High Voltage ChiP DCM reference design for MIL-STD

MIL STD REF DESIGN HV DCM

REV	DESCRIPTION	DATE	APPROVED
1	APPLICATIONS ENGINEERING	5/21/2020	VD

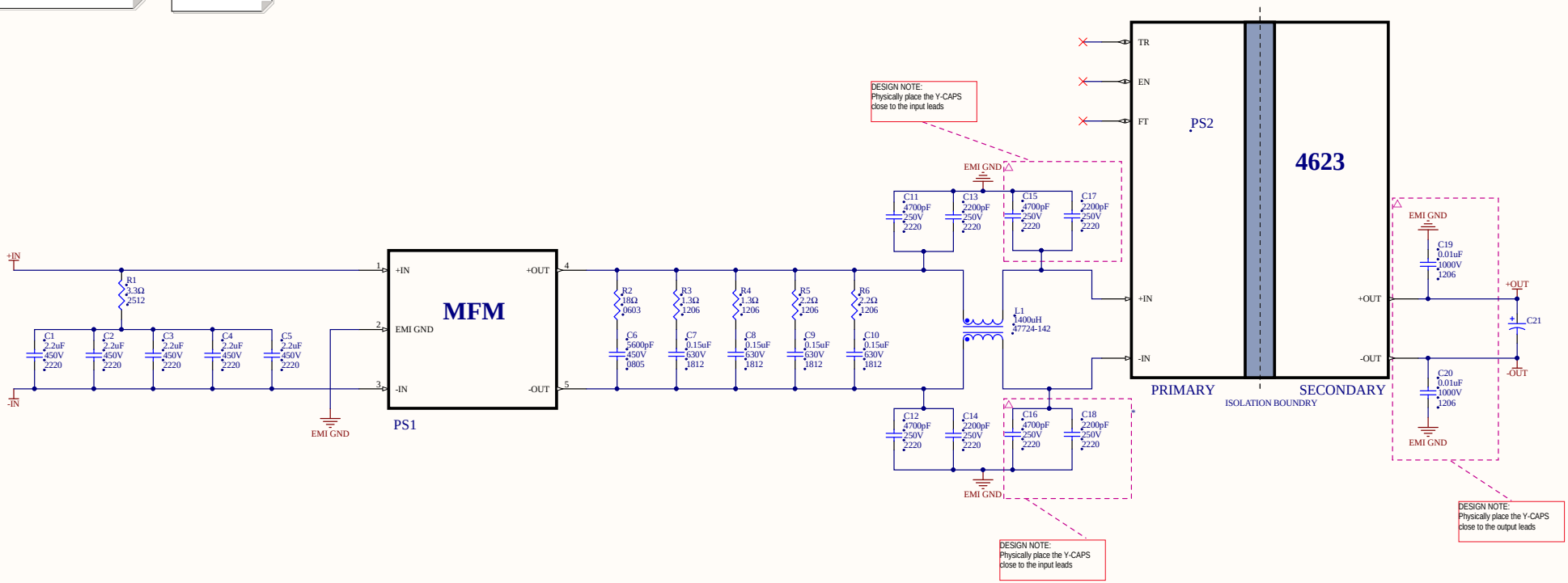
BOARD REVISION NOTES

REVISION NOTES:

1 - Redrawn based on the existing schematic; 5/21/2020

SHEET TO DO

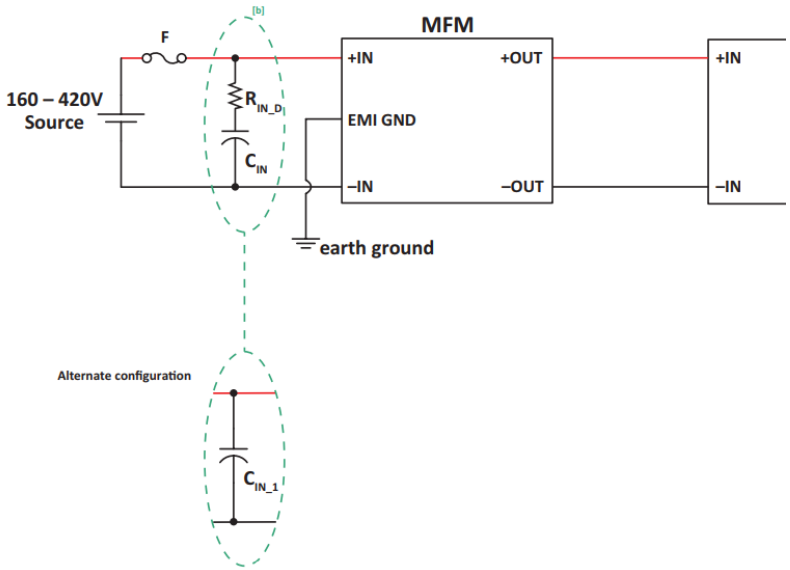
TO DO:



A

HV DCM MIL REF DESIGN
Applicable for 160 - 420Vin DCMs

APPLICATION: Altium Designer	SIZE B	FSCM NO. 67131	DWG NO.
FILENAME: MIL HVDCM.SchDoc			REV 1
DRAWN: Vamshi Domudala DATE: 5/21/2020	SCALE: scale	SHEET 1 OF 1	



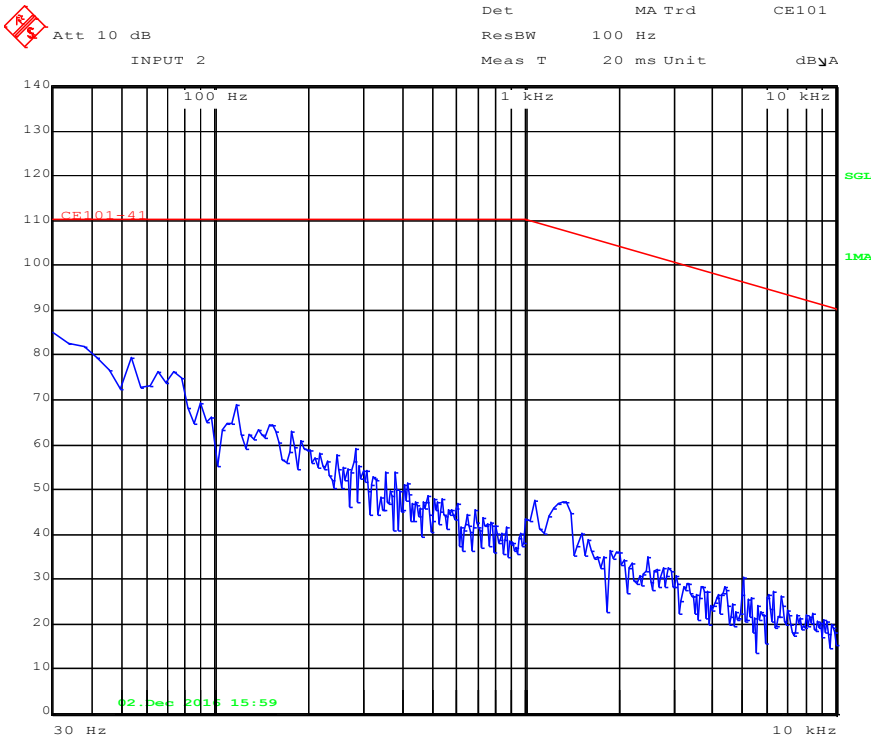
Note:

[a] Alternate configuration: No minimum load is required to meet CE102 with CIN_1 = 100µF.

[b] A minimum load of 10% is required to meet the conducted emissions CE102 for input voltages in the range of 270 – 420VDC with the combination of RIN_D+ CIN (C21-25),.

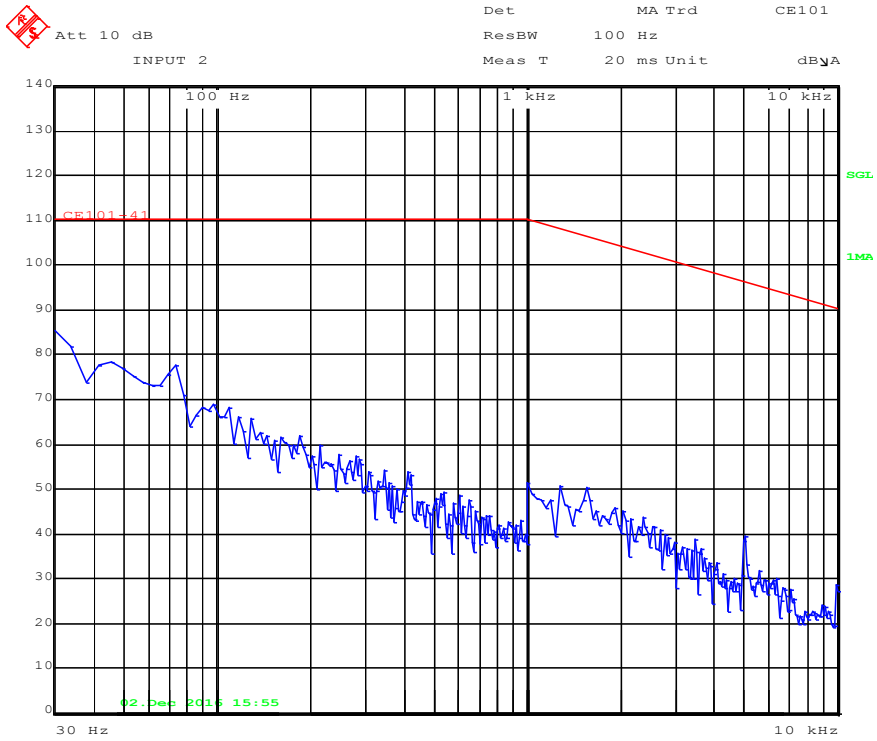
Typical Conducted Emissions Test Data (-OUT Connected to GND)

