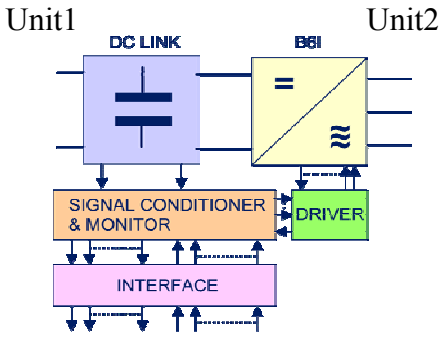
ModSTACK™

Datasheet: B6I 500/800-250W Preliminary Data

General Information

Stack with IGBT, heatsinks, capacitors, drivers and sensors for several inverter applications. These are only technical data! Please read heedful the complete documentation and attend the adopted design environment! Especially the EMC environment and the controller functionality.

Topology		DC Link + B6I
Load Type		Resistive, Inductive Load
Cooling		Water
Targed Application		Industrial
Drivercore		Scale Driver
Monitors		Current-, Voltage-, Temperature-Monitoring
Module (Unit1)		-
Module (Unit2)	IGBT	3x BSM300GB120DLC or FF300R12KE3
Interface		Electrical, opt. Optical
Standards		EN50178, UL94, prepared for UL508C
Product ID (eupec)		On demand
Drawing No.		On demand
Circuit Diagram No.		57000004



Electrical Data

	Parameter		Min	Typ	Max	
Assumed Linevoltage	For Isolation-Management	VLine		500		VRMS
DC Link Voltage		VDC		675	880	Vav
DC Link Overvoltage Shutdown	Within 100µs			VDCmax		V
Voltage Unit1	Depending on Controller	VUnit1	275	-	880	Vav
Continious Current Unit1	$\vartheta=\vartheta_{air\_inlet}$, ϑ_{chip} <= 115°C Vunit1=Vunit1min	IUnit1			-	A
Shorttime Current Unit1	10s, every 180s, initial load = IUnit1	IUnit1_10			-	A
Pulse Current Unit1	Sinehalfwave 20ms				-	Apeak
DC Current at Unit1	No rotating field, $\vartheta=\vartheta_{air\_inlet}$,	IUnit1_DC			-	ADC
Overcurrent Shutdown Unit1	Percentage of IUnit1. Within 15µs			-		%
Switching Freq. Unit1		fsw1			-	Hz
Power Losses Unit1	I=IAC1, fsw=fsw1	Ploss1		-		W

Voltage Unit2	Depending on Controller	V_{Unit2}	0	500	550	V_{RMS}
Continious Current Unit2	$\vartheta=\vartheta_{air\_inlet}$, ϑ_{chip} <= 115°C f_{Unit2}>5Hz	I_{Unit2}			250	A_{RMS}
Shorttime Current Unit2	10s, every 180s, initial load = I_{Unit2}	I_{Unit2_10}			300	A_{RMS}
Pulse Current Unit2	Sinehalfwave 20ms				-	Apeak
DC Current at Unit2	No rotating field, $\vartheta=\vartheta_{air\_inlet}$,	I_{Unit2_DC}			0,4* I_{Unit2}	A_{DC}
Overcurrent Shutdown Unit2	Percentage of I_{Unit2}. Within 15µs			125		%
Switching Freq. Unit2	Warning:! To avoid current resonance in the dc capacitors do not use other frequencies. Please ask for details	fsw2			2500	Hz
Power Losses Unit2	I=I_{Unit2}, fsw=fsw2	Ploss2		2200		W
Power Losses (PCB and Capacitor)		Ploss_aux			150	W
Auxiliary Voltage		Vaux	18	24	30	Vav
Auxiliary Power Demand	Vaux=24 Vav, to feed with B6U	Paux		40		W
EMC Test	According EN61800-3 at named interfaces — Power	V_{Burst}		2		kV
	Control	V_{Burst}		1		
	Aux (24V)	V_{Surge}		1		kV
Insulation Test Voltage	According EN50178 f=50Hz, t=1min	Visol		1,8		kVRMS

