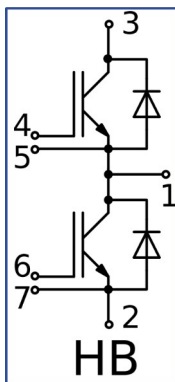
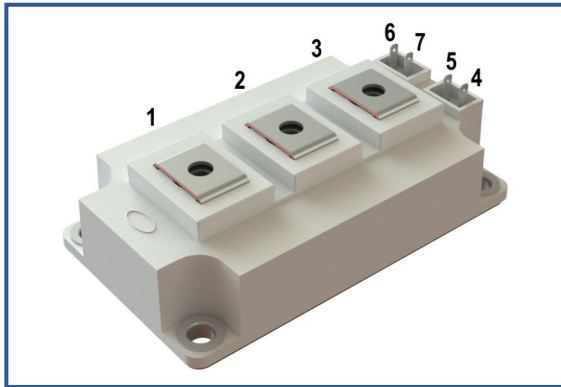


Industry standard 62mm IGBT module

1700 V 200 A



Chip features

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

Design features

- copper baseplate
- Al₂O₃ DBC substrate
- ultrasonically welded power terminals
- Improved thermal cycling
- RoHS compliant

Typical application

- AC motor drives
- solar inverter
- air conditioning
- high power converters and UPS

Maximum rated values

Definition	Symbol	Conditions	Value	Unit
IGBT				
Collector-Emitter voltage	V_{CES}	$V_{GE} = 0$.	1700	V
Maximum allowable collector current (continuous)	$I_{C 25}$	$T_{vj(max)} = 175^{\circ}C; T_c = 25^{\circ}C$.	-	A
	$I_{C 80}$	$T_{vj(max)} = 175^{\circ}C; T_c = 80^{\circ}C$.	200	A
Repetitive peak collector current*1	I_{CRM}	$I_{CRM} = 2 \times I_{C nom}; t_p = 1$ ms.	400	A
Short-circuit duration	t_{psc}	$T_{vj} = 25^{\circ}C; V_{GE} = \pm 15$ V; $V_{CE} = 700$ V; $R_{G on} = R_{G off} = 2.2 \Omega; I_{Cmax} < 1330$ A.	10	μ s
		$T_{vj} = 150^{\circ}C; V_{GE} = \pm 15$ V; $V_{CE} = 700$ V; $R_{G on} = R_{G off} = 2.2 \Omega; I_{Cmax} < 1230$ A.	10	
Gate-Emitter voltage	U_{GES}		± 20	V
Junction operating temperature	$T_{vj (op)}$		-40...+150	°C
Inverse diode \ Freewheeling diode				
Repetitive peak reverse voltage	V_{RRM}	$V_{GE} = 0$ V.	1700	V
Maximum allowable forward current (continuous)	$I_{F 25}$	$T_{vj(max)} = 175^{\circ}C; T_c = 25^{\circ}C$.	-	A
	$I_{F 80}$	$T_{vj(max)} = 175^{\circ}C; T_c = 80^{\circ}C$.	200	A
Repetitive peak forward current*1	I_{FRM}	$I_{FRM} = 2 \times I_{F nom}; t_p = 1$ ms.	400	A
Junction operating temperature	$T_{vj (op)}$		-40...+150	°C
Module				
Storage temperature	T_{stg}		-40...+50	°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.