CE101 – RED Lead, 0% Load, Cin = 100uF/450V, Cout = 200uF/63V



Date: 2.DEC.2016 15:59:28

CE101 – RED Lead, 10% Load, Cin = 100uF/450V, Cout = 200uF/63V



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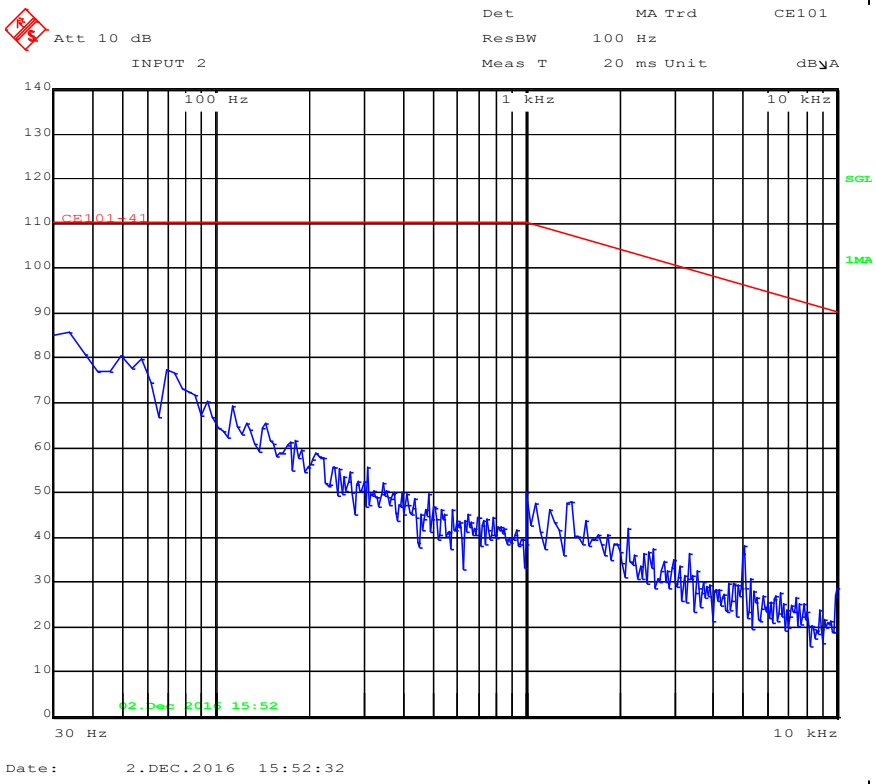
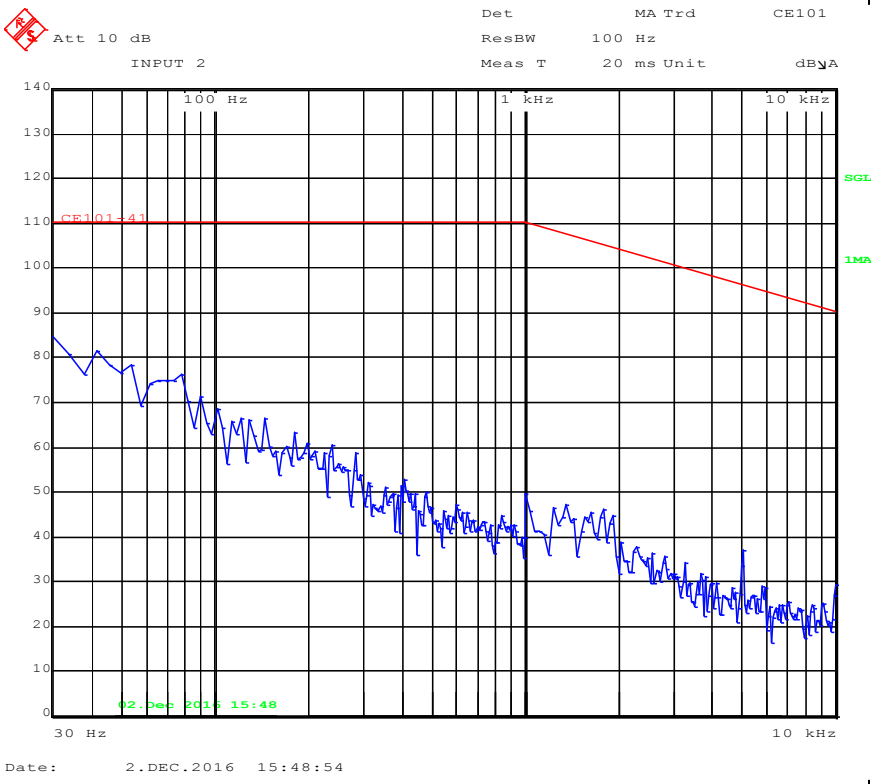
CE101 – RED Lead, 50% Load, Cin = 100uF/450V, Cout = 200uF/63V



Date: 2.DEC.2016 15:52:32

CE101 – RED Lead, 90% Load, Cin = 100uF/450V, Cout = 200uF/63V



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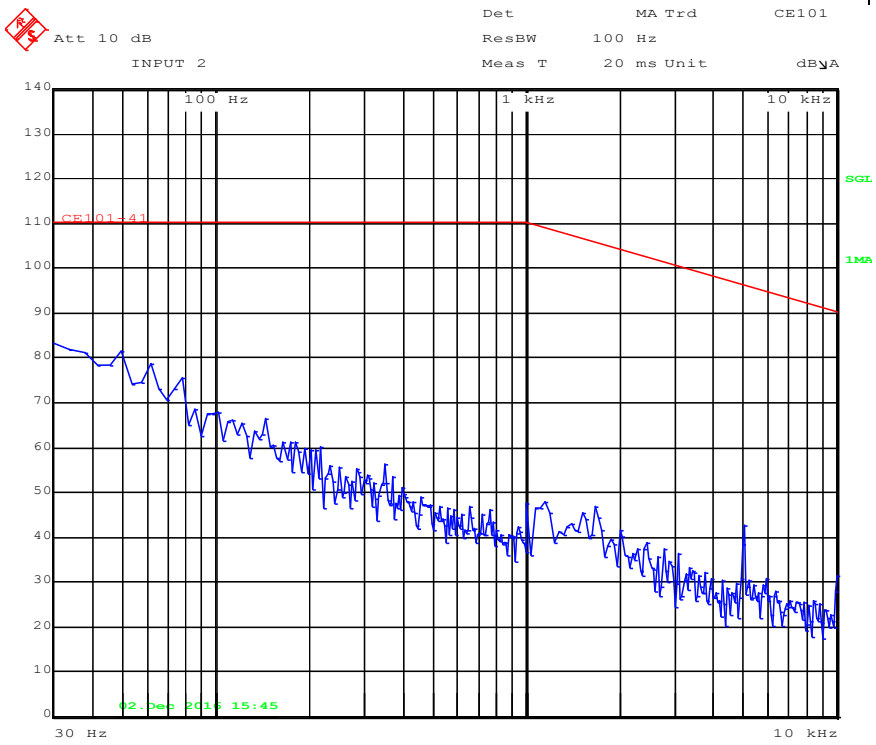
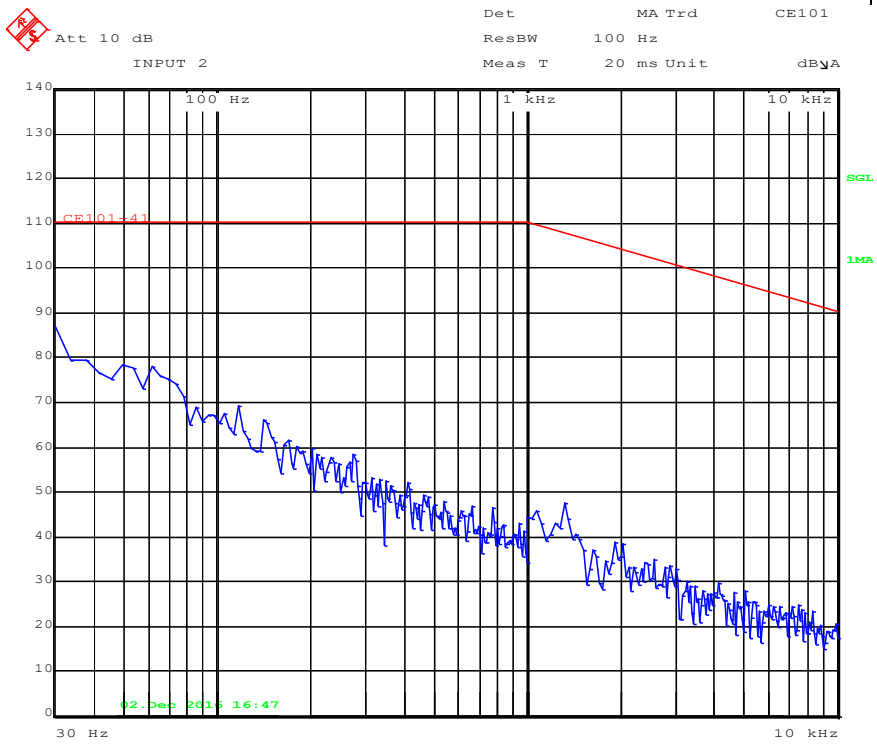
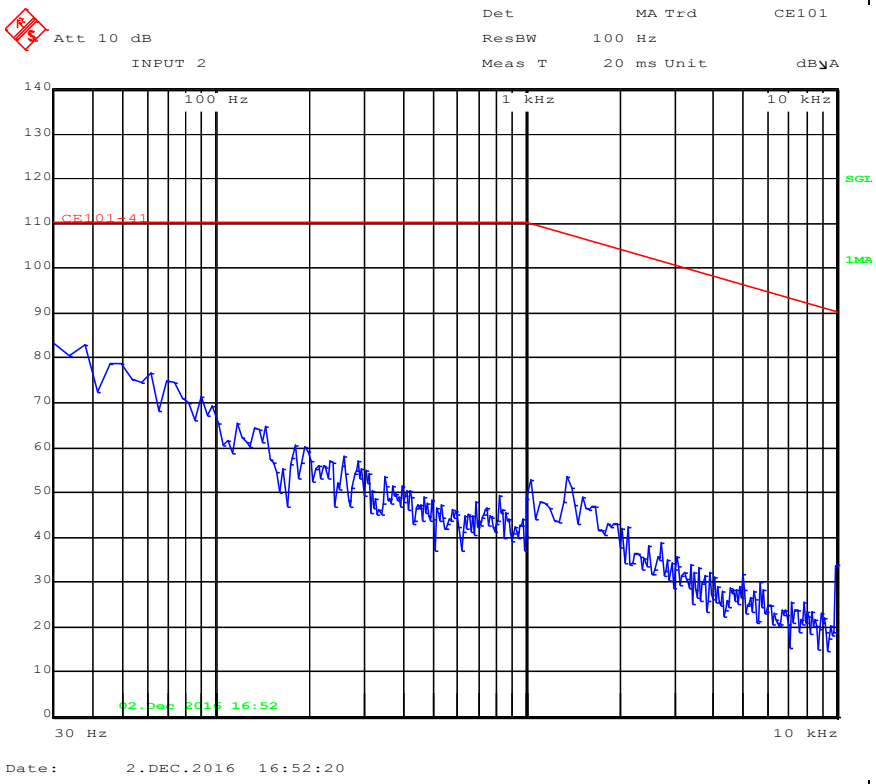


CE101 – RED Lead, 0% Load, Cin = 100uF/450V, Cout = 2000uF/63V



CE101 – RED Lead, 10% Load, Cin = 100uF/450V, Cout = 2000uF/63V



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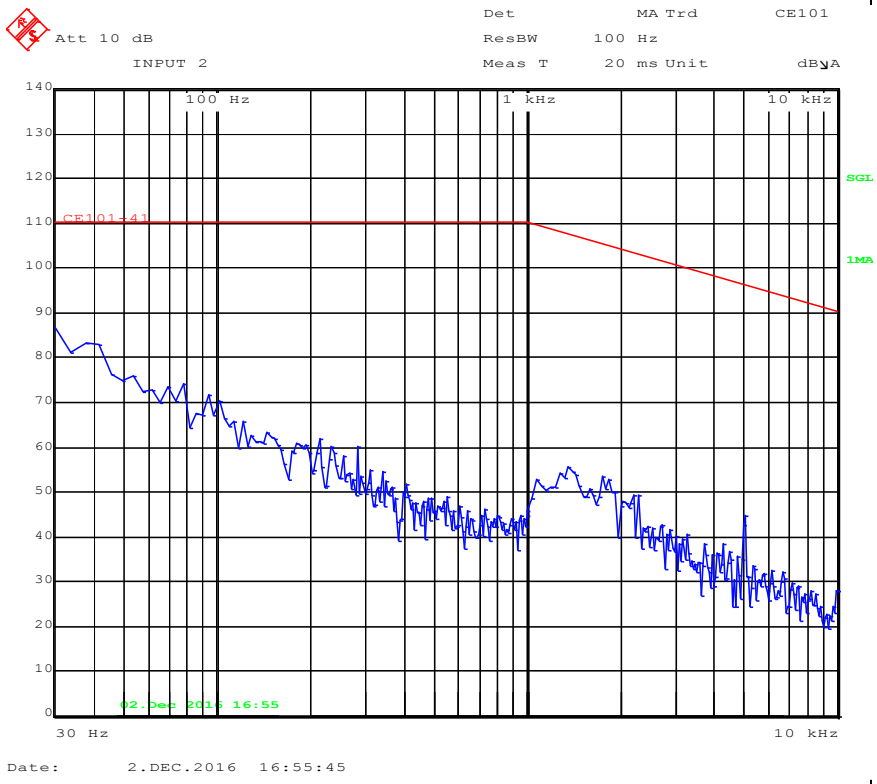

