Technical Information

PrimeSTACK™

2PS06012S42G28187

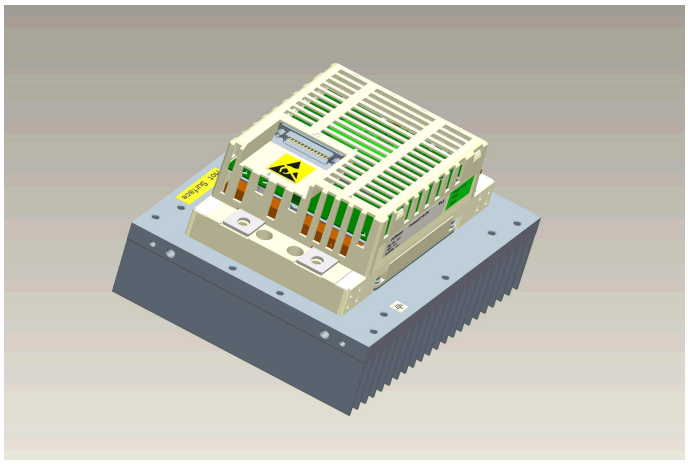
Preliminary data

General information

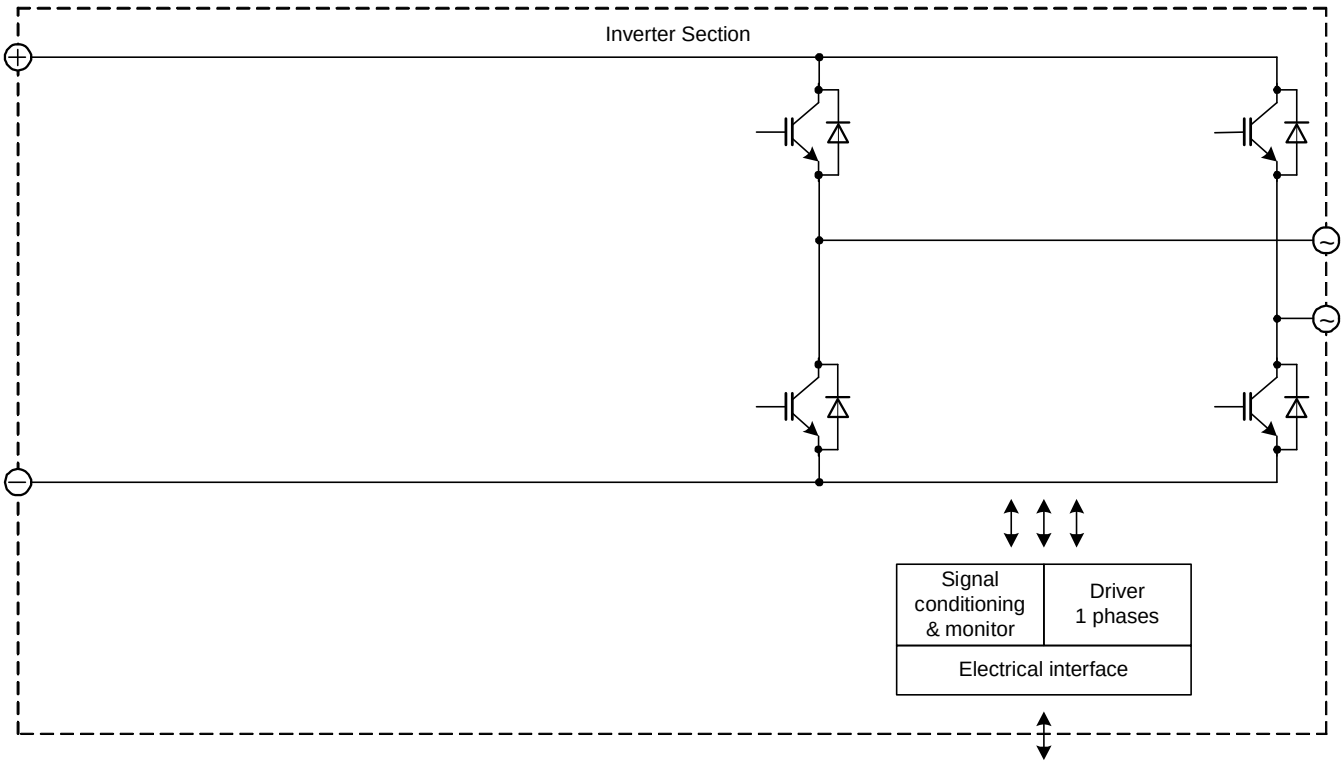
IGBT Stack for typical voltages of up to 400 V_{RMS}
Rated output current 366 A_{RMS}

