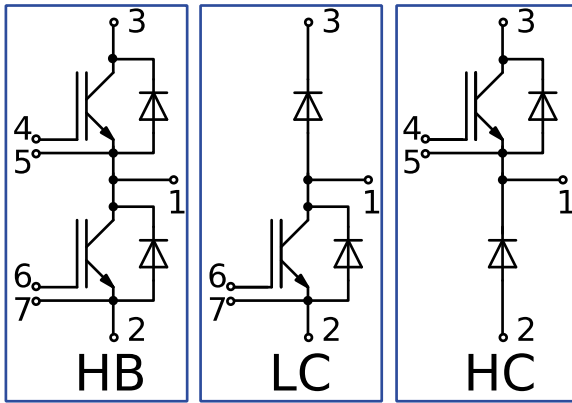
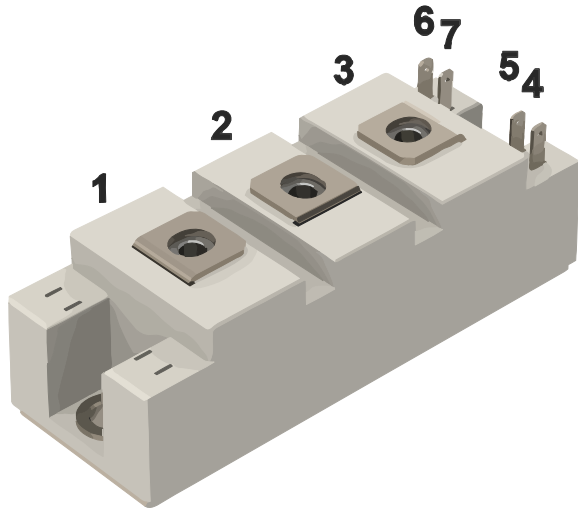


Industry standard 34mm IGBT module
1200V 200A

Chip features

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

Design features

- copper baseplate
- Al_2O_3 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}	$V_{GE} = 0V$	1200	V
Collector current (nominal)	$I_{C\ nom}$		200	A
Collector current (maximum continuous)	$I_{C\ 25}$	$T_j = 175^\circ C, T_c = 25^\circ C$	298	A
	$I_{C\ 80}$	$T_j = 175^\circ C, T_c = 80^\circ C$	226	A
Repetitive peak collector current *1	I_{CRM}	$I_{CRM} = 3 \times I_{C\ nom}, t_p = 1ms$	600	A
Gate-Emitter voltage	V_{GES}		± 20	V
Junction temperature	T_j		-40 ... 175	°C
Inverse diode / Freewheeling diode				
Repetitive peak reverse voltage	V_{RRM}	$V_{GE} = 0V$	1200	V
Forward current (nominal)	$I_{F\ nom}$		200	A
Forward current (maximum continuous)	$I_{F\ 25}$	$T_j = 175^\circ C, T_c = 25^\circ C$	216	A
	$I_{F\ 80}$	$T_j = 175^\circ C, T_c = 80^\circ C$	160	A
Repetitive peak forward current *1	I_{FRM}	$I_{FRM} = 3 \times I_{F\ nom}, t_p = 1ms$	600	A
Surge (non-repetitive) forward current	I_{FSM}	$t_p = 1ms, \sin 180^\circ, T_j = 25^\circ C$	990	A
Junction temperature	T_j		-40 ... 175	°C
Module				
Storage temperature	T_{stg}		-40 ... 125	°C
Isolation voltage	V_{isol}	AC sinus 50 Hz, $t = 1min$	4000	V

*1 Pulse width and repetition rate should be such that device junction temperature (T_j) does not exceed maximum T_j rating.

