Technical Information

ModSTACK™ 6MS1200R17KE3-3F-B16B9C23VTIO

Vorläufige Daten
preliminary data

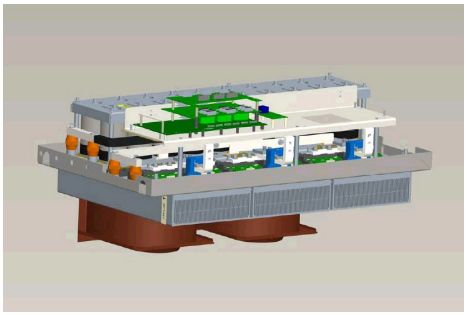
Key data

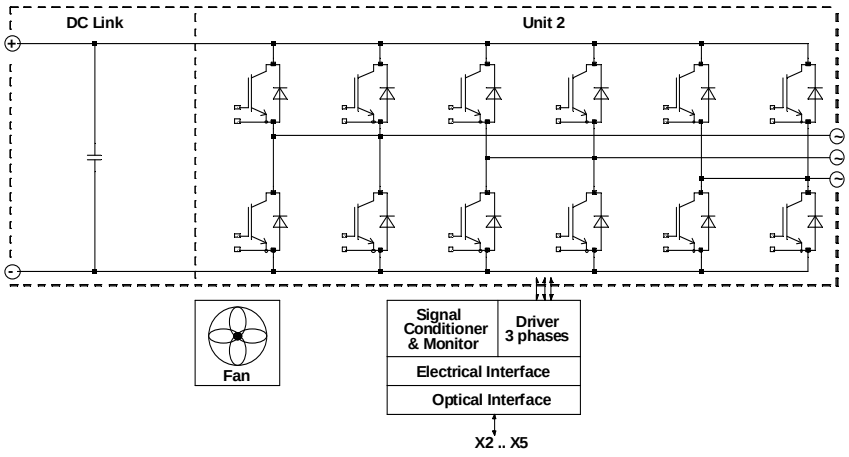
3x 663A rms at 690V rms, forced air (fan included)

General information

Stacks for various inverter application. Semiconductors, heat sinks, capacitors, drivers and sensors included. These are only technical data!
Please read carefully the complete documentation and maintain the proper design environment!
Especially note the EMC environment and the controller's functionality.

Topology		DC Link + B6I
Application / Modulation		Inverter / Sine
Load type		resistive, inductive
Cooling		forced air (fan included)
Market		wind
Implemented sensors		current, voltage, temperature
Semicond. (Unit 1)		none
DC Link		8.4mF
Semicond. (Unit 2)	IGBT	6x FF600R17KE3_B2
Driver signals IGBT		optical HFBR-15X1 / HFBR-25X1
Standards		EN50178
Sales - name		6MS12017E33F33879
Internal ID		33879
Mechanical drawing number		33878_MB
Electrical drawing number		ModSTACK B6_01_OEA101_Rev03
Dimensions (width x depth x height)		1090 mm x 596 mm x 470 mm
Weight		110 kg





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approved by: Jürgen Schiele	revision: 2.0

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Electrical data

DC Link			min	typ	max	units
Voltage		V_{DC}		1100	1200	V
Overvoltage shutdown	within 150µs			1250		V

Unit 2 AC			min	typ	max	units
Voltage	depending on controller	V_{Unit2}		690		V_{RMS}
Continuous current	V_{Unit2} = 690V_{RMS}, V_{DC} = 1100V, T_{inlet} = 40°C, $T_J \leq$ 125°C, f_{Unit2} = 50Hz, f_{sw2} = 2000Hz, cos(phi) = 0,99	I_{Unit2}			663	A_{RMS}
Continuous current overload cap.	T_{inlet} = 40°C, for overload capability 150% for 60s			476		A_{RMS}
Short time current	T_{inlet} = 40°C, 10s, every 180s, initial load = 588A_{RMS}	I_{Unit2}			735	A_{RMS}
DC current	no rotating field, T_{inlet} = 40°C	$I_{Unit2\ DC}$			291,0	A_{av}
Overcurrent shutdown	within 15µs			1300		A_{peak}
Switching frequency		f_{sw2}			6000	Hz
Power losses	V_{Unit2} = 690V, V_{DC} = 1100V, T_{inlet} = 40°C, $T_J \leq$ 125°C, f_{Unit2} = 50Hz, f_{sw2} = 2000Hz, cos(phi) = -0,99, I_{Unit2} = 663A_{RMS}	P_{loss2}		8260		W
Power factor		$cos(phi)_{Unit2}$	-1,00		1,00	

