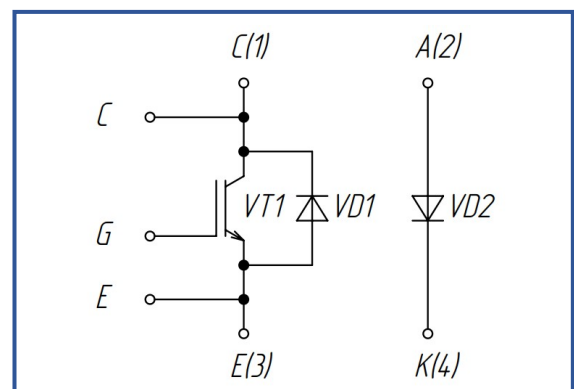
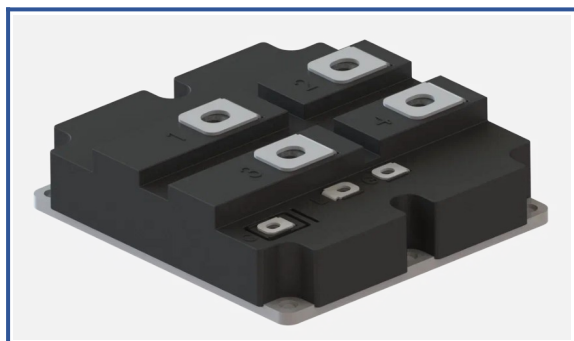


IGBT high-power module
1700 V 1200 A

Chip features

- IGBT chip
 - low $V_{CE(sat)}$ value
 - 10 μs short circuit of 150°C
 - square RBSOA of 2xIC
 - low EMI
- FRD chip
 - fast and soft reverse recovery
 - low voltage drop

Design features

- AlSiC baseplate
- AlN DBC substrate
- ultrasonically welded power terminals

Typical application

- AC and DC motor drives
- high-power converters
- wind-powered generator inverters
- industrial equipment

Maximum rated values

Definition	Symbol	Conditions	Value	Unit
IGBT				
Collector-Emitter voltage	V_{CES}	$V_{GE} = 0$.	1700	V
Maximum allowable collector current (continuous)*2	$I_{C\ 25}$	$T_{vj\ (max)} = 175^{\circ}C$; $T_c = 25^{\circ}C$.	1841	A
	$I_{C\ 80}$	$T_{vj\ (max)} = 175^{\circ}C$; $T_c = 80^{\circ}C$.	1200	A
Repetitive peak collector current*1	I_{CRM}	$I_{CRM} = 2 \times I_{C\ nom}$; $t_p = 1\ ms$.	2400	A
Short-circuit duration	t_{psc}	$T_{vj} = 25^{\circ}C$; $V_{GE} = \pm 15\ V$; $V_{CE} = 1000\ V$; $R_{G\ on} = R_{G\ off} = 1\ \Omega$.	10	μs
		$T_{vj} = 150^{\circ}C$; $V_{GE} = \pm 15\ V$; $V_{CE} = 1000\ V$; $R_{G\ on} = R_{G\ off} = 1\ \Omega$;	10	
Gate-Emitter voltage	V_{GES}		± 20	V
Junction operating temperature	$T_{vj\ (op)}$		-40...+150	$^{\circ}C$
Inverse diode \ Freewheeling diode				
Repetitive peak reverse voltage	V_{RRM}	$V_{GE} = 0\ V$.	1700	V
Maximum allowable forward current (continuous)*2	$I_{F\ 25}$	$T_{vj\ (max)} = 175^{\circ}C$; $T_c = 25^{\circ}C$.	1819	A
	$I_{F\ 80}$	$T_{vj\ (max)} = 175^{\circ}C$; $T_c = 80^{\circ}C$.	1200	A
Repetitive peak forward current*1	I_{FRM}	$I_{FRM} = 2 \times I_{F\ nom}$; $t_p = 1\ ms$.	2400	A
Junction operating temperature	$T_{vj\ (op)}$		-40...+150	$^{\circ}C$
Module				
Storage temperature	T_{stg}		-55...+50	$^{\circ}C$
Isolation voltage	V_{isol}	AC sin 50 Hz; $t = 1\ min$.	4000	V

*1 Pulse width and repetition rate should be such that device junction temperature does not exceed maximum T_{vj} rating.

*2 $I_{C\ 25}$ and $I_{C\ 80}$ ($I_{F\ 25}$ и $I_{F\ 80}$) values were calculated in accordance with typical U_{CE0} , r_{CE0} and $R_{th(j-c)}$ (U_{T0} , r_{T} and $R_{th(jc-D)}$).



