

1. Features of SM5018Q series:

- AEC-Q200 Grade 1 Compliant .
- 13.8 x 12.9 mm foot Print, 5.0mm Max. height SMD Power Inductor for high frequency application, Operating frequency up to 5MHz.
- Inductance range from 0.10uH to 33.0uH. Custom values are welcomed.
- High saturation current characteristics by distributed gapped metal dust core.
- Ideal for portable device, Pad, E-reader and high density DC to DC Converter.
- Operating Temperature Range: -55°C to 165°C (ambient + self-temperature rise) .
- T & R Qty: 500 pcs , 13" Reel with Plastic tape 24mm wide and 16mm pocket spacing.
- RoHS and HF compliant.

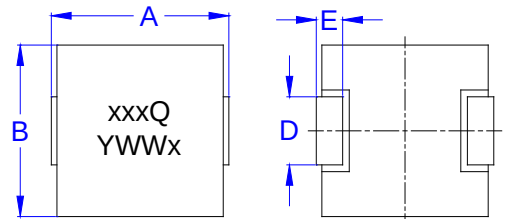


2. Electrical Characteristics of SM5018Q series:

ITG Part Number	OCL (uH) ±20%	DCR (mΩ) Typ. @25°C	DCR (mΩ) Max. @25°C	Saturation Current Isat (A) Typ.	Heat Rating Current Irms (A) Typ.	Dim.D (mm) ± 0.30
SM5018Q-R10MHF	0.10	0.33	0.38	100.0	54.00	3.68
SM5018Q-R22MHF	0.22	0.53	0.61	82.00	48.00	3.68
SM5018Q-R33MHF	0.33	0.58	0.67	64.00	46.00	3.68
SM5018Q-R47MHF	0.47	0.72	0.83	64.00	44.00	3.68
SM5018Q-R56MHF	0.56	1.15	1.32	62.00	36.00	3.68
SM5018Q-R68MHF	0.68	1.20	1.35	60.00	36.00	3.68
SM5018Q-R82MHF	0.82	1.40	1.60	47.00	31.00	3.68
SM5018Q-1R0MHF	1.00	1.78	2.05	45.00	26.00	3.68
SM5018Q-1R5MHF	1.50	2.70	3.10	38.00	23.00	3.68
SM5018Q-1R8MHF	1.80	3.25	3.70	35.00	20.00	3.68
SM5018Q-2R2MHF	2.20	4.00	4.55	32.00	18.00	3.68
SM5018Q-3R3MHF	3.30	5.80	6.60	25.00	16.00	4.80
SM5018Q-4R7MHF	4.70	8.00	9.10	22.00	14.00	4.80
SM5018Q-5R6MHF	5.60	10.70	12.20	20.00	12.00	4.80
SM5018Q-6R0MHF	6.00	10.95	12.50	19.00	12.00	4.80
SM5018Q-6R8MHF	6.80	11.90	13.60	17.00	11.50	4.80
SM5018Q-7R8MHF	7.80	14.80	16.90	16.00	10.00	4.80
SM5018Q-8R2MHF	8.20	15.90	18.10	15.00	9.00	4.80
SM5018Q-100MHF	10.00	18.30	20.80	14.00	8.50	4.80
SM5018Q-120MHF	12.00	19.50	22.20	13.00	8.20	4.80
SM5018Q-150MHF	15.00	22.40	25.50	10.00	7.80	4.80
SM5018Q-220MHF	22.00	34.50	39.50	8.00	6.50	4.80
SM5018Q-330MHF	33.00	49.50	56.50	7.00	5.50	4.80

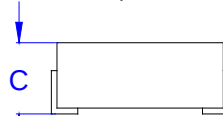
3. Mechanical Dimensions (unit: mm):

A ± 0.35	B ± 0.30	C ± 0.20	D ± 0.30	E ± 0.50
13.45	12.60	4.80	See Table	2.00



Top View

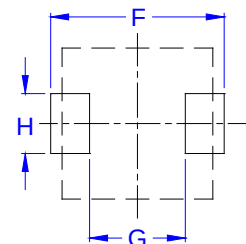
Bottom View



Front View

Part Marking:
xxx: Inductance value in uH(R:decimal point).
Q : Automotive Grade Part Code.
YWWX: Y is Year Code, WW: Week ,
x is Special Code.

Pad Dimension	SM5018Q- R10~2R2MHF	SM5018Q- 3R3~330MHF
F	14.50 Typ.	14.50 Typ.
G	8.00 Typ.	8.00 Typ.
H	4.50 Typ.	5.00 Typ.

