### Chip Common Mode Choke Coil

Circuit Type?





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# **Product Guide**

Common Mod	e Choke Coils	Series	Size Code in inch (in mm)	Common Mode Impedance (Ω) at 100MHz	Effective Frequency Range (Applicable Frequency Ranges are only for reference.) 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz
	For Audio Lines	p184 DLM11G	0504 (1210)	600	
		DLM11S	0504 (1210)	45 90	
		DLP0QSN P186	025020 (0605)	60	
		DLP0QSA P186	025020 (0605)	15 7 35	
		DLP0NSC P187	03025 (0806)	28	
		DLPONSN P187	03025 (0806)	35 90 67 120	
		DLPONSA P187	03025 (0806)	15 7	
	nes	DLP11SN P189	0504 (1210)	67 240 90 120 160 200 280 330	
ype	alLi	DLP11SA P189	0504 (1210)	35 90 67	
Signal Lines Type	Sign	DLP11RN	0504 (1210)	45	
al Lir	beed	DLP11RB	0504 (1210)	15 40	
Sign	ds dg	DLP11TB	0504 (1210)	80	
	ä Hiç	DLP31S P192	1206 (3216)	120 220 550	
	For Ultra High Speed Signal Lines	(2 circuits array)	05025 (1506)	35 90 67	
	<u>Ē</u>	(2 circuits array)	0804 (2010)	35 90 67	
		(2 circuits array) p194	0804 (2010)	90 240 67 120 160 200 280	
		(2 circuits array) p196	1206 (3216)	90 130 200 320 440	
		DLW21S	0805 (2012)	90 490 67 120 180 260 370 500	
		DLW21H	0805 (2012)	90 67 120 180	
		DLW31SN P200	1206 (3216)	90 160 260 600 1000 2200	
		DLW43SH P201	1812 (4532)		
Universal	Lines / Signal Lines ]	DLW5AH/DLW5BS*	2014 /2020 (5036)/(5050)	500 800 1500 4000 190 350 600 1000 3000	
Úni -	ב מ ב י	DLW5AT*/DLW5BT*	2014 /2020 (5036)/(5050)	50         110         230         330         500         1000         1400           100         150         250         400         850         1100         2700	

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Large Current Common Mode Choke Coil for Automotive Available	Series	Size Code in inch (in mm)		ode Impedance (Ω) a 500	at 10MHz 1000	Effective Frequency Range (Applicable Frequency Ranges are only for reference.) 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz
Large Current Type for Auto- motive Available	PLT10HH*	-	45 100	400 500	900 1000	

<b>BNX</b>							
Block El	Block EMIFIL® Series			Height (mm)			Effective Frequency Range (Applicable Frequency Ranges are only for reference.) 10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz
		BNX022*	p221	3.1	50	10	
	Type	BNX023*	p221	3.1	100	15	
e	SMD Type	BNX024*	p221	3.5	50	15	
Typ	0	BNX025*	p221	3.5	25	15	
Power Lines Type		BNX002	p223	13 max.	50	10	
wer	be	BNX003	p223	13 max.	150	10	
Ро	Lead Type	BNX005	p223	13.5 max.	50	15	
	Lea	BNX012*	p224	8.5 max.	50	15	
		BNX016*	p224	8.5 max.	25	15	

\* The derating of rated current is required for some items according to the operating temperature on each product page.

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# **DL** Series Introduction





Magnetic flux caused by common mode current accumulates and works as an inductor.

Magnetic flux caused by differential mode current cancel each other and does not work as an inductor.

Category	Features, Classification	Structure	Part Number	Comments
	Ultra high cut-off frequency for high speed differential signal lines	Film type	<ul> <li>DLP0QSA</li> <li>DLP0NSA</li> <li>DLP11SA</li> <li>DLP11RB</li> <li>DLP11TB</li> <li>DLP2ADA</li> </ul>	<ul> <li>Low profile, small size, suitable for mobile equipment.</li> <li>Tight terminal pitch enables high density layout.</li> <li>Ultra high cut-off frequency and its matching to line impedance enables good transmission of high speed signal.</li> </ul>
	dinerential signal lines	Wound type	<ul> <li>DLW21SN_HQ2</li> <li>DLW21HN_HQ2</li> </ul>	<ul> <li>Ultra high self-resonance frequency enables high cut-off frequency.</li> <li>Its matching to line impedance enables good transmission of high speed signal.</li> </ul>
High cut-off frequency High Coupling /For high speed		Multilayer type	DLM11SN	<ul> <li>Enables noise suppression for differential signal line without distortion in high-speed signal transmission.</li> </ul>
differential signal lines/	High cut-off frequency for high speed differential signal lines	Film type	<ul> <li>DLP0QSN</li> <li>DLP0NS</li> <li>DLP11SN</li> <li>DLP11RN</li> <li>DLP2AD</li> </ul>	<ul> <li>Low profile, small size, suitable for mobile equipment.</li> <li>Tight terminal pitch enables high density layout.</li> <li>High cut-off frequency enables good transmission of high speed signal.</li> </ul>
		Wound type	<ul> <li>DLW21SN_SQ2</li> <li>DLW31S</li> <li>DLW21HN_SQ2</li> </ul>	<ul> <li>Ultra high self-resonance frequency enables high cut-off frequency.</li> <li>DLW21H is designed as low profile.</li> </ul>
	For general differential signal lines	Film type	<ul><li>DLP31S</li><li>DLP31D</li></ul>	<ul> <li>Low profile,small size, suitable for mobile equipment.</li> <li>Tight terminal pitch enables high density layout.</li> </ul>
Large current High coupling (For power lines)		Wound type	DLW5AH DLW5BS DLW5AT DLW5BT	<ul> <li>Large current (6A max.), suitable for input connector from an AC adaptor.</li> <li>DLW5AT/DLW5BT is designed as low profile.</li> </ul>
Relative high differential mode impedance Low coupling (For audio lines)		Multilayer type	DLM11G	<ul> <li>Modified differential mode impedance is higher than other common mode choke coils; this feature makes it possible to suppress both common mode and differential mode noise.</li> <li>Ideal to keep low distortion audio signal.</li> </ul>
Large current Automotive Available (For power lines)	Available up to 18A	Winding type Cased structure	PLT10HH	· Large current, high reliability, suitable for motors in automobiles.

**Chip Ferrite Bead** 

Chip EMIFIL®

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Suppression DLP/DLW Series

Noise

## **Skew Improvement Effect of Common Mode Choke Coil**

Example of Skew Improvement by Common Mode Choke Coil (Tested using pulse generator waveform)

Waveform is equivalent to 1000Mbps signal



- 341-

D+



## Noise Suppression of Common Mode Choke Coil in HDMI Line



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Mechanism of Skew Improvement

ent change generates etic flux on a ferrite core

111

Curre

Waveform rises (or falls)



Transition Time

Fall time: 77.4ps

Each common mode choke coil can keep the waveform and satisfy the specification

Fall time: 85.5ps

Fall time: 97.4ps

(Part Number)	DL	W	21	S	Ν	371	S	Q	2	L
	1	2	3	4	5	6	7	8	9	10

Product ID	
Product ID	
DL	Chip Common Mode Choke Coils

#### 2 Structure

Code	Structure
W	Wire Wound Type
М	Multilayer Type
Р	Film Type

#### Object Stress (L×W)

	,	
Code	Dimensions (L×W)	EIA
0Q	0.65×0.5mm	025020
0N	0.85×0.65mm	03025
11	1.25×1.0mm	0504
1N	1.5×0.65mm	05025
21	2.0×1.2mm	0805
2A	2.0×1.0mm	0804
31	3.2×1.6mm	1206
43	4.5×3.2mm	1812
5A	5.0×3.6mm	2014
5B	5.0×5.0mm	2020
		·

#### 4 Features (1)

Code	Туре
S	Magnetically Shielded One Circuit Type
D	Magnetically Shielded Two Circuit Type
н	Open Magnetic One Circuit Type
G	Magnetically Shielded Audio Type
R/T	One Circuit Low Profile Type

#### GCategory Code Category Α в С н Expressed by a letter. Μ Ν R

#### 6Impedance

Typical impedance at 100MHz is expressed by three figures. The unit is in ohm ( $\Omega$ ). The first and second figures are significant digits, and the third figure expresses the number of zeros that follow the two figures.