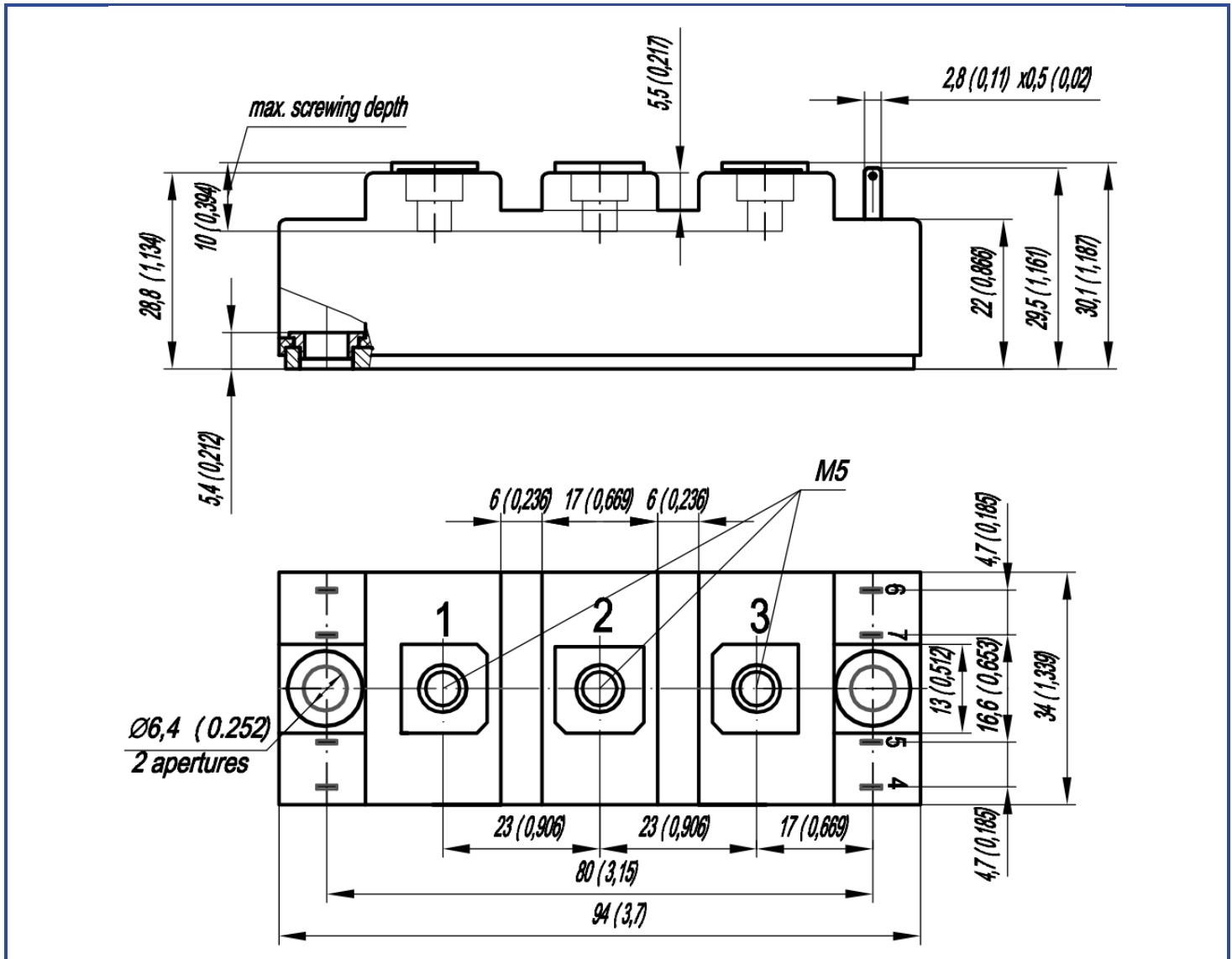


Characteristics

Definition	Symbol	Conditions	Value			Unit	
			min.	typ.	max.		
IGBT							
Collector-Emitter saturation voltage	V_{CEsat} (chip)	$V_{GE} = 15V$ $I_C = 200A$	$T_J = 25^\circ C$	-	1.75	2.2	V
			$T_J = 150^\circ C$	-	2.2	2.5	V
	V_{CEsat} (terminal)		$T_J = 25^\circ C$	-	1.85	2.3	V
			$T_J = 150^\circ C$	-	2.3		V
Gate-Emitter threshold voltage	$V_{GE(th)}$	$I_C = 8mA, V_{CE} = V_{GE}, T_J = 25^\circ C$	5.5	6	6.5	V	
Collector-Emitter cut-off current	I_{CES}	$V_{CE} = 1200V$ $V_{GE} = 0V$	$T_J = 25^\circ C$	-	100	300	μA
			$T_J = 150^\circ C$	-	-	2000	μA
Gate-Emitter leakage current	I_{GES}	$V_{CE} = 0V, V_{GE} = \pm 20V$	-	-	400	nA	
Input capacitance	C_{ies}	$V_{CE} = 25V, V_{GE} = 0V$ $f = 1MHz, T_J = 25^\circ C$	-	12000	-	pF	
Output capacitance	C_{oes}		-	1180	-	pF	
Reverse transfer capacitance	C_{res}		-	1178	-	pF	
Total gate charge	Q_G		$I_C = 200A, V_{CE} = 600V, V_{GE} = -8 \div 20V$	-	2210	-	nC
Internal gate resistance	R_{Gint}	$T_J = 25^\circ C$	-	3.8	-	Ω	
Turn-on delay time	$t_{d(on)}$	$V_{CE} = 600V, I_C = 200A,$ $R_G = 3.0\Omega, V_{GE} = \pm 15V,$ $T_J = 150^\circ C,$ $di/dt_{on} = 7000 A/\mu S,$ $di/dt_{off} = 2300 A/\mu S,$ $du/dt_{off} = 6900 V/\mu S$	-	320	384.0	ns	
Rise time	t_r		-	45	54.0	ns	
Turn-on energy	E_{on}		-	14	16.8	mJ	
Turn-off delay time	$t_{d(off)}$		-	550	660.0	ns	
Fall time	t_f		-	72	86.4	ns	
Turn-off energy	E_{off}		-	22	26.4	mJ	
Short circuit duration	t_{psc}		$V_{cc} = 720V, V_{GE} \leq 20V,$ $T_J = 150^\circ C, \text{non-repetitive}$	-	-	10	μs
Collector-emitter threshold voltage	V_{CE0}		$V_{GE} = 15V, T_J = 150^\circ C$	-	0.88	0.98	V
On-State slope resistance (IGBT)	r_{CE0}	for static power loss calculation	-	6.6	7.6	m Ω	
Thermal resistance junction to case	$R_{th(j-c)}$	per IGBT	-	-	0.155	K/W	
Inverse diode / Freewheeling diode							