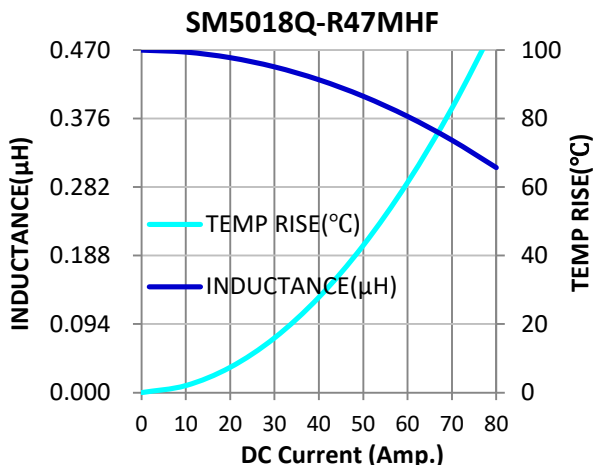
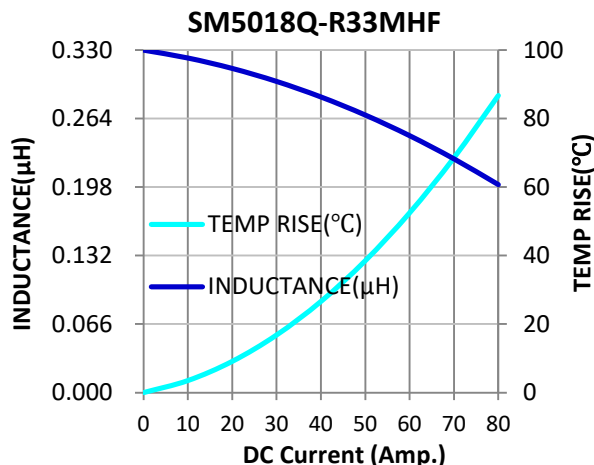
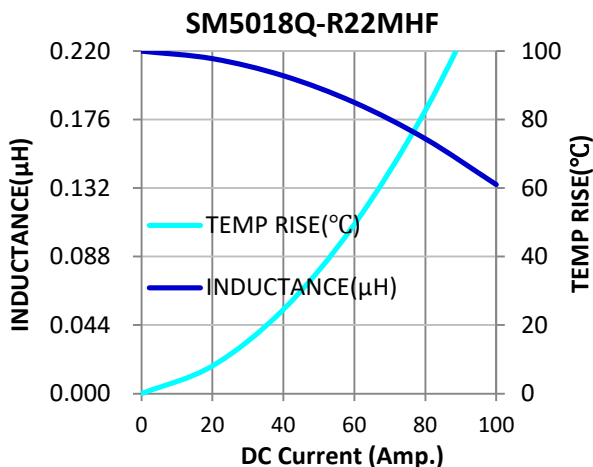
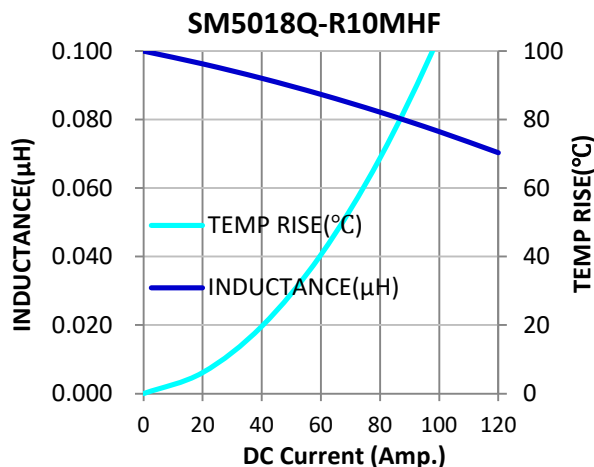