Important Component Data

DC Link Capacitor	Installed	C_{DC}		3,4		mF
DC Link Capacitor		Type		Foil		
Capacitor Design Lifetime (eupec approximation)	Loadcycle: Wind	L_{TD}		-		Year
	Loadcycle: Solar	L_{TD}		20		Year
	Loadcycle: Industrial	L_{TD}		20		Year

Requirements to the Powersource

Assumed Inductance Of Feeding Powersource	(Necessary inductance not included, feeding by B6U)	L_{Feed}		339		µH

Fan Data (assumed when excluded)

Fan Type	Assumed		n.a.			
Fan Voltage		V_{Fan}				V_{RMS}
Fan Frequency		f_{Fan}				Hz

Fan Current		IFan				ARMS
Fan Air Pressure	Assumed	ΔpAirFan				Pa

Controller Interface Data

Driver	See Datasheet	PCB	TR100			
Paralleling Interface	See Datasheet	PCB	-			
Optical Interface	See Datasheet	PCB	-			
Digital Input Level	Resistor to Gnd (1,8k) High = on min 15mA	Vin	0		15	V
Digital Output Level	Open collector Low = ok max 15mA	Vout	0		15	V
Analog Current Outputs Unit1	Load max 1mA At IUnit1			-		V
Analog Current Outputs Unit2	Load max 1mA At IUnit2		3,92	4	4,08	V
Analog DC Link Voltage Output	Load max 1 mA At VDCmax	VDCout	8,82	9	9,18	V
Analog Temperature Out	Load max 1mA At ϑj=115°C	Vϑout	8,82	9	9,18	V
Optical Input Level	optionally		12			µW
Optical Output Level	optionally				60	µW

Requirements to the Controller

EMC Protection	According EN61800-3 at auxiliary power and controlinterface		1			kV
EMC Enviroment			Shieldconcept with TE (True Earth) separated from PE, HF conform installation			
Drive Pulse Time		ton_min	10			µs
Blockout Time		tpause	10			µs
Overvoltage Shut Down Reaction Time	After overvoltage message by PowerSTACK Interface				300	µs
Overcurrent Shut Down Reaction Time	After overcurrent message by PowerSTACK Interface				10	µs