General data				min	typ	max	units
Power losses (PCB and capacitor)			$P_{loss\ aux}$			220	W
EMC test	according to IEC61800-3 at named interfaces	power	V_{Burst}		2		kV
		control	V_{Burst}		1		kV
		aux (24V)	V_{Surge}		1		kV
Insulation management is designed for			V_{Line}		690		V_{RMS}
Insulation test voltage	according to EN50178, f = 50Hz, t = 60s		V_{isol}		2,5		kV_{RMS}

Important component data

			min	typ	max	units
DC Link capacitor		C_{DC}		8,40		mF
		type		Foil		
Rated voltage	per device	U_R		1100		V_{DC}
Surge voltage	per device	U_{Surge}			1650	V
Rated capacitance	per device	C_R		420		µF
Capacitance tolerance	per device	Tol	-15		0	%
wiring system	**s**eries, **p**arallel			1s, 20p		
Balance or discharge resistors	per DC Link unit	R_b		6,0		kΩ

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Controller interface data

			min	typ	max	units
Auxiliary voltage		V_{aux}	18	24	30	V_{av}
Auxiliary power requirement	V_{aux} = 24V_{av}	P_{aux}		40		W
Driver and interface board	see separate technical information			TR110 / DR110		
Driver core				EiceDRIVER 2ED300C17-S		
Digital input level	resistor to GND 1,8kΩ, capacitor to GND 4nF, high = on, min 15mA	V_{in}	0,0		15,0	V
Digital output level	open collector, low = ok, max 15mA	V_{out}	0,0		15,0	V
Analog current outputs Unit 2	load max 1mA; at 663A	$V_{ana\ out}$	4,36	4,45	4,54	V
Analog DC Link voltage output	load max 1mA; at 1100V	$V_{DC\ out}$	7,73	7,89	8,05	V
Analog temperature output	load max 1mA; at T_{NTC} = 80°C correspond to T_j = 125°C	$V_{T\ out}$	9,70	9,90	10,10	V
Overtemperature shutdown	at T_{NTC} = 81°C correspond to T_j = 130°C	$V_{T\ out\ OT}$		10		V
Optical interface board	see separate technical information			OEA101		
Optical input power				12		µW
Optical output power					60	µW

Heat sink air cooled / Thermal data

			min	typ	max	units
Airflow	T_{Air} = 20°C, Pair = 1013hPa, dry- and dust free, measured on side of heat sink. according to DIN 41882	$\Delta V/\Delta t_{Air}$	2700			m³/h
Air pressure drop		Δp_{Air}		300		Pa
Cooling air inlet temperature	heat sink temperature > -25°C	T_{inlet}	-25		40	°C

Fan data

			min	typ	max	units
Type	assumed			2x Ziehl-Abegg. RF22P-2DK.3F.1R		
Voltage		V_{Fan}		400		V_{RMS}
Frequency		f_{Fan}		50		Hz
Current		I_{Fan}		3,90		A_{RMS}

IGBT data unit 2

			min	typ	max	units
Type	assumed					
collector-emitter saturation voltage	I_c = 600A; V_{ge} = 15V; T_{vj} = 125°C	$V_{CE\ sat}$		2,4		V
parameter for linear model	T_{vj} = 25°C	V_{ce1}		1,07		V
parameter for linear model	T_{vj} = 25°C	r_{ce1}		1,55		mΩ
parameter for linear model	T_{vj} = 125°C	V_{ce2}		1,02		V
parameter for linear model	T_{vj} = 125°C	r_{ce2}		2,3		mΩ
turn-on / turn-off energy loss per pulse	T_{vj} = 25°C	E_1		125 / 150		mJ
turn-on / turn-off energy loss per pulse	T_{vj} = 125°C	E_2		185 / 220		mJ
thermal resistance, junction to case	per IGBT	R_{thjc}		0,029		K/W
thermal resistance, case to heatsink	per IGBT	R_{thch}		0,024		K/W

