Shielded Power Inductors

NPIS__HA Series

FEATURES

- AEC-Q200 QUALIFIED
- MAGNETIC RESIN SHIELDED POWER INDUCTOR
- ROBUST SHOCK RESISTANCE SMT CONSTRUCTION
- 30% HIGHER CURRENT RATED (UP TO 16 AMPS)
- -40°C to +125°C (INCLUDING SELF HEATING)
- HIGH INDUCTANCE (UP TO 470uH)
- TAPED AND REELED FOR AUTOMATIC PLACEMENT

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

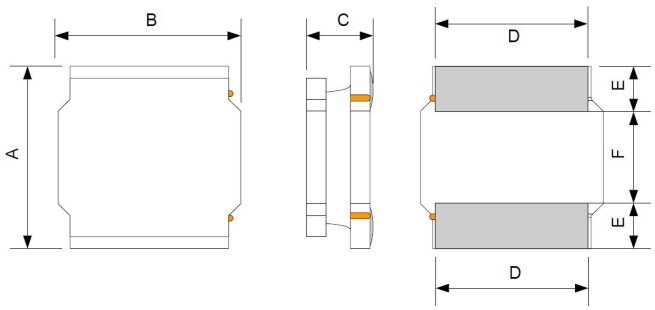
CHARACTERISTICS:

Case Size	NPIS44HA 4.0 × 4.0 × 3.5mm	NPIS66HA 6.0 × 6.0 × 5.5mm	NPIS85HA 8.0 × 8.0 × 5.0mm
Inductance Range	0.47 ~ 150 uH	3.3 ~ 330 uH	1.0 ~ 470 uH
Ambient Operating Temperature Range	-40°C ~ +125°C (including self-heating)		
Temperature Rise at Irms	Maximum +40°C Temperature Rise		
Inductance Change at Isat	Maximum -30% Inductance Drop from Initial Measured Value		
Inductance Tolerance	±20% (M), 100KHz, 1V		
Resistance to Solder Heat	+260°C for 10 seconds		

DIMENSIONS: (mm)

Series	Figure	A	B	C	D	E	F	a	b	c
NPIS44HA	1.	4.0±0.2	4.0±0.2	3.5±0.2	3.2±0.1	0.95±0.1	2.1±0.2	1.9	1.1	3.7
NPIS66HA	1.	6.0±0.2	6.0±0.2	5.5±0.2	4.9±0.2	1.55±0.2	2.9±0.3	2.8	1.7	5.7
NPIS85HA	2.	8.0±0.3	8.0±0.3	5.0±0.2	6.3±0.3	2.0±0.2	4.0±0.3	3.8	2.2	7.5

Figure 1.



Recommended Land Pattern

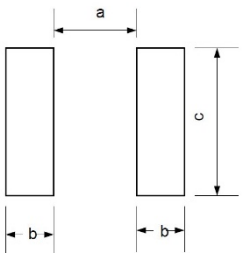
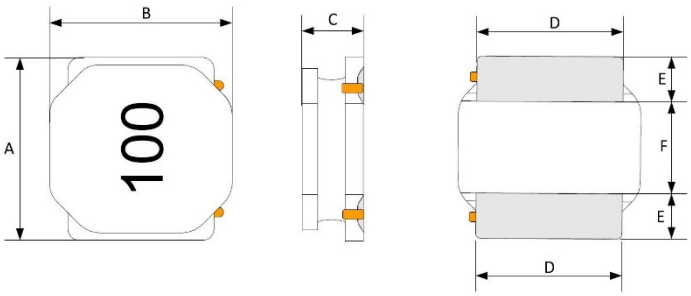
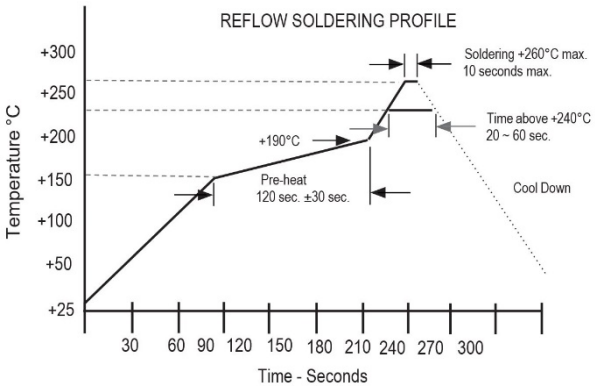


Figure 2.





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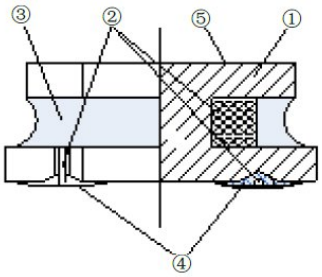

No.	Components	Material
①	Ferrite Core	NiZn Ferrite
②	Wire	Polyurethane system enameled copper wire
③	Magnetic Glue	Epoxy resin and magnetic powder
④	Electrodes	Ag/Ni/Cu +Sn Alloy
⑤	Marking	Laser Marking

NPIS 66 HA 101 M TR QY F

- F — RoHS Compliant
- QY — "QY" denotes AEC-Q200 verified, suitable for automotive equipment, sourced to special production and inspection at IATF-16949 certified production site.
- TR — Packaging: TR = Tape and Reel
- M — Inductance Tolerance Code: M=±20%
- 101 — Inductance Code (µH): 1st two digits are significant; 3rd digit is multiplier for values from 10µH and up.
- HA — Construction Code: HA
- 66 — Size Code: 44, 66, 85
- NPIS — Series Prefix: NPIS

Series	Standard Values - Case Size 44 (4.0 × 4.0 × 3.5mm)								
	Inductance (uH)	Tolerance	DCR (Ω) Max.	DCR (Ω) Typ.	Isat (Amps) Max.	Isat (Amps) Typ.	Irms (Amps) Max.	Irms (Amps) Typ.	SRF (MHz) Min.
NPIS44HAR47MTRQYF	0.47	±20%	0.010	0.008	7.80	9.80	5.20	5.90	176
NPIS44HAR68MTRQYF	0.68	±20%	0.013	0.010	6.80	7.80	4.56	5.10	132
NPIS44HA1R0MTRQYF	1.0	±20%	0.024	0.020	6.30	6.90	3.85	4.50	121
NPIS44HA1R2MTRQYF	1.2	±20%	0.028	0.023	6.00	6.70	3.60	4.20	70
NPIS44HA1R5MTRQYF	1.5	±20%	0.032	0.027	5.20	6.10	3.30	3.90	62
NPIS44HA1R8MTRQYF	1.8	±20%	0.034	0.028	4.60	5.50	3.20	3.70	52
NPIS44HA2R2MTRQYF	2.2	±20%	0.040	0.033	4.30	4.80	3.00	3.50	52
NPIS44HA3R3MTRQYF	3.3	±20%	0.058	0.048	3.50	3.80	2.50	2.90	38
NPIS44HA4R7MTRQYF	4.7	±20%	0.082	0.068	3.00	3.20	2.10	2.45	31
NPIS44HA6R8MTRQYF	6.8	±20%	0.101	0.084	2.50	2.80	1.90	2.20	24
NPIS44HA8R2MTRQYF	8.2	±20%	0.108	0.090	2.10	2.40	1.80	2.10	26
NPIS44HA100MTRQYF	10	±20%	0.140	0.120	2.00	2.30	1.55	1.85	21
NPIS44HA150MTRQYF	15	±20%	0.230	0.190	1.60	1.80	1.25	1.45	16
NPIS44HA220MTRQYF	22	±20%	0.290	0.240	1.30	1.50	1.10	1.30	10
NPIS44HA330MTRQYF	33	±20%	0.420	0.350	1.10	1.30	0.90	1.05	10
NPIS44HA470MTRQYF	47	±20%	0.590	0.490	0.95	1.05	0.75	0.90	8.4
NPIS44HA680MTRQYF	68	±20%	1.090	0.910	0.75	0.85	0.55	0.65	7.0
NPIS44HA101MTRQYF	100	±20%	1.380	1.150	0.65	0.75	0.45	0.55	5.6
NPIS44HA151MTRQYF	150	±20%	2.280	1.900	0.50	0.55	0.35	0.45	4.0

1. Maximum +40°C temperature rise at Irms. Maximum -30% inductance drop from the initial measured value at Isat.
2. Component temperature (ambient + temp. rise) should not exceed +125°C, and operating temperature should be verified in the end application.
3. Circuit design, component layout, PCB pad size and thickness, airflow, and other cooling techniques can affect the component operating temperature.

