FrelTec GmbH

Mathildenstr. 10A
82319 Starnberg
Germany

Wire Wound SMD Power Inductor SMD

Part Number

194	303010*	H*	151*	J*	E02	_
Type	Size	Feature Type	Value	Tolerance	Packing	Optional
194 : Wire Wound SMD Power Inductor	201610: 2,0x1,6x1,0 202012: 2,0x2,0x1,2 252010: 2,5x2,0x1,0 252012: 2,5x2,0x1,2 303010: 3,0x3,0x1,0 303012: 3,0x3,0x1,2 303015: 3,0x3,0x1,5 404012: 4,0x4,0x1,2 404018: 4,0x4,0x1,8 808030: 8,0x8,0x3,0	H: High Type Material	The value is given in µH "N" indicates the decimal point for nH and "U" indicates the decimal point for µH. When higher than 100 µH the last digit is the multiplier which denotes the number of zero following	M : ±20%	E02 : Embossed tape and reel for 2k pcs (7"reel) size 201610, 202012, 252010, 252012, 303010, 303012, 303015 L0X : Embossed tape and reel for 1,5k pcs (13"reel) size 808030	
				N: ±30%	L03 : Embossed tape and reel for 3k pcs (13"reel) size 404018	
			Example:		L0R: Embossed tape and reel for 4,5k pcs (13"reel) size 404012	
			10N : 10 nH			
			3U3 : 3300nH			
			U68 : 680 nH			
			151 : 150 µH		* not all combination is possible	

All products according to RoHS (2011/65/EU)

Dimensions:

Fig. 1

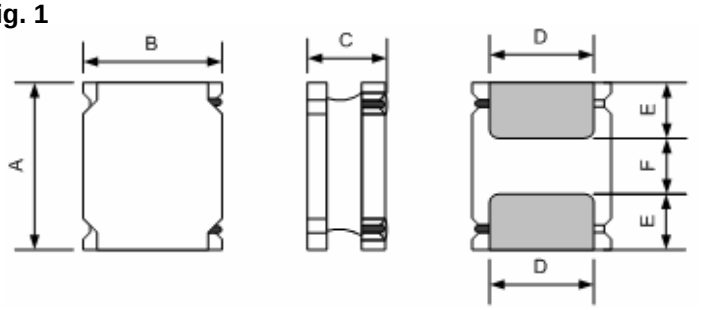


Fig. 2

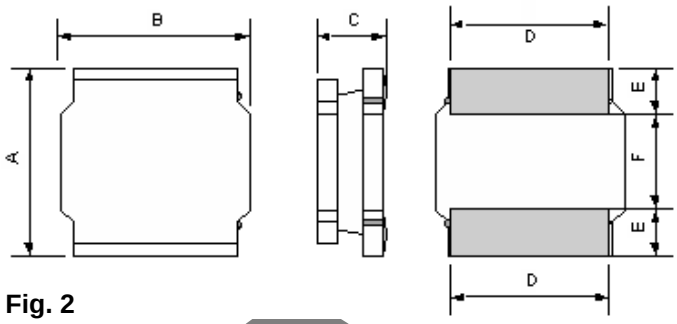


Fig. 3

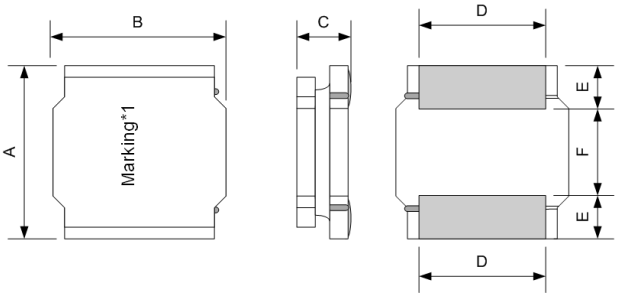
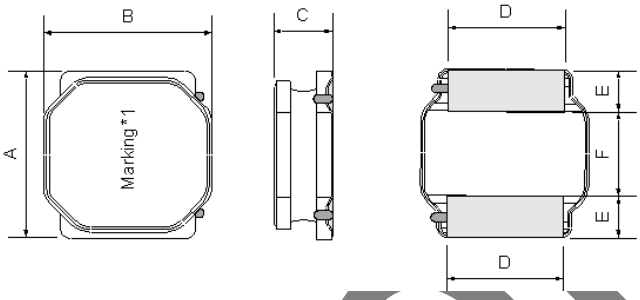
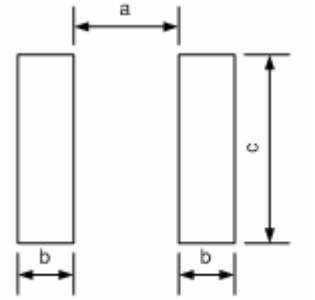


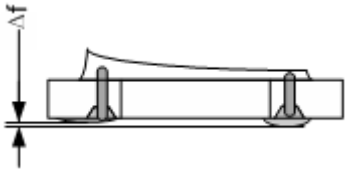
Fig. 4





Series	A	B	C Max	D	E	F	a Typ	b Typ	c Typ	Shape
194202012H	2,0±0,1	2,0±0,1	1,2 Max.	1,5±0,2	0,60±0,2	0,80±0,2	0,65	0,70	2,0	Fig. 1
194201610H	2,0±0,2	1,6±0,2	1,0 Max.	1,2±0,2	0,60±0,2	0,80±0,2	0,70	0,70	1,70	Fig. 1
194252010H	2,5±0,2	2,0±0,2	1,0 Max.	1,5±0,2	0,8±0,2	0,8±0,2	0,80	0,85	2,0	Fig. 1
194252012H	2,5±0,2	2,0±0,2	1,2Max.	1,5±0,2	0,8±0,2	0,8±0,2	0,8	0,85	2,0	Fig. 1
194303010H	3,0±0,2	3,0±0,2	1,0Max.	2,5±0,2	0,75±0,2	1,5±0,2	1,5	0,8	2,7	Fig. 4
194303012H	3,0±0,2	3,0±0,2	1,2Max.	2,5±0,2	0,75±0,2	1,5±0,2	1,5	0,8	2,7	Fig. 4
194303015H	3,0±0,2	3,0±0,2	1,5Max.	2,5±0,2	0,75±0,2	1,5±0,2	1,5	0,8	2,7	Fig. 4
194404012H	4,0±0,2	4,0±0,2	1,2 Max.	3,3±0,2	0,95±0,2	2,1±0,2	1,9	1,1	3,7	Fig. 3
194404018H	4,0±0,2	4,0±0,2	1,8 Max.	3,3±0,2	0,95±0,2	2,1±0,2	1,9	1,1	3,7	Fig. 3
194808030H	8,0±0,3	8,0±0,3	3,0Max.	6,3±0,3	2,00±0,3	4,0±0,3	3,8	2,2	7,5	Fig. 3

Products size 4040 and 8080 are printed with marking other not



Δf: Clearance between terminal and the surface of plate must be 0,1mm (0,2mm for 8080) max when coil is placed on a flat plate.