· Solar power
· Motor drives

· 62mm power module
· Fast IGBT2 for high-frequency switching



Topology	$^1/_2$B2I
Application	Inverter
Load type	Resistive, inductive
Semiconductor (Unit 1 (not installed)	2x FF300R12KS4
Heatsink	Forced air cooled (fan not included)
Implemented sensors	Current, temperature
Driver signals IGBT	Electrical
Approvals	UL 94, prepared for UL 508C
Sales - name	2PS06012S42G28187
SP - No.	SP000254017



prepared by: OW	date of publication: 2012-06-26
approved by: SD	revision: 2.1

Preliminary data

Absolute maximum rated values

Collector-emitter voltage	IGBT; T_{vj} = 25°C	V_{CES}	1200	V
Repetitive peak reverse voltage	Diode; T_{vj} = 25°C	V_{RRM}	1200	V
DC link voltage		V_{DC}	850	V
Insulation management		V_{line}	500	V_{RMS}
Insulation test voltage	according to EN 50178, f = 50 Hz, t = 1 s	V_{ISOL}	2.5	kV_{RMS}
Repetitive peak collector current inverter section (IGBT)	t_p = 1 ms	I_{CRM2}	930	A
Repetitive peak forward current inverter section (Diode)	t_p = 1 ms	I_{FRM2}	859	A
I^2t-value inverter section (Diode)	V_R = 0 V, t_p = 10 ms, T_{vj} = 125 °C	I^2t	32	kA^2s
Junction temperature	under switching conditions	T_{vjop}	125	°C
Switching frequency inverter section		f_{sw2}	13	kHz

Notes
Further maximum ratings are specified in the following dedicated sections

Characteristic values

DC Link

			min.	typ.	max.	
Rated voltage		V_{DC}		650	800	V

Inverter Section

			min.	typ.	max.	
Rated continuous current	V_{DC} = 650 V, V_{AC} = 400 V_{RMS}, cos(φ) = 0.85, $f_{AC\ sine}$ = 50 Hz, f_{sw} = 5000 Hz, T_{inlet} = 40°C, $T_j \leq$ 125 °C	I_{AC}			366	A_{RMS}
Continuous current at low frequency	V_{DC} = 650 V, $f_{AC\ sine}$ = 0 Hz, f_{sw} = 5000 Hz, T_{inlet} = 40 °C, $T_j \leq$ 125 °C	$I_{AC\ low}$			200	A_{RMS}
Rated continuous current for 150% overload capability	$I_{AC\ 150\%}$ = 392 A_{RMS}, $t_{on\ over}$ = 60 s, $T_j \leq$ 125 °C	$I_{AC\ over1}$			260	A_{RMS}
Rated continuous current for 150% overload capability	$I_{AC\ 150\%}$ = 443 A_{RMS}, $t_{on\ over}$ = 3 s, $T_j \leq$ 125 °C	$I_{AC\ over2}$			295	A_{RMS}
Over current shutdown	within 15 µs	$I_{AC\ OC}$		930		A_{peak}
Power losses	V_{DC} = 650 V, V_{AC} = 400 V_{RMS}, cos(φ) = 0.85, $f_{AC\ sine}$ = 50 Hz, f_{sw} = 5000 Hz, T_{inlet} = 40 °C, $T_j \leq$ 125 °C	P_{loss}		1330		W