Continuous forward voltage	V_F (chip)	$I_F = 200A$	$T_J = 25^\circ C$	-	2.20	2.50	V
			$T_J = 150^\circ C$	-	2.15	2.45	V
	V_F (terminal)		$T_J = 25^\circ C$	-	2.30	2.60	V
			$T_J = 150^\circ C$	-	2.25	2.55	V
Peak reverse recovery current	I_{RM}	$V_R = 600V$ $I_F = 200A$ $di_F/dt = 3200$ $/\mu S$	$T_J = 25^\circ C$	-	230	276	A
Reverse recovered charge	Q_{rr}		$T_J = 125^\circ C$	-	250	300	A
			$T_J = 25^\circ C$	-	20.0	24	μC
Reverse recovery energy	E_{rr}		$T_J = 125^\circ C$	-	32.0	38	μC
			$T_J = 25^\circ C$	-	9.00	11	mJ
$T_J = 125^\circ C$	-		16.0	19	mJ		
Forward threshold voltage (Diode)	V_{F0}	$T_J = 150^\circ C$	-	0.9	1.1	V	
On-state slope resistance (Diode)	r_F	for static power loss calculation	-	6.3	6.8	m Ω	
Thermal resistance junction to case	$R_{th(j-c)}$		-	-	0.27	K/W	
Module							
Parasitic inductance Collector-Emitter	L_{CE}		-	30	-	nH	
Resistance terminal-chip	$R_{CC'}+R_{EE'}$	terminal-chip	$T_J = 25^\circ C$	-	0.65	-	m Ω
Thermal resistance case to heatsink	R_{thCH}	per module		-	0.05	-	K/W
Mounting torque for screws to heatsink	M_s	to heatsink M6		3	-	5	Nm
Mounting torque for terminal screws	M_t	to terminals M5		2.5	-	5	Nm
Weight	W			-	-	170	g



Overall dimensions: Package type FA



Part numbering guide

MIFA	-	HB	12	FA	-	200	N	
MIFA								IGBT module package type: FA
		HB						2 switches as Half-Bridge
		HC						1 switch as High-Side chopper
		LC						1 switch as Low-Side chopper
			12					Voltage rating (V _{CES} /100)
				FA				IGBT+FRD chipset modification
						200		Current Rating
							N	Climatic version: normal climate

This datasheet is a tentative target data. The information in this document will be updated according to product qualification test results.

The information contained herein is protected by Copyright. In the interest of product improvement, Proton-Electrotex reserves the right to change datasheet without notice.