Characteristics

Definition	Symbol	Conditions	Value			Unit.		
			min.	typ.	max.			
IGBT								
Collector-Emitter saturation voltage	V_{CEsat}	$V_{GE} = +15\text{ V}; I_C = 200\text{ A}; t_u = 1000\text{ }\mu\text{s}.$	$T_{vj} = 25^\circ\text{C}$	-	2.35	-	V	
			$T_{vj} = 150^\circ\text{C}$	-	2.85	-	V	
Gate-Emitter threshold voltage	$V_{GE(th)}$	$I_C = 8\text{ mA}; V_{CE} = V_{GE}; T_{vj} = 25^\circ\text{C}; t_u = 2\text{ ms}.$		4.50	-	6.50	V	
Collector-Emitter cut-off current	I_{CES}	$V_{CE} = 1700\text{ V}; t_u = 50\text{ ms}; V_{GE} = 0.$	$T_{vj} = 25^\circ\text{C}$	-	-	200	μA	
			$T_{vj} = 150^\circ\text{C}$	-	5.00	-	mA	
Gate-Emitter leakage current	I_{GES}	$V_{CE} = 0; V_{GE} = \pm 20\text{ V}; T_{vj} = 25^\circ\text{C}; t_u = 30\text{ ms}.$		-	-	500	nA	
Input capacitance	C_{ies}	$V_{CE} = 25\text{ V}; V_{GE} = 0\text{ V}; f = 1\text{ MHz}; T_{vj} = 25^\circ\text{C}.$		-	12.20	-	nF	
Reverse transfer capacitance	C_{res}			-	0.48	-	nF	
Total gate charge	Q_G	$I_C = 200\text{ A}; V_{CE} = 920\text{ V}; V_{GE} = -8\div 15\text{ V}.$		-	1400	-	nC	
Internal gate resistance	R_{Gint}	$T_{vj} = 25^\circ\text{C}.$		-	2.95	-	Ω	
Turn-on delay time	$t_{d(on)}$	$V_{CE} = 920\text{ V}; V_{GE} = \pm 15\text{ V}; I_{Cmax} = 200\text{ A}; R_G = 2.2\text{ }\Omega; L_s = 56\text{ nH}.$	$T_{vj} = 25^\circ\text{C}$	-	195	-	ns	
			$T_{vj} = 150^\circ\text{C}$	-	207	-	ns	
Rise time	t_{ri}		$T_{vj} = 25^\circ\text{C}$	-	70	-	ns	
			$T_{vj} = 150^\circ\text{C}$	-	78	-	ns	
Turn-on energy	E_{on}		$T_{vj} = 25^\circ\text{C}$	-	45.0	-	mJ	
			$T_{vj} = 150^\circ\text{C}$	-	68.0	-	mJ	
Turn-off delay time	$t_{d(off)}$		$T_{vj} = 25^\circ\text{C}$	-	250	-	ns	
			$T_{vj} = 150^\circ\text{C}$	-	350	-	ns	
Fall time	t_{fi}		$T_{vj} = 25^\circ\text{C}$	-	160	-	ns	
			$T_{vj} = 150^\circ\text{C}$	-	190	-	ns	
Turn-off energy	E_{off}	$T_{vj} = 25^\circ\text{C}$	-	30.0	-	mJ		
		$T_{vj} = 150^\circ\text{C}$	-	58.0	-	mJ		
Collector-emitter threshold voltage	V_{CE0}	$V_{GE} = +15\text{ V}; T_{vj} = 150^\circ\text{C}; I_{CE1} = 50\text{ A}; I_{CE2} = 200\text{ A}; t_u = 1000\text{ }\mu\text{s}.$		-	-	-	V	
On-State slope resistance (IGBT)	r_{CE0}			-	-	-	m Ω	
Thermal resistance junction to case	$R_{th(j-c)}$	$DC; I_{CE} = 150\pm 10\text{ A}; I_{test} = 0.5\text{ A}; V_{GE} = +15\text{ V}.$		-	-	0.135	K/W	
Inverse diode \ Freewheeling diode								
Forward voltage drop	V_F	$I_F = 200\text{ A}; V_{GE} = 0; t_u = 1000\text{ }\mu\text{s}.$	$T_{vj} = 25^\circ\text{C}$	-	1.75	-	V	
			$T_{vj} = 150^\circ\text{C}$	-	1.90	-	V	
Reverse recovery time	t_{rr}	$V_{GE} = \pm 15\text{ V}; V_{CE} = 920\text{ V}; I_{Cmax} = 200\text{ A}; R_{Gon} = 2.2\text{ }\Omega; L_s = 56\text{ nH}.$	$T_{vj} = 25^\circ\text{C}$	-	500	-	ns	
			$T_{vj} = 150^\circ\text{C}$	-	680	-	ns	
Peak reverse current	I_{RM}		$T_{vj} = 25^\circ\text{C}$	-	255	-	A	
			$T_{vj} = 150^\circ\text{C}$	-	305	-	A	
Recovered charge	Q_r		$T_{vj} = 25^\circ\text{C}$	-	50.0	-	μC	
			$T_{vj} = 150^\circ\text{C}$	-	100.0	-	μC	
Reverse recovery energy	E_{rec}		$T_{vj} = 25^\circ\text{C}$	-	32.0	-	mJ	
			$T_{vj} = 150^\circ\text{C}$	-	62.0	-	mJ	
Threshold voltage	$V_{(T0)}$		$T_{vj} = 150^\circ\text{C}; V_{GE} = 0; I_{CE1} = 50\text{ A}; I_{CE2} = 200\text{ A}; t_u = 1000\text{ }\mu\text{s}.$		-	-	-	V
Forward slope resistance	r_T				-	-	-	m Ω
Thermal resistance junction to case	$R_{th(jc-D)}$	$DC; I_{CE} = 80\pm 10\text{ A}; I_{test} = 0.5\text{ A}; V_{GE} = +15\text{ V}.$		-	-	0.210	K/W	

