



## SH150 Series • Inductors for National's 150kHz Simple Switcher™

**SH150 Series low cost toroidal inductors**, designed for use with National Semiconductor's 150kHz Simple Switcher™ Part Numbers LM259X-L1 through LM259X-L44 and LM258X-L

### Features

- High energy storage with minimum saturation
- High stability from no load to full load
- Available in both SMD and TH versions
- Manufactured in ISO-9001:2000, TS-16949:2002 and ISO-14001:2004 certified Talema facility
- Meets lead free reflow level J-STD-020C
- Fully RoHS compliant

### Electrical Specifications @ 25°C

Test voltage between windings: 500 Vrms

Operating temperature range: -40°C to +125°C

Climatic Category: IEC68-1 40/125/56

Test frequency: Inductance measured @ 10kHz / 10mV



Part Number	National Part Number	Rated Current (i <sub>DC</sub> )	L <sub>N</sub> (μH) ±20%	ET <sub>OP</sub> (V·μSec) Max.	DCR (Ohms)	Energy Storage (μJ)	Package	
							"S"	"C" & "T"
SH150_-0.13-259	LM-259X-L1	0.13	259	23.1	3.40	2	S1	T1
SH150_-0.16-178	LM-259X-L2	0.16	178	16.5	2.80	2		
SH150_-0.20-118	LM-259X-L3	0.20	118	13.2	1.80	2		
SH150_-0.25-79	LM-259X-L4	0.25	79	9.9	1.50	2		
SH150_-0.30-55	LM-259X-L5	0.30	55	6.6	1.00	2		
SH150_-0.34-39	LM-259X-L6	0.34	39	6.6	0.80	2		
SH150_-0.45-26	LM-259X-L7	0.45	26	6.6	0.62	3		
SH150_-0.20-374	LM-259X-L8	0.20	374	75.9	2.70	7	S2	T2
SH150_-0.25-256	LM-259X-L9	0.25	256	33.0	2.20	8		
SH150_-0.30-176	LM-259X-L10	0.30	176	26.4	1.40	8		
SH150_-0.38-118	LM-259X-L11	0.38	118	19.8	1.20	9		
SH150_-0.46-78	LM-259X-L12	0.46	78	16.5	0.80	8		
SH150_-0.56-55	LM-259X-L13	0.56	55	13.2	0.50	9		
SH150_-0.68-39	LM-259X-L14	0.68	39	9.9	0.30	9		
SH150_-0.84-26	LM-259X-L15	0.84	26	6.6	0.20	9	S3	T3
SH150_-1.02-17	LM-259X-L16	1.02	17	6.6	0.10	9		
SH150_-0.36-375	LM-259X-L17	0.36	375	75.9	1.30	24		
SH150_-0.44-252	LM-259X-L18	0.44	252	49.5	0.90	24		
SH150_-0.54-173	LM-259X-L19	0.54	173	36.3	0.60	25		
SH150_-0.67-115	LM-259X-L20	0.67	115	29.7	0.40	26		
SH150_-0.82-78	LM-259X-L21	0.82	78	23.1	0.30	26		
SH150_-1.0-54	LM-259X-L22	1.00	54	16.5	0.20	27	S4	T4
SH150_-1.2-38	LM-259X-L23	1.20	38	13.2	0.10	27		
SH150_-1.48-26	LM-259X-L24	1.48	26	9.9	0.10	28		
SH150_-1.81-18	LM-259X-L25	1.81	18	9.9	0.06	29		
SH150_-0.68-377	LM-259X-L26	0.68	377	75.9	1.00	87		
SH150_-0.83-248	LM-259X-L27	0.83	248	72.6	0.60	85		
SH150_-1.02-168	LM-259X-L28	1.02	168	56.1	0.40	87		
SH150_-1.26-112	LM-259X-L29	1.26	112	42.9	0.30	89	SH6A	C1 - T4
SH150_-1.54-77	LM-259X-L30	1.54	77	33.0	0.20	91		
SH150_-1.87-53	LM-259X-L31	1.87	53	26.4	0.13	93		
SH150_-2.24-37	LM-259X-L32	2.24	37	19.8	0.10	93		
SH150_-2.74-24	LM-259X-L33	2.74	24	16.5	0.07	90		
SH150_-3.00-17	LM-259X-L34	3.00	17	13.2	0.05	77		
SH150_-1.5-250	LM-259X-L35	1.50	250	72.6	0.23	281		
SH150_-1.81-168	LM-259X-L36	1.81	168	75.9	0.18	275	C3 - TH6A	

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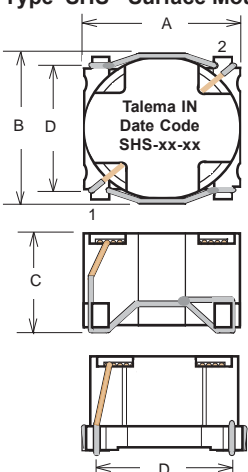
## Electrical Specifications at 25°C

