

MBM400E25E

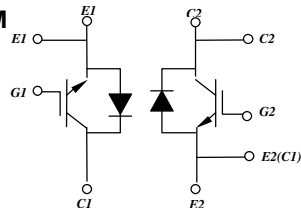
Silicon N-channel IGBT

OUTLINE DRAWING

FEATURES

- * High speed, low loss IGBT module.
- * Low driving power due to low input capacitance MOS gate.
- * Low noise due to ultra soft fast recovery diode.
- * High reliability, high durability module.
- * High thermal fatigue durability.
($\Delta T_c=70K$, $N>30,000$ cycles)
- * Isolated heat sink (terminal to base).

CIRCUIT DIAGRAM

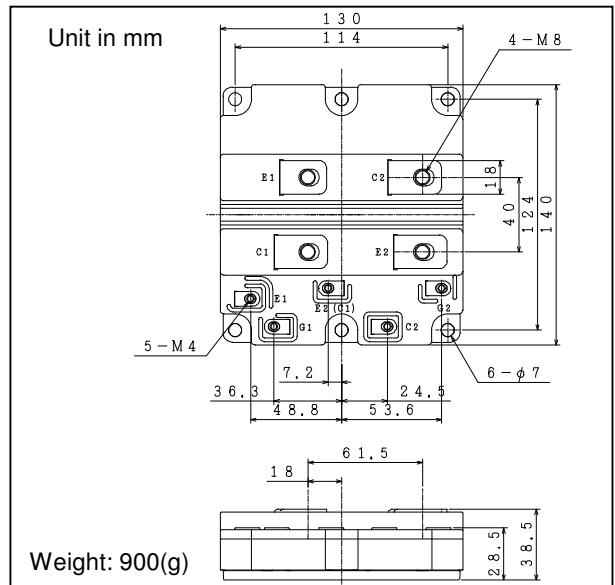


ABSOLUTE MAXIMUM RATINGS (T_c=25°C)

Item	Symbol	Unit	MBM400E25E
Collector Emitter Voltage	V _{CES}	V	2,500
Gate Emitter Voltage	V _{GES}	V	±20
Collector Current	DC	I _C	400 (T _c =100 °C)
	1ms	I _{Cp}	800
Forward Current	DC	I _F	400
	1ms	I _{FM}	800
Junction Temperature	T _j	°C	-40 ~ +150
Storage Temperature	T _{stg}	°C	-40 ~ +125
Isolation Voltage	V _{ISO}	V _{RMS}	4,000(AC 1 minute)
Screw Torque	Terminals (M4/M8)	-	2/15 (1)
	Mounting (M6)	-	6 (2)

Notes: (1) Recommended Value 1.8±0.2/9±1N·m

(2) Recommended Value 5.5±0.5N·m



ELECTRICAL CHARACTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Collector Emitter Cut-Off Current	I _{CES}	mA	-	-	4	V _{CE} =2,500V, V _{GE} =0V, T _j =25°C
Gate Emitter Leakage Current	I _{GES}	nA	-500	-	+500	V _{GE} =±20V, V _{CE} =0V, T _j =25°C
Collector Emitter Saturation Voltage	V _{CE(sat)}	V	1.6	2.3	3.0	I _C =400A, V _{GE} =14.7V, T _j =138°C (chip level)
Gate Emitter Threshold Voltage	V _{GE(TO)}	V	4.5	6.0	7.5	V _{CE} =15V, I _C =40mA, T _j =25°C
Input Capacitance	C _{ies}	nF	-	67	-	V _{CE} =10V, V _{GE} =0V, f=100kHz, T _j =25°C
Internal Gate Resistance	R _{ge}	Ω	-	4.8	-	V _{CE} =10V, V _{GE} =0V, f=100kHz, T _j =25°C
Switching Times	Rise Time	t _r	0.9	1.5	2.1	V _{CC} =1,300V, I _C =150A L=120nH R _G (ON/OFF)=15/4.7Ω (3) V _{GE} =±14.7V, T _j =138°C
	Turn On Time	t _{on}	2.0	2.6	3.2	
	Fall Time	t _f	0.8	1.4	2.0	
	Turn Off Time	t _{off}	2.8	3.8	4.8	
Peak Forward Voltage Drop	V _{FM}	V	1.8	2.2	2.8	I _F =400A, V _{GE} =0V, T _j =138°C (chip level)
Reverse Recovery Time	t _{rr}	μs	0.3	0.6	0.9	V _{CC} =1,300V, I _F =150A, L=120nH T _j =138°C
Turn On Loss	E _{on(10%)}	J/P	-	0.25	0.28	V _{CC} =1,300V, I _C =I _F =150A, L=120nH
Turn Off Loss	E _{off(10%)}	J/P	-	0.23	0.30	R _G (ON/OFF)=15/4.7Ω (3)
Reverse Recovery Loss	E _{rr(10%)}	J/P	-	0.15	0.19	V _{GE} =±14.7V, T _j =138°C
Thermal Impedance	IGBT	R _{th(j-c)}	-	-	0.0255	Junction to case (par arm)
	FWD	R _{th(j-c)}	-	-	0.051	
Contact Thermal Impedance	R _{th(c-f)}	K/W	-	0.018	-	Case to fin (par arm)

Notes:(3) R_G value is the test condition's value for evaluation of the switching times, not recommended value.Please, determine the suitable R_G value after the measurement of switching waveforms

(overshoot voltage, etc.) with appliance mounted.

* Please contact our representatives at order.

* For improvement, specifications are subject to change without notice.

* For actual application, please confirm this spec sheet is the newest revision.

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HITACHI POWER SEMICONDUCTORS

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