Electrical Characteristics

201610

Part Number	Inductance	Min. Self-resonant frequency	DC Resistance		Saturation Current		Heat Rating Current		Marking
	1MHz/1V		Max.	Typ.	Max.	Typ.	Max.	Typ.	
Units	µH	MHz	Ω	Ω	A	A	A	A	
Symbol	L	SRF	DCR		Isat		Irms		-
194201610HU16ME02	0,16±20%	402	0,031	0,026	4,30	4,80	3,20	3,50	N/A
194201610HU24ME02	0,24±20%	285	0,040	0,033	3,70	4,10	2,90	3,20	N/A
194201610HU33ME02	0,33±20%	224	0,040	0,033	2,50	3,10	2,90	3,20	N/A
194201610HU47ME02	0,47±20%	130	0,059	0,049	2,30	2,85	2,35	2,60	N/A
194201610HU68ME02	0,68±20%	98	0,076	0,063	1,95	2,45	2,05	2,25	N/A
194201610H1U0ME02	1,0±20%	97	0,114	0,095	1,65	1,85	1,45	1,60	N/A
194201610H1U5ME02	1,5±20%	67	0,174	0,145	1,35	1,65	1,25	1,40	N/A
194201610H2U2ME02	2,2±20%	59	0,264	0,220	1,20	1,45	1,10	1,20	N/A
194201610H3U3ME02	3,3±20%	47	0,335	0,279	0,90	1,05	0,88	0,98	N/A
194201610H4U7ME02	4,7±20%	37	0,479	0,399	0,70	0,85	0,74	0,82	N/A
194201610H6U8ME02	6,8±20%	25	0,816	0,680	0,60	0,70	0,52	0,58	N/A
194201610H10UME02	10±20%	21	1,020	0,850	0,50	0,55	0,45	0,50	N/A

202012

Part Number	Inductance	Min. Self-resonant frequency	DC Resistance		Saturation Current		Heat Rating Current		Marking
	1MHz/1V		Max.	Typ.	Max.	Typ.	Max.	Typ.	
Units	µH	MHz	Ω	Ω	A	A	A	A	
Symbol	L	SRF	DCR		Isat		Irms		-
194202012HU16ME02	0,16±20%	427	0,031	0,026	5,20	5,80	2,50	2,75	N/A
194202012HU24ME02	0,24±20%	329	0,042	0,035	4,70	5,20	2,20	2,40	N/A
194202012HU33ME02	0,33±20%	276	0,042	0,035	3,50	4,00	2,20	2,40	N/A
194202012HU47ME02	0,47±20%	220	0,050	0,042	3,55	3,75	2,00	2,20	N/A
194202012HU68ME02	0,68±20%	147	0,060	0,050	2,95	3,10	1,80	2,00	N/A
194202012H1U0ME02	1,0±20%	95	0,088	0,073	2,70	2,85	1,50	1,65	N/A
194202012H1U5ME02	1,5±20%	74	0,112	0,093	2,00	2,20	1,30	1,45	N/A
194202012H2U2ME02	2,2±20%	49	0,127	0,106	1,40	1,65	1,20	1,35	N/A
194202012H3U3ME02	3,3±20%	35	0,276	0,230	1,20	1,35	0,85	0,95	N/A
194202012H4U7ME02	4,7±20%	32	0,294	0,245	0,97	1,10	0,82	0,90	N/A
194202012H6U8ME02	6,8±20%	25	0,479	0,399	0,82	0,92	0,64	0,70	N/A
194202012H10UME02	10±20%	21	0,785	0,654	0,72	0,82	0,49	0,54	N/A
194202012H15UME02	15±20%	14	1,368	1,140	0,55	0,65	0,38	0,42	N/A
194202012H18UME02	18±20%	19	1,680	1,400	0,60	0,68	0,35	0,38	N/A
194202012H22UME02	22±20%	11	1,680	1,400	0,40	0,50	0,35	0,38	N/A
194202012H33UME02	33±20%	11	2,160	1,800	0,35	0,40	0,30	0,33	N/A

252010

Part Number	Inductance @1MHz,1V	Min. Self-resonant frequency	DC Resistance		Saturation Current		Heat Rating Current		Marking
			Max.	Typ.	Max.	Typ.	Max.	Typ.	
Units	µH	MHz	Ω	Ω	A	A	A	A	
Symbol	L	SRF	DCR		Isat		Irms		-
194252010HU24ME02	0,24±20%	360	0,034	0,028	3,60	4,40	2,75	3,00	N/A
194252010HU33ME02	0,33±20%	270	0,043	0,036	3,80	4,60	2,40	2,65	N/A
194252010HU47ME02	0,47±20%	170	0,044	0,037	2,40	2,80	2,40	2,65	N/A
194252010HU68ME02	0,68±20%	110	0,061	0,051	2,75	3,10	2,10	2,35	N/A
194252010HU68ME021	0,68±20%	110	0,061	0,051	2,75	3,10	2,10	2,35	N/A
194252010HU68ME022	0,68±20%	110	0,065	0,055	3,20	3,50	2,10	2,30	N/A
194252010H1U0ME02	1,0±20%	84	0,08	0,067	2,05	2,45	1,80	2,00	N/A
194252010H1U5ME02	1,5±20%	60	0,108	0,090	1,70	2,05	1,55	1,70	N/A
194252010H2U2ME02	2,2±20%	56	0,137	0,114	1,55	1,80	1,40	1,55	N/A
194252010H3U3ME02	3,3±20%	39	0,228	0,170	1,10	1,40	1,10	1,20	N/A
194252010H4U7ME02	4,7±20%	28	0,323	0,269	1,00	1,15	0,91	1,00	N/A
194252010H6U8ME02	6,8±20%	25	0,451	0,376	0,82	0,95	0,76	0,84	N/A
194252010H10UME02	10±20%	20	0,584	0,487	0,65	0,75	0,67	0,74	N/A
194252010H15UME02	15±20%	19	0,954	0,795	0,55	0,65	0,50	0,55	N/A
194252010H22UME02	22±20%	15	1,548	1,290	0,45	0,55	0,40	0,45	N/A
194252010H33UME02	33±20%	10	1,548	1,290	0,25	0,30	0,40	0,45	N/A