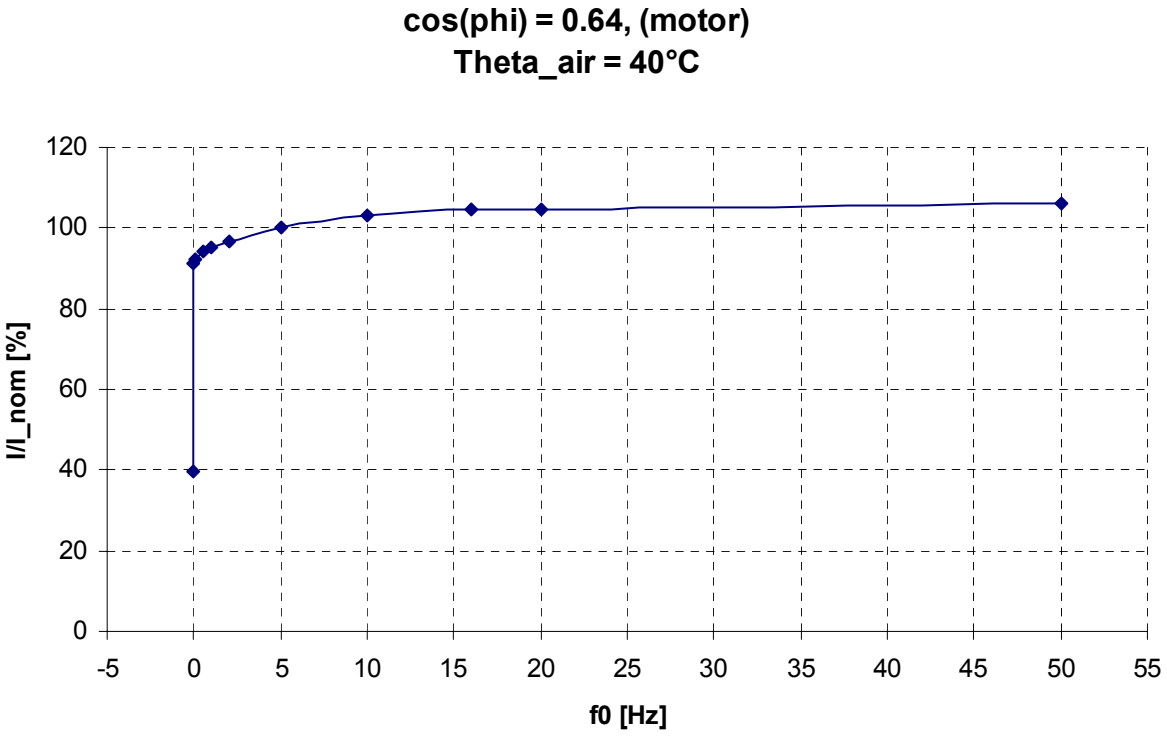
Mechanical Data

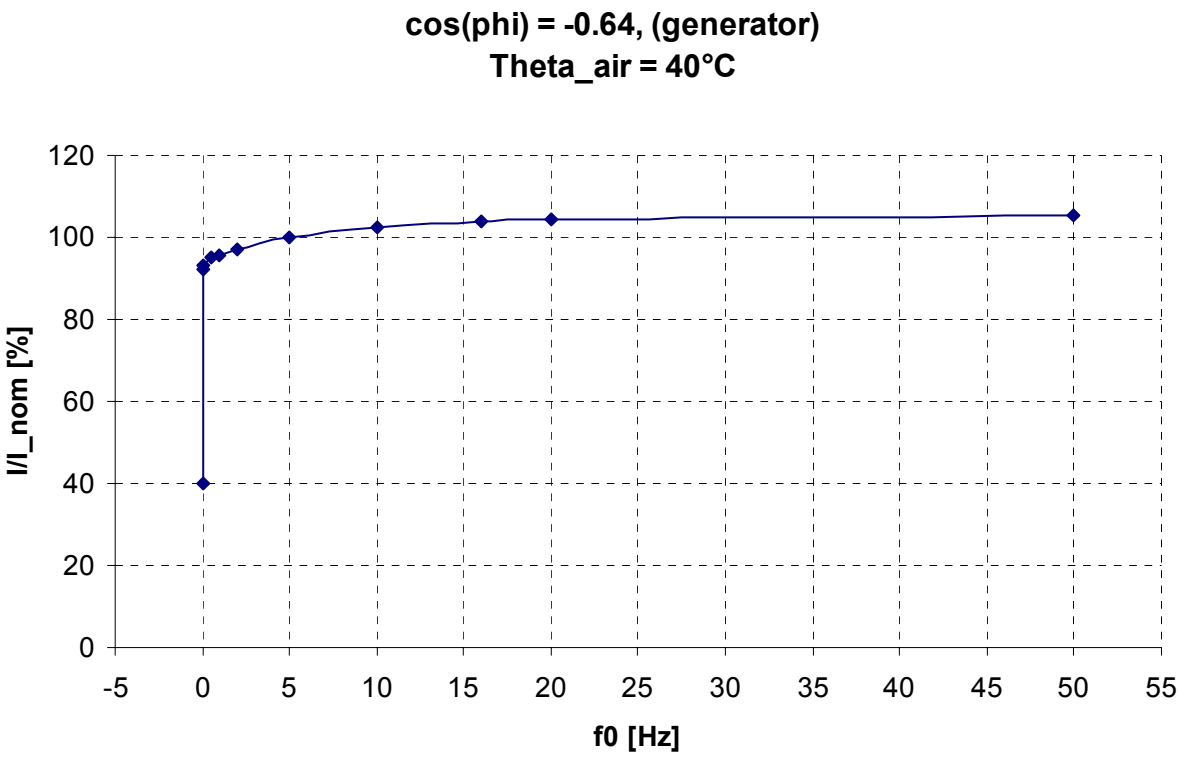
Airvelocity	ϑAir=20°C	vAir				m/s
Airflow heatsink		dV/dtAir				m³/h