Characteristics

Definition	Symbol	Conditions		Value			Unit.
				min.	typ.	max.	
IGBT							
Collector-Emitter saturation voltage	V _{CEsat}	V _{GE} = +15 V; I _C = 1200 A; t _u = 10 μs.	T _{vj} = 25°C	-	2.67	-	V
			T _{vj} = 150°C	-	3.31	-	V
Gate-Emitter threshold voltage	V _{GE(th)}	I _C = 48 mA; U _{CE} = U _{GE} ; T _{vj} = 25°C; t _u = 2 ms.		4.50	5.50	6.50	V
Collector-Emitter cut-off current	I _{CES}	V _{CE} = 1700 V; t _u = 10 ms; V _{GE} = 0.	T _{vj} = 25°C	-	-	4.00	mA
			T _{vj} = 150°C	-	-	40.00	
Gate-Emitter leakage current	I _{GES}	V _{CE} = 0; V _{GE} = ±20 V; T _{vj} = 25°C; t _u = const.		-	-	500	nA
Input capacitance	C _{ies}	V _{CE} = 25 V; V _{GE} = 0 V; f = 1 MHz; T _{vj} = 25°C.		-	73.2	-	nF
Output capacitance	C _{oes}			-	4.16	-	nF
Reverse transfer capacitance	C _{res}			-	2.88	-	nF
Total gate charge	Q _G	V _{GE} = -15...+15 V.		-	8.40	-	μC
Internal gate resistance	R _{Gint}	T _{vj} = 25°C.		-	0.59	-	Ω
Turn-on delay time	t _{d(on)}	V _{CE} = 920 V; V _{GE} = ±15 V; I _{C max} = 1200 A.	T _{vj} = 25°C	-	-	-	ns
			T _{vj} = 150°C	-	-	-	
Rise time	t _{ri}		T _{vj} = 25°C	-	-	-	ns
			T _{vj} = 150°C	-	-	-	
Turn-on energy	E _{on}		T _{vj} = 25°C	-	440	-	mJ
			T _{vj} = 150°C	-	600	-	
Turn-off delay time	t _{d(off)}		T _{vj} = 25°C	-	-	-	ns
			T _{vj} = 150°C	-	-	-	
Fall time	t _{fi}		T _{vj} = 25°C	-	-	-	ns
			T _{vj} = 150°C	-	-	-	
Turn-off energy	E _{off}		T _{vj} = 25°C	-	232	-	mJ
			T _{vj} = 150°C	-	372	-	
Collector-emitter threshold voltage	V _{CE0}	V _{GE} = +15 V; T _{vj} = 150°C;		-	1.00	-	V
On-State slope resistance (IGBT)	r _{CE0}	I _{CE1} = 300 A; I _{CE2} = 1200 A.		-	1.92	-	mΩ
Thermal resistance junction to case	R _{th(j-c)}	DC; V _{GE} = +15 V.		-	0.018	-	K/W
Inverse diode \ Freewheeling diode							
Forward voltage drop	V _F	I _F = 1200 A; V _{GE} = 0; t _u = 10 μs.	T _{vj} = 25°C	-	2.07	-	V
			T _{vj} = 150°C	-	2.36	-	V
Reverse recovery time	t _{rr}	V _{CE} = 920 V; V _{GE} = ±15 V; I _{C max} = 1200 A.	T _{vj} = 25°C	-	-	-	ns
			T _{vj} = 150°C	-	-	-	ns
Peak reverse current	I _{RM}		T _{vj} = 25°C	-	-	-	A
			T _{vj} = 150°C	-	-	-	A
Recovered charge	Q _r		T _{vj} = 25°C	-	688	-	μC
			T _{vj} = 150°C	-	1288	-	μC
Reverse recovery energy	E _{rec}		T _{vj} = 25°C	-	336	-	mJ
			T _{vj} = 150°C	-	712	-	mJ
Threshold voltage	V _(T0)	T _{vj} = 150°C; V _{GE} = 0; I _{CE1} = 300 A;		-	0.81	-	V
Forward slope resistance	r _T	I _{CE2} = 1200 A; t _u = 10 μs		-	1.29	-	mΩ
Thermal resistance junction to case	R _{th(JC-D)}	DC; U _{GE} = +15 V.		-	0.026	-	K/W

