

FEATURES

- HIGH CURRENT, SMALL SIZE (UP TO 8.6 AMPS)
- SURFACE MOUNTABLE CONSTRUCTION
- HIGH INDUCTANCE (UP TO 1000 μ H)
- TAPED AND REELED FOR AUTOMATIC INSERTION
- FOR USE IN DC/DC CONVERTERS

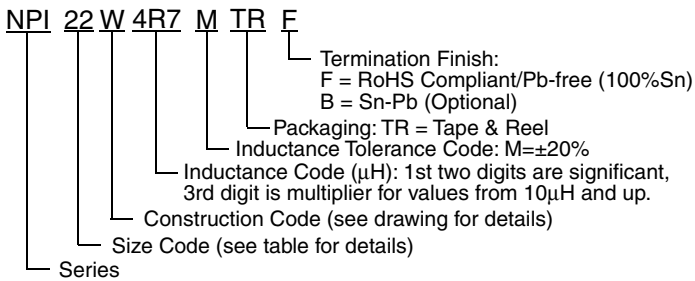
**RoHS
Compliant**
includes all homogeneous materials
*See Part Number System for Details



CHARACTERISTICS

Case Size	NPI16W	NPI22W	NPI30W	NPI31W	NPI34W	NPI52W
Inductance Range	1 ~ 1000 μ H	3.3 ~ 330 μ H	10 ~ 1000 μ H	1.0 ~ 1000 μ H	10 ~ 1000 μ H	1 ~ 1000 μ H
Temperature Range	-40°C ~ +125°C					
Temperature Rise at Irms	15°C max.	40°C max.				
Inductance Change at Isat	-10% typical					
Inductance Tolerance	20% (M)					
Resistance to Solder Heat	260°C for 10 seconds					

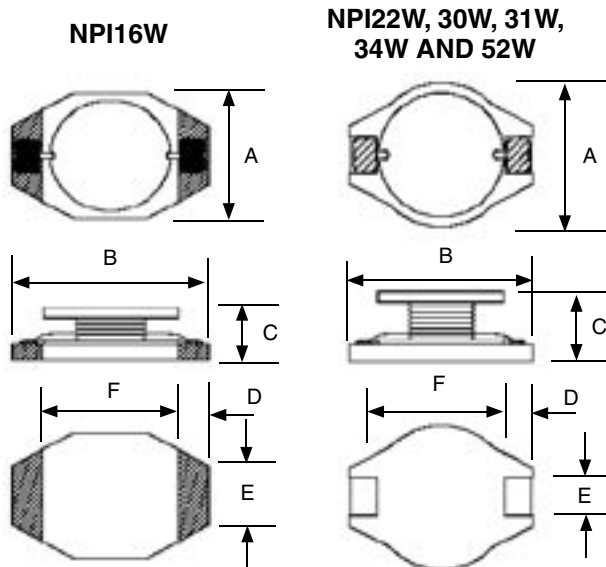
PART NUMBER SYSTEM



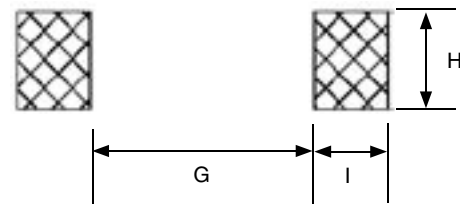
DIMENSIONS (mm)

Series	A	B	C	D	E	F	G (Ref)	H (Ref)	I (Ref)
NPI16W	4.45 Max	6.60 Max	2.92 Max	1.02 ± 0.2	1.27 ± 0.2	4.32 ± 0.3	4.06	3.56	1.4
NPI22W	8.00 ± 0.2	10.50 ± 0.2	5.00 ± 0.3	2.10 ± 0.2	2.00 ± 0.2	6.00 ± 0.3	5.7	2.2	2.4
NPI30W	10.0 ± 0.2	12.70 ± 0.2	3.00 ± 0.3	2.40 ± 0.2	2.20 ± 0.2	7.60 ± 0.3	7.3	2.8	3
NPI31W	10.0 ± 0.2	12.70 ± 0.2	5.00 ± 0.3	2.40 ± 0.2	2.20 ± 0.2	7.60 ± 0.3	7.3	2.8	3
NPI34W	10.0 ± 0.2	12.70 ± 0.2	11.0 ± 0.5	2.40 ± 0.2	2.20 ± 0.2	7.60 ± 0.3	7.3	2.8	3
NPI52W	15.0 ± 0.3	18.40 ± 0.3	7.00 ± 0.5	2.40 ± 0.2	2.20 ± 0.2	13.30 ± 0.3	12.7	2.8	3

