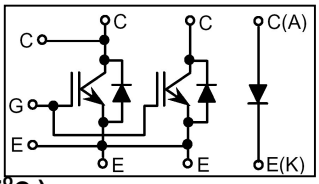
MBL800E33C

Silicon N-channel IGBT

FEATURES

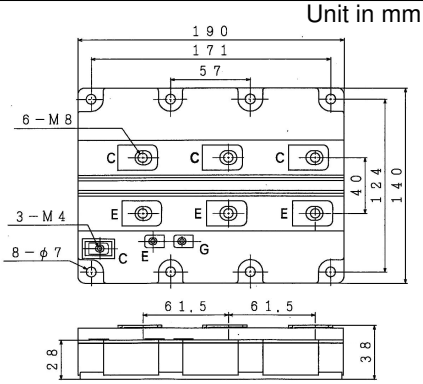
* High thermal fatigue durability.(delta Tc=70℃,N>30,000cycles) diode – ultra soft fast recovery diode(USFD).
* low noise due to built-in free-wheeling
* High speed,low loss IGBT module.
* Low driving power due to low input capacitance MOS gate.
* High reliability,high durability module.
* Isolated heat sink(terminal to base).

CIRCUIT DIAGRAM



OUTLINE DRAWING

Unit in mm



Weight : 1300(g)

ABSOLUTE MAXIMUM RATINGS (Tc=25°C)

Item		Symbol	Unit	MBL800E33C
Collector Emitter Voltage		V_{CES}	V	3,300
Gate Emitter Voltage		V_{GES}	V	±20
Collector Current	DC	I_C	A	800
	1ms	I_{Cp}		1,600
Forward Current	DC	I_F	A	800
	1ms	I_{FM}		1,600
Junction Temperature		T_j	°C	-40 ~ +125
Storage Temperature		T_{stg}	°C	-40 ~ +125
Isolation Voltage		V_{ISO}	V_{RMS}	6,000(AC 1 minute)
Screw Torque	Terminals (M4/M8)	-	N·m	2/10 (1)
	Mounting (M6)	-		6 (2)

Notes: (1) Recommended Value 1.8±0.2N·m 9±1N·m (2) Recommended Value 5.5±0.5N·m

CHARECTERISTICS

1) IGBT + FWD

Item		Symbol	Unit	Min.	Typ.	Max.	Test Conditions
Collector Emitter Cut-Off Current		I_{CES}	mA	-	-	12	V_{CE}=3,300V, V_{GE}=0V, Tj=25℃
				-	20	60	V_{CE}=3,300V, V_{GE}=0V,Tj=125℃
Gate Emitter Leakage Current		I_{GES}	nA	-	-	±500	V_{GE}=±20V, V_{CE}=0V, Tj=25℃
Collector Emitter Saturation Voltage		$V_{CE(sat)}$	V	-	4.1	5.0	I_C=800A, V_{GE}=15V, Tj=25℃
				-	4.8	5.3	I_C=800A, V_{GE}=15V ,Tj=125℃
Gate Emitter Threshold Voltage		$V_{GE(TO)}$	V	4.5	5.5	6.5	V_{CE}=5V, Ic=800mA, Tj=25℃
Input Capacitance		C_{ies}	nF	-	100	-	V_{CE}=10V, V_{GE}=0V,f=100KHz, Tj=25℃
Switching Times	Rise Time	t_r	μs	-	2.0	3.2	V_{CC}=1,650V Ic=800A L=120nH R_G=4.7Ω (3) V_{GE}=±15V Tj=125°C
	Turn On Time	t_{on}		-	2.9	3.8	
	Fall Time	t_f		-	1.7	3.2	
	Turn Off Time	t_{off}		-	3.5	5.6	
Turn On Loss		$E_{on(10\%)}$	J/P	-	1.6	2.1	
Turn Off Loss		$E_{off(10\%)}$	J/P	-	1.1	1.6	
Peak Forward Voltage Drop		V_{FM}	V	-	2.2	2.8	-Ic=800A, V_{GE}=0V, Tj=25℃
				-	2.3	2.75	-Ic=800A, V_{GE}=0V, Tj=125℃
Thermal Impedance	IGBT	Rth(j-c)	K/W	-	-	0.013	Junction to case
	FWD	Rth(j-c)		-	-	0.026	