prepared by: OW	date of publication: 2012-06-26
approved by: SD	revision: 2.1

Preliminary data

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 V	P_{aux}			40	W
Digital input level	resistor to GND 10 kΩ, capacitor to GND 1 nF	$V_{in\ low}$	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, @ 366 A_{RMS}	$V_{IU\ ana2}$ $V_{IV\ ana2}$ $V_{IW\ ana2}$	3.9	4	4.1	V
Analog temperature sensor output inverter section (NTC)	load max 1 mA, @T_{NTC} = 80 °C, corresponds to T_j = 125 °C at rated conditions	$V_{Theta\ NTC2}$	9.6	9.8	10	V
Over temperature shutdown inverter section	@T_{NTC} = 82 °C	$V_{Error\ OT2}$		10		V

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, DC link capacitor, bus bar, excluding cooling medium		$T_{op\ amb}$	-25		55	°C
Cooling air velocity	PCB, DC link capacitor, bus bar, standard atmosphere		V_{air}	0.3			m/s
Humidity	no condensation		Rel. F	5		95	%
Vibration	according to IEC 60721					5	m/s²
Shock	according to IEC 60721					40	m/s²
Protection degree					IP 00		
Pollution degree					2		
Dimensions	width x depth x height			216	200	167	mm
Weight					6.3		kg

Heatsink air cooled

			min.	typ.	max.	
Air flow	T_{air} = 20 °C, P_{air} = 1013 hPa, dry and dust free, measured at the side of the heat sink	$\Delta V/\Delta t$	500			m³/h
Air pressure drop	at min. air flow	Δp		110		Pa
Air inlet temperature		T_{inlet}	-40		40	°C

prepared by: OW	date of publication: 2012-06-26
approved by: SD	revision: 2.1

Preliminary data

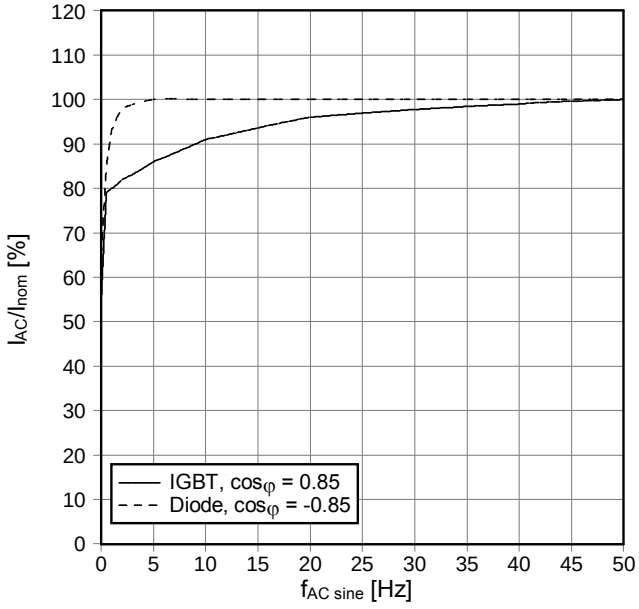
Overview of optional components

	Unit 1 (not installed	Inverter Section	Unit 3
Parallel interface board			
Optical interface board			
Voltage sensor			
Current sensor		×	
Temperature sensor		×	
Temperature simulation			
DC link capacitors			
Fan			
Collector-emitter Active Clamping		×	

