF)
Rated Current ( $I_{th}$ ) @ 60 °C amb. Temperature	0.4 A	0.6 A	0.8 A	1 A
Max. DC Resistance @ 25 °C	1300 mOhm (1 - 2)	735 mOhm (1 - 2)	405 mOhm (1 - 2)	265 mOhm (1 - 2)
Inductance Lcm @ 10kHz; 0.2 mA	47 mH	33 mH	15 mH	10 mH
Stray Inductance Ls @ 10kHz; 0.2 mA	330 uH	231 uH	105 uH	70 uH

## CURRENT DERATING CURVE

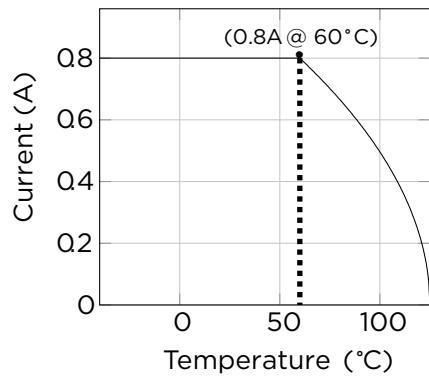
## RE100-0.4-47M (823901-SF)



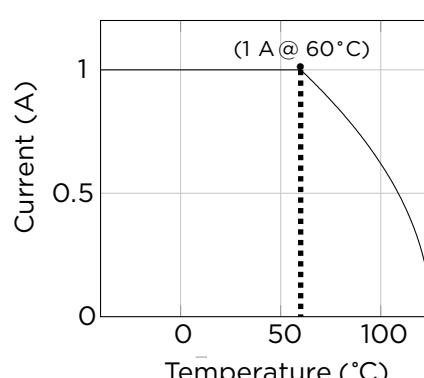
## RE100-0.6-33M (823902-SF)



## RE100-0.8-15M (823903-SF)



## RE100-1-10M (823904-SF)



$$I = I_N \cdot \sqrt{\frac{\Theta_{max} - \Theta_{act}}{\Theta_{max} - \Theta_N}}$$

for  $\Theta_{act} > \Theta_N$  and  $\Theta_{act} < \Theta_{max}$

$I_N$  rated current at  $\Theta_N$

$\Theta_{act}$  actual ambient temperature

$\Theta_N$  temperature at which the rated current is defined

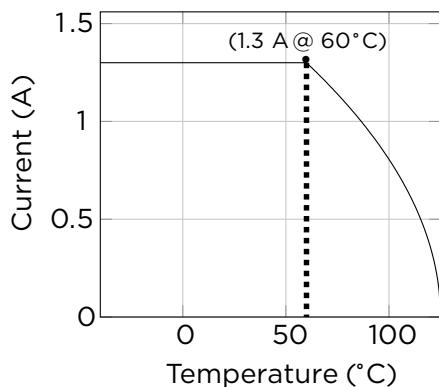
$\Theta_{max}$  rated maximum temperature of the component

## CURRENT DERATING

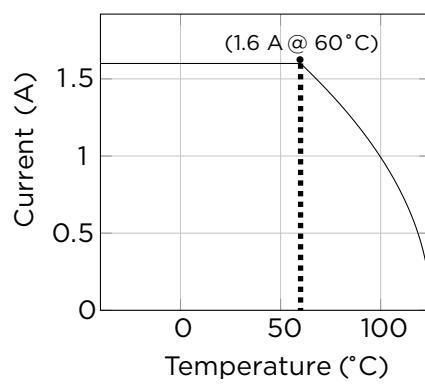
	RE100-1.3-6M8 (823905-SF)	RE100-1.6-4M7 (823906-SF)	RE100-2-3M3 (823907-SF)	RE100-2.5-2M2 (823908-SF)
Rated Current ( $I_{th}$ ) @ 60 °C amb. Temperature	1.3 A	1.6 A	2 A	2.5 A
Max. DC Resistance @ 25 °C	170 mOhm (1 - 2)	115 mOhm (1 - 2)	85 mOhm (1 - 2)	52 mOhm (1 - 2)
Inductance Lcm @ 10kHz; 0.2 mA	6.8 mH	4.7 mH	3.3 mH	2.2 mH
Stray Inductance Ls @ 10kHz; 0.2 mA	47 uH	33 uH	23 uH	15 uH