2) DIODE

Item	Symbol	Unit	Min.	Typ.	Max.	Test Conditions	
Collector Emitter Cut-Off Current	I_{AKS}	mA	-	-	12	V_{AK}=3,300V	
			-	5	20	V_{AK}=3,300V,Tc=125℃	
Peak Forward Voltage Drop	V_F	V	-	2.4	3.0	Tj=25℃	I_F =800A At Main Terminal (Terminal resistance:0.5mΩ typical)
			-	2.7	3.2	Tj=125℃	
Reverse Recovery Time	trr	μs	-	0.8	1.4	I_F =800A, V_{CC}=1,650V (4)	
Reverse Recovery Loss	$E_{rr(10\%)}$	J/P	-	1.0	1.4	L=120nH, Tj=125°C	
Thermal Impedance	Rth(j-c)	K/W	-	-	0.026	Junction to case	

Notes: (3) R_G value is the test condition's value for decision 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.
(4)Counter arm IGBT V_{GE}=±15V

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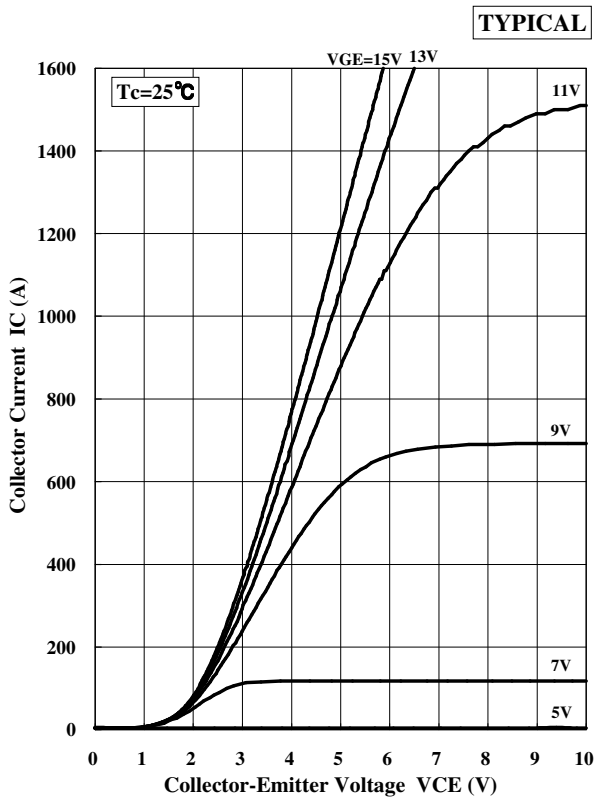
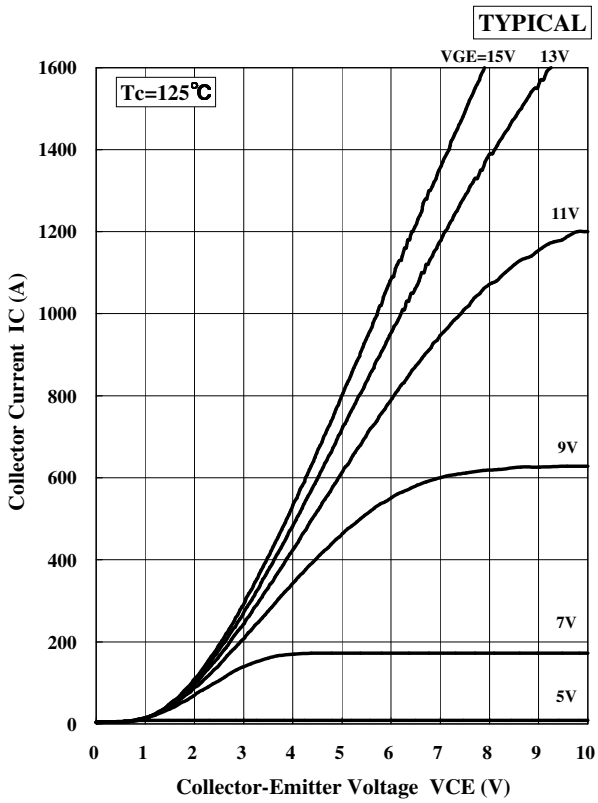
MBL800E33C