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Series	Standard Values - Case Size 66 (6.0 x 6.0 x 5.5mm)								
	Inductance (uH)	Tolerance	DCR (Ω) Max.	DCR (Ω) Typ.	Isat (Amps) Max.	Isat (Amps) Typ.	Irms (Amps) Max.	Irms (Amps) Typ.	SRF (MHz) Min.
NPIS66HA3R3MTRQYF	3.3	±20%	0.026	0.022	5.50	6.00	3.95	4.60	32
NPIS66HA4R7MTRQYF	4.7	±20%	0.031	0.026	4.5	5.00	3.60	4.25	24
NPIS66HA6R8MTRQYF	6.8	±20%	0.034	0.028	3.90	4.30	3.50	4.10	20
NPIS66HA8R2MTRQYF	8.2	±20%	0.049	0.041	3.90	4.30	2.90	3.40	21
NPIS66HA100MTRQYF	10	±20%	0.054	0.045	3.30	3.70	2.70	3.20	15
NPIS66HA150MTRQYF	15	±20%	0.074	0.062	2.80	3.30	2.35	2.75	12
NPIS66HA220MTRQYF	22	±20%	0.100	0.083	2.30	2.60	2.00	2.35	10
NPIS66HA330MTRQYF	33	±20%	0.170	0.142	1.70	2.00	1.55	1.80	7.8
NPIS66HA470MTRQYF	47	±20%	0.252	0.210	1.50	1.70	1.25	1.50	6.4
NPIS66HA680MTRQYF	68	±20%	0.353	0.294	1.30	1.40	1.00	1.25	6.4
NPIS66HA101MTRQYF	100	±20%	0.434	0.362	1.00	1.10	0.95	1.10	4.2
NPIS66HA121MTRQYF	120	±20%	0.509	0.424	0.98	1.10	0.80	0.90	4.2
NPIS66HA151MTRQYF	150	±20%	0.686	0.572	0.80	0.90	0.75	0.90	4.2
NPIS66HA221MTRQYF	220	±20%	1.036	0.863	0.60	0.70	0.60	0.70	3.5
NPIS66HA331MTRQYF	330	±20%	1.603	1.336	0.55	0.65	0.50	0.60	2.8
NPIS66HA471MTRQYF	470	±20%	2.34	1.80	0.48	0.54	0.45	0.55	2.4

1. Maximum +40°C temperature rise at Irms. Maximum -30% inductance drop from the initial measured value at Isat.
2. Component temperature (ambient + temp. rise) should not exceed +125°C, and operating temperature should be verified in the end application.
3. Circuit design, component layout, PCB pad size and thickness, airflow, and other cooling techniques can affect the component operating temperature.

Series	Standard Values - Case Size 85 (8.0 x 8.0 x 5.0mm)								
	Inductance (uH)	Tolerance	DCR (Ω) Max.	DCR (Ω) Typ.	Isat (Amps) Max.	Isat (Amps) Typ.	Irms (Amps) Max.	Irms (Amps) Typ.	SRF (MHz) Min.
NPIS85HA1R0MTRQYF	1.0	±20%	0.010	0.008	15.0	16.0	6.30	7.20	99
NPIS85HA1R5MTRQYF	1.5	±20%	0.012	0.010	12.0	13.0	5.60	6.50	79
NPIS85HA2R2MTRQYF	2.2	±20%	0.014	0.012	10.0	11.0	5.20	5.80	59
NPIS85HA3R3MTRQYF	3.3	±20%	0.020	0.017	8.00	9.00	4.40	4.90	24
NPIS85HA4R7MTRQYF	4.7	±20%	0.023	0.019	6.60	7.50	4.10	4.60	23
NPIS85HA6R8MTRQYF	6.8	±20%	0.029	0.024	5.40	6.10	3.60	4.20	19
NPIS85HA8R2MTRQYF	8.2	±20%	0.035	0.029	4.70	5.60	3.40	3.80	18
NPIS85HA100MTRQYF	10	±20%	0.038	0.032	4.60	5.20	3.20	3.60	14
NPIS85HA150MTRQYF	15	±20%	0.061	0.051	3.90	4.50	2.40	2.70	13
NPIS85HA220MTRQYF	22	±20%	0.088	0.073	3.00	3.50	1.90	2.20	9.0
NPIS85HA330MTRQYF	33	±20%	0.122	0.102	2.60	3.00	1.80	2.00	7.6
NPIS85HA470MTRQYF	47	±20%	0.173	0.144	2.10	2.40	1.50	1.70	6.6
NPIS85HA680MTRQYF	68	±20%	0.252	0.210	1.70	2.00	1.25	1.45	5.4
NPIS85HA101MTRQYF	100	±20%	0.326	0.272	1.40	1.60	1.10	1.25	4.4
NPIS85HA151MTRQYF	150	±20%	0.480	0.400	1.20	1.40	0.85	1.00	3.2
NPIS85HA221MTRQYF	220	±20%	0.708	0.590	1.00	1.10	0.65	0.75	2.9
NPIS85HA331MTRQYF	330	±20%	1.044	0.870	0.80	0.90	0.60	0.65	2.3
NPIS85HA471MTRQYF	470	±20%	1.540	1.283	0.70	0.80	0.50	0.55	1.9

1. Maximum +40°C temperature rise at Irms. Maximum -30% inductance drop from the initial measured value at Isat.
2. Component temperature (ambient + temp. rise) should not exceed +125°C, and operating temperature should be verified in the end application.
3. Circuit design, component layout, PCB pad size and thickness, airflow, and other cooling techniques can affect the component operating temperature.

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Environmental and Reliability Tests

Methods: Per AEC-Q200 REV.D / Table 5

Post Test Limits:
(1) No visible mechanical damage
(2) ΔL: Inductance change: Within ±10%

Test	Test Conditions
Terminal Strength:	Reflow two times, 17.7N, X & Y directions, 60 seconds
Resistance to Flexure:	Reflow two times, 2mm PCB deflection, 60 seconds
Solderability:	① Pretreatment:155°C, 4 hours ②③ Steam aging, 8 hours SAC305: ①② +235°C, 5 second dip ③ +260°C, 7 second dip Wetting: ≥ 95% coverage
Resistance to Soldering Heat:	Reflow: Max. +260°C / 10s, Three times
Vibration:	10 to 2000Hz, 5g, 20min / Cycle, 4hours in each three mutually perpendicular directions (total of 12hours)
Mechanical Shock:	Half-sine shock pulse, 100g, 6ms, six shocks in each three mutually perpendicular directions (total of 18 pulses)
ESD Test:	HBM ESD discharge waveform, 8KV, one time each polarity
Thermal Shock:	Reflow two times, -40°C /(30±3min), +125°C /(30±3min), transforming interval: 20s (Max.), 1000 cycles
Resistance to Low Temperature:	Reflow two times, -40±2°C, 1000 hours
Resistance to High Temperature:	Reflow two times, +125±2°C,1000 hours
Moisture Resistance:	Reflow two times, ① +25°C → +65°C,90%~100% RH, 2.5 hours ② +65°C, 90%~100% RH, 3 hours ③ +65°C → +25°C,80%~100% RH, 2.5 hours ④ +25°C → +65°C,90%~100% RH, 2.5 hours ⑤ +65°C, 90%~100% RH, 3 hours ⑥ +65°C → +25°C, 80%~100% RH, 2.5 hours ⑦ +25°C , 90%~100% RH, 8 hours, 24 hours = 1 cycle (10 cycles: total of 240 hours)
Biased Humidity:	Reflow two times, +85°C, 85%RH, 1000 hours
Operational Life:	Reflow two times, +85±2°C, 1000 hours, rated current
Temperature Characteristics (TC):	-40°C / 15min → +25°C / 15min → +125°C / 15min, Within ±20% of reference value measured at +25°C

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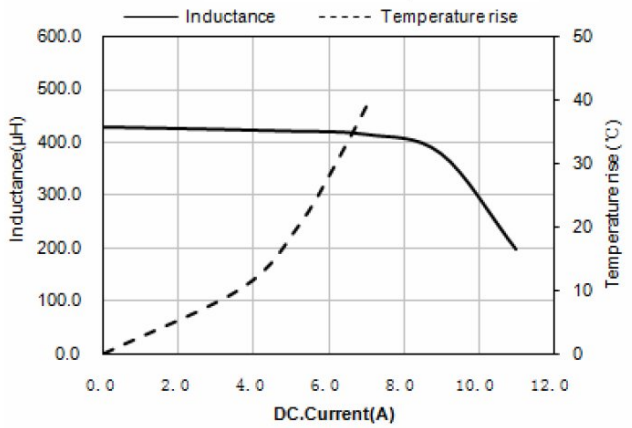
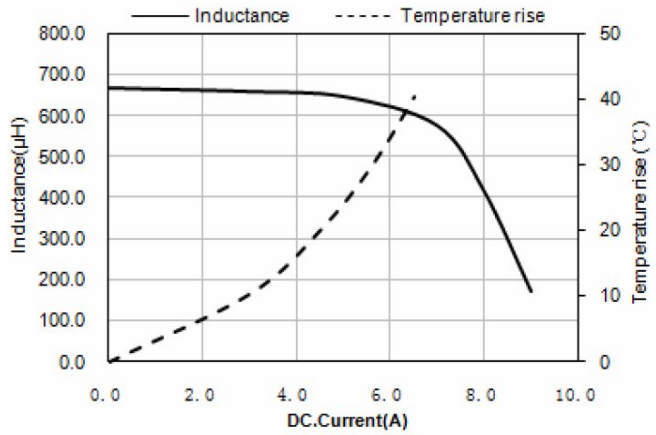
Performance Characteristics

