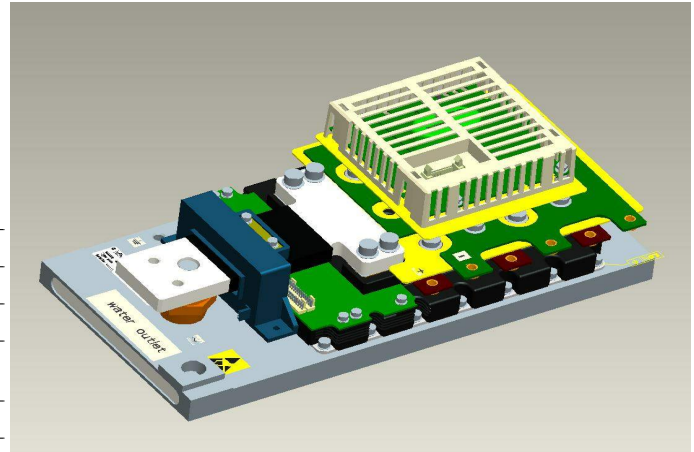


General information

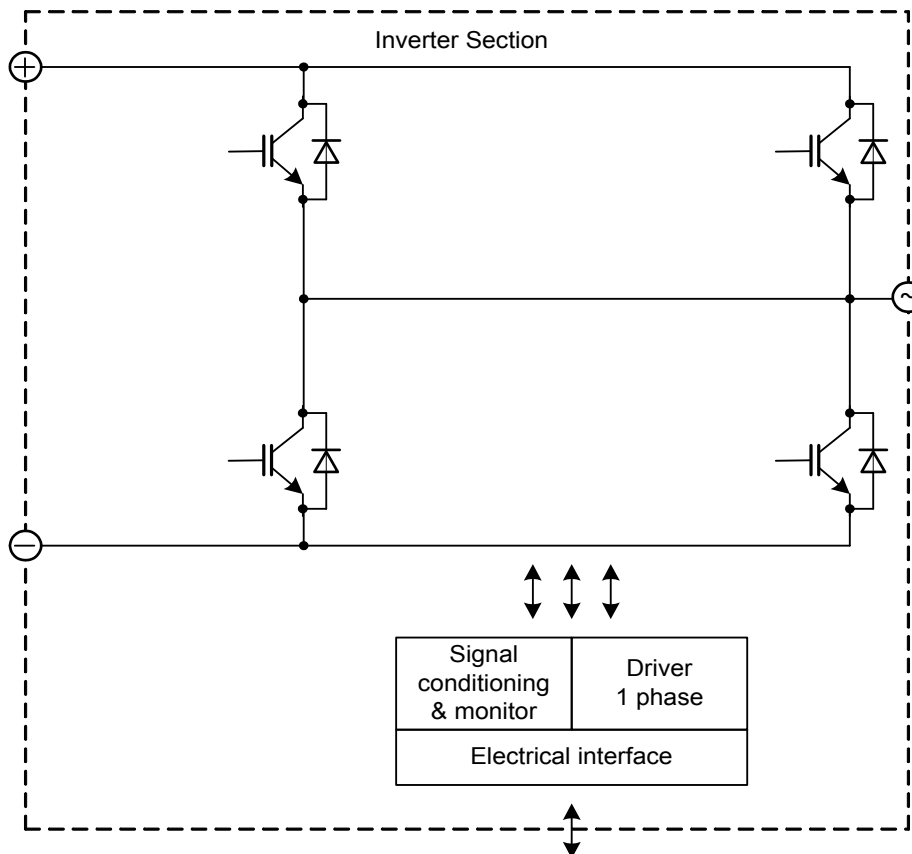
IGBT Stack for typical voltages of up to 690 V_{RMS}
Rated output current 1520 A_{RMS}

- High power converter
- Wind power
- Motor drives

- PrimePACK™3 module
- Extended operational temperature
- Low V_{cesat}



Topology	1/2B2I
Application	Inverter
Load type	Resistive, inductive
Semiconductor (Inverter Section)	2x FF1000R17IE4
Heatsink	Water cooled
Implemented sensors	Current, temperature
Driver signals IGBT	Electrical
Design standards	EN 50178
Sales - name	2LS20017E42W36702
SP - No.	SP000934308



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Absolute maximum rated values