CHARACTERISTICS CURVE

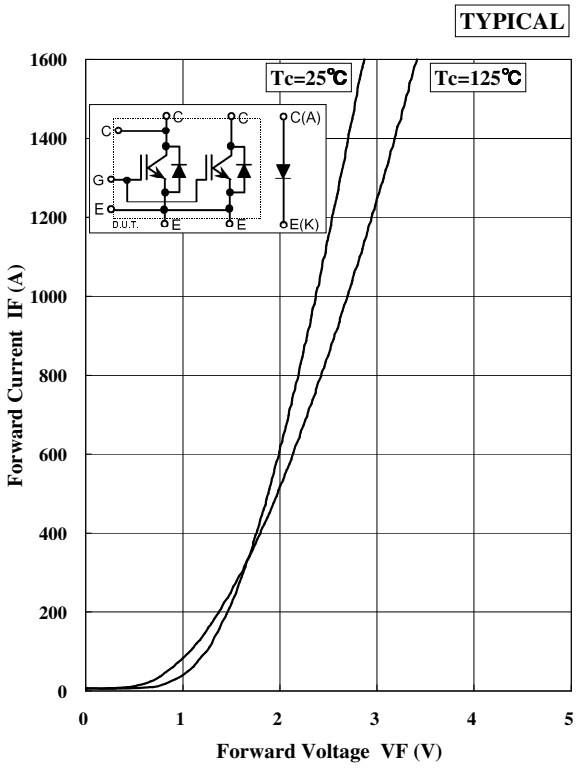
STATIC CHARACTERISTICS



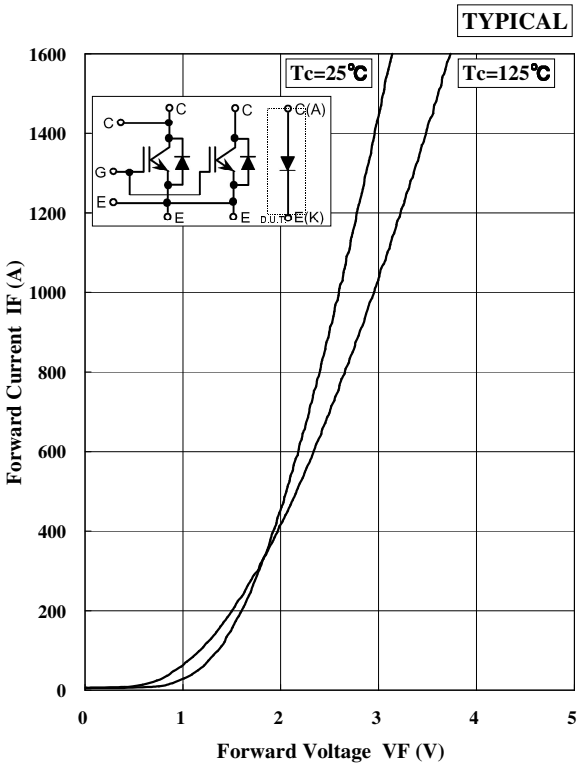
Collector Current vs.Collector to Emitter Voltage