## CURRENT DERATING

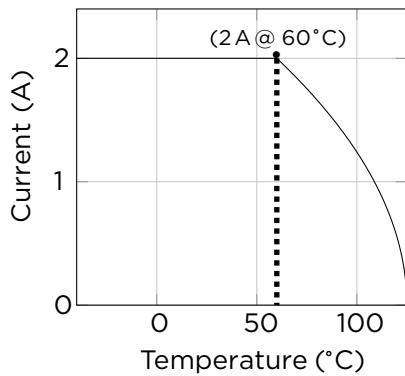
## RE100-1.3-6M8 (823905-SF)



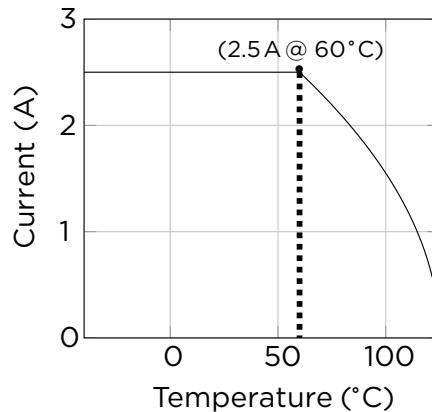
## RE100-1.6-4M7 (823906-SF)



## RE100-2-3M3 (823907-SF)



## RE100-2.5-2M2 (823908-SF)



$$I = I_N \cdot \sqrt{\frac{\Theta_{max} - \Theta_{act}}{\Theta_{max} - \Theta_N}}$$

for  $\Theta_{act} > \Theta_N$  and  $\Theta_{act} < \Theta_{max}$

$I_N$  rated current at  $\Theta_N$

$\Theta_{act}$  actual ambient temperature

$\Theta_N$  temperature at which the rated current is defined

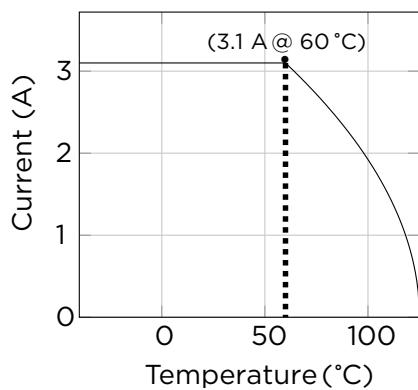
$\Theta_{max}$  rated maximum temperature of the component

## CURRENT DERATING

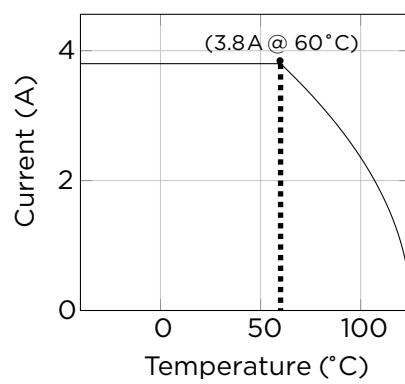
	RE100-3.1-1MO (823909-SF)	RE100-3.8-M68 (823910-SF)	RE100-4.6-M47 (823911-SF)	RE100-6-M33 (823912-SF)
Rated Current ( $I_{th}$ ) @ 60 °C amb. Temperature	3.1 A	3.8 A	4.6 A	6 A
Max. DC Resistance @ 25 °C	33 mOhm (1 - 2)	22 mOhm (1 - 2)	17 mOhm (1 - 2)	12 mOhm (1 - 2)
Inductance Lcm @ 10kHz; 0.2 mA	1 mH	0.68 mH	0.47 mH	0.33 mH
Stray Inductance Ls @ 10kHz; 0.2 mA	7 uH	4.76 uH	3.29 uH	2.31 uH

