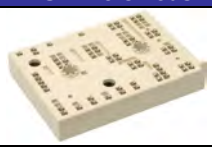
MiniSKiiP® 3 PIM **1200V/100A**

Features

- Solderless interconnection
- Mitsubishi Generation 6.1 technology

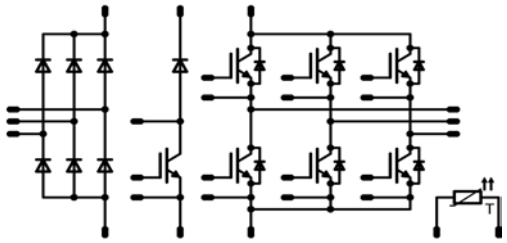
MiniSKiiP® 3 housing



Target Applications

- Industrial Motor Drives

Schematic



Types

- V23990-K420-A60-PM

Maximum Ratings

T_j=25℃, unless otherwise specified

Parameter	Symbol	Condition		Value	Unit
Input Rectifier Diode					
Repetitive peak reverse voltage	V_{RRM}			1600	V
DC forward current	I_{FAV}	T_j=$T_j$max	T_h=80℃ T_c=80℃	91	A
Surge forward current	I_{FSM}	t_p=10ms	T_j=25℃	500	A
I2t-value	I^2t			1250	A^2s
Power dissipation per Diode	P_{tot}	T_j=$T_j$max	T_h=80℃ T_c=80℃	99	W
Maximum Junction Temperature	$T_j$max			150	℃
Inverter Transistor					
Collector-emitter break down voltage	V_{CE}			1200	V
DC collector current	I_C	T_j=$T_j$max	T_h=80℃ T_c=80℃	105	A
Repetitive peak collector current	I_{Cpulse}	t_p limited by $T_j$max		200	A
Power dissipation per IGBT	P_{tot}	T_j=$T_j$max	T_h=80℃ T_c=80℃	183	W
Gate-emitter peak voltage	V_{GE}			±20	V
Short circuit ratings	t_{SC} V_{CC}	T_j≤150℃ V_{GE}=15V		10 850	µs V
Maximum Junction Temperature	$T_j$max			175	℃

Maximum Ratings

T_j=25℃, unless otherwise specified

Parameter	Symbol	Condition	Value	Unit
Inverter Diode				
Peak Repetitive Reverse Voltage	V_{RRM}	T_j=25℃	1200	V
DC forward current	I_F	T_j=$T_j$max T_h=80℃ T_c=80℃	85	A
Repetitive peak forward current	I_{FRM}	t_p limited by $T_j$max	200	A
Power dissipation per Diode	P_{tot}	T_j=$T_j$max T_h=80℃ T_c=80℃	144	W
Maximum Junction Temperature	$T_j$max		175	℃
Thermal Properties				
Storage temperature	T_{stg}		-40…+125	℃
Operation temperature under switching condition	T_{op}		-40…+(Tjmax - 25)	℃
Insulation Properties				
Insulation voltage	V_{is}	t=2s DC voltage	4000	V
Creepage distance			min 12,7	mm
Clearance			min 12,7	mm
Comparative tracking index	CTI		>200	