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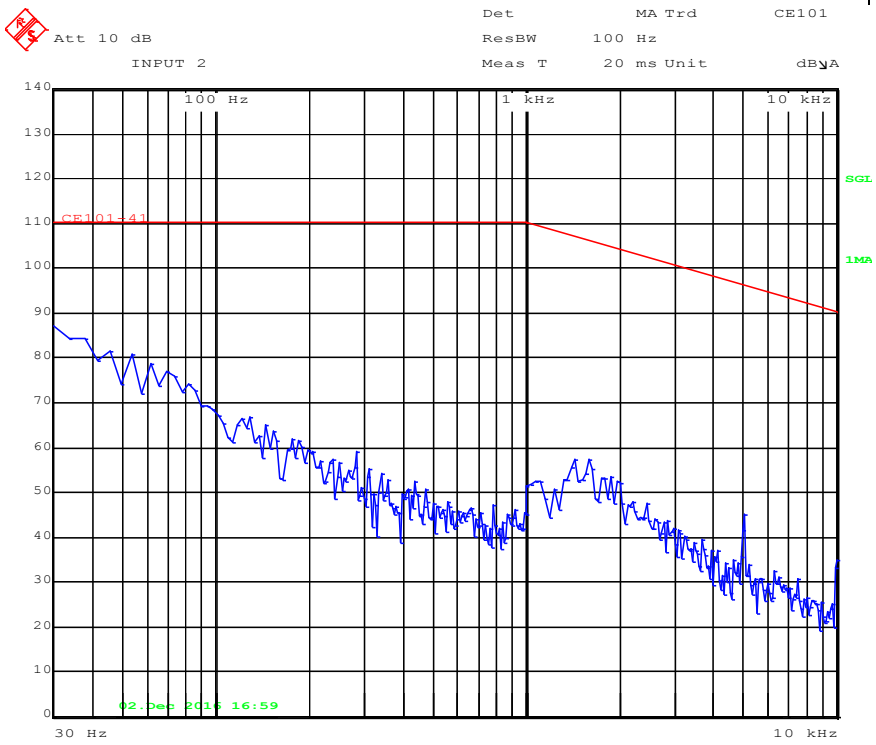

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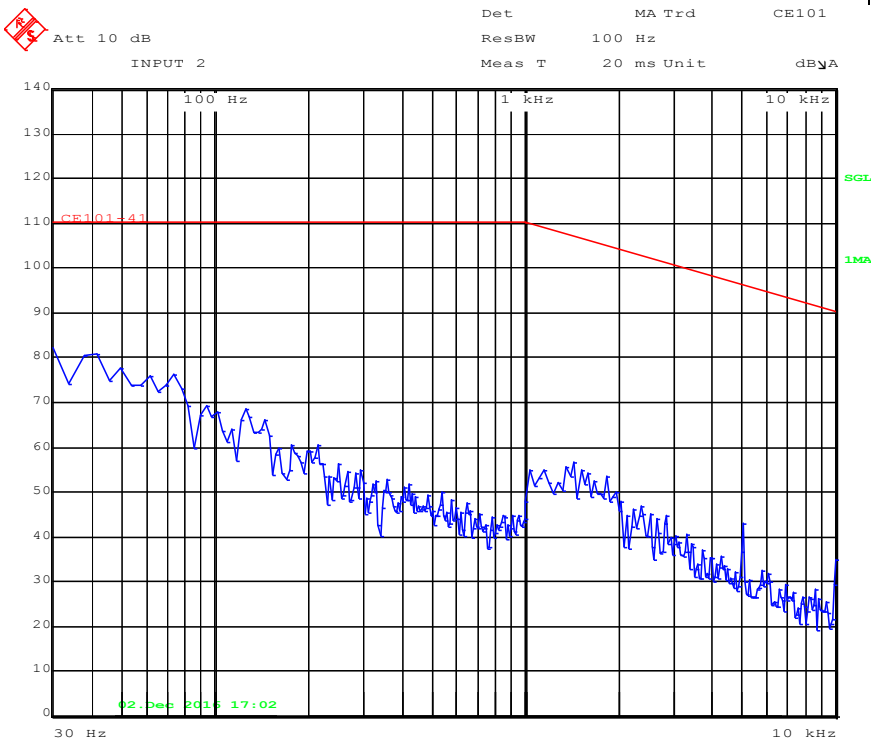

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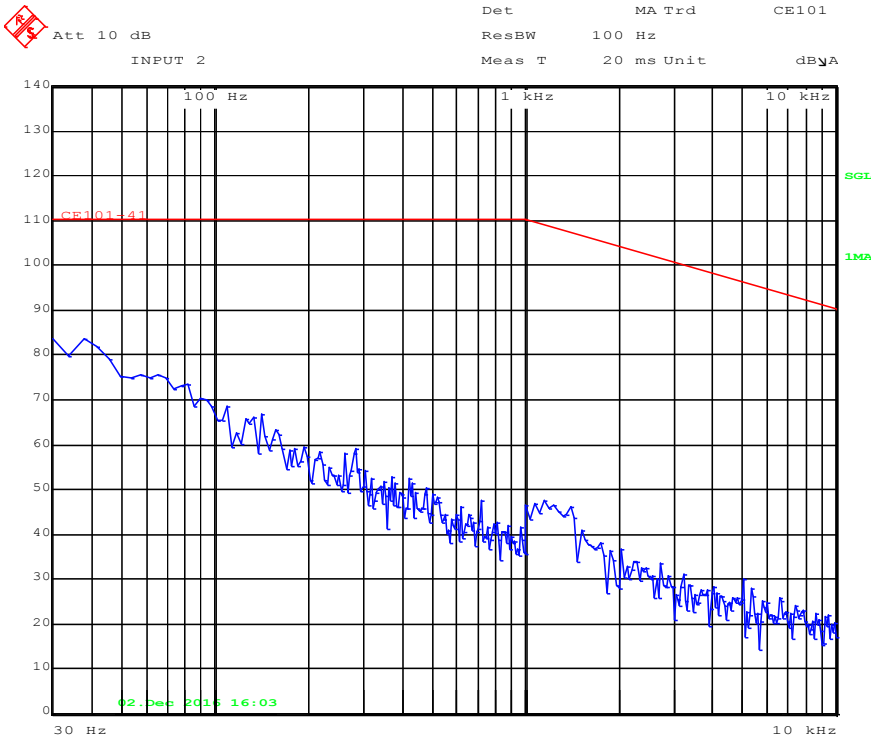
CE101 – BLACK Lead, 0% Load, Cin = 100uF/450V, Cout = 200uF/63V



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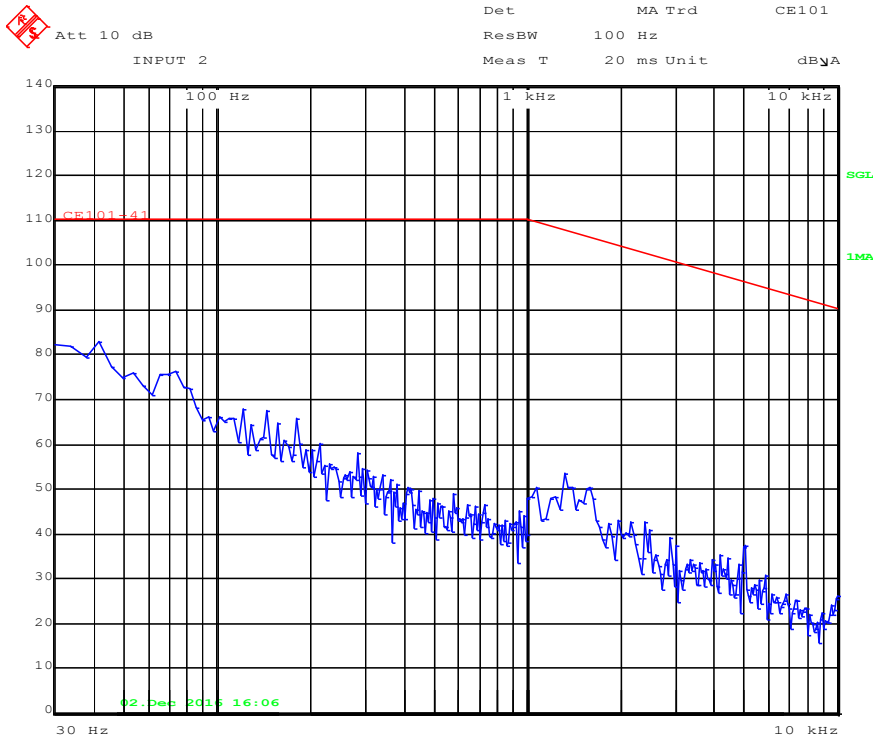

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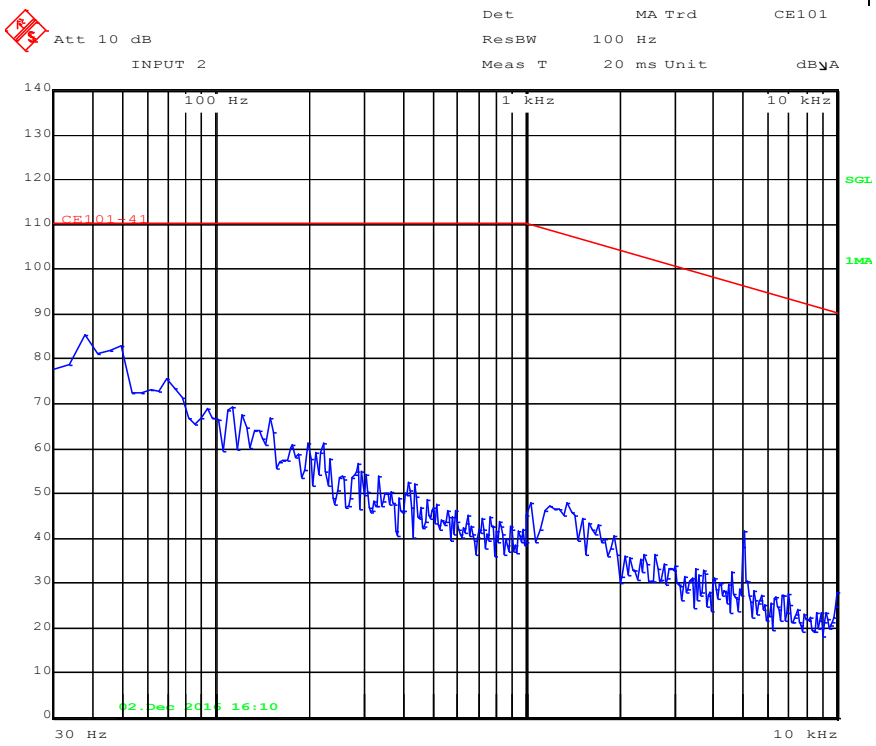
CE101 – BLACK Lead, 50% Load, Cin = 100uF/450V, Cout = 200uF/63V



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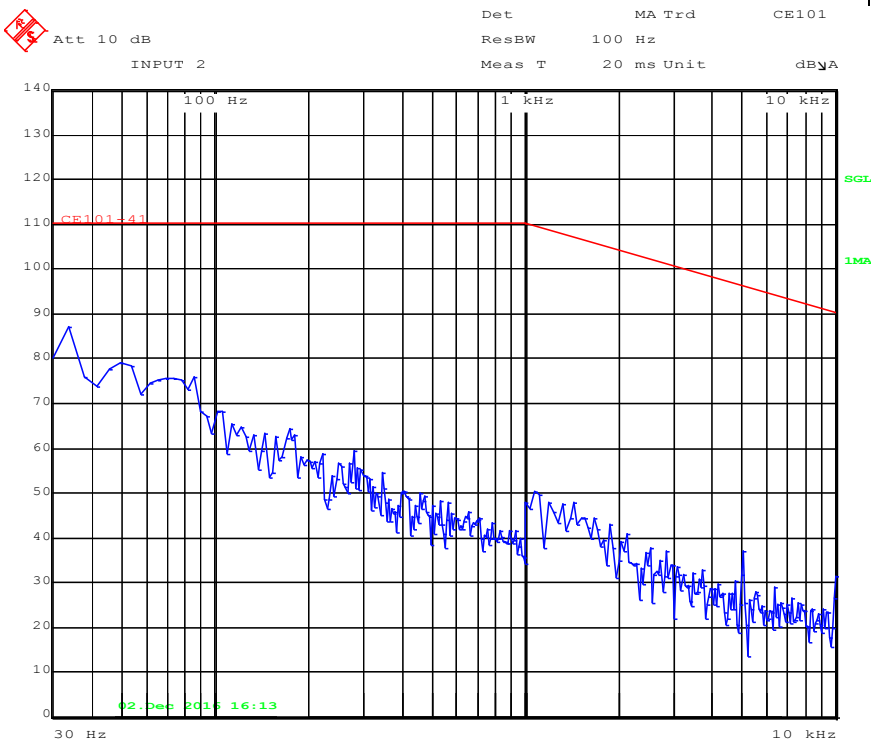

