



How to select the EMI Filter ?

Würth Electronic Taiwan
FAE Bruce Tsai

WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

Precise determination of inductor loss with **REDEXPERT**

Navigate by order code

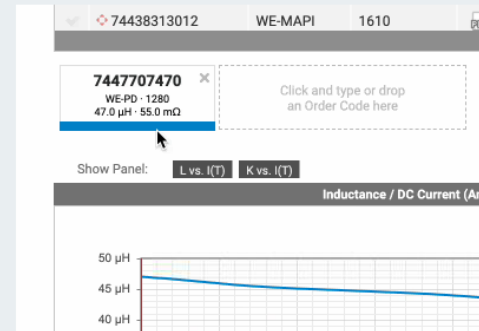
Enter at least first 4 characters

Design Tools

- EMI Filter Designer
- MagI³C Power Module Designer
- Resonance Tank Calculation for Wireless Power
- Filter Circuits >
- DC/DC Converter >
- Flyback Transformer >
- AC/DC Converter >
- Wireless Connectivity and Sensors >
- Capacitor lifetime calculator

Product selection

- EMC Components >
- Power Inductors and Magnetics >
- MagI³C Power Products
- Signal & Communications >
- Capacitors & Resistors >
- Optoelectronics >
- Quartz Crystals & Oscillators >
- EMC Shielding & Grounding >



Fast adding part numbers

Click in the product storage on the next free spot and start typing a part number. Select the desired one from the list to quickly add it for analysis.



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Interface

Order Code	Series	Size	Spec	Type	Spec. Z	Z _{max}	R _{DC}	I _r	L	W	H	Pin L...	Lines	Assembl...	AEC-Q	Automotive
7427523	WE-CMS	908545		Common M...	83.0 Ω	325 Ω @1.20 GHz	3.00 mΩ	21.0					2	SMT	1	×
7427521	WE-CMS	9056		Common M...	52.0 Ω	80.0 Ω @1.50 GHz	3.00 mΩ	19.0					2	SMT	1	×
7427932	WE-PBF	7847		High Current	98.0 Ω	147 Ω @3.00 GHz	0.900 mΩ	18.0					1	SMT	×	×
74279392	WE-PBF	7847		High Current	98.0 Ω	147 Ω @3.00 GHz	0.900 mΩ	18.0					1	SMT	×	×
74279321	WE-PBF	8520		High Current	91.0 Ω	203 Ω @3.00 GHz	0.900 mΩ	18.0					1	SMT	×	×
7427520	WE-CMS	4856		Common M...	30.0 Ω	40.0 Ω @3.00 GHz	3.00 mΩ	17.0 A	4.80 mm	5.60 mm	2.50 mm		2	SMT	1	×
74279390	WE-PBF	4030		High Current	42.0 Ω	64.0 Ω @3.00 GHz	0.600 mΩ	16.0 A	4.00 mm	3.00 mm	2.55 mm		1	SMT	×	×
7427930	WE-PBF	4030		High Current	42.0 Ω	64.0 Ω @3.00 GHz	0.600 mΩ	16.0 A	4.00 mm	3.00 mm	2.55 mm		1	SMT	×	×

