

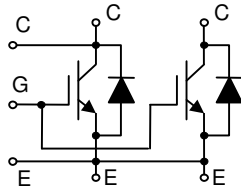
MBN1600E17D

Silicon N-channel IGBT

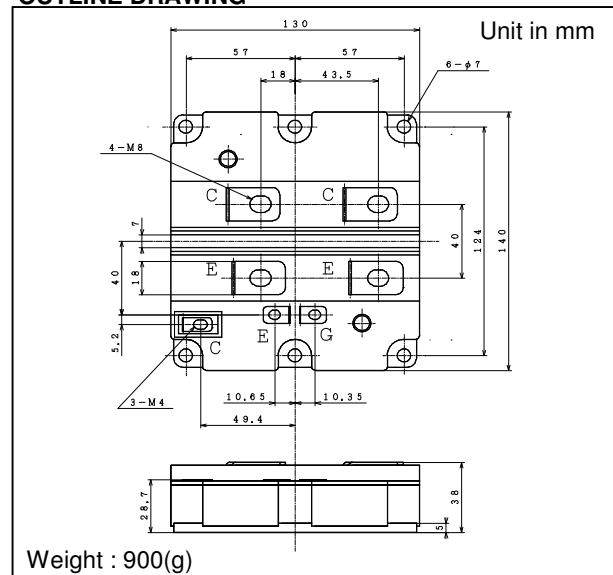
FEATURES

- * 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.
($\Delta T_c=70^\circ\text{C}$, $N>30,000$ cycles)
- * Isolated heat sink (terminal to base).

CIRCUIT DIAGRAM



OUTLINE DRAWING



ABSOLUTE MAXIMUM RATINGS ($T_c=25^\circ\text{C}$)

Item	Symbol	Unit	MBN1600E17D
Collector Emitter Voltage	V_{CES}	V	1,700
Gate Emitter Voltage	V_{GES}	V	± 20
Collector Current	DC	I_C	1,600
	1ms	I_{CP}	3,200
Forward Current	DC	I_F	1,600
	1ms	I_{FM}	3,200
Junction Temperature	T_j	$^\circ\text{C}$	-40 ~ +125
Storage Temperature	T_{stg}	$^\circ\text{C}$	-40 ~ +125
Isolation Voltage	V_{ISO}	V_{RMS}	4,000(AC 1 minute)
Screw Torque	Terminals (M4/M8)	-	2/10 (1)
	Mounting (M6)	-	6 (2)

Notes: (1) Recommended Value $1.8\pm 0.2/9\pm 1\text{N}\cdot\text{m}$ (2) Recommended Value $5.5\pm 0.5\text{N}\cdot\text{m}$

ELECTRICAL CHARACTERISTICS

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions	
Collector Emitter Cut-Off Current	I_{CES}	mA	-	-	10	$V_{CE}=1,700\text{V}$, $V_{GE}=0\text{V}$, $T_j=25^\circ\text{C}$	
			-	10	35	$V_{CE}=1,700\text{V}$, $V_{GE}=0\text{V}$, $T_j=125^\circ\text{C}$	
Gate Emitter Leakage Current	I_{GES}	nA	-500	-	+500	$V_{GE}=\pm 20\text{V}$, $V_{CE}=0\text{V}$, $T_j=25^\circ\text{C}$	
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	V	-	2.7	3.3	$I_C=1,600\text{A}$, $V_{GE}=15\text{V}$, $T_j=125^\circ\text{C}$	
Gate Emitter Threshold Voltage	$V_{GE(TO)}$	V	5.5	7.0	8.5	$V_{CE}=10\text{V}$, $I_C=160\text{mA}$, $T_j=25^\circ\text{C}$	
Input Capacitance	C_{ies}	nF	-	140	-	$V_{CE}=10\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$, $T_j=25^\circ\text{C}$	
Internal Gate Resistance	R_{ge}	Ω	-	0.8	-	$V_{CE}=10\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$, $T_j=25^\circ\text{C}$	
Switching Times	Rise Time	t_r	-	0.7	1.4	$V_{CC}=900\text{V}$, $I_C=1,600\text{A}$	
	Turn On Time	t_{on}	-	1.2	2.4	$L=65\text{nH}$, $C_{GE}=150\text{nF}$ (TBD) (3)	
	Fall Time	t_f	-	0.2	0.4	$R_G=1.5\Omega$ (TBD) (3)	
	Turn Off Time	t_{off}	-	1.9	3.8	$V_{GE}=\pm 15\text{V}$, $T_j=125^\circ\text{C}$	
Peak Forward Voltage Drop	V_{FM}	V	-	1.9	2.5	$I_C=1,600\text{A}$, $V_{GE}=0\text{V}$, $T_j=125^\circ\text{C}$	
Reverse Recovery Time	t_{rr}	μs	-	0.7	1.1	$V_{CC}=900\text{V}$, $I_C=1,600\text{A}$	
Turn On Loss	$E_{on(10\%)}$	J/P	-	0.5	0.8	$L=65\text{nH}$, $C_{GE}=150\text{nF}$ (TBD) (3)	
Turn Off Loss	$E_{off(10\%)}$	J/P	-	0.5	0.8	$R_G=1.5\Omega$ (TBD) (3)	
Reverse Recovery Loss	$E_{rr(10\%)}$	J/P	-	0.5	0.8	$V_{GE}=\pm 15\text{V}$, $T_j=125^\circ\text{C}$	
Stray inductance module	L_{SCE}	nH	-	18	-		
Thermal Impedance	IGBT	$R_{th(j-c)}$	$^\circ\text{C/W}$	-	-	0.015	Junction to case
	FWD	$R_{th(j-c)}$	$^\circ\text{C/W}$	-	-	0.023	
Contact Thermal Impedance	$R_{th(c-f)}$	$^\circ\text{C/W}$	-	0.008	-	Case to fin	

Notes:(3) R_G and C_{GE} value is the test condition's value for evaluation of the switching times, not recommended value.Please, determine the suitable R_G and C_{GE} value after the measurement of switching waveforms (overshoot voltage, etc.) with appliance mounted.

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* 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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