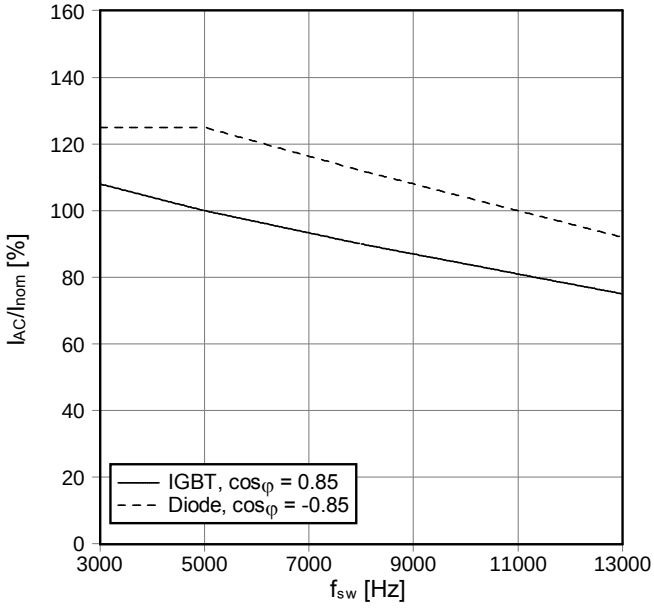
Notes
Setting of Active Clamping TVS-Diodes: V_Z = 824 V

Preliminary data

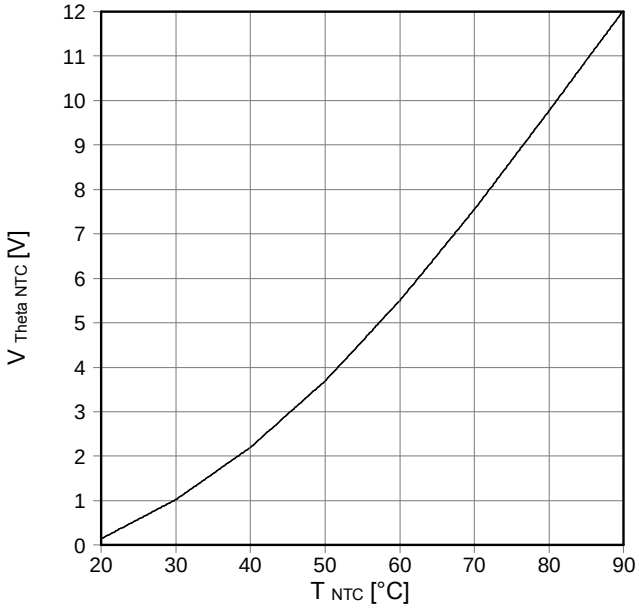
f_{sw} - derating curve IGBT (motor), Diode (generator)
V_{DC} = 650 V, V_{AC} = 400 V_{RMS}, f_{sw} = 5 kHz, $\cos\varphi$ = ±0.85,
T_{inlet} = 40 °C and nom. cooling conditions



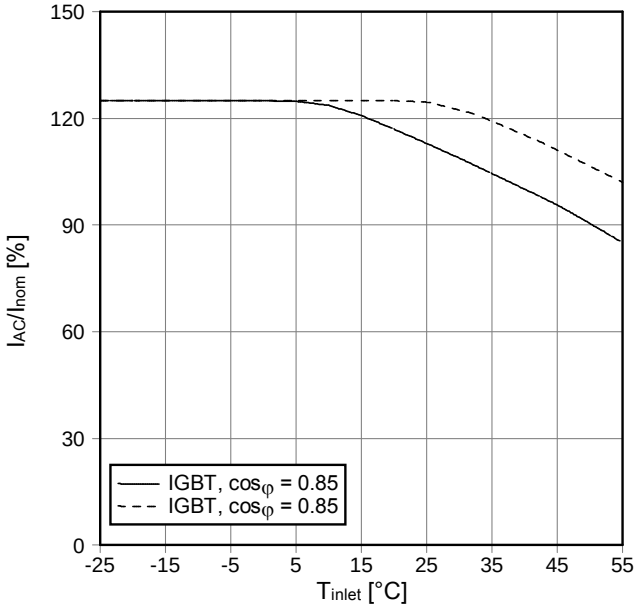
f_{sw} - derating curve IGBT (motor), Diode (generator)
V_{DC} = 650 V, V_{AC} = 400 V_{RMS}, $f_{AC\ sine}$ = 50 Hz, $\cos\varphi$ = ±0.85,
T_{inlet} = 40 °C and nom. cooling conditions