Air Pressure Drop heatsink	Pair=1013 hPa Dry- and dustfree, measured outside of heatsink. According DIN 41882	ΔpAir				Pa
Watervelocity	According Coolingwater Specification from eupec	vWater		t.b.d.		m/s
Waterflow heatsink		dV/dt Water	-	t.b.d.		m³/h
Water Pressure Drop heatsink		ΔpWater		t.b.d.		Pa
Antifreeze Additive						
Water Connection						
Dimensions	Width x Depth x Hight		450	300	376	mm
Mass	Approximation			25		kg
Storage Temperature Range		ϑstor	-40		+65	°C
Operating Temperature range (PCB and Capacitor)	Minimal 0 °C for optional optical interface	ϑop	-25 (0)		+55	°C
Cooling Water Inlet Temperature (Heatsink)		ϑwater_ inlet	-25		+45	°C
Cooling Airvelocity (PCB and Capacitor)		vAir_PCB	2			m/s
Air Pressure	Standard atmosphere	pAir	900		1100	hPa
Humidity	No Condensation	Rel. F	0		95	%
Installation Height			0		1000	m
Vibration	EN60068-2-6, Fc 10..59Hz 0,075mm				10	m/s²
Permanence Vibration	EN60068-2-6, Fc 10-150Hz, 20 Cycles				20	m/s²
Shock	EN60068-2-27, Ea Halfsine 11ms, 3 pulses				100	m/s²
Protection Degree			IP00			
Pollution Degree			2			
Overvoltage Category			III			