Show parts with I_r is from: to

0A
 10A
 100A
 1kA

前端打勾, 特性曲線疊圖

點PDF, 可看到規格書

點小漏斗, 可輸入選擇範圍

7427523 WE-CMS 908545 83.0 Ω

7427521 WE-CMS 9056 52.0 Ω

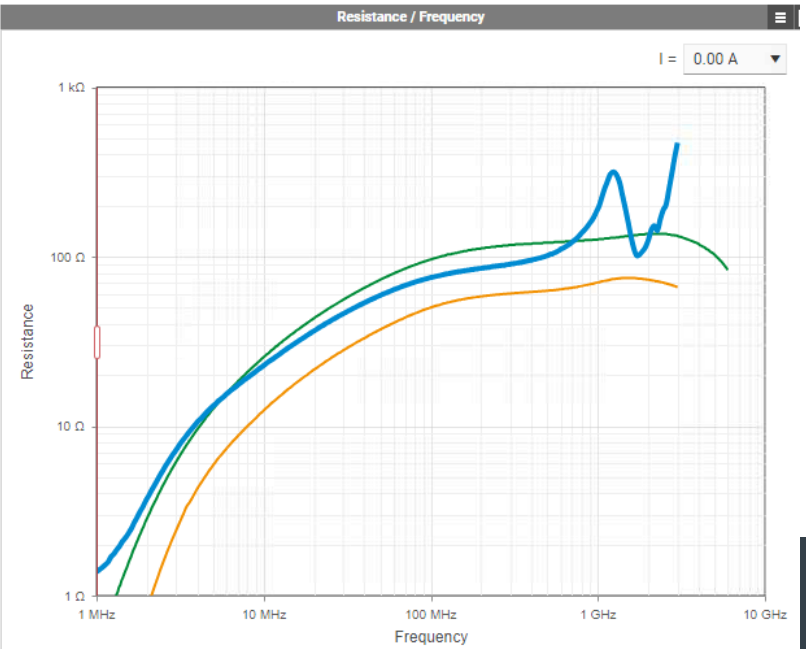
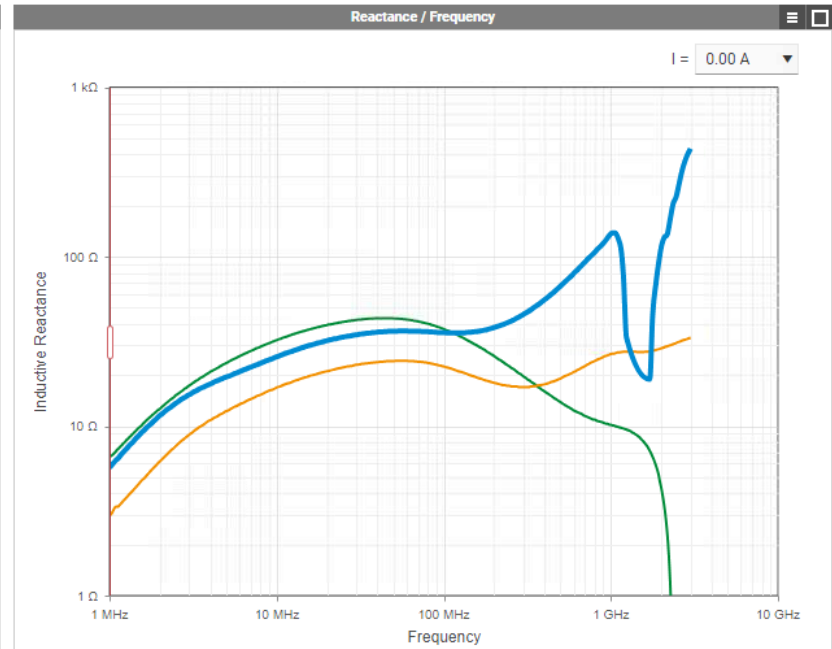
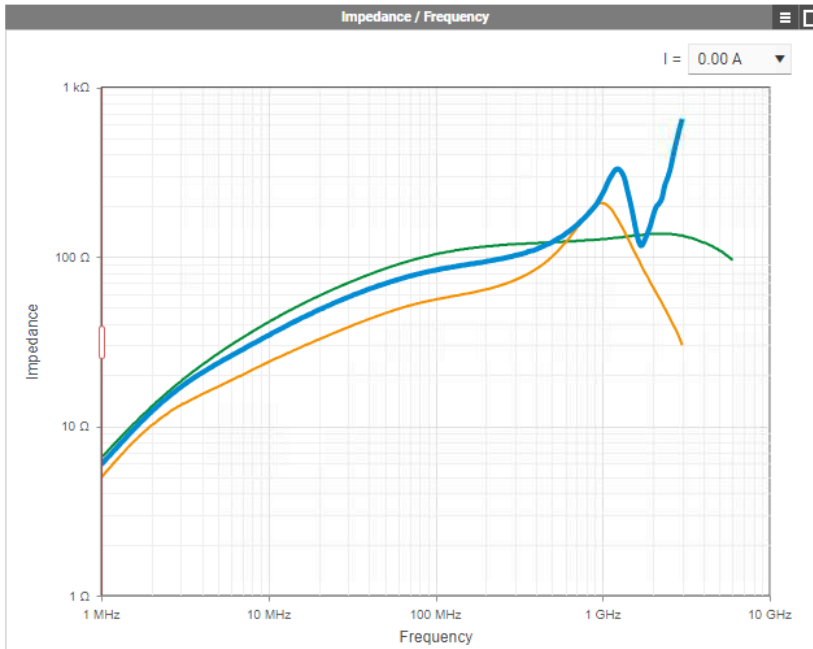
7427932 WE-PBF 7847 98.0 Ω

Click and type or drop an Order Code here

ADD

MORE

Show Panel: Z vs. F X vs. F R vs. F I vs. PL I vs. N



Redexpert-Filter Circuit

Precise determination of inductor loss with REDEXPERT®

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- Optoelectronics
- Quartz Crystals & Oscillators
- EMC Shielding & Gaskets

Design Tools

- Impedance Finder for PCB Ferrites Bead
- Pulse Current for PCB-Ferrites Bead
- Impedance Finder for Cable Ferrites 磁環
- Impedance Finder for Power Line CMC 共模電感
- Impedance Finder for Data CMC 共模電感

Navigate by order code

Enter at least first 4 characters

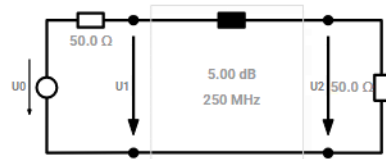
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Redexpert-Bead



模擬的小信號模型

Filters: $Z_{0.35\text{ A}@250\text{ MHz}} \geq 77.8\ \Omega$

Order Code	Series	Size	Spec	Type	Spec. Z	Z _{max}	Z _{0.35 A@250 MHz}	Atto.35 A@250 MHz	R _{DC}	I _R
742861160	WE-CBF HF	0603	PDF	Wide Band	600 Ω	900 Ω @350 MHz	142 Ω	7.69 dB	900 mΩ	500
74269241102	WE-TMSB	0402	PDF	Wide Band	1.00 kΩ	1.16 kΩ @129 MHz	255 Ω	11.0 dB	430 mΩ	480

邊輸入參數,軟體同時進行篩選

輸入頻率點的阻抗值

Applications Hints

- Long Datasignal Lines: 90 Ω
- Clock- and Datasignal Lines: 50 Ω
- Supply Voltage Lines (V_{CC}): 10 Ω
- Ground Planes (GND): 1 Ω
- User defined