#### 6 Inductance (DLW43SH)

Expressed by three figures. The unit is micro-henry ( $\mu$ H). The first and second figures are significant digits, and the third figure expresses the number of zeros which follow the two figures.

#### Circuit

Code	Circuit			
S				
М				
н	Expressed by a letter.			
U				
т				
х				

#### 8Features (2)

Code	Features		
D			
К			
Р	Exercise of her a letter		
L	Expressed by a letter.		
Q			
Y			

#### ONUMber of Signal Lines

Code	Number of Signal Lines
2	Two Lines
4	Four Lines

#### I

Packaging		
Code	Packaging	Series
К	Embossed Taping (ø330mm Reel)	DLW5AH/DLW5BS/DLW5BT
L	Embossed Taping (ø180mm Reel)	All Series
В	Bulk	All Series
D	Paper Taping (ø180mm Reel)	DLP0QS/DLM11G

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# Chip Common Mode Choke Coil Series Line Up

Туре	Size Code	Thickness	Part Number	Common Mode Impedance	Rated Current	New Kit	A HD Zmatch F	low ReFlow
	in inch (in mm)	(mm)		(at 100MHz/20°C)			BA UD	
Multilayer Type for Audio Lines	0504(1210) p184 p185	0.5	DLM11GN601SD2	600ohm±25%	100mA			ReFlow
Multilayer Type for Differential Signal Lines	0504(1010)	0.5	DLM11SN450HY2	45ohm±25% 90ohm±25%	100mA 100mA	Kit Kit	HD Zmatch	R <sub>eFlow</sub>
Differential Signal Lines	p186	0.5	DLM11SN900HY2					
	<i>μ</i> 180	0.3	DLP0QSN600HL2	60ohm±25%	50mA	Kit Kit	HD Zmatch	R <sub>eFlow</sub>
	025020(0605)	0.3	DLP0QSA070HL2	7ohm±2ohm	100mA			ReFlow
		0.3	DLP0QSA150HL2	15ohm±5ohm	100mA	Kit		ReFlow
	p187	0.3	DLP0QSA350HL2	35ohm±10ohm	100mA	Kit		RoFlow
	p187	0.45	DLP0NSC280HL2	280hm±20%	100mA	Kit	H <sub>D</sub> Z <sub>match</sub>	ReFlow
		0.45	DLP0NSN350HL2	35ohm±10ohm	100mA	Kit	HD Zmatch	ReFlow
	00005(0000)	0.45	DLP0NSN670HL2	67ohm±20%	110mA	Kit	H <sub>D</sub> Z <sub>match</sub>	RoFlow
	03025(0806)	0.45	DLP0NSN900HL2	90ohm±20%	100mA	Kit	HD Zmatch	RoFlow
		0.45	DLP0NSN121HL2	120ohm±20%	90mA	Kit	HD Zmatch	ReFlow
		0.45	DLP0NSA070HL2	7ohm±2ohm	100mA	Kit		ReFlow
		0.45	DLP0NSA150HL2	15ohm±5ohm	100mA	Kit		RoFlow
	p189	0.82	DLP11SN670SL2	67ohm±20%	180mA	Kit	H⊳	ReFlow
		0.82	DLP11SN121SL2	120ohm±20%	140mA	Kit	H⊳	ReFlow
Film Type		0.82	DLP11SN161SL2	160ohm±20%	120mA	Kit	H⊳	R <sub>eFlow</sub>
for Differential		0.82	DLP11SN900HL2	90ohm±20%	150mA	Kit	HD Zmatch	ReFlow
Signal Lines		0.82	DLP11SN201HL2	200ohm±20%	110mA	Kit	HD Zmatch	ReFlow
		0.82	DLP11SN241HL2	240ohm±20%	100mA	Kit	H <sub>D</sub> Z <sub>match</sub>	ReFlow
		0.82	DLP11SN281HL2	280ohm±20%	90mA	Kit	HD Zmatch	RoFlow
	0504(1210)	0.82	DLP11SN331HL2	330ohm±20%	80mA	Kit	HD Zmatch	ReFlow
		0.82	DLP11SA350HL2	35ohm±20%	170mA	Kit		ReFlow
		0.82	DLP11SA670HL2	67ohm±20%	150mA	Kit		R <sub>eFlow</sub>
		0.82	DLP11SA900HL2	90ohm±20%	150mA	Kit		ReFlow
	p190	0.5	DLP11RN450UL2	45ohm±25%	100mA	Kit	HD Zmatch	ReFlow
		0.5	DLP11RB150UL2	15ohm±5ohm	100mA	Kit		ReFlow
		0.5	DLP11RB400UL2	40ohm±10ohm	100mA	Kit	U <sub>D</sub> Z <sub>match</sub>	ReFlow
	p191	0.3	DLP11TB800UL2	80ohm±25%	100mA	Kit		ReFlow
	p192	1.15	DLP31SN121ML2	120ohm±20%	100mA		H⊳	ReFlow
	1206(3216)	1.15	DLP31SN221ML2	220ohm±20%	100mA		H⊳	ReFlow
		1.15	DLP31SN551ML2	550ohm±20%	100mA		H⊳	ReFlow
	p193	0.45	DLP1NDN350HL4	35ohm±20%	100mA	Kit	HD Zmatch	ReFlow
	05025(1506)	0.45	DLP1NDN670HL4	67ohm±20%	80mA	Kit	HD Zmatch	ReFlow
		0.45	DLP1NDN900HL4	90ohm±20%	60mA	Kit	HD Zmatch	ReFlow
	p194	0.82	DLP2ADA350HL4	35ohm±20%	150mA	Kit		ReFlow
		0.82	DLP2ADA670HL4	67ohm±20%	130mA	Kit		ReFlow
		0.82	DLP2ADA900HL4	90ohm±20%	120mA	Kit	U <sub>D</sub> Z <sub>match</sub>	ReFlow
		0.82	DLP2ADN670HL4	67ohm±20%	140mA	Kit	H <sub>D</sub> Z <sub>match</sub>	ReFlow
	0004(0010)	0.82	DLP2ADN900HL4	90ohm±20%	130mA	Kit	H <sub>D</sub> Z <sub>match</sub>	ReFlow
Film Array Type	0804(2010)	0.82	DLP2ADN121HL4	120ohm±20%	120mA	Kit	H <sub>D</sub> Z <sub>match</sub>	R <sub>*Flow</sub>
for Differential		0.82	DLP2ADN161HL4	160ohm±20%	100mA	Kit	HD Zmatch	ReFlow
Signal Lines		0.82	DLP2ADN201HL4	200ohm±20%	90mA	Kit	HD Zmatch	ReFlow
		0.82	DLP2ADN241HL4	240ohm±20%	80mA	Kit	H <sub>D</sub> Z <sub>match</sub>	ReFlow
		0.82	DLP2ADN281HL4	280ohm±20%	80mA	Kit	HD Zmatch	ReFlow
	p196	1.15	DLP31DN900ML4	90ohm±20%	160mA		H	ReFlow
		1.15	DLP31DN131ML4	130ohm±20%	120mA		H⊳	ReFlow
	1206(3216)	1.15	DLP31DN201ML4	200ohm±20%	100mA		Ho	RoFlow
		1.15	DLP31DN321ML4	320ohm±20%	80mA		Ho	ReFlow
		1.15	DLP31DN441ML4	440ohm±20%	70mA		H₀	ReFlow
	p197	1.2	DLW21SN670SQ2	67ohm±25%	400mA	Kit	Ho	ReFlow
		1.2	DLW21SN900SQ2	90ohm±25%	330mA	Kit	Ho	ReFlow
		1.2	DLW21SN121SQ2	120ohm±25%	370mA	Kit	H	ReFlow
		1.2	DLW21SN181SQ2	180ohm±25%	330mA	Kit	H₀	ReFlow
		1.2	DLW21SN261SQ2	260ohm±25%	300mA	Kit	Ho	ReFlow
		1.2	DLW21SN371SQ2	370ohm±25%	280mA	Kit	H⊳	ReFlow
	0805(2012)	1.2	DLW21SN501SK2	500ohm±25%	250mA	Kit	Ho	ReFlow
		1.2	DLW21SN670HQ2	67ohm±25%	320mA	Kit	UD Zmatch	ReFier
		1.2	DLW21SN900HQ2	90ohm±25%	280mA	Kit		ReFlow
Wire Wound Type		1.2	DLW21SN121HQ2	120ohm±25%	280mA	Kit	UD Zmatch	ReFlow
for Differential	p198	1.2	DLW21SN1211Q2	180ohm±25%	240mA	New Kit	HD	ReFlow
Signal Lines		1.2	DLW21SN161XQ2	260ohm±25%	220mA	New Kit	HD	ReFlow
	1	1.6		20001111220/0				under low