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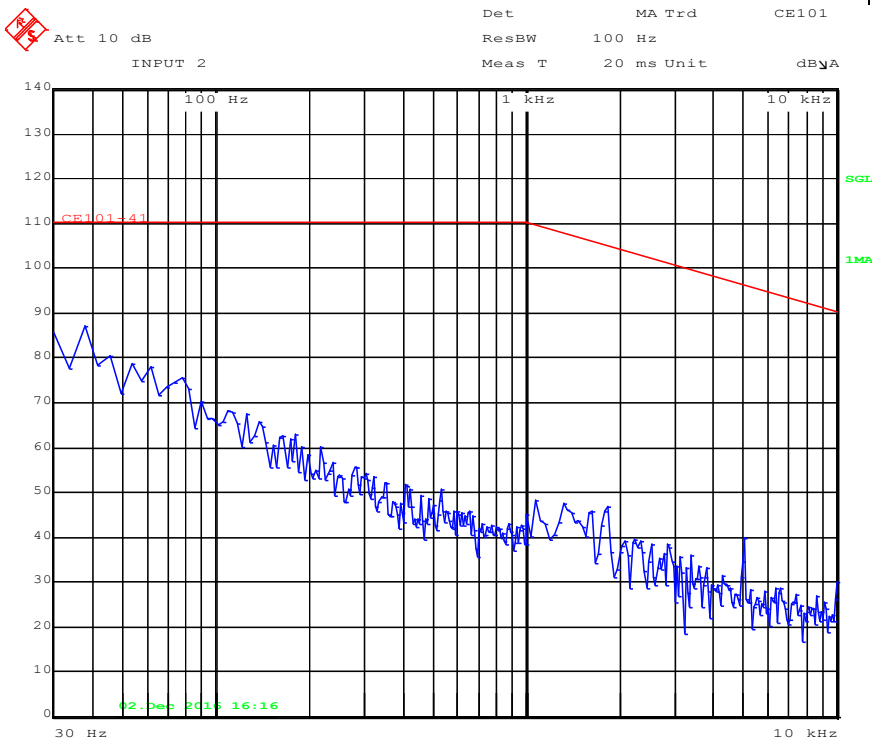

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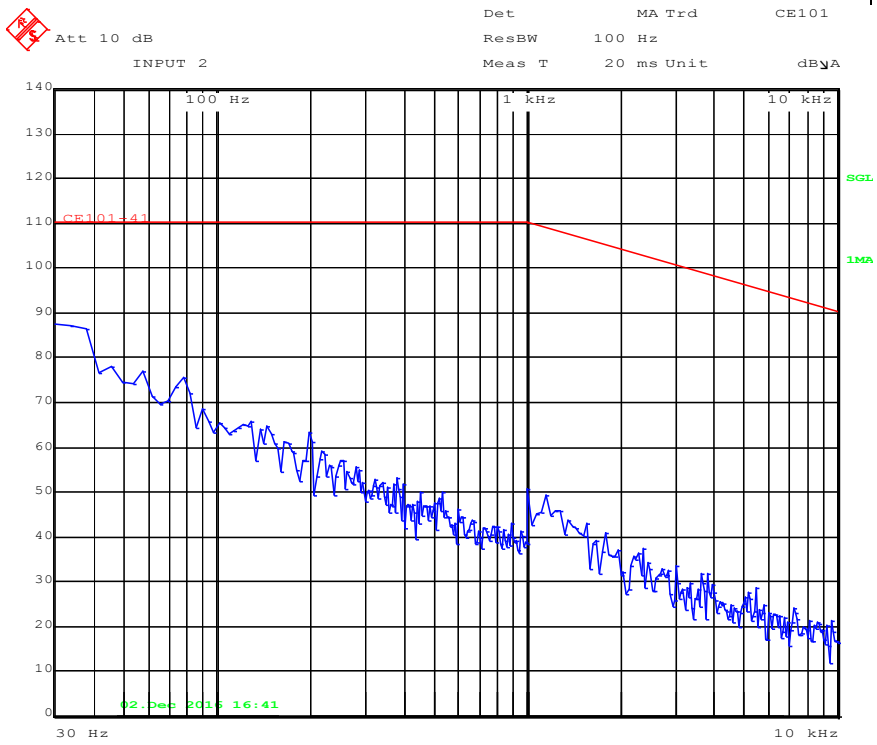
CE101 – BLACK Lead, 0% Load, Cin = 100uF/450V, Cout = 2000uF/63V



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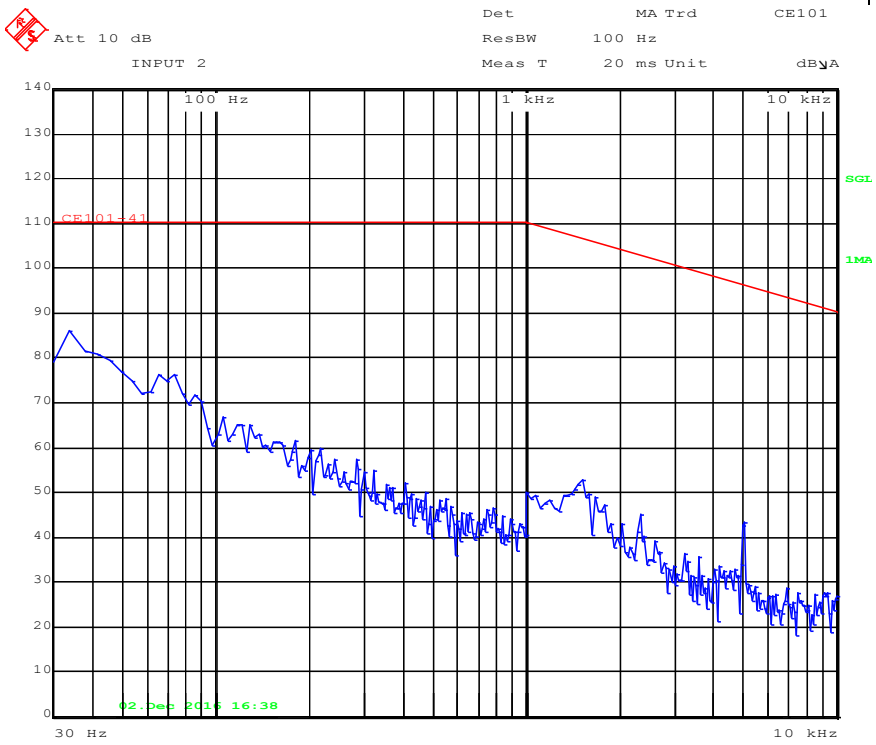
CE101 – BLACK Lead, 10% Load, Cin = 100uF/450V, Cout = 2000uF/63V



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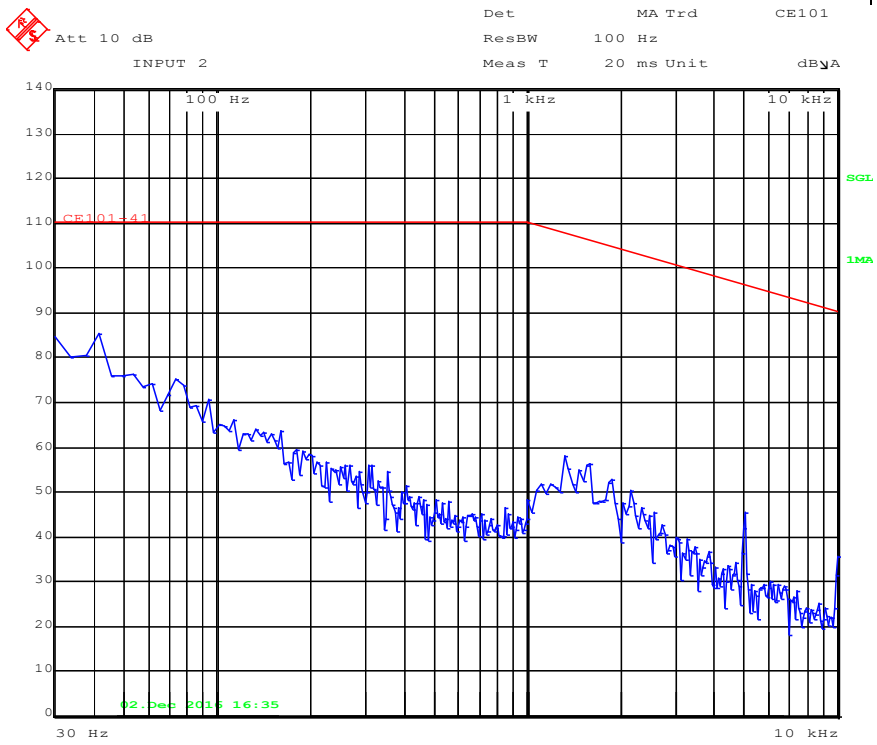
CE101 – BLACK Lead, 50% Load, Cin = 100uF/450V, Cout = 2000uF/63V



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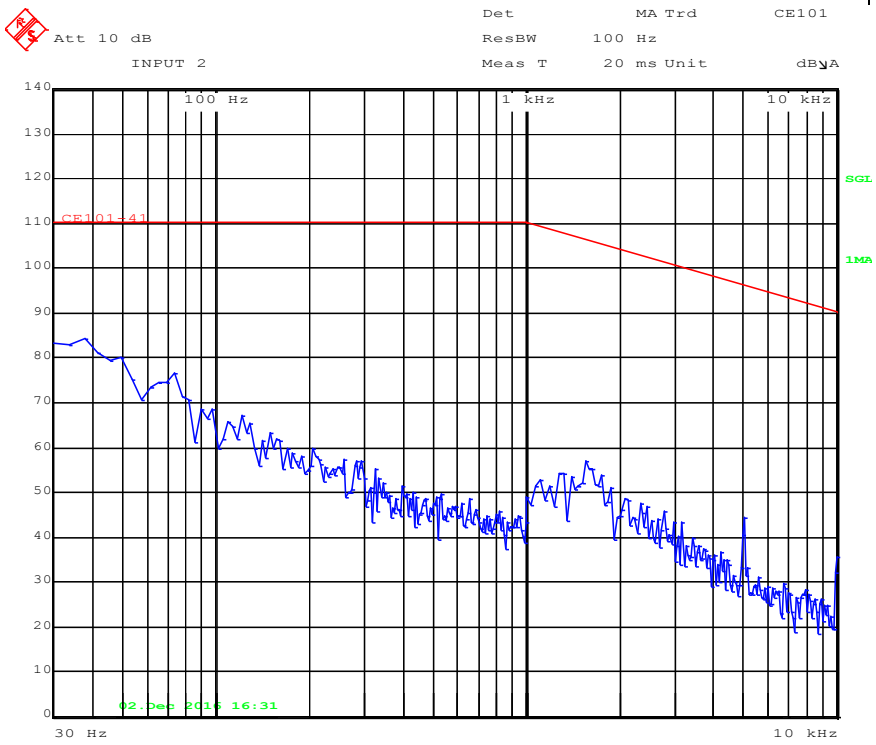