## CURRENT DERATING

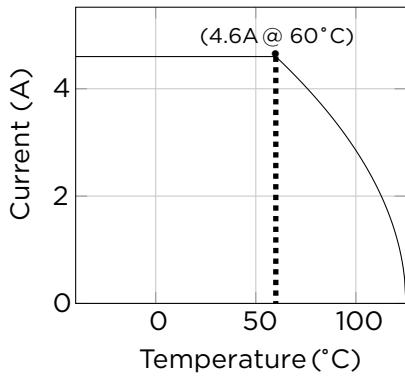
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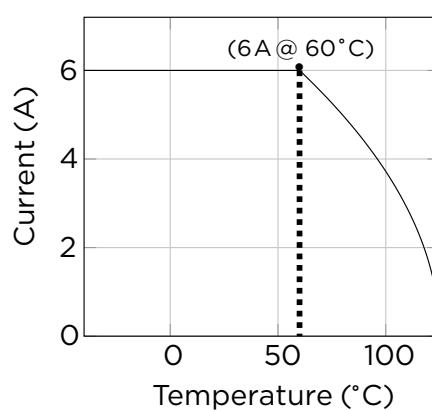
## RE100-3.8-M68 (823910-SF)



## RE100-4.6-M47 (823911-SF)



## RE100-6-M33 (823912-SF)



$I_N$  rated current at  $\Theta_N$   
 $\Theta_{act}$  actual ambient temperature  
 $\Theta_N$  temperature at which the rated current is defined  
 $\Theta_{max}$  rated maximum temperature of the component

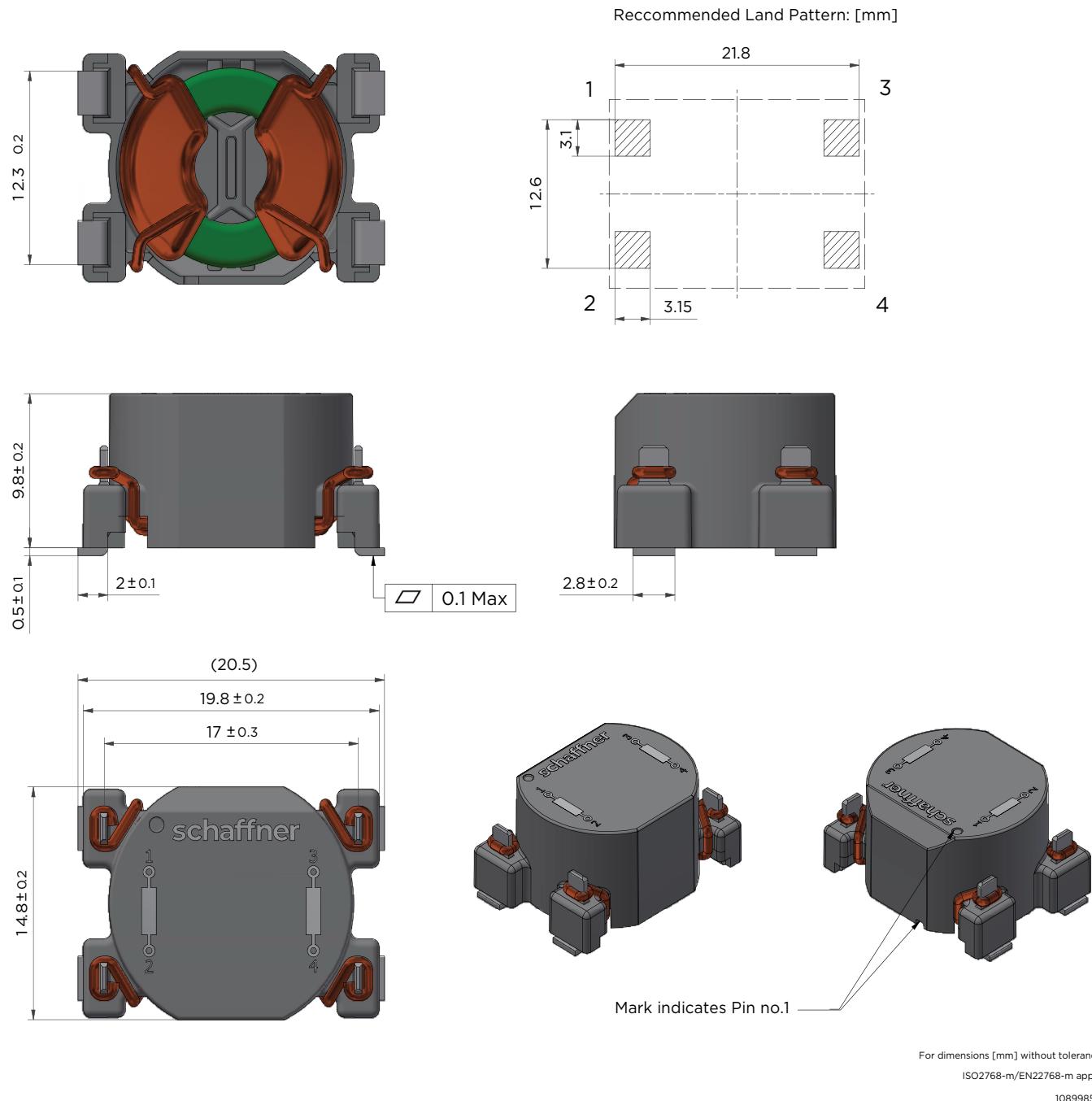
$$I = I_N \cdot \sqrt{\frac{\Theta_{max} - \Theta_{act}}{\Theta_{max} - \Theta_N}}$$