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Chip Common Mode Choke Coil



# DL Chip Common Mode Choke Coil Series Line Up

Туре	Size Code	Thickness	Part Number	Common Mode Impedance	Rated Current	New Kit 200 UN Zmatch Flow ReFlow
	in inch (in mm)	(mm)		(at 100MHz/20°C)	nated Ourient	≧3A UD
Wire Wound Type	p198	1.2	DLW21SN491XQ2	490ohm±25%	190mA	New Kit HD ReFlow
for Differential	p197	1.2	DLW21SR670HQ2	67ohm±25%	400mA	Kit UD Zmatch ReFlow
Signal Lines	p199	0.9	DLW21HN670SQ2	67ohm±25%	330mA	
		0.9	DLW21HN900SQ2	90ohm±25%	330mA	
	0805(2012)	0.9	DLW21HN121SQ2	120ohm±25%	280mA	
		0.9	DLW21HN181SQ2	180ohm±25%	250mA	
		0.9	DLW21HN670HQ2	67ohm±25%	240mA	
		0.9	DLW21HN900HQ2	90ohm±25%	220mA	Kit UD Zmatch ReFlow
		0.9	DLW21HN121HQ2	120ohm±25%	200mA	Kit UD Zmatch ReFlow
	p200	1.9	DLW31SN900SQ2	90ohm±25%	370mA	HD ReFlow
		1.9	DLW31SN161SQ2	160ohm±25%	340mA	
	1206(3216)	1.9	DLW31SN261SQ2	260ohm±25%	310mA	HD ReFlow
	1200(0210)	1.9	DLW31SN601SQ2	600ohm±25%	260mA	HD ReFlow
		1.9	DLW31SN102SQ2	1000ohm±25%	230mA	Но В. Екон
		1.9	DLW31SN222SQ2	2200ohm±25%	200mA	HD ReFlow
	p201	2.6	DLW43SH110XK2	-	360mA	ReFlow
Wire Wound Type for		2.6	DLW43SH220XK2	-	310mA	ReFlow
Differential Signal Lines	8 1812(4532)	2.6	DLW43SH510XK2	-	230mA	ReFier
Automotive Type		2.6	DLW43SH101XK2	-	200mA	ReFlow
		2.7	DLW43SH101XP2	-	170mA	ReFlow
	p177	4.3	DLW5AHN402SQ2	4000ohm (Typ.)	200mA	Kit ReFlow
	p179	2.2	DLW5ATN111SQ2	110ohm (Typ.)	5000mA	Kit ≧3A ReFlow
		2.2	DLW5ATN401SQ2	400ohm (Typ.)	2000mA	Kit 21A ReFlow
		2.2	DLW5ATN501SQ2	500ohm (Typ.)	1500mA	Kit ≧1A ReFlow
		2.2	DLW5ATN851SQ2	850ohm (Typ.)	1500mA	Kit 21A ReFlow
		2.2	DLW5ATN272SQ2	2700ohm (Typ.)	1000mA	Kit 21A ReFlow
	p182	2.2	DLW5ATN500MQ2	50ohm (Typ.)	6000mA	Kit ≧3A Flow ReFlow
	2014(5036)	2.2	DLW5ATN151MQ2	150ohm (Typ.)	5000mA	Kit ≧3A Flow ReFlow
		2.2	DLW5ATN331MQ2	330ohm (Typ.)	4000mA	Kit 23A Flow ReFlow
		2.2	DLW5ATN501MQ2	500ohm (Typ.)	2500mA	New Kit ≧1A Flow ReFlow
		2.2	DLW5ATN112MQ2	1100ohm (Typ.)	2000mA	Kit ≧1A Flow ReFlow
		2.2	DLW5ATN111TQ2	100ohm (Typ.)	5000mA	Kit ≧3A ReFlow
		2.2	DLW5ATN231TQ2	230ohm (Typ.)	4000mA	Kit ≧3A ReFlow
		2.2	DLW5ATN401TQ2	400ohm (Typ.)	2500mA	New Kit ≧1A ReFlow
		2.2	DLW5ATN501TQ2	500ohm (Typ.)	2000mA	Kit ≧1A ReFlow
Wire Wound Type	p177	4.5	DLW5BSM501TQ2	500ohm (Typ.)	1000mA	New Kit ≧1A ReFlow
for Power Lines		4.5	DLW5BSM601TQ2	600ohm (Typ.)	1400mA	New Kit ≧1A ReFlow
and Signal Lines		4.5	DLW5BSM801TQ2	800ohm (Typ.)	2000mA	New Kit ≧1A ReFlow
		4.5	DLW5BSM191SQ2	190ohm (Typ.)	5000mA	Kit 23A ReFlow
		4.5	DLW5BSM351SQ2	350ohm (Typ.)	2000mA	Kit 21A ReFlow
		4.5	DLW5BSM102SQ2	1000ohm (Typ.)	1500mA	Kit 21A ReFlow
		4.5	DLW5BSM152SQ2	1500ohm (Typ.)	1000mA	Kit 21A ReFlow
		4.5	DLW5BSM302SQ2	3000ohm (Typ.)	500mA	
	p179	2.35	DLW5BTM101SQ2	100ohm (Typ.)	6000mA	Kit 23A ReFlow
	2020(5050)	2.35	DLW5BTM251SQ2	250ohm (Typ.)	5000mA	Kit 23A ReFlow
		2.35	DLW5BTM501SQ2	500ohm (Typ.)	4000mA	Kit 23A ReFlow
		2.35	DLW5BTM102SQ2	1000ohm (Typ.)	2000mA	Kit 21A ReFlow
		2.35	DLW5BTM142SQ2	1400ohm (Typ.)	1500mA	Kit ≧1A ReFlow
	p182	2.35	DLW5BTM101TQ2	100ohm (Typ.)	6000mA	Kit ≧3A ReFion
		2.35	DLW5BTM251TQ2	250ohm (Typ.)	5000mA	Kit ≧3A ReFlow
		2.35	DLW5BTM501TQ2	500ohm (Typ.)	4000mA	Kit ≧3A ReFixe
		2.35	DLW5BTM102TQ2	1000ohm (Typ.)	2500mA	New Kit ≧1A ReFixe
		2.35	DLW5BTM142TQ2	1400ohm (Typ.)	2000mA	Kit ≧1A ReFlow