252012

Part Number	Inductance @1MHz,1V	Min. Self-resonant frequency	DC Resistance		Saturation Current		Heat Rating Current		Marking
			Max.	Typ.	Max.	Typ.	Max.	Typ.	
Units	µH	MHz	Ω	Ω	A	A	A	A	
Symbol	L	SRF	DCR		Isat		Irms		-
194252012HU16ME02	0,16±20%	380	0,022	0,018	6,50	7,20	4,05	4,50	N/A
194252012HU24ME02	0,24±20%	260	0,022	0,018	4,00	4,75	4,05	4,50	N/A
194252012HU33ME02	0,33±20%	230	0,029	0,024	4,00	4,70	3,35	3,70	N/A
194252012HU47ME02	0,47±20%	170	0,036	0,03	3,70	4,10	3,00	3,30	N/A
194252012HU47ME021	0,47±20%	165	0,038	0,032	4,90	5,20	2,90	3,20	N/A
194252012HU68ME02	0,68±20%	150	0,061	0,051	3,00	3,30	2,10	2,30	N/A
194252012HU68ME021	0,68±20%	150	0,042	0,035	3,20	3,50	2,50	2,70	N/A
194252012HU68ME022	0,68±20%	150	0,060	0,051	3,80	4,20	2,10	2,30	N/A
194252012H1U0ME02	1,0±20%	85	0,044	0,037	1,70	1,90	2,20	2,40	N/A
194252012H1U0ME023	1,0±20%	85	0,043	0,037	2,40	2,60	2,40	2,60	■
194252012H1U2ME02	1,2±20%	75	0,078	0,065	2,20	2,50	1,95	2,10	N/A
194252012H1U5ME02	1,5±20%	75	0,078	0,065	2,00	2,35	1,95	2,10	N/A
194252012H2U2ME02	2,2±20%	55	0,096	0,080	1,80	1,95	1,80	1,95	N/A
194252012H3U3ME02	3,3±20%	43	0,144	0,120	1,15	1,25	1,40	1,50	N/A
194252012H4U7ME02	4,7±20%	36	0,210	0,175	1,10	1,20	1,12	1,25	N/A
194252012H6U8ME02	6,8±20%	25	0,360	0,300	0,80	1,00	0,95	1,05	N/A

194252012H10UME02	10±20%	21	0,522	0,435	0,70	0,85	0,79	0,87	N/A
194252012H15UME02	15±20%	18	1,000	0,830	0,65	0,75	0,57	0,63	N/A
194252012H18UME02	18±20%	14	1,000	0,830	0,5	0,65	0,57	0,63	N/A
194252012H22UME02	22±20%	11	1,090	0,910	0,45	0,55	0,54	0,60	N/A
194252012H33UME02	33±20%	7,5	1,840	1,530	0,35	0,40	0,42	0,46	N/A
194252012H47UME02	47±20%	8,9	2,220	1,850	0,25	0,30	0,30	0,35	N/A

303010

Part Number	Inductance	Min. Self-resonant frequency	DC Resistance		Saturation Current		Heat Rating Current		Marking
	@1MHz,1V		Max.	Typ.	Max.	Typ.	Max.	Typ.	
Units	µH		Ω	Ω	A	A	A	A	
Symbol	L	MHz	DCR		Isat		Irms		-
194303010H4U7ME02	4,7±20%	42	0,18	0,15	0,85	0,95	1,10	1,25	N/A
194303010H10UME02	10±20%	30	0,42	0,35	0,60	0,70	0,62	0,80	N/A
194303010H22UME02	22±20%	18	0,92	0,77	0,40	0,50	0,48	0,56	N/A

303012

Part Number	Inductance	Min. Self-resonant frequency	DC Resistance		Saturation Current		Heat Rating Current		Marking
	@1MHz/1V		Max.	Typ.	Max.	Typ.	Max.	Typ.	
Units	µH		Ω	Ω	A	A	A	A	
Symbol	L	MHz	DCR		Isat		Irms		-
194303012H1U0ME02	1,0±20%	74	0,04	0,032	2,20	2,50	2,30	2,50	N/A
194303012H1U0ME022	1,0±20%	91	0,056	0,047	2,80	3,20	1,90	2,00	N/A
194303012H2U2ME02	2,2±20%	51	0,090	0,075	1,50	1,80	1,40	1,60	N/A
194303012H3U3ME02	3,3±20%	62	0,134	0,112	1,23	1,55	1,10	1,30	N/A
194303012H10UME02	10±20%	22	0,372	0,310	0,75	0,90	0,75	0,80	N/A
194303012H10UME021	10±20%	27	0,495	0,413	1,00	1,10	0,90	1,00	N/A
194303012H10UME022	10±20%	32	0,324	0,270	0,73	0,85	0,78	0,85	N/A
194303012H22UME02	22±20%	14	0,840	0,700	0,50	0,60	0,50	0,55	N/A
194303012H22UME021	22±20%	20	0,756	0,630	0,50	0,60	0,50	0,60	N/A

303015

Part Number	Inductance	Min. Self-resonant frequency	DC Resistance		Saturation Current		Heat Rating Current		Marking
	@1MHz,1V		Max.	Typ.	Max.	Typ.	Max.	Typ.	
Units	µH	MHz	Ω	Ω	A	A	A	A	
Symbol	L	SRF	DCR		Isat		Irms		-
194303015HU22ME02	0,22±20%	226	0,022	0,018	6,00	6,80	3,00	3,50	N/A
194303015HU24ME02	0,24±20%	206	0,022	0,018	5,00	5,50	3,00	3,50	N/A
194303015HU47ME02	0,47±20%	157	0,022	0,018	2,40	2,80	3,00	3,50	N/A
194303015HU55ME02	0,55±20%	159	0,019	0,016	2,40	2,70	3,05	3,55	N/A
194303015H1U0ME02	1,0±20%	92	0,040	0,033	2,70	3,00	2,20	2,50	N/A
194303015H1U5ME02	1,5±20%	70	0,048	0,040	2,00	2,30	2,00	2,30	N/A