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Diode data unit 2

			min	typ	max	units
Type	assumed					
forward voltage	I_F = 600A; V_{ge} = 0V; T_{vj} = 125°C	V_F		1,7		V
parameter for linear model	T_{vj} = 25°C	V_{F1}		1,09		V
parameter for linear model	T_{vj} = 25°C	r_{F1}		0,85		mΩ
parameter for linear model	T_{vj} = 125°C	V_{F2}		0,89		V
parameter for linear model	T_{vj} = 125°C	r_{F2}		1,35		mΩ
reverse recovery energy	T_{vj} = 25°C	E_{rec1}		120		mJ
reverse recovery energy	T_{vj} = 125°C	E_{rec2}		210		mJ
thermal resistance, junction to case	per Diode	R_{thjc}		0,055		K/W
thermal resistance, case to heatsink	per Diode	R_{thch}		0,046		K/W

Environmental conditions

			min	typ	max	units
Storage temperature		T_{stor}	-40		65	°C
Ambient temperature	minimum 0°C for optional optical interface	T_{amb}	-25		55	°C
Operating temperature	see chapter Heat sink air cooled / Thermal data					
Cooling air velocity (PCB and capacitor)		$V_{Air\ PCB}$	2,0			m/s
Air pressure	standard atmosphere	p_{Air}	900		1100	hPa
Humidity	no condensation	Rel. F	0		95	%
Installation height			0		1000	m
Vibration	according to EN60068				10	m/s²
Continuous vibration	according to EN60068				20	m/s²
Shock	according to EN60068				100	m/s²
Protection degree				IP00		
Pollution degree				2		
Dimensions	width × depth × height		1090	596	470	mm
Weight with heat sink	approximation			110,0		kg

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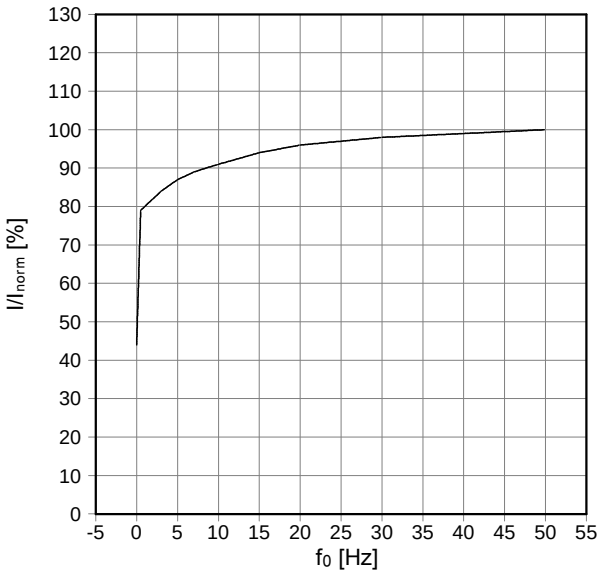
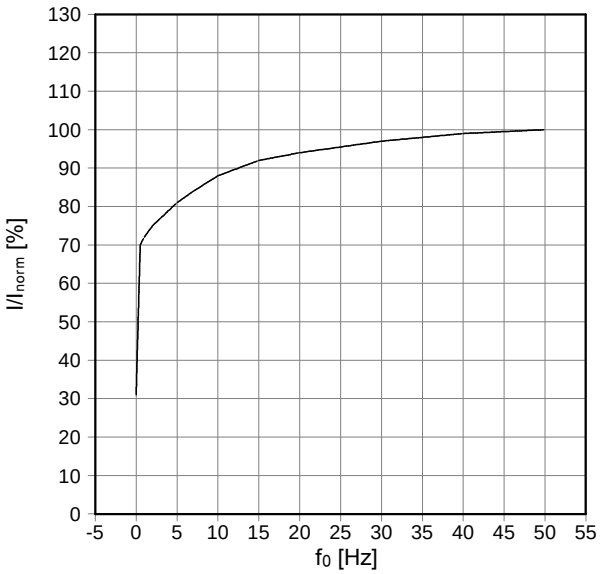
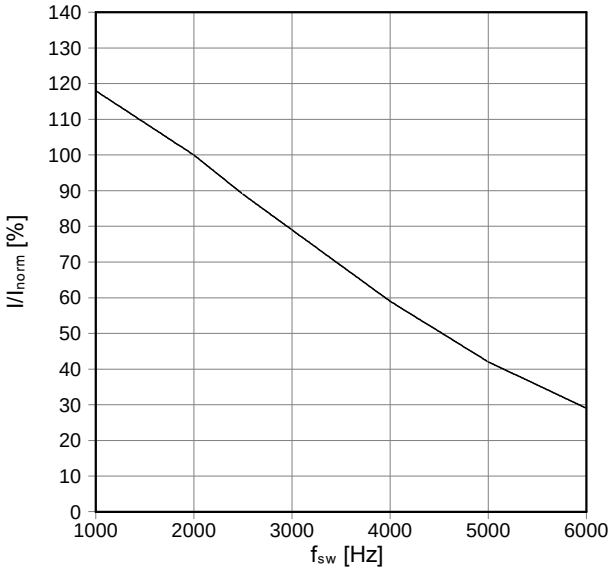
fo - derating curve IGBT (motor)
cos(phi) = 0,99
$T_{cool\ medium}$ = 40°C ; 100% = 663 A rms



