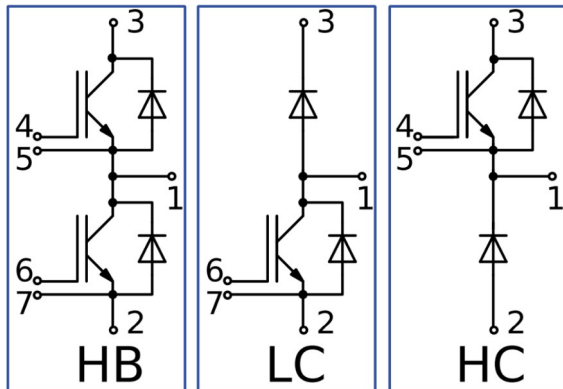
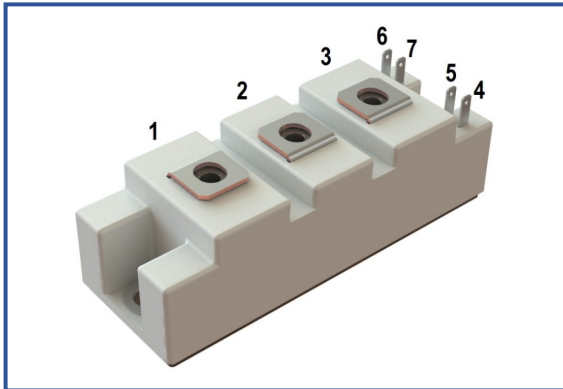




Industry standard 34mm IGBT module

1200 V 100 A



Chip features

- IGBT chip
 - low $V_{CE(sat)}$ value
 - 10 μs 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}	$V_{GE} = 0$	1200	V
Maximum allowable collector current (continuous)	$I_{C 25}$	$T_{vj(max)} = 175^{\circ}C; T_c = 25^{\circ}C$	167	A
	$I_{C 80}$	$T_{vj(max)} = 175^{\circ}C; T_c = 80^{\circ}C$	100	A
Repetitive peak collector current ^{*1}	I_{CRM}	$I_{CRM} = 3 \times I_{C nom}; t_p = 1 ms$	300	A
Short-circuit duration	t_{psc}	$T_{vj} = 25^{\circ}C; V_{GE} = \pm 15 V; V_{CE} = 720 V;$ $R_{G on} = R_{G off} = 1.1 \Omega; I_{C max} < 630 A$	10	μs
		$T_{vj} = 150^{\circ}C; V_{GE} = \pm 15 V; V_{CE} = 720 V;$ $R_{G on} = R_{G off} = 1.1 \Omega; I_{C max} < 570 A$	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}	$V_{GE} = 0 V$	1200	V
Maximum allowable forward current (continuous)	$I_{F 25}$	$T_{vj(max)} = 175^{\circ}C; T_c = 25^{\circ}C$	130	A
	$I_{F 80}$	$T_{vj(max)} = 175^{\circ}C; T_c = 80^{\circ}C$	96	A
Repetitive peak forward current ^{*1}	I_{FRM}	$I_{FRM} = 3 \times I_{F nom}; t_p = 1 ms$	300	A
Junction operating temperature	$T_{vj(op)}$		-40...+150	°C
Module				
Storage temperature	T_{stg}		-55...+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