194303015H2U2ME02	2,2±20%	55	0,060	0,050	1,50	1,70	1,80	2,05	N/A
194303015H3U3ME02	3,3±20%	51	0,084	0,070	1,30	1,50	1,50	1,70	N/A
194303015H3U9ME02	3,9±20%	39	0,115	0,096	1,30	1,60	1,30	1,50	N/A
194303015H4U7ME02	4,7±20%	35	0,115	0,096	1,10	1,20	1,30	1,50	N/A
194303015H6U8ME02	6,8±20%	27	0,144	0,120	0,80	0,90	1,16	1,35	N/A
194303015H10UME02	10±20%	21	0,276	0,230	0,75	0,90	0,84	0,97	N/A
194303015H15UME02	15±20%	18	0,360	0,300	0,60	0,70	0,73	0,84	N/A
194303015H22UME02	22±20%	14	0,540	0,450	0,52	0,60	0,60	0,70	N/A
194303015H26UME02	26±20%	13	0,768	0,640	0,40	0,50	0,45	0,55	N/A
194303015H33UME02	33±20%	15	1,090	0,910	0,50	0,55	0,50	0,55	N/A
194303015H47UME02	47±20%	11	1,250	1,040	0,35	0,42	0,45	0,50	N/A

404012

Part Number	Inductance	Min. Self-resonant frequency	DC Resistance		Saturation Current		Heat Rating Current		Marking
	@ 0.1MHz,1V		Max.	Typ.	Max.	Typ.	Max.	Typ.	
Units	µH	MHz	Ω	Ω	A	A	A	A	
Symbol	L	SRF	DCR		Isat		Irms		-
194404012HU33NL0R	0,33±30%	260	0,031	0,026	5,50	6,30	2,90	3,35	R33
194404012HU47NL0R	0,47±30%	193	0,032	0,027	3,50	4,20	2,90	3,20	R47
194404012HU82NL0R	0,82±30%	121	0,042	0,035	3,00	3,50	2,50	2,90	R82
194404012H1U0NL0R	1,0±30%	100	0,050	0,042	2,80	3,30	2,20	2,50	1R0
194404012H1U5NL0R	1,5±30%	72	0,050	0,042	2,10	2,20	2,20	2,50	1R5
194404012H1U8NL0R	1,8±30%	73	0,066	0,055	2,10	2,40	2,00	2,30	1R8
194404012H2U2ML0R	2,2±20%	61	0,066	0,055	1,70	1,80	2,00	2,30	2R2
194404012H2U7ML0R	2,7±20%	57	0,084	0,070	1,90	2,20	1,70	2,00	2R7
194404012H3U3ML0R	3,3±20%	55	0,084	0,070	1,40	1,70	1,70	2,00	3R3
194404012H3U6ML0R	3,6±20%	49	0,090	0,075	1,20	1,60	1,70	2,00	3R6
194404012H4U3ML0R	4,3±20%	42	0,108	0,090	1,20	1,50	1,50	1,80	4R3
194404012H4U7ML0R	4,7±20%	39	0,108	0,090	1,20	1,30	1,50	1,80	4R7
194404012H5U1ML0R	5,1±20%	35	0,132	0,110	1,20	1,40	1,40	1,60	5R1
194404012H5U6ML0R	5,6±20%	35	0,132	0,110	1,10	1,40	1,40	1,60	5R6
194404012H6U8ML0R	6,8±20%	33	0,150	0,125	0,90	1,10	1,30	1,60	6R8
194404012H10UML0R	10±20%	27	0,204	0,170	0,80	0,90	1,10	1,30	100
194404012H10UML0R1	10±20%	27	0,240	0,200	0,90	1,10	1,00	1,10	100
194404012H12UML0R	12±20%	23	0,312	0,260	0,85	1,00	0,90	1,00	120
194404012H15UML0R	15±20%	21	0,312	0,260	0,65	0,80	0,90	1,00	150
194404012H18UML0R	18±20%	18	0,432	0,360	0,65	0,80	0,78	0,90	180
194404012H22UML0R	22±20%	18	0,460	0,380	0,50	0,65	0,78	0,90	220
194404012H27UML0R	27±20%	14	0,672	0,560	0,50	0,60	0,63	0,73	270
194404012H33UML0R	33±20%	13	0,756	0,630	0,45	0,55	0,57	0,68	330
194404012H36UML0R	36±20%	11	0,756	0,630	0,40	0,50	0,57	0,68	360

194404012H39UML0R	39±20%	11	1,188	0,990	0,55	0,62	0,47	0,54	390
194404012H47UML0R	47±20%	11	1,188	0,990	0,40	0,50	0,47	0,54	470
194404012H56UML0R	56±20%	10	1,320	1,100	0,35	0,45	0,45	0,52	560
194404012H68UML0R	68±20%	9,1	1,800	1,500	0,38	0,45	0,38	0,44	680
194404012H82UML0R	82±20%	7,7	2,040	1,700	0,30	0,38	0,36	0,42	820
194404012H101ML0R	100±20%	7	2,040	1,700	0,25	0,31	0,36	0,42	101

404018

Part Number	Inductance	Min. Self-resonant frequency	DC Resistance		Saturation Current		Heat Rating Current		Marking
	@0.1MHz		Max.	Typ.	Max.	Typ.	Max.	Typ.	
Units	µH	MHz	Ω	Ω	A	A	A	A	
Symbol	L	SRF	DCR		Isat		Irms		-
194404018HU33NL03	0,33±30%	230	0,016	0,012	6,50	8,00	4,20	4,70	R33
194404018HU47NL03	0,47±30%	220	0,020	0,017	6,50	7,20	3,50	4,00	R47
194404018H1U0NL03	1,0±30%	90	0,032	0,027	4,00	4,80	3,20	3,70	1R0
194404018H1U5NL03	1,5±30%	70	0,037	0,031	3,60	4,30	2,95	3,30	1R5
194404018H2U2ML03	2,2±20%	60	0,050	0,042	3,00	3,40	2,20	2,90	2R2
194404018H3U3ML03	3,3±20%	45	0,066	0,055	2,30	2,90	2,00	2,50	3R3
194404018H4U7ML03	4,7±20%	35	0,084	0,070	2,00	2,20	1,70	2,10	4R7
194404018H6U8ML03	6,8±20%	30	0,118	0,098	1,60	1,80	1,45	1,70	6R8
194404018H10UML03	10±20%	25	0,180	0,150	1,30	1,50	1,20	1,50	100
194404018H15UML03	15±20%	18	0,252	0,210	1,10	1,20	0,85	1,20	150
194404018H22UML03	22±20%	15	0,348	0,290	0,90	1,10	0,70	1,00	220
194404018H33UML03	33±20%	12	0,552	0,460	0,70	0,90	0,55	0,82	330
194404018H47UML03	47±20%	11	0,744	0,620	0,57	0,70	0,50	0,66	*470*
194404018H68UML03	68±20%	7,1	0,972	0,810	0,53	0,62	0,40	0,60	*680*
194404018H101ML03	100±20%	5,2	1,560	1,300	0,49	0,57	0,40	0,47	101
194404018H151ML03	150±20%	5,1	3,120	2,600	0,41	0,47	0,28	0,33	151
194404018H221ML03	220±20%	4,2	3,840	3,200	0,33	0,38	0,25	0,29	221
194404018H331ML03	330±20%	3,2	5,880	4,900	0,26	0,31	0,20	0,23	331