Collector-emitter voltage	IGBT; $T_{vj} = 25^{\circ}\text{C}$	V_{CES}	1700	V
Repetitive peak reverse voltage	Diode; $T_{vj} = 25^{\circ}\text{C}$	V_{RRM}	1700	V
DC link voltage		V_{DC}	1250	V
Insulation management	according to installation height of 2000 m	V_{line}	690	V_{RMS}
Insulation test voltage		V_{ISOL}	2.5	kV_{RMS}
Repetitive peak collector current inverter section (IGBT)	$t_p = 1\text{ ms}$	I_{CRM2}	2500	A
Repetitive peak forward current inverter section (Diode)	$t_p = 1\text{ ms}$	I_{FRM2}	2500	A
Continuous current inverter section		I_{AC2}	1660	A_{RMS}
Junction temperature	under switching conditions	T_{vjop}	150	$^{\circ}\text{C}$
Switching frequency inverter section		f_{sw2}	4	KHz

Notes

Further maximum ratings are specified in the following dedicated sections

Characteristic values

Inverter Section

			min.	typ.	max.	
Rated continuous current	$V_{DC} = 1100\text{ V}$, $V_{AC} = 690\text{ V}_{RMS}$, $\cos(\varphi) = 0.85$, $f_{AC\ sine} = 50\text{ Hz}$, $f_{sw} = 2000\text{ Hz}$, $T_{inlet} = 40^{\circ}\text{C}$, $T_j \leq 150^{\circ}\text{C}$	I_{AC}			1520	A_{RMS}
Continuous current at low frequency	$V_{DC} = 1100\text{ V}$, $V_{AC} = 690\text{ V}_{RMS}$, $f_{AC\ sine} = 0\text{ Hz}$, $f_{sw} = 2000\text{ Hz}$, $T_{inlet} = 40^{\circ}\text{C}$, $T_j \leq 150^{\circ}\text{C}$	$I_{AC\ low}$			770	A_{RMS}
Rated continuous current for 150% overload capability	$I_{AC\ 150\%} = 1660\text{ A}_{RMS}$, $t_{on\ over} = 3\text{ s}$, $T_j \leq 150^{\circ}\text{C}$	$I_{AC\ over1}$			1110	A_{RMS}
Over current shutdown	within 15 μs	$I_{AC\ OC}$		4200		A_{peak}
Power losses	$I_{AC} = 1520\text{ A}$, $V_{DC} = 1100\text{ V}$, $V_{AC} = 690\text{ V}_{RMS}$, $\cos(\varphi) = 0.85$, $f_{AC\ sine} = 50\text{ Hz}$, $f_{sw} = 2000\text{ Hz}$, $T_{inlet} = 40^{\circ}\text{C}$, $T_j \leq 150^{\circ}\text{C}$	P_{loss}		6700		W

Controller interface

Driver and interface board	ref. to separate Application Note		DR240			
			min.	typ.	max.	
Auxiliary voltage		V_{aux}	18	24	30	V
Auxiliary power requirement	$V_{aux} = 24\text{ V}$	P_{aux}			40	W
Digital input level	resistor to GND 1.8 k Ω , capacitor to GND 4 nF, logic high = on, min. 15 mA	$V_{in\ low}$	0		4	V
		$V_{in\ high}$	11		15	V
Digital output level	open collector, logic low = no fault, max. 15 mA	$V_{out\ low}$	0		1.5	V
		$V_{out\ high}$		15		V
Analog current sensor output inverter section	load max 1 mA, @ 1520 A_{RMS}	$V_{IU\ ana2}$ $V_{IV\ ana2}$ $V_{IW\ ana2}$	3.3	3.4	3.5	V
Analog temperature sensor output inverter section (NTC)	load max 1 mA, @ $T_{NTC} = 66^{\circ}\text{C}$, corresponds to $T_j = 150^{\circ}\text{C}$ at rated conditions	$V_{\theta\ NTC2}$	6.4	6.5	6.6	V
Over temperature shutdown inverter section	load max 1 mA, @ $T_{NTC} = 75^{\circ}\text{C}$	$V_{Error\ OT2}$		8.6		V

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Technical Information

ModSTACK™

2LS20017E42W36702



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System data

		min.	typ.	max.	
EMC robustness	according to IEC 61800-3 at named interfaces	power	V_{Burst}	2	kV
		control	V_{Burst}	1	kV
		aux (24V)	V_{surge}	1	kV
Storage temperature		T_{stor}	-40	80	°C
Operational ambient temperature	PCB, bus bar, excluding cooling medium	$T_{op\ amb}$	-25	55	°C
Humidity	no condensation	Rel. F	0	95	%
Vibration				5	m/s ²
Shock				40	m/s ²
Protection degree			IP00		
Pollution degree			2		
Dimensions	width x depth x height		205	400	117 mm
Weight			9		kg