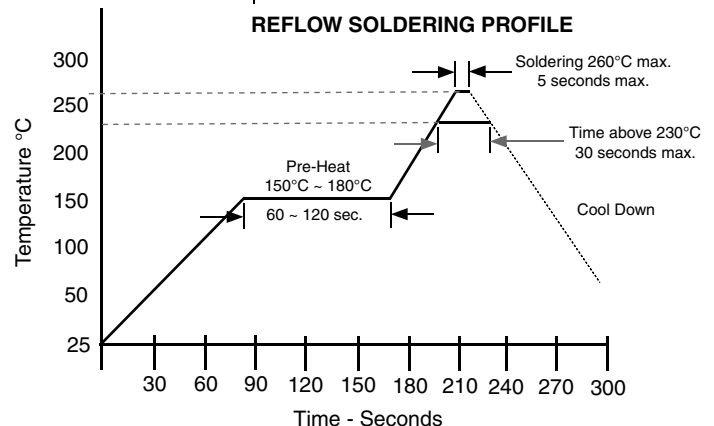
CONSTRUCTION



LAND PATTERN



REFLOW SOLDERING PROFILE



Part Number	STANDARD VALUES - CASE SIZE 16 (4.45 x 6.6 x 2.92mm)					Test Frequency
	Inductance Value (μH)	SRF (Typical) MHz	DC Resistance (Ω)	DC Current I _{rms} (Amps)	DC Current I _{sat} (Amps)	
NPI16W1R0MTRF	1.0 ± 20%	130	0.05	2.9	2.9	100KHz
NPI16W1R5MTRF	1.5 ± 20%	115	0.05	2.8	2.6	
NPI16W2R2MTRF	2.2 ± 20%	90	0.07	2.4	2.3	
NPI16W3R3MTRF	3.3 ± 20%	70	0.08	2.0	2.0	
NPI16W4R7MTRF	4.7 ± 20%	50	0.09	1.5	1.5	
NPI16W6R8MTRF	6.8 ± 20%	45	0.13	1.4	1.2	
NPI16W100MTRF	10 ± 20%	35	0.16	1.1	1.1	
NPI16W150MTRF	15 ± 20%	30	0.23	1.0	0.90	
NPI16W220MTRF	22 ± 20%	20	0.27	0.80	0.70	
NPI16W330MTRF	33 ± 20%	15	0.51	0.60	0.58	
NPI16W470MTRF	47 ± 20%	14	0.64	0.50	0.50	
NPI16W680MTRF	68 ± 20%	11	0.86	0.40	0.50	
NPI16W101MTRF	100 ± 20%	9.0	1.27	0.30	0.31	
NPI16W151MTRF	150 ± 20%	6.0	2.00	0.25	0.27	
NPI16W221MTRF	220 ± 20%	5.5	3.11	0.20	0.22	
NPI16W331MTRF	330 ± 20%	5.0	3.80	0.16	0.18	
NPI16W471MTRF	470 ± 20%	4.0	5.06	0.15	0.16	
NPI16W681MTRF	680 ± 20%	3.0	9.20	0.12	0.14	
NPI16W102MTRF	1000 ± 20%	2.0	13.8	0.07	0.10	

Maximum +15°C temperature rise at I_{rms}. Typical -10% inductance change at I_{sat}.

Part Number	STANDARD VALUES - CASE SIZE 22 (8.0 x 10.5 x 5.0mm)					Test Frequency
	Inductance Value (μH)	SRF (Typical) MHz	DC Resistance (Ω)	DC Current I _{rms} (Amps)	DC Current I _{sat} (Amps)	
NPI22W3R3MTRF	3.3 ± 20%	50	0.030	3.7	7.0	100KHz
NPI22W4R7MTRF	4.7 ± 20%	40	0.018	3.3	6.0	
NPI22W6R8MTRF	6.8 ± 20%	30	0.050	2.7	5.0	
NPI22W100MTRF	10 ± 20%	23	0.060	2.3	4.0	
NPI22W150MTRF	15 ± 20%	20	0.080	2.1	3.0	
NPI22W220MTRF	22 ± 20%	16	0.130	1.6	2.5	
NPI22W330MTRF	33 ± 20%	12	0.180	1.3	2.0	
NPI22W470MTRF	47 ± 20%	11	0.260	1.1	1.8	
NPI22W680MTRF	68 ± 20%	9.0	0.350	1.0	1.5	
NPI22W101MTRF	100 ± 20%	7.0	0.580	0.70	1.0	
NPI22W151MTRF	150 ± 20%	5.0	0.750	0.60	0.9	
NPI22W221MTRF	220 ± 20%	4.0	1.05	0.50	0.8	
NPI22W331MTRF	330 ± 20%	3.5	1.60	0.45	0.6	

Maximum +40°C temperature rise at I_{rms}. Typical -10% inductance change at I_{sat}.

