

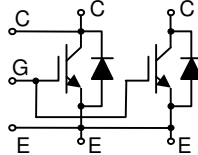
MBN600E45A

Silicon N-channel IGBT

FEATURES

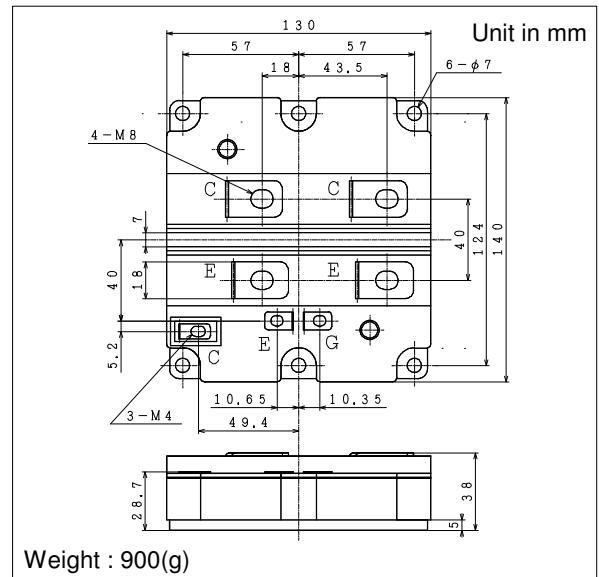
- * High speed, low loss IGBT module.
- * Low driving power due to low input capacitance MOS gate.
- * Low noise due to ultra soft fast recovery diode.
- * High reliability, high durability module.
- * High thermal fatigue durability.
($\Delta T_c=70^\circ\text{C}$, $N>30,000$ cycles)
- * Isolated heat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

CIRCUIT DIAGRAM



TERMINALS

OUTLINE DRAWING



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

Item	Symbol	Unit	MBN600E45A
Collector Emitter Voltage	V_{CES}	V	4,500
Gate Emitter Voltage	V_{GES}	V	± 20
Collector Current	DC	I_C	600
	1ms	I_{Cp}	1,200
Forward Current	DC	I_F	600
	1ms	I_{FM}	1,200
Junction Temperature	T_j	$^\circ\text{C}$	-40 ~ +125
Storage Temperature	T_{stg}	$^\circ\text{C}$	-40 ~ +125
Isolation Voltage	V_{ISO}	V_{RMS}	6,000(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	-	-	12	$V_{CE}=4,500\text{V}$, $V_{GE}=0\text{V}$, $T_j=25^\circ\text{C}$	
			-	34	67	$V_{CE}=4,500\text{V}$, $V_{GE}=0\text{V}$, $T_j=125^\circ\text{C}$	
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	4.5	5.5	6.3	$I_C=600\text{A}$, $V_{GE}=15\text{V}$, $T_j=125^\circ\text{C}$	
Gate Emitter Threshold Voltage	$V_{GE(TO)}$	V	4.5	6.0	7.5	$V_{CE}=10\text{V}$, $I_C=600\text{mA}$, $T_j=25^\circ\text{C}$	
Input Capacitance	C_{ies}	nF	-	87	-	$V_{CE}=10\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$, $T_j=25^\circ\text{C}$	
Internal Gate Resistance	R_{ge}	Ω	-	2.3	-	$V_{CE}=10\text{V}$, $V_{GE}=0\text{V}$, $f=100\text{kHz}$, $T_j=25^\circ\text{C}$	
Switching Times	Rise Time	t_r	1.1	1.6	2.5	$V_{CC}=2,600\text{V}$, $I_C=600\text{A}$	
	Turn On Time	t_{on}	1.5	2.2	3.0	$L=130\text{nH}$	
	Fall Time	t_f	1.6	1.9	3.0	$R_G=3.3\Omega$ (3)	
	Turn Off Time	t_{off}	3.1	3.6	5.5	$V_{GE}=\pm 15\text{V}$, $T_j=125^\circ\text{C}$	
Peak Forward Voltage Drop	V_{FM}	V	3.7	4.2	5.0	$I_F=600\text{A}$, $V_{GE}=0\text{V}$, $T_j=125^\circ\text{C}$	
Reverse Recovery Time	t_{rr}	μs	0.3	0.6	1.0	$V_{CC}=2600\text{V}$, $I_F=600\text{A}$, $L=130\text{nH}$, $T_j=125^\circ\text{C}$	
Turn On Loss	$E_{on(10\%)}$	J/P	-	1.5	2.0	$V_{CC}=2600\text{V}$, $I_C=600\text{A}$, $L=130\text{nH}$	
Turn Off Loss	$E_{off(10\%)}$	J/P	-	1.3	1.7	$R_G=3.3\Omega$ (3)	
Reverse Recovery Loss	$E_{rr(10\%)}$	J/P	-	0.7	1.0	$V_{GE}=\pm 15\text{V}$, $T_j=125^\circ\text{C}$	
Thermal Impedance	IGBT	$R_{th(j-c)}$	K/W	-	-	0.013	Junction to case
	FWD	$R_{th(j-c)}$	K/W	-	-	0.026	
Contact Thermal Impedance	$R_{th(c-f)}$	K/W	-	0.008	-	Case to fin	

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.

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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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