808030

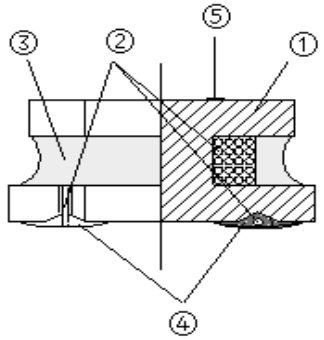
Part Number	Inductance	Min. Self-resonant frequency	DC Resistance		Saturation Current		Heat Rating Current		Marking
	0.1MHz/1V		Max.	Typ.	Max.	Typ.	Max.	Typ.	
Units	µH	MHz	Ω	Ω	A	A	A	A	
Symbol	L	SRF	DCR		Isat		Irms		-
194808030H1U0NL0X	1,0±30%	120	0,012	0,009	7,80	9,00	6,20	7,30	1R0
194808030H1U5NL0X	1,5±30%	80	0,016	0,012	6,20	7,60	5,30	6,20	1R5
194808030H2U2ML0X	2,2±20%	60	0,020	0,015	4,90	6,30	4,80	5,70	2R2
194808030H3U3ML0X	3,3±20%	50	0,025	0,019	4,20	5,10	4,30	5,10	3R3
194808030H4U7ML0X	4,7±20%	40	0,029	0,022	3,60	4,30	4,00	4,70	4R7
194808030H6U8ML0X	6,8±20%	32	0,038	0,029	3,00	3,50	3,40	3,90	6R8
194808030H10UML0X	10±20%	27	0,043	0,033	2,40	2,80	3,00	3,70	100
194808030H15UML0X	15±20%	20	0,078	0,060	2,00	2,40	2,20	2,80	150
194808030H22UML0X	22±20%	16	0,091	0,070	1,75	2,00	1,90	2,40	220
194808030H33UML0X	33±20%	13	0,156	0,120	1,30	1,70	1,50	2,10	330
194808030H47UML0X	47±20%	11	0,221	0,170	1,10	1,40	1,30	1,70	470

Note:

1 : Rated current: Isat (max.)or Irms(max.), whichever is smaller;
2 : Saturation Current: *Max.Value*, DC current at which the inductance drops less than 30% from its value without current; T*yp. Value,* DC current at which the inductance drops 30% from its value without current;
3 : Irms: DC current that causes the temperature rise (ΔT) from 20°C ambient temperature.
For Max*. Value*, ΔT＜40℃; for *Typ. Value*, ΔT is approximate 40℃.

The part temperature (ambient + temp. rise) should not exceed 125 °C under worst case operating conditions. Circuit design, component placement, PCB trace size and thickness, airflow and other cooling provisions all affect the part temperature. Part temperature should be verified in the end application.

Structure of product



No.	Components	Material
1	Ferrite Core	Ni-Zn Ferrite
2	Wire	Polyurethane system enameled copper wire
3	Magnetic Glue	Epoxy resin and magnetic powder
4	Electrodes	AgNiSn or FeNiCu +Sn Alloy
5	Marking	Nitrocellulose (where marking available)

Test and Measurement Procedures

1 Test Conditions

Unless otherwise specified, the standard atmospheric conditions for measurement/test as:

a. Ambient Temperature: 20±15℃
b. Relative Humidity: 65±20%
c. Air Pressure: 86kPa to 106kPa

If any doubt on the results, measurements/tests should be made within the following limits:

a. Ambient Temperature: 20±2°C
b. Relative Humidity: 65±5%
c. Air Pressure: 86kPa to 106kPa

2 Visual Examination

a. Inspection Equipment: 10X microscope, size 303015, 404012 and 808030 only visual inspection.

3 Electrical Test

3.1 Inductance (L)

a. Refer to product table. Test equipment: WK3260B LCR meter or equivalent.
b. Test Frequency and Voltage: refers to tables electrical characteristics.

3.2 Direct Current Resistance (DCR)

a. Refer to tables electrical characteristics.
b. Test equipment: HIOKI 3540 or equivalent.

3.3 Saturation Current (Isat)

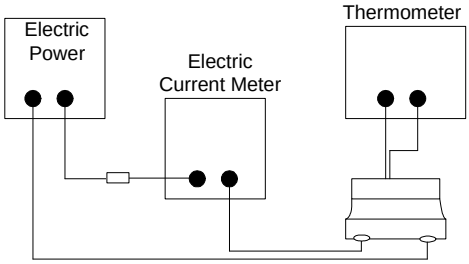
a. Refer to tables electrical characteristics.
b. Test equipment:WK3260B LCR meter or equivalent.
c. Definition of saturation current (Isat): DC current at which the inductance drops approximate 30% from its value without current.

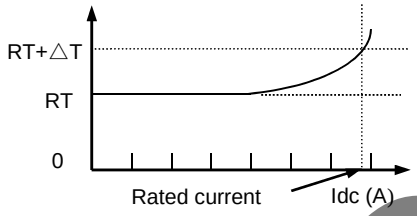
3.4 Temperature rise current (Irms)

a. Refer to tables electrical characteristics.
b. Test equipment (see Fig. below): Electric Power, Electric current meter, Thermometer.
c. Measurement method
   1. Set test current to be 0 mA.
   2. Measure initial temperature of choke surface.
   3. Gradually increase current and measure choke temperature for

corresponding current.