EMI雜訊來源與不同阻抗

Noise attenuation

Att: 5 dB f: 250 MHz I_{bias}: 0.35 A

Z_{In}: 50 Ω

Z_{Out}: 50 Ω

要衰減的雜訊強度, 頻率與電流值

742861160

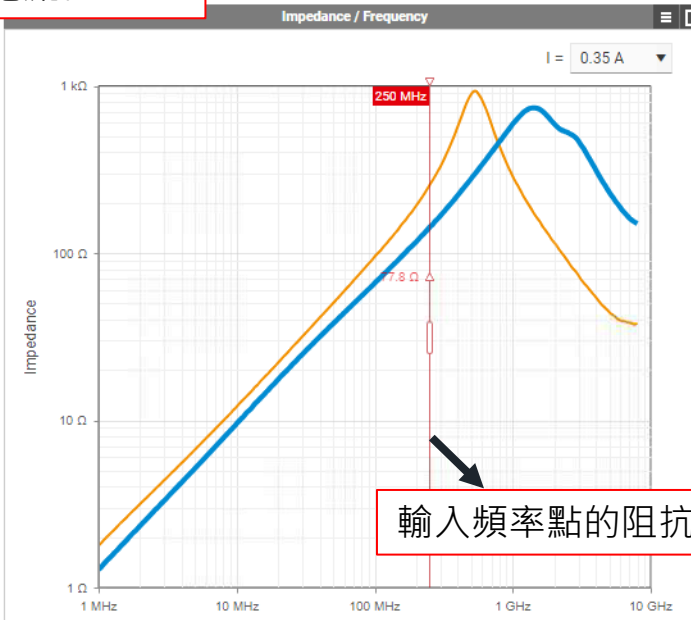
74269241102

WE-TMSB_0402
1.00 kΩ

Click and type or drop an Order Code here

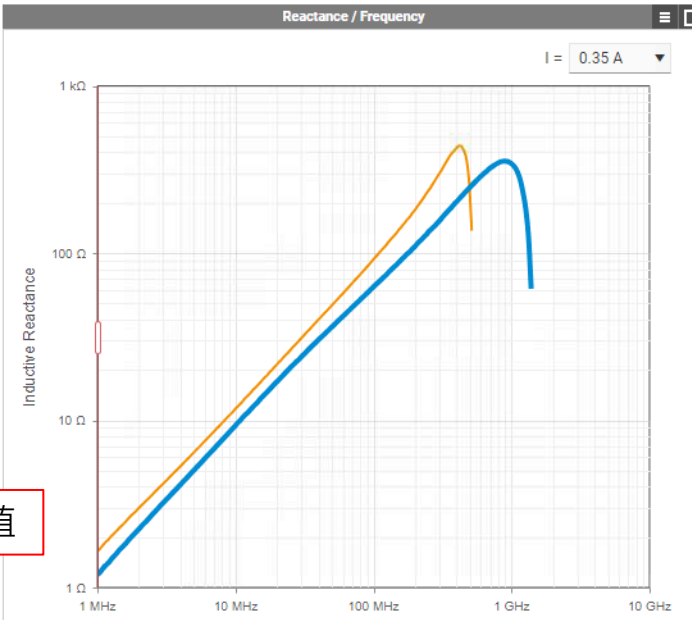
va. F R vs. F I vs. PL I vs. N

Impedance / Frequency



輸入頻率點的阻抗值

Reactance / Frequency



Ferrites for PCB Assembly



WE-TMSB Tiny Multilayer Suppression Bead

Tiny Allrounder | $Z @ 100 \text{ MHz}$ 10 to 1800 Ω | I_R 150 to 7500 mA



WE-CBF SMT EMI Suppression Ferrite Bead

Multi-purpose Ferrite | $Z @ 100 \text{ MHz}$ 10 to 2700 Ω | I_{R2} 450 to 12000 mA



WE-CBF HF SMT EMI Suppression Ferrite Bead (High Frequency)

High Frequency Specialist | $Z @ 100 \text{ MHz}$ 180 to 1000 Ω | I_{R2} 250 to 1300 mA



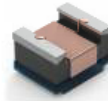
WE-MPSB EMI Multilayer Power Suppression Bead

Low R_{DC} Expert for High Peak Currents | $Z @ 100 \text{ MHz}$ 8 to 600 Ω | I_R 2100 to 10500 mA



WE-PBF Flat Wire High Current SMT Ferrite Bead

Wired SMT Ferrite | $Z @ 100 \text{ MHz}$ 39 to 98 Ω | I_R 14 to 18 A | R_{DC1} 0.6 to 0.9 m Ω



WE-RFI SMT Wirewound Ferrite Bead **EXTENDED**

$Z @ 100 \text{ MHz}$ 11 to 2300 Ω | I_{R2} 110 to 1910 mA



WE-PF SMT EMI Suppression Power Ferrite **EXTENDED**

High Current Version for a Wide Frequency Range | I_R 4.5 to 10 A



WE-CMS SMT Bead Array

Line Filter Array | $Z @ 100 \text{ MHz}$ 30 to 83 Ω | I_{R2} 34 to 41 A



WE-SUKW SMT EMI Suppression 5-Hole Ferrite Bead

Wired SMT Ferrite with Different Number of Turns | $Z @ 100 \text{ MHz}$ 416 to 580 Ω | I_R 8.5 to 9 A

Redexpert-磁環

System

PARAMETERS

Applications Hints

- Long Datasignal Lines: 90 Ω
- Clock- and Datasignal Lines: 50 Ω
- Supply Voltage Lines (V_{CC}): 10 Ω
- Ground Planes (GND): 1 Ω
- User defined