Case Size 44 (4.0 × 4.0 × 3.5mm)

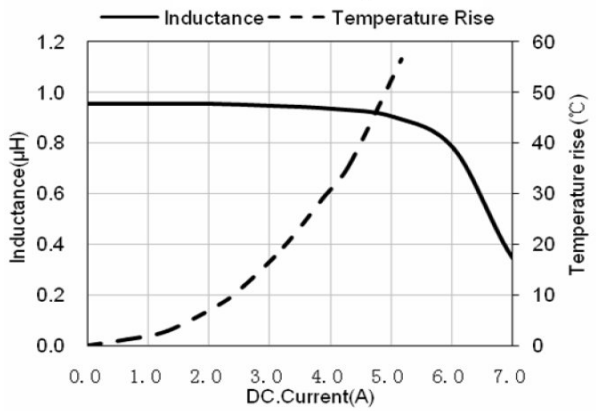
0.47uH PN: NPIS44HAR47MTRQYF



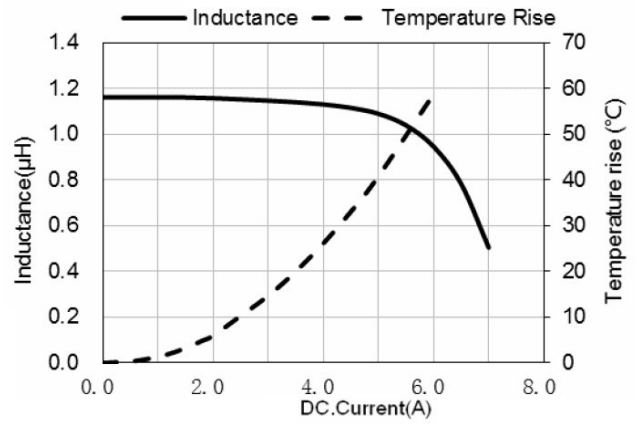
0.68uH PN: NPIS44HAR68MTRQYF



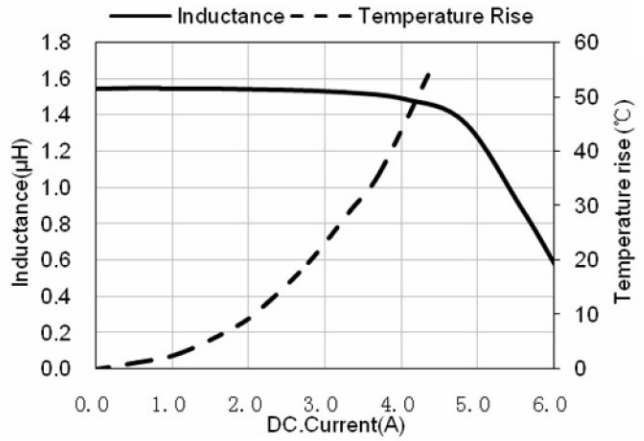
1.0uH PN: NPIS44HA1R0MTRQYF



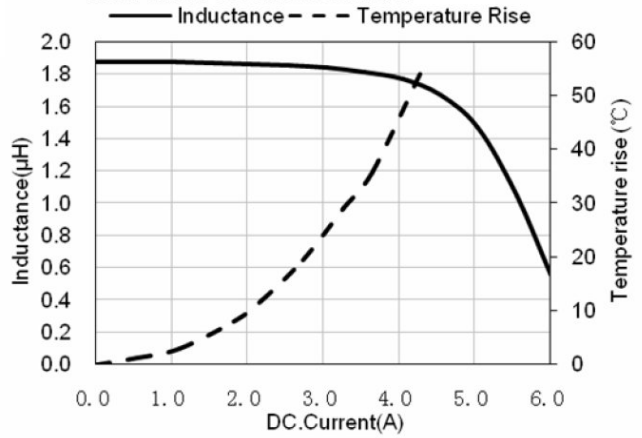
1.2uH PN: NPIS44HA1R2MTRQYF



1.5uH PN: NPIS44HA1R5MTRQYF



1.8uH PN: NPIS44HA1R8MTRQYF



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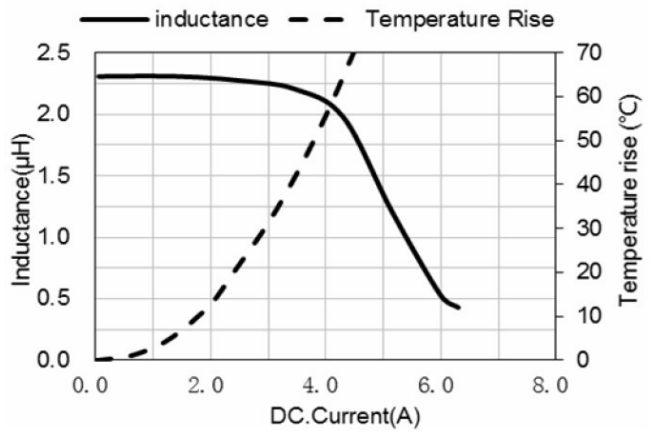
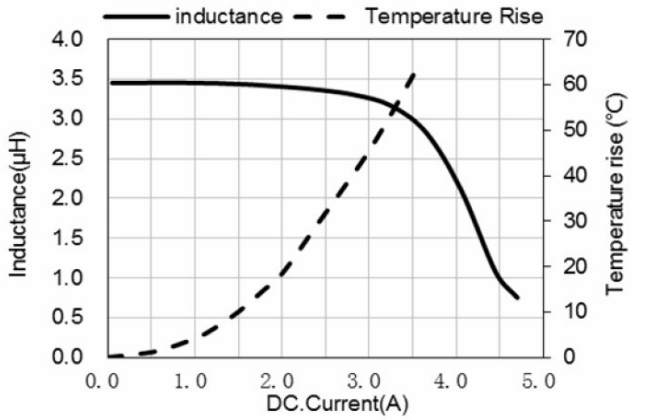
Case Size 44 (4.0 × 4.0 × 3.5mm)