4. Definition of Temperature rise current: DC current that causes the temperature rise (△T) from ambient temperature

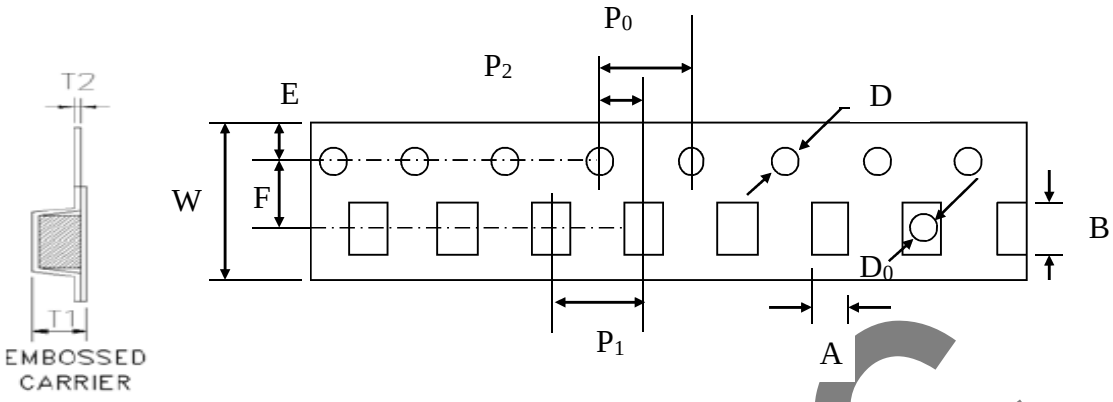




3.5 Self-resonant frequency (SRF) (where applicable)

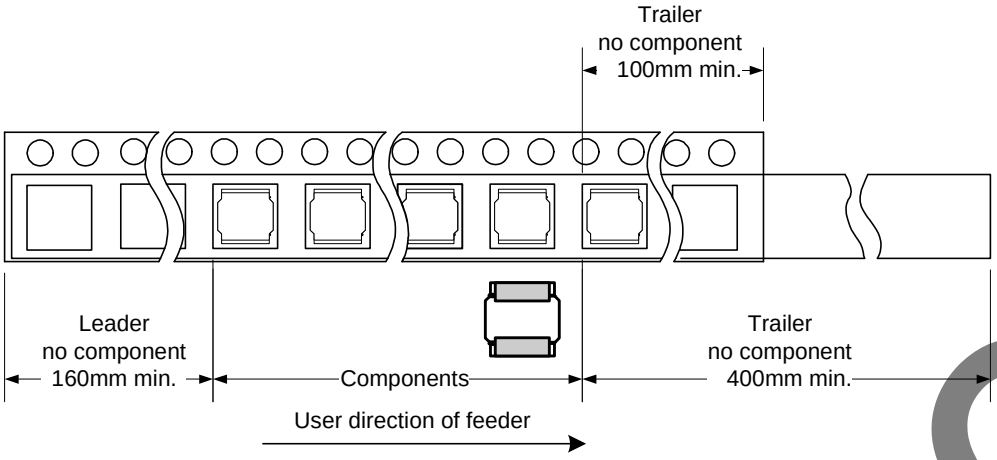
a. Refer to tables electrical characteristics.
b. Test equipment: Agilent E4991A+16197or equivalent

Tape Dimensions

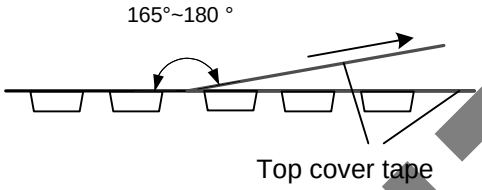


Series	A	B	W	E	F	P_0	P_1	P_2	D	T_2	T_1
194201610H	1,90±0,05	2,20±0,05	8,0±0,1	1,75±0,1	3,5±0,05	4,0±0,1	4,0±0,1	2,0±0,05	1,5+0,1/-0,0	0,25±0,02	1,20±0,05
194202012H	2,20±0,05	2,20±0,05	8,0±0,1	1,75±0,1	3,5±0,05	4,0±0,1	4,0±0,1	2,0±0,05	1,5+0,1/-0,0	0,25±0,02	1,30±0,05
194252010H	2,45±0,05	2,75±0,05	8,0±0,1	1,75±0,1	3,5±0,05	4,0±0,1	4,0±0,1	2,0±0,05	1,5+0,1/-0,0	0,25±0,03	1,20±0,05
194252012H	2,45±0,05	2,75±0,05	8,0±0,3	1,75±0,1	3,5±0,05	4,0±0,1	8,0±0,1	2,0±0,05	1,5+0,1/-0,0	0,25±0,03	1,55±0,05
194303010H	3,3±0,1	3,3±0,1	8,0±0,3	1,75±0,1	3,5±0,05	4,0±0,1	4,0±0,1	2,0±0,1	1,5+0,1/-0,0	0,25±0,03	1,4±0,1
194303012H	3,3±0,1	3,3±0,1	8,0±0,3	1,75±0,1	3,5±0,05	4,0±0,1	4,0±0,1	2,0±0,1	1,5+0,1/-0,0	0,25±0,03	1,6±0,1
194303015H	3,3±0,1	3,3±0,1	8,0±0,3	1,75±0,1	3,5±0,05	4,0±0,1	4,0±0,1	2,0±0,1	1,5+0,1/-0,0	0,25±0,03	1,9±0,1
194404012H	4,3±0,1	4,3±0,1	12,0±0,3	1,75±0,1	5,5±0,1	4,0±0,1	8,0±0,1	2,0±0,1	1,5+0,1/-0,0	0,35±0,03	1,6±0,1
194404018H	4,3±0,1	4,3±0,1	12,0±0,3	1,75±0,1	5,5±0,1	4,0±0,1	8,0±0,1	2,0±0,05	1,5+0,1/-0,0	0,35±0,03	2,1±0,1
194808030H	8,35±0,1	8,35±0,1	16,0±0,2	1,75±0,1	7,5±0,1	4,0±0,1	12,0±0,1	2,0±0,1	1,5+0,1/-0,0	0,4±0,03	3,4±0,1

Lead Dimensions:



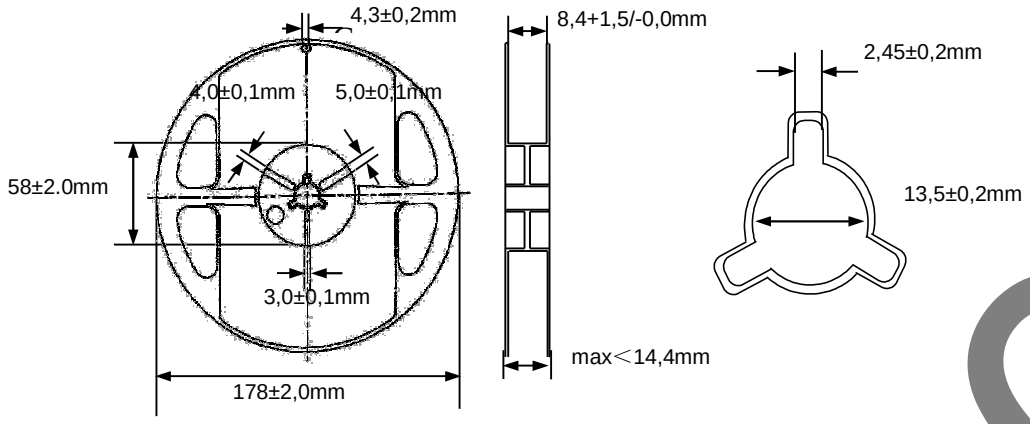
Maximum two chip cavities missing product may exist in a reel but they may not be consecutive two cavities.



