



## 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	SH6A	C3 - TH6A
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		

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

## 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

Surface Coplanarity will be <math><0.005(0.13)</math>

### Type SHT - Through Hole Mount

### Type SHC - Clip Mount

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)	<table border="1"> <thead> <tr> <th>Mounting Style</th> <th>Size Code</th> <th colspan="4">Dimensions - Inches ±0.01 (mm ±0.25)</th> </tr> <tr> <td rowspan="5">"C" Vertical Clip Mount</td> <td>C1</td> <td>0.580 (14.73)</td> <td>0.340 (8.64)</td> <td>0.220 (5.58)</td> <td>0.110 (2.80)</td> </tr> <tr> <td>C2</td> <td>0.650 (16.5)</td> <td>0.449 (11.4)</td> <td>0.299 (7.60)</td> <td>0.110 (2.80)</td> </tr> <tr> <td>C3</td> <td>0.827 (21.0)</td> <td>0.449 (11.4)</td> <td>0.299 (7.60)</td> <td>0.110 (2.80)</td> </tr> <tr> <td>C4</td> <td>0.949 (24.1)</td> <td>0.598 (15.2)</td> <td>0.449 (11.4)</td> <td>0.110 (2.80)</td> </tr> <tr> <td>C5</td> <td>1.252 (31.8)</td> <td>0.701 (17.8)</td> <td>0.500 (12.7)</td> <td>0.130 (3.30)</td> </tr> </thead></table>	Mounting Style	Size Code	Dimensions - Inches ±0.01 (mm ±0.25)				"C" Vertical Clip Mount	C1	0.580 (14.73)	0.340 (8.64)	0.220 (5.58)	0.110 (2.80)	C2	0.650 (16.5)	0.449 (11.4)	0.299 (7.60)	0.110 (2.80)	C3	0.827 (21.0)	0.449 (11.4)	0.299 (7.60)	0.110 (2.80)	C4	0.949 (24.1)	0.598 (15.2)	0.449 (11.4)	0.110 (2.80)	C5	1.252 (31.8)	0.701 (17.8)	0.500 (12.7)	0.130 (3.30)
	Mounting Style	Size Code	Dimensions - Inches ±0.01 (mm ±0.25)																																				
	"C" Vertical Clip Mount	C1	0.580 (14.73)	0.340 (8.64)	0.220 (5.58)	0.110 (2.80)																																	
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C5		1.252 (31.8)	0.701 (17.8)	0.500 (12.7)	0.130 (3.30)																																		
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)																																		