Noise attenuation

Att 15 dB

f 100 MHz

Z_{In}

z 10 Ω

Z_{Out}

z 10 Ω

DETAILS

Filters: $Z_{IT}@100\text{ MHz} \geq 92.5\ \Omega$

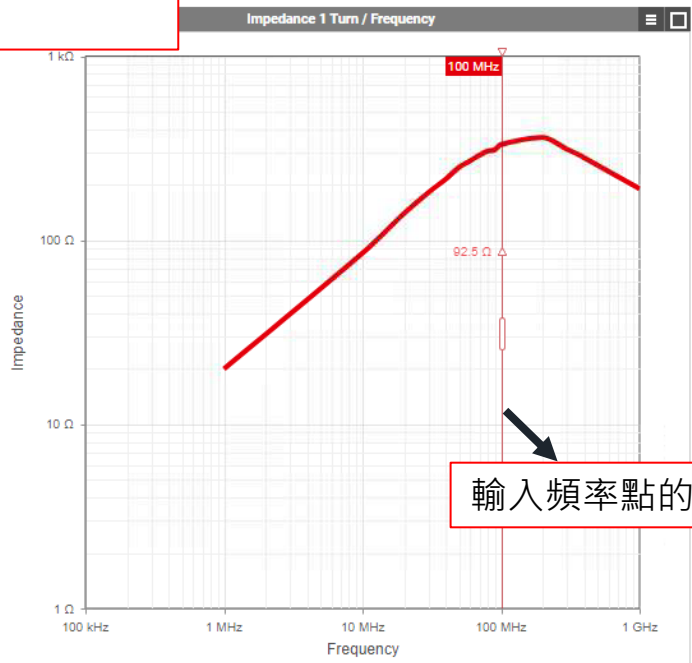
Order Code	Series	Spec	Cable type	Cable ϕ /Width M_{Max}	Cable pole...	$Z_{IT}@100\text{ MHz}$	Att @100 MHz	L	W/ ϕ OD	H/ ϕ OD	T_{Min}	T_{Max}	Z 1-turn @ f_1	Z 1-turn @ f_2	Core Material
74271111	WE-STAR-T...		Round	5.00 mm	-	331 Ω	24.9 dB	40.5 mm	23.7 mm	18.2 mm	-25°C	105°C	175 Ω @25.0 MHz	320 Ω @100 MHz	4W620
74271111S	WE-STAR-T...		Round	5.00 mm	-	246 Ω	24.9 dB	40.5 mm	23.7 mm	18.2 mm	-25°C	105°C	175 Ω @25.0 MHz	320 Ω @100 MHz	4W620
74271112	WE-STAR-T...		Round	6.00 mm	-	331 Ω	24.9 dB	40.5 mm	23.7 mm	18.2 mm	-25°C	105°C	176 Ω @25.0 MHz	321 Ω @100 MHz	4W620
74271112S	WE-STAR-T...		Round	6.00 mm	-	246 Ω	22.5 dB	40.5 mm	24.5 mm	21.0 mm	-25°C	105°C	145 Ω @25.0 MHz	246 Ω @100 MHz	4W620
74271131S	WE-STAR-T...		Round	7.50 mm	-	246 Ω	22.5 dB	40.5 mm	24.5 mm						
74271132	WE-STAR-T...		Round	8.50 mm	-	246 Ω	22.5 dB	40.5 mm	24.5 mm						
74271133	WE-STAR-T...		Round	8.50 mm	-	246 Ω	22.5 dB	40.5 mm	24.5 mm						
74271134	WE-STAR-T...		Round	5.00 mm	-	179 Ω	20.0 dB	32.5 mm	18.8 mm						

模擬的小信號模型

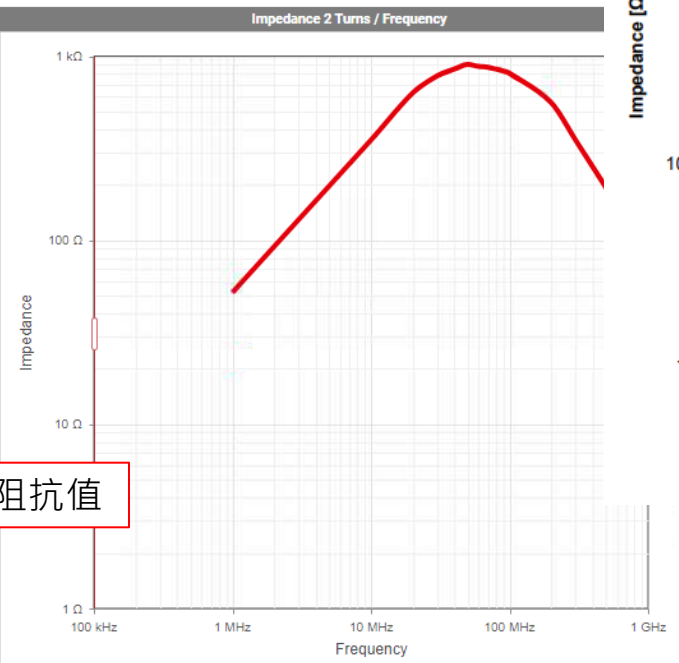
EMI雜訊來源與不同阻抗

要衰減的雜訊強度, 頻率

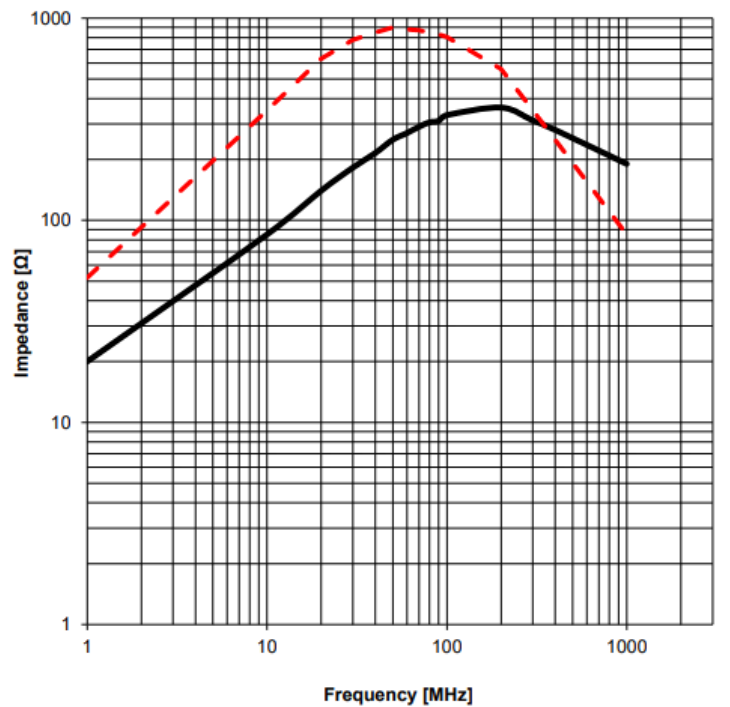
雜訊頻率點的阻抗值



輸入頻率點的阻抗值



Typical Impedance Characteristics:



Snap Ferrites for Cable Assembly



WE-STAR-TEC

Multi-purpose Ferrite | **Core Material** NiZn |
Frequency Range 1 MHz to 1 GHz | **Ø Cable** 3.5 to 25 mm



WE-STAR-TEC LFS

Low Frequency Specialist | **Core Material** MnZn
Frequency Range 300 kHz to 30 MHz | **Ø Cable** 3.5 to 25 mm



WE-STAR-RING

Screwable Fixation | **Core Material** NiZn
Frequency Range 1 MHz to 1 GHz | **Ø Cable** 8 to 27 mm



WE-STAR-FLAT

Ribbon Cable Suppressor | **Core Material** NiZn
Frequency Range 1 MHz to 1 GHz | **Ø Cable** 34 to 64.5 mm



WE-NCF

Easy Clip | **Core Material** NiZn
Frequency Range 1 MHz to 1 GHz | **Ø Cable** 7.8 to 26.5 mm

Redexpert-CMC for Data line

System PARAMETERS

Filters: $Z_{CM} @ 125 \text{ MHz} \geq 832 \Omega$

Order Code	Series	Size	Spec	V _R	Z	L ₀	I _R	R _{DC}	Winding Style	Z _{CM} @ 125 MHz	Att @ 125 MHz	Length	Width	Height	Lines	T _{max}	Assemb...	AEC-Q
744232101	WE-CNSW	1206	PDF	50.0 V	6.00 kΩ	100 μH	90.0 mA	5.50 Ω	bifilar	2.44 kΩ	23.3 dB	3.20 mm	1.60 mm	1.80 mm	2	125°C	SMT	1
744232102	WE-CNSW	1206	PDF	50.0 V	1.00 kΩ	1.30 μH	230 mA	1.00 Ω	bifilar	1.23 kΩ	17.9 dB	3.20 mm	1.60 mm	1.80 mm	2	125°C	SMT	1
744232222	WE-CNSW	1206	PDF	50.0 V	2.20 kΩ	2.60 μH	200 mA	1.60 Ω	bifilar	10.0 kΩ	35.1 dB	4.50 mm	3.20 mm	2.80 mm	2	125°C	SMT	1

Applications Hints

- Long Datasignal Lines: 90 Ω
- Clock- and Datasignal Lines: 50 Ω
- Supply Voltage Lines (V_{CC}): 10 Ω
- Ground Planes (GND): 1 Ω
- User defined

Noise attenuation

Att 15 dB f 125 MHz

Z_{In} 90 Ω Z_{Out} 90 Ω

模擬的小信號模型

EMI雜訊來源與不同阻抗

點小漏斗輸入電流範圍

雜訊頻率點的阻抗值

要衰減的雜訊強度，
頻率

744232101 744232102 744232222

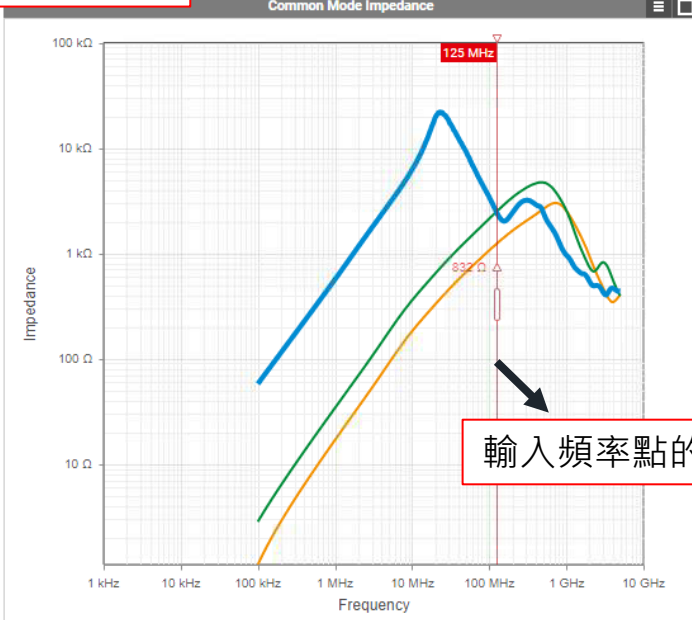
WE-CNSW · 1206 WE-CNSW · 1206 WE-CNSW · 1206