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



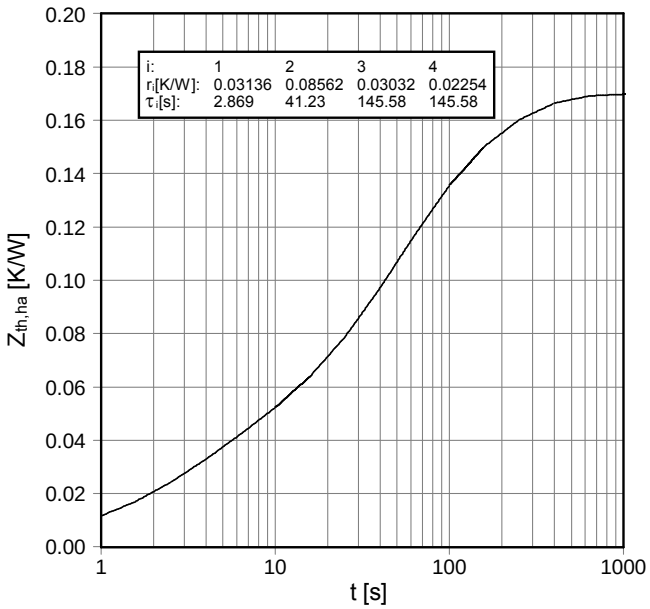
T_{inlet} - derating curve IGBT (motor), Diode (generator)
V_{DC} = 650 V, V_{AC} = 400 V_{RMS}, $f_{AC\ sine}$ = 50 Hz, $\cos\varphi$ = ±0.85,
T_{inlet} = 40 °C and nom. cooling conditions