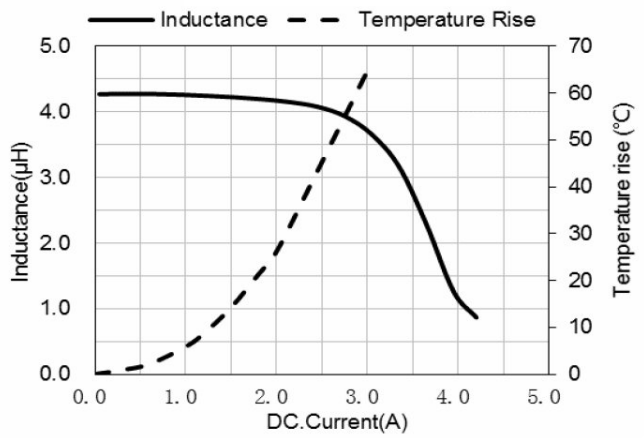
2.2uH PN: NPIS44HA2R2MTRQYF



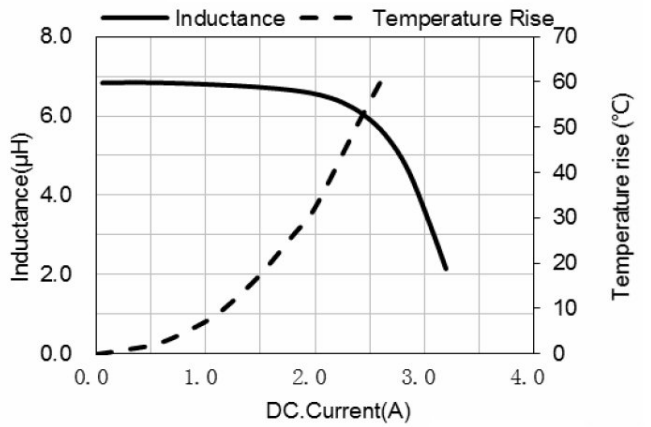
3.3uH PN: NPIS44HA3R3MTRQYF



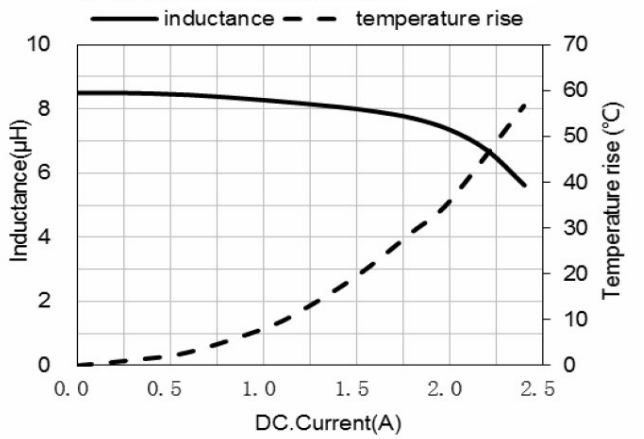
4.7uH PN: NPIS44HA4R7MTRQYF



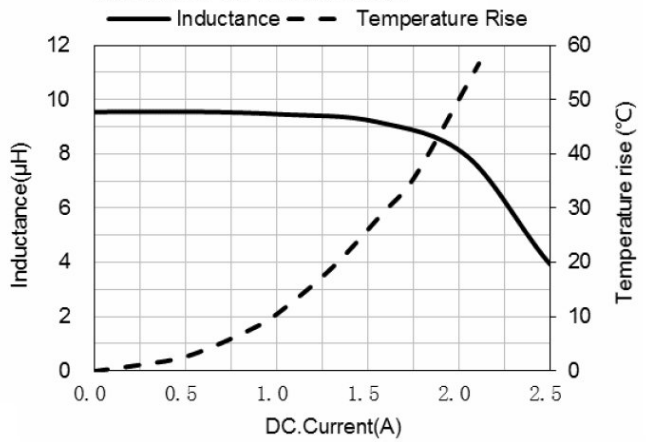
6.8uH PN: NPIS44HA6R8MTRQYF



8.2uH PN: NPIS44HA8R2MTRQYF



10uH PN: NPIS44HA100MTRQYF



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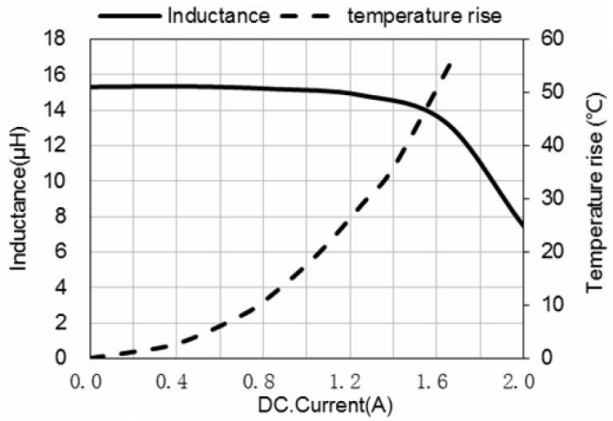
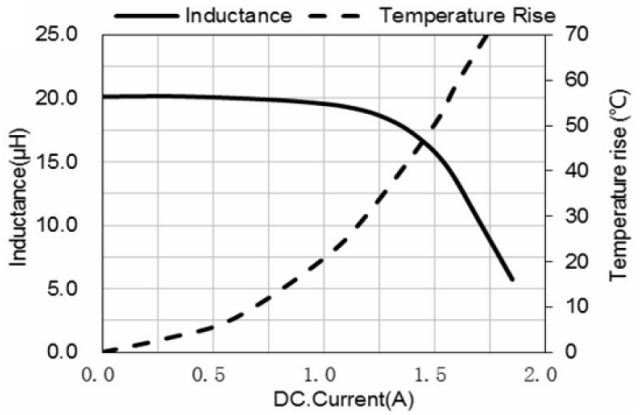
Case Size 44 (4.0 × 4.0 × 3.5mm)

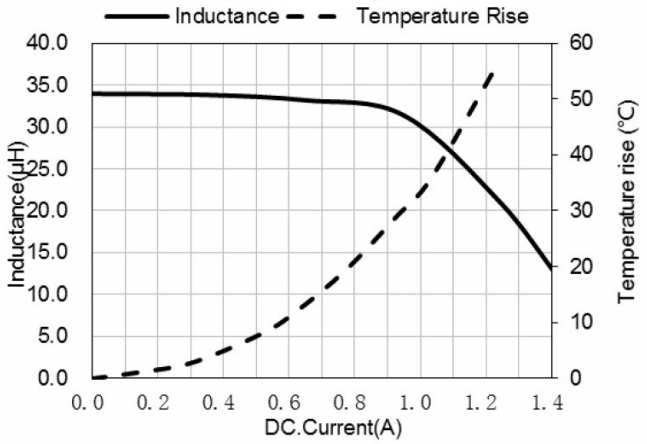
15uH PN: NPIS44HA150MTRQYF



22uH PN: NPIS44HA220MTRQYF



33uH PN: NPIS44HA330MTRQYF



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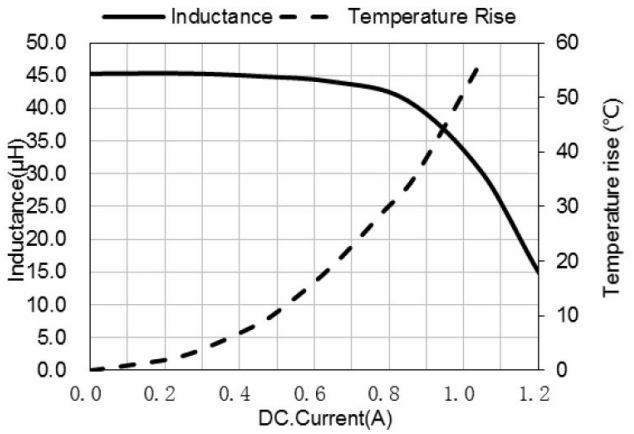
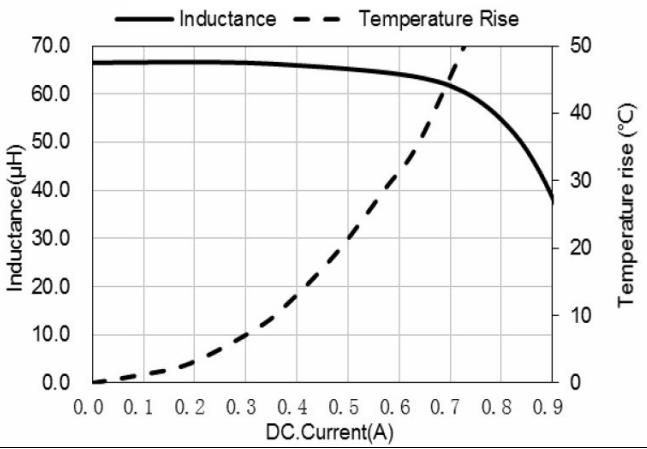
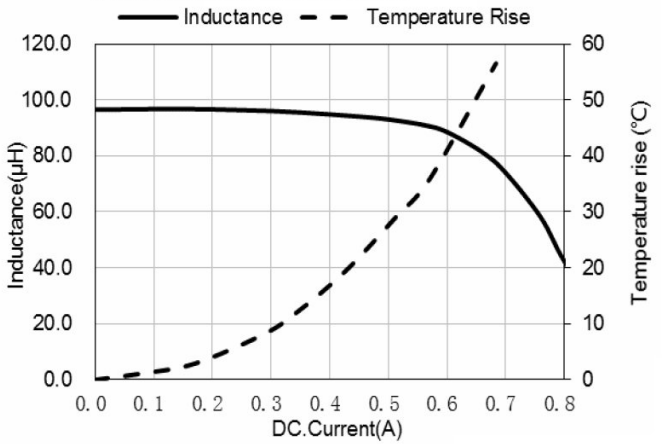


68uH PN: NPIS44HA680MTRQYF



100uH PN: NPIS44HA101MTRQYF



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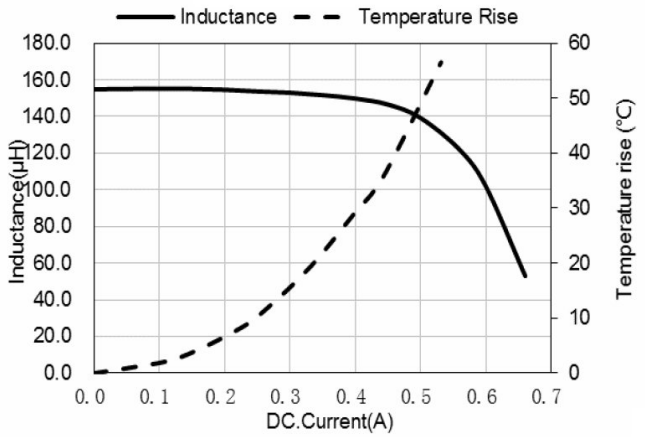
Case Size 44 (4.0 × 4.0 × 3.5mm)

