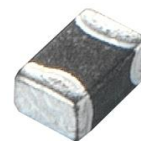


Multilayer Chip Ferrite Large Current Inductors DFL Series



Features

- Compact size and light weight
- Excellent solderability and heat resistance for either flow or reflow soldering
- No cross coupling between inductors due to magnetic shield
- Low RDC and High IDC

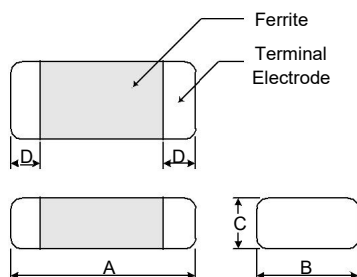
Applications

- Cellular platform DC-DC converter circuit
- Portable AV equipment (digital camera, DVD Type)
- Cellular platform(handset Type)
- Memex(computer Type)

PRODUCT IDENTIFICATION

<u>DFL</u>	<u>1608</u>	<u>C</u>	<u>1R0</u>	<u>M</u>																								
①	②	③	④	⑤																								
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<table><tr><th colspan="2">Type</th></tr><tr><td>DFL</td><td>Series</td></tr></table>	Type		DFL	Series		<table><tr><th colspan="2">External Dimensions (L×W) (mm)</th></tr><tr><td>1608 [0603]</td><td>1.6×0.8</td></tr><tr><td>2012 [0805]</td><td>2.0×0.9</td></tr><tr><td>201212[0805]</td><td>2.0×1.2</td></tr><tr><td>2016 [0806]</td><td>2.0×1.6</td></tr><tr><td>2520 [1008]</td><td>2.5×2.0</td></tr><tr><td>3216 [1206]</td><td>3.2×1.6</td></tr></table>	External Dimensions (L×W) (mm)		1608 [0603]	1.6×0.8	2012 [0805]	2.0×0.9	201212[0805]	2.0×1.2	2016 [0806]	2.0×1.6	2520 [1008]	2.5×2.0	3216 [1206]	3.2×1.6		<table><tr><th colspan="2">Material Code</th></tr><tr><td colspan="2">C</td></tr><tr><td colspan="2">F</td></tr></table>	Material Code		C		F	
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※R= 小数点,																												

Shape and Dimensions



Chip size				
Size	A(mm)	B(mm)	C(mm)	D(mm)
1608	1.6±0.2	0.8±0.2	0.8±0.2	0.3±0.2
2012	2.0±0.2	1.2±0.2	0.9±0.2	0.5±0.3
201212	2.0±0.2	1.2±0.2	1.2±0.2	0.5±0.3
2016	2.0±0.2	1.6±0.2	0.9±0.2	0.5±0.3
2520	2.5±0.2	2.0±0.2	0.9±0.2	0.5±0.3
3216	3.2±0.2	1.6±0.2	0.9±0.2	0.5±0.3

Rating:

Storage Temperature: - 2 5 °C ~ 8 5 °C (after PCB)

- 5 °C ~ 4 0 °C, Humidity 4 0 % ~ 7 0 % (before PCB)

Standard Testing Condition

	Unless otherwise specified	In case of doubt
Temperature	Ordinary Temperature(15 to 35)	20±2
Humidity	Ordinary Humidity(25 to 85% RH)	60 to 70 % RH

Electrical Characteristics
DFL1608 (0603) Series

Part no.	Inductance (uH)	Test Frequency	DC Resistance(Ω) Max.	Irms Max.
DFL1608F1R0M	1uH±20%	1MHz	0.12ohm	1500mA
DFL1608F2R2M	2.2uH±20%	1MHz	0.20ohm	1000mA
DFL1608C2R7M	2.7uH±20%	1MHz	1.50ohm	200mA
DFL1608F3R3M	3.3uH±20%	1MHz	0.70ohm	600mA
DFL1608C4R7M	4.7uH±20%	1MHz	0.80ohm	500mA
DFL1608F4R7M	4.7uH±20%	1MHz	0.25ohm	800mA
DFL1608F6R8M	6.8uH±20%	1MHz	1.00ohm	400mA
DFL1608C100M	10uH±20%	1MHz	0.90ohm	90mA
DFL1608F100M	10uH±20%	1MHz	1.30ohm	400mA