prepared by: OW	date of publication: 2012-06-26
approved by: SD	revision: 2.1

Preliminary data

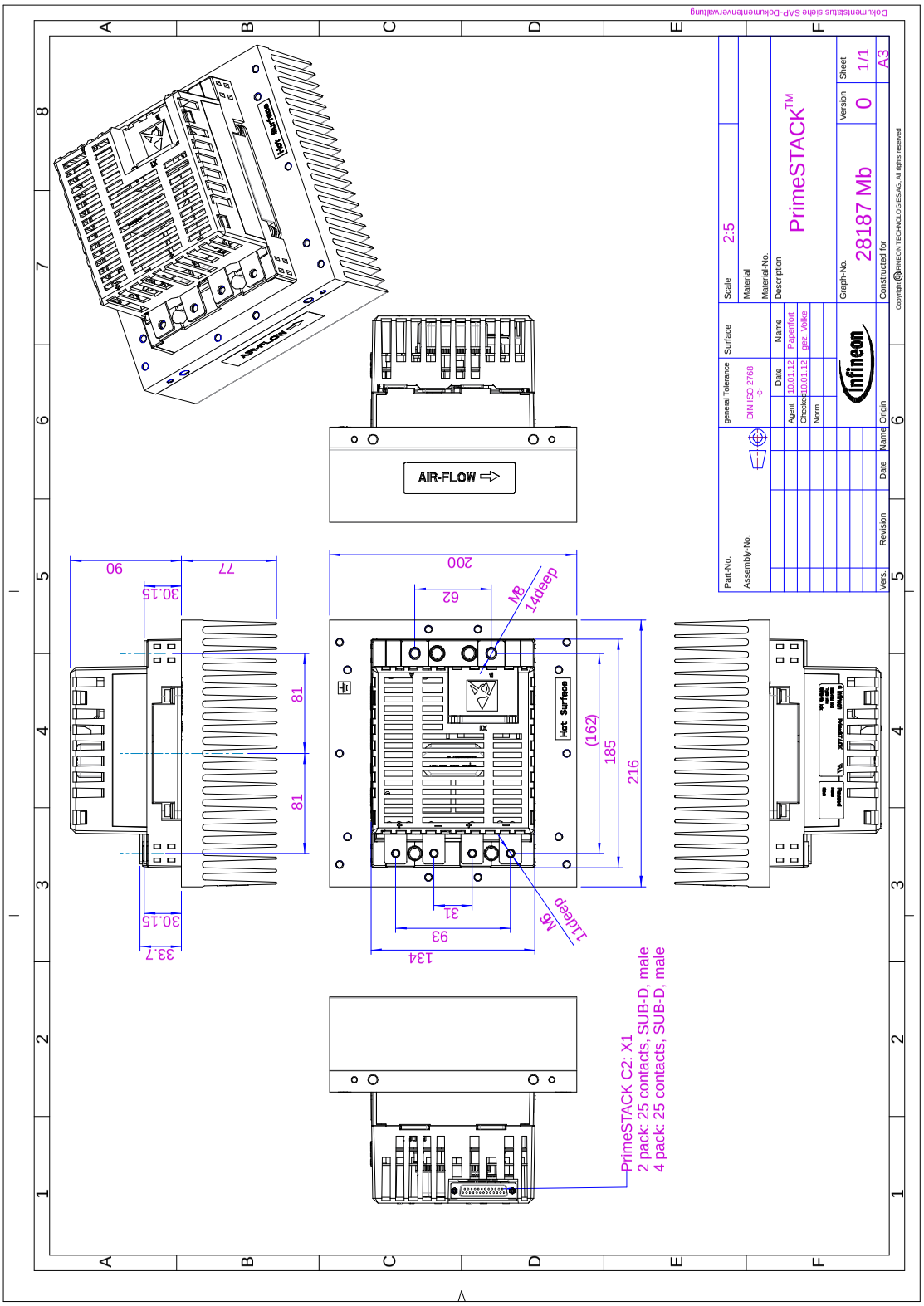
$Z_{th,ha}$ - thermal impedance heatsink to ambient per switch
nom. cooling conditions