Heatsink water cooled

		min.	typ.	max.	
Water flow	according to coolant specification from Infineon	$\Delta V/\Delta t$	15		dm ³ /min
Water pressure				8	bar
Water pressure drop		Δp	60		mbar
Coolant inlet temperature		T_{inlet}	-40	55	°C

Notes

Composition of coolant: Water and 52 vol. % Antifrogen N

Overview of optional components

	Unit 1	Inverter Section	Unit 3
Parallel interface board			
Optical interface board			
Voltage sensor			
Current sensor		x	
Temperature sensor		x	
Temperature simulation			
DC link capacitors			
Data cable for control signals			
Collector for water cooled heatsink			
Collector-emitter Active Clamping		x	

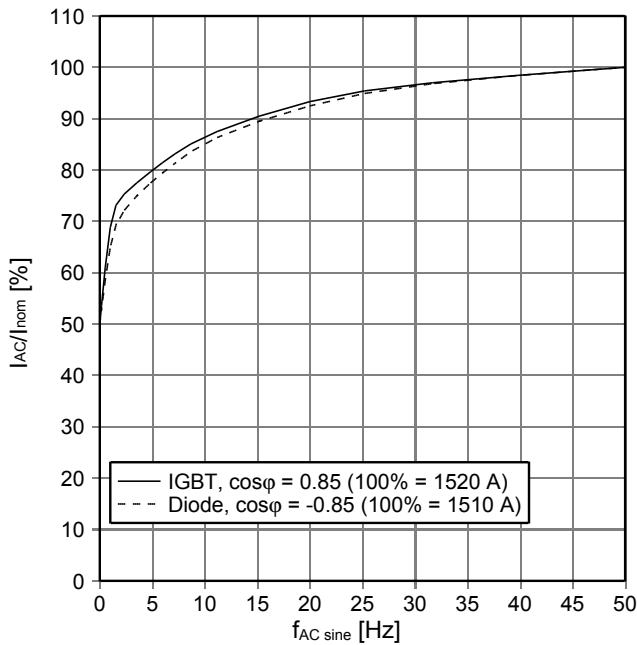
Notes

Setting of Active Clamping TVS-Diodes: $V_z = 1280\text{ V}$

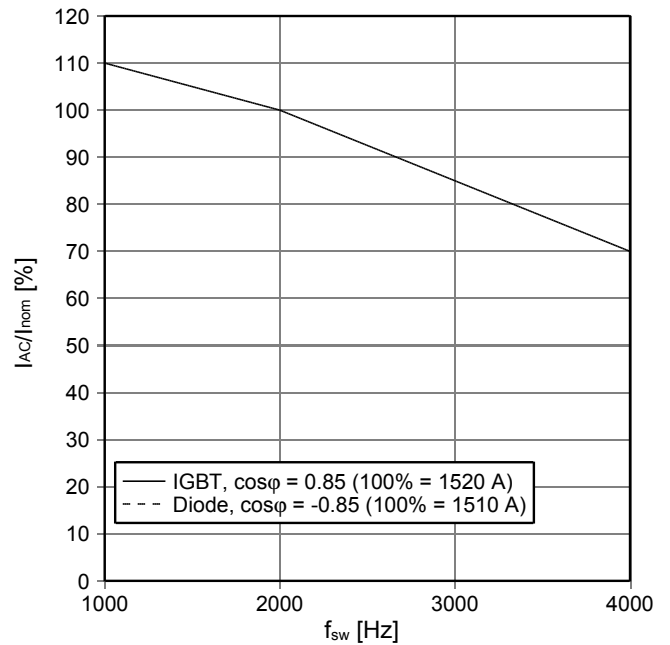
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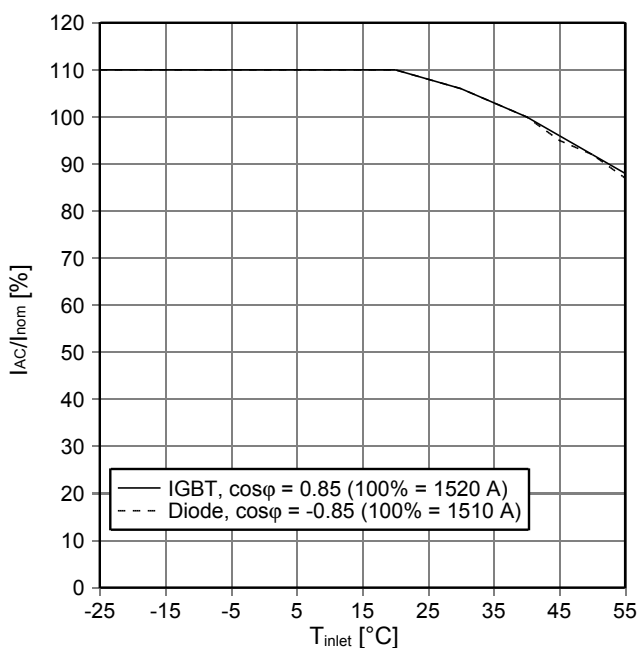
$f_{AC\ sine}$ - derating curve IGBT (motor), Diode (generator)
 $V_{DC} = 1100\ V$, $V_{AC} = 690\ V_{RMS}$, $f_{sw} = 2\ kHz$, $\cos\phi = \pm 0.85$,
 $T_{inlet} = 40\ ^\circ C$ and nom. cooling conditions