Characteristic Values

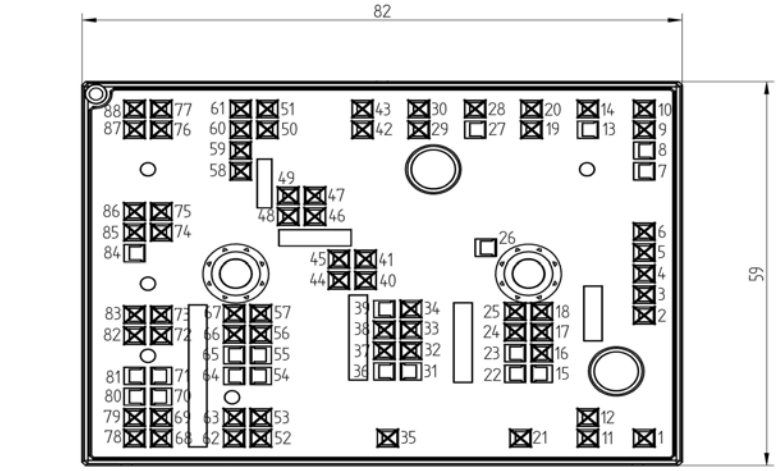
Parameter	Symbol	Conditions					Value			Unit
			V_{GE} [V] or V_{GS} [V]	V_r [V] or V_{CE} [V] or V_{DS} [V]	I_C [A] or I_F [A] or I_D [A]	T_j	Min	Typ	Max	
Input Rectifier Diode										
Forward voltage	V_F				35	Tj=25℃ Tj=125℃	0,8	0,97 0,88	1,35	V
Threshold voltage (for power loss calc. only)	V_{to}					Tj=25℃ Tj=125℃		0,85 0,71		V
Slope resistance (for power loss calc. only)	r_t					Tj=25℃ Tj=125℃		3,5 4,7		mΩ
Reverse current	I_r			1500		Tj=25℃ Tj=125℃			0,1 1,1	mA
Thermal resistance chip to heatsink per chip	R_{thJH}	Thermal grease thickness≤50µm λ = 1W/mK						0,70		K/W
Inverter Transistor										
Gate emitter threshold voltage	$V_{GE(th)}$				0,01	Tj=25℃ Tj=150℃	5,4	6	6,6	V
Collector-emitter saturation voltage	$V_{CE(sat)}$		15		100	Tj=25℃ Tj=150℃		1,7 1,95	2,15	V
Collector-emitter cut-off current incl. Diode	I_{CES}		0	600		Tj=25℃ Tj=150℃			0,34	mA
Gate-emitter leakage current	I_{GES}		20	0		Tj=25℃ Tj=150℃			500	nA
Integrated Gate resistor	R_{gint}							-		Ω
Turn-on delay time	$t_{d(on)}$	Rgoff=6,2 Ω Rgon=6,2 Ω	±15	600	100	Tj=25℃ Tj=150℃		tbd tbd	300	ns
Rise time	t_r					Tj=25℃ Tj=150℃		tbd tbd	200	
Turn-off delay time	$t_{d(off)}$					Tj=25℃ Tj=150℃		tbd tbd	600	
Fall time	t_f					Tj=25℃ Tj=150℃		tbd tbd	300	
Turn-on energy loss per pulse	E_{on}					Tj=25℃ Tj=150℃		tbd tbd		mWs
Turn-off energy loss per pulse	E_{off}					Tj=25℃ Tj=150℃		tbd tbd		
Input capacitance	C_{ies}	f=1MHz	0	10		Tj=25℃			10000	nF
Output capacitance	C_{oss}								1000	
Reverse transfer capacitance	C_{rss}								170	
Gate charge	Q_{Gate}		±15			Tj=25℃		tbd		nC
Thermal resistance chip to heatsink per chip	R_{thJH}	Thermal grease thickness≤50um λ = 1 W/mK						0,52		K/W
Inverter Diode										
Diode forward voltage	V_F				100	Tj=25℃ Tj=150℃		2,5 2	3,3	V
Peak reverse recovery current	I_{RRM}	Rgon=tbd Ω				Tj=25℃ Tj=150℃		tbd tbd		A
Reverse recovery time	t_{rr}					Tj=25℃ Tj=150℃		tbd tbd		ns
Reverse recovered charge	Q_{rr}					Tj=25℃ Tj=150℃		tbd tbd		µC
Peak rate of fall of recovery current	di(rec)max /dt					Tj=25℃ Tj=150℃		tbd tbd		A/µs
Reverse recovered energy	Erec					Tj=25℃ Tj=150℃		tbd tbd		mWs
Thermal resistance chip to heatsink per chip	R_{thJH}	Thermal grease thickness≤50um λ = 1 W/mK						0,66		K/W
Thermistor										
Rated resistance	R					T=25℃		1000		Ω
Deviation of R100	ΔR/R	R100=1486 Ω				T=100℃	-3		3	%
Power dissipation	P					T=25℃		1670,313		mW
B-value	$B_{(25/50)}$	Tol. ±3%				T=25℃		7,635*10-3		K
B-value	$B_{(25/100)}$	Tol. ±3%				T=25℃		1,731*10-5		K
Vincotech NTC Reference									E	

Ordering Code and Marking - Outline - Pinout

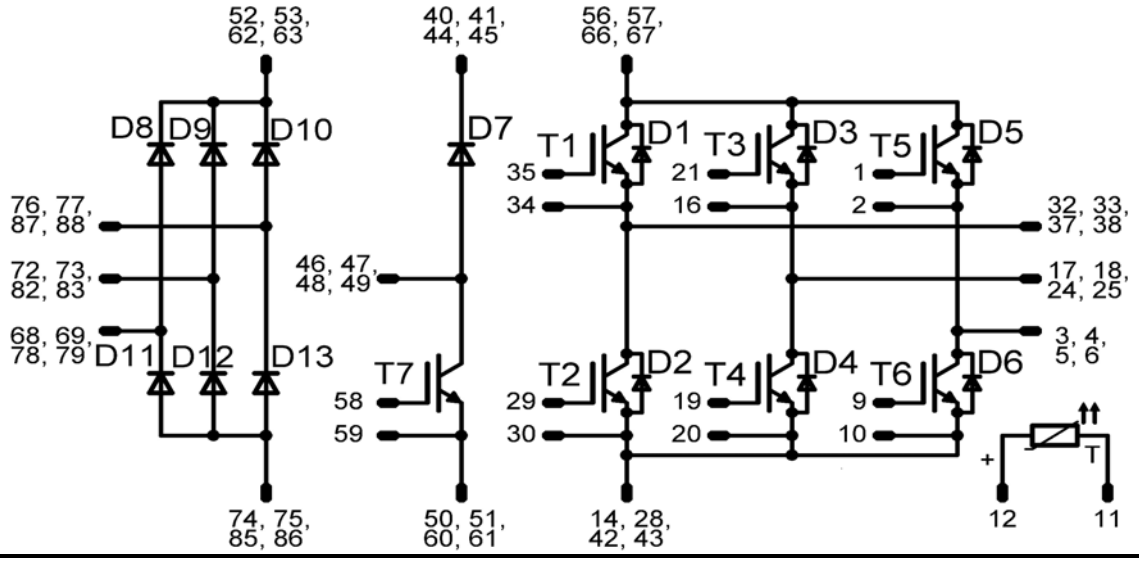
Ordering Code & Marking

Version	Ordering Code	in DataMatrix as	in packaging barcode as
with std lid (black V23990-K32-T-PM)	V23990-K420-A60-/0A/-PM	K420A60	K420A60-/0A/
with std lid (black V23990-K32-T-PM) and P12	V23990-K420-A60-/1A/-PM	K420A60	K420A60-/1A/
with thin lid (white V23990-K33-T-PM)	V23990-K420-A60-/0B/-PM	K420A60	K420A60-/0B/
with thin lid (white V23990-K33-T-PM) and P12	V23990-K420-A60-/1B/-PM	K420A60	K420A60-/1B/

Outline



Pinout



PRODUCT STATUS DEFINITIONS

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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