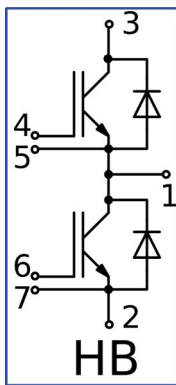
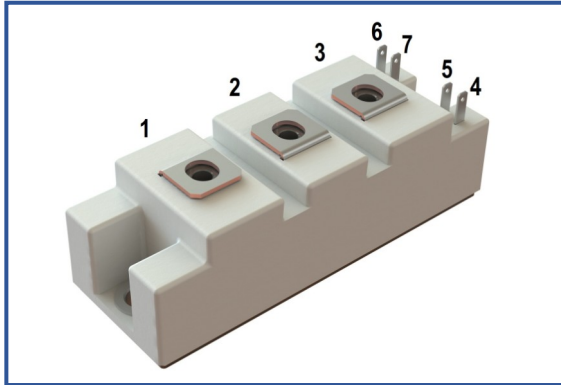


Industry standard 34mm IGBT module

1700 V 75 A



Chip features

- IGBT chip
 - Trench FS
 - low $V_{CE(sat)}$ value
 - 10 μ s short circuit of 150°C
 - square RBSOA of 2xlc
 - 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
	$I_{C 80}$	$T_{vj (max)} = 175^{\circ}C; T_c = 80^{\circ}C$.	75	A
Repetitive peak collector current ^{*1}	I_{CRM}	$I_{CRM} = 2 \times I_{C nom}; t_p = 1 ms$.	150	A
Short-circuit duration	t_{psc}	$T_{vj} = 25^{\circ}C; V_{GE} = \pm 15 V; V_{CE} = 700 V;$ $R_{G on} = R_{G off} = 2.2 \Omega; I_{Cmax} < 570 A$.	10	μ s
		$T_{vj} = 150^{\circ}C; V_G = \pm 15 V; V_{CE} = 700V;$ $R_{G on} = R_{G off} = 2.2 \Omega; I_{Cmax} < 477 A$.	10	
Gate-Emitter voltage	V_{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
	$I_{F 80}$	$T_{vj (max)} = 175^{\circ}C; T_c = 80^{\circ}C$.	75	A
Repetitive peak forward current ^{*1}	I_{FRM}	$I_{FRM} = 2 \times I_{F nom}; t_p = 1 ms$.	150	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