Part Number	STANDARD VALUES - CASE SIZE 30 (10.0 x 12.7 x 3.0mm)					Test Frequency
	Inductance Value (µH)	SRF (Typical) MHz	DC Resistance (Ω)	DC Current I _{rms} (Amps)	DC Current I _{sat} (Amps)	
NPI30W100MTRF	10 ± 20%	35	0.11	2.0	2.4	100KHz
NPI30W150MTRF	15 ± 20%	33	0.15	1.5	2.0	
NPI30W220MTRF	22 ± 20%	25	0.23	1.3	1.6	
NPI30W330MTRF	33 ± 20%	19	0.30	1.1	1.4	
NPI30W470MTRF	47 ± 20%	14	0.39	0.80	1.0	
NPI30W680MTRF	68 ± 20%	12	0.66	0.70	0.9	
NPI30W101MTRF	100 ± 20%	10	0.34	0.60	0.7	
NPI30W151MTRF	150 ± 20%	8.0	1.2	0.50	0.6	
NPI30W221MTRF	220 ± 20%	6.0	1.9	0.40	0.5	
NPI30W331MTRF	330 ± 20%	5.0	2.7	0.30	0.4	
NPI30W471MTRF	470 ± 20%	4.0	4.0	0.20	0.2	
NPI30W681MTRF	680 ± 20%	3.0	5.3	0.10	0.2	
NPI30W102MTRF	1000 ± 20%	2.5	3.4	0.05	0.1	

Maximum +40°C temperature rise at I_{rms}. Typical -10% inductance change at I_{sat}.

Part Number	STANDARD VALUES - CASE SIZE 31 (10.0 x 12.7 x 5.0mm)					Test Frequency
	Inductance Value (µH)	SRF (Typical) MHz	DC Resistance (Ω)	DC Current I _{rms} (Amps)	DC Current I _{sat} (Amps)	
NPI31W1R0MTRF	1.0 ± 20%	150	0.009	6.8	9.0	100KHz
NPI31W1R5MTRF	1.5 ± 20%	100	0.010	6.4	8.0	
NPI31W2R2MTRF	2.2 ± 20%	85	0.012	6.1	7.0	
NPI31W3R3MTRF	3.3 ± 20%	60	0.015	5.4	5.8	
NPI31W4R7MTRF	4.7 ± 20%	45	0.018	4.8	5.2	
NPI31W6R8MTRF	6.8 ± 20%	35	0.027	4.4	4.3	
NPI31W100MTRF	10 ± 20%	25	0.038	3.9	3.4	
NPI31W150MTRF	15 ± 20%	20	0.046	3.1	3.0	
NPI31W220MTRF	22 ± 20%	18	0.085	2.7	2.5	
NPI31W330MTRF	33 ± 20%	14	0.10	2.1	2.0	
NPI31W470MTRF	47 ± 20%	11	0.14	1.8	1.8	
NPI31W680MTRF	68 ± 20%	10	0.20	1.5	1.4	
NPI31W101MTRF	100 ± 20%	7.0	0.28	1.3	1.1	
NPI31W151MTRF	150 ± 20%	6.5	0.40	1.0	0.9	
NPI31W221MTRF	220 ± 20%	5.0	0.61	0.8	0.8	
NPI31W331MTRF	330 ± 20%	4.0	1.02	0.6	0.6	
NPI31W471MTRF	470 ± 20%	3.0	1.27	0.5	0.5	
NPI31W681MTRF	680 ± 20%	2.5	2.02	0.4	0.4	
NPI31W102MTRF	1000 ± 20%	2.0	3.00	0.3	0.3	

Maximum +40°C temperature rise at I_{rms}. Typical -10% inductance change at I_{sat}.