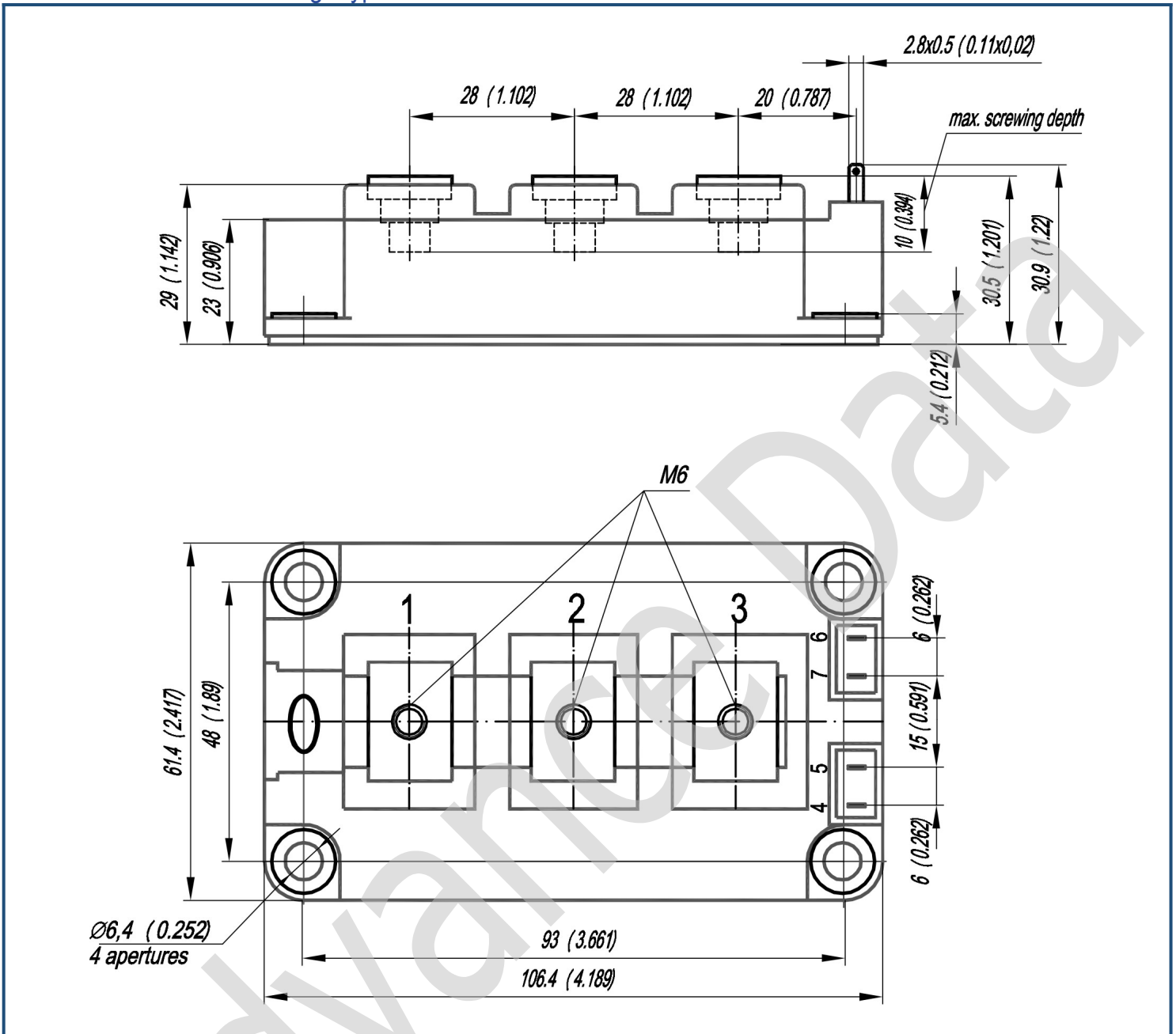
Module							
Pin resistance	R_{Pxy}	$T_{vj} = 25^{\circ}\text{C}.$	R_{P12}	-	0.28	0.50	m Ω
			R_{P13}	-	0.38	0.50	
Parasitic inductance between terminals	L_{Pce}			-	22	-	nH
Thermal resistance case to heatsink	R_{thCH}	per module		-	0.02	0.04	K/W
Mounting torque for screws to heatsink	M_s	to heatsink M6		3.00	-	5.00	N*m
Mounting torque for terminal screws	M_t	to terminals M6		2.25	2.50	2.75	N*m
Weight	W			-	320	340	g

" - " — data will be refined as additional tests are conducted and statistics are collected.

Notes:

- Insulating material operating temperature 125°C max;
- Case temperature 125°C max;
- The recommended operating junction temperature $T_{vj\ op} = -40\dots+150^{\circ}\text{C}.$

Advance Data

Overall dimensions: Package type – AA

Part numbering guide

MIAA	-	HB	17	AB	-	200	N	
MIAA								IGBT module package type: AA
		HB						2 switches as Half-Bridge
			17					Voltage rating ($V_{CE}/100$)
				AB				IGBT+FRD chipset modification
						200		Current Rating
							N	Climatic version: normal climate

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