DFL2012 (0805) Series

Part no.	Inductance (uH)	Test Frequency	DC Resistance(Ω) Max.	Irms Max.
DFL2012C1R0M	1uH±20%	1MHz	0.30ohm	500mA
DFL2012F1R0M	1uH±20%	1MHz	0.06ohm	2200mA
DFL2012C2R2M	2.2uH±20%	1MHz	0.30ohm	500mA
DFL2012F2R2M	2.2uH±20%	1MHz	0.19ohm	1300mA
DFL2012C3R3M	3.3uH±20%	1MHz	0.30ohm	500mA
DFL2012F3R3M	3.3uH±20%	1MHz	0.12ohm	1500mA
DFL2012C4R7M	4.7uH±20%	1MHz	0.40ohm	500mA
DFL2012F4R7M	4.7uH±20%	1MHz	0.30ohm	900mA
DFL2012F6R8M	6.8uH±20%	1MHz	0.27ohm	550mA
DFL2012F100M	10uH±20%	1MHz	0.9ohm	50mA
DFL2012XD100M	10uH±20%	1MHz	0.56ohm	250mA
DFL2012C100M	10uH±20%	1MHz	0.50ohm	400mA
DFL2012C150M	15uH±20%	1MHz	0.50ohm	400mA
DFL2012C220M	22uH±20%	1MHz	0.70ohm	300mA

※Irms: DC current value when the self-generation of heat rises to 40°C
(Reference ambient temperature:25°C)

Electrical Characteristics
DFL2016 (0806) Series

Part no.	Inductance (uH)	Test Frequency	DC Resistance(Ω) Max.	Irms Max.
DFL2016F1R0M	1uH±20%	1MHz	0.11ohm	1400mA
DFL2016F1R5M	1.5uH±20%	1MHz	0.15ohm	1200mA
DFL2016F2R2M	2.2uH±20%	1MHz	0.20ohm	1200mA
DFL2016F3R3M	3.3uH±20%	1MHz	0.30ohm	1200mA
DFL2016F4R7M	4.7uH±20%	1MHz	0.35ohm	1100mA

DFL2520 (1008) Series

Part no.	Inductance (uH)	Test Frequency	DC Resistance(Ω) Max.	Irms Max.
DFL2520F1R0M	1uH±20%	1MHz	0.15ohm	1600mA
DFL2520F1R5M	1.5uH±20%	1MHz	0.18ohm	1500mA
DFL2520F2R2M	2.2uH±20%	1MHz	0.25ohm	1300mA
DFL2520F3R3M	3.3uH±20%	1MHz	0.30ohm	1200mA
DFL2520F4R7M	4.7uH±20%	1MHz	0.32ohm	1100mA