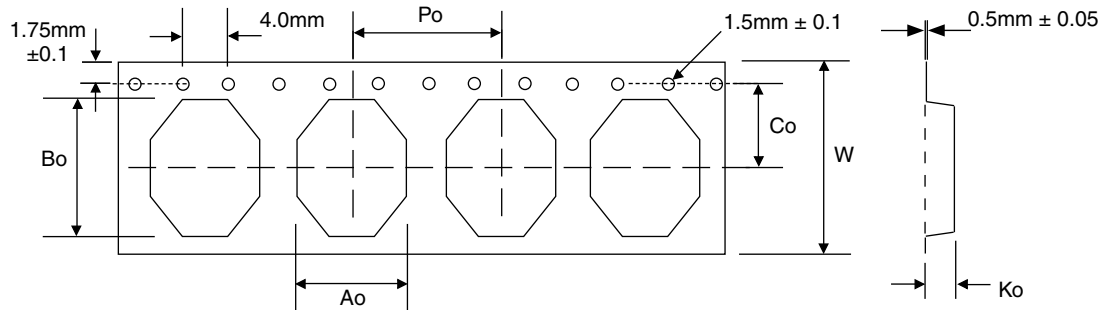
Part Number	STANDARD VALUES - CASE SIZE 34 (10.0 x 12.7 x 11mm)					Test Frequency
	Inductance Value (μH)	SRF (Typical) MHz	DC Resistance (Ω)	DC Current I _{rms} (Amps)	DC Current I _{sat} (Amps)	
NPI34W100MTRF	10 ± 20%	23	0.040	3.50	7.0	100KHz
NPI34W150MTRF	15 ± 20%	14	0.050	3.20	5.8	
NPI34W220MTRF	22 ± 20%	8.5	0.066	2.90	4.8	
NPI34W330MTRF	33 ± 20%	7.0	0.080	2.35	3.8	
NPI34W470MTRF	47 ± 20%	6.5	0.110	2.10	3.4	
NPI34W680MTRF	68 ± 20%	4.5	0.170	1.90	2.7	
NPI34W101MTRF	100 ± 20%	4.0	0.220	1.55	2.2	
NPI34W151MTRF	150 ± 20%	3.0	0.340	1.35	1.9	
NPI34W221MTRF	220 ± 20%	2.5	0.440	1.00	1.5	
NPI34W331MTRF	330 ± 20%	2.3	0.700	0.90	1.3	
NPI34W471MTRF	470 ± 20%	2.0	0.950	0.75	1.0	
NPI34W681MTRF	680 ± 20%	1.5	1.20	0.55	0.9	
NPI34W102MTRF	1000 ± 20%	1.3	2.00	0.50	0.7	

Maximum +40°C temperature rise at I_{rms}. Typical -10% inductance change at I_{sat}.

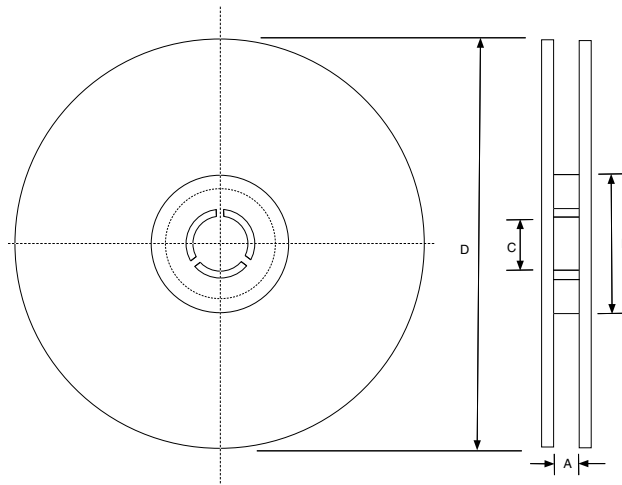
Part Number	STANDARD VALUES - CASE SIZE 52 (15.0 x 18.4 x 7.0mm)					Test Frequency
	Inductance Value (μH)	SRF (Typical) MHz	DC Resistance (Ω)	DC Current I _{rms} (Amps)	DC Current I _{sat} (Amps)	
NPI52W1R0MTRF	1.0 ± 20%	140	0.009	8.6	20	100KHz
NPI52W1R5MTRF	1.5 ± 20%	110	0.012	7.5	18	
NPI52W2R2MTRF	2.2 ± 20%	75	0.014	7.1	16	
NPI52W3R3MTRF	3.3 ± 20%	70	0.018	6.2	14	
NPI52W5R6MTRF	5.6±20%	45	0.020	5.3	12	
NPI52W100MTRF	10 ± 20%	21	0.031	4.3	10	
NPI52W150MTRF	15 ± 20%	16	0.036	4.0	8.0	
NPI52W220MTRF	22 ± 20%	13	0.047	3.5	7.0	
NPI52W330MTRF	33 ± 20%	11	0.066	3.0	5.5	
NPI52W470MTRF	47 ± 20%	9.0	0.086	2.6	4.5	
NPI52W680MTRF	68 ± 20%	6.5	0.13	2.3	3.5	
NPI52W101MTRF	100 ± 20%	5.7	0.19	1.8	3.0	
NPI52W151MTRF	150 ± 20%	4.5	0.25	1.5	2.6	
NPI52W221MTRF	220 ± 20%	3.7	0.38	1.2	2.4	
NPI52W331MTRF	330 ± 20%	3.0	0.56	1.0	1.9	
NPI52W471MTRF	470 ± 20%	2.7	0.85	0.82	1.4	
NPI52W681MTRF	680 ± 20%	2.2	1.10	0.72	1.2	
NPI52W102MTRF	1000 ± 20%	2.0	1.30	0.56	1.0	