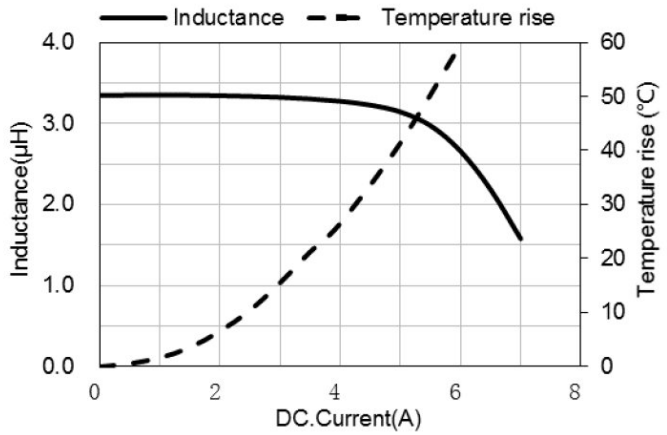
150uH PN: NPIS44HA151MTRQYF



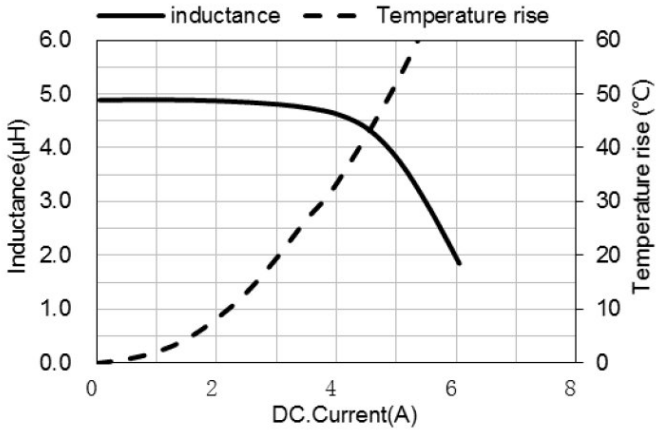
Performance Characteristics

Case Size 66 (6.0 x 6.0 x 5.5mm)

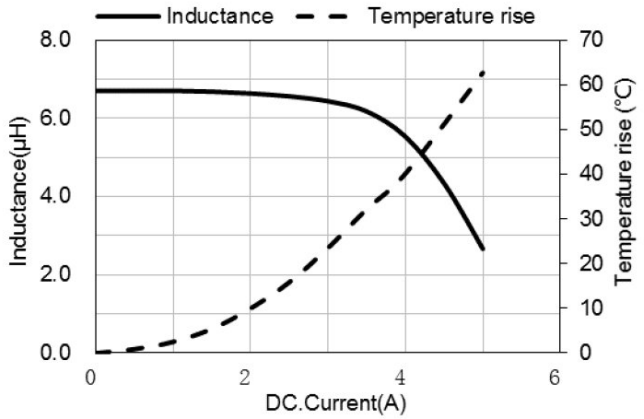
3.3uH PN: NPIS66HA3R3MTRQYF



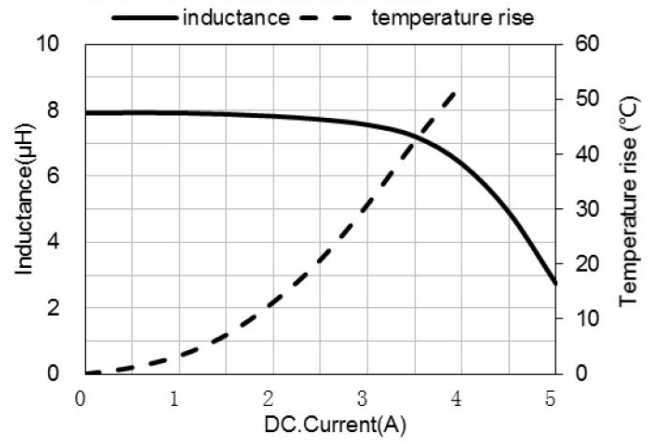
4.7uH PN: NPIS66HA4R7MTRQYF



6.8uH PN: NPIS66HA6R8MTRQYF



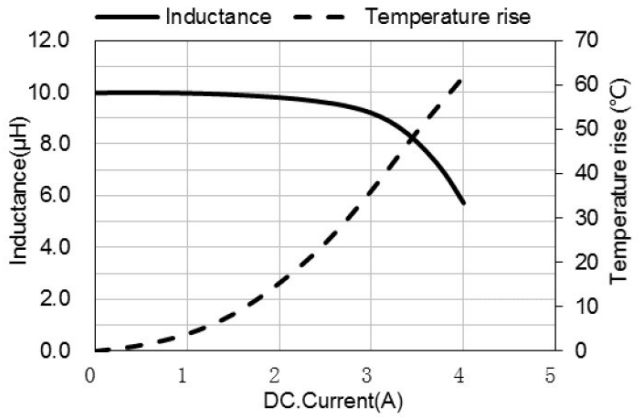
8.2uH PN: NPIS66HA8R2MTRQYF



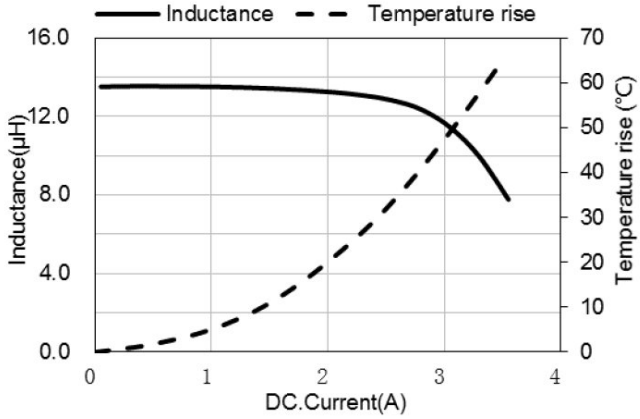
Downloaded from Arrow.com.

Case Size 66 (6.0 x 6.0 x 5.5mm)

