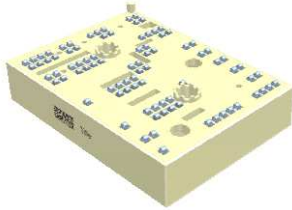
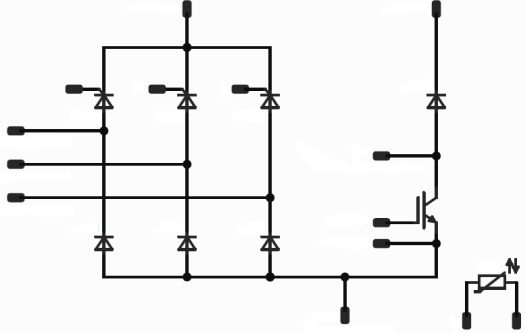




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MiniSkiiP®3	1200 V / 140 A
<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; background-color: #cccccc; margin: 0;"><b>Features</b></p> <ul style="list-style-type: none"> <li>3 phase input rectifier with BRC</li> <li>Solderless interconnection</li> <li>Trench Fieldstop IGBT4 technology</li> <li>Si<sub>3</sub>N<sub>4</sub> ceramic material</li> </ul> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; background-color: #cccccc; margin: 0;"><b>Target applications</b></p> <ul style="list-style-type: none"> <li>Industrial drives</li> <li>UPS</li> </ul> </div> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #cccccc; margin: 0;"><b>Types</b></p> <ul style="list-style-type: none"> <li>80-M312BA140SC03-K489-G42</li> </ul> </div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;"> <p style="text-align: center; background-color: #cccccc; margin: 0;"><b>MiniSkiiP® 3 housing</b></p>  </div> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #cccccc; margin: 0;"><b>Schematic</b></p>  </div>

## Maximum Ratings

$T_j=25^{\circ}\text{C}$ , unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
<b>Brake Switch</b>				
Collector-emitter voltage	$V_{CES}$		1200	V
Collector current	$I_C$	$T_j = T_{jmax}$ $T_S = 80^{\circ}\text{C}$	145	A
Repetitive peak collector current	$I_{CRM}$	$t_p$ limited by $T_{jmax}$	450	A
Total power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_S = 80^{\circ}\text{C}$	356	W
Gate-emitter voltage	$V_{GES}$		$\pm 20$	V
Maximum Junction Temperature	$T_{jmax}$		175	$^{\circ}\text{C}$



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Parameter	Symbol	Conditions	Value	Unit
<b>Brake Diode</b>				
Peak Repetitive Reverse Voltage	$V_{RRM}$		1200	V
DC forward current	$I_F$	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	103	A
Non-repetitive peak surge current	$I_{FSM}$	sin 180° tp=10ms $T_j = 150^\circ\text{C}$	900	A
$I^2t$ value	$I^2t$		4050	A <sup>2</sup> s
Power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	216	W
Maximum Junction Temperature	$T_{jmax}$		175	°C

Parameter	Symbol	Conditions	Value	Unit
<b>Rectifier Thyristor</b>				
Repetitive peak reverse voltage	$V_{RRM}$		1600	V
Forward average current	$I_{FAV}$	sine, d= 0,5 $T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	134	A
Surge forward current	$I_{FSM}$	tp=10 ms $T_j = 130^\circ\text{C}$	1250	A
$I^2t$ value	$I^2t$		7810	A <sup>2</sup> s
Power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	143	W
Maximum Junction Temperature	$T_{jmax}$		130	°C

Parameter	Symbol	Conditions	Value	Unit
<b>Rectifier Diode</b>				
Peak Repetitive Reverse Voltage	$V_{RRM}$		1600	V
DC forward current	$I_{FAV}$	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	115	A
Non-repetitive peak surge current	$I_{FSM}$	sin 180° tp=10ms $T_j = 150^\circ\text{C}$	1380	A
$I^2t$ value	$I^2t$		9520	A <sup>2</sup> s
Power dissipation	$P_{tot}$	$T_j = T_{jmax}$ $T_h = 80^\circ\text{C}$	155	W
Maximum Junction Temperature	$T_{jmax}$		150	°C