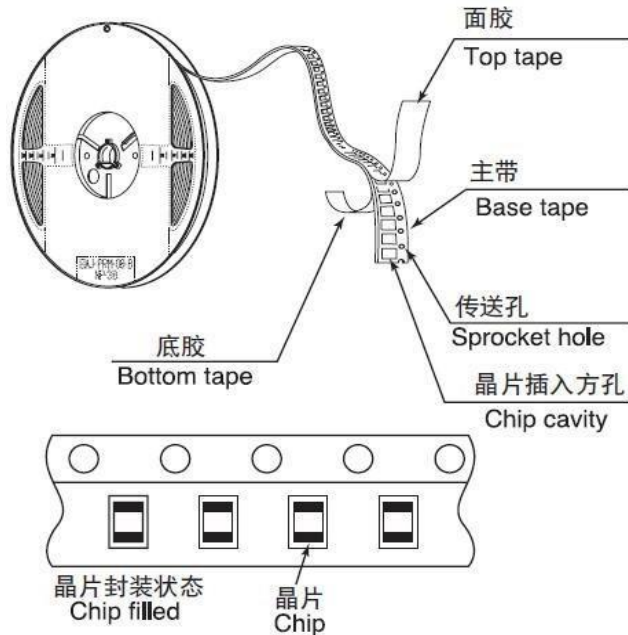
DFL3216 (1206) Series

Part no.	Inductance (uH)	Test Frequency	DC Resistance(Ω) Max.	Irms Max.
DFL3216C1R0M	1uH±20%	1MHz	0.30ohm	500mA
DFL3216F1R0M	1uH±20%	1MHz	0.15ohm	1500mA
DFL3216C2R2M	2.2uH±20%	1MHz	0.40ohm	500mA
DFL3216F2R2M	2.2uH±20%	1MHz	0.24ohm	900mA
DFL3216C3R3M	3.3uH±20%	1MHz	0.40ohm	500mA
DFL3216F3R3M	3.3uH±20%	1MHz	0.30ohm	800mA
DFL3216C4R7M	4.7uH±20%	1MHz	0.60ohm	300mA
DFL3216F4R7M	4.7uH±20%	1MHz	0.38ohm	700mA
DFL3216C6R8M	6.8uH±20%	1MHz	0.80ohm	200mA
DFL3216F6R8M	6.8uH±20%	1MHz	0.45ohm	500mA
DFL3216C100M	10uH±20%	1MHz	1.00ohm	100mA
DFL3216F100M	10uH±20%	1MHz	0.55ohm	300mA

包装 PACKAGING

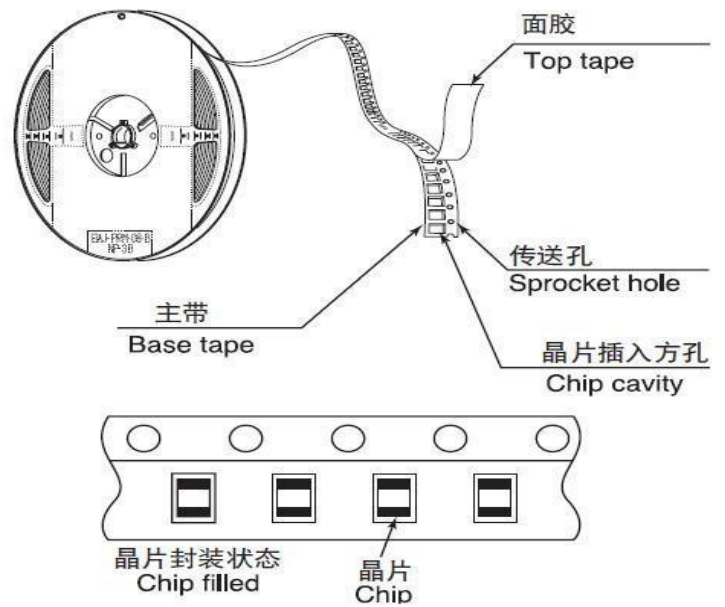
纸带

Card board carrier tape

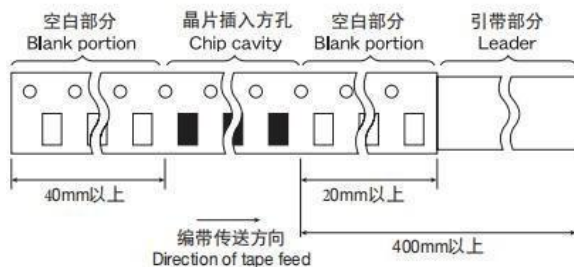


压纹带

Embossed Tape

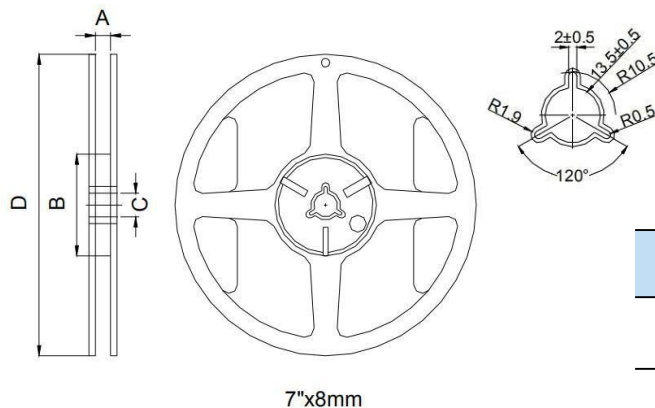


引带和空白部分 LEADER AND BLANK PORTION



型 号 TYPE	元件厚度 Thickness (mm)	标准数量 [pcs] Standard Quantity	
		纸带 Paper Tape	压纹带 Embossed Tape
DFL1608	0.8	4000	
DFL2012	0.9	4000	
DFL201212	1.2		3000
DFL2016	0.9		3000
DFL2520	0.9		3000
DFL3216	0.9	4000	