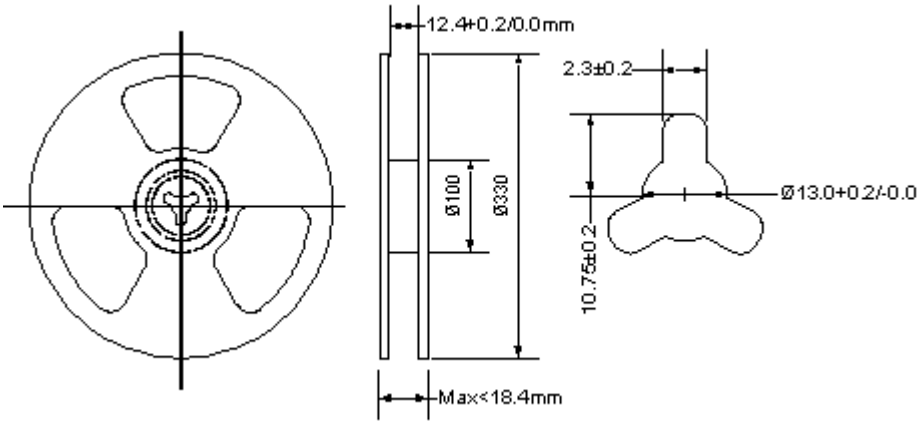
Peel-off strength: 10~100gf size 201610, 202012, 252010, 252012, 303010, 303012, 303015 other 10~130gf.
Peel-off angle: 165°~180°
Peel-off speed: 300mm/min

Reel Dimensions

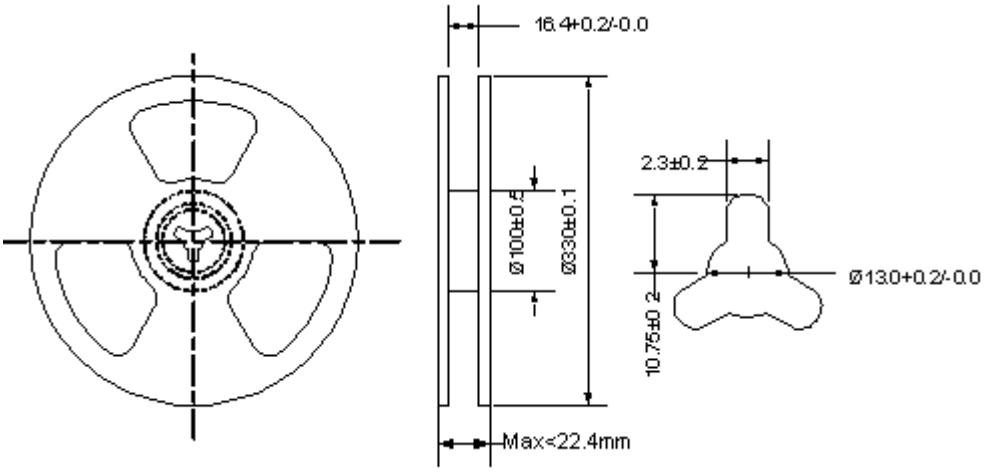
201610, 202012, 252010, 252012, 303010, 303012, 303015



404012, 404018



808030



Stock period

The performance of these products, including the solderability, is guaranteed for 12 month, provided that they remain packed as they were when delivered and stored at a temperature of maximum 40°C (minimum -10°C) and a relative humidity less than 70%RH. In case of storage over 6 months, solderability shall be checked before actual usage.

The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust of harmful gas (e.g. HCl, sulfurous gas of H_2S).
Packaging material may be deformed if package are stored where they are exposed to heat of direct sunlight.

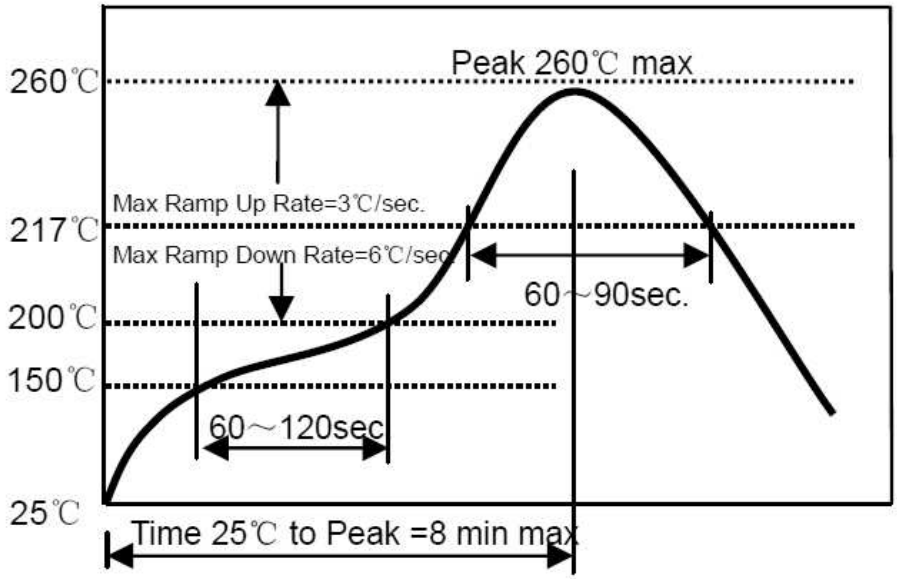
Operating and storage temperature range

(individual chip without packing):): -40°C ~ +125°C, 125°C (Including Self-heating)

Handing

Keep the products away from all magnets and magnetic objects.
Be careful not to subject the products to excessive mechanical shocks.
Please avoid applying impact to the products after mounted on pc board.
Avoid ultrasonic cleaning.