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## Module Properties

Parameter	Symbol	Conditions	Value	Unit
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### Thermal Properties

Storage temperature	$T_{stg}$		-40...+125	°C
Operation Junction Temperature	$T_{jop}$		-40...+( $T_{jmax} - 25$ )	°C

### Isolation Properties

Isolation voltage	$V_{isol}$	DC voltage	$t_p=2s$	4000	V
Creepage distance				min 12,7	mm
Clearance				min 12,7	mm
Comparative Tracking Index	CTI			>200	



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## Characteristic Values

### Brake Switch

Parameter	Symbol	Conditions					Value			Unit
		$V_{GE}$ [V]	$V_{CE}$ [V]	$I_C$ [A]	$T_j$ [°C]	Min	Typ	Max		

#### Static

Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}$			0,0052	25 125	5,3	5,8	6,3	V
Collector-emitter saturation voltage	$V_{CEsat}$		15		150	25 125 150	1,58	1,93 -	2,07	V
Collector-emitter cut-off current	$I_{CES}$		0	1200		25 125			10	μA
Gate-emitter leakage current	$I_{GES}$		20	0		25 125			240	nA
Internal gate resistance	$r_g$							5		Ω
Input capacitance	$C_{ies}$	f=1 MHz	0	25		25		8600		pF
Reverse transfer capacitance	$C_{res}$							320		

#### Thermal

Thermal resistance junction to sink	$R_{th(j-s)}$	Phase-Change Material $\lambda=3,4W/mK$						0,27		K/W
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### Brake Diode

Parameter	Symbol	Conditions					Value			Unit
		$di_F/dt$ [A/us]	$V_r$ [V]	$I_F$ [A]	$T_j$	Min	Typ	Max		

#### Static

Forward voltage	$V_F$			150	25°C 125°C 150°C		2,50 -	2,46		V
Reverse leakage current	$I_{rm}$			1200	25°C 150°C			180 28000		μA

#### Thermal

Thermal resistance chip to heatsink	$R_{th(j-h)}$	Phase-Change Material $\lambda=3,4W/mK$						0,44		K/W
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## Rectifier Thyristor

Parameter	Symbo	Conditions					Value			Unit
		$dI_F/dt$ [A/us]	$V_r$ [V]	$I_F$ [A]	$T_j$	Min	Typ	Max		
<b>Static</b>										
Forward voltage	$V_F$			110	25°C 125°C		1,09 1,02	1,2		V
Threshold voltage (for power loss calc. only)	$V_{to}$				25°C 130°C			0,85		V
Slope resistance (for power loss calc. only)	$r_t$				25°C 130°C			3,2		mΩ
Reverse current	$I_r$			1600	25°C 130°C			0,2		mA
Gate controlled delay time	$t_{GD}$	$T_{vj}=25^\circ\text{C}$ $I_G=1\text{A}$ $di/dt=1\text{A}/\mu\text{s}$ $V_D=0,67*V_{DRM}$		1072	25°C 130°C		1			μs
Gate controlled rise time	$t_{GR}$			1072	25°C 130°C		2			μs
Critical rate of rise of off-state voltage	$(dv/dt)_{cr}$				25°C 130°C			1000		V/μs
Critical rate of rise of on-state current	$(di/dt)_{cr}$				25°C 130°C			100		A/μs
Circuit commutated turn-off time	$t_q$				25°C 130°C		150			μs
Holding current	$I_H$				25°C 130°C			220		mA
Latching current	$I_L$				25°C 130°C			550		mA
Gate trigger voltage	$V_{GT}$				25°C 130°C			1,98		V
Gate trigger current	$I_{GT}$				25°C 130°C			100		mA
Gate non-trigger voltage	$V_{GD}$				25°C 130°C	0,25				V
Gate non-trigger current	$I_{GD}$				25°C 115°C	6				mA
<b>Thermal</b>										
Thermal resistance chip to heatsink per chip	$R_{thjH}$	Phase-Change Material						0,35		K/W