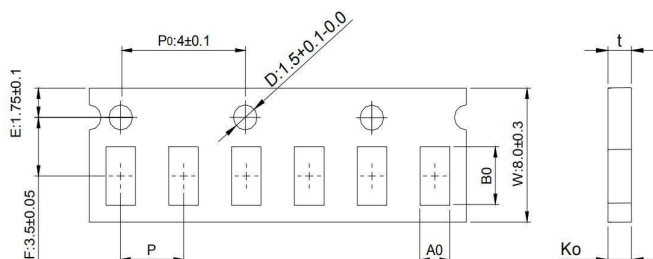
卷盘尺寸



Type	A (mm)	B (mm)	C (mm)	D (mm)
7" x8mm	9.0±0.5	60±2	13.5±0.5	178±2

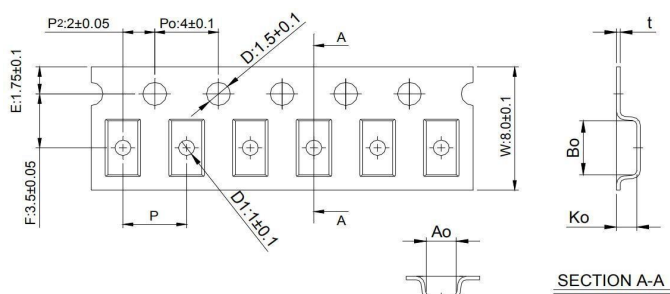
包装 PACKAGING

纸带 (8mm宽) (0.315英寸宽) Paper tape (0.315 inches wide)



型号 TYPE	元件厚度 Thickness (mm)	晶片插入方孔 Chip cavity		插入间距 Insertion Pitch P	带厚 Tape Thickness KO&t
		AO	BO		
DFL1608	0.8	1.1±0.2	1.9±0.2	4.0±0.2	1.1max
DFL2012	0.9	1.5±0.2	2.3±0.2	4.0±0.2	1.1max
DFL3216	0.9	1.9±0.2	3.5±0.2	4.0±0.2	1.1max

压纹带 (8mm宽) (0.312英寸宽) Embossed Tape (0.312 inches wide)

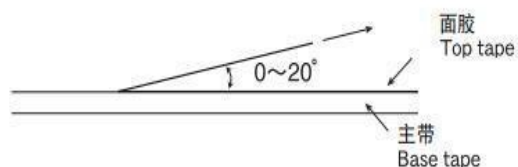


型号 TYPE	元件厚度 Thickness (mm)	晶片插入方孔 Chip cavity		插入间距 Insertion Pitch P	槽孔深度 Slot Depth KO	带厚 Tape Thickness t
		AO	BO			
DFL2012	1.2	1.52±0.1	2.41±0.1	4.0±0.1	1.35±0.1	0.23±0.1
DFL2016	0.9	1.80±0.1	2.41±0.1	4.0±0.1	1.15±0.1	0.23±0.1
DFL2520	0.9	2.25±0.1	2.80±0.1	4.0±0.1	1.15±0.1	0.23±0.1

面胶强度 Top tape strength

面胶的剥离力应在0.1~0.7N以内, 其方向如下图所示。

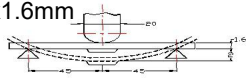
The top tape requires a peel-off force of 0.1~0.7N in the direction of the arrow as illustrated below.



Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

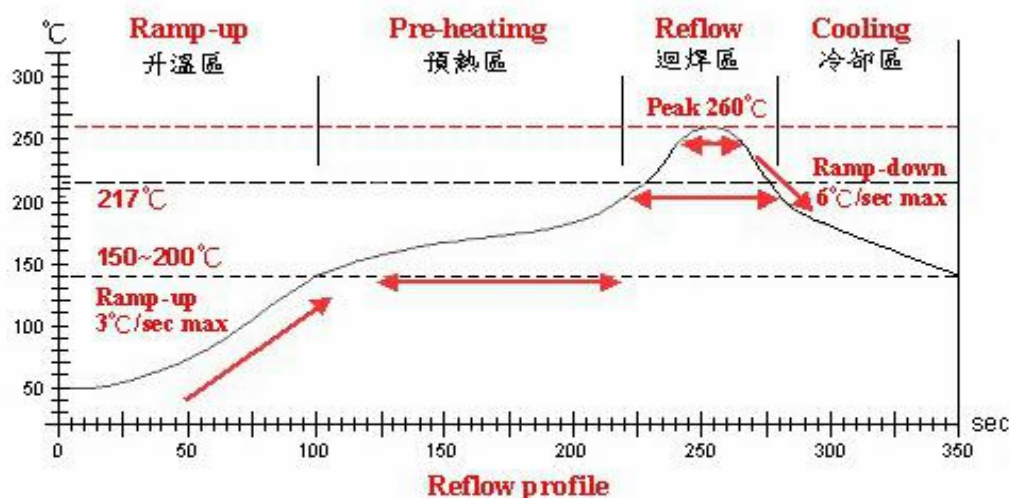
Reliability Of Ferrite Multilayer Chip Inductor