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**DLW5AH/DLW5BS** 



Refer to pages from p.205 to p.209 for mounting information.

Bulk(Bag)

в

#### Rated Value ( packaging code)

Part Number	Common Mode Impedance (at 10MHz/20°C)	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLW5AHN402SQ2	-	4000ohm (Typ.)	200mA	50Vdc	10M ohm	125Vdc	3.0ohm max.	Kit
DLW5BSM501TQ2	2800ohm ±40%	500ohm (Typ.)	1000mA	50Vdc	10M ohm	125Vdc	0.23ohm max.	New Kit ≧1A
DLW5BSM601TQ2	1200ohm ±40%	600ohm (Typ.)	1400mA	50Vdc	10M ohm	125Vdc	0.12ohm max.	New Kit ≧1A
DLW5BSM801TQ2	550ohm ±40%	800ohm (Typ.)	2000mA	50Vdc	10M ohm	125Vdc	0.056ohm max.	New Kit ≧1A
DLW5BSM191SQ2	-	190ohm (Typ.)	5000mA	50Vdc	10M ohm	125Vdc	0.02ohm max.	Kit ≧3A
DLW5BSM351SQ2	-	350ohm (Typ.)	2000mA	50Vdc	10M ohm	125Vdc	0.04ohm max.	Kit ≧1A
DLW5BSM102SQ2	-	1000ohm (Typ.)	1500mA	50Vdc	10M ohm	125Vdc	0.06ohm max.	Kit ≧1A
DLW5BSM152SQ2	-	1500ohm (Typ.)	1000mA	50Vdc	10M ohm	125Vdc	0.1ohm max.	Kit ≧1A
DLW5BSM302SQ2	-	3000ohm (Typ.)	500mA	50Vdc	10M ohm	125Vdc	0.3ohm max.	Kit
Operating Temperature Rang	e: -25°C to +85°C (DLW5AH), -	40°C to +105°C (DLW5BS_TQ2	2), -40°C to	+85°C (DL	W5BS_SQ2)	Number of Ci	rcuit: 1	

(3) 1.3±0.3

0.9±0.3

1.3±0.3 7±0.3

: Marking

(in mm)

Continued on the following page.

100

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#### Impedance-Frequency Characteristics DLW5AH\_SQ2/DLW5BS\_SQ2 Series



#### Notice (Rating)

In operating temperature exceeding +75°C, derating of current is necessary for DLW5BSM191SQ2. Please apply the derating curve shown in

chart according to the operating temperature.



#### DLW5BS\_TQ2 Series



In operating temperature exceeding +65°C, derating of current is necessary for DLW5BS\_TQ2 series. Please apply the derating curve shown in chart according to the operating temperature.

Derating of Rated Current



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DLW5AT/DLW5BT

Reflow OK

# DLW5AT/DLW5BT 2014/5036 (inch/mm) Hi 2020/5050 (inch/mm) Power

Low profile wire-wound common choke coil for power lines.





Refer to pages from p.205 to p.209 for mounting information.

#### Rated Value ( reackaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance	
DLW5ATN111SQ2	110ohm (Typ.)	5000mA	50Vdc	10M ohm	125Vdc	0.020ohm max.	Kit ≧3A
DLW5ATN401SQ2	400ohm (Typ.)	2000mA	50Vdc	10M ohm	125Vdc	0.034ohm max.	Kit ≧1A
DLW5ATN501SQ2	500ohm (Typ.)	1500mA	50Vdc	10M ohm	125Vdc	0.056ohm max.	Kit ≧1A
DLW5ATN851SQ2	850ohm (Typ.)	1500mA	50Vdc	10M ohm	125Vdc	0.073ohm max.	Kit ≧1A
DLW5ATN272SQ2	2700ohm (Typ.)	1000mA	50Vdc	10M ohm	125Vdc	0.12ohm max.	Kit ≧1A
DLW5BTM101SQ2	100ohm (Typ.)	6000mA	50Vdc	10M ohm	125Vdc	0.013ohm max.	Kit ≧3A
DLW5BTM251SQ2	250ohm (Typ.)	5000mA	50Vdc	10M ohm	125Vdc	0.020ohm max.	Kit ≧3A
DLW5BTM501SQ2	500ohm (Typ.)	4000mA	50Vdc	10M ohm	125Vdc	0.027ohm max.	Kit ≧3A
DLW5BTM102SQ2	1000ohm (Typ.)	2000mA	50Vdc	10M ohm	125Vdc	0.034ohm max.	Kit ≧1A
DLW5BTM142SQ2	1400ohm (Typ.)	1500mA	50Vdc	10M ohm	125Vdc	0.056ohm max.	Kit ≧1A

Operating Temperature Range: -40°C to +85°C Number of Circuit: 1

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#### Impedance-Frequency Characteristics DLW5AT Series



#### Notice (Rating)

In operating temperature exceeding +60°C, derating of current is necessary for DLW5AT series. Please apply the derating curve shown in chart according to the operating temperature.

Derating of Rated Current



#### **DLW5BT Series**



In operating temperature exceeding +60°C, derating of current is necessary for the following part name of DLW5BT series. Please apply the derating curve shown in chart according to the operating temperature.



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Chip Ferrite Bead

Chip EMIFIL®

**Microwave Absorber** 

**UW5AT/DLW5BT** Series (105degreeC available type)

Low profile wire-wound common choke coil for power lines. (105degreeC available type)





: Marking

(in mm)

1.3±0.3

0.9±0.3

Refer to pages from p.205 to p.209 for mounting information.

330mm Reel Embossed Tape

Bulk(Bag)

к

в

Continued on the following page.