Collector Current vs.Collector to Emitter Voltage



Forward Voltage of free-wheeling diode



Forward Voltage of diode

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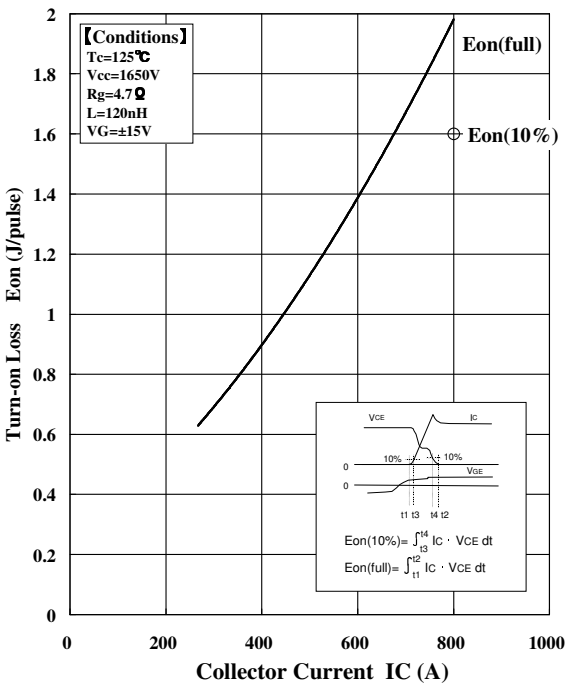
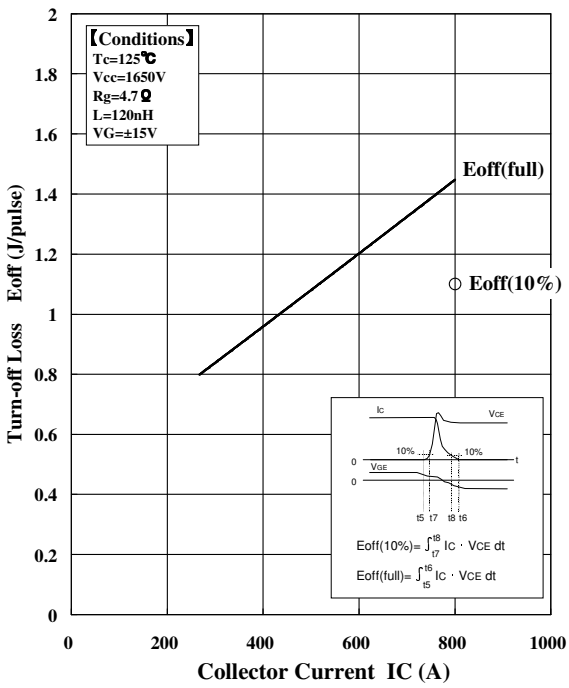
DEPENDENCE OF CURRENT