for  $\Theta_{act} > \Theta_N$  and  $\Theta_{act} < \Theta_{max}$

# TE SCHAFFNER SMD COMMON MODE CHOKE

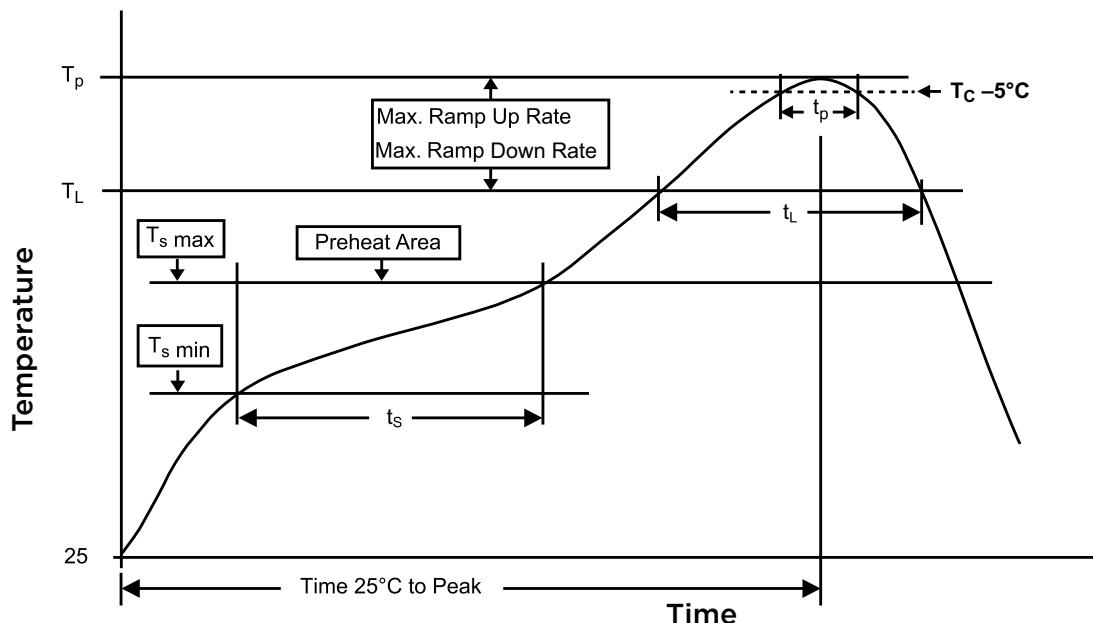
RE100

## MECHANICAL DRAWING (Unit mm)



## REFLOW PROFILE ACCORDING TO J-STD-020E

## Classification Reflow Profile for SMT components:

CLASSIFICATION REFLOW  
SOLDERING PROFILE

refer to IPC/ JEDEC J-STD-020E

Profile Feature	Value
Ts min - Preheat Temperature Minimum	150 °C
Ts max - Preheat Temperature Maximum	200 °C
t <sub>s</sub> - Preheat Time t <sub>s</sub> from T <sub>s</sub> min to T <sub>s</sub> max	60 - 120 seconds