2500

100

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1.7±0.3 1.3±0.3

## ■ Rated Value (□: packaging code)

Part Number	Common Mode Impedance (at 100MHz/20°C)	Rated Current	Rated Voltage	Insulation Resistance (min.)	Withstand Voltage	DC Resistance		
DLW5ATN500MQ2	50ohm (Typ.)	6000mA	50Vdc	10M ohm	125Vdc	0.013ohm max.	Kit ≧	<b>≧3A Flow</b> ReFlow
DLW5ATN151MQ2	150ohm (Typ.)	5000mA	50Vdc	10M ohm	125Vdc	0.020ohm max.	Kit ≧	<b>≧3A Flow</b> ReFlow
DLW5ATN331MQ2	330ohm (Typ.)	4000mA	50Vdc	10M ohm	125Vdc	0.027ohm max.	Kit ≧	<b>≧3A Flow</b> ReFlow
DLW5ATN501MQ2	500ohm (Typ.)	2500mA	50Vdc	10M ohm	125Vdc	0.034ohm max.	New Kit ≧1A	Flow ReFlow
DLW5ATN112MQ2	1100ohm (Typ.)	2000mA	50Vdc	10M ohm	125Vdc	0.056ohm max.	Kit ≧1A	Flow ReFlow
DLW5ATN111TQ2	110ohm (Typ.)	5000mA	50Vdc	10M ohm	125Vdc	0.020ohm max.	Kit ≧	<b>≧3A</b> ReFlow
DLW5ATN231TQ2	230ohm (Typ.)	4000mA	50Vdc	10M ohm	125Vdc	0.027ohm max.	Kit ≧	<b>≧3A</b> ReFlow
DLW5ATN401TQ2	400ohm (Typ.)	2500mA	50Vdc	10M ohm	125Vdc	0.034ohm max.	New Kit ≧1A	ReFlow
DLW5ATN501TQ2	500ohm (Typ.)	2000mA	50Vdc	10M ohm	125Vdc	0.056ohm max.	Kit ≧1A	ReFlow
DLW5BTM101TQ2	100ohm (Typ.)	6000mA	50Vdc	10M ohm	125Vdc	0.013ohm max.	Kit ≧	<b>≧3A</b> ReFlow
DLW5BTM251TQ2	250ohm (Typ.)	5000mA	50Vdc	10M ohm	125Vdc	0.020ohm max.	Kit ≧	<b>≧3A</b> ReFlow
DLW5BTM501TQ2	500ohm (Typ.)	4000mA	50Vdc	10M ohm	125Vdc	0.027ohm max.	Kit ≧	≧3A ReFlow
DLW5BTM102TQ2	1000ohm (Typ.)	2500mA	50Vdc	10M ohm	125Vdc	0.034ohm max.	New Kit ≧1A	ReFlow
DLW5BTM142TQ2	1400ohm (Typ.)	2000mA	50Vdc	10M ohm	125Vdc	0.056ohm max.	Kit ≧1A	ReFlow

Operating Temperature Range: -40°C to +105°C Number of Circuit: 1

#### Impedance-Frequency Characteristics DLW5AT\_MQ2 Series



#### DLW5BT\_TQ2 Series



#### DLW5AT\_TQ2 Series



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Block Type EMIFIL®

**Microwave Absorber** 

#### Notice (Rating)

In operating temperature exceeding +85°C, derating of current is necessary for DLW5AT series (105 degree C available type). Please apply the derating curve shown in chart according to the operating temperature.

Derating of Rated Current



In operating temperature exceeding +85°C, derating of current is necessary for DLW5BT series (105 degree C available type). Please apply the derating curve shown in chart according to the operating temperature.

Derating of Rated Current



In operating temperature exceeding +85°C, derating of current is necessary for DLW5AT series (105 degree C available type). Please apply the derating curve shown in chart according to the operating temperature.

#### Derating of Rated Current



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Block Type EMIFIL®

#### DL Chip Common Mode Choke Coil **Caution/Notice**

#### **Caution**

#### Rating

Do not use products beyond the rated current and rated voltage as this may create excessive heat and deteriorate the insulation resistance. Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure our product.

#### Soldering and Mounting

1. Self-heating

Please provide special attention when mounting chip common mode choke coils DLW5 series in close proximity to other products that radiate heat. The heat generated by other products may deteriorate the insulation resistance and cause excessive heat in this component.

#### Storage and Operating Conditions

#### <Operating Environment>

Do not use products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.

Do not use products in the environment close to the organic solvent.

<Storage and Handling Requirements>

- 1. Storage Period
  - DLM11G series should be used within 6 months, the other series should be used within 12 months. Solderability should be checked if this period is exceeded.
- 2. Storage Conditions
- (1) Storage temperature: -10 to +40°C Relative humidity: 15 to 85% Avoid sudden changes in temperature and humidity.
- (2) Do not store products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.

#### Notice (Soldering and Mounting)

1. Cleaning

Failure and degradation of a product are caused by the cleaning method. When you clean in conditions that are not in mounting information, please contact Murata engineering.

2. Soldering

Reliability decreases with improper soldering methods. Please solder by the standard soldering conditions shown in mounting information.

3. Other

Noise suppression levels resulting from Murata's EMI suppression filters EMIFIL® may vary, depending on the circuits and ICs used, type of noise, mounting pattern, mounting location, and other operating conditions. Be sure to check and confirm in advance the noise suppression effect of each filter, in actual circuits, etc. before applying the filter in a commercialpurpose equipment design.

#### 2. Mounting Direction

Mount Chip Common Mode Choke Coils in right direction. Wrong direction, which is 90 degrees rotated from right direction, causes not only open or short circuit but also flames or other serious trouble.



#### Notice

- Handling
- 1. Resin Coating (Except for DLW Series.) Using resin for coating/molding products may affect the products performance. So please pay careful attention in selecting resin. Prior to use, please make the reliability evaluation with the product mounted in your application set.
- 2. Resin Coating (DLW Series) The impedance value may change due to high curestress of resin to be used for coating/molding products. An open circuit issue may occur by mechanical stress caused by the resin, amount/cured shape of resin, or operating condition etc. Some resin contains some impurities or chloride possible to generate chlorine by hydrolysis under some operating condition may cause corrosion of wire of coil, leading to open circuit. So, please pay your careful attention in selecting resin in case of coating/molding the products with the resin. Prior to use the coating resin, please make sure no reliability issue is observed by evaluating products mounted on your board.
- 3. Caution for Use (DLW Series)

When you hold products with a tweezer, please hold by the sides. Sharp materials, such as a pair of tweezers, should not touch the winding portion to prevent breaking the wire. Mechanical shock should not be applied to the products mounted on the board to prevent breaking the core.

4. Brushing

When you clean the neighborhood of products such as connector pins, bristles of cleaning brush shall not be touched to the winding portion of this product to prevent the breaking of wire.

5. Handling of a Substrate

After mounting products on a substrate, do not apply any stress to the product caused by bending or twisting to the substrate when cropping the substrate. inserting and removing a connector from the substrate or tightening screw to the substrate. Excessive mechanical stress may cause cracking in the Product. Bending

Twisting 4-10 4-11

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Chip Ferrite Bead

Chip EMIFIL®

Microwave Absorber



#### 1. Standard Land Pattern Dimensions



**Microwave Absorber** 

**Chip Ferrite Bead** 

Chip EMIFIL®

Soldering and Mounting

Block Type EMIFIL®

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## PCB Warping

PCB should be designed so that products are not subjected to the mechanical stress caused by warping the board.

Products should be located in the sideways direction (Length: a<b) to the mechanical stress.

Poor example

Good example

Land Pattern

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#### 2. Solder Paste Printing and Adhesive Application

When reflow soldering the chip common mode choke coils, the printing must be conducted in accordance with the following cream solder printing conditions. If too much solder is applied, the chip will be prone to

damage by mechanical and thermal stress from the PCB and may crack.