Pulse Engineering - Talema Electronic

Pulse Part Number		National	Specified	Idc (Amps)	Talema Part Number		
THT	SMD	Part Number	L(μH)		SMD	TH - Flat	TH - Vertical
PE-53801	PE-53801S	LM259X-L1	259	0.13	SH150S-0.13-259	SH150T-0.13-259	
PE-53802	PE-53802S	LM259X-L2	178	0.16	SH150S-0.16-178	SH150T-0.16-178	
PE-53803	PE-53803S	LM259X-L3	118	0.20	SH150S-0.20-118	SH150T-0.20-118	
PE-53804	PE-53804S	LM259X-L4	79	0.25	SH150S-0.25-79	SH150T-0.25-79	
PE-53805	PE-53805S	LM259X-L5	55	0.30	SH150S-0.30-55	SH150T-0.30-55	
PE-53806	PE-53806S	LM259X-L6	39	0.34	SH150S-0.34-39	SH150T-0.34-39	
PE-53807	PE-53807S	LM259X-L7	26	0.45	SH150S-0.45-26	SH150T-0.45-26	
PE-53808	PE-53808S	LM259X-L8	374	0.20	SW150S-0.20-374	SH150T-0.20-374	
PE-53809	PE-53809S	LM259X-L9	256	0.25	SH150S-0.25-256	SH150T-0.25-256	
PE-53810	PE-53810S	LM259X-L10	176	0.30	SH150S-0.30-176	SH150T-0.30-176	
PE-53811	PE-53811S	LM259X-L11	118	0.38	SH150S-0.38-118	SH150T-0.38-118	
PE-53812	PE-53812S	LM259X-L12	78	0.46	SH150S-0.46-78	SH150T-0.46-78	
PE-53813	PE-53813S	LM259X-L13	55	0.56	SH150S-0.56-55	SH150T-0.56-55	
PE-53814	PE-53814S	LM259X-L14	39	0.68	SH150S-0.68-39	SH150T-0.68-39	
PE-53815	PE-53815S	LM259X-L15	26	0.84	SH150S-0.84-26	SH150T-0.84-26	
PE-53816	PE-53816S	LM259X-L16	17	1.02	SH150S-1.02-17	SH150T-1.02-17	
PE-53817	PE-53817S	LM259X-L17	375	0.36	SH150S-0.36-375	SH150T-0.36-375	
PE-53818	PE-53818S	LM259X-L18	252	0.44	SH150S-0.44-252	SH150T-0.44-252	
PE-53819	PE-53819S	LM259X-L19	173	0.54	SH150S-0.54-173	SH150T-0.54-173	
PE-53820	PE-53820S	LM259X-L20	115	0.67	SH150S-0.67-115	SH150T-0.67-115	
PE-53821	PE-53821S	LM259X-L21	78	0.82	SH150S-0.82-78	SH150T-0.82-78	
PE-53822	PE-53822S	LM259X-L22	54	1.00	SH150S-1.00-54	SH150T-1.00-54	
PE-53823	PE-53823S	LM259X-L23	38	1.20	SH150S-1.20-38	SH150T-1.20-38	
PE-53824	PE-53824S	LM259X-L24	26	1.48	SH150S-1.48-26	SH150T-1.48-26	
PE-53825	PE-53825S	LM259X-L25	18	1.81	SH150S-1.81-18	SH150T-1.81-18	
PE-53826	PE-53826S	LM259X-L26	377	0.68	SH150S-0.68-377	SH150T-0.68-377	
PE-53827	PE-53827S	LM259X-L27	248	0.83	SH150S-0.83-248	SH150T-0.83-248	
PE-53828	PE-53828S	LM259X-L28	168	1.02	SH150S-1.02-168	SH150T-1.02-168	
PE-53829	PE-53829S	LM259X-L29	112	1.26	SH150S-1.26-112	SH150T-1.26-112	
PE-53830	PE-53830S	LM259X-L30	77	1.54	SH150S-1.54-77	SH150T-1.54-77	
PE-53831	PE-53831S	LM259X-L31	53	1.87	SH150S-1.87-53	SH150T-1.87-53	
PE-53932	PE-53932S	LM259X-L32	37	2.24	SH150S-2.24-37	SH150T-2.24-37	
PE-53933	PE-53933S	LM259X-L33	24	2.74	SH150S-2.74-24	SH150T-2.74-24	
PE-53934	PE-53934S	LM259X-L34	17	3.00	SH150S-3.00-17	SH150T-3.00-17	SH150C-3.00-17
PE-53935	PE-53935S	LM259X-L35	250	1.50	SH150S-1.50-250		SH150C-1.50-250
PE-54036	PE-54036S	LM259X-L36	168	1.81	SH150S-1.81-168		SH150C-1.81-168
PE-54037	PE-54037S	LM259X-L37	114	2.22	SH150S-2.22-114		SH150C-2.22-114
PE-54038	PE-54038S	LM259X-L38	77	2.70	SH150S-2.70-77		SH150C-2.70-77
PE-54039	PE-54039S	LM259X-L39	53	3.00	SH150S-3.00-53		SH150C-3.00-53
PE-54040	PE-54040S	LM259X-L40	38	3.00	SH150S-3.00-38		SH150C-3.00-38
PE-54041	PE-54041S	LM259X-L41	25	3.00	SH150S-3.00-25	SH150T-3.00-25	SH150C-3.00-25
PE-54042	—	LM259X-L42	167	2.50	SH150S-2.50-167		SH150C-2.50-167
PE-54043	—	LM259X-L43	110	3.00	SH150S-3.00-110		SH150C-3.00-110
PE-54044	PE-54044S	LM259X-L44	77	3.00	SH150S-3.00-77		SH150C-3.00-77
PE-53900	—	LM258X-L	19	4.50	SH150S-4.50-19		SH150C-4.50-19