Ramp-up Rate (T <sub>L</sub> to T <sub>p</sub> )	3 °C/ second max.
T <sub>L</sub> - Liquidous Temperature	217 °C
t <sub>L</sub> - Time t <sub>L</sub> maintained above T <sub>L</sub>	60 - 150 seconds
Tp - Peak package body temperature	Tp ≤ Tc, see Table below
tp - Time within 5°C of actual peak	20 - 30 seconds
temperature Ramp-down Rate (T <sub>p</sub> to T <sub>L</sub> )	6 °C/ second max.
Time 25°C to peak temperature	8 minutes max.

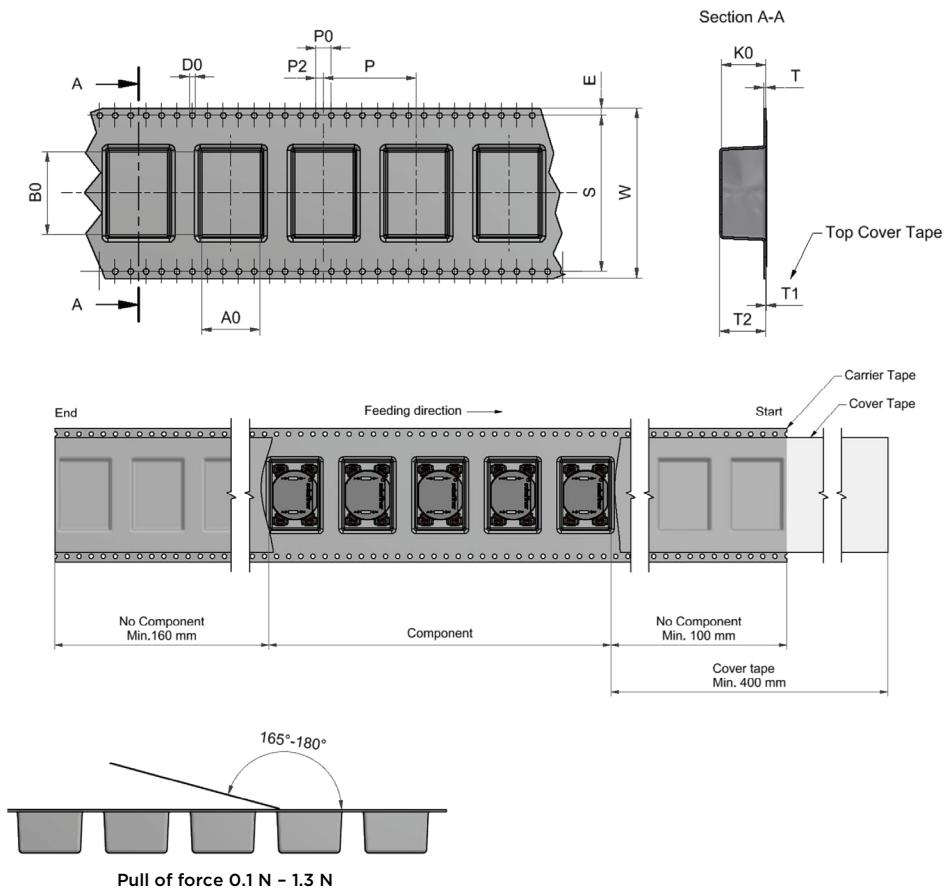
PACKAGE CLASSIFICATION  
REFLOW TEMPERATURE (T<sub>c</sub>)