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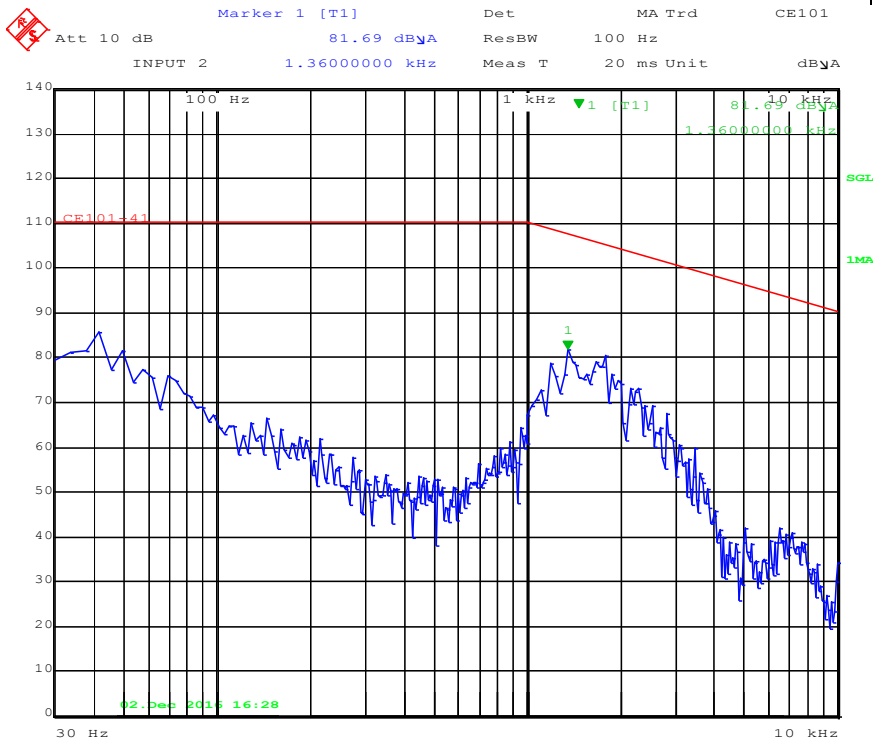
CE101 – BLACK Lead, 100% Load, Cin = 100uF/450V, Cout = 2000uF/63V



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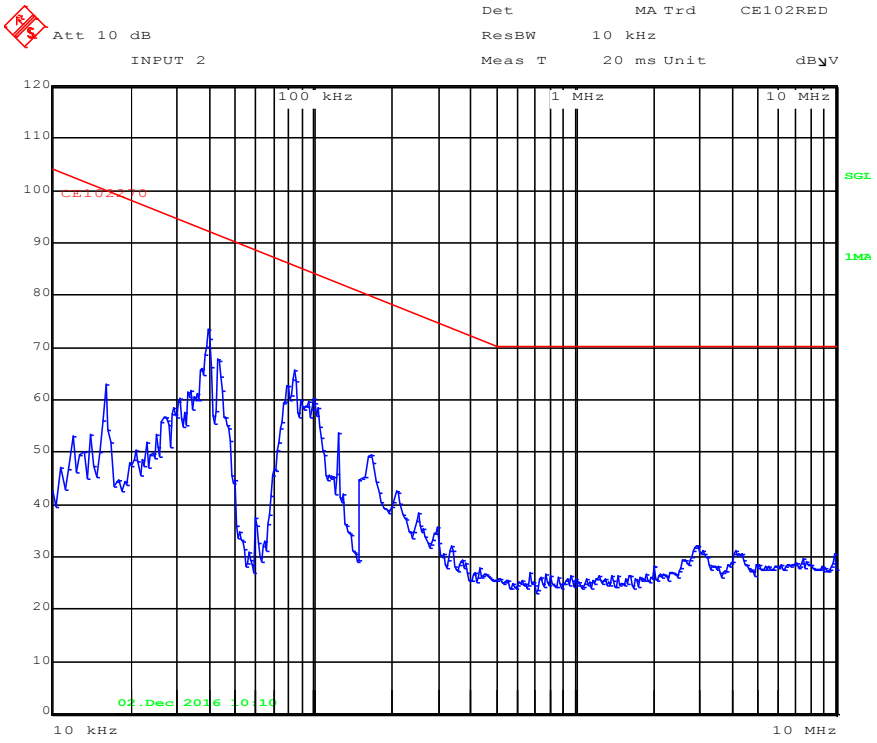
CE102 – RED Lead, 0% Load, Cin = 100uF/450V, Cout = 200uF/63V



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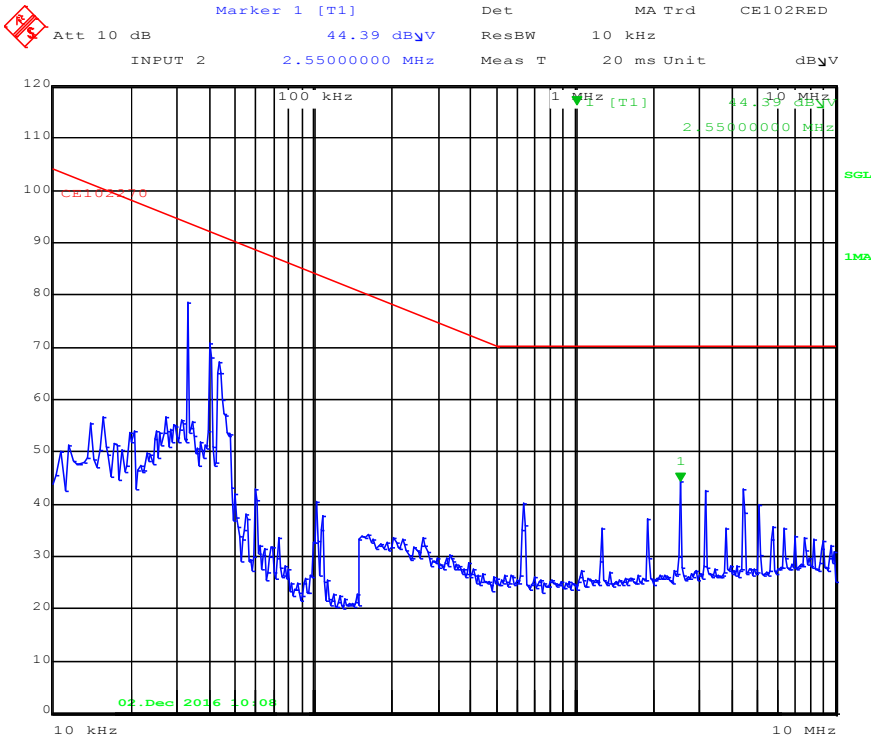
CE102 – RED Lead, 10% Load, Cin = 100uF/450V, Cout = 200uF/63V



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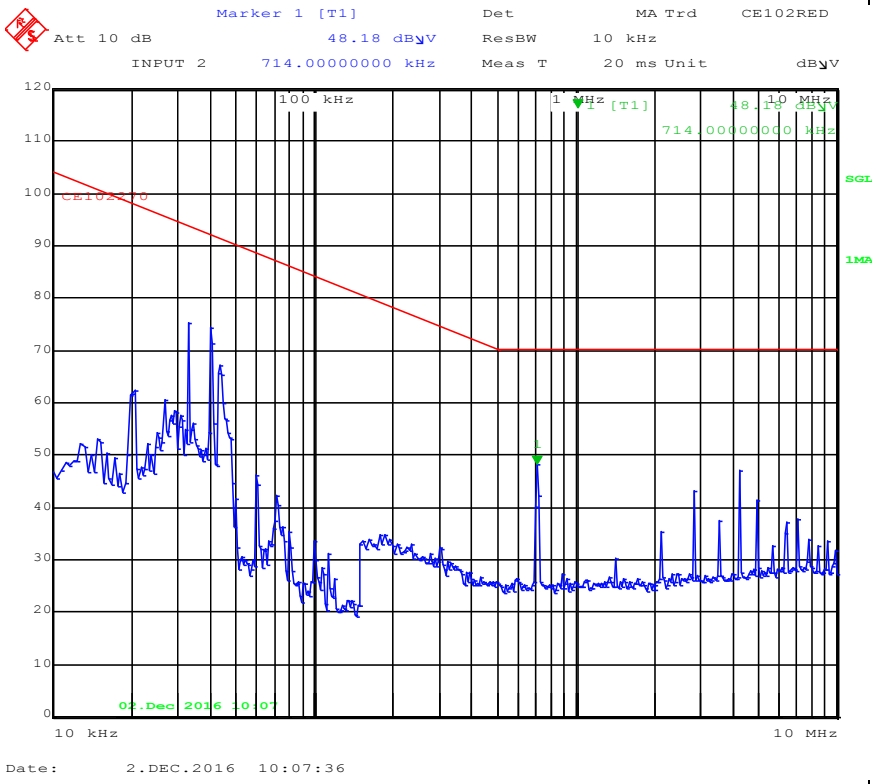
CE102 – RED Lead, 50% Load, Cin = 100uF/450V, Cout = 200uF/63V



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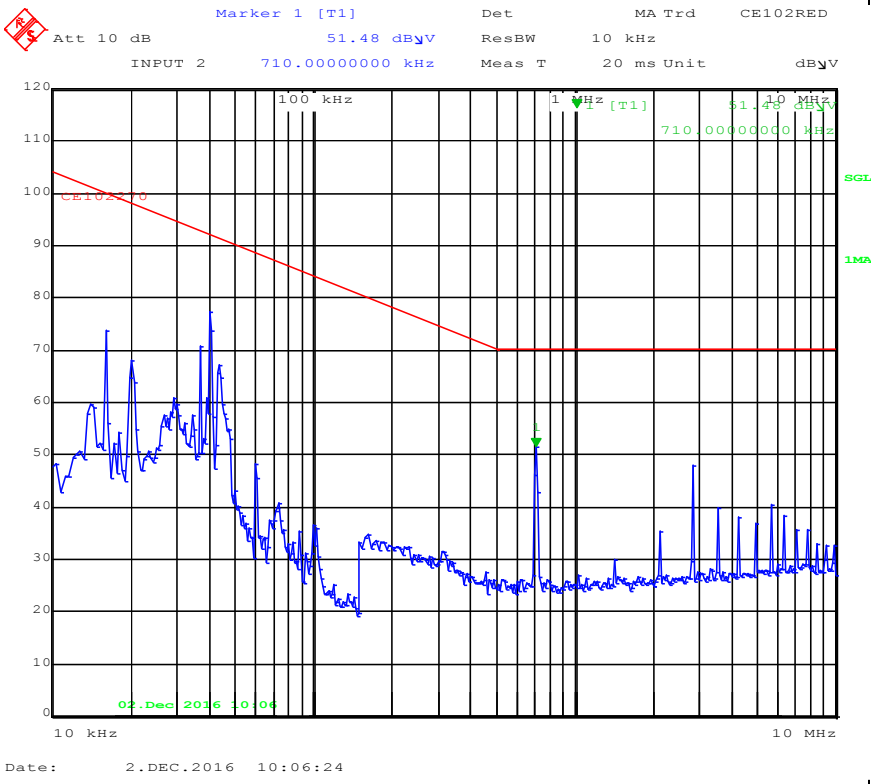
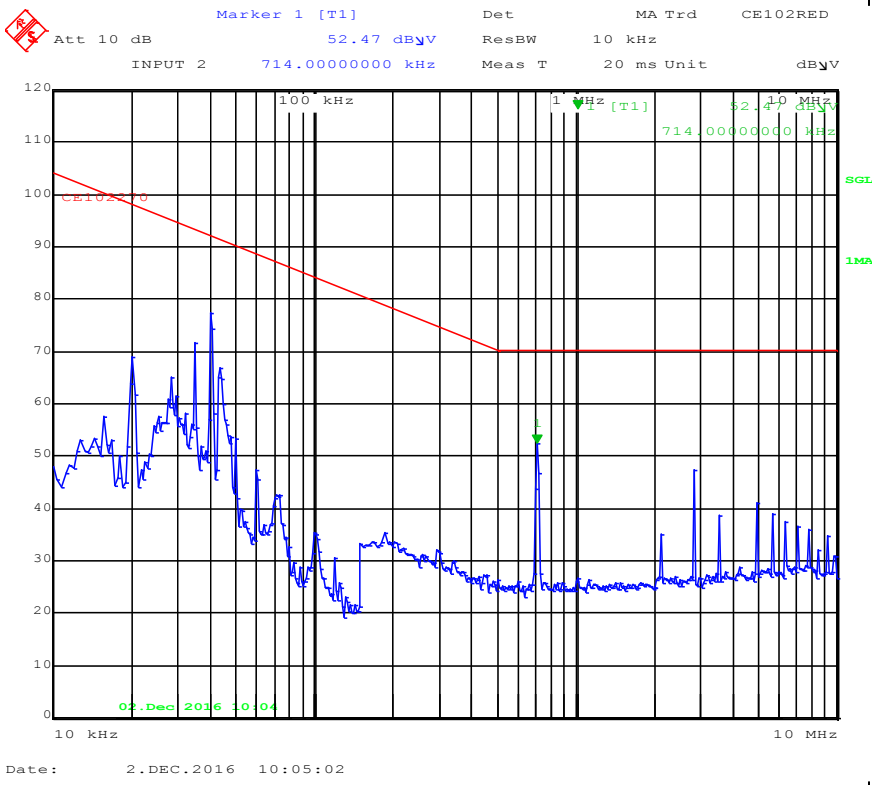
CE102 – RED Lead, 90% Load, Cin = 100uF/450V, Cout = 200uF/63V