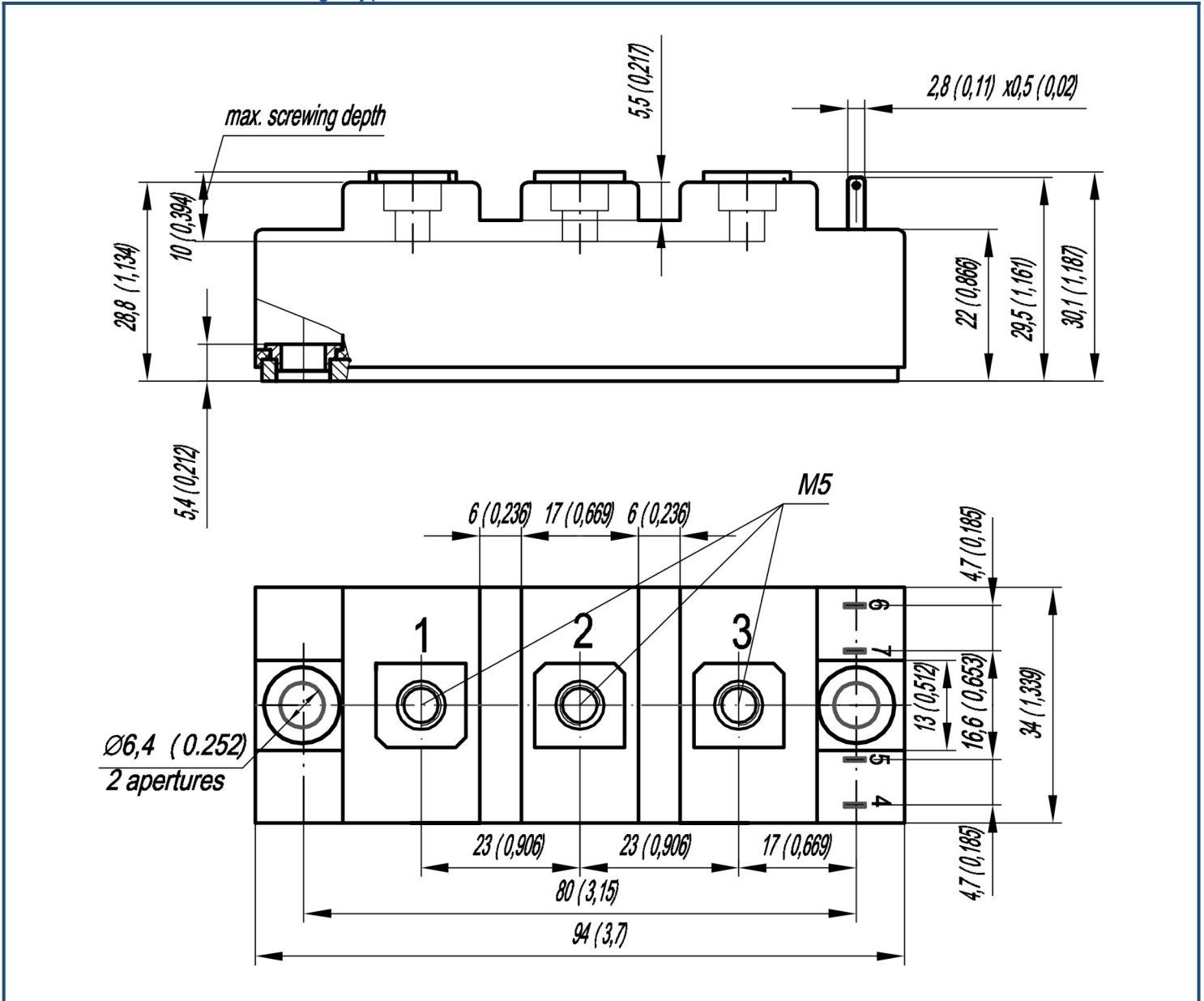
Definition	Symbol	Conditions	Value			Unit.		
			min.	typ.	max.			
IGBT								
Collector-Emitter saturation voltage	V_{CEsat}	$V_{GE} = +15\text{ V}; I_C = 75\text{ A};$ $t_u = 1000\ \mu\text{s}.$	$T_{vj} = 25^\circ\text{C}$	-	1.77	2.30	V	
			$T_{vj} = 150^\circ\text{C}$	-	2.09	2.50	V	
Gate-Emitter threshold voltage	$V_{GE(th)}$	$I_C = 3\text{ mA}; V_{CE} = V_{GE}; T_{vj} = 25^\circ\text{C};$ $t_u = 2\text{ ms}.$		4.90	5.50	6.10	V	
Collector-Emitter cut-off current	I_{CES}	$V_{CE} = 1700\text{ V};$ $t_u = 50\text{ ms}; V_{GE} = 0.$	$T_{vj} = 25^\circ\text{C}$	-	-	100	mA	
			$T_{vj} = 150^\circ\text{C}$	-	-	16.0		
Gate-Emitter leakage current	I_{GES}	$V_{CE} = 0; V_{GE} = \pm 20\text{ V}; T_{vj} = 25^\circ\text{C};$ $t_u = 30\text{ ms}.$		-	-	100	nA	
Input capacitance	C_{ies}	$V_{CE} = 10\text{ V}; V_{GE} = 0\text{ V};$ $f = 1\text{ MHz}; T_{vj} = 25^\circ\text{C}.$		-	8.67	-	nF	
Reverse transfer capacitance	C_{res}			-	0.28	-	nF	
Total gate charge	Q_G	$I_C = 75\text{ A}; V_{CE} = 920\text{ V};$ $V_{GE} = -15\dots+15\text{ V}.$		-	620	800	nC	
Internal gate resistance	R_{Gint}	$T_{vj} = 25^\circ\text{C}.$		-	8.50	-	Ω	
Turn-on delay time	$t_{d(on)}$	$V_{CE} = 920\text{ V};$ $V_{GE} = \pm 15\text{ V};$ $I_{Cmax} = 75\text{ A};$ $R_G = 2.2\ \Omega;$ $L_s = 56\text{ nH}.$	$T_{vj} = 25^\circ\text{C}$	-	-	167	ns	
			$T_{vj} = 150^\circ\text{C}$	-	-	181		
Rise time	t_{ri}		$T_{vj} = 25^\circ\text{C}$	-	-	46	ns	
			$T_{vj} = 150^\circ\text{C}$	-	-	54		
Turn-on energy	E_{on}		$T_{vj} = 25^\circ\text{C}$	-	-	12.0	mJ	
			$T_{vj} = 150^\circ\text{C}$	-	-	18.0		
Turn-off delay time	$t_{d(off)}$		$T_{vj} = 25^\circ\text{C}$	-	-	312	ns	
			$T_{vj} = 150^\circ\text{C}$	-	-	374		
Fall time	t_{fi}		$T_{vj} = 25^\circ\text{C}$	-	-	411	ns	
			$T_{vj} = 150^\circ\text{C}$	-	-	554		
Turn-off energy	E_{off}		$T_{vj} = 25^\circ\text{C}$	-	-	14.0	mJ	
			$T_{vj} = 150^\circ\text{C}$	-	-	17.0		
Collector-emitter threshold voltage	V_{CE0}	$V_{GE} = +15\text{ V}; T_{vj} = 150^\circ\text{C};$		-	-	0.94	V	