refer to IPC/ JEDEC J-STD-020E

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

## PACKAGING SPECIFICATION

## PACKAGING SPECIFICATION - TAPE AND REEL (Unit: mm)



Dimension	Value (mm)	Tolerance
A0	15.20	typ.
B0	21.50	typ.
W	44.00	±0.3
K0	11.30	typ.
T	0.50	ref.
T1	0.06	max.
T2	12.00	max.
D0	1.50	+0.1/-0.0
P	24.00	±0.1
P0	4.00	±0.1
P2	2.00	±0.1
S	40.40	±0.1
E	1.75	±0.1

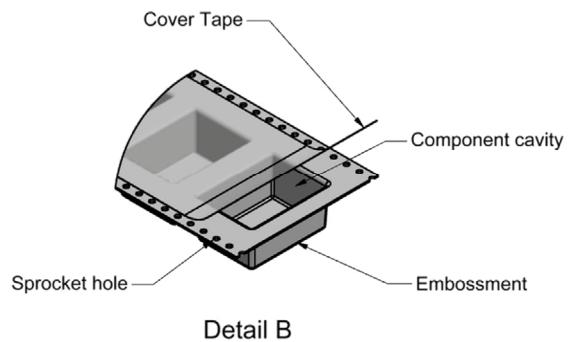
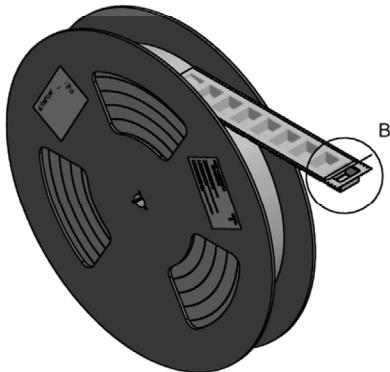
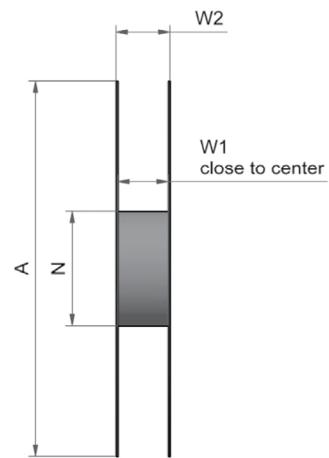
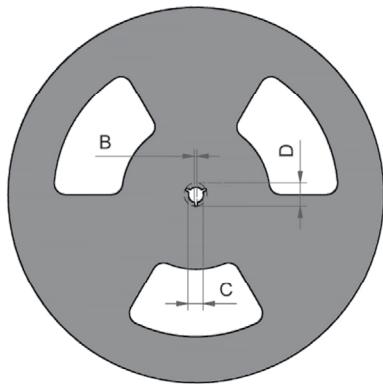
Tape Type	Polystyrene	-
Packaging unit	220	pcs

Packaging is referred to the international standard IEC 60286-3

# TE SCHAFFNER SMD COMMON MODE CHOKE

RE100

## PACKAGING SPECIFICATION – REEL (mm)



Dimension	Value (mm)	Tolerance
A	330.00	$\pm 1.5$
B	2.40	$\pm 0.2$
C	13.40	+0.5 / -0.2
D	20.60	$\pm 0.5$
N	100.00	$\pm 1.5$
W1	44.30	+0.2 / -0.1
W2	47.30	$\pm 0.2$
Material	Polystyrene	