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## Rectifier Diode


Parameter	Symbol	Conditions					Value			Unit
		$di_F/dt$ [A/us]	$V_r$ [V]	$I_F$ [A]	$T_j$	Min	Typ	Max		
<b>Static</b>										
Forward voltage	$V_F$			77	25°C 125°C 150°C		1,03 1,12	1,21		V
Reverse leakage current	$I_r$		1600		25°C 150°C			50 1100		μA
<b>Thermal</b>										
Thermal resistance chip to heatsink per chip	$R_{thJH}$	Phase-Change Material						0,45		K/W

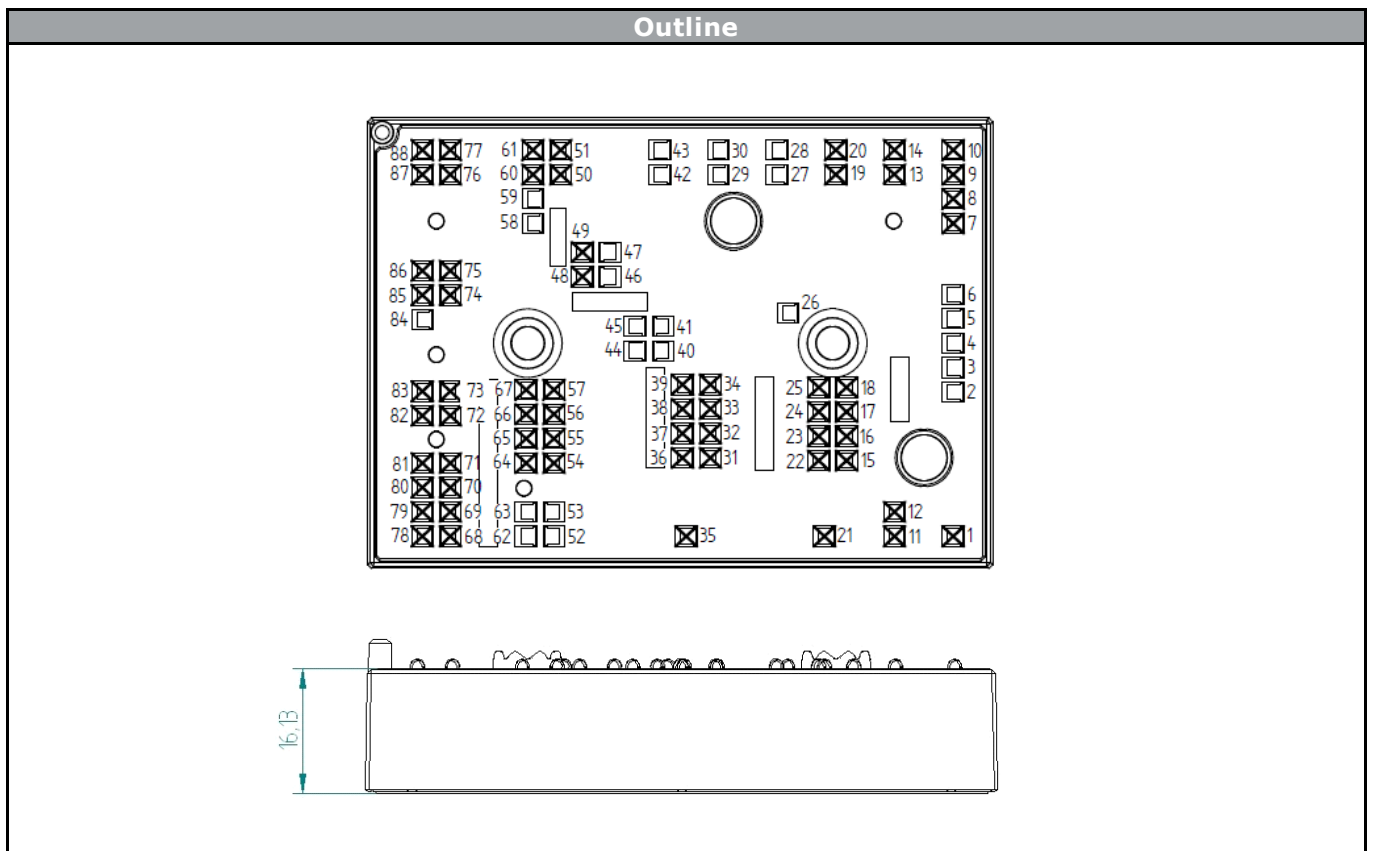
## Thermistor

Parameter	Symbol	Conditions					Value			Unit
		$V_{GE}$ [V]	$V_{CE}$ [V]	$I_C$ [A]	$T_{ij}$ [°C]	Min	Typ	Max		
Rated resistance	$R$				25		1			kΩ
Deviation of R100	$\Delta_{R/R}$	R100=1670 Ω			100	-2		+2		%
R100	$R$				100		1670			Ω
Power dissipation constant					25		0,76			mW/K
A-value	$A_{(25/50)}$				25		$7,635 \cdot 10^{-3}$			1/K
B-value	$B_{(25/100)}$				25		$1,731 \cdot 10^{-5}$			1/K <sup>2</sup>
Vincotech NTC Reference									E	