Part Number	National Part Number	Rated Current (I <sub>DC</sub> )	L <sub>N</sub> (μH) ±20%	ET <sub>OP</sub> (V-μSec) Max.	DCR (Ohms)	Energy Storage (μJ)	Package	
							"S"	"C", "T" & "F"
SH150_-2.22-114	LM-259X-L37	2.22	114	62.7	0.10	281	SH6A	C3 - TH6A
SH150_-2.70-77	LM-259X-L38	2.70	77	52.8	0.09	281		
SH150_-3.00-53	LM-259X-L39	3.00	53	42.9	0.08	239		
SH150_-3.00-38	LM-259X-L40	3.00	38	29.7	0.05	171	S5	F2 - C2
SH150_-3.00-25	LM-259X-L41	3.00	25	19.8	0.04	113	SHC7	C4
SH150_-2.50-167	LM-259X-L42	2.50	167	75.9	0.14	522		
SH150_-3.00-110	LM-259X-L43	3.00	110	75.9	0.09	495		
SH150_-3.00-77	LM-259X-L44	3.00	77	59.4	0.08	347	SH6A	C3 - TH6A
SH150_-4.50-19	LM-258X-L	4.50	19	32.0*	0.02	192		

\*Note: ET<sub>OP</sub> for P/N SH150\_-4.50-19 is based on a frequency of 100kHz. All other items are rated at 150kHz. Simple Switcher™ is a trademark of National Semiconductor Corporation.

## Dimensions

### Type SHS - Surface Mount



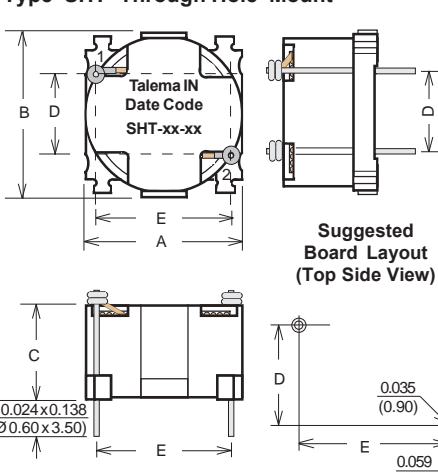
**Schematic**

**Suggested Pad Layout**

Pad Width: S1-S5: 0.059 (1.50), SH6A-SHC7: 0.079 (2.00)

Surface Coplanarity will be <0.005(0.13)

### Type SHT - Through Hole Mount

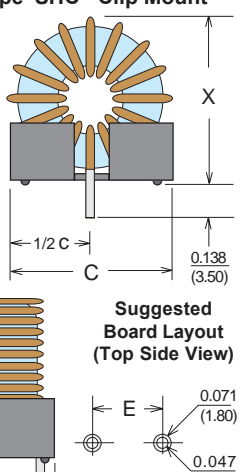


**Schematic**

**Suggested Board Layout (Top Side View)**

Dimensions: Ø0.024x0.138 (Ø0.60x3.50)

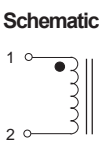
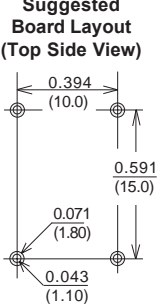
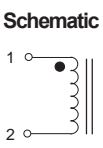
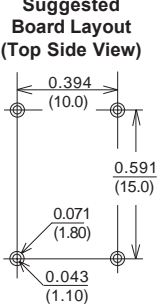
### Type SHC - Clip Mount



**Schematic**

**Suggested Board Layout (Top Side View)**

Dimensions: 0.138 (3.50), 0.071 (1.80), 0.047 (1.20)

Mounting Style	Size Code	Dimensions - Inches ±0.010 (mm ±0.25)					Schematic	Suggested Board Layout (Top Side View)
		A	B	C	D	E		
"S" SMD	S1	0.339 (8.6)	0.339 (8.6)	0.205 (5.2)	0.268 (6.9)	0.378 (9.6)		
	S2	0.433 (11.0)	0.441 (11.2)	0.291 (7.4)	0.358 (9.1)	0.433 (11.0)		
	S3	0.551 (14.0)	0.559 (14.2)	0.327 (8.3)	0.461 (11.7)	0.520 (13.2)		
	S4	0.591 (15.0)	0.614 (15.6)	0.376 (9.6)	0.508 (12.9)	0.551 (14.0)		
	S5	0.669 (17.0)	0.701 (17.8)	0.433 (11.0)	0.591 (15.0)	0.630 (16.0)		
	SH6A	0.925 (23.5)	0.957 (24.3)	0.402 (10.2)	0.843 (21.4)	0.748 (19.0)		
	SHC7	1.000 (25.4)	1.213 (30.8)	0.465 (11.8)	1.100 (27.94)	0.915 (23.24)		
"T" TH	T1	0.339 (8.6)	0.339 (8.6)	0.201 (5.1)	0.250 (6.35)	0.250 (6.35)		
	T2	0.433 (11.0)	0.441 (11.2)	0.280 (7.1)	0.300 (7.62)	0.300 (7.62)		
	T3	0.551 (14.0)	0.559 (14.2)	0.311 (7.9)	0.375 (9.52)	0.375 (9.52)		
	T4	0.591 (15.0)	0.614 (15.6)	0.358 (9.1)	0.300 (7.62)	0.500 (12.7)		
	TH6A	0.925 (23.5)	0.957 (24.3)	0.386 (9.8)	0.650 (16.51)	0.800 (20.32)		
	"C" Vertical Clip Mount	C1	0.580 (14.73)	0.340 (8.64)	0.220 (5.58)	X = Coil O.D. + (2.80)		
C2		0.650 (16.5)	0.449 (11.4)	0.299 (7.60)	X = Coil O.D. + (2.80)			
C3		0.827 (21.0)	0.449 (11.4)	0.299 (7.60)	X = Coil O.D. + (2.80)			
C4		0.949 (24.1)	0.598 (15.2)	0.449 (11.4)	X = Coil O.D. + (2.80)			
C5		1.252 (31.8)	0.701 (17.8)	0.500 (12.7)	X = Coil O.D. + (3.30)			