# TE SCHAFFNER SMD COMMON MODE CHOKE

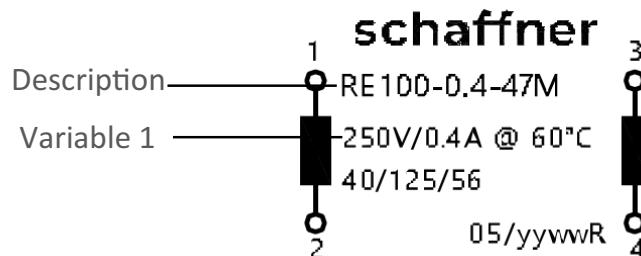
RE100

## PRODUCT LABEL

LABEL: 258666

SIZE: 70mmx41mm

FILE: 1093948A



Material	Description	Variable 1
823901-SF	RE100-0.4-47M	250V/0.4A @ 60°C
823902-SF	RE100-0.6-33M	250V/0.6A @ 60°C
823903-SF	RE100-0.8-15M	250V/0.8A @ 60°C
823904-SF	RE100-1-10M	250V/1A @ 60°C
823905-SF	RE100-1.3-6M8	250V/1.3A @ 60°C
823906-SF	RE100-1.6-4M7	250V/1.6A @ 60°C
823907-SF	RE100-2-3M3	250V/2A @ 60°C
823908-SF	RE100-2.5-2M2	250V/2.5A @ 60°C
823909-SF	RE100-3.1-1M0	250V/3.1A @ 60°C
823910-SF	RE100-3.8-M68	250V/3.8A @ 60°C
823911-SF	RE100-4.6-M47	250V/4.6A @ 60°C
823912-SF	RE100-6-M33	250V/6A @ 60°C

## LABEL FOR PRODUCT REEL

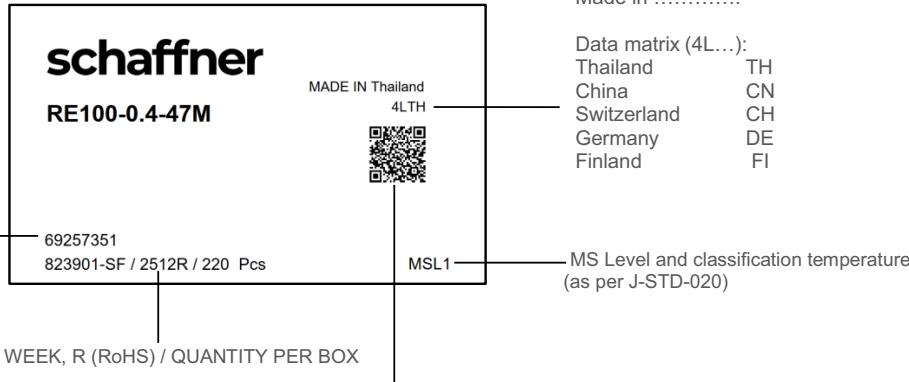
LABEL: 258666

SIZE: 70mmx41mm

FILE: L-258666-1

MAT. NO. / PRODUCTION-DATE YEAR, WEEK, R (RoHS) / QUANTITY PER BOX

Material	Description
823901-SF	RE100-0.4-47M
823902-SF	RE100-0.6-33M
823903-SF	RE100-0.8-15M
823904-SF	RE100-1-10M
823905-SF	RE100-1.3-6M8
823906-SF	RE100-1.6-4M7
823907-SF	RE100-2-3M3
823908-SF	RE100-2.5-2M2
823909-SF	RE100-3.1-1M0
823910-SF	RE100-3.8-M68
823911-SF	RE100-4.6-M47
823912-SF	RE100-6-M33



QR CODE	
Batch number	
(240) Additional product identification assigned by the manufacturer	
(241) Customer part number	
(11) Production date	
(30) Variable count of items	
Example: 69257351(240)RE100-0.4-47M(241)(11)yywwR(30)220	

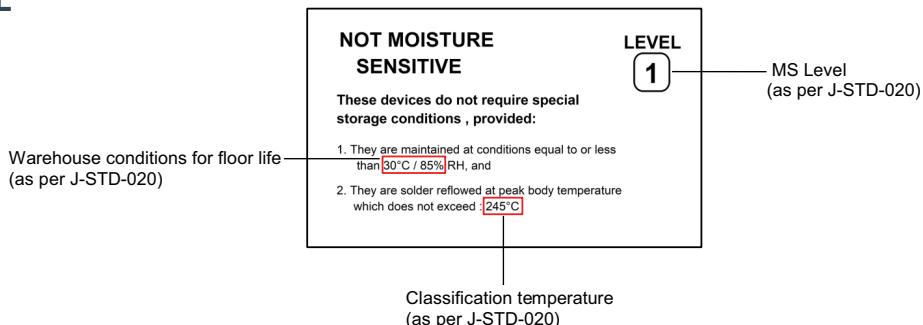
Packing labels printed directly from ZMM2TM004 based on the settings from Classification in SAP!