prepared by: OW	date of publication: 2012-06-26
approved by: SD	revision: 2.1

Preliminary data

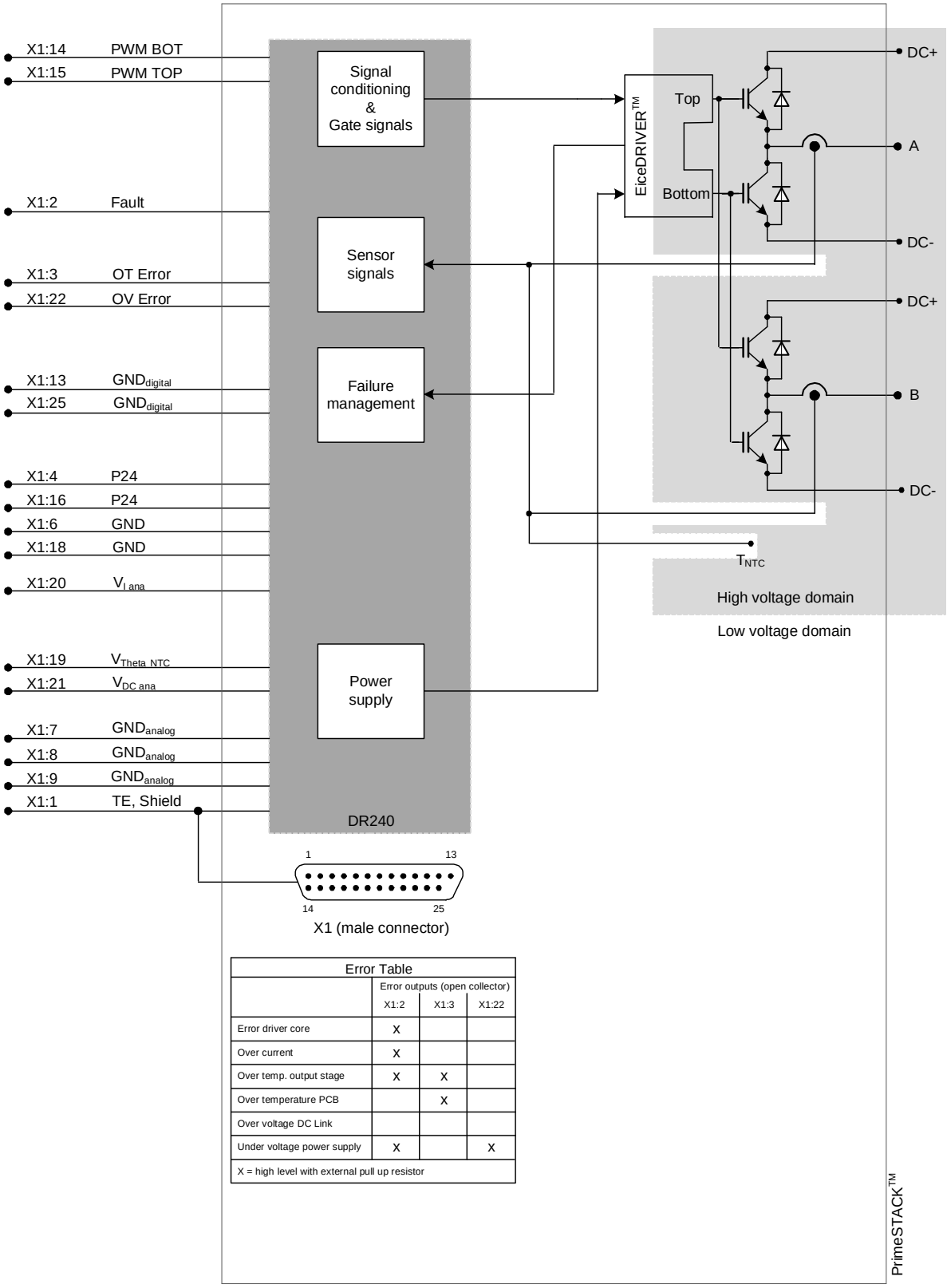
Mechanical drawing



prepared by: OW	date of publication: 2012-06-26
approved by: SD	revision: 2.1

Preliminary data

Circuit diagram



Error Table			
	Error outputs (open collector)		
	X1:2	X1:3	X1:22
Error driver core	X		
Over current	X		
Over temp. output stage	X	X	
Over temperature PCB		X	
Over voltage DC Link			
Under voltage power supply	X		X
X = high level with external pull up resistor			

prepared by: OW	date of publication: 2012-06-26
approved by: SD	revision: 2.1

Preliminary data

Terms & Conditions of usage

The data contained in this product data sheet is exclusively intended for technically trained staff. You and your technical departments will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to such application.

This product data sheet is describing the characteristics of this product for which a warranty is granted. Any such warranty is granted exclusively pursuant the terms and conditions of the supply agreement. There will be no guarantee of any kind for the product and its characteristics.

Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of our product, please contact the sales office, which is responsible for you (see www.infineon.com, sales&contact). For those that are specifically interested we may provide application notes.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the Product in aviation applications, in health or live endangering or life support applications, please notify. Please note, that for any such applications we urgently recommend
- to perform joint Risk and Quality Assessments;
- the conclusion of Quality Agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery depended on the realization of any such measures.

If and to the extent necessary, please forward equivalent notices to your customers.

Changes of this product data sheet are reserved.

Safety Instructions

Prior to installation and operation, all safety notices and warnings and all warning signs attached to the equipment have to be carefully read. Make sure that all warning signs remain in a legible condition and that missing or damaged signs are replaced. To installation and operation, all safety notices and warnings and all warning signs attached to the equipment have to be carefully read. Make sure that all warning signs remain in a legible condition and that missing or damaged signs are replaced.