Recommend PCB Layout

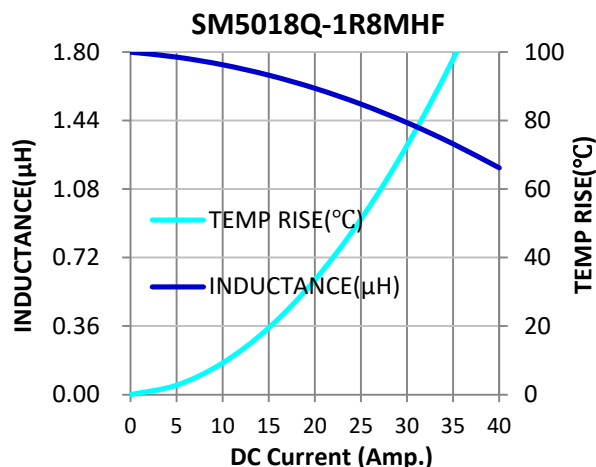
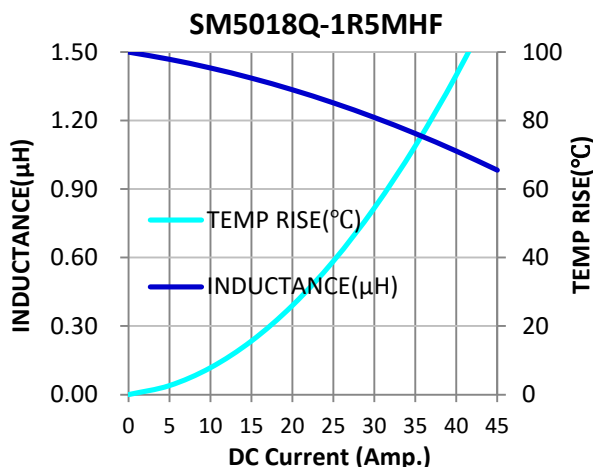
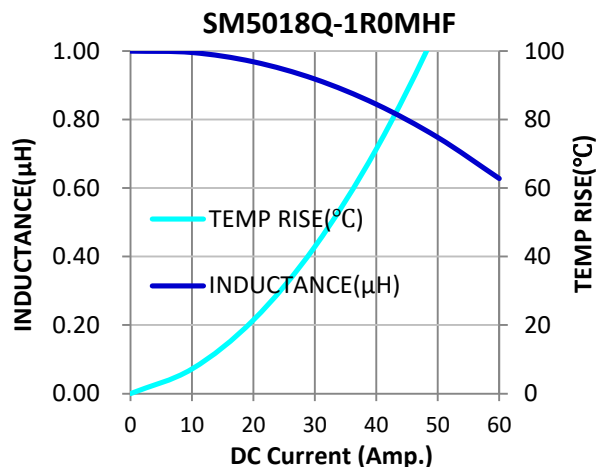
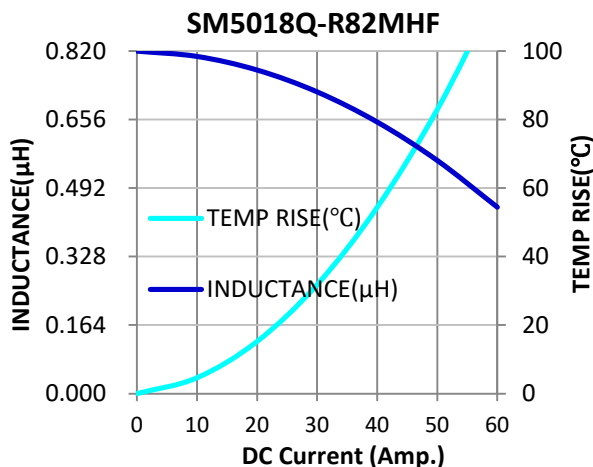
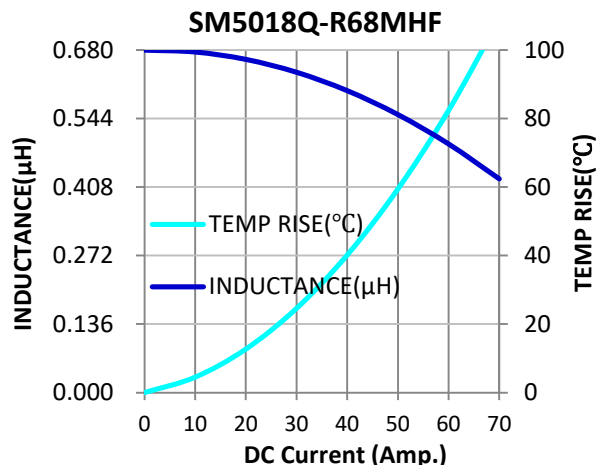
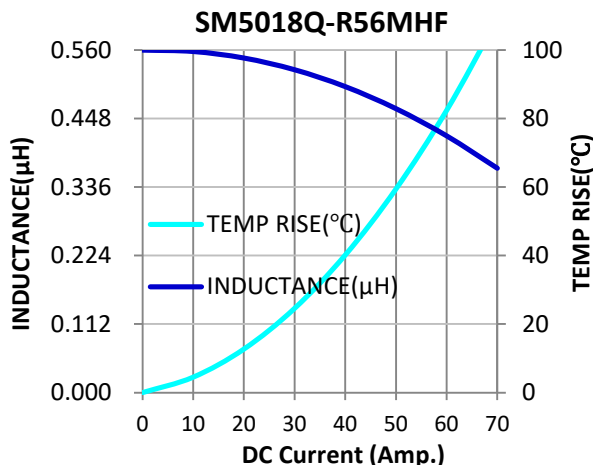
Notes:

1. Test conditions: 100KHz, 1.0V, 25°C ambient temperature .
2. Isat: DC current that causes inductance to drop 30% (Typ.) from OCL (Ta=25°C).
3. Irms: DC current for an approximate temperature rise of 40°C without core loss. Derating is necessary for AC currents.
PCB pad layout, trace thickness and width, air-flow and proximity of other heat generating components will affect the temperature rise. It is recommended the part temperature not exceed 165° C under worst case operating conditions as verified in the end application.