On-State slope resistance (IGBT)	r_{CE0}	$I_{CE1} = 19\text{ A}; I_{CE2} = 75\text{ A};$ $t_u = 1000\ \mu\text{s}.$		-	-	15.29	m Ω	
Thermal resistance junction to case	$R_{th(j-c)}$	DC; $I_{CE} = 80 \pm 10\text{ A}; I_{test} = 0.5\text{ A};$ $V_{GE} = +15\text{ V}.$		-	-	0.250	K/W	
Inverse diode \ Freewheeling diode								
Forward voltage drop	V_F	$I_F = 75\text{ A};$ $V_{GE} = 0; t_u = 1000\ \mu\text{s}.$	$T_{vj} = 25^\circ\text{C}$	-	1.81	2.30	V	
			$T_{vj} = 150^\circ\text{C}$	-	1.87	2.30	V	
Reverse recovery time	t_{rr}	$V_{GE} = \pm 15\text{ V};$ $V_{CE} = 920\text{ V};$ $I_{Cmax} = 75\text{ A};$ $R_{Gon} = 2.2\ \Omega;$ $L_s = 56\text{ nH}.$	$T_{vj} = 25^\circ\text{C}$	-	-	220	ns	
			$T_{vj} = 150^\circ\text{C}$	-	-	370		
Peak reverse current	I_{RM}		$T_{vj} = 25^\circ\text{C}$	-	-	74	A	
			$T_{vj} = 150^\circ\text{C}$	-	-	87		
Recovered charge	Q_r		$T_{vj} = 25^\circ\text{C}$	-	-	12.5	μC	
			$T_{vj} = 150^\circ\text{C}$	-	-	13.5		
Reverse recovery energy	E_{rec}		$T_{vj} = 25^\circ\text{C}$	-	-	7.0	mJ	
			$T_{vj} = 150^\circ\text{C}$	-	-	13.0		
Threshold voltage	$V_{(T0)}$		$T_{vj} = 150^\circ\text{C}; V_{GE} = 0; I_{CE1} = 19\text{ A};$		-	-	0.90	V
Forward slope resistance	r_T		$I_{CE2} = 75\text{ A}; t_u = 1000\ \mu\text{s}$		-	-	12.85	m Ω
Thermal resistance junction to case	$R_{th(jc-D)}$		DC; $I_{CE} = 80 \pm 10\text{ A}; I_{test} = 1.0\text{ A};$ $V_{GE} = +15\text{ V}.$		-	-	0.460	K/W

Module							
Pin resistance	R_{Pxy}	$T_{vj} = 25^{\circ}\text{C}.$	R_{P12}	-	0.47	0.50	mΩ
			R_{P13}	-	0.66	0.66	
Parasitic inductance between terminals	L_{Pce}			-	27	-	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 M5		1.80	2.00	2.20	N*m
Weight	W			-	153	170	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 $T_{vj\ op} = -40\dots+150^{\circ}\text{C}.$

Overall dimensions: Package type – FA

Part numbering guide

MIFA	-	HB	17	SA	-	075	N	
MIFA								IGBT module package type: FA
		HB						2 switches as Half-Bridge
			17					Voltage rating ($V_{CES}/100$)
				SA				IGBT+FRD chipset modification
						075		Current Rating
							N	Climatic version: normal climate

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