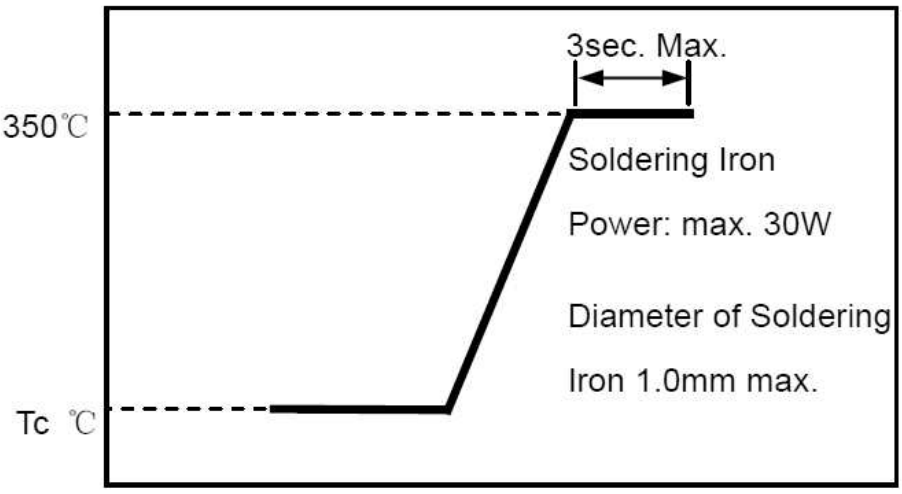
Recommanded Lead Free Reflow Soldering Profile



1~2 °C/sec. Ramp
Pre-heating: 150~200°C/60~120 sec.
Time above 217°C: 60~90sec
Peak temperature: 260°C
Max time at max temp. 5s.
Solder paste: Sn/3,0Ag/0,5Cu
Max.2 times for reflowing

Applicable soldering process to this product is reflow soldering only.

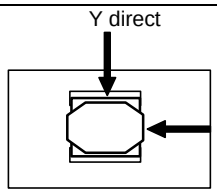
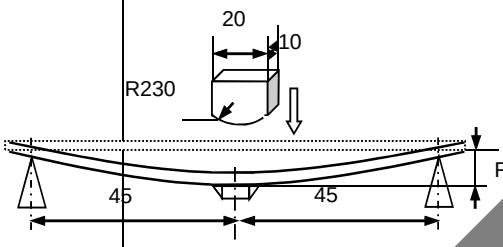
Iron Soldering Profile

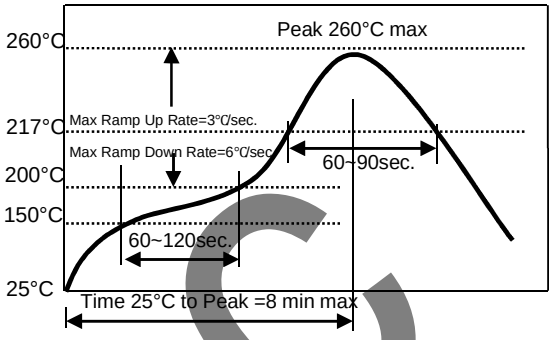
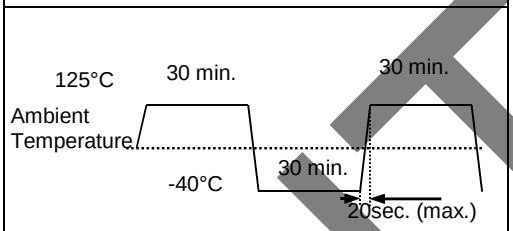


Iron soldering power: Max.30W.
Pre-heating: 150°C / 60sec.
Soldering Tip temperature: 350°C Max.
Soldering time: 3sec Max.
Solder paste: Sn/3,0Ag/0,5Cu.
Max.1 times for iron soldering.

Take care not to apply the tip of the soldering iron to the terminal electrodes.
Recommended conditions for repair by soldering iron:
Preheat the circuit board with product to repair at 150°C for about 1 minute.
Put soldering iron on the land-pattern.
Soldering iron's temperature: 350°C maximum/Duration: 3 seconds maximum/1 time for each terminal.
The soldering iron should not directly touch the inductor.
Product once removes from the circuit board may not be used again.

Reliability Test

Items	Requirements	Test Methods and Remarks
Terminal Strength	No removal or split of the termination or other defects shall occur. 	① Solder the inductor to the testing jig (glass epoxy board shown using leadfree solder. Then apply a force in the direction of the arrow. ② 10N force. ③ Keep time: 5s.
Resistance to Flexure	No visible mechanical damage. 	① Solder the chip to the test jig (glass epoxy board shown) Using a leadfree solder. Then apply a force in the direction shown. ② Flexure: 2mm. ③ Pressurizing Speed: 0,5mm/sec. ④ Keep time: 30 ±1 sec. ⑤ Test boards size: 100x40x1,0
Vibration	① No visible mechanical damage. ② Inductance change: Within ±10%	① Solder the chip to the testing jig (glass epoxy board shown) using leadfree solder. ② The chip shall be subjected to a simple harmonic motion having total amplitude of 1,5mm, the frequency being varied uniformly between the approximate limits of 10 and 55 Hz. ③ The frequency range from 10 to 55 Hz and return to 10 Hz shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (total of 6 hours).
Temperature	Inductance change within ±20%	Temperature range: -40°C~ +125°C Reference temperature: +20°C, change rate shall be calculated
Solderability	90% or more of electrode area shall be coated by new solder.	① The test samples shall be dipped in flux, and then immersed in molten solder. ② Solder temperature: 245±5°C ③ Duration: 5±1 sec. ④ Solder: Sn/3,0Ag/0,5Cu ⑤ Flux: 25% resin and 75% ethanol in weight ⑥ Immersion depth: all sides of mounting terminal shall be immersed

Resistance to Soldering Heat	① No visible mechanical damage. ② Inductance change: Within ±10%.	① Re-flowing Profile ② Test board thickness: 1,0mm ③ Test board material: glass epoxy resin ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring 
Thermal Shock	① No mechanical damage. ② Inductance change: Within ±10%. 	① Temperature, Time: -40±3°C for 30±3 min→ 125°C for 30±3min. ② Transforming interval: 20 sec.(max.). ③ Tested cycle: 100 cycles. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
Resistance to Low Temperature	□ No mechanical damage. □ Inductance change: Within ±10%.	① Temperature: -40±3°C ② Duration: 1000^{+24} hours. ③ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
Resistance to High Temperature	□ No mechanical damage. ② Inductance change: Within ±10%.	① Temperature: 125±2°C ② Duration: 1000^{+24} hours. ③ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
Damp Heat	① No visible mechanical damage. ② Inductance change: Within ±10%.	① Temperature: 60±2°C ② Humidity: 90% to 95% RH. ③ Duration: 1000^{+24} hours. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
Loading Under Damp Heat	① No mechanical damage. ② Inductance change within ±10%	① Temperature: 60±2°C ② Humidity: 90% to 95% RH. ③ Applied current: Rated current. ④ Duration: 1000^{+24} hours. ⑤ The chip shall be stabilized at normal condition for 1~2 hours before measuring.
Loading at High Temperature	① No visible mechanical damage. ② Inductance change within ±10%	① Temperature: 85±2°C ② Duration: 1000^{+24} hours. ③ Applied current: Rated current. ④ The chip shall be stabilized at normal condition for 1~2 hours before measuring.

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