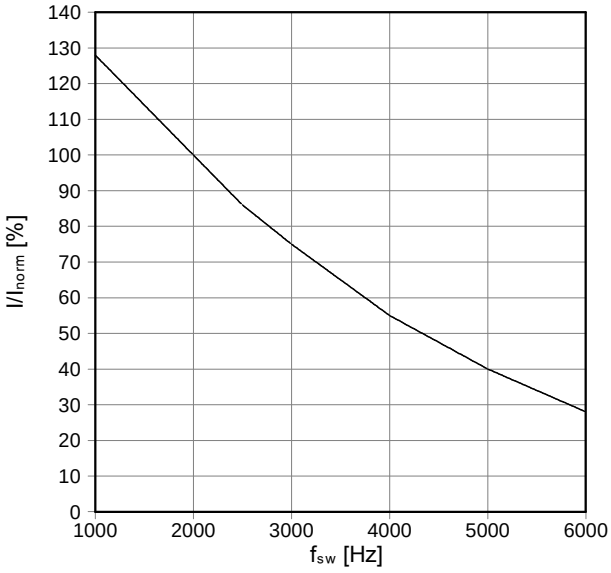
fo - derating curve Diode (generator)
cos(phi) = -0,99
$T_{cool\ medium}$ = 40°C ; 100% = 636 A rms



fsw - derating curve IGBT (motor)
cos(phi) = 0,99
$T_{cool\ medium}$ = 40°C ; 100% = 663 A rms



fsw - derating curve Diode (generator)
Diode, cos(phi) = -0,99
$T_{cool\ medium}$ = 40°C ; 100% = 636 A rms



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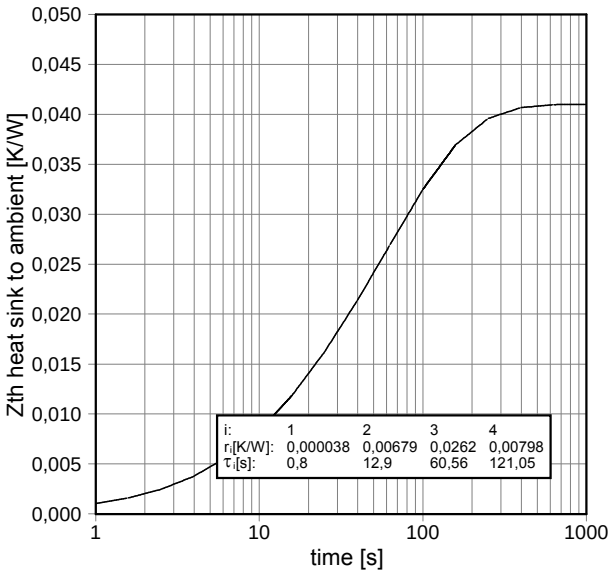
Transient thermal impedance per module
$T_{cool\ medium}$ = 40°C