When flow soldering the chip common mode choke coils, apply the adhesive in accordance with the following conditions.

If too much adhesive is applied, then it may overflow into the land or termination areas and yield poor solderability. In contrast, if insufficient adhesive is applied, or if the adhesive is not sufficiently hardened, then the chip may become detached during flow soldering process.

Standard land dimensions should be used for resist and copper foil patterns.

Series	Solder Paste Printin	g				Adhesive Application
DLP DLW DLM	<ul> <li>Guideline of solder paste thickness: 80-100µm: DLP0QS 100-150µm: DLW21S/21H/31S, DLP0NS/TDLM11S/11G</li> <li>150µm: DLW43S</li> <li>150-200µm: DLP31D/31S, DLW5A/5B</li> <li>*Solderability is subject to reflow conditions at Please make sure that your product has been specifications with our product being mounted</li> </ul>	and the	rmal co uated ir	nductiv n view (	ity.	DLP31S/DLP31D/ DLW5AT_MQ2 Apply 0.3mg of bonding agent at each chip. DLP31D
	DLP0QS/0NS/11S/11R/11T/31S/DLM11S/11G					
	Series	а	b	с	d	
		0.3	0.2	0.23	0.48	
	ot DLPONS	0.3	0.3	0.3	0.5	Coating Position of Bonding Agent
	DLM11S/DLP11S	0.7	0.55	0.3	0.55	
	DLP11R/T	0.5	0.55	0.3	0.55	DLP31S
	DLP31S	1.0	0.6	0.7	2.1	
	DLM11G	0.5	0.5	0.4	0.7	
	DLW21S/21H/31S					
	Series	а	b	с	d	
	DLW21S/H	0.8	2.6	0.5	1.2	Coating Position of
	DLW31S	1.6	3.7	0.4	1.6	Bonding Agent
						DIWEAT MO2
	DLP1ND/2AD/31D					DLW5AT_MQ2
	Series	а	b	с	d	
		0.3	0.3	0.2	0.4	
		0.55	0.4	0.25	0.5	
		1.0	0.8	0.4	0.8	
	DLW43S					Coating Position of
	Series		а	b	c d	Bonding Agent
	DLW43S	· · ·	0/220/51	0) 5.9	1.6 3.4	
	a	3.2 (10	1)			
	l → b					
	DLW5A/5B					

**Chip Ferrite Bead** 

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#### 3. Standard Soldering Conditions

(1) Soldering Methods

Use flow and reflow soldering methods only.

Use standard soldering conditions when soldering chip common mode choke coils.

In cases where several different parts are soldered, each having different soldering conditions, use those conditions requiring the least heat and minimum time.

Solder: Use Sn-3.0Ag-0.5Cu solder. Use of Sn-Zn based solder will deteriorate performance of products. If using DLP/DLM series with Sn-Zn based solder, please contact Murata in advance.

#### Flux:

Use Rosin-based flux.

In case of DLW21/31 series, use Rosin-based flux with converting chlorine content of 0.06 to 0.1wt%. In case of using RA type solder, products should be cleaned completely with no residual flux.

- Do not use strong acidic flux (with chlorine content) exceeding 0.20wt%)
- Do not use water-soluble flux.

For additional mounting methods, please contact Murata.



Reflow Soldering Profile (Sn-3.0Ag-0.5Cu Solder)



		Standar	d Profile		Limit Profile				
Series	Heating		Peak Tomporaturo Cycle		Hea	ting	Peak Temperature	Cycle	
	Temp. (T1)	Time. (t1)	Temperature (T2)	of Reflow	Temp. (T3)	Time. (t2)	(T4)	of Reflow	
DLM/DLP DLW21/31	220°C min.	30 to 60s	245±3°C	2 times max.	230°C min.	60s max.	260°C/10s	2 times max.	
DLW43S	220°C min.	30 to 60s	245±3°C	2 times max.	240°C min.	30s max.	260°C/10s	2 times max.	
DLW5A/5B	220°C min.	30 to 60s	250±3°C	2 times max.	230°C min.	60s max.	260°C/10s	2 times max.	

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- (3) Reworking with Solder Iron The following conditions must be strictly followed when using a soldering iron. Pre-heating: 150°C 60s min.
  - Soldering iron power output / Tip diameter: 30W max. / ø3mm max.
  - Temperature of soldering iron tip / Soldering time / Times: 350°C max. / 3-4s / 2 times\*1
  - \*1 DLP0QS, DLP0NS, DLP11S, DLP11T, DLP1ND, DLP2AD: 380°C max. / 3-4s / 2 times DLW43S: 350°C max. / 3s / 2 times

#### 4. Cleaning

Following conditions should be observed when cleaning chip EMI filter.

- (1) Cleaning Temperature: 60°C max. (40°C max. for alcohol type cleaner)
- (2) Ultrasonic

Output: 20W/liter max. Duration: 5 minutes max. Frequency: 28 to 40kHz

(3) Cleaning agent

The following list of cleaning agents have been tested on the individual components. Evaluation of final assembly should be completed prior to production. Do not clean DLW (Except for DLW21H) series.

Do not allow the tip of the soldering iron to directly contact the chip.

Before cleaning, please contact Murata engineering.

Component should be thoroughly dried after aqueous

(4) Ensure that flux residue is completely removed.

agent has been removed with deionized water.

(a) Alcohol cleaning agent

Isopropyl alcohol (IPA)

(b) Aqueous cleaning agent

Pine Alpha ST-100S

For additional methods of reworking with a soldering iron, please contact Murata engineering.

**Chip Ferrite Bead** 

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Chip Common Mode Choke Coil Packaging

#### Minimum Quantity and Dimensions of 8mm Width Paper / Embossed Tape







c: Total Thickness of Tape (Paper Tape)

Dimension of the cavity of embossed tape is measured at the bottom side.

		Di	nensions		Minimum Qty. (pcs.)					
Part Number		Din	lensions		ø180m	ım Reel	ø330m	ım Reel	Dulle	
	a	b	с	d	Paper Tape	Embossed Tape	Paper Tape	Embossed Tape	Bulk	
DLM11G	1.45	1.2	0.8 max.	-	10000	-	-	-	1000	
DLM11S	1.4	1.15	0.65	0.25	-	4000	-	-	500	
DLP0QS	0.73	0.6	0.55 max.	-	15000	-	-	-	500	
DLPONS	0.95	0.75	0.55	0.25	-	10000	-	-	500	
DLP11S	1.4	1.2	0.98	0.25	-	3000	-	-	500	
DLP11R	1.4	1.15	0.7	0.25	-	4000	-	-	500	
DLP11T	1.35	1.1	0.45	0.25	-	5000	-	-	500	
DLP1ND	1.7	0.84	0.57	0.25	-	5000	-	-	500	
DLP2AD	2.2	1.2	0.98	0.25	-	3000	-	-	500	
DLP31D/31S	3.5	1.9	1.3	0.25	-	3000	-	-	500	
DLW21S	2.25	1.45	1.4	0.3	-	2000	-	-	500	
DLW21H	2.3	1.55	1.1	0.25	-	3000	-	-	500	
DLW31S	3.6	2.0	2.1	0.3	-	2000	-	-	500	

#### Minimum Quantity and Dimensions of 12mm Width Embossed Tape



Part Number	Dir	nensic	ons	Minir	Minimum Qty. (pcs.)				
Part Number	а	b	с	ø180mm Reel	ø330mm Reel	Bulk			
DLW43SH_XK	4.9	3.6	2.7	500	2500	100			
DLW43SH_XP	4.9	3.6	2.9	500	2500	100			
DLW5AH	5.4	4.1	4.4	400	1500	100			
DLW5AT	5.4	4.1	2.7	700	2500	100			
DLW5BS	5.5	5.4	4.7	400	1500	100			
DLW5BT	5.5	5.5	2.7	700	2500	100			
						(i			

"Minimum Quantity" means the number of units of each delivery or order. The quantity should be an integral multiple of the "Minimum Quantity."