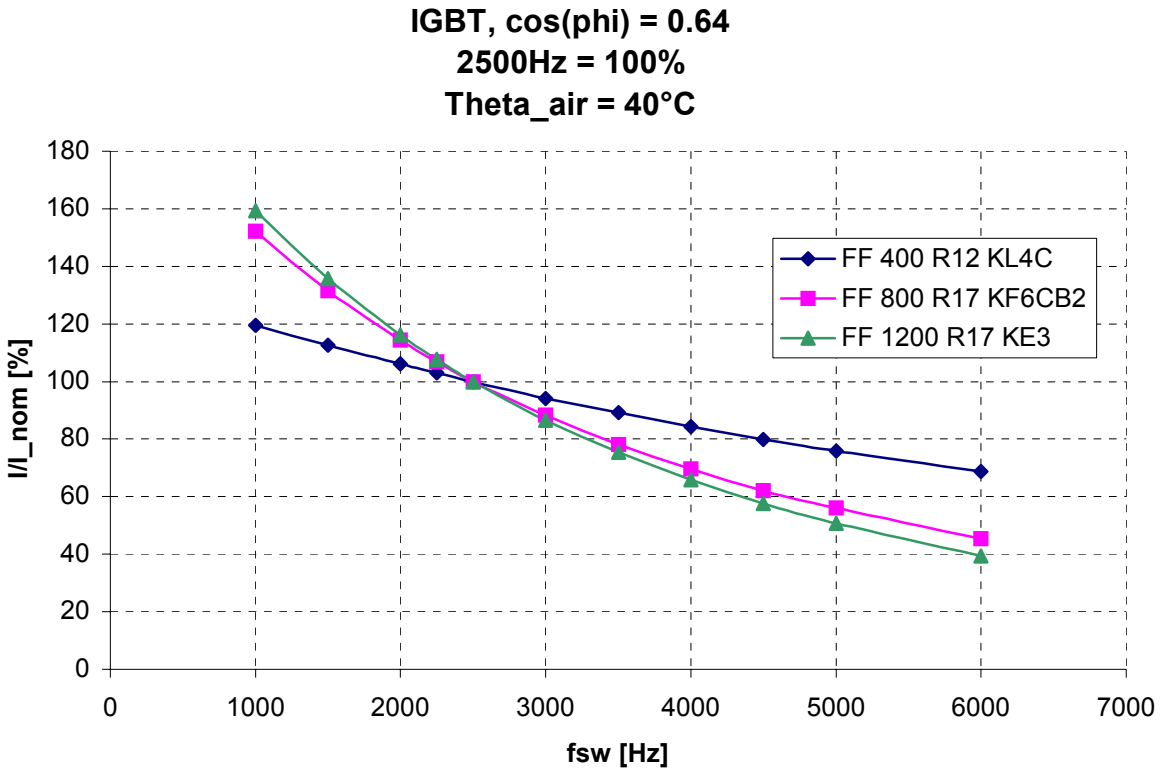
Derating Curves *(IGBT Part)*

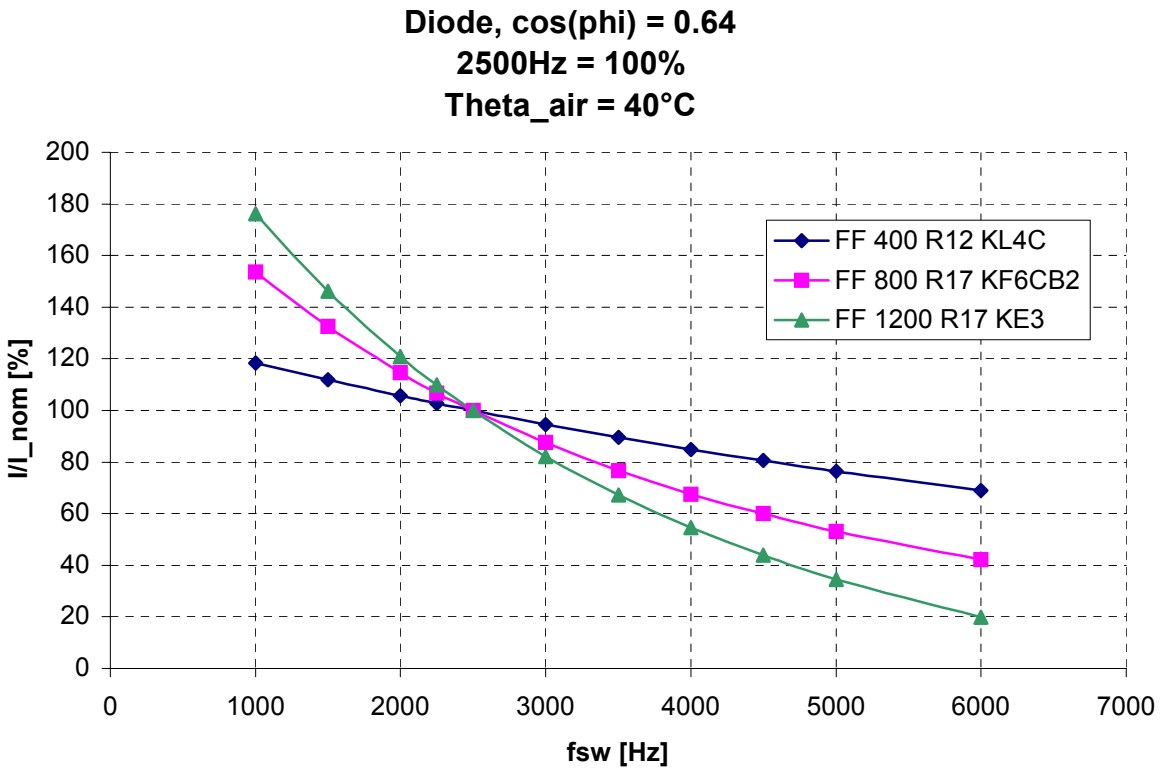
Current derating at low rotating field frequency (f0). **Maximal 100% current is allowed.**