**LABEL FOR MSL**

LABEL: 258666

SIZE: 70mmx41mm

FILE: 1093948A

**DISCLAIMER**

- Product suitability for a given application must ultimately be determined by the user (the party that is putting the product into operation) on a case by case basis. Product functionality and suitability must be determined with proper verification within the final application. Neither Schaffner nor its subsidiaries will assume liability for any consequential downtimes or damages resulting from use of products outside their specifications or due to incomplete verification in application.
- Do not attempt to install, operate, maintain or inspect any product until you have read and understood the related safety notes and installation guidelines delivered with the product. If not available, general safety and installation notes are available on Schaffner Website: [www.te.com](http://www.te.com). Non-qualified persons are not allowed to install or maintain TE Connectivity's Schaffner products.
- The user is responsible to observe compliance with all local installation and electrical regulations.
- All products must have their safety earth connected using properly dimensioned connectors. It is recommended to avoid chaining safety earth of multiple equipment together.
- Warnings, cautions and notes as displayed on the product label must be observed at all times.
- Overcurrent or overvoltage applied to products or resulting from an improper setup (i.e. resonances) may cause substantial damages, represent a fire hazards and lead to body injury or death.
- Unless specifically indicated in datasheet, products do not contain any protection components. Suitable overcurrent and overvoltage protection circuits must be placed upstream of the product to avoid any consequential damage in case of any system malfunction.
- Products with capacitive elements can have significant amount of stored energy. If misused or mishandled it could lead to body harm, damage and eventually fire hazard.
- Products have limited lifetime and are subject to ageing effects heavily depending on operating conditions and environment. TE Schaffner recommends to regularly check any inbuilt capacitance to ensure constant performance and considering replacement after 12 years from initial commissioning unless otherwise indicated. Even when properly operated as in specifications, it is not possible to rule out single malfunctioning or failures of components happening before the usual lifetime. User is responsible to evaluate the environment in the application and eventually perform preventive maintenance before the above recommendation. User shall also evaluate risk of possible failures and implement proper containment actions to avoid damage or injury.
- TE Schaffner reserves the right to change raw materials used in this product during its life cycle on the company's own discretion, mainly for the purpose of managing and maintaining a capable international supplier base and for ensuring prompt product availability at all times. All changes having no impact on form, fit, function and technical specifications according to company internal evaluation will be carried out without notification. Stricter change management process can be implemented on request.

**CAUTIONS AND WARNINGS.**

The Product specific

**Soldering:** The solder profile must comply with the technical product specifications. All other profiles will void the warranty. All other soldering methods are at the customer's own risk. Strong forces which may affect the coplanarity of the components electrical connection with the PCB (i.e. pins), can damage the part and the resulting in void of the warranty.

**Cleaning and Washing:** Washing agents used during the production to clean the customer application might damage or change the characteristics of the wire insulation, marking or plating. Washing agents may have a negative effect on the long-term functionality of the product. Using a brush during the cleaning process may break the wire due to its small diameter. Therefore, we do not recommend using a brush during the PCB cleaning process.

**Potting:** If the product is potted in the customer application, the potting material might shrink or expand during and after hardening. Shrinking could lead to an incomplete seal, allowing contaminants into the core. Expansion could damage the component. We recommend a manual inspection after potting to avoid these effects.

**Storage Conditions:** A storage of the products for longer than 12 months is not recommended. Within other effects, the terminals may suffer degradation, resulting in bad solderability. Therefore, all products shall be used within the period of 12 months based on the day of shipment. Do not expose the components to direct sunlight.

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