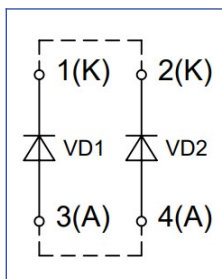
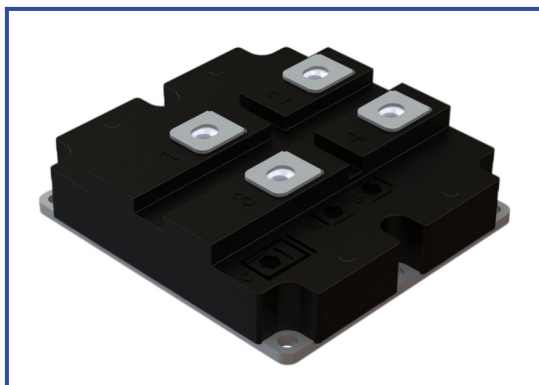


FRD high-power module
3300 V 1500 A

Chip features

- Fast and soft reverse recovery
- Low voltage drop

Design features

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

Typical application

- transport (auxiliary power systems for rail and public transport)
- industrial equipment

Maximum rated values

Definition	Symbol	Conditions	Value	Unit
Diode				
Repetitive peak reverse voltage	V_{RRM}		3300	V
Maximum allowable forward current (continuous)	I_{F25}	$T_{vj(max)} = 150^{\circ}C; T_c = 25^{\circ}C.$	2331	A
	I_{F80}	$T_{vj(max)} = 150^{\circ}C; T_c = 80^{\circ}C.$	1500	A
Repetitive peak forward current ^{*1}	I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}; t_p = 1 \text{ ms}.$	3000	A
Safety factor	I^2t	$T_{vj(max)} = 150^{\circ}C; t_p = 10 \text{ ms}; \sin.$	720	$A^2s \cdot 10^3$
Junction operating temperature	$T_{vj(op)}$		-40...+150	$^{\circ}C$
Module				
Storage temperature	T_{stg}		-40...+50	$^{\circ}C$
Isolation voltage	V_{isol}	AC sin 50 Hz; $T_c = 25^{\circ}C; t = 1 \text{ min}.$	6000	V

Characteristics

Definition	Symbol	Conditions	Value			Unit.	
			min.	typ.	max.		
Diode							
Forward voltage drop	V_F	$I_F = 1500\text{ A};$ $t_u = 1000\text{ }\mu\text{s.}$	$T_{vj} = 25^{\circ}\text{C}$	-	2.42	-	V
			$T_{vj} = 150^{\circ}\text{C}$	-	2.65	-	V
Repetitive peak reverse current	I_{RRM}	$V_R = 3300\text{ V.}$	$T_{vj} = 25^{\circ}\text{C}$	-	-	1.00	mA
			$T_{vj} = 150^{\circ}\text{C}$	-	-	30.00	
Reverse recovery time	t_{rr}	$V_{CE} = 1800\text{ V};$ $I_{C\text{ max}} = 1400\text{ A};$ $L_s = 20\text{ }\mu\text{H.}$	$T_{vj} = 25^{\circ}\text{C}$	-	-	-	ns
			$T_{vj} = 150^{\circ}\text{C}$	-	-	-	ns
Peak reverse current	I_{RM}		$T_{vj} = 25^{\circ}\text{C}$	-	1000	-	A
			$T_{vj} = 150^{\circ}\text{C}$	-	1150	-	A
Recovered charge	Q_r		$T_{vj} = 25^{\circ}\text{C}$	-	960	-	μC
			$T_{vj} = 150^{\circ}\text{C}$	-	1500	-	μC
Reverse recovery energy	E_{rec}		$T_{vj} = 25^{\circ}\text{C}$	-	1140	-	mJ
			$T_{vj} = 150^{\circ}\text{C}$	-	1860	-	mJ