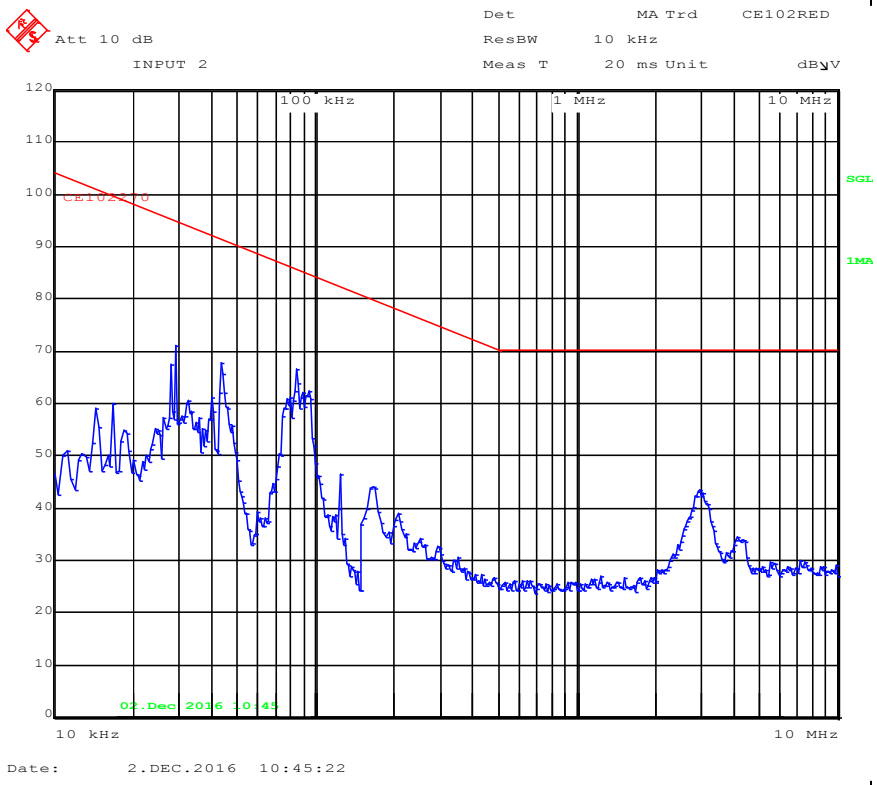


Date: 2.DEC.2016 10:06:24

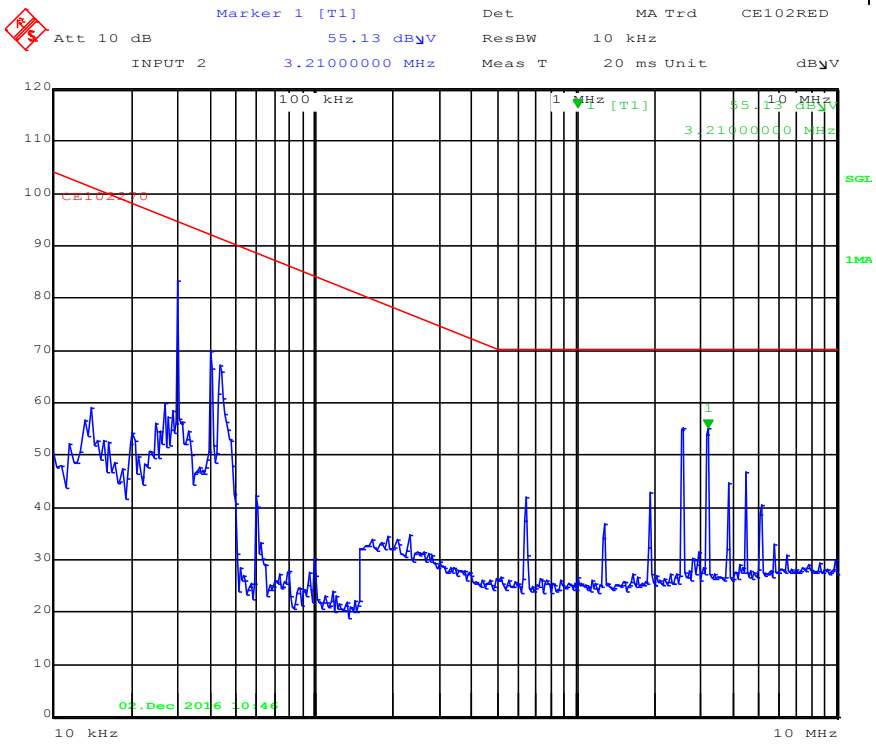
CE102 – RED Lead, 100% Load, Cin = 100uF/450V, Cout = 200uF/63V



CE102 – RED Lead, 0% Load, Cin = 100uF/450V, Cout = 2000uF/63V



CE102 – RED Lead, 10% Load, Cin = 100uF/450V, Cout = 2000uF/63V



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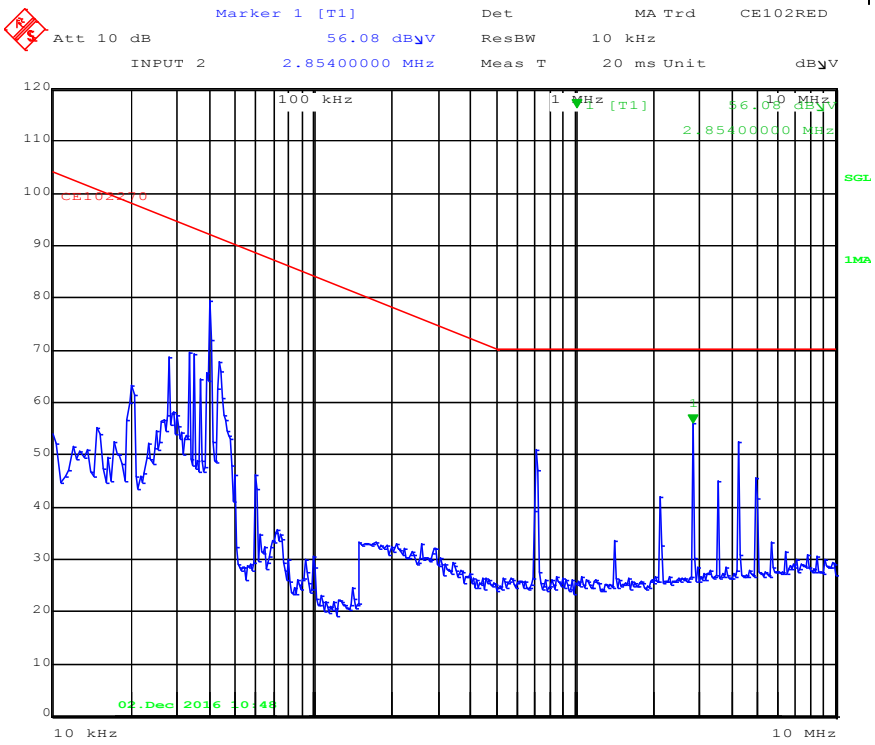

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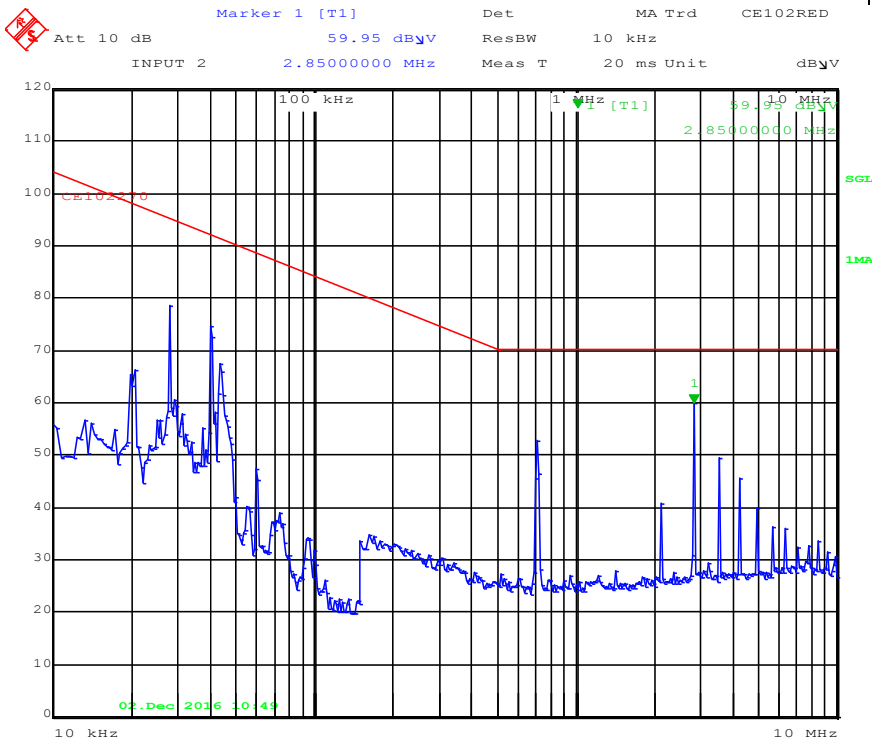

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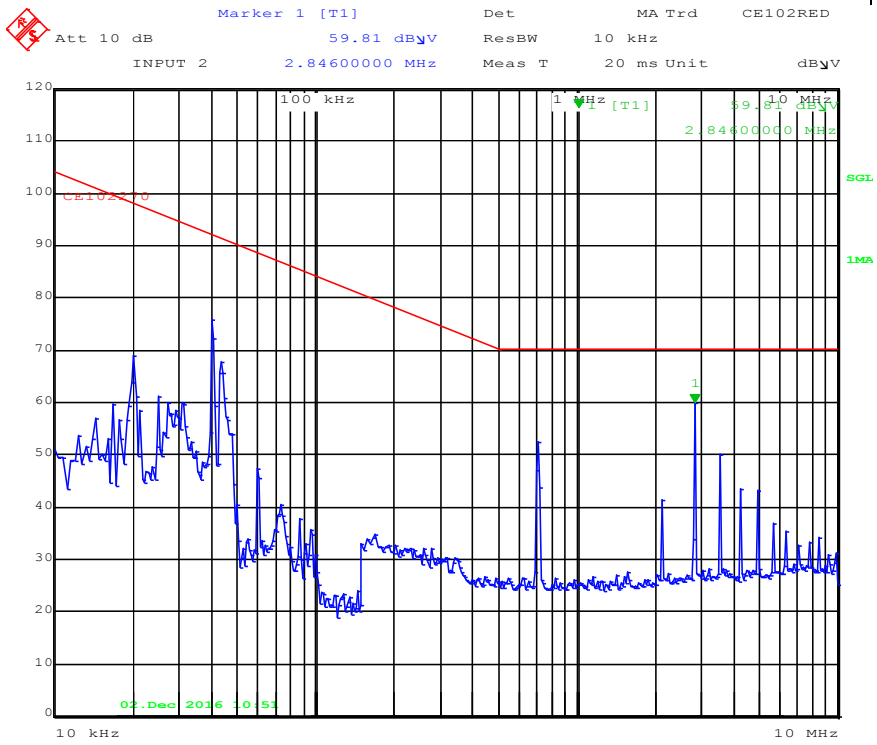
CE102 – RED Lead, 100% Load, Cin = 100uF/450V, Cout = 2000uF/63V