Maximum +40°C temperature rise at I_{rms}. Typical -10% inductance change at I_{sat}.

Case Size	TAPING DIMENSIONS (mm)					
	Ao	Bo	Co	Ko	W	Po
NPI16W	6.7	4.6	4.25	3.2	12.0	8.0
NPI22W	11.0	8.5	11.50	3.2	24.0	16.0
NPI30W	13.2	9.5	10.25	3.2	24.0	12.0
NPI31W	13.2	9.5	10.25	5.4	24.0	12.0
NPI34W	13.2	9.5	10.25	11.6	24.0	20.0
NPI52W	18.7	15.4	14.25	7.3	32.0	20.0



Tape Width	REEL DIMENSIONS (mm)			
	A(mm)	B(mm)	C(mm)	D(mm)
16mm	16.5±0.1	100±1	13±0.5	330
24mm	24.5±0.1			
32mm	32.5±0.1			



Size	REEL QUANTITY PER CASE SIZE					
	NPI16W	NPI22W	NPI30W	NPI31W	NPI34W	NPI52W
Quantity per reel	2500	1000	1000	500	225	250
Tape Width	16mm	24mm	24mm	24mm	32mm	32mm

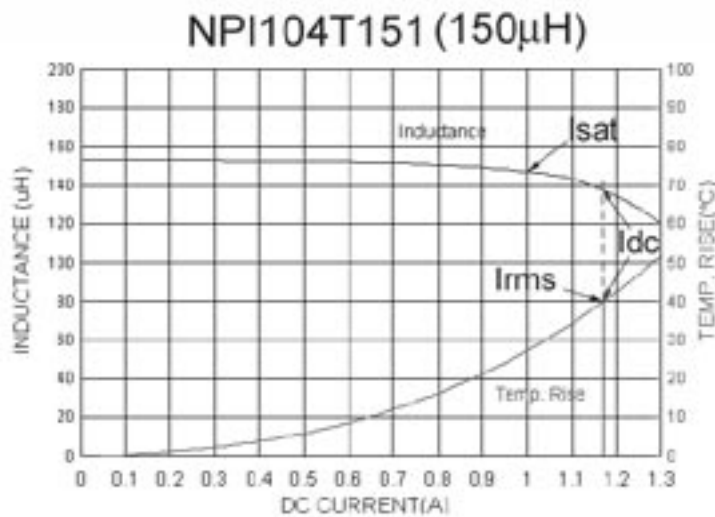
Isat and Irms

NPI & NPIS Series

Isat (Saturation Current) - is the current required to **decrease the inductance** value by the specified maximum amount (given as a percentage of the nominal inductance value).

Irms - is the current required to **increase the temperature** of the part a maximum specified amount (given as a temperature rise in °C).

In some instances Isat and Irms are shown separately with a maximum decrease in inductance specified at one current rating (Isat) and a maximum temperature rise specified at another current rating (Irms). In other cases one current value is given for both (specified as Idc) and represents the current at which a specified maximum inductance decrease and a maximum specified temperature rise can occur. The graph below illustrates change in inductance and temperature as current increases.



Based on the above graph Isat and Irms could be expressed as follows:

1. Isat and Irms can be shown as separate current values. The Isat current is a value of current that could potentially produce a specified maximum inductance change [-5%, -10%, -20%, etc. of the nominal value]. In this case a 1.0A current has produced a -5% inductance change so 1.0A could be specified as the inductor's Isat current rating. The Irms could be expressed as the current that produces a +40°C temperature rise which in this case is about 1.18A.
2. Both Isat and Irms can be expressed using one current value (Idc). In the above graph 1.18A could be specified as the Idc for the part noting that at 1.18A a potential +40°C temperature rise (equivalent to Irms) and a -10% change in inductance (equivalent to Isat) could occur.