1-1.Mechanical Performance

No	Item	Specification	Test Method
1-1-1	Flexure Strength	The forces applied on the right conditions must not damage the terminal electrode and the ferrite	Test device shall be soldered on the substrate Substrate Dimension: 100x40x1.6mm Deflection: 2.0mm Keeping Time: 30sec  *For 100505, substrate dimension is 100x40x0.8mm
1-1-2	Vibration		Test device shall be soldered on the substrate Oscillation Frequency: 10 to 55 to 10Hz for 1min Amplitude: 1.5mm Time: 2hrs for each axis (X, Y & Z), total 6hrs
1-1-3	Resistance to Soldering Heat	Appearance: No damage More than 75% of the terminal electrode should be covered with solder. Inductance: within $\pm 20\%$ of initial value	Pre-heating: 150°C, 1min Solder Composition: Sn/Ag3.0/Cu0.5(Pb-Free) Solder Temperature: 260 $\pm 5^\circ\text{C}$ Immersion Time: 10 ± 1 sec
1-1-4	Solder ability	The electrodes shall be at least 95% covered with new solder coating	Pre-heating: 150°C, 1min Solder Composition: Sn/Ag3.0/Cu0.5(Pb-Free) Solder Temperature: 245 $\pm 5^\circ\text{C}$ (Pb-Free) Immersion Time: 4 ± 1 sec

1-2.Environmental Performance

No	Item	Specification	Test Method		
1-2-1	Temperature Cycle	Appearance: No damage Inductance:within±20% of initial value	One cycle:		
			Step	Temperature ()	Time (min)
			1	-25±3	30
			2	25±2	3
			3	85±3	30
			4	25±2	3
			Total: 100cycles Measured after exposure in the room condition for 24hrs		
1-2-2	Humidity Resistance	Temperature: 40±2 Relative Humidity: 90 ~ 95% / Time: 1000hrs Measured after exposure in the room condition for 24hrs			
1-2-3	High Temperature Resistance	Temperature: 85±3 Relative Humidity: 20% Applied Current: Rated Current / Time: 1000hrs Measured after exposure in the room condition for 24hrs			
1-2-4	Low Temperature Resistance	Temperature: -25±3 Relative Humidity: 0% / Time: 1000hrs Measured after exposure in the room condition for 24hrs			



Lead-Free(LF) 標準溫度分析範圍

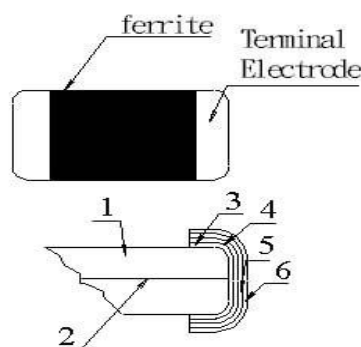
Refer to J-STD-020C

管制項目 Item.	升温區 Ramp-up	預熱區 Pre-heating	迴焊區 Reflow	Peak Temp	冷卻區 Cooling
溫度範圍 Temp. scope	R.T. ~ 150°C	150°C ~ 200°C	217°C	260±5°C	Peak Temp. ~ 150°C
標準時間 Time spec.	—	60 ~ 180 sec	60 ~ 150 sec	20 ~ 40 sec	—
實際時間 Time result	—	75 ~ 100 sec	90 ~ 120 sec	20 ~ 35 sec	—

NOTE :

1. Re-flow possible times : within 2 times
2. Nitrogen adopted is recommended while in re-flow

Construction:



Material List:

NO	PART	MATERIAL
1	Ferrite Substance	NiO-CuO-ZnO-Ferrite
2	Silver electrode	Ag
3	Silver electrode	Ag
4	Cu plating	Cu
5	Ni plating	Ni
6	Sn plating	Sn