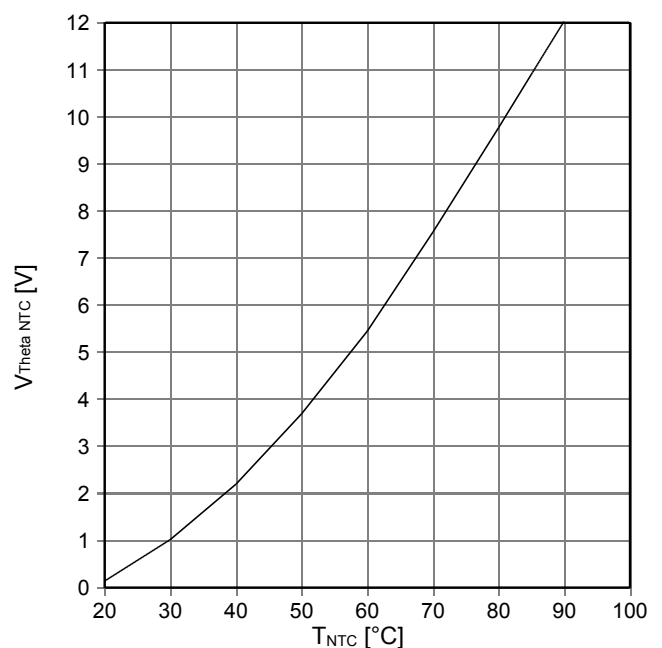
f_{sw} - derating curve IGBT (motor), Diode (generator)
 $V_{DC} = 1100\ V$, $V_{AC} = 690\ V_{RMS}$, $f_{AC\ sine} = 50\ Hz$, $\cos\phi = \pm 0.85$,
 $T_{inlet} = 40\ ^\circ C$ and nom. cooling conditions



T_{inlet} - derating curve IGBT (motor), Diode (generator)
 $V_{DC} = 1100\ V$, $V_{AC} = 690\ V_{RMS}$, $f_{sw} = 2\ kHz$, $f_{AC\ sine} = 50\ Hz$,
 $\cos\phi = \pm 0.85$ and nom. cooling conditions



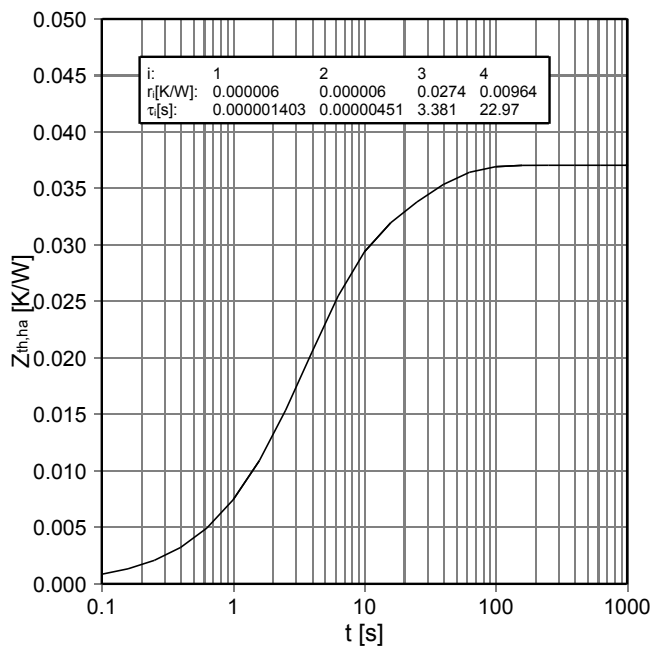
Analog temperature sensor output $V_{Theta\ NTC}$
 Sensing NTC of IGBT module