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Chip Ferrite Bead







#### EKEMDL21AQ-KIT (Chip Common Mode Choke Coils)

lo.	Part Number	Quantity (pcs.)	Common Mode Impedance (at 100MHz, 20 degrees C)	Rated Voltage (Vdc)	Rated Curren (mA)
1	DLW21HN670SQ2	10	67Ω±25%	50	330
2	DLW21HN900SQ2	10	90Ω±25%	50	330
3	DLW21HN121SQ2	10	120Ω±25%	50	280
4	DLW21HN181SQ2	10	180Ω±25%	50	250
5	DLW21HN670HQ2	10	67Ω±25%	20	240
6	DLW21HN900HQ2	10	90Ω±25%	20	220
7	DLW21HN121HQ2	10	120Ω±25%	20	200
8	DLW21SN501SK2	10	500Ω±25%	50	250
9	DLW21SN670SQ2	10	67Ω±25%	50	400
0	DLW21SN0705Q2	10	90Ω±25%	50	330
	DLW21SN9003Q2	10	<u>120Ω±25%</u>		
1		10		50	370
2	DLW21SN181SQ2	-	180Ω±25%	50	330
3	DLW21SN261SQ2	10	260Ω±25%	50	300
4	DLW21SN371SQ2	10	370Ω±25%	50	280
5	DLW21SN670HQ2	10	67Ω±25%	20	320
6	DLW21SN900HQ2	10	90Ω±25%	20	280
7	DLW21SN121HQ2	10	120Ω±25%	20	280
8	DLW21SR670HQ2	10	67Ω±25%	20	400
9	DLW21SN181XQ2	10	180Ω±25%	20	240
20	DLW21SN261XQ2	10	260Ω±25%	20	220
21	DLW21SN491XQ2	10	490Ω±25%	20	190
2	DLP0NSC280HL2	10	28Ω±20%	5	100
23	DLP0NSN350HL2	10	35Ω±10Ω	5	100
24	DLP0NSN670HL2	10	67Ω±20%	5	110
25	DLP0NSN900HL2	10	90Ω±20%	5	100
26	DLP0NSN121HL2	10	<u>120Ω±20%</u>	5	90
27	DLP0NSA070HL2	10	7Ω±2Ω	5	100
				5	
28	DLP0NSA150HL2	10	<u>15Ω±5Ω</u>		100
29	DLP0QSN600HL2	10	<u>60Ω±25%</u>	5	50
80	DLP0QSA070HL2	10	7Ω±2Ω	5	100
31	DLP0QSA150HL2	10	15Ω±5Ω	5	100
32	DLP0QSA350HL2	10	35Ω±10Ω	5	100
33	DLP1NDN350HL4	10	35Ω±20%	5	100
34	DLP1NDN670HL4	10	67Ω±20%	5	80
35	DLP1NDN900HL4	10	90Ω±20%	5	60
86	DLP11SA350HL2	10	35Ω±20%	5	170
37	DLP11SA670HL2	10	67Ω±20%	5	150
8	DLP11SA900HL2	10	90Ω±20%	5	150
9	DLP11SN670SL2	10	67Ω±20%	5	180
0	DLP11SN121SL2	10	120Ω±20%	5	140
1	DLP11SN161SL2	10	160Ω±20%	5	120
2	DLP11SN900HL2	10	90Ω±20%	5	150
.3	DLP11SN201HL2	10	200Ω±20%	5	110
4	DLP11SN241HL2	10	240Ω±20%	5	100
.5	DLP11SN281HL2	10	280Ω±20%	5	90
.6	DLP11SN331HL2	10	330Ω±20%	5	80
	DLP11RB150UL2		<u>330Ω±20%</u> 15Ω±5Ω	5	100
7		10	40Ω±10Ω	5	100
8	DLP11RB400UL2	10			
9	DLP11RN450UL2	10	45Ω±25%	5	100
50	DLP11TB800UL2	10	80Ω±25%	5	100
51	DLP2ADA350HL4	10	35Ω±20%	5	150
52	DLP2ADA670HL4	10	67Ω±20%	5	130
i3	DLP2ADA900HL4	10	90Ω±20%	5	120
54	DLP2ADN670HL4	10	67Ω±20%	5	140
5	DLP2ADN900HL4	10	90Ω±20%	5	130