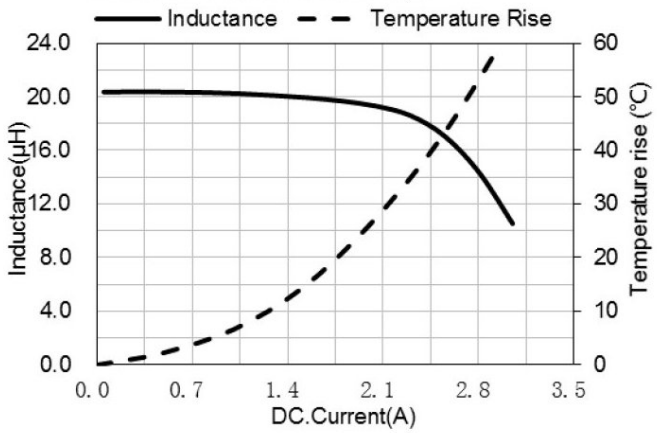
10uH PN: NPIS66HA100MTRQYF



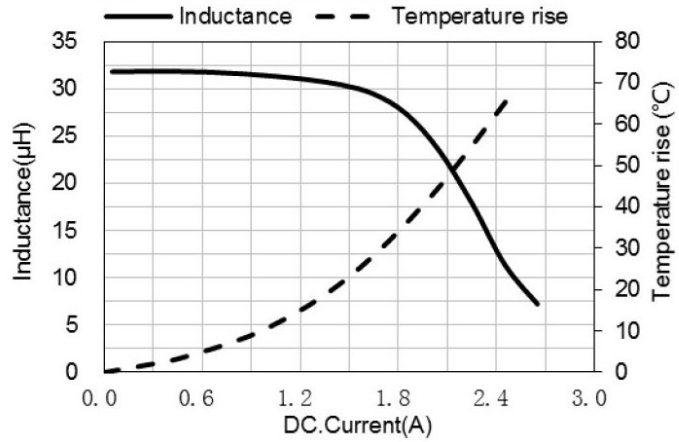
15uH PN: NPIS66HA150MTRQYF



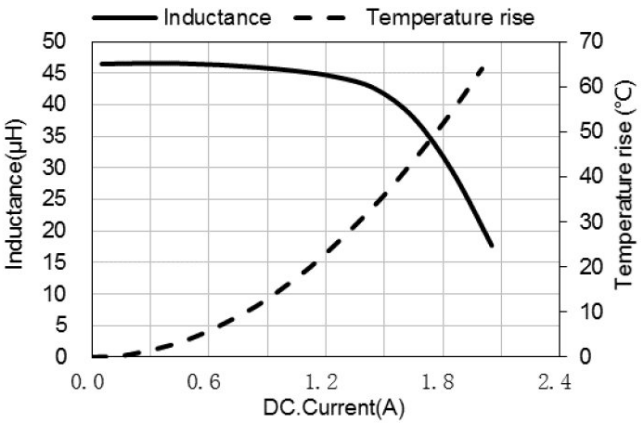
22uH PN: NPIS66HA220MTRQYF



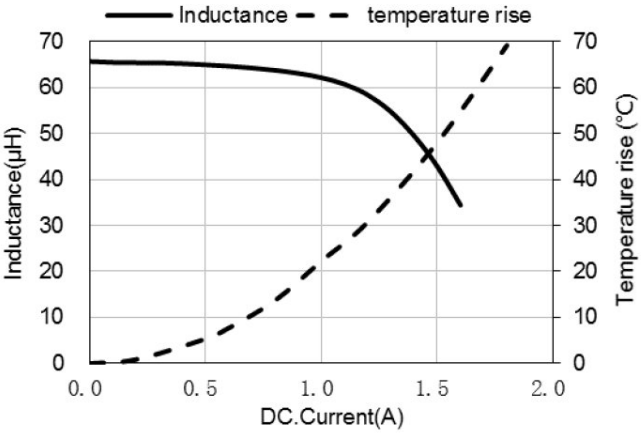
33uH PN: NPIS66HA330MTRQYF



47uH PN: NPIS66HA470MTRQYF



68uH PN: NPIS66HA680MTRQYF



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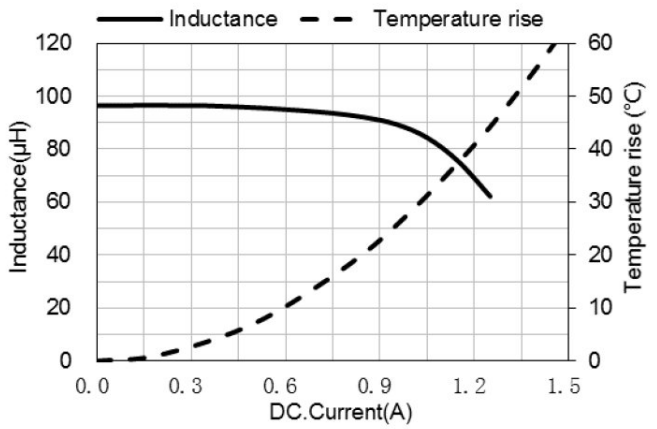
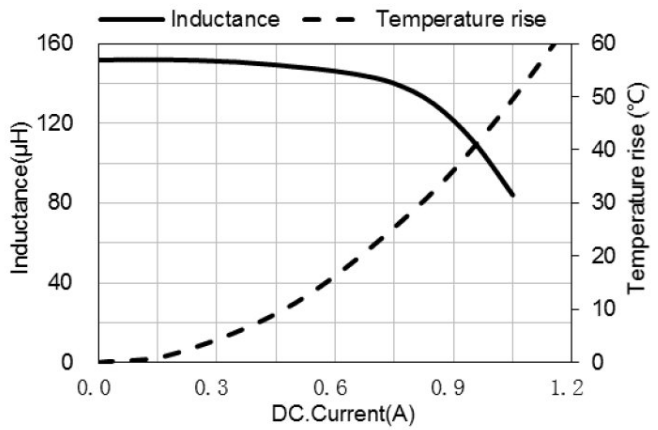
Case Size 66 (6.0 x 6.0 x 5.5mm)

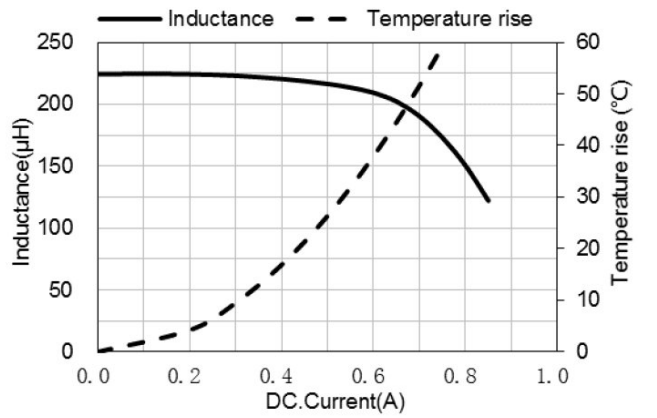
100uH PN: NPIS66HA101MTRQYF



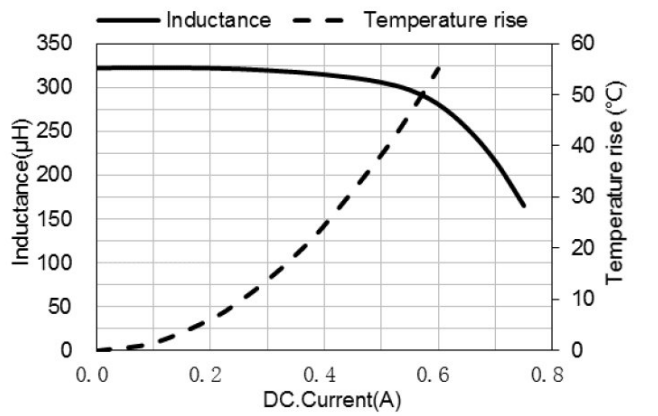
150uH PN: NPIS66HA151MTRQYF



220uH PN: NPIS66HA221MTRQYF



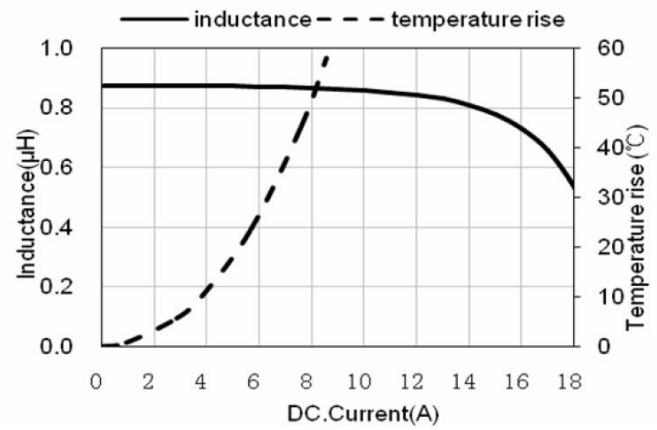
330uH PN: NPIS66H331MTRQYF



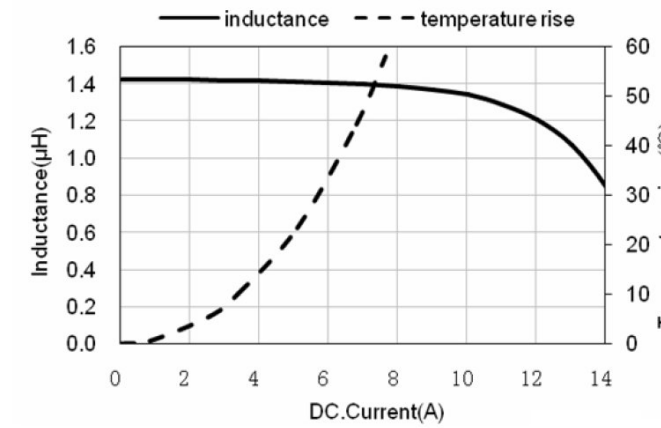
Performance Characteristics

Size 85 (8.0 x 8.0 x 5.0mm)

1.0uH PN: NPIS85HA1R0MTRQYF



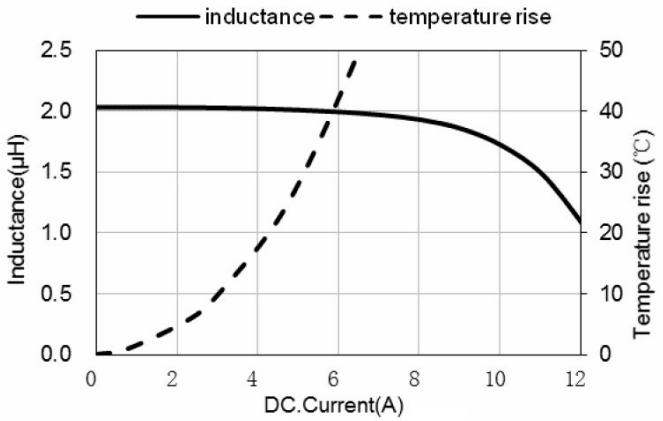
1.5uH PN: NPIS85HA1R5MTRQYF



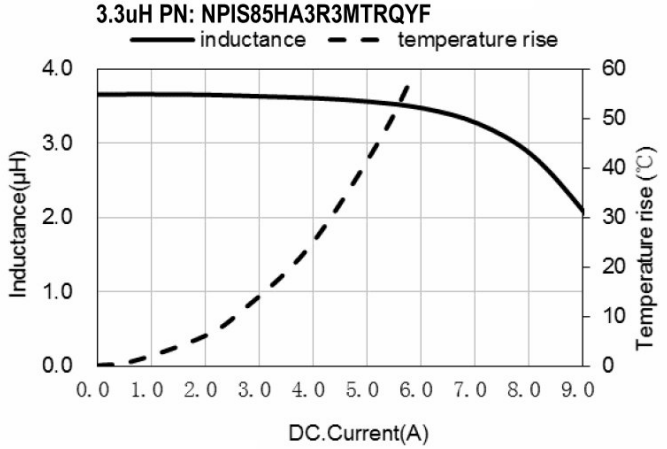
Downloaded from Arrow.com.