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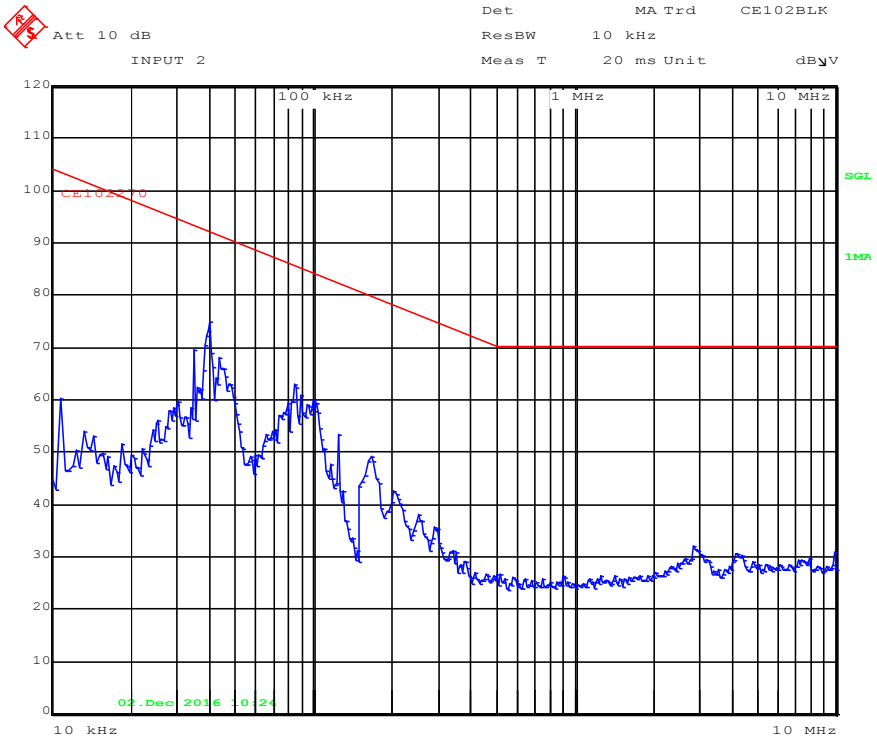
CE102 – BLACK Lead, 0% Load, Cin = 100uF/450V, Cout = 200uF/63V



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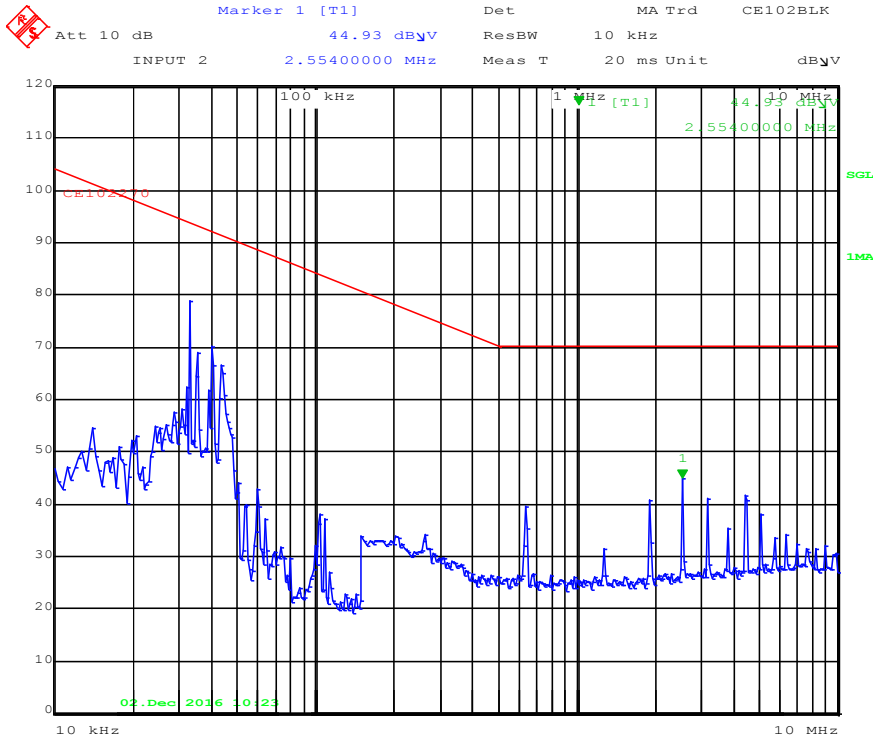
CE102 – BLACK Lead, 10% Load, Cin = 100uF/450V, Cout = 200uF/63V



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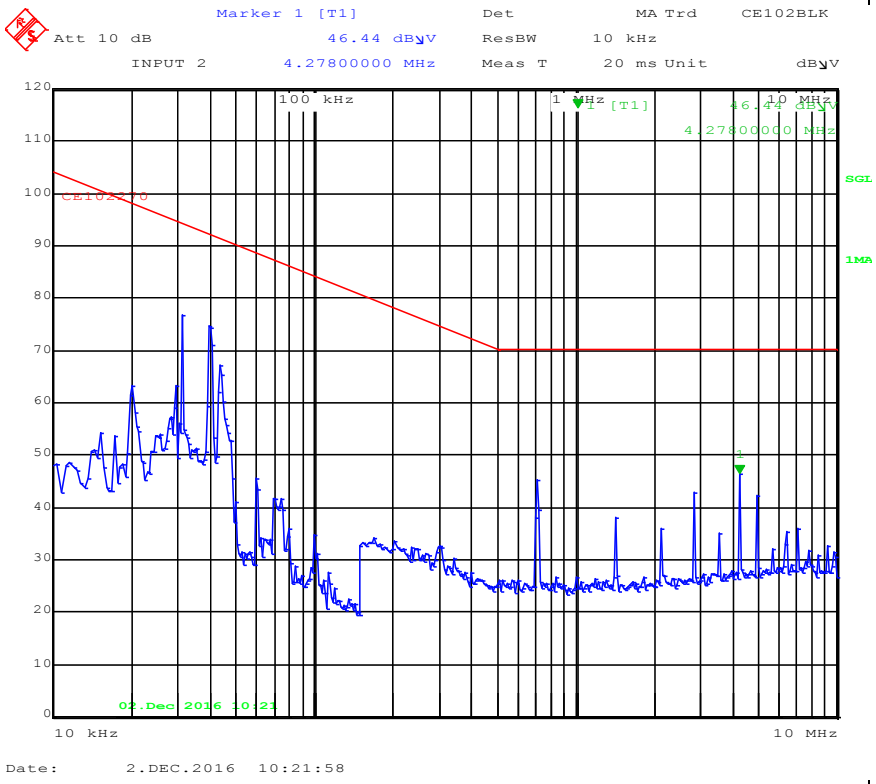

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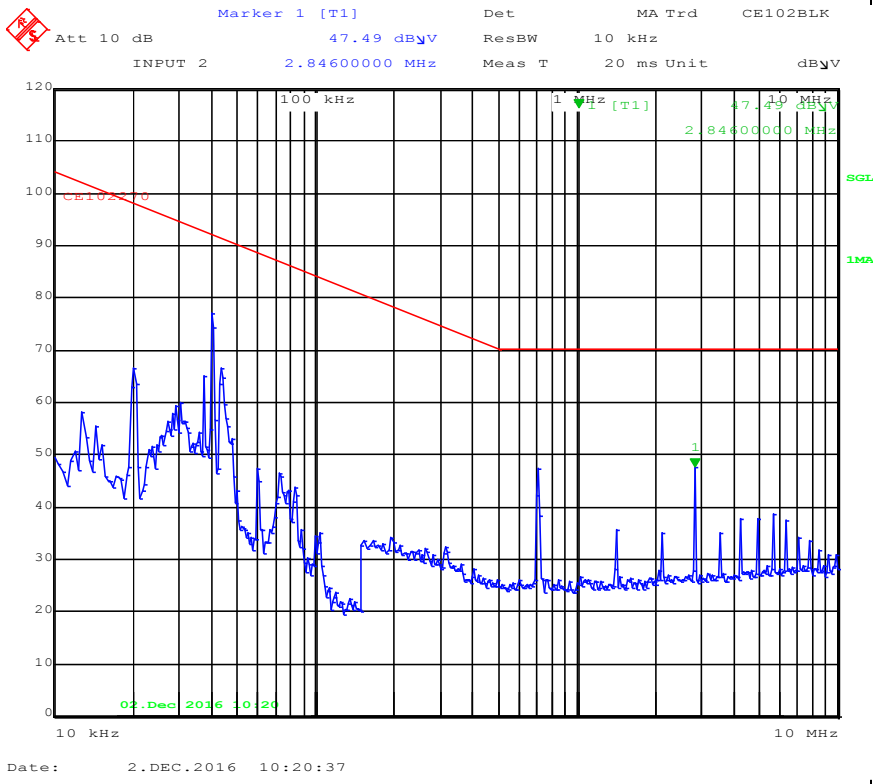
CE102 – BLACK Lead, 90% Load, Cin = 100uF/450V, Cout = 200uF/63V



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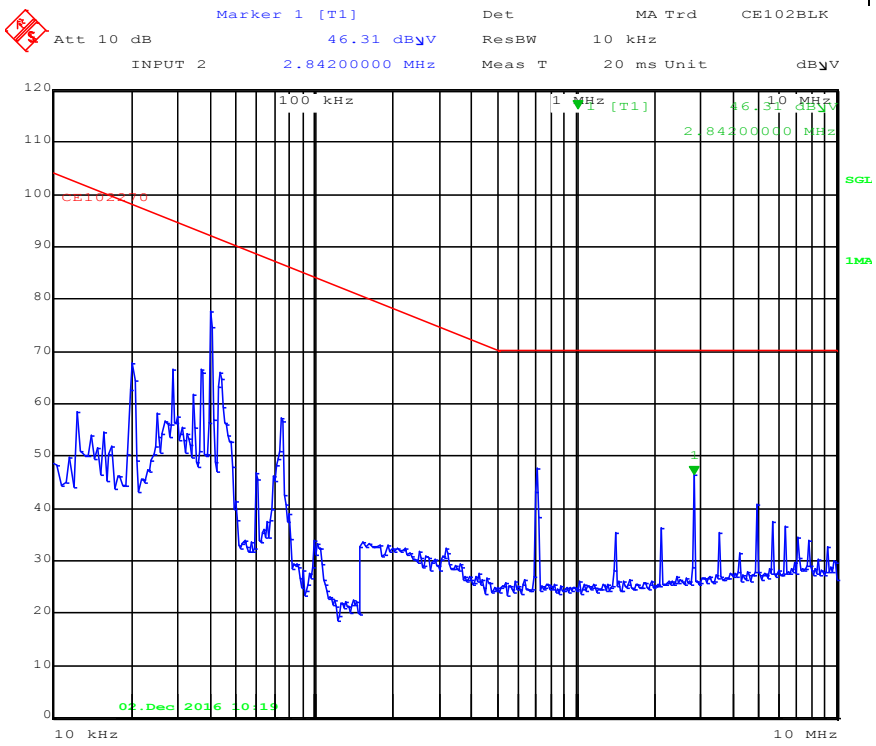
CE102 – BLACK Lead, 100% Load, Cin = 100uF/450V, Cout = 200uF/63V