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	Part Number	Quantity (pcs.)	Common Mode Impedance (at 100MHz, 20 degrees C)	Rated Voltage (Vdc)	Rated Current (mA)
56	DLP2ADN121HL4	10	120Ω±20%	5	120
57	DLP2ADN1211L4	10	160Ω±20%	5	120
58	DLP2ADN201HL4	10	200Ω±20%	5	90
59	DLP2ADN241HL4	10	240Ω±20%	5	80
60	DLP2ADN24111L4	10	24002±20%	5	80
61	DLM11SN450HY2	10	45Ω±25%	5	100
62	DLM11SN900HY2	10	90Ω±25%	5	100
			ode Choke Coils for DC Power Line		1
No.	Part Number	Quantity (pcs.)	Common Mode Impedance (at 100MHz, 20 degrees C)	Rated Voltage (Vdc)	Rated Current (mA)
1	DLW5AHN402SQ2	5	4000Ω (Typ.)	50	200
2	DLW5ATN111SQ2	5	110Ω (Typ.)	50	5000
3	DLW5ATN401SQ2	5	400Ω (Typ.)	50	2000
4	DLW5ATN501SQ2	5	500Ω (Typ.)	50	1500
5	DLW5ATN851SQ2	5	850Ω (Typ.)	50	1500
6	DLW5ATN272SQ2	5	2700Ω (Typ.)	50	1000
7	DLW5BSM501TQ2	5	500Ω (Typ.)	50	1000
8	DLW5BSM601TQ2	5	600Ω (Typ.)	50	1400
9	DLW5BSM801TQ2	5	800Ω (Typ.)	50	2000
10	DLW5BSM191SQ2	5	190Ω (Typ.)	50	5000
11	DLW5BSM351SQ2	5	350Ω (Typ.)	50	2000
12	DLW5BSM102SQ2	5	1000Ω (Typ.)	50	1500
13	DLW5BSM152SQ2	5	1500Ω (Typ.)	50	1000
14	DLW5BSM302SQ2	5	3000Ω (Typ.)	50	500
15	DLW5BTM101SQ2	5	100Ω (Typ.)	50	6000
16	DLW5BTM251SQ2	5	250Ω (Typ.)	50	5000
17	DLW5BTM501SQ2	5	500Ω (Typ.)	50	4000
18	DLW5BTM102SQ2	5	1000Ω (Typ.)	50	2000
19	DLW5BTM142SQ2	5	1400Ω (Typ.)	50	1500
			hoke Coils for DC Power Lines / SMD Block Ty		1
No.	Part Number	Quantity (pcs.)	Common Mode Impedance (at 100MHz, 20 degrees C)	Rated Voltage (Vdc)	Rated Current (mA)
	DLW5ATN500MQ2	(pcs.) 5	50Ω (Typ.)	50	6000
1		-		50	5000
1					
2	DLW5ATN151MQ2 DLW5ATN331MQ2	5	150Ω (Typ.) 330Ω (Typ.)		
2 3	DLW5ATN331MQ2	5	330Ω (Typ.)	50	4000
2 3 4	DLW5ATN331MQ2 DLW5ATN501MQ2	5 5	330Ω (Typ.) 500Ω (Typ.)	50 50	4000 2500
2 3 4 5	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2	5 5 5	330Ω (Typ.) 500Ω (Typ.) 1100Ω (Typ.)	50 50 50	4000 2500 2000
2 3 4 5 6	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2 DLW5ATN111TQ2	5 5 5 5 5	330Ω (Typ.) 500Ω (Typ.) 1100Ω (Typ.) 110Ω (Typ.)	50 50 50 50	4000 2500 2000 5000
2 3 4 5 6 7	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2 DLW5ATN111TQ2 DLW5ATN231TQ2	5 5 5 5 5 5	330Ω (Typ.)           500Ω (Typ.)           1100Ω (Typ.)           110Ω (Typ.)           230Ω (Typ.)	50 50 50 50 50 50	4000 2500 2000 5000 4000
2 3 4 5 6 7 8	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2 DLW5ATN111TQ2 DLW5ATN231TQ2 DLW5ATN401TQ2	5 5 5 5 5 5 5 5	330Ω (Typ.)           500Ω (Typ.)           1100Ω (Typ.)           230Ω (Typ.)           400Ω (Typ.)	50 50 50 50 50 50 50 50	4000 2500 2000 5000 4000 2500
2 3 4 5 6 7 8 9	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2 DLW5ATN111TQ2 DLW5ATN231TQ2 DLW5ATN401TQ2 DLW5ATN501TQ2	5 5 5 5 5 5 5 5 5	330Ω (Typ.)           500Ω (Typ.)           1100Ω (Typ.)           110Ω (Typ.)           230Ω (Typ.)           400Ω (Typ.)           500Ω (Typ.)	50 50 50 50 50 50 50 50 50	4000 2500 2000 5000 4000 2500 2000
2 3 4 5 6 7 8 9 10	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2 DLW5ATN111TQ2 DLW5ATN231TQ2 DLW5ATN401TQ2 DLW5ATN501TQ2 DLW5BTM101TQ2	5 5 5 5 5 5 5 5 5 5 5 5 5	330Ω (Typ.)           500Ω (Typ.)           1100Ω (Typ.)           230Ω (Typ.)           400Ω (Typ.)           500Ω (Typ.)           100Ω (Typ.)           100Ω (Typ.)           500Ω (Typ.)           100Ω (Typ.)	50 50 50 50 50 50 50 50 50 50	4000 2500 2000 5000 4000 2500 2000 6000
2 3 4 5 6 7 8 9 10 11	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2 DLW5ATN111TQ2 DLW5ATN231TQ2 DLW5ATN401TQ2 DLW5ATN501TQ2 DLW5BTM101TQ2 DLW5BTM101TQ2	5 5 5 5 5 5 5 5 5 5 5 5 5	330Ω (Typ.)           500Ω (Typ.)           1100Ω (Typ.)           110Ω (Typ.)           230Ω (Typ.)           400Ω (Typ.)           500Ω (Typ.)           100Ω (Typ.)           500Ω (Typ.)           250Ω (Typ.)           250Ω (Typ.)	50 50 50 50 50 50 50 50 50 50 50	4000 2500 5000 4000 2500 2500 2000 6000 5000
2 3 4 5 6 7 8 9 10 11 12	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2 DLW5ATN111TQ2 DLW5ATN231TQ2 DLW5ATN401TQ2 DLW5ATN501TQ2 DLW5BTM101TQ2 DLW5BTM251TQ2 DLW5BTM501TQ2	5 5 5 5 5 5 5 5 5 5 5 5 5	330Ω (Typ.)           500Ω (Typ.)           1100Ω (Typ.)           110Ω (Typ.)           230Ω (Typ.)           400Ω (Typ.)           500Ω (Typ.)           10Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)	50 50 50 50 50 50 50 50 50 50 50 50	4000 2500 2000 5000 4000 2500 2000 6000 5000 4000
2 3 4 5 6 7 8 9 10 11 12 13	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2 DLW5ATN111TQ2 DLW5ATN231TQ2 DLW5ATN401TQ2 DLW5ATN501TQ2 DLW5BTM101TQ2 DLW5BTM251TQ2 DLW5BTM501TQ2 DLW5BTM102TQ2	5 5 5 5 5 5 5 5 5 5 5 5 5 5	330Ω (Typ.)           500Ω (Typ.)           1100Ω (Typ.)           110Ω (Typ.)           230Ω (Typ.)           400Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           100Ω (Typ.)           250Ω (Typ.)           100Ω (Typ.)           100Ω (Typ.)           500Ω (Typ.)           1000Ω (Typ.)	50 50 50 50 50 50 50 50 50 50 50 50 50 5	4000 2500 2000 5000 4000 2500 2000 6000 5000 4000 2500
2 3 4 5 6 7 8 9 10 11 12 13 14	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2 DLW5ATN111TQ2 DLW5ATN231TQ2 DLW5ATN401TQ2 DLW5ATN501TQ2 DLW5BTM101TQ2 DLW5BTM251TQ2 DLW5BTM501TQ2 DLW5BTM102TQ2 DLW5BTM102TQ2	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	330Ω (Typ.)           500Ω (Typ.)           1100Ω (Typ.)           110Ω (Typ.)           230Ω (Typ.)           400Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           100Ω (Typ.)           250Ω (Typ.)           100Ω (Typ.)           100Ω (Typ.)           100Ω (Typ.)           1000Ω (Typ.)           1400Ω (Typ.)	50 50 50 50 50 50 50 50 50 50 50 50 50 5	4000 2500 2000 5000 4000 2500 2000 6000 5000 4000 2500 2000
2 3 4 5 6 7 8 9 10 11 12 13	DLW5ATN331MQ2 DLW5ATN501MQ2 DLW5ATN112MQ2 DLW5ATN111TQ2 DLW5ATN231TQ2 DLW5ATN401TQ2 DLW5ATN501TQ2 DLW5BTM101TQ2 DLW5BTM251TQ2 DLW5BTM501TQ2 DLW5BTM102TQ2	5 5 5 5 5 5 5 5 5 5 5 5 5 5	330Ω (Typ.)           500Ω (Typ.)           1100Ω (Typ.)           110Ω (Typ.)           230Ω (Typ.)           400Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           500Ω (Typ.)           100Ω (Typ.)           250Ω (Typ.)           100Ω (Typ.)           100Ω (Typ.)           500Ω (Typ.)           1000Ω (Typ.)	50 50 50 50 50 50 50 50 50 50 50 50 50 5	4000 2500 2000 5000 4000 2500 2000 6000 5000 4000 2500

800Ω (Typ.)

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