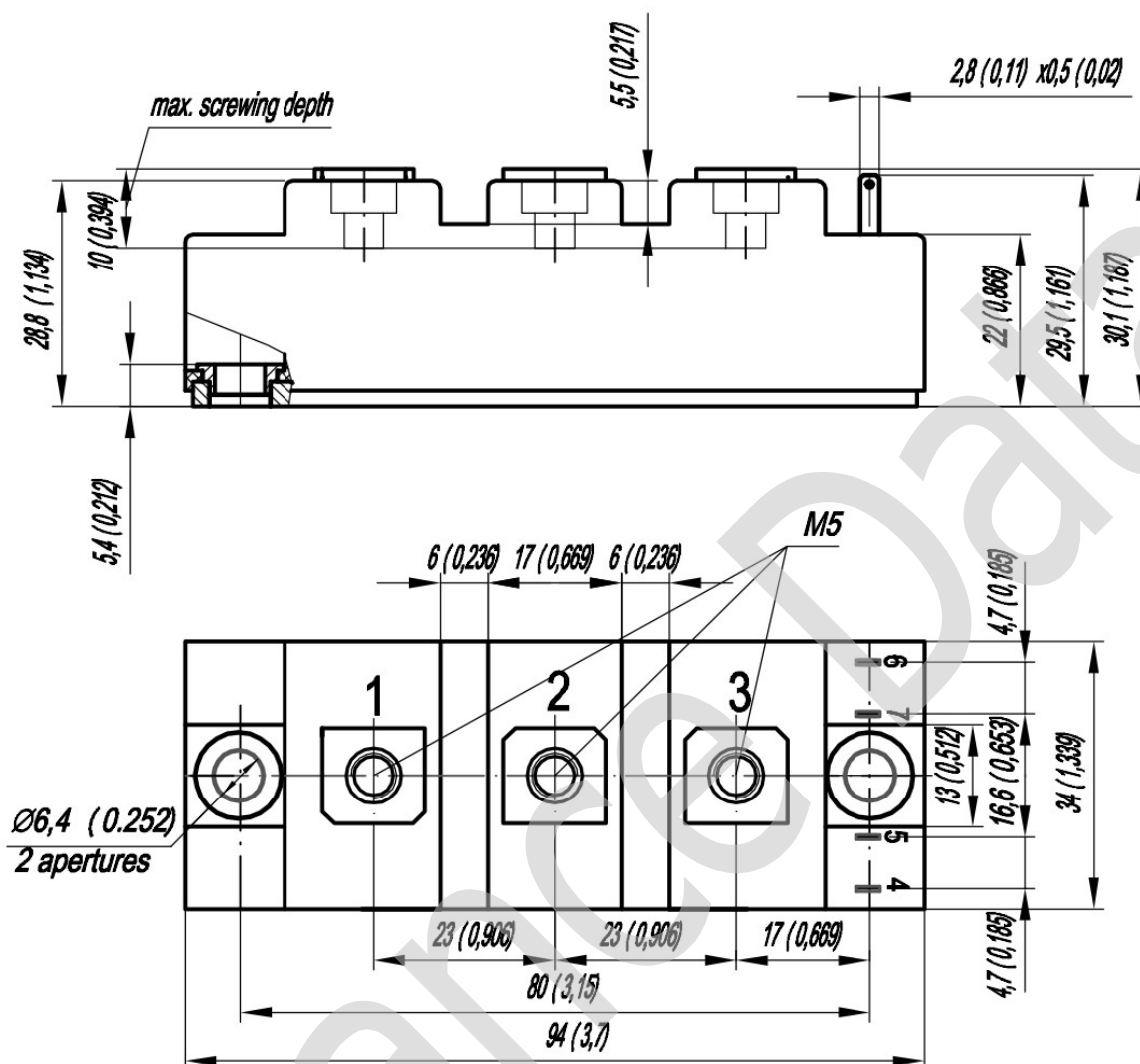
Definition	Symbol	Conditions	Value			Unit	
			min.	typ.	max.		
IGBT							
Collector-Emitter saturation voltage	V _{CEsat}	V _{GE} = +15 V; I _C = 100 A; t _u = 1000 μs.	T _{vj} = 25°C	-	1.70	-	V
			T _{vj} = 150°C	-	2.06	-	V
Gate-Emitter threshold voltage	V _{GE(th)}	I _C = 4 mA; V _{CE} = V _{GE} ; T _{vj} = 25°C; t _u = 2 ms.	5.20	-	7.20	-	V
Collector-Emitter cut-off current	I _{CES}	V _{CE} = 1200 V; t _u = 50 ms; V _{GE} = 0.	T _{vj} = 25°C	-	0.014	0.20	μA
			T _{vj} = 150°C	-	-	-	mA
Gate-Emitter leakage current	I _{GES}	V _{CE} = 0; V _{GE} = ±20 V; T _{vj} = 25°C; t _u = 30 ms.	-	5.00	100	-	nA
Input capacitance	C _{ies}	V _{CE} = 10 V; V _{GE} = 0 V; f = 1 MHz; T _{vj} = 25°C.	-	46.39	-	-	nF
Output capacitance	C _{oes}		-	0.67	-	-	
Reverse transfer capacitance	C _{res}		-	0.15	-	-	
Total gate charge	Q _G	I _C = 100 A; V _{CE} = 600 V; V _{GE} = -8...+15 V.	-	-	-	-	nC
Internal gate resistance	R _{Gint}	T _{vj} = 25°C.	-	-	-	-	Ω
Turn-on delay time	t _{d(on)}	V _{CE} = 600 V; V _{GE} = ±15 V; I _{Cmax} = 100 A; R _G = 1.1 Ω; L _s = 56 nH.	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	-	-	-	mJ
			T _{vj} = 150°C	-	-	-	
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	-	-	-	mJ
			T _{vj} = 150°C	-	-	-	
Collector-emitter threshold voltage	V _{CE0}	V _{GE} = +15 V; T _{vj} = 150°C;	-	-	0.69	-	V
On-State slope resistance (IGBT)	r _{CE0}	I _{CE1} = 25 A; I _{CE2} = 100 A; t _u = 1000 μs.	-	-	13.74	-	mΩ
Thermal resistance junction to case	R _{th(j-c)}	DC; I _{CE} = 100±15 A; I _{test} = 0.5 A; V _{GE} = +15 V.	-	-	0.300	-	K/W
Inverse diode \ Freewheeling diode							
Forward voltage drop	V _F	I _F = 100 A; V _{GE} = 0; t _u = 1000 μs.	T _{vj} = 25°C	-	1.67	-	V
			T _{vj} = 150°C	-	1.79	-	V
Reverse recovery time	t _{rr}	V _{GE} = ±15 V; V _{CE} = 600 V; I _{Cmax} = 100 A; R _{Gon} = 1.1 Ω; L _s = 56 nH.	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	-	-	-	μC
			T _{vj} = 150°C	-	-	-	μC
Reverse recovery energy	E _{rec}		T _{vj} = 25°C	-	-	-	mJ
			T _{vj} = 150°C	-	-	-	mJ
Threshold voltage	V _(T0)	T _{vj} = 150°C; V _{GE} = 0; I _{F1} = 25 A;	-	-	0.84	-	V
Forward slope resistance	r _T	I _{F2} = 100 A; t _u = 1000 μs	-	-	9.47	-	mΩ
Thermal resistance junction to case	R _{th(JC-D)}	DC; I _{CE} = 100±10 A; I _{test} = 0.5 A; V _{GE} = +15 V.	-	-	0.560	-	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			-	150	170	g

Notes:

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

Overall dimensions: Package type – FA



Part numbering guide

MIFA	-	HB	12	SM	-	100	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 ($V_{CES}/100$)
				SM				IGBT+FRD chipset modification
						100		Current Rating
							N	Climatic version: normal climate

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