

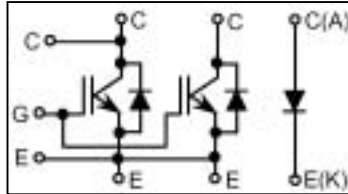
# MBL800D33C

Silicon N-channel IGBT

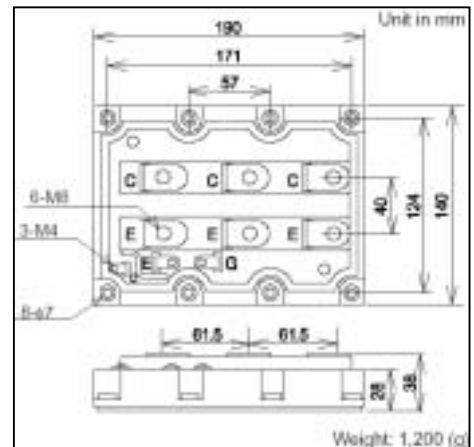
## FEATURES

- \* High thermal fatigue durability.( $\Delta T_c=70^\circ\text{C}$ , $N>30,000$ cycles)
- \* low noise due to built-in free-wheeling diode – ultra soft fast recovery diode(USFD).
- \* 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



## OUTLINE DRAWING



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

Item	Symbol	Unit	MBL800D33C
Collector Emitter Voltage	$V_{CES}$	V	3,300
Gate Emitter Voltage	$V_{GES}$	V	$\pm 20$
Collector Current	DC	$I_C$	800
	1ms	$I_{Cb}$	1,600
Forward Current	DC	$I_F$	800
	1ms	$I_{FM}$	1,600
Collector Power Dissipation	$P_C$	W	8,000
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  $1.8 \pm 0.2$   $9 \pm 1$  N·m(2) Recommended Value  $5.5 \pm 0.5$  N·m

## CHARACTERISTICS ( $T_c=25^\circ\text{C}$ )

### 1) IGBT + FWD

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions	
Collector Emitter Cut-Off Current	$I_{CES}$	mA	-	-	12.0	$V_{CE}=3,300\text{V}$ , $V_{GE}=0\text{V}$	
Gate Emitter Leakage Current	$I_{GES}$	nA	-	-	$\pm 500$	$V_{GE}=\pm 20\text{V}$ , $V_{CE}=0\text{V}$	
Collector Emitter Saturation Voltage	$V_{CE(sat)}$	V	-	4.1	5.0	$I_C=800\text{A}$ , $V_{GE}=15\text{V}$	
Gate Emitter Threshold Voltage	$V_{GE(To)}$	V	4.5	5.5	6.5	$V_{CE}=5\text{V}$ , $I_C=800\text{mA}$	
Input Capacitance	$C_{ies}$	nF	-	100	-	$V_{CE}=10\text{V}$ , $V_{GE}=0\text{V}$ , $f=100\text{KHz}$	
Switching Times	Rise Time	$t_r$	-	2.0	3.2	$V_{CC}=1,650\text{V}$ , $I_C=800\text{A}$	
	Turn On Time	$t_{on}$	-	2.9	3.8	$L=120\text{nH}$	
	Fall Time	$t_f$	-	1.7	3.2	$R_G=4.7\Omega$ (3)	
	Turn Off Time	$t_{off}$	-	3.5	5.6	$V_{GE}=\pm 15\text{V}$ , $T_c=125^\circ\text{C}$	
Peak Forward Voltage Drop	$V_{FM}$	V	-	2.2	2.8	$-I_C=800\text{A}$ , $V_{GE}=0\text{V}$	
Reverse Recovery Time	$t_{rr}$	$\mu\text{s}$	-	0.8	1.4	$V_{CC}=1,650\text{V}$ , $I_F=800\text{A}$ (4) $L=120\text{nH}$ , $T_c=125^\circ\text{C}$	
Thermal Impedance	IGBT	$R_{th(j-c)}$	$^\circ\text{C/W}$	-	-	0.012	Junction to case
	FWD	$R_{th(j-c)}$	$^\circ\text{C/W}$	-	-	0.024	

### 2) DIODE

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions	
Collector Emitter Cut-Off Current	$I_{AKS}$	mA	-	-	12.0	$V_{AK}=3,300\text{V}$	
Peak Forward Voltage Drop	$V_F$	V	-	2.4	3.0	$I_F=800\text{A}$	
Reverse Recovery Time	$t_{rr}$	$\mu\text{s}$	-	0.8	1.4	$I_F=800\text{A}$ , $V_{CC}=1,650\text{V}$ (4) $L=120\text{nH}$ , $T_c=125^\circ\text{C}$	
Thermal Impedance	$R_{th(j-c)}$	$^\circ\text{C/W}$	-	-	-	0.024	Junction to case

Notes: (3)  $R_G$  value is the test condition's value for decision of the switching times, not recommended value. Determine the suitable  $R_G$  value after the measurement of switching waveforms(overshoot voltage,etc.)with appliance mounted.

(4)Counter arm IGBT  $V_{GE}=-15\text{V}$

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