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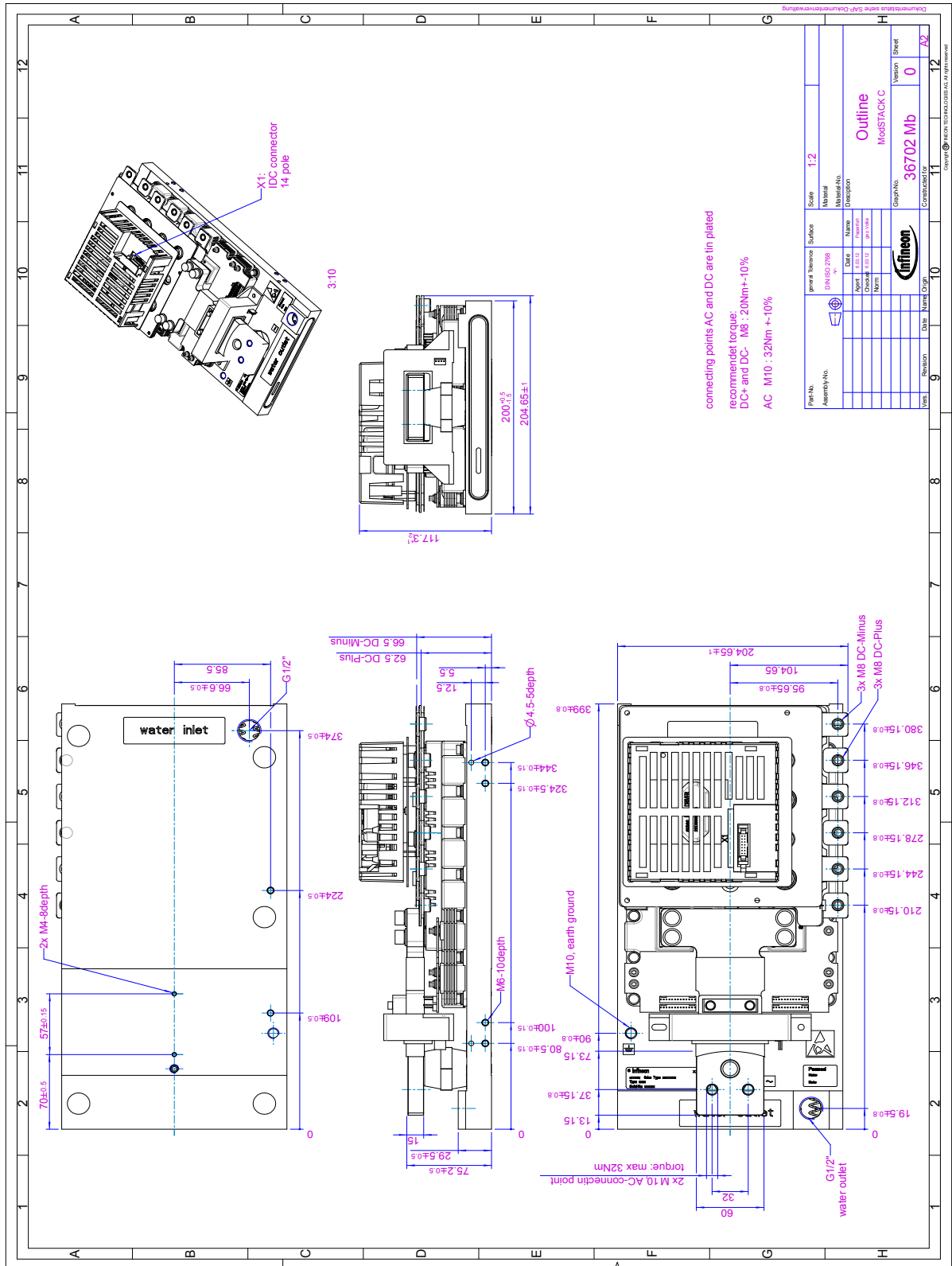


$Z_{th,ha}$ - thermal impedance heatsink to ambient per switch
nom. cooling conditions



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Mechanical drawing



connecting points AC and DC are tin plated
 recommendet torque:
 DC+ and DC- M8 : 20Nm+/-10%
 AC M10 : 32Nm +/-10%

Part No.	Assembly No.	General	Revision	Date	Name	Drawn	Checked	Released	Approved	Scale	Material	Description	Graph No.	Version	Sheet
		DAW/BO 2708		03.11.13	Bohmer					1:2		Outline	36702 Mb	0	12
													ModSTACKC		
													36702 Mb	0	12
													Contributor		

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- the conclusion of Quality Agreements;
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