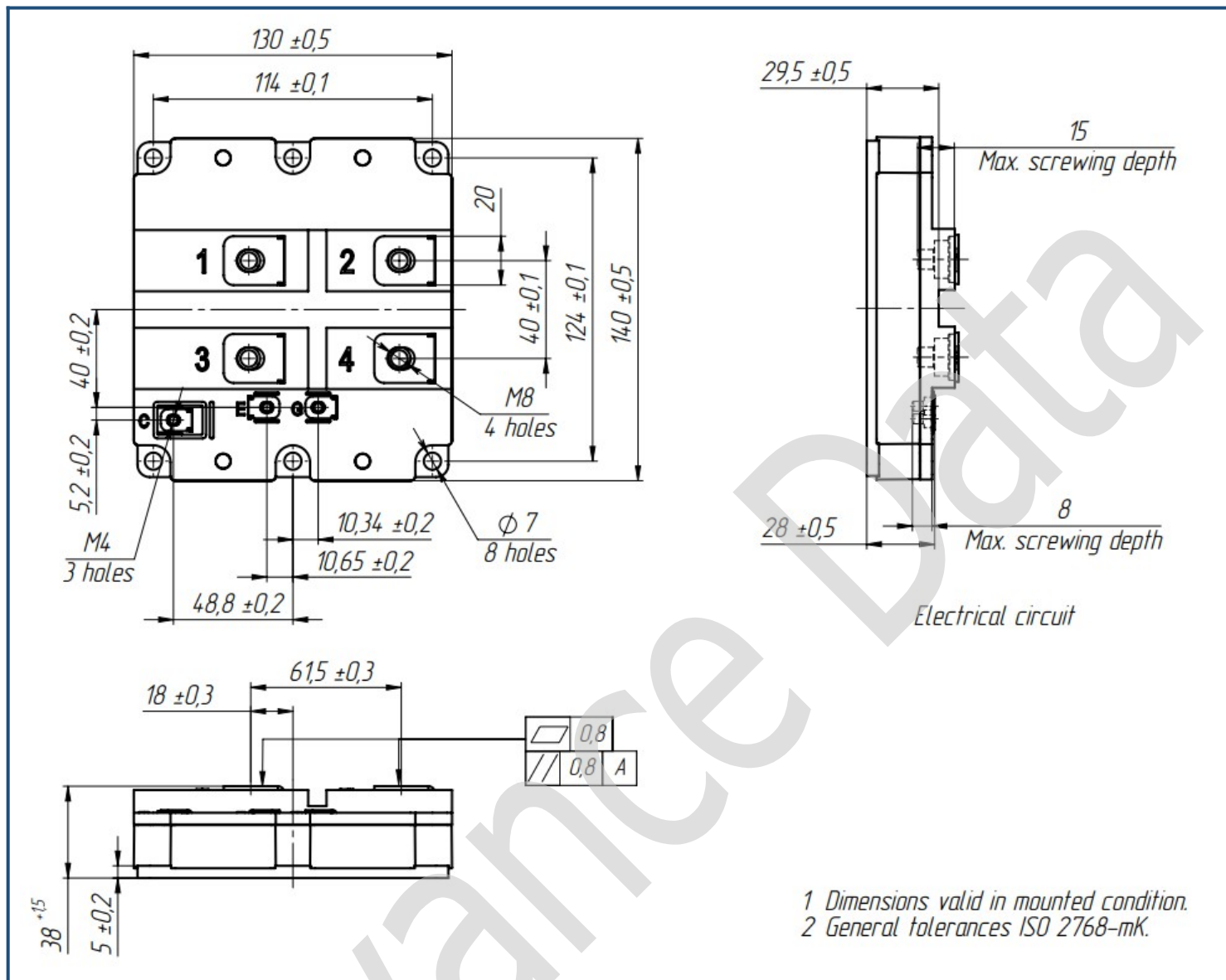


Module							
Pin resistance	R_{Pxy}	$T_{vj} = 25^{\circ}\text{C}$	$R_{P4-3/1-2}$	-	0.31	-	mΩ
Parasitic inductance between terminals	L_{Pxy}		$L_{P4-3/1-2}$	-	28.60	-	nH
Thermal resistance case to heatsink	R_{thCH}	per module		-	16.00	-	K/kW
Mounting torque for screws to heatsink	M_s	to heatsink M6		-	5.75	-	N*m
Mounting torque for screws to power terminal	M_t	to terminals M8		-	9.00	-	N*m
Creepage distance	d_s			32.20	-	-	mm
Clearance	d_a			19.10	-	-	mm
Comparative Tracking Index	CTI			600	-	-	
Weight	W			-	-	900	g

“ - ” Data will be refined as additional tests are conducted and statistics are collected.

Notes:

- Insulating material operating temperature 150°C max;
- Case temperature 150°C max;
- The recommended operating junction temperature $T_{vj\text{ op}} = -40...+150^{\circ}\text{C}$.

Overall dimensions: Package type – SM

Part numbering guide

MISM	-	CH	17	AB	-	1200	N	
MISM		CH						IGBT module package type: SM
			17					1 switch as chopper
				AB				Voltage rating ($V_{CES}/100$)
						1200		IGBT+FRD chipset modification
								Current Rating
							N	Climatic version: normal climate

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