Size 85 (8.0 x 8.0 x 5.0mm)

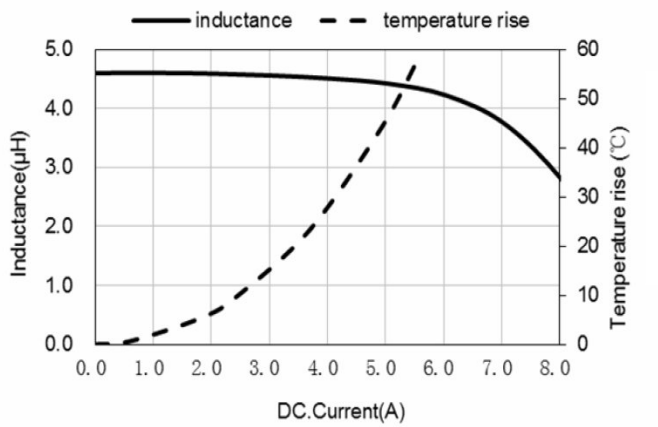
2.2uH PN: NPIS85HA2R2MTRQYF



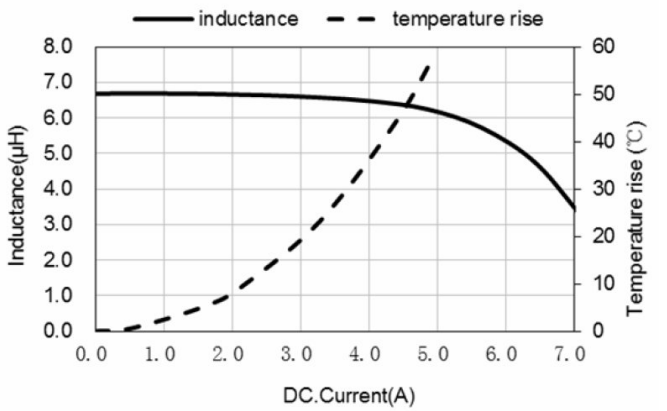
3.3uH PN: NPIS85HA3R3MTRQYF



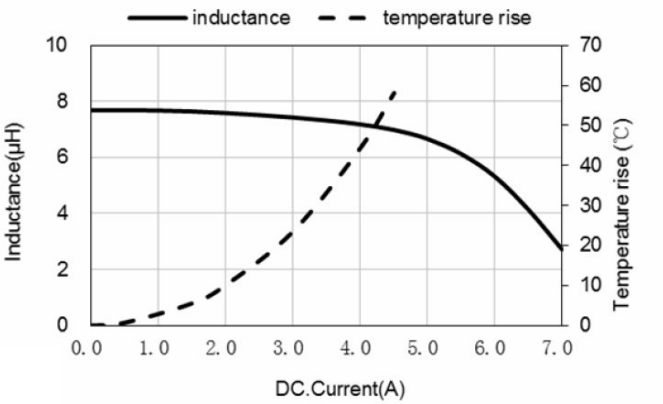
4.7uH PN: NPIS85HA4R7MTRQY



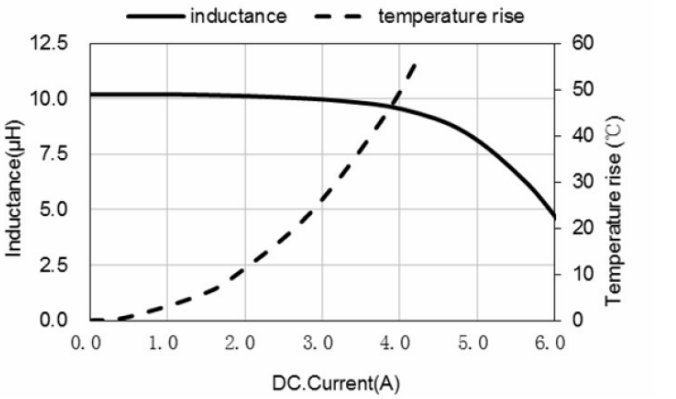
6.8uH PN: NPIS85HA6R8MTRQY



8.2uH PN: NPIS85HA8R2MTRQYF



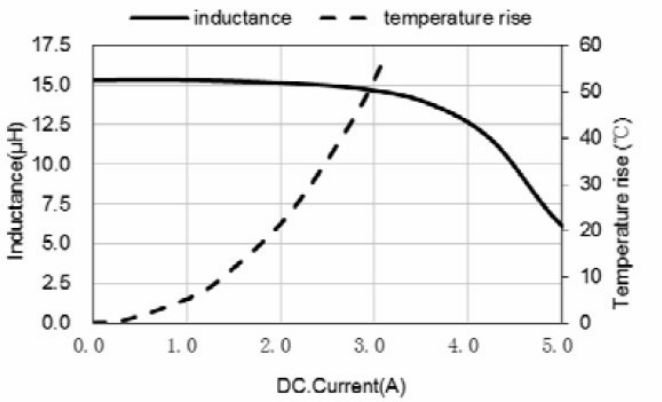
10uH PN: NPIS85HA100MTRQYF



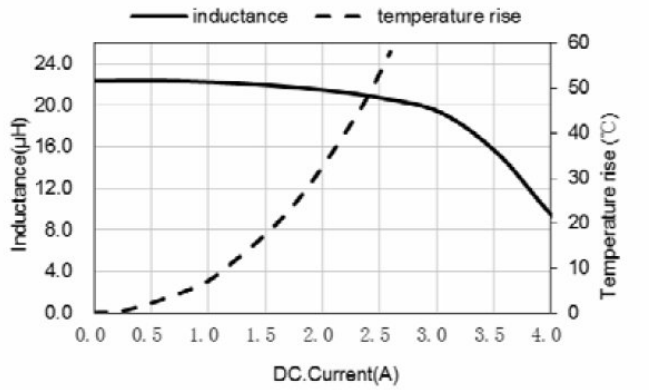
Downloaded from Arrow.com.

Case Size 85 (8.0 x 8.0 x 5.0mm)