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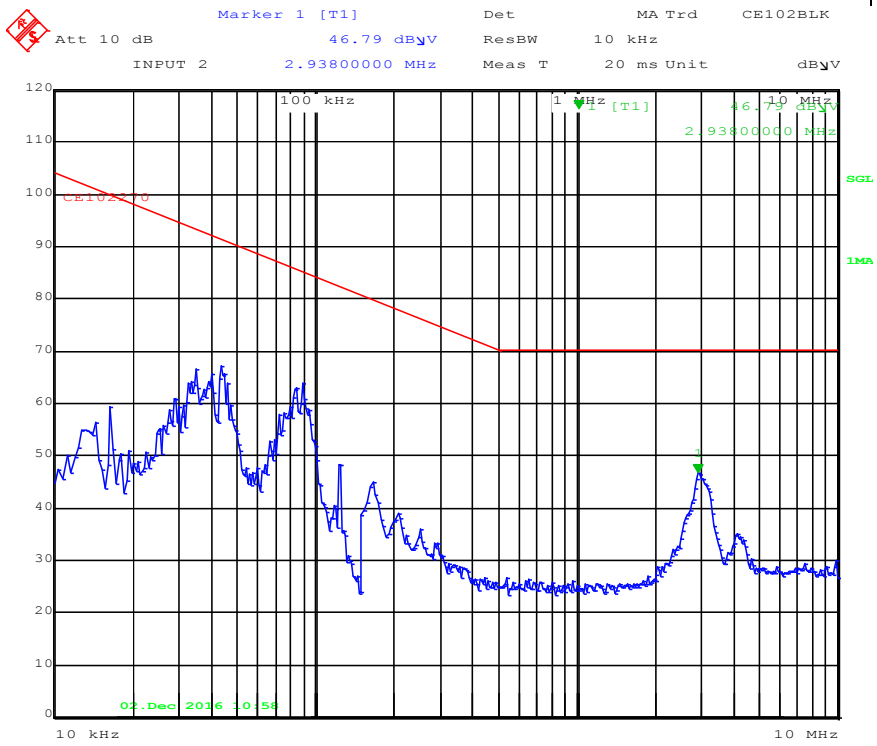
CE102 – BLACK Lead, 0% Load, Cin = 100uF/450V, Cout = 2000uF/63V



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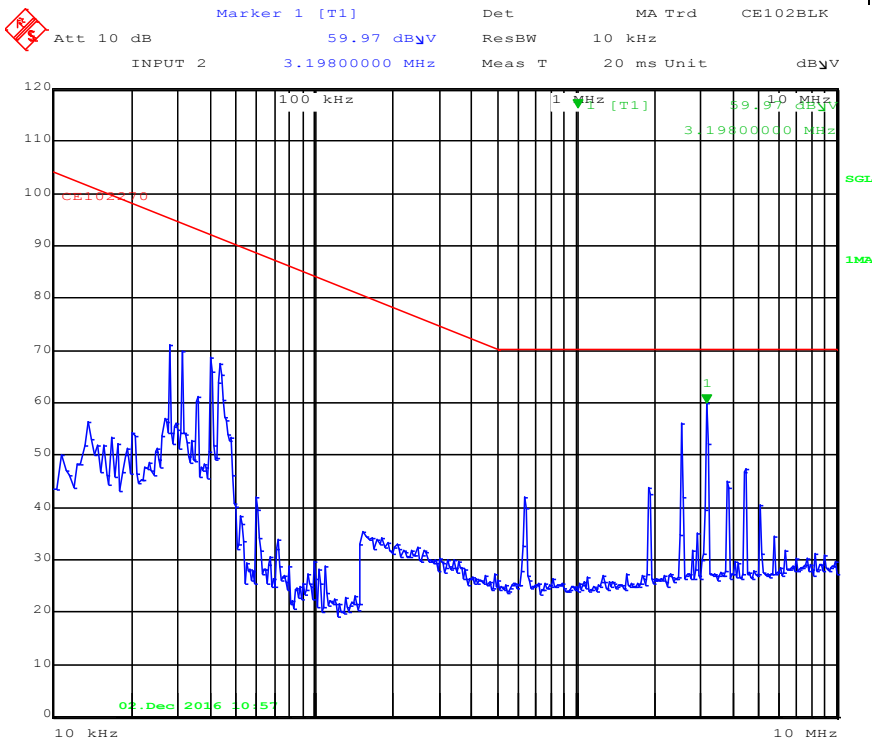
CE102 – BLACK Lead, 10% Load, Cin = 100uF/450V, Cout = 2000uF/63V



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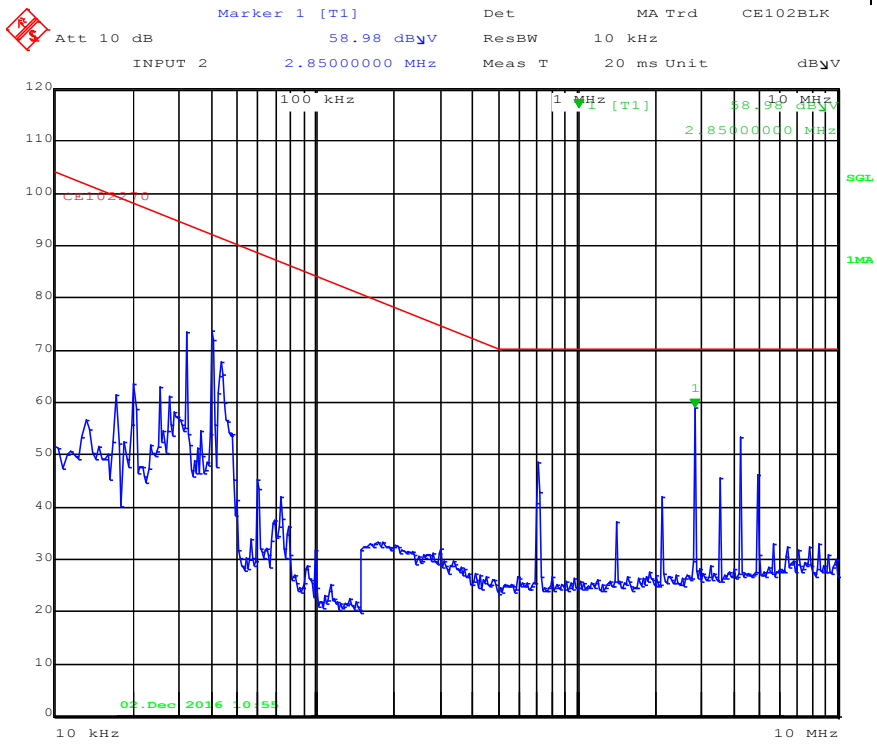

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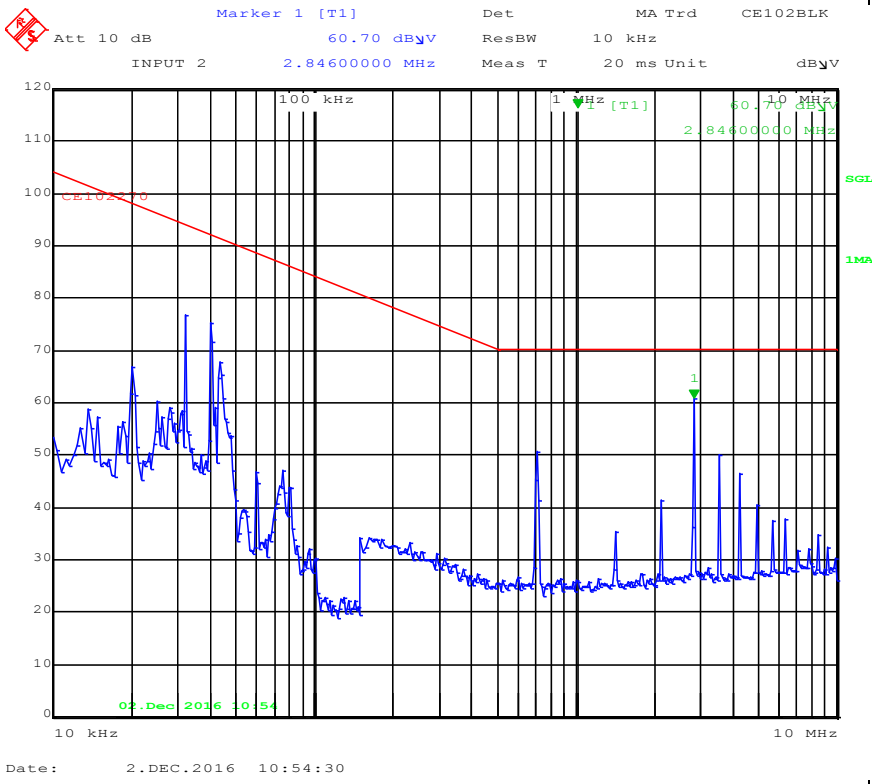
CE102 – BLACK Lead, 90% Load, Cin = 100uF/450V, Cout = 2000uF/63V



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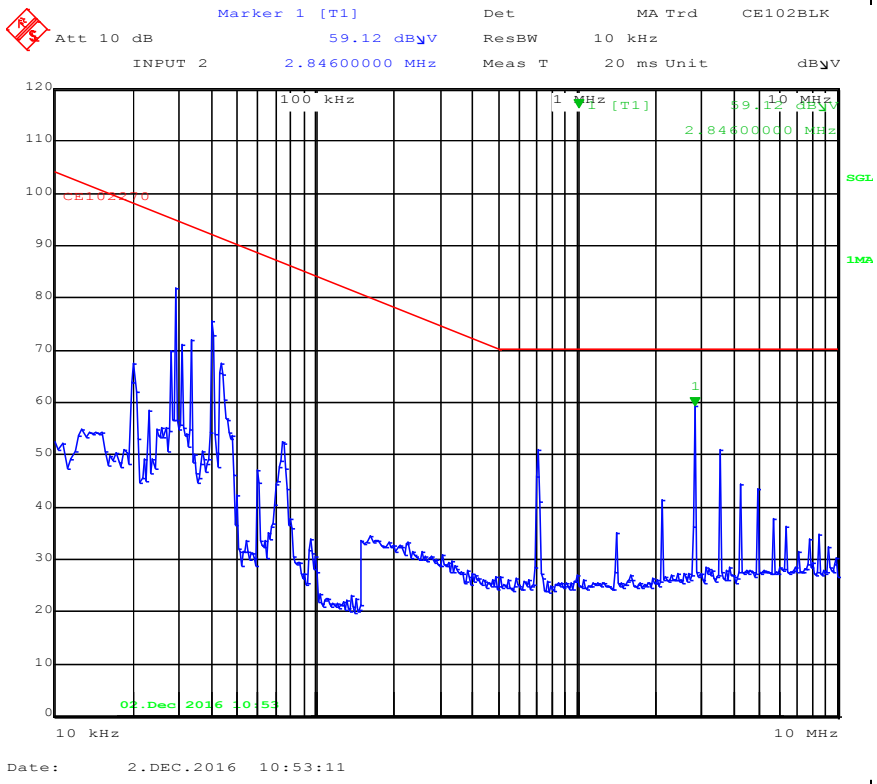
CE102 – BLACK Lead, 100% Load, Cin = 100uF/450V, Cout = 2000uF/63V



Date: 2.DEC.2016 10:53:11

Bill of Material

REFERENCE DESIGNATOR	DESCRIPTION	MFG PART NUMBER	MANUFACTURER	QUANTITY	VALUE NOM	RATING NOM
C1, C2, C3, C4, C5	Capacitor	C5750X6S2W225K250KA	TDK	5	2.2uF	450V
C6	Capacitor	C2012C0G2W562J125AA	TDK	1	5600pF	450V
C7, C8, C9, C10	Capacitor	C4532X7T2J154M160KC	TDK	4	0.15uF	630V
C11, C12, C15, C16	Capacitor	GA355DR7GF472KW01L	Murata Manufacturing	4	4700pF	250V
C13, C14, C17, C18	Capacitor	GA355QR7GF222KW01L	Murata Manufacturing	4	2200pF	250V
C19, C20	Capacitor	CC1206KKX7RCBB103 or VJ1206Y103KXGAT5Z	Yageo or Vishay	2	0.01uF	1000V
C21	Chip DCM Minimum/Maximum output capacitor	Refer respective datasheet		1		
R1	Resistor	CRCW25123R30FKEG	Vishay	1	3.3Ω	
R2	Resistor	ESR03EZPJ180	Rohm	1	18Ω	
R3, R4	Resistor	RK73H2BTTE1R30F	KOA Speer Electronics	2	1.3Ω	
R5, R6	Resistor	RK73H2BTTD2R20F	KOA Speer Electronics	2	2.2Ω	
L1	Ind Com Mode	47724-142	Vicor	1	1400uH	4A
PS1	MFM	MFM1714VD2KD2F4M00	Vicor	1		640W
PS2	DCM4623 160 - 420Vin		Vicor	1		