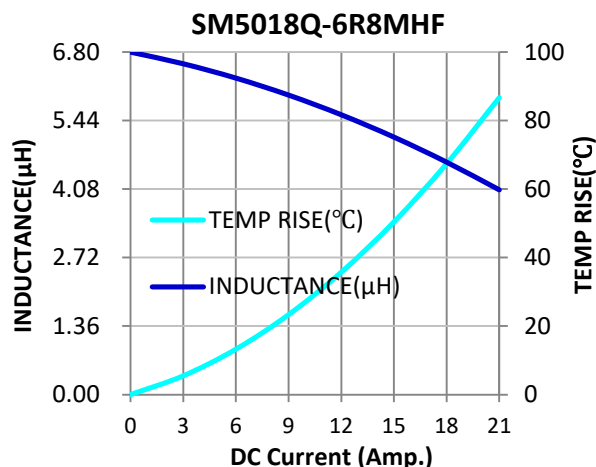
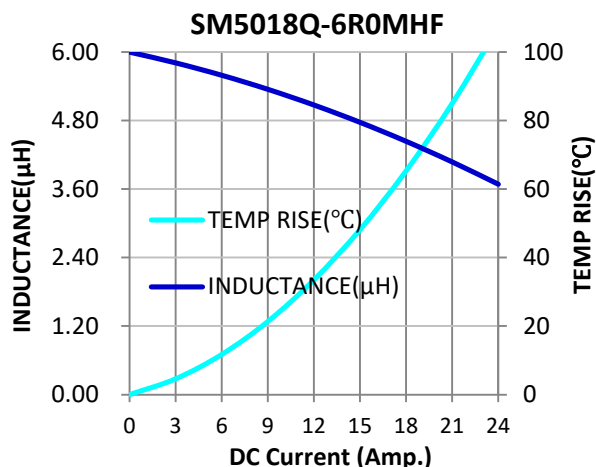
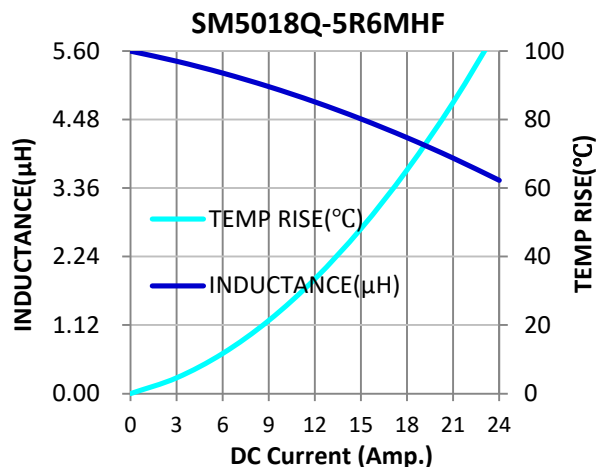
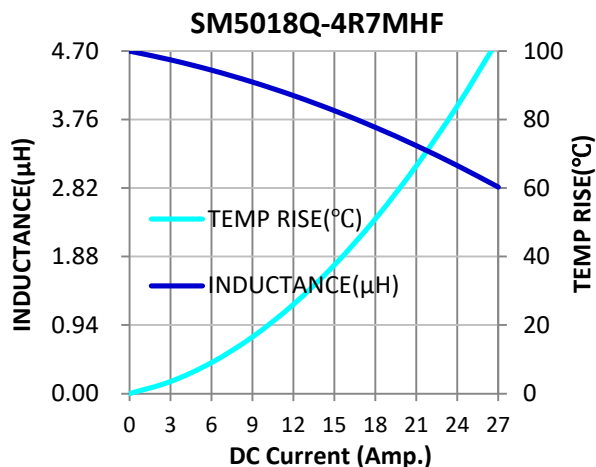
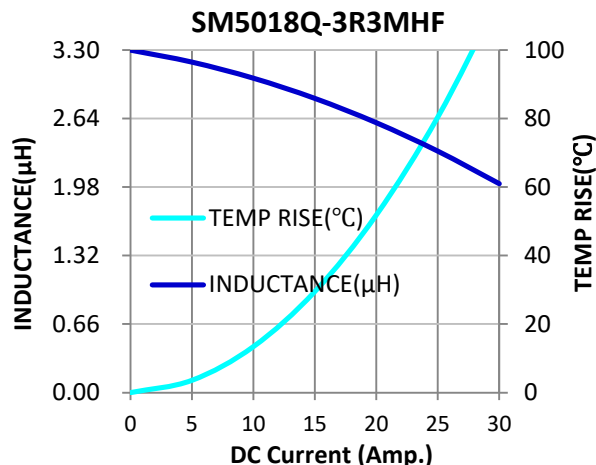
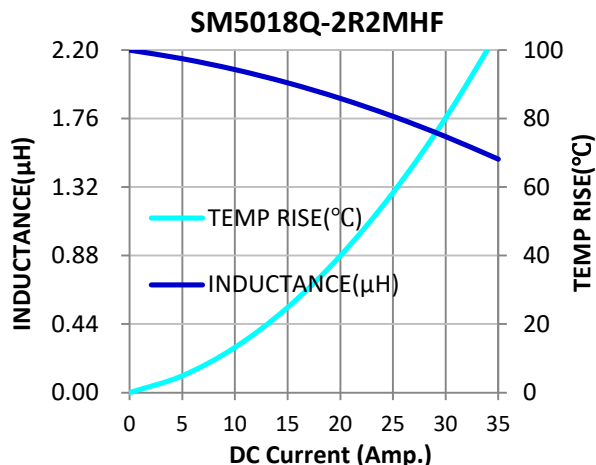
4. Inductance vs. Temperature Rise Characteristics of SM5018Q Series:



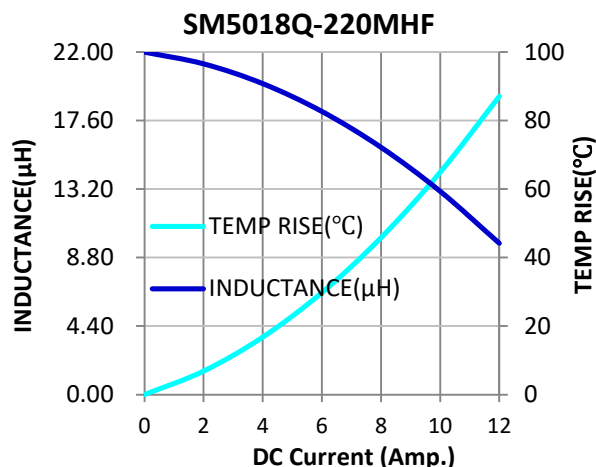
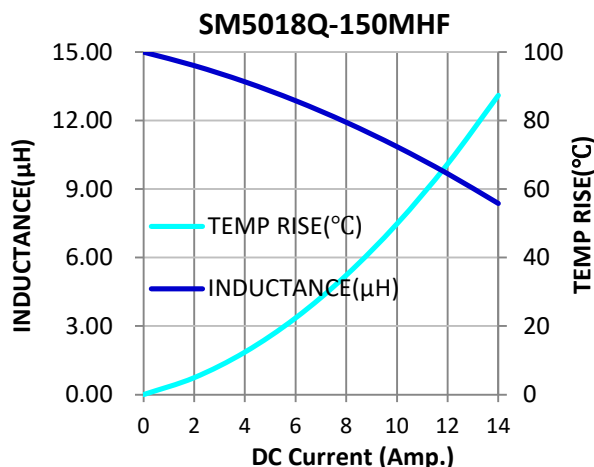
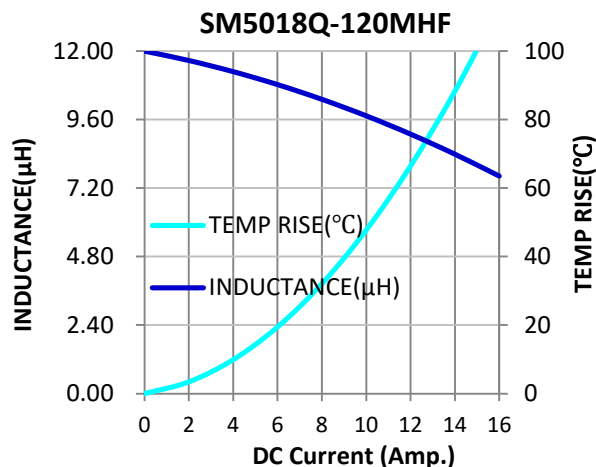
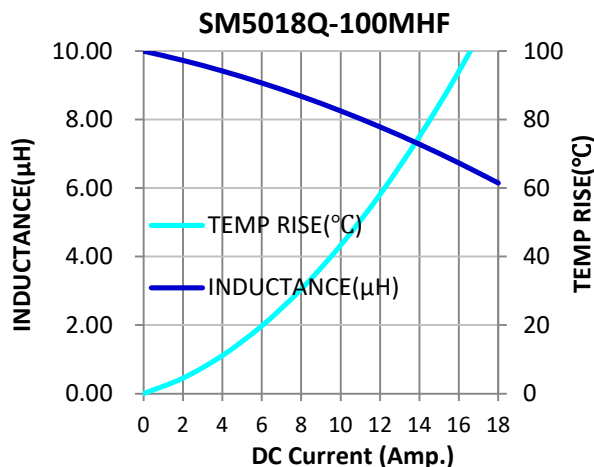
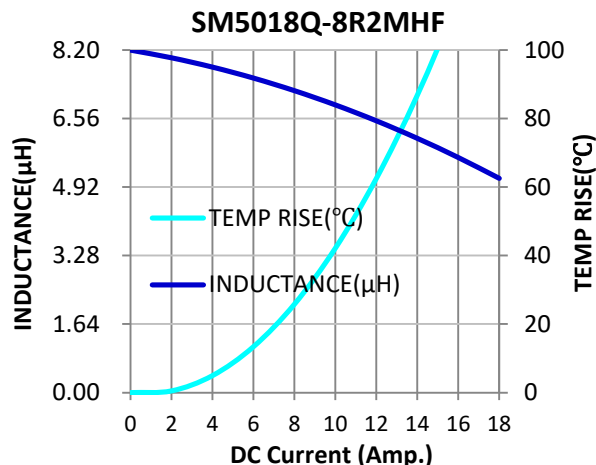
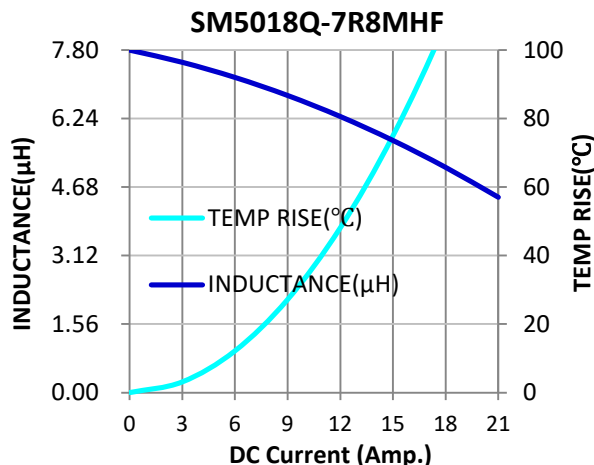
4. Inductance vs. Temperature Rise Characteristics of SM5018Q Series:



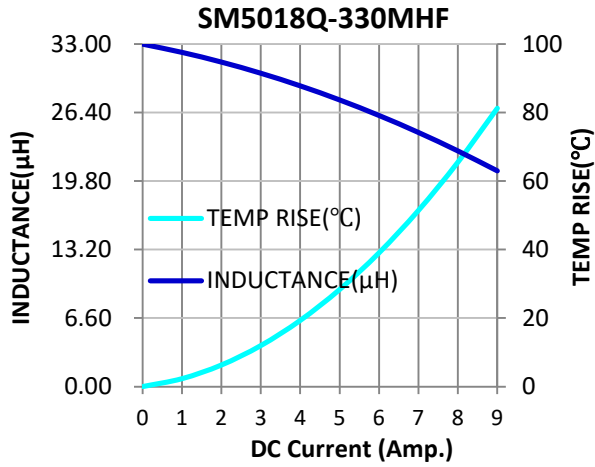
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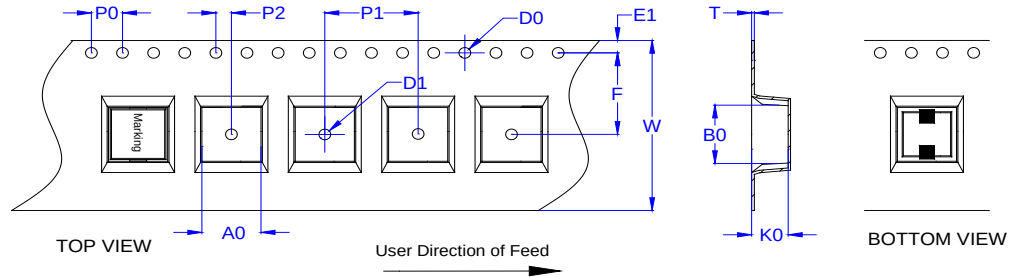


4. Inductance vs. Temperature Rise Characteristics of SM5018Q Series:



5. PACKAGE SPECIFICATION.(UNIT:mm):

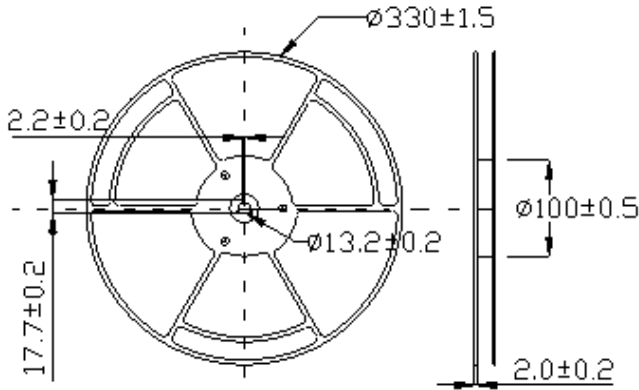
(1).ENCAPSULATION MODE:



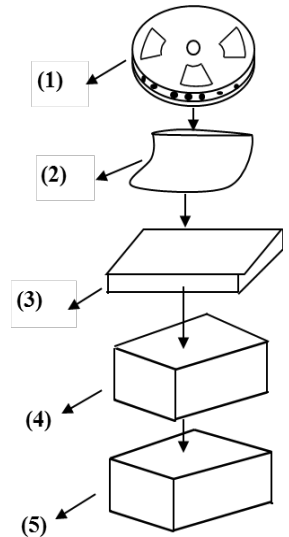
(2).DIMENSION(mm):

W	A0	B0	K0	P1	P0	P2	D0	D1	F	E1	T
24.0±0.30	13.4±0.10	14.4±0.10	5.40±0.10	16.0±0.10	4.0±0.10	2.0±0.10	1.5±0.10	1.5+0.10/-0	11.5±0.10	1.75±0.10	0.50±0.05

(3).REEL SIZE:



(4).PACKAGE MODE:



(5).PACKAGING LIST:

No.	Packing Part	Dimension (mm)	Material	Quantity
1	Reel	330	Plastic	500Pcs / Reel
2	Bag	450 X 360 X 0.075	Plastic	1Reel / Bag
3	Small Box	340 X 335 X 45	Paper	1Bag / Small Box
4	Middle Box	356 X 350 X 226	Paper	4Small Boxes / Middle Box
5	Outer Box	378 X 362 X 252	Paper	1Middle Box / Outer Box

(6).WEIGHT: N.W: 4.79 g/pcs (APPROX), TOTAL 9.58 Kg(APPROX),G.W:TOTAL 13.08Kg (APPROX).

(7).Storage conditions: 20°C~35°C ,75%RH (Max.).

6.1 RELIABILITY TEST:

6.1.1 Mechanical Reliability

Item	Specification and Requirement	Test Method and Remarks
Solderability	The surface of terminal immersed shall be minimum of 95% covered with a new coating of solder	According to J-STD-002 Method D category 3 1. Preheating: 160 ± 10 °C 2. Solder: 99.3%Sn/0.7%Cu , Flux: Rosin 3. Retention time: 255 ± 5 °C for 5 ± 0.5 seconds
Resistance to Soldering Heat	Inductance change: Within $\pm 10\%$ Without mechanical damage such as break	According to MIL-STD-202 Method 210 condition J 1. Solder: 99.3%Sn/0.7%Cu 2. Reflow Peak 235 ± 5 °C (30 ± 5 s)/Time above 183 °C ($90 \sim 120$ s)
Vibration	Inductance change: Within $\pm 10\%$ Without mechanical damage such as break	According to MIL-STD-202 Method 204 5g's for 20 minutes, 12 cycles each of 3 orientations. Note: Use 8"X5" PCB, .031" thick, 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.
Shock	Inductance change: Within $\pm 10\%$ Without mechanical damage such as break	According to MIL-STD-202 Method 213 1. Peak value: 100 G 2. Duration of pulse: 11ms 3. 3 times in each positive and negative direction of 3 mutual perpendicular directions.