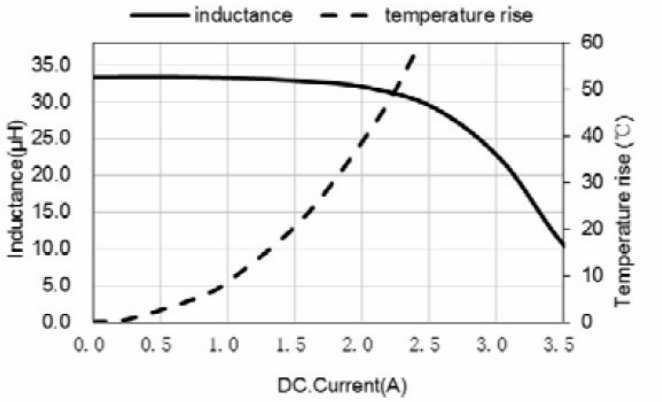
15uH PN: NPIS85HA150MTRQYF



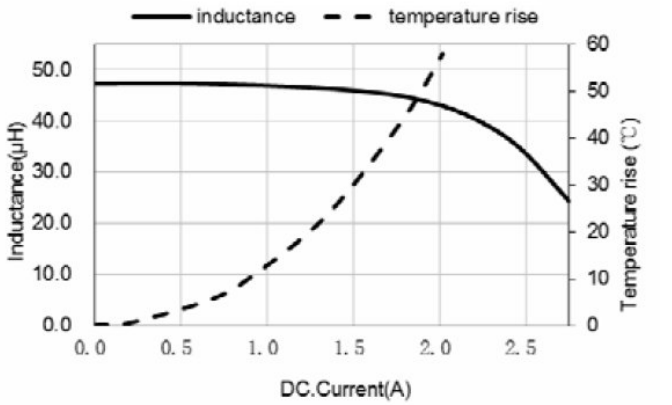
22uH PN: NPIS85HA220MTRQYF



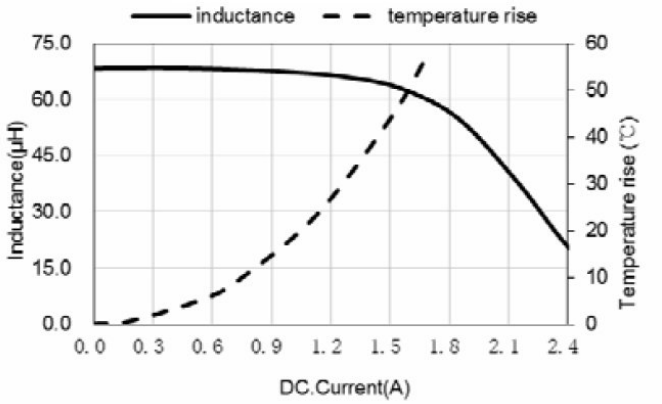
33uH PN: NPIS85HA330MTRQYF



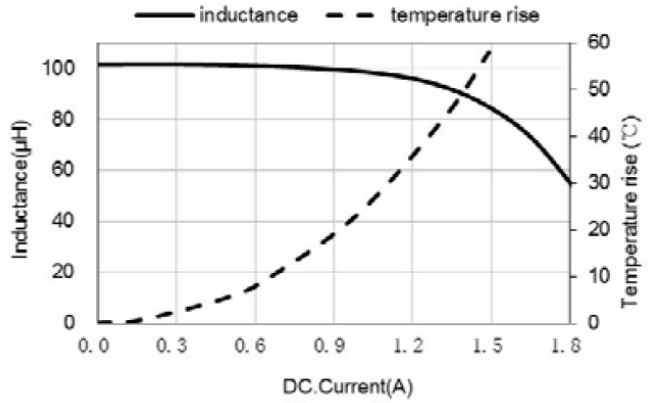
47uH PN: NPIS85HA470MTRQYF



68uH PN: NPIS85HA680MTRQYF



100uH PN: NPIS85HA101MTRQYF



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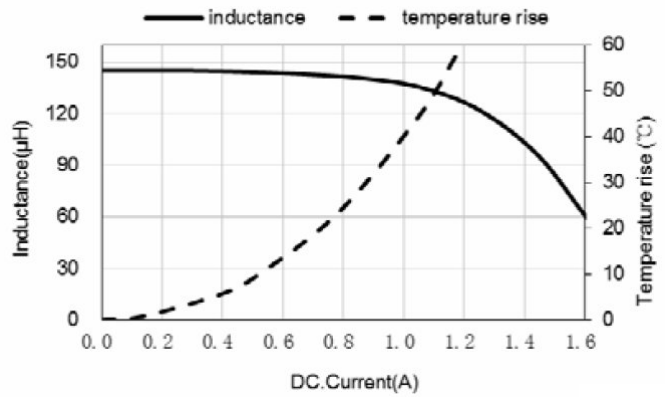
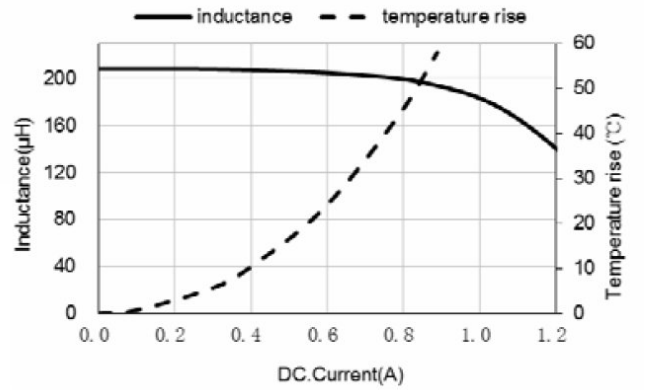
Case Size 85 (8.0 x 8.0 x 5.0mm)

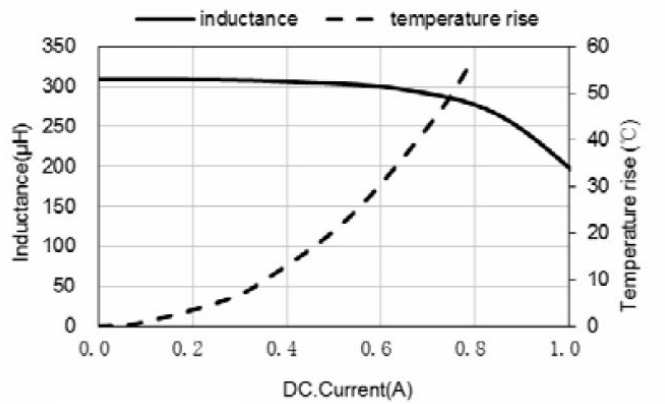
150uH PN: NPIS85HA151MTRQYF



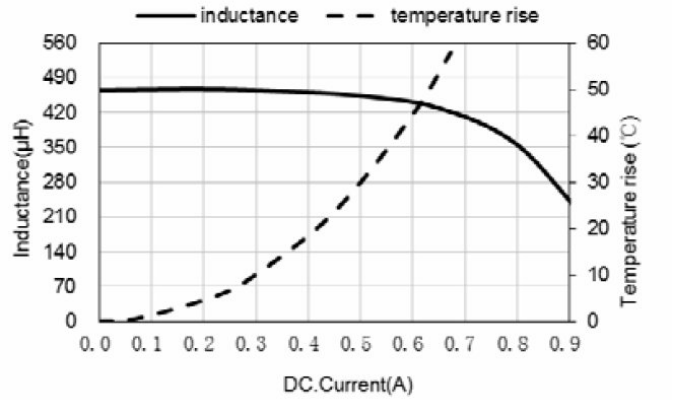
220uH PN: NPIS85HA221MTRQYF



330uH PN: NPIS85HA331MTRQYF



470uH PN: NPIS85HA471MTRQYF



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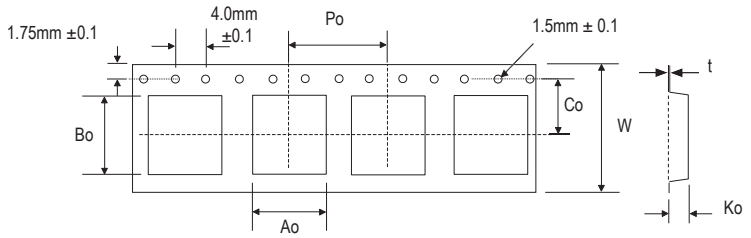
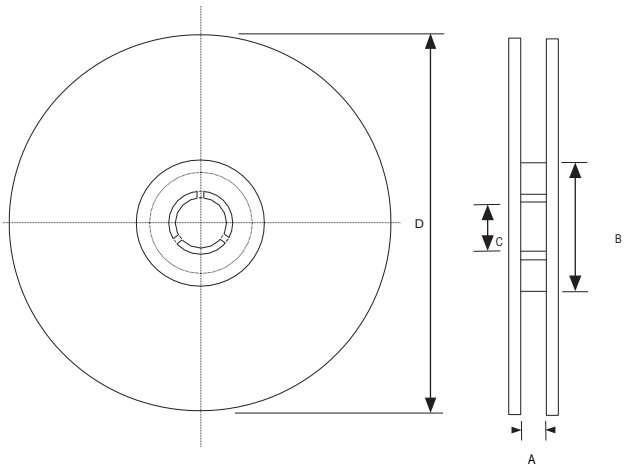
Packaging

Case Size	CARRIER TAPING DIMENSIONS (mm) AND REEL QUANTITY							
	Ao	Bo	Ko	Co	W	Po	t	Quantity
NPIS44HA	4.3 ±0.1	4.3 ±0.1	3.7 ±0.1	5.5 ± 0.1	12.0 ± 0.3	8.0 ± 0.1	0.4 ± 0.05	2000
NPIS66HA	6.3 ±0.1	6.3 ±0.1	5.7 ±0.1	7.5 ±0.1	16.0 ±0.3	12.0 ±0.1	0.50 ±0.05	800
NPIS85HA	8.3 ±0.1	8.3 ±0.1	5.2 ±0.1	7.5 ±0.1	16.0 ±0.3	12.0 ±0.1	0.50 ±0.05	900





Case Size	Tape Width	REEL DIMENSIONS (mm)			
		A	B	C	D
NPIS44HA	12 mm	12.4+0.2/-0.0	100 ± 2.0	13.0+0.2/-0	330 ± 2.0
NPIS66HA	16 mm	16.4+0.2/-0.0	100 ± 2.0	13.0+0.2/-0	330 ± 2.0
NPIS85HA	16 mm	16.4+0.2/-0.0	100 ± 2.0	13.0+0.2/-0	330 ± 2.0

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