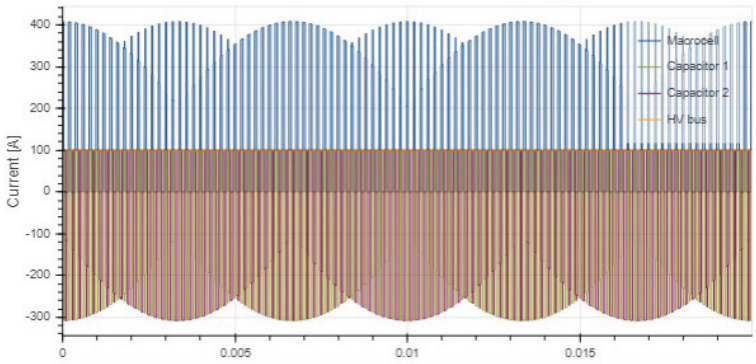
MERSEN ONLINE TOOL

Bus Bar *CALCULATOR*

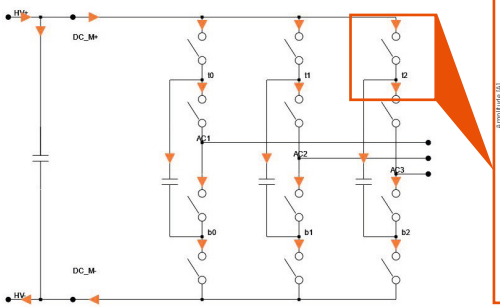
LAMINATED BUS BAR SIZING TOOL

SOLUTIONS
FOR POWER
MANAGEMENT

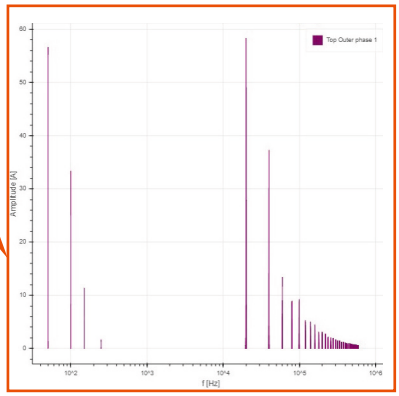


200 kW 3-level NPC converter - DC bus current waveforms

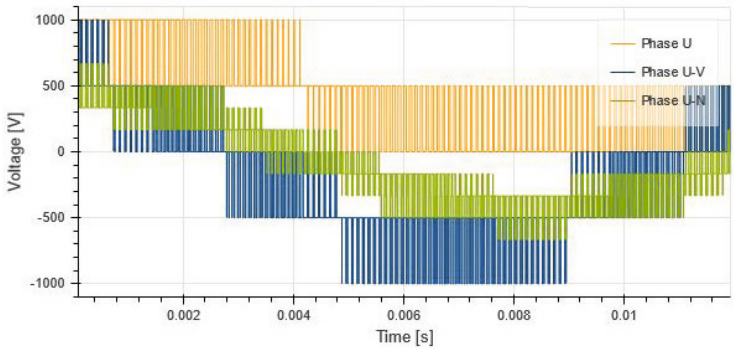
Bus Bar Calculator® is a free-access web-solution to precisely compute the key electrical specifications of laminated bus bars in the context of power converter design. Bus Bar Calculator® provides all the values to help designer make bus bar in a wide variety of converters.



3-level NPC converter electrical diagram



Fourier series of AC current through top outer switch



200 kW 3-level NPC converter - AC voltage waveforms

BUS BAR DESIGN OPTIMIZATION COMPANION

FREE REGISTRATION

- Wide variety of converter topologies
- AC & DC voltage in every node
- RMS current passing through every branches
- Fourier transform and distribution of harmonics
- Partial discharge test conditions
- Simulations as a function of electrical standards of selected applications
- Fully compliant with SiC and GaN technologies
- Fast iterations

BUS BAR CALCULATOR® PROVIDES ALL THE VALUES TO HELP DESIGNER MAKE BUS BAR IN A WIDE VARIETY OF CONVERTERS

Bus Bar Calculator® is a free-access web solution to precisely compute the key electrical specifications of laminated bus bars in the context of power converter design. Bus Bar Calculator® provides all the values to help designers simulate bus bar in a wide variety of converters.
Bus Bar Calculator® is based on GT-PowerForge™, a multi-physics solver developed by Gamma Technologies, handling electrical, thermal, and magnetic physics to cover the complexity of a power converter design. Bus Bar calculator™ is based on a frequential Modified Nodal Analysis (MNA) resolution that provides accurate simulation results within seconds.

IT ALL STARTS WITH THE SELECTION OF THE CONVERTER TOPOLOGY

Bus Bar Calculator® can handle various converter topologies: DC/AC, AC/DC, DC/DC with 2-level and multilevel.
The operating point (V_{DC}, V_{AC} Power, cos ϕ and switching frequency F_{sw}) must also be filled to allow the software to correctly calculate the voltage and current in each branch.

ELECTRICAL STANDARDS AND FINAL APPLICATION AS INPUT CONDITIONS

Depending on the application, the converter doesn't suffer from the same environmental constraints and design requirement changes. The conductive materials composing the bus bar and the converter environment must be entered to consider all the constraints together, from the very beginning of converter design phase, and thus optimizing the complete system.

TYPICAL OUTPUTS FROM BUS BAR CALCULATOR® :

- AC & DC voltage and RMS current passing through every node
- Maximum and repetitive peak voltages between each conductor
- Fourier transform of current through AC phases
- Partial discharge test voltages according to standards

Link to Bus Bar Calculator website

COMPONENT	IRMS (A)
Capcitor_1	166
Capcitor_2	166
DC_M+	194
DC_M-	274
DC_M_NP	194
HV+	100
HV-	100

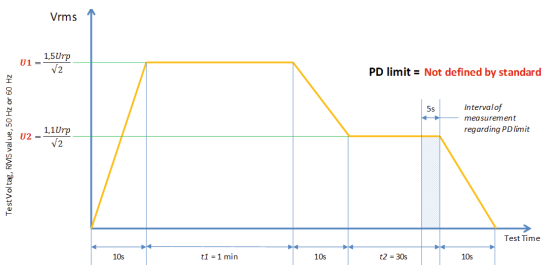
Current RMS values in every branches

		PARTIAL DISCHARGE TEST VALUES	
		U1 (1,5 FACTOR)	U2 (1,1 FACTOR)
REPETITIVE PEAK VOLTAGE (V)	DP1 > 2065*	2811	2061
	DP2 > 2600*	2758	2022
	DP3 > 1300	1379	1011

* Tests noted with an asterisk are mandatory

MAX VOLTAGE (V)	REPETITIVE PEAK VOLTAGE (V)								
	AC1	AC2	AC3	DC_M+	DC_M-	DC_M_NP	m1	m2	m3
AC1	-	2600	2600	2600	2600	1300	1300	2650	2650
AC2	2000	-	2600	2600	2600	1300	2650	1300	2650
AC3	2000	2000	-	2600	2600	1300	2650	2650	1300
DC_M+	2000	2000	2000	-	2600	1300	1300	1300	1300
DC_M-	2000	2000	2000	2000	-	1300	2650	2650	2650
DC_M_NP	1000	1000	1000	1000	1000	-	1300	1300	1300
m1	1000	2050	2050	1000	2050	1000	-	1300	1300
m2	2050	1000	2050	1000	2050	1000	1000	-	1300
m3	2050	2050	1000	1000	2050	1000	1000	1000	-

Repetitive peak voltage values of every node



Partial discharge test profile