

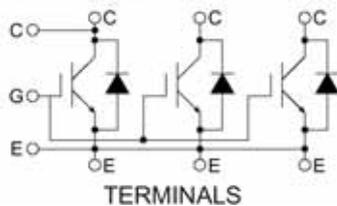
# MBN1200E25C

Silicon N-channel IGBT

## FEATURES

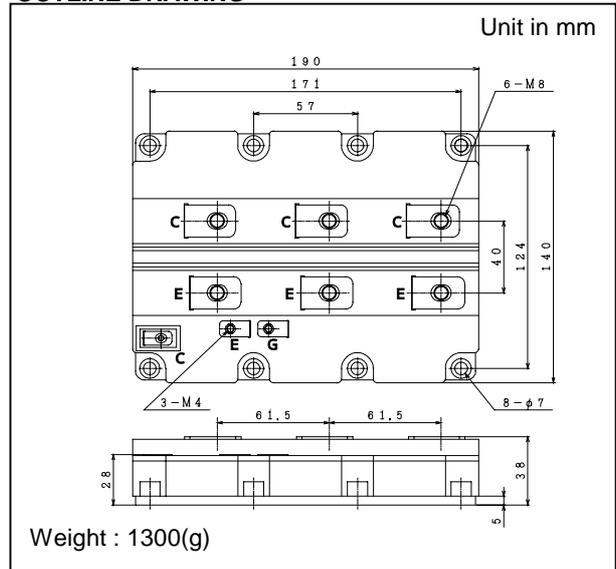
- \* High thermal fatigue durability.  
( $\Delta T_c=70$  ,  $N>30,000$ cycles)
- \* Low noise due to ultra soft fast recovery diode.
- \* High speed, low loss IGBT module.
- \* Low driving power due to low input capacitance MOS gate.
- \* High reliability, high durability module.
- \* Isolated head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

## CIRCUIT DIAGRAM



TERMINALS

## OUTLINE DRAWING



## ABSOLUTE MAXIMUM RATINGS (T<sub>C</sub>=25°C)

Item	Symbol	Unit	MBN1200E25C
Collector Emitter Voltage	V <sub>CES</sub>	V	2,500
Gate Emitter Voltage	V <sub>GES</sub>	V	±20
Collector Current	DC	I <sub>C</sub>	1,200
	1ms	I <sub>Cp</sub>	2,400
Forward Current	DC	I <sub>F</sub>	1,200
	1ms	I <sub>FM</sub>	2,400
Junction Temperature	T <sub>j</sub>	°C	-40 ~ +125
Storage Temperature	T <sub>stg</sub>	°C	-40 ~ +125
Isolation Voltage	V <sub>ISO</sub>	V <sub>RMS</sub>	4,000(AC 1 minute)
Screw Torque	Terminals (M4/M8)	-	2/10 (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 (T<sub>C</sub>=25°C)

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions	
Collector Emitter Cut-Off Current	I <sub>CES</sub>	mA	-	-	12	V <sub>CE</sub> =2,500V, V <sub>GE</sub> =0V, T <sub>j</sub> =25°C	
			-	20	60	V <sub>CE</sub> =2,500V, V <sub>GE</sub> =0V, T <sub>j</sub> =125°C	
Gate Emitter Leakage Current	I <sub>GES</sub>	nA	-500	-	+500	V <sub>GE</sub> =±20V, V <sub>CE</sub> =0V, T <sub>j</sub> =25°C	
Collector Emitter Saturation Voltage	V <sub>CE(sat)</sub>	V	-	3.0	3.5	I <sub>C</sub> =1,200A, V <sub>GE</sub> =15V, T <sub>j</sub> =125°C	
Gate Emitter Threshold Voltage	V <sub>GE(TO)</sub>	V	4.0	5.0	6.0	V <sub>CE</sub> =15V, I <sub>C</sub> =120mA, T <sub>j</sub> =25°C	
Input Capacitance	C <sub>ies</sub>	nF	-	175	-	V <sub>CE</sub> =10V, V <sub>GE</sub> =0V, f=100kHz, T <sub>j</sub> =25°C	
Internal Gate Resistance	R <sub>ge</sub>		-	2.2	-	V <sub>CE</sub> =10V, V <sub>GE</sub> =0V, f=100kHz, T <sub>j</sub> =25°C	
Switching Times	Rise Time	t <sub>r</sub>	-	3.2	4.4	V <sub>CC</sub> =1,000V, I <sub>C</sub> =1,200A	
	Turn On Time	t <sub>on</sub>	-	4.2	5.2	L=100nH	
	Fall Time	t <sub>f</sub>	-	1.9	3.4	R <sub>G</sub> (ON/OFF)=6.8/1.5 (3)	
	Turn Off Time	t <sub>off</sub>	-	3.4	5.6	V <sub>GE</sub> =±15V, T <sub>j</sub> =125°C	
Peak Forward Voltage Drop	V <sub>FM</sub>	V	-	2.0	2.5	I <sub>C</sub> =1,200A, V <sub>GE</sub> =0V, T <sub>j</sub> =125°C	
Reverse Recovery Time	t <sub>rr</sub>	μs	-	0.9	1.4	V <sub>CC</sub> =1,000V, I <sub>C</sub> =1,200A, L=100nH T <sub>j</sub> =125°C	
Turn On Loss	E <sub>on(10%)</sub>	J/P	-	1.8	2.3	V <sub>CC</sub> =1,000V, I <sub>C</sub> =1,200A, L=100nH	
Turn Off Loss	E <sub>off(10%)</sub>	J/P	-	1.2	1.7	R <sub>G</sub> (ON/OFF)=6.8/1.5 (3)	
Reverse Recovery Loss	E <sub>rr(10%)</sub>	J/P	-	0.35	0.85	V <sub>GE</sub> =±15V, T <sub>j</sub> =125°C	
Stray inductance module	L <sub>SCE</sub>	nH	-	12	-		
Thermal Impedance	IGBT	R <sub>th(j-c)</sub>	°C/W	-	-	0.0085	Junction to case
	FWD	R <sub>th(j-c)</sub>	°C/W	-	-	0.017	
Contact Thermal Impedance	R <sub>th(c-f)</sub>	°C/W	-	0.006	-	Case to fin	

Notes:(3) R<sub>G</sub> value is the test condition's value for evaluation of the switching times, not recommended value.Please, determine the suitable R<sub>G</sub> value after the measurement of switching waveforms (overshoot voltage, etc.) with appliance mounted.Counter arm IGBT V<sub>GE</sub>=-15V

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