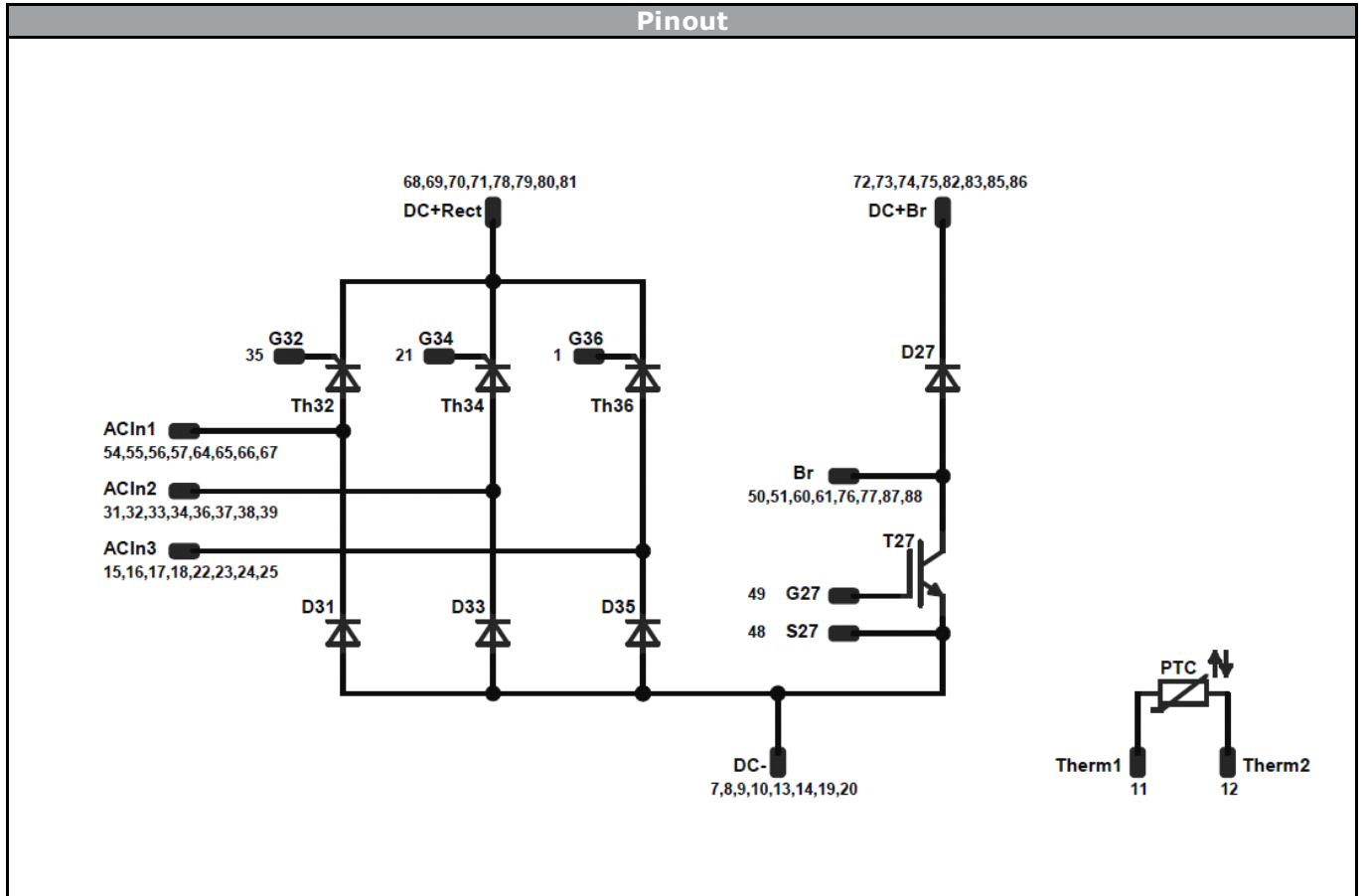
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Ordering Code & Marking							
Version	Ordering Code	in DataMatrix as	in packaging barcode as				
with std lid(black V23990-K32-T-2-PM)	80-M312BA140SC03-K489-G42-/0A/	K489G42	K489G42-/0A/				
with std lid(black V23990-K32-T-2-PM)+PCM	80-M312BA140SC03-K489-G42-/3A/	K489G42	K489G42-/3A/				
NN-NNNNNNNN NNNN-TTTTTVV Vinco LLLLL WWYY SSSS UL		<b>Text</b>	<b>Name</b>	<b>Type&amp;Ver</b>	<b>Date code</b>	<b>Vinco&amp;Lot</b>	<b>Serial&amp;UL</b>
			NN-NNNNNNNNNNNNNN	TTTTTTTVV	WWYY	Vinco LLLLL	SSSS UL
		<b>Datamatrix</b>	<b>Type&amp;Ver</b>	<b>Lot number</b>	<b>Serial</b>	<b>Date code</b>	
			TTTTTTTVV	LLLLL	SSSS	WWYY	





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<b>Identification</b>					
<b>ID</b>	<b>Component</b>	<b>Voltage</b>	<b>Current</b>	<b>Function</b>	<b>Comment</b>
T27	IGBT	1200V	150A	Brake Switch	2*IGC70T120T8RL
D27	FWD	1200V	150A	Brake Diode	SKCD81C120I4F
D31,D33,D35	Rectifier	1600V	140A	Rectifier Diode	SKR 8,9 QU/16B
Th32,Th34,Th36	Thyristor	1600V	125A	Rectifier Thyristor	SKT-TABL 10,3 QU RG
PTC	PTC			Thermistor	SKCS2-Temp100





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Packaging instruction			
Standard packaging quantity (SPQ)	48	>SPQ	Standard
		<SPQ	Sample

Handling instruction
Handling instructions for MiniSkiiP® 3 packages see vincotech.com website.

General datasheet
General datasheet for MiniSkiiP® 3 packages see vincotech.com website.

Document No.:	Date:	Modification:	Pages
80-M312BA140SC03-K489-G42-T2-14	13 Dec. 2016	Corrected ordering code	7

Product status definition		
Datasheet Status	Product Status	Definition
Target	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice. The data contained is exclusively intended for technically trained staff.

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.