TYPICAL



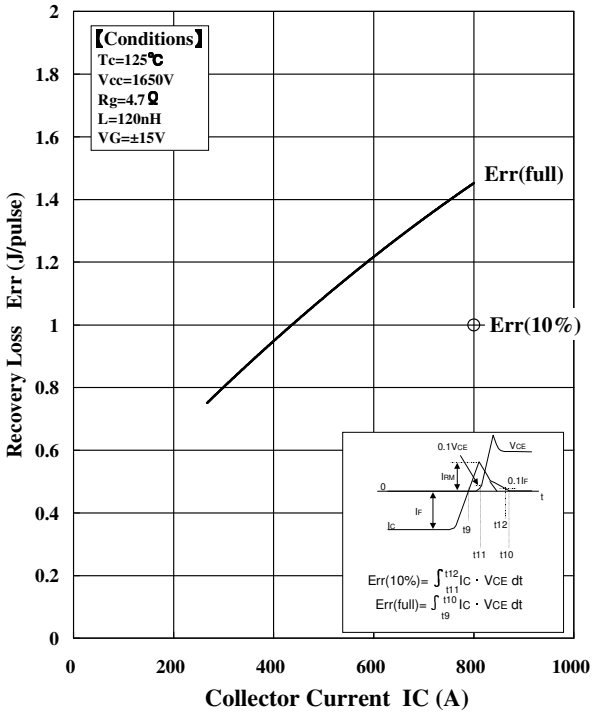
Turn-on Loss vs. Collector Current

TYPICAL



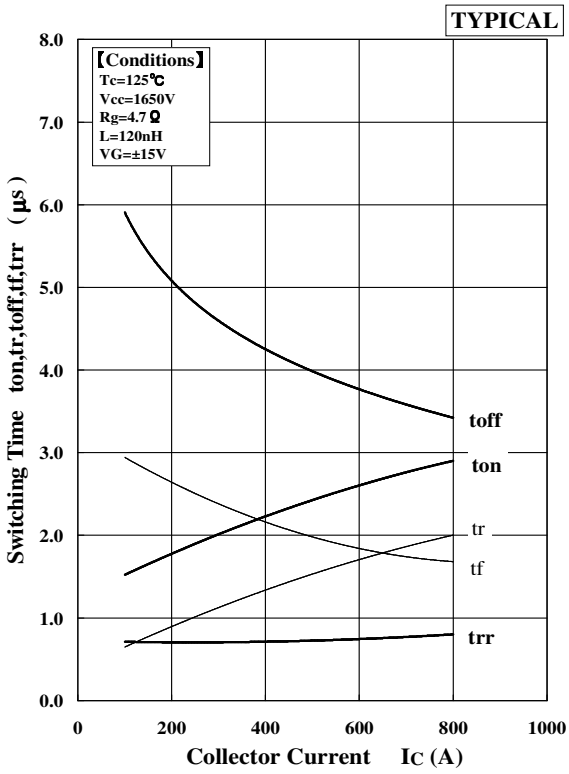
Turn-off Loss vs. Collector Current

TYPICAL



Recovery Loss vs. Collector Current

TYPICAL



Switching Time vs. Collector Current

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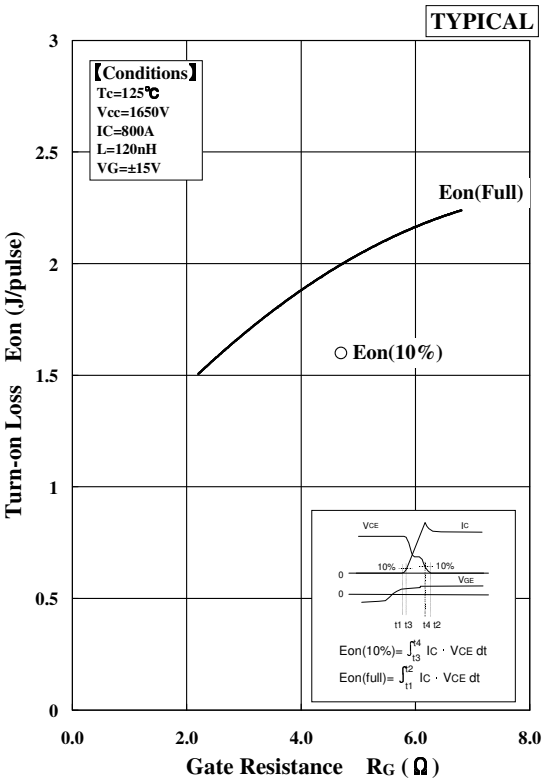
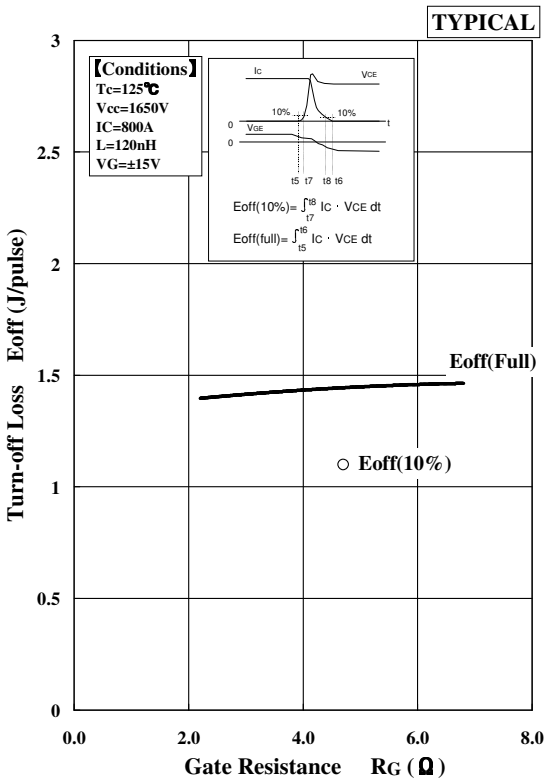
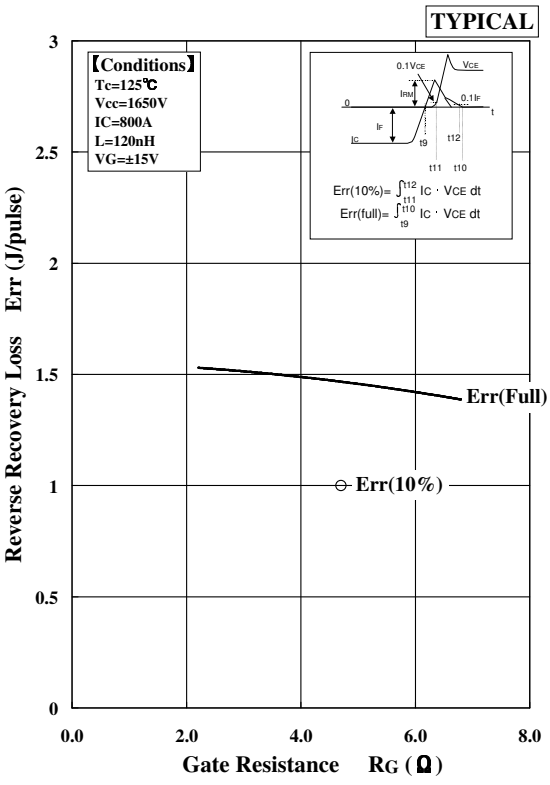
DEPENDENCE OF RG