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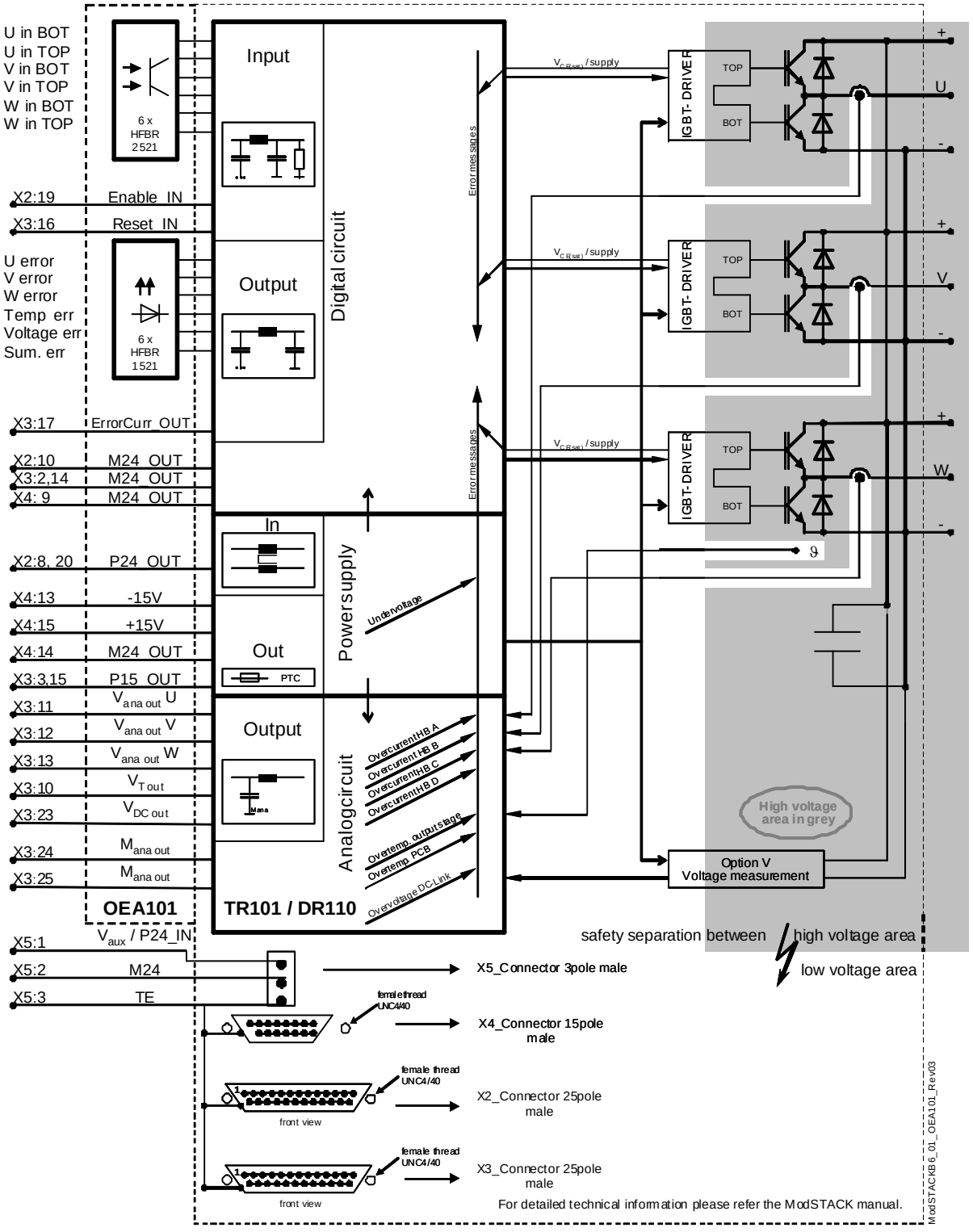
Circuit diagram



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Sicherheitshinweise

Bevor Sie mit der Installation und dem Betrieb der Baugruppe beginnen, lesen Sie bitte sorgfältig alle Sicherheitshinweise, Warnungen und beachten Sie die angebrachten Warnschilder. Vergewissern Sie sich, dass alle Warnschilder in leserlichem Zustand verbleiben und fehlende oder beschädigte Schilder ersetzt werden.