1.00 kΩ · 230 mA · bifilar 2.20 kΩ · 200 mA · bifilar

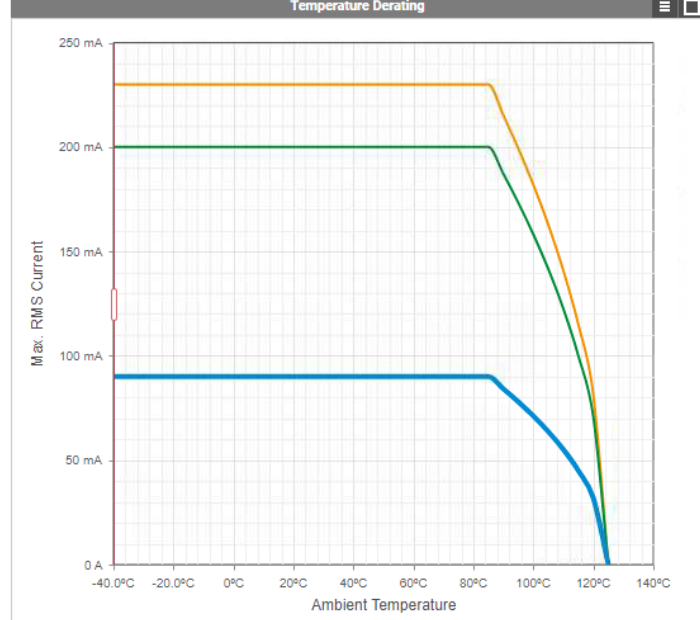
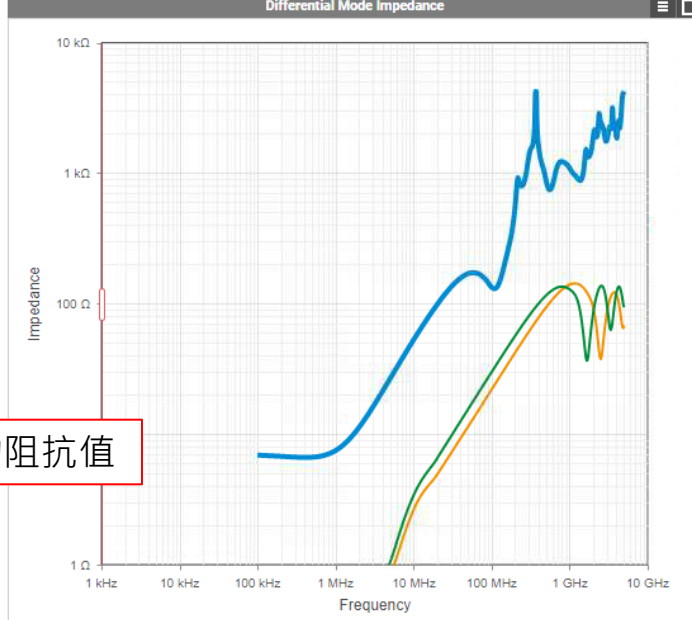
DMA CMI DMI DEC