Turn-on Loss vs. Gate Resistance



Turn-off Loss vs. Gate Resistance



Recovery Loss vs. Gate Resistance

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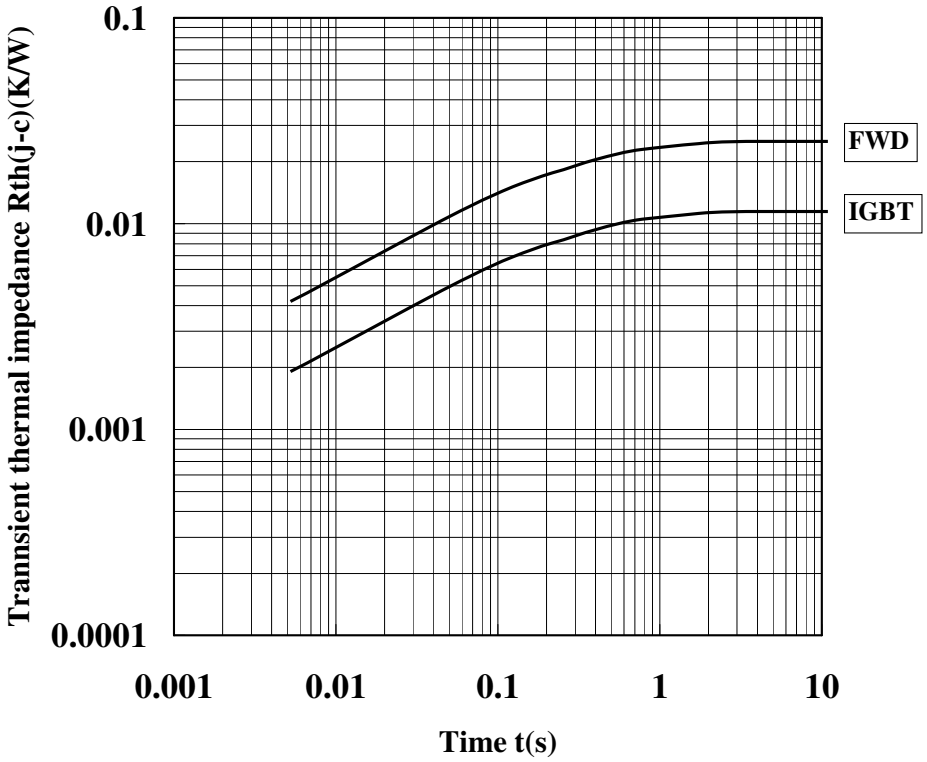
Thermal Impedance
TRANSIENT THERMAL IMPEDANCE



Transient Thermal Impedance Curve (Maximum Value)

HITACHI POWER SEMICONDUCTORS

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