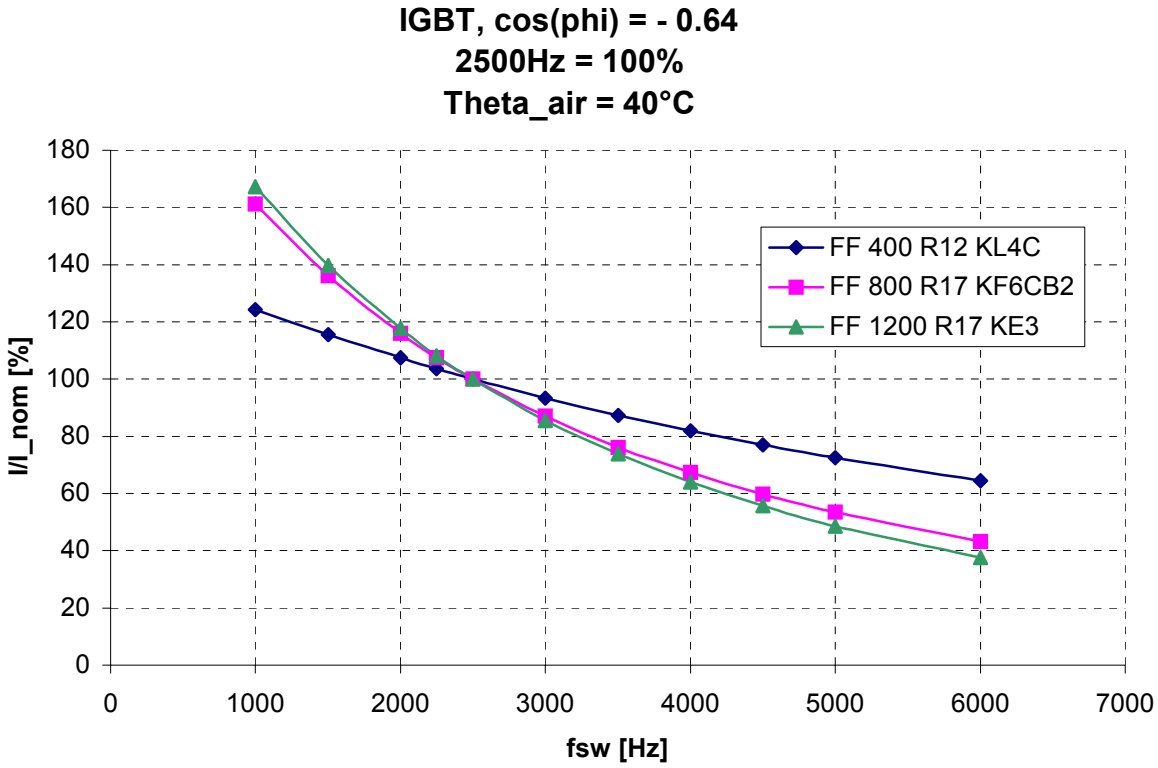


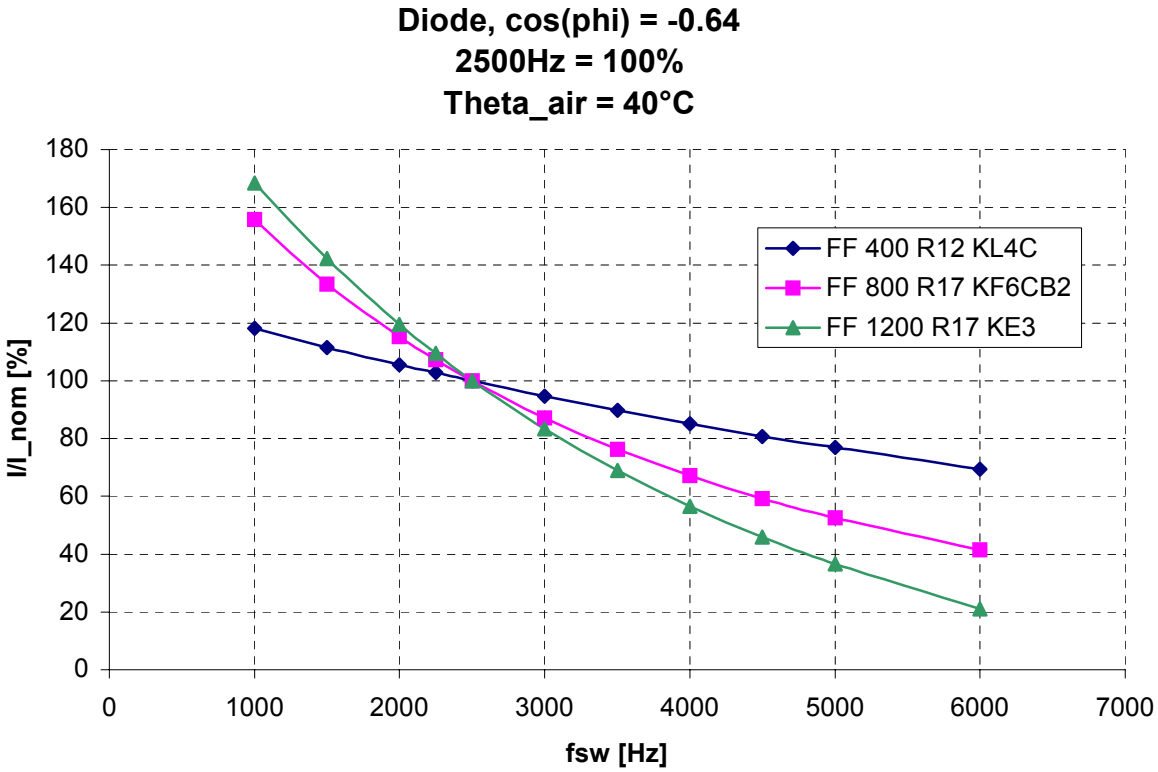


Current derating at different switching frequencies. **Maximal 100% current is allowed.**






IGBT, cos(phi) = - 0.64
2500Hz = 100%
Theta_air = 40°C
I/I_nom [%]
fsw [Hz]
FF 400 R12 KL4C
FF 800 R17 KF6CB2
FF 1200 R17 KE3
0
20
40
60
80
100
120
140
160
180
0
1000
2000
3000
4000
5000
6000
7000


Diode, cos(phi) = -0.64
2500Hz = 100%
Theta_air = 40°C
I/I_nom [%]
fsw [Hz]
FF 400 R12 KL4C
FF 800 R17 KF6CB2
FF 1200 R17 KE3
0
20
40
60
80
100
120
140
160
180
0
1000
2000
3000
4000
5000
6000
7000

Miscellaneous

This technical information specifies semiconductor stacks but promises no characteristics. It is valid in combination with the belonging technical notes.
This document may be changed without prior notice.

Warning!

Prior to installation and commissioning 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 missing or damaged signs are replaced.

The safety instructions have to be strictly adhered to.
The manual contains detailed information on all technical topics with regard to the eupec ModSTACK. For further details regarding publications of the eupec ModSTACK and information on other publications in the area of ModSTACKs please contact your nearest eupec branch or visit our website: http://www.eupec.com.

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