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



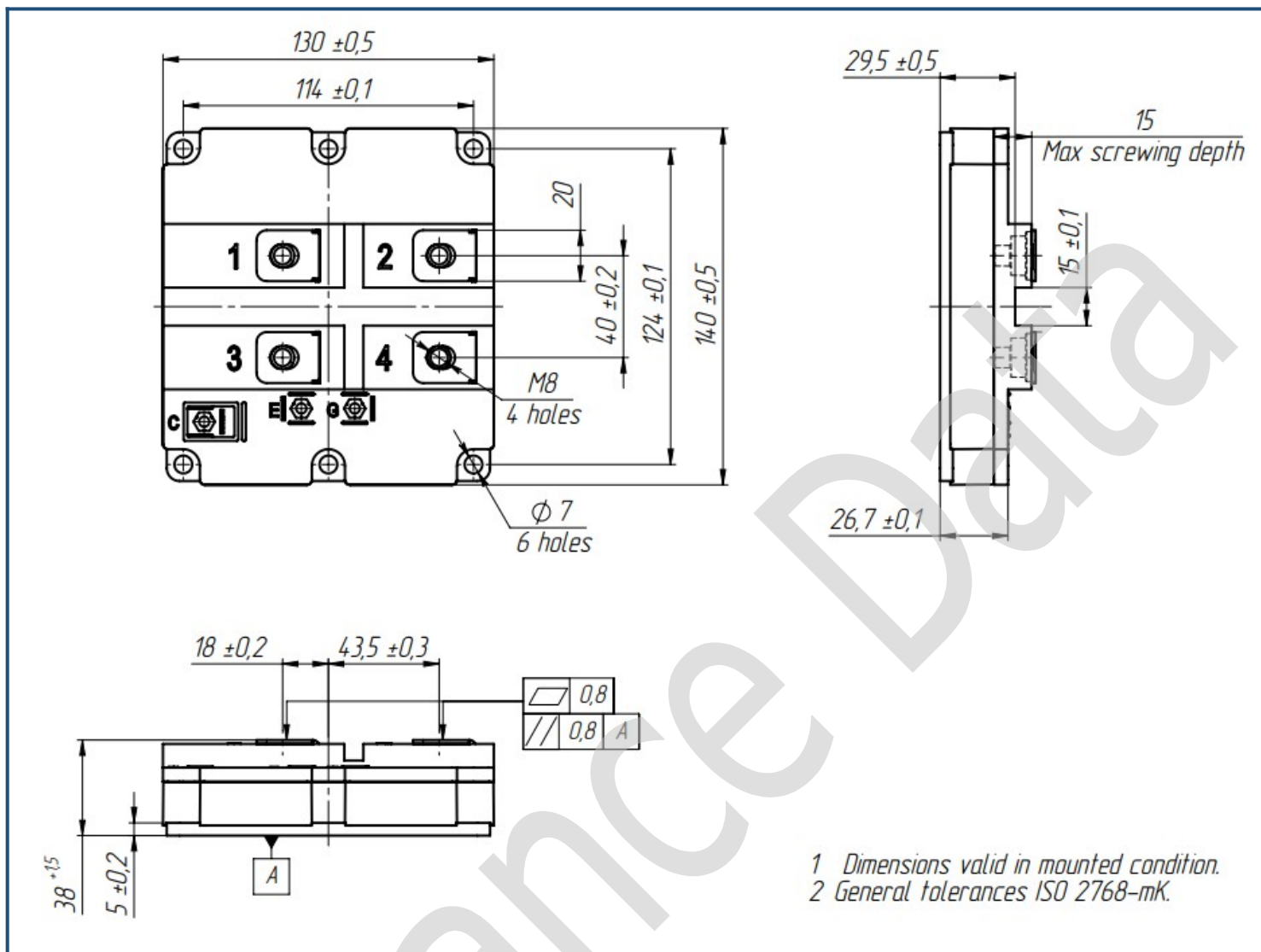
Characteristics

Definition	Symbol	Conditions	Value			Unit.
			min.	typ.	max.	
Diode						
Threshold voltage	$V_{(T0)}$	$T_{vj} = 150^{\circ}\text{C}; I_{F1} = 375 \text{ A};$ $I_{F2} = 1500 \text{ A}; t_u = 10 \text{ ms}$	-	-	0.97	V
Forward slope resistance	r_T		-	-	1.12	mΩ
Thermal resistance junction to case	$R_{th(JC-D)}$	DC; $U_{GE} = +15 \text{ V}.$	-	-	0.018	K/W
Module						
Pin resistance	R_{Pxy}		-	0.16	-	mΩ
Parasitic inductance between terminals	L_{Pxy}		-	17.00	-	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	-	5.00	-	N*m
Mounting torque for screws to power terminal	M_t	to terminals M8	-	9.00	-	N*m
Creepage distance	d_s		-	-	33.00	mm
Clearance	d_a		-	-	20.00	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 $T_{vj\text{ op}} = -40 \div +150^{\circ}\text{C}.$

Overall dimensions: Package type – SM

Part numbering guide

MDSM	-	SD	33	SG	-	1500	N	
MDSM								FRD module package type: SM
		SD						Single diode
			33					Voltage rating (V _{CES} /100)
				SG				FRD chipset modification
					1500			Current Rating
						N		Climatic version: normal climate

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