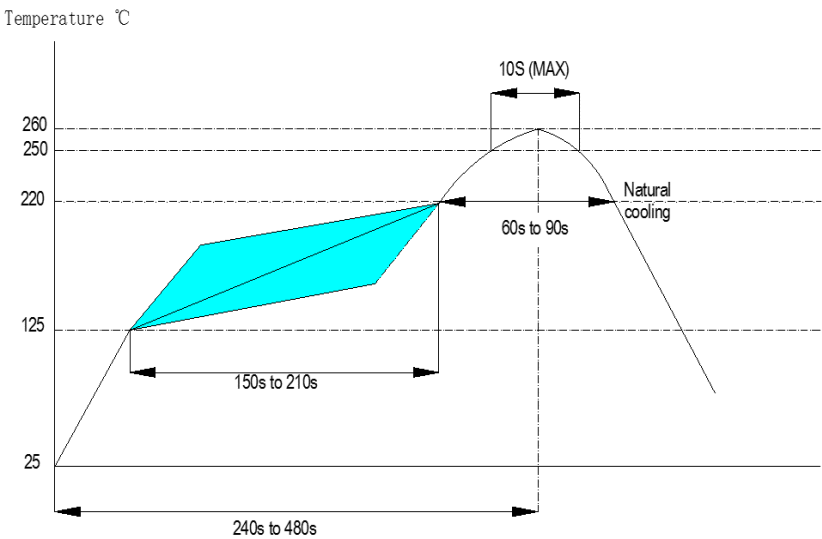
6.2.2 Endurance Reliability

Thermal Shock	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	According to IEC68-2-14 Method N(Nb) 1. Repeat 100 cycles as follow: (-55 ± 2 °C; 30 ± 3 min) → (Room temp., 5 min) → ($+165 \pm 2$ °C, 30 ± 3 min) → (Room temp., 1 min) 2. Recovery: $48 + 4 / -0$ hours of recovery under the standard condition after the test.
High Temperature & Humidity	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	According to MIL-STD-202 Method 103 240 hours 85 °C/ 85% RH. Unpowered. Measurement at 24 ± 4 hours after test conclusion.
Low Temperature Store	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	According to IEC68-2-1 Method A(Ad) Store temperature: -55 ± 2 °C, $1000 + 4 / -0$ hours
High Temperature Store	Inductance change: Within $\pm 10\%$ Without distinct damage in appearance	According to MIL-STD-202 Method 108 Store temperature: $+165 \pm 2$ °C, $1000 + 4 / -0$ hours

6.2 RELIABILITY TEST (AEC-Q200 Test List):

Stress	NO	Reference	Additional Requirements	Remark
Pre- and Post-Stress Electrical Test	1	User Spec.	Test is performed except as specified in the applicable stress reference and the additional requirements in Table 5.	Not Applicable
High Temperature Exposure (Storage)	3	MIL-STD-202 Method 108	1000 hrs. at rated operating temperature (e.g. 125 °C part can be stored for 1000 hrs. @ 125 °C. Same applies for 105 °C and 85 °C. Unpowered. Measurement at 24±4 hours after test conclusion.	OK
Temperature Cycling	4	JESD22 Method JA-104	1000 cycles (-40 °C to +125 °C). Note: If 85 °C part or 105 °C part the 1000 cycles will be at that temperature. Measurement at 24±4 hours after test conclusion. 30min maximum dwell time at each temperature extreme. 1 min. maximum transition time.	OK
Biased Humidity	7	MIL-STD-202 Method 103	1000 hours 85 °C/85%RH. Unpowered. Measurement at 24±4 hours after test conclusion.	OK
Operational Life	8	MIL-PRF-27	1000 hrs. @ 105 °C. If 85 °C or 125 °C part will be tested at that temperature. Measurement at 24±4 hours after test conclusion.	OK
External Visual	9	MIL-STD-883 Method 2009	Inspect device construction, marking and workmanship. Electrical Test not required.	Follow SPEC
Physical Dimension	10	JESD22 Method JB-100	Verify physical dimensions to the applicable device detail specification. Note: User(s) and Suppliers spec. Electrical Test not required.	Follow SPEC
Terminal Strength (Leaded)	11	MIL-STD-202 Method 211	Test leaded device lead integrity only. Conditions: A (910 g), C (1.13 kg), E (1.45 kg-mm)	Not Applicable
Resistance to Solvents	12	MIL-STD-202 Method 215	Note: Add Aqueous wash chemical. OKEM Clean or equivalent. Do not use banned solvents.	OK
Mechanical Shock	13	MIL-STD-202 Method 213	Figure 1 of Method 213. Condition C	OK
Vibration	14	MIL-STD-202 Method 204	5g's for 20 minutes, 12 cycles each of 3 orientations. Note: Use 8"X5" PCB, .031" thick, 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10-2000 Hz.	OK
Resistance to Soldering Heat	15	MIL-STD-202 Method 210	Condition B No pre-heat of samples. Note: Single Wave Solder - Procedure 2 for SMD and Procedure 1 for Leaded with solder within 1.5mm of device body.	OK
ESD	17	AEC-Q200-002 or ISO/DIS10605		Not Applicable
Solderability	18	J-STD-002	For both Leaded & SMD. Electrical Test not required. Magnification 50X. Conditions: Leaded: Method A @ 235 °C, category 3. SMD: a) Method B, 4 hrs @ 155 °C dry heat @ 235 °C. b) Method B @ 215 °C category 3. c) Method D category 3 @ 260 °C.	OK
Electrical Characterization	19	User Spec.	Parametrically test per lot and sample size requirements, summary to show Min, Max, Mean and Standard deviation at room as well as Min and Max operating temperatures.	Follow SPEC
Flammability	20	UL-94	V-0 or V-1 Acceptable	OK/UL Card
Board Flex	21	AEC-Q200-005	60 sec minimum holding time.	OK
Terminal Strength (SMD)	22	AEC-Q200-006		OK

Soldering Reflow Chart

Stage	Precaution	Recommended temperature profile
Reflow soldering	Temperature profile can be referenced after confirming of adhesion , temperature of resistance to soldering heat , component size , soldering etc. sufficient . Note: please refer to the latest IPC/JEDEC J-STD-020: "Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices"	 Temperature °C 260 250 220 125 25 10s (MAX) 60s to 90s Natural cooling 150s to 210s 240s to 480s