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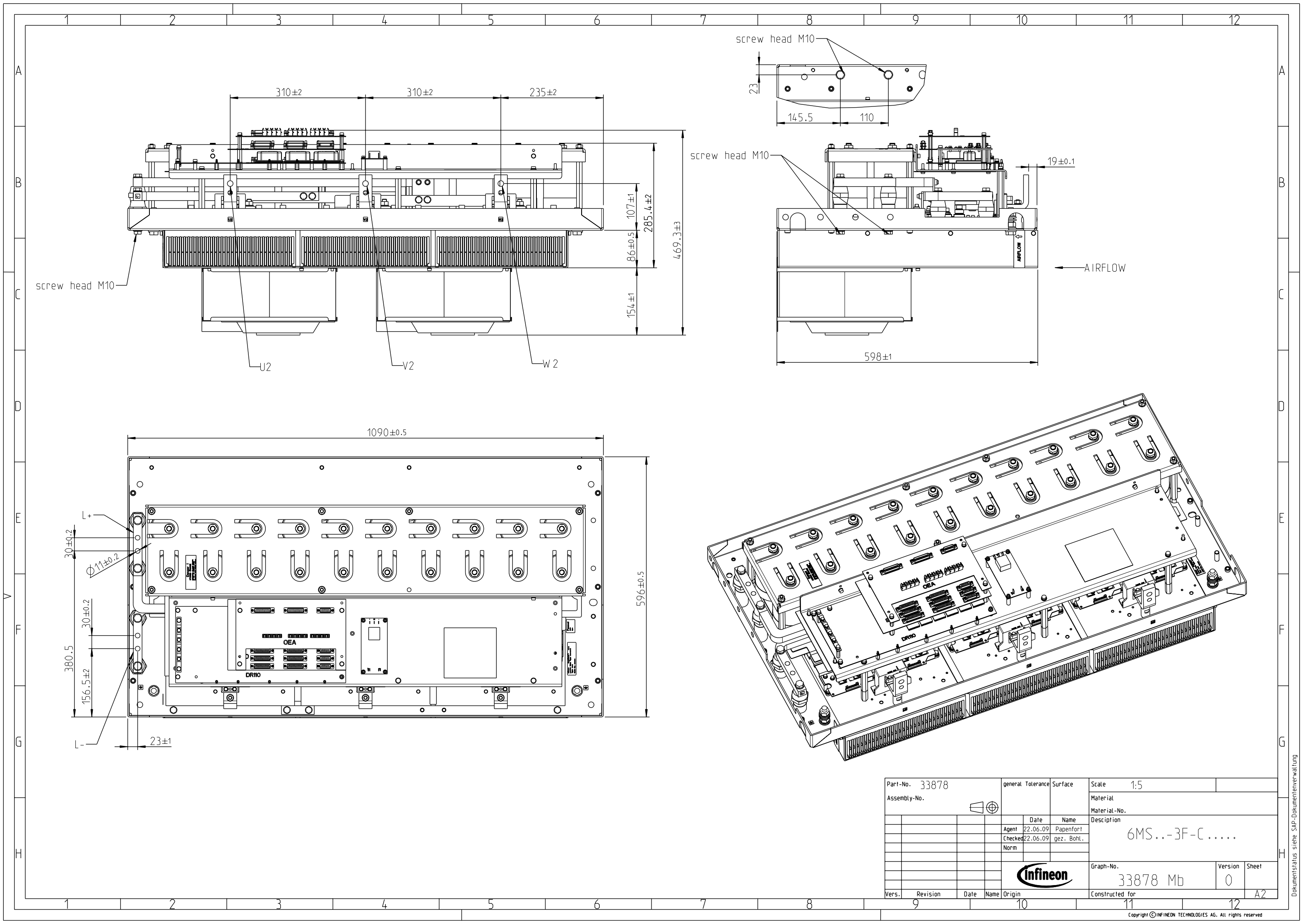

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