Click and type or drop an Order Code here

ADD MORE



輸入頻率點的阻抗值



DETAILS

Common Mode Chokes for Extra-low Voltage and Data Lines



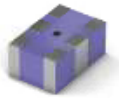
WE-CNSW SMT Common Mode Line Filter

I_R 90 to 2000 mA | $R_{DC\ max.}$ 0.05 to 5.5 Ω



WE-CNSW HF SMT Common Mode Line Filter

I_R 280 to 600 mA | $R_{DC\ max.}$ 220 to 300 m Ω



WE-CCMF Ceramic Common Mode Filter

L 0.245 nH | I_R 300 mA | $R_{DC\ max.}$ 2.5 Ω



WE-CMDC Common Mode Data Line Filter

L 9 to 17 μ H | I_R 4.5 to 8 A



WE-SLM SMT Common Mode Line Filter

L 11 to 470 μ H | I_R 300 to 400 mA | $R_{DC\ max.}$ 0.18 to 0.58 Ω



WE-SL1 SMT Common Mode Line Filter

L 10 to 330 μ H | I_R 300 mA | $R_{DC\ max.}$ 0.16 to 0.3 Ω



WE-SL2 SMT Common Mode Line Filter

L 10 to 20000 μ H | I_R 200 to 1600 mA | $R_{DC\ max.}$ 0.08 to 2.6 Ω



WE-SL3 SMT Common Mode Line Filter

L 20 to 100 μ H | I_R 450 to 700 mA | $R_{DC\ max.}$ 0.14 to 0.45 Ω



WE-SL5 SMT Common Mode Line Filter

L 120 to 4700 μ H | I_R 350 to 2500 mA | $R_{DC\ max.}$ 0.025 to 0.72 Ω



WE-SL5 HC SMT Common Mode Line Filter

L 5 to 30 μ H | I_R 1400 to 5000 mA | $R_{DC\ max.}$ 0.0055 to 0.06 Ω



WE-SL SMT Common Mode Line Filter

L 35 to 4700 μ H | I_R 200 to 2700 mA | $R_{DC\ max.}$ 0.035 to 0.85 Ω



WE-SCC SMT Common Mode Line Filter

L 1 to 1000 μ H | I_R 150 to 4750 mA | $R_{DC\ max.}$ 0.01 to 4.3 Ω



WE-UCF SMT Common Mode Line Filter

L 0.013 to 100 mH | I_R 0.15 to 10 A | $R_{DC\ max.}$ 0.0027 to 8.5 Ω

Redexpert-CMC for Power line

System PARAMETERS



Filters: $Z_{CM, Min} @ 200\text{ kHz} \geq 9.25\ \Omega$

Order Code	Series	Size	Spec	V_R	L_0	I_R	R_{DC}	$Z_{CM, Min} @ 200\text{ kHz}$	Att@200 kHz	Lines	T_{op}	V_T	Assembl...	L	W	H	Certificates
744834101	WE-CMBH	L		250 V	1.00 mH	1.00 A	12.5 mΩ	1.23 kΩ	55.8 dB	2	125°C	1.50 kV	THT	32.5 mm	28.0 mm	22.0 mm	
744834622	WE-CMBH	L		250 V	2.20 mH	6.00 A	230 mΩ	3.45 kΩ				1.50 kV	THT	32.5 mm	28.0 mm	22.0 mm	
744834433	WE-CMBH	L		250 V	3.30 mH	5.00 A	430 mΩ	5.81 kΩ				1.50 kV	THT	32.5 mm	28.0 mm	22.0 mm	
744834405	WE-CMBH	L		250 V	7.00 mH	3.50 A	80.0 mΩ	12.9 kΩ	74.7 dB	2	125°C	1.50 kV	THT	32.5 mm	28.0 mm	22.0 mm	
744834310	WE-CMBH	L		250 V	10.0 mH	3.00 A	110 mΩ	19.5 kΩ	79.8 dB	2	125°C	1.50 kV	THT	32.5 mm	28.0 mm	22.0 mm	
		XS		250 V	20.0 mH	2.00 A	230 mΩ	57.2 kΩ	89.1 dB	2	125°C	1.50 kV	THT	32.5 mm	28.0 mm	22.0 mm	
		XS		250 V	11.0 mH	900 mA	430 mΩ	6.36 kΩ	70.1 dB	2	125°C	1.50 kV	THT	14.0 mm	7.50 mm	16.0 mm	
		XS		250 V	8.00 mH	1.00 A	330 mΩ	4.24 kΩ	66.5 dB	2	125°C	1.50 kV	THT	14.0 mm	7.50 mm	16.0 mm	

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Noise attenuation

Att 15 dB f 200 kHz

Z_{in} z 1 Ω

Z_{out} z 1 Ω

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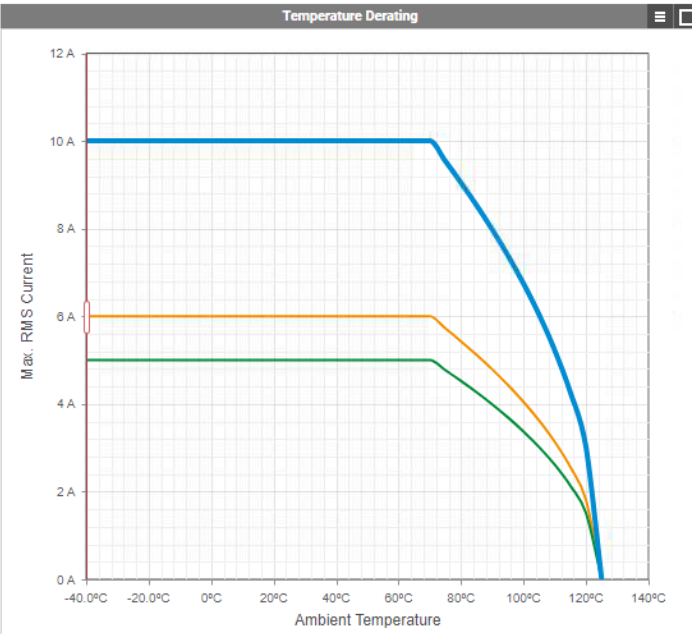
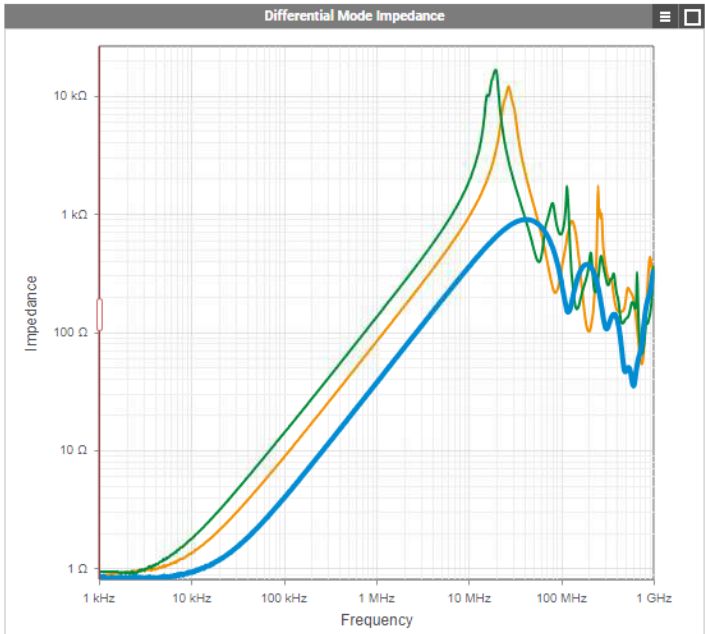
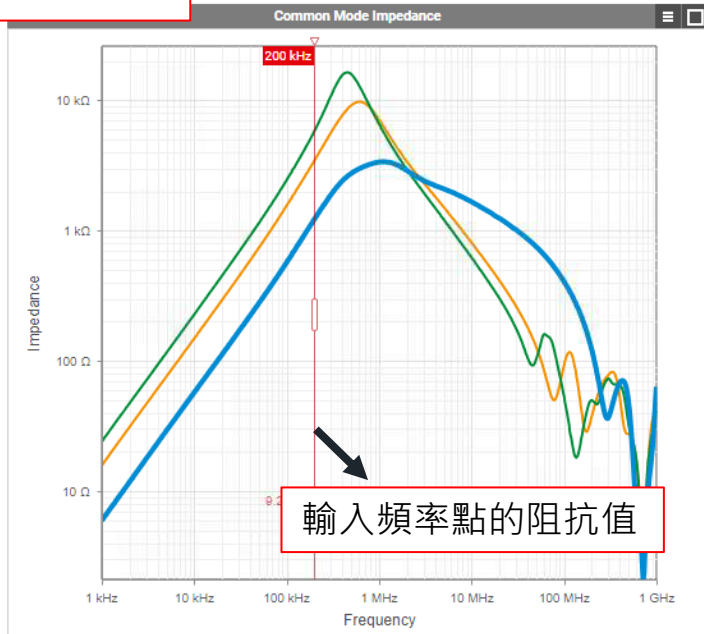
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雜訊頻率點的阻抗值

可根據體積篩選

要衰減的雜訊強度，
頻率



DETAILS

ADD
MORE

Common Mode Chokes for Mains Power Lines



WE-CMBNC Common Mode Power Line Choke Nanocrystalline

L 0.4 to 190 mH | I_R 0.6 to 38 A | $R_{DC\ max.}$ 1.1 to 1000 m Ω



WE-LF SMT Common Mode Power Line Choke

L 0.7 to 47 mH | I_R 0.4 to 5.25 A | $R_{DC\ max.}$ 0.03 to 2.6 Ω



WE-CMB Common Mode Power Line Choke

L 0.5 to 39 mH | I_R 0.3 to 35 A | $R_{DC\ max.}$ 2.3 to 3000 m Ω



WE-TFC Common Mode Power Line Choke

L 1.8 to 25 mH | I_R 0.25 to 1 A | $R_{DC\ max.}$ 0.31 to 3.6 Ω



WE-CMB HC Common Mode Power Line Choke

L 0.175 to 0.7 mH | I_R 5 to 8 A | $R_{DC\ max.}$ 6 to 15 m Ω



WE-FC Common Mode Power Line Choke

L 1.1 to 43 mH | I_R 0.4 to 2.65 A | $R_{DC\ max.}$ 0.08 to 2.88 Ω



WE-CMB HV Common Mode Power Line Choke

L 0.7 to 4.7 mH | I_R 6.8 to 21.5 A | $R_{DC\ max.}$ 3.8 to 44 m Ω



WE-LPCC Common Mode Power Line Choke

L 120 to 450 μ H | I_R 9.5 to 23.5 A | $R_{DC\ max.}$ 1.4 to 9.6 m Ω



WE-CMB NiZn Common Mode Power Line Choke

L 14 to 110 μ H | I_R 1.5 to 10 A | $R_{DC\ max.}$ 3 to 80 m Ω



WE-FCLP Common Mode Power Line Choke

L 6 to 100 mH | $R_{DC\ max.}$ 220 to 3470 m Ω



WE-ExB Common Mode Power Line Choke

L 47 to 1000 μ H | I_R 4.5 to 15 A | $R_{DC\ max.}$ 4.6 to 42 m Ω



WE-TPB HV Three-Phase Common Mode Power Line Choke

L 0.2 to 208 mH | I_R 7.2 to 46 A | $R_{DC\ max.}$ 1.6 to 85 m Ω



WE-CMBH Common Mode Power Line Choke (Horizontal)

L 1 to 20 mH | I_R 2 to 10 A | $R_{DC\ max.}$ 12.5 to 230 m Ω



WE-TPB Three-Phase Common Mode Power Line Choke

L 0.52 to 12 mH | I_R 6 to 24 A

eiSos Taiwan 七大服務



服務 1 REDEXPERT

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服務 2 SEMINAR

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協助 EMC 修改專案，服務內容 CONDUCTION / RADIATION / ESD / EFT / SURGE



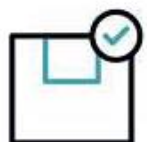
服務 4 開發板

免費開發板借用，快速了解使用功能並取得測試結果



服務 5 EMC 測試板

免費 EMC 測試板提供，只要將 EMC 元件放在測試板，輕鬆完成測試結果



服務 6 無 MOQ

靈活不受數量限制，依實際需求訂購，降低庫存壓力



服務 7 LINE 庫存查詢

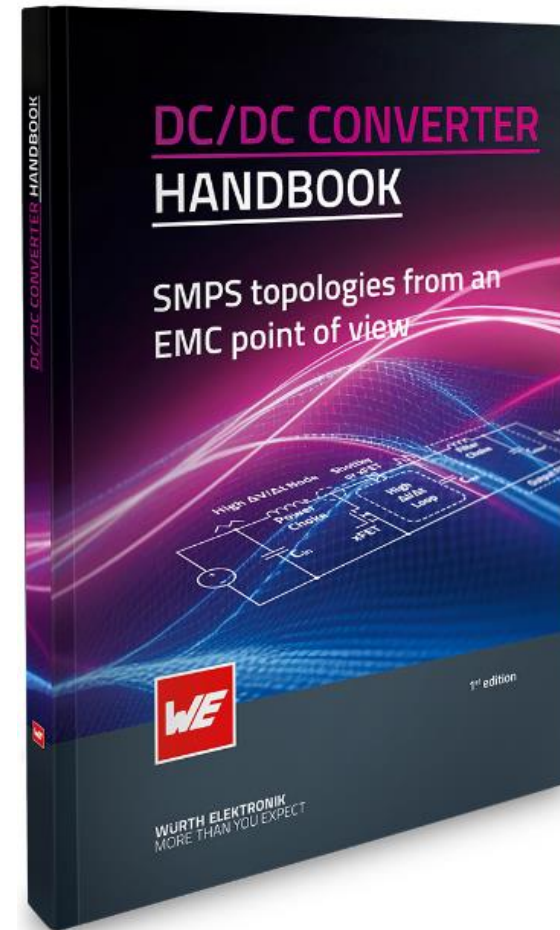
快速便捷的庫存查詢，不需電話 / 郵件，立即取得庫存資訊



Redexpert

好康大放送

- 掃描伍仕電子QR code, 加入line 官方帳號.
- 留言“台南研討會”, 就有機會抽
“DC/DC Converter Handbook”, 限量五本.
- 也請留下您的姓名, 公司名稱, 聯絡方式.



Thank You!